

STATE OF CONNECTICUT
DEPARTMENT OF ENERGY AND ENVIRONMENTAL PROTECTION
REPAIRS TO THE RETAINING WALLS AND STAIRS
GILLETTE CASTLE STATE PARK
EAST HADDAM, CONNECTICUT
PROJECT # DEPA00013202645

ADDENDUM NUMBER 1

January 31, 2019

1. **CHANGE:** Bid Proposal Form, Page 00020-2(PF)-Section 4.2, **Duration of the project is ninety (90) days.**
2. **ADDITION:** Applicable to references within the plans. **Stainless Steel flashing on top of walls and pilasters shall be Type 304, 30 gauge, with a 2" minimum overlap. Soldered joints shall be used, instead of welded joints.**
3. **REPLACE:** Technical Specifications, Section 055213, Aluminum Handrails and Railings with the attached **Section 055213, Aluminum Handrails.**
4. **CLARIFICATION:** The concrete stem face can be constructed with flat concrete form panels of no more than 2' in width.

END OF ADDENDUM NUMBER 1

William J. Coleman, PE, Project Supervisor
Engineering Unit

January 31, 2019

CONNECTICUT DEPARTMENT OF ENERGY AND ENVIRONMENTAL PROTECTION
RETAINING WALL REPAIRS AT GILLETTE CASTLE SITE NO. 1

SECTION 055213 – ALUMINUM HANDRAILS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Handrails.

1.2 RELATED REQUIREMENTS

- A. Division 1 - General Requirements
B. Section 033000 – Cast-in-place concrete
C. Section 321000 - Paving and Surfacing

1.3 REFERENCE STANDARDS

- A. Where referenced herein, the “Standard Specifications” refer to the Connecticut Department of Transportation Standard Specifications for Roads, Bridges, Facilities and Incidental Construction, Form 817, as revised. Comply with the referenced portions of the Standard Specifications.
- B. Aluminum Association (AA):
1. ABH-21 Aluminum Brazing Handbook
 2. ASD-1 Aluminum Standards and Data
 3. DAF-45 Designation System for Aluminum Finishes
 4. SAA-46 Standards for Anodized Architectural Aluminum
 5. 5. SAS-30 Specifications for Aluminum Structures
- C. American Architectural Manufacturers Association (AAMA):
1. AAMA 605.1 Specification for High Performance Organic Coatings on Architectural Extrusions and Panels.
 2. AAMA 606.1 Voluntary Guide Specifications and Inspection Methods of Integral Color Anodic Finishes for Architectural Aluminum.
 3. AAMA 607.1 Voluntary Guide Specifications and Inspection Methods for Clear Anodic Finishes for Architectural Aluminum.
 4. AAMA 608.1 Voluntary Guide Specifications and Inspection Methods for Electrolytically Deposited Color Anodic Finishes for Architectural Aluminum.
 5. AAMA 2604 Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusion and Panels.
- D. American National Standards Institute (ANSI):
1. ANSI A58.1 Minimum Design Loads in Buildings and Other Structures.
 2. ICC/ANSI A117.1 Accessible and Usable Buildings and Facilities.
- E. American Society for Testing and Materials (ASTM):
1. A1264-1 Safety Requirements for Workplace Floor and Wall Openings, Stairs and Railing Systems
 2. B 209 Specification for Aluminum and Aluminum Alloy Sheet and Plate.
 3. B 210 Specification for Aluminum and Aluminum Alloy Drawn Seamless Tubes.
 4. B 211 Aluminum and Aluminum Alloy Bar, Rod and Wire
 5. B 221 Specification for Aluminum-Alloy Bars, Rods, Wires, Shapes and Tubes

