# TECHNICAL SPECIAL PROVISION

for

## Volusia County

City Island Library Building Renovation for Flood Mitigation

**Bentley Project #: 2015.051.G**

*This item has been electronically signed using a Digital Signature. Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.*

**Approved By:**

| | |
|---|---|
| **STRUCTURAL** | |
| **Professional Engineer:** | **Brenton Daily, PE** |
| **Date: May 4, 2020** | |
| **Fla. License No.:** | **81028** |

| | |
|---|---|
| **ARCHITECTURE** | |
| **Registered Architect:** | **Gary Kranston, RA** |
| **Date: May 4, 2020** | |
| **Fla. License No.:** | **11541** |
| **Certificate of Authorization:** | **AAC002023** |

**Date: May 4, 2020**

| | |
|---|---|
| **Firm Name:** | **Bentley Architects + Engineers, Inc.** |
| **Firm Address:** | **651 West Warren Ave., Suite 200** |
| **City, State, Zip Code:** | **Longwood, FL 32750** |
| **Certificate of Authorization:** | **5898 AAC002023** |

**Pages: 1-56**

## TABLE OF CONTENTS

**THE LISTED SPECIFICATIONS WERE PREPARED UNDER THE DIRECT SUPERVISION OF THE PERSON SIGNING AND SEALING THE COVER SHEET OF THESE TECHNICAL SPECIAL PROVISIONS FOR THEIR RESPECTIVE DISCIPINES INDICATED.**


| SECTION | TITLE | DISCIPLINE | PAGES | PAGE NO. |
|---|---|---|---|---|
| | **TECHNICAL SPECIAL PROVISIONS** | | | |
| **DIVISION 01 -- GENERAL REQUIREMENTS** | | | | |
| 00 01 00 | SIGNATURE SHEET/TABLE OF CONTENTS | Not Applicable | 1-3 | 1 |
| 01 10 00 | SUMMARY | Not Applicable | 1-2 | 4 |
| 01 11 00 | SCOPE OF WORK | Architecture | 1-2 | 6 |
| **DIVISION 02 – EXISITING CONDITIONS** | | | | |
| 02 41 00 | DEMOLITION | Architecture | 1-2 | 8 |
| **DIVISION 03 -- CONCRETE** | | | | |
| 03 30 00 | CAST-IN-PLACE CONCRETE | Structural | 1-6 | 10 |
| **DIVISION 04 -- MASONRY** | | | | |
| Not used | | | | |
| **DIVISION 05 -- METALS** | | | | |
| NOT USED | | | | |
| **DIVISION 06 -- WOOD, PLASTICS, AND COMPOSITES** | | | | |
| NOT USED | | | | |
| **DIVISION 07 -- THERMAL AND MOISTURE PROTECTION** | | | | |
| 07 16 13 | EPOXY WATER PROOFER | Architecture | 1-3 | 16 |
| 07 92 00 | JOINT SEALANTS | Architecture | 1-5 | 19 |
| **DIVISION 08 -- OPENINGS** | | | | |
| 08 39 18 | PERMANENT GLASS FLOOD BARRIERS | Architecture | 1-11 | 24 |

| SECTION | TITLE | DISCIPLINE | PAGES | PAGE NO. |
|---|---|---|---|---|
| 08 39 21 | PEDESTRIAN FLOOD DOORS AND FRAMES | Architecture | 1-6 | 35 |
| **DIVISION 09 -- FINISHES** | | | | |
| 09 21 16 | GYPSUM BOARD ASSEMBLIES | Architecture | 1-3 | 41 |
| 09 24 00 | PORTLAND CEMENT PLASTERING | Architecture | 1-3 | 44 |
| 09 91 13 | EXTERIOR PAINTING | Architecture | 1-5 | 47 |
| 09 91 23 | INTERIOR PAINTING | Architecture | 1-5 | 52 |
| **DIVISION 10 -- SPECIALTIES** | | | | |
| NOT USED | | | | |
| **DIVISION 13 -- SPECIALTIES** | | | | |
| NOT USED | | | | |
| **DIVISION 31 -- EARTHWORK** | | | | |
| NOT USED | | | | |


**END OF SECTION**

**SECTION 01 10 00**

**SUMMARY**

## PART 1 GENERAL

1.1 PROJECT

A. Project Name: City Island Library Building Renovation for Flood Mitigation.
Project Address: City Island Library
105 East Magnolia Avenue
Daytona Beach, Florida 32114

B. Owner's Name: Volusia County.
Contact: Laura E. Laser, AIA, Senior Architect
Volusia County Engineering & Construction
123 West Indiana Ave, Room 402, Deland, Florida 32720

C. Architect: Bentley Architect + Engineers, Inc.
Contact: Gary Kranston, R.A.
651 W. Warren Avenue, Suite 200
Longwood, FL 32750

D. The Project consists of the alteration of the perimter of the exisitng library to provide and install pedestrian flood doors and frames, permanent glass flood barriers (storefront system), and a waterproof epoxy coating with a paint topcoat.

1.2 THE SCOPE OF WORK AND TECHNICAL SPECIFICATIONS DESCRIPTION:

A. Base Bid Scope of work is described below and indicated on drawings:
1. SECTION 02 41 00 DEMOLITION: Removal of existing storefront assemblies, doors, and frames for installation of new flood doors. Removal of access control hardware at all exterior doors, disconnection of alarm systems, and disconnection of power outlets. Demolition of walls, ceilings or floors as required for the extension of power and data to the new flood control assemblies.
2. SECTION 03 30 00 CAST IN PLACE CONCRETE: Repair of Cast-in-place concrete damaged by construction work.
3. SECTION 07 16 13 EPOXY WATERPROOFER: Clear two-part 100% solids, thermo setting, self-curing epoxy coating with sand texture finish. Coating shall harden to a ceramic like, clear, non-porous waterproof film for use on exterior concrete, precast concrete, stucco, metal, and similar surfaces.
4. SECTION 07 9100 JOINT SEALANTS: Sealants around perimeter of doors, frames, and windows.
5. SECTION 08 39 18 PERMANENT GLASS FLOOD BARRIERS: Aluminum-Framed Storefront Flood Mitigating Entrances for exterior storefront locations as indicated on drawings. Flood barrier system Engineering required to meet the specified flood requirements is included as part of this section. Contractor is responsible for all door hardware and controls installation. Coordinate power and data requirements with owner. Contractor also shall provide reconnection/relocation of access control hardware at all exterior doors, power, and reconnection of alarm systems, to the new permanent glass flood barriers.

(Note base bid does not include storefront window assemblies W3, W6, W10, and W11.)

6. SECTION 08 39 21 PEDESTRIAN FLOOD DOORS AND FRAMES: : Single Swing and Paired Swing with removable mullion Pedestrian Flood Doors with Frames for use at exterior door locations as indicated on drawings. Flood barrier system Engineering required to meet the specified flood requirements is included as part of this section. Contractor is responsible for all door hardware and controls installation. Coordinate power and data requirements with owner. Contractor also shall provide reconnection/relocation of access control hardware at all exterior doors, power, and reconnection of alarm systems, to the new pedestrian flood doors and frames.
7. SECTION 09 05 61 GYPSUM BOARD ASSEMBLIES: Gypsum board materials for repair of walls damaged during window and door replacement work.
8. SECTION 09 24 00 CEMENT PLASTERING: Stucco materials for repair of walls damaged during window and door replacement work.
9. SECTION 09 91 13 EXTERIOR PAINTING: Touch up painting at exterior precast/stucco locations damaged by window and door replacements. Painting of new metal doors and frames. Topcoat finish on epoxy waterproofing. removal and reinstallation of all signage as required for application of the epoxy and topcoat finishes.
10. SECTION 09 91 13 INTERIOR PAINTING: Touch up painting at exterior precast/stucco locations damaged by window and door replacements. Painting of new flood doors and frames. Topcoat finish on epoxy waterproofing.

B. DESCRIPTION OF ALTERNATES
   1. Alternates are described below:
      a. Alternate 1: Provide all engineering, materials and labor to remove and replace the existing storefront window assemblies W3, W6, W10, and W11 as shown on the drawings.

1.3 OWNER OCCUPANCY

A. Volusia County intends to continue to occupy portions of the existing building during the entire construction period.

B. Cooperate with Volusia County to minimize conflict and to facilitate Volusia County 's operations.

C. Schedule the Work to accommodate Volusia County occupancy.

**PART 2 PRODUCTS - NOT USED**

**PART 3 EXECUTION - NOT USED**

**END OF SECTION**

**SECTION 01 11 00**
**SCOPE OF WORK**

## PART 1 GENERAL

1.1 Base Bid Scope of work is described below and indicated on drawings:

A. SECTION 02 41 00 DEMOLITION: Removal of existing storefront assemblies, doors, and frames for installation of new flood doors. Removal of access control hardware at all exterior doors, disconnection of alarm systems, and disconnection of power outlets. Demolition of walls, ceilings or floors as required for the extension of power and data to the new flood control assemblies.

B. SECTION 03 30 00 CAST IN PLACE CONCRETE: Repair of Cast-in-place concrete damaged by construction work.

C. SECTION 07 16 13 EPOXY WATERPROOFER: Clear two-part 100% solids, thermo setting, self-curing epoxy coating with sand texture finish. Coating shall harden to a ceramic like, clear, non-porous waterproof film for use on exterior concrete, precast concrete, stucco, metal, and similar surfaces.

D. SECTION 07 9100 JOINT SEALANTS: Sealants around perimeter of doors, frames, and windows.

E. SECTION 08 39 18 PERMANENT GLASS FLOOD BARRIERS: Aluminum-Framed Storefront Flood Mitigating Entrances for exterior storefront locations as indicated on drawings. Flood barrier system Engineering required to meet the specified flood requirements is included as part of this section. Contractor is responsible for all door hardware and controls installation. Coordinate power and data requirements with owner. Contractor also shall provide reconnection/relocation of access control hardware at all exterior doors, power, and reconnection of alarm systems, to the new permanent glass flood barriers. Note base bid does not include storefront window assemblies W3, W6, W10, and W11.

F. SECTION 08 39 21 PEDESTRIAN FLOOD DOORS AND FRAMES: Single Swing and Paired Swing with removable mullion Pedestrian Flood Doors with Frames for use at exterior door locations as indicated on drawings. Flood barrier system Engineering required to meet the specified flood requirements is included as part of this section. Contractor is responsible for all door hardware and controls installation. Coordinate power and data requirements with owner. Contractor also shall provide reconnection/relocation of access control hardware at all exterior doors, power, and reconnection of alarm systems, to the new pedestrian flood doors and frames.

G. SECTION 09 05 61 GYPSUM BOARD ASSEMBLIES: Gypsum board materials for repair of walls damaged during window and door replacement work.

H. SECTION 09 24 00 CEMENT PLASTERING: Stucco materials for repair of walls damaged during window and door replacement work.

I. SECTION 09 91 13 EXTERIOR PAINTING: Touch up painting at exterior precast/stucco locations damaged by window and door replacements. Painting of new metal doors and frames. Topcoat finish on epoxy waterproofing. removal and

reinstallation of all signage as required for application of the epoxy and topcoat finishes.

J. SECTION 09 91 13 INTERIOR PAINTING: Touch up painting at exterior precast/stucco locations damaged by window and door replacements. Painting of new flood doors and frames. Topcoat finish on epoxy waterproofing.

1.2 DESCRIPTION OF ALTERATIONS WORK

A. Alternate 1: Provide all materials and labor to remove and replace the existing storefront window assemblies W3, W6, W10, and W11 as shown on the drawings.

B. Alterate 2: Provide all labor and materials to extend the installation of the epoxy waterproofing and painted topcoat from the base bid elevation of 9.1 NAVD 88 to the bottom of the soffit or wall reveal as shown in the drawings.

