WEST COMMUNITY ELEMENTARY SCHOOL (23-H)

16100 Persimmon Boulevard
Westlake, FL 33470
SDPBC Project No. 0222-8462

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School District of Palm Beach County

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NOVEMBER 2025

Phase III 100% Construction Document Submission
Bid Set for CM

Bid Set Note: Unedited District Master Specs included as noted in the Table of Contents for all non-revised sections to assist Construction Manager

TECHNICAL SPECIFICATIONS
VOLUME 1 - DIVISIONS 00-14

ZYSCOVICH
A Stratus Team Company

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Section Number	*Specification Title*	*Status*	*Version Date*	*Responsible Designer*	*Edited for This Project*	*Edited Sections Latest Revision*
DIVISION 0 - ADDITIONAL INFORMATION						
00 01 07	List of Professionals	Zyscovich	NA	Architectural		Nov-25
00 31 32	Geotechnical Report	Radise	NA	Geotech		Nov-25
DIVISION 0 - TOC						
00 01 02	Table of Contents	Master Spec	2023	Architectural	Yes	Nov-25
DIVISION 1- GENERAL CONDITIONS						
01 11 00	Summary of Work Contractor Conduct	Master Spec	2023	Architectural	Yes	Nov-25
01 23 00	Alternates	Zyscovich	NA	Architectural		Nov-25
01 26 00	Contract Modification Procedures	Master Spec	2023	Architectural		
01 29 76	Procedures for Payment	Master Spec	2023	Architectural		
01 31 00	Project Management & Coordination	Master Spec	2023	Architectural	Yes	Nov-25
01 32 17	Network Analysis Schedule	Master Spec	2023	Architectural		
01 33 00	Submittal Procedures	Master Spec	2023	Architectural	Yes	Nov-25
~~01 35 16~~	~~Alteration Project Procedures~~	~~Master Spec~~	~~2023~~	~~Architectural~~		
01 40 00	Quality Control	Master Spec	2023	Architectural		
01 41 00	Regulatory Requirements	Master Spec	2023	Architectural		
01 45 00	Testing Laboratory Services	Master Spec	2023	Architectural		
01 50 00	Temporary Construction Facilities	Master Spec	2023	Architectural		
01 56 00	Security Barriers & Enclosures	Master Spec	2023	Architectural		
01 57 00	Temporary Controls	Master Spec	2023	Architectural		
01 60 00	Material Equipment and Approved Equals	Master Spec	2023	Architectural		
01 72 29	Cutting and Patching	Master Spec	2023	Architectural		
01 75 00	Starting and Adjusting Systems	Master Spec	2023	Architectural		
01 77 00	Contract Closeout	Master Spec	2023	Architectural		
01 78 23	Operation and Maintenance Data	Master Spec	2023	Architectural		
01 78 36	Warranties	Master Spec	2023	Architectural		
01 83 16	Exterior Enclosure Performance Requirements	Zyscovich	NA	Architectural		Nov-25
01 91 00	Commissioning	Master Spec	2023	Architectural	Yes	Nov-25
DIVISION 2 - EXISTING CONDITIONS						
~~02 41 13~~	~~Selective Demolition~~	~~Master Spec~~	~~2023~~	~~Architectural~~		
~~02 41 16~~	~~Building Demolition~~	~~Master Spec~~	~~2023~~	~~Architectural~~		
DIVISION 3 - CONCRETE						
03 11 00	Concrete Formwork	Master Spec	2023	Structural		
03 20 00	Concrete Reinforcement	Master Spec	2023	Structural		
~~03 24 00~~	~~Fibrous Reinforcing~~	~~Master Spec~~	~~2023~~	~~Structural~~		
03 30 00	Cast-in-place Concrete	Master Spec	2023	Structural	Yes	Nov-25
03 30 06	Waterproofing Admixture for Cast-in-Place Concrete	Zyscovich	N/A	Architectural		Nov-25
03 35 00	Concrete Floor Finishing	Master Spec	2023	Structural	Yes	Nov-25
03 36 00	Polished Concrete Floor	Master Spec	2023	Structural	Yes	Nov-25
~~03 41 00~~	~~Structural Precast Concrete~~	~~Master Spec~~	~~2023~~	~~Structural~~		
03 45 00	Precast Architectural Concrete Elements	Zyscovich	N/A	Architectural		Nov-25
03 47 13	Tilt-up Concrete	Master Spec	2023	Structural	Yes	Nov-25
03 52 16	Lightweight Insulating Concrete	Master Spec	2023	Structural	Yes	Nov-25

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03 54 00	Self-Leveling Underlayment	Zyscovich	N/A	Architectural		Nov-25
DIVISION 4 - MASONRY						
04 05 13	Masonry, Mortar and Grout	Master Spec	2023	Structural		
04 20 00	Masonry Units	Master Spec	2023	Structural		
04 20 10	Reinforced Masonry Units	Master Spec	2023	Structural		
~~04 23 00~~	~~Glass Unit Masonry~~	~~Master Spec~~	~~2023~~	~~Structural~~		
DIVISION 5 - METALS						
05 12 00	Structural Steel	Master Spec	2023	Structural		
05 21 00	Steel Joists and Joist Girders	Master Spec	2023	Structural		
05 31 00	Steel Deck	Master Spec	2023	Structural		
05 40 00	Structural Cold Formed Metal Framing	Master Spec	2023	Structural		
05 50 00	Metal Fabrications	Master Spec	2023	Structural	Yes	Nov-25
05 51 00	Metal Stairs	Master Spec	2023	Structural	Yes	Nov-25
05 52 00	Metal Railings	Master Spec	2023	Structural	Yes	Nov-25
~~05 53 10~~	~~Metal Gratings and Floor Plates~~	~~Master Spec~~	~~2023~~	~~Structural~~		
DIVISION 6 - WOODS, PLASTICS & COMPOSITES						
06 10 00	Rough Carpentry	Master Spec	2023	Architectural		
06 41 00	Custom Casework	Master Spec	2023	Architectural	Yes	Nov-25
DIVISION 7 - THERMAL & MOISTURE PROTECTION						
~~07 01 00~~	~~Preparation For Re-Roofing~~	~~Master Spec~~	~~2023~~	~~Architectural~~		
~~07 01 50~~	~~Elastomeric Roof Repair and Restoration~~	~~Master Spec~~	~~2023~~	~~Architectural~~		
~~07 11 13~~	~~Bituminous Dampproofing~~	~~Master Spec~~	~~2023~~	~~Architectural~~		
07 13 00	Sheet Membrane Waterproofing	Master Spec	2023	Architectural	Yes	Nov-25
~~07 14 00~~	~~Fluid Applied Waterproofing~~	~~Master Spec~~	~~2023~~	~~Architectural~~		
07 18 00	Fluid Applied Waterproofing (Exposed)	Zyscovich	N/A	Architectural		Nov-25
07 19 00	Water Repellent Penetrant	Master Spec	2023	Architectural		
07 21 13	Polyisocyanorate Board Insulation	Master Spec	2023	Architectural		
~~07 21 14~~	~~Extruded Polystyrene Board Insulation~~	~~Master Spec~~	~~2023~~	~~Architectural~~		
07 21 16	Batt Insulation	Master Spec	2023	Architectural		
07 21 19	Foamed-in-Place Insulation	Master Spec	2023	Architectural		
07 26 00	Vapor Retarders	Master Spec	2023	Architectural	Yes	Nov-25
07 27 00	Air Barriers	Zyscovich	N/A	Architectural		Nov-25
~~07 31 13~~	~~Asphalt Shingles~~	~~Master Spec~~	~~2023~~	~~Architectural~~		
~~07 32 16~~	~~Concrete Roofing Tiles~~	~~Master Spec~~	~~2023~~	~~Architectural~~		
~~07 42 13~~	~~Metal Wall Panels~~	~~Master Spec~~	~~2023~~	~~Architectural~~		
07 4213.23	Metal Composite Material Wall Panels	Zyscovich	N/A	Architectural		Nov-25
07 52 00	Modified Bitumen Membrane Roofing	Master Spec	2023	Architectural	Yes	Nov-25
~~07 61 13~~	~~Metal Roof Panels~~	~~Master Spec~~	~~2023~~	~~Architectural~~		
07 62 00	Flashing, Gutters, Downspouts and Other Accessories	Master Spec	2023	Architectural	Yes	Nov-25
07 72 33	Roof Hatches	Master Spec	2023	Architectural	Yes	Nov-25
07 81 16	Cementitious Fireproofing	Master Spec	2023	Architectural		
07 84 00	Firestop System	Master Spec	2023	Architectural		
07 92 00	Joint Sealants	Master Spec	2023	Architectural		
07 95 13	Expansion Joint Cover Assemblies	Master Spec	2023	Architectural		

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DIVISION 8 - OPENINGS						
08 11 00	Metal Doors and Frames	Master Spec	2023	Architectural	Yes	Nov-25
08 14 00	Wood Doors	Master Spec	2023	Architectural		
08 31 00	Access Doors and Frames	Master Spec	2023	Architectural	Yes	Nov-25
08 33 13	Coiling Counter Doors	Master Spec	2023	Architectural	Yes	Nov-25
08 33 23	Overhead Coiling Doors	Master Spec	2023	Architectural	Yes	Nov-25
~~08 33 26~~	~~Overhead Coiling Grilles~~	~~Master Spec~~	~~2023~~	~~Architectural~~		
08 43 13	Aluminum-Framed Storefronts	Zyscovich	N/A	Architectural		Nov-25
08 51 13	Aluminum Windows	Master Spec	2023	Architectural	Yes	Nov-25
08 71 00	Door Hardware	Master Spec	2023	Architectural	Yes	Nov-25
08 71 00A	Door Hardware Groups	Allegion	N/A	Architectural		Nov-25
08 80 00	Glazing	Master Spec	2023	Architectural	Yes	Nov-25
08 91 19	Fixed Louvers	Master Spec	2023	Architectural	Yes	Nov-25
DIVISION 9 - FINISHES						
09 05 61	Common Work Results for Flooring Preparation	Zyscovich	N/A	Architectural		Nov-25
09 22 14	Metal Furring and Lathing	Master Spec	2023	Architectural	Yes	Nov-25
09 22 16	Non-Structural Metal Stud Framing	Master Spec	2023	Architectural	Yes	Nov-25
09 24 00	Portland Cement Plaster	Master Spec	2023	Architectural		
09 26 00	Veneer Plaster	Master Spec	2023	Architectural		
~~09 26 13~~	~~Gypsum Veneer Plaster~~	~~Master Spec~~	~~2023~~	~~Architectural~~		
09 29 00	Gypsum Board System	Master Spec	2023	Architectural	Yes	Nov-25
09 30 13	Ceramic ~~and Quarry~~ Tile	Master Spec	2023	Architectural	Yes	Nov-25
09 51 00	Acoustical Ceilings	Master Spec	2023	Architectural		
~~09 54 23~~	~~Linear Metal Ceiling~~	~~Master Spec~~	~~2023~~	~~Architectural~~		
~~09 64 00~~	~~Wood Flooring~~	~~Master Spec~~	~~2023~~	~~Architectural~~		
09 65 00	Resilient Flooring	Master Spec	2023	Architectural	Yes	Nov-25
09 67 00	Fluid Applied Epoxy Flooring	Master Spec	2023	Architectural		
~~09 68 13~~	~~Tile Carpet~~	~~Master Spec~~	~~2023~~	~~Architectural~~		
09 72 00	Wall Covering	Zyscovich	N/A	Architectural		Nov-25
09 84 33	Acoustical Wall and Ceiling Panels	Master Spec	2023	Architectural	Yes	Nov-25
09 91 13	Exterior Painting	Master Spec	2023	Architectural	Yes	Nov-25
09 91 23	Interior Painting	Master Spec	2023	Architectural	Yes	Nov-25
DIVISION 10 - SPECIALTIES						
10 11 00	Marker Boards and Tack Boards	Master Spec	2023	Architectural		
10 12 00	Display Cases	Master Spec	2023	Architectural	Yes	Nov-25
10 14 00	Signage	Master Spec	2023	Architectural	Yes	Nov-25
10 14 16	Plaque	Master Spec	2023	Architectural		
~~10 14 33~~	~~Exterior Marquee Sign~~	~~Master Spec~~	~~2023~~	~~Architectural~~		
10 14 63	Digital Exterior Marquee Sign	Master Spec	2023	Architectural		
10 21 00	Toilet Compartments	Master Spec	2023	Architectural		
10 21 23	Cubicle Curtains	Master Spec	2023	Architectural		
10 22 13	Wire Mesh Partitions	Master Spec	2023	Architectural		
~~10 22 26~~	~~Operable Partitions~~	~~Master Spec~~	~~2023~~	~~Architectural~~		
10 26 00	Door and Wall Protection	Master Spec	2023	Architectural	Yes	Nov-25
10 28 00	Toilet Accessories	Master Spec	2023	Architectural	Yes	Nov-25

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10 43 00	Emergency Aid Specialties	Zyscovich	N/A	Architectural		Nov-25
10 44 00	Fire Protection Specialties	Master Spec	2023	Architectural		
10 51 00	General Corridor Lockers	Master Spec	2023	Architectural		
~~10 51 10~~	~~Athletic Lockers~~	~~Master Spec~~	~~2023~~	~~Architectural~~		
10 56 13	Metal Shelving	Master Spec	2023	Architectural		
10 71 13.43	Fixed Sun Screens	Zyscovich	N/A	Architectural		Nov-25
10 73 26	Walkway Coverings	Master Spec	2023	Architectural	Yes	Nov-25
10 75 00	Flagpoles	Master Spec	2023	Architectural		
DIVISION 11 - EQUIPMENT						
~~11 13 13~~	~~Loading Dock Bumpers~~	~~Master Spec~~	~~2023~~	~~Architectural~~		
11 16 16	Safes	Master Spec	2023	Architectural		
11 31 00	Residential Appliances	Master Spec	2023	Architectural	Yes	Nov-25
11 40 00	Food Service Equipment	Real Food	N/A	Food Service		Nov-25
~~11 51 23~~	~~Library Stack Systems~~	~~Master Spec~~	~~2023~~	~~Architectural~~		
11 52 13	Projection Screens	Master Spec	2023	Architectural		
11 57 00	Wire Management - Cord Reels	Zyscovich	N/A	Architectural		Nov-25
11 61 53	Stage Curtains	Master Spec	2023	Architectural		
11 65 00	Athletic Equipment	Master Spec	2023	Architectural	Yes	Nov-25
~~11 66 53~~	~~Gymnasium Dividers~~	~~Master Spec~~	~~2023~~	~~Architectural~~		
11 95 05	Kilns	Master Spec	2023	Architectural	Yes	Nov-25
DIVISION 12 - FURNISHINGS						
~~12 21 16~~	~~Vertical Louver Blinds~~	~~Master Spec~~	~~2023~~	~~Architectural~~		
12 24 13	Roller Window Shades	Master Spec	2023	Architectural		
~~12 35 53~~	~~Laboratory Casework & Equipment~~	~~Master Spec~~	~~2023~~	~~Architectural~~		
12 48 13	Entrance Floor Mats	Master Spec	2023	Architectural	Yes	Nov-25
~~12 61 00~~	~~Fixed Auditorium Seating~~	~~Master Spec~~	~~2023~~	~~Architectural~~		
~~12 66 00~~	~~Telescoping Bleachers~~	~~Master Spec~~	~~2023~~	~~Architectural~~		
DIVISION 13 - SPECIAL CONSTRUCTION						
13 31 00	Playground Shade Structure	Master Spec	2023	Architectural		
~~13 34 00~~	~~Fabricated Engineered Structures~~	~~Master Spec~~	~~2023~~	~~Architectural~~		
~~13 34 16.01~~	~~Home Side Grandstand Seating System~~	~~Master Spec~~	~~2023~~	~~Architectural~~		
~~13 34 16.02~~	~~Visitor Side Aluminum Seating System~~	~~Master Spec~~	~~2023~~	~~Architectural~~		
~~13 34 16.03~~	~~Modular Press Box~~	~~Master Spec~~	~~2023~~	~~Architectural~~		
~~13 34 16.04~~	~~Portable Exterior Bleachers~~	~~Master Spec~~	~~2023~~	~~Architectural~~		
~~13 60 00~~	~~Spray Painting Booth~~	~~Master Spec~~	~~2023~~	~~Architectural~~		
DIVISION 14 - CONVEYING EQUIPMENT						
~~14 21 00~~	~~Electric Traction Elevators~~	~~Master Spec~~	~~2023~~	~~Architectural~~		
14 24 23	Hydraulic Elevators - Passenger	Master Spec	2023	Architectural	Yes	Nov-25
~~14 42 13~~	~~Wheelchair Lift~~	~~Master Spec~~	~~2023~~	~~Architectural~~		
~~14 45 00~~	~~Automobile Lift System~~	~~Master Spec~~	~~2023~~	~~Architectural~~		
DIVISION 21 - FIRE SUPPRESSION						
21 00 00	Fire Suppression	Master Spec	2023	Mechanical	Yes	Nov-25

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DIVISION 22 - PLUMBING						
22 05 00	Basic Plumbing Requirements	Master Spec	2023	Mechanical		
~~22 05 10~~	~~Minor Plumbing Demolition~~	~~Master Spec~~	~~2023~~	~~Mechanical~~		
22 05 29	Hangers and Supports Plumbing Piping	Master Spec	2023	Mechanical		
22 05 53	Identification for Plumbing, Piping and Equipment	Master Spec	2023	Mechanical		
22 05 93	Tests - Plumbing Piping Systems	Master Spec	2023	Mechanical		
22 07 19	Plumbing Piping Insulation	Master Spec	2023	Mechanical		
22 10 00	Plumbing Piping	Master Spec	2023	Mechanical		
22 11 00	Facility Water Distribution	Master Spec	2023	Mechanical		
22 13 00	Facility Sanitary Drainage	Master Spec	2023	Mechanical		
22 14 00	Facility Storm Drainage	Master Spec	2023	Mechanical		
22 20 00	Plumbing Specialties	Master Spec	2023	Mechanical		
22 30 00	Plumbing Equipment	Master Spec	2023	Mechanical		
22 40 00	Plumbing Fixtures	Master Spec	2023	Mechanical		
DIVISION 23 - HEATING, VENTILATION & AIR CONDITIONING						
23 05 00	Basic HVAC Requirements	Master Spec	2023	Mechanical		
~~23 05 10~~	~~Minor HVAC Demolition~~	~~Master Spec~~	~~2023~~	~~Mechanical~~		
23 05 13	Motor Requirements for HVAC	Master Spec	2023	Mechanical		
23 05 19	Meters, Gages and Thermometers for HVAC Piping	Master Spec	2023	Mechanical		
23 05 29	Curbs, Hangers and Supports for HVAC Piping	Master Spec	2023	Mechanical		
23 05 48	HVAC Vibration Control	Master Spec	2023	Mechanical		
23 05 53	Identification for HVAC Piping & Equipment	Master Spec	2023	Mechanical		
23 05 83	Tests - HVAC Piping Systems	Master Spec	2023	Mechanical		
23 05 93	HVAC Testing, Adjusting & Balancing	Master Spec	2023	Mechanical	Yes	Nov-25
23 07 13	Ductwork Insulation	Master Spec	2023	Mechanical	Yes	Nov-25
23 07 16	HVAC Equipment Insulation	Master Spec	2023	Mechanical		
23 07 19	HVAC Piping Insulation	Master Spec	2023	Mechanical		
23 08 00	Commissioning of HVAC Systems	Master Spec	2023	Mechanical		
23 09 00	Energy Management and Control System	Master Spec	2023	Mechanical		
23 21 13	Hydronic Piping	Master Spec	2023	Mechanical		
23 21 16	Hydronic Specialties	Master Spec	2023	Mechanical		
23 21 23	Hydronic Pumps	Master Spec	2023	Mechanical		
23 23 00	Refrigeration Piping	Master Spec	2023	Mechanical		
23 25 00	HVAC Water Treatment	Master Spec	2023	Mechanical		
23 29 23	Variable Frequency Motor Controls	Master Spec	2023	Mechanical		
23 31 00	Ductwork	Master Spec	2023	Mechanical		
23 33 00	Air Duct Accessories	Master Spec	2023	Mechanical		
23 34 23	HVAC Power Ventilators	Master Spec	2023	Mechanical		
23 36 16	Variable Air Volume Units	Master Spec	2023	Mechanical		
23 37 13	Grilles, Registers & Diffusers	Master Spec	2023	Mechanical		
23 40 00	HVAC Air Filters	Master Spec	2023	Mechanical		
23 63 13	Air Cooled Refrigerant Condensers	Master Spec	2023	Mechanical		
~~23 64 10~~	~~Air Cooled Water Chillers~~	~~Master Spec~~	~~2023~~	~~Mechanical~~		
23 64 16	Centrifugal Water Chillers	Master Spec	2023	Mechanical		
~~23 64 26~~	~~Rotary Screw Water Chillers~~	~~Master Spec~~	~~2023~~	~~Mechanical~~		
23 65 00	Cooling Tower	Master Spec	2023	Mechanical		
23 70 00	Air Handling Units	Master Spec	2023	Mechanical		

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23 81 00	Decentralized HVAC Equipment	Master Spec	2023	Mechanical		
23 82 19	Electric Resistance Duct Heaters	Master Spec	2023	Mechanical		
DIVISION 25 - INTEGRATED AUTOMATION						
25 50 00	Energy Mangement and Control System	Master Spec	2023	Electrical		
DIVISION 26 - ELECTRICAL						
26 00 00	Electrical Requirements	Master Spec	2023	Electrical		
26 05 00	Electrical Materials and Methods	Master Spec	2023	Electrical		
26 05 13	Electrical Wire and Cable	Master Spec	2023	Electrical		
26 05 19	Equipment Wiring Systems	Master Spec	2023	Electrical		
26 05 26	Grounding and Bonding of Electrical Systems	Master Spec	2023	Electrical		
26 05 29	Hangers and Supports for Electrical Systems	Master Spec	2023	Electrical		
26 05 33	Electrical Raceways and Boxes	Master Spec	2023	Electrical		
26 05 36	Cable Tray	Master Spec	2023	Electrical		
~~26 05 40~~	~~Electrical Connections of Relocatable Classrooms~~	~~Master Spec~~	~~2023~~	~~Electrical~~		
26 05 53	Electrical Identification	Master Spec	2023	Electrical		
26 08 00	Work Included	Master Spec	2023	Electrical		
26 09 00	Electrical Instrumentation & Control	Master Spec	2023	Electrical		
26 10 00	Electrical Utility Services	Master Spec	2023	Electrical		
26 22 10	Dry Type Transformers	Master Spec	2023	Electrical		
26 23 10	Disconnect Switches	Master Spec	2023	Electrical		
26 24 13	Switchboards	Master Spec	2023	Electrical		
26 24 16	Panelboards	Master Spec	2023	Electrical		
26 27 16	Electrical Cabinets and Enclosures	Master Spec	2023	Electrical		
26 27 23	Indoor Service Poles	Master Spec	2023	Electrical		
26 27 26	Wiring Devices	Master Spec	2023	Electrical		
26 28 13	Fuses (600 Volt & Below)	Master Spec	2023	Electrical		
26 28 16	Enclosed Switches and Circuit Breakers	Master Spec	2023	Electrical		
26 28 39	Motor Control	Master Spec	2023	Electrical		
26 29 10	Electric Controls and Relays	Master Spec	2023	Electrical		
26 35 13	Gas Engine Drive Generator Assembly	Master Spec	2023	Electrical		
26 36 00	Transfer Switches	Master Spec	2023	Electrical		
26 41 00	Lightning Protection for Structures	Master Spec	2023	Electrical		
26 43 00	Transient Voltage Suppression	Master Spec	2023	Electrical		
26 51 00	Interior Lighting	Master Spec	2023	Electrical		
26 52 00	Emergency Lighting	Master Spec	2023	Electrical		
26 55 61	Theatrical Lighting	Master Spec	2023	Electrical		
26 56 29	Exterior Lighting	Master Spec	2023	Electrical		
26 58 68	Exterior Athletic Lighting	Master Spec	2023	Electrical		
DIVISION 27 - COMMUNICATIONS						
27 10 00	Communication System (Data & Voice)	Master Spec	2023	Electrical		
27 24 10	Projector System	Master Spec	2023	Electrical		
27 41 00	Master Television System (MTS)	Master Spec	2023	Electrical		
27 51 16	Public Address Systems	Master Spec	2023	Electrical		
~~27 51 23~~	~~Intercom Systems (Existing Schools)~~	~~Master Spec~~	~~2023~~	~~Electrical~~		
27 51 24	Intercom Systems (New and Modernized Schools)	Master Spec	2023	Electrical		

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27 53 10	Emergency Radio Communications Systems	Master Spec	2023	Electrical		
27 53 11	Facility Radio Repeater Systems	Master Spec	2023	Electrical		
27 53 13	GPS Wireless Clock Systems	Master Spec	2023	Electrical		
27 60 00	Open Wiring	Master Spec	2023	Electrical		
DIVISION 28 - ELECTRONIC SAFETY AND SECURITY						
28 13 00	Access Control	Master Spec	2023	Electrical		
28 16 00	Intrusion Detection	Master Spec	2023	Electrical		
28 31 00	Fire Alarm and Smoke Detection Systems	Master Spec	2023	Electrical		
28 33 00	Video Surveillance System	Master Spec	2023	Electrical		
DIVISION 31 - EARTH WORK						
31 10 00	Site Clearing	Master Spec	2023	Civil		
31 20 00	Earth Moving	Master Spec	2023	Civil		
31 31 16	Termite Control	Master Spec	2023	Architectural		
DIVISION 32 - EXTERIOR IMPROVEMENTS						
32 12 16	Asphalt Paving	Master Spec	2023	Civil		
32 13 13	Concrete Paving	Master Spec	2023	Civil		
~~32 13 13.29~~	~~Pervious Concrete Pavement~~	~~Master Spec~~	~~2023~~	~~Civil~~		
~~32 14 13.19~~	~~Permeable Interlocking Concrete Pavement~~	~~Master Spec~~	~~2023~~	~~Civil~~		
32 17 13	Parking Bumpers	Master Spec	2023	Civil		
32 17 23	Pavement Marking	Master Spec	2023	Civil		
32 18 16	Playgrounds	Master Spec	2023	Architectural		
~~32 18 23~~	~~Athletic Surfacing~~	~~Master Spec~~	~~2023~~	~~Civil~~		
32 30 00	Exterior Athletic Equipment & Field Markings	Master Spec	2023	Architectural	Yes	Nov-25
32 31 13	Chain Link Fencing and Gates	Master Spec	2023	Architectural		
32 31 19	Decorative Metal Fencing & Gates	Master Spec	2023	Architectural		
32 33 13	Site Bicycle Racks	Zyscovich	N/A	Architectural		Nov-25
32 84 23	Underground Irrigation System	Master Spec	2023	Landscape		
32 92 23	Sodding	Master Spec	2023	Landscape		
32 93 00	Trees, Plants & Ground Cover	Master Spec	2023	Landscape		
DIVISION 33 - UTILITIES						
33 11 00	Water Distribution System	Master Spec	2023	Civil		
~~33 21 16~~	~~Irrigation Water Well~~	~~Master Spec~~	~~2023~~	~~Landscape~~		
33 30 00	Sanitary Sewerage Utilities	Master Spec	2023	Civil		
33 32 19	Waste Water Pump Station	Master Spec	2023	Civil		
33 40 00	Storm Drainage Utilities	Master Spec	2023	Civil		
~~33 49 23~~	~~Cistern Systems~~	~~Master Spec~~	~~2023~~	~~Architectural~~		
35 51 13	Gas Piping	Master Spec	2023	Civil		
33 56 16	Underground LP Storage & Distribution	Master Spec	2023	Civil		
33 71 19	Electrical Utility Manholes	Master Spec	2023	Civil		

END TOC

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NOTE: Refer to SDPBC on-line Master Specifications as noted in the Table of Contents (TOC) for all non-revised sections. These sections are included by reference and the Contractor shall be solely responsible for obtaining the specifcation version listed in the TOC.

SECTION 00 01 02 - TABLE OF CONTENTS

Section Number	*Specification Title*	*Status*	*Version Date*	*Responsible Designer*	*Edited for This Project*	*Edited Sections Latest Revision*
Digital Signature Section						

Firm:
Name:

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SECTION 00 01 07
LIST OF PROFESSIONALS

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SECTION 00 31 32

GEOTECHNICAL REPORT

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Geotechnical Engineering Services Report from RADISE International, L.C.; RADISE Project No. 02-25-092, dated November 18, 2025, for School District of Palm Beach County, Riviera Beach, FL.

B. Report, maps and boring logs as follows this document.

Note: Geotechnical report as provided by the Owner is included by Architect for reference only. Zyscovich Architects is not responsible for the content or accuracy of these documents.

END OF SECTION

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SEE GEOTECHNICAL REPORT FOLLOWING

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November 18, 2025

School District of Palm Beach County
3661 Interstate Park Rd N,
Riviera Beach, FL 33404

Attention: Mr. James Farrell
Phone: 561-882-1983
Email: james.farrell@palmbeachschools.org

RE: Geotechnical Engineering Services Report
West Community Elementary School
Palm Beach County, Florida
RADISE Project No.: 02-25-092

Dear Mr. Farrell,

RADISE International, L.C. (RADISE) is pleased to submit this *Geoechnical Engineering Services Report* for the above-mentioned project. The services were performed in accordance with our proposal dated August 13, 2025, and in compliance with Purchase Order Number 2026008178 dated September 10, 2025.

This report presents the results of our field exploration, laboratory testing, and recommendations regarding geotechnical aspects of the proposed project. We appreciate the opportunity to be of service to the School District of Palm Beach County for this project. Please let us know if you have any questions concerning the content of this report of if we can be of further services.

Respectfully Submitted,

RADISE International, L.C.
Florida Certificate of Authorization No.8901

Vamshi Vemula, State of Florida, Professional Engineer, License No. 93711. This document has been digitally signed and sealed by Vamshi Vemula, P.E. on the date indicated here.

Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

Nitesh Goli, P.E., PMP, ENV SP
Project Engineer

Vamshi Vemula, P.E.
Senior Project Engineer
Florida Registration No. 93711

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Sheet 2: Boring Location Plan
Sheets 3A through 3I: Subsurface Profiles
Table A-1: Summary of Laboratory Test Results
Table A-2: Summary of Exfiltration Test Results
Limerock Bearing Ratio Results

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1.0 INTRODUCTION

This report has been prepared for the School District of Palm Beach County in an effort to assist in the design and construction of the new West Community Elementary School project in Westlake, Palm Beach County, Florida.

The primary purpose of the geotechnical exploration was to determine the stratigraphy and physical properties of the soil and rock conditions encountered underlying the site and to provide recommendations for various foundation elements and construction considerations for the project. This report presents the geotechnical subsurface exploration data, groundwater information, laboratory test data, geotechnical engineering analyses and recommendations for the design and construction of the proposed project.

The analysis and discussions presented in this report are primarily based on our interpretation of the subsurface information disclosed by the test borings and results of the laboratory testing. It should be noted that this report does not reflect extrapolations or variations in subsurface conditions beyond the boundaries of the borings. Variations in soil and groundwater conditions should be expected and the nature and extent of which might not become evident until construction is undertaken. If variations are encountered and/or the scope of the project altered, we should be consulted for additional recommendations.

2.0 PROJECT DESCRIPTION

We understand that multiple new structures are proposed at the project site, and we have not been provided with any specific structural information; nevertheless, we anticipate that the proposed structures will consist of 3-story concrete masonry buildings. For construction of this type, we expect maximum wall loads on the order of 10 kips per lineal foot and maximum column loads in the order of 120 kips. We expect that the top of the floor slab will be 1 to 2 feet above existing ground surface. The project site is located at the general location shown on the attached ***Vicinity Map***, Sheet 1.

3.0 SCOPE OF SERVICES

The purpose of this Geotechnical Engineering task was to perform a subsurface exploration within the premises of the project site to determine the engineering characteristics of the subsurface soils, including strength and load carrying capacity that are vital in supporting the imposed structural elements. More specifically, the scope of services for this task included the following:

- Development of the anticipated subsurface profile and conditions within the depth and area of influence of the proposed structures.
- Identification of important design recommendations and construction considerations based on the soil and groundwater conditions encountered in the borings.
- Assess site preparation and geotechnical construction requirements and engineering

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criteria for placement and compaction of approved fill materials.

RADISE performed the following services in accordance with the proposed scope of work:

1. Visited the project site to observe existing site conditions and field mark the planned boring and test locations.

2. Contacted Sunshine 811 as per Florida Statutes, to request identification of the field locations of underground utilities in the area of the proposed boring and test locations, and coordinated the clearance of underground utilities at these locations.

3. Mobilized a truck-mounted drilling rig and testing equipment to the project site.

4. Drilled twelve (12) Standard Penetration Test (SPT) borings to depths of 50 feet below the existing ground surface for structure investigation purposes, in accordance with the procedures recommended in ASTM D1586. Following completion of the testing, the boreholes were backfilled with a neat cement/bentonite grout.

5. Performed eight (8) Auger borings to depths of 10 feet within the proposed parking areas in accordance with the procedures recommended in ASTM D1452. Following completion of the testing, the boreholes were backfilled with soil cuttings.

6. Performed four (4) percolation tests to a depth of 10 feet below the ground surface in accordance with the usual open-hole exfiltration test method described in the South Florida Water Management District (SFWMD) Permit Information Manual, Volume IV. Following completion of the testing, the test locations were backfilled with a neat cement/bentonite grout.

7. Collected one (1) bulk sample of the existing subgrade materials for the performance of a Lime-rock Bearing Ratio (LBR).

8. The borings and tests were performed at the locations that were confirmed by the AE Team.

9. Visually classified the collected soil samples using the Unified Soil Classification System (USCS) in general accordance with the visual-manual method of ASTM D2488.

10. Performed a laboratory testing program to identify soil index properties and assist in the final classification of the soils for engineering purposes (ASTM D2487).

11. Performed necessary engineering analyses.

12. Prepared this geotechnical report to summarize the field exploration and laboratory testing results, present geotechnical design and construction recommendations, and considerations

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for the proposed work.

4.0 FIELD EXPLORATION

RADISE Representatives visited the project site prior to the drilling commencement to observe the site conditions and mark the locations of the required soil borings and field test locations. Sunshine 811 was then contacted for field location of underground utilities in the area of the borings and test locations as per Florida Statutes. The borings and test locations were determined in the field by RADISE after the underground utility locations were determined. The locations are depicted on the attached ***Boring Location Plan,*** Sheet 2.

4.1 SPT BORINGS

Twelve (12) SPT borings were performed in September and October of 2025. SPT boring location and depth information is summarized in Table 1 below.

Table 1 – Summary of SPT Borings

Boring Number	Boring Location		Boring Depth (feet)
	Longitude (deg)	Latitude (deg)	
B-1	-80.2984	26.7500	50
B-2	-80.2984	26.7503	50
B-3	-80.2980	26.7501	50
B-4	-80.2977	26.7499	50
B-5	-80.2973	26.7497	50
B-6	-80.2969	26.7497	50
B-7	-80.2970	26.7500	50
B-8	-80.2975	26.7502	50
B-9	-80.2979	26.7505	50
B-10	-80.2984	26.7506	50
B-11	-80.2978	26.7502	50
B-12	-80.2973	26.7500	50

The approximate locations of the SPT borings are depicted on the attached ***Boring Location Plan***, Sheet 2.

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The SPT borings were performed in general accordance with ASTM D1586, "*Standard Test Method for Standard Penetration Test and Split-Barrel Sampling of Soils*". The SPT borings were drilled using a CME 45 truck-mounted drilling rig equipped with an automatic hammer. The SPT boring samples of the in-place materials were obtained at frequent vertical intervals using a standard split-barrel sampler driven with a 140-pound hammer freely falling 30 inches. After seating the SPT sampler 6 inches, the number of successive blows required to drive the sampler an additional 12 inches in the soil constitutes the SPT test result, commonly referred to as the SPT N-value. Continuous SPT's were performed to a depth of 10 feet and at 5 feet depth intervals thereafter to the termination depths. The field SPT "N"-values should be corrected for hammer efficiency in accordance with the recommended relationship presented in the FDOT Soils and Foundations Handbook (Nsafety = 1.24*Nautomatic). The N-value has been empirically correlated with various soil properties and is considered to be indicative of the denseness of cohesionless soils and the consistency of cohesive soils.

Soil samples recovered from the drilling operations were visually classified in the field in general accordance with ASTM D2488, "*Standard Practice for Description and Identification of Soils"* (Visual-Manual Procedure) using the Unified Soil Classification System (USCS). The samples were then placed in moisture-proof containers and transported to the RADISE laboratory.

The depth at which groundwater was encountered was measured within the borings at the time of drilling. Following the completion of the field drilling and testing activities, the boreholes were backfilled with a neat cement grout.

4.2 AUGER BORINGS

Eight (8) auger borings, each to a depth of 10 feet, were performed below the existing ground surface. Auger boring location and depth information is summarized in Table 2 below.

Table 2 – Summary of Auger Borings

Boring Number	Longitude	Latitude	Depth (feet)
AB-1	-80.2984	26.7512	10
AB-2	-80.2977	26.7507	10
AB-3	-80.2966	26.7500	10
AB-4	-80.2968	26.7493	10
AB-5	-80.2974	26.7495	10
AB-6	-80.2983	26.7496	10
AB-7	-80.2990	26.7497	10
AB-8	-80.2989	26.7505	10

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The auger borings were drilled using a CME 45 drilling rig in general accordance with ASTM D1452, *"Standard Practice for Soil Exploration and Sampling by Auger Borings"*. Grab samples of in-place materials were obtained at frequent vertical depth intervals in the auger borings.

Soil samples recovered from the borings were visually classified in the field in general accordance with ASTM D2488, *"Standard Practice for Description and Identification of Soils"* (Visual Manual Procedure) using the Unified Soil Classification System (USCS). The samples were then placed in moisture-proof containers and transported to the RADISE laboratory.

The depth at which groundwater was encountered was measured within the borings at the time of drilling. Following the completion of the field drilling activities, the boreholes were backfilled with soil cuttings.

4.3 EXFILTRATION TESTS

Four (4) open-hole exfiltration tests were performed to evaluate the hydraulic conductivity of the subsurface soils. The tests were performed in accordance with the South Florida Water Management District (SFWMD) procedures. The tests were performed in a 10-feet deep augered boreholes.

Table 3 – Summary of Exfiltration Test Locations

Boring Number	Longitude	Latitude	Depth (feet)
EX-1	-80.2990	26.7500	10
EX-2	-80.2987	26.7507	10
EX-3	-80.2973	26.7505	10
EX-4	-80.2966	26.7495	10

4.4 LIMEROCK BEARING RATIO

One (1) bulk sample, LBR-1, was obtained and tested to quantify and provide accurate Limerock Bearing Ratio (LBR) values. The sample was obtained from 1 to 2 feet below the existing grade. The approximate test location is depicted on the attached ***Boring Location Plan***, Sheet 2. The results of the LBR tests are presented on the attached ***Limerock Bearing Ratio Results***.

4.5 GROUNDWATER LEVEL MEASUREMENTS

After completion of the borings and after a short stabilization period, the depth to the groundwater was measured and recorded. The groundwater information is plotted adjacent to the soil profiles on the attached ***Subsurface Profiles***, Sheets 3A through 3I.

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5.0 LABORATORY TESTING

5.1 GENERAL

Representative soils samples collected from the soil borings were visually reviewed in the laboratory by a geotechnical engineer to confirm field classifications. The samples were classified in general accordance with the Unified Soil Classification System (ASTM D2488). The classifications were based on visual observations supplemented by laboratory test results performed on selected soil samples. Laboratory index tests consisting of natural moisture content, percent of material passing through a No. 200 sieve and organic content tests were performed on selected samples.

5.2 RESULTS OF LABORATORY TESTING

The following list summarizes the laboratory tests performed by type and ASTM Designation.

- Thirty-three (33), Moisture content tests (ASTM D2216)
- Thirty-three (33), Percent of material passing through a No. 200 sieve (ASTM D1140)
- Seven (7), Organic content tests (ASTM D2974)

A summary of laboratory index testing results is presented on the attached, Table A-1: ***Summary of Laboratory Test Results*** and on the ***Subsurface Profiles***, Sheets 3A through 3I.

5.3 LIMEROCK BEARING RATIO TESTING

LBR testing was performed in our laboratory on one (1) bulk sample obtained at LBR-1. The bulk sample was collected from approximately 1 to 2 feet below the existing ground surface. The LBR of the bulk sample was tested by Florida Method 5-515. The results of the LBR testing are summarized below in Table 4 and presented on the attached ***Limerock Bearing Ratio Results***.

Table 4 – LBR Results

LBR No.	LBR Value
LBR-1	40

6.0 SUMMARY OF SUBSURFACE CONDITIONS

6.1 SUBSURFACE CONDITIONS

Stratification of the explored soils is based on visual examination of the recovered soil samples, laboratory classification, index property testing, and interpretation of the field boring logs by a geotechnical engineer in accordance with the Unified Soil Classification System (USCS). The

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subsurface profiles showing the soil stratifications at the boring locations are presented in the attached ***Subsurface Profiles***, Sheets 3A through 3I.

Stratification lines represent approximate boundaries between soil types, but the actual transition between layers may be gradual or abrupt. Additionally, soil and groundwater conditions will vary between boring locations.

A generalized stratigraphy of the subsurface deposits was developed based on the information obtained from field exploration and our laboratory testing programs. The soils encountered in the borings generally consist of the types described in Table 5 below:

Table 5 – Generalized Soil Layers

Stratum No.	Soil Description	USCS Soil Classification	Boring No.
1	Light brown to brown, light to dark gray, fine sand, trace to with silt, and occasionally trace to with shells and limerock fragments.	SP/SP-SM	All
2	Brown to dark brown, gray to dark gray, black, silty sand, occasionally trace organics, trace to with shells and limestone fragments.	SM	All
3	Light brown, sandy limestone, occasionally trace to with shell fragments	-	B-1 to B-8, B-10, AB-4 to AB-6
4	Brown, fine, shelly sand, trace to with silt and trace limestone fragments	SP/SP-SM	B-4, B-5, B-8 to B-12
5	Brown to black, silty sand, with organics	SM-PT	EX-2

6.2 GROUNDWATER

After a short stabilization period, the depth to the groundwater was measured below the existing ground surface at each boring and test locations, which are plotted adjacent to the soil profiles on the attached ***Subsurface Profiles*****,** Sheets 3A through 3I. The depth of the encountered groundwater table was approximately between 4.0 and 4.5 feet below the existing ground surface. Groundwater levels will fluctuate with the seasons and variations of precipitation. Groundwater levels are also expected to be influenced by drainage systems for the adjacent properties in the area.

6.3 EXFILTRATION TESTS

Four (4) Exfiltration Tests, EX-1 to EX-4, were performed to evaluate the hydraulic conductivity of the subsurface soils within the project area. The approximate location of the tests is depicted on

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Boring Location Plan, Sheet 2. The exfiltration test was performed in general accordance with the usual open-hole exfiltration test method described in the SFWMD Permit Information Manual, Volume IV procedures in a 10 feet deep borehole. The result of the exfiltration test is presented in Table A-2: ***Summary of Exfiltration Test Results***, and in the following Table 6.

Table 6 – Exfiltration Test Results

Test ID	Test Depth (ft.)	Soil Profile	Hydraulic Conductivity (cfs/sf –ft.)
EX-1	10	0.0 to 2.0 ft. – Light brown, fine sand, trace silt (SP) 2.0 to 4.0 ft. – Dark gray, fine sand with silt, trace limerock (SP-SM) 4.0 to 6.0 ft. – Brown to black, silty sand, trace organics (SM) 6.0 to 10.0 ft. – Brown, silty sand with limestone (SM)	3.52×10^{-5}
EX-2	10	0.0 to 2.0 ft. – Light brown, fine sand, trace silt (SP) 2.0 to 4.0 ft. – Dark gray, fine sand with silt, trace limerock (SP-SM) 4.0 to 6.0 ft. – Brown to black, silty sand, with organics (SM-PT) 6.0 to 10.0 ft. – Brown, silty sand, trace shell fragments (SM)	2.88×10^{-5}
EX-3	10	0.0 to 2.0 ft. – Light brown, fine sand, trace silt (SP) 2.0 to 4.0 ft. – Dark gray, fine sand with silt, trace limerock (SP-SM) 4.0 to 6.0 ft. – Brown, silty sand, trace shell fragments (SM) 6.0 to 10.0 ft. – Brown, fine sand with silt, trace shell fragments (SP-SM)	3.68×10^{-5}
EX-4	10	0.0 to 2.0 ft. – Light brown, fine sand, trace silt, limerock (SP) 2.0 to 4.0 ft. – Dark gray, fine sand with silt, trace limerock (SP-SM) 4.0 to 6.0 ft. – Brown, silty sand (SM) 6.0 to 10.0 ft. – Brown, fine sand with silt, trace shell fragments, limerock (SP-SM)	2.96×10^{-5}

7.0 RECOMMENDATIONS AND DISCUSSIONS

7.1 GENERAL

Based on the findings of our site exploration and evaluation of the encountered subsurface conditions, it is our opinion that the soils underlying this site are generally satisfactory to support the proposed structures on conventional shallow foundations. However, the bearing capacity of the upper 10 feet of the loose sands should be improved or densified—such as by over excavation and replacement with select structural fill, or by ground improvement techniques like vibro-compaction—to reduce the risk of unsatisfactory foundation performance.

Some of the silty sand (SM) soils encountered onsite, which may retain excess moisture and become susceptible to pumping or yielding during proof rolling. These conditions can make it difficult to achieve the required compaction unless the soils are properly conditioned and compacted under controlled field conditions.

The following sections present our conclusions and recommendations for the site preparation, foundation design and related construction. The recommendations discussed herein are based on

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our interpretation and understanding of the project design, and site conditions. If subsurface conditions encountered during construction differ from those disclosed by the soil borings, we should be notified immediately so that we can review our recommendations.

7.2 FOUNDATION RECOMMENDATIONS

7.2.1 General

Based on the results of our subsurface exploration, the near-surface soils (upper approximately 10 feet) consist of very loose and loose sands with SPT N-values less than 6 blows/foot. These soils will be capable of providing an allowable bearing pressure of only 1,500 pounds per square foot (psf) and can result in a high immediate/elastic settlement. Consequently, these soils are not suitable to provide the required allowable bearing pressure of 3,000 psf. To achieve the required allowable bearing pressure and minimize the risk of excessive elastic settlement, one of the following ground improvement alternatives should be implemented:

Alternative No. 1 – Over excavation and Replacement with Select Structural Fill

This option consists of removing the loose near-surface sands within the foundation footprint and replacing them with properly compacted structural fill. The recommended procedure is as follows:

- Over excavate the existing loose sands to a depth of approximately 10 feet below existing grade, or to the depth at which field verification indicates medium dense conditions (e.g., SPT N ≥ 10–15).
- Extend the over excavation laterally at least 2 feet beyond the footing edges (or one-half the footing width, whichever is greater).
- Backfill the excavation with approved select structural fill placed in controlled lifts not exceeding 12 inches (loose) and compacted to at least 95 percent of the Modified Proctor maximum dry density (ASTM D1557).
- Perform field density testing to confirm required compaction throughout the improved zone.

Where groundwater is present, we recommend that the materials below the water level consist of shot rock, extending to at least 12 inches above the water level. This provides a stable working platform and allows the select structural fill above to be placed and compacted properly.

If the project team elects to increase footing dimensions to meet bearing pressure requirements, an alternative to deeper over excavation may be considered. In such a case, excavate to a depth of approximately 6 feet below existing ground surface and place about 3 feet of compacted limerock to satisfy the allowable bearing requirement.

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Alternative No. 2 - Vibro-Compaction Method for Achieving Allowable Bearing Pressures up to 3000 psf

As an alternative to over excavation and replacement, the loose sands may be densified in place using vibro-compaction techniques. With proper design, installation, and verification, this ground improvement method may allow an allowable bearing pressure of up to 3,000 psf. Vibro-compaction is effective in densifying loose granular soils, thereby enhancing their load-bearing capacity and reducing settlement potential. The recommended procedure is as follows:

- The vibro-compaction work should be performed by a qualified specialty contractor with demonstrated experience in executing similar ground improvement projects involving comparable subsurface conditions.

- Perform vibro-compaction within the proposed building footprint to densify the loose sands to the depth where improved relative density meets project requirements.

- A post-treatment verification program, including in-situ testing (e.g., SPTs), should be conducted to confirm that the target bearing capacity has been achieved and to validate the effectiveness of the improvement.

Resistance to lateral loads can be derived from 1) passive pressure acting on the sides of the footings, and 2) friction between the soil and the bottom of foundation elements. An equivalent moist fluid density of 105 pounds per cubic foot may be used to compute the passive pressures acting against the sides of the footings and grade beams. This value includes a factor of safety of 1.5. Passive resistance of the upper foot of soil should be neglected unless it is confined by a slab or pavement. Lateral resistance along the bottom of footings should be computed using a friction factor of 0.35 times the sustained dead load of the structure and foundation elements applied to each foundation location.

7.2.2 Bearing Capacity and Settlements

Based upon the boring information and the assumed loading conditions, we estimate that the recommended allowable bearing pressure (up to 3,000 psf for foundations bearing on ground-improved soils as described above) will provide a minimum factor of safety in excess of two against bearing capacity failure. With the site prepared and the foundations designed and constructed as recommended, we anticipate total settlements of one inch or less, and differential settlement between adjacent similarly loaded footings of less than one half an inch. Based on the loose granular nature of the shallow subsurface soils, the majority of the settlements should occur during constriction. For design purposes, we recommend using a subgrade reaction modulus of 125 pounds per cubic inch (pci) for the well compacted shallow sands.

Our recommendations for foundation design and construction are based on our understanding of the project as described in Section 2.0, Project Description. If this information is incorrect or

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changes, we should be notified so we can review our recommendations and revise them if necessary. RADISE should be contacted to review the foundation design when final structure loads and foundation designs become available.

7.2.3 Slab-on-Grade

Based on the results of our geotechnical investigation, and assuming the recommended subgrade preparation procedures are followed, it is our opinion that the floor slabs can be placed directly on the compacted subgrade. We recommend a vapor barrier be provided under all areas, especially those that will have moisture sensitive coverings, or where stores materials are moisture sensitive. A subgrade modulus of 125 psi/in may be used in the design of any slabs provided that the subgrade and subsequent engineered granular fill is prepared as described below. A 6-inch layer of clean (less than 5% passing a #200 sieve) granular fill is recommended to be placed directly below any slab-on-grade floors where appropriate. The granular fill should be compacted until densities of at least 95% of the maximum dry density as determined by ASTM D1557, the Modified Proctor method. This layer will aid in providing a capillary moisture break below the concrete slab.

Care must be exercised in installing control joints as needed shortly after placing the concrete, and in placing and maintaining the steel reinforcement at its designated elevation within the floor slab.

7.3 PAVEMENT DESIGN CONSIDERATIONS

Typical roadway pavement standards for new construction include the following:

1. 12 inches of Type B stabilized subgrade (LBR 40 or (SN 0.96))
2. Optional Base Group 7 (SN of at least 1.5).
3. 1.5 inches of Type SP structural course (Traffic C) asphalt (SN 0.66).
4. 1 inch of friction course FC-9.5 asphalt (SN 0.44).
5. Total SN should be at least 3.56

Traffic loadings and frequencies were not provided nor taken into account when preparing this report. Such loadings and frequencies will need to be taken into account and addressed by the roadway designer during the final pavement design process.

7.4 SITE PREPARATIONS RECOMMENDATIONS

7.4.1 Replacement of Unsuitable Soils

A notable exception of thin layer of silty sand with organics (SM-PT) is encountered between depths of approximately 4.0 to 6.0 feet below the existing ground surface at exfiltration test location, EX-2. Generally speaking, the silty sand with organics (SM-PT) encountered between depths of approximately 4.0 to 6.0 feet at Exfiltration Test Location EX-2, is not suitable for the support of proposed improvements.

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The unsuitable soils should be excavated from beneath and beyond the edges of the proposed improvements. The excavations are to be maintained dewatered, if needed, to allow the placement and compaction of the backfill. The resulting excavations may then be backfilled with granular fill or aggregate placed in uniform layers, not exceeding 12 inches in loose thickness, individually compacted with a self-propelled vibratory compactor. The granular fill should be uniformly compacted to a density of not less than 95 percent of the maximum dry density in accordance with ASTM D1557, the Modified Proctor Method. The aggregate should be uniformly compacted and probed to confirm that it has been well compacted.

7.4.2 Clearing and Grubbing

Clearing and grubbing may be required in some of the proposed construction areas. Clearing and grubbing where required should include the complete removal and disposal of surficial grasses, associated root systems, topsoil, rubbish, debris, any demolition material/pavement and all other obstructions resting on or protruding through the surface of the existing ground and the surface of excavated areas.

7.4.3 Underground utilities and structures

Existing underground utilities and structures may be present in the proposed construction area. These utilities and structures need to be properly identified, located and/or relocated as necessary to construct the project. The excavation bottoms of any relocated utilities should be cleaned of any undesirable materials prior to placing any engineered backfill. Site preparation, excavation, and backfilling for new utilities or re-aligned utilities should follow all the applicable recommendations of this report.

7.4.4 Surficial Densification

Following site clearing and grubbing activities (i.e. surficial grasses, root systems, etc.) and prior to placement of any engineered fill, we recommend that the surficial soils in the planned foundation and concrete slab areas be densified in-place so that they are unyielding and uniformly compacted. The surficial soils were observed to consist of loose materials that will require densification to achieve adequate support conditions. This effort will be necessary to aid in achieving suitable support for the subsequent foundations by increasing the soil bearing capacity of the existing subgrade. Subgrade compaction will help to mitigate the potential settlement of the exiting granular deposits under the weight of structural loadings.

Soils exposed at the stripped grades will require moisture conditioning to near the optimum content prior to initiating the densification operations. The densification should be accomplished using a self-propelled vibratory compactor which imparts a dynamic drum force of not less than 44,000 ft-pounds of dynamic force. Each section of the stripped grade should be subjected to multiple, overlapping (minimum of 20 percent overlap) coverages of the compactor as it operates at a travel speed of no more than 1.5 miles per hour (normal walking speed). Rolling should be continued

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until no further settlement or subgrade yielding/ can be visually discerned at the ground surface. In no case, however, should any section of subgrade receive less than five roller coverages. We recommend that the in-situ densification be monitored by a RADISE Geotechnical Engineer.

Density control should be exercised in the upper 12 inches of the exposed subgrade. Soils in this interval should be compacted to not less than 95 percent of the maximum dry density in accordance with ASTM D1557, the Modified Proctor Method, and verified in the field by a Geotechnical Engineer. Subgrade soils that pump or deflect under the weight of the passing compaction equipment could indicate the presence of soft soils, compressible soils or voids existing within the depth of influence of the roller. In such cases, those areas should be remedied by tilling, excavating and backfilling as described in the following sections of this report, or as directed by a Geotechnical Engineer.

7.4.5 Excavations

The Contractor should be solely responsible for making temporary excavations in a safe manner and provide appropriate measures to retain side slopes to ensure that persons working in or near the excavation are protected. All excavations shall comply with Occupational Safety and Health Administration (OSHA) stipulations for Trench Excavation Safety including all temporary design and safety requirements. Temporary and/or permanent structural retaining walls shall be designed and sealed by a Structural Engineer registered in the State of Florida.

All excavations should be made in accordance with applicable State, Federal and OSHA requirements. The shallows soils encountered in the borings generally consist of relatively clean sands. OSHA 29 CFR part 1926 (Subpart P, Excavations) defines such sandy soils as Type C soils. As such, temporary side slopes in fully dewatered excavations could be made at a 1½H:1V inclination or flatter if sufficient area is available around the excavation. Adjustment to this inclination and/or the use of sheeting, shoring or trench boxes should be evaluated by the contractor if other soil strata is encountered.

7.4.6 Dewatering

At the time of drilling of the borings (September/October 2025), groundwater was encountered at a depth of approximately 4.0 to 4.5 feet below the existing ground surface. In-the-dry construction of deeper underground utilities and foundations may require groundwater lowering via dewatering and control of groundwater seepage. Dewatering of the excavations may necessitate the use of sumps, wells, well-points or combinations thereof to be operated on a 24/7 basis until the pipeline is constructed and properly backfilled. Control of groundwater should be accomplished in a manner that preserves the integrity of the foundation bearing materials and does not cause instability of the excavation sidewalls. The dewatering system employed should be capable of maintaining a pre-drained surface a minimum of 24 inches below the excavation bottoms. Dewatering measures should be controlled so that the groundwater is not lowered beneath any nearby structure.

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7.4.7 Pipe Bedding

The sands encountered in the borings are expected to provide good support for utility pipelines without the need for bedding when the invert elevations are at least 24 inches above the groundwater level (natural or pre-drained by dewatering). Should organics or other deleterious materials be encountered at or below the pipe invert, such soils shall be considered compressible and unsuitable for pipe support. These soils should be over-excavated and replaced with compacted clean sand or FDOT No. 57 coarse aggregate.
The bedding surface should be uniformly compacted to a density of not less than 95 percent of the maximum dry density in accordance with ASTM D1557, the Modified Proctor Method.

7.4.8 Select Fill Composition, Placement and Compaction

Select structural fill and backfill required for construction should consist of clean, granular materials that are free of debris, cinders, combustibles and organic laden materials. The fines content (i.e., material passing U.S. Standard Number 200 sieve) should not be more than 10 percent by weight. Particle sizes larger than 3 inches in any direction shall not be allowed and the organic content should not exceed 3 percent by dry weight. Some of the on-site fine sandy soils appear to meet the above criteria and are suitable for reuse as backfill once inspected, tested and approved.

The granular fill should be placed at a moisture content within 3 percent of its Modified Proctor (ASTM D 1557) determined optimum in level lifts whose loose thickness does not exceed 12 inches in thickness. In areas where heavy equipment cannot be operated for compaction, the fill should be placed in 6-inch-thick level lifts. In the foundation areas, each fill lift should be stable, unyielding and uniformly compacted to 98 percent of the ASTM D 1557 maximum dry density, as verified by a Geotechnical Engineer. We recommend the use of only relatively light, hand-held compaction equipment in the densification operations adjacent to underground utilities to limit the potential damage to the pipelines and buried structures.

7.4.9 Final Compaction

After completion of the general compaction and filling operations, when the excavations for the construction of foundations are made through the compacted soils, the bottom of the foundation excavations should be compacted to densify soils loosened during or after the excavation process and washed or sloughed into the excavation prior to the placement of the forms. A heavy-duty walk behind vibratory compactor should be used for this final compaction, immediately prior to the placement of reinforcing steel. Foundation subgrade soils should be compacted to not less than 98 percent of the maximum dry density in accordance with ASTM D1557, the Modified Proctor Method, and verified in the field by a Geotechnical Engineer.

After the foundations are cast and the forms are removed, backfill around the foundations should be placed in thin layers, 6 inches or less in loose thickness, individually compacted with a heavy-duty vibratory rammer to not less than 98 percent of the maximum dry density in accordance with ASTM D1557, the Modified Proctor Method, and verified in the field by a Geotechnical Engineer.

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7.5 OBSERVATION AND TESTING

It is recommended that a Geotechnical Engineer be retained to provide soil engineering services during the construction earthwork phase of the project. This is to observe compliance with the design concept, specifications and recommendations, and to allow design changes in the event subsurface conditions differ from those anticipated are encountered. In addition, a Geotechnical Engineer representative should be present to provide excavation observation and monitoring of both fill and concrete placement during the construction phase of the project.

7.6 PROTECTION OF EXISTING STRUCTURES

Ground vibrations induced primarily by soil compaction or any other construction activities should be monitored to assure that they do not reach levels which prove damaging to any adjacent/nearby structures. Vibration Monitoring should be performed in accordance with "Section 108, Protection of Existing Structures" Division II Construction Details: General Construction Operations of the current FDOT Standard Specifications for Road and Bridge Construction.

Vibration levels on adjacent facilities should generally be maintained below a 0.25 ips peak particle velocity level. However, more restrictive/lessor levels may be specified for highly sensitive commercial areas at the discretion of the Designer or local government. The construction Contractor should be required to inventory and provide a preconstruction inspection of adjacent structures and to monitor the adherence to suitable vibration monitoring impact limits for their construction activities.

8.0 LIMITATIONS

This report is intended for geotechnical purposes only, and does not document or detect the presence, or absence, of any environmental conditions at the site, nor is it intended to perform an environmental assessment of the site.

The analysis and recommendations presented in this report are based upon our interpretation of the subsurface information revealed by the test borings and exfiltration tests. The report does not reflect variations in subsurface conditions that may exist between or beyond these borings and tests. Variations in soil and groundwater conditions should be expected, the nature and extent of which might not become evident until construction is undertaken. If variations are encountered, and/or the scope of the project altered, we should be consulted for additional recommendations.

RADISE International warrants that the professional services performed and presented in this report, are prepared for the School District of Palm Beach County and are based upon recognized principles and practices in the discipline of geotechnical engineering and hydrogeology at this place and point in time, and for this specific project site. No other warranties are expressed or implied.

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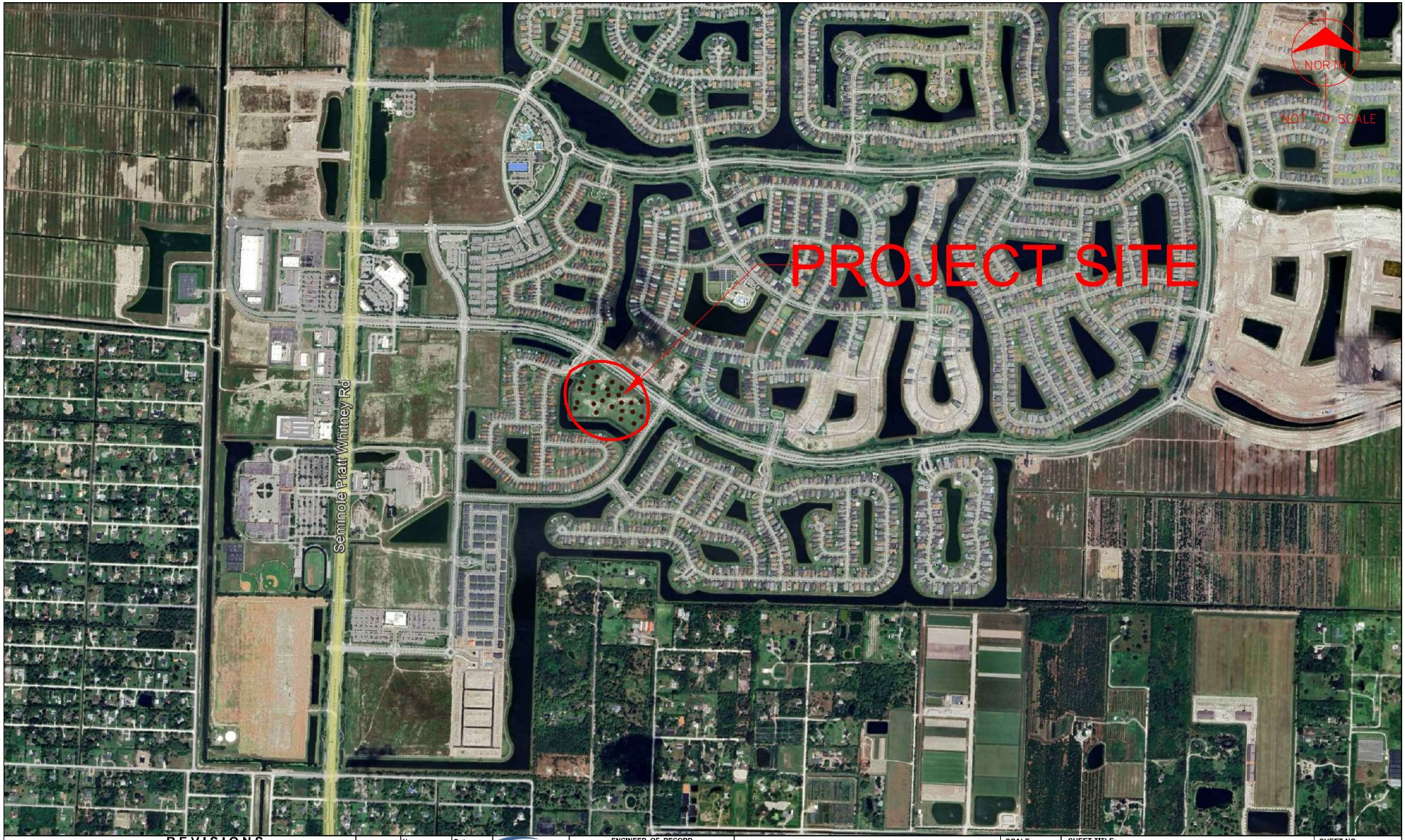
RADISE appreciates the opportunity to be of service to you. Please feel free to contact us at 561-841-0103 if you have any questions or comments regarding this report.

Respectfully submitted,

RADISE International, L.C.



REVISIONS							Names	Dates
Date.	By	Descriptions	Date.	By	Descriptions	Drawn by	AM	10/24/2025
						Checked by	NG	10/24/2025
						Designed by	NG	10/24/2025
						Checked by	NG	10/24/2025
						Approved by	VV	10/24/2025

RADISE INTERNATIONAL

LICENSE NO. - 8901

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SCHOOL DISTRICT OF PALM BEACH COUNTY		SCALE: VERTICAL N.T.S.	SHEET TITLE: VICINITY MAP	SHEET NO. 1
COUNTY	CLIENT	SCALE: HORIZONTAL N.T.S.	PROJECT NAME: WEST COMMUNITY ELEMENTARY SCHOOL	RADISE PROJECT NO: 02-25-092
PALM BEACH	SCHOOL DISTRICT OF PALM BEACH COUNTY			

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Approved by	VV	10/24/2025

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SCHOOL DISTRICT OF PALM BEACH COUNTY		SCALE: VERTICAL N.T.S.	SHEET TITLE: BORING LOCATION PLAN	SHEET NO. 2
COUNTY	CLIENT	SCALE: HORIZONTAL N.T.S.	PROJECT NAME: WEST COMMUNITY ELEMENTARY SCHOOL	RADISE PROJECT NO: 02-25-092
PALM BEACH	SCHOOL DISTRICT OF PALM BEACH COUNTY			

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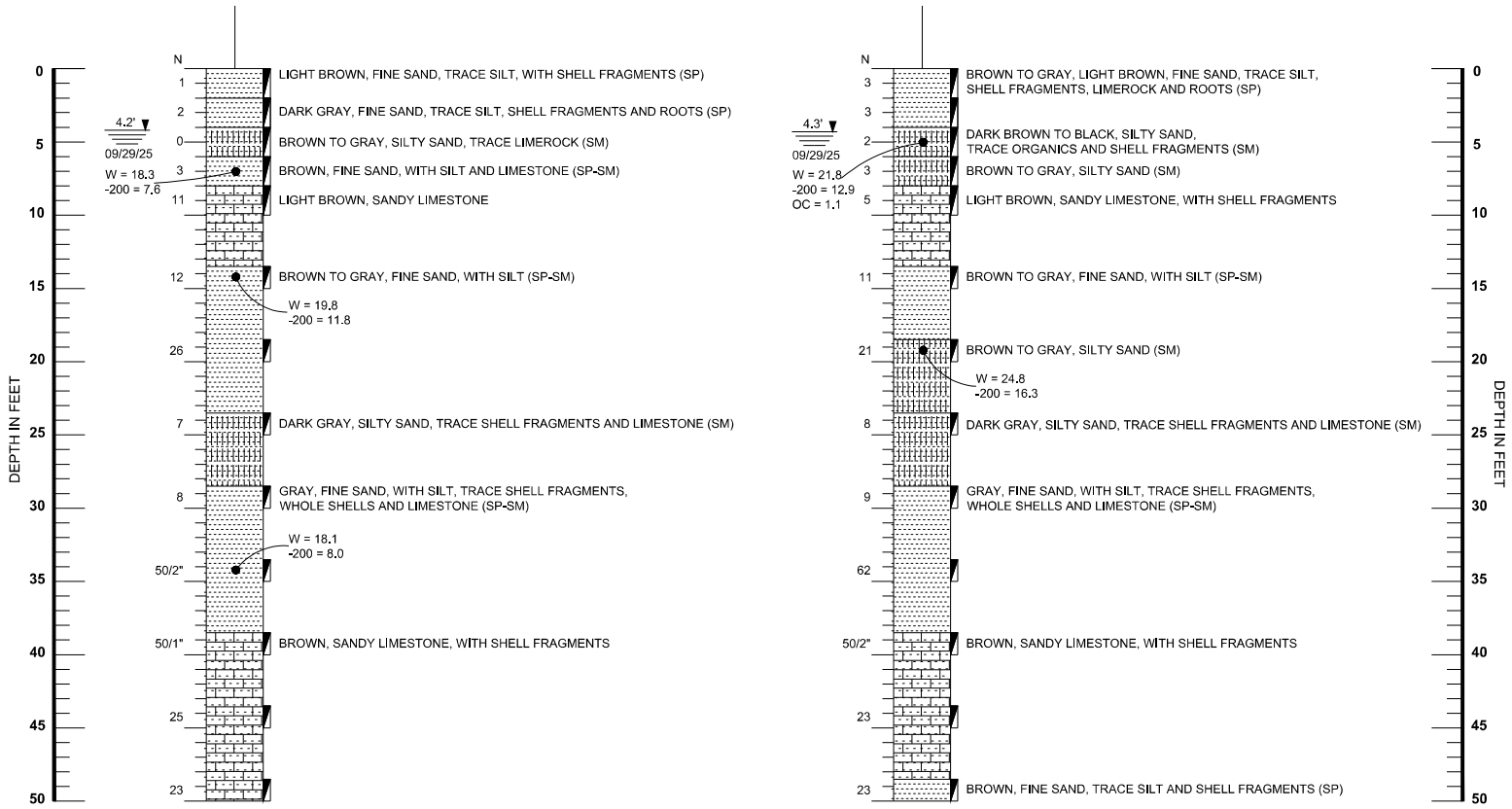
	B-1	B-2
BORING NO.	B-1	B-2
LONGITUDE:	W 80.2984°	W 80.2984°
LATITUDE:	N 26.7500°	N 26.7503°
RIG:	CME 45	CME 45
HAMMER:	AUTO	AUTO
DRILLER:	T. FICKLING	T. FICKLING
DATE:	09/29/2025	09/29/2025



B.T. @ 50'
BELOW EXISTING GRADES

B.T. @ 50'
BELOW EXISTING GRADES

LEGEND

SAND (SP, SP-SM)
SILTY SAND (SM)
SHELLY SAND (SP, SP-SM)
SANDY LIMESTONE

B.T. @ 50'	BORING TERMINATED AT 50 FEET BELOW THE EXISTING GROUND SURFACE
B-1	STANDARD PENETRATION TEST (SPT) BORING AND NUMBER
N	STANDARD PENETRATION RESISTANCE-BLOWS PER FOOT USING AUTOMATIC HAMMER
	SAMPLING INTERVAL
4.2' ▼ 09/29/25	GROUNDWATER LEVEL IN FEET AND DRILLING DATE
W	MOISTURE CONTENT (%)
OC	ORGANIC CONTENT (%)
-200	AMOUNT PASSING US STANDARD 200 SIEVE (%)
SP, SP-SM	UNIFIED SOIL CLASSIFICATION SYSTEM GROUP SYMBOL (ASTM D2487)

NOTES:

1. BORINGS WERE DRILLED BETWEEN 09/29/2025 AND 10/08/2025. SPT BORINGS WERE PERFORMED USING A CME 45 AUTOMATIC HAMMER DRILLING RIG (ASTM D1586).
2. STRATA BOUNDARIES ARE APPROXIMATE AND REPRESENT SOIL STRATA AT EACH TEST HOLE LOCATION ONLY. SOIL TRANSITIONS MAY BE MORE GRADUAL THAN IMPLIED.
3. GROUNDWATER LEVELS SHOWN ON THE SUBSURFACE PROFILES REPRESENT THE GROUNDWATER SURFACES ON THE DATES SHOWN. GROUNDWATER LEVEL FLUCTUATIONS SHOULD BE ANTICIPATED THROUGHOUT THE YEAR.
4. AFTER COMPLETION OF DRILLING, THE BOREHOLES WERE BACKFILLED WITH GROUT.

STANDARD PENETRATION TEST DATA *	
SPOON INSIDE DIA.	1.375 INCH
SPOON OUTSIDE DIA.	2 INCHES
AVG. HAMMER DROP	30 INCHES
HAMMER WEIGHT	140 POUNDS
GRANULAR MATERIALS	AUTOMATIC HAMMER SPT N - VALUE
RELATIVE DENSITY	BLOWS/FOOT
VERY LOOSE	LESS THAN 3
LOOSE	3 - 8
MEDIUM	8 - 24
DENSE	24 - 40
VERY DENSE	GREATER THAN 40
SILTS AND CLAYS	AUTOMATIC HAMMER SPT N - VALUE
CONSISTENCY	BLOWS/FOOT
VERY SOFT	LESS THAN 1
SOFT	1 - 3
FIRM	3 - 6
STIFF	6 - 12
VERY STIFF	12 - 24
HARD	GREATER THAN 24

*FDOT SOILS AND FOUNDATIONS HANDBOOK 2024

REVISIONS

Date.	By	Descriptions	Date.	By	Descriptions

	Names	Dates
Drawn by	AM	10/24/2025
Checked by	NG	10/24/2025
Designed by	NG	10/24/2025
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Approved by	VV	10/24/2025

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SCHOOL DISTRICT OF PALM BEACH COUNTY		SCALE: VERTICAL N.T.S.	SHEET TITLE: SUBSURFACE PROFILES
COUNTY	CLIENT	SCALE: HORIZONTAL N.T.S.	SHEET NO. 3A
PALM BEACH	SCHOOL DISTRICT OF PALM BEACH COUNTY	PROJECT NAME: WEST COMMUNITY ELEMENTARY SCHOOL	RADISE PROJECT NO: 02-25-092

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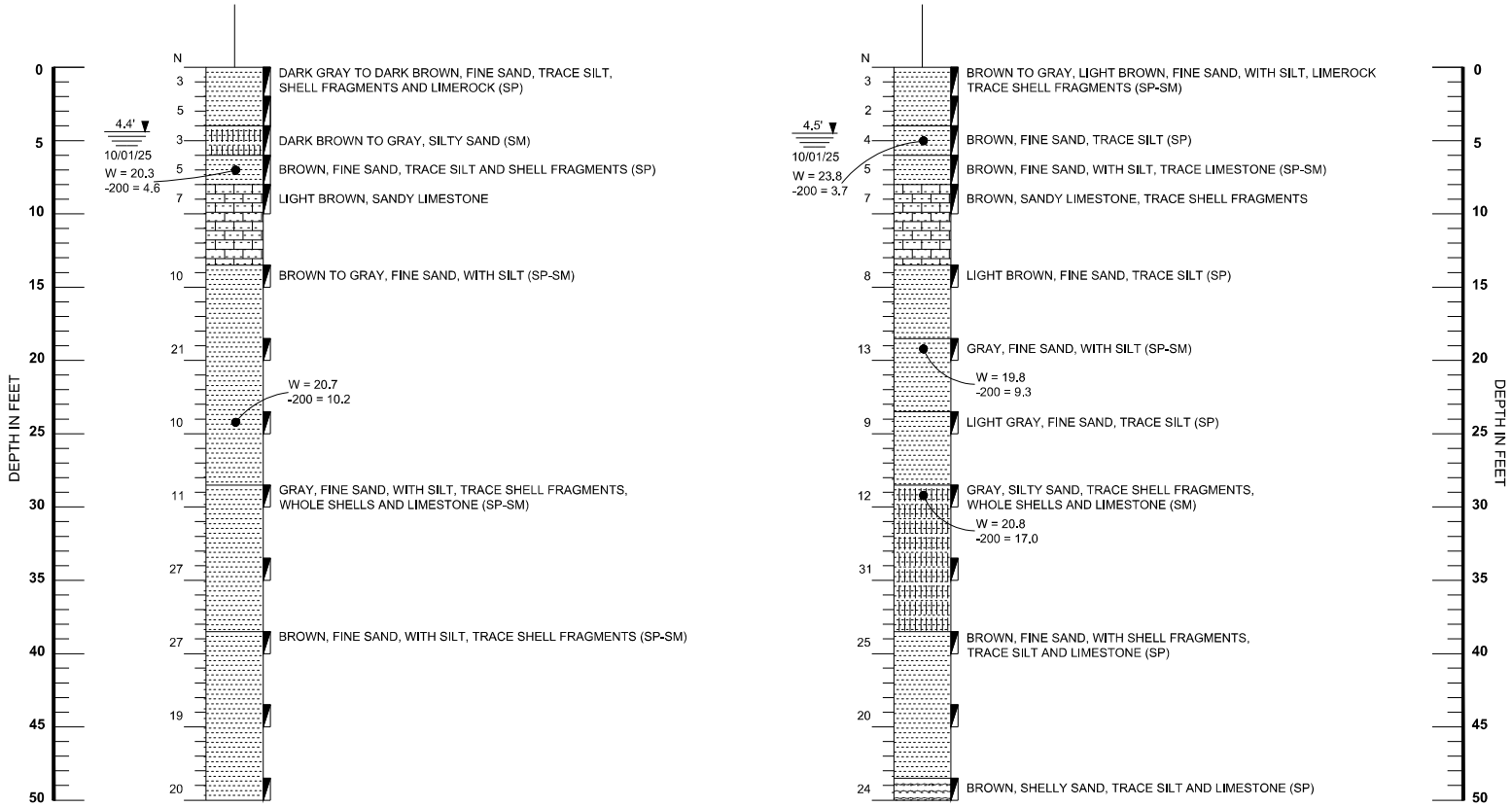
	B-3	B-4
BORING NO.	B-3	B-4
LONGITUDE:	W 80.2980°	W 80.2977°
LATITUDE:	N 26.7501°	N 26.7499°
RIG:	CME 45	CME 45
HAMMER:	AUTO	AUTO
DRILLER:	T. FICKLING	T. FICKLING
DATE:	10/01/2025	10/01/2025



B.T. @ 50'
BELOW EXISTING GRADES

B.T. @ 50'
BELOW EXISTING GRADES

LEGEND

SAND (SP, SP-SM)
SILTY SAND (SM)
SHELLY SAND (SP, SP-SM)
SANDY LIMESTONE

B.T. @ 50'	BORING TERMINATED AT 50 FEET BELOW THE EXISTING GROUND SURFACE
B-1	STANDARD PENETRATION TEST (SPT) BORING AND NUMBER
N	STANDARD PENETRATION RESISTANCE-BLOWS PER FOOT USING AUTOMATIC HAMMER
	SAMPLING INTERVAL
4.2' 09/29/25	GROUNDWATER LEVEL IN FEET AND DRILLING DATE
W	MOISTURE CONTENT (%)
OC	ORGANIC CONTENT (%)
-200	AMOUNT PASSING US STANDARD 200 SIEVE (%)
SP, SP-SM	UNIFIED SOIL CLASSIFICATION SYSTEM GROUP SYMBOL (ASTM D2487)

NOTES:

1. BORINGS WERE DRILLED BETWEEN 09/29/2025 AND 10/08/2025. SPT BORINGS WERE PERFORMED USING A CME 45 AUTOMATIC HAMMER DRILLING RIG (ASTM D1586).
2. STRATA BOUNDARIES ARE APPROXIMATE AND REPRESENT SOIL STRATA AT EACH TEST HOLE LOCATION ONLY. SOIL TRANSITIONS MAY BE MORE GRADUAL THAN IMPLIED.
3. GROUNDWATER LEVELS SHOWN ON THE SUBSURFACE PROFILES REPRESENT THE GROUNDWATER SURFACES ON THE DATES SHOWN. GROUNDWATER LEVEL FLUCTUATIONS SHOULD BE ANTICIPATED THROUGHOUT THE YEAR.
4. AFTER COMPLETION OF DRILLING, THE BOREHOLES WERE BACKFILLED WITH GROUT.

STANDARD PENETRATION TEST DATA *	
SPOON INSIDE DIA.	1.375 INCH
SPOON OUTSIDE DIA.	2 INCHES
AVG. HAMMER DROP	30 INCHES
HAMMER WEIGHT	140 POUNDS
GRANULAR MATERIALS	AUTOMATIC HAMMER SPT N - VALUE
RELATIVE DENSITY	BLOWS/FOOT
VERY LOOSE	LESS THAN 3
LOOSE	3 - 8
MEDIUM	8 - 24
DENSE	24 - 40
VERY DENSE	GREATER THAN 40
SILTS AND CLAYS	AUTOMATIC HAMMER SPT N - VALUE
CONSISTENCY	BLOWS/FOOT
VERY SOFT	LESS THAN 1
SOFT	1 - 3
FIRM	3 - 6
STIFF	6 - 12
VERY STIFF	12 - 24
HARD	GREATER THAN 24

*FDOT SOILS AND FOUNDATIONS HANDBOOK 2024

REVISIONS						Names	Dates
Date.	By	Descriptions	Date.	By	Descriptions	Drawn by	AM 10/24/2025
						Checked by	NG 10/24/2025
						Designed by	NG 10/24/2025
						Checked by	NG 10/24/2025
						Approved by	VV 10/24/2025

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SCHOOL DISTRICT OF PALM BEACH COUNTY		SCALE: VERTICAL N.T.S.	SHEET TITLE: SUBSURFACE PROFILES
COUNTY	CLIENT	SCALE: HORIZONTAL N.T.S.	PROJECT NAME: WEST COMMUNITY ELEMENTARY SCHOOL
PALM BEACH	SCHOOL DISTRICT OF PALM BEACH COUNTY		RADISE PROJECT NO: 02-25-092

SHEET NO. 3B

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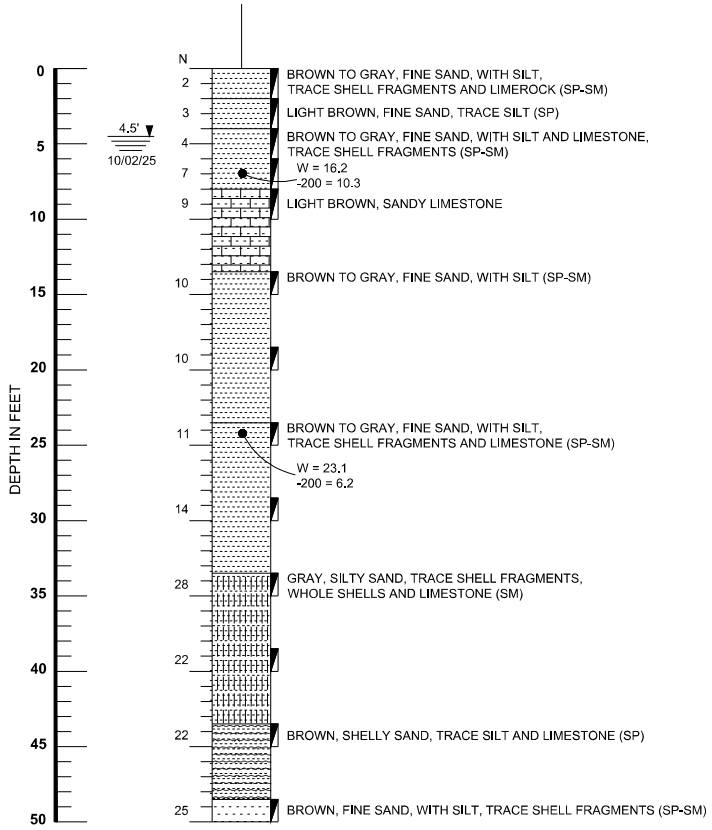
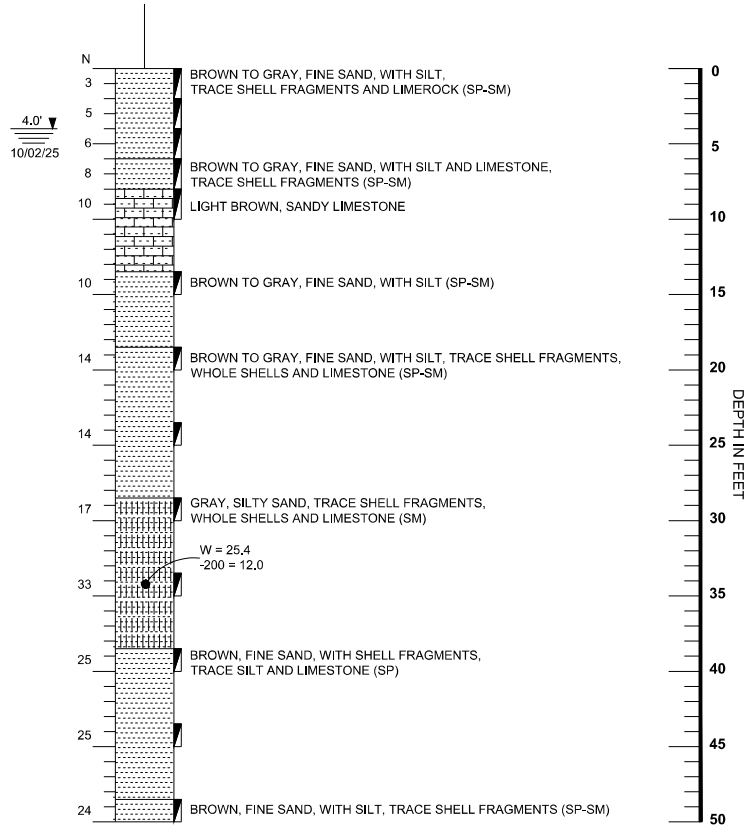
	B-5
BORING NO.	
LONGITUDE:	W 80.2973°
LATITUDE:	N 26.7497°
RIG:	CME 45
HAMMER:	AUTO
DRILLER:	T. FICKLING
DATE:	10/02/2025



B.T. @ 50'
BELOW EXISTING GRADES

	B-6
	W 80.2969°
	N 26.7497°
	CME 45
	AUTO
	T. FICKLING
	10/02/2025



B.T. @ 50'
BELOW EXISTING GRADES

LEGEND

SAND (SP, SP-SM)
SILTY SAND (SM)
SHELLY SAND (SP, SP-SM)
SANDY LIMESTONE

B.T. @ 50'	BORING TERMINATED AT 50 FEET BELOW THE EXISTING GROUND SURFACE
B-1	STANDARD PENETRATION TEST (SPT) BORING AND NUMBER
N	STANDARD PENETRATION RESISTANCE-BLOWS PER FOOT USING AUTOMATIC HAMMER
	SAMPLING INTERVAL
4.2' 09/29/25	GROUNDWATER LEVEL IN FEET AND DRILLING DATE
W	MOISTURE CONTENT (%)
OC	ORGANIC CONTENT (%)
-200	AMOUNT PASSING US STANDARD 200 SIEVE (%)
SP, SP-SM	UNIFIED SOIL CLASSIFICATION SYSTEM GROUP SYMBOL (ASTM D2487)

NOTES:

1. BORINGS WERE DRILLED BETWEEN 09/29/2025 AND 10/08/2025. SPT BORINGS WERE PERFORMED USING A CME 45 AUTOMATIC HAMMER DRILLING RIG (ASTM D1586).
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4. AFTER COMPLETION OF DRILLING, THE BOREHOLES WERE BACKFILLED WITH GROUT.

STANDARD PENETRATION TEST DATA *	
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SPOON OUTSIDE DIA.	2 INCHES
AVG. HAMMER DROP	30 INCHES
HAMMER WEIGHT	140 POUNDS
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RELATIVE DENSITY	BLOWS/FOOT
VERY LOOSE	LESS THAN 3
LOOSE	3 - 8
MEDIUM	8 - 24
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FIRM	3 - 6
STIFF	6 - 12
VERY STIFF	12 - 24
HARD	GREATER THAN 24

*FDOT SOILS AND FOUNDATIONS HANDBOOK 2024

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Designed by	NG	10/24/2025
Checked by	NG	10/24/2025
Approved by	VV	10/24/2025

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SCHOOL DISTRICT OF PALM BEACH COUNTY	
COUNTY	CLIENT
PALM BEACH	SCHOOL DISTRICT OF PALM BEACH COUNTY

SCALE: VERTICAL	N.T.S.
SCALE: HORIZONTAL	N.T.S.
SHEET TITLE:	SUBSURFACE PROFILES
PROJECT NAME:	WEST COMMUNITY ELEMENTARY SCHOOL
SHEET NO.	3C
RADISE PROJECT NO:	02-25-092

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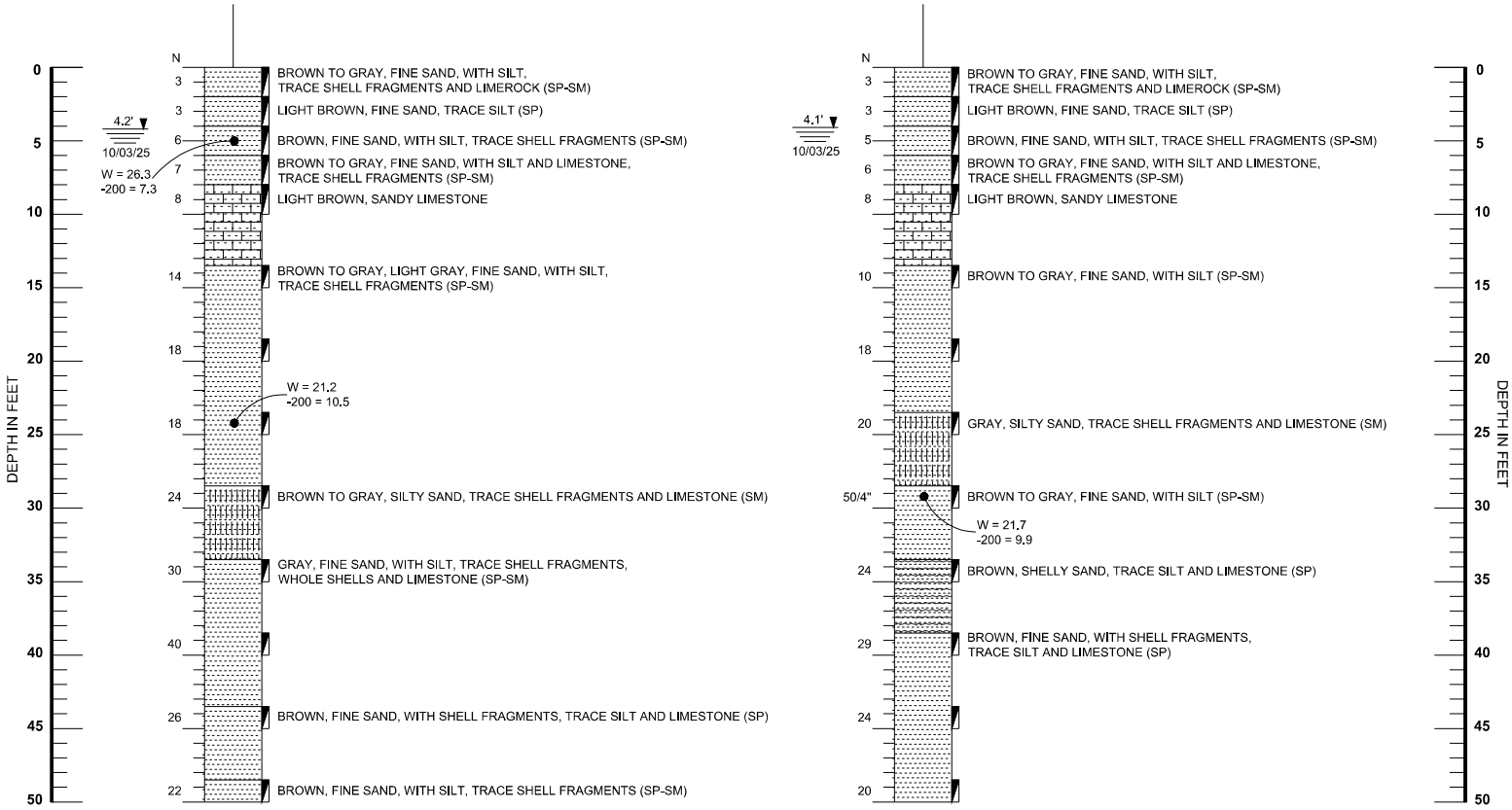
	B-7	B-8
BORING NO.	B-7	B-8
LONGITUDE:	W 80.2970°	W 80.2975°
LATITUDE:	N 26.7500°	N 26.7502°
RIG:	CME 45	CME 45
HAMMER:	AUTO	AUTO
DRILLER:	T. FICKLING	T. FICKLING
DATE:	10/03/2025	10/03/2025



B.T. @ 50'
BELOW EXISTING GRADES

B.T. @ 50'
BELOW EXISTING GRADES

LEGEND

SAND (SP, SP-SM)
SILTY SAND (SM)
SHELLY SAND (SP, SP-SM)
SANDY LIMESTONE

B.T. @ 50'	BORING TERMINATED AT 50 FEET BELOW THE EXISTING GROUND SURFACE
B-1	STANDARD PENETRATION TEST (SPT) BORING AND NUMBER
N	STANDARD PENETRATION RESISTANCE-BLOWS PER FOOT USING AUTOMATIC HAMMER
	SAMPLING INTERVAL
4.2' 09/29/25	GROUNDWATER LEVEL IN FEET AND DRILLING DATE
W	MOISTURE CONTENT (%)
OC	ORGANIC CONTENT (%)
-200	AMOUNT PASSING US STANDARD 200 SIEVE (%)
SP, SP-SM	UNIFIED SOIL CLASSIFICATION SYSTEM GROUP SYMBOL (ASTM D2487)

NOTES:

1. BORINGS WERE DRILLED BETWEEN 09/29/2025 AND 10/08/2025. SPT BORINGS WERE PERFORMED USING A CME 45 AUTOMATIC HAMMER DRILLING RIG (ASTM D1586).
2. STRATA BOUNDARIES ARE APPROXIMATE AND REPRESENT SOIL STRATA AT EACH TEST HOLE LOCATION ONLY. SOIL TRANSITIONS MAY BE MORE GRADUAL THAN IMPLIED.
3. GROUNDWATER LEVELS SHOWN ON THE SUBSURFACE PROFILES REPRESENT THE GROUNDWATER SURFACES ON THE DATES SHOWN. GROUNDWATER LEVEL FLUCTUATIONS SHOULD BE ANTICIPATED THROUGHOUT THE YEAR.
4. AFTER COMPLETION OF DRILLING, THE BOREHOLES WERE BACKFILLED WITH GROUT.

STANDARD PENETRATION TEST DATA *	
SPOON INSIDE DIA.	1.375 INCH
SPOON OUTSIDE DIA.	2 INCHES
AVG. HAMMER DROP	30 INCHES
HAMMER WEIGHT	140 POUNDS
GRANULAR MATERIALS	AUTOMATIC HAMMER SPT N - VALUE
RELATIVE DENSITY	BLOWS/FOOT
VERY LOOSE	LESS THAN 3
LOOSE	3 - 8
MEDIUM	8 - 24
DENSE	24 - 40
VERY DENSE	GREATER THAN 40
SILTS AND CLAYS	AUTOMATIC HAMMER SPT N - VALUE
CONSISTENCY	BLOWS/FOOT
VERY SOFT	LESS THAN 1
SOFT	1 - 3
FIRM	3 - 6
STIFF	6 - 12
VERY STIFF	12 - 24
HARD	GREATER THAN 24

*FDOT SOILS AND FOUNDATIONS HANDBOOK 2024

REVISIONS

Date.	By	Descriptions	Date.	By	Descriptions

	Names	Dates
Drawn by	AM	10/24/2025
Checked by	NG	10/24/2025
Designed by	NG	10/24/2025
Checked by	NG	10/24/2025
Approved by	VV	10/24/2025

RADISE INTERNATIONAL
LICENSE NO. - 8901

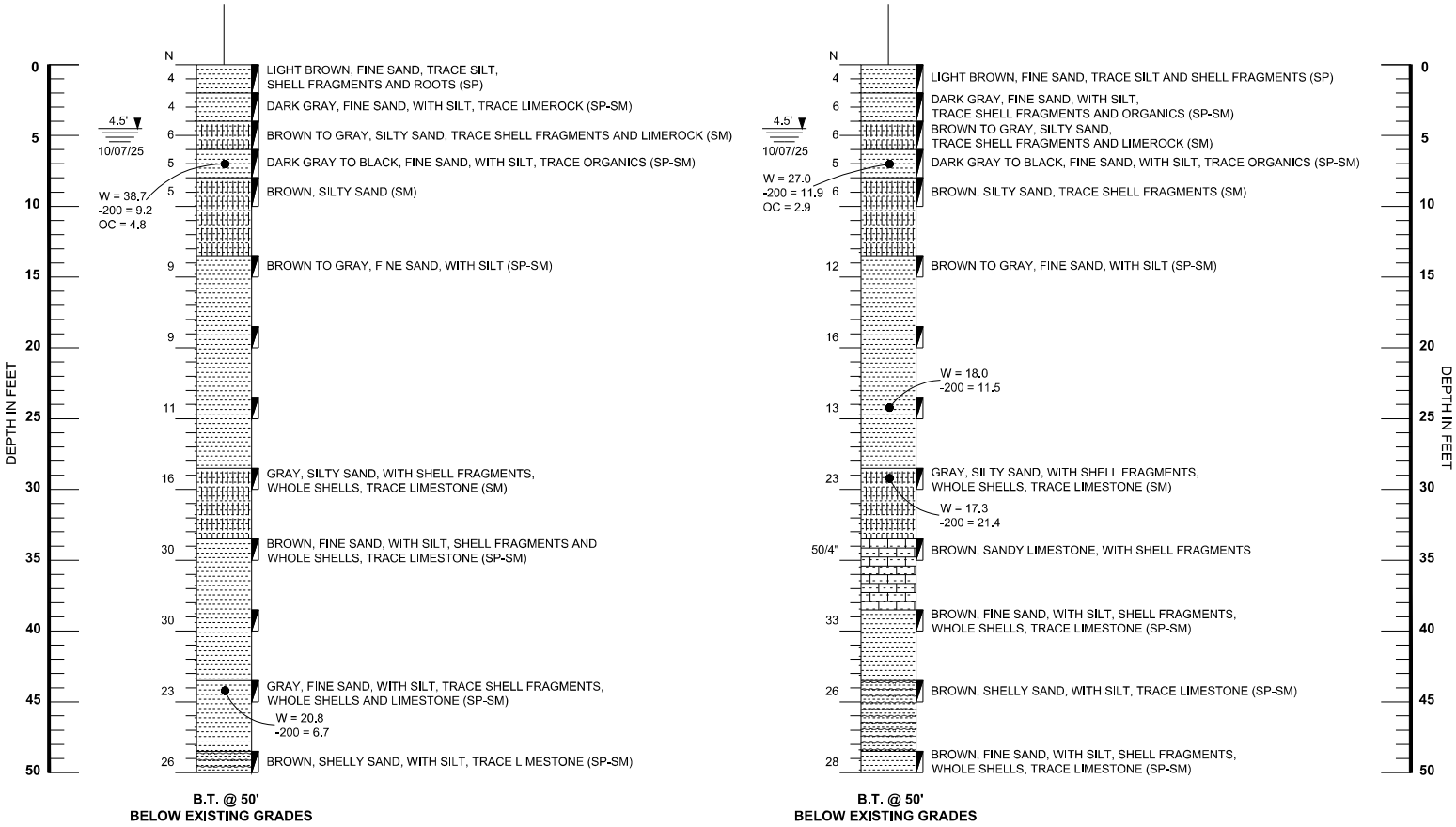
ENGINEER OF RECORD
VAMSHI VEMULA (P.E. No. 93711)
RADISE International
4152 West Blue Heron Boulevard, Suite 1114
Riviera Beach, Florida, 33404
TEL 561-841-0103 FAX 561-841-0104
URL: http://www.radise.net

SCHOOL DISTRICT OF PALM BEACH COUNTY		SCALE: VERTICAL N.T.S.	SHEET TITLE: SUBSURFACE PROFILES
COUNTY: PALM BEACH	CLIENT: SCHOOL DISTRICT OF PALM BEACH COUNTY	SCALE: HORIZONTAL N.T.S.	PROJECT NAME: WEST COMMUNITY ELEMENTARY SCHOOL

SHEET NO. 3D
RADISE PROJECT NO: 02-25-092

MJSS RECEIVED 11/24/2025

	B-9	B-10
BORING NO.	B-9	B-10
LONGITUDE:	W 80.2979°	W 80.2984°
LATITUDE:	N 26.7505°	N 26.7506°
RIG:	CME 45	CME 45
HAMMER:	AUTO	AUTO
DRILLER:	T. FICKLING	T. FICKLING
DATE:	10/07/2025	10/07/2025



B.T. @ 50'
BELOW EXISTING GRADES

B.T. @ 50'
BELOW EXISTING GRADES

LEGEND

SAND (SP, SP-SM)
SILTY SAND (SM)
SHELLY SAND (SP, SP-SM)
SANDY LIMESTONE

B.T. @ 50'	BORING TERMINATED AT 50 FEET BELOW THE EXISTING GROUND SURFACE
B-1	STANDARD PENETRATION TEST (SPT) BORING AND NUMBER
N	STANDARD PENETRATION RESISTANCE-BLOWS PER FOOT USING AUTOMATIC HAMMER
	SAMPLING INTERVAL
4.2' 09/29/25	GROUNDWATER LEVEL IN FEET AND DRILLING DATE
W	MOISTURE CONTENT (%)
OC	ORGANIC CONTENT (%)
-200	AMOUNT PASSING US STANDARD 200 SIEVE (%)
SP, SP-SM	UNIFIED SOIL CLASSIFICATION SYSTEM GROUP SYMBOL (ASTM D2487)

NOTES:

1. BORINGS WERE DRILLED BETWEEN 09/29/2025 AND 10/08/2025. SPT BORINGS WERE PERFORMED USING A CME 45 AUTOMATIC HAMMER DRILLING RIG (ASTM D1586).
2. STRATA BOUNDARIES ARE APPROXIMATE AND REPRESENT SOIL STRATA AT EACH TEST HOLE LOCATION ONLY. SOIL TRANSITIONS MAY BE MORE GRADUAL THAN IMPLIED.
3. GROUNDWATER LEVELS SHOWN ON THE SUBSURFACE PROFILES REPRESENT THE GROUNDWATER SURFACES ON THE DATES SHOWN. GROUNDWATER LEVEL FLUCTUATIONS SHOULD BE ANTICIPATED THROUGHOUT THE YEAR.
4. AFTER COMPLETION OF DRILLING, THE BOREHOLES WERE BACKFILLED WITH GROUT.

STANDARD PENETRATION TEST DATA *

SPOON INSIDE DIA.	1.375 INCH
SPOON OUTSIDE DIA.	2 INCHES
AVG. HAMMER DROP	30 INCHES
HAMMER WEIGHT	140 POUNDS
GRANULAR MATERIALS	AUTOMATIC HAMMER SPT N - VALUE
RELATIVE DENSITY	BLOWS/FOOT
VERY LOOSE	LESS THAN 3
LOOSE	3 - 8
MEDIUM	8 - 24
DENSE	24 - 40
VERY DENSE	GREATER THAN 40
SILTS AND CLAYS	AUTOMATIC HAMMER SPT N - VALUE
CONSISTENCY	BLOWS/FOOT
VERY SOFT	LESS THAN 1
SOFT	1 - 3
FIRM	3 - 6
STIFF	6 - 12
VERY STIFF	12 - 24
HARD	GREATER THAN 24

*FDOT SOILS AND FOUNDATIONS HANDBOOK 2024

REVISIONS

Date.	By	Descriptions	Date.	By	Descriptions

	Names	Dates
Drawn by	AM	10/24/2025
Checked by	NG	10/24/2025
Designed by	NG	10/24/2025
Checked by	NG	10/24/2025
Approved by	VV	10/24/2025

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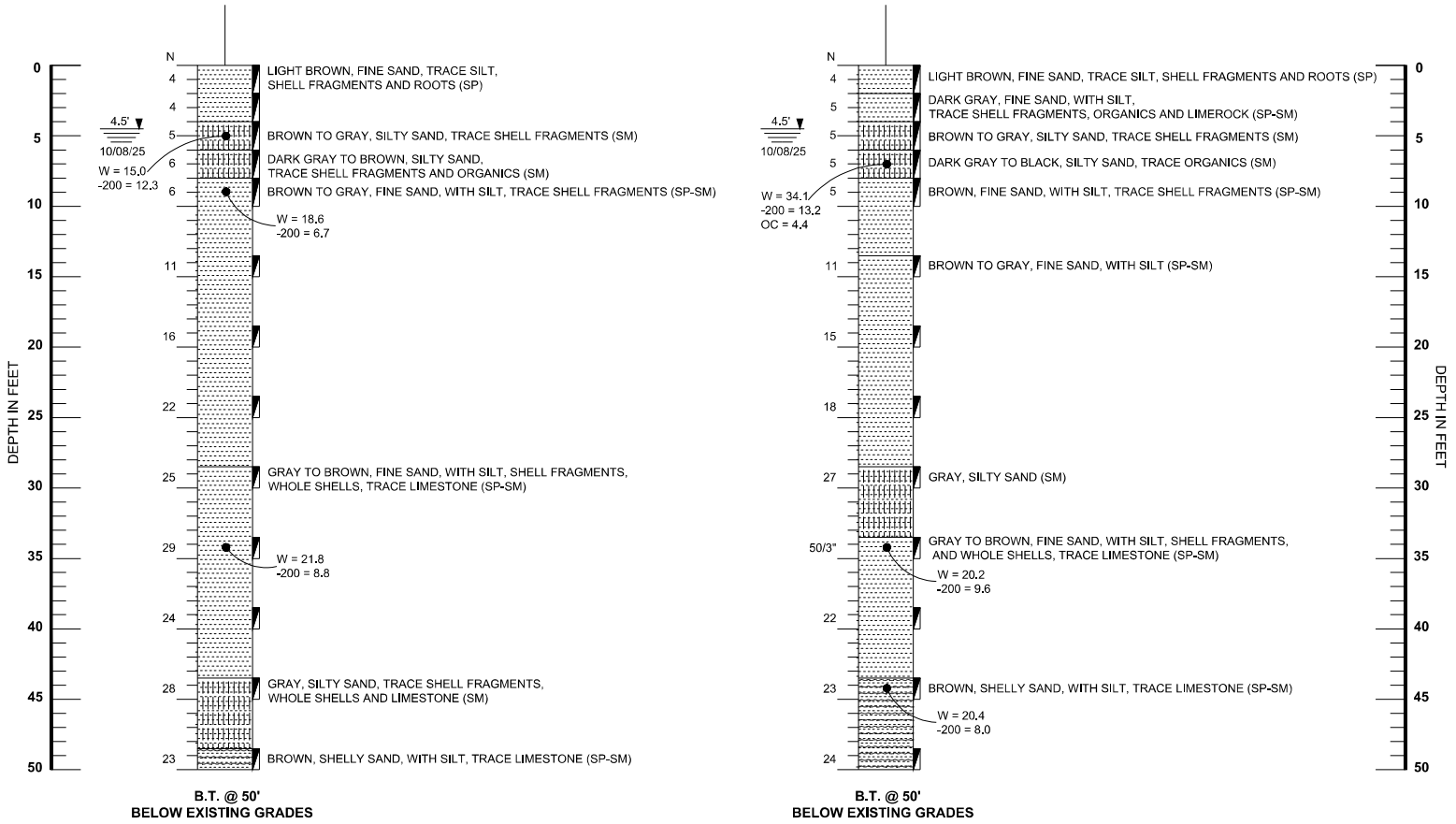
TEL 561-841-0103 FAX 561-841-0104
URL: http://www.radise.net

SCHOOL DISTRICT OF PALM BEACH COUNTY		SCALE: VERTICAL N.T.S.	SHEET TITLE: SUBSURFACE PROFILES
COUNTY: PALM BEACH	CLIENT: SCHOOL DISTRICT OF PALM BEACH COUNTY	SCALE: HORIZONTAL N.T.S.	PROJECT NAME: WEST COMMUNITY ELEMENTARY SCHOOL

SHEET NO. 3E
RADISE PROJECT NO: 02-25-092

RECEIVED 11/24/2025 MOSS

	B-11	B-12
BORING NO.	B-11	B-12
LONGITUDE:	W 80.2978°	W 80.2973°
LATITUDE:	N 26.7502°	N 26.7500°
RIG:	CME 45	CME 45
HAMMER:	AUTO	AUTO
DRILLER:	T. FICKLING	T. FICKLING
DATE:	10/08/2025	10/08/2025



LEGEND

SAND (SP, SP-SM) | SILTY SAND (SM)

SHELLY SAND (SP, SP-SM) | SANDY LIMESTONE

B.T. @ 50'	BORING TERMINATED AT 50 FEET BELOW THE EXISTING GROUND SURFACE
B-1	STANDARD PENETRATION TEST (SPT) BORING AND NUMBER
N	STANDARD PENETRATION RESISTANCE-BLOWS PER FOOT USING AUTOMATIC HAMMER
	SAMPLING INTERVAL
4.2' 09/29/25	GROUNDWATER LEVEL IN FEET AND DRILLING DATE
W	MOISTURE CONTENT (%)
OC	ORGANIC CONTENT (%)
-200	AMOUNT PASSING US STANDARD 200 SIEVE (%)
SP, SP-SM	UNIFIED SOIL CLASSIFICATION SYSTEM GROUP SYMBOL (ASTM D2487)

NOTES:

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STANDARD PENETRATION TEST DATA *	
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SPOON OUTSIDE DIA.	2 INCHES
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HAMMER WEIGHT	140 POUNDS
GRANULAR MATERIALS	AUTOMATIC HAMMER SPT N - VALUE
RELATIVE DENSITY	BLOWS/FOOT
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LOOSE	3 - 8
MEDIUM	8 - 24
DENSE	24 - 40
VERY DENSE	GREATER THAN 40
SILTS AND CLAYS	AUTOMATIC HAMMER SPT N - VALUE
CONSISTENCY	BLOWS/FOOT
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SOFT	1 - 3
FIRM	3 - 6
STIFF	6 - 12
VERY STIFF	12 - 24
HARD	GREATER THAN 24

*FDOT SOILS AND FOUNDATIONS HANDBOOK 2024

REVISIONS

Date.	By	Descriptions	Date.	By	Descriptions

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Checked by	NG	10/24/2025
Designed by	NG	10/24/2025
Checked by	NG	10/24/2025
Approved by	VV	10/24/2025

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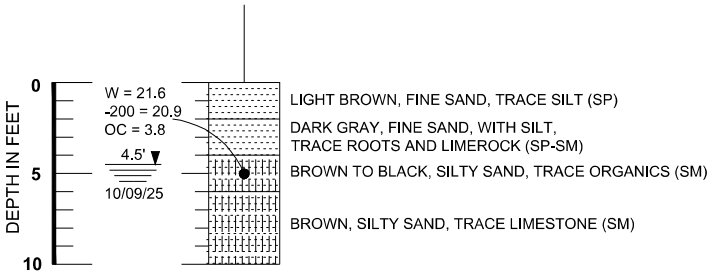
URL: http://www.radise.net

SCHOOL DISTRICT OF PALM BEACH COUNTY		SCALE: VERTICAL N.T.S.	SHEET TITLE: SUBSURFACE PROFILES	SHEET NO. 3F
COUNTY: PALM BEACH	CLIENT: SCHOOL DISTRICT OF PALM BEACH COUNTY	SCALE: HORIZONTAL N.T.S.	PROJECT NAME: WEST COMMUNITY ELEMENTARY SCHOOL	RADISE PROJECT NO: 02-25-092

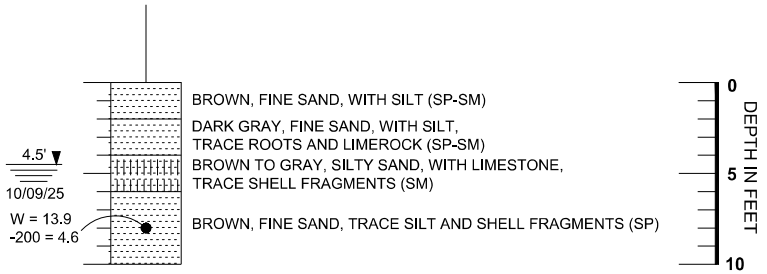
MOSS RECEIVED 11/24/2025

BORING NO. AB-1
LONGITUDE: W 80.2984°
LATITUDE: N 26.7512°
RIG: CME 45
HAMMER: N/A
DRILLER T. FICKLING
DATE: 10/09/2025



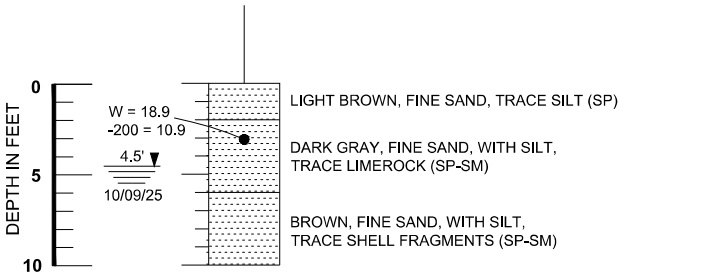
B.T. @ 10.0'
BELOW EXISTING GRADES

BORING NO. AB-2
LONGITUDE: W 80.2977°
LATITUDE: N 26.7507°
RIG: CME 45
HAMMER: N/A
DRILLER T. FICKLING
DATE: 10/09/2025



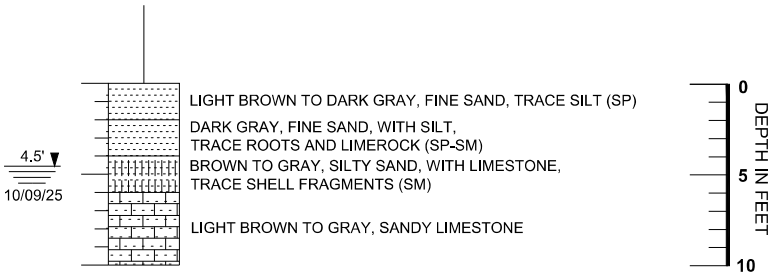
B.T. @ 10.0'
BELOW EXISTING GRADES

BORING NO. AB-3
LONGITUDE: W 80.2966°
LATITUDE: N 26.7500°
RIG: CME 45
HAMMER: N/A
DRILLER T. FICKLING
DATE: 10/09/2025



B.T. @ 10.0'
BELOW EXISTING GRADES

BORING NO. AB-4
LONGITUDE: W 80.2968°
LATITUDE: N 26.7493°
RIG: CME 45
HAMMER: N/A
DRILLER T. FICKLING
DATE: 10/09/2025



B.T. @ 10.0'
BELOW EXISTING GRADES

LEGEND

SAND (SP, SP-SM)

SILTY SAND (SM)

SANDY LIMESTONE

B.T. @ 10.0' BORING TERMINATED AT 10.0 FEET BELOW THE EXISTING GROUND SURFACE

AB-1 AUGER BORING AND NUMBER

4.5' / 10/09/25 GROUNDWATER DEPTH IN FEET AND BORING DATE

W MOISTURE CONTENT (%)

OC ORGANIC CONTENT (%)

-200 AMOUNT PASSING US STANDARD 200 SIEVE (%)

SP, SP-SM UNIFIED SOIL CLASSIFICATION SYSTEM GROUP SYMBOL (ASTM D2487)

NOTES:

1. AUGER BORINGS WERE PERFORMED ON 10/09/2025 IN ACCORDANCE WITH ASTM D1452.
2. STRATA BOUNDARIES ARE APPROXIMATE AND REPRESENT SOIL STRATA AT EACH TEST HOLE LOCATION ONLY. SOIL TRANSITIONS MAY BE MORE GRADUAL THAN IMPLIED.
3. GROUNDWATER LEVEL SHOWN ON THE SUBSURFACE PROFILE REPRESENTS THE GROUNDWATER SURFACE ON THE DATE SHOWN. GROUNDWATER LEVEL FLUCTUATIONS SHOULD BE ANTICIPATED THROUGHOUT THE YEAR.
4. AFTER COMPLETION OF THE BORINGS, THE AUGER HOLES WERE BACKFILLED WITH GROUT.

REVISIONS

Date.	By	Descriptions	Date.	By	Descriptions

	Names	Dates
Drawn by	AM	10/24/2025
Checked by	NG	10/24/2025
Designed by	NG	10/24/2025
Checked by	NG	10/24/2025
Approved by	VV	10/24/2025

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TEL 561-841-0103 FAX 561-841-0104
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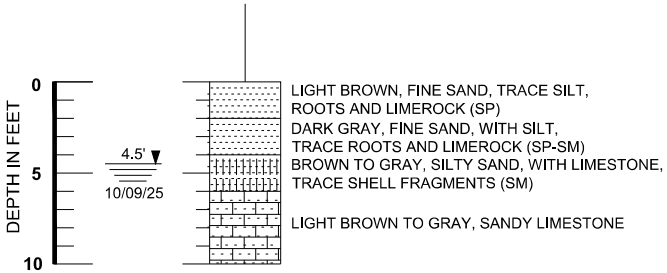
SCHOOL DISTRICT OF PALM BEACH COUNTY		SCALE: VERTICAL N.T.S.	SHEET TITLE: SUBSURFACE PROFILES (AUGER BORINGS)	SHEET NO. 3G
COUNTY	CLIENT	SCALE: HORIZONTAL N.T.S.	PROJECT NAME: WEST COMMUNITY ELEMENTARY SCHOOL	RADISE PROJECT NO: 02-25-092
PALM BEACH	SCHOOL DISTRICT OF PALM BEACH COUNTY			

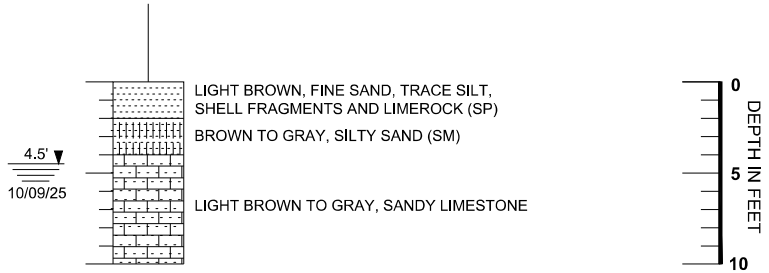
MJSS RECEIVED 11/24/2025

BORING NO. AB-5
LONGITUDE: W 80.2974°
LATITUDE: N 26.7495°
RIG: CME 45
HAMMER: N/A
DRILLER T. FICKLING
DATE: 10/09/2025



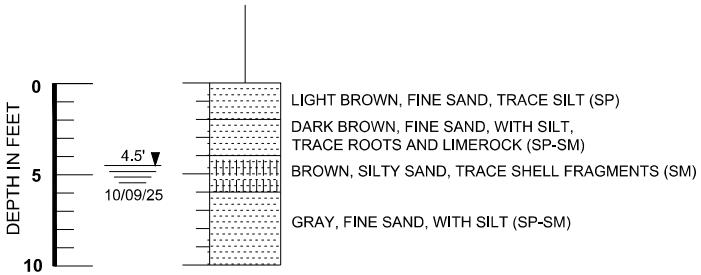
B.T. @ 10.0'
BELOW EXISTING GRADES

AB-6
W 80.2983°
N 26.7496°
CME 45
N/A
T. FICKLING
10/09/2025



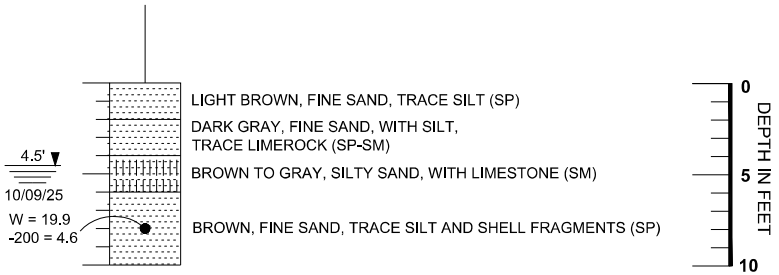
B.T. @ 10.0'
BELOW EXISTING GRADES

BORING NO. AB-7
LONGITUDE: W 80.2990°
LATITUDE: N 26.7497°
RIG: CME 45
HAMMER: N/A
DRILLER T. FICKLING
DATE: 10/09/2025



B.T. @ 10.0'
BELOW EXISTING GRADES

AB-8
W 80.2989°
N 26.7505°
CME 45
N/A
T. FICKLING
10/09/2025



B.T. @ 10.0'
BELOW EXISTING GRADES

LEGEND

SAND (SP, SP-SM)

SILTY SAND (SM)

SANDY LIMESTONE

B.T. @ 10.0'	BORING TERMINATED AT 10.0 FEET BELOW THE EXISTING GROUND SURFACE
AB-1	AUGER BORING AND NUMBER
4.5' ▼ 10/09/25	GROUNDWATER DEPTH IN FEET AND BORING DATE
W	MOISTURE CONTENT (%)
OC	ORGANIC CONTENT (%)
-200	AMOUNT PASSING US STANDARD 200 SIEVE (%)
SP, SP-SM	UNIFIED SOIL CLASSIFICATION SYSTEM GROUP SYMBOL (ASTM D2487)

NOTES:

1. AUGER BORINGS WERE PERFORMED ON 10/09/2025 IN ACCORDANCE WITH ASTM D1452.
2. STRATA BOUNDARIES ARE APPROXIMATE AND REPRESENT SOIL STRATA AT EACH TEST HOLE LOCATION ONLY. SOIL TRANSITIONS MAY BE MORE GRADUAL THAN IMPLIED.
3. GROUNDWATER LEVEL SHOWN ON THE SUBSURFACE PROFILE REPRESENTS THE GROUNDWATER SURFACE ON THE DATE SHOWN. GROUNDWATER LEVEL FLUCTUATIONS SHOULD BE ANTICIPATED THROUGHOUT THE YEAR.
4. AFTER COMPLETION OF THE BORINGS, THE AUGER HOLES WERE BACKFILLED WITH GROUT.

REVISIONS

Date.	By	Descriptions	Date.	By	Descriptions

	Names	Dates
Drawn by	AM	10/24/2025
Checked by	NG	10/24/2025
Designed by	NG	10/24/2025
Checked by	NG	10/24/2025
Approved by	VV	10/24/2025

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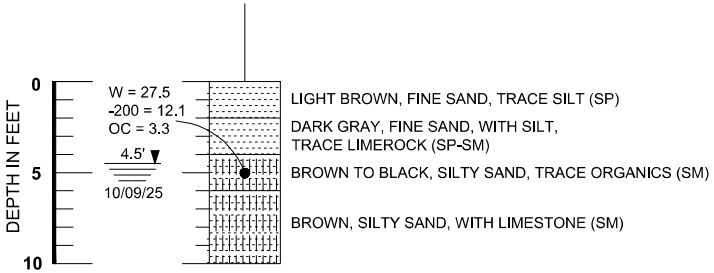
SCHOOL DISTRICT OF PALM BEACH COUNTY		SCALE: VERTICAL N.T.S.	SHEET TITLE: SUBSURFACE PROFILES (AUGER BORINGS)
COUNTY: PALM BEACH	CLIENT: SCHOOL DISTRICT OF PALM BEACH COUNTY	SCALE: HORIZONTAL N.T.S.	PROJECT NAME: WEST COMMUNITY ELEMENTARY SCHOOL

SHEET NO. 3H
RADISE PROJECT NO: 02-25-092

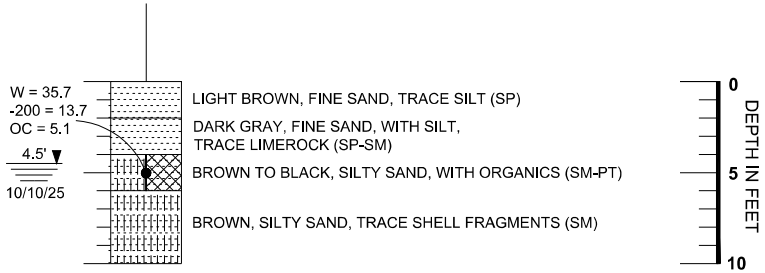
RECEIVED 11/24/2025 MJSS

BORING NO. EX-1
LONGITUDE: W 80.2990°
LATITUDE: N 26.7500°
RIG: CME 45
HAMMER: N/A
DRILLER T. FICKLING
DATE: 10/10/2025



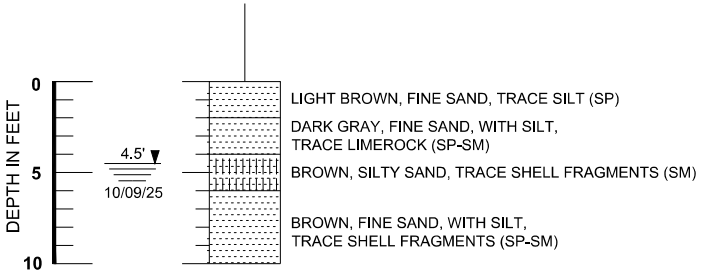
B.T. @ 10.0'
BELOW EXISTING GRADES

EX-2
W 80.2987°
N 26.7507°
CME 45
N/A
T. FICKLING
10/10/2025



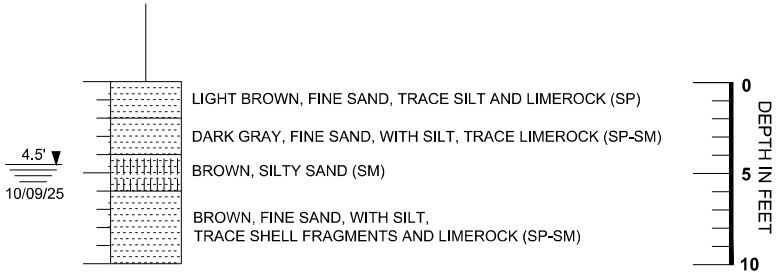
B.T. @ 10.0'
BELOW EXISTING GRADES

BORING NO. EX-3
LONGITUDE: W 80.2973°
LATITUDE: N 26.7505°
RIG: CME 45
HAMMER: N/A
DRILLER T. FICKLING
DATE: 10/10/2025



B.T. @ 10.0'
BELOW EXISTING GRADES

EX-4
W 80.2966°
N 26.7495°
CME 45
N/A
T. FICKLING
10/10/2025



B.T. @ 10.0'
BELOW EXISTING GRADES

LEGEND

- SAND (SP-SM)
- SILTY SAND (SM)
- SILTY SAND WITH ORGANICS (SM-PT)
- SANDY LIMESTONE

B.T. @ 10.0'	BORING TERMINATED AT 10.0 FEET BELOW THE EXISTING GROUND SURFACE
EX-1	EXFILTRATION TEST AND NUMBER
4.5' ▼ 10/10/25	GROUNDWATER DEPTH IN FEET AND BORING DATE
W	MOISTURE CONTENT (%)
OC	ORGANIC CONTENT (%)
-200	AMOUNT PASSING US STANDARD 200 SIEVE (%)
SP, SP-SM	UNIFIED SOIL CLASSIFICATION SYSTEM GROUP SYMBOL (ASTM D2487)

NOTES:

1. AUGER BORINGS WERE PERFORMED ON 10/10/2025 IN ACCORDANCE WITH ASTM D1452.
2. STRATA BOUNDARIES ARE APPROXIMATE AND REPRESENT SOIL STRATA AT EACH TEST HOLE LOCATION ONLY. SOIL TRANSITIONS MAY BE MORE GRADUAL THAN IMPLIED.
3. GROUNDWATER LEVEL SHOWN ON THE SUBSURFACE PROFILE REPRESENTS THE GROUNDWATER SURFACE ON THE DATE SHOWN. GROUNDWATER LEVEL FLUCTUATIONS SHOULD BE ANTICIPATED THROUGHOUT THE YEAR.
4. AFTER COMPLETION OF THE BORINGS, THE AUGER HOLES WERE BACKFILLED WITH GROUT.

REVISIONS						
Date.	By	Descriptions	Date.	By	Descriptions	

	Names	Dates
Drawn by	AM	10/24/2025
Checked by	NG	10/24/2025
Designed by	NG	10/24/2025
Checked by	NG	10/24/2025
Approved by	VV	10/24/2025

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LICENSE NO. - 8901

ENGINEER OF RECORD
VAMSHI VEMULA (P.E. No. 93711)
RADISE International
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Riviera Beach, Florida, 33404
TEL 561-841-0103 FAX 561-841-0104
URL: http://www.radise.net

SCHOOL DISTRICT OF PALM BEACH COUNTY		SCALE: VERTICAL N.T.S.	SHEET TITLE: SUBSURFACE PROFILES (AUGER BORINGS)	SHEET NO. 3
COUNTY: PALM BEACH	CLIENT: SCHOOL DISTRICT OF PALM BEACH COUNTY	SCALE: HORIZONTAL N.T.S.	PROJECT NAME: WEST COMMUNITY ELEMENTARY SCHOOL	RADISE PROJECT NO: 02-25-092

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Table A-1: Summary of Laboratory Test Results

Project Name: West Community Elementary School

Project ID: 02-25-092

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Boring No.	Sample Depth (ft.)	Soil Classification	Moisture Content (%)	Organic Content (%)	-200 wash (%)
B-1	6.0 - 8.0	SP-SM	18.3	-	7.6
B-1	13.5 - 15.0	SP-SM	19.8	-	11.8
B-1	33.5 - 35.0	SP-SM	18.1	-	8.0
B-2	4.0 - 6.0	SM	21.8	1.1	12.9
B-2	18.5 - 20.0	SM	24.8	-	16.3
B-3	6.0 - 8.0	SP	20.3	-	4.6
B-3	23.5 - 25.0	SP-SM	20.7	-	10.2
B-4	4.0 - 6.0	SP	23.8	-	3.7
B-4	18.5 - 20.0	SP-SM	19.8	-	9.3
B-4	28.5 - 30.0	SM	20.8	-	17.0
B-5	6.0 - 8.0	SP-SM	16.2	-	10.3
B-5	23.5 - 25.0	SP-SM	23.1	-	6.2
B-6	33.5 - 35.0	SM	25.4	-	12.0
B-7	4.0 - 6.0	SP-SM	26.3	-	7.3
B-7	23.5 - 25.0	SP-SM	21.2	-	10.5
B-8	28.5 - 30.0	SP-SM	21.7	-	9.9
B-9	6.0 - 8.0	SP-SM	38.7	4.8	9.2
B-9	43.5 - 45.0	SP-SM	20.8	-	6.7
B-10	6.0 - 8.0	SP-SM	27.0	2.9	11.9
B-10	23.5 - 25.0	SP-SM	18.0	-	11.5
B-10	28.5 - 30.0	SM	17.3	-	21.4
B-11	4.0 - 6.0	SM	15.0	-	12.3
B-11	8.0 - 10.0	SP-SM	18.6	-	6.7
B-11	33.5 - 35.0	SP-SM	21.8	-	8.8
B-12	6.0 - 8.0	SM	34.1	4.4	13.2
B-12	33.5 - 35.0	SP-SM	20.2	-	9.6
B-12	43.5 - 45.0	SP-SM	20.4	-	8.0
AB-1	4.0 - 6.0	SM	21.6	3.8	20.9
AB-2	6.0 - 10.0	SP	13.9	-	4.6
AB-3	2.0 - 4.0	SP-SM	18.9	-	10.9
AB-8	6.0 - 10.0	SP	19.9	-	4.6
EX-1	4.0 - 6.0	SM	27.5	3.3	12.1
EX-2	4.0 - 6.0	SM-PT	35.7	5.1	13.7

Notes:

Moisture Content tested in accordance with ASTM D2216,
Organic Content tested in accordance with ASTM D2974,
Soil Classification in accordance with ASTM D2487,
Fines Content (Passing No. 200 Sieve) tested in accordance with ASTM D1140.

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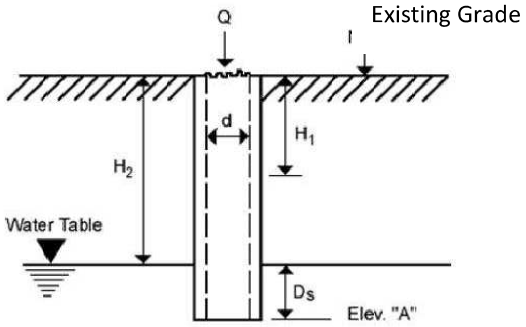
Table A-2: Summary of Exfiltration Test Results
West Community Elementary School
Westlake, Palm Beach County, Florida

Boring No.	Test Depth	Diameter of the test hole		Length of the exposed soil, L	Depth to water table, H_2	Volume of Water		Time	Stabilized flow rate, Q	Saturated Hole Depth, Ds	Hydraulic Conductivity, K
	(ft)	(in)	(ft) d	(ft)	(ft)	(gal)	(cu ft)	(sec)	(cfs)	(ft)	(cfs/ft^2 - ft head)
EX-1	0 - 10	6.0	0.50	10	4.5	8.8	1.18	600	0.002	5.5	3.52E-05
EX-2	0 - 10	6.0	0.50	10	4.5	7.2	0.96	600	0.002	5.5	2.88E-05
EX-3	0 - 10	6.0	0.50	10	4.5	9.2	1.23	600	0.002	5.5	3.68E-05
EX-4	0 - 10	6.0	0.50	10	4.5	7.4	0.99	600	0.002	5.5	2.96E-05

Notes:

1. Methodology and equation from the SFWMD Environmental Resource Permit Information Manual Volume IV.

USUAL OPEN-HOLE TEST



$$K = \frac{4Q}{\pi d (2H_2^2 + 4H_2D_S + H_2d)}$$

K = Hydraulic Conductivity (cfs/ft.^{2} – ft. head)
Q = "Stabilized" Flow Rate (cfs)
d = Diameter of Test Hole (feet)
H_2 = Depth to Water Table (feet)
D_s = Saturated Hole Depth (feet)

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Project No, Name: 02-25-092 - West Community Elementary School
Client: SCHOOL DISTRICT OF PALM BEACH COUNTY, 3361 Interstate Park Road, N, Suite 200, Riviera Beach FL, 33404
Owner: SCHOOL DISTRICT OF PALM BEACH COUNTY

Date: 10/16/2025 **Client Project No:**
Owner Project No:
Sample No: 2025 - 1322 (**QMS**) (**Client**)

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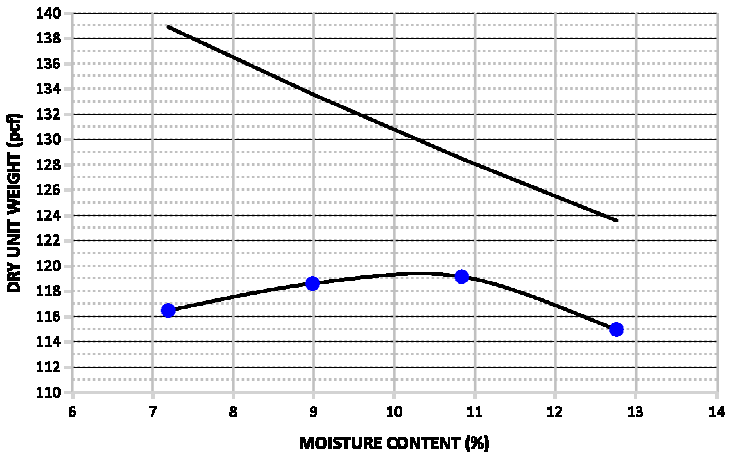
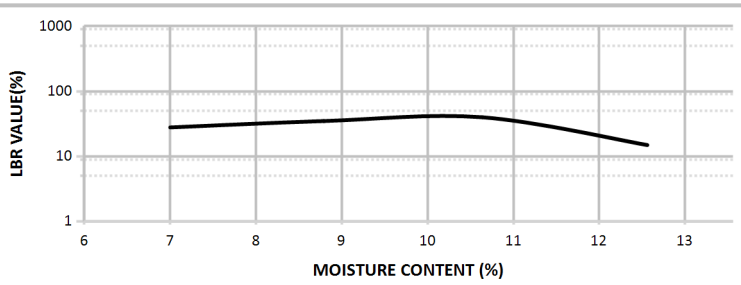
Limerock Bearing Ratio Results

Moisture-Density Relationship



Notes:Soil specific gravity of 2.65 was assumed for Zero air void curve calculations.



Grain Size Analysis	
Sieve	**% Passing**

Sample Details			
Sample Date	10/08/2025	**Sample By**	Kristina McCoy
Test Date	10/14/2025	**Tested By**	Venkata Bottu
Sample Location	Existing Subgrade		
Source	Existing Subgrade	**Source Volume**	N/A
Soil Description	TBD		
Material Use	Subgrade		
Soil Classification			
Northing: Easting: Elevation:			

Moisture Content	
Moisture Content	N/A

Atterberg Limits (Fine fraction)
Liquid Limit: N/A, **Plastic Limit:** N/A, **Plasticity Index:** N/A

Organic Content	
Organic Content (%)	N/A

Coarse Fraction (Retained on 3/4" Sieve)	
Specific Gravity	N/A
Absorption (%)	N/A

Proctor	
Maximum Dry density (pcf)	119.3
Optimum Moisture (%)	10.3
LBR Value	40.0

Note: Moisture Density Relationship performed in accordance with FM 5-515(Limerock Bearing Ratio) Dry Preparation using Automatic hammer.

Maximum Dry Density Correction	
Corrected Maximum Dry Density (pcf)	119.3
Corrected Optimum Moisture(%)	10.3

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SECTION 01 11 00
SUMMARY OF WORK/CONTRACTOR CONDUCT ON CAMPUS

PART 1 GENERAL

1.1 WORK COVERED BY CONTRACT DOCUMENTS

A. Work covers construction for:
   1. West Community Elementary School, Westlake, Florida.

B. General Conditions of the Contract cover additional requirements of all Parties to the Contract.

1.2 WORK SEQUENCE

A. Coordinate, sequence, and stage new work in accordance with approved Construction Schedules and safety plan.

B. Coordinate access, parking, and egress of all Contractor Personnel prior to commencing construction.

C. Construct Work in stages to provide for public and Owner's safety at all times including coordination with the local Fire Department for approval of ingress/egress with construction fencing.