CONNECTICUT DEPARTMENT OF ENERGY AND ENVIRONMENTAL PROTECTION
RETAINING WALL REPAIRS AT GILLETTE CASTLE SITE NO. 1

6. B 241 Specification for Aluminum and Aluminum Alloy Seamless Pipe and Seamless Extruded Tube.
 7. C 595 Specification for Blended Hydraulic Cements.
 8. C 1107 Standard Specifications for Packaged Dry, Hydraulic Cement Grout (non-shrink).
 9. D 1730 Recommended Practices for Preparation of Aluminum and Aluminum Alloy Surfaces for Painting.
 10. E 894 Standard Test Methods for Anchorage of Permanent Metal Railing Systems and Rails for Buildings.
 11. E 935 Standard Test Methods for Performance of Permanent Metal Railing Systems and Rails for Buildings.
 12. E 985 Specification for Permanent Metal Railing Systems and Rails for Buildings.
- F. American Welding Society (AWS):
1. Specifications for Welding Rods and Bare Electrodes.
 2. AWS D1.2 Structural Welding Code – Aluminum.
 3. AWS D1.4 Structural Welding Code – Reinforcing Steel
- G. Americans With Disabilities Act Accessibility Guidelines (ADAAG):
- H. International Code Council (ICC):
1. International Building Code (IBC)
- I. National Association of Architectural Metal Manufacturers (NAAMM) and National Ornamental and Miscellaneous Metals Association (NOMMA):
1. Metal Finishes Manual
- J. National Association of Architectural Metal Manufacturers (NAAMM):
1. Pipe Railing Manual
 2. Metal Stair Manual
- 1.4 SUBMITTALS
- A. Product Data: Submit manufacturer's product lines of handrails assembled from standard components, including, but not limited to, the following:
- a. Grout, anchoring cements and paint products.
 - b. Color chip chart for painted cast aluminum components
- B. Shop Drawings: Submit layout plans, elevations, sections, and details showing the fabrication and installation of handrails. Submittal shall include all, but not limited to, the following: dimensions; splice locations; expansion joint locations; attachments to other work; manufacturer's name; nominal hardness of materials; design loads; and product compliance with referenced specifications. Reproduction or tracings of the Drawings shall not be used for submittal or installation purposes.
- C. Samples:
1. Submit 4 color range samples as selected by the Owner made from specified alloy material for powder coated extruded aluminum components in 4 inch minimum lengths.
- D. Quality Control Submittal:
1. Design Data: Submit handrail structural analysis data signed and sealed by the professional engineer responsible for their preparation.
 2. Certificates: Submit manufacturer's certification that supplied products comply with local regulations controlling the use of volatile organic compounds (VOC's).

CONNECTICUT DEPARTMENT OF ENERGY AND ENVIRONMENTAL PROTECTION
RETAINING WALL REPAIRS AT GILLETTE CASTLE SITE NO. 1

1.5 QUALITY ASSURANCE

- A. Fabricator Qualifications - specializing in performing the Work of this Section shall have a minimum five (5) years documented experience.
- B. Welder Qualifications – qualified in accordance with AWS D1.1 and AWS D1.4 within the previous twelve (12) months.
- C. Installer - fabricator of products.
- D. Regulatory Requirements
 - 1. Components and installation are to be in accordance with state and local code authorities
 - 2. Components and installation are to follow current ADA and ICC/ANSI A117.1 guidelines.
- E. Pre-Installation Meeting
 - 1. Conduct a pre-job conference at the job site prior to commencing Work.
 - 2. Provide seven calendar days advance written notice ensuring the attendance by competent authorized representatives of the fabricator, Owner, Engineer and subcontractors whose work interfaces with the work of this section.
 - 3. Review the specifications to determine any potential problems, changes, scheduling, unique job site conditions, installation requirements and procedures and any other information pertinent to the installation.
 - 4. Record the results of the conference and furnish copies to all participants.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to the job site in good condition and properly protected against damage to finished surfaces.
- B. Storage on site:
 - 1. Store material in a location and in a manner to avoid damage. Stacking shall be done in a way, which will prevent damage.
 - 2. Store material in a clean, dry location away from uncured concrete and masonry. Cover with waterproof paper, tarpaulin, or polyethylene sheeting in a manner that will permit circulation of air inside the covering.
 - 3. Keep handling on site to a minimum. Exercise particular care to avoid damage to finishes of material.

1.7 VERIFICATION OF CONDITIONS

- A. Verify all field dimensions prior to submission of shop drawings, and make adjustments conform to field dimensions, subject to approval of the Engineer.

PART 2 - PRODUCTS

2.1 STRUCTURAL REQUIREMENTS

- A. Railing assembly shall withstand a minimum concentrated load of 200 pounds applied vertically downward or horizontally in any direction, but not simultaneously, at any point on the top rail.
- B. Railing assemblies shall be designed to resist a load of 50 pounds per linear foot applied in any direction at the top and to transfer this load through the supports to the structure.

