SECTION 00 0110
TABLE OF CONTENTS

RECIPIENTS OF BIDDING DOCUMENTS MUST CONSULT THE TABLE OF CONTENTS TO DETERMINE THE FULL SCOPE OF THE WORK INVOLVED AND TO ENSURE THAT ALL PAGES OF THE PROJECT MANUAL AND DRAWINGS HAVE BEEN INCLUDED. NEITHER THE OWNER NOR THE A/E WILL BE RESPONSIBLE FOR BIDS SUBMITTED THAT ARE BASED ON INCOMPLETE BIDDING DOCUMENTS.

END OF SECTION

SECTION 00 0112

INDEX OF DRAWINGS

ARCHITECTURAL

D2.3 DEMOLITION ROOF PLAN

A2.3 ROOF PLAN AND DETAILS

END OF SECTION

SECTION 06 1000
ROUGH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Miscellaneous wood nailers, furring, and grounds.

1.02 SUBMITTALS

A. Product Data: Provide technical data on wood preservative materials and application instructions.

1.03 DELIVERY, STORAGE, AND HANDLING

A. General: Cover wood products to protect against moisture. Support stacked products to prevent deformation and to allow air circulation.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.
   1. If no species is specified, provide any species graded by the agency specified; if no grading agency is specified, provide lumber graded by any grading agency meeting the specified requirements.
   2. Grading Agency: Any grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee (www.alsc.org) and who provides grading service for the species and grade specified; provide lumber stamped with grade mark unless otherwise indicated.

B. Lumber fabricated from old growth timber is not permitted.

2.02 DIMENSION LUMBER

A. Grading Agency: Southern Pine Inspection Bureau, Inc; SPIB (GR).

B. Sizes: Nominal sizes as indicated on drawings, S4S.

C. Moisture Content: S-dry or MC19.

D. Miscellaneous Framing, Blocking, Nailers, Grounds, and Furring:
   1. Lumber: S4S, No. 2 or Standard Grade.
   2. Boards: Standard or No. 3.

E. Miscellaneous Blocking, Furring, and Nailers:

2.03 ACCESSORIES

A. Fasteners and Anchors:
   1. Metal and Finish: Hot-dipped galvanized steel complying with ASTM A153/A153M for high humidity and preservative-treated wood locations, unfinished steel elsewhere.

PART 3 EXECUTION

3.01 INSTALLATION - GENERAL

A. Select material sizes to minimize waste.

3.02 CLEANING

A. Prevent sawdust and wood shavings from entering the storm drainage system.

END OF SECTION

SECTION 07 0150
PREPARATION FOR RE-ROOFING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Removal of existing roofing system in preparation for new roofing system in designated areas as indicated on drawings.

B. Removal of existing flashing and counterflashings.

1.02 ADMINISTRATIVE REQUIREMENTS

A. Coordinate with affected mechanical and electrical work associated with roof penetrations.

B. Preinstallation Meeting: Convene one week before starting work of this section.

1. Attendees:
   a. Architect.
   b. Contractor.
   c. Owner.
   d. Installer.
   e. Roofing system manufacturer's field representative.
2. Meeting Agenda: Provide agenda to participants prior to meeting in preparation for discussions on the following:
   a. Removal and installation schedule.
   b. Necessary preparatory work.
   c. Protection before, during, and after roofing system installation.
   d. Installation of new roofing system.
   e. Temporary roofing and daily terminations.
   f. Transitions and connection to and with other work.

1.03 SUBMITTALS

A. Product Data: Submit for each type of material.

B. Shop Drawings: Indicate size, configuration, and installation details.

C. Installer's Qualification Statement.

1.04 QUALITY ASSURANCE

A. Materials Removal Company Qualifications: Company specializing in performing work of type specified with at least three years of documented experience.

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

1.05 DELIVERY, STORAGE, AND HANDLING

A. Ensure storage and staging of materials does not exceed static and dynamic load-bearing capacities of roof decking.

1.06 FIELD CONDITIONS

A. Do not remove existing roofing membrane when weather conditions threaten the integrity of building contents or intended continued occupancy.