D. Working Hours shall be in accordance with the applicable City Ordinances and/or in compliance with the Owner's directions.

1.3 CONTRACTOR USE OF PREMISES

A. Confine operations at site to areas permitted by Law, Ordinances, Permits, and Contract Documents.

B. Do not encumber site with materials or equipment.

C. Refer to Section 01 35 16 for provisions on safety, security, maintenance of access and operations, maintenance of existing utilities and services and building access restrictions.

1.4 SITE RESTRICTIONS AND REQUIREMENTS FOR ALL PROJECTS

A. The designated superintendent/foreman shall sign in and out all workers on a daily basis.
   1. All visitors to the site shall sign in on the Site Visitors Log kept in the School District Construction Office trailer or other designated location.

B. All Contractors, Subcontractors, and other construction employees shall wear District issued plastic laminated Identification cards at all times.

C. Report all construction site accidents to the School Board Project Facility Manager the same day they occur.
   1. Provide copies of accident reports and police reports to the School District Project Facility Manager the day they occur.

D. All Contractors, Subcontractors, and other construction employees shall park their vehicles in the designated construction site staging area, as shown on the plans.
   1. The staging area shown on the drawings is conceptual and modifications may be coordinated with the District as necessary.

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E. No firearms or other weapons allowed on the site.

F. NO Smoking or tobacco use allowed on any School District property by order of Board policy.

G. No alcohol or drugs allowed on any School Board property by order of Board policy.

1.5 ~~STUDENT OCCUPIED CAMPUS SPECIAL REQUIREMENTS~~

A. ~~Project personnel shall not communicate with students, except to warn of danger or to order out of the construction site.~~

B. ~~Project personnel shall not enter student occupied areas while students are on campus, except in emergencies or with the permission and knowledge of the school staff and the District's construction project representative.~~

C. ~~NO SMOKING, ALCOHOL, or non-Prescription DRUGS on any part of the school property, whether the school is in session or not.~~

D. ~~No firearms or other weapons allowed on the site.~~

E. ~~The use of radios, tape and C.D. players is limited to the contractor's trailer and unoccupied school campuses, and keep the volume level set to prevent being heard on the active student campus or neighboring properties.~~

F. ~~Project personnel shall wear appropriate clothing, shall not have any foul or vulgar language visible on the clothing.~~

G. ~~Project personnel shall not use foul or vulgar language while students and staff are on campus.~~

H. ~~Do not bring or keep animals on the site.~~

I. ~~Comply with all requirements of FBC-B Section 453 - State Requirements for Educational Facilities.~~

1.6 DAILY LOG

A. The Contractor shall maintain a daily log of the construction progress and include the number of workers on site, general activity, inspections performed, visitors, construction site equipment utilized, weather, and other pertinent data. All items shall be summarized each day.

B. Provide one copy to the School District Project Manager daily.

1.7 ITEMS NOT IN CONTRACT

A. Items under this contract include all work indicated on the contract documents, unless specifically noted as "Not in Contract" (N.I.C.).

PART 2 PRODUCTS

2.1 NOT USED.

PART 3 EXECUTION

3.1 NOT USED.

END OF SECTION

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SECTION 01 23 00
ALTERNATES

PART 1 GENERAL

1.1 SUMMARY

A. This Section identifies each Alternate by number. The changes described in each Alternate are to be incorporated into the work only when that Alternate is made a part of such work by specific provision in the Owner-Contractor Agreement

1.2 ACCEPTANCE OF ALTERNATES

A. Alternates will be reviewed and accepted or rejected at Owner's option. Accepted Alternates will be identified in the Owner-Contractor Agreement.

B. If the Owner elects to proceed on the basis of one or more of the described Alternates, make modifications to the work required in furnishing and installing the selected Alternate to the acceptance of the Architect and at no additional cost to the Owner other than as proposed

C. Coordinate related work and modify surrounding work to integrate the Work of each Alternate.

1.3 SCHEDULE OF ALTERNATES

A. Deduct Alternate No. 1 - Modified Bitumen Membrane Roofing, Two ply system:

1. Provide a Two ply modified bitumen roofing system, consisting of base ply and granular surface cap sheet, over light weight concrete, structural concrete and/or metal deck.
    a. Membrane Properties:
        1) One ply, modified bitumen base sheet per ASTM D6164, 3.0 mm (118 mils) minimum thickness.
        2) One ply, modified bitumen membrane, granular surfaced, fire retardant, cap sheet, per ASTM D6164, 4.0 mm (160 mils) nominal thickness.
    b. Follow Section 07 52 00 - Modified Bitumen Membrane Roofing for all other requirements.
2. Base Bid Condition: Provide a Three ply modified bitumen roofing system, consisting of anchor sheet, base ply (interply), and granular surface cap sheet, over light weight concrete and metal deck per Section 07 52 00 - Modified Bitumen Membrane Roofing.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

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SECTION 01 26 00
CONTRACT MODIFICATION PROCEDURES

PART 1 GENERAL

1.1 SECTION INCLUDES
- A. Submittals
- B. Documentation of change in Contract Sum and Contract Time
- C. Change procedures
- D. Construction Change Directive
- E. Stipulated Sum change order
- F. Unit price change order
- G. Time and material change order
- H. Execution of change orders
- I. Correlation of Contractor submittals

1.2 SUBMITTALS
- A. Submit the name of the individual authorized to receive change documents and who is responsible for informing others in Contractor's employ or Subcontractors of changes to the work.
- B. Change Order Forms: Issued by the School District of Palm Beach County

1.3 DOCUMENTATION OF CHANGE IN CONTRACT SUM AND CONTRACT TIME
- A. Maintain detailed records of work done on a time and material basis.
  1. Provide proper documentation to substantiate costs of changes in the work.
- B. Provide data to support computations:
  1. Quantities of products, labor, and equipment
  2. Taxes, insurance, and bonds
  3. Overhead and profit
  4. Justification for any change in Contract Time in the form of a revised CMP schedule.
  5. Credit for deletions from Contract, similarly documented
- C. On request, support each claim for additional costs, and work done on a time and material basis.
  1. Origin and date of claim
  2. Dates and times work was performed and by whom.
  3. Time records and wage rates paid.
  4. Invoices and receipts for products, equipment, and subcontracts, similarly documented.

1.4 CHANGE PROCEDURES
- A. The Architect shall advise of minor changes in the work not involving an adjustment to Contract Sum or Contract Time as authorized by issuing supplemental instructions on AIA Form G710 Architect's Supplemental Instructions (ASI).
- B. The Architect may issue a Proposal Request detailing the description of a proposed change along with additional or revised drawings/specifications, and with a change in contract time to execute the change with a stipulation of required overtime work and the period the price is valid.
  1. Contractor will prepare and submit an estimate within ten working days.

1.5 CONSTRUCTION CHANGE DIRECTIVE
- A. Architect may issue a document, signed by the Owner, instructing the Contractor to proceed with a change in the work, for subsequent inclusion in a change order.
- B. The document will describe changes in the work, and will designate method of determining any change in Contract Sum or Contract Time.
- C. Promptly execute the change in work.
- D. At a predetermined time or at the completion of the work, proceed as shown in Item 1.6, below.

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1.6 STIPULATED SUM CHANGE ORDER
- A. Based on Proposal Request and Contractor's price quotation

1.7 UNIT PRICE CHANGE ORDER
- A. Execute change order(s) on a fixed unit price basis for pre-determined unit prices and quantities.
- B. Execute work under a Construction Change Directive, for unit costs or quantities of units of work, not pre-determined.
- C. Compute changes in contract sum or contract time as specified in a time and material change order.
- D. At a predetermined time or at the completion of the work, proceed as shown in Item 1.6, above.

1.8 TIME AND MATERIAL CHANGE ORDER
- A. Submit itemized account and supporting data after completion of change, within time limits indicated in the Conditions of the Contract.
- B. Maintain detailed records of work done on Time and Material basis.
- C. Maintain all information required for proper evaluation of all proposed changes and to associated costs for changes in the work.
- D. At a predetermined time or at the completion of the work, proceed as shown in Item 1.6, above.

1.9 EXECUTION OF CHANGE ORDERS
- A. Execution of Change Orders: Architect will issue Change Orders for signatures of parties as provided in the Conditions of the Contract, within ten working days.

1.10 CORRELATION OF CONTRACTOR SUBMITTALS
- A. Promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as a separate line item and adjust the Contract Sum.
- B. Promptly revise progress schedules to reflect any change in Contract Time, revise sub schedules to adjust time for other items of work affected by the change, and resubmit.
- C. Promptly enter changes in Project Record Documents.

PART 2 PRODUCTS

2.1 Not Used.

PART 3 EXECUTION

3.1 Not Used.

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SECTION 01 29 76
PROCEDURES FOR PAYMENT

PART 1 GENERAL

1.1 SECTION INCLUDES:
- A. Procedures for preparation and submittal of Applications for Payment

1.2 FORMAT
- A. PBSD 2354 -SD702 - Application and Certificate for Payment and PBSD 2354 -SD703 - Continuation Sheets, contractor's electronic media driven form including continuation sheets as approved by Owner.

1.3 PREPARATION OF APPLICATIONS
- A. Present required information on electronic media printout as approved by Owner.
- B. Execute certification by signature of authorized officer.
- C. Use data from approved Schedule of Values. Provide dollar value in each column for each line item for portion of work performed and for stored products.
- D. List each authorized Change Order as an extension on PBSD 2354 -SD703 - Continuation Sheet, listing Change Order number and dollar amount as for an original item of Work.
- E. Prepare Application for Final Payment as specified in Section 00510, Article 16.4.

1.4 SUBMITTAL PROCEDURES
- A. Payment period: Submit at intervals stipulated in the Agreement.
- B. Electronically submit a draft copy of each Application for Payment to the Owner and other parties as directed by the Owner, five business days prior to the scheduled application date as stipulated in the Agreement.
- C. Upon review of the application the Owner will return the draft copy to the Contractor "Approved" or "Approved as Noted" within three business days.
- D. The Contractor shall revise the application, if necessary, and submit the final copy to the Architect, the Owner, and other parties as directed by the Owner on the scheduled application date as stipulated by the Agreement.
- E. Submit substantiating data, if requested, with the approved or corrected application.
- F. Submit an updated construction schedule with each Application for Payment.

1.5 SUBSTANTIATING DATA
- A. When Architect or Owner requires substantiating information, submit all necessary data justifying the dollar amounts.
- B. A meeting at the construction site with the Contractor, Architect, and Owner will occur to confirm progress of the Work submitted for payment by the Contractor.
- C. Include the following with the application.
  1. Affidavits attesting to off-site stored products.
  2. Construction progress schedules, revised and correct as specified.

1.6 Retainage
- A. A cumulative amount of 5% will be withheld by the Owner as retainage.

PART 2 PRODUCTS

2.1 Not Used.

PART 3 EXECUTION

3.1 Not Used.

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SECTION 01 31 00
PROJECT MANAGEMENT AND COORDINATION

PART 1 GENERAL

1.1 SECTION INCLUDES:

A. Coordination and project conditions
B. Field engineering
C. Preconstruction meeting
D. Site mobilization meeting
E. Progress meetings
F. Pre-installation meetings
G. Alteration project procedures

1.2 COORDINATION AND PROJECT CONDITIONS

A. Coordinate the scheduling, submittals, and Work to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.

B. Verify utility company requirements and characteristics of operating equipment are compatible with building utilities.
   1. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.

C. Coordinate space requirements, supports, and installation of mechanical and electrical work as indicated diagrammatically on Drawings.
   1. Require coordination drawings from each trade identifying routing of work, openings required in or under structure and possible conflicts.
   2. Follow routing shown for pipes, ducts, and conduit, as closely as practicable; place runs parallel with line of building.
   3. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

D. In finished areas, except as otherwise indicated, conceal pipes, ducts, and wiring within the construction.
   1. Coordinate locations of fixtures and outlets with finish elements.

E. 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.

F. After Owner occupancy of premises, coordinate access to site for correction of defective Work and Work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

G. Owner will not consider change orders for extra work required by the Contractor due to poor coordination by the Contractor.

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H. Coordinate scheduling of Contractor Startups, submission of Operations & Maintenance Manuals, Commissioning System Readiness Checklists, Functional Performance Testing, Owner's Training, and Demonstration with the Owner and Commissioning Agent.

1.3 FIELD ENGINEERING

A. Employ a Land Surveyor registered in the State of Florida and acceptable to the Architect and Owner.

B. Contractor shall locate and protect survey control and reference points.

C. Control datum for survey is that established by Owner provided survey.

D. Verify setbacks and easements; confirm drawing dimensions and elevations.

E. Provide field-engineering services.
   1. Establish elevations, lines, and levels, utilizing recognized engineering survey practices.

F. Submit a copy of site drawing and certificate signed by the Land Surveyor that the elevations and locations of the Work are in conformance with the Contract Documents.

1.4 PRECONSTRUCTION MEETING

A. Owner will schedule a conference after Notice to Proceed.

B. Attendance required by the Owner, Architect, and Contractor.

C. Agenda:
   1. Execution of Owner-Contractor Agreement, if not executed
   2. Submission of executed bonds and insurance certificates
   3. Distribution of Contract Documents
   4. Submission of list of Subcontractors, list of Products, schedule of values, and progress schedule
   5. Designation of personnel representing the parties in Contract, and the Architect
   6. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders and Contract closeout procedures
   7. Scheduling
   8. Scheduling activities of a Geotechnical Engineer
   9. Overview of Commissioning requirements

D. Architect to record minutes and distribute copies within two days after meeting to Owner, participants, and those affected by decisions made.

1.5 SITE MOBILIZATION MEETING

A. Owner will schedule a meeting at the Project site prior to Contractor occupancy.

B. Attendance required by the Owner, Architect, Special Consultants, Specialty Contractors, and Contractor, Contractor's Superintendent, and major Subcontractors.

C. Agenda:
   1. Use of premises by Owner and Contractor
   2. Owner's requirements and partial occupancy
   3. Construction facilities and controls provided by Owner
   4. Temporary utilities provided by Owner
   5. Survey and building layout

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6. Security and housekeeping procedures
7. Schedules
8. Application for payment procedures
9. Procedures for testing and Commissioning
10. Procedures for maintaining record documents
11. Requirements for start-up of equipment
12. Inspection and acceptance of equipment put into service during construction period

D. Architect to record minutes and distribute copies within two days after meeting to Owner, participants, and those affected by decisions made.

1.6 PROGRESS MEETINGS

A. Contractor shall schedule and administer meetings throughout progress of the work at bi-weekly intervals.
   1. Arrange for meetings, prepare agenda with copies for participants, and preside at meetings.

B. Attendance Required Job superintendent, major Subcontractors and suppliers if requested, Owner, Architect, as appropriate to agenda topics for each meeting.

C. Agenda:
   1. Review minutes of previous meetings
   2. Review of Work progress
   3. Field observations, problems, and decisions
   4. Identification of problems that impede planned progress
   5. Review of submittals schedule and status of submittals
   6. Review of off-site fabrication and delivery schedules
   7. Maintenance of progress schedule
   8. Review updates to As-Built drawings per work accomplished.
   9. Corrective measures to regain projected schedules
   10. Planned progress during succeeding work period
   11. Coordination of projected progress
   12. Maintenance of quality and work standards
   13. Effect of proposed changes on progress schedule and coordination
   14. Other business relating to work
   15. Commissioning related issues

D. Contractor to record minutes and distribute copies within two days after meeting to Owner, participants, and those affected by decisions made.

1.7 PREINSTALLATION MEETING

A. When required in individual specification section, convene a pre-installation meeting at the site prior to commencing work of the section.

B. Require attendance of parties directly affecting, or affected by, work of the specific section.

C. Notify Owner and Architect five working days in advance of meeting date.

D. Prepare agenda and preside at meeting:

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1. Review conditions of installation, preparation and installation procedures.
2. Review coordination with related work.

E. Contractor to record minutes and distribute copies within two days after meeting to Owner, participants, and those affected by decisions made.

1.8 ~~ALTERATION PROJECT PROCEDURES~~

A. ~~Materials: As specified in Product sections match existing Products and work for patching and extending work.~~

B. ~~Employ skilled and experienced installer to perform alteration work.~~

C. ~~Close openings in exterior surfaces to protect existing work from weather and extremes of temperature and humidity.~~

D. ~~Remove, cut, and patch Work in a manner to minimize damage and to provide means of restoring Products and finishes to original or specified condition.~~

E. ~~Refinish existing visible surfaces to remain in renovated rooms and spaces, to specified condition for each material, with a neat transition to adjacent finishes.~~

F. ~~Where new Work abuts or aligns with existing, provide a smooth and even transition.~~
1. ~~Patch work to match existing adjacent work in texture and appearance.~~

G. ~~When finished surfaces are cut so that a smooth transition with new Work is not possible, terminate existing surface along a straight line at a natural line of division and submit recommendation to the Architect for review.~~

H. ~~Where a change of plane of 1/4" or more occurs, submit recommendation for providing a smooth transition to Architect for review.~~

I. ~~Patch or replace portions of existing surfaces, damaged, lifted, discolored, or showing other imperfections.~~

J. ~~Finish surfaces as specified in individual Product sections.~~

PART 2 PRODUCTS

2.1 NOT USED

PART 3 EXECUTION

3.1 NOT USED

END OF SECTION

SECTION 01 32 17
NETWORK ANALYSIS SCHEDULES

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PART 1 GENERAL

1.1 SECTION INCLUDES:
- A. References
- B. Quality Assurance
- C. Format
- D. Schedules
- E. Submittals
- F. Review and evaluation
- G. Updating schedules
- H. Distribution

1.2 REFERENCES
- A. The Use of CPM in Construction - A Manual for General Contractors and the Construction Industry, Washington, D.C., The Associated General Contractors of America (AGC), Latest edition.

1.3 QUALITY ASSURANCE
- A. Scheduler:
  1. Contractor's personnel specializing in CPM scheduling with minimum of 5-years of experience in scheduling construction work of a complexity comparable to this Project.
  2. Having use of computer facilities the capability of delivering a detailed graphic digital CPM schedule.
- B. Contractor Administrative Personnel: 5-years minimum experience in using and monitoring CPM schedules on comparable projects.

1.4 FORMAT
- A. Listings, reading from left to right, in ascending order for each activity.
  1. Identify each activity with the applicable specification section number.
- B. Scale and Spacing, allowing for notations and revisions

1.5 SCHEDULES
- A. Prepare network analysis diagrams and supporting mathematical analyses using the Critical Path Method, under concepts and methods outlined in AGC's "The Use of CPM in Construction - A Manual for General Contractors and the Construction Industry".
- B. Illustrate order and interdependence of activities and sequence of work.
  1. How the start of a given activity depends upon completion of preceding activities, and how completion of the activity may restrain start of subsequent activities.
- C. Illustrate complete sequence of construction by activity, identifying work of separate stages.
  1. Provide dates for delivery and return of submittals including those for Owner furnished items.
  2. Provide dates for procurement and delivery of critical products; and dates for installation and provision for testing.
  3. Provide allowances for review, correction and re-review by architect, engineer, Commissioning Authority and Building Department as applicable.
  4. Provide legend for symbols and abbreviations used.
  5. Provide for delivery of a separate report reflecting only shop drawing/product submittals. Include with each analysis submittal.
- D. Mathematical Analysis: Tabulate each activity of detailed network diagrams, using calendar dates, and identifying for each activity:
  1. Preceding and following event numbers

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2. Activity description
3. Estimated duration of activity, in maximum 15-day intervals
4. Earliest start date
5. Earliest finish date
6. Actual start date
7. Actual finish date
8. Latest start date
9. Latest finish date
10. Total and free float; float time shall accrue to the contractor and to the contractor's benefit.
11. Monetary value of activity, keyed to Schedule of Values.
12. Percentage of activity completed.
13. Responsibility

E. Analysis Program: Capable of compiling monetary value of completed and partially completed activities, of accepting revised completion dates, and recompilation of all dates and floats.

F. Required Sorts: List activities in sorts or groups:
1. By preceding work item or event number from lowest to highest
2. By amount of float, then in order of early start
3. By responsibility in order of earliest possible start date
4. In order of latest allowable start dates
5. In order of latest allowable finish dates
6. Contractor's periodic payment request sorted by Schedule of Values listings.
7. Listing of basic input data that generates the report
8. Listing of activities on the critical path
9. Provide sub schedules for each state of Work identified in Section 01 11 00.
10. Coordinate contents with Schedule of Values in Section 01 33 00.

G. Commissioning activities: The schedule shall include required Commissioning activities and shall include the following specific issues.
1. Equipment and System Training and Demonstration.
2. Equipment and System Operations and Maintenance documents.
3. Required Equipment and System Contractor Startup.
4. Commissioning System Readiness Checklists.
5. Functional Performance Testing.

1.6 SUBMITTALS FOR REVIEW

A. Within 10 days after date in Notice to Proceed, submit proposed preliminary network diagram defining planned operations for the first 60 days of work, with a general outline for remainder of work.

B. Participate in review of preliminary and complete network diagrams jointly with Architect.

C. Within 20 days after joint review of proposed preliminary network diagram, submit draft of proposed complete network diagram for review.
1. Include written certification that major Subcontractors have reviewed and accepted proposed schedule.

D. Within 10 days after joint review, submit complete network analysis consisting of network diagrams and mathematical analysis.

E. Submit updated network schedules with each Application for Payment.

1.7 REVIEW AND EVALUATION

A. Participate in joint review and evaluation of network diagrams and analysis with Architect at each submittal.

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B. Evaluate project status to determine work behind schedule and work ahead of schedule.
C. After review, revise as necessary as result of review, and resubmit within 10 days.

1.8 UPDATING SCHEDULES

A. Maintain schedules to record actual start and finish dates of completed activities.
B. Indicate progress of each activity to date of revision, with projected completion date of each activity.
   1. Update diagrams graphically depicting the status of work.
C. Identify activities modified since previous submittal, major changes in work, and other identifiable changes.
D. Indicate changes required to maintain Date of Substantial Completion.
E. Submit sorts required to support recommended changes.
F. Provide narrative report to define problem areas, anticipated delays, and affect the schedule. Report corrective action taken or proposed and its effect

1.9 DISTRIBUTION

A. Following joint review, distribute copies of updated schedules to Contractor's project site file, to Subcontractors, Suppliers, Architect, Owner, and other concerned parties.
B. Instruct recipients to promptly report, in writing, problems anticipated by projections shown in schedules.

PART 2 PRODUCTS

2.1 Not used.

PART 3 EXECUTION

3.1 Not used.

END OF SECTION

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SECTION 01 33 00
SUBMITTAL PROCEDURES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Submittal procedures
B. Proposed products list
C. Product data
D. Shop drawings
E. Samples
F. Design data
G. Test reports
H. Certificates
I. Manufacturer's instructions
J. Manufacturer's field reports
K. Erection drawings

1.2 REFERENCES

A. AGC (Associated General Contractors of America) publication "The Use of CPM in Construction - A Manual for General Contractors and the Construction Industry"

1.3 SUBMITTAL PROCEDURES

A. Transmit each submittal electronically with Architect accepted form.
B. Sequentially number the transmittal forms.
   1. Revise submittals with original number and a sequential alphabetic suffix.
C. Identify project, Contractor, Subcontractor or supplier pertinent drawing and detail number, and specification section number, as appropriate.
D. Apply contractor's stamp, signed or initialed certifying that review, approval, verification of products required, field dimensions, adjacent construction work, and coordination of information are in accordance with the requirements of the work and contract documents.
E. Schedule submittals to expedite the project, and deliver to Architect and Construction Manager at business email address.
   1. Coordinate submission of related items.
F. For each submittal for review, allow at least 7 working days excluding delivery time to and from the Contractor.
G. Identify variations from contract documents and product or system limitations, which may be detrimental to successful performance of the completed work.
H. Provide space for Contractor and Architect review stamps.
I. When submittals are stamped “APPROVED” or “APPROVED AS NOTED”, the Contractor shall proceed according to comments on the submittal. No resubmission is required.

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J. When submittals are stamped “REVISE AND RESUBMIT”, the Contractor shall address all comments shown on the submittal, then re-submit a revised submittal for re-evaluation.

K. Distribute copies of reviewed submittals as appropriate. Instruct parties to promptly report any inability to comply with requirements.

L. Submittals not requested will not be recognized or processed.

1.4 PROPOSED PRODUCTS LIST

A. Within 15 days after date of Notice to Proceed, submit list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.

B. For products specified only by reference standards, give manufacturer, trade name, model or catalog designation, and reference standards.

1.5 PRODUCT DATA

A. Product Data For Review:
   1. Submit electronically to Architect for review and checking for conformance with information given and the design concept expressed in the contract documents.
   2. After review, provide copies and distribute per the Submittal Procedures article above and for record documents purposes described in Section 01 77 00 - Contract Closeout.

B. Product Data For Information:
   1. Submitted for the Architect's knowledge as contract administrator or for the Owner

C. Product Data For Project Close-out:
   1. Submitted for the Owner's benefit during and after project completion

D. Mark each submittal to identify applicable products, models, options, and other data.
   1. Supplement manufacturers' standard data to provide information unique to this project.

E. Indicate product utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

F. After review, distribute in accordance with the Submittal Procedures article above and provide copies for record documents described in Section 01 77 00 - Contract Closeout.

1.6 SHOP DRAWINGS

A. Shop Drawings For Review:
   1. Submit electronically (PDF format) to Architect for review and checking for conformance with information given and the design concept expressed in the contract documents.
   2. Submit electronically to the Building Code Services Department after Architect/Engineer approval those items identified in Shop Drawing Requirements and Product Approvals #BD-005 per the outlined procedures.
      a. All shop drawings submitted to the Building Code Services Department must clearly show the Contractor’s and Architect and/or Engineer’s review stamps and review comments.
   3. After review, produce copies and distribute per the Submittal Procedures article above and for record documents purposes described in Section 01 77 00 - Contract Closeout.

B. Shop Drawings For Information:
   1. Submitted for the Architect's knowledge as contract administrator or for the Owner

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C. Shop Drawings For Project Close-out:
   1. Submitted for the Owner's benefit during and after project completion

D. Indicate special utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

E. Prepare accurate, drawn-to-scale, original shop drawing documentation by interpreting Contract Documents and coordinating related work.

F. Do not reproduce Contract Documents to create shop drawings.

G. Generic, non-project-specific information submitted as shop drawings do not meet the requirements for shop drawings.

1.7 SAMPLES

A. Samples For Review:
   1. Submitted to Architect for review and checking for conformance with information given and the design concept expressed in the contract documents.
   2. After review, provide duplicates and distribute per the Submittal Procedures article above and for record documents purposes described in Section 01 77 00 - Contract Closeout.

B. Samples For Information:
   1. Submitted for the Architect's knowledge as contract administrator or for the Owner

C. Samples For Selection:
   1. Submitted to Architect for aesthetic, color, or finish selection.
   2. Submit samples of finishes from the full range of manufactures' standard colors, textures, and patterns for Architect selection.
   3. After review, provide duplicates and distribute per the Submittal Procedures article above and for record documents purposes described in Section 01 77 00- Contract Closeout.

D. Submit samples to illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices.
   1. Coordinate sample submittals for interfacing work.

E. Include identification on each sample, with full project information.

F. Submit the number of samples requested in the specification, one of which the Architect shall retain.

G. Reviewed samples, used in the project for compliance with the specifications.

H. Do not use samples for testing purposes unless specifically stated in the specification.

1.8 DESIGN DATA

A. Submit for the Architect's knowledge as contract administrator or for the Owner.

B. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.

1.9 TEST REPORTS

A. Submit for the Architect's knowledge as contract administrator or for the Owner.

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B. Submit test reports for information for the purpose of assessing conformance with information given and the design concept expressed in the contract documents.

1.10 CERTIFICATES

A. When specified in specification, submit certification by the manufacturer, installation/application subcontractor, or the contractor to Architect, in quantities specified for Product Data.

B. Indicate material or Product conforms to or exceeds specified requirements.
   1. Submit supporting reference date, affidavits, and certifications as appropriate.

C. Certificates may be recent or previous test results on material or Product, but must be acceptable to Architect.

1.11 MANUFACTURE'S INSTRUCTIONS

A. When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, and installation, start-up, adjusting, and finishing, to Architect for delivery to Owner in quantities specified for Product Data.

B. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

C. Refer to Section 01 40 00 - Quality Control, Manufacturer's Field Services article.

1.12 MANUFACTURER'S FIELD REPORTS

A. Submit reports for the Architect's benefit as contract administrator or for the Owner.

B. Submit report within 30 days of observation to Architect for information.

C. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.

1.13 ERECTION DRAWINGS

A. Submit drawings for the Architect's benefit as contract administrator or for the Owner.

B. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.

C. Data indicating inappropriate or unacceptable work is subject to action by the Architect or Owner.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

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SECTION 01 40 00
QUALITY CONTROL

PART 1 GENERAL

1.1 SECTION INCLUDES:
- A. Quality assurance - control of installation
- B. Tolerances
- C. References and standards
- D. Mock-up
- E. Inspecting and testing laboratory services
- F. Manufacturers' field services

1.2 QUALITY ASSURANCE/CONTROL OF INSTALLATION
- A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce work of specified quality.
- B. Comply fully with manufacturers' instructions, including each step in sequence.
- C. If manufacturers' instructions conflict with contract documents, request clarification from Architect before proceeding, and document instructions or directions that may invalidate a warranty.
- D. Comply with specified standards as a minimum quality for the work.
- E. Perform work by persons qualified to produce workmanship of 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, or disfigurement.
- H. Contractor shall schedule work to prevent absorbent materials installation and/or concealment of areas until, the building is dried-in, the installation of permanent doors and windows to prevent development of mold, entrapment of mold, moisture inside concealed spaces, or moisture absorption into interior materials.
- I. In buildings deemed “dried-in” by the Contractor, the Architect/Owner may require testing of building areas they suspect may have water damage/mold. If testing indicates water damage or mold growth, Contractor shall remove effected area and replace with new clean material at no additional cost to the Owner. If no damage/mold is discovered, cost of testing to be paid by the Owner.

1.3 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.
- C. Adjust products to appropriate dimensions; position before securing products in place.

1.4 REFERENCES AND STANDARDS:
- A. Workmanship shall comply with requirements of the standards specified by an association, trade, or other consensus standards of the specified products, except when applicable code requirements are more stringent.
- B. Use current reference standard(s) based on the date of contract documents, except where a code establishes a specific date.
- C. Obtain copies of standards where required by product specification sections.
- D. The contractual relationships, duties, nor responsibilities of the parties in Contract nor those of the Architect shall be altered from the contract documents by mention or inference in any referenced document.

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1.5 MOCK-UP:
- A. Perform all tests identified in this section and in the respective product specification sections.
- B. Assemble and erect specified items with specified attachment and anchorage devices, flashings, seals, and finishes.
- C. Accepted mock-ups shall be a comparison standard for the remaining work.
- D. Where Architect accepts the mock-up and product specification sections specify removal, remove mock-up and clear area when directed.
- E. When feasible, an area of permanent construction may be used as a mock-up.

1.6 TESTING SERVICES:
- A. Owner will appoint and pay for specified services of an independent firm to perform testing.
- B. The independent firm will perform tests and other specified services as outlined in individual specification sections and as required by the Owner.
- C. Testing and source quality control may occur on or off the project site.
  1. Perform off-site testing as required by the Architect or the Owner.
- D. The independent firm shall submit reports to the Owner and Architect and Contractor, indicating observations and results of tests and compliance or non-compliance with contract documents.
- E. Cooperate with independent firm; furnish samples of materials, design mix, equipment, tools, storage, safe access, and assistance by incidental labor as requested.
  1. Notify Owner, Architect and independent firm a minimum of 2-business days prior to expected time for operations requiring services.
  2. Make necessary arrangements with independent firm and pay for additional samples and tests required for Contractor's use.
- F. Testing does not relieve Contractor to perform work to contract requirements.
- G. The Architect may direct the same independent firm to re-test because of non-conformance to specified requirements.
  1. Contractor shall pay for re-testing cost by deducting testing charges from the Contract Price.

1.7 INSPECTION SERVICES:
- A. Owner will appoint, employ, and pay for specified services of an independent firm to perform inspection.
- B. The independent firm will perform inspections and other services specified in individual specification sections and as required by the Owner.
- C. Inspecting may occur on or off the project site.
  1. Perform off-site inspecting as required by the Architect or the Owner.
- D. The independent firm to the Owner and Architect and Contractor, indicating inspection observations and indicating compliance or non-compliance with contract documents, will submit reports.
- E. Cooperate with independent firm; furnish safe access and assistance for incidental labor as requested.
  1. Notify Owner, Architect, and independent firm a minimum of 2-business days prior to expected time for operations requiring services.
- F. Inspecting does not relieve Contractor to perform work to contract requirements.

1.8 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 of equipment and as applicable, and to initiate instructions when necessary.
- B. Submit qualifications of observer to the Architect 30 days in advance of required observations; the observer is subject to Owner's approval.

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C. Report all observations, site decisions, and instructions given to the applicators or the installers that are supplemental or contrary to the manufacturers' written instructions.
D. Refer to Section 01 33 00 - SUBMITTALS, MANUFACTURERS' FIELD REPORTS.

1.9 COMMISSIONING:
A. Commissioning of a system or systems is part of the construction quality process.
B. Documentation and testing of these systems, as well as training of the Owner's operation and maintenance personnel, is required in cooperation with the Owner's Representative and the Commissioning Authority.
C. Project Closeout is dependent on successful completion of all commissioning procedures, documentation, and issue closure.
1. Refer to Section 01 77 00 - Contract Closeout, for substantial completion details.
2. Refer to Section 01 91 00 - Commissioning, for detailed commissioning requirements.

PART 2 PRODUCTS

2.1 Not Used.

PART 3 EXECUTION

3.1 EXAMINATION:
A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work, beginning new work means acceptance of existing conditions.
B. Verify that existing substrate is capable of structural support or attachment of new work.
C. Examine and verify specific conditions described in individual specification sections.
D. Verify that utility services are available, of the correct characteristics, and in the correct locations.

3.2 PREPARATION:
A. Clean substrate surfaces prior to applying next material or substance.
B. Seal cracks or openings of substrate prior to applying next material or substance.
C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

END OF SECTION

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SECTION 01 41 00
REGULATORY REQUIREMENTS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 CODE REQUIREMENTS

A. Perform all work on this Project in strict accordance with, but not limited to, applicable requirements and portions of the latest editions of the currently adopted codes, revisions, amendments, and their references.

1. Florida Building Code:
    a. Florida Building Code – Building
    b. Florida Building Code – Fuel Gas
    c. Florida Building Code – Mechanical
    d. Florida Building Code – Plumbing
    e. Florida Building Code – Accessibility
    f. Florida Building Code – Energy Conservation
    g. National Electrical Code – FBC Chapter 27
    h. FBC Referenced Codes and Standards -- Chapter 35
2. Florida Fire Prevention Code, Ch. 69A-60, Florida Administrative Code, which includes:
    a. NFPA 1
    b. Referenced Mandatory Codes and Standards listed in 69A-60.005, FAC
    c. Referenced Mandatory Codes and Standards listed in NFPA 101
3. American Society of Civil Engineers - Minimum Design Loads for Buildings and Other Structures - ASCE 7
4. Florida Department of Education, State Requirements for Education Facilities (SREF)
5. State Fire Marshal's rule 69A-58 FAC
6. The Occupational Safety and Health Administration rules and regulations.

1.3 CODE STANDARDS

A. All work shall conform to applicable portions of the adopted, or the latest edition of the standards listed, which shall include, but is not limited to, the following:

1. Aluminum Association (AA)
2. American Concrete Institute (ACI)
3. American Institute of Steel Construction (AISC)
4. American National Standards Institute (ANSI)
5. American Society for Testing and Materials (ASTM)
6. American Society of Mechanical Engineers (ASME)
7. American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE)
8. American Welding Society (AWS)
9. Architectural Woodworking Institute (AWI)
10. Architectural Aluminum Manufacturer's Association (AAMA)
11. Commercial Standards (CS)
12. Federal Specifications and Standards (FSS)
13. National Occupations Safety and Health Administration (OSHA)
14. National Institute for Standards and Technology (NIST)

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15. Architectural Sheet Metal Manual (SMACNA)
16. Underwriters Laboratories (UL)
17. U.S. of America Standards Institute (ASI)
18. U.S. Department of Commerce Product Standards (USDCPS)

1.4 CODE DISCREPANCIES

A. In case of discrepancy between the codes, standards, and specifications listed, the code shall govern.

1.5 COMPLIANCE WITH CODES

A. A permit issued by the School District Building Department will be construed as permission to proceed with construction, and not as authority to violate, cancel, alter, or set aside any of the provisions of any Codes.

B. Permit issuance shall not prevent the Building Official from thereafter requiring a correction of errors in plans, construction, or violations of any Codes.

PART 2 PRODUCTS

2.1 NOT USED

PART 3 EXECUTION

3.1 NOT USED

END OF SECTION

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SECTION 01 45 00
TESTING LABORATORY SERVICES

PART 1 GENERAL

1.1 SECTION INCLUDES
- A. Selection and payment
- B. Quality Assurance
- C. Laboratory reports
- D. Limits on testing laboratory authority
- E. Contractor responsibilities

1.2 REFERENCES
- A. ASTM D3740 – Standard Practice for Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.
- B. ASTM E329 - Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection.

1.3 SELECTION AND PAYMENT
- A. Owner will employ and pay for services of an independent testing laboratory to perform specified inspection and testing.
- B. Employment of testing laboratory shall in no way relieve Contractor of obligation to perform work in accordance with requirements of Contract Documents.

1.4 QUALITY ASSURANCE
- A. Laboratory, authorized to operate in state of Florida.
- B. Laboratory maintains a full time registered Engineer on staff to review services.
- C. Testing Equipment, calibrated at reasonable intervals with devices of accuracy traceable to either National Bureau of Standards (NBS) Standards or accepted values of natural physical constants.

1.5 LABORATORY REPORTS
- A. After each inspection and test, submit the laboratory report electronically to Owner, Architect, and Contractor.
- B. Include:
  1. Date issued
  2. Project title and number
  3. Name of inspector
  4. Date and time of sampling or inspection
  5. Identification of product
  6. Location in the Project
  7. Type of inspection or test
  8. Date of test
  9. Results of tests
  10. Pass/fail criteria used to evaluate tests
- C. When requested by Architect, provide interpretation of test results.

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

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1.7 CONTRACTOR RESPONSIBILITIES

A. Make adequate samples of materials requiring testing available on-site, along with proposed mix designs.
B. Cooperate with laboratory personnel, and provide access to the Work and to manufacturer's facilities.
C. Provide incidental labor and facilities to provide access to Work to be tested, to obtain, and handle samples at the site or at source of products to be tested, to facilitate tests and inspections, storage and curing of test samples.
D. Notify Owner and laboratory a minimum of 24 hours prior to expected time for operations requiring inspection and testing services.
E. Arrange with laboratory and pay for additional samples and tests required by Contractor beyond specified requirements, and pay compensation for Architect's additional services made necessary by failed tests and inspections.
F. Testing and reports by the Contractor shall conform to the requirements of this section and to the requirements of Section 01 91 00 - Commissioning.

PART 2 PRODUCTS

2.1 Not Used.

PART 3 EXECUTION

3.1 Not Used.

END OF SECTION

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SECTION 01 50 00
TEMPORARY CONSTRUCTION FACILITIES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Temporary Utilities: Electricity, lighting, heat, ventilation, telephone, water, and sanitary
B. Temporary Controls: Barriers, enclosures and fencing, protection of the Work, and water control
C. Construction Facilities: Access roads, parking, progress cleaning, project signage, and temporary buildings

1.2 REGULATORY REQUIREMENTS

A. Conform to all applicable codes, standards and requirements
   1. Florida Building Code
   2. Florida Fire Prevention Code
   3. OSHA standards
   4. State Requirements for Educational Facilities
   5. District requirements
   6. Other related or referenced codes and standards listed in items 1 thru 5 above

1.3 TEMPORARY ELECTRICITY

A. Cost: By Contractor, provide and pay for power service required from utility source.
B. Provide temporary electric feeder from existing building electrical service at location as directed.
   1. Do not disrupt Owner's use of service.
C. Complement existing power service capacity and characteristics as required.
D. Provide power outlets for construction operations, with branch wiring and distribution boxes located as required.
   1. Provide flexible power cords as required to comply with OSHA standards.
E. Provide main service disconnect and over current protection at convenient location.
F. Contractor may use permanent convenience receptacles during construction as long as the use does not trip circuit breakers in the building or otherwise interferes with Owner’s use of service.

1.4 TEMPORARY LIGHTING FOR CONSTRUCTION PURPOSES

A. Provide and maintain lighting for construction operations to achieve a minimum lighting level as required by OSHA.
B. Provide and maintain adequate security lighting to exterior staging and storage areas after dark.
C. Provide branch wiring from power source to distribution boxes with lighting conductors, pigtails, and lamps as required.
D. Maintain lighting and provide routine repairs.
E. Contractor may use permanent building lighting during construction.

1.5 TEMPORARY HEATING

A. Provide and pay for heating devices and heat as needed to maintain specified conditions for construction operations per material manufacturer’s or supplier’s requirements.
B. Prior to operation of permanent equipment for temporary heating purposes, verify the installation is approved for operation; equipment is lubricated and filters in place.
   1. Provide and pay for operation, maintenance, and regular replacement of filters and worn or consumed parts.

1.6 TEMPORARY COOLING

A. Provide and pay for cooling devices and cooling as needed to maintain specified conditions for construction operations per material manufacturer’s or supplier’s requirements.

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B. Prior to operation of permanent equipment for temporary cooling purposes, verify the installation has approval for operation, the system controls are functional, equipment properly lubricated, and filters in place.
   1. Provide and pay for operation, maintenance, and regular replacement of filters and worn or consumed parts.
C. Unless indicated otherwise in specifications, in areas where construction is in progress, maintain maximum relative humidity of 60%, or as dry as needed to prevent the formation of mold.

1.7 TEMPORARY VENTILATION
A. Ventilate enclosed areas to achieve curing of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.
B. Utilize existing ventilation equipment.
   1. Extend and supplement equipment with temporary fan units as required to maintain clean air for construction operations.

1.8 TELEPHONE SERVICE
A. Provide, maintain, and pay for telephone service, including long distance available for the Owner's use, at time of project mobilization and continue until Final Completion.

1.9 FACSIMILE SERVICE
A. Provide, maintain, and pay for facsimile service and a dedicated telephone line available for the Owner's use at time of project mobilization.

1.10 TEMPORARY WATER SERVICE
A. Provide, maintain, and pay for suitable quality water service required.
B. Extend branch piping with outlets located so water is available by hoses with threaded connections.

1.11 TEMPORARY SANITARY FACILITIES
A. Provide and maintain required sanitary facilities and enclosures for start of project mobilization through the end of project. Do not use any existing facilities.
   1. Portable sanitary facilities shall be checked, cleaned and serviced weekly by the company that provides the units.
B. At end of construction, return facilities to same or better condition as originally found.

1.12 BARRIERS
A. Provide barriers to prevent unauthorized entry to construction areas, 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 as required by governing authorities for public rights-of-way and for public access to existing building.
C. Provide protection for plants designated to remain.
   1. Replace damaged plants.
D. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

1.13 FENCING
A. Construction: Commercial-grade chain link fence or Solid wood fence as designated on drawings.
B. Provide 6' high fence around construction site; equip with vehicular and pedestrian gates with locks.
   1. Provide top rail/support on all temporary fencing.
   2. Provide windscreen on temporary chain link fencing.
C. Permanent fencing required in the contract documents may be installed in place of temporary fencing at the Contractor’s option.

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D. Comply with FBC 453 - STATE REQUIREMENTS FOR EDUCATIONAL FACILITIES.

1.14 WATER CONTROL

A. Grade site to drain and keep excavations free of water.
   1. Provide, operate, and maintain pumping equipment as necessary.
B. Protect site from ponding or running water with water barriers as required to prevent soil erosion.

1.15 EXTERIOR ENCLOSURES

A. Provide temporary weather tight closure of exterior openings to accommodate acceptable working conditions and protection for Products, to allow for temporary heating and maintenance of required ambient temperatures identified in individual specification sections, and to prevent entry of unauthorized persons.
B. Provide access doors with locks.

1.16 INTERIOR ENCLOSURES

A. Provide temporary partitions and ceilings as indicated to separate the work areas from Owner occupied areas, to prevent penetration of dust and moisture into Owner occupied areas, and to prevent damage to existing materials and equipment.
B. Construction: Framing shall be metal stud and gypsum board with reinforced polyethylene sheet materials with closed joints and sealed edges at intersections with existing surfaces:
   1. STC rating of 35 in accordance with ASTM E90
   2. Maximum flame spread rating of 25 in accordance with ASTM E84.

1.17 PROTECTION OF INSTALLED WORK

A. Protect completed work and provide special protection as specified in other specification sections.
B. Provide temporary and removable protection for installed products.
   1. Control activity in immediate work area to prevent damage.
C. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
D. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.
E. Prohibit traffic or storage upon waterproofed or roofed surfaces.
   1. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.
F. Prohibit traffic in landscaped areas.

1.18 SECURITY

A. Provide security and facilities to protect Work in the area of construction from unauthorized entry, vandalism, or theft.
B. Coordinate with Owner's security program.

1.19 ACCESS ROADS

A. Construct and maintain temporary roads accessing public thoroughfares to serve construction area.
B. Extend and relocate, as required to provide detours necessary for unimpeded traffic flow.
C. Provide and maintain access to fire hydrants, free of obstructions.
D. Provide means of removing mud from construction vehicle wheels before entering streets.
E. Only use designated existing on-site roads for construction traffic.

1.20 PARKING

A. Arrange for temporary surface parking areas to accommodate construction personnel.
B. When site space is not adequate, provide additional off-site parking.
C. Do not allow vehicle parking on existing pavement, unless approved by the Owner.

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D. Designate two parking spaces for the Owner.

1.21 PROGRESS CLEANING AND WASTE REMOVAL

A. Maintain site in a clean and orderly condition free of waste materials, debris, and rubbish.
B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.
C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.
D. Collect and remove waste materials, debris, and rubbish from site weekly and properly dispose off-site.
E. No open free-fall chutes permitted terminate closed chutes into appropriate containers with lids.

1.22 PROJECT IDENTIFICATION

A. Provide 8' w x 4' h project sign of exterior grade plywood and wood frame construction, painted, with exhibit lettering by professional sign painter or die cut vinyl self-adhesive letters, and self-adhesive School District logo, to Owner's design and colors.
    1. The wording on project sign shall include the Project Coordinator's name and telephone contact number.
B. Provide a sign near workers entrance with the following information in addition to other required safety instructions:
    1. WARNING: HARD HAT AREA
    2. UNAUTHORIZED ENTRY PROHIBITED
    3. ALL VISITORS MUST REPORT DIRECTLY TO THE CONSTRUCTION TRAILER OR OFFICE.
    4. WORK SITE RULES:
        a. BE ALERT, REPORT UNSAFE CONDITIONS IMMEDIATELY TO JOB SUPERINTENDENT OR DISTRICT REPRESENTATIVE.
        b. NO SMOKING, DRUGS, ALCOHOL or LOUD RADIO PLAYING
        c. NO INAPPROPRIATE CONTACT WITH STUDENTS or SCHOOL STAFF (This is for a student occupied campus)
        d. THE FOLLOWING MUST BE WORN AT ALL TIMES:
            i) HARD HATS and SAFETY GLASSES
            ii) HARD SOLE SHOES (NO SNEAKERS)
            iii) SHIRTS AND LONG PANTS
            iv) DISTRICT ISSUED I.D. BADGE
    5. YOUR COOPPERATION IS GREATLY APPRECIATED
C. Contractors and Designers identification signs shall be located in such a way as to not distract from the District's project sign or interfere with traffic site lines at driveways.
D. Provide permanent and temporary freestanding exterior signs that shall comply with Florida Building Code (FBC) Chapter 16.
E. Erect on site at location indicated.
F. All other signs require Owner's permission except those required by law.

1.23 FIELD OFFICES AND SHEDS

A. Provide weather tight office, with lighting, electrical outlets, heating, cooling and ventilating equipment, and equipped with sturdy furniture, drawing rack and drawing display table.
B. Provide space for Project meetings, with table and chairs to accommodate 10 persons.
C. Provide a separate space for Owner representatives, to be determined by the Senior Project Administrator, with the following utilities and furnishings:
    1. Electrical services

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2. Permanent lighting
3. Heating, Ventilating and Air Conditioning
4. Potable water service
5. Chilled bottled water service
6. Toilet facilities with hand sink and sanitary hook-up
7. Parking - two reserved locations at field office
8. Waste removal
9. Access stairs conforming to codes
10. Secure field office to comply with codes
11. Telephones (2) with answering machines
12. Copy machine (1)
13. Facsimile machine (1)
14. Outdoor thermometer
15. Rain gauge
16. Furniture
    a. Desks (2), 3' x 5' each
    b. Office chairs (2)
    c. Side chairs (2)
    d. File cabinet, legal, four drawer (1)
    e. Folding chairs (6)
    f. Plan table, 3' x 8', (1)
    g. Work table, 3' x 6', (1)

D. Locate offices and sheds a minimum distance of 30' from existing and new structures.
E. Properly anchor any design field offices and/or sheds to resist hurricane force wind loads.
F. Provide space dedicated to Threshold Inspector on applicable projects.

1.24 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

A. Remove temporary utilities, equipment, facilities, and materials, prior to Final Completion inspection.
B. Disconnect and properly cap all temporary utilities prior to Final Completion.
C. Remove underground installations to a minimum depth of 2'; grade site as indicated.
D. Indicate the location and type of all underground temporary utilities on the as-build plans that are to remain.
E. Clean and repair damage caused by installation or use of temporary work.
F. Restore existing and permanent facilities used during construction to original condition. Restore permanent facilities used during construction to specified condition.

1.25 TEMPORARY LIFE SAFETY CONTROLS

A. When existing fire alarm, fire protection, and emergency lighting systems are present and will be used during construction, those systems are to be tested prior to the start of the project. Defects found at that time to be the responsibility of and corrected by the Owner.
B. The Contractor shall provide all temporary life safety systems required by statute, rule or code.

1.26 HURRICANE and SEVERE STORM PROTECTION

A. Construction Manager/Contractor shall develop a plan and implementation procedure for preparing the constructions site in the event of a hurricane or severe storm warning.
B. Develop the plan with the School District representatives.
C. It shall include as a minimum:
    1. Securing construction material from becoming wind borne debris during high winds

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2. Securing and protecting partially completed building components during the event

PART 2 PRODUCTS

2.1 Not Used.

PART 3 EXECUTION

3.1 Not Used.

END OF SECTION

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SECTION 01 56 00
SECURITY BARRIERS & ENCLOSURES

PART 1 GENERAL

1.1 SECTION INCLUDES
- A. Security Program
- B. Entry Control
- C. Personnel Identification

1.2 SECURITY PROGRAM
- A. Protect work, existing premises, and Owner's operations from theft, vandalism, and unauthorized entry.
- B. Initiate program in coordination with Owner's existing security system at project mobilization.
- C. Maintain program throughout construction period until Owner acceptance precludes the need for Contractor security.

1.3 ENTRY CONTROL
- A. Restrict entrance of persons and vehicles into Project site and existing facilities.
- B. Allow entrance only to authorized persons with proper identification.
- C. Maintain log of workers and visitors, make available to Owner on request.
- D. Coordinate access of Owner's personnel to site in coordination with Owner's security forces.

1.4 PERSONNEL IDENTIFICATION
- A. Provide identification badge to each person authorized to enter premises.
- B. Maintain a list of accredited persons; submit copy to Owner on request.

PART 2 PRODUCTS

2.1 Not Used.

PART 3 EXECUTION

3.1 Not Used.

END OF SECTION

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SECTION 01 57 00
TEMPORARY CONTROLS

PART 1 GENERAL

1.1 SECTION INCLUDES
- A. Temporary Controls
  1. Dust Control
  2. Erosion and Sediment Control
  3. Noise Control
  4. Pest Control
  5. Pollution Control
  6. Rodent Control
  7. Environmental (temperature, relative humidity) Control

1.2 DUST CONTROL
- A. Employ all specified controls required to protect Owner's existing property and facilities.
- B. Execute work by methods to minimize raising dust from construction operations.
- C. Provide means to control dust and debris from entering the public streets and rights of way.

1.3 EROSION AND SEDIMENT CONTROL
- A. Plan and execute construction by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas. Prevent erosion and sedimentation.
- B. Minimize amount of bare soil exposed at one time.
- C. Provide temporary measures such as berms, dikes, and drains, to control water flow.
- D. Construct fill and waste areas by selective placement to avoid erosive surface silts or clays.
- E. Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.
- F. Do not allow mud or debris-laden runoff to enter existing storm water system.
- G. Comply with Florida DEP National Pollutant Discharge Elimination System requirements.

1.4 NOISE CONTROL
- A. Provide methods, means, and facilities to minimize noise from and noise produced by construction operations.
- B. Contact local government officials to obtain noise control requirements prior to beginning Work.

1.5 PEST CONTROL
- A. Provide methods, means, and facilities to prevent pests and insects from damaging the work.

1.6 POLLUTION CONTROL
- A. Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations.

1.7 RODENT CONTROL
- A. Provide methods, means, and facilities to prevent rodents from accessing or invading premises.

1.8 ENVIRONMENTAL CONTROL
- A. Maintain temperature in accordance with Section 01 50 00, 1.6 C.
- B. Maintain relative humidity in accordance with Section 01 50 00, 1.6 D.
- C. Contractor is responsible for environmental control until the District accepts the facility with the Certificate of Occupancy (CO) or the Temporary Certificate of Occupancy (TCO).
  a. Contractor is responsible for any damage caused by the formation of mold and mildew or other deterioration of any building materials prior to CO or TCO.

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PART 2 PRODUCTS

2.1 Not Used.

PART 3 EXECUTION

3.1 Not Used.

END OF SECTION

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SECTION 01 60 00
MATERIAL EQUIPMENT AND APPROVED EQUALS

PART 1 GENERAL

1.1 SECTION INCLUDES
- A. Products
- B. Transportation and handling
- C. Storage and protection
- D. Product options
- E. Substitutions
- F. Approved Equals

1.2 PRODUCTS
- A. Product means new material, machinery, components, equipment, fixtures, and systems forming the work, it does not include machinery and equipment used for preparation, fabrication, conveying, and erection of the work.
  1. This may also include existing materials or components required for reuse.
- B. Do not use materials and equipment removed from existing premises, except as specifically permitted by the Contract Documents.

1.3 TRANSPORTATION AND HANDLING
- A. Transport and handle products in accordance with manufacturer's instructions.
- B. Promptly inspect shipments to assure that products comply with requirements, quantities are correct, and products are undamaged.
- C. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.

1.4 STORAGE AND PROTECTION
- A. Store and protect products in accordance with manufacturer's instructions, with seals and labels intact, and legible.
- B. Store sensitive products in weather tight, climate controlled enclosures.
- C. For exterior storage of fabricated products, place on sloped supports, above ground.
- D. Provide off-site storage and protection when site does not permit on-site storage or protection.
- E. Cover products subject to deterioration with impervious sheet covering, and provide ventilation to avoid condensation.
- F. Store loose granular materials on solid flat surfaces in a well-drained area avoid mixing with foreign matter.
- G. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
- H. Arrange product storage to permit access for inspection, and periodically inspect for damage and correct storage conditions, if damaged or incorrect storage conditions take corrective action.

1.5 PRODUCT OPTIONS
- A. Products Specified by Reference Standards or by Description only, means any product meeting those standards or description.
- B. Products Specified by Naming One or More Manufacturers, means products of manufacturers named and meeting specifications, no options or substitutions allowed.
- C. Products specified by naming one or more Manufacturers with a provision for substitutions, means submit a request for substitution for any manufacturer not named.

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1.6 SUBSTITUTIONS

A. Instructions to Bidders specify time restrictions for submitting requests for substitutions to requirements specified in this section during the bidding period.
B. If a product becomes unavailable through no fault of the Contractor, substitutions may be considered.
C. Document each request with complete data substantiating compliance of the proposed Substitution with the Contract Documents.
D. A request constitutes a representation that the Bidder or Contractor:
    1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product.
    2. Is providing the same warranty for the substitution as for the specified product.
    3. Will coordinate installation and make changes to other work that may be required for the work to be complete with no additional cost to Owner.
    4. Waives claims for additional costs or time extension, which may become apparent.
    5. Will reimburse Owner for review or redesign services associated with re-approval.
E. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request, or if acceptance requires revision to the contract documents.
F. The Owner and A/E shall review the request and either approve or deny the request in writing.
    1. The Commissioning Authority may upon request by the Owner, advise the Owner on the technical and operations & maintenance impacts of the request.
G. Installation of substitutions without the Owner's approval shall be cause for immediate rejection and removal without extra cost to the owner.
H. Substitutions that diminish life safety systems are prohibited.

1.7 APPROVED EQUAL

A. It is not the District's intention to limit open competition of products supplied on the construction of schools, but it is the intention to provide products that are cost effective and do not sacrifice the School District needs.
B. If the specifications list a vendor or manufacturer, the contractor may submit a written request for a substitution. This applies if one or more vendors or manufacturers are listed (May include a statement "or approved equal" or "Engineer and Owner approved".
C. All requests for "approved equal" shall be in writing on the District form with the proper back-up information:
    1. Include the product literature/specifications with warranty information.
    2. Product approval or evaluation from Florida Building Code approved agency.
    3. List of five local projects and contacts with this product installed.
    4. Life Cycle Cost evaluation as outlined in the Florida Department of Education's "Life Cycle Cost Guidelines" manual.
D. The Owner and A/E shall review the request and either approve or deny the request in writing.
    1. The Commissioning Authority may upon request by the Owner, advise the Owner on the technical and operations & maintenance impacts of the request.
E. The Contractor shall not use the proposed substitution in the bid, unless the Owner and A/E approve the request in writing.

PART 2 PRODUCTS

2.1 Not Used.

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PART 3 EXECUTION

3.1 Contractor shall submit request for substitution of non-listed items to the Architect/Engineer for their review.

3.2 The Architect/Engineer shall review Contractor's information and request, and then make recommendation to the Districts Project Coordinator.

3.3 Submit all Architect approved substitutions to the District Building Department for review and approval to Code and District requirements.

A. Submittals to the Building Department require Architect and District' SPA's recommendation approvals.

3.4 If Contractor chooses to install substitutions prior to District's approval, they do so at his own risk.

A. Contractor shall be responsible for the cost of changing back to the District specification.

END OF SECTION

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SECTION 01 72 29
CUTTING AND PATCHING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. The requirements and limitations for the cutting and patching of work

1.2 SUBMITTALS

A. Submit written request in advance of cutting or alteration, which affects:
   1. The structural integrity of any element of project
   2. The integrity of weather exposed or moisture resistant element
   3. The efficiency, maintenance, or safety of any operational element
   4. Visual qualities of sight exposed elements
   5. Work of Owner or separate contractor

B. Include in request:
   1. The identification of project
   2. The location and description of affected work
   3. The necessity for cutting or alteration
   4. A description of proposed work, and products
   5. Any possible alternatives to cutting and patching
   6. Any effect on work of Owner or separate contractor
   7. Written permission from affected separate contractor(s)
   8. Proposed date and time the work starts

PART 2 PRODUCTS

2.1 MATERIALS

A. Primary Products: Those required for original installation.

B. Product Substitution: For any proposed change in materials, submit request for substitution described in Section 01 60 00.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching.

C. After uncovering existing work, assess conditions affecting performance of work.

D. The contractor beginning of cutting or patching means acceptance of existing conditions.

3.2 PREPARATION

A. Provide engineered drawings and/or calculations for temporary supports to ensure structural integrity of the work.
   1. Provide devices and methods to protect other portions of project from damage.

B. Provide protection from elements for areas, which may be exposed by uncovering work.

C. Maintain excavations free of water.

3.3 CUTTING

A. Execute cutting and fitting including excavation and fill to complete work.

B. Uncover work to install improperly sequenced work.

C. Remove and replace defective or nonconforming work.

D. Remove samples of installed work for testing when requested.

E. Provide openings in the work for penetration of mechanical and electrical work.

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F. Employ skilled and experienced installer to perform cutting for weather exposed and moisture resistant elements, and sight-exposed surfaces.

3.4 PATCHING

A. Execute patching to complement adjacent work.
B. When patching holes or trench lines cut into existing concrete floors:
    1. Dowel rebars into existing concrete on all sides of the trench or hole.
        a. Rebar dowels shall extend at least six inches into the existing concrete and be secured with construction epoxy.
        b. Rebar dowels shall be placed at 12” interval along the entire repair perimeter.
        c. Epoxy shall fully cure before placing concrete used to fill the hole or trench.
        d. Bridging rebar may be required based upon the size of the trench or hole.
    2. All earth placed in the hole or trench shall be fully compacted per earthwork specifications prior to placing concrete.
    3. At the contractor’s discretion, 200 psi flowable fill may be used in lieu of compacted earth.
C. Properly fit products together to integrate with other work.
D. Execute work by methods to avoid damage to other work and which, provide appropriate surfaces to receive patching and finishing.
E. Employ original installer to perform cutting and patching for weather exposed and moisture resistant elements, and sight-exposed surfaces.
F. Restore work with new products in accordance with requirements of Contract Documents.
G. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
H. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material, to full thickness of the penetrated element.
I. Refinish surfaces to match adjacent finish.
    1. For continuous surfaces, refinish to nearest intersection or natural break.
    2. For an assembly, refinish entire unit.

END OF SECTION

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SECTION 01 75 00
STARTING and ADJUSTING SYSTEMS

PART 1 GENERAL

1.1 SECTION INCLUDES
- A. Starting systems
- B. Demonstration and instructions
- C. Testing, adjusting, and balancing

1.2 STARTING SYSTEMS
- A. Ensure that necessary controls and safeguards are function prior to starting any equipment.
- B. Coordinate schedule for start-up of various equipment and systems.
- C. Notify Architect, Commissioning Authority, and Owner at least two days prior to startup of each item.
- D. Verify each piece of equipment or system for proper lubrication, drive rotation, belt tension, control sequence, or other conditions that may cause damage.
- E. Verify that tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.
- F. Verify wiring and support components for equipment are complete and tested.
- G. Execute startup under supervision of responsible Contractors' personnel in accordance with manufacturers' instructions.
- H. When specified in individual specification sections, require manufacturer to provide authorized representative to be present at site to inspect, check, and approve equipment or system installation prior to startup, and to supervise placing equipment or system in operation.
- I. Submit a written report, per section 01 40 00, verifying the proper installation of the equipment or system and that it functions correctly.

1.3 DEMONSTRATION AND INSTRUCTIONS
- A. See Section 01 91 00 – "Commissioning" for requirements for demonstration and training.
- B. Demonstrate operation and maintenance of Products to Owner's personnel within two weeks after the date of Substantial Completion.
- C. Demonstrate Project equipment instructed by a qualified manufacturers' representative knowledgeable about the Project.
- D. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.
- E. Utilize operation and maintenance manuals as basis for instruction. Review contents of manual with Owners' personnel in detail to explain all aspects of operation and maintenance.
- F. Demonstrate start up, operation, control, adjustment, troubleshooting, servicing, maintenance, and shutdown of each item of equipment at agreed upon times, at equipment location.
- G. Prepare and insert additional data in operations and maintenance manuals when the need for additional data becomes apparent during instruction.
- H. The amount of time required for instruction on each item of equipment and system is that specified in individual sections.

1.4 TESTING, ADJUSTING, AND BALANCING
- A. Owner will appoint, employ, and pay for services of an independent firm to perform testing, adjusting and balancing.
- B. The independent firm shall perform the services specified in section 23 09 00.

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C. The independent firm shall submit reports to the Architect and Commissioning Authority indicating observations, results of tests and compliance or non-compliance with specified requirements and with the requirements of the contract documents.
D. The independent firm shall coordinate scheduling of Testing, Adjusting, and Balancing activities with the Construction Manager.
   1. Testing, Adjusting and Balancing must be completed prior to scheduling equipment and system Functional Performance Testing.
   2. See Section 01 91 00 – "Commissioning" for details on commissioning activities

PART 2 PRODUCTS

2.1 Not Used.

PART 3 EXECUTION

3.1 Contractor shall coordinate equipment and system start-up with the Commissioning Authority.
   A. This is to include in-progress inspections required by the Commissioning Consultant.

END OF SECTION

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SECTION 01 77 00
CONTRACT CLOSEOUT

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Closeout procedures
B. Final cleaning
C. Adjusting
D. Project record documents
E. As-built survey
F. Operation and maintenance data
G. Spare parts and maintenance Products
H. Warranties and bonds
I. Maintenance service

1.2 CLOSEOUT PROCEDURES

A. Submit written certification that contract documents were reviewed, work inspected, and that work is complete in accordance with contract documents and ready for Owner and Architect review.
   1. The written certification shall include documentation verifying all required Commissioning Functional Performance Test Procedures were successfully completed and that all commissioning issues are resolved.
   2. Electronically provide the following documents to the Owner's Representative, as applicable:
      a. Copy of release from the Palm Beach County Health Department for the potable water system.
      b. Copy of the State Elevator Inspection Certificate.
      c. Copy of the Temporary Certificate of Occupancy and/or Certificate of Occupancy issued by the Building Code Services Department.
      d. Copies of all product submittals as outlined in Section 01 33 00, paragraph 1.5.C.
B. Provide submittals to Architect and Owner that are required by governing or other authorities.
C. Owner will have the option to occupy all or portions of the facility.

1.3 FINAL CLEANING

A. Execute final cleaning concurrent with final project assessment.
B. Clean interior and exterior glass, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.
C. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate for the surface and material.
D. Replace filters of operating equipment.
E. Clean debris from roofs, gutters, downspouts, and drainage systems.
F. Clean site; sweep paved areas, rake clean landscaped surfaces.
G. Remove waste and surplus materials, rubbish, and construction facilities from the site.
H. Clean and sanitize water fountains (coolers).
I. Clean all ledges countertops and shelves with all-purpose non-abrasive cleaner leaving no residue.

1.4 ADJUSTING

A. Adjust operating products and equipment to ensure smooth and unhindered operation.

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1.5 PROJECT RECORD DOCUMENTS

A. Maintain on site one set of the following record documents; record actual revisions to the work:
   1. Drawings/specifications, RFIs and addenda
   2. Change orders and other modifications to the contract
   3. Reviewed, approved and accepted shop drawings, product data, and samples
   4. Manufacturer's instruction for assembly, installation, and adjusting

B. Ensure entries are complete and accurate, enabling future reference by Owner.

C. Store record documents separate from documents used for construction.

D. Record information related to changes of approved construction documents concurrent with construction progress.

E. Specifications - legibly mark and record at each product section a description of the products installed.
   1. Manufacturer's name, product name and model number
   2. Product substitutions or alternates utilized
   3. Changes made by addenda and modifications

F. As-Built Drawings and shop drawings - legibly mark each item to record actual construction.
   1. Measured depths of foundations in relation to finish first floor datum
   2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
   3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the work.
   4. Field changes of dimension and detail.
   5. Provide any additional details not on original contract drawings.

G. As-built survey/Flood Certification Form:
   1. Upon completion of site construction improvements, provide Architect and Owner with a complete and accurate field survey prepared, signed and sealed by a Florida registered surveyor.
      a. Exact horizontal and vertical location relative to property lines and NGVD of buildings, concrete and asphalt surfaces and all drainage features including lakes, detention areas, berms, embankments and swales.
      b. Show the actual grades of the spot elevations shown on the paving and drainage plans.
      c. Provide sufficient information indicating a true representation of constructed grade conditions for areas where grading between two elevation points is not constructed at a uniform slope.
      d. Survey shall include cross sections elevations at 50' stations of swales, lakes, and drainage retention areas including banks, berms, bottoms, and transitions constructed or improved.
      e. Elevations shown shall be accurate to the nearest tenth of a foot.
   2. Upon completion of site construction improvements, provide Architect, and Owner with a complete and accurate FEMA Flood Certification form (FEMA 81-31) prepared, signed and sealed by a Florida registered surveyor.

H. Submit documents, AutoCAD (12, 13, 14, or 2000) files, and PDF files to Architect and Owner, prior to claim for final Application for Payment.

I. Final Commissioning Report: The Commissioning Agent will prepare a Final Commissioning Report as described in Section 01 91 00 – Commissioning.

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1.6 OPERATION AND MAINTENANCE DATA
- A. See section 01 78 23 for requirements.

1.7 SPARE PARTS AND MAINTENANCE PRODUCTS
- A. Provide spare parts, maintenance, and extra products in quantities specified in specification.
- B. Provide copies of all itemized receipts/transmittals listing the extra materials or parts with their physical location indicated prior to final payment.

1.8 WARRANTIES AND BONDS
- A. Contractor shall fill out all warranty cards, certificates, and letters to manufacturers in the name of the Palm Beach County School District. All products shall be registered with the Contractor carrying the product warranty for the time period that the District is entitled to.
- B. Execute and assemble transferable warranty documents from subcontractors, suppliers, and manufacturers.
- C. Provide Table of Contents.
- D. Submit prior to final application for payment.
- E. For items of work delayed beyond date of substantial completion, provide updated submittal within ten days after acceptance, listing date of acceptance as start of warranty period.

1.9 MAINTENANCE SERVICE
- A. Furnish service and maintenance of components indicated in specification sections for one-year from date of substantial completion.
- B. Examine, clean, adjust, and lubricate system components as required for reliable operation.
- C. Include systematic examination, adjustment, and lubrication of components repairing or replacing parts as required with parts produced by the manufacturer of the original component.
- D. Owner shall approve in writing of any transfers or reassignments of maintenance service tasks prior to one year from the date of substantial completion with exception to items referred to in Section 1.8.F, above.

PART 2 PRODUCTS

2.1 APPROVED PRODUCTS
- A. Use only cleaning and maintenance products approved for use in Florida Educational Facilities.

PART 3 EXECUTION

3.1 Documentation
- A. Provide copies of all letters of maintenance transfers in the project warranty manual.

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SECTION 01 78 23
OPERATION AND MAINTENANCE DATA

PART 1 GENERAL

1.1 SECTION INCLUDES:
- A. Format and content of manuals
- B. Instruction of Owner's personnel
- C. Schedule of submittals

1.2 QUALITY ASSURANCE
- A. Prepare instructions and data by personnel experienced in maintenance and operation of described products.

1.3 FORMAT
- A. Prepare data in the form of an instructional manual.
- B. Prepare data in electronic format and submit on CD or DVD.
  1. Submit four (4) copies of the CD or DVD
  2. When multiple disks are used, correlate data into related consistent groupings
- C. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title of project; identify subject matter of contents.
- D. Provide tabbed dividers for each separate product and system, with typed description of product and major component parts of equipment.
- E. Provide manufacturer's printed data, or typewritten data.
- F. Drawings: Provide with reinforced punched binder tab; fold larger drawings to size of text pages.
- G. Prepare a table of contents for each volume, with each product or system description identified, in three parts as follows:
  1. Part 1: Directory listing names, addresses, and telephone numbers of Architect, Contractor, Subcontractors, and major equipment suppliers.
  2. Part 2: Operation and maintenance instructions arranged by system and subdivided by specification section for each category, identify names, addresses, and telephone numbers of subcontractors and suppliers.
     a. Significant design criteria
     b. List of equipment and parts list for each component
     c. Operating instructions
     d. Maintenance instructions for equipment and systems
     e. Maintenance instructions for finishes, including recommended cleaning methods and materials, and special precautions identifying detrimental agents.
  3. Part 3: Project documents and certificates, including the following:
     a. Shop drawings and product data
     b. Product submittals as outlined in Section 01 33 00, Paragraph 1.5.
     c. Certificates and originals of warranties and bonds

1.4 CONTENTS, EACH VOLUME
- A. Provide a table of contents with title of project; names, addresses, and telephone numbers of Architect, Sub-consultants, and Contractor with name of responsible parties; schedule of products and systems, indexed to content of the volume.
- B. For each product or system list names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts.

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C. Product data - mark each document sheet to identify specific products and component parts, and data applicable to installation, delete inapplicable information.
D. Drawings - supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.
E. Typed text as required supplementing product data, providing logical sequence of instructions for each procedure, incorporating manufacturer's instructions specified in Section 01 40 00.
F. Warranties - bind in a copy of each as specified in Section 01 78 36.
G. Bonds - bind in photocopy and original of each.

1.5 MANUAL FOR MATERIALS AND FINISHES

A. Building products, applied materials, and finishes - include product data, with catalog number, size, composition, and color and texture designations.
   1. Provide information for reordering custom manufactured products.
   2. Provide complete itemized paint color list stating manufacturer, color name, interior or exterior, and finish for each color used.
B. Instructions for care and maintenance - include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
C. Moisture protection and weather-exposed products - include product data listing applicable reference standards, chemical composition, and details of installation.
   1. Provide recommendations for inspections, maintenance, and repair.
D. Additional requirements as specified in individual product specification sections.

1.6 MANUAL FOR EQUIPMENT AND SYSTEMS

A. Refer to Section 01 91 00 – Commissioning for additional requirements concerning Systems Operations & Maintenance Manuals.
B. For each item of equipment and each system, include the description of the unit or system, and component parts identifying function, normal operating characteristics, and limiting conditions.
   1. Include performance curves, with engineering data and tests, and complete nomenclature and model number of replaceable parts.
C. Panel board circuit directories - provide electrical service characteristics, controls, and communications by label machine.
   1. Include color-coded wiring diagrams as installed.
D. Operating procedures include:
   1. Startup, break-in, and routine normal operating instructions and sequences
   2. Regulation, control, stopping, shut down, and emergency instructions
   3. Summer, winter, and any special operating instructions
E. Maintenance Requirements include routine procedures and guide for preventative maintenance and troubleshooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
F. Provide servicing and lubrication schedule, and list of lubricants required.
G. Include manufacturer's printed operation and maintenance instructions.
H. Include sequence of operation by controls manufacturer.
I. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
J. Provide control diagrams by controls manufacturer as installed.
K. Provide Contractor's coordination drawings, with color-coded piping diagrams as installed.

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L. Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.

1.7 INSTRUCTION OF OWNER PERSONNEL

A. See Section 01 91 00 – "Commissioning" for requirements on Instruction of Owner Personnel.
B. Before final inspection, instruct the Owner's designated personnel in operation, adjustment, and maintenance of products, equipment, and systems, at agreed upon times.
C. List all equipment requiring seasonal operation performance instructions for other seasons within six months.
D. Use operation and maintenance manuals as basis for instruction.

1.8 SUBMITTALS

A. Submit two final draft copies of completed volumes fifteen days prior to the scheduled Functional Performance Testing, the Architect/Engineer, and Commissioning Authority will return with comments after functional performance testing.
   1. Revise content of all document sets as required prior to final submission.
   2. Final Draft Operations and Maintenance Manuals will include updated information from the Preliminary Draft Operations and Maintenance Manuals.
   3. Final Draft Operations and Maintenance Manuals will include System Sequence of Operations, including all set points, as approved prior to Functional Performance Testing.
B. Submit two sets of Final Operations and Maintenance Manuals, within ten days after final inspection at least fifteen days prior to substantial completion.
C. The Final Operations and Maintenance Manuals will incorporate review comments from the Owner, Commissioning Authority, and Architect/Engineer.
D. The Final Operations and Maintenance Manuals shall incorporate any changes in the Systems Sequences of Operations identified during Functional Performance Testing.
E. See Section 01 91 00 – Commissioning for requirements on Submittals of Operation & Maintenance Data.

PART 2 PRODUCTS

2.1 Not Used.

PART 3 EXECUTION

3.1 Not Used.

END OF SECTION

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SECTION 01 78 36
WARRANTIES

PART 1 GENERAL

1.1 SECTION INCLUDES:
- A. Preparation and submittal of warranties
- B. Time and schedule of submittals
- C. Transfer of Maintenance responsibility

1.2 FORM OF SUBMITTALS
- A. Provide two copies of all warranty information in an electronic format on a compact disk (CD).
- B. Provide CD's labeled WARRANTIES, with project number and title, name of responsible company principal, address, and telephone number of Contractor and equipment supplier.
- C. Prepare table of contents in the same sequence as the Project Manual, section 01 78 23; identify each item with the number and title of the correct specification section, and the product name.
- D. Separate each warranty with index tab sheets keyed to the table of contents listing.
- E. Provide full information on CD as necessary listing subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible company principal.

1.3 PREPARATION OF SUBMITTALS
- A. Provide the responsible subcontractors, suppliers, and manufacturers' warranties in duplicate, prior to claim for final Application for Payment.
  1. Warranty shall be on the company's' original forms signed by authorized agent only.
  2. Except for items put into use with Owner’s permission, identify the start date of warranty period after the Date of Substantial Completion is determined.
- B. Verify that documents are in proper form, contain full information, and are notarized.
- C. Co-execute submittals when required.
- D. Retain warranties until time specified for submittal.
- E. All of the above shall be in electronic format included on the CD or DVD, provide 2 copies.

1.4 TIME OF SUBMITTALS
- A. For equipment or component parts of equipment put into service during construction with Owner’s permission, submit documents within ten days after being put into service.
- B. Submit other warranties prior to final Application for Payment.
- C. For warranty items delayed beyond Date of Substantial Completion, submit within ten days after acceptance, listing the date of acceptance as the beginning of the warranty period.

1.5 Transfer of Maintenance Responsibility
- A. Provide a separate tabbed section in the warranty documents for all letters of maintenance responsibility transference.
- B. Provide separate letter for each transfer, which shall include the mutually agreed time and date of the transfer of responsibility.

PART 2 PRODUCTS

2.1 Warranty Certificates
- A. The installation contractor shall complete all warranty certificates, registering the product with the manufacturer.
- B. Use the date of substantial completion as the installation date.
- C. List the product model and serial number on each certificate.
- D. Provide copy of the original certificate in warranty manual if the original goes to manufacturer.

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PART 3 EXECUTION

3.1 The installing contractor shall fill out all product warranty forms during the manufacture's required time limit.

A. Failure to do so may result in the Owner's loss of standard product coverage in which the installing contractor shall become liable for the same coverage and time limit forfeited due to their omission.

B. The installing contractor shall notify the owner, at least 30 days prior to Substantial Completion, of all optional extended warranties provided by the manufacturer and make available to the owner the opportunity to issue a Contract Modification prior to the application for final payment to facilitate the purchase of the extended warranty.

C. The installing contractor shall insure that all warranty documents, including copies of completed registration forms, are submitted to the General Contractor for inclusion into their closeout documents as required by section 01 77 00 of these specifications.

3.2 Warranty pre-expiration equipment review

3.3 The Commissioning Authority shall conduct an on-site review of equipment and systems covered by warranties.

A. This review will be scheduled approximately 2-months prior to expiration of the Warranty.

B. The Construction Manager, Owner's Representative, and Owner's Operations & Maintenance representative shall accompany the Commissioning Authority during this review.

C. The purpose of the review will be to evaluate the condition of the equipment and systems to determine if Warranty repairs of claims are necessary.

D. The Construction Manager shall cooperate to notify the issuer of the Warranty and to schedule necessary repairs or corrective actions prior to expiration of the Warranty.

END OF SECTION

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SECTION 01 83 16
EXTERIOR ENCLOSURE PERFORMANCE REQUIREMENTS

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes overall building enclosure performance requirements and testing for air infiltration.

B. The District will engage a Commissioning Provider to perform building enclosure performance tests; refer to Division 01 Sections Quality Control, Testing Laboratory Services and Commissioning. Visual Inspection and Testing will be performed on the project building wall Mock-up to confirm proper wall assembly. Perform prior to construction of the building wall assemblies. Testing will then be performed on the entire building before concealing the exterior wall and will include the required inspections from a testing and inspection agency.

C. Project scheduling shall be coordinated to indicate all exterior enclosure work to be completed prior to envelope pressure testing and before drywall completion to facilitate the improvement of leakage areas found.

D. Related Sections: Performance requirements for exterior enclosure components are included, but not limited to the following sections. Coordinate with specified testing requirements within each section.
   1. Section 01 91 00 "Commissioning."
   2. Section 07 27 00 Air Barriers."
   3. Section 07 52 00 "Modified Bitumen Membrane Roofing."
   4. Section 07 92 00 "Joint Sealants."
   5. Section 08 43 13 "Aluminum Framed Storefronts."
   6. Section 08 51 13 "Aluminum Windows."
   7. Section 08 80 00 "Glazing."
   8. Section 08 91 19 "Fixed Louvers."

E. Standards: Comply with the applicable provisions and recommendations of the following standards below, where standards conflict the more stringent shall apply:
   1. American Society for Testing and Materials (ASTM):
      a. ASTM E779, "Standard Test Method for Determining Air Leakage Rate by Fan Pressurization."
      b. ASTM E1827, "Standard Test Methods for Determining Airtightness of Buildings Using an Orifice Blower Door."
      c. ASTM E283, "Test Method for Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors under Specified Pressure Differences Across the Specimen."
      d. ASTM E330, "Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference."
      e. ASTM E1186, "Standard Practices for Air Leakage Site Detection in Building Envelopes and Air Barrier Systems."

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1.2 PERFORMANCE REQUIREMENTS

A. General: Provide exterior enclosure meeting or exceeding the following performance requirements:
   1. Full Building Air Leakage: Air leakage through full building enclosure shall not have exceeded 0.40 cfm per envelope sq. ft. when tested in accordance with ASTM E 1827 at a static-air-pressure difference of 0.30 in. w.g.

B. Envelope Commissioning will include document review, preinstall meeting(s), mockup review(s), on-site reviews of installations, and envelope testing. Services include the following:
   1. Review building envelope components' submittals.
   2. Review applicable systems for installation in accord with the contract documents, manufacturer recommendations, and industry accepted standards.
   3. Perform site visits to observe installation of building envelope components, systems, and assemblies.
   4. Document construction observations and prepare reports.
   5. Provide project-specific test procedures.
   6. Coordinate, execute and document Envelope Testing.
   7. Prepare building envelope commissioning final report.

C. Design Modifications:
   1. Submit design modifications necessary to meet the performance requirements and field coordination.
   2. Variations in details or materials shall not adversely affect the appearance, durability or strength of components, nor shall such variations cause excessive stress, or deflections, to the building structural frame.
   3. Maintain the general design concept without altering size of members, profiles and alignment.

1.3 SUBMITTALS

A. Combined Submittals:
   1. The approved shop drawings for exterior enclosure work for the entire project shall be combined into a single submission and shall include scheduling to indicate all exterior enclosure work to be completed prior to envelope pressure testing and before drywall completion to facilitate the improvement of leakage areas found.

B. Product Data: Submit manufacturer's specifications and installation instructions for each exterior enclosure component specified. Include product test reports.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 FIELD QUALITY CONTROL

A. Testing Services: Testing of exterior enclosure shall take place before concealing air barrier components to determine overall compliance of installed assemblies with specified requirements.

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1. Building Air Tightness: perform pressure test in accordance with ASTM E 1827, Single Point Method, and as follows.
    a. Supplement building air tightness test with requirements of ASTM E 779 as applicable.
    b. Perform positive pressure test relative to outdoors at multiple pressures up to minimum 0.30 inches w.g. Measure building leakage rate.
    c. Perform negative pressure test at multiple pressures up to minimum 0.30 w.g. and compare results to positive test. Where difference of 10 percent exists between tests, investigate causes and resolve reasons for differences. Follow up with retest.
    d. Utilize infrared photography and non-toxic fog agents to identify leaks. Improve areas identified regardless of passing/failing maximum allowed leakage rate. Publish infrared photography to the design team.
    e. For each test, take a minimum of five readings at various pressures and air flows within the range of the calibrated equipment. In the test report, show test points in graphical form on a log-log scale with pressure in inches water column displayed on the horizontal axis an flow in cfm displayed on the vertical axis. Submit written report for each complying and non-complying test.
    f. Report results of testing in accordance with cited test standards.

B. Contractor shall verify that the follow items have been completed prior to Pressure Test:
    1. Air barrier membrane system has been installed to specification and completely sealed to existing air barriers if needed.
    2. Wall insulation has been installed to specification and completely sealed to existing air barriers if needed.
    3. All installation and field-testing report items have been mitigated to provide a barrier that does not have sources of leakage.
    4. Post “KEEP DOOR CLOSED” signs on doors that are used to get in and out of the building.
    5. Remove at LEAST four sq. ft. of ceiling tile panels for every 500 sq. ft. of ceiling area.
    6. Make sure that every electrical and data/communication junction box has blank covers or seals on them.
    7. Penetrations have been sealed and/or fire-stopped according to specifications.
    8. Make sure the controls contractor is on site for the test in order to coordinate settings for specific equipment.
    9. Have HVAC system operating at least a day prior in order to make sure that there is a temperature differential of at least 20°F between the interior and exterior.
    10. Make sure that the outside air, exhaust, and return fans have all been turned to a closed position (100% Closed, 0% Open)
    11. Identify which dampers are not motorized or connected to the BAS. Make sure that these are off, sealed, or covered for the test. Including outside air openings, louvers, rooftop unit dampers, or exhaust air device.
    12. Make sure that door sweeps and weather stripping have been installed according to specifications.
    13. Prop open all interior conditioned rooms.
    14. Closets and other non-conditioned rooms are closed.

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15. All windows are closed and locked.
16. Coordinate with Building Pressure Test agency on fan locations for the test.
17. Seal all dryer vents.
18. Seal all kitchen hood exhaust grilles and louvers.
19. Fill all plumbing traps with water or sealed to block the plumbing lines from air leakage.
20. Need separate 20AMP non-GFCI receptacles for each of the fans. Make sure the receptacles are within 50-100 feet.

3.2 ADJUSTING AND RETESTING

A. Exterior wall assemblies will be considered defective if they do not pass tests and inspections.

B. If building fails to meet airtightness performance requirement specified, use technique described in ASTM E 1186 to locate air leak sources. Utilize infrared photography and non-toxic fog agents to identify leaks. Publish infrared photography to the design team.

C. Perform remedial air barrier work to correct deficiencies in building construction and to bring the work into compliance with performance requirements.

D. Perform retesting at Contractors expense to verify corrections meet performance requirements.

END OF SECTION

SECTION 01 91 00
COMMISSIONING

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PART 1 GENERAL

1.1 SUMMERY

Commissioning is a systematic process of ensuring and documenting that District building systems perform according to design intent and District operational objectives. Commissioning shall adhere to all of the commissioning requirements of the Florida Building Code Energy Conservation and the Green Building Standard under which the project is to be designed and constructed.

1.2 REFERENCES

A. American Society of Heating, Refrigeration and Air Conditioning Engineers, ASHRAE.
   1. ASHRAE Guideline 0, The Commissioning Process
   2. ASHRAE Guideline 1, The HVAC Commissioning Process
   3. ASHRAE Guideline 4, Preparation of Operating and Maintenance Documentation for Building Systems
   4. ASHRAE Standard 202, Commissioning Process for Buildings and Systems.

B. Florida Building Code Energy Conservation 6th Edition 2017

1.3 SCOPE

A. Pre-Design Phase
   1. Develop a Commissioning Plan which is to be prepared by a licensed design professional or approved agency and shall be reviewed by the School District of Palm Beach County, SDPBC Building Code Services, BCS.
   2. Review Owner's Project Requirements (OPR).

B. Design Phase
   1. Review Basis of Design (BOD).
   2. Perform design review
   3. Develop Pre-Functional Checklists (PFC) and Functional Performance Test (FPT) Procedures.

C. Construction and Occupancy Phase
   1. Review submittals against Commissioning Plan, OPR, and BOD.
   2. Verify equipment and system installation and document all deficiencies.
   3. Develop Systems Manual.
   4. Develop O&M Manuals.
   5. Review Test and Balance (TAB) Report.
   6. Witness and in some cases perform Functional Performance Testing (FPT).
   7. Create Final Commissioning Report

1.4 SYSTEMS TO BE COMMISSIONED

A. Refer to Systems Summary table that follows:

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SYSTEMS SUMMARY		
System	**Scope of CX Activities**	**Section Number**
Building Envelope		
Building Enclosure	Site observation/ testing	01 83 16 Exterior Enclosure Performance Requirements
Window Systems	Site observation/ testing	08 43 13 Aluminum-Framed Storefronts 08 51 13 Aluminum Windows 08 80 00 Glazing
Mechanical Systems		
Potable Water Heating System	Site observation/ testing	22 30 00 Plumbing Equipment
HVAC System	Site observation/ testing	23 05 93 HVAC Testing, Adjusting and Balancing 23 08 00 Commissioning of HVAC Systems 23 09 00 Energy Management and Control System 23 33 00 Air Duct Accessories 23 34 23 HVAC Power Ventilators 23 37 13 Grilles, Registers, Diffusers 23 70 00 Air Handling Units 23 36 16 Variable Air Volume Units 23 82 19 Electrical Resistance Duct Heaters
Decentralized HVAC Equipment	Site observation/ testing	23 81 00 Decentralized HVAC Equipment
Chilled Water System	Site observation/ testing	23 05 93 HVAC Testing, Adjusting and Balancing 23 08 00 Commissioning of HVAC Systems 23 09 00 Energy Management and Control System 23 21 16 Hydronic Specialties 23 21 23 Hydronic Pumps ~~23 64 10 Air Cooled Water Chillers~~ 23 64 26 Centrifugal Water Chillers ~~23 65 00 Rotary Screw Water Chillers~~ 23 65 00 Cooling Towers
Electrical Systems		
Lighting and Lighting Control System	Site observation/ testing	26 51 00 Interior Lighting
Electrical Distribution	Site observation/ testing	26 24 13 Switchboards 26 24 16 Panelboards 26 28 16 Enclosed Switches and Circuit Breakers 26 43 00 Transient Voltage Surge Suppression
Emergency Generator	Site observation/ testing	26 35 13 Gas Engine Drive Generator Assembly 26 36 00 Transfer Switches
Fire Alarm & Smoke Detection System	Site observation/ testing	28 31 00 Fire Alarm and Smoke Detection System
Intercom System	Site observation/ testing	27 51 23 Intercom System
Public Address System	Site observation/ testing	27 51 16 Public Address System

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1.1 COMMISSIONING TEAM

A. The Commissioning Team shall include a representative of the School District of Palm Beach County, Commissioning Coordination Supervisor assigned by the CM, Systems Installation Subcontractors, Test and Balance Subcontractor, EMS Subcontractor and the Commissioning Provider. Equipment manufacturer's representatives will be present for start-up as specified in the equipment specification sections and for equipment training.

B. Commissioning Coordination Supervisor: The Construction Manager shall assign a person with 5-years of experience with the coordination of disciplines of construction having the following responsibilities:
   1. Coordination meetings
   2. Planning
   3. Scheduling
   4. Documentation
   5. Communication with Owner's Commissioning Provider
   6. Corrective actions
   7. Specified training

C. Commissioning Provider: The Commissioning Provider CxP shall function as the Owner's Technical Representative relative to Commissioning, having the responsibilities listed in Scope Section 1.3. The Commissioning Provider shall be contracted directly with the District and shall not be affiliated with the design and construction team.

1.2 SUBMITTALS

A. Construction Manager shall submit the name of person(s) assigned as Commissioning Coordination Supervisor within 2-weeks of contract award, Construction Manager shall submit the following information for each assigned Commissioning Representative:
   1. Company Name
   2. Name
   3. Title
   4. Phone Number
   5. E-Mail Address

B. Construction Manager shall submit a list of all required submittals to the Commissioning Provider prior to submitting any equipment submittals for review.

C. Commissioning Provider shall identify submittals that require copies submitted to the Commissioning Provider concurrent with submission to the Design Engineers.

D. Construction Manager shall submit copies of selected submittals to Commissioning Provider concurrent with submission to the Design Engineers for review. Also, submit all selected submittals to Commissioning Provider after approval by the Design Engineers.

E. Master Construction Schedule: Construction Manager shall incorporate all commissioning milestones into the Master Construction Schedule. Submit regular updates to construction schedule to the Commissioning Provider concurrent with the design team.

F. Construction Manager shall submit a copy of Construction Meeting Minutes, Construction Change Directives (CCD), Architectural Supplemental Instructions (ASI), Requests for Information (RFI), Change Orders (CO), etc. to the Commissioning Provider.

G. Construction Manager shall submit training session plans to the Commissioning Provider for approval no later than 4-weeks after submittal acceptance.

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1. Document training plans on attached Operation and Maintenance Training Form. See 3.2.C below for a listing of related training.
2. Commissioning Provider shall facilitate approval of submitted training plans by MPO Maintenance Staff.

H. Construction Manager shall submit Operation and Maintenance manuals to Design Engineers and Owner's Representative for review of the systems listed in the.
1. Building Automation System specialty contractor shall submit the building automation system operation and maintenance manuals, including control schematics and sequences of operation, to the Commissioning Provider at the same time they are submitted to the Design Engineers and Owner's Representative.
2. Submit Operations and Maintenance Manuals within 4-weeks of submittal acceptance.

I. Construction Manager shall submit Contractors' test reports and/or Contractor's Equipment Startup Reports to Commissioning Provider upon successful completion of each test (contractors' tests as required in divisions 21, 22, 23, 26, 27, and 28 in the project specifications).

J. Construction Manager shall submit functional performance testing schedule to Commissioning Provider at least 4-weeks prior to the start of testing.
1. Functional performance testing schedule shall include Testing and Balancing and training as milestones to be completed prior to starting functional performance testing.

K. Test and Balance Specialty Contractor shall submit draft daily field balance reports to the Commissioning Provider on a weekly basis for fieldwork completed the previous week.
1. The Test and Balance Specialty Contractors shall submit the completed draft test and balance report to the Design Engineers and Commissioning Provider for review and approval within one week of completion of work and prior to commencement of HVAC system functional performance tests.
2. System verification testing shall not commence until system balancing is complete.
3. The Test and Balance Specialty Contractor shall submit the Final Test and Balance Report to the Commissioning Provider concurrently with submission to the Owner and Design Engineers.

L. Construction Manager shall submit completed System Readiness Checklists to Commissioning Provider.
1. System verification testing shall not commence until each system is documented being ready for testing.

M. Construction Manager shall submit training documentation plan within 8-weeks of approval of submittals.

1.3 LIMITS ON COMMISSIONING PROVIDER

A. Commissioning Provider (CxP) may not release, revoke, alter, or enlarge on requirements of Contract Documents.
B. CxP may not approve or accept any portion of the Work.
C. CxP may not assume any duties of Contractor.
D. CxP has no authority to stop work.

1.4 OPERATION AND MAINTENANCE MANUALS

A. Comply with requirements of Divisions 1, 23 and 26
B. Comply with the submittal requirements listed in this document.

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PART 2 PRODUCTS

2.1 MATERIALS

A. The party responsible for each Commissioning Procedure shall furnish all tools, equipment and instrumentation required for the execution of that Procedure.

B. A list of all tools and equipment to be used during Cx shall be submitted to the District for review and approval prior to the start of execution.

C. Standard tools, testing equipment and instrumentation required for execution of Pre-Functional Procedures, Pre-startup Testing, Startup Procedures, Functional Performance Testing and Post-startup Testing shall be provided by the Contractor responsible for the equipment being tested.

D. The District Energy Management System EMS shall be available as a resource to the CxP for performance trending as required.

E. Testing equipment and instrumentation used for execution of Commissioning Procedures shall be of sufficient quality and accuracy to test and/or measure system performance with the tolerances specified in the District Master Specifications. If not otherwise noted, the following minimum requirements apply:

1. Temperature sensors and digital thermometers: certified calibration within the past year to an accuracy of 0.5°F and a resolution of + or - 0.1°F.
2. Pressure sensors: accuracy of + or - 2.0% of the value range being measured (not full range of meter) and calibrated within the last year.
3. Electrical meters (voltage, current, etc.) shall be true RMS and shall have been calibrated within the last year.
4. Other sensors (RH, CO, CO_2, etc.) shall have been calibrated within the last 6 months.

F. All test equipment and instrumentation used for Commissioning Procedures shall be calibrated according to the manufacturer's recommended intervals and when dropped or damaged.

G. Calibration tags shall be affixed or certificates readily available.

PART 3 EXECUTION

3.1 COORDINATION

A. Construction documents shall clearly indicate the provisions for commissioning.

B. General Contractor shall attend 10-Month Warranty review meeting on-site (including all contractors on the commissioning team)

C. The licensed design professional shall provide evidence of commissioning prior to final mechanical, plumbing and electrical inspections.

D. General Contractor shall work with owner's operations and maintenance staff to define training documentation requirements.

E. General Contractor shall request clarification as needed.

3.2 TRAINING

A. Construction Manager shall coordinate operation and maintenance training activities through the Commissioning Provider and the owner's operations and maintenance staff.

B. Construction Manager shall provide training for systems and sub-systems as specified in this section and individual technical sections.

C. Construction Manager shall provide Training Plans (using attached Operations and Maintenance Training Plan Form) and a detailed training agenda for the following training sessions:

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Specification Section	Training Duration (hours)	Remarks
Mechanical		
22 20 00 – Double Check Backflow Preventors	2	
22 20 00 – Thermostatic Mixing Valve		
22 40 00 – Drinking Fountains & Water Coolers	2	
22 30 00 – Plumbing Equipment	4	
22 30 00 – Domestic Hot Water Heaters		
22 30 00 – Packaged Water Heating Systems		
22 30 00 – Water Softeners		
21 00 00 – Fire Protection	4	Include fire protection zoning
21 00 00 – Fire Pump, Fire Pump Controller, Fire Pump ATS, Jockey Pump, Jockey Pump Controller		
21 00 00 – Hose Rack Assembly		
23 21 16 – Expansion Tank	4	
23 21 16 – Air Separators		
23 21 16 - Strainers		
23 21 16 – Glycol System		
23 21 16 – Backflow Preventors		
23 21 23 – HVAC Pumps (all types)	2	
23 63 13 – Air-Cooled Air Conditioning Condensers	2	
~~23 64 10 – Air-Cooled Chillers~~	~~4~~	
23 64 16 – Centrifugal Water Chillers	~~4~~	
~~23 64 26 – Water-Cooled Rotary Chillers~~	~~4~~	
23 65 00 – Cooling Tower	~~4~~	
23 29 23 – Variable Frequency Drives	4	
23 81 00 – Decentralized HVAC Equipment	~~4~~	
23 25 00 – Water Treatment	4	
23 70 00 – Air Handling Units	4	
23 34 23 – Roof Exhausters	4	
23 34 23 – Wall Exhausters		
23 34 23 – Cabinet and Ceiling Exhaust Fans		
23 34 23 – In-Line Exhaust or Supply Fans		
23 33 00 – Control Dampers	4	
23 33 00 – Fire Dampers		
23 33 00 – Combination Fire and Smoke Dampers		
23 33 00 – Smoke Dampers		
23 33 00 – Back draft Dampers		
23 09 00 – Energy Management and Control System	40	two 20 hour sessions
23 36 16 – VAV Terminal Units	2	
23 05 93 – Testing, Adjusting & Balancing	2	General review of report

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Specification Section	Training Duration (hours)	Remarks
Electrical		
26 24 13 – Switchboards	8	For all switchboards, panelboards, circuit breakers, TVSS, and motor controls
26 24 16 - Panel boards		
26 28 16 – Enclosed Circuit Breakers		
26 28 39 – Motor Controls		
26 43 00 – Transient Voltage Surge Suppressors		
26 35 13 – Packaged Engine Generators	8	For generator, transfer switches and emergency distribution system)
26 36 00 – Transfer Switches		
26 58 68 – Sports Lighting	4	Includes fixtures, poles and controls
26 55 61 – Theatrical Lighting	4	Includes controls
26 41 00 – Lightning Protection System	1	
28 31 00 – Fire Alarm System	8	Includes zones and sequence of operations
28 16 00 – Intrusion Detection	2	
28 33 00 – Video Surveillance System	2	
27 53 10 – Emergency Radio Communications System	2	
28 13 00 – Card Access System	2	
27 51 23 – Intercom System	2	
27 51 16 – Public Address System	2	
27 41 00 – Master Antenna System	2	
26 29 10 – Electric Controls & Relays	2	
27 10 00 – Communications Systems (Data & Voice)	2	
27 24 10 – Ceiling Projection Systems	2	

D. Training Plan outline:
   1. Equipment
   2. Trainer's name and company
   3. Agenda
   4. Time required for the training session
   5. An option of three dates to hold the training session

E. Construction Manager shall obtain written acceptance of the training session from the SDPBC FS staff on the Operation and Maintenance Training Plan Form (attached).
   1. The Commissioning Provider shall assist with coordinating the approval of submitted Operation and Maintenance Training Plan Forms with the Owner's FS staff.

F. Construction Manager shall document performance of the training session by:
   1. Video record the training session
      a. Construction Manager shall engage the services of a firm qualified to video record all training sessions.

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b. The video recording shall be in DVD format and of high quality, both visual and audible.
c. It shall include a static overview of each system along with an actual example of the operation and maintenance of each specific piece of equipment requiring training – in accordance with the approved training outline.
d. The video recording Contractor shall be responsible for consolidating all training DVDs into one (1) consolidated training "volume" and submit four (4) copies of this training record to the Owner's operations and maintenance department.

2. Construction Manager shall submit a training documentation plan to the commissioning Provider and the Owner's FS staff for review and approval.
   a. The training documentation plan shall consist of a sample DVD video of a training session for review of compliance with Owner's documentation requirements.
   b. Submit this plan within 8-weeks of approval of equipment submittals.
3. Completing the Operation and Maintenance Training Plan Form: Indicate on the form:
   a. Date of training
   b. Detailed training agenda for each training session
   c. Sign-in sheet of attendees and their affiliation
   d. Sign-off by Owner's Operations and Maintenance Representative
   e. Include completed attendee training feedback and comment forms with the Operation and Maintenance Training Plan Form.

3.3 EQUIPMENT START-UP AND EQUIPMENT ENERGIZATION

A. Inform Commissioning Team 2-weeks in advance of the start-up or equipment energization schedule for equipment.
   1. The Commissioning Provider and the Owner's FS staff reserves the right to witness the performance of any or all start-up/energization procedures.

3.4 COMMISSIONING SITE OBSERVATIONS

A. The Commissioning Provider shall make periodic site observation visits to review construction activities, focusing on the following:
   1. General conformance with construction documents
   2. General conformance with District guidelines and industry standards
   3. Equipment access for maintenance and operations
   4. Safety provisions for operations and maintenance personnel
   5. Other items of interest to the Owner
B. The Commissioning Provider shall prepare and issue a Field Report outlining the general and specific observations made during the visit.
   1. The Field Report distribute is to the Owner's Project Manager, Architect, Design Engineers, and the Construction Manager.
   2. They shall have the opportunity to review and comment on the issues noted during the site visits.
C. The Owner, Architect, or Design Engineer shall direct the Construction Manger to take corrective action to resolve issues noted on the Field Reports.
   1. The directive will be as a Change Order, CCD, ASI, or other applicable format as outlined in other Division 1 specification.
D. The Commissioning Provider shall enter any issues observed during the site visits on a Master Issues Log, which also tracks resolution of the issues.

3.5 CONTRACTOR'S TESTS

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A. Subcontractor/Installers shall forward to the Commissioning Provider through the General Contractor's Commissioning Coordination Supervisor a list and schedule of specified contractor tests.
B. Unless specified otherwise, provide a minimum one-week notice to the Commissioning Provider for specified Contractor's tests.
C. Submit Contractors' test reports to the Commissioning Provider and Owner's Representative within one week of the successful completion of each test.

3.6 SYSTEM READINESS CHECKLISTS

A. Prior to the scheduled start of verification testing, check out systems to confirm readiness for testing.
B. In addition to verifying proper installation of all equipment and associated hardware, perform and document sensor calibration or provide documentation verifying manufacturer's performance of calibration one week prior to verification testing.
    1. A sensor is any device that measures a system parameter for control purposes or for monitoring the system performance.
    2. The Commissioning Provider may observe sensor calibration procedures.
C. Submit System Readiness Checklists to the Commissioning Provider within 1-week of completing the checklist.
    1. Do not start system verification testing until documentation indicates the system is ready for testing.

3.7 FUNCTIONAL PERFORMANCE TESTS

A. The CxP shall develop the Functional Performance Test procedures necessary to fulfill all commissioning test objectives.
B. Commissioning Provider shall provide input into the master scheduling process as to the timing and duration of the functional performance test procedures.
    1. The master scheduling process shall include the designation of contractor personnel required to perform the functional performance test procedures.
C. Construction Manager, Contractors/Installers, and Specialty Contractors shall review and comment on the final detailed functional performance test procedures developed by the Commissioning Provider based on the system shop drawings and submittals.
    1. Provide feedback as to the efficiency of the procedures and possible alternate approaches to achieving the same results.
D. Construction Manager, Contractors/Installers, and Specialty Contractors shall provide personnel and equipment as required to perform the functional performance test procedures under the direction of the Commissioning Provider.

3.8 CORRECTIVE ACTIONS

A. Construction Manager, Contractors/Installers, and Specialty Contractors shall perform corrective actions for resolution of deficiencies found during:
    1. Contractor testing
    2. Test and balance
    3. System checkout
    4. Verification testing
B. A deficiency is equipment that does not function as expected and more than 5-minutes is required to correct the problem.

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C. Construction Manager, Contractors/Installers, and/or Specialty Contractors are responsible for functional performance retesting of items requiring corrective action as described in Section 3.6 Verification Tests.
   1. Provide staff, time, and equipment necessary to execute the section of the Verification Test Procedure that includes the deficiency.
   2. The Owner may elect to recover the additional costs for the Commissioning Provider to observe and direct retesting.
   3. The Owner shall determine the amount and method of recovering these additional costs.

D. The Commissioning Provider shall identify deficiencies and provide documentation and management of the deficiencies by a Corrective Action Report (sample attached), or other mutually agreed upon format.
   1. The Construction Manager shall have the Corrective Action Report within one working day of discovery.
   2. The Construction Manager, Contractors/Installers, and/or Specialty Contractors are responsible for documenting actions taken to correct the deficiency.
   3. Deficiency Identification Process (by Commissioning Provider):
      a. Date
      b. Description of deficiency
      c. Enter deficiency into Master Corrective Action Log
      d. Give original form to General Contractor Commissioning Coordination Supervisor
      e. Distribute copies to:
         i) Construction Manager
         ii) Owner's Project Manager
         iii) Design Engineers
   4. Corrective Action Direction (by General Contractor)
      a. Obtain the original form
      b. Date of direction
      c. Description of corrective action required
      d. Name of person issuing the direction
      e. Give the original form to the subcontractor/installer who shall perform the corrective action.
      f. Distribute copies to:
         i) Owner's Project Manager
         ii) Design Engineers
         iii) Commissioning Provider
   5. Subcontractor/Installer Corrective Action Completed (by Contractor/ Subcontractor/Installer or Specialty Contractor)
      a. Obtain the original form
      b. Date of correction
      c. Description of final equipment status or corrective action performed
      d. Name of person performing the work
      e. Subcontractor submit the original form to the General Contractor's Commissioning Supervisor
      f. General Contractor to approve and submit original form to Commissioning Provider
      g. Distribute copies to:
         i) Owner's Project Manager

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ii) Design Engineers
iii) Commissioning Provider

6. Verification of Corrective Action Completion (by Commissioning Provider)
   a. Date of retest
   b. Status description; resolved or more work required
   c. Name(s) of person(s) performing verification
   d. Enter resolution into Master Corrective Action Log
   e. Distribute copies to:
      i) Owner's Project Manager
      ii) Design Engineers
      iii) Construction Manager

E. During construction or testing, anyone finding deficiencies may document the deficiencies on an attached Corrective Action Report (CAR) within one working day of discovery.
   1. Forward these deficiencies to the Commissioning Provider.

3.9 ATTACHEMENTS - COMMISSIONING DOCUMENTATION

A. Corrective Action Report Form
B. Operation and Maintenance Training Plan form
C. Commissioning Document Requirements Table
D. Commissioning Site Observation form

END OF SECTION
(Attachments follow)

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School District of Palm Beach County **Palm Beach Gardens Community High Modernization** CORRECTIVE ACTION REPORT (CAR)	**CAR# X-XXX**

Deficiency noted during which evolution:
Contractor testing, test and balance, system checkout, verification testing, other:

System/Equipment Identification:

Description of deficiency:

Name:	Company:	Date:

Attach additional pages if necessary, number of attached pages:
Send original to the CM Cx Supervisor and a copy to: Owner's Project Manager, and Design Engineers

Corrective Action Direction **(by General Contractor):**

Name:	Company:	Date:

Attach additional pages if necessary, number of attached pages:
Send original to the Subcontractor and a copy to: Owner's Project Manager, Design Engineers and Commissioning Provider

Corrective Action Completed Satisfactorily **(by subcontractor)**
☐ Yes ☐ No

Comments on final equipment status or performance of corrective action:

Name:	Company:	Date:

Attach additional pages if necessary, number of attached pages:
Send original to CM Cx Supervisor for submittal to the Commissioning Provider, Owner's Project Manager, and Design Engineers

Verification of Corrective Action Completion **(by Commissioning Provider)**
☐ Yes ☐ No

Comments:

Name:	Company:	Date:

Attach additional pages if necessary, number of attached pages:
Send copies to the CM, Owner's Project Manager, and Design Engineers

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School District of Palm Beach County
Palm Beach Gardens Community High Modernization
OPERATION AND MAINTENANCE TRAINING PLAN

System/Equipment Identification:

Training Plan (by contractor) - **attach a detailed training agenda**

Training to be conducted by:

Name:	Title:
Company:	Phone:

Time Required:

Attach additional pages if necessary, number of attached pages:
Send original to the Owner's Project Manager for approval

Agenda Approval **(by Owner's Project Manager)**
Approved? ☐ Yes ☐ No

Comments:

Name:	Company:	Date:

Attached additional pages if necessary, number of attached pages:

Attendees **(Owner's operations & maintenance staff)**

Name/Affiliation:	Name/Affiliation:

Acceptance of the Training

The training has satisfactorily provided the Owner's personnel with the knowledge to operate and maintain the equipment discussed during the training session.

SDPBC Project Manager ☐ Yes ☐ No Name: Date:

SDPBC O&M Representative ☐ Yes ☐ No Name: Date:

If No, briefly describe the additional training required:

Attach additional pages if necessary, number of attached pages:
Send original to the Owner's Project Manager and copies to the Commissioning Provider

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COMMISSIONING DOCUMENT REQUIREMENTS TABLE

(Submit all items to the Commissioning Provider)

DOCUMENTATION	SUBMIT BY:	SUBMIT WHEN:
General Contractor commissioning coordination Supervisor	Construction Manager	Within 2 weeks of contract award
Subcontractor commissioning coordination Supervisors	Responsible Subcontractor	Within 2 weeks of contract award
Project submittal list (List of all required submittals for the job)	Construction Manager	Within 2 weeks of contract award
Training Documentation Plan (video recording plan)	Construction Manager	Within 8 weeks of contract award
Submittals	Construction Manager	Submit copies to Commissioning Provider at same time they are submitted to the Design Engineers
Project construction documentation: meeting minutes, CCDs, ASI's, RFI's, CO's, etc.	Construction Manager	Immediately upon issuing
Training Plans	Responsible Subcontractor	Within 4 weeks of submittal acceptance
Operation and maintenance manuals	Construction Manager	Within 4 weeks of submittal acceptance
Equipment startup report	Responsible Subcontractor	Submit with Systems Readiness Checklist
Contractors' test reports	Responsible Subcontractor	Within 1 week of test completion
Verification test schedule	Construction Manager	Within 4 weeks of the start of verification testing
Sensor calibration documentation	Building Automation Specialty Contractor	Within 1 week of the start of verification testing
Complete test and balance report	T.A.B. Specialty Contractor	Within 1 week of completion of work and prior to HVAC verification testing
System Readiness Checklist	Responsible Subcontractor	Within 1 week of check out completion and prior to verification testing

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COMMISSIONING SITE OBSERVATION # XX

Report Date: XX-XX-XX	**PROJECT:**	**Project Name –**
	SDPBC Project No:	
SPA: Name School District of Palm Beach County Program Management 3661 Interstate Road N Riviera Beach, FL 33404	**Date of Observations:**	XX-XX-XX
	Prepared By:	
	Quality Control Check:	
	Present at Site:	Name, SDPBC, Building Department Name, SDPBC, Facilities Services
	Copies To:	Name (Facilities Services) Construction Manager's PM Project File

PURPOSE OF MEETING / SITE OBSERVATION:

GENERAL OBSERVATIONS:

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SPECIFIC OBSERVATIONS:

IHC-XX-XX	
Item Classification Reference Drawing: Reference Specification: ☐ Non-Compliant with Drawings/Specifications ☐ Non-Compliant with Industry Standards ☐ Negative Impact on Operations/Maintenance	

Issue	
Impact	
Resolution	

Accepted By:	Resolved By:	Reviewed By:
Date:	Date:	Date:
[Owner]	[Contractor/Installer]	[CxP]

END OF REPORT

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SECTION 03 11 00
CONCRETE FORMWORK

PART 1 GENERAL

1.1 SECTION INCLUDES

1.2 FORMWORK FOR CONCRETE

A. Related accessories

1.3 REFERENCES

A. ACI 301 - Specifications for Structural Concrete Buildings
B. ACI 318 - Building Code Requirements for Structural Concrete
C. ACI 347 - Guide to Formwork for Concrete
D. ACI SP-4: Formwork for Concrete
E. ASME A17.1 - Safety Code for Elevators and Escalators
F. ASTM E1643 - -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 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs
H. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Non-extruding and Resilient Bituminous Types)

1.4 SYSTEM DESCRIPTION

A. Concrete Formwork: For surfaces of cast-in-place concrete to be unexposed or to receive rubbed finish.
B. Form footings and slabs on grade, earth forming are not allowed.
C. Design/Performance Requirements: Design, engineering and construction of formwork and shoring is the responsibility of the Contractor.
    1. Design formwork with sufficient strength to withstand forces due to placement and vibration and sufficient rigidity to maintain specified tolerances.
    2. Design loads, lateral pressure, and allowable stresses in accordance with ACI 347.

1.5 SUBMITTALS

A. Product Data: Proprietary materials and items, including forming accessories, water stops, joint systems, and others
B. Structural Calculations (Threshold Buildings):
    1. Prepare and submit complete design calculations, plans, and details for shoring and re-shoring procedures, indicating conformance to specified performance and design criteria; signed, and sealed by a professional engineer registered in the State of Florida.
    2. Submit calculations for review information only, will not check for accuracy.

PART 2 PRODUCTS

2.1 FORM MATERIALS

A. Concrete Forms for Beams, Columns, and Slabs:
    1. New or properly reconditioned material designed to conform to requirements of ACI SP-4 and to support wet concrete without deflection.
    2. Plywood Panels: PS-1 B-B plywood, Class 1, EXT-APA, sanded, mill oiled, and edge sealed.
B. Structural Concrete Forms for Joists: New or properly reconditioned removable 18-gauge steel or fiberglass pan forms with tapered end closures.

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C. Cylindrical Column Forms:
   1. Metal, fiberglass reinforced plastic, or paper or fiber tubes.
   2. Construct paper or fiber tubes of laminated plies using water-resistant adhesive with wax-impregnated exterior for weather and moisture protection.
      a. Provide units with sufficient wall thickness to resist loads imposed by wet concrete without deformation.

2.2 RELATED MATERIALS
A. Vapor Retarder: Related section 07 26 00.
B. Form Coatings: Colorless commercial formulation form release and sealer compounds that will not bond with, stain, nor adversely affect concrete surfaces, and will not impair subsequent treatments of concrete surfaces.
C. Form Ties: Adjustable length, removable or snap off metal form ties, designed to prevent form deflection and to prevent spalling concrete upon removal, 1½" break back, and maximum hole left 1¼" diameter.
D. Bevels and Rustications: Wood strips milled to shapes indicated or formed rigid plastic strips.
E. Dovetail Anchor Slots: 24-ga. galvanized steel with release tape sealed slots and bent tab anchors.
F. Flashing Reglets shall be 16-oz. copper with release tape sealed slots and alignment splines at end joints.
G. Construction Joints shall be 24-ga. galvanized steel keyway form type with knockout holes spaced 6" o. c. to receive doweling.
H. Carton Forms: Fiberboard void boxes capable of supporting min. load of 600 lbs./sq ft
I. Form Joint System for Architectural Concrete Forms:
   1. Gaskets shall be closed cell foam tape - Source Product/Mfg. - No. 4016 by 3M.
   2. Caulk: Rubberized, non-staining silicone compound GE Product/Mfg. - No. 1201.
   3. Tape: 2-mil Mylar - source Product/Mfg. - No. 371 by 3M.
J. Mastic Water stop: Preformed plastic or butyl resin strips. Source Products/Mfg:
   1. Synko-Flex/Synko-Flex Products Co.
   2. ConSeal CS-102/Concrete Sealants
K. Joint Fillers: Pre-molded mastic strips, asphalt impregnated, ASTM D1751.
L. Fasteners and Anchorages: Nails, spikes, bolts, lag bolts, and other types sized as required to maintain formwork in place.

PART 3 EXECUTION

3.1 EXAMINATION
A. Verify lines, levels, and measurements required before proceeding with formwork.
B. Coordinate the installation of joint materials, reinforcing steel, and vapor retarders with placement of forms.

3.2 INSTALLATION TOLERANCES
A. Allowable tolerances for Structural Concrete Forms shall comply with ACI 301 and 347.
B. Allowable tolerances for camber in slabs and beams shall comply with ACI 301.
C. Allowable tolerances for plumbness in elevator shafts shall comply with requirements of ASME A17.1.

3.3 ERECTION
A. Design, erect, support, brace, and maintain formwork to support vertical and lateral, static, and dynamic loads that may occur before permanent bracing can support such loads.

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B. Construction:
   1. Construct formwork so finished concrete members and structures are of correct size, shape, alignment, elevation, and position.
   2. Build formwork to be readily removable without impact, shock, or damage to cast-in-place concrete surfaces and adjacent materials.
   3. Provide openings, offsets, sinkages, keyways, recesses, moldings, rustications, reglets, chamfers, blocking, screeds, bulkheads, anchorages and inserts, and other features required.
   4. Solidly butt joints and provide back-up at joints to prevent leakage of cement paste.
   5. Kerf wood inserts for forming keyways, reglets, recesses, and the like, to prevent swelling and for easy removal.
   6. Provide temporary openings at bottoms of forms to facilitate cleanout and inspection.
      a. Close openings with tight fitting panels and neat joints so that joints will not be apparent in exposed concrete surfaces.

C. Chamfer exposed corners and edges as indicated, or if not indicated, provide ¾" x ¾".

D. Provide openings in concrete formwork to accommodate work of other trades.
   1. Determine size and location of openings, recesses, and chases from trades providing such items.
   2. Accurately place and securely support items built into forms.

E. Thoroughly clean forms and adjacent surfaces to receive concrete.
   1. Remove chips, wood, sawdust, dirt, or other debris just before placing concrete.
   2. Retighten forms and bracing after concrete placement to eliminate mortar leaks and maintain proper alignment.

F. Construction Joints:
   1. Locate and install formed construction joints at rustications or, if not indicated, locate so as not to impair strength and appearance of the structure, and as approved by the A/E.
   2. Provide keyways at least 1½" deep in construction joints in walls, slabs, and between walls and footings; accepted bulkheads designed for this purpose may be used for slabs.
   3. Place construction joints perpendicular to main reinforcement.
      a. Continue reinforcement across construction joints, except as otherwise indicated.

G. Isolation Joints in Slabs-on-Ground: Construct continuous joint filler at points of contact between slabs-on-ground and vertical surfaces, such as column pedestals, foundations walls, grade beams, and elsewhere as indicated.

H. Water stops: Provide mastic water stops in construction joints of below grade walls and in joints between below grade slabs and walls.
   1. Install water stops to form continuous diaphragm in each joint.
   2. Fabricate field joints in water stops in accordance with manufacturer's printed instructions.

I. Form Coatings: Apply after erecting forms and sealing the joints but prior to placing reinforcing steel, anchoring devices, and embedded items.
   1. Seal surfaces of wood rustications with two coats of form sealer.
   2. Spray-apply one coat of release agent to formwork faces except concrete surfaces scheduled to receive special finishes or special coatings.
   3. Coat steel forms with a non-staining, rust- preventative form oil to protect against rusting.
      a. Rust-stained steel formwork is not acceptable.

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J. Embedded Items: Set and build into work anchorage devices and other embedded items required for other work attached to, or supported by, cast-in-place concrete.
K. Reglets: Install to receive top edge of foundation sheet waterproofing, and to receive thru-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, relieving angles, and other conditions.
L. Vapor Retarder: Place, protect, and repair vapor-retarder sheets according to ASTM E1643 and manufacturer's written instructions.

3.4 RE-USE OF FORMS

A. Clean re-used forms of concrete matrix residue, repair, and patch as required returning forms to acceptable surface condition.
B. Recoat contact surfaces of forms with a form-coating compound as specified.

3.5 SHORES AND SUPPORTS

A. Comply with ACI 347 for shoring and re-shoring in multistory construction, for beams, girders, raised slabs, and as herein specified.
B. Space all shoring in such a manner as to prevent any floor or member from excessive loading or inducing stress in any of the concrete members.
    1. Extend shores beyond minimums to ensure proper distribution of loads throughout structure.

3.6 REMOVAL OF FORMS AND SHORING

A. Remove formwork and shoring progressively and in accordance with ACI 301 and ACI 347 to prevent unbalanced loads on the structure.
B. Do not remove shoring and formwork until members have acquired strength as specified by the engineer of record.
    1. Re-shore structural members as original shores are removed as specified by the engineer of record.
C. In the event the Contractor wishes to remove formwork at an earlier time than specified, the Contractor shall pay for and have testing laboratory obtain two additional concrete test cylinders to confirm strength requirement for early form removal.

END OF SECTION

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SECTION 03 20 00
CONCRETE REINFORCEMENT

PART 1 GENERAL

1.1 SECTION INCLUDES
- A. Reinforcing steel bars, wire fabric and accessories for cast-in-place concrete

1.2 REFERENCES
- A. ACI 301 - Structural Concrete for Buildings
- B. ACI 318 - Building Code Requirements For Reinforced Concrete
- C. ACI SP-66 - American Concrete Institute - Detailing Manual
- D. ASCE 7 - Minimum Design Loads of Buildings and Other Structures
- E. ASTM A82/A82M - Standard Specification for Steel Wire, Plain, for Concrete Reinforcement
- F. ASTM A184/A184M - Standard Specification for Fabricated Deformed Steel Bar Mats for Concrete Reinforcement
- G. ASTM A185/A185M - Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete
- H. ASTM A496/A496M - Standard Specification for Steel Wire Deformed for Concrete Reinforcement
- I. ASTM A497/A497M - Standard Specification for Steel Welded Wire Reinforcement Deformed for Concrete
- J. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
- K. ASTM A706/A706M - Standard Specification for Low Alloy Steel Deformed and Plain Bars for Concrete Reinforcement
- L. ASTM A767/A767M- Standard Specification for Zinc Coated (Galvanized) Steel Bars for Concrete Reinforcement
- M. ASTM A775/A775M- Standard Specification for Epoxy Coated Reinforcing Steel Bars
- N. ASTM D3963/D3963M - Standard Specification for Fabrication and Jobsite Handling of Epoxy Coated Reinforcing Bars
- O. AWS D1.4 - Structural Welding Code-Reinforcing Steel
- P. CRSI - Concrete Reinforcing Steel Institute - Manual of Standard Practice
- Q. CRSI - Placing Reinforcing Bars
- R. FBC - Florida Building Code

1.3 SUBMITTALS FOR REVIEW
- A. Section 01 33 00 - Submittals Procedures
- B. Shop Drawings: Indicate bar sizes, spacing, locations, and quantities of reinforcing steel and wire fabric, bending and cutting schedules, and supporting and spacing devices.

1.4 SUBMITTALS FOR INFORMATION
- A. Section 01 33 00 - Submittals Procedures
- B. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- C. Submit certified copies of mill test report of reinforcement materials analysis.

1.5 DESIGN REQUIREMENTS
- A. Design shall comply with the FBC, ASCE 7 – Wind Loads, and ACI 318.
- B. Do not weld reinforcing steel.

1.6 QUALITY ASSURANCE
- A. Perform work in accordance with ACI 301. Maintain one copy of document on site.
- B. Design reinforcement under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in the State of Florida.

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C. Submit under provisions of Section 01 40 00 Manufacturer's Certificates, certifying welders employed to do the work, verifying AWS qualification within the previous 12 months.

PART 2 PRODUCTS

2.1 REINFORCEMENT

A. Reinforcing Steel: ASTM A615/A615M, Grade 60; deformed carbon steel bars, unfinished
B. Stirrup and Tie Steel: ASTM A615/A615M, Grade 40 or 60; deformed carbon steel bars, unfinished
C. Welded Steel Wire Fabric: ASTM A185/A185M Plain Type; in flat sheets and rolls; unfinished
D. Steel Wire: ASTM A82/A82M, plain, cold drawn, steel

2.2 ACCESSORIES

A. Tie Wire: Minimum 16 gage annealed type or patented system.
B. Chairs, Bolsters, Bar Supports, Spacers: Size and shape for strength and reinforcement support during concrete placement, include load bearing pad on bottom to prevent vapor barrier puncture.
C. Special Chairs, Bolsters, Bar Supports, and Spacers Adjacent to Weather Exposed Concrete Surfaces: Plastic coated steel type; size and shape as required.

2.3 FABRICATION

A. Fabricate concrete reinforcing in accordance with ACI 318.
B. Weld reinforcement in accordance with AWS D1.4.
C. Locate reinforcing splices not shown on plans, at point of minimum stress and review with A/E.

PART 3 EXECUTION

3.1 PLACEMENT

A. Place support and secure reinforcement against displacement, without deviating from the required position.
B. Do not displace or damage vapor barrier.
C. Accommodate placement of formed openings.
D. Conform to applicable code for concrete cover over reinforcement.

3.2 FIELD QUALITY CONTROL

A. Architect, Owner, or Building Department may request field inspections per Section 01 40 00 1.7 Inspection Services.

END OF SECTION

SECTION 03 30 00
CAST-IN-PLACE CONCRETE

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PART 1 GENERAL

1.1 SECTION INCLUDES

A. Cast-in-place concrete building frame members, floors, shear walls, elevator shaft walls, foundation walls, footings, and supported slabs.

B. Floors and slabs on grade.

C. Control, expansion, and contraction joint devices associated with concrete work, including joint sealants.

D. Equipment pads, light pole base, flagpole base, thrust blocks, and manholes.

1.2 REFERENCES

A. ACI 211.1 - Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete

B. ACI 211.2 - Standard Practice for Selecting Proportions for Structural Lightweight Concrete

C. ACI 301 – Specifications Structural Concrete for Buildings

D. ACI 302.2R - Guide for Concrete Floor and Slab Construction

E. ACI 304R - Guide for Measuring, Mixing, Transporting and Placing Concrete

F. ACI 305R - Hot Weather Concreting

G. ACI 306R - Cold Weather Concreting

H. ACI 308.1 - Standard Specification for Curing Concrete

I. ACI 318 - Building Code Requirements for Structural Concrete

J. ACI 347 - Guide to Formwork for Concrete

K. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes

L. ASTM C33/C33M - Standard Specification for Concrete Aggregates

M. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens

N. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete

O. ASTM C150/C150M - Standard Specification Portland Cement

P. ASTM C260/C260M - Standard Specification Air Entraining Admixtures for Concrete

Q. ASTM C330/C330M - Standard Specification Light Weight Aggregates for Structural Concrete

R. ASTM C494/C494 - Standard Specification for Chemical Admixtures for Concrete

S. ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcinated Natural Pozzolan for Use in Concrete

T. ASTM C948 – Standard Test Method for Dry and Wet Bulk Density, Water Absorption and Apparent Porosity of Thin Sections of Glass-Fiber-Reinforced Concrete

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U. ASTM C1017/C1017M - Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete

V. ASTM D994/D994M - Standard Specification for Preformed Expansion Joint Filler for Concrete (Bituminous Type)

W. ASTM D1751 - Standard Specification for Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)

X. ASTM D1752 - Standard Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction.

Y. ASTM D6690 – Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavement

Z. FBC - Florida Building Code

AA. Florida Department of Transportation - Standard Specifications for Road and Bridge Construction

BB. ASCE 7 – Minimum Design Loads for Buildings and other Structures.

1.3 RELATED SECTIONS

A. 31 20 00 Earth Moving

B. 31 31 16 Termite Control

C. 03 11 00 Concrete Formwork

D. 03 36 00 Polished Concrete Floor

E. 07 26 00 Vapor Retarders

1.4 SUBMITTALS FOR REVIEW AND INFORMATION

A. Section 01 33 00 Submittals Procedures

B. Product Data: Provide data on joint devices, attachment accessories, admixtures, curing compound, sealers, and integral coloring.

C. Manufacturer's Installation Instructions: Indicate installation procedures and interface required with adjacent Work.

D. Samples: Submit two 12" long samples of expansion/contraction joint and control joint.

E. Shop Drawings:

1. Submit drawings indicating the locations of all joints in the concrete, construction joints, expansion joints, and contractions joints.
2. Include concrete placement schedule, method, sequence, quantities, location, and boundaries.

1.5 SUBMITTALS AT PROJECT CLOSEOUT

A. Section 01 77 00 Contract Closeout: Procedures for submittals

B. Accurately record actual locations of embedded utilities and components concealed from view.

1.6 DESIGN REQUIREMENTS

A. Design in conformance with Florida Building Code, ACI 318, and ACI 301.

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B. Provide expansion joints, control joints, construction joints, and isolation joints to prevent uncontrolled stress cracks in the structure and according to the latest engineering standards.

1.7 QUALITY ASSURANCE

A. Perform Work in accordance with ACI 301.

B. Mix and deliver ready mixed concrete in accordance with ASTM C94/C94M.

C. Maintain one copy of each document on site.

D. Acquire cement and aggregate from same source for all work.

E. Conform to ACI 305R when concreting during hot weather.

F. Conform to ACI 306R when concreting during cold weather.

1.8 MOCK-UP

A. Comply with the requirements of section 01 40 00 Quality Control, Requirements for mock-up.

B. Construct and erect a field sample for architectural concrete surfaces receiving special treatment or finish as result of formwork.

C. Sample Panel: Sufficient size to indicate special treatment or finish required.

D. If requested by A/E, cast concrete against sample panel.
   1. Obtain acceptance of resultant surface finish prior to erecting formwork.

E. Use the approved sample panel for basis of quality for the finished work.
   1. Keep sample panel exposed to view for duration of concrete work.

F. Locate where directed.

G. Mock-up may not remain as part of the Work.

1.9 COORDINATION

A. Coordinate Concrete Mix, Concrete floor Placement and Curing with requirements of Section 03 36 00 Polished Concrete Floor for areas to receive polished finish.

PART 2 PRODUCTS

2.1 CONCRETE MATERIALS

A. Cement: ASTM C150/C150M, Type I - Normal, Portland type

B. Fine and Coarse Aggregates: ASTM C33/C33M

C. Lightweight Aggregate: ASTM C330/C330M

D. Water: Clean and not detrimental to concrete

E. Glass Fiber Reinforcement: ASTM C948

2.2 ADMIXTURES

A. Air Entrainment: ASTM C260/C260M

B. Chemical: ASTM C494/C494M
   1. Water Reducing - Type A
   2. Retarding - Type B
   3. Accelerating - Type C
   4. Water Reducing and Retarding - Type D

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5. Water Reducing and Accelerating - Type E
6. Water Reducing, High Range - Type F
7. Water Reducing, High Range and Retarding - Type G
8. Flowing Concrete - ASTM C1017/C1017M

C. Fly Ash: ASTM C618

2.3 ACCESSORIES

A. Bonding Agent: Polymer resin emulsion, Polyvinyl Acetate, Latex emulsion, 2-component-modified epoxy resin, Non-solvent two-component polysulfide epoxy, Mineral filled polysulfide polymer epoxy, Mineral filled polysulfide polymer epoxy-resin, and Versamid cured epoxy.

B. Vapor Barrier: Flexible, sandwich of heavy paper, reinforced fibers, and two layers of inert polyethylene, formed into one layer under heat and pressure. (Perm rating of 0.1)

C. Non-Shrink Grout: Premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents; capable of developing minimum compressive strength of 2,400 psi in 48 hours and 7,000 psi in 28 days.

2.4 JOINT DEVICES AND FILLER MATERIALS

A. Joint Filler: ASTM D1751; Asphalt impregnated fiberboard or felt

B. Joint Filler: ASTM D1752; Closed cell polyvinyl chloride foam, resiliency recovery of 95% if not compressed more than 50% of original thickness

C. Construction Joint Devices: Integral galvanized steel; formed to tongue and groove profile, with removable top strip exposing sealant trough, ribbed steel spikes with tongue to fit top screed edge.

D. Expansion and Contraction Joint Devices: ASTM B221 alloy, extruded aluminum; resilient elastomeric filler strip with a Shore A hardness of 35 to permit plus or minus 25% joint movement with full recovery; extruded aluminum cover plate, of longest manufactured length at each location, flush mounted; color as selected.

E. Sealant and Primer: Type, as specified in Section 07 92 00

F. Sealant: Cold applied

2.5 CONCRETE MIX

A. Mix concrete in accordance with ACI 304. Deliver concrete in accordance with ASTM C94/C94M

B. Select proportions for normal weight concrete in accordance with ACI 301 Method 3

C. Select aggregate proportions for lightweight concrete in accordance with ASTM C330/C330M

D. Use accelerating admixtures in cold weather only when approved by A/E
   1. Use of admixtures will not relax cold weather placement requirements.

E. Use set retarding admixtures during hot weather only when approved by A/E

F. Add air-entraining agent to normal weight concrete mix for work exposed to exterior

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PART 3 EXECUTION

3.1 EXAMINATION

A. Verify site conditions under provisions of Section 01 31 00.

B. Verify requirements for concrete cover over reinforcement.

C. Verify that anchors, seats, plates, reinforcement and other items to be cast into concrete are accurately placed, positioned securely, and will not cause hardship in placing concrete.

3.2 PREPARATION

A. Prepare previously placed concrete by cleaning with steel brush and applying bonding agent in accordance with manufacturer's instructions.

B. In locations where doweling new concrete to existing work, drill holes in existing concrete; insert steel dowels and pack solid with non-shrink grout.

C. Coordinate the placement of joint devices with erection of concrete formwork and placement of form accessories.

D. Remove all foreign matter and water from forms or structural excavations.

3.3 FORMWORK

A. Conform to ACI 347

B. Form foundations, earth forms not allowed, unless Engineer of record and the Soil's report can provide information to building official showing the soil conditions are conducive to earth forms.

3.4 PLACING CONCRETE

A. Place concrete in accordance with ACI 301.

B. Notify A/E minimum 24 hours prior to commencement of operations

C. Ensure reinforcement, inserts, embedded parts, formed expansion, and contraction joints are not disturbed during concrete placement.

D. Treat for termites per section 31 31 16.

E. Install vapor retarder under interior slabs on grade, lap joints minimum 6", and seal watertight by taping edges and ends.

F. Repair vapor retarder damaged during placement of concrete reinforcing.

1. Repair with vapor retarder material; lay over damaged areas minimum 6" and seal watertight.

G. Separate slabs on grade from vertical surfaces with joint filler.

H. Place joint filler in floor slab pattern placement sequence.

1. Set top to required elevations.
2. Secure to resist movement by wet concrete.

I. Extend joint filler from bottom of slab to within ¼" of finished slab surface.

1. Conform to Section 07 92 00 for finish joint sealer requirements.

J. Install joint devices in accordance with manufacturer's instructions.

K. Install construction joint devices in coordination with floor slab pattern placement sequence.

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1. Set top to required elevations.
2. Secure to resist movement by wet concrete.

L. Install joint device anchors.
1. Maintain correct position to allow joint cover to be flush with floor and wall finish.

M. Install joint covers in one-piece length, when adjacent construction activity is complete.

N. Apply sealants in joint devices in accordance with Section 07 92 00.

O. Maintain records of concrete placement.
1. Record date, location, quantity, air temperature, and test samples taken.

P. Place concrete continuously between predetermined expansion, control, and construction joints.

Q. Do not interrupt successive placement; do not permit cold joints to occur.

R. Place floor slabs in checkerboard or saw cut pattern indicated.

S. Saw cut joints within 24 hours after placing.
1. Use 3/16" thick blade, cut into ¼ depth of slab thickness.

T. Screed floors and slabs on grade level, maintaining surface flatness of maximum ⅛" in 10'.

3.5 SEPARATE FLOOR TOPPINGS

A. Prior to placing floor topping, roughen substrate concrete surface, and remove deleterious material, broom and vacuum clean.

B. Place dividers, edge strips, reinforcing, and other items being cast in the pour as required.

C. Apply bonding agent to substrate in accordance with manufacturer's instructions.

D. Place concrete floor toppings to required lines and levels.

E. Place topping in checkerboard panels with dimensions not exceeding 20'.

F. Joint spacing in the topping should be coordinated with joint spacing in the base slab.

G. Screen toppings level, maintaining surface flatness of maximum 1:1000.

3.6 CONCRETE FINISHING

A. Provide formed concrete surfaces with exposed, concrete walls, columns, beams, joists, with smooth rubbed finish.

B. Finish concrete floor surfaces in accordance with ACI 301.

C. Wood-float the surfaces that receive quarry tile, ceramic tile, and terrazzo with full bed setting system.

D. Steel trowel surfaces that receive carpeting, resilient flooring, seamless flooring, thin-set quarry tile, and thin set ceramic tile.

E. Steel trowel surfaces scheduled to be exposed.

F. In areas with floor drains, maintain floor elevation at walls; pitch surfaces uniformly to drains at 1:50 nominal.

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3.7 CURING AND PROTECTION

A. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.

B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.