**PART 2 PRODUCTS - NOT USED**

**PART 3 EXECUTION - NOT USED**

**END OF SECTION**

## SECTION 02 41 00
## DEMOLITION

### PART 1 GENERAL

1.1 SECTION INCLUDES

A. Selective demolition of building elements for alteration purposes.

1.2 REFERENCE STANDARDS

A. 29 CFR 1926 - U.S. Occupational Safety and Health Standards; current edition.

1.3 SHOP DRAWINGS

A. Project Record Documents: Accurately record actual locations of capped and active utilities and subsurface construction.

### PART 2 PRODUCTS -- NOT USED

### PART 3 EXECUTION

3.1 SCOPE

A. Perform selective demolition as shown on the drawings and as needed to complete the proposed improvements.

B. Remove other items indicated, for salvage and relocation.

3.2 GENERAL PROCEDURES AND PROJECT CONDITIONS

A. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.
   1. Obtain required permits.
   2. Take precautions to prevent catastrophic or uncontrolled collapse of structures to be removed; do not allow worker or public access within range of potential collapse of unstable structures.
   3. Provide, erect, and maintain temporary barriers and security devices.
   4. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
   5. Conduct operations to minimize obstruction of public and private entrances and exits; do not obstruct required exits at any time; protect persons using entrances and exits from removal operations.

B. Do not begin removal until receipt of notification to proceed from Volusia County .

C. Protect existing structures and other elements that are not to be removed.
   1. Provide bracing and shoring.
   2. Prevent movement or settlement of adjacent structures.
   3. Stop work immediately if adjacent structures appear to be in danger.

D. If hazardous materials are discovered during removal operations, stop work and notify Bentley Architect + Engineers, Inc. and Volusia County ; hazardous materials include regulated asbestos containing materials, lead, PCB's, and mercury.

3.3 EXISTING UTILITIES

A. Coordinate work with utility companies; notify before starting work and comply with their requirements; obtain required permits.

B. Protect existing utilities to remain from damage.

C. Do not disrupt public utilities without permit from authority having jurisdiction.

D. Do not close, shut off, or disrupt existing life safety systems that are in use without at least 7 days prior written notification to Volusia County .

E. Do not close, shut off, or disrupt existing utility branches or take-offs that are in use without at least 3 days prior written notification to Volusia County .

F. Remove exposed piping, valves, meters, equipment, supports, and foundations of disconnected and abandoned utilities.

G. Prepare building demolition areas by disconnecting and capping utilities outside the demolition zone; identify and mark utilities to be subsequently reconnected, in same manner as other utilities to remain.

3.4 SELECTIVE DEMOLITION FOR ALTERATIONS

A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.
   1. Verify that construction and utility arrangements are as indicated.
   2. Report discrepancies to Bentley Architect + Engineers, Inc. before disturbing existing installation.
   3. Beginning of demolition work constitutes acceptance of existing conditions that would be apparent upon examination prior to starting demolition.

B. Separate areas in which demolition is being conducted from other areas that are still occupied.
   1. Provide, erect, and maintain temporary dustproof partitions constructed of wood framing and sheathing, and plastic sheeting as necessary to isolate the construction area and prevent free flow of dust throughout the building and ventilation system.

C. Remove existing work as indicated and as required to accomplish new work.
   1. Remove items indicated on drawings.

D. Protect existing work to remain.
   1. Prevent movement of structure; provide shoring and bracing if necessary.
   2. Perform cutting to accomplish removals neatly and as specified for cutting new work.
   3. Repair adjacent construction and finishes damaged during removal work.
   4. Patch as specified for patching new work.

3.5 DEBRIS AND WASTE REMOVAL

A. Remove debris, junk, and trash from site.

B. Leave site in clean condition, ready for subsequent work.

C. Clean up spillage and wind-blown debris from public and private lands.

**END OF SECTION**

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

### PART 1 GENERAL

1.1 SECTION INCLUDES

A. Concrete formwork.

B. Slabs on grade.

C. Concrete reinforcement.

D. Joint devices associated with concrete work.

E. Concrete curing.

1.2 REFERENCE STANDARDS

A. ACI 117 - Standard Specifications for Tolerances for Concrete Construction and Materials; 2010 (Reapproved 2015).

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

C. ACI 301 - Specifications for Structural Concrete; 2016.

D. ACI 302.1R - Guide to Concrete Floor and Slab Construction; 2015.

E. ACI 304R - Guide for Measuring, Mixing, Transporting, and Placing Concrete; 2000 (Reapproved 2009).

F. ACI 305R - Guide to Hot Weather Concreting; 2010.

G. ACI 306R - Guide to Cold Weather Concreting; 2016.

H. ACI 308R - Guide to External Curing of Concrete; 2016.

I. ACI 318 - Building Code Requirements for Structural Concrete and Commentary; 2014 (Errata 2018).

J. ACI 347R - Guide to Formwork for Concrete; 2014.

K. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement; 2018, with Editorial Revision (2018).

L. ASTM C1602/C1602M - Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete; 2012.

M. ASTM C33/C33M - Standard Specification for Concrete Aggregates; 2016, with Editorial Revision (2016).

N. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens; 2018.

O. ASTM C150/C150M - Standard Specification for Portland Cement; 2018.

P. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete; 2017.

Q. ASTM E1155 - Standard Test Method for Determining F(F) Floor Flatness and F(L) Floor Levelness Numbers; 2014.

R. ASTM E1155M - Standard Test Method for Determining F(F) Floor Flatness and F(L) Floor Levelness Numbers (Metric); 2014.

S. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs; 2017.

T. AWS D1.4 - Structural Welding Code - Reinforcing Steel; American Welding Society; 2005.

1.3 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

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

C. Mix Design: Submit proposed concrete mix design.

D. Steel Reinforcement Shop Drawings: Details of fabrication, bending, and placement, prepared according to ACI 315, "Details and Detailing of Concrete Reinforcement." Include material, grade, bar schedules, stirrup spacing, bent bar diagrams, arrangement, and supports of concrete reinforcement. Include special reinforcement required for openings through concrete structures.

E. Samples:
   1. Submit samples of underslab vapor retarder to be used.
   2. Submit samples of expansion joint to be used.

F. Test Reports: Submit report for each test or series of tests specified.

G. Test Reports: Submit termite-resistant sheet manufacturer's summary of independent laboratory and field testing for effectiveness in subterranean termite exclusion.

1.4 QUALITY ASSURANCE

A. Perform work of this section in accordance with ACI 117, ACI 301 and ACI 318.

B. Follow recommendations of ACI 305R when concreting during hot weather.

C. Installer Qualifications: An experienced installer who has completed concrete work similar in material, design, and extent to that indicated for this project and whose work has resulted in construction with a record of successful in-service performance.

D. Manufacturer Qualifications: A firm experienced in manufacturing ready-mix concrete products complying with ASTM C 94 requirements for production facilities and equipment.
   1. Manufacturer must be certified according to the National Ready Mixed Concrete Association's Certification of Ready Mixed Concrete Production Facilities.

E. Testing Agency Qualifications: An independent testing agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 to conduct the testing indicated.
   1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.

F. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, each aggregate from one source, and each admixture from the same manufacturer.

G. Welding: Qualify procedures and personnel according to AWS D1.4, "Structural Welding Code - Reinforcing Steel."

## PART 2 PRODUCTS

### 2.1 FORMWORK

A. Formwork Design and Construction: Comply with guidelines of ACI 347R to provide formwork that will produce concrete complying with tolerances of ACI 117.

B. Form Materials: Contractor's choice of standard products with sufficient strength to withstand hydrostatic head without distortion in excess of permitted tolerances.

### 2.2 CONCRETE MATERIALS

A. Cement: ASTM C150/C150M, Type I - Normal Portland type.
   1. Acquire cement for entire project from same source.

B. Fine and Coarse Aggregates: ASTM C33/C33M.
   1. Acquire aggregates for entire project from same source.
   2. Nominal Maximum Aggregate Size: 3/4 inch

C. Water: ASTM C1602/C1602M; clean, potable, and not detrimental to concrete.

### 2.3 ADMIXTURES

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

B. High Range Water Reducing and Retarding Admixture: ASTM C494/C494M Type G.

### 2.4 ACCESSORY MATERIALS

A. Underslab Vapor Retarder: Multi-layer, fabric-, cord-, grid-, or aluminum-reinforced polyethylene or equivalent, 10 mil thick, complying with ASTM E 1745, Class A; stated by manufacturer as suitable for installation in contact with soil or granular fill under concrete slabs. Single ply polyethylene is prohibited.
   1. Accessory Products: Vapor retarder manufacturer's recommended tape, adhesive, mastic, prefabricated boots, etc., for sealing seams and penetrations.

### 2.5 CONCRETE MIX DESIGN

A. Proportioning Normal Weight Concrete: Comply with ACI 211.1 recommendations.

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

C. Normal Weight Concrete:
   1. Compressive Strength, when tested in accordance with ASTM C39/C39M at 28 days: As indicated on drawings.
   2. Slump and Aggregate size as indicated on drawings.

2.6 MIXING

A. Transit Mixers: Comply with ASTM C 94/C 94M and ASTM C 1116, and furnish batch ticket information.
   1. Note: When air temperature is between 85 and 90 degrees F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 degrees F, reduce mixing and delivery time to 60 minutes.

B. Adding Water: If concrete arrives on-site with slump less than suitable for placement, do not add water that exceeds the maximum water-cement ratio or exceeds the maximum permissible slump.

**PART 3 EXECUTION**

3.1 EXAMINATION

A. Verify lines, levels, and dimensions before proceeding with work of this section.

3.2 PREPARATION

A. Formwork: Comply with requirements of ACI 301. Design and fabricate forms to support all applied loads until concrete is cured, and for easy removal without damage to concrete.

B. Slabs on Grade: Install vapor retarder under interior slabs on grade. Lap joints minimum 6 inches. Seal joints, seams and penetrations watertight with manufacturer's recommended products and follow manufacturer's written instructions. Repair damaged vapor retarder before covering.

3.3 INSTALLING REINFORCEMENT AND OTHER EMBEDDED ITEMS

A. Comply with requirements of ACI 301. Clean reinforcement of loose rust and mill scale, and accurately position, support, and secure in place to achieve not less than minimum concrete coverage required for protection.

B. Install welded wire reinforcement in maximum possible lengths, and offset end laps in both directions. Splice laps with tie wire. Welded wire reinforcement shall be provided in flat sheets, rolls are not allowed.

3.4 PLACING CONCRETE

A. Place concrete in accordance with ACI 304R.

B. Place concrete for floor slabs in accordance with ACI 302.1R.

C. Ensure reinforcement, inserts, waterstops, embedded parts, and formed construction joint devices will not be disturbed during concrete placement.

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 required dividers, edge strips, reinforcing, and other items to be cast in.

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

3.6 FLOOR FLATNESS AND LEVELNESS TOLERANCES

A. Maximum Variation of Surface Flatness:

1. Exposed Concrete Floors: 1/4 inch in 10 feet.
2. Under Carpeting: 1/4 inch in 10 feet.

B. Minimum F(F) Floor Flatness and F(L) Floor Levelness Values:
1. Exposed to View and Foot Traffic: F(F) of 20; F(L) of 15, on-grade only.

C. Measure F(F) Floor Flatness and F(L) Floor Levelness in accordance with ASTM E1155 (ASTM E1155M), within 48 hours after slab installation; report both composite overall values and local values for each measured section.

D. Correct the slab surface if composite overall value is less than specified and if local value is less than two-thirds of specified value or less than F(F) 13/F(L) 10.

E. Correct defects by grinding or by removal and replacement of the defective work. Areas requiring corrective work will be identified. Re-measure corrected areas by the same process.