B. Maintain continuous temporary protection prior to and during installation of new roofing system.

C. Provide notice at least three days before starting activities that will affect normal building operations.

D. Verify that occupants have been evacuated from building areas when work on structurally impaired roof decking is scheduled to begin.

E. Owner will occupy building areas directly below re-roofing area.

1. Maintain access of Owner's personnel to corridors, existing walkways, and adjacent buildings.

PART 2 PRODUCTS

2.01 COMPONENTS

A. Refer to following sections for additional information on components relating to this work:
   1. Remove existing flashing and counterflashings in preparation for replacement of these materials as part of this work, refer to Section 07 6200 for material requirements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that existing roof surface has been cleared of materials being removed from existing roofing system and ready for next phase of work as required.

3.02 PREPARATION

A. Sweep roof surface clean of loose matter.

B. Remove loose refuse and dispose of properly off-site.

3.03 MATERIAL REMOVAL

A. Remove only existing roofing materials that can be replaced with new materials the same day.

B. Remove metal counter flashings.

3.04 INSTALLATION

A. Coordinate scope of this work with requirements for installation of new roofing system as indicated on the drawing

3.05 PROTECTION

A. Provide temporary protective sheeting over uncovered deck surfaces.

B. Turn sheeting up and over parapets and curbing. Retain sheeting in position with weights.

C. Provide for surface drainage from sheeting to existing drainage facilities.

D. Do not permit traffic over unprotected or repaired deck surface.

END OF SECTION

SECTION 07 5400
THERMOPLASTIC MEMBRANE ROOFING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Adhered system with thermoplastic roofing membrane.

B. Insulation, flat and tapered.

C. Flashings.

D. Roofing roofing expansion joints and walkway pads.

1.02 SUBMITTALS

A. Product Data: Provide data indicating membrane materials, flashing materials, insulation, vapor retarder, surfacing, and fasteners.

B. Manufacturer's Installation Instructions: Indicate membrane seaming precautions and perimeter conditions requiring special attention.

C. Installer's Qualification Statement.

D. Warranty Documentation:
   1. Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.
   2. Submit installer's certification that installation complies with warranty conditions for waterproof membrane.

E. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.03 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in performing the work of this section with at least three years of documented experience.
   1. With minimum 5 years documented experience.

1.04 PRE-INSTALLATION MEETING

A. Convene one week before starting work of this section.

B. Review preparation and installation procedures and coordinating and scheduling required with related work.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver products in manufacturer's original containers, dry, undamaged, with seals and labels intact.

B. Store products in weather protected environment, clear of ground and moisture.

C. Ensure storage and staging of materials does not exceed static and dynamic load-bearing capacities of roof decking.

D. Protect foam insulation from direct exposure to sunlight.

1.06 FIELD CONDITIONS

A. Do not apply roofing membrane during unsuitable weather.

B. Do not apply roofing membrane when ambient temperature is below 40 degrees F or above 100 degrees F.

C. Do not apply roofing membrane to damp or frozen deck surface or when precipitation is expected or occurring.

D. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed the same day.

E. Schedule applications so that no partially completed sections of roof are left exposed at end of workday.

1.07 WARRANTY

A. System Warranty: Provide manufacturer's system warranty agreeing to repair or replace roofing that leaks or is damaged due to wind or other natural causes.
   1. Warranty Term: 15 years NDL warranty
   2. For repair and replacement include costs of both material and labor in warranty.

B. Installer's Guarantee: Submit roofing Installer's guarantee, including all components of roofing system for the following guarantee period:
   1. Guarantee Period: Two Years from date of Substantial Completion.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Thermoplastic Polyolefin (TPO) Membrane Materials:
   1. Carlisle Roofing Systems, Inc; Sure-Weld TPO: www.carlisle-syntec.com/#sle.
   2. GAF: www.GAF.com.
   3. John Mansville; : www.jm.com.

B. Insulation:
   1. Carlisle SynTec;
   2. GAF: www.GAF.com.
   3. John Mansville; : www.jm.com

2.02 ROOFING

A. Thermoplastic Membrane Roofing: One ply membrane, fully adhered, over insulation.

B. Roofing Assembly Requirements:
   1. Insulation Thermal Value (R), nominal: existing ; provide insulation of thickness required.