CONNECTICUT DEPARTMENT OF ENERGY AND ENVIRONMENTAL PROTECTION
RETAINING WALL REPAIRS AT GILLETTE CASTLE SITE NO. 1

2.2 MATERIALS AND FINISHES

- A. General – Provide materials with smooth surfaces. Materials exposed to view, provide without seam marks, roller marks, rolled trade names, or blemishes.
- B. Aluminum:
 - 1. Extruded Pipe - Alloy 6061-T6 conforming to ASTM B221.
 - 2. Extruded Bars, Shapes and Mouldings - Alloy 6063-T6 conforming to ASTM B 221.
 - 3. Castings - Almag 35 conforming to ASTM B 26.
 - 4. Finishes:
 - a. Satin low gloss, “Super Durable” powder coating meeting AAMA 2604.
 - b. Pretreatment shall be full immersion Chromate Conversion coating.
 - c. Color shall be selected from Tiger Drylac, IFS, and or TCI. Final color selection shall be determined by Owner after color sample submittals.

2.3 HANDRAIL

- A. Material and finish shall conform to Article 2.3.B.
- B. Rails and Posts - fabricate rails and posts from aluminum pipe with nominal size of 1¹/₂" (1.900" outside diameter) Schedule 40 (.140" wall).
- C. Connector Sleeves:
 - 1. Internal connector sleeves shall be of extruded aluminum.
 - 2. Set with 3M Scotchweld Epoxy.
- D. Expansion joints - Double-lock Splice locks as manufactured by Wagner Companies or approved equal.
- E. Brackets and saddles - as shown on Drawings.

2.4 FASTENERS

- A. Mechanical fasteners – Stainless steel conforming to ASTM A193, Grade B8, Class 1 or 2 (AISI Type 304).
- B. Cement - Hydraulic, ASTM C 595 and ASTM C 1107, factory prepared with accelerator.

2.5 FABRICATION.

- A. Assemble railings and handrails to the longest possible lengths and continuous over a minimum of two support posts or bracket locations.
- B. Form changes in rail direction by radius elbows, unless otherwise approved by Engineer. Shop bend and field verify.
- C. Provide handrail system free of burrs and sharp edges.
- D. Make exposed joints butt tight and flush.
- E. Close exposed ends of pipe by use of appropriate end cap.
- F. Verify dimensions on site prior to shop fabrication.

CONNECTICUT DEPARTMENT OF ENERGY AND ENVIRONMENTAL PROTECTION
RETAINING WALL REPAIRS AT GILLETTE CASTLE SITE NO. 1

- G. Weld aluminum components in shop in accordance with AWS D1.2. No field welding permitted.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Supply items to be cast in concrete and embedded in masonry.

3.2 METAL INTERACTION

- A. Paint exposed metal surfaces with a heavy coat of proper primer in locations where surfaces contact dissimilar metals.
- B. Paint exposed aluminum surfaces with bitumastic paint in locations where surfaces contact cement or lime mortar.

3.3 INSTALLATION

- A. Install in accordance with shop drawings and manufacturer's instructions at locations indicated on the Drawings.
- B. Erect work square and level, horizontal or parallel to rake of steps or ramp, rigid, and free from distortion or defects detrimental to appearance or performance.
- C. Provide expansion joints as needed to allow for thermal expansion or contraction or maximum of 24 feet. Locate splices in the same vertical plane along the railing, in bays spanning expansion joints and as shown.

3.4 CLEANING

- A. Wash thoroughly using clean water and soap; rinse with clean water after installation is complete.
- B. Do not use acid solution, steel wool or other harsh abrasives.

3.5 REPAIR OF DEFECTIVE WORK

- A. Remove stained or otherwise defective work and replace with material that meets specification requirements.
- B. Repair damaged finish as directed by Engineer
- C. Replace defective or damaged components as directed by Engineer.

3.6 PROTECTION

- A. Be solely responsible for construction methods, means, techniques, and site safety precautions. Conduct construction operations in conformance with all applicable local, state and Federal safety laws, rules, regulations, and codes.

END OF SECTION 055213