3.7 CONCRETE FINISHING

A. Concrete Slabs: Finish to requirements of ACI 302.1R, and as follows:
1. Other Surfaces to Be Left Exposed: Trowel as described in ACI 302.1R, minimizing burnish marks and other appearance defects.

3.8 CURING AND PROTECTION

A. Comply with requirements of ACI 308R. 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.
1. Normal concrete: Not less than seven days.

C. Formed Surfaces: Cure by moist curing with forms in place for full curing period.

D. Surfaces Not in Contact with Forms:
1. Initial Curing: Start as soon as free water has disappeared and before surface is dry. Keep continuously moist for not less than three days by water-saturated sand, water-fog spray, or saturated burlap.
2. Final Curing: Begin after initial curing but before surface is dry.

3.9 FIELD QUALITY CONTROL

A. The Contractor shall obtain an independent testing agency to perform field quality control tests.

B. Provide free access to concrete operations at project site 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 concrete operations.

D. Tests of concrete and concrete materials may be performed at any time to ensure compliance with specified requirements.

E. Compressive Strength Tests: ASTM C 39/C 39M. For each test, mold and cure four concrete test cylinders. Obtain test samples for every 100 cu yd or less of each class of

concrete placed. Test one cylinder at 7 days, two at 28 days and one reserve cylinder for 56 day testing if required.

3.10 PROTECTION

A. Do not permit traffic over unprotected concrete floor surface until fully cured.

**END OF SECTION**

## SECTION 07 16 13
## EPOXY WATERPROOFER

### PART 1 GENERAL

1.1 SECTION INCLUDES

A. Epoxy Waterproofing

B. Preparation of surfaces to be waterproofed, including plugging active water leaks.

1.2 REFERENCE STANDARDS

A. COE CRD-C 48 - Method of Test for Water Permeability of Concrete; 1992.

B. ASTM C881

C. ASTM C882

D. ASTM C883

E. ASTM C884

F. ASTM C900

G. ASTM D570

H. ASTM D1259

1.3 SUBMITTALS

A. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Test data showing hydraulic permeability.
   2. Preparation instructions and recommendations.
   3. Storage and handling requirements and recommendations.
   4. Installation methods.
   5. Details for waterproofing at joints, intersections, and other special conditions.

B. Specimen warranty.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacture of products of the type specified.

B. Installer Qualifications: Acceptable to manufacturer, with documented experience on at least five projects of similar nature within last five years.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Take necessary precautions to keep cementitious materials dry.

1.6 FIELD CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results; do not install products under environmental conditions outside manufacturer's absolute limits.

1.7 WARRANTY

A. Provide installer's warranty agreeing to correct leaking waterproofing for two years from Date of Substantial Completion, unless leakage is caused by structural failure, movement of the structure, or other causes beyond the installer's control.

**PART 2 PRODUCTS**

2.1 MANUFACTURERS

A. Epoxy Waterproofing:
   1. Basis of Design: Chargar Corporation; Chargar.com

2.2 APPLICATIONS

A. Waterproofing for Building Surfaces:
   1. Outside of walls.
   2. Surfaces indicated on drawings.

2.3 MATERIALS

A. Epoxy waterproofer: Heavy bodied thermo setting, self curing, 2 part epoxy resin that forms a clear non-porous, impermeable film that seals porous surfaces, voids, and cracks.

B. Clean washed 1/4 or 00 sand as recommended by the manufacturer for use in the final wet coat.

C. Used for:
   1. Foundations
   2. Precast concrete
   3. Balconies and Decks
   4. Submerged concrete units
   5. Metal or Concrete

D. TECHNICAL DATA:
   1. Percent epoxy resin: 100%
   2. Working pot life at 70F: 30 minutes
   3. Shrinkage: none
   4. 24 hour cube compression test: 11,000 psi
   5. 7 day compression test: 16,300 psi
   6. Tack free time at 70F: 24 hours
   7. Final cure at 70F: 5-7 days
   8. Color: clear
   9. Mixing ratio: 3 parts of resin A to 1 part of activator part B

E. **COVERAGE RATES**
   1. Smooth concrete surfaces: 100 sq. ft per gallon unit
   2. Rough concrete surfaces: 80 sq. ft per gallon unit
   3. Concrete block: 80 sq. ft per gallon unit
   4. Cement plaster: 100 sq. ft per gallon unit
   5. Metal surfaces: 100 sq. ft per gallon unit

## PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. If substrate preparation is the responsibility of another installer, notify Bentley Architect + Engineers, Inc. of unsatisfactory preparation before proceeding.

3.2 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using methods recommended by manufacturer for achieving best result for substrate under project conditions, and use sand blasting as recommended.

C. Dry out wet surfaces.

D. Patch holes, construction joints, and cracks; remove defective concrete.

E. Obtain approval of manufacturer's field representative before beginning installation.

3.3 INSTALLATION

A. Install in strict accordance with manufacturer's instructions, maintain environmental conditions required and recommended by manufacturer, and keep a copy of manufacturer's instructions on site.

B. Coordinate installation with installation of products that must penetrate waterproofed surfaces.

C. Brush or roller apply free of pinholes or voids.

D. Apply in 2 coats with second cost applied 24 hours following the forst coat.

E. Broadcast clean washed sand into the final wet coat in a heavy manner to the wet Epoxy Waterproofer, and allow to cure.

F. Prevent excessive drying of surface.

1. Cure waterproofing for at least three days, or length of time required by manufacturer, with water spray and adequate air circulation.
2. Do not use chemical curing agents unless explicitly approved by waterproofing manufacturer.

3.4 PROTECTION

A. Protect from damage by weather; do not cover with impermeable (plastic) sheeting unless air circulation is provided.

B. Touch-up, repair or replace damaged waterproofing after Date of Substantial Completion.

**END OF SECTION**

## SECTION 07 92 00
## JOINT SEALANTS

### PART 1 GENERAL

1.1 SECTION INCLUDES

A. Nonsag gunnable joint sealants.

B. Self-leveling pourable joint sealants.

C. Joint backings and accessories.

1.2 REFERENCE STANDARDS

A. ASTM C661 - Standard Test Method for Indentation Hardness of Elastomeric-Type Sealants by Means of a Durometer; 2015.

B. ASTM C794 - Standard Test Method for Adhesion-In-Peel of Elastomeric Joint Sealants; 2015a.

C. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2014a.

D. ASTM C1087 - Standard Test Method for Determining Compatibility of Liquid-Applied Sealants with Accessories Used in Structural Glazing Systems; 2016.

E. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2016.

F. ASTM C1248 - Standard Test Method for Staining of Porous Substrate by Joint Sealants; 2008 (Reapproved 2012).

G. ASTM C1311 - Standard Specification for Solvent Release Sealants; 2014.

H. ASTM C1521 - Standard Practice for Evaluating Adhesion of Installed Weatherproofing Sealant Joints; 2013.

1.3 SUBMITTALS

A. Product Data for Sealants: Submit manufacturer's technical data sheets for each product to be used, that includes the following.

1. Physical characteristics, including movement capability, VOC content, hardness, cure time, and color availability.
2. List of backing materials approved for use with the specific product.
3. Substrates that product is known to satisfactorily adhere to and with which it is compatible.
4. Substrates the product should not be used on.
5. Installation instructions, including precautions, limitations, and recommended backing materials and tools.
6. Sample product warranty.

B. Product Data for Accessory Products: Submit manufacturer's technical data sheet for each product to be used, including physical characteristics, installation instructions, and recommended tools.

C. Color Cards for Selection: Where sealant color is not specified, submit manufacturer's color cards showing standard colors available for selection.

D. Samples for Verification: Where custom sealant color is specified, obtain directions from Bentley Architect + Engineers, Inc. and submit at least two physical samples for verification of color of each required sealant.

E. Preconstruction Laboratory Test Reports: Submit at least four weeks prior to start of installation.

F. Field Quality Control Plan: Submit at least two weeks prior to start of installation.

G. Preinstallation Field Adhesion Test Reports: Submit filled out Preinstallation Field Adhesion Test Reports log within 10 days after completion of tests; include bagged test samples and photographic records.

H. Installation Log: Submit filled out log for each length or instance of sealant installed.

I. Field Quality Control Log: Submit filled out log for each length or instance of sealant installed, within 10 days after completion of inspections/tests; include bagged test samples and photographic records, if any.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

B. Installer Qualifications: Company specializing in performing the work of this section and with at least three years of documented experience.

C. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this section.

D. Preconstruction Laboratory Testing: Arrange for sealant manufacturer(s) to test each combination of sealant, substrate, backing, and accessories.
   1. Adhesion Testing: In accordance with ASTM C794.
   2. Compatibility Testing: In accordance with ASTM C1087.
   3. Stain Testing: In accordance with ASTM C1248; required only for stone substrates.
   4. Allow sufficient time for testing to avoid delaying the work.
   5. Deliver to manufacturer sufficient samples for testing.
   6. Report manufacturer's recommended corrective measures, if any, including primers or techniques not indicated in product data submittals.
   7. Testing is not required if sealant manufacturer provides data showing previous testing, not older than 24 months, that shows satisfactory adhesion, lack of staining, and compatibility.

E. Field Quality Control Plan:
   1. Visual inspection of entire length of sealant joints.
   2. Non-destructive field adhesion testing of sealant joints, except interior acrylic latex sealants.
   3. Field testing agency's qualifications.
   4. Field Quality Control Log Form: Show same data fields as on Preinstallation Field Adhesion Test Log, with known information filled out and lines for multiple tests per sealant/substrate combinations; include visual inspection and specified field

testing; allow for possibility that more tests than minimum specified may be necessary.

F. Field Adhesion Test Procedures:
   1. Allow sealants to fully cure as recommended by manufacturer before testing.
   2. Have a copy of the test method document available during tests.
   3. Record the type of failure that occurred, other information required by test method, and the information required on the Field Quality Control Log.
   4. If any combination of sealant type and substrate does not show evidence of minimum adhesion or shows cohesion failure before minimum adhesion, report results to Bentley Architect + Engineers, Inc..

G. Non-Destructive Field Adhesion Test: Test for adhesion in accordance with ASTM C1521, using Nondestructive Spot Method.

1.5 WARRANTY

A. Correct defective work within a five year period after Date of Substantial Completion.

B. Warranty: Include coverage for installed sealants and accessories that fail to achieve watertight seal , exhibit loss of adhesion or cohesion, or do not cure.

**PART 2 PRODUCTS**

2.1 MANUFACTURERS

A. Basis of Design:
   1. Sika Corporation: www.usa-sika.com.
   2. Or Equal.

2.2 JOINT SEALANT APPLICATIONS

A. Scope:
   1. Exterior Joints: Seal open joints, whether or not the joint is indicated on drawings, unless specifically indicated not to be sealed. Exterior joints to be sealed include, but are not limited to, the following items.
      a. Wall expansion and control joints.
      b. Joints between door, window, and other frames and adjacent construction.
      c. Joints between different exposed materials.
      d. Openings below ledge angles in masonry.
      e. Other joints indicated below.
   2. Interior Joints: Do not seal interior joints unless specifically indicated to be sealed. Interior joints to be sealed include, but are not limited to, the following items.
      a. Joints between door, window, and other frames and adjacent construction.
      b. Other joints indicated below.
   3. Do not seal the following types of joints.
      a. Intentional weepholes in masonry.
      b. Joints indicated to be treated with manufactured expansion joint cover or some other type of sealing device.
      c. Joints where sealant is specified to be provided by manufacturer of product to be sealed.
      d. Joints where installation of sealant is specified in another section.

e. Joints between suspended panel ceilings/grid and walls.