C. Acceptable Insulation Types: Any type that meets requirements and is approved by membrane manufacturer for application.

2.03 ROOFING MEMBRANE AND ASSOCIATED MATERIALS

A. Membrane:
   1. Material: Thermoplastic polyolefin (TPO) complying with ASTM D6878/D6878M.
   2. Reinforcing: Internal fabric.
   3. Thickness: 60 mil
   4. Sheet Width: Factory fabricated into largest sheets possible.
   5. Solar Reflectance: 0.75, minimum, initial, and 0.65, minimum, 3-year, certified by Cool Roof Rating Council.
   6. Thermal Emissivity: 0.80, minimum, initial, and 0.79, minimum, 3-year, certified by Cool Roof Rating Council.
   7. Color: White.

B. Seaming Materials: As recommended by membrane manufacturer.

C. Flexible Flashing Material: Same material as membrane.

2.04 INSULATION

A. Polyisocyanurate Board Insulation:

   EnergyGuard™ Ultra Polyiso Insulation or approved Equal

   Rigid cellular foam, complying with ASTM C1289, Type II, Class 2, glass fiber mat both faces; Grade 2 and with the following characteristics:

1. Compressive Strength: 20 psi.
2. Board Size: 48 by 96 inch.
3. Board Thickness: 2”
4. Tapered Board: Slope as indicated; minimum thickness; fabricate of fewest layers possible.
5. Thermal Resistance: NA
6. Board Edges: square.

2.05 ACCESSORIES

A. Pre-Cut Tapered Insulation:

B. Insulation Fasteners: Appropriate for purpose intended and approved by roofing manufacturer.
   1. Length as required for thickness of insulation material and penetration of deck substrate, with metal washers.
   2. Drill-Tec #15 XHD and Drill-Tec 3” standard steel plate.
   3. Field = 10 fasteners per 4’x8’ board.
   4. Perimeter = 15 fasteners per 4’x8’ board.
   5. Corner = 20 fasteners per 4’x8’ board.

C. Membrane Adhesive: As recommended by membrane manufacturer.

D. Sealants: As recommended by membrane manufacturer.

E. Walkway Pads: Suitable for maintenance traffic, contrasting color or otherwise visually distinctive from roof membrane.
   1. Composition: TPO.
   2. Thickness: 170 mils
   3. Size: As indicated.

2.06 FASTENERS

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces and site conditions are ready to receive work.

B. Verify deck is supported and secure.

C. Verify deck is clean and smooth, flat, free of depressions, waves, or projections, properly sloped and suitable for installation of roof system.

D. Verify deck surfaces are dry and free of snow or ice.

E. Verify that roof openings, curbs, and penetrations through roof are solidly set, and cant strips and nailing strips are in place.

F. Re-roof Preparation (at complete tear off area)
   1. Remove all roofing membrane, surfacing, coverboards, insulation, fasteners, asphalt, pitch, adhesives, etc.
      a. Remove an area no larger than can be re-roofed in one day.
   2. Tear out all base flashings, counterflashings, pitch pans, pipe flashings, vents and like components necessary for application of new membrane.
   3. Remove abandoned equipment curbs, skylights, smoke hatches, and penetrations.
      a. Install decking to match existing as directed by Owner's Representative.
   4. After approved by Owner, only Raise (disconnect by licensed craftsmen, if necessary) the necessary HVAC units and other equipment supported by curbs to conform with the following:
      a. Modify curbs as required to provide a minimum required base flashing height

measured from the surface of the new membrane to the top of the flashing membrane.

b. Nail top of flashing and install new metal counterflashing prior to re-installation of unit.
c. Perimeter nailers must be elevated to match elevation of new roof insulation.

5. Immediately remove all debris from roof surface. Demolished roof system may not be stored on the roof surface.
6. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION - GENERAL

A. Perform work in accordance with manufacturer's instructions, NRCA (RM), and NRCA (WM) applicable requirements.

B. Do not apply roofing membrane during unsuitable weather.

C. Do not apply roofing membrane when ambient temperature is outside the temperature range recommended by manufacturer.

D. Do not apply roofing membrane to damp or frozen deck surface or when precipitation is expected or occurring.

E. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed the same day.