C. Cure floor surfaces in accordance with ACI 308.

D. Ponding: Maintain 100% coverage of water over floor slab areas continuously for 4 days.

E. Spraying: Spray water over floor slab areas and maintain wet for 7 days.

3.8 FIELD QUALITY CONTROL

A. Architect, Owner, or Building Department may request field inspections per Section 01 40 00 1.7 Inspection Services

B. Provide free access to Work and cooperate with appointed firm.

C. Submit proposed mix design of each class of concrete to inspection and testing firm for review prior to commencement of Work.

D. The Owner may perform tests of cement and aggregates to ensure conformance with specified requirements.

E. Take three concrete test cylinders for every 150 cu yards or less of each class of concrete placed.

F. Take one additional test cylinder during cold weather concreting, cured on job site under same conditions as concrete it represents.

G. Take one slump test for each set of test cylinders taken.

3.9 PATCHING

A. Contractor shall allow A/E to inspect concrete surfaces immediately upon removal of forms.

B. Excessive honeycomb or embedded debris in concrete is not acceptable; notify A/E upon discovery.

C. Patch imperfections in accordance with ACI 301.

3.10 DEFECTIVE CONCRETE

A. Defective concrete is concrete not conforming to required lines, details, dimensions, tolerances or specified requirements.

B. A/E shall determine the repair or replacement of defective concrete.

C. Do not patch, fill, touch-up, repair or replace-exposed concrete except upon express direction of A/E for each individual area.

END OF SECTION

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SECTION 03 30 06
WATERPROOFING ADMIXTURE FOR CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Waterproofing admixture for cast-in-place concrete.

B. Accessory materials.

1.2 RELATED REQUIREMENTS

A. Section 03 30 00 - Cast-in-Place Concrete: Finishing of concrete surface to tolerance; floating, troweling, and similar operations; curing.

1.3 REFERENCE STANDARDS

A. ACI 211.1 - Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete; 1991 (Reapproved 2009).

B. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete; 2018.

C. ASTM C685/C685M - Standard Specification for Concrete Made by Volumetric Batching and Continuous Mixing; 2014.

D. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2023.

1.4 SUBMITTALS

A. Product Data: Submit manufacturers' data on manufactured products showing compliance with specified requirements and installation instructions.

B. Mix Design: Submit manufacturer approval of proposed concrete mix design.

C. Material Test Report: Document that products of this section comply with specified requirements.

D. Field Quality Control Submittals: Include project name and number, date of admixture application, name of testing agency, location of concrete batch in work, mix proportions, materials, and test result.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than ten years of documented experience.

B. Concrete Supplier Qualifications: Company certified by waterproofing admixture manufacturer with not less than three years of documented experience.

C. Concrete Finisher Qualifications: Company certified by waterproofing admixture manufacturer with not less than three years of documented experience, and approved by manufacturer.

D. Obtain admixture from a single manufacturer.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in original, undamaged containers with labels intact.

B. Comply with manufacturer's written handling instructions prior to mixing.

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C. Comply with manufacturer's written storage instructions.

PART 2 PRODUCTS

2.1 WATERPROOFING ADMIXTURE

A. Do not use chemicals that will result in soluble chloride ions in excess of 0.1 percent by weight of cement.

B. Integral Crystalline Waterproofing Admixture, added to concrete at the time of batching, reacts with cementitious material to integrally and permanently close route of moisture transmission.

1. Consists of Portland cement, very fine treated silica sand and various active, proprietary chemicals which react with the moisture in fresh concrete with the by-products of cement hydration to cause a catalytic reaction, which generates a non-soluble crystalline formation throughout the pores and capillary tracts of the concrete.
2. Can seal hairline cracks up to 1/64 inch.
3. Toxicity: None.
4. Products:
   a. Basis of Design: Penetron Admix: www.pentron.com.
   b. Sika WT-240 P: www.usa.sika.com.
   c. Xypex Admix C: www.xypex.com.
   d. Substitutions: See Section 01 60 00 - Material Equipment and Approved Equals.

2.2 CONCRETE MIX DESIGN

A. Admixtures: Add acceptable admixtures as recommended in ACI 211.1 and at rates required by manufacturer.

PART 3 EXECUTION

3.1 INSTALLATION

A. Dispense admixture according to mix design and supplier's written instructions.

B. Add admixture to concrete according to manufacturer's written instructions.

C. Place and cure concrete as specified in Section 03 30 00.

3.2 FIELD QUALITY CONTROL

A. Provide an independent testing agency to perform field quality control tests.

B. Provide free access to concrete operations at project site and cooperate with testing agency.

C. Concrete Testing: Cooperate with manufacturer of specified waterproofing admixture to allow access for sampling and testing concrete for compliance with warranty requirements.

D. Maintain four concrete cylinders for one year from date of Substantial Completion.

E. Test cylinders as required by admixture manufacturer.

F. Field Quality Control Reports:

1. Submit test results to Architect, Contractor, and admixture manufacturer, within 48 hours of testing.

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2. Include project name, project number, date of admixture application, name of testing agency, location of concrete in the Work, concrete mix design, and waterproofing capability.

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SECTION 03 35 00
CONCRETE FLOOR FINISHING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Finishing separate floor toppings, slabs-on-grade, and monolithic floor slab.

B. Surface treatment with concrete hardener, sealer, and slip resistant coatings.

1.2 REFERENCES

A. ACI 301 - Structural Concrete for Buildings

B. ACI 302 - Guide for Concrete Floor and Slab Construction

C. ASTM E1155 - Standard Test Method for Determining FF Flatness and FL Floor Levelness Numbers

1.3 RELATED SECTIONS

A. 03 36 00 Polished Concrete Floor

1.4 SUBMITTALS

A. Submit under provisions of Section 01 33 00 Submittals Procedures.

B. Product Data: Provide data on concrete hardener, sealer, and slip resistant treatment, compatibilities, and limitations.

1.5 MAINTENANCE DATA

A. Submit under provisions of Section 01 77 00 Contract Closeout.

B. Maintenance Data: Provide data on maintenance renewal of applied coatings.

1.6 QUALITY ASSURANCE

A. Perform work in accordance with ACI 301 and ACI 302.

B. Maintain copies of each document on site.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, protect, and handle products under provisions of Section 01 31 00 Project Management and Coordination.

B. Deliver materials in manufacturer's packaging including application instructions.

1.8 ENVIRONMENTAL REQUIREMENTS

A. Temporary Lighting: Provide minimum 200 W light source, 8' above the floor surface, for each 425 sq. ft. of floor being finished.

B. Temporary Heat: Ambient temperature of 50° F (10° C) minimum

C. Ventilation: Sufficient to prevent injurious gases from temporary heat or other sources affecting concrete.

1.9 COORDINATION

A. Coordinate work under provisions of Section 01 31 00 Project Management and Coordination.

B. Coordinate the work with concrete floor placement and concrete floor curing.

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PART 2 PRODUCTS

2.1 COMPOUNDS - HARDENERS AND SEALERS

A. Non-Metallic Hardener: Premixed, dry powder, colored, emery aggregate and abrasion resistant hardener.

2.2 SLIP RESISTANT TREATMENT

A. Slip Resistant Finish: Aluminum oxide type, color as selected from manufacturer's standard range

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify site conditions under provisions of Section 01 31 00 Project Management and Coordination.

B. Verify that floor surfaces are acceptable to receive the work of this section.

3.2 FLOOR FINISHING

A. Finish concrete floor surfaces in accordance with ACI 301 and ACI 302.

B. Wood-float surfaces that will receive quarry tile, ceramic tile, cementitious terrazzo with full bed setting system.

C. Steel trowel surfaces receiving carpeting, resilient flooring, seamless flooring, thin set terrazzo, thin set quarry tile, and thin set ceramic tile.

D. Steel trowel surfaces scheduled to be exposed.

E. In areas with floor drains, maintain design floor elevation at walls; slope surfaces uniformly to drains as indicated on drawings.

3.3 FLOOR SURFACE TREATMENT

A. Apply dry shake liquid hardener in accordance with manufacturer's instructions as scheduled.

B. Apply slip resistant finish in accordance with manufacturer's instructions as scheduled.

C. Apply sealer in accordance with manufacturer's instructions as scheduled.

3.4 TOLERANCES

A. Measure for FF and FL tolerances for floors in accordance with ASTM E1155, within 72 hours after slab installation

B. Finish concrete to achieve the following tolerances:
   1. Under Ceramic or Quarry Tile on Setting Bed: FF 25 and FL 25
   2. Under Resilient flooring (VCT, sheet vinyl, etc): FF 30 and FL 25
   3. Exposed to View and Foot Traffic (polished concrete): FF 40 and FL 35
   4. Exposed stained concrete (mechanical, electrical, custodial): FF 20 and FL 15
   5. Exception: The FL levelness tolerances do not apply to any un-shored elevated construction.
   6. Correct the slab surface if the actual FF or FL number for the floor installation measures less than required.

C. Identify areas requiring corrective work.

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1. Correct all defects in the defined traffic floor by grinding or removal and replacement of the defective work.
2. Re-measure corrected areas by the same process.

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SECTION 03 36 00
POLISHED CONCRETE FLOOR

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Finishing separate floor toppings, slabs-on-grade, and monolithic floor slab.

B. Surface treatment with concrete hardener, sealer, and slip resistant coatings.

C. Polished concrete finish for interior flatwork; polish concrete finishes for precast, vertical cast-in-place, and exterior concrete are specified in the sections for those types.

1. All labor, materials, equipment, and services necessary for the grinding and polishing of concrete floors.
2. Densifying impregnator/sealer and polishing to specified sheen level and aggregate exposure.
3. Concrete must be cured a minimum of 28-days prior to polishing.

1.2 REFERENCES

A. ACI 301 - Structural Concrete for Buildings

B. ACI 302 - Guide for Concrete Floor and Slab Construction

C. ASTM C33/C33M, Standard Specification for Concrete Aggregates

D. ASTM C150/C150M, Standard Specification for Portland Cement

E. ASTM C779/C779M, Standard Test Method for Abrasion of Horizontal Concrete Surfaces

F. ASTM C805/C805M, Standard Test Method for Rebound Number of Hardened Concrete

G. ASTM C1028, Standard Test Method for Determining the Static Coefficient of Friction of Ceramic Tile and Other like Surfaces by the Horizontal Dynamometer Pull Meter Method

H. ASTM D3960, Standard Practice for Determining Volatile Organic Compound (VOC) Content of Paints and Related Coatings

I. ASTM E1155 - Standard Test Method for Determining FF Floor Flatness and FL Floor Levelness Numbers

J. ASTM E2129, Standard Practice for Data Collection for Sustainability Assessment of Building Products

K. ASTM G23, Standard Practice for Operating Light Exposure Apparatus (Carbon Arc Type) With and Without Water for Exposure of Nonmetalic Materials

1.3 SUBMITTALS

A. Submit under provisions of Section 01 33 00 Submittals Procedures.

1. Product Data: Provide data on concrete hardener, sealer, and slip resistant treatment, each grinding machine, including all types of grinding heads, dust extraction system, joint filler, concrete densifying impregnator, penetrating sealer, and any other chemicals used in the process, along with compatibilities, and limitations.
2. VOC Data: Submit Green Seal Certification to GS-11 and description of basis for certification.

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3. Environmental Date: Submit environmental data in accordance with Table 1 of ASTM E2129 for products provided under the work of this section.
4. Submit Applicators qualifications data.
5. Submit polished concrete samples: Three samples 12" x 12" for each type of polished concrete finish required.

1.4 MAINTENANCE DATA

A. Submit under provisions of Section 01 77 00 Contract Closeout.

B. Maintenance Data: Provide data on maintenance renewal of applied coatings.

C. Provide maintenance procedures using manufacturer's recommended systems.

1.5 QUALITY ASSURANCE

A. Perform work in accordance with ACI 301 and ACI 302.

B. Maintain copies of each document on site.

C. VOC Content; Determine VOC content of solvent borne, water borne paints and related coatings per EPA method 24 or ASTM D3960.

D. Work inspected by Certified Applicator;
1. Concrete finish equipment and chemical manufacturer shall certify installer/applicator.
2. Contractor shall provide adequate number of skilled workers thoroughly trained and experienced in the necessary craft.

E. Pre Installation Conference: Conduct conference at site prior to start of work complying with the requirements of section 01 40 00.

F. Manufacturers Certification: Provide certification letter from both the equipment and chemical manufacturer stating the installer is a certified applicator and is familiar with proper procedures and installation requirements required by the manufacturer.

G. Mock-Ups;
1. General Contractor to notify applicator at least 7-days prior to the pour schedule of mock-up.
2. Reserve 100 SF for each ~~color~~sheen level and finish at a location adjacent to floor receiving polish at concrete floor area able to be removed, patched, or placed in location where applied any variation in floor substrate will be corrected prior to being, with another flooring material. Place mock-up floor on the same day and same pour as the floors to receive polish.
   a. Provide mock-up for review of Sheen Level 1 and Level 2 as defined in PART 3.
3. Install mock-ups to verify selections made under the sample submitted and to demonstrate methods and workmanship proposed for the project.
4. If stand-alone mock-up is required, form shall be clean and free from extraneous substance and be at least 12" x 12" with a level plywood bottom on level ground with unobstructed access on all four sides.
5. Test aggregate to ensure it will accept polish.
6. Include control joints in the mock-up, contractor may saw as soon as the surface is firm enough not to displace any aggregate.
7. Also, include edge conditions in the mock-up.

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8. Approved mock-ups may become part of the completed work if accepted by the owner.

H. Protection: General Contractor shall protect areas receiving polished concrete finish at all times during construction to prevent oils, dirt, metal, excessive water, and any other potentially damaging materials from affecting the finished concrete surface. Protection measures listed below shall start immediately after the concrete slab is poured:
   1. All hydraulic powered equipment shall be diapered to avoid staining of concrete.
   2. Prohibit all vehicle parking or traffic on finished slab receiving polished finish, if vehicle traffic is necessary; provide drop clothes under the vehicles.
   3. Do not use pipe-cutting machines on the slabs receiving polished finish.
   4. Do not place steel on the slabs receiving polished finish.
   5. Keep all acids and acidic detergents form the slabs receiving polished finish.
   6. Painters shall use drop cloths on the slabs receiving polished finish, and if paint does get on the slab, remove the paint immediately.
   7. Inform all trades and workers of the slabs requiring protection at all times.

I. Environmental Limitations:
   1. Comply with the manufactures written instructions for substrate temperature, moisture content, ambient temperature & humidity, ventilation, and other conditions affecting chemical performance.
   2. Provide the proper flatness and levelness of the finished concrete slab.
      a. Floor flatness – minimum rating of 40
      b. Floor levelness – minimum rating of 30
      c. Cure time – minimum of 28-days
   3. Application of finish system shall take place a minimum of 21-days prior to fixture and trim installation or substantial completion.
   4. Close the finish concrete floor area to all traffic during the finish floor application and after application for time as recommended by the manufacturer.

J. Concrete Mix Design:
   1. Concrete mixture shall be at least 3500 PSI, non air-entrained.
      a. Keep any admixtures, plasticizers, slag, fly ash, or anything taking the place of Portland-based cement to a minimum.
      b. Use Portland cement Type I, conforming to ASTM C150/C150M.
      c. Keep concrete as cool and moist as possible, with concrete temperature below 85°F to help control cracking.
      d. Wet cures are most desirable, but if not possible use a penetrating, dissipating, or wax based cure and seal, as recommended by manufacturer.
      e. Do not use a denisifier/hardener material due to grinding of the floor after 6 days.
      f. The Architect/Engineer shall determine the saw cut patterns, colors, and layout.
      g. Color loads for integral color shall not be smaller than 3 cubic yards.
      h. Use one source for cement, aggregate, and pozzolan throughout the job.
         1) Monitor and control incoming material consistency.
         2) Do not use calcium chloride based admixtures.
         3) May use non-chloride admixture with the Architect’s approval.

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i. Wash out all drums before loading, keep slumps consistent (maximum of 4), and minimize driver added water maintaining a 0.45 water content ratio.

j. Place concrete to achieve as true and smooth surface as possible.

1) Mounds or dips are not acceptable.

2) Contractor shall control overall flatness and levelness, including on sloping areas within the permitted tolerances allowed by the specification and ASTM E1155.

k. Protect the slab from indentions and footprints during the pour and the curing.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, protect, and handle products under provisions of Section 01 31 00 Project Management and Coordination.

B. Deliver materials in manufacturer's packaging including application instructions.

1.7 ENVIRONMENTAL REQUIREMENTS

A. Temporary Lighting: Provide minimum 200 W light source, 8' above the floor surface, for each 425 sq. ft. of floor being finished.

B. Temporary Heat: Ambient temperature of 50° F (10° C) minimum

C. Ventilation: Sufficient to prevent injurious gases from temporary heat or other sources affecting concrete.

1.8 COORDINATION

A. Coordinate work under provisions of Section 01 31 00 Project Management and Coordination.

B. Coordinate the work with concrete floor placement and concrete floor curing.

PART 2 PRODUCTS

2.1 COMPOUNDS - HARDENERS AND SEALERS

A. Non-Metallic Hardener: Premixed, dry powder, colored, emery aggregate and abrasion resistant hardener.

2.2 SLIP RESISTANT TREATMENT

A. Slip Resistant Finish: Aluminum oxide type, color as selected from manufacturer's standard range

2.3 POLISHING MATERIALS

A. Three-phase 480 Volt generator and step down transformer.

B. 3-head or 4-head counter rotating variable grinder equal to HTC Superfloor™ approved floor grinder with at least 600 pounds down pressure (Example: HTC 950RX, HTC 800HDX, HTC 800HD, HTC 650HDX, or etc.)

C. Use a dust extraction system, pre-separator, and squeegee attachments in compliance with project IAQ Management Plan.

1. HTC Superfloor™ Dust extraction system, pre-separator, and squeegee attachments with minimum flow rate of 322 cubic feet per minute such as a HTC 75D.

D. Grinding Head:

1. Metal bonded 16, 25, 40, 80, 150, and/or 300 grits.

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2. Bonded phenolic diamonds 100, 200, 400, 800, 1500, and 3000 grits

E. Grinding Pads for Edges
   1. 40, 60, and 120 grits
   2. 100, 200, 400, 800, 1500, and 3000 grits

F. Hand grinder with dust extraction attachment and pads.

G. Penetrating liquid sealer hardener densifying impregnator or as specified by construction manager with the following performance criteria:
   1. Chemical reactive, waterborne solution of inorganic silicate or siliconate materials and propriety components, odorless and colorless, which hardens and densifies concrete surfaces to protect against abrasion, dusting, and absorption of liquids.

H. Control joint and saw cut filler, two part filler or polyurea as specified by construction manager and approved by architect.

I. A ready to use penetrating dye or reactive stain that chemically combines with cured concrete to produce permanent variegated or translucent color effects or a hydrolyzed, or a lithium quartz or siliceous materials to create a translucent or marbled color effect.

J. ~~Graphic design with water based color dye used based on final design and color selection by the Architect~~.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify site conditions under provisions of Section 01 31 00 Project Management and Coordination.

B. Verify that floor surfaces are acceptable to receive the work of this section.
   1. Installer shall examine and approve concrete substrate for conditions affecting performance of the finished polished concrete slab.
   2. General Contractor shall correct any conditions found not in compliance with this section.
   3. Architect shall approve the repairs based on the requirements of this section.
   4. Provide floor clean of materials and debris.
   5. Protect adjacent surfaces as necessary to prevent damage by concrete polishing procedure.

3.2 CONCRETE FLOOR POLISHING

A. Basis of Design is the HTC Superfloor™ system, any other system used shall be pre-approved by the architect.

B. Finish concrete floor surfaces in accordance with ACI 301 and ACI 302.

C. In areas with floor drains, maintain design floor elevation at walls, slope surfaces uniformly to drains as indicated on plans.

D. See plans for locations and type of specialized floor finish, color, and treatment in accordance with the design intent; contractor shall coordinate with architect all field samples and installations.

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E. Grind the concrete floor within 2-3 inches of wall with 16, 25, 40, and 80 grit removing construction debris, floor slab imperfections until there is a uniform scratch pattern, and achievement of the desired concrete aggregate exposure.
   1. Vacuum the floor thoroughly using a squeegee vacuum attachment.

F. Apply material approved by the architect for color effects in accordance with the architect's plans, accepted mock-up, and the manufacturers recommended guidelines.

G. Fill construction joints and cracks with filler products as specified in the manufacturer's instructions colored to match ~~(or contrast)~~ with the concrete color specified by the architect.

H. Apply densifying impregnator per the manufacturer's recommendations.
   1. Cover the entire work area liberally and allow setting as required by manufacturer.
   2. Apply again to areas where the densifying impregnator has soaked in and allow setting.
   3. Squeegee excess material off the floor.
   4. Allow 12 to 24 hours for curing, as required by the manufacturer.

I. Grind the floor to within 2-3 inches of walls with metal bonded diamond grits of 150 and 300, grinding 90° from each previous grind and removing all the scratches from the previous grit.
   1. Vacuum the floor thoroughly after each grind, using a squeegee vacuum attachment.

J. Grind the edges with 40, 60, and 120 grit grinding pads, removing all scratches from the previous grit.
   1. Vacuum the floor thoroughly after each grind, using a squeegee vacuum attachment.

K. Polish the floor to the desired sheen level with phenolic resin bonded diamond grits of 100, 200, 400, 800, 1500, and 3000, first polishing the edges ~~(if specified)~~ with pads of the same grit, then the field of the floor, removing all scratches from the previous grit.
   1. After each polish, clean the floor thoroughly using clean water and an auto scrubber or a mop and wet vacuum.

L. Apply HTC Superfloor™ Stainguard, buff with Green 300 grit twister pad as necessary.

M. Upon completion, the work shall be ready for final inspection and acceptance by the architect and owner.

3.3 SHEEN

A. Provide one of the following as selected in Approved Mock-up:
   1. Polished Concrete Level 1:
      a. At a distance of 100', the floor will reflect images from side lighting.
   2. Polished Concrete Level 2:
      a. At a distance of 30' to 50', the floor will clearly reflect from side and overhead lighting.

3.4 EXPOSED AGGREATE

A. Exposure rate per architect and owner selection based on approved mock-up.

3.5 EDGES

A. Polish all edges to match the field finish area.

3.6 PROTECTION

A. Protect the floors from damage as required.

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3.7 TOLERANCES

A. Measure for FF and FL tolerances for floors in accordance with ASTM E1155, within 72 hours after slab installation

B. Finish concrete to achieve the following tolerances:
   1. Exposed to View and Foot Traffic (polished concrete): FF 40 and FL 35
   2. Exposed stained concrete (mechanical, electrical, custodial): FF 20 and FL 15
   3. Exception: The FL levelness tolerances do not apply to any un-shored elevated construction.
   4. Correct the slab surface if the actual FF or FL number for the floor installation measures less than required.

C. Identify areas requiring corrective work.
   1. Correct all defects in the defined traffic floor by grinding or removal and replacement of the defective work.
   2. Re-measure corrected areas by the same process.

3.8 SITE ENVIRONMRNTAL PROCEDURES

A. Indoor Air Quality: Provide temporary ventilation as necessary and recommended by the manufacturer to meet the project IAQ requirements.

B. Waste Management:
   1. Coordinate with manufacturer for take-back program.
   2. Set aside scrap to be returned to manufacturer for recycling into new product.
   3. Close and seal all partially used containers of paint maintaining quality necessary for reuse.

END OF SECTION

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SECTION 03 45 00
PRECAST ARCHITECTURAL CONCRETE ELEMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Architectural precast concrete caps for exterior seating wall, marquee wall, and where indicated on Drawings.

B. Supports, anchors, and attachments.

1.2 REFERENCE STANDARDS

A. ACI 318 - Building Code Requirements for Structural Concrete and Commentary; 2014 (Errata 2018).

B. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement; 2018.

C. ASTM A666/A666M - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2024.

D. ASTM A767/A767M - Standard Specification for Zinc-Coated (Galvanized) Steel Bars for Concrete Reinforcement; 2016.

E. ASTM A884/A884M - Standard Specification for Epoxy-Coated Steel Wire and Welded Wire Reinforcement; 2014.

F. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete; 2018a.

G. ASTM C1602/C1602M - Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete; 2012.

H. ASTM C33/C33M - Standard Specification for Concrete Aggregates; 2016, with Editorial Revision (2016).

I. ASTM C150/C150M - Standard Specification for Portland Cement; 2018.

J. IAS AC157 - Accreditation Criteria for Fabricator Inspection Programs for Reinforced and Precast/Prestressed Concrete; 2017.

K. PCI MNL-117 - Manual for Quality Control for Plants and Production of Architectural Precast Concrete Products; 2013.

L. PCI MNL-120 - PCI Design Handbook - Precast and Prestressed Concrete; 2012.

M. PCI MNL-122 - Architectural Precast Concrete; 2007.

N. PCI MNL-123 - Design and Typical Details of Connections for Precast and Prestressed Concrete; 1988.

O. PCI MNL-135 - Tolerance Manual for Precast and Prestressed Concrete Construction; 2000.

1.3 SUBMITTALS

A. Product Data: Manufacturer's information on accessory products, including pigments, admixtures, inserts, plates, etc.

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B. Shop Drawings: Include elevations, dimensions, layouts, profiles, cross sections, reinforcement, exposed faces, arrangement of joints, anchoring methods and relationship to adjacent materials.
   1. Include details of mix designs.

C. Samples: Submit two samples, 12 by 12 inch in size, illustrating surface finish, color and texture.

D. Fabricator's Qualification Statement: Provide documentation showing precast concrete fabricator is accredited under IAS AC157.

1.4 QUALITY ASSURANCE

A. Fabricator Qualifications:
   1. Firm having at least 2 years of documented experience in production of precast concrete of the type required.
   2. Fabricator Qualifications: Precast concrete fabricator accredited by IAS according to IAS AC157.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Protect units during handling and installation to prevent chipping, cracking, or other damage.

B. Protect units to prevent staining, and protect corners from damage.

PART 2 PRODUCTS

2.1 PRECAST UNITS, GENERAL

A. Precast Architectural Concrete Units: Comply with PCI MNL-120, PCI MNL-122, PCI MNL-123, PCI MNL-135, and ACI 318.
   1. Design Loads: Static loads, anticipated dynamic loading, including positive and negative wind loads, thermal movement loads, and erection forces as defined by applicable code.
   2. Calculate structural properties of units in accordance with ACI 318.
   3. Accommodate construction tolerances, deflection of structural support members.
   4. Provide connections that accommodate base structure movement and thermal movement and adjust to misalignment without unit distortion or damage.

B. Finish: Ensure exposed-to-view finish surfaces of precast units are uniform in color and appearance.
   1. Surface Texture: Fine grained texture, with no bugholes, air voids, or other surface blemishes.

C. Shapes: Provide shapes indicated on drawings.
   1. Variation from Any Dimension, Including Bow, Camber, and Twist: Maximum of plus/minus 1/8 inch or length divided by 360, whichever is greater, but not more than 1/4 inch.
   2. Wash or slope of 1:12 on exterior horizontal surfaces. Provide drip edge at overlap.

2.2 REINFORCEMENT

A. Provide reinforcement as required to withstand handling and structural stresses; comply with ACI 318.

B. Reinforcing Steel: ASTM A615/A615M, Grade 40 (40,000 psi).

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1. Galvanized in accordance with ASTM A767/A767M, Class I.

C. Steel Welded Wire Reinforcement (WWR): Galvanized, plain type, ASTM A1064/A1064M.

2.3 CONCRETE MATERIALS

A. Cement: ASTM C150/C150M, Type I - Normal Portland type, white.

B. Fine and Coarse Structural Aggregates: ASTM C33/C33M.

C. Surface Finish Aggregate: Complying with approved sample in office of Architect.

D. Water: ASTM C1602/C1602M; clean, potable, and not detrimental to concrete.

2.4 SUPPORT DEVICES

A. Connecting and Support Devices; Anchors and Inserts: ASTM A666 Type 304 stainless steel.
1. Provide type and size as required for conditions.
2. Clean surfaces of rust, scale, grease, and foreign matter.

2.5 FABRICATION

A. Fabricate in compliance with PCI MNL-117 and PCI MNL-135.

B. Use rigid molds, constructed to maintain precast unit uniform in shape, size, and finish.

C. Maintain consistent quality during manufacture.

D. Fabricate connecting devices, plates, angles, inserts, bolts, and accessories. Fabricate to permit initial placement and final attachment.

E. Embed reinforcing steel, anchors, inserts plates, angles, and other cast-in items.

F. Cure units to develop concrete quality, and to minimize appearance blemishes such as non-uniformity, staining, or surface cracking.

2.6 ACCESSORIES

A. Setting Materials: Improved Latex-Portland Cement Mortar Bond Coat: ANSI A118.15.
1. Basis of Design Product: LATICRETE International, Inc; Multimax Lite: www.laticrete.com.

2.7 SOURCE QUALITY CONTROL

A. Provide testing and analysis of concrete mix.

B. Take water absorption test in accordance with PCI MNL-117.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine construction to receive precast components. Notify Architect if construction is not acceptable.

B. Do not begin installation until unacceptable conditions have been corrected.

3.2 INSTALLATION

A. Install units without damage to shape or finish. Replace or repair damaged units.

B. Install units level and plumb within allowable tolerances.

C. Align and maintain uniform horizontal and vertical joints as installation progresses.

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D. When units require adjustment beyond design or tolerance criteria, discontinue affected work; advise Architect.

3.3 TOLERANCES

A. Install members level and plumb within allowable tolerances. Comply with PCI MNL-135, except as specifically amended below.

1. Variation from Plumb: Not more than 1/8 inch in 10 feet or 1/4 inch in 20 feet or more.
2. Variation from Level: Not more than 1/8 inch in 10 feet or 1/4 inch in 20 feet, or 3/8 inch maximum.
3. Variation in Joint Width: Not more than 1/8 inch in 36 inches or 1/4 of nominal joint width, whichever is less.
4. Variation in Plane Between Adjacent Surfaces (Lipping): Not more than 1/16 inch difference between planes of adjacent units or adjacent surfaces indicated to be flush with units.

3.4 PROTECTION

A. Protect installed units from subsequent construction operations.

END OF SECTION

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SECTION 03 47 13
TILT-UP CONCRETE

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Tilt-up, site cast concrete wall panels, load, or no-load bearing, from form to final position.

B. Supports, devices, load bearing supports, and attachments.

C. Perimeter and intermediate joint seals

D. Grouting under panels

1.2 REFERENCES

A. ACI 551.1R - Tilt-Up Concrete Construction Guide

B. ACI 301 - Specifications for Structural Concrete

C. ACI 304R - Guide for Measuring, Mixing, Transporting and Placing Concrete

D. ACI 318 - Building Code Requirements for Structural Concrete

E. ASCE 7 - Minimum Design Loads for Building & Other Structures

F. ASTM A36/A36M - Standard Specification for Carbon Structural Steel

G. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dipped Galvanized) Coatings on Iron and Steel Products

H. ASTM A185/A185M - Standard Specification for Steel Welded Wire, Reinforcement, Plain, for Concrete

I. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60,000-PSI Tensile Strength

J. ASTM A325 - Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength

K. ASTM A416/A416M - Standard Specification for Steel Strand, Uncoated Seven-Wire for Prestressed Concrete

L. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement

M. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel, Sheet, Strip, Plate, and Flat Bar

N. ASTM C31/C31M - Standard Practice for Making and Curing Concrete Test Specimens in the Field

O. ASTM C33/C33M - Standard Specification for Concrete Aggregates

P. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete

Q. ASTM C143/C143M – Standard Test Method for Slump of Hydraulic Cement Concrete

R. ASTM C150/C150M - Standard Specification for Portland Cement

S. ASTM C260/C260M - Standard Specification for Air-Entraining Admixtures for Concrete

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T. ASTM C330/C330M - Standard Specification for Lightweight Aggregates for Structural Concrete

U. AWS D1.1/D1.1M - Structural Welding Code

V. AWS D1.4/D1.4M - Structural Welding Code - Reinforced Steel

W. Florida Building Code (FBC)

1.3 DESIGN REQUIREMENTS

A. Design units to withstand design loads as calculated in accordance with the FBC, ACI 318 and ASCE 7, Chapter 6.

B. Design units to accommodate construction tolerances, deflection of building structural members and clearances of intended openings.

C. Design and size components to withstand loads and sway displacement as calculated per the FBC, ACI 318 and ASCE 7 wind loads, Chapter 6.

D. Design component connections to accommodate building movement and thermal movement. Provide adjustment to accommodate misalignment of structure without unit distortion or damage.

1.4 SUBMITTALS FOR REVIEW

A. Section 01 33 00 - Submittals Procedures

B. Shop Drawings: Indicate layout, tilt-up unit locations, configuration, unit identification marks, reinforcement, connection details, support items, location of lifting devices, dimensions, openings and relationship to adjacent components. Indicate panel finishes and panel joints.

C. Submit signed and sealed engineered drawings to the School District Building Department for approval before fabrication of any panels.

1.5 SUBMITTALS FOR INFORMATION

A. Section 01 33 00 - Submittals Procedures

B. Section 01 40 00 - Quality Control: Submit proposed mix design before starting work.

1.6 QUALITY ASSURANCE

A. Perform work in accordance with ACI C4 and ACI 318.

B. Welding: AWS D1.1/D1.1M

C. Maintain one copy of each document on site.

D. Fabricator: Company specializing in performing the work of this section with minimum five years documented experience.

E. Design units under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in the State of Florida.

F. Welder: Qualified within previous 12 months in accordance with AWS D1.1/D1.1M and AWS D1.4/D1.4M.

1.7 MOCK-UP

A. Section 01 40 00 - Quality Control: Requirements for mock-up.

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B. Construct mock-up, two full panels and corner, to include lifting devices, anchor devices, window, and glazing, doorframes and joint seals. Include example of reveals, form liner texture and liner joints.

C. Locate where directed.

D. Mock-up may remain as part of the work.

1.8 PRE-INSTALLATION MEETING

A. Section 01 31 00 - Project Management and Coordination: Pre-installation meeting

B. Convene two weeks prior to commencing work of this section.

1.9 DELIVERY, STORAGE AND PROTECTION

A. Section 01 60 00 - Material Equipment and approved equals: Transport, handle, store and protect products

B. Handling Tilt-Up Units:
   1. Lift units to position, consistent with their shape and design.
   2. Lift and support only from support points.

C. Blocking and Lateral Support During Erection:
   1. Clean and non-staining, without causing harm to exposed surfaces
   2. Provide temporary lateral support to prevent bowing, warping, or cracking.

D. Protect units from staining, chipping or spalling.

PART 2 PRODUCTS

2.1 MATERIALS

A. Cement: ASTM C150, Type I - Normal, Type IA - Air Entraining or Type III - High Early Strength Portland Type.

B. Concrete Materials: ASTM C33/C33m or ASTM C330/C330M; water and sand

C. Reinforcing Steel: ASTM A615/A615M deformed steel bars or ASTM A185/A185M, welded steel wire fabric galvanized finish strength and size commensurate with tilt-up unit design

D. Air Entrainment Admixture: ASTM C260/C260M

E. Surface Finish Aggregate: Approval by School District Representative

F. Grout: Non-shrink, minimum 10,000 PSI, 28-day strength

G. Form Liners:
   1. Material: Acrylonitrile butadiene styrene (ABS) Plastic.
   2. Pattern: Style as selected by Architect.

2.2 SUPPORT DEVICES

A. Connecting and Support Devices: ASTM A36/A36M weld-steel

B. Bolts, Nuts, and Washers: ASTM A325 high strength steel

C. Primer: Zinc rich oil alkyd.

2.3 MIX

A. Mix concrete in accordance with ACI 301.

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B. Deliver concrete in accordance with ASTM C94/C94M.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 31 00-Project Management and Coordination: Verify existing conditions prior to start of work.

B. Verify building structure, anchors, devices, and openings are ready to receive work of this Section.

3.2 PREPARATION

A. Provide for erection procedures and induced loads during erection.

B. Maintain temporary bracing until final support is in place.

3.3 SITE FABRICATION

A. Maintain environmental records and quality control program during production of tilt-up units.
   1. Make records available upon request.

B. Use rigid forms, constructed to maintain tilt-up units uniform in shape, size, and finish.

C. See specification section 08 51 13 – 3.1 B Sill & Buck for windowsill requirements.

D. Maintain consistent quality during manufacture.

E. Fabricate connecting devices, plates, angles; items fit to steel framing members, inserts, bolts, and accessories.
   1. Fabricate to permit initial placement and final attachment.

F. Embed reinforcing steel, anchors, inserts, plates, angles, and other cast-in items as indicated.

G. Place recessed flashing reglets continuous and straight.

H. Use form liners in accordance with manufacturer's instructions.

I. Locate hoisting devices to permit removal after erection.

J. Cure units to develop concrete quality, and to minimize appearance blemishes such as non-uniformity, staining, or surface cracking.

K. Minor patching is acceptable, providing structural adequacy and appearance is not impaired.

3.4 FINISH - TILT-UP UNITS

A. All exposed panels:
   1. Panel surfaces must be free of voids, holes, pockets, and other surface deformations greater than 1/8 inch; and have no more than one surface deformation per sq/ft.
   2. Panel surfaces must not telegraph imperfections from the casting surface, including floor joints.
   3. Cracks in excess of 1/32 inch width are not acceptable.
   4. Reveals may not deviate from their correct position by more than 1/8 inch in 10 feet.
   5. Wrap reveals around all exposed panel edges.
   6. Repairs must not be apparent from a minimum distance of 10 feet.

B. Interior Finish: Floated.

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C. Exterior Finish: Texture Coating System, refer to Section 09 91 13 – Exterior Painting.
   1. Finish texture: Varies, refer to Drawings for locations and description.
   2. Prepare surfaces to receive textured coating. Remove all bond breaker and curing compounds. Include removal of all oils, waxes, paraffins or other materials that are incompatible or could affect the bond of the subsequent finishes.

3.5 SITE FABRICATION TOLERANCES

A. Maximum Out of Square: ⅛" in 10', non-cumulative.

B. Variation from Dimensions Indicated on Shop Drawings: Plus or minus ⅛"

C. Maximum Misalignment of Anchors, Inserts, and Openings is ⅛"

D. Maximum Bowing of Units: Length of bow /360

E. Location of Reglets: ¼" from true position

3.6 FIELD QUALITY CONTROL

A. Section 01 40 00 - Quality Control: Concrete mix testing

B. Take concrete test cylinders in accordance with ASTM C31/C31M.

C. Take slump tests for every six-test cylinders in accordance with ASTM C143/C143M.

D. Take one air-entrainment test cylinder for each set of exterior concrete test cylinders taken.

3.7 ERECTION

A. Erect units without damage to shape or finish, replace or repair damaged panels.

B. Do not lift prior to 75% of 28-day strength.

C. Erect all members' level and plumb within allowable tolerances.

D. Align and maintain uniform horizontal and vertical joints as erection progresses.

E. When members require adjustment beyond design or tolerance criteria, discontinue affected work; advise A/E.

F. Fasten and weld units in place perform welding, including tack welds, per AWS D1.1/D1.1M

G. Touch-up field welds and scratched or damaged galvanized surfaces.

H. Patch holes, cut-off anchors, surface defects, and damaged corners to match panel with epoxy/cement paste adhesive.

I. Seal perimeter and intermediate joints in accordance with Section 07 92 00 Joint Sealants.

3.8 ERECTION TOLERANCES

A. Maximum Variation from Plane of Location: ¼" in 10' and ⅜" in 100', non-cumulative

B. Maximum Offset from True Alignment between Two Connecting Members: ¼".

C. Joint Tolerance: Plus or minus ¼"

3.9 ADJUSTING

A. Section 01 77 00 - Contract Closeout: Adjusting installed work.

B. Adjust units so that joint dimensions are within tolerances.

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3.10 PROTECTION OF FINISHED WORK

A. Section 01 77 00 - Contract Closeout: Protecting installed work.

B. Protect units from damage.

C. Provide non-combustible shields during welding operations.

END OF SECTION

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SECTION 03 52 16
LIGHTWEIGHT INSULATING CONCRETE

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Lightweight insulating concrete (LWIC) fill over structural roof decking.

B. Perimeter joint filler.

1.2 RELATED REQUIREMENTS

A. Section 07 52 00 - Modified Bitumen Membrane Roofing.

1.3 REFERENCE STANDARDS

A. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete; 2018a.

B. ASTM C138/C138M - Standard Test Method for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete; 2017a.

C. ASTM C150/C150M - Standard Specification for Portland Cement; 2018.

D. ASTM C260/C260M Standard Specification for Air Entraining Admixtures for Concrete; 2016.

E. ASTM C332 - Standard Specification for Lightweight Aggregates for Insulating Concrete; 2017.

F. ASTM C495/C495M - Standard Test Method for Compressive Strength of Lightweight Insulating Concrete; 2012.

G. FBC - Florida Building Code.

1.4 PERFORMANCE REQUIREMENTS

A. Minimum Thermal Resistance of Installed Fill: Refer to plans and energy form for required R-value.

1.5 SUBMITTALS FOR REVIEW

A. Section 01 33 00 - Submittals Procedures.

B. Shop Drawings: Include the following:

1. Provide complete roof plan showing layout of slopes, drain locations, interruptions, roof penetrations, thickness of styrene, and details for proper installation.
2. Show openings such as hatches, vents, equipment curbs, portals, as well as crickets.
3. Show details of interface between deck, steel blocking, and LWIC insulation.
4. Provide design and calculations prepared, signed and sealed by State of Florida Registered Specialty Structural Engineer, in accordance with FBC and ASCE 7.
    a. Design the LWIC system to comply with wind resistance requirements of applicable building codes for specific negative wind pressures as indicated on the Drawings.

C. Product Data: Provide physical characteristics, thermal values, product limitationsand the following.

1. Product Approvals: Provide copy of current Florida Building Code "FLA (PAD)" Product Approval as proof of compliance that the roofing assembly components have been

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tested and approved for use at the wind load and design pressure level requirements specified for the Project.

2. Insulation system must meet requirements of the tested Roofing assembly and be compatible with proposed roofing membrane.

D. Certificates: Certify that products meet or exceed specified requirements and achieve the required densities, thermal value and performance.

E. Manufacturer's Installation Instructions: Indicate mix instructions.

1.6 QUALITY ASSURANCE

A. Installer: Company specializing in placing lightweight concrete fill-material specified in this section with minimum three years documented experience and licensed by manufacturer.

B. Thermal Resistance Values: Use values base the thermal conductivity of insulating concrete in accordance with ASTM specifications at 40°F mean temperature.

C. Wind Uplift Resistance: Use a deck system tested approved and listed in Factory Mutual System Approval Guide for FM Class rating matching the required uplift loads of the structural plans.

D. Certification: Upon completion of roof deck, supply the Owner through the Architect the Manufacturer’s certificate certifying the concrete is per manufacturer's requirements by certified installer.

1.7 REGULATORY REQUIREMENTS

A. Conform to applicable code for combustibility requirements.

1.8 WARRANTY

A. Provide Owner with a no-dollar limit insulating concrete warranty for a minimum of 10-years, signed by the manufacturer stating:

1. Insulating concrete system shall retain a minimum of 80% of designed thermal resistance for the warranty period.
2. Warranty shall include the composite roof deck system - both the concrete and insulation board.
3. Insulating concrete system shall remain re-roofable for the warranty period.
4. Warranty shall not limit by geographic location the Owner's right for claims, actions, or proceedings.
5. Insulating concrete shall remain in place when the roof membrane sustains wind damage.

1.9 PRE-INSTALLATION MEETING

A. Section 01 31 00 – Project Management and Coordination: Pre-installation meeting.

B. Convene two weeks prior to commencing work of this section.

1.10 ENVIRONMENTAL REQUIREMENTS

A. Section 01 60 00 - Material Equipment and approved equals: Environmental conditions affecting products on site.

B. Do not place insulating concrete mix at ambient temperatures lower than 40 degrees F without heating mix water to 90 to 110 degrees F.

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PART 2 PRODUCTS

2.1 MATERIALS

A. Cement: ASTM C150/C150M, Portland Type I - Normal, gray color.

B. Lightweight Aggregate: ASTM C332; Group I, perlite or vermiculite.

C. Concrete Materials: Aggregate required by manufacturer and water.

D. Air-Entrainment Agent: ASTM C260/C260M, type recommended by lightweight aggregate manufacturer.

2.2 CONCRETE MIX

A. Test for compressive strength in accordance with ASTM C495/C495M, for wet density in accordance with ASTM C138/C138M, and for dry density after oven drying.

B. Provide cellular concrete mix to:

1. Compressive Strength: 350 pounds per square inch minimum.
2. Wet Density: 50 lb/cu ft maximum.
3. Oven Dry Density: 36 lb/cu ft maximum.

2.3 ACCESSORIES

A. Reinforcement: Hexagonal woven wire mesh; galvanized.

B. Perimeter Joint Filler: Glass fiber strips, compressible to 50 percent original thickness under load of 25 psi with full recovery.

C. Vents: Type recommended by lightweight aggregate manufacturer.

D. Insulation: Molded polystyrene with venting holes to 3 percent of board area minimum.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 31 00 Project Management and Coordination: Verify existing conditions prior to beginning work.

B. Verify joints in all roof members are grouted or taped to prevent seepage of wet insulating concrete.

C. Verify roof deck is free of standing water, dirt, debris, or other detrimental materials.

D. Verify roof slopes and elevations are as shown on the drawings and ready to receive insulating concrete.

3.2 PREPARATION

A. Install 1 inch thick expansion joint filler at:

1. Perimeter of roof decking.
2. Around penetrations through deck.
3. Every 100 ft of deck surface dimension.
4. Each change of deck direction on metal roof deck surfaces.

3.3 INSTALLATION

A. Slurry deck surface; place insulation; use mix to fill holes and breaks.

B. Place insulating concrete and screed surface to achieve minimum thickness.

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C. Slope surface to 1/4 inch/foot minimum for roof surface drainage.

D. Provide minimum 1/2 inch/foot sloped crickets on the high side of roof equipment curbs.

3.4 CURING

A. Cure in accordance with lightweight aggregate manufacturer's instructions.

B. Protect insulating concrete from excess evaporation of surface moisture.

C. During low humidity conditions, sprinkle water over concrete surface to aid hydration and curing.

3.5 FIELD QUALITY CONTROL

A. Section 01 40 00 - Quality Control Field inspection and testing for dry density.

B. Testing Laboratory: Take three test samples from each 75 or less cu yd of insulating concrete placed.

C. Testing Laboratory: Take one additional test sample during cold weather concreting.

END OF SECTION

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SECTION 03 54 00
SELF-LEVELING UNDERLAYMENT

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Liquid-applied self-leveling floor underlayment.

1.2 RELATED REQUIREMENTS

A. Section 09 05 61 - Common Work Results for Flooring Preparation.

1.3 REFERENCE STANDARDS

A. ASTM C109/C109M - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or (50-mm) Cube Specimens); 2016a.

B. ASTM C1602/C1602M - Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete; 2012.

C. ASTM C348 - Standard Test Method for Flexural Strength of Hydraulic-Cement Mortars; 2018.

D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023d.

1.4 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, 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, environmental limitations, and installation instructions.

C. 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 MOCK-UP

A. Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
   1. Prepare mock-up in location designated by Architect.
   2. Area: 6 ft by 6 ft.

B. Approved Mock-up may remain as part of the Work.

1.8 FIELD CONDITIONS

A. Do not install underlayment until floor penetrations and peripheral work are complete.

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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 MANUFACTURERS

A. Cementitious Underlayment:
1. ARDEX Engineered Cements; ARDEX V 1200 with ARDEX P51 Primer: www.ardexamericas.com/#sle.
2. H.B. Fuller Construction Products, Inc; TEC Level Set 200 Self-Leveling Underlayment with TEC Multipurpose Primer: www.tecspecialty.com/#sle.
3. USG; Durock® Quik-Top Self-Leveling Underlayment: www.usg.com/#sle.
4. Substitutions: See Section 01 60 00 - Material Equipment and Approved Equals.

2.2 MATERIALS

A. Cast Underlayments, General:
1. Comply with applicable code for combustibility or flame spread requirements.

B. 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 5000 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 3-1/2 inch.
6. Surface Burning Characteristics: Flame spread/Smoke developed index of 0/0 in accordance with ASTM E84.

C. Aggregate: Dry, well graded, washed silica aggregate, approximately 1/8 inch in size and acceptable to underlayment manufacturer.

D. Water: ASTM C1602/C1602M; clean, potable, and not detrimental to underlayment mix materials.

E. Primer: Manufacturer's recommended type.

F. Joint and Crack Filler: Latex based filler, as recommended by manufacturer.

2.3 MIXING

A. Site mix materials in accordance with manufacturer's instructions.

B. 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.

C. Mix to self-leveling consistency without over-watering.

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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.

E. Close floor openings.

3.3 APPLICATION

A. Install underlayment in accordance with manufacturer's instructions.

B. Place to indicated thickness, with top surface level to 1/8 inch in 10 ft.

C. 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.

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 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.

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SECTION 04 05 13
MASONRY MORTAR AND GROUT

PART 1 GENERAL

1.1 SECTION INCLUDES
- A. Mortar for Masonry
- B. Grout for Unit Masonry

1.2 REFERENCES
- A. ACI 530/ASCE 5/TMS 402 - Building Code Requirements for Masonry Structures
- B. ACI 530.1/ASCE 6/TMS 602 - Specifications for Masonry Structures
- C. ASTM C91/C91M - Standard Specification for Masonry Cement
- D. ASTM C94/C94M- Standard Specification for Ready-Mixed Concrete
- E. ASTM C144 - Standard Specification for Aggregate for Masonry Mortar
- F. ASTM C150/C150M - Standard Specification for Portland Cement
- G. ASTM C207 - Standard Specification for Hydrated Lime for Masonry Purposes
- H. ASTM C270 - Standard Specification for Mortar for Unit Masonry
- I. ASTM C404 - Standard Specification for Aggregates for Masonry Grout
- J. ASTM C476 - Standard Specification for Grout for Masonry
- K. ASTM C595/C595M - Standard Specification for Blended Hydraulic Cement
- L. ASTM C780 – Standard Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry
- M. ASTM C1019 – Standard Test Method of Sampling and Testing Grout
- N. FBC - Florida Building Code

1.3 SUBMITTALS
- A. Submit mix design for mortar indicating whether to use the proportion or the property specification of ASTM C270.
- B. Submit mix design for grout indication conformance of grout to requirements of ASTM C476.
- C. Submit test reports indicating conformance of mortar materials to property specifications of ASTM C270.
- D. Submit test reports of pre-construction tests of mortar for consistency, mortar aggregate ratio, water content, air content, compressive strength, and splitting tensile strength in conformance with ASTM C780.
- E. Submit test reports of grout tests in conformance to ASTM C1019.
- F. Submit manufacturer's certificate for products indicating conformance with specified requirements.
- G. Submit two samples representative of mortar color.

1.4 DELIVERY, STORAGE, AND HANDLING
- A. Deliver and store packaged materials in original unopened containers and store in dry weather-tight enclosures.
- B. Stockpile and handle aggregates to prevent segregation and contamination.
- C. Maintain sand for volume proportioning of mortar and grout in a damp loose condition.

1.5 ENVIRONMENTAL REQUIREMENTS
- A. Follow requirements of ACI530.1/ASCE6/TMS 602 for cold and hot weather construction.

PART 2 PRODUCTS

2.1 MORTAR MATERIALS
- A. Cementitious Materials:
  1. Masonry Cement: ASTM C91/C91M, Type M or S, gray color
  2. Portland Cement: ASTM C150/C150M, Type I, gray color

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3. Hydrated Lime: ASTM C207, Type S

B. Sand: ASTM C144

C. Water: Provide water suitable for drinking, clean, and free of harmful amounts of acid, alkalies, salts, or organic materials.

D. Admixtures:

1. When required use only non-chloride based accelerators as approved by specifier.
2. Do not add antifreeze substances to the mortar.

E. Pigments: When required used mineral oxide pigments not to exceed 5% of the weight of masonry cement or 10% of the weight of Portland Cement in the mortar.

2.2 GROUT MATERIALS

A. Portland Cement: ASTM C150/C150M, Type I

B. Hydrated Lime: ASTM C207, Type S

C. Aggregates: ASTM C404

D. Water: Provide water suitable for drinking, clean, and free of harmful amounts of acid, alkalis, salts, or organic materials.

2.3 MORTAR MIXES

A. Mortar: Provide ASTM C270, type 'M' or type 'S' in conformance with proportion specifications.

2.4 GROUT MIXES

A. Grout: ASTM C476, coarse grout meeting proportion requirements

2.5 MORTAR MIXING

A. Measure sand by volume or equivalent weight; do not measure by shovel.

B. In clean mortar mixer, mix ingredients for 3 to 5 minutes with maximum amount of water to produce proper workability.

C. Re-temper mortar as needed within 2½-hours after initial mixing.

D. Discard unused mortar 2½-hours after initial mixing.

2.6 GROUT MIXING

A. Control batching procedure to ensure proper volume proportions of grout materials and achieve grout slump between 8" and 11".

B. Mix grout in accordance with ASTM C94.

C. Measure grout materials mixed at job site by volume and mix all ingredients in mechanical mixer for minimum of five minutes.

2.7 MIX TESTS

A. Testing of Mortar: In accordance with ASTM C270

B. Testing of Grout: In accordance with ASTM C1019

PART 3 EXECUTION

3.1 INSTALLATION

A. Install mortar and grout in accordance with ACI 530.1/ASCE 6/TMS 602.

3.2 FIELD QUALITY CONTROL

A. Architect, Owner, or Building Department may request field inspections per Section 01 40 00 1.7 Quality Control.

B. Test Mortar in accordance with ASTM C780 for consistency, mortar aggregate ratio, water content, air content, compressive strength, and splitting tensile strength.

C. Test Grout in accordance with ASTM C1019

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SECTION 04 20 00
MASONRY UNITS

PART I GENERAL

1.1 SECTION INCLUDES

A. Concrete masonry and brick
B. Reinforcement, anchorage, and accessories

1.2 REFERENCES

A. ASCE 7 – American Society of Civil Engineers – Minimum Design Loads of Buildings and Other Structures
B. ACI 530/ASCE 5/TMS 402 – Building Code Requirements for Masonry Structures
C. ACI 530.1 /ASCE 6/TMS 602 – Specifications for Masonry Structures
D. ASTM A82/A82M – Standard Specification for Steel Wire, Plain, for Concrete Reinforcement
E. ASTM A123/A123M – Standard Specification for Zinc (Hot-Dipped Galvanized) Coatings on Iron and Steel Products
F. ASTM A167- Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip
G. ASTM A580/A580M – Standard Specification for Stainless and Heat-Resisting Steel Wire
H. ASTM A615/A615M – Standard Specification for Deformed and Plain Carbon Steel Bars for Concrete Reinforcement
I. ASTM A641/A641M – Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire
J. ASTM A653/A653M – Standard Specifications for Steel Sheet, Zinc-Coated (Galvanized) or Zinc Iron Alloy Coated (Galvannealed) by the Hot-Dip Process
K. ASTM B370 - Standard Specification for Cooper Sheet and Strip for Building Construction
L. ASTM C34 – Standard Specification for Structural Clay Load-Bearing Wall Tile
M. ASTM C55 – Standard Specification for Concrete Building Brick
N. ASTM C56 – Standard Specification for Structural Clay Non-Load Bearing Tile
O. ASTM C62 – Standard Specification for Building Brick (Solid Masonry Units Made from Clay or Shale)
P. ASTM C73 – Standard Specification for Calcium Silicate Face Brick (Sand-Line Brick)
Q. ASTM C90 - Standard Specification for Load-Bearing Concrete Masonry Units
R. ASTM C126 – Standard Specification for Ceramic Glazed Structural Clay Facing Tile, Facing Brick and Solid Masonry Units
S. ASTM C129 – Standard Specification for Non-Load Bearing Concrete Masonry Units
T. ASTM C212 – Standard Specification for Structural Clay Facing Tile
U. ASTM C216 – Standard Specification for Facing Brick (Solid Masonry Units Made from Clay or Shale)
V. ASTM C315 – Standard Specification for Clay Flue Linings and Chimney Pots
W. ASTM C530 – Standard Specification for Structural Clay Non-Load Bearing Screen Tile
X. ASTM C652 – Standard Specification for Hollow Brick (Hollow Masonry Units Made from Clay or Shale)
Y. ASTM C744 – Standard Specification for Prefaced Concrete and Calcium Silicate Masonry Units
Z. IMIAC – International Masonry Industry All-Weather Council: Recommended Practices and Guide Specification for Cold Weather Masonry Units
AA. IMIAC – International Masonry Industry All-Weather Council: Recommended Practices and Guide Specification for Hot Weather Masonry Construction

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BB. UL – Fire Resistance Directory
CC. FBC - Florida Building Code

1.3 SUBMITTALS
A. Submit under provision s of Section 01 33 00.
B. Product Data: Provide data for masonry units and fabricated wire reinforcement.
C. Samples: Submit four samples of decorative block, face brick, pre-faced, units to illustrate color, texture and extremes of color range.
D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

1.4 QUALIFICATIONS
A. Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.

1.5 REGULATORY REQUIREMENTS
A. Design and construction shall comply with ASEC 7 Wind Loads, FBC, ACI 530/ASCE 5/TMS 402, and ACI 530.1/ASCE 6/TMS 602
B. Conform to applicable code for UL Assembly requirements for fire-rated masonry construction.
C. Provide lateral support for block walls, both vertical and horizontal.
1. The vertical heights of masonry between horizontal supports shall be in accordance with the wall lateral support requirements, FBC table 2107.1.

1.6 MOCK-UP
A. Provide mock-up of composite masonry under provisions of Section 01 40 00.
B. Construct a masonry wall into a panel sized 5' long by 4' high, which includes a corner, mortar, and accessories, structural backup, wall openings, flashings, wall insulation, air barrier, vapor barrier and parging.
C. Locate where directed.
D. Mock-up to remain intact and protected until the Punch List is completed or until Owner agrees in writing to removal.
E. Mock-up may remain as part of the work with the Owner's approval.

1.7 PRE-INSTALLATION CONFERENCE
A. Meet one week prior to commencing work of this section, under provisions of Section 01 31 00.

1.8 DELIVERY, STORAGE AND HANDLING
A. Deliver, store, protect, and handle products to site under provisions of Section 01 60 00.

1.9 ENVIRONMENTAL REQUIREMENTS
A. Cold Weather Requirements: IMIAC – Recommended Practices and Guide Specifications for Cold Weather Masonry Construction
B. Hot Weather Requirements: IMIAC – Recommended Practices and Guide Specifications for Hot Weather Masonry Construction

1.10 COORDINATION
A. Coordinate work under provisions of Section 01 31 00.
B. Coordinate the masonry work with installation of window anchors.

PART 2 PRODUCTS

2.1 CONCRETE MASONRY UNITS
A. Load-Bearing Concrete Masonry Units (CMU): ASTM C90, Type II – Non-Moisture Controlled
B. Hollow Non-Load Bearing Block Units (CMU): ASTM C129, Type II – Non-Moisture Controlled

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C. Concrete Brick Units: ASTM C55, Grade N, Type II – Non-Moisture Controlled of same Type and Weight as block units
D. Provide special units for 90° corners, bond beams, lintels, coved bases, bull nosed corners and angle corners.
E. All block installed if fire-rated walls and partitions shall be classified units or certified for the intended use in accordance with FBC.

2.2 BRICK UNITS
A. Face Brick: ASTM C216, Type FBS, Grade MW; color as selected
B. Building Brick: ASTM C62, Grade NW; solid units
C. Hollow Facing and Building Brick: ASTM C652, Grade SW, Type HBS; color as selected
D. Sand-Lime Face Brick: ASTM C73, Grade SW
E. Size and Shape: Provide special units for 90° corners, lintels, bull nosed corners and angle corners.
F. Special Brick Shape: Shaped to profile indicated; surface texture on exposed sides and ends.
G. Giant Face Brick: ASTM C216, Type FBS, Grade MW; color as selected
H. Giant Hollow Facing and Building Brick: ASTM C652, Grade SW, Type HBS; color as selected
I. Provide special units for 90° corners, lintels, bull nosed corners and angle corners.
J. Special Giant Brick Shape: Shaped to profile indicated; surface texture on sides and ends.

2.3 REINFORCEMENT AND ANCHORAGE
A. Single Wythe Joint Reinforcement: Truss type; steel wire, hot dip galvanized to ASTM A641/A641M Class 3 after fabrication, 3/16" side rods with 9-gauge crossties
B. Multiple Wythe Joint Reinforcement: Ladder type; with moisture drip; adjustable type, steel wire, hot dip galvanized ASTM A641/A641M Class 3 fabrication, 3/16" side rods with 9-gauge crossties.
C. Reinforcing Steel: ASTM A615/A615M Grade 40 and 60, deformed carbon bars, unfinished
1. Strap Anchors: Bent steel shape, hot dip galvanized to ASTM A123/A123M, B2 finish.
D. Wall Ties: Corrugated formed sheet metal, gauge thick, adjustable, hot dip galvanized to ASTM A123/A123M B2 steel finish.
E. Wall Ties: Formed steel wire, gage thick, adjustable, eye and pintle type, hot dip galvanized to ASTM A123/A123M B2 steel finish.
F. Dovetail Anchors: Bent steel strap, galvanized to ASTM A123/ASTM 123M B2 finish.

2.4 MORTAR AND GROUT
A. Mortar and Grout: As specified in Section 01 05 13.

2.5 FLASHINGS
A. Copper: ASTM B370/B370M, cold-rolled; 20 oz/sq ft, 0.027" thick; natural finish
B. Galvanized Steel: ASTM A653/A653M, G90 finish, 24-guage core steel
C. Stainless Steel: ASTM A167, Type 304, soft temper; 24-gauge thick; smooth finish
D. Provide dovetail, saw tooth, or other design to develop all direction bonding
E. Lap Sealant: Butyl type as specified in Section 07 92 00

2.6 ACCESSORIES
A. Performed Control Joints: Neoprene material with corner and tee accessories, cement fused joints
B. Joint Filler: Closed cell polyvinyl chloride; oversized 50% to joint width; self-expanding.
C. Cavity Wall Drainage System: High-density polyethylene to support mortar droppings and debris within the cavity.
D. Building Paper: No. 30 asphalt saturated felt.

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E. Nailing Strips: Softwood, preservative treated for moisture resistance, dovetail shape, sized to masonry joints.
F. Weep: Preformed plastic tubes, hollow
G. Cavity Vents: Molded polyvinyl chloride grilles, insect resistant.
H. Cleaning Solutions: Non-acidic, not harmful to masonry work or adjacent materials

PART 3 EXECUTION

3.1 EXAMINATION
A. Verify that field conditions are acceptable and are ready to receive work.
B. Verify items provided by other sections of work are properly sized and located.
C. Verify that built-in items are in proper location, and ready for roughing into masonry work.

3.2 PREPARATION
A. Direct and coordinate placement of metal anchors supplied to other sections.
B. Provide temporary bracing during installation of masonry work. Maintain in place until building structure provides permanent bracing.

3.3 COURSING
A. Establish lines, levels, and coursing indicated.
1. Protect from displacement.
B. Maintain masonry courses to uniform dimension.
1. Provide vertical and horizontal joints of uniform thickness.
C. Concrete Masonry Units:
1. Coursing: One unit and one mortar joint to equal 8"
2. Mortar Joints: Concave
D. Brick Units:
1. Coursing: Three units and three mortar joints to equal 8"
2. Mortar Joints: Concave

3.4 PLACING AND BONDING
A. Lay solid masonry units in full bed of mortar, with full head joints, uniformly jointed with other work.
B. Lay hollow masonry units with face shell bedding on head and bed joints.
C. Do not butter corners of joints or excessively furrow mortar joints.
D. Remove excess mortar as work progresses.
E. Interlock intersections and external corners.
F. Do not shift or tap masonry units after mortar has achieved initial set.
1. To make an adjustment, remove mortar and replace.
G. To prevent broken masonry unit corners or edges perform jobsite cutting of masonry units with proper tools to provide straight, clean, un-chipped edges.
H. Cut mortar joints flush where wall tile is scheduled, cement parging is required, resilient base is scheduled, cavity insulation vapor barrier adhesive or bitumen damp proofing is applied.
I. Isolate masonry partitions from vertical structural framing members with a control joint.
J. Isolate top joint of masonry partitions from horizontal structural framing members and slabs or decks with compressible joint filler.

3.5 WEEPS
A. Install weeps in veneer at intervals recommended by the Brick Institute of America.

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3.6 CAVITY WALL

A. Do not permit mortar to drop or accumulate into cavity air space or to plug weeps. Provide a system of high-density polyethylene strands woven to a mesh to collect mortar dropping and permanently suspend them above the weeps.
B. Build inner wythe ahead of outer wythe to receive cavity insulation air/vapor barrier adhesive.

3.7 REINFORCEMENT AND ANCHORAGES – SINGLE WYTHE MASONRY

A. Install horizontal joint reinforcement 16" o.c.
B. Place masonry joint reinforcement in 1st and 2nd joints above and below openings. Extend minimum 16" each side of opening.
C. Place joint reinforcement continuous in first and second joint below top of walls.
D. Lap joint reinforcement ends minimum 6".
E. Reinforce stack-bonded unit, joint corners, and intersections with strap anchors 16" o.c.
F. All masonry below grade is to be grouted solid.
    1. Provide footing/wall dowels.
    2. Measure the splice length from the finish floor.

3.8 REINFORCEMENT AND ANCHORAGES – VENEER MASONRY

A. Install horizontal joint reinforcement 16" o.c.
B. Place masonry joint reinforcement in 1st and 2nd horizontal joints above and below openings.
    1. Extend minimum 16" each side of opening.
C. Place joint reinforcement ends minimum 6".
D. Lap joint reinforcement ends minimum 6".
E. Embed wall ties in masonry back up for bonding veneer at maximum 16" o.c. vertically and 36" o.c. horizontally.
    1. Place maximum 3" o.c. each way around perimeter of openings, within 12" of openings.
F. Secure wall ties, rods, strap, anchors to back-up and embed into masonry veneer at maximum 16" o.c. vertically, and 36" o.c. horizontally.
G. Place at maximum 3" o.c. each way around perimeter of openings, within 12" of openings.
H. Provide length to extend a minimum of 1½" into the exterior wythe.

3.9 REINFORCEMENT AND ANCHORAGES – CAVITY WALL MASONRY

A. Install horizontal joint reinforcement 16" o.c.
B. Place masonry joint reinforcement in 1st and 2nd horizontal joints above and below openings.
    1. Extend minimum 16" each side of opening.
C. Place joint reinforcement continuous in first and second joint below top of walls.
D. Lap joint reinforcement ends minimum 6".
E. Embed anchors in concrete or attached to structural steel members.
    1. Embed anchorages in every second block or sixth brick joint.
    2. Provide length to extend a minimum 1½" into the exterior wythe.
F. Reinforce stack bonded unit joint corners and intersection with strap anchors 16" o.c.

3.10 REINFORCEMENT AND ANCHORAGES – MULTIPLE WYTHE UNIT MASONRY

A. Install horizontal joint reinforcement 16" o.c.
B. Place masonry joint reinforcement in 1st and 2nd horizontal joints above and below openings.
    1. Extend minimum 16" each side of opening.
C. Place joint reinforcement continuous in first and second joint below top of walls.
D. Lap joint reinforcement ends minimum 6".
E. Support and secure reinforcing bars from displacement.
    1. Maintain position within ½" of dimensioned position.

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F. Embed anchors embedded in concrete or attach to structural steel members.
   1. Embed anchorages in every second block or sixth brick joint.
G. Provide length to extend a minimum 1½" into the exterior wythe.
H. Reinforce stack bonded unit joint corners and intersection with strap anchors 16" o.c.

3.11 MASONRY FLASHINGS

A. Provide through wall flashing under parapet copings, for counter-flashing in masonry walls, where roofs abut, at lintels of exterior wall openings, ledge or shelf angles, under windowsills and band courses, at spandrel beams, foundation walls and where shown on drawings.
B. Turn flashing up minimum 8" and bed into mortar joint of masonry, seal to concrete, and seal to sheathing over framed back up.
C. Lap end joints minimum 6" and seal watertight.
D. Turn flashing, fold and seal at corners, bends and interruptions to form dams.

3.12 SILLS

A. See specification section 08 51 13 – 3.1 B Sill & Buck for windowsill requirements.

3.13 LINTELS

A. Install lintels over openings.
B. Install reinforced unit masonry lintels over openings where steel or pre-cast concrete lintels area not scheduled.
C. Openings up to 42" Wide: Place two, No. 4 reinforcing bars 1" from bottom web
D. Openings from 42": Up to 78" wide:
   1. Place two, No. 5 reinforcing bars 1" from bottom web.
E. Opening over 78": Reinforce openings as detailed.
F. Do not splice reinforcing bars.
G. Support and secure reinforcing bars from displacement.
   2. Maintain position within ½" of dimensioned position.
H. Place and consolidate grout fill without displacing reinforcing.
I. Allow masonry lintels to attain specified strength before removing temporary supports.
J. Maintain bearing on each side of opening. Minimum bearing of 4" on concrete, 3" on steel and 8" on masonry

3.14 ENGINEERED MASONRY

A. Lay masonry units with core cells vertically aligned and cavities between wythes clear of mortar and unobstructed.
B. Place mortar in masonry unit bed-joints back ¼" from edge of unit grout spaces, bevel back and upward.
   1. Permit mortar to cure seven days before placing grout.
C. Reinforce masonry unit cores and cavities with reinforcement bars and grout as indicated.
D. Retain vertical reinforcement in position at top and bottom of cells and at intervals not exceeding 192 bar diameters.
E. Grout space dimension is the clear dimension between any masonry protrusions and increases by diameters of the horizontal bars within the cross-section of the grout space.
F. Wet masonry unit surfaces in contact with grout just prior to grout placement.
G. The minimum grouted spaces in both horizontal dimensions shall be as follows:
   1. Low-Lift Grouted Construction
      a. Fine aggregate: Grout spaces may be less than 2".
      b. Fine or coarse aggregate: Grout spaces shall be 2" or more.

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2. High-Lift Grouted Construction:
    a. Fine or coarse aggregate: Grout space shall not be less than 2" wide.

H. The area of vertical reinforcement shall not exceed 6% of the area of the grout space.

I. When grouting is stopped for more than one hour, terminate grout 1½" below top of upper masonry unit to form a positive key for subsequent grout placement.

J. Low Lift Grouting – Place first lift of grout to a height of 16" and rod for grout consolidation.
    1. Place subsequent lifts in 8" increments and rod for grout consolidation

K. High Lift Grouting:
    1. Provide cleanout opening no less than 4" high at the bottom of each cell to be grouted by cutting one face shell of masonry unit,
    2. In double wythe walls, omit every second masonry unit in one of the wythes for clean out and cell inspection purposes.
    3. In double wythe walls, construct vertical grout barriers or dams between the masonry wythes, with masonry units every 25' maximum.
    4. Clean out masonry cells and cavities with high-pressure water spray before pouring or pumping grout.
        a. Allow the complete water drainage and use compressed air to remove debris.
    5. Contractor shall request inspection of the cells and cavities before concealing them.
        a. Allow three days advance notice of inspection.
    6. After cleaning and cell inspections, seal openings with masonry units.
    7. Pump grout into spaces. Maintain water content in grout to intended slump without aggregate segregation.
    8. Limit grout lift to 48" and rod for grout consolidation. Wait 30 to 60 minutes before placing next lift.

3.15 CONTROL AND EXPANSION JOINTS

A. Provide expansion joints and control joints to prevent uncontrolled stress cracks in the structure and according to the engineering's plans and standards.

B. Do not continue horizontal joint reinforcement through control and expansion joints.

C. Install preformed control joint device in continuous lengths. Seal butt and corner joints in accordance with manufacturer's instructions.

D. Size control joint in accordance with Section 07 92 00 for sealant performance.

3.16 BUILT-IN WORK

A. As work progresses, install built-in metal door and glazed frames, fabricated metal frames, window frames, wood nailing strips, anchor bolts, plates, and other items to be built-in the work and furnished by other sections.

B. Install built-in items plumb and level.

C. Bed anchors of metal door and glazed frames in adjacent mortar joints.
    1. Fill frame voids solid with grout. Fill adjacent masonry cores with grout minimum 12" from framed openings.

D. Do not build in organic materials subject to deterioration.

3.17 TOLERANCES

A. Maximum Variation from Alignment of Columns: Pilasters: ¼"

B. Maximum Variation from Unit to Adjacent Unit: 1/32"

C. Maximum Variation from Plane of Wall: ¼" in 10' and ½" in 20' or more

D. Maximum Variation from Plumb: ¼" per story non-cumulative and ½" in two stories or more

E. Maximum Variation from Level Coursing: ⅛" in 3', ¼" in 10'; and ½" in 30'

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F. Maximum Variation of Joint Thickness: ⅛" in 3'
G. Maximum Variation from Cross-Section Thickness of Walls: ¼"

3.18 CUTTING AND FITTING

A. Cut and fit for chases, pipes, conduit, sleeves, and grounds.
   1. Coordinate with other sections of work to provide correct size, shape, and location.
B. Obtain approval prior to cutting or fitting masonry work not indicated or where appearance or strength of masonry work may be impaired.

3.19 PARGING

A. Dampen masonry walls prior to parging.
B. Scarify each parging coat to ensure full bond to subsequent coat.
C. Parge masonry walls in two uniform coats of mortar to a total thickness of ¾" minimum.
D. Steel trowel surface smooth and flat with a maximum surface variation of ⅛" per foot.
E. Strike top edge of parging at 45°

3.20 FIELD QUALITY CONTROL

A. Architect, Owner, or Building Department may request field inspections per Section 01 40 00 1.7 Quality Control.

3.21 CLEANING

A. Clean work under provisions of 01 77 00, and comply with ASTM, BIA, and ACI 530.
B. Remove excess mortar and mortar smears as work progresses.
   1. Mortar streaks and/or stains that cannot be removed by light cleaning shall be replaced.
   2. Do not use abrasives for rubbing or scraping off mortar stains.
C. Replace defective mortar and match adjacent work.
D. Clean soiled surfaces with cleaning solution.
   1. Use only cleaning products approved by the Architect and applied in direct conformance with the manufacturer's instructions.
   2. DO NOT USE Muratic acid to clean masonry.
E. Use non-metallic tools in cleaning operations.

3.22 PROTECTION OF FINISHED WORK

A. Protect finished work under provisions of Section 01 50 00.
B. Without damaging completed work, provide protective boards at exposed external corners, only at those corners subject to damage due to construction activities.

END OF SECTION

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SECTION 04 20 10
REINFORCED MASONRY UNITS

PART 1 GENERAL

1.1 SECTION INCLUDES
- A. Concrete masonry or brick units
- B. Reinforcement, anchorage, and accessories
- C. Parged masonry surfaces

1.2 REFERENCES
- A. ACI 530/ASCE 5/TMS 402– Building Code Requirements for Masonry Structures
- B. ACI 530.1/ASCE 6/TMS 602- Specifications For Masonry Structures
- C. ASCE 7 - American Society of Civil Engineers – Minimum Design Loads of Buildings and Other Structures
- D. ASTM A82/A82M - Standard Specification for Steel Wire for Concrete Reinforcement
- E. ASTM A123/A123M - Standard Specification for Zinc (Hot Dipped Galvanized) Coatings on Iron and Steel Products
- F. ASTM A167 - Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip
- G. ASTM A653/A653M - Standard Specifications for Steel Sheet, Zinc Coated, (Galvanized) or Zinc Iron Alloy (Galvannealed) by the Hot-Dip Process.
- H. ASTM A580/A580M - Standard Specification for Stainless and Heat-Resisting Steel Wire
- I. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon Steel Bars For Concrete Reinforcement
- J. ASTM A641/A641M – Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire
- K. ASTM B370 - Standard Specification for Cooper Sheet and Strip For Building Construction
- L. ASTM C34 – Standard Specification for Structural Clay Load-Bearing Wall Tile
- M. ASTM C55 - Standard Specification for Concrete Building Brick
- N. ASTM C56 – Standard Specification for Structural Clay Non-Load Bearing Tile
- O. ASTM C62 – Standard Specification for Building Brick (Solid Masonry Units Made from Clay or Shale)
- P. ASTM C73 – Standard Specification for Calcium Silicate Face Brick (Sand-Line Brick)
- Q. ASTM C90- Standard Specification for Load-Bearing Concrete Masonry Units
- R. ASTM C126 - Standard Specification for Ceramic Glazed Structural Clay Facing Tile, Facing Brick, and Solid Masonry Units
- S. ASTM C652 - Standard Specification for Hollow Brick (Hollow Masonry Units Made From Clay or Shale).
- T. FBC - Florida Building Code
- U. IMIAC - International Masonry Industry All-Weather Council: Recommended Practices and Guide Specification for Cold Weather Masonry Construction
- V. IMIAC - International Masonry Industry All-Weather Council: Recommended Practices and Guide Specification for Hot Weather Masonry Construction
- W. UL - Fire Resistance Directory

1.3 SUBMITTALS
- A. Submit under provisions of Section 01 33 00.
- B. Shop Drawings: Indicate bars sizes, spacing, locations, reinforcement quantities, bending and cutting schedules, supporting and spacing devices for reinforcement and accessories.

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C. Product Data: Provide data for brick and masonry units and fabricated wire reinforcement.
D. Samples: Submit samples of decorative block, brick units to illustrate color, texture, and extremes of color range.
E. Design Data: Indicate required mortar strength, masonry unit assembly strength in all planes with supportive test data.
F. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

1.4 QUALITY ASSURANCE
A. Perform work in accordance with ACI 530 and ACI 530.1.
B. Maintain one copy of each document on site.

1.5 QUALIFICATIONS
A. Manufacturer: Company specializing in manufacturing the products specified in this section with minimum five years documented experience.

1.6 REGULATORY REQUIREMENTS
A. Design and construction shall comply with ASCE 7 – Wind loads, FBC, ACI 530/ASCE 5/TMS 402, and ACI 530.1/ASCE 6/TMS 602.
B. Conform to applicable code for UL Assembly requirements for fire rated masonry construction.
C. Provide lateral support for block walls, both vertical and horizontal.
1. The vertical heights of masonry between horizontal supports shall be in accordance with the wall lateral support requirements, FBC table 2107.1

1.7 MOCK-UP
A. Provide mock-up of composite masonry under provisions of Section 01 40 00.
B. Construct a masonry wall panel sized 8' long by 6' high, which includes mortar and accessories, backup, wall openings, flashings, wall insulation, air barrier, vapor barrier, and parging.
C. Locate where directed.
D. Mock-up to remain intact and protected until the Punch List is completed or until Owner agrees in writing to removal.
E. Mockup may not remain as part of the work.

1.8 PRE-INSTALLATION CONFERENCE
A. Meet two weeks prior to commencing work of this section, under provisions of Section 01 31 00.

1.9 DELIVERY, STORAGE, AND HANDLING
A. Store, protect, and deliver products to site under provisions of Section 01 60 00.

1.10 ENVIRONMENTAL REQUIREMENTS
A. Cold Weather Requirements: IMIAC - Recommended Practices and Guide Specifications for Cold Weather Masonry Construction
B. Hot Weather Requirements: IMIAC - Recommended Practices and Guide Specifications for Hot Weather Masonry Construction

1.11 COORDINATION
A. Coordinate work under provisions of Section 01 31 00.
B. Coordinate the masonry work with installation of window anchors.

PART 2 PRODUCTS

2.1 CONCRETE MASONRY UNITS
A. Hollow Load Bearing Block Units (CMU): ASTM C90, Type II – Non-Moisture Controlled
B. Load Bearing Concrete Masonry Units (CMU): ASTM C90, Type II – Non-Moisture Controlled
C. Decorative Block Units (CMU): ASTM C90, Type II – Non-Moisture Controlled

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D. Concrete Brick Units: ASTM C55, Grade N, Type II – Non-Moisture Controlled of same type and weight as block units
E. All block installed in fire rated walls and partitions shall be classified units or certified for the intended use in accordance with FBC.

2.2 BRICK UNITS
A. Face Brick: ASTM C216, Type FBS, Grade MW; color as selected.
B. Building Brick: ASTM C62, Grade NW; solid units
C. Hollow Facing and Building Brick: ASTM C652, Grade SW, Type HBS; color as selected
D. Sand-Lime Face Brick: ASTM C73, Grade SW
E. Size and Shape: Provide special units for 90° corners, lintels, bull nosed corners and angle corners
F. Special Brick Shape: Shaped to profile indicated; surface texture on sides and ends
G. Giant Face Brick: ASTM C216, Type FBS, Grade MW; color as selected
H. Giant Hollow Facing and Building Brick: ASTM C652, Grade SW, Type HBS; color as selected
I. Provide special units for 90° corners, lintels, bull nosed corners and angle corners
J. Special Giant Brick Shape: Shaped to profile indicated; surface texture on sides and ends

2.3 REINFORCEMENT AND ANCHORAGE
A. Single Wythe Joint Reinforcement: Truss type; steel wire, hot dip galvanized to ASTM A641/A641M Class 3 after fabrication, 3/16" side rods with 9-ga cross ties.
B. Multiple Wythe Joint Reinforcement: Ladder type; with moisture drip; adjustable type, steel wire, hot dip galvanized ASTM A641/A641M Class 3 fabrication, 3/16" side rods with 9-gauge crossties.
C. Reinforcing Steel: A615/A615M, Grade 40 or Grade 60; deformed carbon bars as specified in Section 03 20 00, unfinished
1. Strap Anchors: Bent steel shape, hot dip galvanized to ASTM A123/A123M B2 finish.
D. Wall Ties: Corrugated formed sheet metal, gauge thick, adjustable, hot dip galvanized to ASTM A123/A123M B2 steel finish.
E. Wall Ties: Formed steel wire, gage thick, adjustable, eye and pintle type, hot dip galvanized to ASTM A123/A123M B2 steel finish.
F. Dovetail Anchors: Bent steel strap, galvanized to ASTM A123/A123M B2 finish.

2.4 MORTAR AND GROUT
A. Mortar and Grout: As specified in Section 04 05 13.

2.5 FLASHINGS
A. Copper: ASTM B370, cold rolled; 20 oz/sq ft, 0.027 inch thick; natural finish.
B. Galvanized Steel: ASTM A653/A653M, G90 finish, 24-ga core steel
C. Stainless Steel: ASTM A167, Type 304, soft temper; 24-ga thick; smooth finish.
D. Provide dovetail; saw tooth, or other design to develop all direction bonding.
E. Lap Sealant: Butyl type as specified in Section 07 92 00

2.6 ACCESSORIES
A. Preformed Control Joints: Neoprene material, provide with corner and tee accessories, cement fused joints.
B. Joint Filler: Closed cell polyvinyl chloride; oversized 50% to joint width and self-expanding.
C. Cavity Wall Drainage System: High-density polyethylene to support mortar droppings and debris within the cavity.
D. Building Paper: No. 30 asphalt saturated felt.

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E. Nailing Strips: Softwood, preservative treatment for moisture resistance, dovetail-shape, sized to masonry joints.
F. Weep: Preformed plastic tubes, hollow
G. Cavity Vents: Molded polyvinyl chloride grilles insect resistant.
H. Cleaning Solutions: Non-acidic, not harmful to masonry work or adjacent materials

PART 3 EXECUTION

3.1 EXAMINATION
A. Verify that field conditions are acceptable and are ready to receive work.
B. Verify items provided by other sections of work are properly sized and located.
C. Verify that built-in items are in proper location, and ready for roughing into masonry work.

3.2 PREPARATION
A. Direct and coordinate placement of metal anchors supplied to other sections.
B. Provide temporary bracing during installation of masonry work.
1. Maintain in place until building structure provides permanent bracing.

3.3 COURSING
A. Establish lines, levels, and coursing indicated. Protect from displacement.
B. Maintain masonry courses to uniform dimension, with vertical and horizontal joints of uniform thickness.
C. Concrete Masonry Units:
1. Coursing: One unit and one mortar joint to equal 8"
2. Mortar Joints: Concave
D. Brick Units:
1. Coursing: Three units and three mortar joints to equal 8"
2. Mortar Joints: Concave

3.4 PLACING AND BONDING
A. Lay solid masonry units in full bed of mortar, with full head joints, uniformly jointed with other work.
B. Lay hollow masonry units with face shell bedding on head and bed joints.
C. Buttering corners of joints or excessive furrowing of mortar joints is not permitted.
D. Remove excess mortar as work progresses.
E. Interlock intersections and external corners.
F. Do not shift or tap masonry units after mortar has achieved initial set.
1. Where adjustments are made, remove mortar, and replace.
G. Perform job site cutting of masonry units with proper tools to provide straight, clean, un-chipped edges.
1. Prevent broken masonry unit corners or edges.
H. Cut mortar joints flush where wall tile is scheduled, cement parging is required, resilient base is scheduled, cavity insulation vapor barrier adhesive is applied, or bitumen damp proofing is applied.
I. Isolate masonry partitions from vertical structural framing members with a control joint.
J. Isolate top joint of masonry partitions from horizontal structural framing members and slabs or decks with compressible joint filler.

3.5 WEEPS
A. Install weeps in veneer at intervals recommended by the Brick Institute of America.

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3.6 REINFORCEMENT AND ANCHORAGES
- A. Install horizontal joint reinforcement 16" oc.
- B. Place masonry joint reinforcement in first and second horizontal joints above and below openings, and extend minimum 16" each side of opening.
- C. Place joint reinforcement continuous in first and second joint below top of walls.
- D. Lap joint reinforcement ends minimum 6".
- E. Reinforce stack-bonded unit, joint corners, and intersections with strap anchors 16" oc.
- F. All masonry below grade is to be grouted solid.
  1. Provide footing/wall dowels.
- G. Measure the splice length from the finish floor

3.7 REINFORCEMENT AND ANCHORAGES - VENEER MASONRY
- A. Install horizontal joint reinforcement 16" o.c.
- B. Place masonry joint reinforcement in first and second horizontal joints above and below openings, and extend minimum 16 each side of opening.
- C. Place joint reinforcement continuous in first and second joint below top of walls.
- D. Lap joint reinforcement ends minimum 6".
- E. Embed wall ties in masonry back-up for bonding veneer at maximum 16" o.c. vertically and 36" o.c. horizontally.
  1. Place at maximum 3" o.c. each way around perimeter of openings, within 12" of openings.
- F. Secure wall ties, rods, strap, anchors to back-up and embed into masonry veneer at maximum 16" o.c. vertically and 36" o.c. horizontally.
  1. Place at maximum 3" o.c. each way around perimeter of openings, within 12" of openings.
  2. Provide length to extend a minimum of 1½" into the exterior wythe.
- G. Reinforce stack bonded unit joint corners and intersections with strap anchors 16" o.c.

3.8 REINFORCEMENT AND ANCHORAGES - CAVITY WALL MASONRY
- A. Install horizontal joint reinforcement 16" o.c.
- B. Place masonry joint reinforcement in first and second horizontal joints above and below openings, and extend minimum 16" each side of opening.
- C. Place joint reinforcement continuous in first and second joint below top of walls.
- D. Lap joint reinforcement ends minimum 6".
- E. Embed anchors in concrete or attached to structural steel members in every second block or sixth brick joint.
  1. Provide length to extend a minimum 1½" into the exterior wythe.
- F. Reinforce stack bonded unit joint corners and intersections with strap anchors 16" o.c.

3.9 REINFORCEMENT AND ANCHORAGES - MULTIPLE WYTHE UNIT MASONRY
- A. Install horizontal joint reinforcement 16" o.c.
- B. Place masonry joint reinforcement in first and second horizontal joints above and below openings, and extend minimum 16" each side of opening.
- C. Place joint reinforcement continuous in first and second joint below top of walls.
- D. Lap joint reinforcement ends minimum 6".
- E. Support and secure reinforcing bars from displacement.
  1. Maintain position within ½" of dimensioned position.
- F. Embed anchors embedded in concrete or attached to structural steel members.
  1. Embed anchorages in every second block or sixth brick joint.

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2. Provide length to extend a minimum 1½" into the exterior wythe.

G. Reinforce stack bonded unit joint corners and intersections with strap anchors 16" o.c.

3.10 MASONRY FLASHINGS

A. Provide thru-wall flashing under parapet copings, for counter-flashing in masonry walls, where roofs abut, at lintels of exterior wall openings, ledge or shelf angles, under windowsills and band courses, at spandrel beams, foundation walls and where shown on drawings.

B. Turn flashing up minimum 8" and bed into mortar joint of masonry, seal to concrete, and seal to sheathing over framed back up.

C. Lap end joints minimum 6" and seal watertight.

D. Turn flashing, fold, and seal at corners, bends, and interruptions to form dams.

3.11 SILLS

A. See specification section 08 51 13 – 3.1 B Sill & Buck for windowsill requirements

3.12 LINTELS

A. Install pre-cast concrete lintels over openings.

B. Install reinforced unit masonry lintels over openings where steel or precast concrete lintels are not scheduled.

C. Openings Up to 42" wide: Place two, No. 4 reinforcing bars 1" from bottom

D. Openings From 42" Up to 78" wide: Place two, No. 5 reinforcing bars 1" from bottom.

E. Opening Over 78": Reinforce openings as detailed.

F. Do not splice reinforcing bars.

G. Support and secure reinforcing bars from displacement.

1. Maintain position within ½" of dimensioned position.

H. Place and consolidate grout fill without displacing reinforcing.

I. Allow masonry lintels to attain specified strength before removing temporary supports.

J. Maintain bearing on each side of opening.

1. Minimum bearing of 4" on concrete, 3" on steel and 8" on masonry

3.13 ENGINEERED MASONRY

A. Lay masonry units with core cells vertically aligned and cavities between wythes clear of mortar and unobstructed.

B. Place mortar in masonry unit bed joints back ¼" from edge of unit grout spaces, bevel back and upward.

1. Permit mortar to cure seven days before placing grout.

C. Reinforce masonry unit cores and cavities with reinforcement bars and grout.

D. Retain vertical reinforcement in position at top and bottom of cells and at intervals not exceeding 192 bar diameters.

1. Splice reinforcement in accordance with Section 03 20 00.

E. Wet masonry unit surfaces in contact with grout just prior to grout placement.

F. Grout spaces less than 2" in width with fine grout using low lift grouting techniques.

G. Grout spaces 2" or greater in width, use a course grout.

H. When grouting is suspended for more than one hour, terminate grout 1½" below top of upper masonry unit to form a positive key for subsequent grout placement.

I. Low Lift Grouting:

1. Place first lift of grout to a height of 16" and rod for grout consolidation.
2. Place subsequent lifts in 8" increments and rod for grout consolidation.

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J. High Lift Grouting:
   1. Provide cleanout opening no less than 4" high at the bottom of each grouted cell by cutting one face shell of masonry unit.
   2. In double wythe walls, omit every second masonry unit in one of the wythes for clean out and cell inspection purposes.
   3. In double wythe walls, construct vertical grout barriers or dams between the masonry wythes, with masonry units every 30' maximum.
   4. Clean out masonry cells and cavities with high-pressure water spray. Permit complete water drainage.
   5. Contractor shall request inspection of the cells and cavities.
      a. Allow three days advance notice of inspection.
   6. After cleaning and cell inspection, seal openings with masonry units.
   7. Pump grout into spaces. Maintain water content in grout to intended slump without aggregate segregation.
   8. Limit grout lift to 60" and rod for grout consolidation.
      a. Wait 30 to 60 minutes before placing next lift.

3.14 CONTROL AND EXPANSION JOINTS

A. Provide expansion joints and control joints to prevent uncontrolled stress cracks in the structure and according to the engineering's plans and standards.
B. Do not continue horizontal joint reinforcement through control and expansion joints.
C. Install preformed control joint device in continuous lengths.
   1. Seal butt and corner joints in accordance with manufacturer's instructions.
D. Size control joint in accordance with Section 07 92 00 for sealant performance.

3.15 BUILT-IN WORK

A. As work progresses, install built-in metal door and glazed frames, fabricated metal frames, window frames, wood nailing strips, anchor bolts, plates, and other items to be built-in the work and furnished by other sections.
B. Install built-in items plumb and level.
C. Bed anchors of metal door and glazed frames in adjacent mortar joints.
   1. Fill frame voids solid with grout.
   2. Fill adjacent masonry cores with grout minimum 12" from framed openings.
D. Do not build in organic materials subject to deterioration.

3.16 TOLERANCES

A. Maximum Variation From Alignment of Columns and Pilasters: ¼"
B. Maximum Variation From Unit to Adjacent Unit: 1/32"
C. Maximum Variation From Plane of Wall: ¼" in 10' and ½" in 20' or more
D. Maximum Variation From Plumb: ¼" per story non-cumulative, ½" in two stories or more
E. Maximum Variation From Level Coursing: ⅛" in 3' and ¼" in 10', ½" in 30'
F. Maximum Variation of Joint Thickness: ⅛" in 3'
G. Maximum Variation from Cross-Section Thickness of Walls: ¼"

3.17 CUTTING AND FITTING

A. Cut and fit for chases, pipes, conduit, sleeves, and grounds.
   1. Coordinate with other sections of work to provide correct size, shape, and location.
B. Obtain approval prior to cutting or fitting masonry work not indicated or where appearance or strength of masonry work may be impaired.

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3.18 PARGING

A. Dampen masonry walls prior to parging.
B. Scarify each parging coat to ensure full bond to subsequent coat.
C. Parge masonry walls in two uniform coats of mortar to a total thickness of ¾" minimum.
D. Steel trowel surface smooth and flat with a maximum surface variation of ⅛" per foot.
E. Strike top edge of parging at 45°

3.19 FIELD QUALITY CONTROL

A. Architect, Owner, or Building Department may request field inspections per Section 01 40 00 1.7 Inspection Services.

3.20 CLEANING

A. Clean work under provisions of 01 77 00 and conform to ASTM, BIA, and ACI 530.
B. Remove excess mortar and mortar smears as work progresses.
    1. Replace material when mortar streaks and/or stains are not removable by light cleaning.
    2. Do not use Abrasives for rubbing or scraping off mortar stains
C. Replace defective mortar and match adjacent work.
D. Clean soiled surfaces with cleaning solution.
    1. Use only cleaning products approved by the Architect and applied in direct conformance with the manufacturer's instructions.
    2. DO NOT USE Muratic acid to clean masonry.
E. Use non-metallic tools in cleaning operations.

3.21 PROTECTION OF FINISHED WORK

A. Protect finished work under provisions of Section 01 50 00.
B. Without damaging completed work, provide protective boards at exposed external corners that may be damaged by construction activities.

END OF SECTION

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SECTION 05 12 00
STRUCTURAL STEEL

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Structural steel framing members, support members, sag-rods, and struts
B. Base plates, shear stud connectors, and expansion joint plates
C. Grouting under base plates

1.2 REFERENCES

A. AISC - Code of Standard Practice for Steel Buildings and Bridges
B. AISC –Steel Construction Manual
C. AISC - Specification for Structural Steel Buildings
D. ASCE 7 - American Society of Civil Engineers – Minimum Design Loads of Buildings and Other Structures
E. ASTM A36/A36M, Standard Specification for Carbon Structural Steel
F. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-coated Welded and Seamless
G. ASTM A108 - Standard Specification for Steel Bars, Carbon, and Alloy, Cold-Finished
H. ASTM A123/A123M - Standard Specification for Zinc (Hot Dipped Galvanized) Coatings on Iron and Steel Products
I. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot Dip) on Iron and Steel Hardware
J. ASTM A242/A242M - Standard Specification for High-Strength Low-Alloy Structural Steel.
K. ASTM A307 - Standard Specification for Carbon Steel and Studs, 60 000 PSI Tensile Strength
L. ASTM A325 - Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength
M. ASTM A449 – Standard Specification for Hex Cap Screws, Bolts, and Studs, Steel, Heat Treated, 120/105/90 ksi Minimum Tensile Strength, General Use
N. ASTM A490 - Standard Specification for Structural Bolts, Alloy Steel, Heat Treated, 150 ksi Minimum Tensile Strength
O. ASTM A500/A500M - Standard Specification for Cold Formed Welded and Seamless Carbon Steel Structural Tubing in Round and Shapes
P. ASTM A501 - Standard Specification for Hot Formed Welded and Seamless Carbon Steel Structural Tubing
Q. ASTM A514/A514M - Standard Specification for High-Yield Strength, Quenched and Tempered Alloy Steel Plate, Suitable for Welding
R. ASTM A529/A529M - Standard Specification for High-Strength Carbon-Manganese Steel of Structural Quality
S. ASTM A563 - Standard Specification for Carbon and Alloy Steel Nuts
T. ASTM A568/A568M - Standard Specification for Steel, Carbon, Structural, and High-Strength, Low-Alloy, Hot-Rolled Sheet and Cold-Rolled Sheet, General Requirements for
U. ASTM A992/A992M – Standard Specification for Structural Steel Shapes
V. ANSI/AWS A2.4 - Symbols for Welding, Brazing and Nondestructive Examination
W. AWS D1.1/D1.1M - Structural Welding Code
X. FM - Roof Assembly Classifications
Y. SSPC (Steel Structures Painting Council) - Paint Manual

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Z. UL - Fire Resistance Directory
AA. FBC - Florida Building Code

1.3 SUBMITTALS FOR REVIEW
A. Section 01 33 00 - Submittals Procedures
B. Shop Drawings:
1. Indicate profiles, sizes, spacing, and locations of structural members, openings, attachments, and fasteners.
2. Connections
3. Cambers and loads
4. Indicate welded connections with AWS A2.4 welding symbols, along with net weld lengths.
5. Indicate grade of steel.
6. State of Florida Professional Engineer shall date, sign, and seal the required Shop Drawings.

1.4 SUBMITTALS FOR INFORMATION
A. Section 01 33 00 - Submittals Procedures
B. Manufacturer's Mill Certificate: Certify that Products meet or exceed specified requirements.
C. Mill Test Reports: Submit indicating structural strength, destructive and non-destructive test analysis.
D. Welders' Certificates: Certify welders employed on the Work, verifying AWS qualifications within the previous 12-months.

1.5 QUALITY ASSURANCE
A. Fabricate structural steel members in accordance with AISC Code of Standard Practice.
B. Fabricator: Company specializing in performing the work of this section with minimum five years documented experience.
C. Erector: Company specializing in performing the work of this section with minimum 5-years documented experience.
D. State of Florida Professional Structural Engineer experienced in design of connection details shall design all connections not detailed on the plans from the Architect/Engineer of record.

1.6 REGULATORY REQUIREMENTS
A. Structural steel design and construction shall comply with FBC, ASCE 7 – Wind loads, and American Institute of Steel Construction, AISC "Specifications for the Design, Fabrication, and Erection of Structural Steel for Buildings."
B. Conform to UL, FM, and Warnock Hersey Assembly.

1.7 DELIVERY, STORAGE AND PROTECTION
A. Section 01 60 00 - Materials Equipment and approved equals: Transport, handle, store and protect product

PART 2 PRODUCTS

2.1 MATERIALS
A. Structural Steel Members: ASTM A36/A36m and A992/A992M, Grade 50
B. Structural Tubing: ASTM A500/A500M, Grade B. ASTM A501
C. Pipe: ASTM A53/A53M, Type E or S, Grade B
D. Shear Stud Connectors: ASTM A108, Grade 1015, headed, uncoated
E. Bolts, Nuts, and Washers: ASTM A307, A325 and A490 galvanized to ASTM A153/A153M for galvanized members

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F. Anchor Bolts: ASTM A307 and A36/A36M
G. Welding Materials: AWS D1.1; type required for materials being welded
H. Sliding Bearing Plates: Teflon coated
I. Grout: Use non-shrink type, pre-mixed compound consisting of non-metallic aggregate, cement, water reducing, and plasticizing additives, capable of developing a minimum compressive strength of 7,000 psi at 28 days.
J. Shop and Touch-Up Primer: SSPC Paint 15, Type 1, provide a uniform dry film thickness of 1.5 mils
K. Touch-up Primer for Galvanized Surfaces: SSPC 20 Type I Inorganic

2.2 FABRICATION
A. Continuously seal joined members by intermittent welds and plastic filler.
1. Grind exposed welds smooth.
B. Fabricate connections for bolt, nut, and washer connectors.
C. Develop required camber of members.

2.3 FINISH
A. Prepare interior, unexposed, structural component surfaces in accordance with SSPC SP-2.
B. Shop prime interior, unexposed, structural steel members. Finish coating system as specified elsewhere.
1. Do not prime surfaces receiving fireproofing or field welds.
2. Do not prime surfaces in contact with concrete.
3. Do not prime surface of high strength bolts.
C. All structural or miscellaneous steel exposed to earth or weather shall be hot dipped galvanized.
1. All fasteners used at these locations shall also be hot dip galvanized.
D. Galvanize structural steel members to ASTM A123/A123M; provide Special High Grade galvanized coating per ASTM B 6.
1. Minimum coating thickness is 1.25 oz/sq.ft. for each side.

2.4 SOURCE QUALITY CONTROL AND TESTS
A. Provide shop testing and analysis of structural steel sections.

PART 3 EXECUTION

3.1 EXAMINATION
A. Section 01 31 00 – Project Management and Coordination: Verification of existing conditions prior to beginning work

3.2 ERECTION
A. Allow for erection loads, and sufficient temporary bracing to maintain structure safe, plumb, and in true alignment until completion of erection and installation of permanent bracing.
B. Field-weld components and shear studs indicated on shop drawings.
C. Field-connect members with threaded fasteners; torque to required resistance.
D. Do not field cut or alter structural members without approval of A/E.
E. After erection, prime welds, abrasions, and surfaces not shop primed or galvanized, except surfaces to be in contact with concrete.
F. Grout under base plates. Trowel grouted surface smooth, splay neatly to 45°.
G. Provide nuts and lock washers for the connection of the kitchen hood hangers.
H. Do not hang ceilings, pipes, etc. from metal deck.
1. Attach anchors to the top chord of steel truss/joist.

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2. Only loads approved by structural engineer of record as shown on the structural drawings may be attached to the bottom cord of the truss or joist.

I. Provide protection of structural steel from corrosion – base plates, anchor angles embedded in concrete or soil.

J. Attach structural steel trusses to supports with either welds or mechanical fasteners.

3.3 ERECTION TOLERANCES

A. Maximum Variation From Plumb: ¼" per story, non-cumulative

B. Maximum Offset from True Alignment: ¼"

3.4 FIELD QUALITY CONTROL

A. Section 01 40 00 - Quality Control: The District may require field inspection, testing of bolt torque, welds and torque of fasteners.

END OF SECTION

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SECTION 05 21 00
STEEL JOISTS and JOIST GIRDERS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Open web steel joists, joist girders, and shear stud connectors, with bridging, attached seats, anchors, and related items necessary to complete work indicated on the plans and this section.
B. Loose bearing plates and anchor bolts for site placement.
C. Framed floor and roof openings greater than 18".

1.2 REFERENCES

A. AISC - Code of Standard Practice for Steel Buildings and Bridges
B. AISI - Specifications for Structural Steel Buildings
C. ASCE 7 - American Society of Civil Engineers – Minimum Design Loads of Buildings and Other Structures
D. ASTM A36/A36M - Standard Specification for Carbon Structural Steel
E. ASTM A108 - Standard Specification for Steel Bars, Carbon, and Alloy, Cold-Finished
F. ASTM A123/A123M - Standard Specification for Zinc (Hot Dipped Galvanized) Coatings on Iron and Steel Products
G. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot Dip) on Iron and Steel Hardware
H. ASTM A307 - Standard Specification for Carbon Steel and Studs, 60 000 PSI Tensile Strength
I. ASTM A325 - Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength
J. ANSI/AWS A2.4 - Symbols for Welding, Brazing and Nondestructive Examination
K. AWS D1.1/D1.1M - Structural Welding Code
L. FM - Roof Assembly Classifications
M. SJI (Steel Joist Institute) - Specifications, Load tables, and Weight Tables for Steel Joists and Joist Girders
N. SSPC (Steel Structures Painting Council) - Paint Manual
O. UL - Fire Resistance Directory
P. FBC - Florida Building Code

1.3 SUBMITTALS FOR REVIEW

A. Section 01 33 00 - Submittals Procedures
B. Shop Drawings:
    1. Indicate standard designations, configuration, sizes, spacing, locations of joists and joist leg extensions.
    2. Joist coding, bridging, connections and attachments.
    3. Cambers and Loads
    4. Indicate welded connections with AWS A2.0 welding symbols, with the net weld lengths.
    5. Florida PE specializing in steel joist and girders shall prepare, sign, and seal the erection plans and joists fabrication plans.

1.4 SUBMITTALS FOR INFORMATION

A. Section 01 33 00 - Submittals Procedures
B. Manufacturer's Mill Certificate: Certify that Products meet or exceed specified requirements.
C. Mill Test Reports: Submit indicating structural strength, destructive and non-destructive test analysis.

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D. Welders' Certificates: Certify welders employed on the Work, verifying AWS qualifications within the previous 12-months.

1.5 QUALITY ASSURANCE

A. Perform Work in accordance with SJI Load Tables and Weight Tables for steel joists and girders, including headers and other supplementary framing.
B. Maintain one copy of each document on site.
C. Fabricator: Company specializing in performing the work of this section with minimum 5-years documented experience.
D. Erector: Company specializing in performing the work of this section with minimum 5-years documented experience.
E. State of Florida Professional Structural Engineer experienced in design of connection details shall design all connections not detailed on the plans from the Architect/Engineer of record.

1.6 REGULATORY REQUIREMENTS

A. Structural steel design and construction shall comply with FBC, ASCE 7 – Wind loads, and SJI "Standard Specifications Load Tables and Weight Tables for Steel Joists and Joist Girders."
B. Properly certified Welders shall perform all work in accordance with AWS standards.
C. Conform to UL, FM, and Warnock Hersey Assembly.

1.7 DELIVERY, STORAGE AND PROTECTION

A. Section 01 60 00 - Materials Equipment and approve equals: Transport, handle, store and protect product.
B. Follow the requirements and recommendations of SJI and AISC for delivery, storage, and protection of materials.
C. Bent joists members or broken welds are a cause for joist rejection, and require immediate replacement.

PART 2 PRODUCTS

2.1 MATERIALS

A. Steel joist fabrication materials shall comply with SJI and AISC standard specifications.
B. Bolts, Nuts, and Washers: ASTM A307, A325, and A490 galvanized to ASTM A153/A153M for galvanized members.
C. Shear Stud Connectors: ASTM A108, Grade 1015. Forged steel, headed, uncoated.
D. Structural Steel for Supplementary Framing and Joist Leg Extensions: ASTM A36/A36M
E. Welding Materials: Use appropriate type per AWS D1.1 for materials
F. Shop and Touch-Up Primer: SSPC Paint 15, Type 1, provide a uniform dry film thickness of 2.0 to 3.5 mils.
    1. Properly prepare the surface, and immediately apply the primer.
    2. Do not apply primer to joist receiving spray-on fireproofing.
G. Touch-up Primer for Galvanized Surfaces: SSPC 20 Type I - inorganic.

2.2 FABRICATION

A. General; Fabricate steel joist and girders in accordance with SJI and AISC standard specifications and the following:
    1. Make all shop connections and splices with welds, shop bolted connection are not acceptable.
    2. Use only full-length web members, do not splice.
    3. Use uniform sizes throughout their length for top and bottom cords.
    4. Do not splice bottom cord members in the middle third of the span.

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5. The fabricator shall certify any splice in the bottom cord member equals 100% the strength of the cord member.

B. Provide extended ends in locations indicated on the plans per SJI requirements.
C. Provide horizontal and/or diagonal type bridging in compliance with SJI requirements.
D. Provide ceiling extensions on the bottom cord in areas with ceiling attached directly to the joist.
E. Provide end anchorages, including steel bearing plates, to supporting structure.
F. Provide header units to support tail joists at opening in the floor or roof system not framed with steel shapes.
G. Top cords shall be absolutely across the full width and length for application of metal decking.
H. Extend and connect the bottom cords to columns or webs of girders at column lines and where shown on structural plans.
I. Bevel the joist ends when slope exceeds ¼" in 12", may provide sloped shoes.

2.3 FINISH

A. Prepare structural component surfaces in accordance with SSPC SP-2.
B. Shop prime structural steel members
1. Do not prime surfaces scheduled for fireproofing or field welding.
2. Do not prime surfaces in contact with concrete.
3. Do not prime surface of high strength bolts.
C. Galvanize steel ledge angle members to ASTM A123/A123M; provide minimum 1.25 oz/sq ft galvanized coating.
D. Shop Painting
1. Remove all loose scale, rust, and other foreign materials from fabricated joist, girder, and accessories before applying paint.
2. Spray, dip, or other approved method apply one shop coat of steel primer to steel joist, girder, and accessories, that applies a continuous paint film of at least 1.0 mil.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 31 00 – Project Management and Coordination: Verification of existing conditions prior to beginning work

3.2 ERECTION

A. Install and secure steel joist and girders per SJI specifications, final shop drawings, and this section.
B. Furnish anchor bolts, steel bearing plates, and other devices installed in concrete and masonry construction.
C. Place steel joist on secure and completed supporting construction.
1. Adjust and align in proper location and spacing before permanently fastening.
D. Allow for erection loads, and sufficient temporary bracing to maintain structure safe, plumb, and in true alignment until completion of erection and installation of permanent bracing.
E. Install bridging simultaneously with joist/girder erection and before applying construction loads.
F. Fastening of joists and girders:
1. Field weld joists to supporting steel framework and steel bearing plates as indicated in SJI specifications for type of joist and per final shop drawings.

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2. Bolt joists and girders to supporting steel framework per SJI specifications and final shop drawings for type of joist.

3.3 ERECTION TOLERANCES

A. Maximum Variation from Plumb: ¼"
B. Maximum Offset from True Alignment: ¼"

3.4 FIELD QUALITY CONTROL

A. After installation of joists and girders, wire brush and clean with solvent before painting any unpainted surfaces, surfaces with rust, or surfaces damaged during erection.
B. Section 01 40 00 - Quality Control: The A/E or the District may require field inspection, testing of bolt torque, welds and torque of fasteners.

END OF SECTION

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SECTION 05 31 00
STEEL DECK

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Steel floor deck and accessories
B. Formed steel deck end forms to contain wet concrete
C. Framed floor and roof openings 18" or less
D. Bearing plates and angles
E. Shear stud connectors

1.2 REFERENCES

A. AISI – Specification for Steel the Design of Cold-Formed Steel Structural Members
B. ASCE 7 - American Society of Civil Engineers – Minimum Design Loads of Buildings and Other Structures
C. ASTM A36/A36M - Standard Specification for Carbon Structural Steel
D. ASTM A108 - Standard Specification for Steel Bars, Carbon, and Alloy, Cold-Finished
E. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
F. ASTM A780/A780M - Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings
G. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability, and Ultra High Strength
H. ANSI/AWS A2.4 - Symbols for Welding, Brazing and Nondestructive Examination
I. AWS D1.3- Structural Welding Code – Sheet Steel
J. FM - Roof Assembly Classifications
K. SSPC (Steel Structures Painting Council) - Paint Manual
L. SDI – Steel Deck Institute - -Design Manual for Composite Decks, Form Decks, and Roof Decks
M. UL - Fire Resistance Directory
N. FBC - Florida Building Code

1.3 SUBMITTALS FOR REVIEW

A. Section 01 33 00 - Submittals Procedures
B. Shop Drawings:
    1. Indicate decking plan, support locations, projections, openings and reinforcement, cellular raceways and outlet box locations, pertinent details, cant strips, special joining, anchor details, and accessories.
    2. Provide manufacturer's specifications and installation instructions for each type of decking and accessories.
    3. Florida PE specializing in steel joist and girders shall prepare, sign, and seal the erection plans and joists fabrication plans.
C. Manufacturer's Mill Certificate: Certify that Products meet or exceed specified requirements.
D. Mill Test Reports: Submit indicating structural strength, destructive and non-destructive test analysis.
E. Welders' Certificates: Certify welders employed on the Work, verifying AWS qualifications within the previous 12 months.

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1.4 QUALITY ASSURANCE
- A. Fabricator: Company specializing in performing the work of this section with minimum 5-years documented experience.
- B. Installer: Company specializing in performing the work of this section with minimum 5-years documented experience.
- C. State of Florida Professional Structural Engineer experienced in design of connection details shall design all connections not detailed on the plans from the Architect/Engineer of record.

1.5 REGULATORY REQUIREMENTS
- A. Structural steel design and construction shall comply with FBC, ASCE 7 – Wind loads, and AISI Specification for Steel the Design of Cold-Formed Steel Structural Members.
- B. Properly certified Welders shall perform all work in accordance with AWS standards.
- C. Conform to UL, FM, and Warnock Hersey Assembly.

1.6 DELIVERY, STORAGE AND PROTECTION
- A. Section 01 60 00 - Materials Equipment and approved equals: Transport, handle, store and protect product.
- B. Follow the requirements and recommendations of AISI and Manufacturer for delivery, storage, and protection of materials.

PART 2 PRODUCTS

2.1 MATERIALS
- A. Sheet Steel: ASTM A446, Grade B Structural Quality; with G90 galvanized coating conforming to ASTM A525
- B. Plates, Angles, Miscellaneous Steel Shapes: ASTM A36/A36M steel, G90 galvanizing coating
- C. Shear Connectors: Headed stud type, ASTM A108, Grade 1015 or 1020, cold-finished carbon steel, with dimensions complying with AISC specifications.
- D. Shear Connectors: Strap type, ASTM A1011/A1011M, Grade D, hot-rolled carbon steel.
- E. Sheet Metal Accessories: ASTM A653/A653M, commercial quality, galvanized.
- F. Galvanizing: ASTM A653/A653M, G90
- G. Galvanizing Repair: Damaged galvanized surfaces, prepare surfaces and repair per ASTM A780/A780.
- H. Flexible Closure Strips: Use Manufacturer's standard vulcanized, closed cell, synthetic rubber.
- I. Acoustic Sound Barrier Closures: Use Manufacturer's standard mineral fiber closures
- J. Paint: Use Manufacturer's baked on, rust-inhibitive paint, for application to metal surfaces, chemically cleaned, and treated with a phosphate chemical.

2.2 FABRICATION
- A. Minimum roof deck material shall be 22-gage sheet steel.
- B. Form deck units in lengths to span at least three supports, with flush, telescoped, or nested 2" laps at ends and interlocking or nested side laps, of metal thickness, depth, and width indicated.
- C. Roof Deck Units: Provide deck configurations complying with SDI Specifications and Commentary for Steel Roof Deck.
- D. Acoustical Roof Deck Units:
  1. Single-pan Units: Provide fluted units with vertical webs perforated with approximate 5/32" diameter holes staggered at 3/8" oc., with mineral fiber acoustical insulation strips of a profile to fit void space between the vertical ribs.

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2. Multiple-pan Units: Provide composite units consisting of upper fluted section with lower flat plate section having interlocking side laps and approximate 5/32" diameter holes staggered at 3/8" oc., with mineral fiber acoustical insulation strips of a profile to fit void space of each cell.

E. Composite Steel Deck:
1. Fabricate deck units with integral embossing or raised pattern to furnish mechanical bond with concrete slab.
2. Fabricate open-beam deck units with fluted sections interlocking side laps.

F. Non-Composite Form Deck: Provide fluted sections of metal deck as permanent forms for reinforced concrete slabs.

G. Cellular Metal Floor Deck Units:
1. Fabricate flat-bottom units with top fluted section cells combined on a lower flat plate, of metal thickness, depth, and width of unit, number of cells per unit, and width of cells as indicated on plans.
2. Fabricate double-cell units with top fluted section cells combined with matching fluted bottom section, of metal thickness, depth, and width of units, number of cells per unit, and width of cells as indicated on plans.
3. Provide sufficient welds, forming sheets into cellular floor deck units to develop full horizontal shear strength at plane joining the steel sheets.

H. Metal Cover Plates:
1. Fabricate metal cover plates for end-abutting floor deck units of not less than same thickness as decking.
2. Form to match contour of deck units and approximately 6" wide.

I. Metal Closure Strips:
1. Fabricate metal closure strips, for sell raceways and openings between decking and other construction, of not less than 0.045", minimum 18-gage sheet steel.
2. Form to provide tight-fitting closures at open ends of cells or flutes and sides of decking.

J. Roof Sump Pans:
1. Fabricate from single piece of 0.071", minimum 14-gage galvanized sheet steel with level bottoms and sloping sides to direct water flow to drain.
2. Provide sump pans of adequate size to receive roof drains and with bearing flanges not less than 3" wide.
3. Recess pans at least 1½" below roof deck surface unless shown otherwise or required by deck configuration.
4. Cut holes for drains in the field by others.

2.3 FINISH

A. Prepare structural component surfaces in accordance with SSPC SP-2.

B. Shop prime structural steel members
1. Do not prime surfaces scheduled for fireproofing or field welding.
2. Do not prime surfaces in contact with concrete.
3. Do not prime surface of high strength bolts.

C. Galvanize steel ledge angle members to ASTM A123/A123M; provide minimum 1.25 oz/sq ft galvanized coating.

D. Shop Painting
1. Remove all loose scale, rust, and other foreign materials from fabricated joist, girder, and accessories before applying paint.

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2. Spray, dip, or other approved method apply one shop coat of steel primer to steel joist, girder, and accessories, that applies a continuous paint film of at least 1.0 mil.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 31 00 –Project Management and Coordination: Verification of existing conditions prior to beginning work

3.2 INSTALLATION

A. Install deck units and accessories in accordance with manufacturer's requirements, shop drawings, and as specified in this section.

B. Place deck units on supporting steel framework and adjust to final position with ends accurately aligned and bearing on supporting metal members before being permanently fastening.
   1. Do not stretch or contract side lap interlocks.

C. Align deck units for entire length of run of cells and with closure alignment between cells at ends of abutting units.

D. Place deck units flat and square, secure to adjacent framing without warp or deflection.

E. Do not place deck units on concrete supporting structure until concrete is cure and dry.

F. Coordinate and cooperate with structural steel erector in locating decking bundles to prevent overloading of structural members.

G. Do not use floor deck units for storage or working platforms until permanently secured.

H. Fastening Deck units:
   1. Fasten floor deck units to steel supporting members by nominal 5/8" puddle welds or elongated welds of equal strength, spaced not more than 12" o.c. with a minimum of two welds per unit at each support.
   2. Tack weld or use self-tapping No. 8 or larger machine screws at 4' o.c. for fastening end closures.
   3. Fasten floor deck units to steel supporting members by nominal 5/8" dia. puddle welds or elongated welds of equal strength, spaced not more than 12" at each support, and at closer spacing where indicated on plans.
      a. Also, secure deck to each supporting member in ribs where side laps occur.
   4. Comply with AWS requirements and procedures for manual shielded metal arc welding, appearance and quality of welds, and methods used in correcting welding work.
   5. Mechanically fasten side laps of adjacent deck units between supports, at intervals not exceeding 36" o.c., using self-tapping No. 8 or larger machine screws.
   6. Uplift Loading: Install and anchor roof deck units to resist gross uplift loading, as indicated on plans.

I. Cutting and Fitting: Cut and neatly fit deck units and accessories around other work projecting through or adjacent to the decking, as shown on plans.

J. Reinforcement at Openings: Provide additional metal reinforcement and closure pieces as required for strength, continuity of decking, and support of other work as shown.

K. Hanger Slots or Clips: Provide UL-approved punched hanger slots between cells or flutes of lower elements where floor deck units are to receive hangers for support of ceiling construction, air ducts, diffusers, or lighting fixtures.
   1. May use hanger clips designed to clip over male side lap joints of floor deck units instead of hanger slots.

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2. Locate slots or clips not more than 14" o.c. in both directions, not over 9" from walls at ends, and not more than 12" from walls at sides, unless indicated otherwise.
3. Provide manufacturer's standard hanger attachment devices.

L. Joint Covers: Provide metal joint covers at abutting ends and changes in direction of floor deck units, except at taped joints.

M. Roof Sump Pans: Place them over openings in roof decking and weld to top decking surface, spacing the welds not more than 12" o.c. with at least one weld at each corner.

N. Shear Connectors:
1. Weld shear-connectors to supports through decking units in accordance with manufacturer's instructions.
2. Do not weld connectors through two layers (lapped ends) of decking.
3. Weld only on clean dry deck surfaces.

O. Closure Strips: Provide and weld metal closure strips at open uncovered ends and edges of roof decking and in voids between decking and other construction to provide complete decking installation.
1. Provide and install flexible closure strips instead of metal closures, at Contractor's option, wherever their use ensures complete closure, use adhesive per manufacturer's instructions.

P. Touch-Up Painting: After decking installation, wire brush, clean, and paint scarred areas, welds, and rust spots and bottom surfaces of decking units and supporting steel members.
1. Touch-up galvanized surfaces with galvanizing repair paint applied in accordance with manufacturer's instructions.
2. Touch-up painted surfaces with same type of shop paint used on adjacent surfaces.
3. In areas of exposed shop painted surfaces, apply touch-up paint to blend into adjacent surfaces.

Q. Ridge and Valley Plates:
1. Weld ridge and valley plates to the top surface of the roof decking.
2. Lap end joints not less than 3", with laps made in the direction of water flow.

R. Repair and Valley Plates:
1. Holes up to ½" in diameter fill with urethane or silicone sealant and cover with duct tape.
2. Holes over ½" diameter require sheet metal plate patches fastened to deck.

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SECTION 05 40 00
STRUCTURAL COLD FORMED METAL FRAMING

PART 1 GENERAL

1.1 SECTION INCLUDES
- A. Load bearing formed steel stud interior wall and other framing not for exterior walls or roof structures.
- B. Formed steel joist, purlins, slotted channel and miscellaneous framing and bridging

1.2 REFERENCES
- A. AISI - American Iron and Steel Institute - Cold-Formed Steel Design Manual.
- B. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
- C. ASTM A645/A645M - Standard Specification for Pressure Vessel Plates, Five Percent Nickel Alloy Steel, Heat Treated per specification.
- D. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- E. ASTM C955 - Standard Specification for Cold Formed Steel Structural Framing Members.
- F. AWS D1.1/D1.1M - Structural Welding Code
- G. ANSI/AWS D1.3 - Light Steel Welding Code
- H. SSPC (Steel Structures Painting Council) - Steel Structures Painting Manual.
- I. FBC - Florida Building Code
- J. ASCE 7 – Minimum Design Loads of Buildings and Other Structures

1.3 SYSTEM DESCRIPTION
- A. Design wall system to provide for 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.
- B. Design system to accommodate construction tolerances, deflection of building structural members, and clearances of intended openings.

1.4 SUBMITTALS
- A. Submit under provisions of Section 01 33 00.
- B. Shop Drawings:
  1. Provide shop drawings prepared by cold-formed steel framing manufacturer.
  2. Indicate component details, framed openings, bearing, anchorage, loading, welds, type, and location of fasteners, and accessories or items required of related work.
  3. The same specialty engineer shall certify the erection and fabrication plan.
- C. Indicate stud, floor joist, ceiling joist, roof joist, roof rafter, roof truss, and layout.
- D. Describe method for securing studs to tracks and for bolted or welded, screwed framing connections.
- E. Provide calculations for loadings and stresses of specially fabricated framing and roof trusses under the Professional Structural Engineer's seal, licensed in Florida.
- F. Product Data: Provide data on standard framing members; describe materials and finish, product criteria and limitations.
- G. Research reports for cold-formed steel framing:
  1. Steel framing manufacturer to have a third party evaluation report for its products. The evaluation report will demonstrate compliance with the local building code or its model code (IBC - 2012, 2015, or 2018 edition or AISI S100).

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H. Manufacturer's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention.

1.5 REGULATORY REQUIREMENTS

A. Design cold-formed metal framing in accordance with the FBC, AISI A100 "Specifications for the Design of Cold-Formed Steel Structural Members", AISI S200 and ASTM C955, Section 8.
B. Wind loads shall be in accordance with ASCE 7.
C. Design interior partitions for a minimum of 5-PSF with no stress increase.

1.6 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum 5-years documented experience and a member in good standing of the Steel Framing Industry Association (SFIA) or be part of a similar organization that provides a verifiable code compliance program.
B. Installer: Company specializing in performing the work of this section with minimum 3-years documented experience.
C. Design structural elements under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed in the State of Florida.

1.7 MOCKUP

A. Provide mockup of exterior framed wall including insulation, sheathing, window frame, doorframe, and interior and exterior finish specified in other sections, under provisions of Section 01 40 00.
B. Mockup Size: 6' x 4' including corner condition
C. Mockup may remain as part of the Work

1.8 FIELD MEASUREMENTS

A. Verify that field measurements are as indicated on shop drawings.

1.9 COORDINATION

A. Coordinate work under provisions of Section 01 31 00.
B. Coordinate with the placement of components within the stud framing system.

PART 2 PRODUCTS

2.1 ACCESSORIES

A. Bracing, Furring, Bridging: Formed sheet steel, thickness determined for conditions encountered
B. Plates, Gussets, Clips: Formed sheet steel, thickness determined for conditions encountered
C. Shop and Touch-up Primer: SSPC - Paint 15, Type Type-1, red oxide
D. Touch-Up Primer for Galvanized Surfaces: SSPC - Paint 20 Type-I Inorganic

2.2 FASTENERS

A. Self-drilling, Self-tapping Screws, Bolts, Nuts, and Washers, use ASTM A123/A123M, hot dip galvanized to 1.25 oz/sq ft.
B. Anchorage Devices: Power-actuated, drilled expansion bolts and screws with sleeves.
C. Welding cold formed metal framing is not allowed.

2.3 FABRICATION

A. Fabricate assemblies of framed sections of sizes and profiles required; with framing members fitted, reinforced, and braced to suit design requirements.
B. Fit and assemble in largest practical sections for delivery to site, ready for installation.

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2.4 FINISHES

A. General Coating Classifications:
   1. CP 60: G60 (Z180), A60 (ZF180), AZ50 (AZM 150) or GF30 (ZFG90)
   2. CP 90: G90 (Z275), AZ50 (AZM 150) or GF45 (ZGF135)
B. Studs: Coating: CP 90: G90 (Z275), (other coatings must be authorized).
C. Tracks and Headers: Coating: CP 90: G90 (Z275), (other coatings must be authorized).
D. Joists and Purlins: Coating: CP 90: G90 (Z275), (other coatings must be authorized).
E. Bracing, Furring, Bridging: Same finish as framing members.
F. Plates, Gussets, Clips: Same finish as framing members.
G. Plates, Gussets, Clips: Same finish as framing members.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify site conditions under provisions of Section 01 31 00.
B. Verify that substrate surfaces and building framing components are ready to receive work.

3.2 ERECTION OF STUDDING

A. Install components in accordance with manufacturer's instructions.
B. Align floor and ceiling tracks; locate to partition layout. Secure in place with fasteners.
   1. Coordinate installation of sealant with floor and ceiling tracks.
C. Place studs not more than 2" from abutting walls and at each side of openings.
   1. Connect studs to tracks using fasteners.
D. Construct corners using minimum three studs.
   1. Double stud wall openings; door and window jambs.
E. Erect load-bearing studs in one-piece full length do not splice the studs.
F. Erect load-bearing studs, brace, and reinforce to develop full strength, to achieve design requirements.
G. Coordinate placement of insulation in multiple stud spaces made inaccessible after erection.
H. Install intermediate studs above and below openings to align with wall stud spacing.
I. Provide deflection allowance in stud track, directly below horizontal building framing at non-load bearing framing.
J. Attach cross studs and furring channels to studs for attachment of fixtures anchored to walls.
K. Install framing between studs for attachment of mechanical and electrical items, plus to prevent stud rotation.
L. Touch-up damaged galvanized and primed surfaces with primer.

3.3 ERECTION OF JOISTS PURLINS

A. Install framing components in accordance with manufacturer's instructions.
B. Make provisions for erection stresses.
   1. Provide temporary alignment and bracing.
C. Place joists and purlins not more than 2" from abutting walls.
   1. Connect joists to supports using fastener method.
D. Set floor and ceiling joists parallel and level with lateral bracing and bridging.
E. Locate joist end bearing directly over load bearing studs or provide load-distributing member to top of stud track.
F. Provide web stiffeners at reaction points.
G. Touch-up damaged galvanized and primed surfaces with primer.

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SECTION 05 50 00
METAL FABRICATIONS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Shop fabricated steel and aluminum items.

B. Prefabricated aluminum ladders.

C. Prefabricated metal nosings.

1.2 RELATED REQUIREMENTS

A. Section 03 30 00 - Cast-in-Place Concrete: Placement of metal fabrications in concrete.

B. Section 04 20 00 - Unit Masonry: Placement of metal fabrications in masonry.

C. Section 05 51 00 - Metal Stairs.

D. Section 05 52 00 - Metal Railings.

E. Section 09 91 13 - Exterior Painting: Paint finish.

F. Section 09 91 23 - Interior Painting: Paint finish.

G. Section 10 21 00 - Toilet Compartments: Placement of steel support members.

1.3 REFERENCE STANDARDS

A. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum; 2014 (2015 Errata).

B. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2022.

C. ANSI ASC A14.3 - American National Standard for Ladders - Fixed - Safety Requirements.

D. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2014.

E. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2018.

F. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.

G. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2016a.

H. ASTM A283/A283M - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates; 2013.

I. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength; 2014 (Editorial 2017).

J. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2013.

K. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2023.

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L. ASTM B210/B210M - Standard Specification for Aluminum and Aluminum-Alloy Drawn Seamless Tubes; 2019.

M. ASTM B211/B211M - Standard Specification for Aluminum and Aluminum-Alloy Rolled or Cold Finished Bar, Rod, and Wire; 2019.

N. ASTM B26/B26M - Standard Specification for Aluminum-Alloy Sand Castings; 2018.

O. ASTM B85/B85M - Standard Specification for Aluminum-Alloy Die Castings; 2018.

P. ASTM B177/B177M - Standard Guide for Engineering Chromium Electroplating; 2011 (Reapproved 2017).

Q. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2014.

R. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric); 2014.

S. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2014.

T. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2013.

U. ASTM F3125/F3125M - Standard Specification for High Strength Structural Bolts, Steel and Alloy Steel, Heat Treated, 120 ksi (830 MPa) and 150 ksi (1040 MPa) Minimum Tensile Strength, Inch and Metric Dimensions; 2015a.

V. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2012.

W. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2015, with Errata (2016).

X. AWS D1.2/D1.2M - Structural Welding Code - Aluminum; 2014, with Errata.

Y. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 1999 (Ed. 2004).

Z. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); 2002 (Ed. 2004).

AA. SSPC-SP 2 - Hand Tool Cleaning; 1982, with Editorial Revision (2004).

BB. FBC - Florida Building Code.

1.4 SUBMITTALS

A. See Section 01 33 00 - Submittal Procedures.

B. 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. Shop drawings and structural calculations shall be prepared, signed and sealed by a delegated engineer licensed in the State of Florida showing compliance with the indicated loading requirements and the codes of authorities having jurisdiction.

C. Welders' Certificates: Submit certification for welders employed on the project, verifying AWS qualification within the previous 12 months.

D. Designer's Qualification Statement.

E. Exterior Aluminum Trellis: Aluminum Finish Samples:

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1. Selection Samples: Two complete sets of color chips representing finish manufacturer's full line of colors.
2. Verification Samples: For each finish specified, submit at least three samples, minimum size 12 inch square, and representing actual material and finish color.

1.5 QUALITY ASSURANCE

A. Design and prepare shop drawings and structural calculations under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in the State of Florida.

B. Field measurements: Take field measurements prior to preparation of shop drawings and fabrication, to ensure fitting of work.

PART 2 PRODUCTS

2.1 MATERIALS - STEEL

A. Steel Sections: ASTM A36/A36M.

B. Steel Tubing: ASTM A500/A500M Grade B cold-formed structural tubing.

C. Plates: ASTM A283/A283M.

D. Pipe: ASTM A53/A53M, Grade B Schedule 40, minimum.

E. Bolts, Nuts, and Washers: ASTM F3125/F3125M, or ASTM A307, galvanized to ASTM A153/A153M where connecting galvanized components.

F. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.

G. Ladders: ANSI A14.3

H. Shop and Touch-Up Primer: SSPC-Paint 15, Type 1, red oxide.

I. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, zinc rich.

2.2 MATERIALS - ALUMINUM

A. Extruded Aluminum: ASTM B221 (ASTM B221M), 6063 alloy, Temper T5.

B. Sheet Aluminum: ASTM B209 (ASTM B209M), 5052 alloy, H32 or H22 temper.

C. Aluminum-Alloy Drawn Seamless Tubes: ASTM B210/B210M, 6063 alloy, T6 temper.

D. Aluminum-Alloy Bars: ASTM B211/B211M, 6063 alloy, T6 temper.

E. Aluminum-Alloy Sand Castings: ASTM B26/B26M.

F. Aluminum-Alloy Die Castings: ASTM B85/B85M.

G. Bolts, Nuts, and Washers: Stainless steel.

H. Welding Materials: AWS D1.2/D1.2M; type required for materials being welded.

2.3 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 continuous 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.

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E. Exposed Mechanical Fastenings: Provide flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.

F. Exterior Aluminum Trellis: No exposed fasteners.

G. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

2.4 MISCELLANEOUS FRAMING AND SUPPORTS

A. General: Provide steel framing and supports not specified in other Sections as needed to complete the Work.

B. Fabricate units from steel shapes, plates, and bars of welded construction, unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction retained by framing and supports. Cut, drill, and tap units to receive hardware, hangers, and similar items.
   1. Fabricate units from slotted channel framing where indicated.
   2. Furnish inserts if units are installed after concrete is placed.

2.5 FABRICATED ITEMS

A. Ladders: Steel; in compliance with ANSI A14.3; with mounting brackets and attachments; galvanized finish, unless otherwise noted.
   1. Application: Interior locations.
   2. Ladders
      a. Side Rails: 3/8 x 2 inches members spaced at 20 inches.
      b. Rungs: one inch diameter solid round bar spaced 12 inches on center.
      c. Space rungs 7 inches from wall surface.
   3. Ship's Ladders: 63 to 75 degrees from horizontal, with handrails at both sides, rails, rungs, treads, platforms and safety devices.

B. Bollards: Steel pipe, concrete filled, crowned cap, as detailed; galvanized finish.

C. Joist Hangers: Strap anchors, fabricated with sheet steel, 18 gauge, 0.0478 inch minimum base metal thickness; prime paint finish, unless otherwise noted.

D. Ledge Angles, Shelf Angles, Channels, and Plates Not Attached to Structural Framing: For support of metal decking; prime paint finish, unless otherwise noted.

E. Lintels: As detailed; prime paint finish, unless otherwise noted.

F. Door Frames for Overhead Door Openings and Wall Openings: Channel and Angle sections; prime paint finish, unless otherwise noted.

G. Elevator Sill Angles and Hoist and Divider Beams:
   1. Sill Angles: Steel sections as indicated on Drawings for support of elevator sills; prime paint finish, unless otherwise noted.
   2. Hoist and Divider Beams: Steel wide flange sections, shape and size required to support applied loads with maximum deflection of 1/240 of the span; prime paint finish, unless otherwise noted.

H. Toilet Partition Suspension Members: Steel channel sections; prime paint finish.

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I. Curtain and Operable Partition Suspension Members: Steel channel sections; prime paint finish.

J. Slotted Channel Framing: Fabricate channels and fittings from structural steel complying with the referenced standards; hot-dipped galvanized per ASTM A653, Grade G90 finish.

K. Counter support brackets, welded construction; prime paint finish.

L. Exterior Aluminum Trellis:
1. Configuration and profiles: As indicated on Drawings.
2. Materials: comply with the requirements of the MATERIALS article of this section.
3. Finish: Superior Performance Organic Coating System.

2.6 PREFABRICATED ITEMS

A. Factory Fabricated Stair Nosing, two-component system:
1. Application: Concrete stairs, exposed treads.
2. Materials: Extruded aluminum, alloy type 6063-T5, mill finish.
a. Tread Abrasive Filler: Virgin grain aluminum oxide epoxy-bonded to tread base.
b. Tread Type: Ribbed bar.
3. Manufacturers:
a. Basis of Design: Balco: Model DST-330, two-part; www.balcousa.com.
b. Nystrom, Inc: www.nystrom.com.

2.7 PREFABRICATED LADDERS

A. Prefabricated Ladder: Welded metal unit complying with ANSI A14.3; factory fabricated to greatest degree practical and in the largest components possible.
1. Application: Exterior locations.
2. Components: Manufacturer's standard rails, rungs, treads, handrails. returns, platforms and safety devices complying with the requirements of the MATERIALS article of this section.
3. Materials: Aluminum; ASTM B221 (ASTM B221M), 6063 alloy, T52 temper.
4. Finish: Manufacturer's standard clear anodized coating, comply with AAMA 611, Class 1.

2.8 FINISHES - STEEL

A. Prime paint steel items.
1. Exceptions: Galvanize items to be embedded in concrete, items to be imbedded in masonry, and items to be exposed to the exterior..
2. Exceptions: Do not prime surfaces where field welding is required.

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 Structural Steel Members: Galvanize after fabrication to ASTM A123/A123M requirements. Provide minimum 1.7 oz/sq ft galvanized coating.

F. Galvanizing of Non-structural Items: Galvanize after fabrication to ASTM A123/A123M requirements. Provide minimum 1.7 oz/sq ft galvanized coating.

G. Chrome Plating: ASTM B177/B177M, nickel-chromium alloy, satin finish.

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2.9 FINISHES - ALUMINUM

A. Exterior and Interior Aluminum Surfaces: Class I natural anodized.
   1. Class I Natural Anodized Finish: AAMA 611 AA-M12C22A41 Clear anodic coating not less than 0.7 mils thick.

B. Exterior Aluminum Trellis:
   1. Superior Performance Organic Coating System: AAMA 2605 multiple coat, thermally cured polyvinylidene fluoride system; color as indicated.

C. Apply one coat of bituminous paint to concealed aluminum surfaces in contact with cementitious or dissimilar materials.