B. Exterior Joints: Use non-sag polyurethane sealant, Type M,G & A, unless otherwise indicated.
1. Lap Joints in Sheet Metal Fabrications: Butyl rubber, non-curing.
2. Lap Joints between Manufactured Metal Panels: Butyl rubber, non-curing.
3. Control and Expansion Joints in Concrete Paving: Self-leveling polyurethane "traffic-grade" sealant.

2.3 JOINT SEALANTS - GENERAL

A. Colors: To Match Adjacent finish Material

2.4 NONSAG JOINT SEALANTS

A. Polyurethane Sealant: ASTM C920, Grade NS, Uses M and A; single or multi-component; not expected to withstand continuous water immersion.
1. Movement Capability: Plus and minus 25 percent, minimum.
2. Hardness Range: 20 to 35, Shore A, when tested in accordance with ASTM C661.
3. Color: Match adjacent finished surfaces.

B. Non-Curing Butyl Sealant: Solvent-based; ASTM C1311; single component, non-sag, non-skinning, non-hardening, non-bleeding; vapor-impermeable; intended for fully concealed applications.

2.5 SELF-LEVELING SEALANTS

A. Self-Leveling Silicone Sealant: ASTM C920, Grade P, Uses M and A; single or multicomponent, explicitly approved by manufacturer for traffic exposure when recessed below traffic surface; not expected to withstand continuous water immersion.
1. Movement Capability: Plus 100 percent, minus 50 percent, minimum.
2. Hardness Range: 0 to 15, Shore A, when tested in accordance with ASTM C661.
3. Color: Color as selected; Gray

2.6 ACCESSORIES

A. Backer Rod: Cylindrical cellular foam rod with surface that sealant will not adhere to, compatible with specific sealant used, and recommended by backing and sealant manufacturers for specific application.
1. Closed Cell and Bi-Cellular: 25 to 33 percent larger in diameter than joint width.

B. Backing Tape: Self-adhesive polyethylene tape with surface that sealant will not adhere to and recommended by tape and sealant manufacturers for specific application.

C. Masking Tape: Self-adhesive, nonabsorbent, non-staining, removable without adhesive residue, and compatible with surfaces adjacent to joints and sealants.

D. Joint Cleaner: Non-corrosive and non-staining type, type recommended by sealant manufacturer; compatible with joint forming materials.

E. Primers: Type recommended by sealant manufacturer to suit application; non-staining.

**PART 3 EXECUTION**

3.1 EXAMINATION

A. Verify that joints are ready to receive work.

B. Verify that backing materials are compatible with sealants.

C. Verify that backer rods are of the correct size.

3.2 PREPARATION

A. Remove loose materials and foreign matter that could impair adhesion of sealant.

B. Clean joints, and prime as necessary, in accordance with manufacturer's instructions.

C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.

D. Mask elements and surfaces adjacent to joints from damage and disfigurement due to sealant work; be aware that sealant drips and smears may not be completely removable.

3.3 INSTALLATION

A. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.

B. Perform installation in accordance with ASTM C1193.

C. Measure joint dimensions and size joint backers to achieve width-to-depth ratio, neck dimension, and surface bond area as recommended by manufacturer, except where specific dimensions are indicated.

D. Install bond breaker backing tape where backer rod cannot be used.

E. Install sealant free of air pockets, foreign embedded matter, ridges, and sags, and without getting sealant on adjacent surfaces.

F. Do not install sealant when ambient temperature is outside manufacturer's recommended temperature range, or will be outside that range during the entire curing period, unless manufacturer's approval is obtained and instructions are followed.

G. Nonsag Sealants: Tool surface concave, unless otherwise indicated; remove masking tape immediately after tooling sealant surface.

3.4 FIELD QUALITY CONTROL

A. Perform field quality control inspection/testing as specified in PART 1 under QUALITY ASSURANCE article.

B. Non-Destructive Adhesion Testing: If there are any failures in first 100 linear feet, notify Bentley Architect + Engineers, Inc. immediately.

C. Remove and replace failed portions of sealants using same materials and procedures as indicated for original installation.

3.5 POST-OCCUPANCY

A. Post-Occupancy Inspection: Perform visual inspection of entire length of project sealant joints at a time that joints have opened to their greatest width; i.e. at low temperature in thermal cycle. Report failures immediately and repair.

**END OF SECTION**

## SECTION 08 39 18
## PERMANENT GLASS FLOOD BARRIERS

### PART 1 GENERAL

1.1 **SECTION INCLUDES**

A. This Section includes the following:
   1. Permanent glass flood barriers
   2. Exterior entrance systems.
   3. Exterior storefront systems.
   4. Engineered Flood Barriers

1.2 Related sections include the following:

A. Division 7 Section ‘’Joint Sealants” for joint sealants installed as part of glazed aluminum entrances and storefront system.’

1.3 SYSTEM DESCRIPTION

A. General: Provide (4) four sided structural glazed aluminum FLOOD GLASS system that has the following capabilities based on testing manufacturer’s standard units in assemblies similar to those indicated for this project:
   1. Withstands loads, thermal and structural movement requirements indicated without failure.
      a. Air infiltration and water penetration exceeding specified limits.
      b. Framing members transferring stresses, including those caused by thermal and structural movement, to glazing units.
      c. Provide operable window as indicted on drawings above the flood barrier elevation for emergency egress druing a flood event.

B. Flood Loads for flood glazing must meet those expressed by FEMA Technical Bulletin 3-93 and P-936, for Non -Residential flood Protection and must be manufactured to US ARMY Corps Of Engineers ‘Flood Proofing Regulations’ to meet performance for Type 2 Closures as identified in Chapter 7, Section 701.1.1 and ASCE 7-20.

C. System must be able to be reglazed from the exterior.

D. Wind Loads: Provide glazed aluminum entrances and storefronts system, including anchorage, capable of withstanding wind-load design pressures calculated according to requirements of authorities having jurisdiction, and the American Society of Civil Engineers’ ASCE 7-20, “Minimum Design Loads for Buildings and Other Structures,” 6.4.2, “ Analytical Procedure, “ and the Current Edition of the Florida Building Code, whichever are more stringent.
   1. Design wind velocity at the project site is 153 MPH (3 sec gust) per Risk Catagory IV..
   2. Deflection of framing members in a direction normal to wall plain is limited to 1/175 of clear span or ¾ inches, whichever is smaller, unless otherwise indicated.
   3. Deflection of framing members in a direction normal to wall plane is limited to 1/360 of clear span, ¾ inches maximum, where plaster or gypsum board are subject to bending.

4. Deflection of framing members overhanging an anchor point is limited to 2 times the length of the cantilevered member, divided by 175.

E. Dead Loads: Provide glazed aluminum entrances and storefronts system members that do not deflect an amount, which will reduce glazing bite below 75 percent of design dimension when carrying full dead load. Provide a minimum 1/8-inch clearance between members and top of fixed panels, glazing or other fixed part immediately below. Provide a minimum 1/16-inch clearance between members and operable windows and doors.

F. Live Loads: Provide structural glazed aluminum entrances and storefronts system, including anchorage, that accommodates supporting structure's deflection from uniformly distributed and concentrated live loads indicated without failure of materials or permanent deformation.

G. Air Infiltration: Provide glazed aluminum entrances and storefronts system with permanent resistance to air leakage through system of not more than 0.06 cfm/sq.ft. Have fixed wall area when tested according to ASTM E 283 at a static-air-pressure difference of 6.24 lbf/sq.ft.

H. Water Penetration: Provide glazed aluminum entrances and storefronts system that does not evidence water leakage when tested according to ASTM E 331 at minimum differential pressure of 25 percent of inward acting wind-load design pressure as defined by ASCE 7, " Minimum Design Loads for Buildings and other structures, " but not less than 10 lbf/sq.ft.

I. Thermal Movements: Provide glazed aluminum entrances and storefronts system, including anchorage, that accommodates thermal movements of system and supporting elements resulting from the following maximum change (range) in ambient and surface temperatures without buckling, damaging stresses on glazing, failure of joint sealants, damaging loads on fasteners, noise or vibration and other detrimental effects.
   1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.

J. Structural Support Movement: Provide glazed aluminum entrances and storefronts system that accommodates structural movements including, but not limited to, sway, twist, column shortening, long-term creep, and deflection.

K. Condensation Resistance Factor (CRF): Provide glazed aluminum entrances and storefront system with (CRF) of not less than 55 when tested according to AAMA 1503.1

L. Average Thermal Conductance: Provide glazed aluminum entrances and storefronts system with an average U-value of not more than 0.66 Btu/sq.ft. x h x deg F when tested according to AAMA 1503.1

M. Dimensional Tolerances: Provide glazed aluminum entrances and storefronts system, including anchorage that accommodates dimensional tolerances of building frame and other adjacent construction.

1.4 TESTING AND PERFORMANCE REQUIREMENTS

A. Provide Permanent Glass Flood Barrier System and application that is structurally sound, impact resistance and weather tight conforming to applicable testing and performance requirements described herein.

B. Flood Loads for flood barriers must meet those expressed by FEMA Technical Bulletin 3-93 and P-936, for Non -Residential flood Protection and must be manufactured to US ARMY Corps Of Engineers 'Flood Proofing Regulations' to meet performance for Type 2 Closures as identified in Chapter 7, Section 701.1.1 and ASCE 7-20.
   1. Test in accordance with, AND Provide PE Certified test results showing compliance with FEMA 3-93 and FEMA P-936.
   2. Hydrostatic water depth minimum 60 inches of water with 2 GPH max. seepage.
   3. Dynamic Debris Impact Test of 1,000 pound object moving at a speed of 8 FPS. NO GLASS Breakage allowed on impact section of glass during the above Testing.
   4. Building Specific Flood Loads:
      a. Hydrodynamic Breaking Wave load applied to the building at the total design still water level of 3.7 ft NAVD88: 2,192 lb/lf
      b. High Velocity Hydrodynamic Load applied to the building at the total design still water level of 3.7 ft NAVD88:40 psf
      c. Floating Debris Impact Load striking the building at the total design still water level of 3.7 ft NAVD88: 675 psf

C. Provide certification for compliance with the Current Edition of the Florida Building Code.

D. Test Units: All tests, unless otherwise noted, shall conform to the impact, static, cyclic, air and water testes as set forth by SBCCI and the Miami-Dade County Building Code Compliance, and/or Florida Building Code Approval.

E. Test Procedure and performance:
   1. Storefront system shall conform to criteria for conducting impact, static, cyclic air and water tests set forth by the SBCCI and the Miami-Dade County Building Code Compliance Office.
   2. Impact Test - PA 201-94 and 1-3023.2
      a. Missile Impact storefront system with a solid S4S nominal 2 x 4, #2 surface dry, Southern Pine of not less than 8'-6' in length and 9 lbs in weight at a velocity between 50 and 52 ft/sec. Without defined specimen failure.
   3. Cycle Wind Pressure Loading Test - PA203-94 and 302.4 - 302.7.3
      a. Apply loads to the specimen using the cycles specified in The South Florida Building Code and as in Table 1 of SSTD 12-97 without failure.
      b. Specified Design Pressure (DP) should not be less than 90 psf.

1.5 SUBMITTALS

A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.

B. Site Specific Engineering, per FEMA Bulletin 3-93, signed and sealed by a Professional Engineer licensed in the state in which the work is being performed.

C. Materials Impact testing, certified by an accredited testing laboratory acceptable to the Architect.

D. D. Test in accordance with FEMA 3-93 and FEMA P-936, AND Provide PE Certified test results showing compliance with for Glass strength and floating debris impact test simulating use of a 1,000 log.

E. Product Data for each product specified, including details of construction relative to materials, dimensions of components, profiles, silicone strength tests, and finishes.