3.03 INSULATION APPLICATION - UNDER MEMBRANE

A. Attachment of Insulation:
1. Mechanically fasten insulation to deck in accordance with roofing manufacturer's instructions.

B. Lay subsequent layers of insulation with joints staggered minimum 6 inch from joints of preceding layer.

C. On metal deck, place boards parallel to flutes with insulation board edges bearing on deck flutes.

D. Lay boards with edges in moderate contact without forcing. Cut insulation to fit neatly to perimeter blocking and around penetrations through roof.

E. At roof drains, use factory-tapered boards to slope down to roof drains over a distance of 18 inches.

F. Do not apply more insulation than can be covered with membrane in same day.

3.04 MEMBRANE APPLICATION

A. Roll out membrane, free from wrinkles or tears. Place sheet into place without stretching.

B. Shingle joints on sloped substrate in direction of drainage.

C. Fully Adhered Application: Apply adhesive to substrate at rate of as required by manufacturer gal/sq ft. Fully embed membrane in adhesive except in areas directly over or within 3 inches of expansion joints. Fully adhere one roll before proceeding to adjacent rolls.

D. Overlap edges and ends and seal seams by contact adhesive, minimum 3 inches. Seal permanently waterproof. Apply uniform bead of sealant to joint edge.

E. At intersections with vertical surfaces:

1. Extend membrane over cant strips and up a minimum of 4 inches onto vertical surfaces.
2. Fully adhere flexible flashing over membrane and up to nailing strips.

F. Around roof penetrations, seal flanges and flashings with flexible flashing.

G. Coordinate installation of roof drains and sumps and related flashings.

3.05 FIELD QUALITY CONTROL

A. Require site attendance of roofing and insulation material manufacturers periodically during installation of the Work.

3.06 CLEANING

A. In areas where finished surfaces are soiled by work of this section, consult manufacturer of surfaces for cleaning advice and conform to their documented instructions.

B. Repair or replace defaced or damaged finishes caused by work of this section.

3.07 PROTECTION

A. Protect installed roofing and flashings from construction operations.

B. Where traffic must continue over finished roof membrane, protect surfaces using durable materials.

END OF SECTION

SECTION 07 6200
SHEET METAL FLASHING AND TRIM

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Fabricated sheet metal items, including flashings, counterflashings.

1.02 SUBMITTALS

A. Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.

1.03 QUALITY ASSURANCE

A. Perform work in accordance with SMACNA (ASMM) and CDA A4050 requirements and standard details, except as otherwise indicated.

B. Fabricator and Installer Qualifications: Company specializing in sheet metal work with 3 years of documented experience.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Stack material to prevent twisting, bending, and abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.

B. Prevent contact with materials that could cause discoloration or staining.

PART 2 PRODUCTS

2.01 SHEET MATERIALS

A. Pre-Finished Aluminum: ASTM B209 (ASTM B209M); 20 gauge, 0.032 inch thick; plain finish shop pre-coated with modified silicone coating.
   1. Fluoropolymer Coating: High Performance Organic Finish, AAMA 2604; multiple coat, thermally cured fluoropolymer finish system.
   2. Color: As selected by Architect from manufacturer's standard colors.

2.02 FABRICATION

A. Form sections true to shape, accurate in size, square, and free from distortion or defects.

B. Form pieces in longest possible lengths.

C. Hem exposed edges on underside 1/2 inch; miter and seam corners.

D. Form material with flat lock seams, except where otherwise indicated; at moving joints, use sealed lapped, bayonet-type or interlocking hooked seams.

E. Fabricate corners from one piece with minimum 18 inch long legs; seam for rigidity, seal with sealant.

F. Fabricate vertical faces with bottom edge formed outward 1/4 inch (6 mm) and hemmed to form drip.

G. Fabricate flashings to allow toe to extend 2 inches over roofing gravel. Return and brake edges.

2.03 ACCESSORIES

A. Fasteners: Galvanized steel, with soft neoprene washers.

B. Primer: Zinc chromate type.

C. Protective Backing Paint: Zinc molybdate alkyd.

D. Concealed Sealants: Non-curing butyl sealant.

E. Exposed Sealants: ASTM C920; elastomeric sealant, with minimum movement capability as recommended by manufacturer for substrates to be sealed; color to match adjacent material.