2.10 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 and aluminum 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 shop 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. Furnish and install all supplementary parts necessary to complete each item.

G. After erection, prime welds, abrasions, and surfaces not shop primed or galvanized, except surfaces to be in contact with concrete.

H. Provide isolation coatings where dissimilar metals are in contact or where aluminum is in contact with concrete.

3.4 ERECTTION 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 51 00
METAL STAIRS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Steel stair frame of structural sections with closed risers.

B. Steel pan to receive concrete-fill stair treads and landings.

C. Integral balusters and aluminum hand railing.

D. Aluminum hand railing on walls.

1.2 RELATED REQUIREMENTS

A. Section 03 30 00 - Cast-in-Place Concrete: Concrete fill in stair pans and landings, and placement of metal anchors in concrete.

B. Section 05 50 00 - Metal Fabrications.

C. Section 05 52 00 - Metal Railings: Metal handrails for the stairs specified in this section.

1.3 REFERENCE STANDARDS

A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.

B. ASCE 7 - American Society of Civil Engineers, Minimum Design Loads of Buildings and Other Structures.

C. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2014.

D. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2018.

E. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.

F. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2016a.

G. ASTM A283/A283M - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates; 2013.

H. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength; 2014 (Editorial 2017).

I. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2013.

J. ASTM A501/A501M - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing; 2014.

K. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2023.

L. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable; 2023, with Editorial Revision.

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M. 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; 2023.

N. ASTM E935 - Standard Test Methods for Performance of Permanent Metal Railing Systems and Rails for Buildings; 2013, with Editorial Revision.

O. ASTM F3125/F3125M - Standard Specification for High Strength Structural Bolts, Steel and Alloy Steel, Heat Treated, 120 ksi (830 MPa) and 150 ksi (1040 MPa) Minimum Tensile Strength, Inch and Metric Dimensions; 2015a.

P. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2012.

Q. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2015, with Errata (2016).

R. NAAMM AMP 510 - Metal Stairs Manual; 1992.

S. NAAMM MBG 531 - Metal Bar Grating Manual; 2017.

T. NAAMM MBG 532 - Heavy Duty Metal Bar Grating Manual; 2009.

U. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 1999 (Ed. 2004).

V. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); 2002 (Ed. 2004).

1.4 DESIGN REQUIREMENTS

A. Florida Building Code (FBC)

B. Design stair assembly in accordance with ASCE 7

1.5 SUBMITTALS FOR REVIEW

A. Section 01 33 00 - Submittals Procedures.

B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories.

1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.

C. Structural Design Data: Submit drawings and supporting calculations as required by authorities having jurisdiction.

D. Welders' Certificates.

1.6 QUALITY ASSURANCE

A. Prepare work in accordance with ASTM E985.

B. Prepare and submit signed & sealed Shop Drawings under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in the State of Florida.

C. Welder Qualifications: Submit under provisions of Section 01 33 00, certifying welders employed on the Work, verifying AWS qualification within the previous 12 months.

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

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PART 2 PRODUCTS

2.1 FABRICATION - GENERAL

A. Metal Stairs: Provide stairs of the design specified, complete with landing platforms, vertical and horizontal supports, railings, and guards, fabricated accurately for anchorage to each other and to building structure.

1. Regulatory Requirements: Provide stairs and railings that comply with most stringent requirements of local, state, and federal regulations; where requirements of Contract Documents exceed those of regulations, comply with Contract Documents.
2. Handrails: Comply with applicable accessibility requirements of ADA Standards.
3. Structural Design: Provide complete stair and railing assemblies complying with the applicable local code., including the Florida Building Code (FBC) and ASCE-7, latest editions.
4. Dimensions: As indicated on drawings.
5. Fit and shop assemble components; disassemble into largest practical sections suitable for transport and access to site.
6. Fabricate components with joints tightly fitted and secured.
7. Continuously seal jointed pieces by continuous welds.
8. Grind exposed joints flush and smooth with adjacent finish surface.
   a. Make exposed joints butt tight, flush, and hairline.
   b. Ease exposed edges to small uniform radius.
9. No sharp or rough areas on exposed travel surfaces and surfaces accessible to touch.
10. Exposed Mechanical Fastenings shall be flush countersunk screws or bolts unobtrusively located consistent with design of component except as noted otherwise.
11. Supply components required for anchorage of fabrications of same material and finish as fabrication, except as noted otherwise.
12. Accurately form components required for anchorage of stairs, landings, and railings to each other and to building structure.

2.2 FABRICATION - PAN STAIRS AND LANDINGS

A. Fabricate stairs and landings with closed risers and treads of metal pan construction, ready to receive concrete.

B. Prime paint components.

2.3 FABRICATION - UNIT STAIR TOWERS

A. Fabricate self-supporting steel stair towers with formed treads and risers; steel channel stringers; landing platforms; sectioned for transport; corner structural support members designed to support full weight of complete stair tower plus design live load; with aluminum railings, newel posts, and balusters.

B. Fabricate stair towers to height not exceeding 40' for transportation purposes; designed for stacking to height of building as a self-supporting structure.

2.4 HANDRAILS AND GUARDS

A. Wall-Mounted Rails, Guards and Handrails: As specified in Section 05 52 00.

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2.5 MATERIALS

A. Steel Sections: ASTM A36/A36M.

B. Steel Tubing: ASTM A500/A500M, Grade B.

C. Steel Plates: ASTM A283/A283M.

D. Pipe: ASTM A53/A53M, Grade B Schedule 40.

E. Ungalvanized Sheet Steel: Hot- or cold-rolled, except use cold-rolled where finished work will be exposed to view.
   1. Hot-Rolled Steel Sheet: ASTM A1011/A1011M, Designation CS (commercial steel).
   2. Cold-Rolled Steel Sheet: ASTM A1008/A1008M, Designation CS (commercial steel).

F. Galvanized Sheet Steel: ASTM A653/A653M, Grade B Structural Quality with G90, 0.90 oz/sq ft galvanized coating.

G. Gratings: Bar gratings that comply with NAAMM MBG 531 or NAAMM MBG 532, whichever applies based on bar sizes.

H. Concrete for Treads and Landings: Portland cement Type I, 3000 psi 28 day strength, 2 to 3 inch slump.

2.6 ACCESSORIES

A. Steel Bolts, Nuts, and Washers: ASTM F3125/F3125M, Type 1, and galvanized to ASTM A153/A153M where connecting galvanized components.

B. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; consistent with design of stair structure.

C. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.

D. Shop and Touch-Up Primer: SSPC-Paint 15, Type 1, red oxide.

E. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20 Type I - Inorganic, zinc rich.

2.7 FINISHES

A. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.

B. Do not prime surfaces where field welding is required.

C. Prime Painting: Use specified shop- and touch-up primer.
   1. Preparation of Steel: In accordance with SSPC SP 2.
   2. Number of Coats: One.

D. Galvanizing: Hot-dip galvanize to minimum 1.25-oz/sq ft zinc coating in accordance with ASTM A123/A123M, where specified or indicated and at all exterior locations.
   1. Touch up abraded areas after fabrication using specified touch-up primer for galvanized surfaces.
   2. Use un-galvanized steel sheet to fabricate interior stairs.

PART 3 EXECUTION

3.1 EXAMINATION

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

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3.2 PREPARATION

A. When field welding is required, clean and strip primed steel items to bare metal.

B. Supply items required to be cast into concrete and embedded in masonry with setting templates.

3.3 INSTALLATION

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

B. Provide anchors, plates, angles, hangers, and struts required for connecting stairs to structure.

C. Allow for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.

D. Field weld components as indicated on shop drawings. Perform field welding in accordance with AWS D1.1/D1.1M.
   1. Grind welds smooth and flush.

E. Field bolt and weld to match shop bolting and welding.
   1. Conceal bolts and screws whenever possible.
   2. Where not concealed, use flush countersunk fastenings.

F. Mechanically fasten joints butted tight, flush, and hairline.

G. Obtain approval prior to site cutting or creating adjustments not scheduled.

H. After erection, clean and remove any rust before priming any field welds, abrasions, and surfaces not shop primed or galvanized.

3.4 ERECTION TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.

B. Maximum Offset From True Alignment: 1/4 inch.

C. Completed installations shall meet FBC tolerance requirements for rise and run.

END OF SECTION

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SECTION 05 52 00
METAL RAILINGS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Aluminum pipe handrails, balusters, and fittings.

1.2 RELATED REQUIREMENTS

A. Section 03 30 00 - Cast-in-Place Concrete: Placement of anchors in concrete.

B. Section 04 20 00 - Unit Masonry: Placement of anchors in masonry.

C. Section 05 51 00 - Metal Stairs: Attachment plates for handrails specified in this section.

1.3 REFERENCE STANDARDS

A. ACSE 7 – Minimum Design Loads of Buildings and Other Structures.

B. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum; 2014 (2015 Errata).

C. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.

D. ASTM B210/B210M - Standard Specification for Aluminum and Aluminum-Alloy Drawn Seamless Tubes; 2019.

E. ASTM B211/B211M - Standard Specification for Aluminum and Aluminum-Alloy Rolled or Cold Finished Bar, Rod, and Wire; 2019.

F. ASTM B221/B221M Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2014.

G. ASTM B241/B241M - Standard Specification for Aluminum and Aluminum-Alloy Seamless Pipe and Seamless Extruded Tube; 2016.

H. ASTM B483/B483M - Standard Specification for Aluminum and Aluminum-Alloy Drawn Tubes for General Purpose Applications; 2013, with Editorial Revision (2014).

I. ASTM E935 - Standard Test Methods for Performance of Permanent Metal Railing Systems and Rails for Buildings; 2013, with Editorial Revision.

J. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2012.

K. FBC - Florida Building Code.

1.4 DESIGN REQUIREMENTS

A. Railing assembly, wall rails, and attachments shall conform to the Florida Building Code (FBC).

B. Design stairs and handrails to conform to ASCE 7.

1.5 SUBMITTALS FOR REVIEW

A. Section 01 33 00 - Submittals Procedures.

B. 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.

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C. Samples: Submit two, 12 inch long samples of handrail. Submit two samples of elbow, Tee, wall bracket, escutcheon, and end stop.

D. Certification: Submit written certification prepared, signed, and sealed by a Professional Engineer, registered to practice in the State of Florida verifying that the metal handrail system design meets indicated loading requirements and codes of authorities having jurisdiction.

1.6 QUALITY ASSURANCE

A. Welders' Certificates: Submit under provisions of Section 01 33 00, certifying welders employed on the Work, verifying AWS qualification within the previous 12 months.

B. Field Measurements: Verify handrail and railing dimensions by field measurements before fabrication and indicate measurements on Shop Drawings.

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 codes including the Florida Building Code (FBC).

B. Comply with applicable accessibility requirements of ADA Standards.

C. 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

D. 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

E. Design Intermediate rails, balusters and infill panel assembly and attachments to resist a concentrated force of 50 pounds on an area equal to 1 square foot.

F. Allow for expansion and contraction of members and building movement without damage to connections or members.

2.2 ALUMINUM RAILING SYSTEM

A. Rails and Posts: 1-1/2 inch outside diameter, excluding tubing conforming to ASTM B211.

B. Fittings: Elbows, T-shapes, wall brackets, escutcheons; cast aluminum.

C. Mounting:

1. Provide adjustable brackets and flanges, with aluminum inserts for casting in concrete with aluminum brackets for embedding in masonry.
2. Prepare backing plate for mounting in wall.

D. Exposed Fasteners: Flush countersunk screws or bolts consistent with design of railing.

E. Splice Connectors: Concealed spigots; cast aluminum.

2.3 FABRICATION

A. Fit and shop assemble components in largest practical sizes for delivery to site.

B. Fabricate components with joints tightly fitted and secured. Provide spigots and sleeves to accommodate site assembly and installation.

C. Provide anchors, plates, and angles required for connecting railings to structure.

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D. Exposed Mechanical Fastenings, install flush-countersunk screws or bolts that are unobtrusively located and are consistent with the design of component.

E. Supply components required for anchorage of fabrications.
   1. Fabricate anchors and related components of same material and finish as fabrication, except as noted otherwise.

F. Exterior Components: Continuously seal joined pieces by continuous welds. Drill condensate drainage holes at bottom of members at locations that will not encourage water intrusion.

G. Interior Components: Continuously seal joined pieces by continuous welds.

H. 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.

I. Accurately form components to suit stairs and landings to each other and to building structure.

J. Provide wall returns at ends of wall-mounted handrails, unless otherwise indicated. Close ends of returns.

2.4 FINISHES

A. Exterior Aluminum Surfaces: Class I Natural Anodized Finish: AAMA 611 AA-M12C22A41 Clear anodic coating not less than 0.7 mils thick.
   1. May use an electrostatic painting system with prior approval by the District and the Architect, must provide minimum 3-year warranty.

B. Interior Aluminum Surfaces: Class II Natural Anodized Finish: AAMA 611 AA-M12C22A31 Clear anodic coating not less than 0.4 mils thick.
   1. May use an electrostatic painting system with prior approval by the District and the Architect, must provide minimum 3-year warranty.

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 aluminum 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.

C. Apply one coat of bituminous paint to concealed aluminum surfaces that will be in contact with cementitious or dissimilar materials.

3.3 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install components plumb and level, accurately fitted, free from distortion or defects, with tight joints.

C. Install railings in compliance with ADA Standards for accessible design at applicable locations.

D. Anchor railings securely to structure with anchor plates and angles.

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E. Field weld anchors as indicated on shop drawings. Touch-up welds with primer. Grind welds smooth.

F. Conceal anchor bolts and screws whenever possible. Where not concealed, use flush countersunk fastenings.

G. Assemble with spigots and sleeves to accommodate tight joints and secure installation.

H. Install floor mounted support post plumb and secure in the concrete within a core-drilled hole filled with epoxy grout.

1. Exterior railings: Grout should be placed in a dome higher than the surrounding grade to force water away from the rail post.

I. All fasteners into concrete shall be stainless steel.

3.4 ERECTION 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.

END OF SECTION

SECTION 06 10 00
ROUGH CARPENTRY

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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 work in this section.

1.2 DESCRIPTION OF WORK
- A. The majority of the carpentry work is shown on the drawings and schedules but includes all rough carpentry such as miscellaneous rough carpentry, roof curbs, cants, blocking, nailers, grounds, concealed wood blocking, panel backboards, etc. whether shown, not shown, or required for proper installation of other work.

1.3 QUALITY ASSURANCE
- A. Lumber Standard: Comply with PS 20, except as otherwise indicated
- B. Plywood Standard: Comply with PS 1, except as otherwise indicated
- C. Factory-mark each piece of lumber and plywood with type, grade, mill, and grading agency, except omit marking from exposed surfaces with transparent finish or without finish.
- D. AWPA (American Wood Preservers Association) Standards

1.4 PRODUCT HANDLING
- A. Keep materials dry during delivery and storage.
- B. Protect against exposure to weather and contact with damp or wet surfaces.
- C. Stack lumber and plywood, and provide air circulation within stacks.

1.5 REFERENCES
- A. ALSC - American Lumber Standards Committee – Softwood Lumber Standards
- B. APA - The Engineered Wood Association
- C. AWPA U1 – Use Category System- User Specification for Treated Wood
- D. AWPA P5 - Standard for Waterborne Preservatives
- E. AF&PA - American Forest and Paper Association
- F. ANSI/APA (American National Standards Institute/American Plywood Association)
- G. ASTM D226 - Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing
- H. FBC - Florida Building Code

PART 2 PRODUCTS

2.1 MATERIALS
- A. Lumber for blocking may be any grade and classified standard and better for western species or classified No. 2 for Southern Pine.
  1. All wood in contact with masonry or concrete shall be pressure treated.
  2. The manufacturer and applicator of pressure treatment shall mark all wood.
- B. Do not install any wood material into any concealed spaces, except under the following conditions and meeting the requirements of FBC:
  1. The Architect or Engineers permitted set of plans show wood blocking.
  2. The wood blocking is a minimum nominal 2" x 4" and spans from metal stud to metal stud.
  3. Wood meets requirements of 2.1.A of this section.
- C. DO NOT use Fire Retardant Treated Wood (FRTW) in educational facilities.

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D. Plywood: APA Rated sheathing or exterior, Grade CDX; Exposure Durability 1; sanded
E. Building Paper: Asphalt saturated felt, non-perforated, ASTM D226
F. Fasteners and Anchoring:
   1. Provide size and type as indicated and as recommended by applicable standards, complying with applicable Federal Specifications for nails, staples, screws, bolts, nuts, washers and anchoring devices.
   2. Provide hot-dipped galvanized anchors and hardware installed in contact with concrete, masonry, and roofing.
   3. Use treated wood products containing preservative using water as the preservative carrier.

2.2 WOOD TREATMENT
A. Treatment:
   1. Lumber or plywood indicated as "treated," or specified as treated, shall comply with the applicable requirement of the American Wood Preservers Association (AWPA).
   2. Mark each treated item to comply with the AWPA Quality Mark requirements for the specified requirements.
B. All wood used below grade and in contact with concrete or masonry shall be given pressure treatment with waterborne preservatives for decay and termite protection as follows:
   1. Pressure-treated lumber and plywood shall conform to AWPA U1 to AWPA P5 (waterborne) and bear a mark-certifying conformance.
   2. Retention requirements: Provide retention of 4.0 kg/m3 (0.25 pcf) and the notation that the material is intended for Above Ground Use and retention of 6.4 kg/m3 (0.40 pcf) with the notation that the material is intended for Fresh Water or Soil Contact Use.
   3. After treatment, kiln-dry to a maximum moisture content of 16%.
   4. Koppers "Wolmanized" brand shall be acceptable or approved equal.
   5. Wood treated with materials containing arsenic is not permitted.
C. Complete fabrication of treated items prior to treatment, wherever possible.
   1. If cut after treatment, coat cut surfaces with heavy brush coat of same preservative.
   2. Inspect each piece of lumber or plywood after drying and discard all damaged pieces.
D. Do not use treatments known or suspected to be a carcinogen.

PART 3 EXECUTION

3.1 INSPECTION
A. Examine the substrates and supporting structure and conditions before installing carpentry work.
B. Do not install on unsatisfactory conditions.

3.2 INSTALLATION
A. General:
   1. Discard units of material with defects that may impair the quality of work, and units too small to fabricate the work with minimum joints or the optimum joint arrangement.
   2. Set carpentry work accurately to required levels and lines, with members plumb and true and accurately cut and fitted.
   3. Securely attach carpentry work to substrate by anchoring and fastening as required by recognized standards.
      a. Countersink nail heads on exposed carpentry work and fill holes.
      b. Use finishing nails for finish work.

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c. Select fasteners of size that will not penetrate members where opposite side will by exposed to view or will receive finish materials.
d. Make tight connections between members.
e. Install fasteners without splitting of wood, pre-drill as required.

B. Wood Grounds, Nailers, Blocking and Sleepers:
1. Provide as shown and at all locations required for attachment of other work.
a. Form shapes as shown or required. Coordinate location with other work involved.
2. Stagger joints at least 6" for individual members in built-up installations.
3. Attach to substrates as required to support applied loading.
a. Countersink bolts and nuts flush with surfaces, unless otherwise shown.
b. Build into masonry during installation of masonry work.
c. Where possible, anchor to formwork before concrete placement.

C. Coordination: Fit carpentry work to other work, scribe, and cope as required for accurate fit.
1. Correlate location of furring, nailers, blocking, grounds, and similar supports to allow proper attachment of other work.

D. Do not expose wood products in attics, soffits, chases, or other spaces concealed within the building, clarify prior to installation.

E. Provide panel backboards 12" larger than the mounted equipment to the greatest extent practicable.
1. Butt adjoining boards to form continuous backboard.

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SECTION 06 41 00
CUSTOM CASEWORK

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 specification sections, apply to work in this section.

B. Millwork and custom casework including cabinetry, countertops, and shelving

C. Millwork and casework hardware and accessories

D. Windowsills.

1.2 REFERENCES

A. ASTM E84 – Standard Test Method for Surface Burning Characteristics of Building Materials

B. AWI – Quality Standards

C. BHMA A156.9 – Cabinet Hardware

D. A-A-1936 – Federal Specification; Adhesive, Contact

E. NEMA (National Electric Manufacturer's Association) LD3 – High Pressure Decorative Laminates

F. ALSC - PS 20 – American Softwood Lumber Standard

1.3 SUBMITTALS

A. Shop Drawings: Submit Shop Drawings in accordance with Section 01 33 00.
   1. Indicate quality grade, materials, species, construction, sizes, shapes, quantities, locations, and conditions of adjoining work.
   2. Indicate items in related or dimensional position with sections or details shown either full size or 3" = 1'-0" scale.
   3. Indicate required field measurements beyond control of mill.
   4. Indicate the allowable uniformly distributed loads for shelving.
   5. Indicate grommet locations.

B. Samples: Submit manufacturer's full range of sample colors, textures, and patterns of plastic laminate for Architect's selection.

C. Installation Instruction: Provide installation instructions and lists of replacement parts for all hardware and accessories.

D. Product Data: Provide product data for all hardware and accessories.

E. Key Schedule:
   1. Provide lock and key schedule for lockable cabinets.
   2. Coordinate key schedule with Section 08 71 00 Door Hardware.

F. Certification: Submit certifications by treating plant that pressure treatment materials comply with governing ordinances.

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1.4 QUALITY ASSURANCE

A. Millwork and casework fabricator shall have a minimum 5-years previous experience of successfully completed comparable work.

B. Lumber Grading:
   1. Lumber Grading Rules and Wood Species in accordance with Voluntary Product Standards PS 20
   2. Grading rules of Southern Pine Inspection Bureau (SPIB) apply to materials furnished.

C. Fire Hazard Classification: Comply with required NFPA, ANSI, and UL surface burning characteristics for plastic laminates, lumber, and plywood.

D. Perform work in compliance with AWI standards.

1.5 MOCK-UP

A. Prepare mock-up under provisions of Section 01 40 00.

B. Provide full size base cabinet and upper cabinet of each type indicated, in specified finish with hardware installed.

C. Owner shall inspect units to ascertain quality and conformity to AWI Standards.

D. Units will establish a minimum standard of quality for this work.

E. Vendor may use undamaged approved units as part of the work.

1.6 FIELD MEASUREMENTS

A. Design and fabricate units based upon field conditions and measurements.

B. Verify field measurements are included in shop drawings.

1.7 PRE-INSTALLATION CONFERENCE

A. Convene a pre-installation conference after site inspection and prior to commencement of work.

B. Discuss any items that may alter fabrications or intended installation and determine acceptable conclusions.

1.8 COORDINATION

A. Coordinate work with plumbing, mechanical, electrical, and other trades for rough-in work and installation of adjacent and associated components.

1.9 ENVIRONMENTAL REQUIREMENTS AND PROTECTION

A. Section 01 60 00 - Material Equipment and approved equals: Environmental conditions affecting products on site.

B. Immediately prior to, during and after installation of work of this section, maintain the same temperature and humidity conditions in building spaces as will occur after occupancy.

C. Protect work from damage until final acceptance.

PART 2 PRODUCTS

2.1 QUALITY GRADE

A. Materials and Fabrication: Provide premium grade construction and finishing in accordance with AWI "Quality Standards", conforming to Section 400B - Laminate Clad Cabinets.

B. Design Type: Reveal overlay design in accordance with AWI Architectural Casework - General Details, except as otherwise specified and detailed.

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2.2 CABINET MATERIALS

A. Sub-base Material:
1. Provide millwork or casework plywood cores of Hardwood Plywood "veneer core" with no-added-Urea Formaldehyde adhesives.
2. Use ¾" thick, 9-ply closed-grain hardwood plywood typical unless noted otherwise.
3. Use ¼" thick hardwood plywood at cabinet backs and drawer bottoms.

B. Adhesive: Provide type II, CS 35 or as recommended by plastic laminate manufacturer.
1. Adhesives shall be low VOC meeting USGB LEED for Schools requirements for low VOC.

C. Plastic Laminate: High-pressure laminate, General Purpose Grade, NEMA LD3, GP-50 by Formica, Nevamar, or Wilson Art.
1. Exposed horizontal surfaces: Use 0.050" thick, matte finish.
2. Exposed vertical surfaces: Use 0.030" thick, matte finish.
3. Provide GP 42 for post forming: Use 0.042" thick, matte finish.
4. BK 20 for concealed backing: Use 0.020" thick, matte finish, vertical grade, white unless otherwise indicated.
5. Architect and the District's Design Coordinator shall select the Color and pattern, which may determine the laminate manufacturer.

D. Chemical Resistant Plastic Laminate: High-pressure laminate complying with the following:
1. Provides resistance to acids/bases, solvents, stains, indicators and general reagents.
2. Conforms to NEMA LDS-3.4 stain resistance and SEFA 8-PL recommended practices, section 8.1 chemical resistance.
3. Manufacturers:
   a. Wilsonart; Chemsurf: www.wilsonart.com.
   b. or Approved equal from Manufacturers listed above.

E. Countertops:
1. Plastic Laminate Countertops: High Pressure Laminate on 3/4” plywood.
   a. Marine grade plywood at wet areas or countertops with sinks.
   b. Exposed Edge Treatment: Square, substrate built up to minimum 1-1/2 inch thick; covered with matching laminate.
2. Solid Surfacing Countertops: 1/2" Solid surfacing sheet over 3/4” plywood.
   a. Solid Surfacing Sheet and Plastic Resin Castings: Complying with ISFA 2-01 and NEMA LD 3; acrylic resin, mineral filler, and pigments; homogenous, non-porous and capable of being worked and repaired using standard woodworking tools; no surface coating; color and pattern consistent throughout thickness.
   b. Manufacturers:
      1) Dupont: www.corian.com.
      2) Formica Corporation: www.formica.com.
      3) Wilsonart: www.wilsonart.com.
   c. Surface Burning Characteristics: Flame spread index of 25, maximum; smoke developed index of 450, maximum; when tested in accordance with ASTM E84.

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d. Finish on Exposed Surfaces: Matte, gloss rating of 5 to 20
e. Color and Pattern: As indicated on drawings.
f. Exposed Edge Treatment: Built up to minimum 1-1/2 inch thick; edge profile as indicated in drawings.
g. Back and End Splashes: Same sheet material, square top.

3. Epoxy Resin Countertops: Filled epoxy resin molded into homogenous, non-porous sheets; no surface coating, and color and pattern consistent throughout thickness; with integral or adhesively seamed components.
   a. Flat Surface Thickness: 1 inch.
   b. Furnish tops in maximum practicable lengths, in configuration indicated on the drawings.
   c. Chemical-Resistance: Provide products that resist the following chemicals with not more than Moderate Effect when tested in accordance with NEMA LD 3:
   d. Flammability: Self-extinguishing, when tested in accordance with ASTM D635.
   e. Color: As selected by Architect and the District's Design Coordinator from manufacturer's standard line.
   f. Exposed Edge Shape: 3/16 inch radius corner.
   g. Drip Edge: Drip groove 1/8 inch wide and deep, located 1/2 inch back from edge on underside of all exposed edges.
   h. Back and End Splashes: Same material, same thickness.

F. Finish Hardware Items: Provide following items of finish hardware with millwork:
   1. Drawer Glides: No. 8400 Extension Slides by Knape & Vogt Mfg. Co.
      a. Equal products to Knape & Vogt produced by Accuride and Blum are acceptable.
   2. Shelf Standards and Supports (recessed in cabinets): No. 255 Standard and No. 256 Supports by Knape & Vogt Mfg. Co., Natural aluminum finish.
      a. Equal products to Knape & Vogt produced by Accuride and Blum are acceptable.
   3. Doors: 1 pair heavy-duty institutional hinges, Stanley HT1592, US28.
      a. 1 catch, Stanley 41 Series.
      b. 1 pull, Stanley 4483, US28.
      c. Equal products to Stanley produced by Grant and Hettich America are acceptable.
   4. Drawer Pulls: Stanley 4483, US28. Equal products to Stanley produced by Grant and Hettich America are acceptable.
   5. Drawer Locks: Schlage CL 888R or Olympus 888IC cabinet drawer lock, US26D, complete with strike plate.
      a. Provide locks with Interchangeable Core Schlage cylinders keyed to the existing Facility Master Key System as directed by Owner.
   6. Door Locks: Schlage CL 777R or Olympus 777IC cabinet door lock, US26D, complete with strike plate.
      a. Provide locks with Interchangeable Core Schlage cylinders keyed to the existing Facility Master Key System as directed by Owner.
      b. Provide one elbow catch per pair doors.
   7. Cabinet locks keyed to the facility shall be coordinated with the Hardware Supplier of section 08710 who shall provide the locks.

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8. Master key:
   a. Master key doors and drawers of cabinetry in each room with each other and the main entrance room door.
   b. Use a Schlage Everest D245 or Schlage 1456 restricted keyway as directed by owner.
   c. Equal products to Schlage produced by Olympus are acceptable.
9. Silencers: Use neoprene type with self-adhesive at all cabinet doors.

G. Glazing: Provide clear, tempered glass for glazed doors and openings in cabinetwork, ¼" thick unless otherwise indicated or approved.

H. Accessories: Provide adhesives, concealed fasteners, nuts, bolts, screws, pins, washers, and etc of type and size to suit application and severity of use.
1. Provide finished grommets for holes and cut-outs; Standard plastic grommets for cut-outs in plastic laminate, in color to match adjacent surface. Stainless steel grommets for cut-outs in other materials.
2. Wire Management: Under desk wire cable manager, J-shaped with flanges for mechanical fastening.
   a. Size: 1 inch by 1 3/4 inch trough, length as indicated in Drawings.
   b. Product: Basis of Design: WM22 manufactured by Doug Mockett and Co., Inc.

I. Miscellaneous: Provide shims, blocking, etc. as required for complete installation.

2.3 WINDOWSILLS

A. General: Refer to drawings for details and profile of windowsills.
1. Provide Windowsills, width as required to provide minimum 3/4" overhang to wall finish below by full length of wall or frame opening; minimum 1/2" thick, 1/4" radiused corners, ease all exposed edges.

B. Solid Surfacing Sheet and Plastic Resin Castings: Complying with ISFA 2-01 and NEMA LD 3; acrylic resin, mineral filler, and pigments; homogenous, non-porous and capable of being worked and repaired using standard woodworking tools; no surface coating; color and pattern consistent throughout thickness.
1. Manufacturers:
   a. Dupont: www.corian.com.
   b. Formica Corporation: www.formica.com.
   c. Wilsonart: www.wilsonart.com.
2. Surface Burning Characteristics: Flame spread index of 25, maximum; smoke developed index of 450, maximum; when tested in accordance with ASTM E84.
3. Finish on Exposed Surfaces: Matte, gloss rating of 5 to 20.
4. Color and Pattern: As indicated on drawings.

2.4 FABRICATION

A. General:
1. All exposed cabinet edges shall be beveled or rounded to prevent sharp edges or corners.
2. All counter tops exposed to room or student access have beveled or rounded edges, and exposed corners rounded with minimum ½" radius.

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B. Fabrication Workmanship:
   1. Construct millwork items in accordance with specified quality grade of reference standards, except as otherwise specified or detailed.
   2. Construct millwork items using materials specified for plastic laminate finish.

C. Milling:
   1. Fabricate and assemble work at mill as complete as practicable.
   2. Deliver ready to assemble and set in place.
   3. Machine sand all work at mill and deliver free of machine or tool marks or defects that will show through finish.

D. Plastic Laminate Tops, Panels, Cabinet Shelving, and All Exposed Surfaces:
   1. Use plywood substrate as specified.
      a. Particleboard, hardboard, and flake-board are not acceptable.
   2. Glue tops and panels under pressure using Type II water- resistant adhesive.
      a. Glue plastic, core, and backing sheet in one operation after applying edge bands.

E. Fabricate finished tops and edges from one continuous sheet of plastic laminate.
   1. Make corners and joints hairline.
   2. Slightly bevel arises.

F. Ease the edges of millwork as required to eliminate sharp edges.

G. Backsplash and Aprons:
   1. Square edge, direct bond cover, and full returns.
   2. Make corners and joints hairline.

H. Door and Drawer fronts shall be ¾" thick.

I. Provide plastic laminate finish on all exposed surfaces of doors, drawers, countertops, splashes, etc. of cabinets.
   1. Shelves shall be finished on all sides and edges.
   2. Cabinet interiors to be melamine finish unless otherwise noted.

J. Construction: Construct each unit or cabinet in one section where practical, or construct in largest practical sections to facilitate ease of handling and installation.
   1. Cabinet constructed in more than one section, ship trim and scribe strips loose at field joints.
   2. Locate counter butt joints minimum 2' from sink cutouts.

K. Finish Hardware: Fit drawer guides and cabinet-mounted shelf standards at mill.
   1. Ship other finish hardware items loose for installation at job site.

L. Glazing: Install glazing at mill to the greatest extent practical.
   1. Field glazing shall be with dry type glazing gaskets sized to eliminate gaps and prevent loose glazing installations.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine surfaces for conditions that would prevent quality installation of millwork.

B. Verify that grounds and blocking are in place to support millwork.

C. Do not install on defective conditions, doing so shall indicate acceptance of site conditions and require you to correct any defects.

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3.2 INSTALLATION

A. General:
1. Install all millwork items, plumb, level and true (within 1/16" in 10'), in accordance with drawing details and shop drawings.
2. Do not install trim until backs and unexposed edges have been back primed.
3. Provide cutting, fitting, fabricating, erecting, wedging, bracing, blocking, nailing, and securing of items of rough woodwork throughout, including miscellaneous furring, grounds, blocking, and nailers.
   a. Build-in items where indicated on Drawings or where required for attachment of finish and other work.
4. Provide 4" high backsplash and end splashes at all locations where countertops abut walls.
5. Fully bed backsplashes and end splashes to top and each other with Dow Corning #786 mildew resistant silicone sealant.
6. Offsets: Offsets in plane on work surfaces and counters shall be negligible and no more than 1/32" at other abutting materials.

B. Cabinets:
1. Install cabinets plumb with countertops level to within 1/16" in 10'.
2. Level the base cabinets to within allowable tolerances.
3. Accurately scribe and fit scribe strips, trim strips, and filler panels to irregularities of adjacent surfaces, maximum gap opening 0.025".
4. Secure cabinets permanently to floor using anchors spaced at maximum of 30" o.c., minimum of two for each unit while maintaining ¾” clearance between the back of cabinet and the exterior wall.
5. Bolt adjoining cases together, maximum width of joints 1/32".
6. Fasten tops to bases with screws driven through base cabinet top frame into bottom of countertop.
7. Scribe all backsplashes and aprons and caulk.
8. Blocking, Bucks, and Nailers: Install plumb, level and true with joints flush, fastened securely in place.
9. Furring and Stripping: Install plumb and level, shim to provide true finish surface.
10. Install color-matched sealant at unfinished joints with other materials.
11. Install wall-shelving standards on solid backing or with toggle bolts into steel studs or masonry or TEK screws into concrete.
    a. Do not install wall-shelving standards into gypsum wallboard only.
    b. Space standards as required to support indicated loading but not less than 5-plf based on shelf material provided.
12. Do not install cabinetry or millwork closer than 24" to ceilings in fully sprinklered buildings or such that installation obstructs any fire sprinkler head.

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3.3 ADJUSTING AND CLEANING

A. Adjust doors, drawers, hardware, fixtures, and other moving or operating parts to function smoothly and correctly.

B. On completion of installation, touch up marred or abraded finished surfaces and wipe down surfaces to remove fingerprints and markings, and leave in clean condition.

END OF SECTION

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SECTION 07 13 00
SHEET MEMBRANE WATERPROOFING

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. The provisions of the General Conditions, Supplementary Conditions, and the Sections included under Division 1, General Requirements, are included as a part of this Section.

1.2 SECTION INCLUDES

A. Sheet Membrane Waterproofing systems for elevator pit and where indicated in Drawings.

B. The Work required under this section includes, but is not limited to the following:
   1. Rubberized asphalt sheet membrane waterproofing system
   2. Prefabricated drainage composite
   3. Protection board
   4. Accessories such as sealants, waterstops and waterproofing flashings needed to ensure a complete waterproof membrane system.

1.3 RELATED SECTIONS

A. Section 03 30 00 - Cast-in-Place Concrete: Concrete substrate.

B. Section 07 14 00 – Fluid Applied Waterproofing.

C. Section 07 62 00 –Flashing, Gutters, Downspouts, & Other Accessories.

D. Section 07 92 00 - Joint Sealants: Sealing moving joints in waterproofed surfaces that are not required to be treated in this section.

E. Section 07 95 13 – Expansion Joint Cover Assemblies.

1.4 REFERENCES

A. ASTM C836/C836M - Standard Specification for High Solids Content, Cold Liquid-Applied Elastomeric Waterproofing Membrane for Use with Separate Wearing Course; 2015.

B. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers--Tension; 2016.

C. ASTM D570 - Standard Test Method for Water Absorption of Plastics; 1998 (Reapproved 2010).

D. ASTM D638 - Standard Test Method for Tensile Properties of Plastics; 2014.

E. ASTM D751 - Standard Test Methods for Coated Fabrics; 2006 (Reapproved 2011).

F. ASTM D882 - Standard Test Method for Tensile Properties of Thin Plastic Sheeting; 2018.

G. ASTM D903 - Standard Test Method for Peel or Stripping Strength of Adhesive Bonds; 1998 (Reapproved 2010).

H. ASTM D1876 - Standard Test Method for Peel Resistance of Adhesives (T-Peel Test); 2008 (Reapproved 2015).

I. ASTM D1970/D1970M - Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection; 2021.

J. ASTM D3767 - Standard Practice for Rubber-Measurement of Dimensions.

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K. ASTM D5385/D5385M - Standard Test Method for Hydrostatic Pressure Resistance of Waterproofing Membranes; 1993, with Editorial Revision (2014).

L. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2023.

M. ASTM E154/E154M - Standard Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover; 2008a, with Editorial Revision (2013).

N. NRCA (WM) - The NRCA Waterproofing Manual; 2005.

O. FBC - Florida Building Code

P. FFPC – Florida Fire Prevention Code

1.5 SUBMITTALS

A. Section 01 33 00 - Submittals Procedures

B. Product Data: Provide data for membrane, surface conditioner, flexible flashings, joint cover sheet, and joint and crack sealants with temperature range for application of waterproofing membrane.

C. Shop Drawings: Indicate special joint or termination conditions and conditions of interface with other materials.

D. Certificate: Certify that products meet or exceed specified requirements.

E. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

F. Section 01 77 00 - Contract Closeout.

G. Warranty: Submit completed manufacturer warranty forms in Owner's name and registered with manufacturer.

1.6 QUALITY ASSURANCE

A. Perform Work in accordance with NRCA Waterproofing Manual and manufacturer’s recommendations.

B. Manufacturer:
   1. Shall be a Company specializing in waterproofing membrane with minimum 5-years experience in the production and sales of sheet membranes.
   2. Manufacturer shall submit evidence of ability to meet all requirements specified, and include a list of similar projects completed within the past 5-years.

C. Applicator: Company specializing in performing the work of this section with minimum 5-years documented experience and approved by manufacturer.

D. Materials: For each type of material required for the work of this section, provide primary materials, which are the products of one manufacturer.

E. Pre-Installation Conference:
   1. Hold a pre-installation conference prior to commencement of field operations to establish procedures to maintain optimum working conditions and to coordinate this work with related and adjacent work.
   2. Agenda for meeting shall include review of special details and flashing.

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1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials and products in labeled packages.

B. Store and handle in strict compliance with manufacturer's instructions, recommendations, and material safety data sheets.

C. Protect from damage from sunlight, weather, excessive temperatures, and construction operations.

D. Remove damaged material from the site and dispose of in accordance with applicable regulations.

1.8 ENVIRONMENTAL REQUIREMENTS

A. Perform work only when existing and forecasted weather conditions are within the limits established by the manufacturer of the materials and products used.

B. Proceed with installation only when substrate construction and preparation work is complete and in condition to receive sheet membrane waterproofing per the manufacturer's requirements.

1.9 WARRANTY

A. Provide written five year material warranty issued by the membrane manufacturer upon completion of the work..

PART 2 PRODUCTS

2.1 MEMBRANE COMPOUND MATERIAL

A. Provide Waterproofing Membrane in areas as indicated on the plans of one of the following.
   1. A complete dual-waterproofing, vapor-protective, composite sheet membrane system composed of high-density polyethylene having a sodium-bentonite face with a protective laminate layer of spun polypropylene designed for buried concrete or masonry construction having the following attributes.
      a. Provide a product similar to the Paramount Paraseal systems by Tremco, Inc.
   2. A self-adhesive, cold-applied composite sheet a minimum thickness of 1.4 mm (0.056 in.) of rubberized asphalt and 0.1 mm (0.004 in.) of cross-laminated, high-density polyethylene film specially formulated for use with water-based surface conditioner.
      a. Provide rubberized asphalt membrane covered with a release sheet and remove during installation.
      b. Provide a product similar to the Bituthene System 4000 membrane by Grace Construction Products.
      c. <u>Use in conjunction with the following :</u>
         1) <u>Self-Adhered HDPE Sheet Membrane: for placement below concrete slabs before placement of concrete.</u>
            (a) <u>Provide a product similar to Preprufe 300R by Grace Construction Products.</u>

B. Acceptable products:
   1. Paramount Paraseal LG, by Tremco, Inc.
      a. Puncture resistance 165 lbs ASTM E154/E154M
      b. Tensile strength 4000 psi ASTM D412

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c. Water vapor permeance 0.03 perms ASTM E96/E96M
d. Percentage elongation 700% ASTM D638
e. Resistance to hydrostatic head 150 ft ASTM D751
f. Warranted crack-bridging capacity 1/8 in

2. Bituthene® System 4000 Membrane by Grace Construction Products
   a. Thickness 0.060 in
   b. Puncture resistance 50 lbs ASTM E154/E154M
   c. Tensile strength, membrane 325 psi ASTM D412
   d. Tensile strength, film 5000 psi ASTM D882
   e. Water vapor permeance 0.05 perms ASTM E96/E96M
   f. Percentage elongation 300% ASTM D412
   g. Resistance to hydrostatic head 231 ft ASTM D5385
   h. Crack cycling @ -25°F 100 cycles Unaffected ASTM C836/C836M
   i. Lap adhesion @ minimum
      Application temperature 5 psi ASTM D1876
      Peel strength 9 psi ASTM D903
   j. Water absorption 0.1% max ASTM D570
3. Preprufe 300R used in conjunction with Bituthene® System 4000
   a. Thickness 0.046 in
   b. Tensile strength, film 4000 psi ASTM D412
   c. Water vapor permeance 0.01 perms ASTM E96/E96M
   d. Percentage elongation 500% ASTM D412
   e. Resistance to hydrostatic head 231 ft ASTM D5385
   f. Crack cycling @ -9.4°F 100 cycles Unaffected ASTM C836/C836M
   g. Lap adhesion @ minimum
      Application temperature 5 psi ASTM D1876
      Peel strength 5 psi ASTM D903
   h. Water absorption 0.5% max ASTM D570
4. Architect and Owner approved equal.

2.2 ACCESSORIES

A. Provide all accessories required for a complete and proper application as per the manufacturer's requirements.

2.3 OTHER MATERIALS

A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor and approved by the waterproofing system manufacturer as compatible, subject to Architect's approval.

B. Drainage and Protection Board: Multi-Composite type capable of preventing damage to waterproofing due to backfilling and construction traffic with a drainage layer.

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PART 3 EXECUTION

3.1 EXAMINATION

A. Coordinate as required with other trades to assure proper and adequate provision in the work of those trades for interface with the work of this Section and to prevent damage to installed waterproofing.

B. Verify substrate surfaces are free of dampness, loose particles, cracks, pits, projections, penetrations, or foreign matter detrimental to adhesion or application of waterproofing system.

C. Verify items, which penetrate surfaces receiving waterproofing, are securely installed.

D. Follow manufacturer's requirements for proper surface to apply the waterproof material.

E. Do not proceed with installation unless work is acceptable for installation.

3.2 PREPARATION

A. Protect adjacent surfaces from damage not designated to receive waterproofing.

B. Clean and prepare surfaces to receive waterproofing in accordance with manufacturer's instructions; vacuum substrate clean.

C. Do not apply waterproofing to surfaces unacceptable to membrane manufacturer or applicator.

D. Seal cracks and joints with sealant materials using depth to width ratio as recommended by sealant manufacturer.

3.3 APPLICATION

A. Surface preparation and detailing procedures shall be in accord with this Specification and the Drawings.

B. Comply with waterproofing system manufacturer's instructions except if more stringent requirements in this specification indicate otherwise.

C. Lay out project to determine and anticipate conditions prior to start of work.

3.4 INSTALLATION

A. Install membrane waterproofing in accordance with manufacturer's instructions, recommendationsand specific project instructions as applies to the Work.

B. Install waterproofing system in accord with the plans, specifications, and any building code requirements.

3.5 PROTECTION OF FINISHED WORK

A. Section 01 77 00 - Contract Closeout.

B. Remove any masking materials after installation.

1. Clean any stains on materials exposed in the completed work.

C. Protect completed membrane waterproofing from subsequent construction activities as recommended by manufacturer.

1. Do not permit traffic over unprotected or uncovered membrane.

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SECTION 07 18 00
FLUID-APPLIED WATERPROOFING (EXPOSED)

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Fluid applied waterproof system with base and top coat for exposed applications including concrete eyebrows, canopies, beams, ledges, and where indicated on drawings.

1.2 REFERENCE STANDARDS

A. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers--Tension; 2016.

B. ASTM D903 - Standard Test Method for Peel or Stripping Strength of Adhesive Bonds; 1998 (Reapproved 2010).

C. ASTM D4060 - Standard Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser; 2014.

D. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2017.

1.3 SUBMITTALS

A. Section 01 33 00 - Submittals Procedures.

B. Product Data: Include product characteristics and limitations. Identify dissolving solvents, fuels, and potential destructive compounds.

C. Selection Samples: Color charts illustrating available colors for initial selection.

D. Verification Samples: Three samples minimum 4-inch square in size of coating mounted on plywood backing illustrating colors and textures selected.

E. Manufacturer's Installation Instructions: Include special field conditions required to install waterproof membrane and potential incompatibilities with adjacent materials. Describe completely the preparation of surfaces and application of specified materials.

F. Maintenance Data: Include procedures for stain removal, repairing surface, and cleaning.

G. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products of the type specified in this section, with not less than three years of documented experience.

B. Applicator Qualifications: Company specializing in performing installation of waterproof membrane, with minimum three years documented experience and approved by manufacturer.

1.5 MOCK-UP

A. Provide one mock-up, 6 feet long by 6 feet wide, with membrane system applied to representative substrate.

B. Locate where directed.

C. Mock-up may remain as part of the Work.

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1.6 FIELD CONDITIONS

A. Do not install materials when temperature is below 50 degrees F or above 90 degrees F.

B. Maintain this temperature range, 24 hours before, during and 72 hours after application.

C. Weather to be clear with no rain during application or anticipated within 12 hours.

D. Restrict traffic from area where materials are being installed or are curing.

1.7 WARRANTY

A. See Section 01 77 00 - Contract Closeout, for additional warranty requirements.

B. Correct defective Work within a five year period after Date of Substantial Completion.

C. Provide five year manufacturer warranty.

1. Include coverage for delamination of system from substrate and degradation of waterproofing ability.

PART 2 PRODUCTS

2.1 WATERPROOF COATING

A. Manufacturers:

1. Basis of Design: Tremco Commercial Sealants & Waterproofing; Vulkem 350NF/351: www.tremcosealants.com/#sle.
2. Master Builders Solutions by BASF; MasterSeal Traffic 1500: www.master-builders-solutions.basf.us/en-us/#sle.
3. Pecora Corporation; Pecora-Deck 8013: www.pecora.com/#sle.
4. See Section 01 6000 - Material Equipment and Approved Equals for Substitutions.

2.2 MATERIALS

A. Membrane: Fluid applied polyurethane waterproof coating system including Primer, Base and Top Coats; color as selected; conforming to the following:

1. Finished Coating Thickness: 48 mils (0.048 inch), minimum.
2. Tensile Strength (ASTM D412): 2500 psi.
3. Adhesive Bond Peel Strength (ASTM D903): 30 lb/in width maximum.
4. Abrasion Resistance (ASTM D4060): Maximum Weight loss of 50 mg/1000 cycles.

B. Texture: as selected in mock-up; provide aggregate surfacing layer to create a highly slip-resistant wearing surface at pedestrian applications.

C. Filler and Primer: As recommended by membrane manufacturer.

D. Cant Strips: 1 x 1 inches x 45 degrees.

E. Sealant: As recommended by membrane manufacturer, and compatible with system and adjacent materials.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that substrate is ready to receive work, surface is clean, dry and free of substances that could adversely effect bond.

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B. Do not begin work until concrete substrate has cured at least 28 days and moisture content is 4.5 percent or less.

C. Test concrete surfaces according to ASTM F710 for acceptable level of alkalinity.

3.2 PREPARATION

A. Clean substrate surface free of foreign matter.

B. Patch concrete substrate with filler to produce surface conducive to bond.

C. Install cant strips securely at intersecting surfaces.

D. Protect adjacent surfaces.

3.3 INSTALLATION

A. Apply system materials in accordance with manufacturer's instructions.

B. Extend primer, base and top coats up intersecting and perimeter vertical surfaces, 4 inches. Terminate top edge in a straight line.

C. Finish to smooth surface sloped to drains. Cove at vertical surfaces.

D. Apply sealant to junction of horizontal and intersecting surfaces to achieve watertight seal.

3.4 PROTECTION

A. Do not permit traffic over unprotected surfaces.

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SECTION 07 19 00
WATER REPELLENT PENETRANT

PART 1 GENERAL

1.1 RELATED DOCUMENTS
- A. The provisions of the general Conditions, Supplementary Conditions, and the Sections included under Division 1, General Requirements, are included as a part of this Section.

1.2 SECTION INCLUDES
- A. Water-repellent coating applied to exterior masonry and concrete surfaces not scheduled for painting.

1.3 REFERENCES
- A. F S SS-W-110 C – Federal Specification for Water Repellent, Colorless Silicone Water Base
- B. ASTM E514/E514M – Standard Test Method for Water Penetration and Leakage through Masonry

1.4 SUBMITTALS FOR REVIEW
- A. Section 01 33 00 - Submittals Procedures
- B. Product Data: Provide details of product description, tests performed, limitations to coating, and chemical properties including percentage of solids.
- C. Manufacturer's Installation Instructions: Indicate special procedures and conditions requiring special attention; cautionary procedures required during application.
- D. Manufacturer's Certificate: Certify that Products meet or exceed specified requirements.

1.5 QUALITY ASSURANCE
- A. Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum 5-year documented experience.
- B. Applicator: Company specializing in performing the work of this section with minimum 5-years documented experience.

1.6 DELIVERY, STORAGE, AND PROTECTION
- A. Section 01 60 00 - Material Equipment and approved equals

1.7 ENVIRONMENTAL REQUIREMENTS
- A. Section 01 60 00 - Material Equipment and approved equals
- B. Do not apply coating when ambient temperature is lower than 50°F or higher than 100°F.
- C. Do not apply coating when wind velocity is above 20 mph.

1.8 WARRANTY
- A. Section 01 77 00 - Contract Closeout
- B. Correct defective work within a five-year period after Date of Substantial Completion.

PART 2 PRODUCTS

2.1 MATERIALS
- A. Water based, colorless, oligomeric siloxane/silane, deep penetrating water repellent.
- B. VOC requirements: With less than 3.3 lb/gal (400g/L) VOC's
- C. Approved Manufacturer's shall be as follows:
  1. Euclid Chemical Company; CHEMSTOP WB Heavy Duty
  2. Cadeco Sonneborn; White Roc 10 VOC
  3. PROSOCO, Inc.; Siloxane PD

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PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 31 00 – Project Management and Coordination
B. Verify joint sealants are properly installed and cured.
C. Verify surfaces receiving a coating are dry, clean, and free of efflorescence, oil, or other matter detrimental to application of coating.

3.2 PREPARATION

A. Delay work until masonry mortar and concrete substrate is cured in accordance with the manufacturer's instructions.
B. Remove loose particles and foreign matter.
C. Remove oil or foreign substance with a chemical solvent that will not affect coating.
D. Scrub and rinse surfaces with water and let dry.

3.3 APPLICATION

A. Apply coating in accordance with manufacturer's instructions.
B. Apply airless spray.
C. Do not apply to surfacing receiving paint, unless instructed to by the Architect.

3.4 PROTECTION TO FINISHED AND ADJACENT WORK

A. Section 01 77 00 - Contract Closeout
B. Protect adjacent surfaces not scheduled to receive coating.
C. Protect landscaping, property, vehicles.
D. If applied to unscheduled surfaces, remove immediately by a method instructed by coating manufacturer.

END OF SECTION

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SECTION 07 21 13
RIGID POLYISOCYANORATE BOARD INSULATION

PART 1 GENERAL

1.1 RELATED DOCUMENTS
- A. The provisions of the general Conditions, Supplementary Conditions, and the Sections included under Division 1, General Requirements, are included as a part of this Section.

1.2 SECTION INCLUDES
- A. Gypsum Underlayment System
- B. Furred and Cavity Wall Masonry Wall
- C. Exterior Sheathing System

1.3 REFERENCES
- A. ASHRAE Handbook
- B. ASTM C272/C272M – Standard Test Methods for Water Absorption of Core Materials for Structural Sandwich Construction
- C. ASTM C518 – Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus
- D. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanorate Insulation Board
- E. ASTM D1621 – Standard Test Method for Compressive Properties of Rigid Cellular Plastics
- F. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials
- G. ASTM E96/E96M – Standard Test Methods for Water Vapor Transmission of Materials
- H. FBC - Florida Building Code

1.4 DELIVERY, STORAGE AND HANDLING
- A. Deliver to the job site in the original manufacturer's wrapping or individual sheets clearly marked to identify contents.
- B. Protect all material from exposure to direct sunlight using an opaque, light-colored tarp, or the original manufacturer's packaging.
  1. Protect any unwrapped material using an opaque, light-colored tarp or packaging.
  2. Follow manufacturer's requirements.

1.5 ENVIRONMENTAL REQUIREMENTS
- A. Install only when surfaces are dry and inclement weather is not prevalent.

1.6 WARRANTY
- A. Provide written warranty from the manufacturer that the actual thermal resistance of the extruded polyisocyanorate insulation will not vary by more than 10% from its published thermal resistance.
- B. Warranty period is 15-years from the date of Substantial Completion.

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PART 2 PRODUCTS

2.1 MATERIALS

A. Insulation: Provide rigid closed cell Polyisocyanorate insulation board conforming to the properties shown in the following table.

PROPERTY	TEST	VALUE
R-value (°F-ft-h/BTU) (1)	ASTM C518	6.5 (min) per inch thickness
Compressive Strength	ASTM D1621	25 psi (min)
Water Absorption	ASTM C272/C272M	1% (max)
Water Vapor Transmission Rate (perm)	ASTM E96/E96M	1.1 (max)
Flame Spread	ASTM E84	25 (max)
Smoke Developed Index	ASTM E84	450 (max)

Footnotes:
(1) Measured at 75°F Mean Temperature

B. Provide thermal barrier as required by FBC.

2.2 ADHESIVE

A. Adhesive: Type recommended by insulation manufacturer.

2.3 FASTENERS

A. Type as recommended by the insulation manufacturer.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that substrate is flat, dry, and free of honeycombs, fins, or foreign material that will impede adhesive bond or damage the insulation board.
B. Beginning of installation means installer accepts the existing conditions.

3.2 INSTALLATION-GYPSUM UNDERLAYMENT SYSTEM

A. Install vertically with seams located on studs using fasteners.
B. Fasteners should be of sufficient length to penetrate the studs a minimum of ½".

3.3 INSTALLATION-MASONRY WALL-FURRED

A. Attach to the masonry wall using a compatible adhesive, carefully following the manufacturer's installation instructions.
B. Attach metal furring strips over insulation using common masonry fasteners, which are long enough to penetrate the masonry wall a minimum of 1".
C. Attach gypsum wallboard to the furring strips.

3.4 INSTALLATION-MASONRY WALL-CAVITY WALL

A. Install boards horizontally beginning at the bottom of the wythe.
B. Secure between joint reinforcement and the wall ties.
C. Install subsequent courses with staggered joints.

3.5 INSTALLATION-EXTERIOR SHEATHING-FRAME SYSTEM

A. Install diagonal corner bracing or engineered sheathing that complies with code requirements for racking resistance.
B. Apply insulation vertically with seams located on framing members using galvanized roofing nails or staples in accordance with Miami Dade NOA or Florida Product Approval.
   1. If using staples, apply with the crown parallel to the framing members.
   2. Do not overdrive nail heads or staples this will damage the insulation.

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3.6 DRAFT STOPPING

A. Provide draft stopping in any concealed space of the extruded insulation at the ceiling line, where interior wall(s) intersect or abut the exterior wall, at no more than 20' intervals in large rooms with walls over 20' long, and as required by FBC.
   1. Draft stopping may be ½" drywall, solid minimum 22-gauge metal strip, or ½" minimum mineral wool.
   2. Anchor draft stopping independent of the extruded insulation.

END OF SECTION

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SECTION 07 21 16
BATT INSULATION

PART 1 GENERAL

1.1 RELATED DOCUMENTS
- A. The provisions of the general Conditions, Supplementary Conditions, and the Sections included under Division 1, General Requirements, are included as a part of this Section.

1.2 SECTION INCLUDES
- A. Batt insulation and vapor retarder in exterior wall and ceiling, roof construction.
- B. Batt insulation for filling perimeter window and door shim spaces and crevices in exterior wall and roof
- C. Acoustical batt insulation for interior partitions

1.3 REFERENCES
- A. ASTM E96/E96M – Standard Test Method for Water Vapor Transmission of Materials
- B. ASTM C665 – Standard Specification for Mineral Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing
- C. ASTM E84 – Standard Test Method for Surface Burning Characteristics of Building Materials
- D. ASTM E119 – Standard Test Methods for Fire Tests of Building Construction and Materials
- E. ASTM E136 – Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C
- F. ASTM C518 – Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus
- G. ASTM C423 – Standard Test Method for Sound Absorption Coefficient by the Reverberation Room Method
- H. NFPA 255 – Standard Method of Test of Surface Burning Characteristics of Building Materials
- I. UL 723 – Standard for Test for Surface Burning Characteristics of Building Materials
- J. Florida Building Code (FBC)

1.4 PERFORMANCE REQUIREMENTS
- A. Materials of this Section: Provide continuity of thermal barrier at building enclosure elements.

1.5 SUBMITTALS
- A. Submit under provisions of Section 01 33 00.
- B. Product Data: Provide data on product characteristics, performance criteria, and limitations.
- C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

1.6 COORDINATION
- A. Coordinate work under provisions of Section 01 31 00.
- B. Coordinate the work of Section 07 26 00 for installation of vapor barrier.

PART 2 PRODUCTS

2.1 MATERIALS
- A. Thermal Batt: Provide and install ASTM C665, un-faced glass fiber thermal insulation in accordance with ASTM C518, R-Value for insulation only as indicated on drawings.
  1. FRK (foil), Type III, Class A
  2. PSK (white), Type II, Class A
  3. Surfacing Burning Characteristics for both FRK and PSK faced product:
  4. Maximum Flame Spread: 25
  5. Maximum Smoke Developed: 50
  6. Combustion Characteristics: Non-combustible.

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7. Dimensional Stability: Linear Shrinkage less than 0.1%

B. Acoustical Batt: Provide and install ASTM C665 un-faced glass fiber acoustical insulation, install in areas as shown on the drawings.
   1. Type I
   2. Surfacing Burning Characteristics, max flame spread of 10 and max smoke developed of 10.
   3. Combustion Characteristics: Passes ASTM E136
   4. Fire Resistance Ratings: Passes ASTM E119 as part of a complete fire tested wall assembly
   5. Dimensional Stability: Linear Shrinkage less than 0.1%

2.2 ACCESSORIES

A. Steel wire: electroplated; type and size to suit application.

B. Tape: Polyethylene self-adhering type, mesh reinforced.

C. Insulation Fasteners: Steel impale spindle and clip on flat metal base, self-adhering backing, length to suit insulation thickness, capable of securely and rigidly fastening insulation in place.

D. Wire Mesh: Galvanized steel, hexagonal wire mesh.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify site conditions under provisions of Section 01 31 00

B. Verify that substrate, adjacent materials, and insulation are dry and ready to receive insulation.

3.2 INSTALLATION

A. Install insulation in accordance with insulation manufacturer's instructions.

B. Install in exterior walls, roof, and ceiling spaces without gaps or voids do not compress insulation.

C. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.

D. Fit insulation tight in spaces and tight to exterior side of mechanical and electrical services within the plane of insulation.

E. Install with factory applied membrane facing exterior side of building spaces.
   1. Lap the ends and side flanges of membrane over framing members.

F. Retain in place with wire mesh secured to framing members.

G. Tape seal butt ends, lapped flanges, and tears or cuts in membrane.

H. Metal Framing: If vapor barrier is used, place on exterior side of insulation; lap and seal sheet retarder joints over membrane face.

END OF SECTION

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SECTION 07 21 19
FOAMED-IN-PLACE INSULATION

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. General provisions of the Contract, including General and Supplementary Conditions and Division 1 specification sections, apply to work in this section.

1.2 DESCRIPTION OF WORK

A. Extent of this work shall be as indicated on the drawings and/or specified herein.
B. Foamed-in place insulation in masonry cavity walls and at exterior wall crevices requiring a thermal seal.
C. Foamed-in-place insulation at junctions of dissimilar wall and roof materials to achieve a thermal and air seal

1.3 REFERENCES

A. ASTM D1621 – Standard Test Method for Compressive Properties of Rigid Cellular Plastics
B. ASTM D1622 – Standard Test Method for Apparent Density of Rigid Cellular Plastics
C. ASTM E84 – Standard Test Method for Surface Burning Characteristics of Building Materials
D. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements
E. ASTM E96/E96M – Standard Test Methods for Water Vapor Transmission Rate of Materials
F. ASTM C177 – Standard Test Method for Steady State heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded Hot-Plate Apparatus
G. ASTM C1029 – Standard Specification for Spray-Applied Rigid Cellular Polyurethane Insulation Thermal Insulation
H. FBC - Florida Building Code

1.4 QUALITY ASSURANCE

A. Manufacturer: Company specializing in manufacturing the products specified herein with a minimum of 5-year documented experience.
    1. Provide the product from a single manufacturer.
    2. Product shall be pre-mixed to ensure consistency.
B. Applicator: Company specializing in installing the products specified herein with a minimum of 5-years documented experience.
C. Do not install any product specified when the ambient temperature is below manufacturer's recommendation.

1.5 SUBMITTALS

A. Submit complete product data for all materials furnished.
B. Material Safety Data Sheet: Submit Material Safety Data Sheet complying with OSHA Hazard Communication, Standard 29 CRF 1910.1200.
C. Certified Test Reports: With product data, submit copies of certified test reports showing compliance with the specified performance values, including R-Values, fire performance, and sound abatement characteristics.
D. Installer shall provide a copy certification to install the product from manufacturer.

PART 2 PRODUCTS

2.1 MATERIALS

A. Two component plastic resin and catalyst foaming agent free of urea formaldehyde.

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1. Maximum Surface Burning Characteristics per ASTM E84:
   a. Flame spread 25
   b. Smoke developed 200
   c. Fuel contributed 0
2. Thermal Values: R-Value of 4.9" @ 32°F mean; ASTM C-177.
3. Sound Abatement: Minimum sound transmission class (STC) rating of 53 and a minimum outdoor indoor transmission class (OITC) rating of 44 for 8” wall assembly (ASTM E90).
4. Compressive Strength 35
5. Density 1.3 lbs per cu ft
6. Water Vapor Transmission 15.5-16.9 perms per inch
7. Non-Toxic per FHSA

PART 3 EXECUTION

3.1 EXAMINATION
- A. Verify site conditions prior to commencement of installation.
- B. Verify work within construction spaces or crevices are complete prior to insulation application.
- C. Verify that surfaces are clean, dry, and free of matter that may inhibit insulation adhesion.

3.2 PREPARATION
- A. Mask and protect adjacent surfaces from over spray or dusting.
- B. Apply primer in accordance with manufacturer's instructions.

3.3 APPLICATION
- A. Apply insulation in accordance with manufacturer's instructions.
- B. Apply insulation to a uniform monolithic density without voids.
- C. Coordinate installation of protective covering to achieve fire rating required.
- D. Patch damaged areas.

3.4 FIELD QUALITY CONTROL
- A. Inspection includes verification of insulation and overcoat thickness and density.

3.5 PROTECTION OF FINISHED WORK
- A. Protect finished Work under provisions of Section 1.
- B. Do not permit subsequent construction work to disturb applied insulation.

END OF SECTION

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SECTION 07 26 00
VAPOR RETARDERS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. The provisions of the general Conditions, Supplementary Conditions, and the Sections included under Division 1, General Requirements, are included as a part of this Section.

B. Section 03 30 00 Cast-in-Place Concrete

C. FBC-Florida Standard for Radon-Resistant New Commercial Constrution

1.2 SECTION INCLUDES

A. Sheet and sealant materials for controlling vapor diffusion through on grade concrete slabs.

1.3 REFERENCES

A. ASHRAE Fundamentals Handbook: CHAPTER 25

B. ASTM C920 – Standard Specification for Elastomeric Joint Sealant

C. ASTM E96/E96M – Standard Test Methods for Water Vapor Transmission of Materials

D. ASTM E1643-18a – Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contac with Earth or Granular Fill Under Concrete Slabs.

E. ASTM E1745 – Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill Under Concrete Slabs

F. SWRI (Sealant, Waterproofing and Restoration Institute) - Sealant and Caulking Guide Specification

G. FBC - Florida Building Code

H. ACI 302.1R-15 – Guide for Concrete Floor & Slab Construction

I. ACI 302.2R-06 – Guide for Concrete Slabs that Receive Moisture Sensitive Flooring Materials

1.4 PERFORMANCE REQUIREMENTS

A. Water Vapor Transmission Rate: Maximum 1.1 grain/ft2/24 hrs per ASTM E96/E96M

B. Minimum ASTM E1745 Class B rating for slabs on grade

1.5 SUBMITTALS

A. Submit under provisions of Section 01 33 00

B. Product samples and literature

C. Shop Drawings: Provide detail drawings of special joint conditions and interface required with adjacent construction.

D. Provide the manufacturer's installation instructions indicating preparation and installation requirements techniques per ASTM E1643.

1.6 QUALITY ASSURANCE

A. Summary of test results per paragraph 9.3 of ASTM E1745Perform Work in accordance with SWRI - Sealant and Caulking Guide Specification requirements for materials and installation.

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1.7 SEQUENCING

A. Sequence work under the provisions of Section 01 11 00.

B. Do not install vapor retarder until items penetrating it are in place.

PART 2 PRODUCTS

2.1 SHEET MATERIALS

A. Above Grade Sheet Retarder: Polyethylene film, 6-mil thick, a perm rating of 1.1.

B. Below Grade Vapor Barrier (Slabs on grade) shall have the following properties
   1. Maintain permeance of less than 0.01 Perms (grains/ft squared x hr x inHG) as tested in accordance with mandatory conditioning tests per ASTM E1745 Section 7.1 (7.1.1-7.1.5).
   2. Other performance criteria:
      a. Strength: ASTM E1745 Class A
      b. Thickness: 15 mils
   3. Provide third party documentation that all testing was performed on a single production roll per ASTM E1745 Section 8.1

C. Vapor Barrier Products:
   1. Basis of design: Stego Wrap Vapor Barrier (15-mil) by Stego Industries LLC

2.2 ACCESSORIES

A. Seams:
   1. Stego Tape by Stego Industries LLC

B. Sealing Penetrations of Vapor Barrier:
   1. 1. Stego Mastic by Stego Industries LLC
   2. 2. Stego Tape by Stego Industries LLC

C. Perimeter/edge seal:
   1. Stego Crete Claw by Stego Industries
   2. Stego Term Bar by Stego Industries
   3. Stego Tape (double-sided sealant tape) by Stego Industries LLC

D. Penetration Prevention:
   1. Beast Foot by Stego Industries LLC
   2. Beast Form Stake by Stego Industries LLC

E. Vapor Barrier-Safe Screed System:
   1. Beast Screed by Stego Industries LLC
   2. Beast Hook by Stego Industries LLC

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify condition of substrate and adjacent materials under provisions of Section 01 31 00.

3.2 PREPARATION

A. Ensure that subsoil is approved by Geotechnical Engineer
   1. Level and compact base material

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3.3 INSTALLATION

A. Install vapor barrier in accordance with ASTM E1643

1. Unroll vapor barrier with the longest dimension parallel with the direction of the concrete placement and face laps away from the expected direction of the placement whenever possible
2. Extend vapor barrier to the perimeter of the slab. If practicable, terminate it at the top of the slab, otherwise at a point; (a) acceptable to the structural engineer or (b) where obstructed by impediments, such a dowels, waterstops, or any other site condition requiring early termination of the vapor barrier. At the point of termination, seal vapor barrier to the foundation wall, grade beam or slab itself.
   a. Seal vapor barrier to the entire slab perimeter using Stego Crete Claw, per manufacturer's instructions.
      OR
   b. Seal vapor barrier to the entire perimeter wall or footing/grade beam with double-sided Stego Tape, or both Stego Term Bar and Stego Tape, per manufacturer's instructions. Ensure concrete is clean and dry prior to adhering the Stego Tape.
3. Overlap joints 6 inches and seal with Stego Tape
4. Apply Stego Tape/Stego Crete Claw to a clean dry vapor barrier
5. Seal all penetrations (including pipes) per manufacturer's instructions
6. For interior forming applications, avoid the use of non-permanent stakes driven through vapor barrier. Use Beast Form Stake and Beast Foot a s a vapor barrier-safe forming system. Ensure Beast Foot's peel-and-stick adhesive base is fully adhered to vapor barrier.
7. If non-permanent stakes must be driven through the vapor barrier, repair as recommended by manufacturer
8. Use reinforcing bar supports with base sections that eliminate or minimize the potential for puncture of the vapor barrier
9. Repair damaged areas with vapor barrier material of similar (or better) permeance, puncture, and tensile strength.
10. For vapor barrier-safe concrete screeding applications, install Beast Screed per manufacturer's instructions prior to placing concrete.

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SECTION 07 27 00
AIR BARRIERS

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PART 1 GENERAL

1.1 SECTION INCLUDES

A. Air barriers: Materials that form a system to stop passage of air, with sealed seams and sealed joints to adjacent surfaces.

B. Vapor Retarders: Materials that form a system to stop passage of air that is relatively water vapor impermeable, with sealed seams and sealed joints to adjacent surfaces.

1.2 RELATED REQUIREMENTS

A. Section 01 83 16 - Exterior Enclosure Performance Requirements: Coordination with Mock-up and Testing.

B. Section 07 21 13 - Polyisocyanorate Board Insulation.

C. Section 07 21 16 - Batt Insulation.

D. Section 07 21 19 - Foamed-in-Place Insulation.

E. Section 07 4213.23 - Metal Composite Material Wall and Soffit Panels: coordinate with mock-up and installation.

1.3 REFERENCE STANDARDS

A. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers--Tension; 2016.

B. ASTM D903 - Standard Test Method for Peel or Stripping Strength of Adhesive Bonds; 1998 (Reapproved 2010).

C. ASTM D1970/D1970M - Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection; 2021.

D. ASTM D4541 - Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers; 2017.

E. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023d.

F. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2023.

G. ASTM E2178 - Standard Test Method for Air Permeance of Building Materials; 2013.

H. ASTM G154 - Standard Practice for Operating Fluorescent Ultraviolet (UV) Lamp Apparatus for Exposure of Nonmetallic Materials; 2016.

I. NFPA 285 - Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components; 2012.

1.4 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Provide data on material characteristics, performance criteria, limitations, and compatibility with adjacent materials and systems.

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C. Shop Drawings: Indicate proposed locations of each product and provide drawings of special joint conditions.

D. Manufacturer's Installation Instructions: Indicate preparation, installation methods, and storage and handling criteria.

E. ABAA Manufacturer Qualification: Submit documentation of current evaluation of proposed manufacturer and materials.

F. Manufacturer's Field Reports: Indicate procedures followed, weather conditions, and supplementary instructions given.

1.5 QUALITY ASSURANCE

A. Air Barrier Association of America (ABAA) Evaluated Air Barrier Assemblies; www.airbarrier.org/#sle: Use evaluated materials from a single manufacturer regularly engaged in air barrier material manufacture, and use secondary materials approved in writing by primary material manufacturer.

B. Installer Qualifications: Company specializing in performing the work of this section with minimum three years documented experience, and approved by manufacturer.

1.6 MOCK-UPS

A. Coordinate and install air barrier materials in specified mock-ups of exterior materials.

1.7 FIELD CONDITIONS

A. Maintain temperature and humidity recommended by materials manufacturers before, during, and after installation.

PART 2 PRODUCTS

2.1 AIR BARRIER MATERIALS (AIR IMPERMEABLE AND WATER VAPOR PERMEABLE)

A. Air Barrier, Fluid Applied: Vapor permeable, elastomeric waterproofing.

1. Air Barrier Membrane:

a. Applications: Applied to exterior wall behind panels, cladding, and where indicated in Drawings.

b. Single component, water-based and cures to a tough monolithic rubber-like membrane, resistant to air leakage and water penetration.

c. Dry Film Thickness (DFT): as recommended by manufacturer, 40 mil, 0.040 inch, minimum.

d. Air Permeance: 0.004 cfm/sq ft, maximum, when tested in accordance with ASTM E2178.

e. Water Vapor Permeance: 11 perms, minimum, when tested in accordance with ASTM E96/E96M using Procedure B - Water Method, at 73.4 degrees F.

f. Elongation: 250 percent, minimum, when tested in accordance with ASTM D412.

g. Surface Burning Characteristics: Flame spread index of 25 or less, smoke developed index of 450 or less, Class A when tested in accordance with ASTM E84.

h. Comply with NFPA 285 requirements for wall assembly.

i. Nail Sealability: Pass, when tested in accordance with ASTM D1970/D1970M.

j. VOC Content: 100 g per L, maximum.

k. Sealants, Tapes and Accessories: As recommended by coating manufacturer.

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l. Products:
1) Basis of Design: Henry Company; Air-Bloc 17MR: www.henry.com/#sle.
2) Provide Basis of Design or Approved Equal from the following Manufacturers:
(a) GCP Applied Technologies: www.gcpat.com/#sle.
(b) Polyglass USA, Inc: polyglass.us.
(c) Polyguard Products, Inc: www.polyguardproducts.com/#sle.
(d) Tremco Commercial Sealants & Waterproofing: www.tremcosealants.com/#sle.
3) Substitutions: See Section 01 60 00 - Material Equipment and Approved Equals.

2. UV-Resistant Air Barrier Membrane:
a. Applications: Applied to exterior wall behind rainscreen panel system, and where indicated in Drawings.
b. Single component, moisture cure Silyl Terminated Polyether (STPE) which forms a tough monolithic rubber-like membrane, resistant to air leakage, water penetration and long term weathering.
c. Dry Film Thickness (DFT): as recommended by manufacturer, 20 mil, 0.020 inch, minimum.
d. Air Permeance: 0.004 cfm/sq ft, maximum, when tested in accordance with ASTM E2178.
e. Water Vapor Permeance: 11 perms, minimum, when tested in accordance with ASTM E96/E96M using Procedure B - Water Method, at 73.4 degrees F.
f. Accelerated Weathering: >5000 hours, when tested in accordance with ASTM G154.
g. Elongation: 300 percent, minimum, when tested in accordance with ASTM D412.
h. Surface Burning Characteristics: Flame spread index of 25 or less, smoke developed index of 450 or less, Class A when tested in accordance with ASTM E84.
i. Comply with NFPA 285 requirements for wall assembly.
j. Nail Sealability: Pass, when tested in accordance with ASTM D1970/D1970M.
k. VOC Content: 25 g per L, maximum.
l. Sealants, Tapes and Accessories: As recommended by coating manufacturer.
m. Products:
1) Basis of Design: Henry Company; Air-Bloc All-Weather STPE: www.henry.com/#sle.
2) Provide Basis of Design or Approved Equal from the following Manufacturers:
(a) GCP Applied Technologies: www.gcpat.com/#sle.
(b) Polyglass USA, Inc: polyglass.us.
(c) Polyguard Products, Inc: www.polyguardproducts.com/#sle.
(d) Tremco Commercial Sealants & Waterproofing: www.tremcosealants.com/#sle.
3) Substitutions: See Section 01 60 00 - Material Equipment and Approved Equals.

2.2 AIR BARRIER MATERIALS (AIR IMPERMEABLE AND WATER VAPOR IMPERMEABLE)

A. Air and Vapor Barrier, Foamed-in-Place: Low-density, closed-cell polyurethane foam.

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1. Applications: Joints of framed openings, roof deck to wall seal, and where indicated in Drawings.
2. Regulatory Requirements: Comply with local building code for flame and smoke, concealment, and overcoat limitations.
3. Closed Cell Content: At least 70 percent.
4. Shrink: None.
5. Post Expansion: None.
6. Thermal Resistance: R-value of 3.9, minimum, per 1 inch thickness at 75 degrees F mean temperature when tested in accordance with ASTM C518.
7. Products:
   a. Basis of Design: Soudal; SoudaFoam D&W: www.soudalusa.com.
   b. Provide Basis of Design or Approved Equal from the following Manufacturers:
      1) BASF Corporation: www.spf.basf.com/#sle.
   c. Substitutions: See Section 01 60 00 - Material Equipment and Approved Equals.

2.3 VAPOR RETARDER MATERIALS (AIR BARRIER AND WATER-RESISTIVE)

A. Vapor Retarder Sheet: ASTM D1970/D1970M.
   1. Application: Around openings in exterior walls, joints between exterior wall panels, and where indicated in Drawings.
   2. Type: Rubberized asphalt bonded to thermoplastic sheet, self-adhesive.
   3. Thickness: 40 mil, 0.040 inch, nominal.
   4. Water Vapor Permeance: 0.05 perm, maximum, when tested in accordance with ASTM E96/E96M.
   5. Air Leakage: 0.0002 cfm/sq ft, maximum, when tested in accordance with ASTM E2178.
   6. Elongation: 200 percent, minimum, when tested in accordance with ASTM D412.
   7. Tensile Strength: 500 psi, when tested in accordance with ASTM D412.
   8. Comply with NFPA 285 requirements for wall assembly.
   9. Nail Sealability: Pass, when tested in accordance with ASTM D1970/D1970M.
   10. Sealants, Tapes and Accessories: As recommended by sheet manufacturer.

B. Products:
   1. Basis of Design: Henry Company; Blueskin SA: www.henry.com/#sle.
   2. Provide Basis of Design or Approved Equal from the following Manufacturers:
      a. GCP Applied Technologies: www.gcpat.com/#sle.
      b. Polyglass USA, Inc: polyglass.us.
      c. Polyguard Products Inc.: www.polyguardproducts.com.
      d. Tremco Commercial Sealants & Waterproofing: www.tremcosealants.com/#sle.
   3. Substitutions: See Section 01 6000 - Product Requirements.

2.4 ACCESSORIES

A. General - Sealants, Tapes, and Accessories for Sealing Air Barrier and Adjacent Substrates: As indicated or in compliance with air barrier manufacturer's installation instructions.

B. Sealant: Building envelope resilient elastomeric joint sealant compatible with substrate and air barrier materials.
   1. Products:

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a. Basis of Design: Henry Company; BES Black Sealant: www.henry.com/#sle.
b. Provide Basis of Design or Approved Equal from the following Manufacturers:
   1) GCP Applied Technologies: www.gcpat.com/#sle.
   2) Polyglass USA, Inc: polyglass.us.
   3) Polyguard Products Inc.: www.polyguardproducts.com.
   4) Tremco Commercial Sealants & Waterproofing: www.tremcosealants.com/#sle.
c. Substitutions: See Section 01 60 00 - Material Equipment and Approved Equals.

C. Primers: As specified or as recommended by air barrier manufacturer for each specific application.

D. Flexible Flashing: Self-adhesive sheet flashing complying with ASTM D1970/D1970M, except slip resistance requirement waived if not installed on roof.

E. Transition Membrane: Self-adhesive, tapered edges, tear resistant.

F. Thinners and Cleaners: As recommended by material manufacturer.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that surfaces and conditions are ready for work of this section.
   1. All surfaces must be sound, dry, clean and free of oil, grease, dirt, excess mortar or other contaminants detrimental to the adhesion of the membranes

B. Do not proceed with this work until unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Remove projections, protruding fasteners, and loose or foreign matter that might interfere with proper installation.

B. Clean prepare, treat, seal, and prime substrate surfaces to receive adhesives, sealants, and membrane in accordance with manufacturer's installation instructions.
   1. Remove contaminants such as grease, oil and wax from exposed surfaces. Remove dust, dirt, loose stone and debris. Use repair materials and methods that are acceptable to manufacturer of the fluid-applied air barrier assembly.
   2. Fill voids, gaps and spalled areas in substrate to provide an even plane. Strike masonry joints full-flush.

C. Cover gaps in substrate plane and form a smooth transition from one substrate plane to another with stainless-steel sheet mechanically fastened to structural framing to provide continuous support for air barrier.

3.3 INSTALLATION

A. Install materials in accordance with manufacturer's installation instructions.

B. Install continuous airtight barrier over surfaces indicated, with sealed seams and with sealed joints to adjacent surfaces.

C. Apply sealants and adhesives within recommended temperature range in accordance with manufacturer's installation instructions.

D. Self-Adhered Sheets:

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1. Prepare substrate in accordance with sheet manufacturer's installation instructions; fill and tape joints in substrate and between dissimilar materials.
2. Lap sheets shingle fashion to shed water and seal laps airtight.
3. Once sheets are in place, press firmly into substrate with resilient hand roller; ensure that laps are firmly adhered with no gaps or fishmouths.
4. Use same material, or other material approved by sheet manufacturer, to seal to adjacent substrates, and as flashing.
5. At wide joints, provide extra flexible membrane allowing joint movement.
6. At expansion joints, provide transition to joint assemblies approved by sheet manufacturer.

E. Fluid-Applied Coatings or Membranes:
1. Prepare substrate in accordance with manufacturer's installation instructions; treat joints in substrate and between dissimilar materials as indicated.
2. Where exterior masonry veneer is being installed, install masonry anchors before installing air barrier over masonry; provide airtight seal around anchors.
3. Apply bead or trowel coat of mastic sealant with minimum thickness of 1/4 inch along coating seams, rough cuts, and as recommended by manufacturer.
4. Use flashing to seal to adjacent construction and to bridge joints in coating substrate.

F. Openings and Penetrations in Exterior Air Barriers:
1. Install flashing over sills, covering entire sill frame member, extending at least 5 inches onto air barrier and at least 6 inches up jambs; mechanically fasten stretched edges.
2. At openings with frames having nailing flanges, seal head and jamb flanges using a continuous bead of sealant compressed by flange and cover flanges with sealing tape at least 4 inches wide; do not seal sill flange.
3. At openings with nonflanged frames, seal air barrier to each side of framing at opening using flashing at least 9 inches wide, and covering entire depth of framing.
4. At head of openings, install flashing under air barrier extending at least 2 inches beyond face of jambs; seal air barrier to flashing.
5. At interior face of openings, seal gap between window/door frame and rough framing, using joint sealant over backer rod.
6. Service and Other Penetrations: Form flashing around penetrating item and seal to air barrier surface.

3.4 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Control for additional requirements.

B. Perform Adhesion Test of air barriers per ASTM D4541 - Pull-Off Strength of Coatings Using Portable Adhesion Testers.

C. Air barrier manufacturer representative to perform periodic inspections of coating application to certify installation complies with manufacturer's recommendation and required coating thickness.

D. Do not cover installed air barriers until required inspections have been completed.

E. Obtain approval of installation procedures from air barrier manufacturer based on a mock-up installed in place, prior to proceeding with remainder of installation.

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F. Take digital photographs of each portion of installation prior to covering up air barriers.

3.5 PROTECTION

A. Do not leave materials exposed to weather longer than recommended by manufacturer.

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SECTION 07 42 13.23
METAL COMPOSITE MATERIAL WALL PANELS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Exterior panels with mounting system consisting of formed metal composite material (MCM) sheet, secondary framing supports, and anchors to structure with matching flashing, trim and accessory components.

B. System to include roof, facia and soffit panels with parapet coping, sills, border and filler items as integral components of the panel system.

1.2 RELATED REQUIREMENTS

A. The provisions of the general Conditions, Supplementary Conditions, and the Sections included under Division 1, General Requirements, are included as a part of this Section.

B. Section 03 30 00 - Cast-in-Place Concrete: Installation of anchors.

C. Section 03 4513 - Tilt-up Concrete: Installation of anchors.

D. Section 04 20 00 - Unit Masonry: Installation of anchors.

E. Section 07 27 00 - Air Barriers: Air barrier behind wall panel system.

F. Section 07 62 00 - Flashing, Gutters, Downspouts and Other Accessories: Metal flashing components integrated with this wall system.

G. Section 07 92 00 - Joint Sealants: Sealing joints between siding and adjacent construction and fixtures.

1.3 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); 2022.

B. ASTM A480/A480M - Standard Specification for General Requirements for Flat-Rolled Stainless and Heat-Resisting Steel Plate, Sheet, and Strip; 2018.

C. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2014.

D. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric); 2014.

E. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2014.

F. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2013.

G. ASTM D1781 - Standard Test Method for Climbing Drum Peel for Adhesives; 1998 (Reapproved 2012).

H. ASTM D1929 - Standard Test Method for Determining Ignition Temperature of Plastics; 2016.

I. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023d.

J. FBC - Florida Building Code

K. ASCE 7 – Minimum Design Loads for Buildings and Other Structures

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1.4 ADMINISTRATIVE REQUIREMENTS

A. Pre-Installation Meeting: Convene one week before starting work of this section to verify project requirements, coordinate with installers of other work, establish condition and completeness of building substrate, and review manufacturers' installation instructions and warranty requirements.
   1. Require attendance by the Installer and relevant sub-contractors, the Contractor, Owner, and Architect.
   2. Coordinate installation of air barrier behind MCM panel system.
   3. Coordinate substrate preparation and openings and penetrations of MCM panel system.

1.5 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Manufacturer's data sheets on each product to be used, including thickness, physical characteristics of components, and finish.
   1. Specimen warranty for wall panels and finish, as specified herein.

C. Shop Drawings: Show layout and elevations, dimensions and thickness of panels, connections, details and location of joints, sealants and gaskets, method of anchorage, number of anchors, supports, reinforcement, trim, flashings, and accessories.
   1. Indicate substrates and adjacent work with which the panel system must be coordinated.
   2. Include large-scale details of anchorages and connecting elements.

D. Delegated Design Data: Submit structural, wind load and deflection calculations, and summary of forces and loads on wall panels. Shop drawings and calculations to be signed and sealed by a Structural Engineer experienced in design of this type of work and licensed in the State of Florida.

E. Product Approval: Provide Florida Building Code "FLA (PAD)" approval.

F. Selection Samples: For each finish product specified, submit at least three sample color chips representing manufacturer's full range of available colors.

G. Verification Samples: For each finish product specified, submit at least three samples, minimum size 12 inch square, and representing actual product in color.

H. Manufacturer's Field Reports: Provide within 48 hours of field review. State what was observed and what changes, if any, were requested or required.

I. Manufacturer's Qualification Statement.

J. Installer's Qualification Statement.

1.6 QUALITY ASSURANCE

A. Field Measurements: Verify actual dimensions by field measurement before fabrication; show recorded measurements on shop drawings.

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B. Delegated Engineer's Qualifications: Structural supports and anchorages are to be designed by a Structural Engineer experienced in design of this type of work and licensed in the State of Florida.

C. Metal Composite Material (MCM) Sheet Manufacturer Qualifications: Company with a minimum of ten years of continuous experience manufacturing MCM of the type specified in North America.
   1. Able to provide specified warranty on finish.

D. Wall Panel System Manufacturer Qualifications: Company specializing in manufacturing wall panel systems specified in this section.
   1. With not less than five years of documented experience.
   2. Approved by MCM sheet manufacturer.

E. Installer Qualifications: Company specializing in performing work of the type specified in this section.
   1. With minimum five years of documented experience.
   2. Approved by wall panel system manufacturer.

F. Manufacturer/Source: Provide MCM wall panel and panel accessories from a single manufacturer.

1.7 MOCK-UP

A. Construct mock-up, 10 feet long by 10 feet wide; include panel system, attachments to building frame, associated Weather barrier materials, and accessories and trim.

B. Approved mock-up may remain as part of the Work.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver products in manufacturer's original, unopened, undamaged containers with identification labels intact.
   1. Protect finishes by applying heavy-duty removable plastic film during production.
   2. Package for protection against transportation damage.
   3. Provide markings to identify components consistently with drawings.
   4. Exercise care in unloading, storing, and installing panels to prevent bending, warping, twisting, and surface damage.

B. Store products protected from exposure to harmful weather conditions and at temperature conditions recommended by manufacturer.
   1. Store in well-ventilated space out of direct sunlight.
   2. Protect from moisture and condensation with tarpaulins or other suitable weathertight covering installed to provide ventilation.
   3. Store at a slope to ensure positive drainage of accumulated water.
   4. Do not store in enclosed space where ambient temperature can exceed 120 degrees F.
   5. Avoid contact with other materials that might cause staining, denting, or other surface damage.

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1.9 WARRANTY

A. MCM System and System Installation Warranty: Repair or replace components of metal panel assemblies that fail in materials and workmanship within five (5) years from date of Substantial Completion.

B. Finish Warranty: Provide 20-year manufacturer warranty from the date of Substantial Completion against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking. Complete forms in Owner's name and register with warrantor.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Metal Composite Material (MCM) Sheet Manufacturers:
1. 3A Composites USA; Alucobond Plus: www.3Acompositesusa.com/#sle.
2. Arconic; Reynobond FR: www.arconic.com.
3. Alfrex, LLC; Alfrex fr: www.alfrexusa.com/#sle.
4. ALPOLIC Materials; ALPOLIC/fr (Fire Retardant core): www.alpolic-americas.com/#sle.
5. Fairview Architectural LLC; VitraBond (Fire Rated): www.fairview-na.com/#sle.
6. Substitutions: See Section 01 60 00 - Material Equipment and Approved Equals.

B. Wall Panel System Manufacturers:
1. Altech Panel Systems; DS System: www.altechpanel.com.
2. CEI Materials by Formas Inc; R4000: www.ceimaterials.com.
3. Fairview Architectural LLC; Arrowhead ACM Rainscreen: www.fairview-na.com/#sle.
4. Petersen Aluminum Corporation; PAC-3000 RS: www.pac-clad.com/#sle.
5. Substitutions: See Section 01 60 00 - Material Equipment and Approved Equals.

2.2 METAL PANEL SYSTEM

A. Performance: Provide installed panel system and support framing assembly capable of maintaining specified performance without defects, damage or failure.
1. Design and size components to support assembly dead loads, and to withstand live loads caused by positive and negative wind pressure acting normal to plane of wall.
2. Design Pressure: In accordance with Florida Building Code (FBC) and ASCE 7.
3. Maximum deflection of perimeter framing member of L/175 normal to plane of the wall; maximum deflection of individual panels of L/60.
4. Maximum anchor deflection in any direction of 1/16 inch at connection points of framing members to anchors.
5. Thermal Movement: Provide for free and noiseless vertical and horizontal thermal movement due to expansion and contraction under material temperature range of minus 20 degrees F to 180 degrees F without buckling, opening of joints, undue stress on fasteners, or other detrimental effects; allow for ambient temperature at time of fabrication, assembly, and erection procedures.
6. Drainage: Provide positive drainage to exterior for moisture entering or condensation occurring within panel system.

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7. Provide continuity of air barrier and vapor retarder seal at building enclosure elements in accordance with materials specified in Section 07 2700.

B. Fabrication:
1. Panels: 1 inch deep pans formed of metal composite material sheet by routing back edges of sheet, removing corners, and folding edges.
a. Provide concealed attachment to supporting structure.
b. Maintain maximum panel bow of 0.8 percent of panel dimension in width and length; provide stiffeners of sufficient size and strength to maintain panel flatness without showing local stresses or read-through on panel face.
c. Panel stiffeners of extruded aluminum or stainless steel shapes must be positively engaged in the perimeter extrusion or mechanically fastened to the perimeter extrusion and secured to the rear face of the composite panel to maintain panel's specified deflection under load.
d. Metallic Finished Panels: Maintain consistent grain of MCM sheet; specifically, do not rotate sheet purely to avoid waste.
e. Fabricate panels under controlled shop conditions.
f. Where final dimensions cannot be established by field measurement before commencement of manufacturing, make allowance for field adjustments without requiring field fabrication of panels.
g. Fabricate as indicated on drawings and as recommended by MCM sheet manufacturer.
1) Make panel lines, breaks, curves, and angles sharp and true.
2) Keep plane surfaces free from warp or buckle.
3) Keep panel surfaces free of scratches or marks caused during fabrication.

2.3 MATERIALS

A. Panel Composition: Two sheets of aluminum sandwiching a core of extruded thermoplastic material formed in a continuous process with no glues or adhesives between dissimilar materials; no foamed insulation material content.
1. Overall Panel Thickness: 4 mm, minimum.
2. Face Sheet Thickness: 0.019 inches, minimum.
3. Alloy: Manufacturer's standard, selected for best appearance and finish durability.
4. Bond and Peel Strength: No adhesive failure of the bond between the core and the skin nor cohesive failure of the core itself below 22.4 inch-pound/inch with no degradation in bond performance, when tested in accordance with ASTM D1781, simulating resistance to panel delamination, after 8 hours of submersion in boiling water and after 21 days of immersion in water at 70 degrees F.
5. Surface Burning Characteristics: Flame spread index of 25, maximum; smoke developed index of 450, maximum; when tested in accordance with ASTM E84.
6. Flammability: Self-ignition temperature of 650 degrees F or greater when tested in accordance with ASTM D1929.
7. Fire Performance: Tested in accordance with, and complying with the acceptance criteria of, NFPA 285.

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B. Metal Framing Members: Include sub-girts, zee-clips, base and sill angles and channels, hat-shaped and rigid channels, and furring channels required for complete installation.
   1. Provide material strength, dimensions, configuration as required to meet the applied loads applied and in compliance with applicable building code.
   2. Stainless Steel Sheet Components: ASTM A480/A480M.
   3. Aluminum Components: ASTM B209 (ASTM B209M); or ASTM B221 (ASTM B221M).

2.4 FINISHES

A. Fluoropolymer Coil Coating System: Polyvinylidene fluoride (PVDF) multi-coat superior performing organic coatings system complying with AAMA 2605, including at least 70 percent PVDF resin, with at least 80 percent of coil coated aluminum surfaces having minimum total dry film thickness (DFT) of 0.9 mils, 0.0009 inch; color and gloss as selected by Architect from manufacturer's standard line.

2.5 ACCESSORIES

A. Provide panel system manufacturer's and installer's stainless steel accessories, including fasteners, clips, anchorage devices and attachments.

B. Sealants and gaskets within the panel system shall be as per manufacturer's standards to meet performance requirements.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine dimensions, tolerances, and interfaces with other work.
   1. Verify that air barrier system is properly installed; refer to Section 07 27 00 for requirements.

B. Examine substrate on-site to determine that conditions are acceptable for product installation in accordance with manufacturer's written instructions.

C. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

D. Notify Architect in writing of conditions detrimental to proper and timely completion of work, and do not proceed with erection until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Do not install products that are defective, including warped, bowed, dented, and broken members, and members with damaged finishes.

B. Comply with instructions and recommendations of MCM sheet manufacturer and wall system manufacturer, as well as with approved shop drawings.

C. Install metal panel system securely allowing for necessary thermal and structural movement; comply with panel system manufacturer's instructions for installation of concealed fasteners.

D. Do not handle or tool products during erection in manner that damages finish, decreases strength, or results in visual imperfection or failure in performance. Return component parts that require alteration to shop for refabrication, if possible, or for replacement with new parts.

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E. Separate dissimilar metals; use gasket fasteners, isolation shims, or isolation tape where needed to eliminate possibility of electrolytic action between metals.

F. Install square, plumb, straight, and true, accurately fitted, with tight joints and intersections maintaining the following installation tolerances:
   1. Variation From Plane or Location: 1/2 inch in 30 feet of length and up to 3/4 inch in 300 feet, maximum.
   2. Deviation of Vertical Member From True Line: 0.1 inch in 25 feet run, maximum.
   3. Deviation of Horizontal Member From True Line: 0.1 inch in 25 feet run, maximum.
   4. Offset From True Alignment Between Two Adjacent Members Abutting End To End, In Line: 0.03 inch, maximum.

G. Replace damaged products.

3.3 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Control for additional requirements.

B. Wall System Manufacturer's Field Services: Provide field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with instructions.
   1. Site Visits: Schedule two site visits during execution of installation.

3.4 CLEANING

A. Ensure weep holes and drainage channels are unobstructed and free of dirt and sealants.

B. Remove protective film after installation of joint sealers, after cleaning of adjacent materials, and immediately prior to completion of work.

C. Remove temporary coverings and protection of adjacent work areas.

D. Clean installed products in accordance with manufacturer's instructions.

3.5 PROTECTION

A. Protect installed panel system from damage until Date of Substantial Completion.

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SECTION 07 52 00
MODIFIED BITUMEN MEMBRANE ROOFING

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. The provisions of the General Conditions, Supplementary Conditions, and the Sections included under Division 1, General Requirements, are included as a part of this Section.

B. Section 01 23 00 - Alternates.

1.2 SECTION INCLUDES

A. Three ply system; modified bitumen roofing system, consisting of anchor sheet, base ply (interply), and granular surface cap sheet, over light weight concrete and metal deck.

B. Flashing material system by the roofing manufacturer for use with their roofing system

1.3 RELATED REQUIREMENTS

A. Section 03 52 16 - Lightweight Insulating Concrete.

1.4 REFERENCES

A. FS-HH–I–1972/GEN – Polyisocyanurate Insulation

B. ASTM D41/D41M – Standard Specification for Asphalt Primer for Used in Roofing, Dampproofing, and Waterproofing

C. ASTM D312 – Standard Specification for Asphalt Used in Roofing

D. ASTM D2178/D2178 – Standard Specification for Asphalt-Impregnated Glass Felt used in Roofing and Waterproofing

E. ASTM D2842 – Standard Test Method for Water Absorption of Rigid Cellular Plastics

F. ASTM D4586/D4586M – Standard Specification for Asphalt Roof Cement, Asbestos Free

G. ASTM D6164 – Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using a Combination of Polyester and Glass Fiber Reinforcements

H. ASTM E96/E96M – Standard Test Method for Water Vapor Transmission of Materials

I. ASTM E108 Standard Test Methods for Fire Test of Roof Coverings

J. ASCE 7-16 – Minimum Design Loads for Buildings and Other Structures

K. NRCA - Roofing and Waterproofing Manual, Current Edition

L. UL - Fire Hazard Classifications

M. UL – Roofing System & Material Guide

N. FBC - Florida Building Code

O. FFPC – Florida Fire Prevention Code

P. LEED for Schools by USGBC

1.5 SUBMITTALS

A. Product Data: Submit specifications, installation instructions, and general recommendations from manufacturers of roofing system materials, for type of roofing required.

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B. Shop Drawings: Submit complete installation details showing roof configuration, sheet layout, seam locations, flashing, roof slopes, details at each different perimeter condition and special conditions.
   1. Provide fastening pattern layout in compliance with ASCE 7-16.
   2. Provide a copy of product approval for the system, per FBC requirements.

C. Samples: Submit 8” x 10" sized products.

D. Certificates included with closeout documents:
   1. At completion of work, submit Manufacturers certification that roofing system installation is in accordance with Manufacturer’s warranty requirements.

E. Safety Provisions:
   1. Submit a complete detailed schedule of special safety provisions implemented to insure the health and safety of the people.
   2. Work shall not start without the Owner’s agreement of the following provisions:
      a. A plan on how to maintain the school’s existing exits and fire protection systems during construction;
      b. A plan for the sequencing of work, including the removal of debris from the site during and after construction;
      c. A fall protection plan indicating the contractor plans for complying with OSHA’s requirements.

1.6 QUALITY ASSURANCE

A. Manufacturer:
   1. Obtain primary roofing materials from a single manufacturer, with at least 10-years of documented experience in the roofing material business.

B. Installer: Shall be a Company specializing in installation of bituminous roofing, minimum five-years of continuous documented experience operating under the same name, with extensive experience in the application of roofs of similar size and type, and approved in writing by manufacturer of accepted roofing system.
   1. The job supervisor shall have minimum 5-years of documented experience in supervising projects of this size and scope.

C. All work shall conform to NRCA Roofing and Waterproofing Manual, and to manufacturers' instructions.

D. Requirements of Regulatory Agencies:
   1. Underwriter's Laboratories, Inc.: Class A fire hazard classification.
   2. Roofing system shall meet current ASCE 7-16 wind requirements for the roofing system.

E. Pre-Installation Conference:
   1. Prior to installation of roofing system, conduct a pre-installation site conference after submittal approval.
   2. Attendance: Owners Representative, Building Department Representative, Architect, Contractor, Job Superintendent, Subcontractors, and Manufacturer’s Representative related to roofing work.
   3. Agenda: Review project conditions, application, coordination with other work, and protection of completed roofing.

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F. Inspections:
   1. Provide on-site weekly inspections by Owner’s representative during and after installation of roofing system.
   2. Provided through the Building Department as necessary to assure proper installation of the roofing system.
   3. Manufacturer’s representative as necessary to supply the warranty.

1.7 DELIVERY, STORAGE AND HANDLING

A. Deliver materials in manufacturer's original, unopened containers or packages with labels intact and legible, including required fire resistance classification labels.

B. Store and handle material per manufacturer's requirements.

C. Store rolled goods on end on clean raised platforms with a breathable weather protective covering, such as canvas, when stored outdoors.

D. Provide continuous protection of materials against wetting and absorption; remove wet materials from project site.

E. Rooftop Storage: Disperse material evenly across the roof to avoid concentrated loading.

1.8 PROJECT CONDITIONS

A. Proceed with roofing work only if weather conditions permit work in accordance with manufacturers' recommendations and warranty requirements.

B. Do not apply roofing membrane to damp deck surface.

1.9 WARRANTIES

A. Installer's Warranty: Provide written warranty signed by the roofing Installer and the Contractor agreeing to replace or repair defective components and workmanship of the total roofing system for a period of two-years after date of Substantial Completion of the project.

B. Manufacturer's Warranty: Provide written warranty signed by the Manufacturer of the primary roofing materials agreeing to replace or repair defective roof membrane and flashing materials and workmanship as required to maintain the roofing system in a watertight condition at no expense to the Owner for a period of 20-years after date of Substantial Completion of the Project.
   1. In addition, provide written warranty signed by the manufacturer of primary roofing materials agreeing to allow Owner to make emergency repairs to roof without voiding manufacturer's warranty.
   2. Specifications on repair of the membrane Owner may do without voiding warranty.
   3. Warranty shall include coverage for damage to building resulting from failure of roof system to resist penetration of water with no dollar limit to the value of repairs or replacements covered.
   4. Warranty shall include coverage up to design wind loads against damage due to wind uplift. Prefabricated coping is a requirement of the District and shall be included as part of such warranty.

C. Provide on-site inspections by roofing manufacturer's representative during installation of roofing.

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D. Manufacturer's Certification: Submit written certification signed by manufacturer stating that the roofing system manufacturer will provide warranties and that this specification meets the requirements of the 20-year warranty.

PART 2 PRODUCTS

2.1 MODIFIED BITUMEN ROOFING SYSTEMS, 3-PLY

A. Approved Manufacturers:
   1. Johns Manville
   2. Soprema Inc
   3. The Garland Company
   4. Polyglass USA
   5. Other pre-approved equal

B. THREE-PLY SYSTEM over light weight concrete and metal deck, Membrane Properties:
   1. Anchor sheet (anchor ply), reinforced modified bitumen coated membrane, per ASTM D4601
      a. 1.5mm (59 mils) thickness minimum
   2. One ply (interply), modified bitumen base sheet per ASTM D6164
      a. 3.0 mm (118 mils) minimum thickness
   3. One ply, modified bitumen membrane, granular surfaced, fire retardant, cap sheet per ASTM D6164
      a. 4.0 mm (160 mils) nominal thickness
      b. The cap sheet will meet the initial SRI and 3-year aged Thermal Emittance required by the green rating system, if required by the project Architect
      c. The cap sheet will meet energy code requirements as absolute minimum criteria.

C. COMMON ELEMENTS/COMPONENTS
   1. Roof covering shall be Class A fire rating
   2. Primer: ASTM D41/D41M
   3. Roofing Cement: ASTM D4586/D4586M, asbestos-free
   4. Mineral Granules: Size No. 11 ceramic, white in color, free of fines and dust, unaffected by airborne acids and ultraviolet radiation

2.2 ACCESSORIES

A. Roof System Vents: Manufacturer's standard spun aluminum one-way venting

B. Cant Strip: mineral wool, modified bitumen, torch or cold adhesive applied (optional use of cant strip if approved by manufacturer)

C. Low Profile Roof Expansion Joint System

D. Walk Pads: SBS-modified bitumen ply, 5.0 mm (197 mils) minimum

2.3 LIGHTWEIGHT CONCRETE INSULATION

A. Lightweight Concrete Insulation: cellular insulating concrete with EPS insulation board, stair stepped as required.
   1. Acceptable insulation products as manufactured by Elastizell, Celcore, Concrecel, or Mearlcrete.

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a. Insulation thickness as shown on drawings to a minimum of 2” at all roof drains shall provide a minimum insulation value as required by FBC-Energy Conservation.

B. Fastening Devices: Provide membrane manufacturers' insulation fastening system of appropriate size and nailing pattern as designed and tested in the Product Approval documents.

C. Provide vented deck system for lightweight concrete.

PART 3 EXECUTION

3.1 PRE-INSTALLATION REQUIREMENTS

A. Do not start the installation of accessories or membrane without the presence of the Manufacturer's Technical Representative. This requirement shall not be waived.
1. Due to the incompatibility of various materials with the roofing membrane, the Representative shall inspect the substrate and shall have a barrier applied for complete separation and protection of the roofing membrane and accessories.

B. Install all vents, drains, curbs, nailers, blocking, insulation, and projections through the roof before starting membrane installation.
1. These items may be installed after the membrane installation only with Architect’s written approval, proper provision for re-inspection, and continued warranty protection.

3.2 PREPARATION OF SUBSTRATE

A. Insulation:
1. The applicator shall carefully inspect all surfaces to receive insulation and assure all surfaces are satisfactory prior to beginning installation.
2. Beginning insulation installation constitutes acceptance of substrate without recourse.

B. Roofing Membrane: The manufacturer's Technical Service Representative shall carefully inspect the substrate receiving the roofing and provide a written report.

C. Install all nails, blocking, vertical surfaces, etc. prior to proceeding with membrane installation.

D. Verify that all units are properly secured in place prior to proceeding with membrane installation.

3.3 LIGHTWEIGHT CONCRETE INSTALLATIONS

A. Slurry: Cover the metal deck with a ⅛" inch slurry coat of the lightweight insulating fill.

B. Insulation Board: Place the insulation board in the ⅛" slurry coat.
1. Place the insulation board within 30 minutes of slurry coat placement.
2. Place the insulation board in a manner that provides full contact of slurry to board.
3. Install the insulation board in a stair-stepped configuration to achieve the minimum ⅛" per foot slope.

C. Lightweight Insulating Fill: Within 4 hours of insulation board placement, install a minimum of 2" of lightweight insulating fill over the insulation board, screened to an even surface for the receive the roofing membrane.

D. Do not install more insulation each day than can be covered with a watertight cover before end of day or start of inclement weather.

E. Vent insulation board to roof edges as recommended by manufacturer.

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3.4 INSTALLATION OF ROOFING MEMBRANE SYSTEM & LIGHTWEIGHT CONCRETE & METAL DECK

A. Install in accordance with accepted roofing manufacturer's specification and recommendations, and as specified below.
   1. Phased construction of roofing membrane is strictly prohibited.

B. Apply an anchor sheet and two plys, over a lightweight concrete and structural concrete deck
   1. Mechanically attach the anchor sheet to the new lightweight concrete deck in a pattern to meet ASCE 7 as per manufacturer recommendations and the Product Approvals for wind uplift classification, minimum 180 mph or as specified by structural engineer.
   2. Torch apply or use cold adhesive to adhere a base sheet and a cap sheet to complete the system.
      a. Remove the roll wrapping tape and labels before membrane installation.
      b. Unroll first roll of membrane completely and align.
         1) Unroll remaining rolls approximately halfway in order to align the side laps and maintain the required end lap.
         2) Installation shall start at the lowest point and continue in a shingle method.
      c. Re-roll one end of the roll, approximately half way to facilitate alignment.
      d. Roll up the un-adhered half of the membrane sheet and repeat the above procedure to complete the installation of the roll.
      e. Apply membrane: seal seams, ends, and permanently waterproof.
      f. Apply membrane smooth, free from air pockets, wrinkles, or tears.
      g. Extend membrane up cant strips a minimum of 4" onto vertical surfaces.
      h. Seal membrane around roof penetrations.
      i. Keep rooftop traffic to a minimum shortly after installation of membrane in order to minimize damage.

C. Complete installation of modified roofing system up to line of termination of day's work.
   1. Install temporary water cut-offs of plastic cement and base sheet strips at end of each day's work.
   2. Remove upon resumption of work.

D. Base Flashing:
   1. Install in accordance with requirements of roofing system manufacturer.
   2. Install where roofing system abuts vertical surfaces and at other locations detailed.

E. Roof Edging:
   1. Prior to application of metal edging treatment, extend roofing felts up over tapered edging and secure to wood nailer with base felt extended and folded back over ply felts.
   2. After metal edging is in place, flash as recommended by roofing manufacturer.

F. Flashings: Install metal flashings in such a manner as to prevent leaks.

G. Venting Light Weight Concrete: Provide aluminum one-way vent stacks for every 900 square feet of roof area or as recommended by manufacturer (when light weight concrete system not vented through metal deck).

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3.5 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Provide periodic inspections of roof application by qualified technical representative of roofing manufacturer.

3.6 CLEANING

A. Clean up debris, excess materials, and equipment and remove from site.

B. Remove bitumen from surfaces other than those requiring bituminous roof coatings.

C. Remove bituminous markings from finished surfaces.

3.7 PROTECTION

A. Provide special protection or avoid heavy traffic on completed work when ambient temperature is above 80°F.

B. Restore to original condition or replace work or materials damaged during handling of bitumen and roofing materials.

C. Do not transverse any walkways where new work has been completed where traffic must continue over finished roof membrane, protect surfaces.

D. Do not throw or drop debris from roof, use chutes, or high lift trucks.

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SECTION 07 60 00
FLASHING, GUTTERS, DOWNSPOUTS, AND OTHER ACCESSORIES

PART 1 GENERAL

1.1 RELATED SECTIONS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 specification sections, apply to work in this section.

B. Wood Curbs and Nailers - Section 06 10 00

C. Modified Bitumen Membrane Roofing - Section 07 52 00

D. Metal Roof Panels - Section 07 61 13: Flashing, trim, gutter and downspout components as part of Metal Roof System.

E. Joint Sealants - Section 07 92 00

1.2 SECTIONS INCLUDE

A. Shop or field-formed sheet metal work for moisture protection

B. Miscellaneous sheet metal accessories

1.3 QUALITY ASSURANCE

A. All welding personnel affiliated with the site construction shall be approved certified welders and shall supply certified welding certificates to the School Board Project Facility Manager prior to commencing work.

B. Applicator/Installer shall be a company specializing in sheet metal flashing work with minimum 5 years of experience.

C. Job supervisor shall have minimum 5-years of documented trade experience in supervision of projects of this size and type.

D. Manufacturer Qualifications: A qualified manufacturer offering products meeting the requirements that are ANSI/SPRI FM 4435 ES-1 tested.

E. Products shall be manufactured in specified manufacturer's facilities. Products fabricated by installer or other fabricator will not be acceptable unless fabricator can demonstrate to Architect's satisfaction that products have been tested and passed SPRI RE-1, RE-2, and RE-3 Wind Design Standard, and meet specified pressures for perimeter and corner zones.

1.4 REFERENCES

A. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2022.

B. ASTM A167 – Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip

C. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process

D. ASTM B32 – Standard Specification for Solder Metal

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E. ASTM B101 - Standard Specification for Lead-Coated Copper Sheet and Strip for Building Construction

F. ASTM B209 – Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate

G. ASTM B370 – Standard Specification for Copper Sheet and Strip for Building Construction

H. ASTM B813 - Standard Specification for Liquid and Paste Fluxes for Soldering of Copper and Copper Alloy Tube

I. ASTM D226/D226M – Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing

J. ASTM D4586/D4586M – Standard Specification for Asphalt Roof Cement, Asbestos-Free

K. FED A-A-51145 - Flux, Soldering, Non-Electronic Paste and Liquid

L. NRCA (National Roofing Contractors Association) - Roofing Manual

M. SMACNA - Architectural Sheet Metal Manual

N. FBC - Florida Building Code

O. Factory Mutual (FM Global): FM Property Loss Prevention Data Sheet 1-49

P. ANSI/SPRI/FM 4435 ES-1 – Wind Design Standard for Edge Systems Used with Low Slope Roofing Systems (RE-1, RE-2, and RE-3 Testing).

Q. 2018 International Building Code Chapter 15, Section 1504.5 Edge Securement for Low-Slope Roofs.

R. American Society of Civil Engineers (ASCE-7) Minimum Design Loads for Buildings and Other Structures, Chapter 26, Wind Loads: General Requirements and Chapter 30, Wind Loads: Components and Cladding.

S. State Product Approval Documentation (current), ie. Miami-Dade County NOA, FL Issue, 3rd Party Evaluation Firm.

1.5 SUBMITTALS

A. Product Data: Submit manufacturer's product data, installation instructions, and general recommendations for each specified sheet material and fabricated product.

B. Samples: Submit 8" square samples of specified sheet materials exposed as finished surfaces.
   1. Submit 12" long, completely finished units of specified factory-fabricated products.
   2. Submit samples of splash pads.

C. Provide FBC product approval if system is not covered in the product approval for roof covering.

PART 2 PRODUCTS

2.1 FLASHING, FASCIA, COPINGS, GUTTERS, DOWNSPOUTS, AND OTHER ACCESSORIES

A. Sheet Metal Flashing/Trim:
   1. ~~Copper: ASTM B370, cold rolled 20 oz/sq ft; lacquered finish~~
   2. Stainless Steel: ASTM A167, Type 304, soft temper; smooth patterned finish

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3. Aluminum: ASTM B-209, .040 gauge (minimum). Not allowable within 1600' of coastal areas.

B. Roof Edge Fascia: Manufactured, two-piece, roof-edge fascia consisting of snap-on metal fascia cover in section lengths not exceeding 12 feet and a continuous extruded cleat to engage cover and secure membrane, Provide matching corner units.
   1. Roof edge fascia, including components, shall be manufactured by same manufacturer at manufacturer's facility
   2. All fasteners shall be supplied by specified manufacturer and installed per manufacturer's written instructions.
   3. Tested per ANSI/SPRI/ FM 4435 ES-1 RE-1 and RE-2. Designed and installed to meet specified wind loads referenced on drawings for Zone 2 (Perimeter) and Zone 3 (Corner).
   4. Prefabricated Aluminum Sheet Fascia Cover- consisting of aluminum sheet of following thickness as determined by fascia face height indicated on drawings:
      a. up to 8-1/2 inches: 0.040 inch thick.
      b. 8-1/2 - 10 inches: 0.050 inch thick.
      c. 10 - 13 inches: 0.063 inch thick.
      d. when greater than 13 inches, refer to manufacturer.
   5. ~~Prefabricated Stainless Steel Sheet Fascia Cover- consisting of aluminum sheet of following thickness as determined by fascia face height indicated on drawings: up to 8-1/2", 24 gauge, 8 ½" - 10", 22 gauge, 10" to 13", 20 gauge, when greater than 13", refer to manufacturer.~~

C. Metal Copings: Manufactured coping system consisting of metal coping cap in section lengths not exceeding 12 feet, concealed anchorage with corner units, end caps, and concealed splice plates. Finish to match coping metal.
   1. All components of coping caps, corners and system shall be manufactured by the same manufacturer.
   2. All fasteners shall be concealed, supplied by specified manufacturer, and installed per manufacturer's written instructions.
   3. Tested: ANSI/SPRI FM 4435 ES-1 RE-2 and RE-3. Designed and installed to meet wind loads specified on drawings for Zone 2 (Perimeter) and Zone 3 (Corner).
   4. Prefabricated Aluminum Sheet Coping Cap Cover: Aluminum sheet of following thickness as determined by width of covered wall indicated on drawings:
      a. up to 12 inches: 0.040 inch thick.
      b. 12 - 16 inches: 0.050 inch thick.
      c. 16 - 24 inches: 0.063 inch thick.
      d. when greater than 24 inches, refer to manufacturer.
   5. ~~Prefabricated Stainless Sheet Coping Cap Cover: Stainless Steel sheet of following thickness as determined by width of covered wall indicated on drawings: up to 12", 24 gauge, greater than 24", 22 gauge, greater than 24", refer to manufacturer.~~
   6. Coping cap attachment method: Snap-on
   7. Snap-on coping anchor plates: Concealed, galvanized sheet-metal, 12 inches wide with integral cleats.

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D. Sheet Metal Gutters and Collector Heads:
   1. Form gutters in sections not to exceed 12’ lengths (and not less than 8' lengths) complete with end pieces, outlet tubes, and special pieces as necessary.
   2. Keep joints to minimum, but any joint that is required, rivet, and seal.
   3. Unless otherwise indicated, provide expansion joint with cover plate where indicated but no more than 50' between expansion joints.
   4. Furnish gutter supports constructed of same metal as gutters, spaced at 3 feet o. c. per SMACNA plate 13, Chart 9.
      a. Provide standard aluminum-wire ball strainers at each outlet.
   5. Gutters and Collector Heads shall be aluminum ~~or stainless steel~~.
   6. The Architect based the gutter and collector head size upon a minimum rainfall rate of 8 inches per hour over five-minute duration.

E. PVC Downspouts:
   1. All downspouts shall be PVC Schedule 40, painted.
   2. Space 8-gauge aluminum downspout straps at a maximum of 4' o.c.
   3. All strap edges shall be rolled or smooth.
   4. Downspout size and configuration shall be at a minimum the sizes and locations shown on the drawings.
   5. The Architect based the gutter size upon a minimum rainfall rate of 8" per hour for five-minute duration.
   6. Configure supports to avoid forming ladders for students to use as a means to climb to the roof while maintaining proper support of the downspout to prevent separation of the downspout at all connections joints.

F. Vent Stack Flashing:
   1. Provide and install stainless steel vent extensions with a stainless steel vandal resistant cap.
   2. Field verify the flashing height prior to ordering/installation to comply with the plans.

G. Finish: ~~All flashing, trim, gutters, and downspout guards shall be mill finish.~~
   1. Aluminum components: Pre-finished, Fluoropolymer Coating.
      a. Superior Performance Organic Finish, AAMA 2605; multiple coat, thermally cured fluoropolymer finish system.
      b. Color: As selected by Architect from manufacturer's standard colors.
   2. Stainless Steel components: mill finish.

H. Reglets and Counter-flashings: Shall be prefabricated, 24-gauge stainless steel with factory mitered corners.
   1. Provide continuous foam backer rod and elastomeric sealant where shown.

I. Miscellaneous Materials and Accessories:
   1. Solder: Provide approved sheet metal compatible lead free solder with resin flux.
   2. Fasteners: Provide and install Stainless Steel or other non-corrosive metal as recommended by manufacturer.
      a. Match finish of exposed heads with material it is fastening.

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3. Bituminous Coating: FS TT-C-494 or SSPC-Paint 12, solvent type bituminous mastic, nominally free of sulfur, compounded for 15-mil dry film thickness per coat.
4. Metal Accessories: Provide sheet metal clips, straps, anchoring devices and similar accessory units as required for installation of work, matching or compatible with material it is fastening, non-corrosive, size, and gauge required for performance.
5. Roofing Cement: Provide product meeting ASTM D4586 with no asbestos.
6. Master Sealant: For slipping joints in flashings shall be polyisobutylene and be non-hardening, non-migrating, non-skinning, and non-drying.
7. Back paint concealed metal surfaces with protective backing paint to a minimum dry film thickness of 15-mil.

2.2 FABRICATED UNITS

A. Shop-fabricate work to greatest extent possible.

B. Comply with details shown and with applicable requirements of SMACNA Architectural Sheet Metal Manual.

C. Form exposed sheet metal work without excessive oil-canning, buckling and tool marks, true to line and levels as indicated with exposed edges folded back to form hems.

D. Fabricate non-moving seams in sheet metal with flat-lock seams.

E. When movable expansion type joints indicated on plans or required for proper performance of work, form metal to provide for proper installation of elastomeric sealant, in compliance with SMACNA standards.

2.3 ACCESSORIES

A. Splash Pads: Provide and install precast concrete type.

PART 3 EXECUTION

3.1 INSTALLATION REQUIREMENTS

A. Except as otherwise indicated, comply with manufacturer's installation instructions and recommendations and with SMACNA Architectural Sheet Metal Manual.

B. Anchor units of work securely in place by methods indicated, providing for thermal expansion of metal units; conceal fasteners and set units true to line and level as indicated.

C. Provide drip edge flashing with concealed splice plates for joints 10' o. c.

D. Bed flanges of work in a thick coat of bituminous roofing cement where required for waterproofing performance.

E. Install counter-flashing in reglets by snap-in seal arrangement.

3.2 CLEANING AND PROTECTION

A. Clean all exposed metal surfaces, removing substances that might cause corrosion of metal or deterioration of finishes.

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B. Provide for surveillance and protection of flashings and sheet metal work during construction, to ensure the work will be without damage or deterioration, other than natural weathering at time of substantial completion.

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SECTION 07 72 33
ROOF HATCHES

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 work in this section.

B. Modified Bitumen Membrane Roofing – Section 07 52 00

1.2 DESCRIPTION OF WORK

A. Prefabricated roof hatches with integral support curbs, operable hardware, counter-flashings, and OSHA compliant hatch rail system.

1.3 REFERENCES

A. OSHA – Occupational Safety and Health Administration

B. FM – Roof Assembly Classifications

C. UL – Fire Hazard Classifications

D. Florida Building Code

1.4 QUALITY ASSURANCE

A. Manufacturer: Company specializing in manufacturing the products specified in this section with minimum 5-years documented experience.

B. The same manufacturer shall provide roof hatches and hatch railing system.

1.5 SUBMITTALS

A. Product Data: Provide data on unit construction, size and configuration, jointing methods, attachment method, and manufacturer's installation instructions.

B. Product Approval: Florida Building Code "FLA (PAD)" Product Approval.

1.6 REGULATORY REQUIREMENTS

A. Conform to applicable Code for UL and FM requirements for fire rated roof hatches.

B. Provide certificate of compliance from the manufacturer indicating testing lab approval of fire or smoke rated units.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with requirements, provide products by one of the following:
   1. Bilco Company
   2. Milcor, Inc.
   3. Babcock-Davis Hatchways, Inc.

2.2 ROOF HATCH SYSTEM

A. Integral Steel Cover: 14-gauge galvanized, prime painted steel, ASTM A653/A653M, with rigid foam insulation; integral cap flashing to receive roof flashing; extended flange for mounting.
   1. Cover to be double wall construction with 1-inch thick insulation core.

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B. Flush Steel Cover: 14-gauge galvanized, prime painted steel with foam insulation, 22-gauge steel interior liner, and continuous neoprene gasket to provide weatherproof seal.

C. Gaskets: Provide Manufacturer's standard design of neoprene or EDPM.

D. Hardware:
   1. Provide compression spring operators and shock absorbers.
   2. Steel manual pull handle for interior and exterior operation.
   3. Steel hold-open arm with vinyl covered grip handle.
   4. Padlock hasp.
   5. Hinges use manufacturer's standard type.

E. Size: As indicated on drawings; single-leaf style.
   1. Opening dimensions must meet requirements of the Florida Building Code (FBC) Section 1011.12.2 Roof access.

2.3 HATCH RAIL SYSTEM

A. Furnish and install as indicated on plans hatch rail system with self-closing gate.
   1. HSF series by Fall Protection USA.com
   2. KHML series by Keehatch Roof Hatch Railing System
   3. RHSR series by Keehatch Roof Hatch Railing System
   4. Milcor safety rail system
   5. SRCG series by Babcock-Davis
   6. Approved equal

B. Performance characteristics:
   1. Hatch rail system shall satisfy the requirements of OSHA 29 CFR 1910.23 and shall meet OSHA strength requirements with a factor of safety of two.

C. Posts and Rails: Shall be round hot dipped galvanized steel, stainless steel, or aluminum. Fiberglass is not acceptable.

2.4 FABRICATION

A. Fabricate units to withstand 40-lb/SF (external) and 20-lb/SF (internal) loading pressure.
   1. Curb to be min. 12" high, integral with double wall construction and insulation.

B. Fully weld all joints and corners.

C. Provide for removal of condensation occurring within components or assembly.

D. Fit components for weather-tight assembly.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Coordinate with installation of the roofing system and related flashings for a weather-tight installation.

3.2 PROTECTION OF FINISHED WORK

A. Protect adjacent surfaces from damage by material installation.

B. Protect installation during construction activities.

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C. Adjust hinges for a smooth operation.

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SECTION 07 81 16
CEMENTITIOUS FIREPROOFING

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. The provisions of the general Conditions, Supplementary Conditions, and the Sections included under Division 1, General Requirements, are included as a part of this Section.

1.2 SECTION INCLUDES

A. Cementitious mineral fiber reinforced fireproofing, spray applied.

1.3 REFERENCES

A. ASTM E72 – Standard Test Method For Conducting Strength Tests of Panels for Building Construction
B. ASTM E84 – Standard Test Method for Surface Burning Characteristics of Building Materials
C. ASTM E119 – Standard Test Method for Fire Tests of Building Construction and Materials
D. ASTM E605 – Standard Test Methods for Thickness and Density of Sprayed Fire-Resistive Material (SFRM) Applied to Structural Members
E. ASTM E736 – Standard Test Method for Cohesion/Adhesion of Sprayed Fire-Resistive Materials Applied to Structural Members
F. ASTM E759 – Standard Test Method for Effect of Deflection on Sprayed Fire Resistive Material Applied to Structural Members
G. ASTM E761 – Standard Test Method for Compressive Strength of Sprayed Fire-Resistive Material Applied to Structural Members
H. ASTM E859 – Standard Test Method for Air Erosion of Sprayed Fire Resistive Materials (SFRMs) Applied to Structural Members
I. ASTM E937 - Standard Test Method for Corrosion of Steel by Sprayed Resistive Material (SFRM) Applied to Structural Members
J. ASTM E1354 - Standard Test Method for Heat and Visible Smoke Release Rates for Materials and Products Using an Oxygen Consumption Calorimeter
K. ASTM G21 – Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi
L. UL (Underwriters Laboratories, Inc.) - Fire Hazard Classifications
M. FBC - Florida Building Code

1.4 SUBMITTALS

A. Submit under provisions of Section 01 33 00.
B. Product Data: Provide data indicating product characteristics, performance and limitation criteria.
C. Test Reports: Indicating the following:
    1. Bond Strength of Fireproofing: ASTM E72, tested to provide minimum bond strength twenty-times weight of fireproofing materials.
    2. Reports from reputable independent testing agencies, of product proposed for use, which indicate conformance to ASTM E119 and ASTM E84.
D. Manufacturer's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention.
E. Manufacturer's Certificate: Certify that Products meet or exceed specified requirements.
F. Manufacturer's Field Reports: Indicate environmental conditions during the installation of fireproofing materials. Submit under provisions of Section 01 40 00.

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1.5 QUALIFICATIONS
- A. Manufacturer: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
- B. Applicator: Manufacturer approved Company specializing in applying the work of this section.

1.6 REGULATORY REQUIREMENTS
- A. Conform to applicable code for fire resistance ratings.

1.7 MOCKUP
- A. Provide mockup of applied cementitious fireproofing under provisions of Section 01 40 00.
- B. Locate where directed.
- C. Mockup may remain as part of the work.

1.8 PRE-INSTALLATION CONFERENCE
- A. Convene 2-weeks prior to commencing work of this section, under provisions of Section 01 31 00.

1.9 ENVIRONMENTAL REQUIREMENTS
- A. Apply spray fireproofing when temperature of substrate material and surrounding air meets manufacturer's installation instructions.
- B. Provide ventilation in areas receiving fireproofing during and 24 hours after application
- C. Provide temporary enclosure to prevent spray from contaminating air.

1.10 SEQUENCING
- A. Sequence work in conjunction with placement of ceiling hangers, mechanical component hangers and electrical components.

1.11 WARRANTY
- A. Provide 5-year warranty under provisions of Section 01 77 00.
- B. Warranty: Include coverage for fireproofing to remain free from cracking, checking, dusting, flaking, spalling, separation, and blistering. Reinstall or repair failures.

PART 2 PRODUCTS

2.1 MATERIAL
- A. Fireproofing shall be a factory mixed cementitious mixture blended for uniform texture, non-fibrous material.

2.2 PHYSICAL PERFORMANCE CHARACTERISTICS
- A. Fireproofing material shall meet the following performance standards:
  1. Dry Density: Measure the field density in accordance with ASTM Standard E605.
     a. Minimum average density shall be that listed in the UL Fire Resistance Directory for each rating indicated or minimum average 19 pcf, whichever is greater.
  2. Deflection: Material shall not crack or delaminate from the sub-surface when tested in accordance with ASTM E759.
  3. Bond Impact: Material shall meet impact tests of ASTM E736, with minimum average bond strength of 200 psf and minimum individual bond strength of 150 psf.
  4. Air Erosion: Maximum allowable total weight loss of the fireproofing material shall be .005 g/sq. ft. when tested in accordance with ASTM E859.
     a. Sample surface shall be "as applied" and the total reported weight loss shall be the total weight loss over a 24-hour period from the beginning of the test.
  5. High Speed Air Erosion: Materials used in plenums or ducts shall exhibit no continued erosion after 4 hours at an air speed of 47 km/h when tested in accordance with the UMC Standard 6-1 and ASTM E859.
  6. Compressive Strength: The fireproofing shall not deform more than 10% when subjected to

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compressive forces of 1200 psf when tested in accordance with ASTM E761.

7. Corrosion Resistance: Test fireproofing applied to steel in accordance with ASTM E937, shall not promote corrosion of steel.
8. Surface Burning Characteristics: Material shall exhibit the following surface burning characteristics when tested in accordance with ASTM E84, Flame Spread 0, and Smoke Development 0.
9. Resistance to Mold: Formulate the fireproofing material at the time of manufacturing with a mold inhibitor.
    a. Test fireproofing material per ASTM G21 and show resistance to mold growth for a period of 21 days for general use and 60 days for materials installed in plenums.
10. Combustibility: Material shall have a maximum 125 kW/m2 peak rate of heat release 600 seconds after insertion when tested in accordance with ASTM E1354 at a radiant heat flux of 75kW/m2 with the use of electric spark ignition.
    a. Test the sample in the horizontal orientation.

B. Mixing water shall be clean, fresh, and suitable consumption and free from such amounts of mineral or organic substances as would affect the set of the fireproofing material.
    1. Provide water with sufficient pressure and volume to meet the fireproofing application schedule.

2.3 ACCESSORIES

A. Provide accessories to comply with the manufacturer's recommendations and to meet fire resistance design and code requirements.
B. Such accessories include, but not limited to, any required or optional items such as bonding agents; mechanical attachments; application aids as metal lath, scrim, or netting; or accelerators.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that surfaces are ready to receive work.
B. Verify that clips, hangers, supports, sleeves, and other items required to penetrate fireproofing are in place.
C. Verify ducts, piping, equipment, or other items that may interfere with application of fireproofing are not in position until fireproofing work is complete.
D. Verify that voids and cracks in substrate are filled, and projections are removed where fireproofing is exposed to view as a finish material.

3.2 PREPARATION

A. Clean substrate of dirt, dust, grease, oil, loose material, or other matter that may affect bond of fireproofing.
B. Remove incompatible materials that effect bond by scraping, brushing, scrubbing, or sandblasting.

3.3 PROTECTION

A. Protect surfaces not scheduled for fireproofing and equipment from damage by over spray, fall-out, and dusting.
B. Close off and seal ductwork in areas where fireproofing is being applied.

3.4 APPLICATION

A. Install metal lath over structural members and as indicated on shop drawings.
B. Apply adhesive, fireproofing, and overcoat in accordance with manufacturer's instructions.
C. Apply fireproofing in sufficient thickness to achieve rating with as many passes necessary to cover with monolithic blanket of uniform density and texture.

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3.5 FIELD QUALITY CONTROL

A. Perform field inspection and testing under provisions of Section 01 40 00.
B. Inspect the installed fireproofing after application and curing for integrity of fire protection, prior to concealment of work.
C. Re-inspect installed fireproofing for integrity of fire protection after installation of subsequent work.

3.6 CLEANING

A. Clean work under provisions of 01 77 00.
B. Remove excess material, over spray, droppings, and debris.
C. Remove fireproofing from materials and surfaces not requiring fireproofing.

END OF SECTION

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SECTION 07 84 00
FIRESTOP SYSTEMS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Applications of Firestop systems include:
   2. Penetrations for passage of duct, cable tray, conduit, piping, electrical busways and raceways through fire rated vertical barriers (walls and partitions), horizontal beams (floor/ceiling assemblies) and vertical service shaft walls and partitions
   3. Safing gaps between edge of floor slabs and curtain walls
   4. Gaps between tops of walls and ceiling or roof assemblies
   5. Expansion joints in fire rated walls and floors
   6. Openings and penetrations in fire rated partitions or walls containing fire doors
   7. Openings around structural membranes which penetrate fire rated floors or walls

B. Related sections:
   1. Concrete: Division 3 Concrete Sections
   2. Masonry: Division 4 Masonry Sections
   3. Insulation: Division 7 Saving Insulation and accessories
   4. Gypsum Drywall: Section 09 29 00
   5. Mechanical: Division 23 Mechanical Sections
   6. Plumbing: Divisions 21 and 22 Fire Suppression and Plumbing sections
   7. Electrical: Divisions 25, 26, and 27 Electrical Sections

1.2 REFERENCES

A. ASTM E84 – Standard Test Method for Surface Burning Characteristics of Building Materials
B. ASTM E119 – Standard Test Method for Fire Tests of Building Construction and Materials
C. ASTM E814 – Standard Test Method of Fire Tests of Through Penetration Firestop
D. ASTM E1966 – Standard Test Methods for Fire Tests of Joints
E. FM (Factory Mutual) - Fire Hazard Classifications
F. UL - Fire Hazard Classifications
G. UL 2079 – Tests for Fire Resistance of Building Joint Systems
H. UL 1479 – Fire Tests of Through-Penetration Firestop
I. WH (Warnock Hersey) - Certification Listings
J. FBC - Florida Building Code

1.3 SYSTEM DESCRIPTION

A. Provide Firestop systems manufactured and installed to maintain performance criteria stated by manufacturing without defects, damage, or failure.

1.4 SUBMITTALS

A. Comply with pertinent provisions of Section 01300.
B. Product Data:
   1. Materials list of items used under this Section.
   2. Provide the manufacturer's specifications and data.
   3. Shop Drawings:
      a. Submit shop drawings showing layout, profiles, and product components.
      b. Include Independent laboratory with system classification number on shop drawings.
   4. Provide written documentation of applicator's qualifications, including reference projects of similar scope and complexity, with current phone contacts of references for

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verification.

5. Certification from sealant manufacturers that their products are suitable for the use indicated and comply with specification requirements.

1.5 QUALITY ASSURANCE

A. Use adequate numbers of skilled workers thoroughly trained and experienced in the necessary crafts and completely familiar with the specified requirements and methods needed for proper performance of the work of this Section.

B. Applicator Qualifications:

1. Applicator shall have at least 3-years experience in installing materials of types specified and shall have successfully completed at least 3-projects of similar scope and complexity.
2. Manufacturer approved applicator.
3. Applicator shall designate a single individual as project supervisor who shall be on site at all times during installation.

C. Single source responsibility for firestopping materials:

1. Obtain Firestop materials from single manufacturer for each different product required.
2. Manufacturer shall instruct applicator in procedures for each material.

D. Regulatory Requirements:

1 Firestop System installation shall meet requirements of ASTM E814 and provide a fire-rating equal to that of the construction it penetrates.

2 Proposed Firestop materials and methods shall conform to applicable governing codes having local jurisdiction.

3 For those Firestop applications not having an UL or third party tested system available through any manufacturer.

a Prior to installation the manufacturer may submit to the authorities having jurisdiction for their consideration an engineering judgment derived from similar independently tested system of similar design.

b Manufacturer's engineering judgment drawings must follow requirements set forth by the International Firestop Council.

1.6 MOCKUP

A. Provide mockups of applied Firestop assemblies under provisions of Section 01 40 00.

B. Apply 3 sq. ft. to a representative substrate surface.

C. Apply Firestop material to a representative penetrated masonry, concrete, stud wall, and substrate.

D. If accepted, mockup will demonstrate minimum standard of the Work.

E. Mockup may remain as part of the Work.

1.7 ENVIRONMENTAL REQUIREMENTS

A. Do not apply materials when temperature of substrate material and ambient air is below 60°F.

B. Maintain this minimum temperature before, during and three days after installation of materials.

C. Provide ventilation in areas to receive solvent cured materials.

PART 2 PRODUCTS

2.1 GENERAL

A. Product Categories

1. SILICONE ELASTOMERIC COMPOUND
   a. Single-component, neutral cure silicone firestopping sealant.
   b. Silicone Elastomeric high performance sealant is capable of plus or minus 25%

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movement.