F. Detailed Shop Drawings showing fabrication and installation of glazed aluminum entrances and storefront system including plans, elevations, sections, details of components, and attachments to other units of Work.
   1. For installed products indicated to comply with certain design loadings, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
   2. Samples for initial selection in the form of manufacturer's standard sizes. Where finishes involve normal color and texture variations, include Sample sets showing the full range of variations expected.

G. Samples for verification of each type of exposed finish required in manufacturer's standard sizes. Where finishes involve normal color and texture variations expected.

H. Cutaway sample of each vertical-to-horizontal intersection of system, made from 12-inch lengths of full-size components and showing details of the following:
   1. Joinery
   2. Anchorage
   3. Expansion provisions
   4. Glazing
   5. Flashing and drainage

I. Welder Certificates indicating that welders comply with requirements specified in " Quality Assurance " Article.

J. Installer certificates signed by installer certifying that installer comply with requirements in " Quality Assurance " Article.

K. Manufacturer must submit Product Test Reports from a qualified independent engineering firm evidencing compliance of glazed aluminum entrances and storefront system with requirements based on comprehensive testing of manufacturer's current system.

1.6 QUALITY ASSURANCE

A. Manufacturer must have 5 years minimum experience manufacturing the Store Front / Curtainwall Permanent Glass Flood Barriers and be able to submit evidence of this to the architects satisfaction.

B. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in the jurisdiction where project is located and who has a minimum of 5 years experience in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of flood glazed aluminum

entrances and storefront systems that are similar to those indicated for this Project in material, design, and extent.

1. Engineering Responsibility: Engage a qualified professional engineer to prepare or supervise the preparation of data for glazed aluminum entrances and storefront systems, including drawings, testing program development, test-result interpretation, and comprehensive engineering analysis that shows systems' compliance with specified requirements.

C. Installer Qualifications: Engage an experienced installer to assume responsibility and perform work of this Section with a minimum of 5 years experience in installing glazed aluminum storefront / curtainwall systems designed specifically for flood protection similar to those required for this Project and who is acceptable to manufacturer.

D. Source Limitations: Obtain each type of glazed aluminum entrances and storefront system from one source and by a single manufacturer.

E. Product Options: Drawings indicate size, profiles, and dimensions of glazed aluminum entrances and Permanent Glass Flood Barrier System and are based on the specific systems indicated.

1. Project's basis of design is Savannah Flood Protection, Inc, Permanent Glass blood Barrier System with Perimeter blow-in protection devices.
2. Do not modify intended aesthetic effects, as judged solely by architect, except with Architect's written approval and only to the extent needed to comply with performance requirements. Where modifications are proposed, submit comprehensive explanatory data to architect for review. Architects determination is final.

F. Welding Standards: Comply with applicable provisions of AWSD 1.2, "Structural Welding Code-Aluminum."

1. Engage welders who have satisfactorily passed AWS qualification tests for welding processes involved and who are currently certified for these processes.

G. Mockups: Prior to installing glazed aluminum entrances and storefront system, construct mockups for each form of construction and finish required to verify selections made under Sample submittals and to demonstrate aesthetic as well as qualities of materials and execution. Build mockups to comply with the following requirements, using materials indicated for work.

1. Locate mockups on-site in the location and of the size indicated or, if not indicated, as directed by Architect.
2. Notify Architect 7 days in advance of the dates and times when mockups will be constructed.
3. Demonstrate the proposed range of aesthetic effects and workmanship.
4. Obtain Architect's approval of mockups before start of work.
5. Retain and maintain mockups during construction in an undisturbed condition as a standard for judging the completed work.
    a. Approved mockups in an undisturbed condition at the time of Substantial Completion may become part of the completed work.

H. Pre-installation Conference: Conduct conference at Project site.

1. Comply with requirements of Division 1 Section "Project Meetings."

1.7 PROJECT CONDITIONS

A. Field Measurements: Verify dimensions by field measurements before fabrication and show recorded measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
   1. Where field measurements cannot be made without delaying the work, General Contractor shall guarantee dimensions to the manufacturer, and fabrication shall proceed without field measurements. Coordinate construction to ensure that actual dimensions correspond to guarantee dimensions.

1.8 WARRANTY

A. General Warrant: The special warranty specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.

B. Special Warranty: Submit a written warranty executed by the manufacturer and installer, agreeing to repair or replace components of a glazed aluminum entrances and storefront system that fail in materials or workmanship within the specified warranty period. Failures include, but are not limited to, the following:
   1. Structural failures including, but not limited to, excessive deflection
   2. Failure of system to meet performance requirements.
   3. Deterioration of meals, metal finishes, and other materials beyond normal weathering.
   4. Glazing breakage.
   5. Delamination.
   6. Warranty Period: 5 years from date of Substantial Completion.

**PART 2 PRODUCTS**

2.1 MANUFACTURERS / INSTALLERS

A. Basis of Design Manufacturer: Savannah Trims, Inc. phone 888-640-0850.
   1. Subject to compliance with requirements, design intent and these specifications, other manufacturers will be considered for these specifications subject to submission of all testing requirements and Laboratory Certification, a minimum of 10 calendar days prior to the project bid date.

B. Installer must have a minimum of 5 years of field experience installing designed flood glazing and must be approved by the manufacturer.

2.2 MATERIALS

A. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated, complying with the requirements of standards indicated below.
   1. Sheet and plate: ASTM B 209
   2. Extruded Bars, Rods, Shapes, and tubes: ASTM B 221.
   3. Extruded Structural Pipe and Tubes: ASTM B 429.
   4. Welding Rods and Bare Electrodes: AWS A5.10.

B. Steel Reinforcement: ASTM A 36 for structural shapes, plates, and bars; ASTM A 611 for cold-rolled sheet and strip; or ASTM A 570 for hot-rolled sheet and strip.
   1. Provide only where required by manufacturer to meet engineering requirements.
   2. Back paint concealed metal surfaces and surfaces in contact with dissimilar metals with protective backing paint to a minimum dry film thickness of 15 mil.

C. Glass: Shall be tinted 'Flood Glass', manufactured to the specifications of Savannah Flood Protection consisting of two layers of 1/4 inch thick, heat - strengthened glass separated by a hi-bred laminated as specified by Savannah Flood Protection, that is designed to meet the performance specifications outlined in this specification.
   1. Thermal and Optical Performance: Provide exterior glazing products with performance properties as indicated. Performance properties are in accordance with manufacturer's published data as determined with the following procedures and/or test methods:
      a. Center of Glass U-Value: Comply with NFRC 100 using Lawrence Berkeley National Laboratory (LBNL) WINDOW 6.3 computer program.
      b. Center of Glass Solar Heat Gain Coefficient (SHGC): Comply with NFRC 200 using Lawrence Berkeley National Laboratory (LBNL) WINDOW 6.3 computer program.
      c. Solar Optical Properties: Comply with NFRC 300 test method.

D. Glazing Gaskets: Manufacturer's standard sealed-corner pressure-glazing system of black, resilient elastomeric glazing gaskets, and shims or spacers; in hardness recommended by manufacturer.

E. Glazing sealants and fillers as manufactured by Dow Corning specifically for this application.

F. Framing system gaskets and joint fillers as recommended by Savannah Flood Protection, Inc.

G. Sealants and joint fillers for joints within glazed aluminum entrances and storefront system as tested and approved by manufacturer.

H. Firesafing materials as specified in Division 7 Section " Building Insulation."

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

2.3 COMPONENTS

A. Storefront: Savannah Trims model CTC SG9 framing system with 9/16" laminated (outer lite) ½" IG glazing. - Coatings to be determined.

B. Doors: Provide manufacturer's standard 1 ¾ - inch - thick glazed doors with minimum 0.125 - inch - thick, extruded tubular rail and stile members. Mechanically fasten corners with reinforcing brackets that are deep penetration and fillet welded or that incorporate concealed tie-rods.
   1. Glazing stops and gaskets: Provide manufacturer's standard snap-on extruded-aluminum glazing stops and performed gaskets.
   2. Stile Design: Medium stiles: 3 ½ - inch nominal width, with 4 ½ - inch center rail.

C. Brackets and Reinforcements: Provide manufacturers' standard high-strength aluminum brackets and reinforcements. Provide nonstaining, nonferrous shims for aligning system components.

D. Fasteners and Accessories: Manufacturer's standard corrosion-proof, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials. Finish exposed portions to match glazed aluminum entrances and storefront.
   1. At movement joints, use slip-joint linings, spacers, and sleeves of material and type recommended by manufacturer.
   2. Where fasteners anchor into aluminum less than 0.125 inches thick, provide reinforcement to receive fastener threads.
   3. Use exposed fasteners with countersunk Phillips screw heads finished to match framing members, unless otherwise indicated.

E. Anchors: 3-way adjustable anchors that accommodate fabrication and installation tolerances in materials and finish compatible with adjoining materials and recommended by manufacturer.
   1. Concrete and Masonry Inserts: Hot-dip galvanized cast-iron, malleable-iron, or steel inserts complying with ASTM A 123 or ASTM A 153 requirements.
   2. Back paint concealed metal surfaces and surfaces in contact with dissimilar metals with protective backing paint to a minimum dry film thickness of 15 mil.

F. Concealed Flashing: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding flashing, compatible with adjacent materials, and of type recommended by manufacturer.

G. Glass Units: 9/16" Laminated Glass.
   1. Glazing materials from Outboard Lite to Inboard Lite:
      a. 1/4" Glass
      b. .120 interlayer
      c. 1/4" Glass
   2. Tint: Bronze Reflective #2.
   3. Thermal Transmittance (U-Value), Summer - Center of Glass: 0.85, nominal.
   4. Visible Light Transmittance (VLT): 24 percent, nominal.
   5. Shading Coefficient: 0.52, nominal.
   6. Solar Heat Gain Coefficient (SHGC): 0.45, nominal.
   7. Visible Light Reflectance, Outside: 11 percent, nominal.

H. Weather Stripping: Manufacturers' standard replaceable weather stripping as follows:
   1. Compression Weather Stripping: Molded neoprene complying with ASTM D 2000 requirements or molded PVC complying with ASTM D 2287 requirements.
   2. Sliding Weather Stripping: Wool , polypropylene, or nylon woven pile with nylon-fabric or aluminum-strip backing complying with AAMA 701 requirements.

I. Hardware shall be manufacturers standard package.

## 2.4 FABRICATION

A. General: Fabricate glazed aluminum entrances and storefront systems according to shop Drawings. Fabricate components that, when assembled, will have accurately fitted

joints with ends coped or mitered to produce hairline joints of burrs and distortion. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

1. Fabricate components for head - and sill-receptor frame construction with shear-block construction at intermediate horizontal components.
2. Provide method(s) indicated above as standard with manufacturer for frame construction assemblies applicable to this Project.

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

C. Prepare components to receive concealed fasteners and anchor and connection devices.

D. Fabricate components to drain water-passing joints, condensation occurring in glazing channels, condensation occurring within framing members, and moisture migrating within the system to the exterior.

E. Welding: Weld components to comply with referenced standard and Shop Drawings, unless otherwise indicated. Weld before finishing components. Weld in concealed locations to greatest extent possible to minimize distortion or discoloration of finish. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.

F. Glazing Pockets: Provide minimum clearances for thickness and type of glass indicated.

G. Metal Protection: Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces finished paint, or by applying sealant or tape recommended by manufacturer for this purpose. Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with zinc-chromate paint.

H. Frame Units: Factory assembles frame units according to Shop Drawings to greatest extent possible. Rigidly secure nonmovement joints. Seal joints watertight, unless otherwise indicated. Assemble components to drain water passing joints, condensation occurring within framing members, and moisture migrating within the system to exterior.

I. Install glazing in the manufacturers shop, prior to shipment and according to Shop Drawings.

2.5 ALUMINUM FINISHES

A. General: Comply with NAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations relative to applying and designating finishes.