F. Plastic Cement: ASTM D4586/D4586M, Type I.

G. Reglets: Recessed type, galvanized steel; face and ends covered with plastic tape.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify roof openings, curbs, pipes, sleeves, ducts, and vents through roof are solidly set, reglets in place, and nailing strips located.

B. Verify roofing termination and base flashings are in place, sealed, and secure.

3.02 PREPARATION

A. Install starter and edge strips, and cleats before starting installation.

3.03 INSTALLATION

A. Secure flashings in place using concealed fasteners, and use exposed fasteners only where permitted..

B. Apply plastic cement compound between metal flashings and felt flashings.

C. Fit flashings tight in place; make corners square, surfaces true and straight in planes, and lines accurate to profiles.

D. Seal metal joints watertight.

3.04 FIELD QUALITY CONTROL

A. Inspection will involve surveillance of work during installation to ascertain compliance with specified requirements.

END OF SECTION

SECTION 07 7200
ROOF ACCESSORIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Roof hatches guard rails

B. Non-penetrating pedestals.

C. Fall protection guard rails

1.02 SUBMITTALS

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

B. Shop Drawings: Submit detailed layout developed for this project and provide dimensioned location and number for each type of roof accessory.

1.03 DELIVERY, STORAGE, AND HANDLING

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

B. Store products under cover and elevated above grade.

PART 2 PRODUCTS

2.01 ROOF HATCHES (NOT APPLICABLE)

A. Roof Hatches: Factory-assembled steel frame and cover, complete with operating and release hardware.
   1. Style: Provide flat metal covers unless otherwise indicated.
   2. Mounting Substrate: Provide frames and curbs suitable for mounting on corrugated metal roof deck with insulation.
   3. Size(s): to match existing.

B. Safety Post: LadderUP safety post
   1. Bilco model # LU-1.

2.02 NON-PENETRATING ROOFTOP SUPPORTS/ASSEMBLIES

A. Non-Penetrating Rooftop Support/Assemblies: Manufacturer-engineered and factory-fabricated, with pedestal bases that rest on top of roofing membrane, and not requiring any attachment to roof structure and not penetrating roofing assembly.
   1. Design Loadings and Configurations: As required by applicable codes.
   2. Height: Provide minimum clearance of 6 inches under supported items to top of roofing.
   3. Support Spacing and Base Sizes: As required to distribute load sufficiently to prevent indentation of roofing assembly.
   4. Steel Components: Stainless steel, or carbon steel hot-dip galvanized after fabrication in accordance with ASTM A123/A123M.
   5. Hardware, Bolts, Nuts, and Washers: Stainless steel, or carbon steel hot-dip galvanized after fabrication in accordance with ASTM A153/A153M.

B. Non-Penetrating Pedestals: Steel pedestals with square, round, or rectangular bases.
   1. Bases: High density polypropylene.
   2. Base Sizes: As required to distribute load sufficiently to prevent indentation of roofing assembly.
   3. Steel Components: Stainless steel, or carbon steel hot-dip galvanized after fabrication in accordance with ASTM A123/A123M.

PART 3 EXECUTION

3.01 EXAMINATION

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

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

3.02 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using methods recommended by manufacturer for achieving acceptable results for applicable substrate under project conditions.

3.03 INSTALLATION

A. Install in accordance with manufacturer's instructions, in manner that maintains roofing system weather-tight integrity.

3.04 CLEANING

A. Clean installed work to like-new condition.

3.05 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Date of Substantial Completion.

END OF SECTION

SECTION 07 7300
ROOF EDGE PROTECTION

PART 1 GENERAL

1.01 SUMMARY

Provide and install freestanding Roof Edge Protection System, including pipe railings, uprights, bases, counterweights, fittings and delivery to site.

1.02 REFERENCES

A. American National Standards Institute (ANSI) - A21.I Safety Requirements for Floor and Wall Openings, Railings and Toe Boards.