2. ELASTOMERIC SEALANT
   a. Single component water-based acrylics Fire stop sealant, that allows for a plus or minus 25% movement.
3. INTUMESCENT SEALANTS
   a. Single component water-based, intumescent acrylic firestop sealant that expands filling any void caused when combustible materials burn.
   b. Sealant qualities include superb unprimed adhesion, easy gunning, and the ability to be painted once fully cured.
4. FIBER STUFFING
   a. 4 lb. to 8 lb. Mineral Wool or Cerablanket Insulation
5. MECHANICAL DEVICE WITH FILLERS
   a. Field fabricated or pre-fabricated collar device used to Firestop combustible pipe penetrations through walls or floors.
   b. Pre-fabricated Cast-in-Place devices affixed to forms prior to concrete pour used to Firestop combustible or non-combustible pipe penetrations through floors.
6. INTUMESCENT PUTTY
   a. A moldable intumescing putty that remains pliable allowing for easy retrofit and reduces sound transmission through assemblies.
7. FIRE PREVENTION PILLOW SYSTEM
   a. Intumescent moisture resistant, dust free fiberglass bags for sealing cable tray openings.
8. ACCESSORIES
   a. Use primer recommended by firestopping manufacturer for specific substrate surfaces.
   b. Installation Accessories are clips, collars, fasteners, temporary stops/dams, and other devices required to position and retain materials in place.

PART 3 EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS
   A. Provide copy of manufacturer's product data including product technical bulletins, product catalog, installation instructions, and product packaging instructions.

3.2 EXAMINATION
   A. Site Verification of Conditions:
      1. Verify substrate conditions, previously installed under other sections, are acceptable for product installation and product packaging instructions.
      2. Examine areas and conditions of work area and identify conditions detrimental to proper and timely completion.

3.3 PREPARATION
   A. Clean substrate surfaces of dirt, dust, grease, oil, loose material or other matter that may affect bond of firestopping material.
   B. Verify that penetrations and joints are properly sized
   C. Remove incompatible materials that may affect bond.
   D. Do not proceed until unsatisfactory conditions have been corrected

3.4 INSTALLATION
   A. Install Firestop materials in accordance with published "Through-Penetration Firestop Systems" in UL's Fire Resistant Directory or the publication of another approved independent

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laboratory

B. Comply with manufacturer's instructions for installation of Firestop Materials
   1. Seal all holes or voids made by penetrations to ensure an air and water resistant seal.
   2. Seal all joints to ensure an air and water resistant seal, capable to withstand compression and expansion due to thermal, wind or seismic joint movement
   3. Consult with Mechanical Engineer, Project Manager prior to installation of Third Party Tested Firestop Systems that might hamper the performance of fire dampers as it pertains to duct work.

3.5 FIELD QUALITY CONTROL
   A. Examine Firestop areas to ensure proper installation before concealing or enclosing areas
   B. Keep areas of work accessible until inspection by applicable code authorities

3.6 IDENTIFICATION
   A. Identify Firestop systems with pressure-sensitive, self-adhesive, printed vinyl labels.
   B. Attach labels permanently to surfaces of penetrated construction on both sides of each Firestop system installation where labels will be visible to anyone seeking to remove penetrating items or Firestop systems.
      1. Include the following information on labels:
         a. The words: “Warning: Through-Penetration Firestop system – Do Not Disturb”
         b. Contractor’s name, address and phone number
         c. Designation of applicable testing and inspection agency
         d. Date of installation
         e. Manufacturer’s name for Firestop materials

3.7 CLEANING
   A. Clean work under provisions of Section 01 77 00.
   B. Clean adjacent surfaces of firestopping materials.

3.8 PROTECTION OF FINISHED WORK
   A. Protect finished work under provisions of Section 01 50 00.
   B. Protect adjacent surfaces from damage by material installation.

END OF SECTION

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SECTION 07 92 00
JOINT SEALANTS

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 work in this section.

1.2 DESCRIPTION OF WORK
- A. This Contractor shall furnish and install all joint sealers as shown on the drawings or herein specified, or both.

1.3 JOB CONDITIONS
- A. This Contractor shall inspect the job conditions as he finds them, and his starting of the work constitutes approval of all conditions.

1.4 QUALITY ASSURANCE
- A. All manufacturer items must be factory labeled, on the material or its container.
- B. Manufacturer shall have a minimum of 10 years of experience specializing in specified item.
- C. Applicator shall be Sealant Manufacturer approved with 5-years of successful experience.

1.5 REFERENCES
- A. ACI 504 R – Guide to Joint Sealants for Concrete Structures
- B. ASTM C834 – Standard Specification for Latex Sealants
- C. ASTM C919 – Standard Practice for Use of Sealants in Acoustical Applications
- D. ASTM C920 – Standard Specification for Elastomeric Joint Sealants
- E. ASTM C1193 – Standard Guide for Use of Joint Sealants
- F. ASTM D1056 – Standard Specification for Flexible Cellular Materials - Sponge or Expanded Rubber

1.6 SUBMITTALS
- A. Submit manufacturer's detailed technical data for materials, fabrication, and installation, including catalog cuts of bond breakers, backer rods, and accessories.
  1. Submit full color samples for Architect selection.

1.7 DELIVERY, STORAGE, AND HANDLING
- A. Deliver materials to the project site in original unopened containers or bundles with labels indicating manufacturer, product name and designation, color, expiration period for use, pot life, curing time, and mixing instructions for multi-component materials.
- B. Store and handle materials in compliance with manufacturer’s requirements to prevent their deterioration or damage due to moisture, temperature, contaminants, or other causes.

1.8 WARRANTY
- A. The Contractor shall furnish written warranty that work executed under this section is free from defects of material and workmanship for a period of 1-year from date of substantial completion of the entire project.
  1. Include coverage that the Contractor will immediately and at its own expense, repair and replace all such defects as may develop during the term of this warrantee.

PART 2 PRODUCTS

2.1 MANUFACTURERS
- A. Manufacturers: Subject to compliance with the requirements, provide products by one on the following:

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1. DAP Products Inc., Dayton, Ohio
2. Dow Corning Corp., Midland, Michigan
3. Emseal Joint System, Ltd., Westborough, Massachusetts
4. General Electric Co., GE Silicones, Waterford, New York
5. Pecora Corp., Harleysville, Pennsylvania
6. Sonneborn Products Division of BASF
7. Tremco
8. Hilti Construction Chemicals

B. Contractor may request other products or manufacturers for acceptance provided they equal or exceed the material requirements and functional qualities of the specified product.

2.2 MATERIALS

A. General
1. The term “Acceptable Standard” when used within this Section, refers to the manufacturer and product listed, specified as to type and quality required for this project.
2. Contractor shall supply a single resource responsibility for joint sealer materials.
3. Compatibility: Provide joint sealers, joint fillers, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer based on testing and final experience.

B. Caulking Compounds (Acrylic Latex Sealant)
1. Latex rubber modified, acrylic emulsion polymer sealant compound; manufacturer’s standard, one part, non-sag, mildew resistant, acrylic emulsion sealant complying with ASTM C 834, formulated for accepting paint. (Product recommended for exposed interior locations involving joint movement of less than 5%).
2. Acceptable Standard
   a. “Sonolac”; Sonneborn Products, Inc
   b. “Acrylic Latex Caulk834”; Tremco, Inc
   c. “Acrylic Latex Caulk with Silicone”; DAP
   d. “AC-20”; Pecora Corp

C. One-Part Elastomeric Sealant (Silicone)
1. One component elastomeric sealant complying with ASTM C 920, Class 25, Type NS (non-sag), unless manufacturer recommends Type S (self-leveling) for the application shown.(general caulking , glazing applications).
   a. Acceptable Standard
      i) “Pecora 864NST Architectural Silicone Sealant; Pecora Corp.
      ii) “Dow Corning 791; Dow Corning Corp
      iii) “SCS2700 Silpruf”: General Electric
      iv) “Spectrem 2”; Tremco, Inc
2. One component mildew resistant silicone sealant used around countertops, backsplashes, and other wet interior locations.
   a. Acceptable Standard
      i) “Dow Corning 786”, Dow Corning Corp
      ii) “Sanitary 1700”; General Electric
3. One-component high movement joints (+100/-50) use sealants in locations indicating high movement.
   a. “Dow Corning 790”; Dow Corning Corp

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b. "Spectrem 1"; Tremco, Inc

D. Elastomeric Sealants (Polyurethane) – Precast concrete & Tilt-Up Concrete Panels
   1. One component polyurethane sealant, complying with ASTM C 920, Type S, Grade NS (non-sag), Class 25 (expansion and control joints, precast concrete panel joints, tilt-up concrete panel joints, perimeter caulking, flashing and sheet metal conditions).
      a. Acceptable Standard
         i) "Sonolastic NP 2"; Sonneborn Products, Inc
         ii) "Dymonic": Tremco, Inc
         iii) "Dynatrol I"; Pecora Corp
         iv) "CS 2130"; Hilti
   2. Multi- component polyurethane sealant, complying with ASTM C920, Type M, Grade N(non-sag)Class 25 (same uses as in previous item)
      a. Acceptable Standard
         i) "Sonolastic NP 2" Sonneborn Products, Inc
         ii) "Dymeric"; Tremco, Inc
         iii) "Dynatrol II"; Pecora Corp
         iv) "Vulkem 922"; Tremco
   3. Multi-component epoxidized polyurethane sealant complying with ASTM C 920, Type M, Grade NS, Class A (same uses as described in item 1, also used on fire resistance rated joint design details.)
      a. Acceptable Standard
         i) "Dymeric"; Tremco, Inc
         ii) "DynaTrol II"; Pecora Corp

E. One-part self-leveling polyurethane sealant (for traffic areas)
   1. One component polyurethane self-leveling sealant, complying with ASTM C 920, Type S, Grade P, Class 25.
      a. Acceptable Standard
         i) "Sonolastic SL 1"; Sonneborn Products, Inc
         ii) "NR-201 Urexpan"; Pecora Corp
         iii) "Vulkem 45"; Tremco
   2. Two component polyurethane self-leveling sealant, complying with ASTM C920, Type M, Grade P, Class 25.
      a. Acceptable Standard
         i) "Sonolaastic SL 2"; Sonneborn Products, Inc
         ii) "NR-200 Urexpan": Pecora Corp
         iii) "Vulkem 245"; Tremco
         iv) "THC900/THC901": Tremco, Inc

F. Flexible Polyurethane Security Sealant (for use on interior joints, perimeter of fixtures, penetrations, vents, doors, windows and similar openings)
   1. Two component polyurethane sealant, complying with ASTM C 920, Grade NS, Class 12.5, with a Shore A Hardness of 55, Type M.
      a. Acceptable Standard
         i) "Dynaflex", Pecora Corp

G. Miscellaneous Materials
   1. Provide joint cleaner and joint primer sealer as recommended by the sealant or caulking compound manufacturer.

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2. Sealant backer rod shall be compressible rod stock, polyethylene foam; polyethylene jacketed polyurethane foam, butyl rubber foam, neoprene foam, or other materials as recommended by sealant manufacturer.
    a. Where plans indicate a 2" building expansion joint, provide an expanding foam secondary sealant, “BackerSeal” as manufactured by Emseal Joint Systems, Ltd., or Apolytite Standard as manufactured by Polytite Manufacturing Corporation, behind sealant in lieu of standard backer rod.
3. Primer: Provide type recommended by joint sealer manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint sealer substrate tests and field tests.
4. Cleaners for Nonporous Surfaces: Provide non-staining, chemical cleaners of type acceptable to manufacturer of sealant and sealant backing materials, which are not harmful to substrates and adjacent nonporous materials, and which do not leave oily residues or otherwise have a detrimental effect on sealant adhesion or in service performance.
5. Masking Tape: Provide non-staining, non-absorbent type compatible with joint sealants and to surfaces adjacent to joints.

PART 3 EXECUTION

3.1 INSPECTION

A. This Contractor shall notify the General Contractor, when he has completed his work and is ready for A/E inspection.

3.2 INSTALLATION

A. Install all products in strict accordance to all manufacturers' recommendations.
B. Install joint backing to achieve a neck dimension no greater than 1/3 the joint width.
C. Install bond breaker where joint backing is not used.
D. Tool joints concave.
E. Tilt-up concrete wall panel joints; clean joints so clean concrete is exposed for sealant bonding.
    1. Exterior wall joints
        a. Seal both sides (outside and inside) with an exterior joint system consisting of a foam-backer rod (set into the joint for the entire length of the joint cavity) and cover with a urethane or other acceptable joint sealant material (sealant depth should be one-half the joint width, max. ½” depth) tool joint material in place.
        b. Protect sealant material during painting of walls.
    2. Interior wall joints
        a. In fire resistance rated walls
            i) Seal both sides of joint with a fire-stopping sealant, encapsulating the ceramic blanket protection material, finish joint similar to that of the exterior wall joint described above.
        b. In non-fire resistance rated walls
            i) Seal exposed concrete panel joints
            ii) Concealed (furred) concrete panel joints need not be sealed

3.3 ADJUSTMENT AND CLEANING

A. After installation, thoroughly clean all exposed surfaces and restore all damaged material to its original condition, or replaced with new material.

END OF SECTION

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SECTION 07 95 13
EXPANSION JOINT COVER ASSEMBLIES

PART 1 GENERAL

1.1 SECTION INCLUDES
- A. Expansion joint assemblies for floor, wall and ceiling surfaces

1.2 REFERENCES
- A. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Shapes, and Tubes
- B. ASTM B308/B308M - Standard Specification for Aluminum-Alloy, 6061-T6 Standard Structural Profiles
- C. ASTM B455 - Standard Specification for Copper-Zinc Lead Alloy (Leaded Brass) Extruded Shapes
- D. FBC - Florida Building Code

1.3 SUBMITTALS
- A. Submit under provisions of Section 01 33 00
- B. Shop Drawings: Indicate joint and splice locations, miters, and layout of the work, affected adjacent construction, and anchorage locations.
- C. Product Data: Provide joint assembly profiles, profile dimensions, anchorage devices, available colors, and finish.
- D. Submit two samples 12" long, illustrating profile, dimension, color, and finish selected.
- E. Manufacturer's Installation Instructions: Indicate rough-in sizes; provide templates for cast-in or placed frames or anchors; required tolerances for item placement.

1.4 FIELD MEASUREMENTS
- A. Verify that field measurements are as instructed by the manufacturer.

PART 2 PRODUCTS

2.1 MATERIALS
- A. Extruded Aluminum: ASTM B221, 6005 alloy, T5 temper; MIL AA-MIO or clear anodized AA C22A41
- B. Resilient Filler: Neoprene, exhibiting Shore A hardness of 40 - 50 Durometer.
- C. Threaded Fasteners: Aluminum
- D. Backing Paint: Asphaltic type

2.2 FABRICATION
- A. Joint Covers: Aluminum cover plate, aluminum frame construction, retainers with resilient neoprene filler strip, designed to permit plus or minus 50% joint movement with full recovery, flush and recess mounted.
- B. Back paint components in contact with cementitious materials.
- C. Galvanize embedded ferrous metal anchors and fastening devices.
- D. Shop assembled components and package with anchors and fittings.
- E. Provide joint components in single length wherever practical. Minimize site splicing.

2.3 FINISHES
- A. Floors: Mill finish
- B. Walls and Ceilings: Clear anodized
- C. Resilient Filler Exposed to View: Gray

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PART 3 EXECUTION

3.1 EXAMINATION

A. Verify existing conditions under provisions of Section 01 31 00.
B. Verify that joint preparation and affected dimensions are acceptable.

3.2 PREPARATION

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

3.3 INSTALLATION

A. Install components and accessories in accordance with manufacturer's instructions.
B. Align work plumb and level, flush with adjacent surfaces.
C. Rigidly anchor to substrate to prevent misalignment.
D. Provide rated units where required.

3.4 PROTECTION OF FINISHED WORK

A. Protect finished Work under provisions of Section 01 50 00.
B. Do not permit traffic over unprotected floor joint surfaces.
C. Provide removable strippable coating to protect finish surface.

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SECTION 08 11 00
METAL DOORS AND FRAMES

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. The work under this section to include the furnishing of all items shown on the drawings and as specified, including, but not limited to, the following.
   1. Steel Doors
   2. Steel Door Frames
   3. Borrowed Lite Systems

1.2 RELATED SECTIONS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 specification sections, apply to work in this section.

B. Section 04 05 13: Masonry Mortar and Grout

C. Section 08 14 00: Wood Doors

D. Section 08 71 00: Door Hardware

E. Section 08 80 00: Glazing

F. Section 09 90 00: Painting

1.3 REFERENCES

A. ANSI A115.1 – Preparation for Mortise Locks for 1-3/8 & 1-3/4 in Standard Steel Doors and Frames

B. ANSI A115.2 – Preparation for Bored Locks for 1-3/8 & 1-3/4 Doors

C. ANSI A117.1 - Accessible and Usable Buildings and Facilities

D. ANSI/SDI A250.3 – Test Procedure and Acceptance Criteria for Factory Applied Finish Painted Steel Surfaces for Steel Doors and Frames

E. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames, Frame Anchors and Hardware Reinforcing

F. ANSI/SDI A250.10 – Test procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames

G. ANSI/SDI A250.11 – Recommended Erection Instructions for Steel Frames

H. ASCE 7 – Minimum Design Loads for Buildings and other Structures

I. ASTM A568/A568M – Standard Specification for Steel, Sheet, Carbon, Structural, and High Strength, Low Alloy, Hot Rolled and Cold Rolled, General Requirements for

J. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process

K. ASTM C1363 – Standard Test Method for Thermal Performance of Building Materials and Envelope Assemblies by Means of a Hot Box Apparatus

L. ASTM E413 - Classification for Rating Sound Insulation

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M. DHI (Door Hardware Institute) - Installation Guide for Doors and Hardware
N. NFPA 80 - Fire Doors and Other Opening Protectives
O. NFPA 252 – Standard Methods of Tests of Door Assemblies
P. FBC - Florida Building Code
Q. SDI-100 – Recommended Specifications for Standard Steel Doors and Frames
R. UL 10B - Fire Tests of Door Assemblies

1.4 QUALITY ASSURANCE

A. Conform to requirements of SDI-100.
B. Manufacturer: Company specializing in manufacturing the products specified in this section with a minimum of 3-years documented experience.
C. All exterior Door/Frame and Borrowed Lite Assemblies shall meet current FBC Product Approval System requirements.
D. Design door/frame and borrowed lite systems for a wind velocity and large missile impact protection in compliance with the District Design Criteria-Structural, FBC, and ASCE 7.
   1. Missile impact protection shall be passive with impact glass.
E. Coordinate hardware requirements with the District's card-reader system requirements.
F. Guardrail: Where borrowed lite system is located in part or completely below 42 inches above finish floor and there is a drop of 30 inches or more between the two sides of the borrowed lite system, the system shall be engineered by a specialty engineer to comply with Chapter 2407 of the Florida Building Code, latest edition.

1.5 SHOP DRAWINGS AND PRODUCT DATA

A. Submit shop drawings, product data, manufacturer's literature, and installation instructions.
   1. Include details of each frame type, elevations of door design types, conditions at openings details of construction, location, and installation requirements of finish hardware and reinforcements and details of joints and connections.
B. Indicate door and frame configuration, anchor spacing, anchor types, location of cutouts for hardware and glazing, and internal reinforcement.
C. Provide hollow metal doors and frame assemblies that comply with performance requirements as demonstrated by testing manufacturer’s assemblies in accordance with ASCE 7.

1.6 DELIVERY, STORAGE, AND PROTECTION

A. Deliver doors and frames marked to identify doors with frames with openings.
B. Store doors and frame in a dry area on end with spacers between units to allow ventilation.
C. Ship and store frames with temporary stiffeners and spacers in place to prevent distortion.

1.7 WARRANTY

A. Provide minimum 5-year manufacturer's warranty under provisions of Section 01 77 00.

PART 2 PRODUCTS

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2.1 ACCEPTABLE MANUFACTURERS

A. SDI or NAAMM members conforming to the requirements of this specification

2.2 STEEL DOORS

A. Material: Commercial quality carbon steel conforming to ASTM A568/A568, hot-dipped A60 Galvannealed steel conforming to ASTM A653/A653M or hot dipped G90 galvanized steel.
   1. Steel doors with less than 50% glass shall be Level 3 Model 2 by 1¾" thick full flush seamless construction.
   2. Steel doors with more than 50% glass shall be Level 3 Model 3 by 1¾" thick stile and rail construction.
   3. Reinforcements shall be of the same material as door.
      a. Hinge reinforcements shall be no less than 7-gauge for 1¾" door.
      b. Closer reinforcement shall be no less than 14-gauge box minimum 6" high x 20" long.
      c. Lock reinforcement shall be 16-gauge.
   4. Door cores:
      a. Exterior doors shall be fully filled with one-piece foam plastic or fiberglass insulation securely bonded to both face sheets, minimum R-7.
      b. Interior doors shall be a one-piece honeycombed core securely bonded to both face sheets.

B. Fire Rated:
   1. Provide fire rated assembly where scheduled or required by Code.
   2. All installations shall be in accordance with the requirements of NFPA 80.

2.3 STEEL FRAMES

A. Flush frame construction of hot-dipped A60 Galvannealed steel conforming to ASTM A653/A653M or hot dipped G90 galvanized steel.
   1. Exterior frames: 14 gauge material masonry/flush.
   2. Interior frames 16 gauge material drywall on frame wall, masonry on concrete or block wall.
   3. Assemble so that the face miter seam is “closed and tight”.
      a. Weld the face seam and the full web of the frame corner or intersection.
      b. Grind and dress smooth the weld area.
      c. Apply a zinc rich primer over the grinding area, and finish with a matching prime paint.
   4. Factory prepare for field installation of silencers
   5. Provide 7-gauge universal steel hinge reinforcement and prepare for 4½" x 4½" standard or heavy weight template hinges.
   6. Strikes reinforcing 16-gauge prepped for ANSI A115.1 or ANSI A115.2 strike.
   7. Strike jambs 14-gauge reinforcement

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2.4 ACCESSORIES

A. Door Silencers: Except on weather-stripped frames, drill stops to receive three silencers on strike jambs of single frames and two silencers on heads of double frames.

B. Jamb Anchors:
   1. Provide a minimum of four anchors on both the hinge and latch jambs.
   2. Provide 14-gauge galvanized sheet steel, angle anchors welded for each jamb, which extends to the floor, punched for a minimum of two ¼" bolts.

C. Spreader: Provide frames with temporary steel spreader bars tack welded to jamb bottoms to maintain full rigidity and proper alignment during installation.

D. Astragals: Provide steel astragals (removable) as scheduled.

2.5 PROTECTIVE COATINGS

A. Frames: Provide full immersion dip coat of rust-inhibitive metal primer reaching all surfaces in accordance with ANSI/SDI A250.10.

B. Doors: Fill in all groves and seams on top of door prior to painting, and provide full coverage electrostatic spray coat of rust-inhibitive metal primer.

C. Dry the protective coating of all frames and doors in a baking oven process.

D. Bituminous Coating: Coat the inside of frame profile with bituminous coating to a minimum thickness of 1/16" for exterior openings and interior openings in wet locations.

2.6 FABRICATION

A. General design and construction
   1. Provide welded steel frames for doors, transoms, sidelight, borrowed light, and other openings to the size and design as shown on the architectural drawings.
   2. All finished work shall be strong and rigid, neat in appearance square, true, and free of defects.
   3. Provide jamb depths, trim, profile, and backbends as scheduled and shown on approved shop drawings.
   4. When shipping limitations so dictate, fabricate frames for large openings in sections designed for splicing or splining in the field by others.
   5. Hardware reinforcements are to be in accordance with the minimum standard gages as listed in SDI-100.
   6. Mortised, reinforce, drill, and tap frames at the factory only for template mortised hardware, in accordance with approved hardware schedule and the hardware contractor template.
      a. Where surface mounted hardware is applied, frames to have reinforcing plates only, drilling and tapping by others.

PART 3 EXECUTION

3.1 INSTALLATION

A. Examine new and existing adjacent framing and rough opening preparation for conditions, which would prevent quality installation of doors and frames.

B. Install frames in accordance with ANSI/SDI A250.11 and ASCE 7.

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C. Install doors in accordance with DHI A115.1G.

D. Install fire rated frames in accordance with NFPA 80.

E. Install all doors to meet accessibility requirements.

F. Coordinate with masonry wall construction for anchor placement.

G. Install roll-formed-steel reinforcement channels between two abutting frames.
   1. Anchor to structure and floor.

H. Fully grout exterior hollow metal frames, and hollow metal frames in masonry and concrete walls with non-shrink grout.

I. Install with no spaces between the frame and the structure to prevent water or pest from entering the building.
   1. Install sealant to maintain watertight seal.

J. Recess all doorframes opening to the exterior of the building a minimum of one-inch from the exterior surface of the adjoining wall.
   1. Maintain the proper swing and opening capacity to meet the code requirements.

3.2 TOLERANCES

A. Maximum Diagonal Distortion: 1/16" measured with straight edge, corner to corner.

3.3 ADJUSTING AND CLEANING

A. Adjust for smooth and balanced door movement.

B. Check and readjust operating finish hardware items, leaving steel doors and frames undamaged and in complete and proper operating condition.

END OF SECTION

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SECTION 08 14 00
SOLID CORE WOOD DOORS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 apply to work in this section.

1.2 REFERENCES

A. ASTM E413 - Classification for Rating Sound Insulation
B. AWI - Quality Standards of the Architectural Woodwork Institute
C. NEMA (National Electric Manufacturers Association) LD3 - High Pressure Decorative Laminates
D. NFPA 80 – Standard for Fire Doors and Other Opening Protectives
E. NFPA 252 - Standard Methods of Fire Tests for Door Assemblies
F. UL 10B - Fire Tests of Door Assemblies
G. Warnock Hersey (Intertek) - Certification for Fire Door Testing
H. Warnock Hersey (Intertek) - Certification for Acoustical Testing of Doors
I. FBC - Florida Building Code

1.3 SECTION INCLUDES

A. Solid core wood doors and transom panels; flush and flush glazed configurations; fire rated and non-fire rated.

1.4 SUBMITTALS

A. Shop Drawings:
   1. Submit fully detailed shop drawings of all doors included in this section, including a complete door schedule of all wood doors.
   2. Schedule shall include door openings, elevations, sizes, types, swings, required undercuts, special beveling, and special blocking for hardware, factory machining criteria, factory finishing criteria, and identification of louvers, and glazing requirements.
   3. Architect shall approve shop drawings prior to the manufacturing or fabrication of doors.
B. Product Data: Indicate door core materials and construction; veneer species, type and characteristics.
C. Samples:
   1. Submit sample of door veneer, 12” X 12” in size illustrating wood grain, stain color, and sheen.
   2. The approved sample shall become the standard of quality for all solid core wood doors delivered to the project site.
   3. Contractor shall replace at no cost to the Owner, any door the Owner deems not conforming with the approve sample.

1.5 QUALITY ASSURANCE

A. Manufacture all wood doors in accordance with AWI Quality Standard Section 1300 - Premium Grade Standards.
B. Finish doors in accordance with AWI Quality Standard Section 1500 – Premium Grade Standards.
C. Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum 5-years documented experience.
D. All fire rated wood doors shall comply with all the requirements of NFPA 80.

1.6 DELIVERY, STORAGE AND PROTECTION

A. Section 01 60 00 – Material Equipment and approved equals.
B. Follow manufactures requirements for storage and handling of doors.

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C. Deliver all wood doors to the site after the HVAC system is operational and temperature and humidity levels are controlled.
D. Doors shall be stored flat on a level surface in a dry conditioned shelter.
   1. Protect doors with resilient packaging.
   2. Do not store in damp or wet areas, or in areas that may be subject to sunlight that might blanch the veneer.
   3. Cover to keep clean, but allow air circulation by breaking factory seals once on site.
   4. Doors stored for more than 7-days shall have all ends primed.

1.7 PROJECT CONDITIONS
A. Section 01 31 00 – Project Management and Coordination.
B. Coordinate the work with door opening construction, doorframe, and door hardware installation.

1.8 WARRANTY
A. Section 01 77 00 - Contract Closeout.
B. Provide warranty for interior doors to include the life of installation.
C. Include coverage for delamination of veneer, warping beyond specified installation tolerances, defective materials and telegraphing core construction.

PART 2 PRODUCTS

2.1 CONSTRUCTION
A. Wood Doors: Flush 1¾" thick meeting AWI Premium Grade standards to size per door schedule.
B. Face Veneer: Shall be plain-sliced, stain grade White Birch or equivalent as selected by the Architect, medium density, thoroughly kiln dried, smoothly sanded and laid at right angles to grain of cross-band.
C. Cross-bands: Kiln dried hardwood, 1/16" thickness, laid with grain at right angles to length of door.
D. Core: Stave core (SLC) or Structural Composite Lumber Core (SCLC).
E. Edge Bands: Kiln dried hardwood at all edges matching face veneer species, ¾" thick, glued to wood core.
F. Top and Bottom Rails: Kiln dried hardwood at all edges matching face veneer species, 1⅛" thick, glued to wood core.
G. Adhesives:
   1. Cross-band and face veneer adhesive shall conform to CS-35, Type I.
   2. Core and edge band adhesive shall conform to CS-35, Type II.
H. Finish: Stain color as selected by the Architect.
I. Labels: Provide U.L. or WH Label for doors where required see door schedule.
J. Factory finished doors in accordance with approved sample.

2.2 VISION LITES
A. Provide vision lutes of shapes and sizes where shown on drawings.
B. Manufacture and supply lutes as a unit and meet the requirements of section 08 80 00.

2.3 LOUVERS
A. Material and Finish: Roll formed steel with a wipe coat of zinc.
B. Inverted blade, sight proof, and fire rated with fusible link conforming to UL or FM as required.
C. Frame to have tampered proof fasteners.

PART 3 EXECUTION

3.1 FABRICATION
A. Refer to Door Schedule for types, sizes, and details.

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B. Fabricate non-rated doors in accordance with AWI Quality Premium requirements.
C. Fabricate fire rated doors in accordance with AWI Quality Premium and to UL requirements.
   1. Attach fire-rating label to door.
D. Astragals for Fire Rated Double Doors: Steel, T shaped, overlapping and recessed at face edge specifically for double doors.
E. Sound Rating for Single Door Leaf and Frame Assembly: Provide a minimum STC 30, see door schedule for required rating meet ASTM E413.
F. Provide lock blocks at lock edge and top of door for closer for hardware reinforcement.
G. Vertical Exposed Edge of Stiles: Provide hardwood for transparent finish.
H. Provide factory-machined doors for finish hardware per hardware requirements and dimensions.
   1. Do not machine for surface hardware.
   2. Provide solid blocking for through bolted hardware.
I. Factory fit doors for frame opening dimensions identified on shop drawings.

3.2 INSTALLATION

A. Cut all doors for specified hardware and hang.
   1. Protect as recommended by manufacturer.
   2. Fit all doors to provide a clearance of $^{1}/_{16}$" to ⅛" at jambs and heads.
   3. Bevel lock stile ⅛" to 2"
   4. Ease all edges of doors.
   5. Maximum clearance at floor shall be ½", unless otherwise indicated.
   6. Install wall mounted doorstops in alignment with the door handle.
      a. Provide proper backing behind the drywall for the doorstop to prevent the door from puncturing the drywall.
      b. Coordinate with section 09 22 16.

END OF SECTION

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SECTION 08 31 00
ACCESS DOORS AND PANELS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Wall and ceiling mounted access doors and frames.
   1. Provide doors where required for access to work of other divisions, including access to wires, pipes, valves and equipment for maintenance and repair.
   2. Provide fire-rated door assemblies in fire-rated wall assemblies.

1.2 RELATED REQUIREMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 specification sections, apply to work in this section.

1.3 REFERENCE STANDARDS

A. FM (AG) - FM Approval Guide; current edition.

B. ITS (DIR) - Directory of Listed Products; current edition.

C. UL (FRD) - Fire Resistance Directory; Current Edition.

D. Warnock Hersey-Certification Listings

E. FBC - Florida Building Code

1.4 REGULATORY REQUIREMENTS

A. Conform to applicable Code for UL and FM requirements for fire rated access doors.

1.5 SUBMITTALS

A. Product Data: Provide data on unit construction, size, configuration, scheduled locations, and attachment method.

B. Manufacturer's Installation Instructions: Indicate any special installation criteria requiring an interface with adjacent components.

C. Project Record Documents: Contractor shall provide information so the Architect can record actual location of all access units on as-built drawings.

1.6 QUALITY ASSURANCE

A. Perform work in accordance with UL Design requirements.

B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

C. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years documented experience.

PART 2 PRODUCTS

2.1 ACCESS DOORS / HATCHES

A. Walls/Ceilings - Non-Fire Rated Door and Frame Unit: Formed steel, prime painted.

B. Walls/Ceilings - Rated Door and Frame Unit: Formed steel, prime painted with rated label.

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C. ~~Floors, Non-Fire and Fire Rated Hatch and Frame Unit: Aluminum or Stainless Steel, fire rating label as required.~~

2.2 FABRICATION WALL AND CEILING MOUNTED ACCESS UNITS

A. Fabricate frames and flanges of 16-gauge steel.

B. Fabricate door panels of 14-gauge single thickness steel sheet or double sheet with integral non-combustible insulation filler.

C. Weld, fill, and grind joints to assure flush and square unit.

D. Hardware:

1. Hinge shall be 175° steel piano hinge with removable pin.
2. Lock shall have screwdriver slot for quarter turn cam-lock.

2.3 ~~FABRICATION FLOOR UNITS~~

A. ~~Fabricate frames and flanges of ¼" aluminum.~~

B. ~~Fabricate door panels of ¼" aluminum single thickness sheet or double sheet with integral non-combustible insulation filler.~~

C. ~~Weld, fill, and grind joints to assure flush and square unit.~~

D. ~~Hardware:~~

1. ~~Hinge shall be 175° stainless steel piano hinge with removable pin.~~
2. ~~Lock shall have screwdriver slot for quarter turn cam-lock.~~

2.4 FINISHES

A. Steel protection shall be galvanized, hot dipped finish, prime coat units with alkyd primer.

B. Steel finish shall be two coats, baked enamel, and color as selected by the Architect.

C. Aluminum finish shall be factory mil finish.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install units in accordance with manufacturer's instructions.

B. Coordinate with work of other trades.

C. Verify sizes of openings prior to installation.

D. Install frames plumb and level in openings, and secure units rigidly in place.

E. Position units to provide convenient access to concealed work-requiring access.

F. Provide minimum clear access opening of 24" X 24" with 180° swing on the door to access mechanical devices, see plans for required size.

3.2 PROTECTION OF FINISHED WORK

A. Protect adjacent surfaces from damage by material installation.

B. Protect installation during construction activities.

C. Adjust unit for a smooth operation.

END OF SECTION

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SECTION 08 33 13
COILING COUNTER DOORS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Standard rolling counter doors; manual operated.

1.2 REFERENCE STANDARDS

A. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.

B. ASTM A666/A666M - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2024.

C. UL 325 - Standard for Door, Drapery, Gate, Louver, and Window Operators and Systems; Current Edition, Including All Revisions.

1.3 SYSTEM DESCRIPTION

A. Push up manual operation.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.

B. Installer Qualifications: Company specializing in performing work of type specified and with at least three years documented experience and approved by manufacturer.

C. Coordination:

1. Provide steel support framing and anchors in walls and ceilings.
2. Furnish inserts and anchoring devices to be set in concrete or built into masonry.

1.5 SUBMITTALS

A. Submit shop drawings and product data under provisions of Section 01 33 00.

B. Provide pertinent dimensioning, general construction, component connections and details, anchorage methods, hardware location and installation details.

C. Submit manufacturer's installation instructions under provisions of Section 01 33 00.

D. Submit sample of door for specified finish under provisions of Section 01 33 00.

1.6 OPERATION AND MAINTENANCE DATA

A. Submit manufacturer's operation and maintenance data under provisions of Section 01 77 00.

1.7 WARRANTY

A. Manufacturer Warranty: Provide manufacturer warranty for counterbalance shaft assembly for two years from the date of Substantial Completion.

PART 2 PRODUCTS

2.1 MATERIALS

A. Curtain:

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1. Stainless steel slats with stainless steel angle bottom bar with lift handles and vinyl astragal.
2. Slats: No. 1F interlocked flat-faced slats, 1½ inch high by ½ inch deep, stainless steel ASTM A666/A666M, Type 304; minimum thickness 22 gauge, 0.03 inch.
3. Fabricate interlocking sections with high strength molded nylon end-locks riveted to ends of alternate slats.
4. Slat Finish: Stainless steel: No. 4 finish.
5. Bottom Bar Finish: Stainless steel: No. 4 finish.

B. Curtain Guides:
1. Stainless steel: 12-gauge formed shapes for integral frame and 14 gauge sill.
2. Finish: Stainless steel: No. 4 finish.

C. Counterbalance Shaft Assembly:
1. Barrel shall be steel pipe capable of supporting curtain load with maximum deflection of 0.03 inch per foot of width.
2. Spring Balance: Oil-tempered, heat-treated steel helical torsion spring assembly designed for proper balance of door to ensure that maximum effort to operate will not exceed 25 lbs.
a. Provide wheel for applying and adjusting spring torque.

D. Brackets: Fabricate from reinforced steel plate with bearings at rotating support points to support counterbalance shaft assembly and form end closures.
1. Finish: ASTM A123/A123M, Grade 85 zinc coating, hot dip galvanized after fabrication.

E. Hood: 24 gauge stainless steel with reinforced top and bottom edges and minimum ¼ inch steel intermediate support brackets as required to prevent excessive sag.
1. Finish: Stainless steel: No. 4 finish.

2.2 ACCESSORIES

A. Locking:
1. Pad lockable slide bolt on coil side of bottom bar of each jamb extending into slots in guides.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine substrates upon which work will be installed and verify conditions are in accordance with approved shop drawings.

B. Coordinate with the Contractor to correct unsatisfactory substrates.

C. Commencement of work by installer is acceptance of substrate.

3.2 INSTALLER

A. General: Install door and operating equipment with necessary hardware, anchors, inserts, hangers, and supports.

B. Follow manufacturer’s installation instructions.

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3.3 ADJUSTING

A. Following completion of installation, including related work by others, lubricate, test, and adjust doors for ease of operation, free from warp, twist, or distortion.

3.4 CLEANING

A. Clean surfaces soiled by work as recommended by the manufacturer.

B. Remove surplus materials and debris from the site.

3.5 DEMONSTRATION

A. Demonstrate proper operation and maintenance procedures to the Owner.

END OF SECTION

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SECTION 08 33 23
OVERHEAD COILING DOORS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Standard rolling service doors; motor operated.

1.2 REFERENCE STANDARDS

A. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2023.

B. ASTM A666/A666M - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2024.

C. ITS (DIR) - Directory of Listed Products; current edition.

D. NEMA EN 10250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2024.

E. NEMA ICS 2 - Industrial Control and Systems Controllers, Contactors and Overload Relays Rated 600 Volts; 2000, with Errata (2008).

F. NEMA MG 00001 - Motors and Generators; 2024.

G. UL (DIR) - Online Certifications Directory; Current Edition.

H. UL 325 - Standard for Door, Drapery, Gate, Louver, and Window Operators and Systems; Current Edition, Including All Revisions.

1.3 SYSTEM DESCRIPTION

A. Electric operator with manual override in case of power failure.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.

B. Installer Qualifications: Company specializing in performing work of type specified and with at least three years documented experience and approved by manufacturer.

C. Products Requiring Electrical Connection: Listed and classified by ITS (DIR), UL (DIR), or testing firm acceptable to authorities having jurisdiction as suitable for purpose specified and indicated.

D. Coordination:
   1. Provide steel support framing and anchors in walls and ceilings.
   2. Furnish inserts and anchoring devices to be set in concrete or built into masonry.

1.5 SUBMITTALS

A. Submit shop drawings and product data under provisions of Section 01 33 00.

B. Provide pertinent dimensioning, general construction, component connections and details, anchorage methods, hardware location and installation details.

C. Submit manufacturer's installation instructions under provisions of Section 01 33 00.

D. Submit sample of door for specified finish under provisions of Section 01 33 00.

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1.6 OPERATION AND MAINTENANCE DATA

A. Submit manufacturer's operation and maintenance data under provisions of Section 01 77 00.

1.7 WARRANTY

A. Manufacturer Door-Only Warranty: Provide manufacturer warranty for door assembly for two years from the date of Substantial Completion.

B. Manufacturer Door and Operator Warranty: Provide manufacturer's limited warranty for door and operator system free from material and workmanship defects for duration and cycles indicated; counterbalance spring and finish not covered by warranty.

1. Warranty Period: Three years or 20,000 cycles, whichever comes first, from the date of Substantial Completion.

PART 2 PRODUCTS

2.1 MATERIALS

A. Curtain:

1. Interlocking Slats: Flat Profile Type F-265, stainless steel ASTM A666/A666M, Type 304; minimum thickness 20 gauge, 0.0359 inch.
2. Slat Finish: No. 4 finish.

B. Curtain Guides:

1. Stainless steel channels, Type 304, No. 4 finish.

C. Counterbalance Shaft Assembly:

1. Helical torsion spring type designed for standard 50,000-cycle life design.
2. Counterbalance shall be housed in a steel tube, supporting the curtain with deflection limited to 0.03 inch per foot of span.
3. Counterbalance shall be adjustable by means of an adjusting tension wheel.

D. Brackets: Fabricate from stainless steel, Type 304 No. 4 finish, to support counterbalance, curtain, and hood.

E. Hood: 24 gauge, 0.028 inch stainless steel, Type 304 No. 4 finish, with reinforced top and bottom edges.

1. Provide min ¼-inch steel intermediate support brackets as required to prevent excessive sag.

F. Bottom Bar: Double angle stainless steel, No. 4 finish.

2.2 ELECTRIC OPERATION

A. Provide UL-listed electric operator; size as recommended by manufacturer to move door in either direction at minimum 8 inches, maximum 1 foot per second.

B. Electric Operators:

1. Mounting: Side mounted, unless otherwise noted
2. Motor Enclosure:
   a. Interior Coiling Doors: NEMA MG 00001, Type 1; open drip proof.
3. Motor Voltage: 120 volts, single phase, 60 Hz.
4. Motor Controller: NEMA ICS 2, full voltage, reversing magnetic motor starter.
5. Controller Enclosure: NEMA EN 10250, Type 4.

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6. Brake: Manufacturer's standard type, activated by motor controller.
7. Manual override in case of power failure.
8. Refer to Division 26 for electrical connections.

C. Control Station: Provide standard three button, 'Open-Close-Stop' continuous-constant control device for each operator complying with UL 325.
   1. 24 volt circuit.
   2. Surface mounted, at interior door jamb, unless otherwise indicated.
   3. Entrapment Protection Devices: Provide sensing devices and safety mechanisms complying with UL 325.
      a. Provide electric sensing edge with wireless edge kit or non-monitored safety edge as an option along with continuous-constant control device.

D. Safety Edge: Located at bottom of coiling door, full width, electro-mechanical sensitized type, wired to stop and reverse door direction upon striking object, hollow neoprene covered.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine substrates upon which work will be installed and verify conditions are in accordance with approved shop drawings.

B. Verify that electrical services have been installed and are accessible.

C. Coordinate with the Contractor to correct unsatisfactory substrates.

D. Commencement of work by installer is acceptance of substrate.

3.2 INSTALLER

A. Install door and operating equipment with necessary hardware, anchors, inserts, hangers, and supports.

B. Follow manufacturer’s installation instructions.

C. Coordinate installation of electrical service.

D. Complete wiring from disconnect to unit components.

E. Install enclosure and perimeter trim.

3.3 ADJUSTING

A. Following completion of installation, including related work by others, lubricate, test, and adjust doors for ease of operation, free from warp, twist, or distortion.

3.4 CLEANING

A. Clean surfaces soiled by work as recommended by the manufacturer.

B. Remove surplus materials and debris from the site.

3.5 DEMONSTRATION

A. Demonstrate proper operation and maintenance procedures to the Owner.

END OF SECTION

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SECTION 08 43 13
ALUMINUM-FRAMED STOREFRONTS

PART 1 GENERAL

1.1 SYSTEM DESCRIPTION

A. Provide all labor, materials, and equipment necessary for the complete Aluminum-framed storefront system installation as indicated on the drawings and/or specified herein.

1.2 RELATED DOCUMENTS

A. Documents affecting work of this section include but are not necessarily limited to:
   1. General Conditions, special provisions and sections in Division 1 of these specifications
   2. 01 83 16 - Exterior Enclosure Performance Requirements
   3. 03 11 00 – Concrete Formwork
   4. 03 30 00 – Cast-in-Place Concrete
   5. 03 47 00 – Tilt-up Concrete
   6. 04 20 00 – Masonry Unit
   7. 04 20 10 – Reinforced Masonry Unit
   8. 06 10 00 – Rough Carpentry
   9. 07 21 19 – Foamed-in-place Insulation
   10. 07 27 00 - Air Barriers
   11. 07 92 00 – Joint Sealants
   12. 08 80 00 - Glazing

1.3 REFERENCE STANDARDS

A. AAMA CW-10 - Care and Handling of Architectural Aluminum From Shop to Site; 2015.

B. AAMA 503 - Voluntary Specification for Field Testing of Newly Installed Storefronts, Curtain Walls and Sloped Glazing Systems; 2014.

C. AAMA 609 & 610 - Cleaning and Maintenance Guide for Architecturally Finished Aluminum (Combined Document); 2015.

D. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum; 2014 (2015 Errata).

E. AAMA 612 - Voluntary Specification, Performance Requirements, and Test Procedures for Combined Coatings of Anodic Oxide and Transparent Organic Coatings on Architectural Aluminum; 2017a.

F. AAMA 1503 - Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections; 2009.

G. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2014.

H. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.

I. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2014.

J. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric); 2014.

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K. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2014.

L. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2013.

M. ASTM E283 - Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2004 (Reapproved 2012).

N. ASTM E330/E330M - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference; 2014.

O. 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).

P. ASTM E783 - Standard Test Method for Field Measurement of Air Leakage Through Installed Exterior Windows and Doors; 2002 (Reapproved 2018).

Q. ASTM E1105 - Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform or Cyclic Static Air Pressure Difference; 2015.

R. FLA (PAD) - Florida Building Code Online - Product Approval Directory; Current Edition.

S. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); 2002 (Ed. 2004).

1.4 SUBMITTALS

A. Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, glass and infill, internal drainage details.

B. Shop Drawings:
1. Submit shop drawings for the fabrication and installation of aluminum storefront system.
2. Indicate system dimensions, framed opening requirements and tolerances, affected related work, expansion and contraction joint location and details, and field welding required.

C. Samples: Submit two samples 12 by 12 inches in size illustrating finished aluminum surface, glass, glazing materials.

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. Shop drawings and calculations shall be signed and sealed by a Delegated (Specialty) Engineer registered in the State of Florida.

F. Product Approval: Submit Florida Building Code "FLA (PAD)" approval for proposed system.

G. Field Quality Control Submittals: Report of field testing for water penetration and air leakage.

1.5 QUALITY ASSURANCE

A. Designer Qualifications: Design structural support framing components under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed in the State of Florida.

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B. Manufacturer Qualifications: Company specializing in performing work of type specified and with at least three years of documented experience.

C. Installer Qualifications: Company specializing in performing work of type specified and with at least three years of documented experience and approved by manufacturer.

D. Testing: Provide certified copy of test results from an approved testing laboratory or agency per the FBC Product Approval System.
   1. Testing certification must accompany requests for substitutions and approvals.

E. Provide documentation the storefront assembly complies with the thermal requirements indicated on the plans and in the approved energy code calculations.

F. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
   1. Build mockup in location to be determined.
   2. A minimum of one mock-up will be required for each different wall condition.

G. Pre-Installation Conference:
   1. Prior to installation of storefront system, conduct a pre-installation site conference.
   2. Attendance: Owner (MP&O and PM), Building Department Inspector, Architect, Contractor, job superintendent, subcontractors, and suppliers related to work.
   3. Agenda to include but not be limited to:
      a. Review of surface preparation and installation procedures.
      b. Review of submittals shop drawings, product approval, etc.
      c. Review of special details and situations.
      d. Discuss sequence of construction, responsibilities and schedule for subsequent operations.
      e. Review full-scale mockup and water test the mockup; the mockup may be separate or several units in the building.

H. Inspections: Provide on-site weekly inspections by Owner's representative during and after installation of storefront system.

1.6 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.

1.7 PROJECT WARRANTY

A. The Contractor shall provide a written warranty signed by manufacturer, installer, and Contractor, agreeing to replace aluminum storefront that has defects or failures in materials or workmanship within 5-years of date of Substantial Completion for the project.

B. Failure of material or workmanship shall include, but not be limited to, water leakage or air infiltration, excessive deflections, deterioration of finish or metal in excess of normal weathering, defects in weather-stripping and other components of work

1.8 STOREFRONT WARRANTY

A. Section 01 77 00 – Contract Closeout.

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B. Provide written warranty from manufacturer against material defects in manufacturing for a minimum period of 5-years from the date of Substantial Completion for the project.
   1. Provide ten year, minimum, manufacturer warranty that includes coverage for degradation of the finish. Include provision for replacement of units with excessive fading, chalking, or flaking.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Aluminum-Framed Storefronts Manufacturers:
   1. Sol-a-Trol Aluminum Products: www.solatrol.com.
   2. C.R. Laurence Company, Inc; U.S. Aluminum: www.crl-arch.com/#sle.
   3. ES Windows and Doors: www.eswindows.com.
   4. Kawneer North America: www.kawneer.com/#sle.
   5. PGT Industries: ww.pgtindustries.com.
   6. Trulite Glass & Aluminum Solutions, LLC: www.trulite.com/#sle.
   7. Wausau Window and Wall Systems: www.wausauwindow.com.
   8. YKK AP America Inc: www.ykkap.com.
   9. Substitutions: See Section 01 60 00 - Material Equipment and Approved Equals.

2.2 ALUMINUM-FRAMED STOREFRONT

A. Aluminum-Framed Storefront: Factory fabricated, factory finished aluminum framing members with infill, and related flashings, anchorage and attachment devices.
   1. 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.
   2. Construction: Eliminate noises caused by wind and thermal movement, prevent vibration harmonics, and prevent "stack effect" in internal spaces.
   3. 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.
   4. 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.
   5. Movement: Allow for movement between storefront and adjacent construction, without damage to components or deterioration of seals.
   6. Perimeter Clearance: Minimize space between framing members and adjacent construction while allowing expected movement.

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 ASCE 7 and the Florida Building Code.

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b. Member Deflection: Limit member deflection to 1/175 in any direction, with full recovery of glazing materials.

2. Wind-Borne-Debris Resistance: Identical full-size glazed assembly without auxiliary protection, having Florida Building Code FLA (PAD) approval for 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 Laboratory Test: Maximum of 0.06 cu ft/min sq ft of wall area, when tested in accordance with ASTM E283 at 6.27 psf pressure differential across assembly.
5. Condensation Resistance Factor of Framing: 50, minimum, measured in accordance with AAMA 1503.
6. Guardrail: Where glass storefront is located in part or completely below 42 inches above finish floor and there is a drop of 30 inches or more between the two sides of the storefront system, the glass and storefront systems shall be engineered by a specialty engineer to comply with Chapter 2407 of the Florida Building Code, latest edition.

2.3 COMPONENTS

A. Aluminum Framing Members: Tubular aluminum sections, thermally broken with interior section insulated from exterior, drainage holes and internal weep drainage system.
   1. Glazing Stops: Flush.
   2. Structurally Reinforced Members: Extruded aluminum with internal reinforcement of structural steel member.
      a. Contractor to provide all required steel internal reinforcement and exterior steel framing (with aluminum cladding to match frames) to meet the design intent of the glazed openings.

B. Glazing: As specified in Section 08 80 00.
   1. Impact-Resistant Insulating Laminated Vision Glazing, double glazed: South-facing Exterior glazing.
   2. Impact-Resistant Laminated Vision Glazing, monolithic: All other Exterior glazing unless otherwise noted.

C. Trim and Covers at beams, columns and concrete base curbs: Provide 0.09 inch thick extruded or brake formed aluminum where required. Finish to match storefront framing members.

2.4 MATERIALS

A. Extruded Aluminum: ASTM B221 (ASTM B221M).

B. Sheet Aluminum: ASTM B209 (ASTM B209M).

C. Structural Steel Sections: ASTM A36/A36M; galvanized in accordance with requirements of ASTM A123/A123M.

D. Fasteners: Stainless steel.

E. Exposed Flashings: Aluminum sheet, 20 gauge, 0.032 inch minimum thickness; finish to match framing members.

F. Concealed Flashings: Stainless steel, 26 gauge, 0.0187 inch minimum thickness.

G. Sill Flashing Sealant: Elastomeric, silicone or polyurethane, compatible with flashing material.

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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: As specified in Section 08 80 00.

K. Touch-Up Primer for Galvanized Steel Surfaces: SSPC-Paint 20, zinc rich.

2.5 FINISHES

A. Class I Natural Anodized Finish: AAMA 611 AA-M12C22A41 Clear anodic coating not less than 0.7 mils thick, OR

B. Natural Anodized Finish with Organic Seal: AAMA 612 Clear anodic coating with non-aqueous electro-deposited organic seal; not less 0.7 mils thick.

C. Factory finish all surfaces that will be exposed in completed assemblies.

D. Coat concealed metal surfaces that will be in contact with cementitious materials or dissimilar metals with bituminous paint.

E. Touch-Up Materials: As recommended by coating manufacturer for field application.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify dimensions, tolerances, and method of attachment with other work.

B. Verify that wall openings and adjoining air and vapor 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. 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.

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C. Sealant Space Between Storefront Mullions and Adjacent Construction: Maximum 1/2 inch; Minimum 1/4 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. Provide field testing of installed storefront system by independent laboratory in accordance with AAMA 503 during construction process and before installation of interior finishes.
   1. Perform a minimum of two tests in each designated area as directed by Architect.
   2. Conduct tests in each area prior to 10 percent and 50 percent completion of this work.
   3. Field test for water penetration in accordance with ASTM E1105 with uniform static air pressure difference (Procedure A) at 15 percent of the maximum design pressure for the building, or 15 psf, whichever is greater.
      a. Maximum allowable rate of water penetration in 15-minute test is 0.5 ounce that is not contained in an area with provisions to drain to exterior, or collected on surface of interior horizontal framing member.
   4. Field test for air leakage in accordance with ASTM E783 with uniform static air pressure difference of 1.57 psf.
      a. Maximum allowable rate of air leakage is 0.06 cfm/sq ft.

C. Repair or replace storefront components that have failed designated field testing, and retest to verify performance complies with specified requirements.

3.5 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.

3.6 PROTECTION

A. Protect installed products from damage until Date of Substantial Completion.

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SECTION 08 51 13
ALUMINUM WINDOWS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Documents affecting work of this section include but are not necessarily limited to:
   1. General Conditions, special provisions and sections in Division 1 of these specifications
   2. 03 11 00 – Concrete Formwork
   3. 03 30 00 – Cast-in-Place Concrete
   4. 03 47 00 – Tilt-up Concrete
   5. 04 20 00 – Masonry Unit
   6. 04 20 10 – Reinforced Masonry Unit
   7. 06 10 00 – Rough Carpentry
   8. 07 21 19 – Foamed-in-place Insulation
   9. 07 92 00 – Joint Sealants
   10. 08 80 00 – Glazing
   11. 09 24 00 – Portland Cement Plaster

1.2 SYSTEM DESCRIPTION

A. Provide all labor, materials, and equipment necessary for the complete aluminum window installation as indicated on the drawings and/or specified herein.

1.3 REFERENCES

A. AA (Aluminum Association) - Designation System for Aluminum Finishes

B. AAMA CW-11 - Design Wind Loads for Buildings and Boundary Layer Wind Tunnel Testing

C. AAMA 101-85 - Voluntary Specification for Aluminum Prime Window, and Sliding Glass Doors

D. FMA/AAMA 200 – Standard Practice for the Installation of Windows with Frontal Flanges for Surface Barrier Masonry Construction and Extreme Wind/Water Conditions

E. AAMA 502-– Voluntary Specification for field Testing of Newly Installed Fenestration Products

F. AAMA 511 – Voluntary Guideline for Forensic Water Penetration Testing of Fenestration Products

G. AAMA 606.1 – Voluntary Guide Specifications and Inspection Methods for Integral Color Anodic Finishes for Architectural Aluminum

H. AAMA 607.1 – Voluntary Guide Specification and Inspection Methods for Clear Anodic Finishes for Architectural Aluminum

I. AAMA 608.1 – Voluntary Guide Specification and Inspection Methods for Electrolytically Deposited Color Anodic Finishes for Architectural Aluminum

J. AAMA 611 - Specification for Anodized Architectural Aluminum

K. AAMA 612 - Voluntary Specification, Performance Requirements, and Test Procedures for Combined Coatings of Anodic Oxide and Transparent Organic Coatings on Architectural Aluminum

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L. AAMA 701/702 - Voluntary Specifications for Pile Weather-stripping and Replaceable Fenestration Weather seals

M. AAMA 1503.1 – Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections

N. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2022.

O. ASCE 7 – Minimum Design Loads for Buildings and other Structures

P. ASTM A123/A123M – Standard Specification for Zinc (Hot Dip Galvanized) Coatings on Iron and Steel Products

Q. ASTM B209 – Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate

R. ASTM B221 – Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes

S. ASTM C509 - Standard Specification for Elastomeric Cellular Preformed Gasket and Sealing Material

T. ASTM D2000 - Standard Classification System for Rubber Products in Automotive Applications

U. ASTM D2287 - Standard Specification for Nonrigid Vinyl Chloride Polymer and Copolymer Molding and Extrusion Compounds

V. ASTM E283 – Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls and Doors Under Specified Pressure Differences Across the Specimen

W. ASTM E330 – Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference

X. ASTM E331 – Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference

Y. ASTM E783- Standard Test Method for Field Measurement of Air Leakage Through Installed Exterior Windows and Doors

Z. ASTM E1105 – Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform or Cyclic Static Air Pressure Difference

AA. ASTM F588 – Standard Test Methods for Measuring the Forced Entry Resistance of Window Assemblies, Excluding Glazing Impact

BB. FED L-S-125B - Screening, Insect, Nonmetallic

CC. Current Florida Building Code Product Approval

DD. FBC- Florida Building Code

1.4 QUALITY ASSURANCE

A. Standards:

1. Except as otherwise indicated, requirements for aluminum windows, terminology, and standards of performance, fabrication, and workmanship shall be specified and

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recommended in AAMA 101 and applicable general recommendations published by ASTM, AAMA and AA and compliance with ASCE 7.

2. Manufacturer shall submit written proof of compliance with all the above standards.

B. Performance:
   1. All single window units and multiple window units furnished under this section shall meet or exceed the following performance requirements.
      a. Resistance to Air Infiltration, water resistance, uniform load deflector, and load structural tests as set forth in AAMA 101.
      b. Water Leakage: No uncontrolled leakage on interior face when tested in accordance with ASTM E331 at differential pressure of 12.11-psf.
      c. Systems shall also comply with ANSI A58.1.
   2. Structural Design: Design all window systems for a wind velocity and large missile impact protection in compliance with the District Design Criteria-Structural, FBC, and ASCE 7.
      a. Missile impact protection shall be passive, such as impact glass.
   3. Air Leakage: 0.1 cfm/sq ft maximum leakage per unit area of outside window frame dimension when tested at 1.57 psf pressure difference in accordance with ASTM E283/E283M.
   4. Testing: Provide certified copy of test results from an approved testing laboratory or agency per the FBC Product Approval System.
      a. Testing certification must accompany requests for substitutions and approvals.
   5. Provide sound transmission rating (STC) for each type of window assembly that shows compliance with the District Design Criteria – Architectural and permit documents.
   6. Provide documentation the window assembly complies with the thermal requirements indicated on the plans and in the approved energy code calculations.

C. Installer Qualifications: An installer acceptable to aluminum window manufacturer for installation of units required for this Project.
   1. Installer's responsibilities include providing professional Florida structural engineering services needed to assume engineering responsibility.
   2. Engineering Responsibility: Preparation of data for aluminum windows, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project.

D. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
   1. Build mockup for type of window in location to be determined.
   2. A minimum of one mock-up will be required for each different wall condition.

E. Pre-Installation Conference:
   1. Prior to installation of windows, conduct a pre-installation site conference.
   2. Attendance: Owner (MP&O and PM), Building Department Inspector, Architect, Contractor, job superintendent, subcontractors, and suppliers related to window work.
   3. Agenda to include but not be limited to:
      a. Review of surface preparation and window installation procedures.
      b. Review of submittals shop drawings, product approval, etc.
      c. Review of special details and situations.

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d. Discuss sequence of construction, responsibilities and schedule for subsequent operations.
e. Review full-scale mockup and water test the mockup; the mockup may be separate or several units in the building.

F. Inspections: Provide on-site weekly inspections by Owner's representative during and after installation of window system.

G. The Owner may request random water test after installation of window units.
1. Contractor shall cooperate with the Owner, Architect, or Owner's Representative in conducting the water test.
2. Contractor shall correct any defective installation without any additional cost to the Owner.

1.5 SUBMITTALS

A. Shop Drawings:
1. Submit shop drawings for the fabrication and installation of aluminum window units.
2. Details of associated scale: typical unit elevations at 1" scale, and full size detail sections of every typical composite member.
3. Show fasteners, anchors, joint system, material, profiles, thicknesses, hardware, weather-stripping, expansion provisions, and other elements not included in manufacturer's data.
4. Include glazing details and assembly and erection details in conjunction with other trades.

B. Manufacturer's Certificate: Provide certification that all products meet or exceed specified requirements and performance criteria tests of this specification.

C. Samples: Submit samples of each exposed member and finish.

D. Product Approval: Supply copy to SDPBC Building Department.

1.6 PROJECT WARRANTY

A. The Contractor shall provide a written warranty signed by manufacturer, installer, and Contractor, agreeing to replace aluminum window units that have defects or failures in materials or workmanship within 5-years of date of Substantial Completion for the project.

B. Failure of material or workmanship shall include, but not be limited to, water leakage or air infiltration, excessive deflections, faulty operation of sash, deterioration of finish or metal in excess of normal weathering, defects in hardware, weather-stripping, and other components of work.

1.7 WINDOW WARRANTY

A. Section 01 77 00 – Contract Closeout.

B. Provide written warranty from manufacturer against material defects in manufacturing for a minimum period of 5-years from the date of Substantial Completion for the project.
1. Provide ten year, minimum, manufacturer warranty that includes coverage for degradation of the finish. Include provision for replacement of units with excessive fading, chalking, or flaking.

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PART 2 PRODUCTS

2.1 GENERAL

A. All Window units shall carry an AAMA label, or the manufacturer shall provide documentation of compliance with AAMA requirements from independent testing agency.

B. All window units shall be a minimum AW60 AAMA performance class & performance grade.
   1. If the structural engineer's plans require a higher load than 60, the window shall be the closest higher grade than what the engineer plans state as the minimum.

C. Manufacturers seeking approval shall submit the required product information, certified test data, samples, and evidence of meeting the FBC "Product Approval Requirements" for review and acceptance by the Architect and the Districts Building Department.
   1. A Professional Engineer registered in the State of Florida must certify compliance with all listed standards.

D. Approval: Window system must meet current FBC Product Approval in compliance with ASCE 7 wind and missile impact requirements for the window system.

E. Furnish any additional reinforcing materials determined to be required for compliance with ASCE 7 under this section.

F. All window units shall meet all other code requirements.

2.2 MATERIALS

A. Frame and vent members shall be at a minimum extruded aluminum shapes of 6063-T5 alloy.

B. Fasteners: Nonmagnetic stainless steel warranted by manufacturer to be non-corrosive and compatible with the aluminum window members, trim, hardware, anchors, and others components of the window units.
   1. Reinforcement: Where fasteners screw anchor into aluminum less than 0.125" thick, reinforce interior with nonmagnetic stainless steel to receive screw threads, or provide standard non-corrosive pressed in spline grommet nuts.
   2. Do not use exposed fasteners except where unavoidable for application of hardware.
      a. Match finish of adjoining metal.
   3. Use Phillips flat head machine screws for exposed fasteners.
   4. Anchor the frame to the structure using fasteners as specified in the manufacturer's instructions and the product approval details.
      a. If anchor head is exposed, provide in a color that match the window frame.

C. Anchors, Clips, and Window Accessories: Fabricate units of aluminum, nonmagnetic stainless steel, or hot-dip zinc coated steel per ASTM A123/A123M.

D. Compression Glazing Strips and Weather-stripping: At manufacturer's option, provide molded neoprene gaskets complying with ASTM D2000 Designation 2BC415 to 3BC620, molded PVC gaskets complying with ASTM D2287, or molded expanded neoprene gaskets complying with ASTM C509, Grade 4.

E. Sealant: Unless otherwise indicated for sealants required within fabricated window units, provide type recommended by window manufacturer for joint size and movement, to remain permanently elastic, non-shrinking, and non-migrating.
   1. Comply with paragraph 3.02 for application and installation of project sealants.

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F. Friction Shoes: Provide nylon or other non-abrasive, non-metallic, non-staining, non-corrosive durable material.

2.3 CONSTRUCTION AND FABRICATION

A. All frame-to-frame attachments shall be air and watertight.

B. Construction type: Thermally broken aluminum framing members with interior section insulated from exterior.

C. General:
1. Fabrication and accessories shall comply with the specified standards and windows units shall be re-glazable without dismantling of sash framing.
2. Include complete system for assembly of components and anchorage of window units.
3. Prepare sash for job site glazing if sashes are not factory glazed.

D. Window Sizes and Profiles:
1. Required sizes of window units and profile requirements are as indicated on the Drawings.

E. Coordination of Fabrication: Verify actual window openings by accurate field measurement before fabrication and show recorded measurements on final shop drawings.
1. Coordinate fabrication schedule with construction progress to avoid delay of work.

F. Glazing Fabrication:
1. Install all glazing in the factory - jobsite glazing is not acceptable.
2. Comply with requirements of Glazing Section 08 80 00.

G. Provide means of drainage for water and condensation, which may accumulate in members of window units.

H. Sliding Weather-stripping: Provide double weather-stripping using silicone-coated woven pile with polypropylene fin center complying with AAMA 701/702.

I. Provide sub-frames with anchors for all window units as detailed, of profile and dimensions as indicated on plans, but not less than 0.062" thickness extruded aluminum, finish matching window units.

J. Provide mullions and cover plates as detailed, matching window units, and complete with anchors for support and installation.
1. Allow for erection tolerances and provide for movements of window units due to thermal expansion and building deflections.
2. Seal mullion joints between windows per manufacturer’s requirements to prevent water intrusion.

2.4 HARDWARE

A. All hardware used in the construction of the window units shall be stainless steel, see 2.4.B.4 of this spec for anchorage of frame to structure.

B. Sash lock: Lever handle with cam lock.

C. Threshold: Extruded aluminum sloped to exterior.

D. Casement and hopper type windows shall have devices allowing the sash to remain in open position when opened.

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2.5 GLAZING

A. Refer to Section 08 80 00 for glass type for glazing types.
   1. Impact-Resistant Insulating Laminated Vision Glazing, double glazed: South-facing Exterior glazing.
   2. Impact-Resistant Laminated Vision Glazing, monolithic: All other Exterior glazing unless otherwise noted.

B. Comply with applicable codes and regulations and with the Consumer Product Safety Commission CPSC 16 CFR 1201 and with applicable recommendations of Flat Glass

C. Provide labels showing glass manufacturer's identity, type of glass, thickness, and quality.
   1. Labels shall remain on glass until inspection and approved by the Architect and District Building Department.

2.6 SCREENS

A. If drawing indicate screen for venting sash units, provide standard screens of an extruded aluminum frame with 18 by 16 dark coated fiberglass mesh and retain the unit with either fixed rigid clips or integral extruded members with aluminum plungers.
   1. Provide screens in food preparation areas kitchens and other areas as shown on the plans.

2.7 FINISH

A. Sections shall be free of scratches and other serious surface blemishes and chemically cleaned.

B. Both interior and exterior aluminum sections shall have the following finish:
   1. Class I Natural Anodized Finish: AAMA 611 AA-M12C22A41 Clear anodic coating not less than 0.7 mils thick, OR
   2. Natural Anodized Finish with Organic Seal: AAMA 612 Clear anodic coating with non-aqueous electro-deposited organic seal; not less 0.7 mils thick.

PART 3 EXECUTION

3.1 OPENINGS

A. Openings for aluminum windows shall be prepared as part of the work of other sections to the proper size, plumb, square, level, and in the proper location and alignment as shown on the Architect's Drawings and the approved shop drawings.

B. Sill and Bucks
   1. Sills shall provide a top surface profile equivalent to the following with a slope to exterior:
      a. "HiDri" by Cast Crete, www.castcrete.com
   2. Use a sill created by cast-in-place concrete or built-up waterproof non-absorbent materials as detailed on plans and coordinated with the Architect.
      a. Provide signed and sealed engineer plans on the anchoring of the pre-cast unit or the built-up units to the structure.
      b. Other manufacturers with equal profiles of the specified unit are acceptable.
      c. Provide exterior overhang with drip relief as directed by the Architect.
      d. Provide sills as detailed on plans and install in compliance with FMA/AAMA 200.

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3. Provide bucks at the head and jambs for all openings receiving unequal leg flanged windows.
    a. Install buck plumb and square with anchors as specified on the plans.
    b. Install one ½" wide x 1/8" thick strip of caulk between the buck and wall opening at the exterior edge and one at the interior edge the full length of the buck.
    c. Install buck so that the exterior edge of the buck receiving the window flange does not cause gaps between the buck and the flange, and the interior edge does not extend more than 1/16" into the interior.
    d. Align bucks properly with the sill.
    e. Install bucks in compliance with FMA/AAMA 200.
4. Contractor shall coordinate the installation of the Sill, Bucks, and Window units with the proper Contractor, Subcontractor, Architect, and Engineer.
5. Window installer shall not install window units if window openings do not meet these specifications.
6. Sills and Bucks to be set in a bed of caulking, see Sealants, below.

3.2 ALUMINUM WINDOW INSTALLATION

A. Install window units, hardware, operators, and miscellaneous components in accordance with the details shown on the drawings, approved shop drawings, and in strict accordance with the manufacturer's directions and product approval requirements.
1. The Contractor shall prepare openings plumb and square and of a size and configuration compatible with the windows to be installed.
2. Set window units plumb, level, and true line, without warp or rack of frames of sash.
3. Provide proper and acceptable separation of aluminum and other corrodible surfaces from sources of corrosion or electrolytic action.
4. Set window units true in exact alignment with the surrounding building materials and construction.
5. Anchor the units securely in place in strict accordance to the structural requirements, product approval requirements, and the manufacturer's recommendations.
6. Provide sufficient caulking to render a tight seal between components of window units and their surrounding construction, see Sealants below.

3.3 SEALANTS

A. General: Provide and install sealants as specified herein, indicated on the drawings, and as otherwise required to make a watertight seal between the windows and frames and window frames and their surrounding construction.

B. Sealant Application:
1. Joints to receive sealant shall have widths of approximately ⅛" min and ¼" max.
2. The depth of sealant shall not exceed the width of joints.
3. Apply sealants in properly prepared and if necessary primed joints.
4. Apply sealant so that joints will not trap water, with additional attention given to the bottom flange of the window.
5. All joints shall have physical barriers to control the width and depth of sealant.
6. Provide sealant rated to perform for a minimum of 20-years.

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7. The District's Building Envelope section shall review and accept the contractor's sealant selection.

3.4 FIELD TESTING

A. The District shall field test newly installed window fenestration products using an AAMA accredited independent testing agency in accordance with AAMA 502.

B. The initial testing is at the Owner's expense, the contractor pays for any additional testing due to failed test.

C. Test the unit selected by the District from the first five units completely installed unit for air leakage resistance and then water penetration resistance as specified by AAMA 502 and AAMA/WDMA/CSA 101/I.S.2/A440.
   1. Make necessary installation correction to pass the test, on the test windows and units installed.
   2. Inform the contractor and installer of necessary changes for proper installation of the units before proceeding with installation of the remaining units.

D. The Owner or Architect shall identify an additional fenestration testing of not less than 5% of the project.
   1. Test at least three windows.
   2. Test at least one of each type of window unit.
   3. Test units from at least two different elevations.
   4. In case of failures, the Owner shall require additional testing of the failed unit, plus two additional fenestrations.
   5. All additional testing because of failed test is at the contractor's expense.

E. Field test for air leakage in accordance with ASTM E783 with uniform static air pressure difference of 1.57 psf.
   1. Maximum allowable rate of air leakage is 1.5 times specified rate of 0.10 cfm/sq ft as indicated in AAMA/WDMA/CSA 101/I.S.2/A440.

F. Field test for water penetration in accordance with ASTM E1105 using Procedure A - uniform for AW windows static air pressure difference; test pressure shall not be less than 1.9 psf.

3.5 ADJUSTMENTS, CLEANING, AND PROTECTION

A. Adjust operating sash and hardware to provide tight fit at contact points and at weather-stripping, and to insure smooth operation and weather-tight closure.

B. Upon completion of work specified under this section, thoroughly clean aluminum windows and surrounding surfaces of excess material and soil from the work of this section.

C. Clean aluminum surfaces promptly after installation of windows, exercising care to avoid damage to protective coatings and finishes.
   1. Remove excess glazing and sealant compounds, dirt, and other substances.
   2. Lubricate hardware and moving parts.

D. Clean glass of pre-glazed units promptly after installation of windows.

E. After cleaning, protect the units against damage or deterioration until final acceptance of work.

1. Replace all damaged or defective units without additional cost to the Owner.

END OF SECTION

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SECTION 08 71 00
DOOR HARDWARE

PART 1 GENERAL

1.1 SECTION INCLUDES:

A. Hardware for wood and hollow steel doors.
B. Lock Cylinders for gates, folding partitions, wire cages and doors.
C. Thresholds.
D. Gaskets

1.2 REFERENCES

A. NFPA 80 - Fire Doors and Windows
B. AWI - Architectural Woodwork Institute
C. BHMA - Builders' Hardware Manufacturers Association
D. DHI - Door and Hardware Institute
E. Florida Accessibility Code for Building Construction, Chapter 11, FBC
F. NAAMM - National Association of Architectural Metal Manufacturers
G. NFPA 101 - Life Safety Code
H. SDI - Steel Door Institute
I. FBC - Florida Building Code

1.3 COORDINATION

A. Coordinate work of this Section with other directly affected Sections involving manufacturer of any internal reinforcement for door hardware.

1.4 QUALITY ASSURANCE

A. Manufacturers: Companies specializing in manufacturing door hardware with minimum five years’ experience.
B. Hardware Supplier: Company specializing in supplying institutional door hardware with minimum five years documented experience.
C. Hardware Supplier Personnel: Employ an Architectural Hardware Consultant (AHC) to assist in the work of this Section and be readily available for consultation.

1.5 REGULATORY REQUIREMENTS

A. Conform to the FBC for requirements applicable to both fire rated doors/frames and accessibility for the physically disabled.
B. Conform to the applicable sections of NFPA 101.

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1.6 CERTIFICATIONS

A. Architectural Hardware Consultant shall inspect complete installation and certify that hardware and installation is in accordance with manufacturer's instructions and this specification.
B. Provide two copies of certifications to the Architect.

1.7 SUBMITTALS

A. Submit schedule and product data under provisions of Section 01300.
B. Indicate locations and mounting heights of each type of hardware.
C. Provide product data on specified hardware.
D. Submit samples under provisions of Section 01300.
E. Submit samples of hinge, latch set, exit device, door closer, threshold, illustrating style, color and finish.
F. Samples: Incorporate the samples within the Work.
G. Submit manufacturer's parts lists, templates, and installation instructions under provisions of Section 01300.
H. Submit manufacturer's certificate under provisions of Section 01400 that fire rated hardware meets or exceeds specified requirements.

1.8 OPERATION AND MAINTENANCE DATA

A. Submit operation and maintenance data under provisions of Section 01700.
B. Include data on operating hardware, and inspection procedures related to preventative maintenance.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site under provisions of Section 01600.
B. Store and protect products under provisions of Section 01600.
C. Package hardware items individually; label and identify package with door opening code and hardware group to match hardware schedule.
D. Deliver all final keys and permanent cores to Owner's Lock Department by security shipment direct from hardware supplier.
    1. Delivery Address:
        The School District of Palm Beach County
        Department of Maintenance & Plant Operations
        Quality Assurance Section
        West Palm Beach, Florida 33406-4108
E. Deliver two copies of factory key biting schedule to the Owner's Lock Department in conjunction with delivery of final keys.
F. Protect hardware from theft by cataloging and storing in secure area.

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1.10 WARRANTY

A. Provide a minimum of a five-year warranty period under provisions of Section 01700.
B. Warranty: Include coverage of door closers, locksets, latch sets, exit devices hinges and all items listed in the hardware schedule

1.11 MAINTENANCE MATERIALS

A. Provide special wrenches and tools applicable to different or special hardware components.
B. Provide maintenance tools and accessories supplied by hardware component manufacturers.

PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Hinges: Ives, Hager, Stanley
B. Reinforcing Pivots: Hager
C. Cylinder Locks: Schlage FSIC Core
D. Latch Sets: Schlage
E. Cabinet Locks: Schlage, Olympus with Schlage FSIC Core
F. Rim /Mortise Cylinders: Schlage FSIC Core
G. Mortise Locks: Schlage FSIC Core
H. Exit Devices: Von Duprin – using Schlage FSIC Core
I. Removable Mullions: Von Duprin - *Keyed Removable using Schlage FSIC Core where listed

J. Manual/Automatic Bolts, Coordinators: Ives, DCI
K. Push/Pulls: Ives, Trimco
L. Protection Plates: Ives, Trimco
M. Gaskets/Thresholds: Zero, National Guard
N. Power Supplies: Von Duprin.
O. Power Transfer: Von Duprin

2.2 HINGES

A. Size: 4½" wide x 4½" high, 5BB1 at exterior and 5BB1 at interior locations.
B. No less than three hinges on any door and add a reinforcing pivot on all doors over 3' 0" wide.
C. Ball Bearing hinges on doors with door closers and provide Non-Removable Pin type on all exterior out-swing doors.

2.3 LOCKSETS

A. Supply in the following functions:

LOCATION	FUNCTION
1. Passage	ND10S

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2.	Privacy	ND40S(44S in Grades K-2)
3.	Offices	ND98TD x RHO x 626
4.	Classroom/Storeroom/Mechanical Room	ND96TD x RHO x 626
5.	Deadlocks (student areas)	B663T
6.	Deadlocks (non-student areas)	B660T

B. Electronic Lever Lock: Schlage L9080TEU x 06 x 630 or ND96TDEU X RHO X 626

2.4 DOOR CLOSERS

A. All door closers to 4040XP/4041XP series as required.
B. Furnish Parallel arms on all doors scheduled for closers except where they are mounted showing in corridors.
C. Supply nylon spacer for fifth mounting screw on parallel arm installations where required due to frame configuration.
D. Supply with EDA arm on installations in main corridor entrances, gymnasiums, locker rooms, and restrooms.

2.5 EXIT DEVICES AND POWER SUPPLY

A. Supply in the following functions:

	LOCATION	FUNCTION
1.	Non-fire rated	Von Duprin 98/99 Trim as specified
2.	Fire-rated	Von Duprin 98/99F with Trim as Specified
3.	Non-fire rated (pairs)	Von Duprin 98/99 with Trim and Mullion as specified
4.	Fire-rated (pairs)	Von Duprin 98/99F with Trim and Mullion as specified
	Fire-rated (Electronic)	Von Duprin 98/99F QEL or E996 Trim as specified
5.	Non-fire-rated (Electronic)	Von Duprin 98/99 QEL or E996 Trim as specified
6.	Power Supply	Von Duprin PS900 Series per requirements
7.	Electrical Power Transfer	Von Duprin EPT-10 X SP28

Note – Interior Doors shall be Removable Mullions with key removable with IC cylinders
Note – Exterior Doors shall be Non-Keyed Removable per FBC/Miami Dade NOA Requirements

2.6 DOOR TRIM

A. All push plates, pull plates and kick plates manufactured of .050 stainless steel.
B. Push plates and pull plates 4" wide x 16" high.
C. Kick plates 10" high x 2" less than door width.

2.7 DOOR STOPS

A. Door stops of the follow types:
1. MANUFACTURER

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Ives- As Specified
Trimco - As specified

B. Overhead Stop and Holders:

1. GLYNN Johnson- As Specified
2. Trimco - As Specified

2.8 AUTOMATIC FLUSH BOLTS, SURFACE BOLTS AND COORDINATORS

A. Supply door bolts of the following type:

1.

MANUFACTURER	NON-FIRE RATED	FIRE RATED
Ives	458-B26D 8"	FB41P-B26D, FB31P-B26D as required.

B. Supply coordinators of the following type:

1.

MANUFACTURER	MODEL
H. B. Ives	COR-B26D with FL carry bar

2.9 THRESHOLDS AND SEALS

A. Supply thresholds and seals of the following types for Exterior Doors per current FBC/Miami Dade NOA Requirements

1. MANUFACTURERS
   Zero International
   NGP Products

B. Supply thresholds and seals of the following types for Interior Doors: As scheduled in hardware sets

1. MANUFACTURERS
   Zero International
   NGP

2.10 OVERHEAD RAIN DRIP

A. Provide overhead rain drip of the following types at all exterior door frame locations or as scheduled within these specifications: Per NOA Requirements

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1. MANUFACTURER
   Zero International
   NGP Products

2.11 FASTENINGS

A. All screws of matching finish to their product and to manufacturer's standards for that item and its intended use.
B. All surface mounted hardware, use manufacturer's supplied bolts for through bolting of hardware.

2.12 KEYING

A. Pre-Order Meeting: Hardware Supplier shall meet with a representative of the Owner's Lock Department and Department Head to establish a keying schedule before placing any orders.
B. Locks:
   1. Keying as established in pre-order meeting with Hardware Supplier.
   2. All locks to be furnished with FSIC Construction cores.
C. All locks and cylinders factory keyed to Palm Beach County School District Schlage EVEREST D245 restricted keyway.
D. Hardware Supplier and a representative of the Owner's Lock Department will meet and establish final count of locks and cylinders.
   1. The Owner's Lock Department will transmit a letter to the Schlage Lock Company releasing locks and cylinders in the amount established in the final count to the Hardware Supplier.
E. Supply two keys for each lock with a maximum of four keys of keyed alike sets.

F. Supply keys in the following quantities:
   1. Five Master Keys
   2. Five Grand Master Keys
   3. Five Great Grand Master Keys
   4. Two Control Keys (for interchangeable cores)
   5. Twelve Construction Master Keys
   6. 10 Construction Change Keys
G. Key/Permanent Core Delivery: Refer to Section 08710 1.09, D.
H. Visual Key control: Use visual key control – stamp keys only. Stamp all keys “Do Not Duplicate”.

2.13 KEY CABINETS

A. Key Cabinet: Sheet steel construction, piano hinged door with pin tumbler lock of brass construction.
B. Cabinet Size: Size for project keys plus 10%.

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C. Horizontal metal strips for key hook labeling with clear plastic strip cover over labels.
D. Finish: Baked enamel finish, gray color.

2.14 KNOX BOX

A. Provide the required Knox box as manufactured by Knox Company to meet the local Fire Department criteria.
   1. Coordinate ordering and locating with the Fire Department having jurisdiction.
B. Provide a Knox box as manufactured by Knox Company to meet the School District's Police Department criteria.
   1. Coordinate ordering and locating with the School District's Police Department
C. Provide two Knox padlocks to meet the local Fire Department criteria.
   1. Coordinate ordering and locating with the Fire Department having jurisdiction.

2.15 FINISHES

A. Exterior Hinges: US32D x NRP
B. Interior Hinges: US26D
C. Exterior Locks: US26D/US32D
D. Interior Locks: US26D
E. Coordinators: US26D
F. Push, Pull & Kick Plates: US32D
G. Door Closers: AL - 689
H. Exit Devices: US32D/US26D
I. Door Stops & Holders: US32D
J. Thresholds & Weather-strip: AL

2.16 CLOSER / MAGNETIC HOLD OPEN SYSTEM:

A. Furnish closer/electromagnet complete with required accessories necessary for a complete working system. Supply a two-year warranty.
   1. MANUFACTURER SERIES
      LCN SEM7800
      RIXSON 998

PART 3 EXECUTION

3.1 INSPECTION

A. Verify that doors and frames are ready to receive work and dimensions are as indicated on shop drawings.
B. Beginning of installation means acceptance of existing conditions.
C. Do not install any hardware until after the hardware manufacturer's representative pre-installation class to insure proper installation of the specified products.

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3.2 INSTALLATION

A. Install hardware in accordance with manufacturer's instructions and requirements of DHI.
B. Use the templates provided by hardware item manufacturer.
C. Mounting heights for hardware from finished floor to center line of hardware item:
   1. Locksets: 38 inches.
   2. Push/Pulls: 42 inches.
   3. Dead Locks: 48 inches.
   4. Exit Devices: 38 inches.
D. Conform to Florida Accessibility Code for Building Construction for positioning requirements for the disabled.
E. Set all thresholds in a full bed of butyl rubber.
F. The hardware manufacturers will provide a post installation review to insure proper installation of the specified products.

3.3 ADJUST AND CLEAN

A. Adjust and check the operation of each item of hardware and each door, to ensure the proper function of every item.
   1. Replace all items that cannot be adjusted to operate freely and smoothly.
B. Made final adjustments after all ventilating systems are in operation.
C. Clean all hardware and adjacent surfaces after hardware installation.
D. Instruct Owner's personnel in adjustment and maintenance of hardware and hardware finishes.

END OF SECTION

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SECTION 08 71 00A
DOOR HARDWARE GROUPS

HARDWARE SCHEDULE:

1. The following schedule is furnished for whatever assistance it may afford the contractor; do not consider it entirely inclusive. Should any particular door or item be omitted in any scheduled hardware group, provide door or item with hardware same as required for similar purposes. The quantities listed are for each pair of doors or for each single door.

2. The intent of the hardware specification is to specify the hardware for interior and exterior doors, and to establish a type, continuity, and standard of quality. However, it is the door hardware supplier's responsibility to thoroughly review existing conditions, schedules, specifications, drawings, and other Contract Documents to verify the suitability of the hardware specified.

3. This hardware schedule was prepared by.

Allegion, PLC
3451 Technological Ave, Suite 7

Orlando FL 32817

Ph: 407-571-2000
Fax 407-571-2006

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HARDWARE GROUP NO. 01 - EXTERIOR - CARD READER

1-005.1 1-005 1-008.1 1-014 1-126.2 1-126.3 1-182

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1 4.5 X 4.5 NRP	630	IVE
1	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	FIRE RATED REMOVABLE MULLION	HH-9954B	689	VON
1	EA	PANIC HARDWARE	HH-99-EO-SNB	626	VON
1	EA	ELEC PANIC HARDWARE	HH-99-L-M996-06-299F-FSE-SNB	626	VON
1	EA	RIM CYLINDER	20-057 ICX	626	SCH
1	EA	FSIC CORE	23-030 EV D	626	SCH
2	EA	SURFACE CLOSER	4040XP SCUSH TBSRT	689	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
2	EA	RAIN DRIP	11A	A	ZER
2	EA	GASKETING	139A	A	ZER
1	EA	RAIN DRIP	142AA	AA	ZER
1	EA	GASKETING	188SBK PSA	BK	ZER
2	EA	DOOR SWEEP	328AA	AA	ZER
1	SET	MEETING STILE	328AA-S	AA	ZER
1	SET	GASKETING	475AA-S	AA	ZER
2	EA	DOOR SWEEP	8197AA 36" (914MM)	AA	ZER
2	EA	DOOR BOTTOM	FAS-SEAL		STE
1	EA	THRESHOLD	566A-223	A	ZER
1	EA	CARD READER	CARD READER – BY SECURITY SYSTEMS INTEGRATOR		UNK
1	EA	PUSH BUTTON	621AL 12/24 VDC	630	SCE
1	EA	POWER SUPPLY	PS902 900-2RS 900-BBK 120/240 VAC		VON
2	EA	DOOR POSITION SWITCH	DOOR POSITION SWITCH (DPS) BY SECURTY SYSTEMS INTEGRATOR	BLK	UNK

CARD ACCESS SYSTEM AND CARD READER TO BE SUPPLIED BY THE SECURITY SYSTEMS INTEGRATOR

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HARDWARE GROUP NO. 02 - EXTERIOR EXIT

1-102P 1-198

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1 4.5 X 4.5 NRP	630	IVE
1	EA	FIRE RATED REMOVABLE MULLION	HH-9954B	689	VON
1	EA	FIRE EXIT HARDWARE	HH-99-EO-F-SNB	626	VON
1	EA	FIRE EXIT HARDWARE	HH-99-L-NL-F-06-SNB	626	VON
1	EA	RIM CYLINDER	20-057 ICX	626	SCH
1	EA	FSIC CORE	23-030 EV D	626	SCH
2	EA	SURFACE CLOSER	4040XP SCUSH TBSRT	689	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	RAIN DRIP	11A	A	ZER
2	EA	GASKETING	139A	A	ZER
1	EA	RAIN DRIP	142AA	AA	ZER
2	EA	DOOR SWEEP	328AA	AA	ZER
1	SET	MEETING STILE	328AA-S	AA	ZER
1	EA	GASKETING	8150SBK PSA	BK	ZER
2	EA	DOOR BOTTOM	FAS-SEAL		STE
1	EA	THRESHOLD	566A-223	A	ZER

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HARDWARE GROUP NO. 03 - EXTERIOR - GENERATOR/FLAMABLE SORAGE

1-183 1-199B

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1 4.5 X 4.5 NRP	630	IVE
1	EA	FIRE RATED REMOVABLE MULLION	HH-9954B	689	VON
1	EA	PANIC HARDWARE	HH-99-EO-SNB	626	VON
1	EA	PANIC HARDWARE	HH-99-L-NL-06-299F-SNB	626	VON
1	EA	RIM CYLINDER	20-057 ICX	626	SCH
2	EA	SURFACE CLOSER	4040XP SCUSH TBSRT	689	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
2	EA	RAIN DRIP	11A	A	ZER
3	EA	GASKETING	139A	A	ZER
1	EA	RAIN DRIP	142AA	AA	ZER
1	SET	MEETING STILE	328AA-S	AA	ZER
1	EA	GASKETING	8150SBK PSA	BK	ZER
2	EA	DOOR BOTTOM	FAS-SEAL		STE
1	EA	THRESHOLD	566A-223	A	ZER

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HARDWARE GROUP NO. 04 - EXTERIOR - PE/TEACHER PLANNING
1-131C

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1 4.5 X 4.5 NRP	630	IVE
1	EA	POWER TRANSFER	EPT10 CON	689	VON
2	EA	SURFACE BOLT	SB360 12" T	604	IVE
1	EA	VANDL EU STOREROOM	ND96TDEU RHO CON 12V/24V DC	626	SCH
2	EA	SURFACE CLOSER	4040XP SCUSH TBSRT	689	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
2	EA	RAIN DRIP	11A	A	ZER
3	EA	GASKETING	139A	A	ZER
1	EA	RAIN DRIP	142AA	AA	ZER
2	EA	DOOR SWEEP	328AA	AA	ZER
1	SET	MEETING STILE	328AA-S	AA	ZER
1	EA	GASKETING	8150SBK PSA	BK	ZER
2	EA	DOOR BOTTOM	FAS-SEAL		STE
1	EA	THRESHOLD	566A-223	A	ZER
1	EA	CARD READER	CARD READER – BY SECURITY SYSTEMS INTEGRATOR		UNK
1	EA	POWER SUPPLY	POWER SUPPLY BY SECURITY SYSTEMS INTEGRATOR		UNK
1	EA	DOOR POSITION SWITCH	DOOR POSITION SWITCH (DPS) BY SECURTY SYSTEMS INTEGRATOR	BLK	UNK

CARD ACCESS SYSTEM AND CARD READER TO BE SUPPLIED BY THE SECURITY SYSTEMS INTEGRATOR
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HARDWARE GROUP NO. 05 - EXTERIOR EXIT - CARD READER

1-128

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	630	IVE
1	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	ELEC PANIC HARDWARE	RX-HH-99-L-M996-06-299F-FSE-SNB	626	VON
1	EA	RIM CYLINDER	20-057 ICX	626	SCH
1	EA	FSIC CORE	23-030 EV D	626	SCH
1	EA	SURFACE CLOSER	4040XP SCUSH TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	RAIN DRIP	11A	A	ZER
1	EA	GASKETING	139A	A	ZER
1	EA	RAIN DRIP	142AA	AA	ZER
1	EA	GASKETING	188SBK PSA	BK	ZER
1	EA	DOOR SWEEP	328AA	AA	ZER
1	SET	GASKETING	475AA-S	AA	ZER
1	EA	DOOR BOTTOM	FAS-SEAL		STE
1	EA	THRESHOLD	566A-223	A	ZER
1	EA	CARD READER	CARD READER – BY SECURITY SYSTEMS INTEGRATOR		UNK
1	EA	POWER SUPPLY	PS902 900-2RS 900-BBK 120/240 VAC		VON
1	EA	DOOR POSITION SWITCH	DOOR POSITION SWITCH (DPS) BY SECURTY SYSTEMS INTEGRATOR	BLK	UNK

CARD ACCESS SYSTEM AND CARD READER TO BE SUPPLIED BY THE SECURITY SYSTEMS INTEGRATOR

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HARDWARE GROUP NO. 06 - EXTERIOR - CARD READER

1-101L 1-105.1 1-124.1

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
4	EA	HINGE	5BB1 4.5 X 4.5 NRP	630	IVE
1	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	VANDL EU STOREROOM	ND96TDEU RHO CON 12V/24V DC	626	SCH
1	EA	FSIC CORE	23-030 EV D	626	SCH
1	EA	SURFACE CLOSER	4040XP EDA TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	RAIN DRIP	11A	A	ZER
1	EA	GASKETING	139A	A	ZER
1	EA	RAIN DRIP	142AA	AA	ZER
1	EA	GASKETING	188SBK PSA	BK	ZER
1	EA	DOOR SWEEP	328AA	AA	ZER
1	SET	GASKETING	475AA-S	AA	ZER
1	EA	DOOR BOTTOM	FAS-SEAL		STE
1	EA	THRESHOLD	566A-223	A	ZER
1	EA	VIEWER	U700	626	IVE
1	EA	CARD READER	CARD READER – BY SECURITY SYSTEMS INTEGRATOR		UNK
1	EA	POWER SUPPLY	PS902 900-2RS 900-BBK 120/240 VAC		VON
1	EA	DOOR POSITION SWITCH	DOOR POSITION SWITCH (DPS) BY SECURTY SYSTEMS INTEGRATOR	BLK	UNK

CARD ACCESS SYSTEM AND CARD READER/AI TO BE SUPPLIED BYTHE SECURITY SYSTEMS INTEGRATOR

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HARDWARE GROUP NO. 07 - EXTERIOR EXIT - CARD READER

1-004.1 1-100.1 1-106.1 1-127

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	630	IVE
1	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	ELEC PANIC HARDWARE	RX-HH-99-L-M996-06-299F-FSE-SNB	626	VON
1	EA	RIM CYLINDER	20-057 ICX	626	SCH
1	EA	FSIC CORE	23-030 EV D	626	SCH
1	EA	SURFACE CLOSER	4040XP SCUSH TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	RAIN DRIP	11A	A	ZER
1	EA	GASKETING	139A	A	ZER
1	EA	RAIN DRIP	142AA	AA	ZER
1	EA	GASKETING	188SBK PSA	BK	ZER
1	EA	DOOR SWEEP	328AA	AA	ZER
1	SET	GASKETING	475AA-S	AA	ZER
1	EA	DOOR BOTTOM	FAS-SEAL		STE
1	EA	THRESHOLD	566A-223	A	ZER
1	EA	CARD READER	CARD READER – BY SECURITY SYSTEMS INTEGRATOR		UNK
1	EA	POWER SUPPLY	PS902 900-2RS 900-BBK 120/240 VAC		VON
1	EA	DOOR POSITION SWITCH	DOOR POSITION SWITCH (DPS) BY SECURTY SYSTEMS INTEGRATOR	BLK	UNK

CARD ACCESS SYSTEM AND CARD READER TO BE SUPPLIED BY THE SECURITY SYSTEMS INTEGRATOR

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HARDWARE GROUP NO. 08 - EXTERIOR - BOILER EMERGENCY GENERATOR

1-197 1-199

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	630	IVE
1	EA	PANIC HARDWARE	HH-99-L-NL-06-299F-SNB	626	VON
1	EA	RIM CYLINDER	20-057 ICX	626	SCH
1	EA	SURFACE CLOSER	4040XP SCUSH TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	RAIN DRIP	11A	A	ZER
1	EA	GASKETING	139A	A	ZER
1	EA	RAIN DRIP	142AA	AA	ZER
1	EA	GASKETING	188SBK PSA	BK	ZER
1	EA	DOOR SWEEP	328AA	AA	ZER
1	SET	GASKETING	475AA-S	AA	ZER
1	EA	DOOR BOTTOM	FAS-SEAL		STE
1	EA	THRESHOLD	566A-223	A	ZER

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HARDWARE GROUP NO. 09 - EXTERIOR - STORAGE

1-123

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	630	IVE
1	EA	VANDL STOREROOM LOCK	ND96TD RHO	626	SCH
1	EA	FSIC CORE	23-030 EV D	626	SCH
1	EA	SURFACE CLOSER	4040XP SCUSH TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	RAIN DRIP	11A	A	ZER
1	EA	GASKETING	139A	A	ZER
1	EA	RAIN DRIP	142AA	AA	ZER
1	EA	GASKETING	188SBK PSA	BK	ZER
1	EA	DOOR SWEEP	328AA	AA	ZER
1	SET	GASKETING	475AA-S	AA	ZER
1	EA	DOOR BOTTOM	FAS-SEAL		STE
1	EA	THRESHOLD	566A-223	A	ZER

FBC NOA FL 12400 BASIS OF DESIGN

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HARDWARE GROUP NO. 10 - INTERIOR - CARD READER

1-016 1-125

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	FIRE RATED REMOVABLE MULLION	KR9954	689	VON
1	EA	FIRE EXIT HARDWARE	99-EO-F-SNB	626	VON
1	EA	ELEC FIRE EXIT HARDWARE	99-L-F-M996-06-FSE-SNB	626	VON
1	EA	RIM CYLINDER	20-057 ICX	626	SCH
1	EA	MORTISE CYLINDER	20-061 ICX X K510-730 36-083	626	SCH
2	EA	FSIC CORE	23-030 EV D	626	SCH
2	EA	SURFACE CLOSER	4040XP EDA TBSRT	689	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
2	EA	WALL STOP	WS406/407CCV	630	IVE
1	SET	MEETING STILE	328AA-S	AA	ZER
1	SET	GASKETING	8303AA-S	AA	ZER
1	EA	CARD READER	CARD READER – BY SECURITY SYSTEMS INTEGRATOR		UNK
1	EA	POWER SUPPLY	PS902 900-2RS 900-BBK 120/240 VAC		VON
1	EA	DOOR POSITION SWITCH	DOOR POSITION SWITCH (DPS) BY SECURTY SYSTEMS INTEGRATOR	BLK	UNK

CARD ACCESS SYSTEM AND CARD READER TO BE SUPPLIED BY THE SECURITY SYSTEMS INTEGRATOR

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HARDWARE GROUP NO. 11 - INTERIOR - CARD READER - HOLD OPEN
1-006

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	FIRE RATED REMOVABLE MULLION	KR9954	689	VON
1	EA	FIRE EXIT HARDWARE	99-EO-F-SNB	626	VON
1	EA	ELEC FIRE EXIT HARDWARE	99-L-F-M996-06-FSE-SNB	626	VON
1	EA	RIM CYLINDER	20-057 ICX	626	SCH
1	EA	MORTISE CYLINDER	20-061 ICX X K510-730 36-083	626	SCH
2	EA	FSIC CORE	23-030 EV D	626	SCH
2	EA	FIRE/LIFE CLOSER	4040SE TBWMS AC/DC	689	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	SET	MEETING STILE	328AA-S	AA	ZER
1	SET	GASKETING	8303AA-S	AA	ZER
1	EA	CARD READER	CARD READER – BY SECURITY SYSTEMS INTEGRATOR		UNK
1	EA	POWER SUPPLY	PS902 900-2RS 900-BBK 120/240 VAC		VON
1	EA	DOOR POSITION SWITCH	DOOR POSITION SWITCH (DPS) BY SECURTY SYSTEMS INTEGRATOR	BLK	UNK

CARD ACCESS SYSTEM AND CARD READER/AI TO BE SUPPLIED BYTHE SECURITY SYSTEMS INTEGRATOR
4040SE DOOR CLSOERS TO BE CONNECTED TO THE FIRE ALARM SYSTEM

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HARDWARE GROUP NO. 12 - INTERIOR - STAIR/CORRIDOR

1-007.2	1-007.3	1-007	1-008.2	1-008.3	1-008
1-009.2	1-009.3	1-009	1-017	1-102M	1-102N
1-102O					

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	FIRE RATED REMOVABLE MULLION	KR9954	689	VON
1	EA	FIRE EXIT HARDWARE	99-EO-F-SNB	626	VON
1	EA	FIRE EXIT HARDWARE	99-L-F-06-SNB	626	VON
1	EA	RIM CYLINDER	20-057 ICX	626	SCH
1	EA	MORTISE CYLINDER	20-061 ICX X K510-730 36-083	626	SCH
2	EA	FSIC CORE	23-030 EV D	626	SCH
2	EA	SURFACE CLOSER	4040XP EDA TBSRT	689	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
2	EA	WALL STOP	WS406/407CCV	630	IVE
2	EA	FIRE/LIFE WALL MAG	SEM7850 AS REQ (12/24/120V AC/DC TRI-VOLT)	689	LCN
1	SET	MEETING STILE	328AA-S	AA	ZER
1	SET	GASKETING	8303AA-S	AA	ZER

WALL MAGNETS MUST BE TIED TO FIRE ALARM.

HARDWARE GROUP NO. 13 - INTERIOR EXIT

1-126.1	1-126

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	FIRE RATED REMOVABLE MULLION	KR9954	689	VON
1	EA	FIRE EXIT HARDWARE	99-EO-F-SNB	626	VON
1	EA	FIRE EXIT HARDWARE	99-L-F-06-SNB	626	VON
1	EA	RIM CYLINDER	20-057 ICX	626	SCH
1	EA	MORTISE CYLINDER	20-061 ICX X K510-730 36-083	626	SCH
2	EA	FSIC CORE	23-030 EV D	626	SCH
2	EA	SURFACE CLOSER	4040XP SCUSH TBSRT	689	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	SET	MEETING STILE	328AA-S	AA	ZER
1	SET	GASKETING	8303AA-S	AA	ZER

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HARDWARE GROUP NO. 14 - INTERIOR - CUSTODIAL - CARD READER

1-182.1

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
2	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	AUTO FLUSH BOLT	FB31P	630	IVE
1	EA	DUST PROOF STRIKE	DP2	626	IVE
1	EA	VANDL EU STOREROOM	ND96TDEU RHO CON 12V/24V DC	626	SCH
1	EA	FSIC CORE	23-030 EV D	626	SCH
1	EA	COORDINATOR	COR X FL	628	IVE
2	EA	MOUNTING BRACKET	MB	689	IVE
2	EA	SURFACE CLOSER	4040XP EDA TBSRT	689	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
2	EA	WALL STOP	WS406/407CCV	630	IVE
1	SET	GASKETING	8303AA-S	AA	ZER
1	EA	CARD READER	CARD READER – BY SECURITY SYSTEMS INTEGRATOR		UNK
1	EA	POWER SUPPLY	PS902 900-2RS 900-BBK 120/240 VAC		VON
1	EA	DOOR POSITION SWITCH	DOOR POSITION SWITCH (DPS) BY SECURTY SYSTEMS INTEGRATOR	BLK	UNK

ASTRAGAL BY DOOR SUPPLIER

HARDWARE GROUP NO. 15 - INTERIOR - MECHANICAL

1-191 1-194 1-196 1-291 1-293 1-391

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	AUTO FLUSH BOLT	FB41P	630	IVE
1	EA	DUST PROOF STRIKE	DP2	626	IVE
1	EA	DUST PROOF STRIKE	DP2	626	IVE
1	EA	VANDL STOREROOM LOCK	ND96TD RHO	626	SCH
1	EA	COORDINATOR	COR X FL	628	IVE
2	EA	MOUNTING BRACKET	MB	689	IVE
2	EA	SURFACE CLOSER	4040XP EDA TBSRT	689	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
2	EA	WALL STOP	WS406/407CCV	630	IVE
1	SET	GASKETING	8303AA-S	AA	ZER

ASTRAGAL BY DOOR SUPPLIER

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HARDWARE GROUP NO. 16 - INTERIOR CARD READER

1-124

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	POWER TRANSFER	EPT10 CON	689	VON
1	EA	ELEC FIRE EXIT HARDWARE	RX-99-L-F-M996-06-FSE-SNB	626	VON
1	EA	RIM CYLINDER	20-057 ICX	626	SCH
1	EA	FSIC CORE	23-030 EV D	626	SCH
1	EA	SURFACE CLOSER	4040XP EDA TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	SET	GASKETING	8303AA-S	AA	ZER
1	EA	CARD READER	CARD READER – BY SECURITY SYSTEMS INTEGRATOR		UNK
1	EA	POWER SUPPLY	PS902 900-2RS 900-BBK 120/240 VAC		VON
1	EA	DOOR POSITION SWITCH	DOOR POSITION SWITCH (DPS) BY SECURTY SYSTEMS INTEGRATOR	BLK	UNK

CARD ACCESS SYSTEM AND CARD READER TO BE SUPPLIED BY THE SECURITY SYSTEMS INTEGRATOR

HARDWARE GROUP NO. 17 - INTERIOR EXIT - CARD READER

1-003 1-100.2 1-100 1-101.1 1-101

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	POWER TRANSFER	EPT10 CON	689	VON
1	EA	ELEC PANIC HARDWARE	RX-99-L-M996-06-FSE-SNB	626	VON
1	EA	RIM CYLINDER	20-057 ICX	626	SCH
1	EA	FSIC CORE	23-030 EV D	626	SCH
1	EA	SURFACE CLOSER	4040XP EDA TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	SET	GASKETING	8303AA-S	AA	ZER
1	EA	CARD READER	CARD READER – BY SECURITY SYSTEMS INTEGRATOR		UNK
1	EA	POWER SUPPLY	PS902 900-2RS 900-BBK 120/240 VAC		VON
1	EA	DOOR POSITION SWITCH	DOOR POSITION SWITCH (DPS) BY SECURTY SYSTEMS INTEGRATOR	BLK	UNK

CARD ACCESS SYSTEM AND CARD READER TO BE SUPPLIED BY THE SECURITY SYSTEMS INTEGRATOR

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HARDWARE GROUP NO. 18 - INTERIOR ELECTRICAL

1-192 1-198.1 1-294 1-392

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	FIRE EXIT HARDWARE	99-L-NL-F-06	626	VON
1	EA	RIM CYLINDER	20-057 ICX	626	SCH
1	EA	FSIC CORE	23-030 EV D	626	SCH
1	EA	SURFACE CLOSER	4040XP EDA TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	SET	GASKETING	8303AA-S	AA	ZER

HARDWARE GROUP NO. 19 - INTERIOR EXIT

1-004.2 1-004 1-126A.1 1-126A

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	FIRE EXIT HARDWARE	99-L-F-06	626	VON
1	EA	RIM CYLINDER	20-057 ICX	626	SCH
1	EA	FSIC CORE	23-030 EV D	626	SCH
1	EA	SURFACE CLOSER	4040XP EDA TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	SET	GASKETING	8303AA-S	AA	ZER

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HARDWARE GROUP NO. 20 - INTERIOR CARD READER

1-105	1-106	1-107	1-108	1-109	1-110
1-111	1-112	1-113	1-114	1-115	1-116
1-117	1-118	1-119	1-120	1-121	1-122
1-201	1-203	1-204	1-205	1-206	1-207
1-208	1-209	1-210	1-211	1-212	1-213
1-214	1-215	1-216	1-217	1-218	1-219
1-220	1-221	1-222	1-301	1-302	1-303
1-304	1-305	1-306	1-307	1-308	1-309
1-310	1-311	1-312	1-313	1-314	1-315
1-316	1-317	1-318			

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	POWER TRANSFER	EPT10 CON	689	VON
1	EA	VANDL EU STOREROOM	ND96TDEU RHO CON 12V/24V DC	626	SCH
1	EA	FSIC CORE	23-030 EV D	626	SCH
1	EA	SURFACE CLOSER	4040XP EDA TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	SET	GASKETING	8303AA-S	AA	ZER
1	EA	CARD READER	CARD READER – BY SECURITY SYSTEMS INTEGRATOR		UNK
1	EA	POWER SUPPLY	PS902 900-2RS 900-BBK 120/240 VAC		VON
1	EA	DOOR POSITION SWITCH	DOOR POSITION SWITCH (DPS) BY SECURTY SYSTEMS INTEGRATOR	BLK	UNK

CARD ACCESS SYSTEM AND CARD READER/AI TO BE SUPPLIED BYTHE SECURITY SYSTEMS INTEGRATOR

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HARDWARE GROUP NO. 21 - INTERIOR CARD READER

1-126SS 1-193 1-292

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	POWER TRANSFER	EPT10 CON	689	VON
1	EA	VANDL EU STOREROOM	ND96TDEU RHO CON 12V/24V DC	626	SCH
1	EA	FSIC CORE	23-030 EV D	626	SCH
1	EA	SURFACE CLOSER	4040XP REG OR PA AS REQ TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	SET	GASKETING	8303AA-S	AA	ZER
1	EA	CARD READER	CARD READER – BY SECURITY SYSTEMS INTEGRATOR		UNK
1	EA	POWER SUPPLY	PS902 900-2RS 900-BBK 120/240 VAC		VON
1	EA	DOOR POSITION SWITCH	DOOR POSITION SWITCH (DPS) BY SECURTY SYSTEMS INTEGRATOR	BLK	UNK

CARD ACCESS SYSTEM AND CARD READER/AI TO BE SUPPLIED BYTHE SECURITY SYSTEMS INTEGRATOR

HARDWARE GROUP NO. 22 - INTERIOR CARD READER

1-126C

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	VANDL EU STOREROOM	ND96TDEU RHO CON 12V/24V DC	626	SCH
1	EA	FSIC CORE	23-030 EV D	626	SCH
1	EA	SURFACE CLOSER	4040XP EDA TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
3	EA	SILENCER	SR64	GRY	IVE
1	EA	CARD READER	CARD READER – BY SECURITY SYSTEMS INTEGRATOR		UNK
1	EA	POWER SUPPLY	PS902 900-2RS 900-BBK 120/240 VAC		VON
1	EA	DOOR POSITION SWITCH	DOOR POSITION SWITCH (DPS) BY SECURTY SYSTEMS INTEGRATOR	BLK	UNK

CARD ACCESS SYSTEM AND CARD READER TO BE SUPPLIED BY THE SECURITY SYSTEMS INTEGRATOR

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HARDWARE GROUP NO. 23 - INTERIOR CARD READER

1-127.1 1-390

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	POWER TRANSFER	EPT10 CON	689	VON
1	EA	VANDL EU STOREROOM	ND96TDEU RHO CON 12V/24V DC	626	SCH
1	EA	FSIC CORE	23-030 EV D	626	SCH
1	EA	SURFACE CLOSER	4040XP EDA TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
3	EA	SILENCER	SR64	GRY	IVE
1	EA	CARD READER	CARD READER – BY SECURITY SYSTEMS INTEGRATOR		UNK
1	EA	POWER SUPPLY	PS902 900-2RS 900-BBK 120/240 VAC		VON
1	EA	DOOR POSITION SWITCH	DOOR POSITION SWITCH (DPS) BY SECURTY SYSTEMS INTEGRATOR	BLK	UNK

CARD ACCESS SYSTEM AND CARD READER TO BE SUPPLIED BY THE SECURITY SYSTEMS INTEGRATOR

HARDWARE GROUP NO. 24 - INTERIOR CARD READER

1-101B	1-101K	1-101N	1-101P	1-101S	1-101T
1-101X	1-102	1-124A	1-125A	1-126B	1-128B
1-128F	1-195	1-202F	1-202H	1-290	

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	POWER TRANSFER	EPT10 CON	689	VON
1	EA	VANDL EU STOREROOM	ND96TDEU RHO CON 12V/24V DC	626	SCH
1	EA	FSIC CORE	23-030 EV D	626	SCH
1	EA	SURFACE CLOSER	4040XP REG OR PA AS REQ TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
3	EA	SILENCER	SR64	GRY	IVE
1	EA	CARD READER	CARD READER – BY SECURITY SYSTEMS INTEGRATOR		UNK
1	EA	POWER SUPPLY	PS902 900-2RS 900-BBK 120/240 VAC		VON
1	EA	DOOR POSITION SWITCH	DOOR POSITION SWITCH (DPS) BY SECURTY SYSTEMS INTEGRATOR	BLK	UNK

CARD ACCESS SYSTEM AND CARD READER TO BE SUPPLIED BY THE SECURITY SYSTEMS INTEGRATOR

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HARDWARE GROUP NO. 25 - INTERIOR STOREROOM
1-124C
Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA	VANDL STOREROOM LOCK	ND96TD RHO	626	SCH
1	EA	FSIC CORE	23-030 EV D	626	SCH
1	EA	SURFACE CLOSER	4040XP REG OR PA AS REQ TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	SET	GASKETING	8303AA-S	AA	ZER

HARDWARE GROUP NO. 26 - INTERIOR STOREROOM
1-104 1-180
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	VANDL STOREROOM LOCK	ND96TD RHO	626	SCH
1	EA	FSIC CORE	23-030 EV D	626	SCH
1	EA	SURFACE CLOSER	4040XP EDA TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	SET	GASKETING	8303AA-S	AA	ZER

HARDWARE GROUP NO. 27 - INTERIOR STOREROOM
1-190 1-280
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	VANDL STOREROOM LOCK	ND96TD RHO	626	SCH
1	EA	FSIC CORE	23-030 EV D	626	SCH
1	EA	SURFACE CLOSER	4040XP REG OR PA AS REQ TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	SET	GASKETING	8303AA-S	AA	ZER

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HARDWARE GROUP NO. 28 - INTERIOR STOREROOM

1-104A 1-106B 1-181 1-202G 1-205B

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	VANDL STOREROOM LOCK	ND96TD RHO	626	SCH
1	EA	FSIC CORE	23-030 EV D	626	SCH
1	EA	SURFACE CLOSER	4040XP EDA TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

HARDWARE GROUP NO. 29 - INTERIOR STOREOOM

1-101Y 1-202A 1-302A 1-380 1-1202E

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	VANDL STOREROOM LOCK	ND96TD RHO	626	SCH
1	EA	FSIC CORE	23-030 EV D	626	SCH
1	EA	SURFACE CLOSER	4040XP REG OR PA AS REQ TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

HARDWARE GROUP NO. 30 - INTERIOR OFFICE

1-101C 1-101D 1-101E 1-101F 1-101H 1-101J
1-101Q 1-101R 1-101U 1-102A

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	VANDL CLASSROOM SEC	ND98TD RHO	626	SCH
2	EA	FSIC CORE	23-030 EV D	626	SCH
1	EA	WALL STOP	WS406/407CCV	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

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HARDWARE GROUP NO. 31 - INTERIOR OFFICE

1-182B

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	VANDL CLASSROOM SEC	ND98TD RHO	626	SCH
2	EA	FSIC CORE	23-030 EV D	626	SCH
1	EA	OH STOP	450S	652	GLY
3	EA	SILENCER	SR64	GRY	IVE

HARDWARE GROUP NO. 32 - INTERIOR RESTROOM VESTUBULE

1-101K.1 1-101N.1 1-127A

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
2	EA	VANDL CLASSROOM SEC	ND98TD RHO	626	SCH
2	EA	FSIC CORE	23-030 EV D	626	SCH
1	EA	SURFACE CLOSER	4040XP EDA TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

HARDWARE GROUP NO. 33 - INTERIOR KITCHEN

1-128A.1 1-128A.3

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA	SGL CYL DEADBOLT	B660T	626	SCH
1	EA	FSIC CORE	23-030 EV D	626	SCH
1	EA	PUSH PLATE	8200 8" X 16"	630	IVE
1	EA	PULL PLATE	8303 10" 4" X 16"	630	IVE
1	EA	SURFACE CLOSER	4040XP HEDA TBSRT	689	LCN
1	EA	WALL STOP	WS406/407CCV	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

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HARDWARE GROUP NO. 34 - INTERIOR RESTROOM

1-103

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 W/DB & IND	L9496T 06A 09-544	626	SCH
1	EA	FSIC CORE	23-030 EV D	626	SCH
1	EA	SURFACE CLOSER	4040XP EDA TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	SET	GASKETING	8303AA-S	AA	ZER

PROVIDE OH STOPS WHERE WALL STOPS CANNOT BE MOUNTED

HARDWARE GROUP NO. 35 - INTERIOR RESTROOM

1-101A	1-101M	1-102B	1-106A	1-107A	1-108A
1-109A	1-110A	1-111A	1-112A	1-113A	1-114A
1-115A	1-116A	1-117A	1-118A	1-119A	1-120A
1-121A	1-122A	1-124B	1-125B	1-127B	1-127C
1-128E	1-131A	1-131B	1-131D	1-202B	1-202C
1-202D	1-203A	1-206A	1-207A	1-208A	1-209A
1-210A	1-211A	1-212A	1-213A	1-214A	1-215A
1-216A	1-217A	1-218A	1-219A	1-220A	1-221A
1-222A					

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 W/DB & IND	L9496T 06A 09-544	626	SCH
1	EA	FSIC CORE	23-030 EV D	626	SCH
1	EA	SURFACE CLOSER	4040XP EDA TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

PROVIDE OH STOPS WHERE WALL STOPS CANNOT BE MOUNTED

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HARDWARE GROUP NO. 36 - INTERIOR RESTROOM

1-101V 1-101W 1-182C 1-205A 1-301A

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 W/DB & IND	L9496T 06A 09-544	626	SCH
1	EA	FSIC CORE	23-030 EV D	626	SCH
1	EA	SURFACE CLOSER	4040XP REG OR PA AS REQ TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

HARDWARE GROUP NO. 37 - INTERIOR GROUP RESTROOM

1-019A 1-019B 1-129 1-130

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 DEADBOLT	B663T 12-631	626	SCH
1	EA	FSIC CORE	23-030 EV D	626	SCH
1	EA	PUSH PLATE	8200 8" X 16"	630	IVE
1	EA	PULL PLATE	8303 10" 4" X 16"	630	IVE
1	EA	SURFACE CLOSER	4040XP REG OR PA AS REQ TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	SILENCER	SR64	GRY	IVE

HARDWARE GROUP NO. 38 - INTERIOR KITCHEN LAUNDRY

1-128C

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	ND10S RHO	626	SCH
1	EA	SURFACE CLOSER	4040XP SCUSH TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

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HARDWARE GROUP NO. 39 - WIRE MESH/CHAIN LINK GATE

1-182A 1-184.1 1-184

Provide each PR door(s) with the following:

QTY	DESCRIPTION	CATALOG NUMBER	FINISH	MFR
EA	CHAIN LINK GATE	ALL HARDWARE BY GATE MANUFACTURER		UNK

ALL HARDWARE BY GATE MANUFACTURER.

HARDWARE GROUP NO. 40 - Roll Up Door

1-128A.2 1-128J.2

Provide each RU door(s) with the following:

QTY	DESCRIPTION	CATALOG NUMBER	FINISH	MFR

All hardware by door manufacturer.

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SECTION 08 80 00
GLAZING

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 work in this section.

1.2 DESCRIPTION OF WORK

A. Furnish all labor, materials, and equipment necessary to complete all glass and glazing work as indicated on the drawings and specified herein.

1.3 REFERENCES

A. ASCE-7– Minimum Design Loads for Buildings and other Structures

B. ANSI Z97.1 - Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test

C. ASTM C162 – Standard Terminology of Glass and Glass Products

D. ASTM C864 – Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers

E. ASTM C920 – Standard Specification for Elastomeric Joint Sealants

F. ASTM C1036 – Standard Specification for Flat Glass

G. ASTM C1048 – Standard Specification for Heat Strengthened and Fully Tempered Flat Glass

H. ASTM C1172 – Standard Specification for Laminated Architectural Flat Glass

I. ASTM C1349 - Standard Specification for Architectural Flat Glass Clad Polycarbonate

J. ASTM C1503 - Standard Specification for Silvered Flat Glass Mirror

K. ASTM E84 – Standard Test Method for Surface Burning Characteristics of Building Materials

L. ASTM E283 – Standard Test Method For Determining Rate of Air leakage Through Exterior Windows, Curtain Walls and Doors Under Specified Pressure Differences Across the Specimen

M. ASTM E330 – Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference

N. ASTM E1996 - Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Windborne Debris in Hurricanes

O. ASTM E2025 - Standard Test Method for Evaluating Fenestration Components and Assemblies for Resistance to Impact Energies

P. CPSC 16 CFR 1201 Safety Standards for Architectural Glazing Materials

Q. FBC - Florida Building Code

R. GANA - Glazing Manual

S. GANA - Laminated Glazing Reference Manual

T. GANA - Sealant Manual

U. NFPA 80 – Standard for Fire Doors and Other Opening Protectives

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V. NFPA 252 – Standard Methods of Fire Test of Doors Assemblies

W. NFPA 257 – Standards on Fire Test of Window and Glass Block Assemblies

1.4 LABELS

A. Glass shall bear labels indicating the manufacturer, type and thickness, and a note "Do Not Remove Label".

B. All safety glass shall bear a permanent label indicating manufacturer, type, thickness, and compliance with CPSC 16 CFR 1201.

C. If temporary label, label is to remain on glass until District Building Inspection is complete, then removed and turned into the District Building Department.

1.5 GLASS BREAKAGE

A. The glazing subcontractor shall be responsible for all glass broken, scratched, damaged, or defective and shall replace same at his expense.

1.6 SUBMITTALS

A. Manufacturer's Data:

1. Submit two-copies of manufacturer's specifications, and installation instruction for each type of glass, glazing sealant and compound, gasket and associated miscellaneous material required.
2. Include manufacturer's published data, or letter of certification, or certified test laboratory report indicating that each material complies with the requirements and is intended generally for the applications shown.
3. Show by transmittal that the Glazer distributed one copy of each recommendation and instruction.
4. If Safety glass, provide two copies of manufacturer certification of the glass meeting the requirements of CPSC 16 CFR 1201.

B. Samples: Submit two-samples 12" x 12" in size illustrating glass coloration.

1.7 QUALITY ASSURANCE

A. Perform Work in accordance with GANA Glazing Manual and GANA Sealant Manual.

B. Installer Qualifications: Company specializing in performing the work of this section with minimum 5-years documented experience.

1.8 WARRANTY

A. Provide a 5-year warranty to include coverage for sealed glass units from seal failure.

B. Provide a 5-year warranty to include coverage for delamination of laminated glass and replacement.

PART 2 PRODUCTS

2.1 GENERAL

A. Tempered Glass: Glass to be heat-strengthened by Manufacturer's standard process (after cutting to final size), to achieve a flexural strength of four times normal glass strength; provide tempered glass where required by code, generally 4’ horizontally from doors and within 18" of floor.

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2.2 GLASS TYPES

A. Interior Window Glazing: Hollow Metal frames
   1. Tempered Glass: ASTM C1048, Kind FT fully tempered, Condition A uncoated, Type 1 transparent flat, Class 1 clear, Quality q3 glazing select conforming to ANSI Z97.1.
   2. Fire-Protection-Rated Glazing ~~Wired Glass~~
      a. Can be used only in fire rated assemblies.
      b. Shall meet the safety glazing requirements of CPSC 16 CFR 1201, and
      c. Have the proper fire rating for the assembly (see plans for assembly fire ratings).
      d. Glass Type: Specialty tempered float glass or Safety ceramic glass.
      e. Provide products listed by ITS (DIR) or UL (DIR) and approved by authorities having jurisdiction.
      f. Provide permanent markings on fire-protection-rated glazing in compliance with FBC, FFPC, and authorities having jurisdiction.
         1) SAFTI – Superlite I, Superlite I-XL and Superlite X-45/60/90 ~~I-W~~ acceptable for Cat I and Cat II location per CPSC.
         2) TGP - Fireglass20 and FireLite Plus acceptable for Cat I and Cat II location per CPSC.
         3) ~~Pilkington – Pyroshield Plus acceptable for Cat I location per CPSC~~
         4) Cat I location is glass area less than or equal to 9 SF, and Cat II is glass area greater than 9 SF.
         5) Or approved equal.
   3. All glass shall have label indicating fire rating and safety glazing rating.

B. Exterior Glazing: Impact-Resistant Laminated Vision Glazing, Monolithic.
   1. Applications: Exterior glazing for all exterior impact windows, window walls, storefronts, and door systems, unless otherwise noted.
   2. Glazing:
      a. Outside Lite: 1/4 inch (6mm) Heat-Strengthened Glass
         1) Tint: Clear
         2) Coating: Solarban 90 (low-e glass) by Vitro on #2 Surface or equal, manufactured by Guardian or Viracon
      b. Interlayer: 0.90 inches thick, minimum, type as required to meet performance criteria
      c. Inside Lite: 1/4 inch (6mm) Heat-Strengthened Glass
         1) Tint: to be selected from Standard Grey or Bronze options
         2) Coating: None
      d. Total overall thickness: 9/16 inch, minimum
         1) Comply with Florida Building Code (FBC), latest edition, and required Florida Product Approval for Impact Windows, Window Walls, Storefronts, and Door Systems manufacturers
      e. Thermal Transmittance (U-Value, summer): 0.85, maximum
      f. Solar Heat Gain Coefficient (SHGC): 0.31, maximum
      g. Shading Coefficient (SC): 0.44, maximum

C. Exterior Glazing: Impact-Resistant Insulating Laminated Vision Glazing, double glazed.

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1. Applications: South-facing Exterior glazing for all exterior impact windows, window walls, storefronts, and door systems.
2. Glazing:
   a. Outboard Lite: 1/4 inch (6mm) Fully Tempered Glass
      1) Tint: Clear
      2) Coating: Solarban 90 (low-e glass) by Vitro on #2 Surface or equal, manufactured by Guardian or Viracon
   b. Inboard Lite: 7/16 inch Laminated Heat-strengthened Glass
      1) Outside Lite: Heat-Strengthened glass.
         (a) Tint: Clear
         (b) Coating: None
      2) Interlayer: 0.90 inches thick, minimum, type as required to meet performance criteria.
      3) Inside Lite: Heat-Strengthened glass.
         (a) Tint: Clear.
         (b) Coating: None
   c. Total overall thickness: 1-3/16 inch, minimum
      1) Comply with Florida Building Code (FBC), latest edition, and required Florida Product Approval for Impact Windows, Window Walls, Storefronts, and Door Systems manufacturers
   d. Thermal Transmittance (U-Value, summer): 0.30, maximum
   e. Solar Heat Gain Coefficient (SHGC): 0.23, maximum

D. Miscellaneous Glazing in Interior Doors:
   1. 1/4 inch clear, tempered glass.
   2. Safety rated and fire rated glass where label door is required by schedule or code.

E. One-way Reflective Glass: Laminated from 2 pieces of Type I, Class 1, Quality q3, laminated together with a clear 0.030 inch thick polyvinyl butyl interlayer, total 3/8 inch thick, coated on the No. 2 face with a hard, adherent film of chromium or other approved coating of equal durability.
   1. Glass shall transmit not more than 14% of total incident visible light and shall reflect from the front surface of the coating not less than 33% of the total incident visible light.

F. Glazing in Millwork: 1/4 inch clear, tempered glass.

G. Provide and install glass mirrors as indicated on plans, minimum thickness of 1/4 inch tempered or laminated safety glass and labeled as such.

2.3 GLAZING SEALANTS/COMPOUNDS

A. General:
   1. Provide materials as recommended by the manufacturer for the required application and condition of installation in each case.
   2. Provide only fully proven compounds that are compatible with surfaces contacted.

2.4 MISCELLANEOUS GLAZING MATERIALS

A. Setting Blocks: Neoprene, 70-90 Durometer hardness, with proven compatibility of sealants used.

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B. Spacers: Provide neoprene, 40-50 Durometer hardness, with proven compatibility of sealants used.

C. Cleaners, Primers and Sealers: Type recommended by sealant or gasket manufacturer.

2.5 OTHER MATERIALS

A. Provide other materials not specifically described but required for a complete and proper installation.

PART 3 EXECUTION

3.1 INSTALLATION OF GLASS

A. General Requirements:
1. Follow recommendations of the glass manufacturer and the sealant, gaskets and glazing materials manufacturer, except if the codes or listed references are more restrictive.
2. Where a combination of sealing materials is required for glazing in the same frame, the manufacturer must certify that all glazing materials furnished are compatible with each other.
3. Where setting blocks and spacer shims require setting into a glazing compound or sealant, contractor may butter them with the compound or sealant, then place them in position and allow to firmly setting prior to installation of glass.

B. Sash and Frame Preparation and Acceptance
1. Inspect all window sash, frames, and surrounds glazed under this section and notify the Contractor of any defects, improper materials, or workmanship of other conditions that will affect the satisfactory installation of glass.
a. Do not proceed with glazing until such conditions are acceptable.
b. Absence of notification, or the beginning of glazing, will indicate acceptance of all previously placed related work executed by other trades.
2. Other trades will execute the following work; but before starting glazing work, the glazier shall verify compliance with the requirements listed.
a. That the sash and frames are firmly anchored in proper position, plumb and square within 1/8" nominal dimensions on approved shop drawings.
b. That the rivet, screw, bolt or nail heads, welding fillets and other projections are removed from glazing rabbets to provide the specified clearances.
c. That all corners and fabrication intersections are sealed and sash and frames are weather-tight.
d. That rabbets at seals weep to outside and all rabbets are of sufficient depth and width to receive the glass and provide the required overlap of the glass.
e. That all sealing surfaces of steel sash and frames are primer painted.

C. Preparation of Glass and Rabbets:
1. Clean the sealing surfaces of glass and the sealing surfaces of rabbets and stop beads before applying any glazing compound or gaskets.
2. Use only the approved solvents and cleaning agents recommended by the compound manufacturer.

D. Positioning Glass:

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1. Center in glazing in the frame and rabbet to maintain specified clearances at perimeter on all four sides.
2. Maintain centered position of glass in rabbet and provide the required sealer thickness (1/8" maximum) on both sides of glass.
3. Whenever glass dimensions are larger than 50 united inches, provide setting blocks at the sill and spacer shims on all four sides; locate setting blocks one-quarter way in from each end of glass.

E. Stop Bead Glazing; Use Putty or Elastic Glazing Compound for bedding glass in hollow metal frames, except if otherwise specified in this document.
1. Apply ample back putty or compound to rabbet so that it will ooze out when pressing glass into position and completely cover glass in rabbet.
   a. Place setting blocks and spacer shims as required, and press glass into position.
2. Secure glass in place by the application of stop beads.
   a. Bed stop beads against glass and bottom of rabbet with compound and/or putty, leaving proper thickness between glass and stop beads.
   b. Secure stop beads in place with suitable fastenings.
   c. Strip surplus compound or putty from both sides of glass and tool to provide clean sight lines.

F. Glazing - Using Glazing Gaskets
1. Use glass stops with glazing gaskets for securing glass in frames of all storefront type entrance-doors and in such other locations as indicated on the drawings.
2. Use glazing gaskets without stops for glazing glass in all storefront type sash and frames, except where as indicated on the drawings.
   a. Install glazing of storefront type sash and frames using glazing gaskets without stops in strict accordance with the manufacturer's directions.
   b. Provide and place setting blocks as required.
   c. Gaskets shall be of the proper size for the thickness of installed glass.
   d. After glazing, seal gaskets to glass continuously with a clear elastic and watertight sealant similar to G.E. Silicon Sealant.
   e. Seal gaskets to glass on exterior face only.

3.2 REPLACEMENT AND CLEANING:

A. Upon completion of work, all glass shall be free from cracks and other defects.

B. Remove and replace any defective or broken glass that may appear before acceptance or within the 1-year warranty period with new glass without additional cost to the Owner, except glass broken by a specific cause relating to building occupancy not relating to this contract.

C. Thoroughly wash and clean all glass upon completion of the work and just prior to occupancy of the building.

END OF SECTION

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SECTION 08 91 19
FIXED LOUVERS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 specification section, apply to work of this section.

1.2 SECTION INCLUDES

A. Fixed louvers and frames
   1. Fixed blade louvers
   2. Drainable lowers
   3. Storm-proof louvers
   4. Hurricane resistant louvers

B. Screening

C. Blank out sheeting

1.3 REFERENCES

A. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix).

B. AMCA 500-L (Air Movement and Control Association International, Inc) – Laboratory Methods of Testing Louvers for Rating

C. AMCA 511 - Certified Ratings Program for Air Control Devices

D. AMCA 540 - Test Method for Louvers Impacted by Wind Borne Debris

E. AMCA 550 - Test Method for High Velocity Wind Driven Rain Resistant Louvers

F. ASTM A167 – Standard Specification for Stainless and Heat Resisting Chromium Nickel Steel Plate, Sheet, and Strip

G. ASTM A653/A653M – Standard Specification for Steel Sheet, Zinc Coated (Galvanized) or Zinc Iron Alloy Coated (Galvannealed) by the Hot Dip Process

H. ASTM B209 – Standard Specification for Aluminum and Aluminum Alloy Sheet and Plate

I. ASTM B221 – Standard Specification for Aluminum and Aluminum Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes

J. FBC - Florida Building Code

1.4 PERFORMANCE REQUIREMENTS

A. Provide a louver to permit passage of air without blade vibration or noise.

B. Louvers to permit minimum 50% free area.

1.5 SUBMITTALS

A. Submit under provisions of Section 01 33 00.

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B. Shop Drawings: Indicate louver layout plan and elevations, opening and clearance dimensions, tolerances; head, jamb, and sill details; blade configuration; screens, blank out areas required and frames.

C. Provide product data describing design characteristics, maximum recommended air velocity, free area, materials, and finishes.

D. Submit samples 12 x 12 illustrating finish and color of exterior and interior pre-finish.

E. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

1.6 OPERATION AND MAINTENANCE DATA

A. Submit under provisions of Section 01 77 00.

B. Maintenance Data: Include lubrication schedules and adjustment requirements.

1.7 QUALITY ASSURANCE

A. Perform work in accordance with AMCA Certification for louvers.

1.8 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum with 5 years of experience.

1.9 REGULATORY REQUIREMENTS

A. Conform to applicable codes for closing of operable louvers in conjunction with the fire and smoke alarm system.

B. Provide -Florida Building Code Product Approval certificates for exterior louvers.

C. Licensed to bear the AMCA Seal based on tests and procedures performed in accordance with AMCA Publication 511 and complies with the requirements of the AMCA Certified Ratings Program. The AMCA Certified Ratings Seal applies to Water Penetration, Air Performance, and Wind-Driven Rain ratings.

D. AMCA 540 and AMCA 550 Listed.

E. Products Requiring Electrical Connection: Listed and classified by UL as suitable for the purpose specified and indicated.

1.10 FIELD MEASUREMENTS

A. Verify that field measurements are as indicated on shop drawings.

1.11 COORDINATION

A. Coordinate work under provisions of Section 01 31 00.

B. Coordinate work with installation of wall assembly.

C. Coordinate work with installation of mechanical ductwork and electrical services to motorized devices.

1.12 WARRANTY

A. Provide 10-year warranty under provisions of Section 01 77 00.

B. Warranty: Include coverage for degradation of finish.

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PART 2 PRODUCTS

2.1 MATERIALS

A. Aluminum shall be ASTM B221, 6063 alloy, T5, extruded shape, pre-finished with mill applied fluropolymer finish.

B. Steel sheet shall be ASTM A653/A653M, galvanized to G90 zinc coating, pre-finished with shop applied fluropolymer finish.

C. Stainless steel shall be ASTM A167, Type 304, soft temper, smooth surface.

2.2 SCREENS

A. Bird screen shall be interwoven wire mesh of steel 0.063" diameter wire, with 1/2" open weave, square design.

B. Insect screen (Note: To be only used if specified by the Mechanical Engineer in the Design Documents, but in no case is it to be used on fresh air intake) shall be 18 x 16 size aluminum mesh set in aluminum frame.

2.3 ACCESSORIES

A. Fasteners and Anchors: Stainless steel type

B. Primer: Zinc chromate, alkyd type

C. Flashings: Of same material as louver frame

D. Sealants: Type specified in Section 07 92 00

E. Sleeve: 12-ga Aluminum

2.4 FABRICATION

A. Louver Blade Design:
   1. Inverted 'Y' shape or Inverted V shape, reinforced with intermediate stiffeners, integral and lateral rainwater stops positioned on blade.
   2. Drainable and/or storm-proof as indicated on plans.

B. Louver Frame: Channel shape, mechanically fastened welded corner joints.

C. Intermediate Mullions: Provide a concealed piece of formed steel, or formed and extruded aluminum profiled to suit louver frame.

D. Head and Sill Flashings: Roll formed or extruded to required shape, single length in one piece per location.

E. Screens: Install a screen mesh in a shaped frame, with reinforce corner construction, and shop installed to louver with fasteners.

F. Blank Out Sheeting on Interior of Louver:
   1. Use the same material as louver and frame configuration of single sheet.
   2. Separate dissimilar metals to prevent electrolytic action.

G. Design and fabricate louver to prevent entry of wind driven rain into the building.
   1. Provide louver, which traps rain and diverts water back to the exterior and not into the building or the wall cavity.