B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

C. Class I, Dark Bronze Anodic Finish: AA- M12C22A41 (Mechanical Finish: nonspecular as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class I clear coating 0.018mm or thicker) complying with AAMA 607.1.

## PART 3 EXECUTION

3.1 EXAMINATION

A. Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of glazed aluminum entrances and storefront system. Do not proceed with installation until unsatisfactory conditions have been corrected or accommodations acceptable to architect have been made.

3.2 INSTALLATION

A. General: Install product in openings prepared by the General Contractor to accept this application of Permanent Glass Flood Barrier System.
   1. Start of installation shall signify acceptance of conditions.

B. Comply with manufacturer's written instructions for protecting, handling, and installing glazed aluminum entrances and storefront system. Do not install damaged components. Fit joints to produce hairline joints free of burrs and distortion. Rigidly secure nonmovement joints. Seal joints watertight, unless otherwise indicated. Provide means to drain water to the exterior to produce a permanently weatherproof system.

C. Perimeter of all openings must be protected against water pressure blow-in by manufacturers certified device as patented by Savannah Trims, Inc.

D. Metal Protection: Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape recommended by manufacturer for this purpose. Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.

E. Install components to drain water-passing joints, condensation occurring in glazing channels, condensation occurring within framing members, and moisture migrating within the system to the exterior.

F. Install framing members plumb and true in alignment with established lines and grades.

G. Install factory-assembled frame units plumb and true alignment with established lines and grades.

H. Anchorage: After system components are positioned, fix connections to build structure as indicated on Shop Drawings.
   1. Provide separators and isolators to prevent metal corrosion and electrolytic deterioration and to prevent impeding movement of moving joints.

I. Welding: Weld components to comply with referenced standard and Shop Drawings, unless otherwise indicated. Weld in concealed locations to minimize distortion or discoloration of finish. Protect glazing surfaces from welding.

J. Install glazing according to Shop Drawings.

K. Install sealant according to Shop Drawings.

L. Erection Tolerances: Install pre-glazed aluminum entrances and storefront to comply with the following maximum tolerances:
   1. Plumb: 1/8 inch in 10 feet; 1/4 inch in 40 feet.

2. Level: 1/8 inch in 20 feet; 1/4 inch in 40 feet.
3. Alignment: Where surfaces abut in line, limit offset from true alignment to 1/16 inch; where a reveal or protruding element separates aligned surfaces by less than 2 inches, limit offset to ½ inch.
4. Location: Limit variation from plane or location shown on Shop Drawings to 1/8 inch in 12 feet; 1/2 inch over total length.

M. Installer shall furnish certification, signed by an officer of the Company, certifying that all work is installed per the contract documents and the manufacturers shop drawings, and agreeing to the conditions and terms of the warranty.

N. Installer shall maintain a daily work log for each day worked on the jobsite, noting manpower, installation progress, problems encountered and all other issues of note.

O. Install entrances plumb and true in alignment with established lines and grades without warp or rack. Lubricate operating hardware and other moving parts according to hardware manufacturers' written instructions.
1. Install surface-mounted hardware according to manufacturers' written instructions.

3.3 PROTECTION

A. General Contractor shall provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer that ensure that the Glass flood Barrier System, and the glazed aluminum entrances and storefront system is protected without damage or deterioration for the remainder of the project until the time of Substantial Completion.

**END OF SECTION**

## SECTION 08 39 21
## PEDESTRIAN FLOOD DOORS AND FRAMES

### PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Single Swing and Paired Swing with removable mullion Pedestrian Flood Doors with Frames.
   2. Door Hardware.

1.2 SUBMITTALS

A. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Installation instructions.

B. Shop Drawings: Provide shop drawings showing layout, profiles, and product components, including anchorage, hardware, and finishes. Include dimensional plans, applicable material specifications, elevations and sections detailing mounting and connections, and load diagrams.

C. Calculations: Upon signed finalization and approval of dimensions, mounting location material and configuration, and load requirements;
   1. Submit stamped calculations by a registered professional engineer from within the state or territory where the project will be constructed or substantially improved, to verify the flood door's ability to withstand the design loading.

1.3 CLOSEOUT SUBMITTALS

A. Provide Operation and Maintenance data to include methods for maintaining installed products, precautions against cleaning materials and methods detrimental to finishes and performance.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: Manufacturer must demonstrate a minimum of five (5) years successful experience in design and manufacture of similar flood related closures. Upon request, provide supporting evidence including list of installations, descriptions, name and method of contact.

B. Minimum Qualifications: Manufacturer must demonstrate compliance and certification of a Quality Management System administered by the International Organization for Standardization (ISO). Documentation of current certification status to be provided upon request.

C. Welder Qualifications: Welders Certified in accordance with American Welding Society Procedures for applicable material used in production of specified product.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging container with identification markings intact until ready for installation.

B. Protect materials from exposure to moisture during storage.

C. Store materials in a dry, warm, ventilated weathertight location. If outdoor storage is required, block materials to store at an incline, to prevent pooling of any moisture and promote runoff. Tarp materials in a tent-like arrangement, elevated above the product with open sides to allow airflow. Store loose or high value components in a dry, controlled environment.

D. Use caution when unloading and handling product to avoid bending, denting, crushing, or other damage to the product.

E. When using forklifts, use forks of proper length to fully support product being moved. Consult "Approved for Construction" drawings or consult with factory for proper lift points.

1.6 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's indicated limits.

1.7 COORDINATION

A. Conduct site survey and provide to flood door manufacturer, prior to manufacturer's commencement of shop drawings, the actual site conditions of the mounting location, to include; material type, dimensions and configuration, interferences with mounting surface, or any other condition that may impact the ability of the flood door to be properly installed.

B. Coordinate work with other operations and installation of adjacent materials to avoid damage.

1.8 WARRANTY

A. Manufacturer's Standard Warranty: Product to be free from defects in material and workmanship for a period of one (1) year from date of shipment.

**PART 2 - PRODUCTS**

2.1 PERFORMANCE REQUIREMENTS

A. Design flood resistance doors to support, solely or in combinations of, temporary super-imposed live loads as indicated below. All applied types of flood related loadings are transferred from the flood product barriers, solely or in combinations of, by mullion anchorage to structural floor slabs and/or jamb anchorage and direct pressure contact to structural walls or other structural elements.

1. Hydrostatic Loading
2. Hydrodynamic Loading
3. Debris Impact Loading
4. Wave Loading (Dynamic/ Non-Breaking or Broken Wave)
5. Wave Loading (Impact/ Breaking Wave - Below & Above DFE)
6. Wind Loading

B. Engineer Code Practices: Engineer flood products to conform to the design requirements that are based on the latest adopted edition of the International Building

Code (IBC). LFRD and/or ASD methodologies are applied as appropriate to align with specific project specifications and/or limited published material data.

C. Water Density: 64 pcf, unless otherwise noted on drawings.

2.2 PEDESTRIAN FLOOD DOOR WITH FRAME

A. Description: Hinged, Pedestrian Flood Door including door frame, door panel, threshold, and door hardware.
   1. Basis of Design Manufacturer: PS Flood BarriersTM, which is located at: 1150 S. 48th Street, Grand Forks, ND 58201; Toll Free Tel: 877.446.1519; Email: 4info@psindustries.com; Web: www.psfloodbarriers.com or www.psindustries.com
      a. Basis of Design Product: Model: PD 520.

B. Substitutions:
   1. Requests for substitutions will be considered in accordance with provisions of Section 01600.

C. Single Source Responsibilities: Obtain all watertight doors and flood protection barriers from single manufacturer.

2.3 EQUIPMENT

A. Products Details:
   1. Sealing Requirements: Flood Door and compression gasket design shall provide an effective barrier against short-term high water situations, to the protection level indicated on drawings.
   2. Operation: Provide with latching operable from both sides.
   3. Mounting/Load Transfer: Anchor to existing structure. Flood Door designed for specified hydrostatic pressure (and other loads as specified) and will transfer loads to adjacent structure.
   4. Frames to be anchored utilizing mechanical, chemical or other framing methods as designed. Manufacturer to include all anchors, water-stop, and sealants, as designed.
   5. Loading Direction:
      a. Positive Pressure Loading, (direction of loading against flood door so as to further compress gaskets against flood door frame - "seating").
   6. Provide rectangular door opening with square corners to facilitate easy passage.
   7. Provide compression gasket which do not require air inflation.

2.4 MATERIALS

A. Flood Door to be fabricated from the following type of material;
   1. Stainless Steel: Type 316 structural or formed shapes, tubing, and bars of appropriate size and strength with welded construction.

B. Door Panel to be sheeted with sheeting or plate of the following type;
   1. Stainless Steel: Type 316- No. 2b stainless steel of appropriate size and strength, structurally bonded.

C. Gaskets: Factory mounted, compressible rubber type, field replaceable. Gasket does not require air inflation.

1. Material: UV resistant EPDM, neoprene and rubber unless otherwise noted.

D. Door Frame to be manufactured of the same material type and finish as door panel. Frame to include jambs, header jamb, and threshold members for field locating and installation on structure. Jamb members to be designed and fabricated with appropriate material as required for the loading.

E. Thresholds to be PS Flood BarriersTM proprietary threshold:

F. Frame Mounting Hardware: Provide anchors, sealant, and water stop, as required.

G. Operating Hardware: Provide hardware appropriate for the size and weight of the flood door and loads. Hardware to be factory located on jambs and door panels, as practical. Latching hardware to be as indicated on drawings. Flood door panel to be factory prepared for applicable latching devices.
   1. Aluminum (AL689 finish) Hinge to be continuous type.
      a. Back paint concealed metal surfaces and surfaces in contact with dissimilar metals with protective backing paint to a minimum dry film thickness of 15 mil.
   2. Standard Latching/Locking Hardware: Interior: Von Duprin 98/99 series Rim exit device. Exterior: Von Duprin 996L Lever, classroom function.
      a. (Note: this hardware has been specifically chosen and tested on the PD-520, substitutions require manufacturer's engineering review.)
   3. Deadbolt latch (Elevation above max design water height only).
   4. Closer; Retrolock RDC4000 H-CUSH, Heavy Duty Grade 1 (AL689 finish)

H. Finish:
   1. Steel Shop Finish: Apply the following paint system in accordance with manufacturer recommendations and instructions;
      a. Finish: Two shop coats of Standard Industrial Enamel (S-W Industrial and Marine Coatings B54 Series)

I. Labeling: Each watertight door and frame will be individually identified for matched installation.

2.5 FABRICATION

A. Fit and factory assemble items in largest practical sections, for shipment to site.

B. Fabricate items with joints tightly fitted and secured.

C. Supply components required for anchorage of fabrications, unless otherwise noted.

D. Conduct shop operational test with factory installed gaskets to verify flood door assembly components operate as designed and flood protective gasket alignment and contact surfaces interact as intended.

**PART 3 - EXECUTION**

3.1 EXAMINATION

A. Do not begin installation until mounting substrates have been properly prepared.

B. If substrate preparation is the responsibility of another subcontractor, notify Architect of uncompleted preparation before proceeding.

C. Inspect opening for compliance with door manufacturer requirements. Verify open conditions are within required tolerances.

3.2 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

A. Install in accordance with manufacturer's installation instructions, "Approved for Construction" drawings, shipping, handling, and storage instructions, and product carton instructions for installation.

B. Frames must be installed level, square, plumb, and rigid.

C. Perform light or chalk test for gasket alignment, continuity contact and pre-compression prior to field grouting.

D. Sealants, water-stop, and grouting to be applied per product application directions and in accordance with manufacturer's instructions, and "Approved for Construction" drawings.

E. Field Grouting to be completed by appropriate personnel, and in accordance with product application directions, manufacturer's instructions, and "Approved for Construction" drawings.