B. American National Standards Institute (ANSI) - A58.I Minimum Design Loads in Buildings and Other Structures.

C. American National Standards Institute (ANSI) - Al 17.1 Accessible and Usable Buildings and Facilities.

D. American Society of Testing and Materials (ASTM) A47 - Standard Specification for Ferrite Malleable Iron Castings.

E. American Society of Testing and Materials (ASTM) A53 - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.

F. American Society of Testing and Materials (ASTM) A153 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

G. American Society of Testing and Materials (ASTM) A500 - Standard Specification for cold-formed welded and seamless carbon steel structural tubing.

H. Occupational Safety & Health Administration (OSHA): 1910.23 - Guarding Floor and Wall Openings and Holes.

1.03 SUBMITTALS

. Manufacturer's data sheets on each product to be used, including:

1. Preparation instructions and recommendations.
2. Shop Drawings: Indicate profiles, sizes, connections, size and type of fasteners and accessories.
3. Field Measurements: Verify field measurements prior to assembly and/or ordering.
4. Installation Instruction.

B. Shop Drawings: Drawings showing fabrication and installation of handrails and

guardrails including plans, elevations, sections, details of components, anchor details, and attachment to adjoining units of work.

C. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.

1.04 QUALITY ASSURANCE

A. Railings Structural Requirements:
   1. Handrail, wall rail and guardrail assemblies and attachments shall withstand a minimum concentrated load of 200 pounds applied in any direction on the top rail.
   2. Infill area of guardrail system capable of withstanding a horizontal concentrated load of 200 pounds applied to one square foot at any point in the system. Load not to act concurrently with loads on top rail of system in determining stress on guardrail.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Materials to be delivered to the job site in good condition and adequately protected against damage as handrails are a finished product.

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

1.06 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 absolute limits.

B. Field Measurements: Where handrails and railings are indicated to fit to other construction, check actual dimensions of other construction by accurate field measurements before fabrication; show recorded measurements on final shop drawings.
   1. Where field measurements cannot be made without delaying the railing fabrication and delivery, obtain guaranteed dimensions in writing by the Contractor and proceed with fabrication of products to not delay fabrication, delivery and installation.

C. Coordinate fabrication and delivery schedule of handrails with construction progress and sequence to avoid delay of railing installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

Basis of design:

A. Kee Safety, Inc
B. or approval equal

2.02 SYSTEMS

A. Provide pipe or tubing, fittings, and accessories as indicated or required to match design indicated on the Drawings.

1. Fittings: Cast iron.
2. Handrail Tubing, 12 gauge, Size
   a. 1-1/2 inches - 1.90 inches O D.
   b. 1-1/4 inches – 1.660 inches O D.

3. Handrail Pipe, Schedule 40, Size:
   a. 1-1/2 inches - 1.90 inches (48 mm) O D.
   b. 1-1/4 inches – 1.660 inches (38 mm) O D.
4. Infill Panels: As indicated. Refer to Drawings.

B. Roof Edge Protection: Provide freestanding KeeGuard Roof Edge Protection System, including pipe railings, uprights, bases, counterweights and fittings.

1. Freestanding counterweighted guardrail system with 42 inch (1067 mm) minimum height to provide a pedestrian egress barrier on the roof to withstand a minimum load of 200 lb (90719 g) in any direction to the top rail per OSHA Regulation 29 CFR 1910.23.
2. Pipe: Steel, 1-1/2 inches (48 mm) schedule 40, galvanized.
3. Tube: Galvanized tube, 12 gauge, 1-1/2 inches, 1.90 inches (48 mm) OD.
4. Rails and Posts: Galvanized Tube, 12 gauge, 1-1/2 inches 1.90 inches (38 mm) diameter.
5. Counterweight Levers: Galvanized Tube, 12 gauge, 1-1/4 inches 1.660 inches (38 mm) diameter.
6. Mounting Bases: Steel bases are galvanized and are supplied with a rubber pad on underside of the component.
7. Counterweights: Molded recycled PVC with one fixing collar per counterbalance.
8. Fasteners: stainless steel or galvanized.

C. Custom Design: Provide pipe, fittings, and accessories as indicated or required by Drawings to match design indicated.

2.03 MATERIALS

A. Pipe:
   1. Steel Pipe: Steel, 1-1/2 inches (38 mm) schedule 40, galvanized.
   2. Tube: Galvanized tube, 12 gage, 1-1/2 inches, 1.90 inches (48 mm) OD.