H. Sleeve:

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1. Fabricate an aluminum sleeve around entire perimeter of louvered opening, 16” in horizontal depth, with a 1 ½” perimeter flange at the exterior perimeter, with an upturned flange along the back of the sleeve, so there is at least 2" between the bottom of the ductwork and the bottom of the sleeve.
2. The sleeve is to serve as a pan to collect wind driven rainwater diverted back to the exterior of the building envelope, and shall be pressure and impact rated.
3. Seal all louvers to wall penetrations through the sleeve.
4. Also, seal both the exterior and interior perimeter of the sleeve.

2.5 FINISHES

A. Fluoropolymer coating system: meeting requirements of AAMA 2605 multiple coat, thermally cured polyvinylidene fluoride system.
   1. Color: as selected by architect.

B. The interior steel surfaces, screens, and blank-out sheeting shall be of galvanized or galvananealed, unfinished material.

C. Interior aluminum surfaces, screens, and blank-out sheeting shall be of mill finished.

D. Stainless steel shall be a No. 4 finish.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify site conditions under provisions of Section 01 31 00.

B. Verify that prepared openings and flashings are ready to receive work and opening dimensions are as indicated on shop drawings.

3.2 INSTALLATION

A. Install louver assembly in accordance with manufacturer's instructions.

B. Install louvers level and plumb.

C. Install flashings and align louver assembly to ensure moisture shed from flashings and diversion of moisture to exterior.

D. Secure louvers in opening framing with concealed fasteners, removable and hinged for maintenance purposes.

E. Install bird and insect screen and frame to exterior of louver, hinge screens for access.

F. Install insect screens and frame to intake louvers.

G. Install bird screens to exhaust louvers.

H. Install perimeter sealant and backing rod in accordance with Section 07 92 00.

3.3 ADJUSTING

A. Adjust work under provisions of Section 01 77 00.

B. Adjust operable louvers for freedom of movement of control mechanism.
   1. Lubricate operating joints.

3.4 CLEANING

A. Clean work under provisions of Section 01 77 00.

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B. Strip protective finish coverings.

C. Clean surfaces and components.

END OF SECTION

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SECTION 09 05 61
COMMON WORK RESULTS FOR FLOORING PREPARATION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. This section applies to floors identified in Contract Documents that are receiving the following types of floor coverings:
   1. Resilient Flooring.
   2. Fluid-Applied Flooring.
   3. Thin-set tiling.

B. Preparation of new concrete floor slabs for installation of floor coverings.

C. Testing of concrete floor slabs for moisture and alkalinity (pH).

D. Remediation of concrete floor slabs due to unsatisfactory moisture or alkalinity (pH) conditions.
   1. Contractor shall perform all specified remediation of concrete floor slabs. If such remediation is indicated by testing agency's report and is due to a condition not under Contractor's control or could not have been predicted by examination prior to entering into the contract, a contract modification will be issued.

E. Patching compound.

F. Remedial floor treatment.

1.2 RELATED REQUIREMENTS

A. Section 03 54 00 - Self-Leveling Underlayment: Self-leveling cast underlayment applied as remediation treatment.

1.3 REFERENCE STANDARDS

A. ASTM C109/C109M - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or (50-mm) Cube Specimens); 2016a.

B. ASTM C472 - Standard Test Methods for Physical Testing of Gypsum, Gypsum Plasters and Gypsum Concrete; 1999 (Reapproved 2014).

C. ASTM D4259 - Practice for Abrading Concrete.

D. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2017.

E. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride; 2016a.

F. ASTM F2170 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes; 2017.

G. RFCI (RWP) - Recommended Work Practices for Removal of Resilient Floor Coverings; 2011.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Coordinate scheduling of cleaning and testing, so that preliminary cleaning has been completed for at least 24 hours prior to testing.

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1.5 SUBMITTALS

A. Floor Covering and Adhesive Manufacturers' Product Literature: For each specific combination of substrate, floor covering, and adhesive to be used; showing:
   1. Moisture and alkalinity (pH) limits and test methods.
   2. Manufacturer's required bond/compatibility test procedure.

B. Remedial Materials Product Data: Manufacturer's published data on each product to be used for remediation.
   1. Manufacturer's qualification statement.
   2. Manufacturer's statement of compatibility with types of flooring applied over remedial product.
   3. Test reports indicating compliance with specified performance requirements, performed by nationally recognized independent testing agency.
   4. Manufacturer's installation instructions.
   5. Specimen Warranty: Copy of warranty to be issued by coating manufacturer and certificate of underwriter's coverage of warranty.

C. Testing Agency's Report:
   1. Description of areas tested; include floor plans and photographs if helpful.
   2. Summary of conditions encountered.
   3. Moisture and alkalinity (pH) test reports.
   4. Copies of specified test methods.
   5. Recommendations for remediation of unsatisfactory surfaces.
   6. Product data for recommended remedial coating.
   7. Submit report to Architect.
   8. Submit report not more than two business days after conclusion of testing.

D. Adhesive Bond and Compatibility Test Report.

1.6 QUALITY ASSURANCE

A. Moisture and alkalinity (pH) testing shall be performed by an independent testing agency employed and paid by Contractor.

B. Contractor may perform adhesive and bond test with Contractor's own personnel or hire a testing agency.

C. Testing Agency Qualifications: Independent testing agency experienced in the types of testing specified.
   1. Submit evidence of experience consisting of at least 3 test reports of the type required, with project Owner's project contact information.

D. Contractor's Responsibility Relating to Independent Agency Testing:
   1. Provide access for and cooperate with testing agency.
   2. Confirm date of start of testing at least 10 days prior to actual start.
   3. Allow at least 4 business days on site for testing agency activities.
   4. Achieve and maintain specified ambient conditions.
   5. Notify Architect when specified ambient conditions have been achieved and when testing will start.

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E. Remedial Coating Installer Qualifications: Company specializing in performing work of the type specified in this section, trained by or employed by coating manufacturer, and able to provide at least 3 project references showing at least 3 years' experience installing moisture emission coatings.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, handle, and protect products in accordance with manufacturer's instructions and recommendations.

B. Deliver materials in manufacturer's packaging; include installation instructions.

C. Keep materials from freezing.

1.8 FIELD CONDITIONS

A. Maintain ambient temperature in spaces where concrete testing is being performed, and for at least 48 hours prior to testing, at not less than 65 degrees F or more than 85 degrees F.

B. Maintain relative humidity in spaces where concrete testing is being performed, and for at least 48 hours prior to testing, at not less than 40 percent and not more than 60 percent.

PART 2 PRODUCTS

2.1 MATERIALS

A. Patching Compound: Floor covering manufacturer's recommended product, suitable for conditions, and compatible with adhesive and floor covering. In the absence of any recommendation from flooring manufacturer, provide a product with the following characteristics:

1. Cementitious moisture-, mildew-, and alkali-resistant compound, compatible with floor, floor covering, and floor covering adhesive, and capable of being feathered to nothing at edges.
2. Latex or polyvinyl acetate additions are permitted; gypsum content is prohibited.
3. Compressive Strength: 3000 psi, minimum, after 28 days, when tested in accordance with ASTM C109/C109M or ASTM C472, whichever is appropriate.
4. Products:
   a. ARDEX Engineered Cements; ARDEX Feather Finish: www.ardexamericas.com/#sle.
   b. TEC, an H.B. Fuller Construction Products Brand; TEC Feather Edge Skim Coat: www.tecspecialty.com/#sle.
   c. USG Corporation; Durock Brand Advanced Skim Coat Floor Patch: www.usg.com/#sle.
   d. Substitutions: See Section 01 60 00 - Material Equipment and Approved Equals.

B. Alternate Flooring Adhesive: Floor covering manufacturer's recommended product, suitable for the moisture and pH conditions present; low-VOC. In the absence of any recommendation from flooring manufacturer, provide a product recommended by adhesive manufacturer as suitable for substrate and floor covering and for conditions present.

C. Remedial Floor Coating: Single- or multi-layer coating or coating/overlay combination intended by its manufacturer to resist water vapor transmission to degree sufficient to meet flooring manufacturer's emission limits, resistant to the level of alkalinity (pH) found, and suitable for adhesion of flooring without further treatment.

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1. Thickness: As required for application and in accordance with manufacturer's installation instructions.
2. Use product recommended by testing agency.

PART 3 EXECUTION

3.1 CONCRETE SLAB PREPARATION

A. Perform following operations in the order indicated:
1. Preliminary cleaning.
2. Moisture vapor emission tests; 3 tests in the first 1000 square feet and one test in each additional 1000 square feet, unless otherwise indicated or required by flooring manufacturer.
3. Internal relative humidity tests; in same locations as moisture vapor emission tests, unless otherwise indicated.
4. Alkalinity (pH) tests; in same locations as moisture vapor emission tests, unless otherwise indicated.
5. Specified remediation, if required.
6. Patching, smoothing, and leveling, as required.
7. Other preparation specified.
8. Adhesive bond and compatibility test.
9. Protection.

B. Remediations:
1. Active Water Leaks or Continuing Moisture Migration to Surface of Slab: Correct this condition before doing any other remediation; re-test after correction.
2. Excessive Moisture Emission or Relative Humidity: If an adhesive that is resistant to the level of moisture present is available and acceptable to flooring manufacturer, use that adhesive for installation of the flooring; if not, apply remedial floor coating or remedial sheet membrane over entire suspect floor area.
3. Excessive Alkalinity (pH): If remedial floor coating is necessary to address excessive moisture, no additional remediation is required; if not, if an adhesive that is resistant to the level present is available and acceptable to the flooring manufacturer, use that adhesive for installation of the flooring; otherwise, apply a skim coat of specified patching compound over entire suspect floor area.

3.2 PRELIMINARY CLEANING

A. Clean floors of dust, solvents, paint, wax, oil, grease, asphalt, residual adhesive, adhesive removers, film-forming curing compounds, sealing compounds, alkaline salts, excessive laitance, mold, mildew, and other materials that might prevent adhesive bond.

B. Do not use solvents or other chemicals for cleaning.

C. Non-chemical methods for removal, such as abrasive cleaning or bead-blasting, including methods described in ASTM D4259 may be used on existing slabs with deleterious residues.

3.3 MOISTURE VAPOR EMISSION TESTING

A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.

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B. Where this specification conflicts with the referenced test method, comply with the requirements of this section.

C. Test in accordance with ASTM F1869 and as follows.

D. Plastic sheet test and mat bond test may not be substituted for the specified ASTM test method, as those methods do not quantify the moisture content sufficiently.

E. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if test values exceed 3 pounds per 1000 square feet per 24 hours.

F. Report: Report the information required by the test method.

3.4 INTERNAL RELATIVE HUMIDITY TESTING

A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.

B. Where this specification conflicts with the referenced test method, comply with the requirements of this section.

C. Test in accordance with ASTM F2170 Procedure A and as follows.

D. Testing with electrical impedance or resistance apparatus may not be substituted for the specified ASTM test method, as the values determined are not comparable to the ASTM test values and do not quantify the moisture content sufficiently.

E. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if any test value exceeds 75 percent relative humidity.

F. Report: Report the information required by the test method.

3.5 ALKALINITY TESTING

A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.

B. The following procedure is the equivalent of that described in ASTM F710, repeated here for the Contractor's convenience.

1. Use a wide range alkalinity (pH) test paper, its associated chart, and distilled or deionized water.
2. Place several drops of water on a clean surface of concrete, forming a puddle approximately 1 inch in diameter. Allow the puddle to set for approximately 60 seconds, then dip the alkalinity (pH) test paper into the water, remove it, and compare immediately to chart to determine alkalinity (pH) reading.
3. Use of a digital pH meter with probe is acceptable; follow meter manufacturer's instructions.

C. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if alkalinity (pH) test value is over 10.

3.6 PREPARATION

A. See individual floor covering section(s) for additional requirements.

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B. Comply with recommendations of testing agency.

C. Comply with requirements and recommendations of floor covering and adhesive manufacturer.

D. Remove sub-floor ridges and bumps. Fill and smooth surface cracks, grooves, depressions, control joints and other non-moving joints, and other irregularities with patching or underlayment compound. Refer to Section 03 54 00 - Cast Underlayment for Self-leveling underlayment if required as remediation treatment.

E. Do not fill expansion joints, isolation joints, or other moving joints.

F. Clean floors of all loose material by scraping, brushing, vacuuming, or other methods, or a combination thereof, as recommended by the flooring manufacturer, immediately before commencing installation of flooring.

3.7 ADHESIVE BOND AND COMPATIBILITY TESTING

A. Comply with requirements and recommendations of floor covering manufacturer.

3.8 APPLICATION OF REMEDIAL FLOOR COATING

A. Comply with requirements and recommendations of coating manufacturer.

3.9 PROTECTION

A. Cover prepared floors with building paper or other durable covering.

END OF SECTION

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SECTION 09 22 14
METAL FURRING AND LATHING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Walls, bulkheads, and ceilings.

B. Metal lathing for wet plaster finish.

1.2 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 specification sections, apply to work in this section.

B. Section 08 31 00 - Access Doors and Panels: Product requirements for metal access panels integral with metal lath.

C. Section 09 24 00 - Portland Cement Plaster.

1.3 SYSTEM DESCRIPTION

A. The extent of the use of metal furring and lathing as indicated on the drawings and/or specified.

B. Fabricate horizontal ceiling and soffit framing to limit finish surface to 1/240 deflection under superimposed dead loads and wind uplift.

1.4 REFERENCES

A. ASCE 7 – Minimum Design Loads of Buildings and Other Structures

B. ASTM C841 - Standard Specification for Installation of Interior Lathing and Furring; 2003 (Reapproved 2018).

C. ASTM C847 - Standard Specification for Metal Lath; 2018.

D. ASTM C933 - Standard Specification for Welded Wire Lath; 2018.

E. ASTM C1063 - Standard Specification for Installation of Lathing and Furring to Receive Interior and Exterior Portland Cement-Based Plaster; 2019.

F. EMLA (Expanded Metal Lath Association) – Guide Specifications for Metal Lathing and Furring

G. FBC - Florida Building Code; current edition.

H. GA-600 – Fire Resistance Design Manual

1.5 SUBMITTALS

A. Shop Drawings: Indicate prefabricated work, component details, stud layout, framed openings, anchorage, type and location of fasteners, and accessories or items required of other related work.

1. Exterior Ceilings/ Soffit systems: Provide drawings and calculations for loadings and stresses of exterior soffit system, signed and sealed by a Professional Structural Engineer licensed in the State of Florida.

B. Product Data: Provide data describing standard framing member materials and finish, product criteria, load charts and limitations.

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1.6 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in performing the work of this section with at least three years of documented experience.

B. Delegated Designer Qualifications: Design exterior framing system under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed in the State of Florida.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials and store off the floor in dry area.
   1. When moisture occurs, immediately remove water and allow members to completely dry.

B. Installation of rusted furring members is not acceptable.

PART 2 PRODUCTS

2.1 FRAMING MATERIALS

A. Main Runner Channels; 1½ inch cold rolled, 16-ga steel, galvanized weight 500lb/1,000 LF.

B. Cross Furring Channels; ¾ inch cold rolled, 16-ga steel, galvanized weight 300lb/1,000 LF.

C. Hanger wire shall be 8-ga galvanized annealed.

D. Tie wire shall be 16-ga galvanized annealed for framing members

E. Hangers: Rolled steel sections, of size and type to suit application, to rigidly support ceiling components in place to deflection limits as indicated; galvanized.

F. Lateral Bracing: Formed steel, minimum 16-ga thick; size and length as required.

G. Casing Bead, formed zinc minimum 26-ga thick; ground depth governed by plaster thickness; maximum possible lengths; expanded metal flanges, with square edges.
   1. Product: ClarkDietrich; #66X Zinc Expanded Flange Casing Bead, or comparable product.

H. Corner Bead, formed zinc minimum 26-ga thick; depth governed by plaster thickness; maximum possible lengths; expanded metal flanges, with radii edge.
   1. Product: ClarkDietrich; #1A Expanded Corner Bead, or comparable product.

I. Base Screed, formed zinc minimum 26-ga thick; ground depth governed by plaster thickness; maximum possible lengths; expanded metal flanges, with beveled edge.
   1. Product: ClarkDietrich; Foundation Weep Screed , or comparable product with specified ground.

J. Control and Expansion Joint Accessories, formed zinc minimum 26-ga thick; accordion profile, 2" expanded metal flanges each side, with plaster ground thickness.
   1. Product: ClarkDietrich; #15 Double-V Control Joint, or comparable product.
   2. Product: ClarkDietrich; #40 Two-Piece Expansion Joint, or comparable product.

K. Install plaster frames for recessed light fixtures furnished by electrical contractor under this section.

L. The owner will consider vinyl beads and other accessories with documentation indicating the product performs equivalently with the metal system.

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2.2 LATHING MATERIALS

A. Metal Lath: ASTM C847; self-furring diamond mesh sheet; 3.4 lb/sq yd.
   1. Product: ClarkDietrich; Self-Furring Dimple Lath , or comparable product.

B. Corner Mesh: Formed sheet steel, minimum 26-ga thick, expanded flanges shaped to permit complete embedding in plaster, minimum 4 inch size, as needed.

C. Strip Mesh: Expanded metal lath, minimum 26-ga thick, 4 inch wide by 24 inch long; as needed.

2.3 ACCESSORIES

A. Tie wire, nails, screws and other supports, of type and size rigidly securing materials in place.

2.4 FINISHES

A. Framing Materials: Galvanized

B. Hangers, Anchors and Fastening Devices: Galvanized

C. Lath Materials: G60 Galvanized

D. Lathing Accessories: Zinc Alloy

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that conditions are ready to receive work.

B. Verify field measurements are as shown on drawings.

C. Beginning of installation means installer accepts existing conditions.

3.2 INSTALLATION - GENERAL

A. Install metal lath and furring for Portland cement plaster in accordance with ASTM C1063.

B. Install lath and furring for fire-rated assemblies in accordance with requirements of assembly as indicated.

3.3 CEILING AND SOFFIT FRAMING INSTALLATION

A. Install furring to height indicated, erect after work above ceiling or soffit is complete. Coordinate the location of hangers with other work.

B. Install furring independent of walls, columns, and above-ceiling work.

C. Securely anchor hangers to structural members or embed in structural slab. Space hangers to achieve deflection limits indicated.

D. Space main carrying channels at maximum 72 inch on center, and not more than 6 inches from wall surfaces. Lap splice securely.

E. Securely fix carrying channels to hangers to prevent turning or twisting and to transmit full load to hangers.

F. Install furring channels perpendicular to carrying channels, not more than 2 inches from perimeter walls, and rigidly secure. Lap splices securely.

G. Reinforce openings in suspension system that interrupt main carrying channels or furring channels with lateral channel bracing. Extend bracing minimum 24 inches past each opening.

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H. Laterally brace suspension system.

3.4 CONTROL AND EXPANSION JOINT INSTALLATION

A. Install control and expansion joints as described in ASTM C1063.
   1. Set both beads over 6" wide strip of rubberized-asphalt, peel and stick sheet to assist with air seal continuity.

B. Provide Control Joint Spacing as indicated on reflected ceiling plan, per ASTM C1063.

C. Provide Expansion Joint Spacing as indicated on reflected ceiling plan, per ASTM C1063.

D. Comply with ASTM C1063 and the following, whichever is stricter:
   1. Area of plaster panel not to exceed 144 sq ft for vertical surfaces.
   2. Area of plaster panel not to exceed 100 sq ft for horizontal, curved or angled surfaces.
   3. Spacing between control joints not to exceed 18 ft in each direction.
   4. Area bounded by control joints not to exceed a length-to-width ratio of 2-1/2 to 1.

3.5 LATHING INSTALLATION

A. Apply lath taut, with long dimension perpendicular to supports.

B. Lap ends minimum 1 inch, and secure end laps with tie wire where they occur between supports.

C. Lap sides of diamond mesh lath minimum 1½ inch, not to exceed 3 inches.

D. Attach metal lath to metal supports using tie wire at maximum 6 inches on center.

E. Attach metal lath to concrete and concrete masonry using wirehair pins. Attach anchors to backup surface; space at maximum 24 inches on center.

F. Continuously reinforce internal angles with corner mesh, except where the metal lath returns 3 inches from corner to form the angle reinforcement; fasten at perimeter edges only.

G. Place corner bead at external wall corners; fasten at outer edges of lath only.

H. Place base screeds at termination of plaster areas; secure rigidly in place.

I. Place 4 inch wide strips of lath centered over junctions of dissimilar backing materials, and secure rigidly in place.

J. Place lath vertically above each top corner and each side of door frames to 6 inches above ceiling line.

K. Place casing beads at terminations of plaster finish. Butt and align ends. Secure rigidly in place.

L. Place strip mesh diagonally at corners of lathed openings. Secure rigidly in place.

3.6 TOLERANCES

A. Maximum Variation from True Position: 1/8 inch in 10 feet.

B. Maximum Variation of any Member from Plane: 1/8 inch.

END OF SECTION

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SECTION 09 22 16
NON-STRUCTURAL METAL STUD FRAMING

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 specification sections, apply to work in this section.

B. Requirements of this section apply to Gypsum Plaster and Portland Cement Plaster Work.

C. Section 06 10 00 Rough Carpentry

D. Section 05 40 00 Cold Formed Metal Framing

1.2 SYSTEM DESRIPTION

A. See plans for and this document for the extent of the use of metal studs.

B. See Section 05 40 00 Cold Formed Metal Framing, structural steel studs.

1.3 REFERENCES

A. ASTM C645 – Standard Specification for Nonstructural Steel Framing Members

B. ASTM C754 – Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products

C. ASCE 7 – Minimum Design Loads for Buildings and other Structures

D. Underwriters Laboratories (UL) - Fire Resistance Manual

E. Gypsum Association (GA) - Fire Resistance Design Manual

F. Florida Building Code (FBC)

1.4 SUBMITTALS

A. Shop Drawings: Indicate prefabricated work, component details, stud layout, framed openings, anchorage to structure, type, location of fasteners, and accessories or items required of other related work.

B. Describe method for securing studs to tracks, splicing, and for blocking and reinforcement to framing connections.

C. Delegated Design: Provide calculations, from Florida professional engineer, for loadings and stresses of exterior walls to meet or exceed the requirements of ASCE 7.

D. Provide data describing standard framing member materials and finish, product criteria, load charts and limitations.

E. Evaluation Reports: Submit evaluation reports certified under an independent third-party inspection program administered by an agency accredited by IAS to ICC-ES AC98 accreditation criteria for inspection agencies.

F. Manufacturer's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention.

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1.5 QUALITY ASSURANCE

A. Code-Compliance Certification of Studs and Tracks: Provide documentation that framing members are certified in accordance with the product-certification program of the Steel Framing Industry Association (SFIA) or a similar organization that provides a verifiable code-compliance program.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials and store off the floor in dry area to prevent damage due to corrosion, moisture, excessive handling.
   1. When evidence of moisture occurs, immediately remove water and leave members completely dry.

B. Installation of rusted framing members is not acceptable.

PART 2 PRODUCTS

2.1 STUD FRAMING MATERIALS

A. Interior wall framing: Studs in interior partitions shall comply with AISI S220 and ASTM C645, Section 10.
   1. Web Size: 3-5/8 inches.
   2. Minimum Base-Steel Thickness: 0.0181 inch for 20 gauge equivalent (70 ksi) or 0.0296 inch for traditional 20 gauge.
      a. Comply with manufacturer's limiting heights tables for proper thickness and web size.

B. Provide 18-ga studs (min) at window and door openings.
   1. Standard: ClarkDietrich; RedHeader PRO. Header sections installed with Header Brackets (HDSC) or comparable products.

C. Exterior wall framing:
   1. Load bearing (axially loaded) walls: Studs shall be minimum 16-ga (0.0538", 50 KSI Fy) galvanized steel studs conforming to ASTM C955 Section 8 and AISI 200.
      a. Delegated Designer may specify heavier materials when needed.
   2. Non-load (axial) bearing walls: Studs shall be minimum 20-ga. (0.0329", 33 KSI Fy) galvanized steel material conforming to ASTM C955 Section 8 and AISI 200.
      a. Delegated Designer may specify heavier materials when needed.
   3. Comply with or exceed the manufacturer's limit height tables for proper thickness and web size for all exterior framing.

D. Floor and Ceiling Runners:
   1. Channel type metal runners, formed from 20-ga. galvanized steel, AISI S220.
   2. Provide and install extended leg retainer on ceiling runners. Slotted track runners may be used to allow for deflection.
   3. Provide same gauge runners as studs when studs exceed 20-ga. thickness.

E. Coating:
   1. In contact with concrete or for exterior walls, provide CP 90: G90 (Z275).
   2. Not in contact with concrete or for interior walls, provide CP 40: G40 (Z140).
   3. A40 galvannealed products are not acceptable.

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4. Provide a coating evaluation report to demonstrate equivalent corrosion resistance for alternate coating systems.

F. Fasteners:
1. Use Hex Washer Head Screw for framing member connections.
2. Use Pan Tex Screw for framing member connections.
3. Use Bugle Head Screw to attach gypsum lath to studs.
4. Use Lath Tek Screw to attach metal lath to studs.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that conditions are ready to receive work.

B. Verify field measurements are as shown on drawings.

C. Verify that rough-in utilities are in proper location.

3.2 INSTALLATION, GENERAL

A. Installation will comply with ASTM C754.

3.3 ERECTION

A. Align and secure top and bottom runners at 24 inches o.c. with 0.145 inch diameter low-velocity power driven fasteners with 1¼ inch penetration.

B. Fit runners under and above openings; secure intermediate studs at spacing of wall studs.

C. Install studs vertically at 16 o.c. unless otherwise noted.

D. Properly install studs in channels; bottomed out, plumbed, aligned, and securely attached top, and bottom.

E. Stud splicing will not be permissible.

F. Construct corners to allow for installation of wall board.

G. Double studs at wall openings, door and window jambs, and not more than 2 inches each side of openings.

H. Brace stud-framing system and make rigid.
1. Provide and install bridging not to exceed 4'-3" o.c., unless using an approved engineered system.

I. Align stud web openings.

J. Coordinate installation of bucks, anchors, and blocking with electrical and mechanical work placed in or behind stud framing.

K. Blocking:
1. Secure metal stud blocking to studs.
2. Install blocking for support of plumbing fixtures, wall cabinets, counter tops, toilet partitions and accessories, hardware, and other items as indicated.
3. Provide and install, minimum 20-gage, horizontal doorstop blocking spanning 3-vertical studs at door handle height on the hinged side, starting at the doorframe.

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L. All partitions shall extend through the ceiling system and be supported from the structure above.
   1. See wall types shown on the drawings for exact requirements.

3.4 TOLERANCES

A. Maximum Variation from True Position is 1/8 inch per 10 feet

B. Maximum Variation of any Member from Plane is 1/8 inch

END OF SECTION

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SECTION 09 24 00
PORTLAND CEMENT PLASTER

PART 1 GENERAL

1.1 RELATED DOCUMENTS
- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 - General Requirements, apply to work specified in this Section.

1.2 SECTION INCLUDES
- A. See plans and schedules for the extent of plasterwork.
- B. The type of plastering required includes:
  1. Portland Cement Plaster (Stucco)
  2. Smooth, aggregate and special rendered surface finishing.

1.3 REFERENCES
- A. ASTM C11 Standard Terminology Relating to Gypsum and Related Building Materials and Systems
- B. ASTM C91/C91M – Standard Specification for Masonry Cement
- C. ASTM C150/C150M – Standard Specification for Portland Cement
- D. ASTM C206 – Standard Specification for Finishing Hydrated Lime
- E. ASTM C207 – Standard Specification for Hydrated Lime for Masonry Purposes
- F. ASTM C631 – Standard Specification for Bonding Compounds for Interior Gypsum Plastering
- G. ASTM C665 – Standard Specification for Mineral Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing
- H. ASTM C897 – Standard Specification for Aggregate for Job-Mixed Portland Cement-Based Plasters
- I. ASTM C926 – Standard Specification for Application of Portland Cement-Based Plaster
- J. ASTM E119 – Standard Test Methods for Fire Tests of Building Construction and Materials
- K. PCA (Portland Cement Association) – Portland Cement Plaster/Stucco Manual
- L. Florida Building Code (FBC)

1.4 SYSTEM DESCRIPTION
- A. Fabricate vertical elements to limit finish surface to 1/180 deflection under lateral point load of 100 lbs.
- B. Fabricate horizontal elements to limit finish surface to 1/260 deflection under superimposed dead loads and wind uplift loads.

1.5 QUALITY ASSURANCE
- A. Cement Plaster: Perform work in accordance with ASTM C926.
- B. Allowable Tolerances: For flat surfaces, do not exceed ⅛" to 10'-0" for bow, warp, plumb, or level, including surfaces to receive applied finishes (tile, etc.).
- C. This Contractor shall make sample panels at the site at least 4' x 4' of each type of plasterwork.
  1. The Architect and Owner shall accept the panels before Contractor starts plastering.
  2. The accepted panels will be a basis for all work.
- D. Applicator shall show proof of specializing in lath and plaster work for a minimum of 5-years.

1.6 SUBMITTALS
- A. Submit under the provisions of Section 01 33 00.
- B. Manufacturer's Data Plaster:
  1. For information only, submit copies of the manufacturer's product specifications and installation instructions for each material, and include other data as may be required to

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show compliance with these specifications.
2. Distribute an additional copy of each installation instruction to the Installer.

1.7 REGULATORY REQUIREMENTS
A. Conform to ASTM E119 and applicable code for fire rated assemblies as follows:
1. Fire Rated Partitions: Listed assembly by UL or FM.
2. Fire Rated Ceiling and Soffits: Listed assembly by UL or FM
3. Fire Rated Structural Column Framing: Listed assembly by UL or FM.
4. Fire Rated Structural Beam Framing: Listed assembly by UL or FM.

1.8 PRODUCT HANDLING
A. Except for sand and water, deliver materials to the site in sealed containers or bags fully identified with manufacturer's name, brand, type, and grade.
B. Store all materials in a dry, well-ventilated space, under cover and off the ground.

1.9 JOB CONDITIONS
A. Installer must examine surfaces that are to receive plaster, repair, alter, and prepare surfaces to insure a timely completion of the work.
1. Do not start the plasterwork until any unsatisfactory conditions are corrected in an acceptable manner to the Installer and Architect.
B. Temporary Heat and Ventilation: Comply with ANSI A42.1 and A42.2 as applicable to the work.
C. Do not apply plaster when ambient temperature is less than 50°F both during installation and until cured.
D. Protect contiguous work from soiling, spattering, moisture deterioration, and other harmful effects, which might result from plastering.

PART 2 PRODUCTS

2.1 PLASTER BASE COAT MATERIALS
A. Cement: ASTM C150/C150M, Type I Portland
B. Lime: ASTM C206, Type S
C. Aggregate: In accordance with ASTM C897
D. Water: Clean, fresh, potable, and free of mineral or organic material that may affect plaster.
E. Bonding Agent
F. Bonding Agent: ASTM C631; type recommended for bonding plaster to concrete and concrete masonry surfaces
G. Admixtures: Air entrainment

2.2 PLASTER FINISH COAT MATERIALS
A. Cement: As specified for plaster base coat
B. Lime: As specified for plaster base coat
C. Color Pigment: Mineral oxide
D. Water: Clean, fresh, potable, and free of mineral or organic matter that can affect plaster.

2.3 CEMENT PLASTER MATERIALS (STUCCO)
A. Job mixed Stucco - Mix bondcrete or mortaseal mason's lime with Portland cement and sand according to ASTM C926, in Portland cement: lime: sand ratios (bags: bags: cu ft) as follows:
1. Basecoat - Scratch coat 1:1:8 and Brown coat 1:1:10.
2. Finish - Apply exterior stucco finish in accordance with U.S. Gypsum data sheet.
3. Skim Coat: Provide smooth textured skim coat where scheduled on drawings.
4. Finish Texture: As shown on the drawings and/or finish schedule.

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PART 3 EXECUTION

3.1 PREPARATION FOR PLASTERING

A. Clean plaster bases and substrates to be plastered, removing loose materials, coatings, and other substances that might impair the work.

B. Etch concrete and masonry surfaces indicated for direct plastering.

1. Wet surface, scrub with acid etch solution, and rinse thoroughly; repeat if necessary for adequate plaster bond.

C. Apply dash-coat on concrete surfaces receiving direct plastering, and moisture-cure for 2-days.

D. Apply bonding agent on interior concrete surfaces indicated for direct plastering; comply with manufacturer's instructions.

E. Cover chases and similar openings in the surfaces to receive plaster with metal lath strip reinforcing, extending not less than 6" beyond edges of opening.

1. Securely fasten lath along edges.

F. Install temporary grounds and screeds as required to control plaster thickness and comply with tolerances.

G. Install plastering accessories, anchored to substrates 8" o. c. along each flange.

1. Miter corners and spline joints to form tight accurate joints without offsets.
2. Install screws in all accessories at a maximum of 4'0" o. c. as well as clinched into place.
3. Install resilient-edged casing beads for interior work against exterior-wall door and window frames, and at similar locations as indicated.
4. Control Joints: Install control joints at locations indicated, or if not indicated, at locations complying with the following criteria and approved by Architect.
   a. Where an expansion or control joint occurs in the construction surface directly behind the plaster membrane, continue the joint through the plaster.
   b. Where distance between control joints exceed 10' in either direction.
   c. Where plaster panels exceed an area of 100 sq ft.
   d. Where panel sizes or dimensions change, extend joints full width or height.

H. Surface Conditioning: Immediately before applying plaster to concrete or masonry, except when using a bonding agent, dampen the surfaces sufficiently to obtain optimum plaster suction.

3.2 INSTALLATION OF PLASTER

A. General: Comply with ASTM C926, except comply with manufacturer's instructions where more detailed or more stringent.

B. Plaster Thickness and Number of Coats:

1. Thickness on Vertical Surfaces: Except as otherwise indicated or specified, the minimum thickness of plaster as measured from face of lath, masonry, or concrete to finished plaster surfaces shall be as follows:
   a. Exterior Portland Cement Plaster: ⅝".
   b. Interior Portland Cement Plaster: ⅞".
   c. Plaster on unit masonry surfaces: ½".
   d. Plaster on concrete surfaces: ⅝"
   e. Plaster skim coat on interior masonry surfaces: ¼"
2. Thickness on Horizontal Surfaces: Per ASTM C926
3. Number of Coats: Plaster on unit masonry surfaces 2-coats; on concrete or applied over bonding agents, 3-coats; doubling back with brown coat over scratch coat before it is

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partially dry and set will not be permitted on 3-coat work.

C. Mechanically mix plaster materials at the project site; do not hand mix except when requiring amounts of less than 1-bag.
D. Sequence the plaster installation properly with the installation and protection of other work, to prevent damage to either installation.
E. Apply skim-coat plaster with a minimum thickness scratch and leveling coat and a normal minimum thickness finish coat.
F. Cure Plaster by maintaining each coat in a moist condition for 2-days following application; keep enclosed and fog-spray (after initial set) as required to prevent dry-out.

3.3 CUTTING AND PATCHING

A. Cut, patch, point-up, and repair plaster as necessary to accommodate other work and to restore cracks, dents, and imperfections.
B. Repair or replace work to eliminate blisters, buckles, excessive crazing and check crackling, dry-outs, efflorescence, sweat-outs, and similar defects, including areas of the work which do not comply with specified tolerances, and where bond to the substrate has failed.
C. Sand smooth-trowel finishes lightly removing trowel marks and arises.

3.4 CLEANING AND PROTECTION

A. Remove temporary protection and enclosure of other work.
    1. Promptly remove plaster from doorframes, windows, and other surfaces not requiring plaster.
    2. Repair floors, walls, and other surfaces stained, marred, or damaged from plastering work.
    3. When plastering work is complete, remove unused materials, containers, and equipment, clean floors of plaster debris.
B. Installer shall advise the Contractor of requirements for the protection of plaster from deterioration and damage during the remainder of the construction period.

END OF SECTION

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SECTION 09 26 00
VENEER PLASTER

PART 1 GENERAL

1.1 RELATED DOCUMENTS
- A. The provisions of the General Conditions, Supplementary Conditions and the Sections in Division 1, General Requirements, are included as a part of this Section as though bound herein.

1.2 SECTION INCLUDES
- A. Gypsum backing board
- B. Veneer plaster over sheet gypsum, masonry, and concrete surface.

1.3 REFERENCES
- A. ASTM C442/C442M - Standard Specification for Gypsum Backing Board, Gypsum Coreboard, and Gypsum Shaftliner Board
- B. ASTM C587 – Standard Specification for Gypsum Veneer Plaster
- C. ASTM C1396/C1396M– Standard Specification for Gypsum Board Plasters
- D. ASTM C631 – Standard Specification for Bonding Compounds for Interior Gypsum Plastering
- E. ASTM C665 – Standard Specification for Mineral Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing
- F. ASTM C843 – Standard Specification for the Application of Gypsum Veneer Plaster
- G. ASTM C844 – Standard Specification for the Application of Gypsum Base to Receive Gypsum Veneer Plaster
- H. ASTM C1047 – Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base
- I. ASTM E90 – Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements
- J. ASTM E119 – Standard Methods for Fire Tests of Building Construction and Materials
- K. GA 216 - Application and Finishing of Gypsum Panel Products
- L. GA-600 - Fire Resistance Design Manual
- M. Warnock-Hersey - Certification Listings
- N. UL (Underwriters Laboratories, Inc.) - Fire Hazard Classifications
- O. Florida Building Code (FBC).

1.4 SYSTEM DESCRIPTION
- A. Acoustic Attenuation for Identified Interior Partitions: STC ratings per plans in accordance with ASTM E90

1.5 SUBMITTALS
- A. Section 01 33 00 - Submittals Procedures
- B. Product Data: Provide data on veneer plaster products.
- C. Samples: Submit sample panels, 12" x 12" in size illustrating veneer finish and texture.
- D. Manufacturer's Certificate: Certify that Products meet or exceed specified requirements.

1.6 QUALITY ASSURANCE
- A. Perform work in accordance with the following:
  1. Apply gypsum-backing board in accordance with ASTM C844 and GA 216.
  2. Apply gypsum veneer plaster in accordance with ASTM C843.
- B. Maintain one copy of each document on site.

1.7 REGULATORY REQUIREMENTS
- A. Conform to applicable code and ASTM E119 for fire rated assemblies:

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1. Fire Rated Partitions: Listed assembly by UL, FM, or Warnock Hersey.
2. Fire Rated Ceiling and Soffits: Listed Assembly by UL, FM, or Warnock Hersey.
3. Fire Rated Structural Column Framing: Listed assembly by UL, FM, or Warnock Hersey.
4. Fire Rated Structural Beam Framing: Listed Assembly by UL, FM, or Warnock Hersey.

B. Provide certificate of compliance from authority having jurisdiction indicating approval of products.

1.8 ENVIRONMENTAL REQUIREMENTS

A. Section 01 60 00 - Material Equipment and approved equals: Environmental conditions affecting products on site.

B. Do not apply veneer plaster when substrate or ambient air temperature is less than 50°F for 24 hours prior to, during operations, and after, until building-heating system can maintain the above minimum temperature.

PART 2 PRODUCTS

2.1 MATERIALS

A. Gypsum Veneer Plaster: ASTM C587

B. Gypsum Backing Board: ASTM C442/C442M, standard type or fire rated Type X; square, rounded edges, ends square

C. Gypsum Board Accessories: GA 216 and GA 600, ASTM C1047

D. Acoustic Insulation: ASTM C665 Type I, glass fiber blanket

E. Reinforcing Tape, Joint Compound, Adhesive, Water, and Fasteners: GA 216

F. Bond Coat: ASTM C631, vinyl polymer type

G. Acoustical Sealant: Non-hardening, non-skinning, for use in conjunction with gypsum board assemblies.

2.2 MIX DESIGN

A. Mix plaster in accordance with ASTM C587 and manufacturer's instructions.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify substrate conditions under provisions of Section 01 21 00.

B. Verify masonry mortar joints are cut flush; verify surface is ready to receive work of this section.
1. Verify no bituminous or water repellent coatings exist on masonry surface.

C. Verify concrete surfaces are flat, any honeycomb filled flush, and surface is ready to receive work of this section.
1. Verify no bituminous, water repellent, or form release agents exist on concrete surfaces.

D. Verify gypsum board substrate is flat, joints are taped and sanded, and surface is ready to receive work of this section.
1. Verify joint and surface perimeter accessories are in place.

E. Verify gypsum plaster base has been installed in accordance with ASTM C844, is flat, smooth and surface is ready to receive work.
1. Verify joint and surface perimeter accessories are in place.

3.2 PREPARATION

A. Clean surfaces of dust or loose matter.

B. Remove projections greater than ⅛" and fill depressions greater than ¼" with Portland cement mortar.

C. Apply color tinted bond coat to prepare masonry surfaces of veneer plaster application.

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D. Apply in accordance with manufacturer's instructions.

3.3 INSTALLATION - GYPSUM BACKING BOARD

A. Place acoustical insulation in partitions tight within spaces, around cut openings, behind and around electrical and mechanical items within or behind partitions, and tight to items passing through partitions.
B. Install gypsum-backing board in accordance with GA 216.
C. Use drywall screws to fasten gypsum board to frame substrate.
D. Single Layer:
    1. Erect fire rated gypsum board vertical, with edges and ends occurring over firm bearing.
E. Double Layer:
    1. Erect first layer of fire rated gypsum board perpendicular to framing or furring members.
    2. Place second layer of fire rated gypsum board perpendicular to first layer.
        a. Ensure end joints of second layer do not occur over joints of first layer.
    3. Secure second layer with fasteners.
F. Install accessories.
G. Tape, fill, and sand filled joints, edges, corners, openings, and fixings to produce surface ready to receive veneer finish.
H. Feather coats onto adjoining surfaces so that joint camber is maximum 1/32".
I. Install acoustical sealant at gypsum board perimeter at:
    1. Metal Framing: Two beads
    2. Perimeter interruptions
    3. Caulk all penetrations of partitions by conduit, pipe, ductwork, and rough-in boxes.

3.4 APPLICATION - VENEER PLASTER

A. Apply gypsum veneer plaster in accordance with ASTM C843 and manufacturer's instructions.
B. Dampen masonry and concrete surfaces without visible water on surface to minimize suction from plaster materials.
C. Apply single coat immediately after dampening substrate to a thickness of ⅛".
D. Finish surface to flat, smooth, hard trowel or sand coat or textured finish as selected.

3.5 ERECTION TOLERANCES

A. Maximum Variation from Specified Thickness is plus or minus 1/64".

3.6 PROTECTION OF FINISHED WORK

A. Protect finished work under provisions of Section 01 50 00.
B. Do not permit traffic near unprotected finished surfaces.

END OF SECTION

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SECTION 09 29 00
GYPSUM BOARD SYSTEM

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 work in this section.

1.2 SECTION INCLUDES

A. Gypsum Board Partition Systems

B. Gypsum Board Accessories

C. Joint Treatment

D. Textured Finish (Acrylic "knockdown" textured finish)

1.3 REFERENCES

A. ASTM C1396/C1396M – Standard Specification for Gypsum Board

B. ASTM C475 – Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board

C. ASTM C645 – Standard Specification for Nonstructural Steel Framing Members

D. ASTM C754 – Standard Specification for Installation of Steel Framing Members to Receive Screw Attached Gypsum Panel Products

E. ASTM C919 – Standard Practice for Use of Sealants in Acoustical Applications

F. ASTM E695 – Standard method for Measuring Relative Resistance of Wall, Floor, and Roof Construction to Impact loading

G. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber

H. ASTM D5420 – Standard Test Method for Impact Resistance of Flat Rigid Plastic Specimen By Means of a Striker Impacted by Falling Weight (Gardner Impact)

I. ASTM E119 – Standard Test Methods for Fire Tests of Building Construction and Materials

J. ASTM C840 – Standard Specification for the Application and Finishing of Gypsum Board

K. GA-216 –Application and Finishing of Gypsum Panel Products

L. GA-600 – Fire Resistance Design Manual

M. Florida Building Code (FBC)

1.4 SUBMITTALS

A. Product Data: Submit manufacturer's product data sheets and printed installation instructions for each product or system proposed for use.

B. Samples: Submit two samples of gypsum board finished with proposed texture application, 12 by 12 inches in size, illustrating finish color and texture.

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1.5 QUALITY ASSURANCE

A. Perform gypsum board systems work in accordance with recommendations of ASTM C754, C840, and GA-216 except as otherwise specified in this Section.

B. Regulatory Requirements:
   1. Fire-rated Assemblies: Listed and rated by Underwriter's Laboratories, Inc. or generic fire resistance ratings listed in GA-600.
   2. Fire-Hazard Classification: Listed and labeled by Underwriter's Laboratories, Inc.

C. Installer Qualifications: Company specializing in performing metal framing and gypsum board application and finishing, with minimum five years of documented experience and approved by manufacturer.

1.6 COORDINATION

A. Prior to and during installation, coordinate with work of other trades to facilities required openings and finishes.

B. Conduct pre-construction meeting with drywall contractor, architect, owner, project coordinator, and others involved with process.

1.7 DELIVERY, STORAGE AND HANDLING

A. Store the material off the floor in dry area to prevent damage from moisture or excessive handling.

B. Follow manufacturer's requirements for on-site storage and handling of materials.

1.8 MOCK-UP

A. Provide interior mock-up of acrylic texture finish at an outside corner condition with finish extending minimum 10' both directions and selected height, include door jamb, and other interior finishes.

B. Locate where directed by Architect and Owner.

C. Accepted mock-up may remain as part of the work.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. U.S. Gypsum Co products listed as a standard of quality.

B. Use products manufactured by United States based companies only, do not use drywall manufactured in China.
   1. National Gypsum Corp
   2. U.S. Gypsum Corp
   3. Georgia-Pacific Corp
   4. Lafarge North America Inc
   5. Other approved equal

C. All gypsum board products shall have minimum mold growth ASTM D3273 rating of 10.

2.2 MATERIALS

A. Furring Channels: ClarkDietrich metal stud channel, 1½" deep, roll-formed sections of 20-ga galvanized steel, AISI S220.

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B. Gypsum Wallboard (General and above 8' AFF): 5/8" thick, ASTM C1396/C1396M, tapered edge, fire rated Type X. (Note: At radius walls the Contractor has the option to install ¼" and/or 3/8" thick gypsum wallboard in layers.)

C. Gypsum Wallboard (Corridors, stairways, cafeteria, stage, and gymnasium up to at least 8' AFF minimum): Abuse resistant brand, 5/8" thick, ASTM C1396/C1396M, tapered edge, fire rated Type X. (Note: At radius walls the Contractor has the option to install ¼" and/or 3/8" thick gypsum wallboard in layers.)
   1. Acceptable abuse resistant drywall:
      a. Fiber Rock VHI by USG
      b. Hi-Abuse-XP Gypsum Wallboard by National Gypsum
      c. DensArmor by Georgia Pacific
      d. Protecta AR 100 by LaFarge
      e. Or approved equal

D. Water Resistant Gypsum Wallboard: 5/8" thick, tapered edge
   1. Provide at “wet” areas (areas subject to contact with water), as shown on plans.
   2. Wet locations use DensArmor Plus Interior Guard or equal product by other approved manufacturers in 2.1 of this section.
   3. If for ceramic tile backing, use DensShield Tile Guard by GP or equal product by other approved manufacturers in 2.1 of this section.

E. Exterior Gypsum Soffit Board: Standard or Fire Rated type, tapered edges, ends square cut, ASTM C931.

F. Gypsum Backing Board: Standard or Fire Rated type, square edges, ASTM C1396/C1396M.

G. Gypsum Sheathing 5/8" thick exterior water resistant board for metal framing systems with book tongue and grooved edges.
   1. Acceptable product shall be DensGlass Gold Exterior Guard, or similar product by other approved manufacturers in 2.1 of this section.

H. Compounds: Pre-fill powdered joint compound, laminating adhesive, taping compound and topping compound, ASTM C475.

I. Joint Tape; use perforated tape per ASTM C475.

J. Fasteners; Self-drilling, self-tapping bugle head screws, Type S12 and GA 216, length required for each assembly.

K. Metal Accessories:
   1. Corner Beads; Dur-A-Bead No. 101, galvanized or plastic.
   2. Metal Trim (Casing Bead): No. 200-A or 200-B metal trim, galvanized or plastic.

L. Interior Expansion Joint Covers: Balco Inc. or equal;
   1. Walls – Use Type 6ADW-1 and 6ADWC-1 or type as recommended by manufacturer.

M. Acrylic texture (knockdown)
   1. Performance Requirements: Provide a 100% acrylic, color-fast, mildew resistant interior base and texture coating which has been manufactured and installed to maintain performance criteria stated by the manufacturer without defects, damage or failure.

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2. Applications: Lobbies, Reception, Corridors, Circulation spaces, student occupied assembly areas including Dining/Multipurpose, and where indicated in Drawings.
3. Products:
   a. Basis of Design: TWI System Dursystem coatings.
   b. Coronado Paint company Tough-Tex.
   c. Other approved equal.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine adjacent construction for conditions that prevent proper installation of drywall systems.

B. Do not proceed until defects are corrected.

3.2 METAL FRAMING INSTALLATION

A. General:
   1. Install metal framing in accordance with ASTM C754 except as otherwise specified.
   2. Install the members true to line and level to provide surface flatness with maximum variation of 1/8" in 10' in any direction.
   3. Install metal studs at 16" o.c. unless noted otherwise.

B. Metal Furring Channels
   1. Secure to masonry walls and around door and window openings, intersections, and corners with low velocity power driven anchors.
   2. Install metal furring at 16" o.c. vertically.
   3. Extend furring on exterior walls full height of wall.

3.3 GYPSUM BOARD SYSTEM INSTALLATION

A. Install in strict accordance with GA-216 and GA-600, do not install until building is dried in.

B. Maximum variation in flatness required is 1/8" in 10'.

C. Install sound-attenuation blankets, where indicated, prior to installing gypsum panels unless blankets are readily installed after panels have been installed on one side.

D. Install ceiling board panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in the central area of each ceiling.
   1. Stagger abutting end joints of adjacent panel not less than one framing member.

E. Install gypsum panels with face side out.
   1. Do not install imperfect, damaged, or damp panels.
   2. Butt panels together for a light contact at edges and ends with not more than 1/16" of open space between panels.
   3. Do not force into place.

F. Locate both edge or end joints over supports, except in ceiling applications where providing intermediate supports or gypsum board back blocking behind end joints.
   1. Do not place tapered edges against cut edges or ends.
   2. Stagger vertical joints on opposite sides of partitions.
   3. Avoid joints other than control joints at corners of framed openings where possible.

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G. Attach gypsum panels to steel studs so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.

H. Attach gypsum panels to framing provided at openings and cutouts.

I. Spot grout hollow metal doorframes for solid-core wood doors, and hollow metal doors.
   1. Apply spot grout at each jamb anchor clip and immediately insert gypsum panels into frames.

J. Form control and expansion joints at locations indicated and as detailed, with space between edges of adjoining gypsum panels, as well as supporting framing behind gypsum panels.

K. Cover both faces of steel stud partition framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.
   1. Except in concealed applications indicating or requiring sound, fire, air, or smoke ratings, may use scraps of not less than 8 sf in.
   2. Fit gypsum panels around ducts, pipes, and conduits.
   3. Where partitions intersect open concrete coffers, concrete joists, and other structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by coffers, joists, and other structural members; allow ¼" - 3/8" wide joints to install sealant.

L. Isolate perimeter of non load-bearing gypsum board partitions at structural abutments, except floors, as detailed.
   1. Provide (¼" - ½" wide spaces at these locations and trim edges with U-bead edge trim where edges of gypsum panels are exposed.
   2. Seal joints between edges and abutting structural surfaces with acoustical sealant.

M. In STC-rated gypsum board assemblies, seal construction at perimeters, behind control and expansion joints, openings, and penetrations with a continuous bead of acoustical sealant at both faces of the partitions.
   1. Comply with ASTM C 919 and manufacturer's recommendations for location of edge trim and closing off sound-flanking paths around or through gypsum board assemblies, including sealing partitions above acoustical ceilings.

N. Space the fasteners in gypsum panels according to GA-216, finishing standard, and manufacturer's recommendations.

3.4 ACCESSORIES INSTALLATION

A. Corner Beads: Install on external corners, with screws spaced 8" o.c. both sides.

B. Trim: Install over face-layer gypsum board with fasteners spaced 8" o.c. Install where gypsum board surfaces meet dissimilar surfaces and at other detailed locations.

C. Corner beads and trim may be either galvanized metal or plastic.

3.5 JOINT TREATMENT

A. Treat joints, interior angles, fastener depressions, and finishing trim on face-layer gypsum board, including gypsum board in ceiling plenums.

B. Pre-fill, tape, fill, and finish in accordance with manufacturer's directions.

C. Apply a thin skim coat of joint compound over entire surface of gypsum board.

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D. Sand finish coat and leave surfaces smooth, uniform, and free of fins, depressions, cracks and other imperfections (Level 4 finish).

E. Provide a Level 5 finish at areas to receive wall graphics. See Section 09 26 00 - Veneer Plaster.

F. Apply Acrylic textured coating (knockdown) where indicated in accordance with manufacturer's instructions.
   1. Finished Dry Film thickness: 10 mils.
   2. Prepare coating for Painting - see section 09 91 23.

G. Joints and fasteners in ceiling plenums or other unexposed areas may be taped only (1 coat) provided the joints are completely sealed.

END OF SECTION

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SECTION 09 30 13
CERAMIC TILE

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 specification sections, apply to work in this section.

B. Section 03 54 00 - Self-Leveling Underlayment

C. Section 09 05 61 - Common Work Results for Flooring Preparation

1.2 SECTION INCLUDES

A. This Contractor shall furnish and install all tile and accessories shown on the plans or specified.

B. Work includes all plant facilities, services, materials, labor, tools, and appliances required.

C. Marble thresholds.

1.3 REFERENCES

A. ANSI A108/A118/A136.1 – American National Specifications for the Installation of Ceramic Tile - A Collection of 20 ANSI/CTI A108 Series Standards on Ceramic Tile Installation: A108.1A-C, 108.4 -.13, A118.1-.10, ANSI A136.1

B. ANSI A137.1 – American National Standards Specifications for Ceramic Tile

C. ASTM C144 - Standard Specification for Aggregate for Masonry Mortar

D. ASTM C206 - Standard Specification for Finishing Hydrated Lime

E. ASTM C207 - Standard Specification for Hydrated Lime for Masonry Purposes

F. TCNA - (Tile Council of North America) - Handbook for Ceramic Tile Installation

1.4 JOB CONDITIONS

A. This Contractor shall inspect the job conditions before starting.

B. All flooring variations less than 1/8” in 10 ft., chips, and cracks are the responsibility of the flooring subcontractor to feather/patch prior to the installation of tile.

1.5 SUBMITTALS

A. Submit manufacturer’s detailed technical data and tile and grout samples per Section 01 33 00.

B. Samples, Threshold: Initially provide full color range for selection. Then submit selected color sample, min. 2 inch by 24 inch, with specified profile.

C. Product Data: Provide instruction for using adhesives and grouts.

D. Shop Drawings: Indicate tile layout, patterns, color arrangement, perimeter conditions, and junctions with dissimilar materials, control and expansion joints, thresholds, and setting details.

E. Manufacturer's Certificate: Certify that products meet or exceed ANSI A137.1.

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1.6 EXTRA MATERIALS

A. Furnish extra materials described below that match products installed, packaged with protective covering for storage, and identified with labels describing contents.

B. Furnish quantity of full-size units equal to 2.0% of amount installed.

1.7 MOCK-UP

A. Construct Mock-up for each tile type, minimum size of 6 feet x 8 feet, incorporating all components specified for the location. Approved mock-up may remain as part of the Work.

PART 2 PRODUCTS

2.1 CERAMIC TILE (CT)

A. Tile Products manufactured by American Olean, Dal-Tile, Inter-Ceramic, or US Tile are acceptable, providing their products equal or exceed the type and quality of the specified products and the colors match the colors specified. Refer to Finish Schedule for Basis of Design products.

B. Provide standard grade ceramic glazed wall tile conforming to ANSI A137.1.

C. Provide 5/16" thick standard size as shown on plans with matte glazed tile and cushioned edge.
   1. Use master-set, back mounted sheets.

D. Provide standard grade ceramic unglazed floor tile conforming to ANSI A137.1.
   1. Tile shall meet or exceed the ADAAG slip resistance coefficient of 0.6 on static surfaces and 0.8 on ramps, and submit documentation to Architect.
   2. Provide 5/16" thick standard size as shown on plans with matte unglazed tile and cushioned edge.
   3. Use master-set, back mounted sheets.

E. Glazed Wall Tile Trim, provide the following:
   1. Trim in a size, color, and shade to match field tile.
   2. Bull nose wainscot cap where required.
   3. In a standard, square top, cove base at tile floors.
   4. In a square top, set-on type, cove base at other floors.
   5. Square edges at inside corners.
   6. Bull nose edges at outside corners and jambs.

2.2 CERAMIC MOSAIC TILE (CMT)

A. Tile Products manufactured by American Olean, Dal-Tile, Inter-Ceramic, or US Tile are acceptable, providing their products equal or exceed the type and quality of the specified products and the colors match the colors specified. Refer to Finish Schedule for Basis of Design products.
   1. Tile shall meet or exceed the ADAAG slip resistance coefficient of 0.6 on static surfaces and 0.8 on ramps, and submit documentation to Architect.

B. Provide standard grade ceramic mosaics conforming to ANSI A137.1.

C. Provide rectangular by ¼" thick porcelain type with all purpose edges and patterns.

D. Use master-set, back mounted sheets.

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E. Furnish with 7½% abrasive grain content in wet areas only.

2.3 MATERIALS

A. Provide setting and grout materials from same manufacturer for a complete installation system.

B. Anti-Fracture Membrane/Cleavage Membrane: As indicated on the drawings, and elsewhere as required for isolating the installation from cracking due to minor substrate movement and normal structural deflections, complying with ANSI A118.12.
   1. Applications: Use in all locations where waterproofing membrane is not required.

C. Waterproofing and Anti-Fracture Membrane: As indicated on the drawings, and elsewhere as required for thin-set tile installations complying with ANSI 118.10 for waterproof membranes.
   1. Applications: Provide for all elevated (second floor and above) restroom and custodial room floors at full area, shower walls and floors, and where indicated in drawings.

D. Sound Control/Acoustical Underlayment: As indicated on the drawings, and elsewhere as required to be load bearing, shock, and vibration resistant.

E. Moisture Barrier System: As indicated on the drawings and elsewhere as required for thin-set tile installations.

F. Self-Leveling Underlayment: As indicated on the drawings, and elsewhere as required to provide a flat, level surface for direct receipt of tile and other floor coverings on dry, interior installations.

G. Mortar Bed Installations: As indicated on the drawings, and elsewhere as required for mortar bed or brown coat as the substrate for tile work; work to conform to ANSI A108.1.

H. Cementitious Backer Units: ANSI A118.9, where indicated on the drawings, if so; and elsewhere as required for floors wet areas and dry as recommended substrate for tile, heat shield with UL listing for floors; installation to comply with ANSI A108.11 and manufacturer's installation instructions.
   1. ½" Wonder Board Backer board (Exterior or Interior Floors, and Countertops)

I. Use water resistant wallboard as specified in section 09 26 00 for walls and ceilings as indicated on drawings.

J. Cementitious Tile Adhesives:
   1. ANSI A118.1: As indicated on the drawings, and elsewhere as required for setting tile as specified by ANSI A108.5, Dry-Set Portland Cement Mortar or Latex Portland Cement Mortar, over substrates prepared accordingly.
   2. ANSI A118.4: Polymer-Enhanced Mortars:
   3. Latex Additives: As specified, use a latex additive as the mixing liquid, per manufacturer's direction, with certain pre-packaged, dry-set mortar mixes, to achieve a Latex Portland Cement Dry Set Mortar complying with ANSI A118.4.

K. Organic Tile Adhesives:
   1. ANSI A136.1: As indicated on the drawings, and elsewhere as required for setting tile as specified by ANSI 108.4, Organic Adhesives, over substrates prepared accordingly.

L. Epoxy Tile Adhesives:

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1. ANSI A118.3: As indicated on the drawings, and elsewhere as required for setting tile as specified by ANSI A108.6 Chemical Resistant, Water-Cleanable Tile Setting and Grouting Epoxy, over substrates prepared accordingly.

M. Grout: As indicated on the drawings, and elsewhere as required for filling the joints between tiles.
1. Polymer-Modified Portland Cement Grout: Use High Performance grout meeting ANSI A118.7.
2. Dry-Set Grout: Use grout meeting ANSI A118.6, for joints up to 1/8".
3. Chemical Resistant, As indicated on the drawing and elsewhere as required provide Water-Cleanable Tile Setting and Grouting Epoxy; per ANSI A118.3.
   a. Applications include the following floor areas: Restrooms and showers.
4. Elastomeric Joint Caulk: ANSI A108.01.3.7 As indicated on the drawings, and elsewhere as required provide in all joints between floors and walls and at joints between tile and dissimilar materials.

2.4 ACCESSORIES

A. Ceramic Trim: The Contractor to supply all necessary base, cap edge corner, trim, or accessory tiles required for a complete installation.

B. Non-Ceramic Trim: Brushed stainless steel, style and dimensions to suit application, for setting using tile mortar or adhesive.
1. Provide as indicated in drawings and for the following applications if manufacturer's standard ceramic trim pieces are not available:
   a. Open edges of wall tile.
   b. Corners of wall tile.
   c. Transition between floor finishes of different heights.
   d. Expansion and control joints, floor and wall.
   e. Borders and other trim as indicated on drawings.
2. Basis of Design Products:
   a. Schluter-Systems: www.schluter.com/#sle.
      1) Jolly series
      2) Quadec series
      3) Schiene series
   b. Substitutions: See Section 01 60 00 - Approved Equals.

C. Shower Pan Membrane (use at shower and drying rooms)
1. Mud-Set Method: Shall be equal to "Chloraloy" Shower Pan Liner chlorinated polyethylene shower pan membrane by The Noble Co.
2. Thin-Set Method: Shall be equal to "Nobleseal TS" Thin-Bed Waterproofing chlorinated polyethylene sheet membrane as manufactured by The Noble Co.

D. Use marble thresholds at all changes of materials, maximum of ½" thick to meet handicap requirements. Minimum 2 inches wide by full width of wall or frame opening, ease all exposed edges.
1. Material: Marble, honed finish; medium to low shade variation, without holes, cracks, or open seams. Conform to ASTM C503.

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a. Color: as selected by Architect.

E. Sealer – after cleaning, apply two coats of joint sealer per manufacturer's recommendations.
1. Aqua Mix Grout Sealer
2. Penetrating Sealer – for Quarry and other Vitreous, Semi-Vitreous & Non – Vitreous Tile
3. Other product equal to the above

F. Install layout, pattern, and colors as designed by the Architect.
1. Primary Color – approx. 55%
2. Secondary Color – approx. 25%
3. Tertiary Color – approx. 15%
4. Accent Colors – approx. 5%

PART 3 EXECUTION

3.1 INSPECTION

A. This Contractor shall notify the General Contractor when he has completed his work and is ready for inspection.

3.2 INSTALLATION

A. Install tile, per TCNA F113, sloping to floor drains, where applicable, in accordance with ANSI specification A-108.5.
1. Install wall tile per TCNA W202.

B. Install tile in grid pattern with continuous and properly aligned joints in all directions.

C. Install thresholds at all wall openings where tile abuts other floor finishes.
1. Provide maximum threshold height ¼" for HDCP requirements.
2. A threshold up to ½" in height maybe installed, if it has edges beveled at 1:2 slope.

D. Provide a 1/8" joint between the tile, and the doorframe or other item of dissimilar material then use a sealant over the joint instead of grout.
1. Caulk the joints with caulking compound that matches grout.

E. Space tiles a minimum of ½-tile width from corners and edges.

F. Use masonry saw to cut tile unless Architect and Owner approve another method.

G. Install accent wall tile level and true to line and flush with stucco surface.

H. Floor tile in toilet rooms shall be epoxy grouted.

3.3 INSTALLATION - MARBLE THRESHOLDS

A. Before setting, clean surfaces by removing soil stains and foreign materials.

B. Use only adhesives formulated for marble material and recommended by their manufacturer for the application indicated.

C. Dress joints straight and at right angle to face unless otherwise indicated. Finish exposed faces and edges to match approved Samples.

D. Construction Tolerance: Variation from Level; Do not exceed 1/16 inch in 10 feet.

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3.4 ADJUSTMENT AND CLEANING:

A. Upon completion of the building, all finishes shall be free of all mars, dents, or other visible imperfections.

3.5 WARRANTY:

A. This Contractor shall fully guarantee all materials and labor under this section for a period of not less than 1-year from date of final acceptance of the building against all defects in both workmanship and materials, and he shall promptly correct and/or replace such faulty work if so notified.

END OF SECTION

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SECTION 09 51 00
ACOUSTICAL CEILINGS

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 REFERENCES
- A. ASTM C635/C635M – Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings
- B. ASTM A641/A641M Standard Specification for Zinc Coated (Galvanized) Carbon Steel Wire
- C. ASTM C636/C636M – Standard Practice for the Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels
- D. ASTM C665 – Standard Specification for Mineral Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing
- E. ASTM E84 – Standard Test Method for Burning Characteristics of Building Materials
- F. ASTM E795 – Standard Practices for Mounting Test Specimens During Sound Absorption Tests
- G. ASTM E1264 – Standard Classification of Acoustical Ceiling Products
- H. Ceilings and Interior Systems Contractors Association (CISCA) - Acoustical Ceilings Use and Practice
- I. UL - Fire Resistance Directory and Building Material Directory
- J. Florida Building Code (FBC)

1.3 SUBMITTALS
- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
  1. Product data for each type of product specified.
  2. Samples for verification purposes of each type of exposed finish required, prepared on samples of size indicated below and of same thickness and material indicated for final unit of Work. Where finishes involve normal color and texture variations, include sample sets showing full range of variations expected.
     - a. 6" square samples of each acoustical panel type, pattern, and color
     - b. Set of 12" long samples of exposed suspension system members, including moldings, for each color and system type required.

1.4 QUALITY ASSURANCE
- A. Fire Performance Characteristics:
  1. Surface Burning Characteristics: As follows, tested per ASTM E84 and complying with ASTM E1264 for Class A products.
     - a. Flame Spread Index: 25 or less.
     - b. Smoke Developed Index: 50 or less.
  2. Tested by UL or another nationally recognized testing laboratory.
  3. All ceiling panels must be appropriately marked with Class A designation.
- B. Single Source Responsibility for Ceiling Units: Obtain each type of acoustical ceiling unit from a single source with resources to provide products of consistent quality in appearance and physical properties without delaying progress of the Work.
- C. Single Source Responsibility for Suspension System: Obtain each type of suspension system from a single source with resources to provide products of consistent quality in appearance and physical properties without delaying progress of the Work.

1.5 DELIVERY, STORAGE, AND HANDLING
- A. Deliver acoustical ceiling units and suspension system components to Project site in original, unopened packages.
  1. Store in a clean dry fully enclosed space and protect against damage from moisture, direct sunlight, surface contamination, and other causes.

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1.6 PROJECT CONDITIONS
- A. Install interior acoustical ceilings only when space is enclosed and weatherproof, wet work in space is complete and nominally dry, work above ceilings is complete, and ambient conditions of temperature and humidity are at values near those for final occupancy.

1.7 EXTRA MATERIALS
- A. Furnish extra materials described below matching installed products, packaged with protective covering for storage, and are identified with labels describing contents.
  1. Acoustical Ceiling Units: Full size units equal to 2% of amount installed.
  2. Suspension System Components: Furnish the lesser of 1 full carton or a quantity of each exposed component equal to 2% of amount installed.

PART 2 PRODUCTS

2.1 MANUFACTURERS
- A. Products: Subject to compliance with requirements, provide one of the following:
  1. Mineral Base Panels are typical unless noted on Reflected Ceiling Plans.
  2. Tiles may be 24" x 24" or 24" x 48" non-directional, resistant to high humidity, and growth of mold/mildew, with Painted Finish (white) Perforated and Fissured Pattern, Class A finish.
     - a. General minimum NRC = 0.70 and CAC = 35
       - i) Armstrong World Industries "School Zone Fine Fissured"
       - ii) CertianTeed Ceilings (Subsidiary of Saint-Gobain) "Fine Fissured High NRC"
       - iii) USG "Radar" Climaplus High CAC/High NRC
     - b. Kitchen
       - i) USG "Climaplus Clean Room"
       - ii) Armstrong World Industries, “Clean Room VL" or "Fine Fissured Ceramaguard"
       - iii) CertianTeed Ceilings "Fine Fissured" with PlasticGard.
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following, and the grid system shall be compatible with the tiles to provide resistant to high humidity and growth of mold/mildew:
  1. Non-Fire-Resistance Rated Double-Web Steel Suspension Systems:
     - a. Armstrong World Industries, Inc.
     - b. Chicago Metallic Corporation.
     - c. USG Interiors, Inc.
     - d. CertianTeed Ceilings
  2. Edge Moldings:
     - a. Armstrong World Industries, Inc.
     - b. Chicago Metallic Corporation.
     - c. Fry Reglet Corp.
     - d. USG Interiors, Inc.
     - e. CertianTeed Ceilings

2.2 ACOUSTICAL CEILING UNITS, GENERAL
- A. Standard for Acoustical Ceiling Units: Provide manufacturers' standard units of configuration indicated that comply with ASTM E 1264 classifications as designated by reference to types, patterns, acoustical ratings, and light reflectance, unless otherwise indicated.
  1. Mounting Method for Measuring NRC: Use type E 400 (plenum mounting in which face of test specimen is 15-3/4" away from the test surface) per ASTM E795.
- B. Colors and Patterns: Provide products to match appearance characteristics indicated under each product type.

2.3 METAL SUSPENSION SYSTEMS, GENERAL
- A. Standard for Metal Suspension Systems: Provide manufacturer's standard metal suspension systems of types, structural classifications, and finishes indicated that comply with applicable ASTM C635/C635M requirements.
- B. Finishes and Colors: Provide manufacturer's standard factory applied finish for type of system indicated.
- C. Attachment Devices: Size for 5 times design load indicated in ASTM C635/C635M, Table 1, Direct Hung unless otherwise indicated.

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D. Wire Hangers, Braces, and Ties: ASTM A641/A641M, Class 1 zinc coating, soft temper.
   1. Gage: Provide wire sized so that stress at 3 times hanger design load (ASTM C635/C635M, Table 1, Direct-Hung), will be less than yield stress of wire, but provide not less than 2.69 mm (0.106") diameter wire.
E. Edge Moldings and Trim:
   1. Metal or extruded aluminum of types and profiles indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations that fit type of edge detail and suspension system indicated.
   2. Provide column surround trim at round columns.
F. Retention Clips: Armstrong #414 or similar by other acoustical panel manufacturers.

2.4 NON-FIRE-RESISTANCE-RATED DIRECT-HUNG SUSPENSION SYSTEMS
A. Wide-Face Capped Double-Web Steel Suspension System: Main and cross-runners roll-formed from pre-painted or electrolytic zinc-coated cold-rolled steel sheet, with pre-finished 15/16" wide metal caps on flanges; other characteristics as follows:
   1. Structural Classification: Intermediate Duty System
   2. End Condition of Cross-Runners: Override (stepped) or butt-edge type, as standard with manufacturer.
   3. Cap Material and Finish: Steel sheet painted white

2.5 MISCELLANEOUS MATERIALS
A. Tile Adhesive as recommended by tile manufacturer, with UL label for Class 0-25 flame spread

PART 3 EXECUTION

3.1 EXAMINATION
A. Examine substrates and structural framing ceiling system attaches or abuts, with Installer present, for compliance with requirements specified in this and other sections that affect installation and anchorage of ceiling system.
B. Correct all unsatisfactory conditions before proceeding with work.

3.2 PREPARATION
A. Furnish layouts for preset inserts, clips, and other ceiling anchors for installation specified in other sections.
   1. Furnish concrete inserts and similar devices to other trades for installation well in advance of time needed for coordination of other work.
B. Measure each ceiling area and establish layout of acoustical units to balance border widths at opposite edges of each ceiling.
   1. Avoid use of less than half width units at borders, and comply with reflected ceiling plans.

3.3 INSTALLATION
A. General: Install acoustical ceiling systems to comply with installation standard referenced below, per manufacturer's instructions and CISCA "Ceiling Systems Handbook."
   1. Standard for Installation of Ceiling Suspension Systems: Comply with ASTM C636/C636M.
B. Install edge moldings of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical units.
C. Install acoustical panels in coordination with suspension system, with edges concealed by support of suspension members.
   1. Scribe and cut panels to fit accurately at borders and at penetrations.

3.4 CLEANING
A. Clean exposed surfaces of acoustical ceilings, including trim, edge moldings, and suspension members.
B. Comply with manufacturer's instructions for cleaning and touch-up of minor finish damage.
C. Remove and replace work that cannot be successfully cleaned.

END OF SECTION

SECTION 09 65 00
RESILIENT FLOORING

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PART 1 GENERAL

1.1 SECTION INCLUDES

A. Resilient sheet and tile flooring.

B. Resilient base.

C. Resilient stair accessories.

D. Installation accessories.

1.2 RELATED REQUIREMENTS

A. Section 03 54 00 - Self-Leveling Underlayment.

B. Section 09 05 61 - Common Work Results for Flooring Preparation: Concrete slab moisture and alkalinity testing and remediation procedures.

1.3 REFERENCE STANDARDS

A. ASTM E84 - Standard Test Method for the Surface Burning Characteristics of Building Materials

B. ASTM E648 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source; 2017.

C. ASTM F1066 - Standard Specification for Vinyl Composition Floor Tile; 2004 (Reapproved 2018).

D. ASTM F1344 - Standard Specification for Rubber Floor Tile; 2015.

E. ASTM F1700 - Standard Specification for Solid Vinyl Floor Tile; 2013a.

F. ASTM F1861 - Standard Specification for Resilient Wall Base; 2016.

G. ASTM F1913 - Standard Specification for Vinyl Sheet Floor Covering Without Backing; 2004 (Reapproved 2014).

H. NFPA 253 - Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source; 2015.

I. RR-T-650E – Federal Specification, Treads, Metallic and Non-metallic, Skid Resistant

J. FBC - Florida Building Code

1.4 SUBMITTALS

A. See Section 01 33 00 - Submittal Procedures.

B. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions indicating procedures and perimeter conditions.

C. Shop Drawings: Indicate seaming plans and floor patterns.

D. Submit two samples, 12 by 12 inch in size illustrating color and pattern for each resilient flooring product specified.

E. Submit two 12" long samples of base material for each color specified.

F. Concrete Sub-floor Test Report: Submit a copy of the moisture and alkalinity (pH) test reports.

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G. Certification: Prior to installation of flooring, submit written certification by flooring manufacturer and adhesive manufacturer that condition of sub-floor is acceptable.

H. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.
   1. See Section 01 77 00 - Contract Closeout.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in installing specified flooring with minimum five years documented experience and approved by flooring manufacturer.

B. All flooring and base material in a room or space shall be from the same dye lot or run.

1.6 REGULATORY REQUIREMENTS

A. Conform to ASTM E84 for flame/smoke rating requirements.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, protect, and handle products per the Manufacturer's recommendations and Warranty requirements.

1.8 ENVIRONMENTAL REQUIREMENTS

A. Store the materials at least 3-days prior to installation in area of installation to achieve temperature stability.

B. Maintain ambient temperature required by adhesive manufacturer at least 3-days prior to, during, and 24 hours after installation of materials.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with requirements, provide products from one of the following:
   1. Armstrong Flooring
   2. Forbo Flooring
   3. Johnsonite, a Tarkett Company.
   4. LG Floors
   5. Approved Equal

B. Refer to Finish Schedule for Basis of Design products.

2.2 MATERIALS - SHEET FLOORING

A. Vinyl Sheet Flooring: Homogeneous without backing, through-grain vinyl granules with pattern and color uniformly distributed throughout entire thickness.
   1. Factory Finish with Enhanced Traction.
   2. Minimum Requirements: Comply with ASTM F1913.
   3. Thickness: 0.080 inch nominal.
   4. Seams: Heat welded using welding rod produced by the manufacturer of the flooring.

B. Feature Strips: Of same material as sheet flooring.

C. Provide and install color and pattern as selected by the Architect and Owner from manufacturer's standard colors and patterns.

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2.3 MATERIALS - TILE FLOORING

A. Vinyl Tile - LVT: Printed film type, with transparent or translucent wear layer.
   1. Minimum Requirements: Comply with ASTM F1700, Class III, Type B embossed surface.
   2. Wear Layer Thickness: 0.020 inch.
   3. Total Thickness: 0.100 inch.

B. Rubber Tile- ASTM F1344: Type II; Class B.
   1. Total Thickness: 3/16 inch.
   2. Design: flat.

C. Feature Strips: Of same material as tile.

D. All tiles in a room or space shall be from the same dye lot or run.

E. Provide and install color and pattern as selected by the Architect and Owner from manufacturer's standard colors and patterns.

2.4 MATERIALS - STAIR COVERING

A. Stair Treads: RR T 650E, Composition A, Type II; full width and depth of stair tread in one piece; return down edge of tread with tapered thickness.
   1. Material: Rubber.
   2. Nominal Thickness: 0.250 inch.
   3. Pattern: Raised.
   4. Design: smooth nosing.

B. Stair Risers: Maintain height and length in one piece, matching treads in material and color.
   1. Material: Rubber.
   2. Thickness: 0.125 inch.

C. Stair Nosings: 2-5/8 inch horizontal return, 1-3/8 inch return down edge of tread, full width of stair tread in one piece.
   1. Material: Rubber.
   2. Nominal Thickness: 3/16 inch.
   3. Pattern: Smooth.

D. Stair Skirting: Maintain width sufficient to provide 2 inches above stair nose, measured perpendicular to stair slope.
   1. Sheet Material: Rubber.
   2. Nominal Thickness: 0.125 inch.
   3. Pattern: Smooth.

E. All material in a room or space shall be from the same dye lot or run.

F. Color(s): To be selected by Architect from manufacturer's standards.

2.5 MATERIALS - BASE

A. Resilient Base: ASTM F1861, Type TS rubber, vulcanized thermoset; top set Top set coved or toeless; formed external corners.
   1. Height: 4 inch.
   2. Thickness: 0.125 inch.
   3. Finish: Satin.

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4. Length: Roll.
5. Color: To be selected by Architect from manufacturer's full range.
6. Accessories: Premolded external corners and end stops of same material, size and color as base.
7. All base material in a room or space shall be from the same dye lot or run.
8. Apply base with adhesive and in compliance with manufacturer's requirements.

2.6 ACCESSORIES

A. Subfloor Filler: Portland cement-based latex underlayment; type recommended by adhesive material manufacturer.

B. Primers and Adhesives: Waterproof; types recommended by flooring manufacturer.

C. Moldings, Transition and Edge Strips: Same material as flooring.
1. Applications: Locations between two different types of flooring, as indicated on the drawings.
2. Color: as selected by the Architect from standard colors available.
3. Profile: as recommended by manufacturer to suit the thickness of materials to be transitioned and ADA compliant.

D. Sealer and Wax: Types recommended by flooring manufacturer.
1. Sealer and wax applied shall meet or exceed the ADAAG slip resistance coefficient of 0.6 on static surfaces and 0.8 on ramps, submit documentation to the Architect and Owner.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that surfaces are flat to tolerances acceptable to flooring manufacturer, free of cracks that might telegraph through flooring, clean, dry, and free of curing compounds, surface hardeners, and other substances that might interfere with bonding of flooring to substrate.

B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, free of substances that may impair adhesion , and are ready to receive resilient base.

C. Verify concrete floors are dry to maximum moisture content required by the flooring manufacturer , and exhibit negative alkalinity, carbonization, or dusting, follow manufacturer's instructions.
1. Test in accordance with Section 09 05 61 - Common Work Results for Flooring Preparation.
2. Obtain instructions if test results are not within limits recommended by resilient flooring manufacturer and adhesive materials manufacturer.

3.2 PREPARATION

A. Prepare floor substrates for installation of flooring in accordance with Section 09 05 61 - Common Work Results for Flooring Preparation.

B. Remove sub-floor ridges and bumps. Fill minor low spots, cracks, joints, holes, and other defects with sub-floor filler to achieve smooth, flat, hard surface.

C. Prohibit traffic until any added filler is fully cured.

D. Scrape all and any materials and debris from concrete surface before installing finish floor.

E. Vacuum clean substrate.

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3.3 INSTALLATION - GENERAL

A. Starting installation constitutes acceptance of sub-floor conditions.

B. Install in accordance with manufacturer's written instructions.

C. Spread only enough adhesive to permit installation of materials before initial set.

D. Fit joints and butt seams tightly.

E. Set flooring in place, press with heavy roller to attain full adhesion.

F. Where type of floor finish, pattern, or color are different on opposite sides of door, terminate flooring under centerline of door.

G. Install edge strips at unprotected or exposed edges, where flooring terminates, and where indicated.

H. Scribe flooring to walls, columns, floor outlets, and other appurtenances to produce tight joints.

I. Install flooring in recessed floor access covers, maintaining floor pattern.

J. At movable partitions, install flooring under partitions without interrupting floor pattern.

K. Install feature strips and edge strips and floor markings where indicated.

3.4 INSTALLATION - SHEET FLOORING

A. Lay flooring with joints and seams in accordance with seaming plan.

B. Install sheet flooring parallel to length of room.
   1. Provide minimum of 1/3 full roll width.
   2. Double cut sheet; provide continuously heat-welded seal.

3.5 INSTALLATION - TILE FLOORING

A. Mix tile from container to ensure shade variations are consistent when tile is placed, unless otherwise indicated in manufacturer's installation instructions.

B. Lay flooring with joints and seams parallel to building lines to produce symmetrical tile pattern.
   1. Install tile to selected pattern, allow minimum 1/2 full size tile width at room or area perimeter.

C. Provide uniform, straight, and aligned tile joints.

3.6 INSTALLATION - RESILIENT BASE

A. Fit joints tightly and make vertical. Maintain minimum dimension of 18 inches between joints.

B. Field mitered internal or exterior corners are acceptable provided workmanship produces results comparable to using premolded corner pieces.

C. Install base on solid backing. Bond tightly to wall and floor surfaces.
   1. Provide solid non-water absorbent material.

D. Scribe and fit to door frames and other interruptions.

3.7 INSTALLATION - STAIR COVERINGS

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A. Install stair coverings in one piece for full width and depth of tread.

B. Install stair skirting configured tightly to stair and stringer profile.

C. Adhere over entire surface. Fit accurately and securely.

3.8 CLEANING

A. Clean work under provisions of section 01 77 00.

B. Remove excess adhesive from floor, base, and wall surfaces without damage.

C. Clean, seal, and wax in accordance with manufacturer's written instructions, apply a minimum of 2-coats of acrylic polish at installation.

1. Apply; prior to final acceptance, 6 additional coats of polish max no more than 4-coats in any 1-application.
2. If installing pre-finished flooring, do not apply wax/polish.

3.9 PROTECTION

A. Protect finished work under provisions of Section 01 50 00.

B. Prohibit traffic on resilient flooring for 48 hours after installation.

END OF SECTION

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SECTION 09 67 00

FLUID-APPLIED EPOXY FLOORING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Fluid-applied flooring and base.

1.2 RELATED REQUIREMENTS

A. Section 07 92 00 - Joint Sealants: Sealing joints between fluid-applied flooring and adjacent construction and fixtures.

B. Section 09 05 61 - Common Work Results for Flooring Preparation: Concrete slab moisture and alkalinity testing and remediation procedures.

1.3 REFERENCE STANDARDS

A. ASTM D570 - Standard Test Method for Water Absorption of Plastics; 1998 (Reapproved 2010).

B. ASTM D638 - Standard Test Method for Tensile Properties of Plastics; 2014.

C. ASTM D695 - Standard Test Method for Compressive Properties of Rigid Plastics; 2015.

D. ASTM D790 - Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials; 2017.

E. ASTM D905 - Standard Test Method for Strength Properties of Adhesive Bonds in Shear by Compression Loading; 2008 (Reapproved 2013).

F. ASTM D2794 - Standard Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact); 2019.

G. ASTM D4060 - Standard Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser; 2014.

H. ASTM E96/E96M - Standard Test Methods for Water Vapor Transmission of Materials; 2016.

I. ASTM E648 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source; 2017.

J. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2017.

K. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride; 2016a.

L. ASTM F2170 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes; 2017.

M. ICRI 310.2R - Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, Polymer Overlays, and Concrete Repair; 2013.

1.4 SUBMITTALS

A. See Section 01 33 00 - Submittal Procedures.

B. Product Data: Provide data on specified products, describing physical and performance characteristics; sizes, patterns and colors available.

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C. Samples: Submit two samples, 12 by 12 inches in size illustrating color and pattern for each floor material for each color specified.

D. Concrete Subfloor Test Report: Submit a copy of the moisture and alkalinity (pH) test reports.

E. Field Quality Control Reports: Submit a copy of the Temperature and Coverage Rate reports.

F. Manufacturer's Installation Instructions: Indicate special procedures.

G. Manufacturer's Qualification Statement.

H. Applicator's Qualification Statement.

I. Maintenance Data: Include maintenance procedures, recommended maintenance materials, procedures for stain removal, repairing surface, and suggested schedule for cleaning.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum three years documented experience.

B. Applicator Qualifications: Company specializing in performing the work of this section.
   1. Minimum three years of documented experience.
   2. Approved by manufacturer.

1.6 MOCK-UP

A. Construct mock-up(s) of fluid applied flooring to serve as basis for evaluation of texture, slip resistance and workmanship.
   1. Number of Mock-Ups to be Prepared: One.
   2. Use same materials and methods for use in the work.
   3. Use approved design samples as basis for mock-ups.
   4. Locate where directed.
   5. Minimum Size: 48 inches by 48 inches.

B. See Section 01 40 00 - Quality Control for additional requirements.

C. Approved mock-up may remain as part of the Work.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Store resin materials in a dry, secure area.

B. Store materials for three days prior to installation in area of installation to achieve temperature stability.

1.8 FIELD CONDITIONS

A. Store materials in area of installation for minimum period of 24 hours prior to installation.

B. Maintain ambient temperature required by manufacturer 72 hours prior to, during, and 24 hours after installation of materials.

1.9 WARRANTY

A. Manufacturer’s warranty covering the fluid-applied flooring against defects in materials for a minimum of one year from date of installation.

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PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Fluid-Applied Flooring:
   1. Basis of Design: Dur-A-Flex: www.dur-a-flex.com.
   2. Crossfield Products Corp; Dex-O-Tex: www.crossfieldproducts.com/#sle.
   3. Sherwin-Williams Company: General Polymers Brand: www.generalpolymers.com/#sle.
   4. Sika Corporation: www.sikafloorusa.com/#sle.
   5. or Approved Equal: See Section 01 60 00 - Material Equipment and Approved Equals.

2.2 FLUID-APPLIED FLOORING SYSTEMS

A. Fluid-Applied Flooring: Cementitious urethane based self-leveling seamless flooring system with decorative epoxy quartz aggregate broadcast and epoxy/aliphatic urethane topcoats.
   1. System Thickness: 3/16 - 1/4 inch, nominal, when dry.
   2. Texture: Slip resistant, as determined in Mock-up.
   3. Color: As selected by Architect from manufacturer's full line.
   4. Physical Properties:
      a. Tensile Strength: 4000 psi, when tested in accordance with ASTM D638.
      b. Compressive Strength: 17500 psi, when tested in accordance with ASTM D695.
      c. Flexural Strength: 6250 psi, when tested in accordance with ASTM D790.
      d. Impact Resistance: >160 inch-lbs, when tested in accordance with ASTM D2794.
      e. Water Absorption: 0.04 percent, when tested in accordance with ASTM D570 for 24 hr.
      f. Static Coefficient of Friction: >0.6, when tested in accordance with ANSI B101.1.
      g. Dynamic Coefficient of Friction - Wet: >0.42 when tested in accordance with ANSI A326.3.
   5. Basis of Design Product: Dur-A-Flex; HYBRI-FLEX EQ: www.dur-a-flex.com.
      a. System Materials:
         1) Body Coat: Dur-A-Flex, Inc, Poly-Crete SL resin, hardener and SL aggregate, cementitious urethane system.
         2) Aggregate: Quartz granules.
         3) Broadcast Coat: Dur-A-Flex, Inc. Dur-A-Glaze #4, epoxy based two-component resin.
         4) Grout Coat: Dur-A-Flex, Inc Dur-A-Glaze #4 Water Clear, epoxy-based, resin and Hardener.
         5) Top coat: Dur-A-Flex, Inc. Armor Top aliphatic urethane two-component resin.

2.3 ACCESSORIES

A. Integral Cove base: 4 inch, unless otherwise noted.
   1. Provide metal L-strip at termination.
      a. Basis of Design: Schluter Jolly.
   2. Align face of base with face of wall finish at tiled walls.

B. Patch Materials:
   1. Basis of Design :
      a. Shallow Fill and Patching (up to ¼ inch): Dur-A-Flex, Inc. Poly-Crete MD.

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b. Deep Fill and Sloping Material (over ¼ inch): Dur-A-Flex, Inc. Poly-Crete WR or Dur-A-Tex UM

C. Primer: Type recommended by fluid-applied flooring manufacturer.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that subfloor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive flooring.

B. Verify that subfloor and wall base surfaces are dust-free and free of substances that could impair bonding of materials to subfloor surfaces.

C. Cementitious Subfloor Surfaces: Verify that substrates are ready for fluid-applied flooring installation by testing for moisture and alkalinity (pH).
1. Test in accordance with Section 09 05 61.
2. Obtain instructions if test results are not within limits recommended by fluid-applied flooring manufacturer.

D. Verify that required floor-mounted utilities are in correct location.

3.2 PREPARATION

A. Remove subfloor ridges and bumps. Fill low spots, cracks, joints, holes, and other defects with subfloor filler.

B. Prepare concrete surfaces according to ICRI 310.2R, CSP 4-5, and manufacturer's instructions.

C. Apply, trowel, and float filler to achieve smooth, flat, hard surface. Prohibit traffic until filler is cured.

D. Vacuum clean substrate.

E. Apply primer to surfaces required by flooring manufacturer.

3.3 INSTALLATION - FLOORING

A. Apply in accordance with manufacturer's instructions.

B. Apply each coat to minimum thickness required by manufacturer.

C. Finish to smooth level surface.

D. Fillet and cove at vertical surfaces.

E. Install cove base in accordance with manufacturer's instructions.

3.4 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Control, for additional requirements.

B. The following tests are to be conducted by the Applicator, submit written reports:
1. Temperature: Check and report air, substrate temperatures and dew point.
2. Coverage Rates: Monitor and report quantity of material used against the area covered for each system layer.

3.5 PROTECTION

A. Prohibit traffic on floor finish for 48 hours after installation.

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B. Barricade area to protect flooring until fully cured.

END OF SECTION

SECTION 09 72 00
WALL COVERINGS

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PART 1 GENERAL

1.1 SECTION INCLUDES

A. Surface preparation.

B. Writable wall covering.

C. Custom, digital print wall covering.

1.2 REFERENCE STANDARDS

A. ASTM D1308 - Standard Test Method for Effect of Household Chemicals on Clear and Pigmented Organic Finishes; 2002 (Reapproved 2013).

B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023d.

C. ASTM F793/F793M - Standard Classification of Wall Coverings by Use Characteristics; 2015.

1.3 SUBMITTALS

A. Product Data: Provide data on wall covering, accessories, primer and adhesive.

B. Shop Drawings: Indicate wall elevations with seaming layout.

C. Samples: Submit two samples of each wall covering, 12 by 12 inch in size illustrating color, finish, and texture.

D. Samples of Printed Graphic Image:

1. Submit a "mini-mural" of complete reduced-scale finished image printed on actual substrate.
2. Submit a sample section of final image at 100% resolution printed on actual substrate.

E. Samples: Submit two samples of each trim type, min. 12 inch in length illustrating profile and finish.

F. Test Reports: Indicate verification of flame and smoke ratings, when tested by UL.

G. Manufacturer's Installation Instructions: Indicate special procedures.

H. Maintenance Data: Submit data on cleaning, touch-up, and repair of covered surfaces.

I. Manufacturer's Qualification Statement.

J. Installer's Qualification Statement.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in 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.

C. Single Source Responsibility: Obtain each type of wall covering system components from a single source.

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1.5 MOCK-UP

A. Provide panel, 12 feet wide, full height, illustrating installed wall covering and joint seaming technique for each type of wall covering system.

B. Locate where directed.

C. Approved mock-up may remain as part of the Work.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Inspect roll materials at arrival on site, to verify acceptability.

B. Protect packaged adhesive from temperature cycling.

C. Do not store roll goods on end.

1.7 FIELD CONDITIONS

A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the adhesive or wall covering product manufacturer.

B. Maintain these conditions 72 hours before, during, and after installation of adhesive and wall covering.

C. Acclimate wallcovering in the area of installation a minimum of 24 hours before installation.

D. Provide lighting level of 80 ft candles measured mid-height at substrate surfaces.

PART 2 PRODUCTS

2.1 WALL COVERINGS

A. General Requirements:
   1. Surface Burning Characteristics: Flame spread/Smoke developed index of 25/50, maximum, when tested in accordance with ASTM E84.
   2. Chemical and Stain Resistance: No visible staining or discoloration and no damage to surface texture when tested in accordance with ASTM D1308.

B. Writable Wall Covering
   1. Manufacturers:
      a. Basis of Design: IdeaPaint All-in-One: www.ideapaint.com.
      b. Substitutions: See Section 01 60 00 - Material Equipment and Approved Equals.
   2. Wall Covering: Writable, complying with the following:
      a. Smooth, low-sheen, white surface for projection, high-performing magnetic and dry erase markers.

C. Custom Digital Graphic Wall Covering
   1. Manufacturers:
      a. Koroseal: www.koroseal.com.
      b. ArcCom: arc-com.com.
      c. Substitutions: See Section 01 60 00 - Material Equipment and Approved Equals.
   2. Wall Covering: Vinyl Type II commercial grade, conforming to the following:
      a. Conform to ASTM F793, Category V, Type II.
      b. Total Weight: 20 oz/sq yd.
      c. Roll Width: minimum 54 inches.

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d. Backing: Woven, osnaburg or non-woven, synthetic fabric.
e. Custom Digitally Printed Graphic.
1) All artwork to be be included in Contract and designed by professional graphic artist to the required resolution.

D. Adhesive: Type recommended by wall covering manufacturer to suit application to substrate.

E. Termination Trim and Drywall Reveal: anodized aluminum, sizes and shapes as indicated in Drawings.
1. Manufacturer: Fry-Reglet: www.fryreglet.com.

F. Substrate Filler: As recommended by adhesive and wall covering manufacturers; compatible with substrate.

G. Substrate Primer and Sealer: As recommended by adhesive and wall covering manufacturers.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that substrate surfaces are ready to receive work, and comply with requirements of wall covering manufacturer.

B. Measure moisture content of surfaces using an electronic moisture meter. Do not apply wall coverings if moisture content of substrate exceeds level recommended by wall covering manufacturer.

C. Verify flatness tolerance of surfaces does not vary more than 1/8 inch in 10 feet nor vary at a rate greater than 1/16 inch/ft.

D. Contractor to provide a Level 5 gypsum board finish in accordance with levels defined in ASTM C840.

3.2 PREPARATION

A. Fill cracks in substrate and smooth irregularities with filler; sand smooth.

B. Wash impervious surfaces with tetra-sodium phosphate, rinse and neutralize; wipe dry.

C. Surface Appurtenances: Remove or mask electrical plates, hardware, light fixture trim, escutcheons, and fittings prior to preparing surfaces or finishing.

D. Surfaces: Correct defects and clean surfaces that affect work of this section.

E. Apply two coats of primer sealer to substrate surfaces. Allow to dry. Lightly sand smooth.

F. Vacuum clean surfaces free of loose particles.

3.3 INSTALLATION

A. Apply adhesive and wall covering in accordance with manufacturer's instructions.

B. Apply wall covering smooth, without wrinkles, gaps or overlaps. Eliminate air pockets and ensure full bond to substrate surface.

C. Install each strip horizontally and in the same sequence as cut from the roll using a level line.

D. Install dry erase wallcovering sheets in exact order as they are cut from bolt. Reverse hang alternate strips (except lined products). Do not crease or bend the wallcovering when handling.

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E. Install termination trim.

F. Remove excess adhesive while wet from seam before proceeding to next wall covering sheet. Wipe clean with dry cloth.

3.4 CLEANING

A. Clean wall coverings of excess adhesive, dust, dirt, and other contaminants.

B. Reinstall wall plates and accessories removed prior to work of this section.

3.5 PROTECTION

A. Do not permit construction activities at or near finished wall covering areas.

END OF SECTION

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SECTION 09 84 33
ACOUSTICAL WALL AND CEILING PANELS

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 work in this section.

1.2 DESCRIPTION OF WORK

A. Provide all labor, materials, and equipment as required to provide the acoustical wall panels as shown on the drawings.

1.3 QUALITY ASSURANCE

A. All packages shall be clearly marked and labeled at plant with manufacturer's name and indicate the specific materials specified.

1.4 REFERENCES

A. ASTM C423 - Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method

B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials

C. ASTM E90 Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements

D. UL 723 Tests for Surface Burning Characteristics of Building Materials

1.5 SUBMITTALS

A. Submit complete specifications and installation instructions for all materials furnished.

B. Submit full range of color samples for Architect's selection.

C. Submit shop drawings showing materials, installation details, sizes, and layout.

1.6 DELIVERY, STORAGE & HANDLING

A. Handle material per manufacturer's requirements.

B. Store the materials in the original packaging material in a clean dry area until ready for installation.

C. Do not install until cleanliness and temperature is controllable.

1.7 WARRANTY

A. Provide written warranty, executed by the manufacturer, agreeing to replace defected products for one year after owner's acceptance of installation.

1.8 MAINTENANCE

A. Provide owner with manufacturer's recommendations for cleaning and repairing panels.

PART 2 PRODUCTS

2.1 INTERIOR ACOUSTICAL WALL PANELS:

A. Act (absorptive) Respond wall panels as manufactured by Conwed, Ladysmith Wisconsin (Owens Corning Company) or equal products by:

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1. AVL System, Inc, FL
2. Armstrong
3. G & S – Golterman & Sabo, MO
4. ESSI Acoustical Products, OH
5. MPC, Inc, OH
6. Lamvin Inc., CA
7. MBI Products Company, Inc, OH
8. Other Pre-approved manufacturer

B. Provide in size per drawings with fiberglass core material (6 PCF) and minimum NRC of 0.80 per inch.
   1. Thickness: 2 inches.

C. Panels shall have beveled edges and be furnished with continuous chemically hardened internal edge protection.

D. Provide woven polyester fabric covering the face, all edges, and a return on the back of a minimum of 1½".
   1. Refer to Finish Schedule for Basis of Design fabrics.

E. All components utilized in the construction of these wall panels shall meet Class A (0-25) rating per ASTM E84, fuel contribution of 20, and smoke density value of 65.

F. Architect will select colors from manufacturer's full range in coordination with the School District Design Coordinator.

2.2 INTERIOR ACOUSTICAL CEILING PANELS:

A. Pyramidal Diffusers as manufactured by Conwed, Ladysmith Wisconsin (Owens Corning Company) or equal products by:
   1. AVL System, Inc, FL
   2. G & S – Golterman & Sabo, MO
   3. Lamvin Inc., CA
   4. Other Pre-approved manufacturer

B. Provide in size and with Edge detail for laying into acoustical ceiling grid.

C. Panel Construction: 1/8 inch Thermoformed co-polymer. Interior lined with a 1-1/2 inch thick layer of fiberglass to enhance sound absorption, white finish.

D. Noise Reduction Coefficient (NRC): 0.10 when tested in accordance with ASRM C423.

E. Surface Burning Characteristics: Flame spread index of 25 or less and smoke developed index of 450 or less, when tested in accordance with ASTM E84.

2.3 EXTERIOR ACOUSTICAL WALL PANELS

A. Acoustiblok, Inc. 6900 Interbay Blvd., Tampa, outdoor sound absorption panels or equal products by:
   1. Acoustical Solutions, Inc., Acoustifiber, Virginia
   2. Acoustical Surfaces, Inc., Chaska, MN, Sound Fighter ® Systems Wall
   3. Unger Technologies Sound Barrier, Indiana

B. Size per drawing x 2.4” thick

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C. All Weather sound panels – hurricane model.

D. Fire Performance, UL 723

E. NRC not less than 0.8

F. Refer to the current edition of the School District Design Criteria for Sound Ratings (http://www.palmbeachschools.org/buildingdepartment/DistrictDesignStandards.asp).

G. Wind resistance not less than 270 mph.

H. Provide framed construction, of corrosion resistant aluminum, mill finish.

PART 3 EXECUTION

3.1 INSTALLATION:

A. Complete installation and workmanship for each type of acoustical system specified under this section in strict accordance with the manufacturers' standard printed specification, recommendations and as detailed on the drawings.

B. The wall panels shall be mounted utilizing concealed splines.

3.2 PROTECTION OF FINISHED WORK

A. Protect finished work under provisions of Section 01 50 00.

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SECTION 09 91 13
EXTERIOR PAINTING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Exterior paint and coating systems

1.2 RELATED SECTIONS

A. See related sections of the specifications for surface preparation, primers, and finishes provided by others.

1.3 REFERENCES

A. ASTM D16 - Standard Terminology for Paint, Related Coating, Materials, and Applications

B. ASTM D3359 – Standard Test Methods for Measuring Adhesion by Tape Test

C. ASTM D4442– Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood Base Materials

D. EPA – Method 24 - Surface Coatings

E. GS-11 Green Seal – Standard for Paints and Coatings

F. LEED for Schools 2009 latest edition by USGBC

G. NACE International (National Association of Corrosion Engineers) - Industrial Maintenance Painting

H. NPCA (National Paint and Coatings Association) - Guide to U.S. Government Paint Specifications

I. Paint - Certified Product List - Florida Department of Agriculture and Consumer Services

J. PDCA (Painting and Decorating Contractors of America) - Architectural Painting Specifications Manual

K. PDCA Standard P1-04 Touchup Painting and Damage Repair; Financial Responsibility

L. PDCA Standard P5-04 Benchmark Sample Procedures for Paint and other Decorative Coating System

M. South Coast Air Quality Management District (SCAQMD) Rule 1113, Architectural Coating

N. SSPC (Steel Structures Painting Council) - Steel Structures Painting Manual

O. SSPC-SP 1 – Solvent Cleaning

1.4 DEFINITIONS

A. Conform to ASTM D16 for interpretation of terms used in this section.

1.5 SUBMITTALS

A. Submit under provisions of Section 01 33 00.

B. Product Data: Provide the manufacturer’s data sheets and Safety Data Sheets on each paint and coating product and at a minimum shall include:

1. Product characteristics
2. Surface preparation instructions and recommendations

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3. Primer requirements and finish specifications
4. Storage and handling requirements
5. Application methods
6. Cautions and VOC levels

C. Selection Samples:
1. Submit a complete set of color chips representing the full range of manufacturer's color samples available.
2. Submit two 9" x 9" samples illustrating selected colors and textures for each type.

1.6 QUALITY ASSURANCE

A. Pre-Application meeting:
1. Prior to contractor starting to apply any material covered in this section, there shall be a meeting with the Owner (FS and PM), Architect, Contractor, Subcontractor, and Material Supplier.
2. Meeting shall discuss mockups, surface condition, surface preparation, material application, and inspection procedures.
a. Prepare all mockups in accordance with PDCA P5-04.

B. The Contractor shall request the following in progress field inspections and the Owner's representative shall approve each inspection prior to proceeding with the next step.
1. Following surface preparation and prior to priming
2. Following priming and prior to applying finish coats
3. Following application of finish coats
4. All inspections shall follow FS normal procedure for verifying surface conditions and materials applied.

1.7 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing the products specified in this section with minimum 5-years documented experience.

B. Applicator: Company specializing in performing the work of this section with minimum 5-years documented experience.

1.8 REGULATORY REQUIREMENTS

A. Conform to applicable code for flame and smoke rating requirements for finishes.

B. Comply with applicable environmental health and safety regulations

1.9 FIELD SAMPLES

A. Provide exterior field sample at an outside corner condition with finish extending minimum 10' both directions and selected height.

B. Locate where directed by Architect and Owner.

C. Accepted sample may remain as part of the work.

1.10 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, protect, and handle products to site under provisions of Section 01 60 00, follow manufacturer's requirements.

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B. Deliver products to site in manufacturer's unopened containers with the following labeling and information:
   1. Product name and type (description)
   2. Application & use instructions
   3. Surface preparation instructions
   4. VOC content
   5. Environmental issues; i.e. cleanup requirements, disposal requirements, etc
   6. Batch date
   7. Color number and name

C. Storage:
   1. Store paint materials in a properly ventilated area at the temperature range r required by the manufacturer'.
   2. Store and dispose of solvent-based materials and materials used with solvent-based materials in accordance with manufacturer's and other regulating authorities having jurisdiction.

1.11 PROJECT CONDITIONS

A. Do not apply materials when surface and ambient temperatures are below 40°F, or below the manufacturer's requirements.

B. Do no exterior work on unprotected surfaces if it is raining or moisture from any source is present or expected before finishes can dry or attain proper cure.
   1. Allow surfaces to dry and attain required temperatures and conditions before proceeding or continuing previously started work.

C. Follow manufacturer's directions for extremes and dew point requirements.
   1. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results.
   2. Do not apply coatings under environmental conditions outside manufacturer's absolute limits.

D. Provide lighting level of 80 foot-candles measured mid-height at substrate surface.

E. Dispose of waste in accordance with applicable regulations.

F. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work in accordance with paint manufacturer's written requirements. Beginning new work upon the existing substrate will be understood to indicate that the Contractor has accepted the existing conditions as compliant with the manufacturer's requirements.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturers
   1. The painting schedule is based on products manufactured by the Sherwin-Williams Company.
   2. The owner's representative will consider equal products by other manufacturers for approval in accordance with paragraph 1.4.

B. Paints

1. Benjamin Moore & Co.
2. PPG Paints, Inc.
3. Sherwin-Williams Company.
4. STO Corp
5. Tex-cote

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C. Owner will consider requests for substitutions in accordance with provisions of the specifications.
   1. When submitting a request for substitution, provide complete product data specified above under paragraph 1.4 for each substitute product.

2.2 EXTERIOR PAINTING SCHEDULE

A. Concrete (Cementitious Siding, Flexboard, Transite Board, Shingles (Non-roof), Tilt-Up, and Cast-In Place)
   1. Flat Sheen:
      a. Benjamin Moore & Co.
         1) Primer: Benjamin Moore Acrylic Masonry Sealer 608
         2) First and Second Coats: Ultra Spec Exterior Flat N447
      b. PPG Paints
         1) Primer: Perma-Crete Alkali Resistant Primer, 4-603XI
         2) First and Second Coats: Sun Proof Exterior House & Trim Flat Latex, 72-45 Series
      c. Sherwin-Williams Company (The)
         1) Primer: Loxon Concrete & Masonry Primer, LX02W0050
         2) First and Second Coats: Superpaint Latex Flat, A80 Series
      d. STO Corp
         1) Primer: Sto Prime or Sto Hot Prime
         2) First and second coats: StoColor Acryl Flat
   2. Flat Sheen (Hi-Build Acrylic):
      a. Benjamin Moore & Co.
         1) Primer: Ultra Spec Masonry Interior/Exterior High Build Block Filler 571
         2) First and Second Coats: Coronado Texcrete 3194
      b. PPG Paints
         1) Primer: Perma-Crete Alkali Resistant Primer, 4-603XI
         2) First and Second Coats: Perma-Crete Hi-Build Flat, 4-22XI Series
      c. Sherwin-Williams Company (The)
         1) Primer: Loxon Concrete & Masonry Primer, LX02W0050
         2) First and Second Coats: Loxon XP Latex Flat
      d. STO Corp
         1) Primer: Sto Prime or Sto Hot Prime
         2) First and second coats: StoColor Lotusan
   3. Satin Sheen (Hi-Build Acrylic):
      a. PPG Paints
         1) Primer: Perma-Crete Alkali Resistant Primer, 4-603XI

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2) First and Second Coats: Perma-Crete Hi-Build Satin, 4-422 Series

b. STO Corp
1) Sto Prime of Sto Hot Prime
2) First and second coats: StoColor Acryl Plus

4. Satin Sheen:
a. Benjamin Moore & Co.
1) Primer: Benjamin Moore Acrylic Masonry Sealer 608
2) First and Second Coats: Ultra Spec Exterior Satin N448
b. PPG Paints
1) Primer: Perma-Crete Alkali Resistant Primer, 4-603XI
2) First and Second Coats: Sun Proof Exterior House & Trim Satin, 76-45 Series
c. Sherwin-Williams Company (The)
1) Primer: Loxon Concrete & Masonry Primer, LX02W0050
2) First and Second Coats: Superpaint Latex Satin, A89 Series
d. STO Corp
1) Primer: Sto Prime or Sto Hot Prime
2) First and second coats: StoCoat Color

5. Semi-Gloss Sheen:
a. Benjamin Moore & Co.
1) Primer: Benjamin Moore Acrylic Masonry Sealer 608
2) First and Second Coats: Ultra Spec Exterior N449
b. PPG Paints
1) Primer: Perma-Crete Alkali Resistant Primer 4-603XI
2) First and Second Coats: Sun Proof Exterior House & Trim Semi-Gloss, 78-45 Series
c. Sherwin-Williams Company (The)
1) Primer: Loxon Concrete & Masonry Primer, LX02W0050
2) First and Second Coats: Pro Industrial Multi-surface Acrylic Semi-Gloss, B66 Series

6. Gloss Sheen:
a. Benjamin Moore & Co.
1) Primer: Benjamin Moore Acrylic Masonry Sealer 608
2) First and Second Coats: Ultra Spec Exterior Gloss N449
b. PPG Paints
1) Primer: Perma-Crete Alkali Resistant Primer 4-603XI
2) First and Second Coats: MANOR HALL® Interior/Exterior Latex Gloss, 52-110 Series
c. Sherwin-Williams Company (The)
1) Primer: Loxon Concrete & Masonry Primer, LX02W0050
2) First and Second Coats: Superpaint Exterior Latex Gloss, A84 Series

7. Clear Water Repellant
a. Benjamin Moore & Co.
1) Texcrete 194 Silicone Water Repellant

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b. PPG Paints
   1) First and Second Coats: PERMA-CRETE® Aqua-Pel™ Clear Siloxane 4-6100
c. Sherwin-Williams Company (The)
   1) First and Second Coats: S-W Loxon Siloxane Water Repellant, CF31T0007
d. Tex-Cote
   1) First and Second Coats: Rainstopper, 1750W Clear

8. Texture Coating System - Contractor shall have option approved by Architect:
   a. Benjamin Moore & Co.
      1) Texcrete Waterborne Acrylic Masonry Waterproofer 3196
   b. PPG Paints Spray-on 100% Acrylic Textured Masonry Coating
      1) Primer: Perma-Crete Alkali Resistant Primer 4-603XI
      2) Finish Coat: PERMA-CRETE® 100% Acrylic Texture Coatings, 4-50, 4-60, 4-70 Series
   c. Sherwin-Williams Company (The)- Spray-on Solvent Borne Textured Coating
      1) Primer: UltraCrete Solvent Borne Smooth, CF18 Series
      2) Finish Coat: UltraCrete Solvent Borne Textured, CF18 Series
      3) Minimum total dry film thickness of 10-16 mils for waterproofing system, Texture and color as selected by Architect
   d. Sherwin-Williams Company (The)- Spray-on 100% Acrylic Textured Masonry Coating
      1) Primer: Loxon® Block Surfacer, LX01 Series
      2) Finish Coat: UltraCrete Textured Masonry Topcoat, CF17 Series
      3) Minimum total dry film thickness of 10-16 mils for waterproofing system, Texture and color as selected by Architect
   e. Tex Cote By Textured Coating of America, inc
      1) Primer: TexCote concrete masonry primer, water-based
      2) Finish Coat: TexCote XL70W textured coating color and texture, dry film thickness 16 mils or for harder wearing coating; TexCote TuffGuard 99, or for extended warranty, two coats FadeBlock supercote heat reflecting color fast top coat
9. Alternate – Tilt-Up Precast and Cast in Place Concrete
   a. Sto Acrylic-based coating
      1) Primer: Stocoat, 80805 Sto Hot Primer (4-6 mil wet. 2 mil dry)
      2) First Coat: Stocoat, 80659 Texture Medium (5-7 mil wet, 3 mil dry)
      3) Second Coat: Stocoat: 216 Lotusan 6 mil wet, 3 mil dry)

B. Masonry (.CMU, Split-Face, Scored, Smooth, High-Density, Low- Density, Fluted)
   1. Satin Sheen
      a. Benjamin Moore & Co.
         1) Primer: Ultra Spec Masonry Interior/Exterior High-Build Block Filler 571
         2) First and Second Coats: Ultra Spec Exterior Satin N448
      b. PPG Paints
         1) Primer: Speedhide Int/Ext Masonry Hi Fill Latex Block Filler 6-15XI
         2) First and Second Coats: Sun Proof Exterior House & Trim Satin, 76-45 Series
      c. Sherwin-Williams Company (The)

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1) Primer: PrepRite® Block Filler, B25W25
2) First and Second Coats: Superpaint Exterior Latex Satin, A89 Series

d. STO Corp
1) Primer: StoPrime Block Surfacer HP
2) First and second coats: StoColor Acryl Plus

2. Semi-Gloss Sheen
a. Benjamin Moore & Co.
1) Primer: Ultra Spec Masonry Interior/Exterior High-Build Block Filler 571
2) First and Second Coats:Ultra Spec Exterior N449
b. PPG Paints
1) Primer: Speedhide Int/Ext Masonry Hi Fill Latex Block Filler 6-15XI
2) First and Second Coats: Sun Proof Exterior House & Trim Semi-Gloss, 78-45 Series
c. Sherwin-Williams Company (The)
1) Primer: PrepRite Blocker Filler, B25W25
2) First and Second Coat: Pro Industrial Multi-surface Acrylic Semi-Gloss, B66 Series

3. Gloss Sheen
a. Benjamin Moore & Co.
1) Primer: Ultra Spec Masonry Interior/Exterior High-Build Block Filler 571
2) First and Second Coats: Ultra Spec Exterior Gloss N449
b. PPG Paints
1) Primer: Speedhide Int/Ext Masonry Hi Fill Latex Block Filler 6-15XI
2) First and Second Coats: MANOR HALL® Interior/Exterior Latex Gloss, 52-110 Series
c. Sherwin-Williams Company (The)
1) Primer: PrepRite Blocker Filler, B25W25
2) First and Second Coats: Superpaint Exterior Latex Gloss, A84 Series

4. Clear Water Repellant
a. PPG Paints
1) Texcrete Silicone Water Repellant 194
b. Sherwin-Williams Company (The)
1) First and Second Coats: S-W Loxon Siloxane Water Repellent, CF31T0007
c. Tex-Cote
1) First and Second Coats: Rainstopper, 1750W Clear

5. Texture Coating System - Contractor shall have option approved by Architect:
a. PPG Paints Spray-on 100% Acrylic Textured Masonry Coating
1) Primer: Perma-Crete Alkali Resistant Primer 4-603XI
2) Finish Coat: PERMA-CRETE® 100% Acrylic Texture Coatings, 4-50, 4-60, 4-70 Series
b. Sherwin-Williams Company (The)- Spray-on Solvent Borne Textured Coating
1) Primer: UltraCrete Solvent Borne Smooth, CF18 Series
2) Finish Coat: UltraCrete Solvent Borne Textured, CF18 Series

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3) Minimum total dry film thickness of 10-16 mils for waterproofing system, Texture and color as selected by Architect

c. Sherwin-Williams Company (The)- Spray-on 100% Acrylic Textured Masonry Coating
   1) Primer: Loxon® Block Surfacer, LX01w0200 Series
   2) Finish Coat: UltraCrete Textured Masonry Topcoat, CF17 Series
   3) Minimum total dry film thickness of 10-16 mils for waterproofing system, Texture and color as selected by Architect

d. Tex Cote By Textured Coating of America, inc
   1) Primer: TEX·COTE® COOLWALL® Smooth Classic Primer or TEX·COTE® COOLWALL® Textured Primer
   2) Finish Coat: TEX·COTE® COOLWALL

C. Metal – (Aluminum, Galvanized)
1. Semi-Gloss Finish
   a. Benjamin Moore & Co.
      1) Primer (Unpainted Surfaces): Corotech Acrylic Metal Primer V110
      2) First and Second Coats: Ultra Spec HP DTM Acrylic Enamel HP29
   b. PPG Paints
      1) Primer (Unpainted Surfaces): Pitt-Tech Plus Int/Ext DTM Industrial Primer, 4020 Series
      2) First and Second Coats: Pitt Tech Plus 4216 HP Semi-Gloss DTM Enamel, 4216 Series
   c. Sherwin-Williams Company (The)
      1) Primer: Pro Industrial Pro-Cryl® Universal Primer, B66-310 Series
      2) First and Second Coats: Pro Industrial Semi-Gloss Acrylic B66W651 Series.
2. Gloss Finish
   a. Benjamin Moore & Co.
      1) Primer (Unpainted Surfaces): Corotech Acrylic Metal Primer V110
      2) First and Second Coats: Ultra Spec HP DTM Acrylic Enamel HP28
   b. PPG Paints
      1) Primer (Unpainted Surfaces): Pitt-Tech Plus Int/Ext DTM Industrial Primer, 4020 Series
      2) First and Second Coats: Pitt Tech Plus Gloss DTM Enamel, 90-1310 Series
   c. Sherwin-Williams Company (The)
      1) Primer: Pro Industrial Pro-Cryl® Universal Primer, B66-1310 Series
      2) First and Second Coats: Pro Industrial Gloss Acrylic B66W611 Series.

D. METAL - (Misc Iron, Ornamental Iron, Structural Iron, Ferrous Metal)
1. Semi-Gloss Finish
   a. Benjamin Moore & Co.
      1) Primer (Unpainted Surfaces): Corotech Acrylic Metal Primer V110
      2) First and Second Coats: Ultra Spec HP DTM Acrylic Enamel HP29
   b. PPG Paints

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1) Primer (Unpainted Surfaces): Pitt-Tech Plus Int/Ext DTM Industrial Primer, 4020 Series
2) First and Second Coats: Pitt Tech Plus 4216 HP Semi-Gloss DTM Enamel, 4216 Series

c. Sherwin-Williams Company (The)
1) Primer: Pro Industrial Pro-Cryl® Universal Primer, B66-1310 Series
2) First and Second Coats: Pro Industrial Semi-Gloss Acrylic B66W651 Series.

2. Gloss Finish
a. Benjamin Moore & Co.
1) Primer (Unpainted Surfaces): Corotech Acrylic Metal Primer V110
2) First and Second Coats: Ultra Spec HP DTM Acrylic Enamel HP28

b. PPG Paints
1) Primer (Unpainted Surfaces): Pitt-Tech Plus Int/Ext DTM Industrial Primer, 4020 Series
2) First and Second Coats: Pitt Tech Plus Gloss DTM Enamel, 90-1310 Series

c. Sherwin-Williams Company (The)
1) Primer: Pro Industrial Pro-Cryl® Universal Primer, B66-1310 Series
2) First and Second Coats: Pro Industrial Gloss Acrylic B66W611 Series.

E. METAL - (Entry Canopy Exposed Galvanized Steel)
1. High Performance Coating, Gloss Finish
a. Sherwin-Williams Company (The)
1) Primer: Macropoxy 646 Fast Cure Epoxy B58 Series
2) First and Second Coats: Sher-loxane 800.

b. Approved Equal from listed Manufacturers

F. Wood (Siding, Trim, Shutters, Hardboard-Bare/Primed)
1. Semi-Gloss Finish
a. Benjamin Moore & Co.
1) Primer: Aqua Lock Plus 100% Acrylic Primer Sealer AQ-0400
2) First and Second Coats: Ultra Spec Exterior N449

b. PPG Paints
1) Primer: PPG Paints: SEAL GRIP Interior/Exterior 100% Acrylic Universal Primer/Sealer 17-921XI
2) First and Second Coats: Sun Proof Exterior House & Trim Semi-Gloss, 78-45 Series

c. Sherwin-Williams Company (The)
1) Primer: A-100 Exterior Latex Wood Primer, B42W8041 Series
2) First and Second Coats: Pro Industrial Multi-surface Acrylic Semi-Gloss, B66 Series

2. Gloss Finish
a. Benjamin Moore & Co.
1) Primer: Aqua Lock Plus 100% Acrylic Primer Sealer AQ-0400
2) First and Second Coats: Ultra Spec Exterior Gloss N449

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b. PPG Paints
1) Primer: PPG Paints: SEAL GRIP Interior/Exterior 100% Acrylic Universal Primer/Sealer, 17-921XI
2) First and Second Coats: MANOR HALL® Interior/Exterior Latex Gloss, 52-110 Series

c. Sherwin-Williams Company (The)
1) Primer: A-100 Exterior Latex Wood Primer, B42W8041 Series
2) First and Second Coats: Superpaint Exterior Latex Gloss, A84 Series

G. Architectural PVC, Plastic, Fiberglass
1. Semi-Gloss Finish
a. Benjamin Moore & Co.
1) Primer: Stix Waterborne Bonding Primer SXA-110
2) First and Second Coats: Ultra Spec Exterior N449

b. PPG Paints
1) Primer: PPG Paints: SEAL GRIP Interior/Exterior 100% Acrylic Universal Primer/Sealer, 17-921XI
2) First and Second Coats: Sun Proof Exterior House & Trim Semi-Gloss, 78-45 Series

c. Sherwin-Williams Company (The)
1) Primer: PreRite ProBlock Latex Primer, B51 Series
2) First and Second Coats: Pro Industrial Multi-surface Acrylic Semi-Gloss, B66 Series

2. Gloss Finish
a. Benjamin Moore & Co.
1) Primer: Stix Waterborne Bonding Primer SXA-110
2) First and Second Coats: Ultra Spec Exterior Gloss N449

b. PPG Paints
1) Primer: PPG Paints: SEAL GRIP Interior/Exterior 100% Acrylic Universal Primer/Sealer, 17-921XI
2) First and Second Coats: MANOR HALL® Interior/Exterior Latex Gloss, 52-110 Series

c. Sherwin-Williams Company (The)
1) Primer: PrepRite ProBlock Latex Primer, B51 Series
2) First and Second Coats: Superpaint Exterior Latex Gloss, A84 Series

H. Drywall (Gypsum Board, Exterior Drywall)
1. Semi-Gloss Finish
a. Benjamin Moore & Co.
1) Primer: Ultra Spec Masonry Int/Ext Acrylic High Build Masonry Primer 609
2) First and Second Coats: Ultra Spec Exterior N449

b. PPG Paints
1) Primer: Perma-Crete Alkali Resistant Primer, 4-603XI
2) First and Second Coats: Sun Proof Exterior House & Trim Semi-Gloss, 78-45 Series

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c. Sherwin-Williams Company (The)
1) Primer: A-100 Exterior Latex Wood Primer, B42W8041 Series
2) First and Second Coats: Pro Industrial Multi-surface Acrylic Semi-Gloss, B66 Series

2. Gloss Finish
a. Benjamin Moore & Co.
1) Primer: Ultra Spec Masonry Int/Ext Acrylic High Build Masonry Primer 609
2) First and Second Coats: Ultra Spec Exterior Gloss N449
b. PPG Paints
1) Primer: Perma-Crete Alkali Resistant Primer, 4-603XI
2) First and Second Coats: MANOR HALL® Interior/Exterior Latex Gloss, 52-110 Series
c. Sherwin-Williams Company (The)
1) Primer: A-100 Exterior Latex Wood Primer, B42W8041 Series
2) First and Second Coats: Superpaint Exterior Latex Gloss, A84 Series

I. Synthetic Stucco
1. Flat Finish
a. Benjamin Moore & Co.
1) Primer: Ultra Spec Masonry Int/Ext 100% Acrylic Sealer 608
2) First and Second Coats: Ultra Spec Exterior Flat N447
b. PPG Paints
1) Primer: PPG Paints: SEAL GRIP Interior/Exterior 100% Acrylic Universal Primer/Sealer, 17-921XI
2) First and Second Coats: Sun Proof Exterior House & Trim Flat Latex, 72-45 Series
c. Sherwin-Williams Company (The)
1) Primer: S-W Superpaint Exterior Latex Flat, A80 Series
2) First and Second Coats: Superpaint Exterior Latex Flat, A80 Series
d. STO Corp
1) Primer: STO Prime or STO Hot Primer
2) First and second coats: StoColor Acryl Flat

2. Semi-Gloss Finish
a. Benjamin Moore & Co.
1) Primer: Ultra Spec Masonry Int/Ext 100% Acrylic Sealer 608
2) First and Second Coats: Ultra Spec Exterior N449
b. PPG Paints
1) Primer: PPG Paints: SEAL GRIP Interior/Exterior 100% Acrylic Universal Primer/Sealer, 17-921XI
2) First and Second Coats: Sun Proof Exterior House & Trim Semi-Gloss, 78-45 Series
c. Sherwin-Williams Company (The)
1) Primer: A-100 Exterior Latex Wood Primer, B42W8041 Series

2) First and Second Coats: Pro Industrial Multi-surface Acrylic Semi-Gloss, B66 Series

d. STO Corp

1) Primer: STO Prime or STO Hot Prime

2) First and second coats: StoColor Acryl Plus

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3. Gloss Finish

a. Benjamin Moore & Co.

1) Primer: Ultra Spec Masonry Int/Ext 100% Acrylic Sealer 608

2) First and Second Coats: Ultra Spec Exterior Gloss N449

b. PPG Paints

1) Primer: PPG Paints: SEAL GRIP Interior/Exterior 100% Acrylic Universal Primer/Sealer, 17-921XI

2) First and Second Coats: MANOR HALL® Interior/Exterior Latex Gloss, 52-110 Series

c. Sherwin-Williams Company (The)

1) Primer: A-100 Exterior Latex Wood Primer, B42W8041 Series

2) First and Second Coats: Superpaint Exterior Latex Gloss, A84 Series

2.3 MATERIALS – GENERAL REQUIREMENTS

A. Paints and Coatings - General

1. Unless otherwise indicated, provide factory-mixed coatings.
2. When required, mix coatings to correct consistency in accordance with manufacturer's instructions before application.
3. Do not reduce, thin, or dilute coatings or add materials to coatings unless approved in manufacturer's product instructions.
4. Confirm VOC’s by using the products SDS sheets. Take appropriate precautions.

B. Primers

1. Where the manufacturer offers options on primers for a particular substrate, use primer categorized as “best” by the manufacturer.

2.4 ACCESSORIES

A. Coating application accessories:

1. Provide all primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials required, per manufacturer’s specifications.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify site conditions under provisions of Section 01 31 00.

B. Do not begin application of coatings until substrates have been properly prepared; notify Owner’s Representative of unsatisfactory conditions before proceeding.

C. If substrate preparation is the responsibility of another installer, notify Owner’s Representative of unsatisfactory preparation before proceeding.

D. Proceed with work only after conditions are corrected and approved by all parties, otherwise application of coatings will be considered as an acceptance of surface conditions.

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E. Test shop applied primer for compatibility with subsequent cover materials.

F. Measure moisture content of surfaces using an electronic moisture meter, DO NOT apply finishes unless moisture content of surfaces are below the following maximums:
   1. Plaster and Gypsum Wallboard: 12%
   2. Masonry, Concrete, and Concrete Unit Masonry: 12%
   3. Interior Wood: 15%, measured in accordance with ASTM D2016
   4. Concrete Floors: 8%

3.2 SURFACE PREPARATION

A. The surface shall be dry and in sound condition.
   1. Remove all oil, dust, dirt, loose rust, peeling paint, or other contamination to ensure good adhesion.

B. Remove or mask electrical plates, hardware, light fixture trim, escutcheons, and fittings prior to preparing surfaces or finishing.

C. Correct defects and clean surfaces that affect work of this section.
   1. Remove existing coatings that exhibit loose surface defects.

D. Seal with shellac any marks, which may bleed through surface finishes.

E. Impervious Surfaces:
   1. Remove mildew by scrubbing with solution of tri-sodium phosphate and bleach.
   2. Rinse with clean water and allow surface to dry.

F. Aluminum Surfaces Scheduled for Paint Finish:
   1. Remove all oil, grease, dirt, oxide, and other foreign material by cleaning per SSPC-SP 1 Solvent Cleaning.

G. Block/Unit Masonry (Cinder and Concrete)
   1. Remove all loose mortar and foreign material.
   2. Surface must be free of laitance, concrete dust, dirt, form release agents, moisture curing membranes, loose cement, and hardeners.
   3. Let concrete and mortar cure at least 30 days at 75°F unless the manufactures products are designed for application prior to the 30-day period.
   4. The pH of the surface and moisture content must be in accordance with the paint manufacturer's recommendations prior to painting.

H. Concrete:
   1. Remove contamination by washing with an appropriate cleaner, rinse thoroughly.
   2. The pH of the surface and moisture content shall be in accordance with the paint manufacturer's recommendations prior to painting.
   3. Allow the surface to thoroughly dry.
   4. Fill bug holes, air pockets, and other voids under another section with a cement-patching compound of sufficient cohesive strength to support the specified coating system.

I. Stucco and Cement Composition Siding/Panels:
   1. Remove all surface contamination by washing with an appropriate cleaner, rinse thoroughly.
      a. Allow the surface to dry thoroughly.

b. The pH of the surface and moisture content should be in accordance with the paint manufacturer's recommendations prior to painting.

J. Copper Surfaces Scheduled for a Paint Finish:
1. Remove contamination by steam, high-pressure water, or solvent washing.
2. Apply vinyl etch primer immediately following cleaning.

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K. Copper Surfaces Scheduled for a Natural Oxidized Finish:
1. Remove contamination by applying oxidizing solution of copper acetate and ammonium chloride in acetic acid.
2. Rub on repeatedly for required effect.
3. Once attained, rinse surfaces with clear water and allow to dry.

L. Drywall – Exterior:
1. Shall be clean, dry and all dust removed prior to painting.
2. All nail heads must be set and spackled.
3. Tape all joints and cover with a joint compound.
4. Spackled nail heads and tape joints shall be sanded smooth.

M. Galvanized Metal Surfaces:
1. Clean per SSPC-SP 1 using detergent and water or a degreasing cleaner to remove greases and oils.
2. Apply a test area, priming as required.
3. Allow the coating to cure in accordance with the manufacturer's recommendation before testing.
4. Perform adhesion tests in accordance with ASTM D3359 Adhesion by Tape Test.
5. If adhesion is poor, then notify Owner's representative that additional surface preparation under another section is necessary to remove pre-treatments or contaminants that interfere with adhesion of the coating.

N. Insulated Coverings: Remove dirt, grease, and oil from canvas and cotton.

O. Plaster Surfaces:
1. Shall allow to thoroughly dry for at least 30 days before painting, unless the manufacturer's products are designed for application prior to the 30-day period.
a. Bare plaster must be cured and hard prior to painting.
b. Correct any soft, porous, or powdery plaster per requirements under another section of the specifications.

P. Steel: Structural, Plate, etc:
1. Check other sections for additional surface preparation and shop priming of bare steel surfaces.
2. Surface preparation shall include appropriate SSPC recommended methods.
3. Shop primer shall be compatible with the field-applied coatings.
4. Surfaces shall be dry and clean prior to the application of field-applied coatings.
5. Remove all contaminants in accordance with SSPC-SP 1 Solvent Cleaning.

Q. Wood:
1. Shall be clean and dry, then prime and paint as soon as possible.

2. Scrape, sand, and spot prime knots and pitch streaks before a full priming coat is applied.
3. Patch all nail holes and imperfections with a wood filler or putty and sand smooth after application of primer.

R. Wood and Metal Doors Scheduled for Painting: Seal top and bottom edges with primer.

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3.3 APPLICATION/INSTALLATION

A. Mix, thin, and apply all coatings and products in accordance with manufacturer's instructions.

B. Do not apply coatings to wet or damp surfaces.
1. Wait at least 30 days before applying to new concrete or masonry, or follow manufacturer’s procedures to apply appropriate coatings prior to 30 days.
2. Test new concrete for moisture content.

C. Apply coatings using methods recommended by manufacturer.

D. Uniformly apply coatings without runs, drips, or sags, without brush marks, and with consistent sheen to achieve a properly painted surface in accordance with PDCA Standard P1-04.

E. Apply coatings at spreading rate required to achieve the manufacturer’s recommended dry film thickness.

F. The coated surface shall be inspected and accepted by the Owner’s Representative.

3.4 FINISHING MECHANICAL AND ELECTRICAL EQUIPMENT

A. Refer to Division 21, 22, 23, 26, 27, & 28 for schedule of color-coding and identification banding of equipment, ductwork, piping, and conduit.

B. Paint shop primed equipment.

C. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.

D. Prime and paint insulated and exposed pipes, conduit, boxes, insulated and exposed ducts, hangers, brackets, collars, and supports, in finished areas, except where items are pre-finished.

E. Paint interior surfaces of air ducts, and convector and baseboard heating cabinets that are visible through grilles and louvers with one coat of flat black paint, to visible surfaces.
1. Paint dampers exposed behind louvers and grilles to match face panels.

F. Paint exposed conduit and electrical equipment occurring in finished areas.

G. Paint both sides and edges of plywood backboards for electrical and telephone equipment before installing equipment.

H. Color code equipment, piping, conduit, and exposed ductwork in accordance with requirements indicated.
1. Color band and identify with flow arrows, names, and numbering.

I. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.5 TOUCH UP AND DAMAGE REPAIR

A. Contractor shall repair all deficiencies in coating application in accordance with PDCA Standard P1-04.

B. Inform Owner's representative of all damage to properly painted surfaces and receive authorization prior to performing damage repair.

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SECTION 09 91 23
INTERIOR PAINTING

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PART 1 GENERAL

1.1 SECTION INCLUDES

A. Interior paint and coating systems

1.2 RELATED SECTIONS

A. See related sections of the specifications for surface preparation, primers, and finishes provided by others.

1.3 REFERENCES

A. ASTM D16 - Standard Terminology for Paint, Related Coating, Materials, and Applications

B. ASTM D3359 – Standard Test Methods for Measuring Adhesion by Tape Test

C. ASTM D3960 – Standard Practice for Determining Volatile Organic Compound (VOC) Content of Paints and Related Coatings

D. ASTM D4442– Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood Base Materials

E. EPA – Method 24 - Surface Coatings

F. GS-11 Green Seal – Standard for Paints and Coatings

G. LEED for Schools 2009 latest edition by USGBC

H. NACE International (National Association of Corrosion Engineers) - Industrial Maintenance Painting

I. NPCA (National Paint and Coatings Association) - Guide to U.S. Government Paint Specifications

J. Paint - Certified Product List - Florida Department of Agriculture and Consumer Services

K. PDCA (Painting and Decorating Contractors of America) - Architectural Painting Specifications Manual

L. PDCA Standard P1-04 Touchup Painting and Damage Repair; Financial Responsibility

M. PDCA Standard P5-04 Benchmark Sample Procedures for Paint and other Decorative Coating System

N. South Coast Air Quality Management District (SCAQMD) Rule 1113, Architectural Coating

O. SSPC (Steel Structures Painting Council) - Steel Structures Painting Manual

P. SSPC-SP 1 – Solvent Cleaning

1.4 DEFINITIONS

A. Conform to ASTM D16 for interpretation of terms used in this section.

1.5 SUBMITTALS

A. Submit under provisions of Section 01 33 00.

B. Product Data: Provide the manufacturer’s data sheets and Safety Data Sheets on each paint and coating product and at a minimum shall include:

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1. Product characteristics
2. Surface preparation instructions and recommendations
3. Primer requirements and finish specifications
4. Storage and handling requirements
5. Application methods
6. Cautions and VOC levels

C. Selection Samples:
1. Submit a complete set of color chips representing the full range of manufacturer's color samples available.
2. Submit two 9" x 9" samples illustrating selected colors and textures for each type.

1.6 QUALITY ASSURANCE

A. Pre-Application meeting:
1. Prior to contractor starting to apply any material covered in this section, there shall be a meeting with the following representatives invited Facility Services, Architect, Contractor, Subcontractor, and Material Supplier.
2. Meeting shall discuss mockups, surface condition, surface preparation, material application, and inspection procedures.
a. Prepare all mockups in accordance with PDCA P5-04.

B. The Contractor shall request the following in progress field inspections and the Owner's representative shall approve each inspection prior to proceeding with the next step.
1. Following surface preparation and prior to priming
2. Following priming and prior to applying finish coats
3. Following application of finish coats
4. All inspections shall follow FS normal procedure for verifying surface conditions and materials applied.

C. Determine VOC (Volatile Organic Compound) content of solvent borne and water borne paints and related coating in accordance with EPA Method 24 or ASTM D3960.
1. Interior architectural paints shall comply with Green Seal GS-11.
2. Anti-corrosive paints shall comply with Green Seal GS-11.
3. Clear wood finishes shall comply with SCAQMD #1113.

1.7 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing the products specified in this section with minimum 5-years documented experience.

B. Applicator: Company specializing in performing the work of this section with minimum 5-years documented experience, certified by the manufacture.

1.8 REGULATORY REQUIREMENTS

A. Conform to applicable code for flame and smoke rating requirements for finishes.

B. Comply with applicable environmental health and safety regulations

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1.9 FIELD SAMPLES

A. Provide interior field sample at an outside corner condition with finish extending minimum 10' both directions and selected height; include doorjamb, and other interior finished.

B. Locate where directed by Architect and Owner.

C. Accepted sample may remain as part of the work, upon approval of the Architect.

1.10 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, protect, and handle products to site under provisions of Section 01 60 00, follow manufacturer's requirements.

B. Deliver products to site in manufacturer's unopened containers with the following labeling and information:
   1. Product name and type (description)
   2. Application & use instructions
   3. Surface preparation instructions
   4. VOC content
   5. Environmental issues; i.e. cleanup requirements, disposal requirements, etc
   6. Batch date
   7. Color number and name

C. Storage:
   1. Store paint materials in a properly ventilated area at the temperature range r required by the manufacturer'.
   2. Store and dispose of hazardous and regulated materials/wastes in accordance with local, state, and federal requirements.