F. Tolerances: All dimensional requirements must be in accordance with manufacturer's installation instructions and "Approved for Construction" drawings.

G. Products to be operated and field verified that sealing surfaces maintain contact at the correct sealing points.

H. Inspect gaskets for damage, wear, and adhesion. Replace compromised gaskets immediately.

I. Verify that latching assemblies operate freely and correctly.

J. Verify all anchorage is in accordance with manufacture's installation instructions and applicable data sheets.

K. Inspect installation sealants to ensure a watertight juncture.

3.4 FIELD QUALITY CONTROL

A. Field Testing:

1. Installer to construct temporary water barrier and test installed flood barrier under hydrostatic conditions.

3.5 CLEANING

A. Touch-up, repair or replace damaged products or components before Substantial Completion.

B. Clean all sealing surfaces.

3.6 PROTECTION

A. Protect installed products until completion of project.

**END OF SECTION**

## SECTION 09 21 16
## GYPSUM BOARD ASSEMBLIES

### PART 1 GENERAL

1.1 SECTION INCLUDES

A. Note: This section is intended for repair of damaged gypsum board materials at new door and window locations.

B. Performance criteria for gypsum board assemblies.

C. Gypsum wallboard.

D. Joint treatment and accessories.

E. Textured finish system.

1.2 RELATED REQUIREMENTS

A. Section 07 92 00 - Joint Sealants: Sealing acoustical gaps in construction other than gypsum board or plaster work.

1.3 REFERENCE STANDARDS

A. ASTM C475/C475M - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board; 2015.

B. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board; 2013.

C. ASTM C1047 - Standard Specification for Accessories For Gypsum Wallboard and Gypsum Veneer Base; 2014a.

D. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2014.

E. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2009 (Reapproved 2016).

F. ASTM E413 - Classification for Rating Sound Insulation; 2016.

G. GA-216 - Application and Finishing of Gypsum Board; 2013.

1.4 SUBMITTALS

A. Product Data: Provide data on gypsum board, accessories, and joint finishing system.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in performing gypsum board installation and finishing.

### PART 2 PRODUCTS

2.1 GYPSUM BOARD ASSEMBLIES

A. Provide completed assemblies complying with ASTM C840 and GA-216.

B. Interior Partitions: Provide completed assemblies with the following characteristics:

1. Acoustic Attenuation: STC of 45-49 calculated in accordance with ASTM E413, based on tests conducted in accordance with ASTM E90.

2.2 BOARD MATERIALS

A. Gypsum Wallboard: Paper-faced gypsum panels as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
   1. Application: Use for vertical surfaces, unless otherwise indicated.
   2. Thickness:
      a. Vertical Surfaces: 5/8 inch or as required to match existing adjacent materials.

B. Gypsum Wallboard: ASTM C 1396/C 1396M. Sizes to minimize joints in place; ends square cut.
   1. Regular Type:
      a. Application: Use for vertical surfaces, unless otherwise indicated.
      b. Thickness: 5/8 inch or as required to match existing adjacent materials.
      c. Edges: Tapered.

2.3 Gypsum Wallboard ACCESSORIES

A. Sealant: Non-hardening, non-skinning, for use in conjunction with gypsum board.

B. Finishing Accessories: ASTM C1047, galvanized steel or rolled zinc, unless noted otherwise.
   1. Types: As detailed or required for finished appearance.
   2. Special Shapes: In addition to conventional corner bead and control joints, provide U-bead at exposed panel edges.

C. Beads, Joint Accessories, and Other Trim: ASTM C1047, rigid plastic, galvanized steel, or rolled zinc, unless noted otherwise.
   1. Corner Beads: Low profile, for 90 degree outside corners.

D. Joint Materials: ASTM C475/C475M and as recommended by gypsum board manufacturer for project conditions.
   1. Paper Tape: 2 inch wide, creased paper tape for joints and corners, except as otherwise indicated.
   2. Ready-mixed vinyl-based joint compound.

E. High Build Drywall Surfacer: Vinyl acrylic latex-based coating for spray application, designed to take the place of skim coating and separate paint primer in achieving Level 5 finish.

F. Textured Finish Materials: Latex-based compound; plain.
   1. Match existing adjacent texture.

G. Screws: ASTM C 1002; self-piercing tapping type; cadmium-plated for exterior locations.

**PART 3 EXECUTION**

3.1 EXAMINATION

A. Verify that project conditions are appropriate for work of this section to commence.

3.2 BOARD INSTALLATION

A. Comply with ASTM C840, GA-216, and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations.

B. Install gypsum board in most economical direction, with ends and edges occurring over firm bearing.

3.3 INSTALLATION OF TRIM AND ACCESSORIES

A. Control Joints: Place control joints consistent with lines of building spaces and corners of window and doors.

B. Edge Trim: Install at locations where gypsum board abuts dissimilar materials.

3.4 JOINT TREATMENT

A. Paper Faced Gypsum Board: Use paper joint tape, bedded with ready-mixed vinyl-based joint compound and finished with ready-mixed vinyl-based joint compound.

B. Finish gypsum board in accordance with levels defined in ASTM C840, as follows:
   1. Level 5: Walls and ceilings to receive paint finish and other areas specifically indicated.
   2. Level 1: Wall areas above finished ceilings, whether or not accessible in the completed construction.

C. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.
   1. Feather coats of joint compound so that camber is maximum 1/32 inch.
   2. Taping, filling, and sanding is not required at surfaces behind adhesive applied ceramic tile.

D. Where Level 5 finish is indicated, spray apply high build drywall surfacer over entire surface after joints have been properly treated; achieve a flat and tool mark-free finish.

E. Fill and finish joints and corners of cementitious backing board as recommended by manufacturer.

3.5 TEXTURE FINISH

A. Apply finish texture coating by means of spraying apparatus in accordance with manufacturer's instructions and to match approved sample.
   1. Texture shall match existing adjacent surface

3.6 TOLERANCES

A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet in any direction.

**END OF SECTION**

## SECTION 09 24 00
## PORTLAND CEMENT PLASTERING

### PART 1 GENERAL

1.1 SECTION INCLUDES

A. Note: This section is intended for repair of damaged stucco materials at new door and window locations.

B. Portland cement plaster for installation over masonry and concrete.

1.2 RELATED REQUIREMENTS

A. Section 09 91 13 - Exterior Painting.

1.3 REFERENCE STANDARDS

A. ASTM C91/C91M - Standard Specification for Masonry Cement; 2012.

B. ASTM C150/C150M - Standard Specification for Portland Cement; 2018.

C. ASTM C206 - Standard Specification for Finishing Hydrated Lime; 2014.

D. ASTM C926 - Standard Specification for Application of Portland Cement-Based Plaster; 2015b.

1.4 SUBMITTALS

A. Product Data: Provide data on plaster materials, characteristics and limitations of products specified.

1.5 QUALITY ASSURANCE

A. Perform Work in accordance with ASTM C 926.
   1. Maintain one copy on site.

### PART 2 PRODUCTS

2.1 PORTLAND CEMENT PLASTER ASSEMBLIES

A. Exterior Stucco: Portland cement plaster system, made of finish, brown, and scratch coat and reinforcing mesh.

2.2 PLASTER MATERIALS

A. Portland Cement, Aggregates, and Other Materials: In accordance with ASTM C 926.

B. Portland Cement: ASTM C150/C150M, Type I.
   1. For finish coat: Gray color.

C. Masonry Cement: ASTM C91 Type N.

D. Lime: ASTM C 206, Type S.

E. Aggregate: In accordance with ASTM C 926.

F. Water: Clean, fresh, potable and free of mineral or organic matter that could adversely affect plaster.

2.3 METAL LATH

A. Metal Lath and Accessories: Conform to ASTM C847; manufacturer's standard G60 galvanized lathe with galvanized fasteners

B. Beads, Screeds, and Joint Accessories by Plastic Components in Widths and Locations as noted on Drawings

2.4 PLASTER MIXES

A. Over Solid Bases: Two-coat application, mixed and proportioned in accordance with ASTM C926.

B. Over Metal Lath: Three-coat application, mixed and proportioned in accordance with ASTM C926.

C. Mix only as much plaster as can be used prior to initial set.

D. Mix materials dry, to uniform color and consistency, before adding water.

E. Protect mixtures from freezing, frost, contamination, and excessive evaporation.

F. Do not retemper mixes after initial set has occurred.

**PART 3 EXECUTION**

3.1 EXAMINATION

A. Verify the suitability of existing conditions before starting work.

B. Masonry: Verify joints are cut flush and surface is ready to receive work of this section. Verify no bituminous or water repellent coatings exist on masonry surface.

C. Metal Lath and Accessories: Verify lath is flat, secured to substrate, and joint and surface perimeter accessories are in place.

3.2 PREPARATION

A. Dampen masonry surfaces to reduce excessive suction.

B. Clean concrete surfaces of foreign matter. Clean surfaces using acid solutions, solvents, or detergents. Wash surfaces with clean water.

C. Roughen smooth concrete surfaces and apply bonding agent in accordance with manufacturer's instructions.

3.3 PLASTERING

A. Apply plaster in accordance with ASTM C926.

B. Three-Coat Application Over Solid Bases:
   1. Apply first coat to a nominal thickness of 1/4 inch.
   2. Apply second coat to a nominal thickness of 1/4 inch.
   3. Apply finish coat to a nominal thickness of 1/8 inch.

C. Moist cure base coats.

D. Apply second coat immediately following initial set of first coat.

E. After curing, dampen previous coat prior to applying finish coat.

F. Finish Texture: Float to a consistent and smooth finish for all trims

G. Finish Texture: Match existing adjacent materials..

H. Avoid excessive working of surface. Delay troweling as long as possible to avoid drawing excess fines to surface.

I. Moist cure finish coat for minimum period of 48 hours.

3.4 TOLERANCES

A. Maximum Variation from True Flatness: 1/8 inch in 10 feet.

**END OF SECTION**

## SECTION 09 91 13
## EXTERIOR PAINTING

### PART 1 GENERAL

1.1 SECTION INCLUDES

A. Surface preparation.

B. Field application of paints.

C. Scope: Finish exterior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated, including the following:
   1. Provide as topcoat over expoxy waterproofing.

D. Do Not Paint or Finish the Following Items:
   1. Items factory-finished unless otherwise indicated; materials and products having factory-applied primers are not considered factory finished.
   2. Items indicated to receive other finishes.
   3. Items indicated to remain unfinished.
   4. Fire rating labels, equipment serial number and capacity labels, and operating parts of equipment.
   5. Non-metallic roofing and flashing.
   6. Stainless steel, anodized aluminum, bronze, terne coated stainless steel, zinc, and lead.
   7. Marble, granite, slate, and other natural stones.
   8. Floors, unless specifically indicated.
   9. Ceramic and other types of tiles.
   10. Glass.
   11. Concealed pipes, ducts, and conduits.

1.2 REFERENCE STANDARDS

A. ASTM D4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Based Materials; 2016.

B. MPI (APSM) - Master Painters Institute Architectural Painting Specification Manual; Current Edition.

C. SSPC-SP 1 - Solvent Cleaning; 2015, with Editorial Revision (2016).

D. SSPC-SP 2 - Hand Tool Cleaning; 1982, with Editorial Revision (2004).

E. SSPC-SP 6 - Commercial Blast Cleaning; 2007.

1.3 SUBMITTALS

A. Product Data: Provide complete list of products to be used, with the following information for each:
   1. Manufacturer's name, product name and/or catalog number, and general product category (e.g. "alkyd enamel").
   2. MPI product number (e.g. MPI #47).
   3. Cross-reference to specified paint system(s) product is to be used in; include description of each system.