B. Fittings, Including Elbows, Crossovers, Wall flanges, Tees, Couplings:
   1. Galvanized Malleable Cast Iron: Kee Klamp structural pipe fittings, ASTM A447 with ASTM A153 galvanizing.

C. Finish: Polyester factory applied spray coating.

D. Fasteners: Type 304 or 305 stainless steel or galvanized.

2.04 FABRICATION

A. Fit and shop assemble components in largest practical sizes for delivery to site.

B. Upright tops shall be plugged with weather and light resistant material.

C. Assemble components with joints tightly fitted and secured. Accurately form

components to suit installation.

PART 3 EXECUTION

3.01 PREPARATION

A. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Fit exposed connections accurately together to form tight joints. For all connections with Kee Klamp fittings, each set screw is to be tightened to 29 foot pounds of torque.

C. Perform cutting, and fitting required for installation of handrails. Set handrails and accurately in location, alignment, and elevation, measured from established lines and levels.

3.03 PROTECTION

A. Protect installed products until completion of project.

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

END OF SECTION

SECTION 09 9000
PAINTING AND COATING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Surface preparation.

B. Field application of paints.

C. See Schedule - Surfaces to be Finished, at end of Section.

1.02 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 5 years experience.

1.03 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.

1.04 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. Do not apply exterior coatings during rain or snow, or when relative humidity is outside the humidity ranges required by the paint product manufacturer.

D. Minimum Application Temperatures for Latex Paints: 45 degrees F for interiors; 50 degrees F for exterior; unless required otherwise by manufacturer's instructions.

1.05 EXTRA MATERIALS

A. Supply 1 gallon of each color; store where directed.

B. Label each container with color in addition to the manufacturer's label.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Provide all paint and coating products used in any individual system from the same manufacturer; no exceptions.

B. Paints:
   1. Behr Process Corporation: www.behr.com/#sle.
   2. Sherwin-Williams Company: www.sherwin-williams.com/#sle.
   3. Farrell Calhoun Paints. www.farrellcalhoun.com

2.02 PAINTS AND COATINGS - GENERAL

A. Paints and Coatings: Ready mixed, unless intended to be a field-catalyzed coating.
   1. Provide paints and coatings 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. Provide materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
3. 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.
4. Supply each coating material in quantity required to complete entire project's work from a single production run.
5. Do not reduce, thin, or dilute coatings or add materials to coatings unless such procedure is specifically described in manufacturer's product instructions.

B. Primers: As follows unless other primer is required or recommended by manufacturer of top coats; where the manufacturer offers options on primers for a particular substrate, use primer categorized as "best" by the manufacturer.

C. Colors: As indicated on drawings
1. In finished areas, finish pipes, ducts, conduit, and equipment the same color as the wall/ceiling they are mounted on/under.

2.03 PAINT SYSTEMS - EXTERIOR

A. Ferrous Metal, Unprimed:
1. 1st Coat: Farrell Calhoun # 1028 Rust Wacker RED (or equal)
2. 2nd Coats: Farrell Calhoun # 800 line Industrial Enamel White (or equal)
3. 3rd Coats: Farrell Calhoun # 800 line Industrial Enamel Grey (or equal)

PART 3 EXECUTION

3.01 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 affect proper application.

3.02 PREPARATION

A. Clean surfaces thoroughly and correct defects prior to coating 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. Surfaces: Correct defects and clean surfaces which affect work of this section. Remove or repair existing coatings that exhibit surface defects.

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. Corroded Steel and Iron Surfaces to be Painted: Prepare using at least SSPC-SP 2 (hand tool cleaning) or SSPC-SP 3 (power tool cleaning) followed by SSPC-SP 1 (solvent cleaning).

G. Metal Doors to be Painted: Prime metal door top and bottom edge surfaces.

3.03 APPLICATION

A. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.

B. Apply products in accordance with manufacturer's instructions.

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 metal surfaces lightly between coats to achieve required finish.

3.04 FIELD QUALITY CONTROL

A. Inspect and test questionable coated areas in accordance with Coating Thickness Gauge.

3.05 CLEANING

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

3.06 PROTECTION

A. Touch-up damaged coatings after Substantial Completion.

END OF SECTION