1.11 PROJECT CONDITIONS

A. Do not apply materials when surface and ambient temperatures are below 40°F, or below the manufacturer's requirements.

B. Do no interior work on unprotected surfaces if it is raining or moisture from any source is present or expected before finishes can dry or attain proper cure.
   1. Allow surfaces to dry and attain required temperatures and conditions before proceeding or continuing previously started work.

C. Follow manufacturer's directions for extremes and dew point requirements.
   1. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results.
   2. Do not apply coatings under environmental conditions outside manufacturer's absolute limits.

D. Provide lighting level of 80 foot-candles measured mid-height at substrate surface.

E. Dispose of waste in accordance with applicable regulations see 1.10 C. 2.

F. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work in accordance with paint manufacturer's written requirements. Beginning new work upon the existing substrate will be understood to indicate that the Contractor has accepted the existing conditions as compliant with the manufacturer's requirements.

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PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturers
   1. The painting schedule is based on products manufactured by the Sherwin-Williams Company.
   2. The owner's representative will consider equal products by other manufacturers for approval in accordance with paragraph 1.45

B. Paints
   1. Benjamin Moore & Co.
   2. PPG Paints, Inc.
   3. Sherwin-Williams Company
   4. STO Corp

C. Owner will consider requests for substitutions in accordance with provisions of the specifications.

2.2 INTERIOR PAINTING SCHEDULE

A. Concrete (Walls, Ceilings, Poured, Precast, Unglazed Brick, Cement Board, Tilt-Up, and Cast-In Place)
   1. Flat Sheen:
      a. Benjamin Moore & Co.
         1) Primer: Benjamin Moore's Acrylic Masonry Sealer 608
         2) First and Second Coats: Eco Spec Flat N373
      b. PPG Paints
         1) Primer: Perma-Crete Alkali Resistant Primer, 4-603XI
         2) First and Second Coats: Pure Performance Interior Flat 9-100 Series
      c. Sherwin-Williams Company (The)
         1) Primer: Loxon® Masonry Primer, LX02W0050
         2) First and Second Coats: Harmony Low Odor Interior Latex Flat, B5 Series
   2. Semi-Gloss Finish
      a. Benjamin Moore & Co.
         1) Primer: Moore's Acrylic Masonry Sealer 608
         2) First and Second Coats: Ultra Spec 500 T546
      b. PPG Paints
         1) Primer: Perma-Crete Alkali Resistant Primer, 4-603XI
         2) First and Second Coats: Pitt Tech Plus 4216 HP Semi-Gloss DTM Enamel, 4216 Series
      c. Sherwin-Williams Company (The)
         1) Primer: Loxon® Masonry Primer, LX02W0050
         2) First and Second Coats: Pro Industrial Semi-Gloss Acrylic B66W651 Series
   3. Gloss Finish
      a. Benjamin Moore & Co.
         1) Primer: Moore's Acrylic Masonry Sealer 608

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2) First and Second Coats: Ultra Spec 500 T546

b. PPG Paints
1) Primer: Perma-Crete Alkali Resistant Primer, 4-603XI
2) First and Second Coats: Pitt Tech Plus Gloss DTM Enamel, 90-1310 Series

c. Sherwin-Williams Company (The)
1) Primer: Loxon® Masonry Primer, LX02W0050
2) Pro Industrial Gloss Acrylic B66W611 Series.

B. Concrete (Walls, Ceilings, Poured, Precast, Unglazed Brick, Cement Board, Tilt-Up, and Cast-In Place) Water-Based Catalyzed Epoxy finish
1. Semi-Gloss Finish
a. Benjamin Moore & Co.
1) First and Second Coats: Corotech Command V392
b. PPG Paints
1) First and Second Coats: Pitt-Glaze WB Water-Borne Acrylic Epoxy 16-551/16-599
c. Sherwin-Williams Company (The)
1) Primer: Water-based Catalyzed Epoxy, B70W211/B60V25
2. Gloss Finish
a. Benjamin Moore & Co.
1) First and Second Coats: Corotech Command V390
b. PPG Paints
1) First and Second Coats: Pitt-Glaze WB Water-Borne Acrylic Epoxy 16-551/16-598
c. Sherwin-Williams Company (The)
1) First and Second Coats: Water-based Catalyzed Epoxy, B70W211/B60V15

C. Concrete Floor- Painted (with anti-slip additive)
1. Benjamin Moore & Co.
a. First and Second Coats: Inls-X Sure Step Acrylic Anti-Lip Coating SU-0XXX
2. PPG Paints
a. First and Second Coats: Floor, Porch & Deck Satin Latex, 3-510 Series
3. Sherwin-Williams Company (The)
a. First and Second Coats:: Tread-Plex Primer B90 Series

D. Concrete Floor- Clear Sealer
1. Benjamin Moore & Co.
a. First and Second Coats: Corotech Moisture Tolerant Quick Set Epoxy Sealer V156
2. PPG Paints
a. First and Second Coats: Perma-Crete Plex-Seal™ WB Clear Sealer 4-6200
3. Sherwin-Williams Company (The)
a. First and Second Coats:: H&C Concrete Sealer Wet Look Water-based

E. Masonry (Ceiling)
1. Low Sheen
a. Benjamin Moore & Co.

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1) First and Second Coats: Benjamin Moore Latex Dry Fall 395

b. PPG Paints
1) First and Second Coats: Speedhide Super Tech WB Dry-Fog 6-724XI

c. Sherwin-Williams Company (The)
1) First and Second Coats:: Water-based Acrylic Dry-Fall, B42W2

F. Masonry (CMU, Split-Face, Scored, Smooth, High-Density, Low- Density, Fluted)
1. Eggshell Finish
a. Benjamin Moore & Co.
1) Primer: Ultra Spec Masonry High Build Block Filler 571
2) First and Second Coats: Ultra Spec 500 Eggshell 538

b. PPG Paints
1) Primer: Speedhide Latex Block Filler 6-7
2) First and Second Coats: Pure Performance Interior Eggshell 9-300XI Series

c. Sherwin-Williams Company (The)
1) Primer: PrepRite® Block Filler, B25W25
2) First and Second Coats: Harmony Low Odor Interior Latex Eg-Shel, B9 Series

d. STO Corp
1) Primer: STOPrime Block Surfacer HP
2) First and second coats: StoColor Acryl Plus

2. Semi-Gloss Finish
a. Benjamin Moore & Co.
1) Primer: High-Ultra Spec Masonry High Build Block Filler 571
2) First and Second Coats: Ultra Spec 500 Semi-Gloss T546

b. PPG Paints
1) Primer: PermaCrete Concrete Block & Masonry Surfacer/Filler 4-100XI
2) First and Second Coats: Pitt Tech Plus 4216 HP Semi-Gloss DTM Enamel, 4216 Series

c. Sherwin-Williams Company (The)
1) Primer: Loxon® Block Surfacer, LX01 Series
2) First and Second Coats: Pro Industrial Semi-Gloss Acrylic, B66-650 Series.

3. Gloss Finish
a. Benjamin Moore & Co.
1) Primer: Ultra Spec Masonry High Build Block Filler 571
2) First and Second Coats: Ultra Spec 500 T546

b. PPG Paints
1) Primer: PermaCrete Concrete Block & Masonry Surfacer/Filler 4-100XI
2) First and Second Coats: Pitt Tech Plus Gloss DTM Enamel, 90-1310 Series

c. Sherwin-Williams Company (The)
1) Primer: Loxon® Block Surfacer, LX01 Series
2) First and Second Coats: Pro Industrial Gloss Acrylic, B66-600 Series

G. Masonry (CMU, Split-Face, Scored, Smooth, High-Density, Low- Density, Fluted)- Water-Based Epoxy System

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1. Semi-Gloss Finish
   a. Benjamin Moore & Co.
      1) Primer: Ultra Spec Masonry High Build Block Filler 571
      2) First and Second Coats: Corotech Command V392
   b. PPG Paints
      1) Primer: PermaCrete Concrete Block & Masonry Surfacer/Filler 4-100XI
      2) First and Second Coats: Pitt-Glaze WB Water-Borne Acrylic Epoxy 16-551/16-599
   c. Sherwin-Williams Company (The)
      1) Primer: Loxon® Block Surfacer, LX01 Series
      2) First and Second Coats: Water-based Catalyzed Epoxy, B70W211/B60V25
2. Gloss Finish
   a. Benjamin Moore & Co.
      1) Primer: Ultra Spec Masonry High Build Block Filler 571
      2) First and Second Coats: Corotech Command V390
   b. PPG Paints
      1) Primer: Ultra Spec Masonry High Build Block Filler 571
      2) First and Second Coats: Pitt-Glaze WB Water-Borne Acrylic Epoxy 16-551/16-598
   c. Sherwin-Williams Company (The)
      1) Primer: Loxon® Block Surfacer, LX01 Series
      2) First and Second Coats: Water-based Catalyzed Epoxy, B70W211/B60V15

H. Metal – (Aluminum, Galvanized)
1. Semi-Gloss Finish
   a. Benjamin Moore & Co.
      1) Primer (Unpainted Surfaces): Corotech Acrylic Metal Primer V110
      2) First and Second Coats: Ultra Spec HP DTM Acrylic Semi-Gloss HP 29
   b. PPG Paints
      1) Primer: Pitt-Tech Plus Int/Ext DTM Industrial Primer, 4020 Series
      2) First and Second Coats: Pitt Tech Plus 4216 HP Semi-Gloss DTM Enamel, 4216 Series
   c. Sherwin-Williams Company (The)
      1) Primer: Pro Industrial Pro-Cryl® Universal Primer, B66-1310 Series
      2) First and Second Coats: Pro Industrial Semi-Gloss Acrylic B66W651 Series
2. Gloss Finish
   a. Benjamin Moore & Co.
      1) Primer: Corotech Acrylic Metal Primer V110
      2) First and Second Coats: Ultra Spec HP DTM Acrylic Gloss, HP28
   b. PPG Paints
      1) Primer: Pitt-Tech Plus Int/Ext DTM Industrial Primer, 4020 Series
      2) First and Second Coats: Pitt Tech Plus Gloss DTM Enamel, 90-1310 Series
   c. Sherwin-Williams Company (The)

1) Primer: Pro Industrial Pro-Cryl® Universal Primer, B66-1310 Series
2) First and Second Coats: Pro Industrial Gloss Acrylic B66W611 Series.

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I. Metal – (Aluminum, Galvanized)- Epoxy System
   1. Semi-Gloss Finish
      a. Benjamin Moore & Co.
         1) Primer (Unpainted Surfaces): Corotech Acrylic Metal Primer V110
         2) First and Second Coats: Corotech Command V392
      b. PPG Paints
         1) Primer: Pitt-Tech Int/Ext DTM Industrial Primer, 90-712 Series
         2) First and Second Coats: Pitt-Glaze WB Water-Borne Acrylic Epoxy 16-551/16-599
      c. Sherwin-Williams Company (The)
         1) Primer: Pro Industrial Pro-Cryl® Universal Primer, B66-1310 Series
         2) First and Second Coats: Water-based Catalyzed Epoxy, B70W211/B60V25
   2. Gloss Finish
      a. Benjamin Moore & Co.
         1) Primer (Unpainted Surfaces): Corotech Acrylic Metal Primer V110
         2) First and Second Coats: Corotech Command V390
      b. PPG Paints
         1) Primer: Pitt-Tech Int/Ext DTM Industrial Primer, 90-712 Series
         2) First and Second Coats: Pitt-Glaze WB Water-Borne Acrylic Epoxy 16-551/16-598
      c. Sherwin-Williams Company (The)
         1) Primer: Pro Industrial Pro-Cryl® Universal Primer, B66-1310 Series
         2) First and Second Coats: Water-based Catalyzed Epoxy, B70W211/B60V15

J. Metal – (Galvanized; Ceiling, Ductwork)
   1. Low Sheen
      a. Benjamin Moore & Co.
         1) Benjamin Moore Latex Dry Fall Flat 395
      b. PPG Paints
         1) Speedhide Super Tech WB Dry-Fog 6-724XI
      c. Sherwin-Williams Company (The)
         1) First and Second Coats: Water-based Acrylic Dry-Fall, B42W181

K. METAL - (Structural Steel Columns, Joists, Trusses, Beams, Miscellaneous & Ornamental Iron, Structural Iron, Ferrous Metal)
   1. Eggshell Finish
      a. Benjamin Moore & Co.
         1) Primer: Corotech Acrylic Metal Primer V110
         2) First and Second Coats: Ultra Spec HP DTM Acrylic Low Lustre HP25
      b. PPG Paints
         1) Primer: Pitt-Tech Plus Int/Ext DTM Industrial Primer, 4020 Series
         2) First and Second Coats: Speedhide Interior Eggshell Latex, 6-411 Series

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c. Sherwin-Williams Company (The)
1) Primer: Pro Industrial Pro-Cryl® Universal Primer, B66-310 Series
2) First and Second Coats: ProMar 200 Zero Eg-Shel, B20 Series

2. Semi-Gloss Finish
a. Benjamin Moore & Co.
1) Primer: Corotech Acrylic Metal Primer V110
2) First and Second Coats: Ultra Spec HP DTM Acrylic Semi-Gloss HP29
b. PPG Paints
1) Primer: Pitt-Tech Plus Int/Ext DTM Industrial Primer, 4020 Series
2) First and Second Coats: Pitt Tech Plus 4216 HP Semi-Gloss DTM Enamel, 4216 Series
c. Sherwin-Williams Company (The)
1) Primer: Pro Industrial Pro-Cryl® Universal Primer, B66-1310 Series
2) First and Second Coats: Pro Industrial Semi-Gloss Acrylic B66W651 Series.

3. Gloss Finish
a. Benjamin Moore & Co.
1) Primer: Corotech Acrylic Metal Primer V110
2) First and Second Coats: Ultra Spec HP DTM Acrylic Gloss HP28
b. PPG Paints
1) Primer: Pitt-Tech Plus Int/Ext DTM Industrial Primer, 4020 Series
2) First and Second Coats: Pitt Tech Plus Gloss DTM Enamel, 90-1310 Series
c. Sherwin-Williams Company (The)
1) Primer: Pro Industrial Pro-Cryl® Universal Primer, B66-310 Series
2) First and Second Coats: Pro Industrial Gloss Acrylic B66W611 Series.

L. METAL - (Structural Steel Columns, Joists, Trusses, Beams, Miscellaneous & Ornamental Iron, Structural Iron, Ferrous Metal)- Epoxy System
1. Gloss Finish
a. Benjamin Moore & Co.
1) Primer: Corotech Acrylic Metal Primer V110
2) First and Second Coats: Corotech Command V390
b. PPG Paints
1) Primer: Pitt-Tech Int/Ext DTM Industrial Primer, 90-712 Series
2) First and Second Coats: Pitt-Glaze WB Water-Borne Acrylic Epoxy 16-551/16-598
c. Sherwin-Williams Company (The)
1) Primer: Pro Industrial Pro-Cryl® Universal Primer, B66-1310 Series
2) First and Second Coats: Water-based Catalyzed Epoxy, B70W211/B60V15

M. Dryfall Waterborne System
1. Low Sheen
a. Benjamin Moore & Co.
1) Benjamin Moore Latex Dry Fall Flat 395
b. PPG Paints

1) Speedhide Super Tech WB Dry-Fog 6-724XI

c. Sherwin-Williams Company (The)

1) First and Second Coats: Water-based Acrylic Dry-Fall, B42W2

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N. Wood (Walls, Ceilings, Doors, Trim)- Painted

1. Eggshell Finish
   a. Benjamin Moore & Co.
      1) Primer: Fresh Start Acrylic Primer 046
      2) First and Second Coats: Eco Spec N374
   b. PPG Paints
      1) Primer: SEAL GRIP Interior/Exterior 100% Acrylic Universal Primer/Sealer 17-921XI
      2) First and Second Coats: Pure Performance Interior Eggshell 9-300XI Series
   c. Sherwin-Williams Company (The)
      1) Primer: PrepRite® ProBlock® Latex Primer, B51 Series
      2) First and Second Coats: Superpaint Air Purifying Satin, a87 Series
2. Semi-Gloss Finish
   a. Benjamin Moore & Co.
      1) Primer: Fresh Start Acrylic Primer 046
      2) First and Second Coats: Eco Spec N376
   b. PPG Paints
      1) Primer: SEAL GRIP Interior/Exterior 100% Acrylic Universal Primer/Sealer 17-921XI
      2) First and Second Coats: Pitt Tech Plus 4216 HP Semi-Gloss DTM Enamel, 4216 Series
   c. Sherwin-Williams Company (The)
      1) Primer: PrepRite® ProBlock® Latex Primer, B51 Series
      2) First and Second Coats: Pro Industrial Semi-Gloss Acrylic B66W651 Series.
3. Gloss Finish
   a. Benjamin Moore & Co.
      1) Primer: Fresh Start Acrylic Primer 046
      2) First and Second Coats: Eco Spec N376
   b. PPG Paints
      1) Primer: SEAL GRIP Interior/Exterior 100% Acrylic Universal Primer/Sealer 17-921XI
      2) First and Second Coats: Pitt Tech Plus Gloss DTM Enamel, 90-1310 Series
   c. Sherwin-Williams Company (The)
      1) Primer: PrepRite® ProBlock® Latex Primer, B51 Series
      2) First and Second Coats: Pro Industrial Gloss Acrylic B66W611 Series.

O. Wood (Walls, Ceilings, Doors, Trim)- Stain and Varnish System

1. Satin Finish
   a. PPG Paints
      1) First: Deft Wood Stain Interior Oil Based DFT400 Series

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2) Second and Third Coats: Deft Polyurethane Interior Water-based Acrylic DFT159

b. Sherwin-Williams Company (The)
1) First: Minwax 250 Stains
2) Second and Third Coats: Wood Classics Waterborne Polyurethane Varnish, A68 Series

2. Gloss Finish
a. PPG Paints
1) First: Deft Wood Stain Interior Oil Based DFT400 Series
2) Second and Third Coats: Deft Polyurethane Interior Water-based Acrylic DFT157

b. Sherwin-Williams Company (The)
1) First: Minwax 250 Stains
2) Second and Third Coats: Wood Classics Waterborne Polyurethane Varnish, A68 Series

P. Drywall (Walls, Ceiling, etc.)
1. Flat Finish (ceilings only)
a. Benjamin Moore & Co.
1) Primer: Eco Spec Waterborne Interior Latex Primer N372
2) First and Second Coats: Eco Spec Flat N373

b. PPG Paints
1) Primer: Pure Performance® Interior Latex Primer, 9-900
2) First and Second Coats: Pure Performance Interior Flat 9-100 Series

c. Sherwin-Williams Company (The)
1) Primer: Harmony Low Odor Interior Latex Primer, B11W900
2) First and Second Coats: Harmony Low Odor Interior Latex Flat, B5 Series

2. Eggshell Finish
a. Benjamin Moore & Co.
1) Primer: Natura Latex Primer, 511
2) First and Second Coats: Natura Latex Eggshell, 513

b. PPG Paints
1) Primer: Pure Performance® Interior Latex Primer, 9-900
2) First and Second Coats: Pure Performance Interior Eggshell 9-300XI Series

c. Sherwin-Williams Company (The)
1) Primer: Harmony Low Odor Interior Latex Primer, B11W900
2) First and Second Coats: Superpaint Air Purifying Interior Latex Satin, A87 Series

3. Semi-Gloss Finish
a. Benjamin Moore & Co.
1) Primer: Eco Spec Waterborne Interior Latex Primer N372
2) First and Second Coats: Eco Spec Semi-Gloss N376

b. PPG Paints
1) Primer: Pure Performance® Interior Latex Primer, 9-900

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2) First and Second Coats: Pure Performance Interior Semi-Gloss 9-500 Series

c. Sherwin-Williams Company (The)

1) Primer: PrepRIte Problock Latex Primer, B51 Series

2) First and Second Coats: Harmony Low Odor Interior Latex Semi-Gloss, B10 Series

4. Green Screen Walls (CCTV Studio):

a. Rosco

1) Primer: Rosco Tough Prime

2) First and Second Coats: Rosco Chroma Key Green Paint, matte finish

b. If school colors are green, provide Blue Chroma Key Paint.

Q. Drywall (Walls, Ceiling, etc.)- Water-based Epoxy System

1. Semi-Gloss Finish

a. Benjamin Moore & Co.

1) Primer: Fresh Start High Hiding All Purpose Primer 046

2) First and Second Coats: Corotech Command V392

b. PPG Paints

1) Primer: Speedhide Interior Latex Sealer Quick-Drying Primer, 6-2

2) First and Second Coats: Pitt-Glaze WB Water-Borne Acrylic Epoxy 16-551/16-599

c. Sherwin-Williams Company (The)

1) Primer: ProMar 200 Interior Latex Primer, B28W2600

2) First and Second Coats: Water-based Catalyzed Epoxy, B70W211/B60V25

2. Gloss Finish

a. Benjamin Moore & Co.

1) Primer: Fresh Start High Hiding All Purpose Primer 046

2) First and Second Coats: Corotech Command V390

b. PPG Paints

1) Primer: Speedhide Interior Latex Sealer Quick-Drying Primer, 6-2

2) First and Second Coats: Pitt-Glaze WB Water-Borne Acrylic Epoxy 16-551/16-598

c. Sherwin-Williams Company (The)

1) Primer: ProMarn 200 Interior Latex Primer, B28W2600

2) First and Second Coats: Water-based Catalyzed Epoxy, B70W211/B60V15

2.3 MATERIALS – GENERAL REQUIREMENTS

A. Paints and Coatings - General

1. Unless otherwise indicated, provide factory-mixed coatings.
2. When required, mix coatings to correct consistency in accordance with manufacturer's instructions before application.
3. Do not reduce, thin, or dilute coatings or add materials to coatings unless approved in manufacturer's product instructions.
4. Confirm VOC's need by using the products SDS sheets.

B. Requirements for USGBC 2009 LEED for Schools

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1. Paints and coatings used on the interior of the building (defined as inside of the weatherproofing system and applied on-site) shall comply with the following criteria:
   a. Architectural paints, coatings and primers applied to interior walls and ceilings: Do not exceed the VOC content limits established in Green Seal Standard GS-11, Paints, First Edition, May 20, 1993; Errata posted 10/31/2007; Second Edition, September 2006.
   b. Under Requirements, add to the end of the first bullet point, "Primers must meet the VOC limit for non-flat paint."
   c. Anti-corrosive and anti-rust paints applied to interior ferrous metal substrates: Do not exceed the VOC content limit of 250 g/L established in Green Seal Standard GC-03 Anti-Corrosive Paints Second Edition January 7, 1997.
   d. Clear wood finishes and stains applied to interior elements: Do not exceed the VOC content limits established in South Coast Air Quality Management District (SCAQMD) Rule 1113, Architectural Coatings, rules in effect on January 1, 2004.
2. Interior Coatings GS-11 VOC content limits:

Coating Types	**VOC weight in grams/liter of product minus water**
Non-Flat	150
Flat	50

2.4 ACCESSORIES

A. Coating application accessories:
   1. Provide all primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials required, per manufacturer's specifications.

PART 3 EXECUTION

3.1 PAINT FINISH

A. High traffic areas (corridors, cafeteria, kitchen, auditorium gymnasium, media center, reception areas, etc) shall be semi-gloss.

B. Restrooms shall be epoxy – semi gloss

C. Other areas designers choice

3.2 EXAMINATION

A. Verify site conditions under provisions of Section 01 31 00.

B. Do not begin application of coatings until substrates have been properly prepared; notify Owner's Representative of unsatisfactory conditions before proceeding.

C. If substrate preparation is the responsibility of another installer, notify Owner's Representative of unsatisfactory preparation before proceeding.

D. Proceed with work only after conditions are corrected and approved by all parties, otherwise application of coatings will be considered as an acceptance of surface conditions.

E. Test shop applied primer for compatibility with subsequent cover materials.

F. Measure moisture content of surfaces using an electronic moisture meter, DO NOT apply finishes unless moisture content of surfaces are below the following maximums:
   1. Plaster and Gypsum Wallboard: 12%

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2. Masonry, Concrete, and Concrete Unit Masonry: 12%
3. Interior Wood: 15%,
4. Concrete Floors: 8%

3.3 SURFACE PREPARATION

A. The surface shall be dry and in sound condition.
   1. Remove all oil, dust, dirt, loose rust, peeling paint, or other contamination to ensure good adhesion.
   2. Specifically, in new construction, all surfaces shall be dry-wiped just prior to painting to remove miscellaneous dust and debris.

B. Remove or mask electrical plates, hardware, light fixture trim, escutcheons, and fittings prior to preparing surfaces or finishing.

C. Correct defects and clean surfaces that affect work of this section.
   1. Remove existing coatings that exhibit loose surface defects.

D. Seal with shellac any marks, which may bleed through surface finishes.

E. Impervious Surfaces:
   1. Remove mildew by scrubbing with solution of tri-sodium phosphate and bleach.
   2. Rinse with clean water and allow surface to dry.

F. Aluminum Surfaces Scheduled for Paint Finish:
   1. Remove all oil, grease, dirt, oxide, and other foreign material by cleaning per SSPC-SP1 Solvent Cleaning.

G. Block/Unit Masonry (Cinder and Concrete)
   1. Remove all loose mortar and foreign material.
   2. Surface must be free of laitance, concrete dust, dirt, form release agents, moisture curing membranes, loose cement, and hardeners.
   3. Let concrete and mortar cure at least 30 days at 75°F unless the manufactures products are designed for application prior to the 30-day period.
   4. The pH of the surface and moisture content must be in accordance with the paint manufacturer’s recommendations prior to painting.

H. Concrete:
   1. Remove contamination by washing with an appropriate cleaner, rinse thoroughly.
   2. The pH of the surface and moisture content shall be in accordance with the paint manufacturer’s recommendations prior to painting.
   3. Allow the surface to thoroughly dry.
   4. Fill bug holes, air pockets, and other voids under another section with a cement-patching compound of sufficient cohesive strength to support the specified coating system.

I. Cement:
   1. Remove all surface contamination by washing with an appropriate cleaner, rinse thoroughly.
      a. Allow the surface to dry thoroughly.
      b. The pH of the surface and moisture content should be in accordance with the paint manufacturer’s recommendations prior to painting.

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J. Drywall – Interior:
   1. Shall be clean, dry and all dust removed prior to painting.
   2. All nail heads must be set and spackled.
   3. Tape all joints and cover with a joint compound.
   4. Spackled nail heads and tape joints shall be sanded smooth.

K. Galvanized Surfaces:
   1. Clean per SSPC-SP1 using detergent and water or a degreasing cleaner to remove greases and oils.
   2. Apply a test area, priming as required.
   3. Allow the coating to cure in accordance with the manufacturer's recommendation before testing.
   4. Perform adhesion tests in accordance with ASTM D3359 Adhesion by Tape Test.
   5. If adhesion is poor, then notify Owner's representative that additional surface preparation under another section is necessary to remove pre-treatments or contaminants that interfere with adhesion of the coating.

L. Insulated Coverings: Remove dirt, grease, and oil from canvas and cotton.

M. Plaster Surfaces:
   1. Shall allow to thoroughly dry for at least 30 days before painting, unless the manufacturer's products are designed for application prior to the 30-day period.
      a. Bare plaster must be cured and hard prior to painting.
      b. Correct any soft, porous, or powdery plaster per requirements under another section of the specifications.

N. Steel: Structural, Plate, etc:
   1. Check other sections for additional surface preparation and shop priming of bare steel surfaces.
   2. Surface preparation shall include appropriate SSPC recommended methods.
   3. Shop primer shall be compatible with the field-applied coatings.
   4. Surfaces shall be dry and clean prior to the application of field-applied coatings.
   5. Remove all contaminants in accordance with SSPC-SP1 Solvent Cleaning.

O. Wood:
   1. Shall be clean and dry, then prime and paint as soon as possible.
   2. Scrape, sand, and spot prime knots and pitch streaks before a full priming coat is applied.
   3. Patch all nail holes and imperfections with a wood filler or putty and sand smooth after application of primer.

P. Wood and Metal Doors Scheduled for Painting: Seal top and bottom edges with primer.

3.4 APPLICATION/INSTALLATION

A. Mix, thin, and apply all coatings and products in accordance with manufacturer's instructions.

B. Do not apply coatings to wet or damp surfaces.
   1. Wait at least 30 days before applying to new concrete or masonry, or follow manufacturer's procedures to apply appropriate coatings prior to 30 days.
   2. Test new concrete for moisture content.

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C. Apply coatings using methods recommended by manufacturer.

D. Uniformly apply coatings without runs, drips, or sags, without brush marks, and with consistent sheen to achieve a properly painted surface in accordance with PDCA Standard P1-04.

E. Apply coatings at spreading rate required to achieve the manufacturer's recommended dry film thickness.

F. The coated surface shall be inspected and accepted by the Owner's Representative.

3.5 FINISHING MECHANICAL AND ELECTRICAL EQUIPMENT

A. Refer to Division 21, 22, 23, 26, 27, & 28 for schedule of color-coding and identification banding of equipment, ductwork, piping, and conduit.

B. Paint shop primed equipment.

C. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.

D. Prime and paint insulated and exposed pipes, conduit, boxes, insulated and exposed ducts, hangers, brackets, collars, and supports, in finished areas, except where items are pre-finished.

E. Paint interior surfaces of air ducts, and convector and baseboard heating cabinets that are visible through grilles and louvers with one coat of flat black paint, to visible surfaces.
   1. Paint dampers exposed behind louvers and grilles to match face panels.

F. Paint exposed conduit and electrical equipment occurring in finished areas.

G. Paint both sides and edges of plywood backboards for electrical and telephone equipment before installing equipment.

H. Color code equipment, piping, conduit, and exposed ductwork in accordance with requirements indicated.
   1. Color band and identify with flow arrows, names, and numbering.

I. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.6 TOUCH UP AND DAMAGE REPAIR

A. Contractor shall repair all deficiencies in coating application in accordance with PDCA Standard P1-04.

B. Inform Owner's representative of all damage to properly painted surfaces and receive authorization prior to performing damage repair.

END OF SECTION

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SECTION 10 11 00
MARKER BOARDS AND TACK BOARDS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division-1 specification section, apply to work of this section.

1.2 DESCRIPTION OF WORK

A. Supply marker boards and tack boards as indicated on drawings.

B. Types of marker boards and tack boards specified in this section include the following:

1. Porcelain enamel marker boards
2. Vinyl fabric faced cork tack boards and tackable wall panels.

1.3 QUALITY ASSURANCE

A. Manufacturer: Unless otherwise acceptable to the Owner or Architect, furnish all marker boards and tack boards by one manufacturer for entire project.

1.4 SUBMITTALS

A. Product Data: Submit manufacturer's technical data and installation instructions on each material and component part, including data substantiating the material complies with requirements.

B. Samples:

1. Submit a full range of color samples for each type of marker board, tack board, trim, and required accessories.
2. Provide 12" square samples of sheet materials and 12" lengths of trim members for color verification.

C. Shop Drawings:

1. Show anchors, grounds, reinforcement, accessories, and installation details.

D. Submit Manufacturer's certification that materials furnished for the project comply with the specified requirements.

1.5 SPECIAL PROJECT WARRANTY

A. Porcelain Enamel Marker Board Warranty:

1. Furnish the manufacturer's "Lifetime of The Building Warranty", agreeing to replace, porcelain enamel marker boards that do not retain their original writing and erasing qualities, or exhibit crazing, cracking or flaking.
2. Replacement is limited to material replacement only; labor for removal and reinstallation is not included.

B. Provide manufacturer's instructions with regard to handling, installation, protection, and maintenance.

PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products from the following:

1. Aarco Products, Inc
2. Polyvision, a Steelcase Company
3. Claridge Products and Equipment, Inc
4. Weber Costello Co
5. Platinum Visual Systems
6. ASI Visual Display Products

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7. Approved Equal

2.2 MATERIALS

A. Porcelain Enamel Marker Boards:
   1. Provide balanced high-pressure laminated porcelain enamel marker boards of 3-ply construction consisting of face sheet, core material and backing.
   2. Facing Sheet:
      a. Provide facing sheet of 24-gauge enameling grade steel sheet especially processed for temperatures used in coating porcelain on steel (can provide- 28-gauge porcelain steel on 4’ height material and 24-gauge on 5’ height material).
      b. Coat the exposed face with a 3-coat process consisting of primer; ground and color cover and the concealed face with a 2-coat process consisting of primer and ground.
      c. Fuse cover and ground coats to steel at the manufacturer's standard firing temperatures, but not less than 1,200°F (649°C).
   3. Cover Coat: Provide the manufacturer's standard light-colored special writing surface with gloss finish intended for use with liquid felt tipped dry erasable markers.
   4. Core: Provide the manufacturer's standard 7/16" thick MDF/particle board core material.
   5. Backing Sheet: Provide the manufacturer’s standard, a moisture barrier backer preferred.
   6. Laminating Adhesive: Provide the manufacturer's standard moisture-resistant, non-flammable, non-contact, pressured activated, water-based type adhesive.
   7. Final surface shall be able to hold paper material to the board with rare earth type magnets.

B. Vinyl Fabric-Faced Tack Boards:
   1. Provide mildew resistant, washable, vinyl fabric complying with Federal Specifications CCC-W-408, Type II, mildew resistant, laminated to 1/4" thick cork backing sheet.
      a. Provide only fabric that has a flame spread rating of 25 or less when tested in accordance with the requirements of ASTM E84.
      b. Provide color and texture as scheduled or as selected by Architect from manufacturer's standard colors.
   2. Make panels rigid, laminate ¼" cork face sheet under pressure to 1/4" thick fiberboard backing at factory.
   3. Metal Trim and Accessories:
      a. Fabricate wrap frames and trim of not less than 0.062" thick aluminum alloy, size and shape as indicated, to suit type of installation.
      b. Provide straight, single-length units wherever possible; keep joints to a minimum, Miter both exposed and concealed faces of trim, not edge, and bend to create a safety corner with neat, hairline closure.
   4. Where the size of boards or other conditions exist, which require support in addition to the normal trim, provide structural supports or modify the trim as indicated by Architect from the manufacturer's standard structural support accessories to suit the condition indicated.

C. Clear Anodized Finish: Furnish exposed aluminum finish with clear anodic coating

D. Chalk Tray: Furnish manufacturer's standard continuous box-type aluminum chalk tray with slanted front, end caps either aluminum or plastic.

E. Map Rail: Furnish 1" map rail at the top of each unit, complete with the following accessories:
   1. Provide one end stop at each end of the map rail.
   2. Provide 2 map hooks with flexible metal clips for each 4' of map rail or fraction thereof.
   3. Provide one flag holder per room installed on the teaching wall marker board.

F. Provide a tack-able wall surface comprising of a vinyl fabric face laminated to 1/4" thick

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underlayment cork laminated to 1/4" thick fiberboard.

1. The vinyl facing shall meet or exceed Federal Specifications CCC-W-408-A, Type II with U.L. ratings 25-10-5 and weigh no less than 22-oz per 54" wide lineal yard.
    a. Size: Provide 4' wide panels.
    b. Aluminum Trim: Wrap with matching vinyl on exposed surfaces.
    c. Joiners shall be "H" in shape with ¾" wide exposed face.
    d. End trim shall be "J" shaped with ½" minimum exposed face.
    e. Provide one-piece corner trim with configuration allowing the trim be fastened to base wall with concealed fasteners/clips.

2.3 FABRICATION

A. Porcelain enamel marker boards, laminate facing, and backing sheet to core material under pressure with manufacturer's recommended waterproof, non-flammable, non-contact, water-based adhesive.

B. Assembly: Provide factory-assembled marker board and tack board units, except where field assembled units are required.
    1. Make joints only where the total length exceeds the maximum manufactured length, fabricate with the minimum number of joints, balanced around the center of the board, as acceptable to the Architect and Owner.
    2. Provide the manufacturer's standard vertical joint system between abutting sections of marker board.
    3. Provide the manufacturer's standard mullion trim at joints between marker boards and tack boards.

PART 3 EXECUTION

3.1 PREPARATION

A. Take field measurements prior to fabrication, to ensure proper fitting of the work.

B. Allow for trimming and fitting wherever taking field measurements.

3.2 INSTALLATION

A. Deliver factory-built marker board and tack board units completely assembled in one piece without joints, wherever possible.
    1. When overall dimensions require delivery in separate units, pre-fit components at the factory, disassemble for delivery, and make final joints at the site.
    2. Use splines at joints to maintain surface alignment.

B. Install units in locations and at mounting heights indicated on the plans and specifications in accordance with the manufacturer's installation instructions.
    1. Keep perimeter lines straight, plumb, and level.

C. Coordinate job-site assembled units with grounds, trim, and accessories; join all parts with a neat, precision fit.

3.3 ADJUST AND CLEAN

A. Verify that the required accessories are properly installed and operating properly.

B. Clean surfaces and trim in accordance with manufacturer's instructions leaving ready for use.

END OF SECTION

SECTION 10 12 00
DISPLAY CASES

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PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and supplementary Conditions and other Division 1 specification sections, apply to work in this section.

1.2 DESCRIPTION OF WORK

A. This Contractor shall furnish and install the display cases as shown on the drawings or herein specified or both.

B. This work includes all plant facilities, services, materials, labor, tools, and accessories as required.

C. All framing and finishing required for the installation of the items specified herein will be by others.

1.3 JOB CONDITIONS

A. This Contractor shall inspect the job conditions as he finds them and his starting work constitutes approval of conditions.

1.4 QUALITY ASSURANCE

A. Take field measurements prior to preparation of shop drawings and fabrication where possible to insure proper fitting or work.

B. However, allow for adjustments within specified tolerances wherever taking of field measurements before fabrication might delay work.

1.5 SUBMITTALS

A. Submit manufacturer's detailed technical data for materials, fabrication, and installation, including catalog cuts of anchors, hardware, fastenings, and accessories.

B. Submit shop drawings for fabrication and erection of display cases not fully described by product drawings, templates, and instructions for installation of devices built into other work.

PART 2 PRODUCTS

2.1 MANUFACTURER

A. Basis of Design: Claridge Products and Equipment, Inc: Series 390 Recessed.

B. AARCO Products, Inc.

C. or Approved equal

2.2 RECESSED DISPLAY CASE

A. Recessed Display Case shall be similar to Model 394, sizes as shown on the drawings, tempered glass sliding doors, three tempered glass shelves per unit, adjustable shelf brackets, inside surfaces are laminate as selected from Manufacturer's full line, keyable lock, with LED lighting/diffuser and a natural cork rear panel, color as selected from Manufacturer's full line.

B. Trim to be satin anodized aluminum.

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C. Supply recessed display cases at locations shown on the drawings.
   1. All tempered or safety glass shall bear permanent labels identifying them as such.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install display cases and accessories in strict accordance with manufacturer's instructions.

B. Verify that site conditions are ready to receive work and dimensions are as indicated on the approved shop drawings and instructed by the manufacturer.

3.2 CLEANING

A. After installation, thoroughly clean all exposed surfaces and repair all damaged material to its original condition or replaced with new material.

3.3 WARRANTY

A. This Contractor shall fully guarantee all materials and labor under this section for a period of one year from date of final acceptance of the building against all defects in both workmanship and materials and he shall promptly correct and/or replace such faulty work if so notified.

END OF SECTION

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SECTION 10 14 00
SIGNAGE

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division-1 specification section, apply to work of this section.

1.2 SECTION INCLUDES

A. Tactile/raised letter plastic signs

B. Individual plastic characters signs

C. Signs of silk-screened characters on plastic

D. Required sign type:
   1. Interior room, space and area ID signs
   2. International symbols of accessibility for accessible spaces and exits
   3. Accessible routes
   4. Tactile “exit” signs
   5. Hazard and safety signs
   6. Evacuation plans

1.3 RELATED SECTIONS

A. Section 10 14 16 - Plaque

B. Section 10 14 63 - Digital Exterior Marquee Sign

1.4 REFERENCES

A. ANSI A117.1 - Accessible and Usable Buildings and Facilities

B. ASCE 7 – Minimum Design Loads for Buildings and Other Structures

C. FBC – Florida Building Code - Accessibility

D. FBC - Florida Building Code Section 423

1.5 SUBMITTALS

A. Submit shop drawings under provisions of Section 01 33 00.

B. Indicate sign styles, lettering font, foreground and background colors, locations, overall dimensions of each sign and anchorage.

C. Exterior Signage: Indicate dimensional letter profiles, dimensions, mounting structure, connection attachments, anchorage, size and type of fasteners, and accessories.
   1. Coordinate electrical requirements for illuminated signs.
   2. Include wind load and deflection calculations, and summary of forces and loads on substrate. Shop drawings and calculations to be signed and sealed by a delegated Structural Engineer licensed in the State of Florida.

D. Provide complete interior and exterior sign schedule showing sign type, location, and verbiage.

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E. Samples: Submit two sample signs in size illustrating type, style, letter font, and colors specified, and method of attachment.

F. Provide manufacturer's installation instructions, templates, and attached devices.

G. Colors shall be as selected by the Architect.

1.6 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

1.7 REGULATORY REQUIREMENTS

A. Conform to applicable codes for requirements for the physically handicapped, safety and egress.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, protect, and handle products to site under provisions of Section 01 60 00.

B. Package signs, labeled in name groups

C. Store adhesive attachment tape at ambient room temperatures

1.9 ENVIRONMENTAL REQUIREMENTS

A. Do not install signs when ambient temperature is lower than recommended by manufacturer.

B. Maintain this minimum temperature during and after installation of signs.

PART 2 PRODUCTS

2.1 FLORIDA AMERICANS WITH DISABILITIES ACT REQUIREMENTS

A. Manufacturer shall conform to tactile, Braille, letter size, and other requirements as required by FBC - Accessibility and ANSI A117.1.

B. ADA requirements supersede technical specifications in this Section.

2.2 BUILDING SIGNAGE - GENERAL

A. General; applies to all signs except as noted:
   1. Material shall be minimum 1/8" stock with 3/8" radius corners.
      a. Exterior signs – Shall be UV stable material of lucent or phenolic resin using raised lettering, which is an integral part of the sign.
      b. Interior signs – Shall be material of lucent or phenolic resin using raised lettering, which is an integral part of the sign.
      c. Interior signs exposed to direct sun, shall be of same material as exterior signs.
      d. Paint shall be Matthews Acrylic Polyurethane system or equal.
         1) Shall be low VOC
         2) Shall be UV Stable
         3) Shall be lead and chromate free
         4) Minimum life expectancy of 10-years
   2. Applied lettering may be not allowed, with the approval of the Owner.
   3. Letters and background colors selected by Architect from manufacturer's standard colors
   4. Mounting:

a. Shall be with adhesives and/or non-removable oval head screws as indicated on the contract documents.
b. Mount at locations as directed by Architect
c. Mount as required by the FBC Accessibility section 703.4
d. For signs to be mounted on glass, provide back panel of same size and material as sign to conceal mounting tape.

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5. Graphic Process with Braille in one of the following, but no applied lettering method allowed:
   a. Provide raised (photopolymer process)
   b. Engraved letters
   c. Sand craved process
6. Letters:
   a. Letters and numbers shall meet the requirements of FBC _ Accessibility section 703.
   b. Letters and numbers to be raised 1/32" upper case sans serif font meeting the requirements of section 703 FBC Accessibility
   c. Raised characters shall be 5/8" high minimum and 2" high maximum.
   d. Braille shall be installed on sign as per section 703.3 FBC Accessibility
   e. Pictograms shall have the equivalent verbal description directly below the pictogram and follow requirements of section 703.6 FBC Accessibility.
7. Characters and backgrounds must be matte or other non-glaze surface and of castrating colors.
8. All signs shall comply with chapter FBC - Accessibility.

B. Capacity signs:
   1. For all rooms with a capacity of 50 persons or more as shown on the drawings or other rooms as indicated on the plans.
   2. Furnish and install signage, 3" high by length required, reading "MAXIMUM CAPACITY".
   3. Allow for 3-digits maximum after "maximum capacity", copy as shown on the drawings.

C. Toilet Room Accessibility Signs
   1. Furnish and install one sign depicting International Symbol of Accessibility (wheelchair) at each toilet room, equipped with facilities for the handicapped.
      a. Size of pictogram field shall be 6" by 6" minimum increase size as necessary to add any required lettering.

D. Room Name and Number Signs
   1. Provide a sign for each room or space to include name and room number.
      a. Classroom and administrative office signs shall have a slot providing the owner the ability to add a teacher's name and change the name as necessary.
      b. Minimum size of 3" high by 6" wide for signs, longer where nomenclature demands
   2. Mount number as directed by Architect.
   3. All spaces listed in Finish Schedule plus one at each additional door if more than one door to a space.

E. Storage Signs

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1. Provide and install at mechanical and electrical rooms a sign mounted on the door to read as follows: " STORAGE NOT ALLOWED"
2. Signs shall be matte acrylic plastic, red background with white letters 3 " high by width needed for copy and Braille, with 3/8" radius corners.
3. Mount on doors with non-removable oval head screws verify number signs required.

F. Fire Extinguisher, No Exit and Pull Station Sign
1. Copy to read: “No Exit”, "Fire Pull Station Inside", And "Fire Extinguisher Inside"
2. Red letters, same material, size and mounting as in A. General.
3. NO EXIT sign shall have letter size as per NFPA 101 section 7.10.8.3.
4. Braille sign not required for fire extinguisher.
5. See plans for locations.

G. Stair Signs
1. Provide tactile signs at each doorway leading to exit stairway.
2. Wording on sign: "EXIT"

H. Evacuation Plan
1. Provide frame for a graphic floor plan in each student occupied room.
   a. Minimum size to be nominal 9" high by 12" width
   b. Provide a clear removable plastic cover over each sign.
   c. Sign shall meet the FBC – Accessibility requirements.
2. Mounting:
   a. Non-removable oval head screws, using rawl plugs where mounted on masonry.
   b. Architect shall supply the plans to the Contractor.
3. Frame Material: Matte acrylic plastic with all edges eased and tempered glass or clear plastic cover.

I. Fire Rated/Smoke Partition Labeling
1. Field label all fire rated walls above ceiling level, with fire rating shown on the construction plans.
   a. Provide minimum 1½" high block lettering, stenciled or self-adhesive, on wall above finished ceiling. If in a storage, mechanical, electrical, or similar unfinished room without finished ceiling, install at approximately 84 inches above floor.
   b. (Contractor to use rating from permit plans) HOUR FIRE RATED WALL, PROTECT ALL OPENINGS AND THROUGH WALL PENETRATIONS PER CODE REQUIREMENTS.
2. Field label all smoke partitions above ceiling level.
   a. Provide minimum 1½" high block lettering, stenciled or self-adhesive, on wall above finished ceiling. If storage, mechanical, electrical, or unfinished room without finished ceiling, install at 84" above floor.
   b. SMOKE PARTITION, PROTECT ALL OPENINGS AND THROUGH WALL PENETRATIONS PER CODE REQUIREMENTS.

J. Mechanical, Electrical, Data, and Similar Rooms
1. Provide a sign saying "NO STORAGE" meeting the General requirements.
2. If these rooms have pair of doors, provide sign saying "THIS DOOR TO REMAIN CLOSED AND LATCHED TOP AND BOTTOM, EXCEPT DURING THE TRANSFER OF EQUIPMENT".

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a. Sign shall have 1" high block letters and be permanently attached (Attached in way as to maintain the rating of the door) to the inactive door near the latch side 60 inches from finished floor to center of sign.
b. Braille not required for this sign.

2.3 BUILDING SPECIALITY SIGNAGE

A. Emergency Access Opening
1. Provide and install at designated emergency access openings a sign mounted on the door to read as follows "EMERGENCY ACCESS OPENING."
2. Signs shall be non-corrosive, 1/8" three-ply laminate, UV inhibitors, non-glare surface, and white background with red letters 3" high by width needed for copy.
3. Mount on doors with non-removable oval head stainless steel screws verify number of signs required.
4. Graphic Process: Raised letters shall be an integral part of the sign face, do not surface apply any lettering.
5. Letters: Letters shall have width to height ratio between 3:5 and 1:1 and a stroke width to height ratio between 1:5 and 1:10.
   a. Letters shall be raised 1/32" upper case, and sans serif type.
6. Background must be matte or other non-glare surface.

B. Exterior Building Letters and Street Numbers
1. Provide minimum 12" high by ¼" thick non-illuminated letters as indicated on plans forming the school name.
2. Provide minimum 8" high by ¼" thick non-illuminated letters on the building as indicated on plans forming the school's street address.
3. Letter style is Helvetica Medium
4. Use F-214 alloy aluminum welded construction of anodized clear satin finish with inlaid properly sanded and primed to receive type A10 baked enamel color as selected by the Architect and Owner from manufacturer's standard colors.
5. Install using manufacturers approved anchoring method to meet ASCE 7 wind load requirements.
6. School name and street address shall be visible from the main road fronting the campus.

C. Exterior Fabricated Metal Letters:
1. Material: Aluminum.
2. Thickness: 3/4 inch min., depth as indicated on drawings.
3. Finish: Baked Enamel.
   a. Color: as selected by Architect from manufacturer’s full line.
4. Fabrication: Mill joints to a tight, hairline fit. Form joints exposed to the weather to exclude water penetration.
5. Mounting: Mechanically attached, concealed fasteners, mount as indicated in drawings and as detailed in delegated design engineered shop drawings.
6. Product Basis of Design: ASI Sign Systems: LF Series Fabricated Metal Dimensional Letters.

D. Interior Dimensional Graphic Letters

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1. Plastic Letters:
   a. Material: Vinyl sheet, flat cutout.
   b. Color: As selected.
   c. Product Basis of Design: ASI Signage Innovations; www.asisignage.com: LTV Series Cut Vinyl lettering
2. Cut Metal Letters:
   a. Material: Aluminum
   b. Finish: As selected.
   c. Product Basis of Design: ASI Signage Innovations; www.asisignage.com: Cut Metal letters.
3. Mounting: per manufacturer's recommendation for substrate.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install all signs in strict accordance with manufacturer's instructions and FADA requirements.

B. Room signs to be mounted 60" to center above finish floor on walls adjacent to the latch side of any door opening.

3.2 CLEANING

A. After installation, thoroughly clean all exposed surfaces and restore all damaged material to its original condition or replaced with new material.

3.3 WARRANTY

A. This Contractor shall fully guarantee all materials and labor under this section for a period of 5-years from date of final acceptance of the building against all defects in both workmanship and materials and he shall promptly correct and/or replace such faulty work if so notified.

END OF SECTION

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SECTION 10 14 16
PLAQUE

PART 1 GENERAL

1.1 RELATED DOCUMENTS
- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 specification section, apply to work of this section.

1.2 SECTION INCLUDES
- A. Cast aluminum dedication plaque at location and design as shown on architectural drawings.

1.3 REFERENCE
- A. School Board Policy 7.041 - Dedicatory plaque in new schools: Place the names of the School Board Members, the Board Chairman, and the Superintendent who are in office at the time of awarding the construction contract for a new facility or major addition.

1.4 SUBMITTAL
- A. Submit under provisions of Section 01 33 00.
- B. Provide shop drawing of plaque size, border type, background finish, letter styles, and sizes, and mounting method.
  1. Verify names, titles and exact wording required for plaque prior to fabrication.
- C. Provide rubbing of actual pattern for architect's approval prior to casting.

1.5 QUALIFICATIONS
- A. Manufacturer: Company specializing in manufacturing the product specified in this section with minimum 5-years documented experience.

PART 2 PRODUCT

2.1 ALUMINUM TABLET
- A. Aluminum Alloy F-214, size 18" x 24" beveled edges, square corners.

2.2 ANCHORS
- A. Provide matching anchors suitable for secure attached to intended wall.

PART 3 EXECUTION

3.1 Casting shall be free of pits, gas holes and all letters shall be sharp, and hand tooled.

3.2 Clean, etch, and treat plaque with Aldine.

3.3 Spray two coats of clear acrylic lacquer on completed plaque.

END OF SECTION

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SECTION 10 14 63
DIGITAL EXTERIOR MARQUEE SIGN

PART 1 GENERAL

1.1 RELATED DOCUMENTS
- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 specification section, apply to work of this section.

1.2 SECTION INCLUDES
- A. Cabinet, face, and message area of exterior marquee sign specifications.
- B. Lighting
- C. Structural support
- D. LED Digital sign

1.3 RELATED SECTIONS
- A. Section 03 20 00 Cast-in-place Concrete
- B. Section 05 50 00 Metal Fabrications
- C. Divisions 26 and 27

1.4 REFERENCES
- A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel
- B. ASTM A307 - Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength
- C. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Structural Tubing in Rounds and Shapes
- D. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon Steel Bars for Concrete Reinforcement
- E. ASTM C33/C33M - Standard Specification for Concrete Aggregates
- F. ASTM C150/C150M - Standard Specification for Portland Cement
- G. ASTM C270 Standard Specification for Mortar for Unit Masonry
- H. FBC - Florida Building Code
- I. ASCE 7 Minimum Design Loads for Buildings and Other Structures
- J. UL Underwriters Laboratories, Inc
- K. NEMA Standards

1.5 SUBMITTALS
- A. Submit shop drawings under provisions of Section 01 33 00.
- B. Product Data: Manufacturer’s product literature including components and accessories
  1. Preparation instructions and recommendations
  2. Storage and handling requirements and recommendations
  3. Printed installation and maintenance instructions
  4. Programming Instructions and directions for access to online training
  5. Provide training as outlined in 3.2.
- C. Shop Drawings shall indicate sign styles, lettering font, foreground and background colors, locations, overall dimensions of each sign and anchorage for Architects and District Design Coordinators review and approval.
  1. Anchorage shall include as a minimum an engineered foundation plans/details, structural components and connections to each other, the sign cabinet, sign face, and the foundation in compliance with FBC.
  2. Submit structural shop drawings to the School District Building Department in addition to the Architect.
- D. Provide color samples for Architects and District Design Coordinators selection.

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E. Submit graphics being applied to the sign for Architects and District Design Coordinators approval.
F. Submit closeout information on operation and maintenance data for installed products.
G. Submit executed warranty as specified to Owner.

1.6 QUALIFICATIONS
A. Obtain all products in this section from single supplier.
B. Manufacturing company specializing in manufacturing the products specified in this section with minimum 5-years documented experience.
C. Installation by installer specializing and with minimum 5-years of experience in the installation of products specified in this section.
D. Design Work under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in the State of Florida.

1.7 WARRANTY
A. Non LED Electronic Display warranty
1. Minimum warranty for 10-years against defects in workmanship and materials, warranty does not cover lightning, lamps or damage from vandalism.
2. Sign Structure and Identification Cabinet: Under Normal use and service should the sign structure or sign malfunction due to defects in workmanship or materials, the Manufacturer will repair or replace any of the defective materials, except as limited below for ballasts.
a. Faulty ballasts will be exchanged for new ballasts for a period of three years
b. The warranty also includes refinishing and reinstallation, which may be required due to repair or replacement of defective sign where defect was not apparent prior to installation.
3. Contractor is responsible for replacement or refinishing of sign where Contractor's work contributed to rejection or to voiding of manufacturer's warranty.
B. LED Electronic Display warranty
1. Manufacturer shall warrant the LED Electronic Display to be free from defects in workmanship or materials for a period of 5-years from the date of Substantial Completion.
2. Damage caused by abuse, misuse, misapplication or accidental damage outside the control of the Manufacturer (including Lightning), and any consequential or contingent liability is excluded from the warranty.
3. Manufacturer will repair or replace malfunctioning or defective parts.

1.8 DELIVERY, STORAGE, AND HANDLING
A. Deliver, store, protect, and handle products to site per manufactures requirements.

PART 2 PRODUCTS

2.1 MATERIALS
A. Warranty
1. All purchased materials shall individually have a minimum 5 year warranty period.
B. LED Signage
1. Provide product in compliance with UL or other approved agency.
2. Expected LED life expectancy is 100,000 hours.
3. Provide LED display on both sides of sign.
4. Minimum of two LEDs per Pixel with a 20mm pitch
5. Provide temperature probe
6. Approximate cabinet size 4’ x 10’; as per plans or by architect

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7. Top of sign height maximum 16', as per plans or by architect
8. Mounting option as per plans or by architect
9. Decorative trim as indicated on plans or by architect.

C. Cabinet Specifications
1. Double sided extruded aluminum and sized as indicated on plans
2. Heliarc welded and mitered at corners
3. Powder coated color finish: 3.0 to 4.0 mils thick electrostatically applied and permanently bonded guaranteed non-fading.

D. Cabinet Face Specifications
1. Provide vandal resistant clear UV solar grade high impact resistant polycarbonate cover with stainless steel hinges secured with dual compression tubular locks.
2. Powder coat covers to match cabinet.

E. Lighting Specifications
1. All electrical components shall be UL listed and approved.
2. Lighting: High output instant start T-8 fluorescent tubes spaced to provide uniform night lighting over entire face of the sign.
3. Install per current NEC edition.

F. Support Structure Specifications
1. Design the support structure to withstand wind loads of as required by ASCE 7 & FBC.
2. Legs: Cover on both sides if indicated on plans and anchor to foundation as indicated on engineered plans.
3. Side frames painted in color approved by the Architect and District Design Coordinator.
4. Provide signed and sealed (by Florida licensed PE) engineered shop drawings and structural calculations for approval by District Building Department.

G. Provide 6" high numbers for the street address on the marquee, both sides if they are viewable from the street.

H. LED Display Cabinets:
1. Heavy Gauge Formed Aluminum Cabinets:
   a. Serviceability: LED cabinets serviceable from front
   b. Protective Covers: Polycarbonate lens protecting LED display area.
   c. Lifts: Gas cylinder assist lifts, one on each end of LED covers.
2. Double Sided: Each side is one self-contained LED Display.
   a. Function: Each side of LED display to contain its own processor and be capable of displaying different independent messages at the same time
   b. Weather resistant cabinets designed to meet the classification requirements of NEMA 4X construction.
   c. Closure Panels: Matching aluminum ventilated closure panels join two cabinets aesthetically together.
   d. Cabinet Finish: Industrial, graffiti resistant coating, DGHS Polyurethane by PPG or Architect approved equal.
   e. Climate Controlled Interior: By thermostat, controlling heaters bars, fans.
   f. Ventilation: With side ventilation/water diverters forced air ventilated design with an air exchange rate of four complete air changes per minute.
3. Service: Serial port provided within Electronic Message Center for troubleshooting by direct connection to PC.
4. Controller (CPU) Central Processing Unit:

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a. The central processing unit provided in each display is a microprocessor based circuit board assembly.
b. Unit is 10 MHz device with minimum of 2-MB battery backed static RAM memory and 128K bytes Flash ROM with on board programmability.
c. Provide 1 GB compact flash memory for message storage.
d. Provide one RS-232, RS-485/422 input/output serial port jumper selectable.
e. Function: CPU assembly provides automatic memory and program testing at power up, diagnostics, and full talk back.
f. Network Interface: Contact the District's IT department to obtain the latest specifications.

5. System Software Requirements
   a. Scheduling made in 12 or 24-hour formats.
   b. Scheduler: Resides within LED display cabinet as onboard processor; does not require PC to operate messaging schedule.
   c. Schedule Storage: System software and program sequence and schedules, can be stored on removable storage or fixed storage device.
   d. Provide advance scheduling or pre-programming for more than 1 year in advance.
   e. Screen Helps: Excerpts from the Owner's Manual.
   f. Bad Word Checker: Prevents display of unacceptable words.
   g. Library of words is password protected.
   h. Library is fully editable for adding or deleting words.
   i. Control: Menu guided control.
   j. Editing and Display: Simultaneous display and edit capability.
   k. Automatic Rebooting: Of system disk, after power outage:
      i) System clock and calendar will continue to function during power failure.
      ii) Message display holds memory for up to 60 days without power.
   l. Provide all operating software to Owner along with required usage licenses and software updates.
   m. Text Modules: Provide various with scalable fonts and traveling text.
   n. Provide remote or on-site programming with appropriate connection.
   o. Software Menu: User-friendly menu and icon-based software.
   p. Provide password protection capability.
6. Power Supplies:
   a. Verify the line voltage to the sign on existing school.
   b. New power line from the building shall be in conduit sized and installed per the NEC and division 26 of the specifications.
   c. Provide the electronic switching power supplies with short circuit and surge protection.
      i) Protect the electronic switching power supplies by an overload allowance ranging from 105 percent up to 150 percent.
   d. Power the LED display by multiple solid-state electronic switching power supplies.
      i) Provide a separate power supply for the CPU to isolate the processor power from the LED drive power.

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7. Information Transmission Method:
    a. The data transmission method must be approved by the District's Information Technology Department.
        i) Approved methods are constantly changing.
    b. Coordinate with the District Information Technology Department and obtain the Department's written acceptance of the data transmission method prior to bid.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install signs in strict accordance with manufacturer's instructions, District Design Standards, District Master Specifications, and FBC requirements.

B. Install signs at location and height as shown on the permitted site plan issued by the District Building Department.

3.2 TRAINING

A. Provide for training by one of the three options:
    1. Online training provided at no charge through secure access log-in at the vendor's or the manufacturer's web site.
    2. Provide (2) DVD training disks, one to the School and one to Facilities Services Department.
    3. Provide onsite training of at least two school staff members by the vendor.

3.3 CLEANING

A. After installation, thoroughly clean all exposed surfaces and restore all damaged material to its original condition or replaced with new material.

END OF SECTION

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SECTION 10 21 00
TOILET COMPARTMENTS and CUBICLES

PART 1 GENERAL

1.1 RELATED DOCUMENTS
- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 specification section, apply to work of this section.

1.2 SECTION INCLUDES
- A. Solid toilet compartments, floor mounted and head rail braced.
- B. Urinal sightscreens; wall mounted with floor to ceiling pilaster brace.
- C. Shower cubicles.

1.3 REFERENCES
- A. Florida Building Code – Building and Accessibility
- B. ASTM A167 – Standard Specification for Stainless and Heat Resisting Chromium Nickel Steel, Plate, Sheet, and Strip
- C. FFPC – Florida Fire Prevention Code

1.4 SUBMITTALS
- A. Submit under provisions of Section 01 33 00.
- B. Shop Drawings:
  1. Indicate partition plan, elevation views, dimensions, and details of wall, floor, and ceiling supports, door swings.
  2. Clearly indicate deviations from the contract documents due to field conditions or code requirements.
- C. Product Data:
  1. Provide product data on panel construction, hardware, and accessories.
  2. Installation instructions
  3. Cleaning and maintenance instructions
  4. Replacement parts information
- D. Samples: Furnish scale model of compartments, including stile, shoe, door, door hardware, divider panel, and mounting brackets.

1.5 FIELD MEASUREMENTS
- A. Verify that field measurements are as indicated on shop drawings.
- B. Notify the contractor of any deviation.

1.6 COORDINATION
- A. Coordinate work under provisions of Section 01 31 00.
- B. Coordinate the work with placement of support framing and anchors in wall and ceiling.

1.7 PRODUCT DELIEVERY, STORAGE, & HANDLING
- A. Deliver items in manufacturer’s original unopened protective packaging.
- B. Store the materials in original protective packaging to prevent physical damage.
- C. Handle material in a way to prevent damage to finished surfaces.

1.8 WARRANTY
- A. Furnish 15-year limited warranty for panels, doors, and stiles against breakage, corrosion, delamination, and defects in factory workmanship.
- B. Furnish 1-year guarantee against defects in material and workmanship for stainless steel door hardware and mounting brackets.

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PART 2 PRODUCTS

2.1 MANUFACTURERS

A. The listing of Bobrick Washroom Equipment, Inc. products is to establish a standard for design, function, materials, workmanship, and appearance.
B. Contractor may submit other manufacturers for evaluation by the Architect and Owner by following the conditions of the substitutions clause.
C. Architect and Owner shall approval the substitution in writing prior to the use of the product.
D. The Owner shall be the sole judge as to the acceptability of all products submitted for substitution.
E. Toilet partitions shall be the product(s) of a single manufacturer.

2.2 COMPONENTS/MATERIALS

A. Stiles, Panels, Doors, and Screens
    1. Manufacture the Stiles, Panels, Doors, and Screens from Solid Color Reinforced Composite material.
B. Toilet Partition Material
    1. Construct toilet partitions of Solid Color Reinforced Composite material, which is composed of dyes, organic fibrous material, and polycarbonate/phenolic resins.
        a. Material shall have a non-ghosting, graffiti resistant surface integrally bonded to core through a series of manufacturing steps requiring thermal and mechanical pressure.
        b. Edges of material shall be the same color as the surface.
    2. Subject to compliance with the material performance requirements, solid surface manufactured toilet partition systems or manufactured using the solid surface materials stated below will be acceptable:
        a. Accurate Partitions, the solid phenolic product
        b. Privacy Plus™ Toilet Compartments by Gerali Custom Design, Inc.
        c. Ultimate Corian® System by Shower Shapes
        d. WilsonArt® Gibraltar® Material
        e. WilsonArt® EarthStone™ Material
    3. Toilet partitions constructed of High Density Polyethylene (HDPE) or High Density Polypropylene will not be acceptable.
C. Finish Thickness
    1. Doors and pilasters shall be 3/4"; wall panels and urinal screens shall be 1/2”.
D. Hardware
    1. All hardware shall be 18-8, type-304 stainless steel with satin finish.
    2. Hardware of chrome-plated “Zamak”, aluminum, or extruded plastic is unacceptable.
E. Latch
    1. Sliding door latch shall be 14-gauge and slide on nylon track.
    2. Sliding door latch shall require less than 5-lb force to operate, twisting latch operation is not acceptable.
    3. Attach latch track to door by machine screws into factory-installed threaded brass inserts.
    4. Threaded brass inserts shall be factory installed for door hinge and latch connections, and shall withstand a direct pull of at least 1,500 lbs. per insert.
    5. Use through bolted, stainless steel, pin-in-head Torx set bolt fasteners at latch keeper to stile connections, to withstand direct pull force of at least 1,500 lbs. per fastener.
F. Hinges
    1. Hinge shall be 16-gauge (1.6-mm) continuous piano hinge.

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2. All doors shall be equipped with self-closing hinge.
3. Continuous piano hinge shall be attached to door and stile by theft resistant, pin-in-head Torx stainless steel machine screws into factory installed, threaded brass inserts
4. Fasteners secured directly into the core are not acceptable.
5. Furnish the door with two-11-gauge stainless steel doorstop plates and attached rubber bumpers to resist door from being kicked in or out beyond the stile.
6. Secure the doorstops and hinges with stainless steel, pin-in-head Torx machine screws into threaded brass inserts.
7. Threaded brass inserts shall withstand a direct pull force of at least 1,500 lbs per insert.

G. Mounting Brackets
1. Mounting brackets shall be 18-gauge stainless steel and extend full height of panel.
2. Furnish U-channels to secure panels to stiles.
3. Furnish angle brackets to secure stiles to walls and panels to walls.
4. Fasteners at locations connecting panels-to-stiles shall utilize through bolted, stainless steel, pin-in-head Torx sex bolt fasteners.
   a. Through bolted fasteners shall withstand direct pull force of at least 1,500 lbs. per fastener.
5. Wall mounted urinal screen brackets shall be 11-gauge double thickness.

H. Leveling Device shall be 7-gauge, 3/16" hot rolled steel bar; chromate treated and zinc-plated; through-bolted to base of solid color reinforced composite stile.

I. Stile Shoe shall be one-piece, 4" high, type-304, 22-gauge stainless steel with satin finish.
1. Top shall have 90° return to stile.
2. Shoe will be composed of one-piece of stainless steel and capable of being fastened (by clip) to stiles starting at wall line.

J. Head rail (Overhead Braced) shall be satin finish, extruded anodized aluminum 0.125” with anti-grip profile.

2.3 FABRICATION
A. Vandal-Resistant Hardware Option for Institutional Hardware.

PART 3 EXECUTION

3.1 EXAMINATION
A. Verify site conditions under provisions of Section 01 31 00.
B. Verify correct spacing of and between plumbing fixtures.
C. Verify correct location of built-in framing, anchorage and bracing.
D. Verify final installation will conform to the accessibility requirements including all of the clearance(s) and door swings.

3.2 INSTALLATION
A. Provide solid backing inside partitions to receive work specified under this section.
B. Install partitions secure, rigid, plumb and level in accordance with manufacturer's instructions.
C. Install to maintain a ⅜" to ½" space between the wall and panels, and between the wall and end pilasters.
D. Attach panel brackets securely to walls using anchor devices.
E. Attach panels and pilasters to brackets with tamper proof through bolts and nuts.
1. Locate head rail joints at pilaster centerline.

F. Anchor urinal screen panels to walls with two panel brackets and vertical upright consisting of pilaster anchored to floor and ceiling.

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G. Provide adjustment of floor variations with screw jack through steel saddles integral with pilaster.
   1. Conceal floor fastenings with pilaster shoes.
H. Equip each door with continuous hinges, one door latch, and bumper and out-swinging door shall have a pull.
I. Install door strike and keeper place a door bumper on each pilaster in alignment with door latch.
J. Field touch-up of scratches or damaged finish are not acceptable.
K. Replace damaged or scratched materials with new materials.

3.3 ERECTION TOLERANCES

A. Install with a maximum variation from true position of ¼".
B. Install with a maximum variation from plumb of ⅛".

3.4 ADJUSTING

A. Adjust work under provisions of Section 01 77 00.
B. Adjust and align hardware to uniform clearance at vertical edges of doors, not to exceed 3/16".
C. Adjust hinges to position doors in partial opening position when unlatched except for doors to accessible stalls.
   1. Return out-swinging doors to closed position.
D. Adjust adjacent components for consistency of line or plane.

END OF SECTION

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SECTION 10 21 23
CUBICLE CURTAINS

PART 1 GENERAL

1.1 RELATED DOCUMENTS
- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division-1 specification section, apply to work of this section.

1.2 SECTION INCLUDES
- A. Overhead metal curtain track and guides
- B. Curtains

1.3 REFERENCES
- A. ASTM E84 – Standard Test Method for Surface Burning Characteristics of Building Materials
- B. NFPA 701 - Fire Tests for Flame Resistant Textiles and Films
- C. UL (Underwriters Laboratories, Inc.) - Flammability Test 214

1.4 SYSTEM DESCRIPTION
- A. Track: Surface mounted.

1.5 PERFORMANCE REQUIREMENTS
- A. Track: Support vertical test load of 50 lbs without visible deflection of track or damage to supports or ceilings.
- B. Track Size: Safely support moving loads.
- C. Track and Mounting: Sufficiently rigid to resist visible deflection and without permanent set.

1.6 SUBMITTALS
- A. Submit under provisions of Section 01 33 00.
- B. Provide shop drawings indicating a reflected ceiling plan view of curtain track, hangers and support points, attachment details and schedule of curtain sizes.
- C. Product Data: Provide data for curtain fabric characteristics and flame-smoke rating.
- D. Samples: Submit two fabric samples illustrating fabric color.
- E. Submit 12" x 12" sample patch of curtain cloth with representative hemstitch detail, heading with reinforcement, and carrier attachment to curtain header.
- F. Submit 12" sample length of curtain track including typical splice and wall and ceiling hanger and escutcheon.
- G. Manufacturer's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention.

1.7 MAINTENANCE DATA
- A. Submit under provisions of Section 01 77 00.
- B. Maintenance Data: Include recommended cleaning methods and materials and stain removal methods. Note cleaning methods deleterious to maintaining low flammability standards.

1.8 REGULATORY REQUIREMENTS
- A. Conform to applicable code and NFPA 701 for flame/smoke rating requirements in accordance with ASTM E84 for curtain fabric.

1.9 DELIVERY, STORAGE, AND HANDLING
- A. Deliver, store, protect, and handle products to site under provisions of Section 01 60 00.
- B. Accept curtain materials on site and inspect for damage.

1.10 FIELD MEASUREMENTS
- A. Verify that field measurements are as indicated on shop drawings.

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PART 2 PRODUCTS

2.1 TRACK MATERIALS

A. Provide a track of extruded aluminum sections one piece per cubicle track run.
B. Track ends stops, tees, and Y's switches to fit track section.
C. Wand is an aluminum hollow section, attached to lead carrier, for pull-to-close action.
D. Provide clear satin anodized finish exposed track surfaces.

2.2 CURTAIN MATERIALS

A. Provide a closed weave nylon curtain with, anti-bacterial, self-deodorizing, sanitized, preshrunk, and flame proofed to UL 214 or NFPA 701.
B. Color selected from manufacturer's standard range by Architect/District Coordinator.
C. Provide open mesh cloth with a fully edge bound, open weave to permit air circulation; flameproof material, of the same color as curtain, 18" to 24" width at top of curtain.

2.3 CARRIERS AND HARDWARE

A. Nylon axle and wheel carriers with nickel-plated brass beaded chain and polished aluminum hook.
B. Provide curtain carriers of nylon roller accurately fitting the track; designed to eliminate bind when curtain is pulled, fitted to curtain to prevent accidental curtain removal.

2.4 FABRICATION

A. Manufacture curtains of one piece, sized 10% wider than track length.
    1. Terminate curtain 15" from floor.
B. Include open mesh cloth at top of curtain for room air circulation.
C. Curtain Heading:
    1. Triple thickness 2" wide, with metal grommet holes for carriers at 6" oc; double fold bottom hem 2" wide included lead weights.
    2. Lock stitch seams in two rows.
    3. Turn seam edges and lock stitch.
D. Fabricate track bend with minimum 12" radius, without deforming track section, or impeding movement of carriers.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that surfaces and above ceiling supports are ready to receive work.
B. Do not anchor track to finish ceiling unless properly designed to accommodate stresses encountered during curtain operation.

3.2 INSTALLATION

A. Install curtain track secure and rigid, true to ceiling line.
B. Install end cap and stop device.
C. Secure track to ceiling system.
D. Install curtains on carriers ensuring smooth operation.

END OF SECTION

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SECTION 10 22 13
WIRE MESH/CHAIN LINK PARTITIONS

PART 1 GENERAL

1.1 RELATED DOCUMENTS
- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 specification section, apply to work of this section.
- B. Section 32 31 13 Chain Link Fencing & Gates

1.2 SECTION INCLUDES
- A. Wire mesh or chain link partitions and systems for walls
- B. Access door/gate

1.3 REFERENCES
- A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel
- B. ASTM A123/A123M – Standard Specification for Zinc (Hot-Dipped Galvanized) Coatings on Iron and Steel Product
- C. ASTM A167 – Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet and Strip
- D. ASTM A500/A500M – Standard Specification for Cold-formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes
- E. ASTM A501 – Standard Specification for Hot-formed Welded and Seamless Carbon Steel Structural Tubing
- F. ASTM A510/A510M – Standard Specification for General Requirements for Wire Rods and Course Round Wire, Carbon Steel
- G. ASTM A580/A580M – Standard Specification for Stainless Steel Wire
- H. ASTM A653/A653M – Standard Specification Sheet Steel, Zinc-Coated (Galvanized) by the Hot Dip Process, Structural or Zinc-Iron Alloy-Coated (Galvannealed)
- I. ASTM A794/A794M - Standard Specification for Commercial Steel (CS), Carbon (0.16% Maximum to 0.25% Maximum), Cold Rolled
- J. AWS D1.1 - Structural Welding Code
- K. SSPC (Steel Structures Painting Council) - Painting Manual

1.4 DESIGN REQUIREMENTS
- A. Design partitions 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 clearance of intended openings.
- C. Design partitions to resist the anticipated or potential lateral loads but not less than 10 psf.
- D. Design gates with locking mechanism that allows egress from a partitioned area at any time.
- E. Increase framing sizes for partitions exceeding 12'0" in height.

1.5 SUBMITTALS
- A. Submit under provisions of Section 01 33 00.
- B. Shop Drawings:
  1. Indicate plan and vertical dimensions, elevations, component details; head, jamb, and sill details; location of hardware.
  2. Provide component details, framed openings, bearing, anchorage, loading, welds, type, and location of fasteners, and accessories or items required of related work.
- C. Product Data: Provide data for screen materials and finishes.
  1. Any expanded metal used for partitions must be completely smooth and free of sharp edges.
- D. Samples:
  1. Submit two samples, illustrating screen material.

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2. Submit samples of hinge, latch set illustrating style, color, and finish.
3. Incorporate sample into the work.

E. Manufacturer's Installation Instructions: Indicate special procedure, perimeter conditions requiring special attention.

1.6 QUALIFICATIONS

A. Manufacturer:
B. Company specializing in the manufacturing products specified in this section.
C. Minimum 3-years documented experience and complies with the standards of the Woven Wire Products Association.

1.7 FIELD MEASUREMENTS

A. Verify that field measurements are as shown on shop drawings.

PART 2 PRODUCTS

2.1 MATERIALS

A. Framing Members meeting the requirements of ASTM A36/A36M formed steel sections.
B. Woven Wire Screen: ASTM A510/A510M uncoated crimped steel wires; conforming to the following:
1. Warp and Fill Wire Size: 10-gauge (.135”)
2. Mesh Size: Maximum 2 x 2 inch
3. Mesh Weave Design: Plain weave, inter-crimp design, diamond
4. Channel framing: Minimum 1/8" thick
5. Maximum 5'0" panel width
C. Provide welding materials meeting the requirements of AWS D1.1.
D. See Section 32 31 13 Chain Link Fencing & Gates for requirements on galvanized chain link.

2.2 FASTENERS

A. Bolts, Nuts and Washers shall be unfinished, or as recommended by manufacturers.
B. Provide power driven anchorage devices:
C. Exposed Mechanical Fasteners, provide flush, countersunk screws or bolts unobtrusively located and consistent with design of structure with vandal proof heads for exterior side.

2.3 ACCESSORIES

A. Bracing: Provide formed or cold-rolled sheet steel, thickness determined for conditions encountered, and same finish as framing members.
B. Plates, Gussets, Clips: Provide formed sheet steel, thickness determined for conditions encountered, manufacturer's standard shapes, same finish as framing members.
C. Capping Bar: Provide minimum 2" x 1" cold-rolled channel.
D. Main Framing: Provide minimum 1" x ½" x 1/8" cold-rolled on formed channel.
E. Shop and Touch-Up Primer shall be SSPC 15, Type 1, red-oxide.

2.4 DOORS AND HARDWARE

A. Doors: Doors shall be swing type, 3' x 7' unless otherwise noted, bended on all four sides with minimum 1/8" thick steel bar.
B. Hinges: Provide the manufacturer’s standard.
C. Latch Sets/Locks: Mortised with cylinder type lock, exterior keyed and interior egress lever.

2.5 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 components required for anchorage to adjacent construction.
D. Frame openings made for penetrating mechanical and electrical components.

2.6 FINISHES

A. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
B. Prime the surfaces with one coat, except surfaces where field welding is required.

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PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that substrate surfaces and required openings are ready to receive work.

3.2 PREPARATION

A. Clean substrate surfaces.

3.3 INSTALLATION

A. Install in accordance with manufacturer's instructions and approved submittals.

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

1. Doors/gates shall operate freely without binding

C. Perform field welding in accordance with AWS D1.1.

D. After installation, touch-up field welds scratched or damaged surfaces with shop-finish.

3.4 ERECTION TOLERANCES

A. The maximum variation from plumb or level is 1/4".

B. The maximum misalignment from True Position is 1/4".

3.5 ADJUSTING

A. Adjust work under provisions of Section 01 77 00.

B. Adjust hinged doors/gates to achieve free movement.

3.6 CLEANING

A. Clean work under provisions of Section 01 77 00.

B. Remove temporary protection to pre-finished surfaces.

END OF SECTION

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SECTION 10 28 00
TOILET ACCESSORIES

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division-1 specification section, apply to work of this section

1.2 SECTION INCLUDES

A. Toilet, bath, shower, and washroom accessories

B. Grab bars

C. Attachment hardware

1.3 REFERENCES

A. ASTM A123 /A123M – Standard Specification for Zinc (Hot Dip Galvanized) Coatings on Iron and Steel Products

B. ASTM A167 – Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet and Strip

C. ASTM A269 – Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service

D. ASTM A794/A794M -Standard Specifications for Commercial Steel (CS), Carbon (0.16% Maximum to 0.25% Maximum), Cold-Rolled

E. ASTM B456 – Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium

F. FBC – Florida Building Code

G. NAMN – National Association Architectural Metal Manufacturers

1.4 SUBMITTALS

A. Submit under provisions of Section 01 33 00.

B. Product Data: Provide data on accessories describing size, finish, details of function and attachment methods.

C. Samples: Submit a sample of each component illustrating color and finish.

D. Manufacturer's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention.

1.5 FIELD MEASUREMENTS

A. Verify that field measurements are as indicated on product data.

1.6 COORDINATION

A. Coordinate work under provisions of Section 01 31 00.

B. Coordinate work with the placement of internal wall reinforcement and reinforcement of toilet partitions to receive anchor attachments.

C. Coordinate placement of toilet accessories with accessibility standards.

PART 2 PRODUCTS

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2.1 MATERIALS

A. Sheet Steel: ASTM A794/A794M

B. Stainless Steel Sheet: ASTM A167, Type 304

C. Tubing: ASTM A269, stainless steel

D. Adhesive: Two-component epoxy type, waterproof

E. Fasteners, Screws, and Bolts: Hot dip galvanized tamper-proof and security type.

F. Expansion Shields: Provide fiber, lead, or rubber as recommended by accessory manufacturer for component and substrate.

2.2 MANUFACTURERS

A. The products of Bobrick Washroom Equipment will set the standard of performance.

B. Equal products by the following manufacturers may be substituted:
   1. AJ Washroom Accessories
   2. American Specialties
   3. Gamco
   4. Bradley Corporation
   5. Georgia Pacific
   6. Other Architect/Owner approved equals.

2.3 FABRICATION

A. Weld and grind joints of fabricated components, smooth.

B. Form exposed surfaces from single sheet of stock, free of joints.
   1. Form surfaces flat without distortion.
   2. Maintain flat surfaces without scratches or dents.

C. Fabricate grab bars of tubing, free of visible joints, return to wall with end attachment flanges.
   1. Form bar with 1½" clearance from wall surface.
   2. Knurl grip surfaces.

D. Shop assembled components and package complete with anchors and fittings.

E. Provide steel anchor plates, adapters, and anchor components for installation.

2.4 KEYING

A. Supply four keys for each accessory to Owner.

B. Provide a master-key system for all accessories.

2.5 FINISHES

A. Galvanizing per ASTM A123/A123M to 1.25-oz/sq yd for ferrous metal and fastening devices.

B. Shop Primed Ferrous Metals: Pre-treat and clean, spray apply one coat primer and bake.

C. Enamel: Pre-treat to clean condition, apply one-coat primer and minimum two-coat epoxy baked enamel.

D. Chrome/Nickel Plating: ASTM B456, Type SC 2 satin finish.

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E. Stainless Steel: No. 4 satin luster finish.

F. Back paint components where in contact with dissimilar finish material to resist electrolysis.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify site conditions under provisions of Section 01 31 00.

B. Verify that site conditions are ready to receive work and dimensions are as indicated on shop drawings and instructed by the manufacturer.

C. Verify exact location of accessories for installation.

D. If accessory locations conflict because of site conditions, notify architect for clarification.

3.2 REPARATION

A. Deliver inserts and rough in frames to site for timely installation.

B. Provide templates and rough in measurements as required.

3.3 INSTALLATION

A. Install accessories in accordance with manufacturer's instructions and Florida Building Code - Accessibility.

B. Install plumb and level, securely and rigidly anchored to substrate.

3.4 SCHEDULE

A. The following schedule is based on products manufactured by Bobrick except as otherwise indicated.

B. Equal products by companies listed in 2.2 B. of this section whose products meet or exceed these specifications are acceptable.

ACCESSORY	CATALOG NO.	DESCRIPTION
Toilet Paper Dispenser	59493	VonDrehle, - Single 12" jumbo roll surface mounted toilet tissue dispenser
Mop Rack	B-223	Surface mounted stainless steel mop holder (Provide at each Custodial Closet) 36" long unless otherwise noted.
Soap Dispenser	ProLine	DEB SBS Inc. Stainless Steel 1-liter dispenser or as approved by the Districts MP&O Department (plastic units supplied ONLY by South Florida Janitorial are pre-approved by M&PO.
Paper Towel Dispenser	GPC-54338A	Hygienic Push-Paddle Roll Towel Dispenser
Sanitary Napkin Disposal	B-254	Surface mounted feminine napkin disposal

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Mirror	B-2906 1836	Stainless steel mirror 18” x 36” (Student/Public restrooms)
Mirror	B-2906 2460	Stainless steel mirror 24" x 60"
Mirror	B-2908 2436	Tempered glass mirror 24” x 36” (Staff)
Grab Bar 1	B-6106.99 x 36"	1½" diameter peened grip horizontal grab bar with concealed mounting; stainless steel
Grab Bar 2	B-6106.99 x 42"	1½" diameter peened grip horizontal grab bar with concealed mounting; stainless steel
Grab Bar 3	B-6161.99	1½" diameter peened grip horizontal grab bar with concealed mounting; stainless steel
Grab Bar 4	B-6106.99 x 24"	1½" diameter peened grip horizontal grab bar with concealed mounting; stainless steel
Grab Bar 5	B-6106.99 x 48"	1½" diameter peened grip horizontal grab bar with concealed mounting; stainless steel
Shower Curtain and Rod	B-207	Heavy-duty shower curtain rod with concealed mounting, model No. 204-3 Vinyl shower curtain and No. 204-1 Stainless steel shower curtain hooks
Hook	B-76717	Single robe hook with concealed mounting
Folding Shower Seat	B-5181	Reversible Folding Shower Seat
Shelf	B-298 x 24"	Stainless Steel Shelf

END OF SECTION

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SECTION 10 43 00
EMERGENCY AID SPECIALTIES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Automated external defibrillator (AED) cabinets.

B. Accessories.

1.2 RELATED REQUIREMENTS

1.3 REFERENCE STANDARDS

A. ASTM E814 - Standard Test Method for Fire Tests of Penetration Firestop Systems; 2013a (Reapproved 2017).

1.4 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Provide color and finish, anchorage details, and installation instructions.

C. Shop Drawings: Indicate locations of cabinets and cabinet physical dimensions.

D. Manufacturer's Installation Instructions: Indicate special criteria and wall opening coordination requirements.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Emergency Aid Cabinets and Accessories:

1. Basis of Design: Activar Construction Products Group, Inc. - JL Industries; LifeStart 1400 Series AED Cabinet Model 1412: www.activarcpg.com/#sle.
2. Substitutions: See Section 01 60 00 - Material Equipment and Approved Equals.

2.2 EMERGENCY AID CABINETS

A. Type: Automated external defibrillator (AED).

B. Cabinet Construction: Non-fire-rated.

1. Formed primed steel sheet; 0.036 inch thick base metal.

C. Cabinet Configuration: Semi-recessed type.

1. Wall Opening dimensions of 15 inch wide by 15 inch high by 3-1/8 inch deep.
2. Trim: 4 inch rolled edge.
3. Provide cabinet enclosure with right angle inside corners and seams, and with formed perimeter trim.
4. Meet 4 inch maximum ADA projection requirement.

D. Door: 0.036 inch metal thickness, reinforced for flatness and rigidity with recessed pull. Hinge door for 180 degree opening with continuous piano hinge; Full Glazing.

E. Door Glazing: Acrylic plastic, clear, 1/8 inch thick, minimum, flat shape and set in resilient channel glazing gasket.

F. Cabinet Mounting Hardware: Appropriate to cabinet, with predrilled holes for placement of anchors.

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G. Fabrication: Weld, fill, and grind components smooth.

H. Finish of Cabinet Exterior Trim and Door and Interior: White powder coat.

2.3 ACCESSORIES

A. Theft Alarm: Battery operated audible alarm, 85 dB with keyed on/off switch on the door.

B. Plastic Wall Signage: Tent style.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify rough openings for cabinet are correctly sized and located.

3.2 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install cabinets plumb and level in wall openings, secure rigidly in place.

C. Wall Signs:

1. Location: Where shown.
2. Apply on walls after field painting is completed and has been accepted.

3.3 ADJUSTING AND CLEANING

A. Remove temporary protective coverings and strippable films, if any, as cabinets are installed unless otherwise indicated in manufacturer's written installation instructions.

B. Adjust cabinet doors to operate smoothly without binding. Verify that alarms and integral locking devices operate properly.

C. On completion of cabinet installation, clean interior and exterior surfaces as recommended by manufacturer.

D. Touch up marred finishes. Replace cabinets that cannot be restored to factory-finished appearance. Use materials and procedures recommended by cabinet manufacturer.

END OF SECTION

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SECTION 10 71 13.43
FIXED SUN SCREENS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Shop fabricated, extruded aluminum sunshades to be mounted on structure.

1.2 RELATED REQUIREMENTS

A. General Conditions, special provisions and sections in Division 1 of these specifications.

B. Section 05 5000 - Metal Fabrications.

C. Section 10 73 26 - Walkway Coverings.

1.3 REFERENCE STANDARDS

A. ASCE 7 - Minimum Design Loads for Buildings and Other Structures; 2010, with 2013 Supplements and Errata.

B. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum; 2014 (2015 Errata).

C. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength; 2014 (Editorial 2017).

D. ASTM A792/A792M - Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process; 2023.

E. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2014.

F. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric); 2014.

G. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2014.

H. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2013.

I. ASTM F593 - Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs; 2017.

1.4 SUBMITTALS

A. Shop Drawings: Prior to commencement of fabrication, submit detailed shop drawings, showing all profiles, sections of all components, finishes, fastening details, and manufacturer's technical and descriptive data. Include field dimensions of openings and elevations on shop drawings.

B. Delegated Design Data: Submit comprehensive structural analysis of design for the specified loads. Include wind load and defletion calculations, summary of forces and loads on walls and jambs, signed and sealed by an Engineer registered in the State of Florida.

C. Samples: 10 inches by 10 inches minimum illustrating design, workmanship and finish color.

D. Delegated Designer's Qualification Statement.

1.5 QUALITY ASSURANCE

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A. Delegated Designer Qualifications: Perform structural design under direct supervision of a Professional Engineer experienced in design of this type of work licensed in the State of Florida.

B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with no less than five years of documented experience.

C. Installer Qualifications: Company specializing in performing the work of this section.
   1. With minimum five years of documented experience.
   2. Approved by manufacturer.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to project site ready for erection.

B. Package using methods that prevent damage during shipping and storage on site.

C. Store materials under cover and elevated above grade.

PART 2 PRODUCTS

2.1 SUN SCREENS

A. Aluminum Sunshades: Shop fabricated, shop finished, extruded aluminum units free of defects impairing strength, durability or appearance.
   1. Configuration: As indicated on drawings.
   2. Design Criteria: Design and fabricate to resist the following loads without failure, damage, or permanent deflection:
      a. Design Wind Loads: Comply with requirements of FBC and ASCE 7.
         1) Refer to Structural drawings.
      b. Thermal Movement: Plus/minus 1/8 inch, maximum.
   3. Sizes: As indicated on drawings.
   4. Exposed Aluminum Finish: Class I natural anodized .
   5. Provide a complete system ready for erection at project site.
   6. Shop fabricate to the greatest extent possible; disassemble if necessary for shipping.

2.2 MATERIALS

A. Aluminum Extrusions: ASTM B209 (ASTM B209M) or ASTM B221 (ASTM B221M).

B. Aluminum Coated Steel Sheet: ASTM A792/A792M.

C. Concealed Structural Supports: Aluminum, or steel coated for corrosion resistance and dissimilar metal isolation.

D. Fasteners: ASTM F593 stainless steel or ASTM A307 carbon steel.

2.3 FINISHES

A. Class I Natural Anodized Finish: AAMA 611 AA-M12C22A41 Clear anodic coating not less than 0.7 mils thick.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine substrates and site area for conditions that might prevent satisfactory installation.

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B. Verify that dimensions of supporting structure are within plus/minus 1/8 inch of dimensions indicated on shop drawings.

C. Verify that all adjacent painting, roofing, masonry work, and other work that might damage sun screen finish has been completed prior to installation of sun screens.

D. Do not install until after all adjacent painting, roofing and masonry have been completed.

E. Do not proceed with installation until all conditions are satisfactory.

3.2 INSTALLATION

A. Install in accordance with manufacturer's installation instructions.

B. Set units level, plumb, with uniform joints, and aligned with building elements.

C. Separate dissimilar metals using concealed bituminous paint or non-absorbent gasket.

D. Anchor units to structure as indicated on drawings.

E. Do not cut or trim aluminum members without approval of manufacturer; do not install damaged members.

3.3 TOLERANCES

A. Maximum Variation from Level: Plus/Minus 1/8 inch.

3.4 CLEANING

A. Clean exterior surfaces units of dust and debris; follow manufacturer's cleaning instructions for the finish used.

3.5 PROTECTION

A. Protect units after installation to prevent damage due to other work until Date of Substantial Completion.

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SECTION 10 44 00
FIRE PROTECTION SPECIALITIES

PART 1 GENERAL

1.1 SUMMARY
- A. The Work required under this Section consists of all labor, material and related items necessary to complete the Work, including:
  1. Fire extinguishers
  2. Fire blankets
  3. Cabinets
  4. Accessories

1.2 RELATED DOCUMENTS
- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and General Requirements (Division 1) apply to work in this section
- B. Section 01 77 00 - Contract Closeout
- C. Section 01 33 00 – Submittals Procedures

1.3 QUALITY ASSURANCE
- A. Conform to NFPA 10 requirements for all portable fire extinguishers and fire blankets.
- B. Use skilled workers thoroughly trained and experienced in the crafts and are familiar with the specifications and the methods needed for proper performance of the work in this section.
- C. Provide fire extinguishers, cabinets, fire blankets, and accessories by single manufacturer.
  1. The identification of the listing and labeling organization, the fire test, and the performance standard that the fire extinguisher meets or exceeds shall be clearly marked on each fire extinguisher.

1.4 REFERENCES
- A. UL 92-Fire Extinguisher & Booster Hose
- B. UL 154 – Carbon-Dioxide Fire Extinguishers
- C. UL 299 – Dry Chemical Fire Extinguishers
- D. UL 626 – Water Fire Extinguishers
- E. UL 711 - Rating and Fire Testing of Fire Extinguishers
- F. UL 1093 – Standard for Halogenated Agent Fire Extinguishers
- G. NFPA 10 – Standard for Portable Fire Extinguishers
- H. NFPA 2001, Standard on Clean Agent Fire Extinguishing Systems
  1. Portable fire extinguishers used to comply with this standard shall be listed and labeled and meet or exceed all the requirements of Fire Test Standards UL 711
- I. FBC - Florida Building Code
- J. FFPC - Florida Fire Prevention Code

1.5 SUBMITTALS
- A. Submittals for review
  1. Shop Drawings: Indicate cabinet physical dimensions, rough-in measurements for recessed cabinets, wall bracket mounting measurements, and locations.
     a. Dimension drawings to depict the space required for these items, and their interface with the work of other trades.
  2. Product Data:
     a. Provide extinguisher operational features, color, and finish, anchorage details.
     b. Manufacturer's brochure, specifications, and other data needed to prove compliance with the specified requirements.

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c. Manufacturers recommended installation procedures, which will become the basis for accepting or rejecting actual installation procedures used on the Work.
d. Manufacturer's Installation Instructions: Indicate special criteria and any wall opening coordination requirements.

B. Submittals at project closeout
1. Maintenance Data: Include test, refill, or recharge schedules and re-certification requirements.

1.6 REGULATORY REQUIREMENTS
A. Conform to referenced code for requirements for extinguishers, fire blankets, and cabinets.

PART 2 PRODUCTS

2.1 MANUFACTURERS
A. The following manufacturers shall be considered, providing their product equals or exceeds the quality specified; and they can provide products of the type, size, function, and arrangement required:
1. Larsen's Manufacturing Co. http://www.larsensmfg.com
2. Potter Roemer http://www.potterroemer.com
3. J.L. Industries, Inc. http://www.jlindustries.com
B. Other manufacturer's product may be considered.
1. The “Substitution Request Form” and complete technical data for evaluation must accompany requests for Architect’s approval.
2. All materials for evaluation must be received at least 10 days prior to bid due date.

2.2 EXTINGUISHERS
A. Multi-purpose Dry Chemical Type: UL 299, Enameled steel tank with pressure gauge size and classification as scheduled, or if not scheduled, provide 2A-10BC units.
B. Water Type: UL 626, Stainless steel tank pressurized, including hose and nozzle, size and classification as scheduled, or if not scheduled, provide 2A units.
C. Wet Chemical Foam Type: UL 299, designed to meet K class listing, Stainless steel tank with pressure gage, size and classification as scheduled.
D. Carbon Dioxide Type: UL 154, Stainless steel tank with pressure gage size and classification as scheduled, or if not scheduled, provide 10-BC units.
E. Halogenated Type: UL 1093, Halotron 1, Stainless steel tank with pressure gage, size, and classification as scheduled, or if not scheduled, provide 10BC units.
F. Extinguisher Finish:
1. Multi-purpose units: Provide heavy-duty, DOT steel cylinders with corrosion and impact resistant polyester/epoxy paint finish.
2. Gaseous and wet chemical units: Provide stainless steel, satin chrome finish.

2.3 CABINETS
A. Metal: Use a formed sheet steel, galvanized 18-gage thick base metal.
B. Configuration: Recessed or semi-recessed type, per drawing details and locations, sized to accommodate required extinguishers, combination fire extinguisher and fire blanket cabinet and accessories.
C. Trim Type: flush for recessed cabinets, rounded corners for semi-recessed or surface mounted unit.
D. Door: 18-gauge thick, reinforced for flatness and rigidity; latch with full glass access.
E. Door Glazing: Use clear plastic, 1/8" thick acrylic.
F. Cabinet Mounting Hardware: Appropriate to cabinet and extinguisher size and weight.

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G. Form cabinet enclosure with right angle inside corners and seams.
   1. Form perimeter-trim and door stiles.
H. Pre-drill the unit for anchors and accessories.
I. Hinge doors for 180° opening with continuous piano hinge.
   1. Provide nylon catch.
J. Weld, fill, and grind components smooth.
K. Glaze doors with resilient channel gasket glazing.
L. Cabinet Exterior Trim and Door Finish: Satin chrome finish with red, silk-screened verbiage “FIRE EXTINGUISHER”.
M. -Cabinet interior finish shall be White enamel.

2.4 ACCESSORIES
A. Fire Blanket: Fire retardant treated wool red color 62 x 84 inch size.
B. Extinguisher Brackets: Formed steel chromed finish.
C. Use silk-screened graphic identification.

PART 3 EXECUTION

3.1 INSPECTION:
A. Verify all rough openings, dimensions and clearances are the correct size and in the correct location prior to installation.
B. Examine the areas and conditions of the work in this Section.
   1. Correct conditions detrimental to timely and proper completion of the Work.
   2. Do not proceed until unsatisfactory conditions are correct.
C. Verify servicing, charging and tagging of all fire extinguishers.

3.2 INSTALLATION
A. Provide occupancy hazard protection with fire extinguishers suitable for such Class A, B, C, D, or K fire potentials as might be present and shown on the drawings and schedules.
B. On each floor level, install fire extinguishers in accordance with NFPA 10.
C. Coordinate as required with other trades to assure proper and adequate provision in the work of those trades for interface with the work of this Section.
D. Install cabinets plumb and level in wall openings in strict accordance with NFPA 10, the original design, the approved Shop Drawings and the manufacturer's recommended installation procedures as approved by the Architect and authorizing agencies, anchoring all components firmly into position for long life under hard use.
   1. Secure rigidly in place.
E. Do not install extinguishers until Substantial Completion inspection date.
   1. Place extinguishers and accessories in cabinets or on wall brackets.
F. Inspection tags shall be current as of the date of Substantial Completion and good for 1-year.

END OF SECTION

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SECTION 10 51 00
GENERAL/CORRIDOR LOCKERS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. The provisions of the General Conditions, Supplementary Conditions, and the Sections included under Division 1, General Requirements, are included as a part of this Section.

1.2 SUMMARY

A. The Work required under this Section consists of new lockers and related items necessary to complete the Work, including:
   1. Wardrobe locker units with hinged doors
   2. Metal tops and filler panels
   3. Locker accessories
   4. At least one of each type of locker unit shall be accessible to the physically disabled.

B. Related Work Specified Elsewhere
   1. Section 03 30 00 - Cast-in-Place Concrete for concrete locker base

C. Refer to Section 01 20 00 for Alternates that may affect the Work of this Section.

1.3 REFERENCES

A ASTM A653/A653M – Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy coated (Galvannealed) by the Hot-Dip Process.

B FBC – Florida Building Code

C NAAMN – National Association Architectural Metal Manufacturers

1.4 SUBMITTALS

A. Submittals for review see Section 01 33 00.

B. Submit product data indicating construction details, material descriptions, dimensions of individual components and profiles and finishes for each type of locker.

C. Submit shop drawings prior to fabrication.
   1. Shop drawings shall indicate locker plan layout, type of material, gauges of metal, reinforcement, filler, finishing strips, and other details of construction.
   2. They shall show methods and details of attachment, layout of the lockers, and devices furnished by others.
   3. Provide locker-numbering system unless otherwise indicated; shop drawings shall identify the locations where each series is to be installed.

D. Submit samples of manufacturer's standard colors.

E. Submittals for information see Section 01 33 00.

F. Provide the manufacturer's installation instructions indicating component installation and assembly.

1.5 DELIVERY, STORAGE, HANDLING, AND PROTECTION

A. Section 01 60 00 - Material Equipment and approved equals: Transport, handle, store and protect products.

B. Do not deliver lockers until spaces to receive them are clean, dry, and ready for locker installation.

C. Protect lockers from damage during delivery, handling, storage, and installation.

D. Deliver master keys, control keys, and combination control charts to owner.

E. Protect locker finishes and adjacent surfaces from damage after installation until final acceptance.

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1.6 COORDINATION
A. Coordinate sizes, locations, and layout of concrete and metal bases.

PART 2 PRODUCTS

2.1 MANUFACTURERS
A. The following manufacturers shall be considered, as equals or exceeds the quality specified; and they can provide products of the type, size, function, and arrangement required:
1. Superior, List Industries, Inc., Deerfield Beach, Florida
2. Lyon Metal Products, Aurora, Illinois
3. Republic Storage Systems Co., Canton, Ohio
4. Penco Products, Inc., Skippack, Pennsylvania
5. ASI Storage Solutions Inc., Eastanollee, Georgia
6. AMP, Storage Craft, Apopka, FL
7. Patterson Pope, West Palm Beach, FL
8. Or approved equal
B. Following is the procedure for obtaining approval of products other.
1. The “Substitution Request Form” and complete technical data for evaluation must accompany requests for Architect’s approval.
2. All materials for evaluation must be received at least 10 days prior to bid due date.
3. Architect shall issue addendum for additional approved manufacturers.

2.2 LOCKER TYPES
A. Refer to the Drawings for the various types, sizes, and locations of lockers required.
B. Provide at least 2% of each type to comply with the Florida Accessibility Code.

2.3 MATERIALS
A. Sheet Steel: ASTM A653/653M, galvanized G90, stretcher leveled; to the following minimum thicknesses:
1. Body, backs and sides: 16-gauge
2. Shelf: 16 gauge
3. Door with louvers: 14-gauge
4. Door Frame: 16-gauge
5. Hinges: 13-gauge seven knuckle
6. Alternate hinge: (2") 18-gauge CRS 5-knuckle full loop
7. Sloping Top: 16-gauge
8. Trim: 16-gauge
9. Back: 18-gauge
10. Boxed End Panels 16-gauge

2.4 ACCESSORIES
A. Hooks:
1. Manufacturer's standard zinc plated ball pointed steel.
2. Provide one double prong ceiling hook
3. Attach hooks with at least 2 fasteners.
4. Provide galvanized steel rod in lieu of ceiling hook for lockers 18" deep or greater.
B. Each locker opening shall have an ADA compliant aluminum number plate with 5/8" high-embossed numerals, attached in the center near top of door with 2 aluminum rivets.
C. Continuously Sloping Tops:
1. Manufacturer's standard, fabricated from minimum 16-gauge steel sheet for installation over lockers with separate flat tops.
2. Fabricate tops in lengths as long as practicable, without visible fasteners at splice locations finished matching lockers.
3. Provide fasteners, filler plates, supports, and closures as follows:
a. Closures: Vertical end type
b. Sloped top corner fillers, mitered.

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D. Recess Trim:
   1. Manufacturer's standard fabricated from minimum 18-gaue steel sheet minimum 2½" face width and finished to match lockers.
   2. Fabricate trim in lengths as long as practicable.
E. Filler Panels:
   1. Manufacturer's standard fabricated from minimum 18-gauge steel sheet in an unequal leg angle shape and finished to match lockers.
   2. Provide slip joint filler angle to receive filler panel.
F. Boxed End Panels: Manufacturer's standard fabricated from minimum 16-gauge steel sheet with 1" wide edge dimension finished to match lockers and designed for concealing exposed ends of non-recessed lockers.

2.5 FABRICATION

A. Locker Units:

1.	Width:	Sizes as shown on the drawings
2.	Depth:	Sizes as shown on the drawings
3.	Height:	Sizes as shown on the drawings
4.	Configuration:	Configuration as shown on the drawings
5.	Mounting:	Surface (curb) mounted
6.	Base:	A 4" high 16-gauge sheet steel to match lockers in areas of no concrete curb
7.	Locking:	Provide for owner supplied padlock system. Locking mechanism shall engage frame at least one point for four or more tier units, two points for two or three tier units and three points for single tier units. 2% of lockers shall have ADA acceptable locking device.
8.	Ventilation	Standard top and bottom door louvers, required by locker height or the drawings.

B. Form and flange the locker body with steel stiffener ribs that are electrically spot-welded or riveted.
C. Frames formed channel shape, welded and ground flush, welded, or riveted to body, resilient gaskets and latching for quiet operation.
D. Doors: One-piece steel with vertical edges formed to channel shape and horizontal edges formed to angle shape; welded construction, grind, and finish edges smooth.
E. Hinges: Two for doors under 42" high; three for doors over 42" high; weld or riveted securely to locker frame and door.
F. Fabricate lockers square, rigid, and without warp, with metal faces flat and free of dents or distortion.
   1. Make exposed metal edges free of sharp edges and burrs, and safe to touch.
   2. Weld frame members together to form a rigid, one-piece assembly.
   3. Form locker body panels, doors, shelves, and accessories from one-piece steel sheet, unless otherwise indicated.
G. Form recess of operating handle and locking device. Provide operating mechanisms for the physically disabled as required herein.
H. Shop fabricated sloped metal tops, ends, and closure pieces.

2.6 FINISHES

A. Finish all steel surfaces and accessories, except pre-finished stainless steel and chrome plated surfaces.
B. Comply with NAAMM "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
C. Clean, degrease, and neutralize metal; prime and finish with one coat of baked enamel.
D. Baked Enamel Finish:
   1. Immediately after cleaning and pre-treating the unit, apply manufacturer's standard baked enamel finish consisting of a thermosetting topcoat.

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2. Comply with paint manufacturers written instructions for applying and baking to achieve a minimum dry film thickness of 1.4 mils on doors, frames, bases, and legs, and 1.1 mils elsewhere.

E. Color: As selected by Architect from manufacturer's standard range.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that bases are in correct position, configuration, and level.

B. Verify the bases and embedded anchors are proper per the manufacturer's shop drawings.

3.2 INSTALLATION

A. Install the Work level, plumb, true, and flush in strict accordance with the manufacturer's specifications, instructions, and recommendations.
   1. This shall include the proper assembly of lockers and their installation in accurate position and alignment.
   2. Properly install and draw tight screws and other assembly devices.
   3. Install end panels and filler plates to complete each section of the assembly.
   4. Install finishing strips required to bring the completed assembly into proper finished condition.

B. Connect groups of all welded lockers together with standard fasteners, with no exposed fasteners on face frames.

C. Securely anchor lockers to curbs, floors, and walls at intervals recommended by manufacturer, but not more than 36" oc.
   1. Install anchors through backup reinforcing plates where necessary to avoid metal distortion, using concealed fasteners.
   2. Lockers shall be leveled with concealed cedar shims, where necessary, to provide for irregularities in the base.
   3. Secure lockers with anchor devices to suit substrate materials, minimum pullout force 100-lb
   4. Bolt adjoining locker units together to provide rigid installation.

D. Fit exposed connections of trim, fillers, and closures accurately together to form tight, hairline joints, with concealed fasteners and splice plates.
   1. Attach recess trim to recessed lockers with concealed clips.
   2. Attach sloping top units to lockers, with closures at exposed ends.

E. Attach boxed end panels with concealed fasteners to conceal exposed ends of non-recessed lockers.

F. Install accessories to provide a neat, finished, functional installation.

G. Replace components that do not operate smoothly or properly.

3.3 FIELD QUALITY CONTROL

A. Protect all new (and existing, if adjacent) lockers installed from scratches or other imperfections or defects up until the time of final acceptance of the building.

B. Replace any defective work of material occurring prior to final acceptance of the building, when requested by the Architect, without additional cost to the Owner.

3.4 APPEARANCE

A. Variations in appearance of abutting or adjacent pieces are acceptable if they are within 1/2 of the range of approved samples.

B. Noticeable variations in the same piece are not acceptable.

C. 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.

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3.5 CLEANING

A. Protect all new (and existing, if adjacent) lockers installed against scratches or other imperfections or defects up until the time of final acceptance of the building.

B. Replace any defective work occurring prior to final acceptance of the building, when requested by the Architect, without additional cost to the Owner.

END OF SECTION

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SECTION 10 56 13
METAL SHELVING

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Documents affecting work of this section include but are not limited to, General Conditions, special provisions and sections in Division I of these specifications.

1.2 DESCRIPTION OF WORK

A. The work required under this Section consists of furnishing and installing items, their accessories, and necessary mounting and installation hardware as indicated on the drawings as specified herein for a complete and finished product.

1.3 SUBMITTALS

A. Submit shop drawings and manufacturer literature in accordance with requirements of Section 01 33 00, Submittals.

B. Shop drawings shall indicate the model number, type of material, gauges, or thickness of metal finishes, and details of construction and attachment.

PART 2 PRODUCTS

2.1 MANUFACTURER

A. Shelving units shall be the products of Tri-Boro Shelving and Partition Corporation, Farmville, Virginia; or equal products as noted below.

B. Equal products by:

1. Lyon Metal Products, Aurora, IL
2. Penco Products, Inc., Skippack, PA
3. Republic Storage Systems, LLC, Canton, Ohio
4. List Industries Inc, Deerfield Beach, FL
5. Patterson Pope, West Palm Beach, FL
6. Other District and Architect pre-approved equals

2.2 MATERIALS

A. Floor Supported Closed Metal Shelving (MS) and Wall Mounted Closed Metal Shelving (MSS): Provide metal shelving system as shown on the drawings.

B. Shelves shall be industrial weight, class 2 reinforced 18-ga steel (min.) and capable of supporting 100 lbs/sq ft, and be adjustable.

C. Shelves shall have triple bends on all four sides.

D. Provide upright units including closed end and back panels, bracing, reinforcing, and hardware for all components.

E. Shelving unit finish - baked on enamel. Architect shall select color based on manufacturer.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install shelving units in strict accordance with the manufacturer's printed instructions, drawings and specifications, and approved shop drawings.

1. Provide additional supports or attachments required for installation.

B. Provide reinforcement of supports as required and coordinate work with other trades.

C. Locate units where shown on drawings.

END OF SECTION

SECTION 10 73 26
WALKWAY COVERINGS

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PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division-1 specification section, apply to work of this section.
   1. Section 31 20 00 – Earth Moving
   2. Section 03 11 00 – Concrete Formwork
   3. Section 03 30 00 – Cast-in-Place Concrete

1.2 SECTION INCLUDES

A. Design, fabricate, and install a welded, extruded aluminum walkway cover with protective finish and illumination of covered areas.

1.3 REFERENCES

A. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum

B. ASCE 7- - Minimum Design Loads for Building and Other Structures

C. ASTM B206/B206M – Standard Specification for Copper Nickel Zinc (Nickel Silver) Wire and Copper Nickel Alloy Wire

D. ASTM B211- Standard Specification for Aluminum and Aluminum Alloy Rolled or Cold Finished Bar, Rod and Wire

E. ASTM B221- Standard Specification for Aluminum and Aluminum Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes

F. FBC - Florida Building Code

1.4 SUBMITTALS

A. Submit shop drawings including plans, elevations, and details, with dimensions and grades, for approval by Architect.

B. Submit manufacturer's product information, specifications, and installation instructions for review by Architect.

C. Submit design calculations signed by a State of Florida Professional Engineer verifying the walkway cover system design meets wind loading requirements of ASCE 7, live and dead loads, footings and other load requirements.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store and protect products as instructed by manufacturer.

B. Promptly inspect shipment to assure the products comply with requirements, quantities are correct, and products are undamaged.

C. Stack the materials to prevent twisting, bending, or abrasion, and to provide ventilation.
   1. Slope metal sheets to ensure drainage.

D. Prevent contact with materials during storage, which may cause discoloration or staining.

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1.6 QUALITY ASSURANCE

A. Manufacturer shall be a specialist with a minimum 5-years documented experience in manufacturing product.

B. Installer shall be specialized with a minimum 5-years documented experience in erecting, applying the work, approved, and certified by manufacturer.

1.7 WARRANTY

A. Provide a 5-year warranty that shall include coverage for structural, water tightness and finish beginning the day of Substantial Completion.

PART 2 PRODUCTS

2.1 DESIGN

A. Design loads for the structure and accessories, auxiliary and collateral loads shall comply with FBC and ASCE 7.
   1. Use exposure category C, Risk Category III, for wind design.
   2. Live load = 20 pounds per sq. ft.

B. Design the structure for temperature change of 100° F.

2.2 COMPONENTS

A. Aluminum members shall be extruded aluminum alloy 6063, heat-treated to T-6 temper.

B. Columns shall be radius-cornered tubular extrusions with cutout and internal diverter for drainage.

C. Beams shall be open-top tubular extrusions; top edges thickened for strength and designed to receive deck members in a self-flashing manner.
   1. Install extruded structural ties in the top of all beams.

D. Deck shall be extruded self-flashing sections interlocking into a composite unit with sufficient camber to offset dead load deflection and cause positive drainage.
   1. Use welded plates as closures at deck ends.

E. Fascia shall be manufacturer's standard shape and a minimum 0.040 aluminum.

F. Fasteners shall be aluminum, 18-8 stainless steel, 300 series stainless steel, or 410-stainless steel with neoprene washers.

G. Protect aluminum columns embedded in concrete with clear acrylic.

H. Grout shall be 2,000-psi compressive strength; concrete 2,500-psi minimum.

I. Gaskets shall be dry seal pressure type of manufacturer's standard material.

2.3 FABRICATION

A. Beams and columns shall be factory welded with mitered corners into one-piece rigid bents.
   1. Welds shall be smooth and uniform using inert gas shielded arc, with 100% penetration.
   2. Grind welds only where interfering with adjoining structure to allow a flush connection.

B. Field welding is not permitted, use rigid mechanical joints when shipping limitations exist.

C. Deck shall be extruded modules that interlock to form a self-flash condition.

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1. Positively fasten interlocking joints at 8" on center forming a monolithic structural unit to develop the full strength of the sections.
2. Fastenings shall have minimum shear strength of 350 pounds each.
3. Assemble the deck with sufficient camber to offset dead load deflection.

2.4 FACTORY FINISH

A. Clear anodized: Class I Natural Anodized Finish: AAMA 611 AA-M12C22A41, clear anodic coating not less than 0.7 mils thick.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine the areas and conditions where installing walkway covers.

B. Notify the contractor of any unsatisfactory conditions.

3.2 ERECTION

A. Erect the walkway covers true to line, level and plumb.
   1. Protect all aluminum columns in concrete with clear acrylic to prevent electrolytic reaction.

B. Downspout columns shall have welded water diverters or other material at the discharge level to prevent standing water.
   1. Non-draining columns shall have weep-holes at concrete grade level to remove condensation.
   2. Do not allow discharge to drain across walkways.

C. Provide concrete splash blocks in size and location to prevent washout of lawn or landscape.
   1. Grade the adjacent area for water to drain away from walkways.

D. Devices, screws, bolts, and crimps shall be on topside of deck with none visible on the underside.

3.3 CLEANING

A. Clean and polish the walkway component upon completion.

3.4 PROTECTION

A. Take extra care to protect materials during and after installation.

B. Remove and replace damaged and defective members.

END OF SECTION

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SECTION 10 73 26
WALKWAY COVERINGS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division-1 specification section, apply to work of this section.
   1. Section 31 20 00 – Earth Moving
   2. Section 03 11 00 – Concrete Formwork
   3. Section 03 30 00 – Cast-in-Place Concrete

1.2 SECTION INCLUDES

A. Design, fabricate, and install a welded, extruded aluminum walkway cover with protective finish and illumination of covered areas.

1.3 REFERENCES

A. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum

B. ASCE 7- - Minimum Design Loads for Building and Other Structures

C. ASTM B206/B206M – Standard Specification for Copper Nickel Zinc (Nickel Silver) Wire and Copper Nickel Alloy Wire

D. ASTM B211- Standard Specification for Aluminum and Aluminum Alloy Rolled or Cold Finished Bar, Rod and Wire

E. ASTM B221- Standard Specification for Aluminum and Aluminum Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes

F. FBC - Florida Building Code

1.4 SUBMITTALS

A. Submit shop drawings including plans, elevations, and details, with dimensions and grades, for approval by Architect.

B. Submit manufacturer's product information, specifications, and installation instructions for review by Architect.

C. Submit design calculations signed by a State of Florida Professional Engineer verifying the walkway cover system design meets wind loading requirements of ASCE 7, live and dead loads, footings and other load requirements.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store and protect products as instructed by manufacturer.

B. Promptly inspect shipment to assure the products comply with requirements, quantities are correct, and products are undamaged.

C. Stack the materials to prevent twisting, bending, or abrasion, and to provide ventilation.
   1. Slope metal sheets to ensure drainage.

D. Prevent contact with materials during storage, which may cause discoloration or staining.

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1.6 QUALITY ASSURANCE

A. Manufacturer shall be a specialist with a minimum 5-years documented experience in manufacturing product.

B. Installer shall be specialized with a minimum 5-years documented experience in erecting, applying the work, approved, and certified by manufacturer.

1.7 WARRANTY

A. Provide a 5-year warranty that shall include coverage for structural, water tightness and finish beginning the day of Substantial Completion.

PART 2 PRODUCTS

2.1 DESIGN

A. Design loads for the structure and accessories, auxiliary and collateral loads shall comply with FBC and ASCE 7.
   1. Use exposure category C, Risk Category III, for wind design.
   2. Live load = 20 pounds per sq. ft.

B. Design the structure for temperature change of 100° F.

2.2 COMPONENTS

A. Aluminum members shall be extruded aluminum alloy 6063, heat-treated to T-6 temper.

B. Columns shall be radius-cornered tubular extrusions with cutout and internal diverter for drainage.

C. Beams shall be open-top tubular extrusions; top edges thickened for strength and designed to receive deck members in a self-flashing manner.
   1. Install extruded structural ties in the top of all beams.

D. Deck shall be extruded self-flashing sections interlocking into a composite unit with sufficient camber to offset dead load deflection and cause positive drainage.
   1. Use welded plates as closures at deck ends.

E. Fascia shall be manufacturer's standard shape and a minimum 0.040 aluminum.

F. Fasteners shall be aluminum, 18-8 stainless steel, 300 series stainless steel, or 410-stainless steel with neoprene washers.

G. Protect aluminum columns embedded in concrete with clear acrylic.

H. Grout shall be 2,000-psi compressive strength; concrete 2,500-psi minimum.

I. Gaskets shall be dry seal pressure type of manufacturer's standard material.

2.3 FABRICATION

A. Beams and columns shall be factory welded with mitered corners into one-piece rigid bents.
   1. Welds shall be smooth and uniform using inert gas shielded arc, with 100% penetration.
   2. Grind welds only where interfering with adjoining structure to allow a flush connection.

B. Field welding is not permitted, use rigid mechanical joints when shipping limitations exist.

C. Deck shall be extruded modules that interlock to form a self-flash condition.

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1. Positively fasten interlocking joints at 8" on center forming a monolithic structural unit to develop the full strength of the sections.
2. Fastenings shall have minimum shear strength of 350 pounds each.
3. Assemble the deck with sufficient camber to offset dead load deflection.

2.4 FACTORY FINISH

A. Clear anodized: Class I Natural Anodized Finish: AAMA 611 AA-M12C22A41, clear anodic coating not less than 0.7 mils thick.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine the areas and conditions where installing walkway covers.

B. Notify the contractor of any unsatisfactory conditions.

3.2 ERECTION

A. Erect the walkway covers true to line, level and plumb.
   1. Protect all aluminum columns in concrete with clear acrylic to prevent electrolytic reaction.

B. Downspout columns shall have welded water diverters or other material at the discharge level to prevent standing water.
   1. Non-draining columns shall have weep-holes at concrete grade level to remove condensation.
   2. Do not allow discharge to drain across walkways.

C. Provide concrete splash blocks in size and location to prevent washout of lawn or landscape.
   1. Grade the adjacent area for water to drain away from walkways.

D. Devices, screws, bolts, and crimps shall be on topside of deck with none visible on the underside.

3.3 CLEANING

A. Clean and polish the walkway component upon completion.

3.4 PROTECTION

A. Take extra care to protect materials during and after installation.

B. Remove and replace damaged and defective members.

END OF SECTION

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SECTION 10 75 00
FLAGPOLES

PART 1 GENERAL

1.1 RELATED DOCUMENTS
- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division-1 specification section, apply to work of this section.

1.2 SECTION INCLUDES:
- A. Aluminum flagpoles, ground mounted.

1.3 REFERENCES
- A. AASHTO M246 - Standard Specification for Steel Sheet, Metallic-Coated and Polymer Precoated, for Corrugated Steel Pipe
- B. ASTM A53/A53M – Standard Specification for Pipe Steel, Black and Hot Dipped, Zinc Coated, Welded and Seamless
- C. ASTM A123/A123M - Standard Specification for Zinc (Hot Dipped Galvanized) Coatings on Iron and Steel Products
- D. ASTM A790/A790M - Standard Specification for Seamless and Welded Ferrite/Austenitic Stainless-Steel Pipe
- E. ASTM B221 - Standard Specification for Aluminum Alloy Extruded Bar, Rod, Wire, Profiles, and Tube
- F. ASTM B241/B241M - Standard Specification for Aluminum and Aluminum Alloy Seamless Pipe and Seamless Extruded Tube
- G. CDA (Copper Development Association) – Copper in Architecture Design Handbook
- H. FBC - Florida Building Code

1.4 PERFORMANCE REQUIREMENTS
- A. Flagpole with flag flying shall resist design wind events without permanent deformation and shall conform to the Florida Building Code and NAAMM FP 1001, entitled “Guide Specifications for the Design of Metal Flag Poles”.
- B. Provide flagpole and foundation constructed to withstand the 50-year mean recurrence wind speed while flying two 5’ x 8’ flags.

1.5 SUBMITTALS
- A. Submit under provisions of Section 01 33 00.
- B. Provide engineered shop drawings indicate detailed dimensions, base details, anchor requirements, and imposed loads.
- C. Product Data: Provide product data on pole, accessories, and configurations.

1.6 OPERATION AND MAINTENANCE DATA
- A. Maintenance Data: Provide lubrication and periodic maintenance requirement schedules.

1.7 QUALIFICATIONS
- A. Design the flagpole foundation under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in the State of Florida provide calculations.

1.8 DELIVERY, STORAGE, AND HANDLING
- A. Deliver, store, protect, and handle products to site under provisions of Section 01 60 00.
- B. Spiral wrap flagpole with protective covering or pack in protective shipping tubes or containers, per manufacturer’s requirements.
- C. Protect flagpole and accessories on site from damage or moisture.

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PART 2 PRODUCTS

2.1 POLE MATERIALS

A. Provide one piece seamless extruded aluminum tubing complying with ASTM B241; 6063 alloy, T6 temper.

2.2 POLE CONFIGURATION

A. Provide a 30 ft. high pole measured from nominal ground elevation.
B. Provide a ground mounted type pole.
C. Flagpole design shall be a cone tapered and seamless.
D. Provide external type halyard.

2.3 COMPONENTS AND ACCESSORIES

A. Provide a finial ball of 6" diameter, spun aluminum.
B. Truck Assembly: Cast aluminum revolving, stainless steel ball bearings, non-fouling.
C. Provide one USA flag, 5 x 8 feet in size, nylon fabric, brass grommets, and hemmed edges.
D. Provide one Florida State flag, 5 x 8 feet in size, nylon fabric, brass grommets, and hemmed edges
E. Provide aluminum cleats with stainless steel fastenings, one per halyard.
F. Provide aluminum cleat box with built-in hinge and hasp assembly, attached to pole with tamper proof screws inside box.
G. Provide 3/8" diameter halyard polypropylene, braided, white.

2.4 MOUNTING COMPONENTS

A. Foundation Tube Sleeve: AASHTO M-246, corrugated 16-gage steel, galvanized.
B. Pole Base Attachment: Flush, aluminum base with base cover.
C. Lightning Ground Rod: Copper rod, 3/4" diameter; design length.

2.5 FINISHES

A. Coat the metal surfaces in contact with concrete with asphaltic paint.
B. Galvanize the concealed steel surfaces to ASTM A123 1.25 oz/sq ft.
C. Aluminum anodized to color as selected by the Architect.
D. Finial shall be spun and lacquered.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify site conditions under provisions of Section 01 31 00.
B. Verify that concrete foundation is ready to receive work and dimensions are as indicated on shop drawings.

3.2 PREPARATION

A. Coat metal sleeve surfaces below grade and surfaces in contact with dissimilar materials with asphaltic paint.

3.3 INSTALLATION

A. Install flagpole, base assembly, and fittings in accordance with manufacturer's instructions into a concrete foundation as indicated on engineered shop drawings.
B. Electrically ground the flagpole installation.
C. Install foundation plate and centering wedges, welded base assembly for flagpoles base set on concrete base and fasten.
D. Fill foundation tube sleeve with sand specified in Section 30 20 00 and compact.

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3.4 ERECTION TOLERANCES

A. Maximum Variation From Plumb: One inch

3.5 ADJUSTING

A. Adjust work under provisions of Section 01 77 00.

B. Adjust operating devices so that halyard and flag function smoothly.

END OF SECTION

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SECTION 11 16 16
SAFES

PART 1 GENERAL

1.1 RELATED DOCUMENTS
- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division-1 specification section, apply to work of this section

1.2 SECTION INCLUDES
- A. Drop safe

1.3 SUBMITTALS FOR REVIEW
- A. Section 01 33 00 – Submittals Procedures
- B. Product Data: Provide UL listing/rating, insurance ratings, dimensions, and anchorage/installation instructions.
- C. Provide the manufacturer's warranty information.

PART 2 PRODUCTS

2.1 COMPONENTS
- A. Safe with hopper emptying into the safe and these minimum requirements:
  1. 1-hour UL Fire Rating
  2. UL RSC Burglary Rating
  3. Inside dimensions 22" H x 18" W x 16" D
  4. Hopper with steel frame capable of handling a 3½" x 9" x 11½ “package
  5. Outer door UL listed group II Changeable dial combination lock
- B. The District will review request for approved equal.

PART 3 EXECUTION

3.1 EXAMINATION
- A. Verify existing site conditions.

3.2 INSTALLATION
- A. Install safe in accordance with manufacturer's instructions in the location shown on plans.
- B. Provide all material, accessories, and labor to complete the installation

END OF SECTION

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SECTION 11 31 00
RESIDENTIAL APPLIANCES

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Documents affecting work of this section include but are not necessarily limited to, General Conditions, special provisions and sections in Division 1 of these specifications.

1.2 SUMMARY

A. The work required under this Section consists of furnishing and installing
   1. Residential appliances as shown on the drawings.
   2. Appliance accessories and necessary mechanical and electrical connections as shown on the plans, or specified, for a complete operating system.

1.3 REFERENCES

A. FBC - Florida Building Code

1.4 SUBMITTALS

A. Submit shop drawings and manufacturer literature in accordance with requirements of Section 01 33 00, and the model number, material, finishes, and details of construction and installation.

PART 2 PRODUCTS

2.1 MANUFACTURER

A. Acceptable manufacturers:
   1. General Electric
   2. Hotpoint
   3. LG Electronics
   4. Maytag
   5. Sharp
   6. Speed Queen
   7. Whirlpool
   8. Other Architect/Owner pre-approved equals

B. All products shall be ADA compliant and installed to meet code requirement.

2.2 MATERIALS

A. The use of Energy Star products is required over non-energy star product when available.

B. Provide appliance in the number, location, and type shown on the plans from the list below of acceptable standards.

C. Clothes Dryer: Minimum 7.4 cu ft front-load dryer with front controls
   1. Control Type: Dials
   2. Temperature Selections: Five.
   3. Cycles: Include Damp Dry/Freshen Up, Heavy Duty, More Dry, Normal Dry, Less Dry, Timed Dry and Wrinkle Control

4. Features: Include interior light, end of cycle signal and moisture sensor
5. Finish: Painted Steel, White
6. Basis of Design: Maytag MEDP586KW
   a. or Approved Equal from listed Manufacturers

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D. Clothes Washer: Minimum 3.5 cu ft top-load washer with front controls
   1. Control Type: Dials
   2. Motor: 1/2 HP
   3. Features: Include stainless steel drum, optional second rinse, detergent dispenser, fabric softener dispenser, end of cycle signal, wash cycle and temperature selections, and automatic load size sensing
   4. Finish: Painted Steel, White
   5. Basis of Design: Maytag MVWP586GW
      a. or Approved Equal from listed Manufacturers

E. Dishwasher:
   1. Residential: Minimum 5-cycle quite motor under counter dishwasher

F. Microwave Oven:
   1. Residential: Minimum 1000-watt microwave with 1.6 cu ft oven

G. Refrigerator
   1. Compact: 6 cu ft refrigerator, undercounter.
   2. Standard: minimum 18 cu ft top-freezer refrigerator, see plans for those requiring icemaker.
   3. Provide refrigerator with a manufacturer installed lock and icemaker for unit in the school clinic .

2.3 ACCESSORIES

A. Provide all accessories as required by each manufacturer to complete the install of each unit as shown on the drawings.

B. Coordinate electrical accessories required for complete installation.

PART 3 EXECUTION

3.1 INSTALLATION

A. Verify all dimensions, clearances, and utility connections prior to starting installation.
   1. Coordinate work with other trades.

B. All appliances shall be set-in-place, all mechanical and electrical connections made, including venting and termination caps.

C. Install in strict accordance with the manufacturer's printed instructions, drawings and specifications, and approved shop drawings.

D. Provide additional supports or attachments required for installation.

E. Test all appliances for proper operation and good working order prior to final inspection.

F. Thoroughly clean all appliances prior to final inspection.

END OF SECTION

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SECTION 11 40 00

FOODSERVICE EQUIPMENT

PART 1 GENERAL

1.01 DESCRIPTION

A. The supply, delivery, and installation of all food service equipment as listed within the following specification and indicated on the related drawings.

1.02 SCOPE OF WORK

A. Except as otherwise herein stated, the work of this Section consists of the furnishing of all materials, labor, fabrication, transportation, equipment and appliances required for the complete execution of all food service equipment as shown on the drawings, as specified, or both and as may reasonably be inferred as necessary to complete the work for Certificate of Occupancy and intended use by Owner. This shall include but not be limited to the following:
   a. Stands and supports required for equipment, including backing plates.
   b. Cutting of holes in equipment for pipes, drains, electric outlets, etc., indicated and those which are not indicated but which are required for this installation
   c. Installation of Owner furnished equipment as listed in the item specifications.

B. Where the word "Contractor" appears in this Section, this shall mean "Food Service Equipment Contractor."
Where the abbreviation "G.C." appears in this Section, this shall mean "General Contractor".
Where the word "Consultant" appears in this Section, this shall mean "RealFood HSD" (617) 876-2100.

C. It shall be the Kitchen Equipment Contractor's responsibility to verify the quantities of the items listed herein with those shown on the drawings prior to submitting a bid. Any discrepancies detected by a bidder shall be called to the Consultant's attention for clarification. A written response to these inquiries will be made by the Consultant in writing to the Architect for distribution to the General Contractor and Bidders.

D. The Contractor shall adhere to all applicable Union Rules and Jurisdictional Trade Agreements. The Contractor shall work in harmony with other trades on this project to insure the prompt and successful completion of this project.

1.03 RELATED SECTIONS

A. Division 26 Electrical Electric services, including wiring and final connections to the fixtures and equipment furnished under this Section, Owner furnished equipment

B. Division 23 – Mechanical: Water, gas steam and waste services to the fixtures and equipment, except as otherwise specified in individual items.

C. Section 23 31 13: Except exposed ducts specified as part of equipment, all ventilation duct work including final connections to hoods and ventilators.

D. Section 09 30 00: Quarry tile

E. Divisions 27 and 28 relating to audio video communication/notification devices including delivery door VIC, point-of-sale registers, and security systems.

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1.04 RESPONSIBILITY

A. The work herein specified and/or shown on the Drawings shall be coordinated with the work of the other Contractors. It shall be the responsibility of the Contractor maintain regular communication with the G.C. and project team members to assure coordination and cooperation with all other trades performing work on this project.
B. Contractor for work of this Section shall examine and become familiar with drawings and specifications for architectural and mechanical work with reference to work in this Contract and shall be responsible for correct fitting of his work in connection with such related work. He shall become familiar with all job conditions, building measurements, and other conditions in order to coordinate the planning, design, delivery, storage and installation of his work, all with proper consideration of the project progress schedule.
C. The Contractor will be held responsible for verifying the electric current characteristics. If any of the equipment to be supplied does not coincide with that which is indicated on the Schedule or the Roughing Drawings, it will be the supplier's responsibility to call the discrepancy to the attention of the Consultation prior to submitting the questionable item.
D. It shall be this Contractor's responsibility to visit the site and coordinate with other trades to preclude cutting and patching and in the event of units of equipment too large to pass through planned openings, arrange for access to the required areas ahead of time not to delay delivery schedule.
E. In addition to the requirements set forth in the Project Specifications, the Contractor shall be completely responsible for the fulfillment of all the requirements pertaining to the fabrication, assembly and installation of all the items of this Section, including those of his subcontractors.
F. Provide all appurtenances which may not be specifically mentioned in the specifications or shown on drawings, but which are required for the proper function and installation of the equipment.

1.05 QUALIFICATIONS

A. Contractor shall submit satisfactory evidence that they are now and have been for the past five (5) years, engaged in the food service equipment industry, installing projects of the type and size herein specified as their principal line of work. Contractor must submit to the Consultant the name of his fabricator for approval, prior to bidding. Contractor's fabricator must show evidence he can meet the requirements concerning qualifications. Contractor's fabricator submitted and approved must be subcontractor used.
B. Contractor shall also submit evidence showing that he has executed contracts of a size comparable to the work herein specified and that he has the experience and financial resources to enable him to execute the work in a satisfactory manner and to deliver the required items of equipment so as not to delay the orderly progress of the work.
C. If, because of trade union rules and jurisdictional trade agreements or their conditions, any work specified to be performed under the Contract must be done by a particular trade, the Contractor shall sublet such work to those who may or can do such work or make other arrangements at his own expense and submit name of manufacturer or subcontractor for approval prior to bidding.
D. The Contractor shall have open accounts with all major food service equipment manufacturers and shall indicate in writing that he or she is capable of being bonded up to the actual amount of the food service equipment contract.

1.06 QUALITY ASSURANCE

A. Requirements of regulatory agencies:
    a. In addition to complying with other legal requirements, comply with:
        i. National Sanitation Foundation Regulations. (NSF)
        ii. AGA: Approved gasfired equipment.
        iii. UL: Approval and listing for equipment and electrical devices.
B. Reference specifications and standards:

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a. NEMA: LP3, Plastic Laminates.
b. ASTM: Designations specified.
c. ANSI: Z21.20, Automatic Gas Ignition Systems & Components.

C. Substitutions and Product Options:
a. Procedures: In accordance with the Bidding and Contract Requirements Section of the General Specifications of this project.
b. Throughout these specifications, manufacturers and model numbers have been selected by the Owner and the Consultant. These have been picked and agreed to for the purpose of establishing a standard of quality and performance. Therefore, this Contractor will not assume the option of substituting any materials or appliances for that specified.
c. If a bidder elects to take any exceptions to the equipment specified, he must request the Consultant's approval in writing to substitute any specified item prior to submitting his bid. The burden to prove equality to that which is specified will be the bidder's responsibility. In his request for such approval to deviate from contract documents, he will submit the proposed substitutes stating dealer net cost difference involved with supporting data. Such supporting data shall include basic specifications of the item(s) and the specifications, characteristics and other information concerning the proposed substitution demonstrating its equality to the specified item(s) and the effect of the substitution including serviceability and warranty.
d. This Contractor will bear all responsibility for adjustments to space, utility services and construction differences incurred by substituted item(s). He will pay all additional costs that may occur due to requirements of accepted substitutions if approved, including but not limited to engineering, design, and construction costs.
e. Note: All bids shall be submitted to the General Contractor on an MS Word Excel spreadsheet and shall include the following columns: Item Number, Qty, Description, Unit Cost, and extended cost. Each equipment item shall be listed on a separate row by number. Unit equipment cost shall include installation, warranties, and freight.