B. Samples: Submit three paper "draw down" samples, 8-1/2 by 11 inches in size, illustrating range of colors available for each finishing product specified.
   1. Where sheen is specified, submit samples in only that sheen.
   2. Allow 30 days for approval process, after receipt of complete samples by Bentley Architect + Engineers, Inc..

C. Certification: By manufacturer that paints and finishes comply with VOC limits specified.

D. Manufacturer's Instructions: Indicate special surface preparation procedures.

E. Maintenance Data: Submit data including finish schedule showing where each product/color/finish was used, product technical data sheets, material safety data sheets (MSDS), care and cleaning instructions, touch-up procedures, repair of painted and finished surfaces, and color samples of each color and finish used.

F. Maintenance Materials: Furnish the following for Volusia County 's use in maintenance of project.
   1. Extra Paint and Finish Materials: 1 gallon of each color; from the same product run, store where directed.
   2. Label each container with color in addition to the manufacturer's label.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum three years documented experience.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.

B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.

C. Paint Materials: Store at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.

1.6 FIELD CONDITIONS

A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.

B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.

C. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

**PART 2 PRODUCTS**

2.1 MANUFACTURERS

A. Provide paints and finishes used in any individual system from the same manufacturer; no exceptions.

B. Paints:
   1. Sherwin-Williams Company: www.sherwin-williams.com/#sle.

2.2 PAINTS AND FINISHES - GENERAL

A. Paints and Finishes: Ready mixed, unless required to be a field-catalyzed paint.
   1. Provide paints and finishes of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
   2. For opaque finishes, tint each coat including primer coat and intermediate coats, one-half shade lighter than succeeding coat, with final finish coat as base color.
   3. Supply each paint material in quantity required to complete entire project's work from a single production run.
   4. Do not reduce, thin, or dilute paint or finishes or add materials unless such procedure is specifically described in manufacturer's product instructions.

B. Colors: As indicated in Color Schedule on Material Finish List

2.3 PAINT SYSTEMS - EXTERIOR

A. Exterior Surfaces to be Painted, Unless Otherwise Indicated: Including concrete, concrete masonry units, primed metal, and Stucco. Also apply over cured epoxy waterroofing.
   1. Two top coats and one coat primer.
   2. Top Coat(s): Exterior Latex; MPI #10, 11, 15, 119, or 214.
   3. Top Coat Sheen:
      a. Flat: MPI gloss level 1; use this sheen at walls..
      b. Semi-Gloss: MPI gloss level 5; use this sheen for metal and primed steel..
   4. Primer: As recommended by top coat manufacturer for specific substrate.

2.4 ACCESSORY MATERIALS

A. Accessory Materials: Provide primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials as required for final completion of painted surfaces.

B. Patching Material: Latex filler.

C. Fastener Head Cover Material: Latex filler.

**PART 3 EXECUTION**

3.1 EXAMINATION

A. Verify that surfaces are ready to receive work as instructed by the product manufacturer.

B. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially effect proper application.

C. Test shop-applied primer for compatibility with subsequent cover materials.

D. 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. Masonry, Concrete, and Concrete Masonry Units: 12 percent.
   2. Exterior Wood: 15 percent, measured in accordance with ASTM D4442.

3.2 PREPARATION

A. Clean surfaces thoroughly and correct defects prior to application.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

C. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces for finishing.

D. Seal surfaces that might cause bleed through or staining of topcoat.

E. Remove mildew from impervious surfaces by scrubbing with solution of tetra-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.

F. Concrete:
   1. Remove release agents, curing compounds, efflorescence, and chalk. Do not coat surfaces if moisture content or alkalinity of surfaces to be coated exceeds that permitted in manufacturer's written instructions.
   2. Clean surfaces with pressurized water. Use pressure range of 1,500 to 4,000 psi at 6 to 12 inches. Allow to dry.

G. Masonry:
   1. Remove efflorescence and chalk. Do not coat surfaces if moisture content or alkalinity of surfaces or if alkalinity of mortar joints exceed that permitted in manufacturer's written instructions. Allow to dry.
   2. Prepare surface as recommended by top coat manufacturer.
   3. Clean surfaces with pressurized water. Use pressure range of 600 to 1,500 psi at 6 to 12 inches. Allow to dry.

H. Galvanized Surfaces:
   1. Remove surface contamination and oils and wash with solvent according to SSPC-SP 1.
   2. Prepare surface according to SSPC-SP 2.

I. Ferrous Metal:
   1. Solvent clean according to SSPC-SP 1.
   2. Shop-Primed Surfaces: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces.
   3. Remove rust, loose mill scale, and other foreign substances using using methods recommended in writing by paint manufacturer and blast cleaning according to SSPC-SP 6 "Commercial Blast Cleaning". Protect from corrosion until coated.

J. Exterior Wood Surfaces to Receive Opaque Finish: Remove dust, grit, and foreign matter. Seal knots, pitch streaks, and sappy sections. Fill nail holes with tinted exterior calking compound after prime coat has been applied. Back prime concealed surfaces before installation.

## 3.3 APPLICATION

A. Exterior Wood to Receive Opaque Finish: If final painting must be delayed more than 2 weeks after installation of woodwork, apply primer within 2 weeks and final coating within 4 weeks.

B. Apply products in accordance with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual".

C. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.

D. Apply each coat to uniform appearance.

E. Sand wood and metal surfaces lightly between coats to achieve required finish.

F. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.

G. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.4 CLEANING

A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

3.5 PROTECTION

A. Protect finishes until completion of project.

B. Touch-up damaged finishes after Substantial Completion.

**END OF SECTION**

## SECTION 09 91 23
## INTERIOR PAINTING

### PART 1 GENERAL

1.1 SECTION INCLUDES

A. Surface preparation.

B. Field application of paints.

C. Scope: Finish interior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated.
   1. Both sides and edges of plywood backboards for electrical and telecom equipment before installing equipment.

D. Do Not Paint or Finish the Following Items:
   1. Items factory-finished unless otherwise indicated; materials and products having factory-applied primers are not considered factory finished.
   2. Items indicated to receive other finishes.
   3. Items indicated to remain unfinished.
   4. Fire rating labels, equipment serial number and capacity labels, bar code labels, and operating parts of equipment.
   5. Stainless steel, anodized aluminum, bronze, terne coated stainless steel, and lead items.
   6. Marble, granite, slate, and other natural stones.
   7. Floors, unless specifically indicated.
   8. Ceramic and other tiles.
   9. Glass.
   10. Acoustical materials, unless specifically indicated.
   11. Concealed pipes, ducts, and conduits.

1.2 RELATED REQUIREMENTS

A. Section 09 91 13 - Exterior Painting.

1.3 REFERENCE STANDARDS

A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency; current edition.

B. ASTM D4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Based Materials; 2016.

C. MPI (APSM) - Master Painters Institute Architectural Painting Specification Manual; Current Edition.

D. SSPC-SP 1 - Solvent Cleaning; 2015, with Editorial Revision (2016).

E. SSPC-SP 6 - Commercial Blast Cleaning; 2007.

1.4 SUBMITTALS

A. Product Data: Provide complete list of products to be used, with the following information for each:

1. Manufacturer's name, product name and/or catalog number, and general product category (e.g. "alkyd enamel").
2. MPI product number (e.g. MPI #47).
3. Cross-reference to specified paint system(s) product is to be used in; include description of each system.

B. Samples: Submit three paper "draw down" samples, 8-1/2 by 11 inches in size, illustrating range of colors available for each finishing product specified.
1. Where sheen is specified, submit samples in only that sheen.
2. Paint color submittals will not be considered until color submittals for major materials not to be painted, such as masonry, have been approved.

C. Certification: By manufacturer that paints and finishes comply with VOC limits specified.

D. Maintenance Materials: Furnish the following for Volusia County 's use in maintenance of project.
1. See Section 01 60 00 - Product Requirements, for additional provisions.
2. Extra Paint and Finish Materials: 1 gallon of each color; from the same product run, store where directed.
3. Label each container with color in addition to the manufacturer's label.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum three years documented experience.

B. Applicator Qualifications: Company specializing in performing the type of work specified with minimum three years experience and approved by manufacturer.

1.6 MOCK-UP

A. Provide panel, 6 feet long by 4 feet wide, illustrating paint color, texture, and finish.

B. Provide door and frame assembly illustrating paint color, texture, and finish.

C. Mock-up may remain as part of the work.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.

B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.

C. Paint Materials: Store at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.

1.8 FIELD CONDITIONS

A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.

B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.

C. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

**PART 2 PRODUCTS**

2.1 MANUFACTURERS

A. Provide paints and finishes used in any individual system from the same manufacturer; no exceptions.

B. Paints:
   1. Sherwin-Williams Company (Basis of Design): www.sherwin-williams.com.
   2. or Equal.

2.2 PAINTS AND FINISHES - GENERAL

A. Paints and Finishes: Ready mixed, unless intended to be a field-catalyzed paint.
   1. Provide paints and finishes of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
   2. Supply each paint material in quantity required to complete entire project's work from a single production run.
   3. Do not reduce, thin, or dilute paint or finishes or add materials unless such procedure is specifically described in manufacturer's product instructions.

B. Volatile Organic Compound (VOC) Content:
   1. Provide paints and finishes that comply with the most stringent requirements specified in the following:
      a. 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.
   2. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at project site; or other method acceptable to authorities having jurisdiction.

C. Sheens: Provide the sheens specified; where sheen is not specified, sheen will be selected later by Bentley Architect + Engineers, Inc. from the manufacturer's full line.

D. Colors: As indicated on drawings; refer to Material Finish List.

2.3 PAINT SYSTEMS - INTERIOR

A. Interior Surfaces to be Painted, Unless Otherwise Indicated: Including gypsum board, uncoated steel, shop primed steel, and galvanized steel.
   1. Two top coats and one coat primer.
   2. Top Coat(s): High Performance Architectural Interior Latex; MPI #138, 139, 140, or 141.
   3. Top Coat Sheen:
      a. Eggshell: MPI gloss level 3; use this sheen at all painted wall and ceiling surfaces .

2.4 ACCESSORY MATERIALS

A. Accessory Materials: Provide primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials as required for final completion of painted surfaces.

B. Patching Material: Latex filler.

C. Fastener Head Cover Material: Latex filler.

**PART 3 EXECUTION**

3.1 EXAMINATION

A. Verify that surfaces are ready to receive work as instructed by the product manufacturer.

B. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially effect proper application.

C. Test shop-applied primer for compatibility with subsequent cover materials.

D. 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. Gypsum Wallboard: 12 percent.
   2. Interior Wood: 15 percent, measured in accordance with ASTM D4442.

3.2 PREPARATION

A. Clean surfaces thoroughly and correct defects prior to application.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

C. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces or finishing.

D. Seal surfaces that might cause bleed through or staining of topcoat.

E. Gypsum Board: Fill minor defects with filler compound. Spot prime defects after repair.

F. Ferrous Metal:
   1. Solvent clean according to SSPC-SP 1.
   2. Shop-Primed Surfaces: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces. Re-prime entire shop-primed item.
   3. Remove rust, loose mill scale, and other foreign substances using using methods recommended in writing by paint manufacturer and blast cleaning according to SSPC-SP 6 "Commercial Blast Cleaning". Protect from corrosion until coated.

G. Wood Surfaces to Receive Opaque Finish: Wipe off dust and grit prior to priming. Seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after primer has dried; sand between coats. Back prime concealed surfaces before installation.

3.3 APPLICATION

A. Apply products in accordance with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual".

B. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.

C. Apply each coat to uniform appearance in thicknesses specified by manufacturer.

D. Sand wood and metal surfaces lightly between coats to achieve required finish.

E. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.

F. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.4 CLEANING

A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

**END OF SECTION**