1.07 SUBMITTALS

A. Procedure: Submit in accordance with the Bidding and Contract Requirements Section of the General Specifications of this project.
B. Contract documents of the Food Service Consultant were prepared along with the Architectural and Engineering drawings, not after. The KEC should be aware that there may be inconsistencies and minor discrepancies between these sets of documents. When the Kitchen Equipment Contractor prepares their submittal drawings, they shall not copy the Consultant's drawings. The KEC submittal drawings shall reflect the manufacturers, models, and utility requirements of the equipment being provided by the KEC. The KEC submittal drawings shall be prepared by using dimensioned architectural and structural plans, increasing to 1/4" scale if required.
C. Roughin drawings:
a. The KEC shall submit ¼” scale .pdf roughin plan drawings for approval. Drawings shall be dimensioned, showing ventilation ducts, floor and wall sleeves, plumbing, gas, steam, and electrical lines, including those items purchased or supplied by the Owner. Elevations shall be submitted at 3/8” or 1/2” scale and sections of special work shall be submitted at 1” or 1 ½” scale.
b. The following shall each be drawn on separate sheets and/or plans; Plumbing; Electrical, and Ventilation. In addition, the KEC shall provide ¼” dimensioned plans locating slab recesses, wall blocking, and chases for refrigeration and beverage lines.
c. Utilities shall be stubbed out of walls wherever possible.
d. Kitchen Equipment Contractor or their authorized representative(s) shall field verify mechanical, electrical, and ventilating roughin and sleeve locations before floor slabs are poured.
D. Shop drawings:
a. Submit detail drawings at 3/4 inch and 1/2 inch scale.

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i. Indicate dimensions, details or construction, installation, relation to adjoining and related work where cutting or close fitting is required. Verify at job site, all dimensions, mechanical, electrical and ventilation roughin, and sleeve locations before fabrication.
ii. Indicate all reinforcements, anchorages and other work required by other trades for complete installation of all items.
iii. Include on shop drawings all items furnished by the Owner. Owner will provide Contractor with product data and other information required for detailing.
iv. Shop drawings submitted for custom fabricated stainless steel items must show all items in plan, elevation, section, and isometric views.

E. Product data: Manufacturer's detailed literature, catalog cuts, and specifications:
   a. Submit for each manufactured item. Include roughin and service information and details.
F. Maintenance data and operating instructions:
   a. Provide the following:
      i. System description.
      ii. Wiring diagrams.
      iii. Operating sequence.
      iv. Manufacturer's data.
      v. Preventative maintenance.
      vi. Trouble shooting.
      vii. Warranties.
      viii. Directory.
      ix. Valve directory with tag schedule showing location of each valve, type, number and manufacturer.
   b. Upon completion of project, the KEC shall compile required operating maintenance data on all food service equipment items into a single .pdf file indexed by item number. Provide (1) printed hard copy incorporated in hardback, three-ring binders with dividers for each item number. These .pdf files shall include a complete list of service agencies for all equipment including phone numbers.

1.08 PRODUCT HANDLING

A. Procedures: In accord with Section 01 70 00.

1.09 WARRANTY

A. Guarantee all equipment furnished under this Section for a period of one year from the date of substantial completion, covering defective materials, design and workmanship. Upon receipt of notice of failure of any part of the warranted equipment during the warranty period, the affected part or parts shall be replaced promptly and at the expense of the food service equipment installer.
   a. Until the time replacement equipment is installed, the Owner shall have full use of the defective equipment.
   b. Warranty shall include installation, startup and one year free service for all selfcontained refrigeration equipment with evidence of manufacturer's one year Warranty on the entire cabinet and additional four year Warranty on sealed compressor motor assembly except for labor.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Stainless steel: ASTM A240, U.S. Standard gauges, 188 type 302 or 304, not over 0.12% maximum carbon. Provide No. 4 finish unless otherwise specified.

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B. Galvanized steel: Arco, gauges as specified or indicated on Drawings.
C. Sink wastes: All custom fabricated and diedrawn sinks: Rotary type waste outlet with onepiece connected overflow assembly and stainless steel removable basket strainer manufactured by Component Hardware Group as “Drain Master” Model DSS-8000.
D. Legs: 15/8 inch diameter 16 gauge stainless steel tubular legs with bullet type feet, Model A10-0881 as manufactured by Component Hardware Group, unless specified or detailed otherwise.
E. Hardware: Except where specified otherwise, all hardware shall be solid material, and where exposed, chrome plated or stainless steel.
    a. Provide locking type hardware.
    b. Identify hardware with manufacturer's name and number so that broken or worn parts may be ordered and replaced.
    c. Unless specified otherwise, provide Kason No. 171C magnetic latches with No. 218 selfclosing hinges for undercounter refrigerator doors.
    d. Unless otherwise specified, provide stainless steel recessed flush pulls, Klein Hardware, Model #12000, and Klein Model #242, solid brass, satin finish door catches for refrigerated drawers, side sliding doors, access panels and hinged doors.
    e. Locks and keys: Equip all doors and drawers on all equipment with stainless steel hasps for padlocks.
    f. Faucets and Pre-Rinse Spray Units: “Encore” as manufactured by Component Hardware Group. Model numbers as shown on Drawings.
    Approved Alternate Mfgrs: T&S, Chicago
    g. Drawers: Model S90-0020 manufactured by Component Hardware Group.
    h. Sound Deadening Material: Q75-2500 “Multiflec Sound Deadener” as manufactured by Component Hardware Group. Color Grey.
    i. Inset type sinks: 16 gauge or heavier polished stainless steel (installed in tops as an integral part of the fixture).
    j. Casters: Size andtype specified, double ball bearing, rubbertired, heavy duty, 1 inch tread width, cadmium plated, as manufactured by Jarvis and Jarvis, Inc., except that the manufacturer's standard casters will be accepted on standard items.
    k. Plumbing Products: All plumbing products shall utilize "lead free" castings and comply with NSF Standard 61, Section 9 (11 micrograms or less of lead when normalized to one liter).
    l. Miscellaneous materials: Provide as specified with specific equipment item.

2.02 FABRICATION

All custom fabricated equipment shall be provided by approved fabricator. The fabricator must be NSF Certified, and if any custom fabricated equipment within the bid contains an electrical load center, the fabricator must be qualified to produce a UL listed assembly.
Approved fabricators: FSF Manufacturing, Advance Tabco, EMI Industries, John Boos
All other fabricators must be approved prior to bidding.

A. Submittal Drawings:
    a. Drawings indicate general arrangement of the piping and location of equipment. Should it be necessary to deviate from the arrangement indicated in order to meet structural conditions, such deviations, as approved, shall be made without additional expanse to the Owner.
    b. Exact locations, distances and levels shall be governed by the building conditions and shall be verified on-site by an authorized representative of the Fabricator.
    c. Submittal drawings shall be computer generated, fully dimensioned, indicate all material types, finishes, and gauges, and shall show all pieces of fabrication in plan, elevation, section, and isometric views. Drawings shall be submitted in .pdf format
B. General:
    a. Provide all fabrication in accord with NSF Standards.
    b. Only type 304 stainless steel shall be used

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c. Provide fully welded construction.

C. Welding:
   a. Make all shop and field welds continuous and hidden or ground smooth.
   b. Polish exposed welds in stainless steel to original finish after grinding, with no visible welds, line or buckles.
   c. Grind galvanized steel so no visible welds, lines or buckles show, and touchup with galvanizing stick, where galvanizing has been removed.

D. Manufacturer's instructions: Follow manufacturer's directions in all cases where the manufacturer of items used in this work furnish directions or prints covering points not indicated or specified.

E. Metal tops:
   a. Fabricate all tops from 14 gauge No. 4 finish stainless steel unless specified otherwise. Provide one piece welded construction reinforced on the underside with 14 gauge stainless steel channels. Work table and sink undershelves shall be 16 gauge s/s
   b. Provide cross braces not more than 30 inch O.C.. Coat underside of all tops with a minimum of 1/8 inch thick approved harddrying, sounddeadening mastic material dried smoothly without dirtcatching crevices.

F. Enclosed cabinet type bases:
   a. Made of formed sheets reinforced to create a rigid structure. All unexposed sections, upright partitions and back shall be 18 gauge galvanized steel or heavier, except as specified otherwise.
   b. Exposed body facings, partitions, stiles and aprons shall be 18 gauge stainless steel, No. 4 finish, unless otherwise specified.
   c. Shop weld all seams and joints where possible. Ground welds smooth and polish welds to match original finish. Faces to have knuckle seams between walls, skirts, and shelves.
   d. Finish ends of all fixtures, splash backs, shelves, etc., flush to walls or adjoining fixtures.
   e. Provide access holes in panels in the equipment to allow plumbing and electrical trades to make their respective connections.
   f. Coved corners:
      i. Provide all dish tables, drain tables, work tops, splash backs and turnedup edges with radius bends on all inside horizontal and vertical corners, and coves at intersections.
      ii. Provide all shelves, under shelves, elevated shelves, port shelves, etc., with turnedup edges and radius bends on all inside horizontal corners.
      iii. Unless specified otherwise in individual items, provide rounded and coved corners or radius ends of 3/4 inch radius or larger.
   g. Fabricate equipment legs and cross rails from 15/8 inch diameter 16 gauge stainless steel tubing unless otherwise noted. Grind smooth and polish all welds at crossrails. Fit bottom of each leg at floor with a sanitary stainless steel bullet type foot with not less than 2 inch adjustment. Fasten legs to equipment as follows:
      i. To sinks by means of cylinder gussets: Provide stainless steel gussets reinforced with bushing and set screw for securing legs. (United Show Case No. LC158).
      ii. To metal top tables and dish tables: Provide cylinder gussets or equivalent, welded to 14 gauge or heavier channel. Weld bracing to underside to tops.
      iii. Closed gussets shall be a minimum 3 inch diameter on top continuously welded to frame members of sink bottoms.

G. Sinks:
   a. Provide fabricated sink compartments with fully coved vertical and horizontal interior corners. All coves 3/4" radius.
   b. Where one or more sink compartments are adjacent, provide double thickness partitions, continuously welded at top. Fronts of multiple compartment sinks to have applied skirt on exterior.
   c. Crease bottoms of each sink compartment to insure complete drainage to waste opening.
   d. Install inset type sinks in tops as an integral part of the fixture.

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H. Drawers: Model S90-0020 manufactured by Component Hardware Group or custom fab to following standards:
    a. Fabricated die stamped 18 gauge stainless steel with stainless steel fronts. Fabricate support slides so that drawers may be pulled out a minimum of twothirds or its length and still support heavy loads without deflection.
    b. Fabricate to allow easy removal without the use of tools. Provide with builtin flush type pulls. All drawers mounted on open tables shall have enclosure on sides and rear and shall be selfclosing.
    c. Mount drawers in refrigerated sections on large ball bearings surface in flat tracks.
    d. Wheels and bearings shall be corrosion resistant, long wearing material, grease packed before assembly.
    e. Provide a means of locking all drawers. This may include an integral hasp for use with an Owner supplied lock.

I. Doors:
    a. All doors shall be double pan type, outer pans cased, with welded corners.
        i. Sliding doors: Removable double pan type, reinforced and stiffened with closed hat sections, and mounted on ball bearing quiet rollers in overhead tracks.
        ii. Hinged doors: Flush type mounted on heavy duty stainless steel lift-off flag hinges. Fill inside core of doors with sound deadening material. Provide builtin flush type pulls as detailed.

J. Shelves:
    a. Overhead shelves: Constructed of #16 gauge stainless steel not less than 12" wide, unless otherwise specified. The shelves shall be polished on all surfaces (top and bottom). Each shelf shall be made in one (1) piece or butt welded, ground and polished smooth. Shelves shall be made as shown, welded, ground, and polished. Where shelves adjoin walls, gauge stainless steel wall brackets, triangular shaped, spaced not more than 48 inches on center, welded to stainless steel 11/4" diameter, #16 gauge stanchions mounted through table backsplash unless otherwise specified for particular item.
    b. Under shelves: At open tables constructed of #16 gauge polished stainless steel, having edges turned down 11/2" and under 3/4" except at walls turned up 2"; with all corners welded, ground and polished; where required shelves suitable reinforced with stainless steel channels running the full length. Shelves connected to legs by means of notching and continuous welding. All cabinet bottoms will be 18 gauge stainless steel reinforced as required and shown on the contract drawing, completely integrally flushwelded to cabinet face. Provide ferruled openings in bottom shelves top entry of service where required.

2.03 UNDERCOUNTER REFRIGERATORS (See Item Specification)

2.04 HEATING EQUIPMENT

A. Provide gas, electric or steam heating equipment or thermostat control for such equipment, and of materials, sizes or ratings specified within the equipment items or details.
    a. All such equipment shall be of nature and so installed as to be readily cleanable or made easily removable for cleaning.
    b. Electrical appliances or heating element circuits of 120 volts shall not exceed 1650 watts.

2.05 GASFIRED EQUIPMENT (Not Applicable)

2.06 SWITCHES AND CONTROLS

A. Provide on each motor driven appliance or electrical heating unit a suitable control switch or starter of proper type in accord with UL requirements. All other switches and controls, including line switches,

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safety cutouts, control panels, fuse boxes, other controls, fittings and connections will be furnished and installed by the electrical trade except where specific instances are specified otherwise.

B. Provide all internal wiring for fabricated equipment items, including all devices, wiring controls, switches, electrical boxes, receptacles, stainless steel face plates, conduit and wiring, etc., built into or forming an integral part of these items, in factory or at the job site, with all items completed to a junction box for final connection to the building services by the electrical trade.
    a. Fixture internal wiring shall conform to UL guidelines.
C. Provide standard 3prong plug to fit "U" slot grounding type receptacles, similar to Hubbell No. 5262, for all equipment items noted as powered by plug connection into 110120 volts, single phase A.C. Provide suitable length 3wire cord for all such equipment.

2.07 UTILITY CONNECTIONS

A. Provide equipment complete with connection terminals as standardized by equipment manufacturers except where specified otherwise, for other trades to make plumbing, gas, steam, electrical, ventilation and refrigeration connections.
B. Provide equipment including refrigerated drawer section and ice bins, and all indirect wastes or other special applications, with 1 inch minimum copper drain tubing of sufficient length to extend to floor sinks. Wrap chilled or cold water drain tubing with 1/4 inch thick foamed plastic insulation to prevent condensation.

2.08 TRIMMING AND SEALING EQUIPMENT

A. Seal spaces between all units at walls, ceilings, floors and adjoining nonportable units with enclosed bodies against entrance of food particles or vermin by means of s/s trim, strips, welding, soldering or commercial joint materials as suited to the nature of the equipment and adjacent materials.
B. Close ends of all hollow sections.
C. Fixtures resting on concrete bases shall be set into sealant bed to eliminate crevices between fixture and base and caulked after installation has been completed.

2.09 EXHAUST VENTILATORS (See Item Specification)

Acceptable Alternate Manufacturers: Captive-Aire, Streivor, Avtec, Gaylord

Kitchen Equipment Contractor (K.E.C.) must provide factory authorized start-up supervision and inspection with written confirmation of same issued to Architect within 48 hours of start-up. Confirmation letter should include names of Owner's representative(s), Contractor's representative(s), and factory service representative present at time of start-up. Units must comply with all applicable codes and be of type 304 s/s construction.

2.10 WALK IN REFRIGERATORS (See Item Specification)

See item specification for detailed requirements.

If concrete and/or quarry tiles is to be installed after the walk-in box is erected, all walk-in doors must remain open. Curing concrete can generate hydrogen gas that may cause discoloration of metal wall and ceiling panels. Protect wall panels from concrete, grout, or chemical splatter with polyethylene sheets taped to walls.

Installation guidelines must accompany all panel structures in the form of complete panel assembly and erection instructions. Accepted construction procedure and special techniques must be described. All necessary working drawings with dimensional detail shall be supplied to illustrate exact location of specific panels. Drawings must clearly indicate inside and outside diagonal dimensions to facilitate “square” layout of all regular shaped structures.

All plastic protective sheeting must be removed from panels before installation.

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Parts and hardware not manufactured by walk-in manufacturer (door hardware, electric components and various optional accessories listed below) shall be guaranteed against defects in material and workmanship under normal use and service for a period of three (3) years.

The manufacturer of the walk-in assembly will replace any panel or part they accept as defective in material and workmanship when those panels are installed properly and used in normal service for a period of ten (10) years.

2.11 REFRIGERANT SYSTEMS (See Item Specification)

General Note: Center mount "spacemizer" evaporator coils may not be used in any freezer compartment. KEC and manufacturer to confirm HP requirements for all units submitted. Design submitted by factory shop drawings shall reflect, field dimensions, building temp/humidity, use, and configuration of compartments.

2.12 ITEM SPECIFICATION AND SCHEDULE OF EQUIPMENT

Note: All items listed on the contract drawings under the heading "Foodservice Equipment Schedule" shall be furnished by the Kitchen Equipment Contractor in accordance with the Master project specifications, food service equipment plans, and the following detailed item specifications.

ITEM 1 - HAND SINK (4 REQ'D)
Advance Tabco Model 7-PS-66 Dimensions: 12.75(h) x 17.25(w) x 15.25(d)
Hand Sink, wall mounted, 14" wide x 10" front-to-back x 5" deep bowl, 20 gauge 304 stainless steel, 7-3/4" high side splashes, with heavy duty splash mounted faucet, wall bracket, NSF, cCSAus

ITEM 2 - AIR CURTAIN (1 REQ'D)
Mars Air Systems Model STD260-2UA-OB Dimensions: 12.13(h) x 60(w) x 12.75(d)
Standard Series 2 air curtain for 60"W door, unheated, galvanized steel cabinet with Obsidian Black powder coat finish, (2) 1/2 HP motors, 115v/60/1-ph, 940 watts, 10.2 amps, cETLus

1 ea	5 year warranty, standard
1 ea	1 year warranty for all parts (except filters), standard
1 ea	Mechanical switches
1 ea	Brackets
1 ea	Transom mounting brackets
1 st	Model B0041 Transom mounting bracket kit for STD2 units, steel with Obsidian Black finish (set of 2)
1 ea	Other options

ITEM 3 - HOSE REEL (2 REQ'D)
T&S Brass Model B-7142-01
Hose Reel System, open, 3/8" x 50' hose with high flow blue spray valve, with ratcheting system & adjustable hose bumper, stainless steel

2 ea	Model 0RK1 Mixing Control Valve, wall mount, 4" centers, concealed body, removable loose key T-handles, 1/2" female NPT bottom, & 3/8" female NPT top
2 ea	Model B-0109-01 Wall Bracket, 6"
2 ea	1 year limited warranty, standard
2 ea	Model G019430-45 EasyInstall Universal Hose Reel Swing Bracket, fits 1/2" & 3/8" hose reels, includes mounting hardware, stainless steel
2 ea	1 year limited warranty for hose, standard
2 ea	2 year limited warranty for hose reel, standard

ITEM 4 - CART, UTILITY/BUSSING (3 REQ'D)

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Lakeside Manufacturing Model 744 Dimensions: 37.13(h) x 38.63(w) x 22.38(d)
Utility Cart, open, (3) shelf, shelf size 33" x 21", U-shaped frame, all-welded stainless steel construction, 700 lb. capacity, (2) 5" swivel & (2) 8" fixed casters, Made in USA
3 ea Casters, (2) 5", swivel, (2) 8", fixed cushion tread, standard

ITEM 5-5.5 - WALK IN COOLER AND FREZER (1 REQ'D)
Custom Model CUSTOM

ITEM 6 - FLOOR TROUGH (1 REQ'D)
IMC/Teddy Model FT-1830-SGAS Dimensions: 12.25(h) x 30(w) x 18(d)
FT Floor Trough, 30"W x 18"D, 4" deep receptacle, (1) 6-1/2" waste outlet with perforated waste basket & 4" OD tailpiece, includes anchor straps, 14/304 stainless steel construction, brushed satin finish, (SGAS) anti-slip subway grating, NSF, Made in USA

ITEM 7 - WORK TABLE, STAINLESS STEEL TOP (1 REQ'D)
Advance Tabco Model TKSS-304 Dimensions: 40.5(h) x 48(w) x 30(d)
Work Table, 48"W x 30"D, 14 gauge 304 stainless steel top with 5"H backsplash, stainless steel legs with side & rear crossrails, adjustable stainless steel bullet feet, NSF
1 ea Model TA-23A Table legs welded to leg gussets under table top and to undershelf or cross rails, shipped set up and crated (per table)

ITEM 7.1 - SHELVING, WALL MOUNTED (1 REQ'D)
Advance Tabco Model WS-12-48-16 Dimensions: 10.5(h) x 48(w) x 12(d)
Shelf, wall-mounted, 48"W x 12"D, 1-5/8" bullnose front edge, 1-1/2"H rear up-turn, 16/304 satin finish stainless steel, NSF

ITEM 7.2 - SHELVING, WALL MOUNTED (1 REQ'D)
Advance Tabco Model WS-15-48-16 Dimensions: 13.5(h) x 48(w) x 15(d)
Shelf, wall-mounted, 48"W x 15"D, 1-5/8" bullnose front edge, 1-1/2"H rear up-turn, 16/304 satin finish stainless steel, NSF

ITEM 10 - FOUR (4) COMPARTMENT SINK (1 REQ'D)
Advance Tabco Model 94-84-80-36RL Dimensions: 45(h) x 162(w) x 36(d)
Regaline Sink, 4-compartment, with left & right-hand drainboards, 28" front-to-back x 20"W sink compartments, 14" deep, with 11"H backsplash, stainless steel legs with adjustable left-to-right and front cross rails, 36" drainboards, 1" adjustable bullet feet, 14 gauge 304 stainless steel, overall 36" F/B x 162" L/R, NSF (requires 2 faucets)
2 ea Model K-472 Faucet hole revision (each)
1 ea Model K-37 Anti-Siphon vacuum breaker holes
1 ea Model K-23A Sink or dish table legs welded to leg gussets under table top and to cross rails (and optional undershelf if ordered), shipped set up and crated (per sink)

ITEM 10.1 - WALL / SPLASH MOUNT FAUCET (2 REQ'D)
T&S Brass Model B-0231-CC-CR
Sink Mixing Faucet, wall mount, 12" swing nozzle, 8" centers, 1/2" NPT male inlets, lever handles, quarter-turn Cerama cartridges, low lead, ADA Compliant

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ITEM 10.2 - PRE-RINSE FAUCET ASSEMBLY (1 REQ'D)
T&S Brass Model B-0133-CCB-CR
EasyInstall Pre-Rinse Unit, 8" wall mount base, wall bracket, 00CC inlets, Cerama cartridges, low lead
1 kt Model B-1105-KIT Inlet Kit, 1/2"NPT close elbows, 24" flex supply hoses

ITEM 10.3 - DISPOSER (1 REQ'D)
InSinkErator Model SS-200-6-AS101
SS-200™ Complete Disposer Package, trough mount system, 6-5/8" diameter inlet, with #6 collar adaptor for trough installation, 2 HP motor, stainless steel construction, includes syphon breaker, (2) solenoid valves, (2) flow control valves, programmable AquaSaver® Control Center AS-101 with water-saving technology, automatic water saving function, auto reversing, timed run, post flush, adjustable leg kit
1 ea (3) years parts & labor warranty from date of installation (standard)
1 ea Standard height disposer body
1 ea 208v/60/3-ph, 3.6 amps
1 ea Model SYPHON STD Syphon breaker standard, 1/2" (11477)

ITEM 10.4 - DRAIN, LEVER / TWIST WASTE (3 REQ'D)
Fisher Model 22209
DrainKing Waste Valve, with flat strainer, 12 GPM drain rate, dual teflon seals, stainless steel ball, cast red brass body

ITEM 10.5 - SHELVING, WALL MOUNTED (2 REQ'D)
Advance Tabco Model WS-15-48-16 Dimensions: 13.5(h) x 48(w) x 15(d)
Shelf, wall-mounted, 48"W x 15"D, 1-5/8" bullnose front edge, 1-1/2"H rear up-turn, 16/304 satin finish stainless steel, NSF

ITEM 10.6 - SHELVING, WALL MOUNTED (1 REQ'D)
Advance Tabco Model WS-15-36-16 Dimensions: 13.5(h) x 36(w) x 15(d)
Shelf, wall-mounted, 36"W x 15"D, 1-5/8" bullnose front edge, 1-1/2"H rear up-turn, 16/304 satin finish stainless steel, NSF

ITEM 12 - DRYING STORAGE RACK (6 REQ'D)
Cambro Model EXMU244878DRPKG Dimensions: 78.25(h) x 48(w) x 24(d)
Camshelving Elements XTRA Series Mobile Drying Rack Cart, 24”W x 48”L x 78-1/4”H, holds up to (84) trays, includes: drying cradles for 3 levels, (6) traverses, (3) bags of traverse dovetails, (2) factory assembled mobile post kits, (4) premium swivel casters with total locking brake, max. weight bearing 900 lbs., speckled gray, NSF listed components. Ships in 5 boxes., Made in USA
6 ea Lifetime warranty against corrosion and rust
REFER TO CAMBRO QUOTE 16_2025_7762

ITEM 14 - WORK TABLE, STAINLESS STEEL TOP (4 REQ'D)
Advance Tabco Model VSS-368 Dimensions: 35.5(h) x 96(w) x 36(d)
Work Table, 96"W x 36"D, 14 gauge 304 stainless steel top with countertop non drip edge, adjustable stainless steel undershelf, stainless steel legs & adjustable bullet feet, NSF
4 ea Model TA-23A Table legs welded to leg gussets under table top and to undershelf or cross rails, shipped set up and crated (per table)

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4 st	Model TA-25S-6 Casters, 5" diameter, set of 6 (2 with brakes) with stainless steel legs for standard working height of 35-1/2"
32 ft	Model TA-94 16 gauge 304 stainless steel undershelf upgrade (per linear foot)
4 ea	Model SS-2020 Deluxe Drawer, 20"W x 20"D x 5" deep drawer pan insert, stainless steel, with drawer slides

ITEM 14.1 - OVERSHELF (2 REQ'D)
Advance Tabco Model CU-18-96 Dimensions: 96(w) x 18(d)
Overshelf, single, 96"W x 18"D, 18/430 stainless steel, to span over existing equipment (supplied by others), NSF (must provide equipment model numbers that shelf is going over to clarify mounting provision)

2 ea	NOTE: Must specify flat or "L" bracket & equipment unit is being mounted over - Prints required

ITEM 16 - WORK TABLE, STAINLESS STEEL TOP (2 REQ'D)
Advance Tabco Model KSS-363 Dimensions: 40.5(h) x 36(w) x 36(d)
Work Table, 36"W x 36"D, 14 gauge 304 stainless steel top with 5"H backsplash, 18 gauge stainless steel adjustable undershelf, stainless steel legs with stainless steel bullet feet, NSF

2 ea	Model TA-23A Table legs welded to leg gussets under table top and to undershelf or cross rails, shipped set up and crated (per table)
6 ft	Model TA-94 16 gauge 304 stainless steel undershelf upgrade (per linear foot)

ITEM 17 - WORK TABLE, STAINLESS STEEL TOP (1 REQ'D)
Advance Tabco Model TKSS-368 Dimensions: 40.5(h) x 96(w) x 36(d)
Work Table, 96"W x 36"D, 14 gauge 304 stainless steel top with 5"H backsplash, stainless steel legs with side & rear crossrails, adjustable stainless steel bullet feet, NSF

1 ea	Model TA-23A Table legs welded to leg gussets under table top and to undershelf or cross rails, shipped set up and crated (per table)
1 ea	Weld-In sink - double bowl
1 ea	Model TA-11W-2 Double Sink Welded Into Table Top, 20"W x 20"D x 14" deep bowls, includes faucet, NSF (must specify sink location)
1 ea	Model K-53OMIT To Delete Faucet
1 ea	Model K-4 Support Bracket, for lever waste drain handle, (1) support required for each lever drain
1 ea	Model K-37 Anti-Siphon vacuum breaker holes
1 ea	Model K-452 Control Bracket 8" x 12" (each)
1 ea	T&S Brass Model B-0221-CC-CR Mixing Faucet, deck mount, 8" centers, 12" swing nozzle, stream regulator outlet, quarter-turn Cerama cartridges with check valves, lever handles, 1/2" NPT "CC" male inlets, low lead, ADA Compliant
1 kt	T&S Brass Model B-1100-KIT 24" Inlet Supply Hoses (3/8" Compression x 1/2" NPSM Female)

ITEM 17.1 - DISPOSER (1 REQ'D)
InSinkErator Model SS-200-6-AS101
SS-200™ Complete Disposer Package, trough mount system, 6-5/8" diameter inlet, with #6 collar adaptor for trough installation, 2 HP motor, stainless steel construction, includes syphon breaker, (2) solenoid valves, (2) flow control valves, programmable AquaSaver® Control Center AS-101 with water-saving technology, automatic water saving function, auto reversing, timed run, post flush, adjustable leg kit

1 ea	(3) years parts & labor warranty from date of installation (standard)
1 ea	Standard height disposer body

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1 ea 208v/60/3-ph, 3.6 amps
1 ea Model SYPHON STD Syphon breaker standard, 1/2" (11477)

ITEM 17.2 - DRAIN, LEVER / TWIST WASTE (1 REQ'D)
Fisher Model 22209
DrainKing Waste Valve, with flat strainer, 12 GPM drain rate, dual teflon seals, stainless steel ball, cast red brass body

ITEM 17.5 - SHELVING, WALL MOUNTED (2 REQ'D)
Advance Tabco Model WS-12-84 Dimensions: 10.5(h) x 84(w) x 12(d)
Shelf, wall-mounted, 84"W x 12"D, 1-5/8" bullnose front edge, 1-1/2"H rear up-turn, 18/430 satin finish stainless steel, NSF (units 84" & longer have (3) support brackets)

ITEM 17.6 - SHELVING, WALL MOUNTED (2 REQ'D)
Advance Tabco Model WS-15-84 Dimensions: 13.5(h) x 84(w) x 15(d)
Shelf, wall-mounted, 84"W x 15"D, 1-5/8" bullnose front edge, 1-1/2"H rear up-turn, 18/430 satin finish stainless steel, NSF (units 84" & longer have (3) support brackets)

ITEM 20 - CONVECTION STEAMER, ELECTRIC, BOILERLESS (1 REQ'D)
AccuTemp Model S62083D100 DBL Dimensions: 71.2(h) x 27(w) x 28(d)
Two Steam'N'Hold™ Boilerless Convection Steamer, includes stand with casters, electric, holds (6) 12" x 20" x 2-1/2" deep pans each compartment, vacuum cooking, manual mechanical timer controls, NO water & drain connection required, 10kW, (2) 208/60/3ph, 28 amps, (2) 5' cords & NEMA L15-30P, cULus, UL EPH Classified, Made in USA, ENERGY STAR®
1 ea 1 year parts & labor warranty, standard
1 ea Lifetime service and support guarantee
1 ea Alternate voltages available, contact factory for details
1 ea Door hinged on right standard
1 ea SNH-21-01 - Support Stand, for double stacked Steam'N'Hold or Evolution units, Ergo-low mounting height: 8-7/8" lowest unit height, stainless steel, with 5" casters in lieu of standard

ITEM 22 - COMBI OVEN, ELECTRIC (3 REQ'D)
Alto-Shaam Model 10-20E PRO Dimensions: 45.69(h) x 43.75(w) x 46.19(d)
Prodigi™ Pro Combi Oven/Steamer, electric, boiler-free, countertop, capacity (10) 18" x 26" full size sheet or (22) 12" x 20" full size hotel pan (GN 1/1), Wi-Fi enabled control with steam/convection/combi cooking modes, removable "T" style temperature probe, (5) shelves, (2) power levels, programmable cool-down, SafeVent™ steam venting, (5) cleaning levels, triple-pan door, high efficiency LED lighting, (2) side racks with (11) non-tilt support rails, door hinged right, stainless steel construction, adjustable stainless steel legs, EcoSmart®, cULus, UL EPH Classified, CE, IPX5, EAC, city-wide COA for New York City, ENERGY STAR®
3 ea NOTE: Subject to Manufacturer’s Terms & Conditions. See Documents Section
3 ea One year parts and labor warranty, standard
3 ea Alto-Shaam Certified Chef provides complimentary support and training on all Alto-Shaam combi ovens
3 ea K-12 Extended Warranty (K-12 operators only): Extends the warranty to 3 years parts and labor. (NET)
3 ea It is the sole responsibility of the owner/operator/purchaser of this equipment to verify that the incoming water supply is comprehensively tested and, if required, provide a means of

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	water treatment that would meet the compliance requirements with the manufacturers water quality standards published on the product spec sheet. Non-compliance with these minimum standards will potentially damage this equipment and/or components and VOID the original equipment manufacturers warranty
3 ea	ECO
3 ea	208-240v/50/60/3-ph, 68.8-79.4 amps, 24.8-33kW, 2-1 AWG, NO cord or plug
3 ea	Model 10-20EVH Ventech Type 1 Hood with Condensation, for 10-20E, self-contained, two-speed high-powered fans, 1242-1410 CFM, includes (2) easy clean grease filters, (2) odor filters, stainless steel construction, 1.92 amps, 0.40 kW, cULus, UL EPA, ANSI/NSF 4, CE, EAC (not available with smoking feature, or units with recessed door) (All utilities are run through the oven, no additional hookups required)
3 ea	Hood Factory install ((NET) NO FURTHER DISCOUNTS APPLY)
3 ea	For Field install, Combitherm Factory Authorized Installation Program (above) MUST be selected for field install option to become available for selection
3 ea	Wifi, standard
3 ea	Single
3 ea	Model 5037355 QTI1+CR Water Filter System for single combi or Converge ovens, (1) CTO-Q10 activated carbon cartidge, reduces chlorine & sediment, (1) CTOS-QCR catalytic carbon cartridge, reduces chloramine; outlet pressure gauge, water-shut off valve, bybass valve; 3/4" inlet, 3/4" outlet; NOTE: hardware for mounting to a wall and connection hoses are not included; ((NET) NO FURTHER DISCOUNTS APPLY)
3 ea	NOTE: Factory Authorized Installation Program (above) MUST be selected for water filtration field install option to become available
3 ea	Removable "T" style temperature probe, standard
1 ea	Model 5015711 Stand, large, casters, shelf, slides, 7-20 & 10-20 Combi

ITEM 25 - REACH-IN REFRIGERATOR (1 REQ'D)
Continental Refrigerator Model D1RENSS Dimensions: 83.25(h) x 28.5(w) x 35.38(d)
Designer Line Wide Refrigerator, reach-in, 28-1/2"W, one-section, self-contained refrigeration, stainless steel exterior & interior, standard depth cabinet, wide full-height solid door, cylinder lock, electronic control with digital display, hi-low alarm, 6" stainless steel legs, R290 hydrocarbon refrigerant, 1/4 HP, cETLus, NSF, ENERGY STAR®

1 ea	Standard warranty (for the United States & Canada Only): 7 year parts, labor, and compressor
1 ea	115v/60/1-ph, 5.2 amps, cord, NEMA 5-15P, standard
1 ea	Door hinged on right, standard
1 st	Model 50205-4 Casters, swivel, with brakes set of 4 (5" height)
8 ea	Model 50-P008A-E Universal Pan Slide Assembly, full section universal slides for 18 x 26 or (2) 12 x 20 pans on 5" centers, bottom support, stainless steel angles (E Models only) (holds 10 pans per full section)
1 ea	NOTE: Please specify location of pan slides

ITEM 26 - REACH-IN FREEZER (1 REQ'D)
Continental Refrigerator Model D1FENSS Dimensions: 83.25(h) x 28.5(w) x 35.38(d)
Designer Line Wide Freezer, reach-in, 28-1/2"W, one-section, self-contained refrigeration, stainless steel exterior & interior, standard depth cabinet, wide full-height solid door, cylinder lock, electronic control with digital display, hi-low alarm, 6" stainless steel legs, R290 hydrocarbon refrigerant, 1/2 HP, cETLus, NSF

1 ea	Standard warranty (for the United States & Canada Only): 7 year parts, labor, and compressor
1 ea	115v/60/1-ph, 6.3 amps, cord, NEMA 5-15P, standard
1 ea	Door hinged on left
1 st	Model 50205-4 Casters, swivel, with brakes set of 4 (5" height)

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8 ea	Model 50-P008A-E Universal Pan Slide Assembly, full section universal slides for 18 x 26 or (2) 12 x 20 pans on 5" centers, bottom support, stainless steel angles (E Models only) (holds 10 pans per full section)
1 ea	NOTE: Please specify location of pan slides

ITEM 30 - PASS-THRU HEATED CABINET (2 REQ'D)
Continental Refrigerator Model DL2WE-SS-PT-HD Dimensions: 83.25(h) x 57(w) x 38.75(d)
Designer Line Heated Cabinet, extra wide pass-thru, two-section, 52 cu. ft. capacity, (3) shelves per section, stainless steel exterior & interior, standard depth, hinged half-doors, electronic control with digital display, hi-low alarm, cETLus, NSF

2 ea	Standard warranty (for the United States & Canada Only): 7 year parts and labor
2 ea	208-230v/60/1-ph, 10.6 amps, 2.25 kW, cord & plug supplied by others
2 ea	Left Door hinged on left & right door hinged on right, (control side) standard
2 ea	Left Door hinged on left & right door hinged on right, (rear) standard
2 st	Model 50205-4 Casters, swivel, with brakes set of 4 (5" height)
16 ea	Model 50-P008A-E Universal Pan Slide Assembly, full section universal slides for 18 x 26 or (2) 12 x 20 pans on 5" centers, bottom support, stainless steel angles (E Models only) (holds 10 pans per full section)
2 ea	NOTE: Please specify location of pan slides

ITEM 34 - PASS-THRU REFRIGERATOR (2 REQ'D)
Continental Refrigerator Model D2RNSSPTHD Dimensions: 83.25(h) x 52(w) x 38.75(d)
Designer Line Refrigerator, pass-thru, two-section, self-contained refrigeration, stainless steel exterior & interior, standard depth cabinet, half-height stainless steel doors, cylinder locks, electronic control with digital display, hi-low alarm, 6" stainless steel legs, R290 hydrocarbon refrigerant, 1/3 HP, ENERGY STAR®

2 ea	Standard warranty (for the United States & Canada Only): 7 year parts, labor, and compressor
2 ea	115v/60/1-ph, 6.9 amps, cord, NEMA 5-15P, standard
2 ea	Left door hinged on left & right door hinged on right, standard(control side)
2 ea	Left door hinged on left & right door hinged on right, standard (rear)
2 st	Model 50205-4 Casters, swivel, with brakes set of 4 (5" height)

ITEM 35 - PASS-THRU REFRIGERATOR (2 REQ'D)
Continental Refrigerator Model D1RNSSPTHD Dimensions: 83.25(h) x 26(w) x 38.75(d)
Designer Line Refrigerator, pass-thru, one-section, self-contained refrigeration, stainless steel exterior & interior, standard depth cabinet, half-height solid doors, cylinder locks, electronic control with digital display, hi-low alarm, 6" stainless steel legs, R290 hydrocarbon refrigerant, 1/4 HP

2 ea	Standard warranty (for the United States & Canada Only): 7 year parts, labor, and compressor
2 ea	115v/60/1-ph, 5.2 amps, cord, NEMA 5-15P, standard
2 ea	Door hinged on right, standard (control side)
2 ea	Door hinged on right, standard(rear)
2 st	Model 50205-4 Casters, swivel, with brakes set of 4 (5" height)

ITEM 43 - SERVING COUNTER, UTILITY (2 REQ'D)
Duke Manufacturing Model TST-46SS Dimensions: 36(h) x 46(w) x 32(d)
Thurmaduke™ Solid Top Unit, mobile utility counter, 46"W x 32"D x 36"H, 16ga stainless steel top, 20ga stainless steel body & undershelves, 5" dia. gray poly swivel casters & brakes, NSF

2 ea	Model MOD-14-3 14ga stainless steel top, in lieu of standard

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2 ea Model 3BTS-FX-3CU Tray Slide on fixed brackets, (3) bar tubular, 1" dia. stainless, end caps, mounted 34"H (specify any other height), NSF
2 ea Model MOD-2S-3CU Kick Plate, customer's side, stainless steel, recessed, screw attached, 1/2" above floor for easy rolling
2 ea 400 Series
2 ea Model TS462-46 Contemporary Food Shield, 45-1/2"W x 20"D x 20-1/8"H, adjustable from full-service to self-service guard, single shelf, sloped guard with fixed end closures, 3/8" glass overshelf & guard with 1/4" glass ends (tempered with polished rounded edges), sloped Ø 1" tube posts, stainless steel finish posts
2 ea Model MOD-SPL Special length overshelf, to next longest size, ADD
2 ea Model TS400HT-3 Radiant Heater, under shelf & wired to base, 120v/60/1-ph (this may require cord & plug option)
Utility Counter and Food shield size modify to 34”

ITEM 43.1 - HOT / COLD SHELF (2 REQ'D)
Duke Manufacturing Model RHF1-SL Dimensions: 26.36(h) x 29(w) x 21(d)
HotFrost™ Recessed Hot Frost, Hot/Cold switchable slimline drop-in unit, 29"W x 21"D, fits (1) 18 x 26" pan per shelf, programmable color touch screen control, stainless steel body and shelves, self-contained refrigeration, 120v/60/1-ph, 5.5 Amps, NEMA 5-15P

ITEM 44 - SERVING COUNTER, UTILITY (2 REQ'D)
Duke Manufacturing Model TST-74SS Dimensions: 36(h) x 74(w) x 32(d)
Thurmaduke™ Solid Top Unit, mobile utility counter, 74"W x 32"D x 36"H, 16ga stainless steel top, 20ga stainless steel body & undershelves, 5" dia. gray poly swivel casters & brakes, NSF
2 ea Model MOD-14-5 14ga stainless steel top, in lieu of standard
2 ea Model 3BTS-FX-5CU Tray Slide on fixed brackets, (3) bar tubular, 1" dia. stainless, end caps, mounted 34"H (specify any other height), NSF
2 ea Model MOD-2S-5CU Kick Plate, customer's side, stainless steel, recessed, screw attached, 1/2" above floor for easy rolling
2 ea 400 Series
2 ea Model TS462-74 Contemporary Food Shield, 73-1/2"W x 20"D x 20-1/8"H, adjustable from full-service to self-service guard, single shelf, sloped guard with fixed end closures, 3/8" glass overshelf & guard with 1/4" glass ends (tempered with polished rounded edges), sloped Ø 1" tube posts, stainless steel finish posts
2 ea Model TS400LED-5 LED light under shelf & wired to base, 120v/60/1-ph (this may require cord & plug option)
2 ea Model TS400HT-5 Radiant Heater, under shelf & wired to base, 120v/60/1-ph (this may require cord & plug option)

ITEM 44.1 - HOT FOOD WELL UNIT, DROP-IN, ELECTRIC (2 REQ'D)
Duke Manufacturing Model WW-4 Dimensions: 10.3(h) x 61.25(w) x 23.5(d)
Waterless Hot Food Well Drop-In Unit, electric, dry operation, with (4) 12" x 20" hot food well, 61-1/4"W x 23-1/2"D x 10.3"H, stainless steel well, removable FDA approved black silicone rubber liner, fully insulated galvanized exterior housing, touch screen control panel, (3) preset temperatures, Wi-Fi enabled, without drain, 72" control wire, includes spacing rim, UL EPH Classified, cULus
2 ea Model WW-4-208 208v/60/1-ph, 9.6 amps, (4) NEMA 6-20P

ITEM 45 - OPEN DISPLAY MERCHANDISER (2 REQ'D)
Everest Refrigeration Model EOMV-60-B-28-S Dimensions: 60.13(h) x 60(w) x 28.38(d)

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Vertical Open Display Merchandiser, 60"W x 28-3/8"D x 60-1/8"H, 15.4 cu. ft. capacity, self-contained bottom mount refrigeration, front air intake & rear air discharge, LED lighting in canopy & underneath shelves, retractable night curtain, (6) adjustable stainless steel shelves, overheat protection alarm, stainless steel interior, black exterior, 5" front swivel casters with locks & leg stabilizers, R290 Hydrocarbon refrigerant, (2) 1/2 HP, 115v/60/1-ph, 10.0 amps, cord, NEMA 5-20P, ETL-Sanitation, cETLus, NSF

2 ea Parts and labor: 2 years from ship date
2 ea Electrical components: 5 years from ship date
2 ea Compressor: 5 years from ship date

ITEM 46 - SERVING COUNTER, UTILITY (2 REQ'D)
Duke Manufacturing Model TST-32SS Dimensions: 36(h) x 32(w) x 32(d)
Thurmaduke™ Solid Top Unit, mobile utility counter, 32"W x 32"D x 36"H, 16ga stainless steel top, 20ga stainless steel body & undershelves, 5" dia. gray poly swivel casters & brakes, NSF

2 ea Model 3BTS-FX-2CU Tray Slide on fixed brackets, (3) bar tubular, 1" dia. stainless, end caps, mounted 34"H (specify any other height), NSF
2 ea Model MOD-2S-2CU Kick Plate, customer's side, stainless steel, recessed, screw attached, 1/2" above floor for easy rolling

ITEM 47 - CASH REGISTER STAND (2 REQ'D)
Duke Manufacturing Model TCS-30SS Dimensions: 36(h) x 30(w) x 32(d)
Thurmaduke™ Cashier Stand, mobile, 30"W, 32"D, 36"H, 16ga stainless top, 20ga stainless steel body & partial undershelf, stainless steel tube foot rest, 5" dia. gray poly swivel casters & brakes, NSF

2 ea Model CS-DR-LK Stainless steel drawer, with lock and keys, for cashier stand
2 ea Model 3BTS-FX-32CR Tray Slide, cashier's right, (3) tubular Ø 1" bars, stainless steel, on fixed brackets, end caps, mounted 34"H (specify any other height)
2 ea Model MOD-2S-2CR Kick Plate, cashier's right, stainless steel, recessed, screw attached, 1/2" above floor for easy rolling
2 ea Model MOD-2S-2OC Kick Plate, opposite cashier, stainless steel, recessed, screw attached, 1/2" above floor for easy rolling

ITEM 47.1 - CASH REGISTER STAND (2 REQ'D)
Duke Manufacturing Model TCS-30SS Dimensions: 36(h) x 30(w) x 32(d)
Thurmaduke™ Cashier Stand, mobile, 30"W, 32"D, 36"H, 16ga stainless top, 20ga stainless steel body & partial undershelf, stainless steel tube foot rest, 5" dia. gray poly swivel casters & brakes, NSF

2 ea Model CS-DR-LK Stainless steel drawer, with lock and keys, for cashier stand
2 ea Model 3BTS-FX-32CL Tray Slide, cashier's left, (3) tubular Ø 1" bars, stainless steel, on fixed brackets, end caps, mounted 34"H (specify any other height)
2 ea Model MOD-2S-2CL Kick Plate, cashier's left, stainless steel, recessed, screw attached, 1/2" above floor for easy rolling
2 ea Model MOD-2S-2OC Kick Plate, opposite cashier, stainless steel, recessed, screw attached, 1/2" above floor for easy rolling

ITEM 48 - MILK DISPENSER (2 REQ'D)
Silver King Model SKMAJ1-ESUS4 Dimensions: 39.5(h) x 15.93(w) x 17.06(d)
Majestic Series Milk Dispenser, refrigerated, single valve- spring loaded , 6 gallon capacity, (accommodates 3, 5, or 6 gallon bags), includes (1) crate, stainless steel interior & exterior with galvanized bottom, bottom-mounted self-contained refrigeration, R290 Hydrocarbon refrigerant, 1/10 HP, 115v/60/1-ph, 1.5 amps, NEMA 5-15P, cETLus, ETL-Sanitation

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ITEM 50 - SOILED DISHTABLE (1 REQ'D)
Advance Tabco Model DTS-S30-96R Dimensions: 44(h) x 95(w) x 30(d)
Straight-Soil Dishtable, attaches to right of dish machine operator, 10-1/2"H backsplash, with pre-rinse sink, stainless steel legs with crossrails front to back, 95"W, 14/304 stainless steel, Includes prerinse basket with slide bar (slide bar only when K-461 or K-461A disposer adapter is specified)

1 ea	SPECIFY DISH MACHINE BRAND & MODEL to ensure proper fit, refer to attached document (AQ only) or consult www.advancetabco.com for compatibility listing. Certain dish machines require modifications at additional cost not shown here
1 ft	Model DTA-84 Simple Pass-Thru (sold per linear foot) (minimum 3 ft)
1 ea	Print required
1 ea	Specify wall thickness
1 ea	Specify wall height
1 ea	Specify distance from dish machine
1 ea	Model TA-1 Modify pass-thru shelf to accommodate roll-down door
1 ea	Model K-23A Sink or dish table legs welded to leg gussets under table top and to cross rails (and optional undershelf if ordered), shipped set up and crated (per sink)
1 ea	Model K-452 Control Bracket 8" x 12" (each)

ITEM 50.1 - PRE-RINSE FAUCET ASSEMBLY (1 REQ'D)
T&S Brass Model B-0133-CCB-CR
EasyInstall Pre-Rinse Unit, 8" wall mount base, wall bracket, 00CC inlets, Cerama cartridges, low lead

1 kt	Model B-1105-KIT Inlet Kit, 1/2"NPT close elbows, 24" flex supply hoses

ITEM 50.2 - DISPOSER (1 REQ'D)
InSinkErator Model SS-200-6-AS101
SS-200™ Complete Disposer Package, trough mount system, 6-5/8" diameter inlet, with #6 collar adaptor for trough installation, 2 HP motor, stainless steel construction, includes syphon breaker, (2) solenoid valves, (2) flow control valves, programmable AquaSaver® Control Center AS-101 with water-saving technology, automatic water saving function, auto reversing, timed run, post flush, adjustable leg kit

1 ea	(3) years parts & labor warranty from date of installation (standard)
1 ea	Standard height disposer body
1 ea	208v/60/3-ph, 3.6 amps
1 ea	Model SYPHON STD Syphon breaker standard, 1/2" (11477)

ITEM 51 - DISHWASHER, CONVEYOR TYPE, VENTLESS (1 REQ'D)
Champion Model 44 PRO-VHR Dimensions: 89(h) x 60(w) x 33.13(d)
Pro Series, 44”W rack conveyor dishwasher, ventless heat recovery technology, proportional rinse, progressive anti-jam drive system, top mounted control panel with HMI user interface, Proactive maintenance software, 100 gallons per hour with energy sentinel (idle pump shut-off), (209) racks per hour, built-in 70° rise booster, electric tank heat, single-piece hood design, single-piece stainless steel upper & lower wash arms manifolds, single removable scrap screen per tank, 20” standard vertical clearance which accommodate 18” x 26” sheet pans, full 180° opening leak proof insulated hinged access doors, automatic tank fill, door safety switches, leak-proof ball valve drains, lower front & side enclosure panels, stainless steel heavy gauge construction including base & legs, electric tank heat, 2 HP wash pump, single point machine & separate booster connection, vent fan control, stainless steel rear manifolds, includes: (2) 20" x 20" peg racks & (1) 20" x 20" flat rack, NSF Pot & Pan mode, CULus, ENERGY STAR®, Made in USA (consult factory for price)

1 ea	**NOTE: Please be advised that all quotes provided are valid for a period of 30 days from the date issued. Champion Industries reserves the right to make price adjustments, price

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increases or add surcharges as appropriate due to tariffs or market fluctuation that are out of our control. Thank you for your understanding.

1 ea consult factory for options & accessories for this model

DRAIN WATER TEMPERING KIT & TABLE LIMIT SWITCH

ITEM 52 - DISHTABLE, CLEAN "L" SHAPED (1 REQ'D)

Advance Tabco Model DTC-K30-84L Dimensions: 44(h)

Korner Clean Dishtable, L-shaped, attaches to left of dish machine operator, 10-1/2" backsplash, 3" rolled front & side rims, stainless steel legs, with stainless steel crossrails, 83" long, 14 gauge 304 stainless steel

1 ea SPECIFY DISH MACHINE BRAND & MODEL to ensure proper fit, refer to attached document (AQ only) or consult www.advancetabco.com for compatibility listing. Certain dish machines require modifications at additional cost not shown here

1 ea Model DTA-75 Provision for limit switch (limit switch by others)

1 ea Model K-23 Sink or dish table legs welded to cross rails (and optional undershelf if ordered), shipped set up and crated (per sink) Top is not welded to legs (for fully welded sink or dish table specify K-23A).

1 ea Model K-23A Sink or dish table legs welded to leg gussets under table top and to cross rails (and optional undershelf if ordered), shipped set up and crated (per sink)

ITEM 52.1 - DISHTABLE SORTING SHELF (1 REQ'D)

Advance Tabco Model DT-6R-13 Dimensions: 15.38(h) x 62(w) x 15.5(d)

Sorting Shelf, wall mounted, traditional design, 62"W, accommodates (3) full size dish racks, solid end brackets, stainless steel, NSF

ITEM 52.2 - HEATED SHELF FOOD WARMER (1 REQ'D)

Duke Manufacturing Model HTO1-SL Dimensions: 2.38(h) x 29(w) x 21(d)

HotFrost™ Hot Top overshelf, 29"W x 21"D, fits (1) 18 x 26" pan per shelf, programmable color touch screen control, stainless steel body and shelves., 120v/60/1-ph, 2.8 Amps, NEMA 5-15P (must be installed in a DUKE BG/BGA series food guard)

ITEM 60-60.2 - ICE MAKER, CUBE-STYLE (1 REQ'D)

Manitowoc Model IDT0450A Dimensions: 21.5(h) x 30(w) x 24(d)

Indigo NXT™ Series Ice Maker, cube-style, air-cooled, self-contained condenser, 30"W x 24"D x 21-1/2"H, production capacity up to 470 lb./24 hours at 70°/50° (358 lb. AHRI certified tat 90°/70°), easyTouch display with 13 different language options, date/time stamp display, automatic reminder/alert icon, one touch asset information, automatic detection of accessories, continuous operating status, programmable production options (time, weight, day or night), one touch cleaning with displayed instructions, Alpha-San anti-microbial protection, acoustical ice sensing probe, self-diagnostic technology, DuraTech™ exterior, dice size cubes, R410A refrigerant, NSF, cULus, CE, ENERGY STAR®

1 ea Model WARRANTY-ICE-SC 3 year parts & labor (Machine), 5 year parts & labor (Evaporator), 5 year parts & 3 years labor (Compressor), standard

1 ea (-161) 115v/60/1-ph, 11.9 amps

1 ea Model AR-10000-P Arctic Pure® Plus Primary Water Filter Assembly, includes head, shroud, hardware, mounting assembly, & (1) filter cartridge, 15,000 gallon capacity, 0-600 lbs./ice per day

1 ea Model WARRANTY-ARCPURE 3 year parts & labor warranty on cap, housing, hardware, & mounting assembly (does not refer to filter cartridge), standard

1 ea Model K00493 Replacement Water Filter Cartridge, for AR-10000-P filter

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1 ea	Model D570 Ice Bin, 30"W x 34"D x 50"H, with side-hinged front-opening door, side grips, 532 lbs. application capacity, AHRI certified 17.9 cu. ft., for top-mounted ice maker, Duratech exterior, NSF
1 ea	Model WARRANTY-BIN/DISP 3 year parts & labor warranty, standard
1 ea	Model K00461 External Scoop Holder, wall or bin mount, metal frame with plastic shield, NSF
1 ea	Legs, 6" adjustable stainless steel, standard

ITEM 61 - FLOOR TROUGH (1 REQ'D)
IMC/Teddy Model FT-1236-SGAS Dimensions: 12.25(h) x 36(w) x 12(d)
FT Floor Trough, 36"W x 12"D, 4" deep receptacle, (1) 6-1/2" waste outlet with perforated waste basket & 4" OD tailpiece, includes anchor straps, 14/304 stainless steel construction, brushed satin finish, (SGAS) anti-slip subway grating, NSF, Made in USA

ITEM 80-98 - SHELVING (1 REQ'D)
Cambro Model CUSTOM
REFER TO CAMBRO QUOTE 16_2025_7762

ITEM 100 - BUN / SHEET PAN RACK (8 REQ'D)
Channel Manufacturing Model 400S Dimensions: 70.25(h) x 20.5(w) x 26(d)
Bun Pan Rack, All-Welded, Stainless Series, 20.5"W x 26"D x 70.25"H, Stainless Steel Construction, End Load, 2" Angle Spacing, (30) 18" x 26" or (60) 13" x 18" pans (2 per shelf), 5" Swivel Stem Casters model # CSS45PU, Made in USA, NSF, 75lbs. (ITEM WEIGHT ONLY), weight does not include 50 lbs. for pallet weight

8 st	Model /024 Accessories, Corner Bumper (Set of 4), 1lbs. (ITEM WEIGHT ONLY)
8 st	Model /011 Accessories, Caster Brakes (Set of 2), 1lbs. (ITEM WEIGHT ONLY)

APPROVED ALTERNATES:
Note: All alternates must equal the listed prime specification in construction, features, warranties, and utility requirements.

Reach-in Refrigeration: Continental, Hoshizaki, Traulsen
Walk-In Refrigeration: American Panel, Kolpak, Bally, Norlake
Mobile Heated Cabinets: Alto-Shaam, Traulsen
Stainless Steel: Advance Tabco, Florida Stainless, Aero Mfg, EMI, Custom Fabricated
Combi Ovens: Rational, Unox, Convotherm

PART 3 - EXECUTION

3.01 GENERAL

A. Review all drawings pertaining to the food facilities and food facilities areas, including the utility load information prepared by the Consultant. Provide all equipment in accordance with the requirements of these documents (i.e., voltage characteristics, kw loads, special valves, etc.).
B. Notify the Consultant and Owner of any discrepancies between plans and specifications and actual conditions on the job before fabrication of equipment.

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C. K.E.C. review of job conditions: The KEC shall visit the job site to field check actual wall dimensions and roughing-in and be responsible for furnishing, fabricating, and installing the equipment in accordance with the available space and utility services as they exist on the job site.
D. Check all door openings, passageways, elevators, etc., to be sure that the equipment can be conveyed to its proper location within the building and, if necessary, check with the General Contractor regarding the possibility of holding wall erection, placement of doorjambs, windows, etc., for the purpose of moving the equipment to its proper location. Any removal and rebuilding of walls, partitions, doorjambs, etc., necessary to place the equipment or, if caused by incorrect information on the Contractor's drawings, shall be done at the expense of the Contractor, at no additional cost to the Owner.
E. Ensure equipment accurately fits the space as it exists and conforms to actual field dimensions on the job. Any changes required after fabrication has been started shall be made at no additional cost to the Owner.
F. Contractor shall review drawings and physically check the location and utility size of all "rough-ins" at the job site for compatibility with the equipment being installed before finished floors, walls, and/or ceilings are in place. K.E.C. shall take full responsibility for coordination of rough-ins. If rough-ins have been completed by others, Contractor shall review same, note any missing or problem areas, shall so advise Consultant, and shall coordinate corrections or shall adjust his equipment to suit conditions.
G. Provide all necessary appurtenances to accommodate plumbing, electrical, and refrigeration, etc., rough-in as shown on utility load information; for example, an S.R. (single receptacle) connection shown on the plan requires that the appropriate grounded cord and plug be provided to fit the receptacle as part of the equipment item to which the connection will be made.
H. Where portions of an item pass through masonry, walls, or partitions, provide complete installation of the item, including trim, field welding, dimensions, and coordinate all other work being performed relative to the item being installed.
I. All equipment, such as pass-through refrigerators and warmers, which pass through a wall where one side is exposed to public view shall be provided and installed with the operating controls located on the kitchen or working side of the wall. All equipment such as coffee urns, which are located on or in a counter having a pick-up side and a working side, shall be provided and installed with the operating controls facing the working side of the counter.

3.02 DELIVERY

A. All food service equipment shall be delivered to the job site protected from weather, vandalism and/or loss, and placed within the building. After delivery into the building, assembled and set in place, all responsibility for loss and/or damage to the food service equipment prior to final acceptance by the Owner shall rest with the Contractor.
B. Recognizing that other building trades tend to damage table and equipment tops by standing upon them to reach ceiling areas or using these surfaces for tool storage, the Food Service Equipment Contractor is encouraged to temporarily protect these surfaces from damage by the use of cardboard, plastic or similar materials, as well as posting notices warning against this damage.
C. Any items lost or damaged shall be immediately replaced or repaired to a new condition at no cost to the Owner, and to the satisfaction of the Consultant and Owner.
D. Coordination with General Contractor: The KEC shall coordinate all food service equipment delivery and installation activities with the General Contractor, avoiding all interference with the work of the G.C.
E. The KEC shall review the construction schedule and shall notify the Owner and G.C. of required lead times and Order/Approval dates for all equipment. Additional costs resulting from special handling or air shipment of equipment shall be paid by the KEC unless delays in ordering are unavoidable and the result of actions by the Owner.

3.03 WARRANTIES

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A. Guarantee all equipment furnished under this Section for a minimum period of one year from the date of substantial completion, covering defective materials, design, and workmanship. See individual equipment descriptions for specific warranties that may exceed one year.
B. Upon receipt of notice of failure of any part of the warranted equipment during the warranty period, the affected part or parts shall be replaced promptly and at the expense of the food service equipment contractor.
C. Until the time replacement equipment is installed, the Owner shall have full use of the defective equipment.
D. Warranty shall include installation, start-up and one-year free service for all self-contained refrigeration equipment with evidence of manufacturer's one year Warranty on the entire cabinet and additional four-year Warranty on any sealed compressor motor assembly except for labor.Warranty documents shall be provided to Owner at project completion

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SECTION 11 52 13
PROJECTION SCREENS

PART 1 GENERAL

1.1 RELATED DOCUMENTS
- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division-1 specification section, apply to work of this section.

1.2 SECTION INCLUDES
- A. See plans for location and number of projection screens.
- B. Types of projection screens required include:
  1. Electrically operated, remote controlled units
  2. Manually operated units
  3. Recessed, ceiling mounted units
  4. Surface mounted units
- C. Electrical wiring, connections, and installation of remote control switches for electrically operated projection screens are included in Division 26.

1.3 QUALITY ASSURANCE
- A. Provide each type of projection screen as a complete unit produced by a single manufacturer including necessary mounting brackets, accessories, fittings and fastenings.

1.4 REFERENCES
- A. NFPA 255: Standard Test Methods of Surface Burning Characteristics of Building Materials

1.5 SUBMITTALS
- A. Product Data: Submit copies of manufacturer's specifications and installation instructions for each type of projection screen unit.
- B. Shop Drawings: Submit complete shop drawings indicating method of attachment to the actual construction including end details and necessary coordination to finish surfaces.

1.6 DELIVERY, STORAGE & HANDLING
- A. Do not deliver projection screens until building is enclosed and ready for screen installation.
- B. Protect screens from damage during delivery, handling, storage, and installation.
- C. Store un-mounted projection screens in accordance with the manufacturer’s instructions (typically horizontal, not upright.)

PART 2 PRODUCTS

2.1 ELECTRICALLY OPERATED, AUTOMATIC RECESS CLOSURE SCREENS
- A. rovide screen units completely housed in a wood case with double top for extra strength and rigidity, with a metal-lined motor compartment, listed by UL, and bearing re-examination markers of UL.
  1. Mount top of screen fabric to metal roller, with roller supported on two heavy-duty brackets with self-aligning bearings.
- B. Screen Case:
  1. Metal- lined motor and wiring compartment, with hinged or removable access panel to motor compartment, electrical outlet box and finished with manufacturer's standard prime coat.
  2. Equip case with hinged bottom connected to drive mechanism for automatic opening and closing with raising and lowering of screen surface.
  3. Mount hinges to allow alignment of bottom panel to adjacent ceiling surface.

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C. Motor Unit:
   1. Size and capacity recommended by the screen manufacturer.
   2. Use instant reversing, gear drive motor with permanently lubricated ball bearings, automatic thermal overload protection, and preset limit switches that automatically stop screen in "up" and "down" position.
   3. Provide a 3-button remote control switch ("up", "down", and "stop") in a box with cover plate for flush wall-mounting.
   4. Stop action to be positive to prevent coasting.

D. Roller:
   1. Roller shall be of rigid metal at least 3" diameter on screens 12' wide and under.
   2. Roller shall be of rigid metal at least 5¾" diameter on screens over 12' wide.

E. Screen Fabric: Manufacturer's standard, flame retardant and mildew resistant fiberglass with matte white picture surface gain no less than 1.0 :
   1. Black masking borders.
   2. Top extension as required for proper image positioning.
   3. All electric screens to have minimum 4’ black screen drop at top (before white part of screen starts), coordinate with ceiling projector-mounting height and add drop as needed for higher ceiling areas.
   4. Screen Size – 16:10 wide format):
      i) 57.5” x 92” in classrooms and conference rooms, Da-Lite Boardroom Electrol Matte White 70145 or pre-approved equal
      ii) 72.5” x 116” in media center – reading room and group project area, Da-Lite Boardroom Electrol Matte White 70154 or pre-approved equal
      iii) 100” x 160” in cafeteria or cafetorium, Da-Lite Boardroom Electrol Matte White 70160 or pre-approved equal
      iv) 12’6” x 20’ in auditoriums, Da-Lite Professional Electrol Matte White 81629C (the C in part number indicates a custom order cut down screen from a 15’ x 20’ or pre-approved equal

F. All exposed materials shall be Class A rated per NFPA 255.

2.2 MANUALLY OPERATED SCREENS

A. Provide projection screen units for type of mounting shown, housed in powder coated white 22-gauge steel case with end caps concealing roller ends.
   1. Screen Fabric: Manufacturer's standard, flame and mildew resistant fiberglass with matte white picture surface gain no less than 1.0:
      a. Black masking borders with top extension as required for proper image positioning.
      b. Bottom of fabric securely mounted into tubular steel slat; protect ends of slat with plastic caps, with steel pull bail attached to slat.
      c. Provide 36" pull cord with plastic knob attached to steel pull bail on bottom of screen.
      d. Mount top of screen fabric into metal strip in a metal Camlok roller system without tape, glue, staples, or cords so that the fabric is easier to replace yet cannot be pulled from roller.

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e. Screen Size (16:10 wide format):
   i) 57.5” x 92” in classrooms and conference rooms, Da-Lite Model B Matte White 36465 or pre-approved equal
   ii) 72.5” x 116” in media center – reading room and group project area, Da-Lite Model C Matte White 70304 or pre-approved equal

B. All exposed materials shall be Class “A” rated per NFPA 255.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install projection screen units and accessories at locations shown in accordance with manufacturer's instructions.
   1. Install level, plumb, secure, and at proper height.
   2. Coordinate with other trades for securing projection screen units to finished surfaces.
   3. Repair or replace damaged units as directed by Architect.

B. Classroom wall mounted screens require universal 6" non-adjustable mounting brackets

C. Provide protections for installed units so that they will be in perfect operating condition, without damage at completion of project.

D. In classroom areas with standard 9 feet ceilings, mount the screens such that the top of white area of the screen material is 8’-6” AFF.
   1. In specialty classroom areas where higher ceilings allow raising the screen, it is recommended that the screen be raised, splitting the difference between the top of the wall and typical mounting height.
   2. This allows digital projector system installation without excessively long down rods.

3.2 INSPECTION

A. Inspect all screens for dirt, damage, and blemishes.

B. Replace screens or units that do not perform as intended.

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SECTION 11 57 00
WIRE MANAGEMENT - CORD REELS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Industrial Power Cord Reels.

1.2 RELATED REQUIREMENTS

A. Division 26: Wiring Connections, electrical supply.

1.3 REFERENCE STANDARDS

A. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

B. UL (DIR) - Online Certifications Directory; current listings at database.ul.com.

1.4 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Manufacturer's catalog cuts and descriptive information on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Installation methods.

C. Shop Drawings: Indicate locations, mounting details, and electrical connections.

PART 2 PRODUCTS

2.1 MANUFACTURERS:

A. Hubbell: www.hubbellcdn.com.

B. KH Industries: www.khindustries.com.

C. Reelcraft: www.reelcraft.com.

2.2 INDUSTRIAL POWER CORD REELS

A. Yellow Industrial Reel with Black Portable Outlet Box.
   1. One (1) 20A Duplex Receptacle, UL Type 1
   2. Cable Length: 25 Ft, unless otherwise noted.
   3. Cable Type: #12/3 SJO
   4. Current / Amperage Rating: 20 A
   5. Max. Working Voltage: 125V AC

B. Features:
   1. Cast Aluminum Construction.
   2. Dry, Indoor, Non-Hazardous Locations - UL Type 1.
   3. Multi-Position Guide Arm can be mounted in two different positions.
   4. Positive Latch mechanism to automatically maintain selected cord length.
   5. Ratchet Lock that can be disengaged in field for constant tension applications.
   6. Include Mounting bracket as required for installation indicated.

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PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that substrate is finished and ready to accept Cord Reel installation.

B. Verify that power connections are accurately placed and deliver building services at specified characteristics.

3.2 PREPARATION

A. Coordinate installation with adjacent construction and fixtures, including ceilings, walls, lighting, fire suppression, and registers and grilles.

3.3 INSTALLATION

A. Install in accordance with manufacturer's instructions, using manufacturer's recommended hardware for relevant substrates.

B. Test Cord Reels for proper working condition. Adjust as needed.

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SECTION 11 61 53
STAGE CURTAINS

PART 1 GENERAL

1.1 RELATED DOCUMENTS
- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division-1 specification section, apply to work of this section

1.2 SECTION INCLUDES
- A. Front Setting - including valance, front curtain (main drape) for multi-purpose room
- B. Back Slope and Side Marks
- C. Cyclorama Curtain and track for CCTV-Studio.

1.3 QUALITY ASSURANCE
- A. Fabricator/Installer Qualifications: Manufacturer shall have no less than 5-years of successful experience in fabricating and installing stage curtains of equal size and value as this project.
- B. Flame Resistance Requirements:
  1. Provide certified flame resistant stage curtains in accordance with NFPA 701.
  2. Permanently attach label to each curtain indicating if curtain is permanently and inherently flame resistant, or if it will require re-treatment after dry cleaning.

1.4 REFERENCES
- A. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc Coated, Welded and Seamless
- B. ASTM A653/A653M - Standard Specifications for Steel Sheet, Zinc Coated (Galvanized) or Zinc Iron Alloy Coated (Galvannealed) by the Hot Dipped Process
- C. ASTM A123/A123M – Standard Specifications for Zinc (Hot Dipped Galvanized) Coatings on Iron and Steel Products
- D. ASTM B221 Standard Specifications for Aluminum and Aluminum Alloy Extruded Bars, Rods, Wires, Profiles and Tubes
- E. ASTM A153/A153 – Standard Specifications for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
- F. NFPA 701 – Standard Methods of Fire Tests for Flame Propagation of Textiles and Films
- G. FBC - Florida Building Code
- H. FFPC - Florida Fire Prevention Code

1.5 SUBMITTALS
- A. Provide manufacturer's specifications, installation instructions, and general recommendations, including certification that materials comply with requirements.
- B. Submit shop drawings, including plans, elevations, and detail sections of typical rigging elements.
  1. Show anchors, hardware, operating equipment, and other components not included in manufacturer's standard product data.
- C. Submit 12" square samples of each fabric in color indicated with flame proofing as IFR.
- D. Provide certificates signed by the curtain fabricator certifying that the products comply with the specifications.

1.6 SUBSTITUTIONS
- A. There are no substitutions allowed for polyester material, cotton not allowed.

1.7 WARRANTIES AND GUARANTEES
- A. Warranty all materials and workmanship to be free of defects for a period of 1-year.
- B. Provide written guarantee the repair or replacement within 30-days of written notice of any defects during the 1-year following substantial completion.
- C. Warranty does not apply to ordinary wear or improper usage.

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1.8 PROJECT CONDITIONS

A. Field verify actual stage curtain openings before fabrication, show field measurements on final shop drawing.
B. Coordinate fabrication schedule with construction progress to avoid delays.

PART 2 PRODUCTS

2.1 MATERIALS

A. Provide a napped fabric of 100% Inherently Flame Resistant Polyester, 54" min width.
   1. Not less than 48 backing ends per inch, 51 pile ends per inch, and 48 picks per inch.
   2. 1224 pile tufts per square inch
   3. Provide a heavyweight fabric weighing not less than 24-oz per lineal yard with pile height of approximately 101 mils.
B. Lining if required shall be 100% Inherently Flame Resistant Polyester woven in a warp-faced twill 72" min width.
C. Color as selected by the Architect, with black lining.
D. Provide a permanent labels sewn on the curtain material in the off stage bottom edge on the up stage side, between 30” and 60” above floor.
   1. Label shall state material is “Inherently Flame Resistant Polyester” per NFA 701 and as specified herein.

2.2 INTERMEDIATE AND CYCLORAMA SETTING FABRIC/CTTVC STUDIO CURTAIN

A. Provide a Woven Chevron 2000 - 100% Inherently Flame Resistant Polyester, 54" min width.
   1. Provide a medium-weight fabric weighing not less than 14-oz per lineal yard with a pile height of approximately 105 mils.
B. Color as selected by the Architect, with black lining.
C. Provide a TV Studio Curtain of 100% inherently Flame Resistant Trevira Polyester 72" min width, weighing no less than 14 ounces per linear yard.

2.3 CURTAIN FABRICATION

A. Curtains:
   1. Provide not less than 50% additional fullness for curtains and provide vertical seams, unless otherwise indicated.
   2. Do not use fabric cuts less than half width, and fabricate velour curtains with nap down.
B. Vertical Hems: Provide not less than 2" wide with 1" tuck, and machine sewn with no salvage material visible from front of curtain; sew open ends of hems closed.
C. Turn Backs: Where indicated, provide by folding 12" of face fabric turned back with 1" tuck and secure by sewing the turn back vertically.
D. Top Hems: Reinforce by double-stitching 3½" wide heavy jute webbing to top edge with minimum 2" of face fabric turned under.
E. Pleats:
   1. Provide fullness in curtain by sewing 6" of additional material into double-stitched box pleats spaced at 12" o.c. along top hem reinforcing.
   2. Provide not less than No. 2 brass grommets spaced 12" o.c. and centered on box pleats, for tie lines, `S´ hooks, or Quick Links.
   3. Arrange vertical seams so they do not fall on faces of pleats.
   4. Provide No.-3 brass grommets for velour curtains at 6" spacing.
F. Bottom Hems:

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1. For curtains that do not hang to floor, provide hems not less than 3" deep with 3/4"weight tape or galvanized jack chain.
2. For floor-length curtains, provide at least 6" deep hems with 1"weight tape.
3. Sew open ends of hem closed.

G. Lining (if required): Provide lining in same fullness as face fabric and finished 2" shorter than face fabric, and of same fiber type as face fabric.
1. Attach lining to face fabric along bottom line at seams with 4" long strips of heavy woven polyester tape.

2.4 METAL PRODUCTS

A. Steel pipe: ASTM A53/A53M, Grade A; black, standard weight (Schedule 40), 1½" nominal, unless otherwise indicated.

B. Galvanized Steel Sheet: Provide an ASTM 653/A653M zinc-coated carbon steel of commercial quality, conforming to ASTM A123/A123M- G60 zinc coating, 14-gauged minimum.

C. Aluminum: Alloy and temper recommended by manufacturer for strength and corrosion resistance, mill finish, ASTM B221 for extrusions.

D. Supports, Clamps and Anchors: Sheet metal in manufacturer's standard gages, galvanized after fabrication in accordance with ASTM A153/A153M, Class B.

E. Support Chain (long link):
1. Minimum 3/16", not less than 0.276" dia. material (all welded proof coil) attached by a forged screw pin shackle and safety bolt.
2. Wrap chain 1½ times around batten.
3. Use a pipe clamp on the batten if the chain is less than one foot from the end of the batten.

F. Inserts, Bolts and Fasteners: Provide the manufacturer's standard.

2.5 CURTAIN TRACK - STRAIGHT

A. Steel Tracks, General: Fabricate of not less than 0.075" (14-gauge) nominal thickness galvanized roll-formed steel, with continuous bottom slot, and with each half of track in one continuous piece where applicable.
1. Provide curtain carriers for track spaced at 12" o.c.

B. Heavy Duty Track (Front Setting Curtain): Equip track with heavy-duty live-end double pulley and heavy-duty dead-end single pulley, with 5" cast-iron or nylon wheels on ball bearings, enclosed in steel housings.
1. Provide curtain carriers of molded nylon with a pair of neoprene or nylon tired ball bearing wheels riveted parallel to body.
2. Equip carriers with neoprene or rubber bumper, heavy-duty swivel eye, and trim chain for attaching curtain ties, Quick Links or `S´ hooks.
3. Provide end stops for track and adjustable floor block designed to maintain proper tension on 3/8" stretch-resistant operating line of braided polypropylene or fiberglass center cord.

C. Medium Duty Track: Provide adjustable pulley blocks containing sleeve-bearing wheels with guards.
1. Curtain carriers of plated or rust proof steel with pair of polyethylene wheels fastened parallel to body by rust proof steel rivets.
2. Carriers with swivel eye for attaching curtain snap or `S´ hook. Provide end stops for track and adjustable floor block to maintain tension on ¼" stretch resistant operating line of braided polypropylene or fiberglass cord.
3. Provide carriers with backpack guide accessory to allow offstage curtain folding.

D. Products: Subject to compliance with requirements, provide one of the following:

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1. Silent Steel Model No. 280, Automatic Devices Company
2. Tru-Roll Model No. 1000, Grosh Scenic Studios, Inc
3. Atlas Silk Model No. 400, H & H Specialties, Inc
4. Silent Steel Model No.170, ADC for lighter weight applications
5. Other approved equal

2.6 CURVED CURTAIN TRACK FABRICATION
(CYCLORAMNINTERMEDIATE SETTING/TV STUDIO CURTAINS)

A. Fabricate curved curtain tracks for walk-along operation without cord or pulleys, designed for rigid attachment to ceiling or hanging clamps.
B. Fabricate of not less than 0.075-inch (14-gauge) nominal thickness galvanized roll-formed steel with continuous bottom slot.
   1. Provide curtain carriers of plated or rustproof steel with pair of polyethylene wheels fastened parallel to body by rustproof steel rivets.
   2. Equip carriers with swivel eye for attaching curtain ties, Quick Links, or `S´ hooks.
C. Subject to compliance with requirements, curved tracks allowable in the work include, but are not limited to, the following:
   1. Besteel model No. 140 Curve, Automatic Devices Co
   2. Atlas Silk Model No 154 Curve, H & H Specialties, Inc
   3. Other approved equal

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify site conditions under the provisions of Section 01 31 00.

3.2 PREPARATION

A. Furnish layout for inserts, clips or other supports installed by other trades.

3.3 INSTALLATION

A. Install in accordance with approved submittals, manufacturer's printed instructions, and recommendations, complying with governing regulations.
B. Verify all materials are properly tagged, certified for fire resistance, and flame retardant.

3.4 BATTENS

A. Fabricate battens from steel pipe with a minimum number of joints.
   1. As necessary for required lengths, connect pipe with a drive fit pipe sleeve not less than 18" long, and secure with four flush rivets, plug welds, threaded couplings, or another equally secure method.
   2. Shop paint completed pipe battens with black paint to comply with Section 09900.
   3. In the TV Studio Fabricate a 5'-0" x 5'-0" pipe grid with overall size per plans, 6" from curtained walls.
   4. Provide matching fittings at all pipe intersections.
B. Install battens by suspending at proper heights with steel chains, aircraft cable, or minimum 3/8" all thread spaced at not more than 10' o.c.
C. Secure minimum 3/16" all welded proof coil chains, aircraft cable or 3/8" all thread either directly to structures or to inserts, eye-screws, or other devices that are secure and appropriate to substrate, and that will not deteriorate or fail with age or elevated temperatures.
   1. Coordinate suspension penetrations with suspended ceiling, neatly working grid and cut ceiling tile around and tight to chains/hangers.

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3.5 TRACK INSTALLATION

A. Above Structure Mounted Tracks: Secure min 3/16" all welded proof coil chains, air craft cable or 3/8" all thread directly to structures or to inserts, eye-screws, or other devices that are secure and appropriate to substrate, and that will not deteriorate or fail with age or elevated temperatures.
   1. Coordinate suspension penetrations with suspended ceiling, neatly working grid and cut ceiling tile around and tight to chains/hangers.
B. Wall Mounted Tracks: Install tracks by suspending from manufacturer's special heavy-duty steel "L" brackets securely mounted to wall construction at recommended spacing.
C. Batten-hung Tracks: Install track by suspending from pipe batten with manufacturer's special pipe clamps at recommended spacing.
D. Heavy-Duty Track: Do not exceed 7' between supports.
E. Medium-Duty Track: Do not exceed 6' between supports.
F. Curved/Walk-Along Track: Do not exceed 4' between supports, and provide additional supports at curves and splices.
G. Install track for center-parting curtains with not less than a 2' overlap of track sections at center, supported by special lap clamps.

3.6 CURTAIN INSTALLATION

A. Track-Hung: Secure curtains to track carriers with track manufacturer's special heavy duty S hooks or Quick Links for grommets.
B. Batten Hung: Secure curtains to pipe battens with minimum #4 (1/8" nominal size) by 36" long braided soft cotton tie lines. Run tie lines through curtain grommets.

END OF SECTION

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SECTION 11 65 00
ATHLETIC AND RECREATIONAL EQUIPMENT

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division-1 specification section, apply to work of this section.

B. Each type of equipment under this section will include all accessories, installation hardware, and necessary mounting required for a completely installed functioning system.
   1. Outdoor Basketball Backboard & Accessories
   2. Outdoor Tennis Systems
   3. Outdoor Volleyball Systems

1.2 REFERENCES

A. Facilities Planning for Physical Activity and Sports

B. National Federation "Court & Field Diagrams Guide"

1.3 QUALITY ASSURANCE

A. Fabricator/Installer Qualifications: Manufacturer shall have no less than 5-years of successful experience in fabricating and installing the specified equipment of this section.

1.4 SUBMITTALS

A. Provide manufacturer's specifications, installation instructions, maintenance instructions, and general recommendations, including certification for each type of equipment specified.

B. Submit shop drawings, including plans, elevations, and detail sections of typical rigging elements.
   1. Show anchors, hardware, operating equipment, and other components not included in manufacturer's standard product data.

1.5 WARRANTY

A. Provide minimum 1-year warranty against defects of material and workmanship under provisions of section 01 78 00.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Unless otherwise specified, products of the Jaypro Sports, Inc. are basis of quality for the equipment specified in this section.

B. Other manufacturers capable of providing equal to or products exceeding the ones specified herein will be acceptable.
   1. American Athletic, Inc.
   2. Porter Athletic Equipment Company
   3. Jaypro Sports Equipment

C. Provide all accessories, adaptors, or special tools required for a complete installation of each item specified.

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2.2 OUTDOOR BASKETBALL BACKSTOP AND ACCESSORIES

A. Permanent Basketball System for 8-foot high rims mounted at the sides of the basketball court (elementary school play courts)
   1. System shall consist of one 4-1/2"-O.D. galvanized steel tubular upright with a formed (not welded) 6' extension, one cast aluminum fan shaped backboard, powder coated white, Model # 996-FA-DR, one 5/8" double ring steel painted orange official size goal, one nylon net, and all required attaching hardware zinc plated.
   2. Provide safety pad, minimum 4 inches thick to a height of 6 foot.
   3. Install the unit in a concrete base as recommended by the manufacturer, with all hardware being zinc plated for weather resistance.
   4. System shall be Jaypro Sports Model # 996-FA-DR or approved equal.

2.3 OUTDOOR TENNIS SYSTEM

A. Semi-Permanent Tennis Post
   1. Construct posts of 3½"-o.d. heavy wall pipe, and provide each set with a tie off post and a winch post.
   2. Each post has a cast aluminum top pulley cap with a 1¾" diameter aluminum pulley.
   3. Tensioning ratchet shall be a cold rolled steel assembly with a removable handle for safety and a spring-loaded safety latch.
   4. Installation shall include two 24" long aluminum sleeves with cast aluminum top caps for semi-permanent installation.
      a. Install sleeves shall as recommended by the manufacturer.
   5. Finish shall be two coats of dark green lacquer paint.
   6. Include all hardware required for a complete assembly.
   7. System shall be Jaypro Sports Model # TP-150 or approved equal.

B. Tennis Net
   1. Provide tennis net constructed of durable 2.5 mm twisted black polyethylene netting.
      a. Quadruple stitched heavy-duty double thickness headband with a 1/8" diameter vinyl coated steel cable.
      b. Top 5 rows are double mesh, and bottom and side edges taped with black synthetic tape.
   2. System shall be Jaypro Sports Model # TPL-5 or approved equal.

2.4 OUTDOOR VOLLEYBALL SYSTEM

A. Volleyball Posts/Sleeves

B. System shall consist of one winch upright and one anchor upright and supplied with a tensioning winch and strap.
   1. Uprights shall fit snugly into 3.57”-I.D. rigid aluminum, 36" deep floor sleeves.
   2. Sleeves shall be Model # OCV-900G.

C. Uprights shall provide men’s and women’s net height settings by means of twin welded roller tabs on the winch upright and twin welded “D”-rings on the anchor end.
   1. Construct uprights of 3½”-O.D. by .187” steel tubing.

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D. Tensioning system shall consist of a ratchet type winch and include an attached 2" high strength nylon web-tensioning strap.
   1. Uprights shall have attached rubber feet to protect finished floors during transport.

E. All hardware shall be zinc plated.

F. System shall be Jaypro Sports Model # OCV-900 or approved equal.

PART 3 EXECUTION

3.1 PREPARATION

A. Make necessary arrangements to provide scaffolding to perform work under this section. Correct any/all damage at no additional expense to the Owner.

3.2 INSTALLATION

A. Install in accordance with manufacturer's printed instructions, drawings, specifications, and final approved shop drawings.

B. Remove loose equipment from packaging or crating, cleaned and tested for proper operation before turning over to the Owner.
   1. Set removable items in the various required positions and check for proper fit for floor inserts.
   2. Store loose equipment in spaces/areas provided in the facility.

3.3 DEMONSTRATION

A. Work under this section shall include demonstrating the proper use and operation of equipment to the Owner as required.

END OF SECTION

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SECTION 11 95 05
KILNS

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PART 1 GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 QUALITY ASSURANCE

A. Use experienced skilled personnel thoroughly trained in Kiln installation and familiar with the requirements and the methods needed for proper performance of the work this section.

B. Conform to NEC and NFPA requirements for Electric and Gas Kiln Units.

C. Provide Electric Kiln Units and Accessories by single manufacturer.

1.3 SUBMITTALS

A. Product Data:
   1. Manufacturer's brochure, specifications, and other data needed to prove compliance with the specified requirements.
   2. Dimensioned drawings as needed to depict the space required for these items, and their interface with the work of other trades.
   3. Manufacturer recommended installation procedures, which will become the basis for accepting or rejecting actual installation procedures used on the Work.

PART 2 PRODUCTS

2.1 ELECTRIC KILN

A. Provide an automatic, top loading electric kiln as manufactured by:
   1. Evenheat Kiln, Inc. model 2917A with 29" dia. x 27" deep 10.5 cu. ft. oven chamber
   2. Easy-fire, model e28T with 28" dia. x 27" deep 10.2 cu. ft. oven chamber
   3. Paragon Industries, L.P., model CT122829 with 28" dia. x 29" deep 10.57 cu. ft. oven chamber

2.2 ELECTRIC KILN ACCESSORIES

A. Supply the Kiln furniture by the same manufacturer as the kiln unit and include.
   1. 8 – half shelves
   2. 8 – 1" square post
   3. 8 – 2" square post
   4. 8 – 3" square post
   5. 8 – 4" square post
   6. 8 – 5" square post
   7. 8 – 6" square post
   8. 1lb kiln wash

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PART 3 EXECUTION

3.1 INSPECTION

A. Thoroughly examine the installation site for unsatisfactory conditions that may inhibit the installation of the kiln.

B. Correct conditions detrimental to timely and proper completion of the Work.

C. Do not proceed with installation until unsatisfactory conditions are correct.

3.2 INSTALLATION

A. Coordinate as required with other trades to assure proper and adequate provision in the work of those trades for interface with the work of this Section.

B. Install the work of this Section in strict accordance with the original design, the approved Shop Drawings, and the manufacturer's recommended installation procedures as approved by the Architect and authorizing agencies.

END OF SECTION

SECTION 12 24 13
ROLLER WINDOW SHADES

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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. Manually operated roller shades with single rollers.

B. Related Requirements:
   1. Section 06 10 53 "Miscellaneous Rough Carpentry" for wood blocking and grounds for mounting roller shades and accessories.
   2. Section 07 92 00 "Joint Sealants" for sealing the perimeters of installation accessories for light-blocking shades with a sealant.

1.3 PRODUCT SUBMITTALS

A. Product Data: For each type of product.
   1. Include styles, material descriptions, construction details, dimensions of individual components and profiles, features, finishes, and operating instructions for roller shades.

B. Shop Drawings: Show fabrication and installation details for roller shades, including shadeband materials, their orientation to rollers, and their seam and batten locations.
   1. Motor-Operated Shades: Include details of installation and diagrams for power, signal, and control wiring.

C. Samples: For each exposed product and for each color and texture specified, 10 inches (250 mm) long.

D. Samples for Initial Selection: For each type and color of shadeband material.
   1. Include samples of accessories involving color selection.

E. Samples for Verification: For each type of roller shade.
   1. Shadeband Material: Not less than 10 inches (250 mm) square. Mark inside face of material if applicable.
   2. Roller Shade: Full-size operating unit, not less than 16 inches (400 mm) wide by 36 inches (900 mm) long for each type of roller shade indicated.
   3. Installation Accessories: Full-size unit, not less than 10 inches (250 mm) long.

F. Roller-Shade Schedule: Use same designations indicated on Drawings for window types. Each exterior window to be provided with a shade typical for entire school.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Product Certificates: For each type of shadeband material, signed by product manufacturer.

C. Product Test Reports: For each type of shadeband material, for tests performed by a qualified testing agency.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: Include in maintenance manuals.

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1.6 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
   1. Roller Shades: Full-size units equal to 5 percent of quantity installed for each size, color, and shadeband material indicated, but no fewer than two units.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: Fabricator of products.
B. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.
   1. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
   2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver roller shades in factory packages, marked with manufacturer, product name, and location of installation using same designations indicated on Drawings.

1.9 FIELD CONDITIONS

A. Environmental Limitations: Do not install roller shades until construction and 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 roller shades 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 operating hardware of operable glazed units through entire operating range. Notify Architect of installation conditions that vary from Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis-of-Design Product: Subject to compliance with requirements, provide Hunter Douglas Designer Roller shades or comparable product by one of the following:
   1. BTX Window Automation, Inc.
   2. DFB Sales.
   3. Draper Inc.
   4. Lutron Electronics Co., Inc.
   5. MechoShade Systems, Inc.
   6. Nysan Solar Control Inc.; Hunter Douglas Company.
   7. OEM Shades Inc.
   8. Shade Techniques, LLC.
   9. Silent Gliss USA, Inc.
   10. SM Automatic, Inc.
B. Source Limitations: Obtain roller shades from single supplier and from single manufacturer.

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2.2 MANUALLY OPERATED SHADES WITH SINGLE ROLLERS

A. Chain-and-Clutch Operating Mechanisms: With continuous-loop bead chain and clutch that stops shade movement when bead chain is released; permanently adjusted and lubricated.
   1. Spring Lift-Assist Mechanisms: Manufacturer's standard for balancing roller-shade weight and lifting heavy roller shades.
      a. Provide for shadebands that weigh more than 10 lb (4.5 kg) or for shades as recommended by manufacturer, whichever criteria are more stringent.

B. Rollers: Corrosion-resistant steel or extruded-aluminum tubes of diameters and wall thicknesses required to accommodate operating mechanisms and weights and widths of shadebands indicated without deflection. Provide with permanently lubricated drive-end assemblies and idle-end assemblies designed to facilitate removal of shadebands for service.
   1. Roller Drive-End Location: Right side of inside face of shade.
   2. Direction of Shadeband Roll: Regular, from back of roller.
   3. Shadeband-to-Roller Attachment: Manufacturer's standard method.

C. Mounting Hardware: Brackets or end-caps, corrosion resistant and compatible with roller assembly, operating mechanism, installation accessories, and mounting location and conditions indicated.

D. Roller-Coupling Assemblies: Coordinated with operating mechanism and designed to join up to three inline rollers into a multiband shade that is operated by one roller drive-end assembly.

E. Material:
   1. Shade Material: Light-filtering fabric.
   2. Shadeband Bottom (Hem) Bar: Steel or extruded aluminum.
      a. Type: Enclosed in sealed pocket of shadeband material.
      b. Color and Finish: As selected by Architect from manufacturer's full range.

2.3 SHADEBAND MATERIALS

A. Shadeband Material Flame-Resistance Rating: Comply with NFPA 701.
   1. Testing by a qualified testing agency.
   2. Identify products with appropriate markings of applicable testing agency.

B. Light-Filtering Fabric: Woven fabric, stain and fade resistant.
   1. Source: Roller-shade manufacturer.
   2. Type: Woven PVC-coated fiberglass and PVC-coated polyester.
   3. Weave: Mesh.
   4. Roll Width: Custom per opening unit width.
   5. Orientation on Shadeband: Up the bolt.
   6. Openness Factor: 5 percent.
   7. Color: As selected by Architect or District from manufacturer's full range.

2.4 ROLLER-SHADE FABRICATION

A. Product Safety Standard: Fabricate roller shades to comply with WCMA A 100.1, including requirements for flexible, chain-loop devices; lead content of components; and warning labels.

B. Unit Sizes: Fabricate units in sizes to fill window and other openings as follows, measured at 74 deg. F (23 deg. C):
   1. Between (Inside) Jamb Installation: Width equal to jamb-to-jamb dimension of opening in which shade is installed less 1/4 inch (6 mm) per side or 1/2-inch (13-mm) total, plus

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or minus 1/8 inch (3.1 mm). Length equal to head-to-sill or -floor dimension of opening in which shade is installed less 1/4 inch (6 mm), plus or minus 1/8 inch (3.1 mm).

2. Outside of Jamb Installation: Width and length as indicated, with terminations between shades of end-to-end installations at centerlines of mullion or other defined vertical separations between openings.

C. Shadeband Fabrication: Fabricate shadebands without battens or seams to extent possible except as follows:

1. Vertical Shades: Where width-to-length ratio of shadeband is equal to or greater than 1:4, provide battens and seams uniformly spaced along shadeband length to ensure shadeband tracking and alignment through its full range of movement without distortion of the material.
2. Skylight Shades: Provide battens and seams at uniformly spaced along shadeband as required to ensure shadeband tracking and alignment through its full range of movement without distortion or sag of material.
3. Railroaded Materials: "Railroad" material where the material roll width is less than the required width of the shadeband and where indicated. Provide battens and seams as required by railroaded material to produce shadebands with full roll-width panel(s) plus, if required, one partial roll-width panel located at top of shadeband.

PART 3 - EXECUTION

3.1 EXAMINATION

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

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

3.2 ROLLER-SHADE INSTALLATION

A. Install roller shades level, plumb, and aligned with adjacent units according to manufacturer's written instructions.

3.3 ADJUSTING

A. Adjust and balance roller shades to operate smoothly, easily, safely, and free from binding or malfunction throughout entire operational range.

3.4 CLEANING AND PROTECTION

A. Clean roller-shade surfaces after installation, according to manufacturer's written instructions.

B. Provide final protection and maintain conditions, in a manner acceptable to Manufacturer and Installer, which ensure the roller shades are free of damage or deterioration at time of Substantial Completion.

C. Replace damaged roller shades that cannot be repaired, in a manner approved by Architect, before time of Substantial Completion.

3.5 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain roller shades.

END OF SECTION

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SECTION 12 48 12
ENTRANCE FLOOR MATS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 specification section, apply to work of this section.

1.2 SECTION INCLUDES

A. See plans for the extent of entrance mat work and the provisions of this section.

B. Types of work specified as work of this section include the following:
   1. Surface-type mats.

1.3 SUBMITTALS

A. Submit under provisions of Section 01 33 00.

B. Product Data:
   1. Submit manufacturer's specifications and installation instructions for each type of entrance mat.
   2. Include methods of installation for each type of substrate.

C. Samples:
   1. Submit samples for each type and color of exposed entrance mat, frames, and accessories.
   2. Provide 12" square samples of mat materials and 12" lengths of frame members.

1.4 MAINTENANCE DATA

A. Submit under provisions of Section 01 77 00.

B. Maintenance Data: Submit manufacturer's printed instructions for cleaning, drying, maintenance, and handling of removable entrance mat units.

1.5 FIELD MEASUREMENTS

A. Verify that field measurements are as indicated on shop drawings.

PART 2 PRODUCTS

2.1 MATERIALS AND FABRICATION

A. General: Provide colors/patterns/profiles of materials, including metals and metal finishes, as indicated on drawings or by this specification or, where not indicated, as selected by Architect from manufacturer's standard colors/ patterns/ profiles.
   1. Shop-fabricate the entrance mat work to greatest extent possible, in sizes as indicated on plans.
   2. Where not otherwise indicated, provide single unit for each mat installation, but do not exceed manufacturer's maximum size recommendation for units intended for removal and cleaning.
   3. Where joints in mats are necessary, space them symmetrically and away from normal traffic lanes.

4. Miter corner joints in framing elements, with hairline joints, or provide prefabricated corner units without joints.
5. Where possible, verify sizes by field measurement prior to shop fabrication.

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B. Roll-Up Type Foot Grilles:surface
1. Provide frame model JL-TR aluminum surface-mounted entrance mat as manufactured by JL-TR Industry or approved equal.
2. With extruded aluminum hinged tread-slat mat system, with slotted hinges of aluminum to form 2" wide x 3/8" thick slat modules
3. With top-surface, tread inserts of fusion-bonded carpet of 1/4" high x 28 oz. per sq. yd, Level-cut DuPont "Antron III" nylon filament, with continuous vinyl cushions on bottom surface of slats.
4. Vinyl edge accessories to accommodate frame application as indicated.

C. Frame Finish: As selected by the Architect from the manufacturer’s standard color palette.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install surface-type units to comply with manufacturer's instructions, at locations indicated on Drawings and coordinated with entrance locations and traffic patterns.
1. Anchor the fixed surface type frame members to floor with devices spaced as recommended by manufacturer.

END OF SECTION

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SECTION 13 31 00
PLAYGROUND SHADE STRUCTURES

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 specification sections, apply to work in this section.

1.2 SUMMARY

A. The shade structure contractor shall be responsible for design, engineering, fabrication, and supply of the work specified herein.

B. The intent of this specification is to have only one manufacturer responsible for all the functions.

1.3 REFERENCES

A. ASCE 7 – Minimum Design Loads for Buildings and other Structures

B. ASTM A135/A135M – Standard Specification for Electric Resistance Welded Steel Pipe

C. ASTM A500/A500M – Standard Specification for Cold Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes

D. ASTM E84 – Standard Test Method for Surface Burning Characteristics of Building Materials

E. NFPA 701- Standard Methods of Fire Tests for Flame Propagation of Textiles and Films

F. FBC - Florida Building Code

G. FFPC Florida Fire Prevention Code

1.4 SUBMITTALS

A. Provide installed reference sites with structures for similar scope and installation engineered to the FBC requirements.

1. Provide minimum of 5-references in Southeast Florida, preferably 5-years or more in age.
2. Include in reference list of structure dimensions with install dates and project locations.

B. Provide material samples and color available.

C. Provide signed and sealed engineered drawings and structural calculations prepared by Florida licensed Engineer.

D. Provide certification that the fabric meets NFPA 701 requirements.

E. Provide a letter signed by the school principal stating conditions for fabric removal.

1. Obtain a copy of a draft form letter from the District's Building Code Services Department.

1.5 WARRANTY

A. The successful bidder shall provide a one-year warranty on all labor and materials.

B. Provide a supplemental non-prorated 10-year warranty from the manufacturer on fabric including stitching and 20-years on the structural integrity of the steel, from date of substantial completion.

C. The warranty shall not deprive the Owner of other rights under the provisions of the Contract Documents, are in addition to, and run concurrent with, other warranties made by the Contractor under requirements.

PART 2 PRODUCTS

2.1 GENERAL

A. Design and manufacture the shade product to the most exacting specifications by skilled craftsmen, and certified by Professional Engineers for structural soundness of designs.

B. Ship all shade products knocked-down, with complete assembly instructions, and ready for

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easy in-field installation

C. Engineer the structures to meet or exceed the requirements of the FBC.
D. Design to the following wind speeds:
   1. Frame only – Wind load per current wind map for Risk Category II, Exposure C.
   2. Frame w/canopy in place – 105 M.P.H., Risk Category II, Exposure C.
E. Material:
   1. All materials shall be structurally sound and appropriate for safe use.
   2. Ensure product durability by the use of corrosion-resistant metals such as stainless steel, and coatings such as zinc plating, galvanizing, and powder coating on steel parts, subject to the product-specific requirements.
   3. Use fabrics with UV-stabilizers and fire retardants for longevity and safety.
F. Packaging: Wrap all metal posts, rafters, and beams to protect the powder coat finish during shipping.
G. Weldments: Factory weld all tubing members using Certified Welders meeting American Welding Society (AWS) specifications and to the highest standards of quality workmanship.
   1. Finish the weldments with a zinc-rich galvanized coating.
   2. Minimize or omit field welding in the assembly of the shade products.
H. Posts, Structural Frame Tubing, and Hardware:
   1. Use cold-formed and milled tubing meeting ASTM A135/A135M and ASTM A500/A500M requirements.
   2. Test material in accordance with ASTM E8.
   3. Minimum yield is 40,000 psi, minimum tensile strength of 45,000 psi on all posts.
   4. Pre-cut all tubing to appropriate lengths, and galvanize all outside surfaces with an exterior corrosion-resistant zinc-rich coating.
   5. Where required, schedule-40 support pipes of hot-dip galvanized or powder-coated black steel.
   6. All fastening hardware shall be stainless steel.
I. Powder-coating Process:
   1. Completely clean and properly, pre-treat all powder-coated parts before coating.
   2. Apply powder coating electrostatically and oven-cured at 375 to 425 degrees Fahrenheit.
   3. Powders shall meet or exceed ASTM standards for Adhesion, Hardness, Impact, Flexibility, Overbake Resistance, and Salt Spray Resistance.
   4. Owner shall select color from manufacturer's palette.
J. Design the footings per the FBC for the specified structure.
K. Roofing:
   1. Design structural frames use with shade fabric.
   2. Attach the fabric to frame using a vinyl covered minimum diameter galvanized and clear vinyl coated cable.
   3. Provide zinc-plated copper cable fasteners for maximum corrosion resistance.

2.2 FASTENING SYSTEM

A. Deliver the Shade Fabric complete with independent cables pre-inserted in fabric hems.
B. Loop and clamp each cable at each end.
C. Provide a Fastening System with a factory-installed device at each roof rafter corner.
D. The fastening device should feature a concealed mechanism.
E. Attach cables to a hook welded to the moving sleeve, thereby distributing tension evenly over rafters and not directly onto the mechanism.

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F. Seal the rafters with no penetrations on the top side, thereby preventing water from entering.
G. Provide a locking cap at the end of each rafter with a vandal-resistant bolt (special wrench provided by the manufacturer) to prevent unauthorized access to the fastening device mechanism.
H. Provide a system to adjust the tension on the fabric, which staff controls with the proper tool supplied by the vendor.
I. Provide instructional video DVD on handling the shade structure, exact procedure for removing, and re-attaching canopy using an actual shade structure in the field.

2.3 FABRIC

A. Shade Fabric:
1. Knitted of monofilament and tape construction high-density polyethylene with Ultra Violet (U.V.) stabilizers and flame retardant, UV-Block Factor varies by standard color offered from 91% to 99%.
2. Normal Thickness: 0.057 inches
3. Fabric Mass: Min 337 g/m²
4. Light Fastness: 7-8 (Blue Wool Scale)
5. Weather Fastness: 4-5 (Grey Scale Test)
6. Tear Resistance: Warp 210N Weft 276N
7. Breaking Force: Warp 786N Weft 1544N
8. Bursting Pressure: Mean 3125kPa
9. Bursting Force: Mean 1775N
10. All hems and seams are double rowlock stitched using exterior grade UV-stabilized polyethylene sewing thread.

B. Flammability:
1. Shade fabric shall pass the requirements established under the NFPA 701 Test Method 2 test standards for flammability, including the accelerated water leaching protocol.
2. Furnish written evidence of compliance with this standard, including with accelerated water leaching protocol, with bid proposal.

PART 3 EXECUTION

3.1 INSTALLATION

A. Installations of shade structure(s) by an installer who shall comply with the manufacturer's instructions for assembly, installation, and erection, per approved drawings.
B. The site shall be free of construction debris upon the completion of the project.

3.2 TRAINING

A. Provide fabric removal and installation training for school staff members selected by their principal.

END OF SECTION

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SECTION 14 24 23
HYDRAULIC ELEVATORS – PASSENGER

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Hydraulic passenger elevator system
   1. Commercial standard pre-engineered hydraulic passenger elevators.
   2. Elevator car enclosures, signal equipment, hoist-way entrances including doors and frames.
   3. Operation and control systems.
   4. Jacks
   5. Accessibility provisions for physically disabled persons.
   6. Equipment, machines, controls, systems and devices as required for safely operating the specified elevators at their rated speed and capacity.
   7. Materials and accessories as required for a complete working elevator installation to meet this specification and all applicable Codes.

1.2 RELATED SECTIONS

A. 01 72 29 Cutting and Patching: Walls floors, etc. as necessary for proper installations of elevator, equipment, materials, signals, anchors, sleeves, and anything related to the elevator installation.

B. 01 50 00 Temporary Construction Facilities: Temporary enclosures or other protection from open hoist ways during the elevator(s) installation.

C. 31 20 00 Earth Moving: Proper trenching and backfilling for any underground piping or conduit.

D. 03 30 00 Cast-in-Place Concrete: Elevator pit, motor, pump, equipment supports and foundations.

E. 04 20 00 Masonry Unit: Hoist way enclosure, building-in and grouting hoist way doorframes, and grouting thresholds.

F. 05 50 00 Metal Fabrications: Hoist beams, pit ladders, steel framing, auxiliary support steel, divider beams for supporting guide-rail brackets, steel angle sill supports, and miscellaneous steel required for proper installation of elevator.

G. 07 13 00 Sheet Membrane Waterproofing: Waterproof pit and hoist way as required.

H. 09 65 00 Resilient Flooring: Finishing floor covering for elevator cab.

I. 09 90 00 Painting:

J. Division 22: Sump pit, sump pump, and oil separator; see M. 4. A. i) below.

K. Division 23: Heating and ventilation of hoist way and machine room, maintain machine room temperature between 50°F and 90°F.

L. Division 28: Card Access System

M. Division 26:
   1. Provide electrical service for elevator, hoist way, machine room, and equipment.

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a. Provide dry and isolated contact set and wiring between elevator controller and disconnect, Auxiliary contact closed when disconnect switch is in ON position and open when in OFF position.
b. Provide wiring and power to controller for cab lighting and ventilation.

2. Provide equipment to automatically discount main power supply to elevator prior to sprinkler activation in machine room with self-resetting ability.
3. Provide wiring for interconnection of elevator control system to fire alarm and security system, emergency communication to elevator controller, and heat and smoke sensing devices per ASME A17.1.
4. On all elevator pits:
   a. Provide pump, float switch in the elevator sump pit connected to the Energy Management System (EMS).
      1) Connect the pump to an oil separator and discharge water indirectly to the sanitary system.
      2) The EMS shall monitor the pump, if the pump fails send an alarm to the EMS monitoring station to notify operator of the pump failure.
      3) See section 22 20 00 for oil-water separator specifications.
      4) The oil separator shall be equipped with a sensor that will stop operation of the sump pump to preclude discharge of oil or oil laden water to the storm sewer system. This sensor shall also report through the EMS system.
      5) The oil separator and all related piping that may convey oil laden water shall be equipped with secondary containment when installed within a well field protection zone.
   b. General contractor shall coordinate the installation of the float switch raceway system.
   c. General contractor shall coordinate with the elevator inspector.

1.3 REFERENCES

A. ASME A17.1 - Safety Code for Elevators and Escalators
B. ASTM A36/A36M - Standard Specification for Carbon Structural Steel
C. ASTM A167 - Standard Specification for Stainless and Heat Resisting Chromium Nickel Steel Plate, Sheet, and Strip
D. ASTM A269 - Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service
E. ASTM A276 - Standard Specification for Stainless Steel Bars and Shapes
F. ASTM A568/A568M – Standard Specification for Steel, Sheet, Carbon, Structural, and High Strength, Low Alloy, Hot Rolled and Cold Rolled, General Requirements for
G. ASTM B36/B36M – Standard Specification for Brass Plate, Sheet, Strip, and Rolled Bars
H. ASTM B43 – Standard Specification for Seamless Red Brass Pipe, Standard Sizes
I. ASTM B209 – Standard Specification for Aluminum Alloy Sheet and Plate
J. ASTM B221 – Standard Specification for Aluminum and Aluminum Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes

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K. ASTM B455 – Standard Specification for Copper Zinc Lead Alloy (Leaded Brass) Extruded Shapes

L. ASTM E84 – Standard Test Method for Surface Burning Characteristics of Building Materials

M. AWI – American Welding Society D1.1

N. FBC - Florida Building Code

O. FFPC – Florida Fire Prevention Code

P. FFPC - Florida Fire Protection Code

Q. NEC - National Electrical Code (NFPA 70)

R. NFPA 80 – Standard for Fire Doors and Fire Windows

S. UL Underwriters Laboratories 10B Fire Test of Door Assemblies

1.4 QUALITY ASSURANCE

A. An approved manufacturer regularly engaged in manufacturing, installing and servicing elevators of the type required by these specifications, shall furnish the elevator.
   1. To ensure strict quality control, the elevator contractor shall be the manufacturer of the power unit, controller, jack, signal fixtures, door operator, cab, entrances, and all other major parts of the elevator operating equipment.
   2. The major parts of the elevator equipment shall be manufactured in the United States, and not be an assembled system.
   3. The elevator manufacturer shall have an ongoing quality assurance program implemented and documented.

B. The installer shall have minimum of five years experience in the installation and service of this type system, and either work for the elevator company or be a manufacturer approved installer.

C. Prior to start of work under this section, this contractor shall have a coordination meeting with the Architect, Owner, and other Contractors related to the installation of the elevator system.

D. Inspection and testing: Elevator Installer shall obtain and pay for all required inspections, tests, permits and fees for elevator installation.
   1. Arrange for inspections and make required tests.
   2. Deliver to the Owner upon completion and acceptance of elevator work.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver elevator materials, components, and equipment in manufacturer's original packaging.

B. Protect and store materials and equipment in accordance with the manufacturer's requirements.

1.6 SUBMITTALS

A. Product data: When requested, submit product data for the following:
   1. Elevator car enclosures and hoist way entrances.
   2. Operation, control, and signal systems.

B. Shop drawings:

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1. Show equipment arrangement in the machine room, pit and hoist way. Provide plans, elevations, sections and details of assembly, erection, anchorage, and equipment location.
2. Indicate elevator system capacities, sizes, performances, safety features, finishes and other pertinent information.
3. Show floors served, travel distances, maximum loads imposed on the building structure at points of support and all similar considerations of the elevator work.
4. Indicate electrical power requirements and branch circuit protection device recommendations.

C. Color selection: Submit color charts of exposed finishes and materials for color selection.
1. When requested, submit samples of exposed finishes and materials selected for the elevator system materials and components.

D. Certificates: Inspection and acceptance certificates of elevator system installation.

E. Operation and maintenance data. Include the following:
1. Operation and maintenance instructions.
2. Parts list, with recommended parts inventory.

F. Provide two copies of "as-built" plans, to have same detail as the shop drawings.
1. One placed in secure location in the elevator equipment room, other to Building Department.

1.7 MAINTENANCE

A. The elevator contractor shall furnish maintenance and call back service for a period of 12 months on each elevator after final acceptance.
1. This service consists of periodic examinations of the equipment, adjustment, lubrication, cleaning, supplies and parts to keep the elevator in proper operations, as required by the manufacturer's specifications.
2. Trained employees of the elevator contractor shall do all work during regular working hours of the trade.

B. Include parts catalog and show evidence of local parts inventory with complete list of recommended spare parts.
1. Use parts produced by manufacturer of original equipment.

C. Show evidence of bidder's insurance coverage, certificate of insurance outlining limits of liability.

D. 24-hour minor emergency repair call back service shall be included.

1.8 WARRANTY

A. The elevator manufacturer warrant shall cover the equipment installed under these specifications against defects in materials and workmanship and any defects not due to ordinary wear or tear or improper use or care for 5-years from the date of Substantial Completion.

B. Substantial Completion includes the elevator (s) passing an inspection by the State of Florida, and placed in operation.

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1.9 JACK HOLE (IF "HOLED" UNIT PROVIDED)

A. Provide the hole for the jack unit as required, based upon excavation through normal soil or clay that is removable by manual digging or with a standard truck-mounted drilling unit.
   1. If determined that a casing is required to retain the walls of the hole, furnish one.
   2. Removal of excavation spoils deposited at the elevator pit will be by the Contractor.

B. If any physical obstruction or hindrance is encountered below the surface of the ground, including by not limited to boulders, rock, gravel, wood, metal, pilings, sand, water, quick sand, caves, public utilities or any other foreign material, provide the elevator contractor with a written authorization to proceed with excavation utilizing any required special excavation equipment.
   1. The elevator contractor shall maintain a daily log of time and material cost.
   2. Compensate is at current billing rates for time and material basis related to additional cost incurred subsequent to encountering the physical obstruction or hindrance including cost of the special excavation equipment.

C. Provide unobstructed access and egress for excavation equipment with adequate workspace at the elevator pit.

PART 2 PRODUCTS

2.1 APPROVED MANUFACTURERS

A. Kone, Inc

B. Otis Elevator Company

C. Thyssenkrupp Elevator

D. Pre-approved equal.

2.2 ELEVATOR DESCRIPTION

A. Elevator Minimum Requirements:
   1. Quantity: As shown on the plans.
   2. Capacity: 3000 pounds
   3. Clear Inside: 6'-8" wide by 4'-9" deep.
   4. Car height of 8'-0" nominal
   5. Entrance Size:
      a. Height: 7'-0"
      b. Width: 3'-6"
   6. Speed: 100 fpm.
   7. Net Elevator Travel: As per plans.
   8. Openings:
      a. Front: As per plans.
      b. Rear: As per plans.
   9. Door Type: As per plans.
   10. Power Characteristics: V277/480-VAC, 3-PHASE, 60-HZ.

B. Special Features:
   1. Baked Enamel: Electrostatically applied, oven baked to match selected color.

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2. Paint: Except as otherwise specified, properly paint all metal work fabricated by the elevator contractor with the manufacturer's standard paint.
3. Floor finish as scheduled.

2.3 MATERIALS, GENERAL

A. Colors, patterns, and finishes, as selected by the Architect from manufacturer's range of standard colors, patterns, and finishes.

B. Steel
1. Steel shapes, bars, and plates complying ASTM A36/A36M.
2. Sheet Steel Exposed Work: Stretcher leveled, cold rolled, commercial-quality carbon steel complying with ASTM A568/A568M.
3. Sheet Steel Un-Exposed Work: Hot rolled, commercial-quality carbon steel complying with ASTM A568/A568M.

C. Stainless Steel
1. Type 304 with #4 (satin) or #8 (polished) finishes to comply with ASTM A167 and NAAMM.
2. Shapes and bars shall comply with ASTM A276. Type 300.
3. Tubing shall comply with ASTM A269, Type 300.

D. Bronze:
1. Drawn pipe shall comply with ASTM B43; alloy UNS C23000, red brass.
2. Sheet shall comply with ASTM B36/B36M; alloy UNS C28000, muntz metal.
3. Extrusions shall comply with ASTM B455; alloy UNS C38500, architectural bronze.

E. Aluminum
1. Sheet and plate shall comply with ASTM B209, alloy 6063-T52.
2. Extrusions shall comply with ASTM B221, alloy 6063-T52.

F. Plastic Laminate, Decorative high-pressure type complying with NEMA LD3 and ASTM E84.

2.4 HOISTWAY EQUIPMENT

A. Platform: Fabricated frame of formed or structural steel shapes, gusseted and rigidly welded with a wood sub floor.
1. Fireproof platform underside.
2. The platform shall have a Class A rating.

B. Sling: Steel stiles properly affixed to a steel crosshead and bolster channels with bracing members, to remove all strain from the car enclosure.

C. Guide Rails: Formed steel properly fastened to the building structure with steel brackets.

D. Guide Shoes: Top and bottom rigid type with metal body and removable non-metallic liners.

E. Guide Rail Lubricators: Provide a leak proof reservoir mounted on top of upper guide shoes.
1. Wood felt wiper shall apply and even, uniform flow of lubricant which shall thoroughly cover face of guide rail.

F. Buffers: Provide substantial buffers in the elevator pit.
1. Mount on continuous channels fastened to the elevator guide rail or securely anchored to the pit floor with substantial extensions if required by job conditions.

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G. Jack: Provide a jack unit of sufficient size to lift the gross loads the height specified and factory test to insure adequate strength and freedom from leakage.
   1. Do not use brittle material, such as grey cast iron, in the jack construction.
   2. The jack unit shall consist of the following parts:
      a. Single post conventional (in ground). Single polished steel hydraulic plunger housed in a steel sealed casing with sufficient clearance space to allow for alignment during installation.
      b. The casing shall have a dished end cap and safety bulkhead as required by ASME A17.1 code.
      c. The plunger shall have a high-pressure sealing system which will not allow for seal movement or displacement during the course of operation.
      d. The jack system will be supplied with schedule 40 PVC or an HDPE protection system complying with ASME A17.1 code requirements to prevent in ground corrosion of the casing.
      e. The jack casing shall have a bleeder valve to discharge any air trapped in the jack.
   3. Double wrap the jack cylinder and any underground piping with an approved coating designed to help protect it from electrolytic and chemical corrosion.

H. Automatic Terminal Limits: Place electric limit switches in the hoist way near the terminal landings designed to cut off the electric current and stop the car should it run beyond either terminal landing.

I. Automatic Self-Leveling: Provide the elevator with a self-leveling feature that will automatically bring the car to the floor landings and correct for over travel or under travel.
   1. The self-leveling shall, within its zone, be entirely automatic and independent of the operating device.
   2. Maintain the car approximately level with the landing irrespective of the load.

J. Failure Protection: Design electrical control circuit so that if a malfunction occurs, due to motor starter failure, oil becoming low in the system, or the car failing to reach landing in the up direction with a pre-determined time, the elevator car will automatically descend to the lowest terminal landing.
   1. If using power-operated doors, the doors shall automatically open when the car reaches that landing to allow passengers to depart.
   2. The doors will then automatically close and all control buttons, except the “door open” button in the car station are inoperative.

K. Wiring, Piping, and Oil:
   1. Provide and install all necessary wiring in the hoist way in accordance with the NEC.
   2. All necessary pipe and fittings to connect the power unit to the jack unit.
   3. Provide Biodegradable oil of the proper grade.
      a. ISO Grade 32, Chevron clarity hydraulic oil AW or equal.

L. Emergency Terminal Stopping Device: Provide an emergency terminal stopping device for speeds over 100-FPM which operates independently of the normal terminal stopping device should it fail to slow down the car at the terminal as intended.
   1. Stopping devices shall function at all times, even if there is a single short circuit caused by a combination of grounds, or by other conditions.

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2. The normal and emergency terminal stopping devices shall not control the same controller switches unless two or more separate and independent switches are furnished, two of which shall be closed in either direction of travel to complete the circuit to the control valve solenoids in the down direction and to complete the circuit to the pump motor for the up direction of travel.

2.5 POWER UNIT

A. Provide a compact and neatly designed Power Unit (Oil Pumping and Control Mechanism) with all of the components listed below combined in a self-contained unit.
   1. Oil reservoir with tank cover and controller compartment with cover.
   2. An oil-hydraulic pump.
   3. An electric motor, oil control unit with the following components built into a single housing.
   4. A high-pressure relief valve.
   5. A check valve.
   6. An automatic unloading up start valve.
   7. A lowering and leveling valve.
   8. A magnetic controller.

B. Provide a pump specifically designed and manufactured for oil-hydraulic elevator service.
   1. It shall be of the positive displacement type, inherently designed for steady discharge with minimum pulsations to give smooth and quiet operation.
   2. Discharge of pump shall not vary more than 10% between no load and full load on the elevator car.

C. Drive shall be by direct coupling with the pump and motor submerged in the oil reservoir or by multiple V-belts and sheaves of number and size to insure maximum factor of safety.
   1. Drive type shall be determined based primarily on the load on the car, travel and speed.

D. Provide a motor specifically designed for oil-hydraulic elevator service, of standard manufacturer, and of duty rating to comply with herein specified speeds and loads.

E. Oil Control unit shall consist of the following components, all built into a single housing.
   1. Welded manifolds with separate valves to accomplish each function will not be acceptable under this specification.
   2. All adjustments shall be readily accessible and made without removing the assembly from the oil line.
   3. Provide an externally adjustable relief valve capable of bypassing the total oil flow without increasing backpressure by more than 10% above that required to barely open the valve.
   4. Up start and stop valve shall be externally adjustable, and designed to bypass oil flow during start and stop of motor pump assembly.
      a. Valve shall close slowly, gradually diverting oil to or from the jack unit, insuring smooth up starts and up stops.
   5. Provide check valve designed to close quietly without permitting any perceptible reverse flow.

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6. Provide externally adjustable lowering valve and leveling valve for drop-away speed, lowering speed, leveling speed and stopping speed to insure smooth DOWN starts and stops.
    a. Provide a leveling valve designed to level the car to the floor in the direction the car is traveling when slowdown is initiated.

F. Power controller shall contain all necessary electrical contractors; electro-mechanical switches and thermal overload relays.
1. All components shall be mounted in a NEMA I enclosure.
2. Logic control system shall be microprocessor based and protected from environmental extremes and excessive vibrations.

G. Reduced Voltage Starting:
1. Provide a solid-state starter to limit current inrush during starting and to provide gradual acceleration of the motor.
2. Do not initiate motor starting by mechanical contacts.
3. The starter shall include a current limit adjustment range of 200% to 450% of the overload adjustment range.
4. Do not provide an integral fault detection and diagnostic system.
5. Remove power from the motor if the internal fault detection system detects a failure.

2.6 OIL-HYDRAULIC SILENCER

A. Provide and install an oil-hydraulic silencer (muffler device) at the power unit location.
1. It shall contain pulsation absorbing material inserted in a blowout proof housing arranged for inspecting interior parts without removing unit from oil line.
2. Rubber hose without blowout proof features will not be acceptable.

2.7 VIBRATION PADS

A. Provide and mount vibration pads under the power unit assembly to isolate the unit from building structure.

2.8 SOUND INSULATING PANELS

A. Where pump and motor are not submerged, provide panels manufactured of reinforced 14-ga steel with a 1"-thick 1½ lb. fiberglass core affixed to interior and mounted on all four open sides of the power unit frame.

2.9 SOUND ISOLATING COUPLINGS

A. Where pump and motor are not submerged, provide and mount a minimum of two couplings in the oil line in the machine room between pump and jack.

2.10 CAR ENCLOSURE

A. Walls: Cab type DLP, durable wood core finished on both sides with high-pressure plastic laminate.
1. Reveals: Finish the exposed surface of cab shell in Baked Enamel.

B. Canopy: Reinforced 14-ga cold roll steel with hinged exit openable from car top only. Finish shall be two coats factory applied reflective baked enamel.

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C. Ceiling: Suspended type, LED lighting with translucent diffuser mounted in a metal baked enamel frame at 7'-4" above the finished floor.

D. Cab Columns, Front and Transom: Stainless steel: ASTM A167, Type 300 stainless steel panels, # 4 satin finish.

E. Doors: Horizontal sliding car doors reinforced with steel for panel rigidity.
   1. Hang doors on sheave type hangers with polyurethane tires that roll on a polished steel track, and guided at the bottom by non-metallic shoes sliding in a smooth threshold groove.
   2. Door Finish: Stainless steel: ASTM A167, Type 300 stainless steel panels, # 4 satin finish.
   3. Cab Sills: Extruded, with grooved surface, ¼" thickness, and ASTM B221 aluminum mill finish.

F. Ventilation: Mount a two-speed exhaust fan on the car top.

G. Pad Buttons: Provide pad buttons on cab front(s) and walls.
   1. Protection Pads: Provide one set of vinyl pads.

H. Base: No base.

I. Finished Floor: See Finish Schedule.

J. Hand Rail: Stainless steel flat bar stock spaced from wall 2"; placed at rear wall only.

2.11 CAR OPERATING STATION

A. Car Operating Station, General:
   1. The main car control in each car shall contain the devices required for specific operation mounted in an integral swing return panel requiring no applied faceplate.
   2. Swing return shall have a brushed stainless steel finish.
   3. The main car operating panel shall be mounted in the return and comply with all Accessibility Code requirements.
   4. Pushbuttons that illuminate using long lasting LED's shall be included for each floor served, and emergency buttons and switches shall be provided per code.
   5. Switches for car light and accessories shall be provided

B. Emergency Light:
   1. Provide an emergency light and capacity plate integrated into a module.
   2. The emergency light shall illuminate automatically upon loss of the building's normal power supply.

C. Column Mounted Car Riding Lantern: Install a car-riding lantern in the elevator cab and located in the entrance.
   1. The lantern, when illuminated, will indicate the intended direction of travel.
   2. The lantern will illuminate and a signal will sound when the car arrives at a floor where it will stop.
   3. The lantern shall remain illuminated until the door(s) begin to close.

D. Provide an emergency communications device complying with requirements specified in the FBC and FFPC.
   1. Elevator vender shall provide the box, phone by others.

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E. Special Accessories:
   1. Two speed fan/light switch.
   2. Telephone jack.
   3. Certificate frame.

2.12 HALL STATIONS

A. Provide one set of risers.
   1. Each terminal station shall contain an illuminating push-button.
   2. Each intermediate station shall consist of two illuminating push buttons, one for up direction and the other for the down direction.
   3. The buttons shall illuminate to indicate a call is registered at the floor and the direction.
   4. Phase-I firefighters service key switch, with instructions, shall be incorporated into the hall station at the designated level.
   5. Faceplate shall be stainless steel # 4.

B. Floor Identification Pads:
   1. Provide doorjamb pads at each floor.
   2. Jamb pads shall comply with the requirements of FBC and FFPC.

2.13 HOISTWAY ENTRANCES

A. Doors and Frames: Provide and install complete hollow metal sliding type at each hoist way opening.
   1. Provide manufacturer's standard design bearing the proper UL fire rated labels.
      a. They shall consist of 14-ga frames with 2" profile, 16-ga doors, hangers, hanger supports, hanger covers, fascia plates, sigh guards and all necessary hardware.
   2. The interface of the elevator wall with the hoist way entrance assembly shall be in strict compliance with the elevator manufacturer's requirements.
   3. Doors: Flush construction.
      a. Stainless Steel: ASTM A 167, Type 300 stainless steel panels, # 4 satin finish.
   4. Frames: Formed construction.
      a. Stainless Steel: ASTM A 167, Type-300 stainless steel panels, # 4 satin finish.

B. Interlocks: Provide each hoist way entrance with an approved type interlock tested as required by Code.
   1. The interlock shall prevent operation of the car away from the landing until the doors are locked in the closed position as defined by Code and shall prevent opening the doors at any landing from the corridor side unless the car is at rest at that landing or is in the leveling zone and stopping at that landing.

C. Door Hanger and Tracks: For each hoist way sliding door, furnish and install sheave type two point suspension hangers and tracks complete.
   1. Sheaves shall have polyurethane tires with ball bearings properly sealed to retain grease.
   2. Provide hangers with an adjustable slide to take the up-thrust of the doors.
   3. Tracks are to be drawn steel shapes, smooth surface and shaped to conform to the hanger sheaves.

D. Hoist way Sills: Extruded, with grooved surface, ¼ inch thickness, ASTM B221 aluminum-mill finish.

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2.14 OPERATION

A. Controller:
   1. Provide a microprocessor based elevator control system with software oriented and linked together for purposes of communication by a serial communications link.
   2. Control of the elevator shall be automatic in operation by means of push buttons in the car numbered to correspond to floors served, for registering car stops, and by "up-down" push buttons at each intermediate landing and "call" push buttons at terminal landings.
      a. Momentary pressing of one or more buttons shall dispatch the car to the designated landings in the order the car reaches the landing, irrespective of the sequence the buttons are pressed.
         1) Cancel each landing when answered.
      b. When the car is traveling in the up direction, it shall stop at all floors for which car buttons or "up" hall buttons are pressed.
         1) The car shall not stop at floors where "down" button is pressed, unless the stop for that floor is registered by a car button or unless the down call is at the highest floor for any button pressed.
         2) Pressing the "up" button when the car is traveling in the down direction shall not intercept the travel unless the stop for that floor is registered by a car button or unless the up call is the lowest button pressed.
      c. When the car responds to its highest or lowest stop and stops are registered for the opposite direction, the direction of travel shall reverse automatically and it shall answer the calls registered for that direction.
         1) If both up and down calls are registered at an intermediate floor, cancel only the call corresponding to the direction of car travel upon the stopping of the car at the landing.

B. Microprocessor: Locate the main microprocessor and car controller in the elevator machine room.
   1. Microprocessor door operator shall reside in the door operator and control all functions of the elevator door(s).
   2. Electronic selector shall reside on the car top and contain hall affect transducers that detect magnetic fields. Magnets, corresponding to floor positions and top/bottom of hoist way are mounted on a perforated metal tape that runs the length of the hoist way.

C. Provide a key operated switch in the elevator for the purpose of removing the car from normal operation.
   1. When the switch is in the "independent service" position, the elevator will bypass all landing calls and answer only car calls.
   2. The operator will have complete control over the operation of the car.

D. Emergency Power:
   1. In the event of a normal power supply failure, program the elevator system to lower from ~~an~~ the building emergency power supply.
   2. ~~The emergency power supply shall consist of a battery furnished by the elevator contractor.~~

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3. Building emergency power supply shall consist of a backup generator. Provide elevator system components as required for emergency power characteristics with phase rotation the same as for normal power.
   a. Provide transfer switches and auxiliary contacts.
   b. Install connections to power feeders.
4. The elevator contractor shall provide circuitry so after normal power failure and establishment of emergency power, each elevator shall lower to a field adjustable return landing and after initial opening of doors to discharge any occupants, park with the doors closed.
5. If the designated return landing is above the current position, the elevator shall run down to the next lower landing and park with the doors closed.

E. When the hoist way doors are exposed to the weather, (no enclosure to protect the doors), program the system to have the car wait for a call at the upper most stop. This is to help protect the car and its controls from damage of water entering the hoist way.

2.15 DOOR OPERATION

A. Provide and install a direct current motor driven heavy-duty operator designed to operate the car and hoist way doors simultaneously.
   1. Provide a microprocessor based door operator linked to the main microprocessor through a serial communication link residing in the door operator controlling all functions of the door.
   2. Door movements shall electrically cushion at both limits of travel and arrange the door operating mechanism for manual operation in event of power failure.
   3. Doors shall open automatically when the car arrives at the landing and close automatically after an adjustable time interval or when called to another landing.
   4. Direct drive geared operators, AC controlled units with oil checks, or other deviations from the above are not acceptable.

B. No Unnecessary Door Operation: The car door shall open only if the car is stopping for a car or hall call, answering a car or hall call at the present position or selected as the next car up.

C. Door Open Time Saver: If a car is stopping in response to a car call assignment only (no coincident hall call), the current door hold open time is changed to a shorter field programmable time when the electronic door protection device is activated.

D. Double Door Operation: When a car stops at a landing with concurrent up and down hall calls, no car calls, and no other hall call assignments, the car door opens to answer the hall call in the direction of the car's current travel. If an onward car call is registered before the door closes to within 6" of full closure, the preference will reverse and the door shall reopen to answer the other call.

E. Nudging Operation: The doors remain open as long as the electronic detector senses the presence of a passenger or object in the door opening.
   1. Obstructed door movement, for a field programmable time, causes a buzzer to sound and the doors close at reduced speed.
   2. If the infrared door protection system detects a person or object while closing, the doors shall stop and resume closing after removal of the obstruction.

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F. Limited Door Reversal:
   1. If the doors are closing and an infrared beam interrupted, the doors shall reverse and re-open partially.
   2. After clearing the obstruction the doors will begin to close.

G. Door Open Sentinel: If the doors are opening but do not fully open after a field adjustable time, the doors will recycle closed then open six times to try and correct the fault.

H. Door Close Sentinel: If the doors are closing but do not fully close after a field adjustable time, the doors will recycle open then close six times to try and correct the fault.

I. Door Close Assist: When the doors have failed to fully close and are in the recycle mode, the door drive motor shall have increased torque applied in an effort to possibly overcome any mechanical resistance or differential air pressure and allow the door to close.

2.16 DOOR PROTECTION DEVICES

A. Provide a solid-state electronic detector at the entrance of the elevator car.
   1. Also, provide an electro-mechanical reversal edge on the leading edge of the car doors.
   2. The doors will remain open as long as the electronic detector sense the presence of a passenger or object in the door opening.
   3. If door movement is obstructed for a predetermined time, the doors will resume normal closing operation.
   4. If the electro-mechanical reversal edge contacts a person or object while closing, the doors will immediately stop and reopen.
   5. Initiate closing after the passenger or object has moved from the opening.

2.17 CAR TOP INSPECTION

A. Provide a car top inspection station with an “emergency stop” switch and constant pressure “up-down” direction buttons to make the normal operating devices inoperative and give the inspector complete control of the elevator.

B. The car top inspection station shall be mounted in the door operator assembly and not be a separate unit.

2.18 ELEVATORS WITH UNPROTECTED HOIST WAY DOORS

A. In elevator installation with hoist ways exposed to the weather, without a roofed enclosure protecting the hoist way doors, provide NEMA 4 rated equipment.
   1. Hall stations and lanterns exposed to weather.
   2. Elevator car operating stations, lanterns, controls and electronics.
   3. Door protection devices.
   4. Other electrical and electronic devices which maybe damaged from water intrusion.

2.19 CONTROLLED ACCESS TO THE ELEVATOR

A. Provide elevator control wiring, equipment, and programming to limit the access to the elevator by the programmed badges.

B. Elevators shall have a card access device controlling the cab call and floor stops of each cab. This feature shall include key switch overrides of the access system to insure continuing operations of the elevators in case of a card access system failure.

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C. The elevator shall have a call station located outside of the elevator on each floor that calls the cab when activated, and shall have the following controls and functions.
   1. A key controlled override switch that when activated calls the cab and overrides the card access control system and the Off/On override switch.
      a. The override is for use by the Fire Department or other emergency response forces.
      b. In override mode the elevator cab shall be capable of performing all functions that are required by the elevator code.
   2. A key controlled switch that disables the call button when in the OFF position and will activate the call button in the ON position. Wire this switch to override the card access controls when in the on position.
   3. A button that will call the elevator cab.
   4. A card access card reader junction box mounted adjacent to the call station at ADA height with a ¾" conduit between the card reader junction box and the elevator call station box. The distances between the two boxes shall not be more than 12".

D. The elevator shall have a control station located in the cab with the following controls and functions.
   1. Override key controlled switch that enables each elevator floor control button to be activated.
      a. Label the switch as "Fire Department Use Only".
      b. Providing complete control of the cab, taking priority over any other control device or system.
   2. A key controlled switch that will disable the floor control buttons when in the OFF position and overrides the card access control of the floor control buttons when in the ON position.
   3. Vendor installed card reader in the cab(s) of the elevator to control the access to each floor.
      a. Districts Security Support Services Section shall provide the card reader.
   4. This elevator control station shall have a floor control button for each floor.

E. The contractor shall coordinate the installation of the elevator and the security access system with the elevator vendor and the School Police Department.

PART 3 EXECUTION

3.1 EQUIPMENT AND TOOL STORAGE

A. Project Manager will assign a dry and protected area, conveniently located to the elevator hoist way, for the elevator contractor without cost, for storage of material and tools.

B. If storage on site is not available at time of delivery, Purchaser will provide suitable storage, assume all costs incurred, and make the payments due for the equipment.

3.2 EXAMINATION

A. Before starting the elevator installation, the Elevator Contractor shall inspect the hoist way, hoist way openings, pits and machine rooms, verify all critical dimensions, and examine supporting structures and all other conditions necessary for the elevator installation.

B. Installation of the elevator constitutes acceptance of existing conditions and responsibility for satisfactory performance.

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3.3 INSTALLATION

A. Competent elevator installation personnel in accordance with ASME A17.1, manufacturer's instructions, approved shop drawings, and all codes shall perform work.

B. Supply in ample time for installation by other trades, inserts, anchors, bearing plates, brackets, supports, and bracing including all setting templates and diagrams for placement.

C. Jack unit excavation: Drill or otherwise excavate below elevator pit construction as required to install the jack unit.
   1. Install casing for jack unit.
   2. Set casing for jack unit assembly plumb.

D. Set jack unit-cylinder assembly plumb, centered accurately and shimmed to proper elevation.

E. Install all the elevator systems components, coordinate installation of hoist way wall construction, and adjust equipment to comply with required performance levels.

F. Before permitting either temporary or permanent use of elevators, perform tests required by ASME A17.2 and governing agencies or regulations.

3.4 PERMITS, TAXES AND LICENSES

A. The Elevator Contractor shall pay all applicable sales and use taxes, permits, fees and licenses, as of the date bids as part of the contract.

3.5 TEMPORARY USE OF ELEVATOR

A. Temporary use of the elevator (before final acceptance) allowed only after the elevator contractor has a signed temporary acceptance from the user.
   1. The User shall pay for any work required to return the elevator in the condition prior to the temporary acceptance agreement.
   2. The User shall provide fees, temporary enclosures, guard, or other protection of the hoist way openings, elevator operators, and any other item necessary to permit safe temporary operation of the elevator.

B. User shall provide protection for the cab walls, ceiling, and floor.

3.6 ACCEPTANCE OF INSTALLATION

A. Upon notice from the elevator contractor that the installation of the elevators is complete, the purchaser will arrange for a person duly authorized to make the final inspection and provide a written acceptance.

B. The mutually agreed date shall be not more than ten business days after the date the elevator contractor's notification of completion.

3.7 OWNER'S INFORMATION

A. Once Owner accepts the elevators, elevator contractor shall supply the Owner with two Owner's Manual containing parts list, general maintenance instructions, lubrication instructions, and other data relating to the installation.

END OF SECTION