

Elm Street Cemetery Cast Iron Fence and Gate Restoration

Elm Street/Railroad Street
Braintree, MA 02184

PROJECT MANUAL



**McGinley Kalsow
& Associates, Inc.**
ARCHITECTS & PRESERVATION PLANNERS
324 Broadway ~ PO Box 45248
Somerville, MA 02145-2803

Bid Set July 12, 2017

**Elm Street Cemetery
Cast Iron Fence Restoration**

SECTION 01010 - SUMMARY OF WORK

PART 1 - GENERAL

1.01 WORK COVERED BY THE CONTRACT DOCUMENTS

- A. The project includes the historic fence restoration of the cast iron fence and gates at the Elm Street Cemetery.

1.02 EXAMINATION OF SITE AND DOCUMENTS

- A. The Contractor shall visit the site and examine contract documents before submitting a bid. The Contractor shall inspect and be thoroughly familiar with the same and conditions under which work will be carried out.
- B. Neither the Owner nor the Architect shall be responsible for errors, omissions and/or charges for extra work arising from the Contractor's failure to familiarize himself with the existing conditions, the contract documents or work to be done under a separate contract.
- C. By submitting a bid, the bidder agrees and warrants that the bidder had the opportunity to examine the site and the contract documents, that the bidder is familiar with the conditions and requirements of both and where they require, in any part of the work, a given result to be produced, that the contract documents are adequate and that the bidder will produce the required result.

1.03 CONTRACTOR USE OF PREMISES

- A. During the work of construction, the Contractor shall control and limit general access to the Work area so as not to endanger the public or present the risk of damage to the Owner's Property. Security of the site is the responsibility of the Contractor.

1.04 SAFETY AND SECURITY

- A. Maintain security of each specific work site at all times. The localized work site shall be barricaded during work and off-work hours.
- B. Work of this Project shall comply with all Federal, State and local safety regulations concerning project safety. The Contractor shall be solely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the performance of the Contract.
- C. This project is subject to compliance with Public Law 91-596, "Occupational Safety and Health Act of 1970" (OSHA), with respect to all rules and regulations

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pertaining to construction, including Volume 36, numbers 75 and 105, of the Federal Register, as amended, and as published by the U. S. Department of Labor.

1.05 CONTRACT CONDITIONS

- A. This Contract is subject to applicable State and local laws and all amendments thereto. Where any requirements contained herein do not conform to statutes governing the Work of this Contract, the statutes shall govern.
- B. This Project will be constructed for a political subdivision of the Commonwealth of Massachusetts, and is therefore exempt from State Sales and Use Tax. All bids shall be prepared and purchase of materials for the Project made on the basis of such exemption. After execution of the Contract, the Owner will furnish the Contractor with the exemption number to be used.
- C. The provisions of the Federal Occupational Safety and Health Act (OSHA) apply to the execution of the Work of this Contract, in addition to all other laws, ordinances, rules, regulations, and orders of any Federal, State, or local public authority bearing on the performance of the Work.
- D. Each and every provision of law and clause required by law to be inserted in this Contract shall be deemed to be inserted herein and the Contract shall be read and enforced as though it were included herein, and if, through mistake or otherwise, any such provision is not inserted, or is not correctly inserted, then upon application of either part the Contract shall forthwith be physically amended to make such insertion or correction.

END OF SECTION 01010

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SECTION 01025 - UNIT PRICES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. The drawings and general provisions of the Contract, including General and Supplementary Conditions, Division 1 Specification Sections and relevant sections of these Specifications, apply to the work specified in this Section.

1.02 DEFINITION OF UNIT PRICE

- A. Unit prices shall include material, labor, overhead, profit and all other related expenses. Unit measure shall include only work incorporated into the project. All associated work shall be included in unit prices.
- B. Contract Sum shall include the General Contractor's unit price times the stated number of units. Whenever units actually used are more than or less than that stated, the Contract Sum shall be adjusted accordingly by Change Order.

1.If any/all of the unit price work is not undertaken as part of the contract, the Owner shall be entitled to a credit of 90% of the unexpended unit price balance after all unit prices have been totaled together.

- C. Contractor shall not proceed with any unit price work without review and approval of the work by the Architect.
- D. Unit prices are for information purposes, and not made part of the bid.

1.03 UNIT PRICES IN EFFECT

The following items are included in the base bid, and are in addition to work specifically identified on the Drawings:

Item #1: Replace (1) double baluster @ \$_____ per EA = \$_____

Item #2: Replace (1) post cape @ \$_____ per EA = \$_____

Item #3: Replace (1) 1'-0" long section of top rail
with new casting @ \$_____ per EA = \$_____

END OF SECTION 01025

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SECTION 01030 - ALTERNATES

PART 1 - GENERAL

1.1 GENERAL

- A. For each of the listed alternates, the Bidder(s) shall state in their proposals the amount to be added to or deducted from the Contract Sum for the work of each of the Alternates.
- B. The work described under any or all of the listed Alternates may be accepted or rejected by the Owner. The Contract Agreement, at the time of execution, shall list those which are accepted, if any, and the work of the Contract shall thereby be modified to the extent described under the accepted Alternate(s). Also, the Contract Sum for the project shall be altered on the basis of alternate prices given on the successful Bidder's proposal. Rejected Alternate(s), as evidenced by not being listed in the Contract Agreement at the time of execution, shall thereupon be null and void.
- C. The detailed descriptions of Alternates herein and in the Specification trade Section(s) are detailed to assist the Contractor and various trades in understanding the work required thereby, and are intended to set the intent and to list the major work only. Such descriptions are not to be taken as limiting the work required under any of the Alternates, and all work required to carry out the intent of each of the accepted Alternates shall be done without additional cost to that agreed upon as the Alternate price.

1.2 DESCRIPTION OF ALTERNATES

- 1. Alternate #1: Provide and install three coat zinc primer, epoxy mid coat, polyurethane top coat paint system in lei of galvanized coating. Install stainless steel bottom bar, and sub rail in lei of Carbon Steel.

END OF SECTION 01030#

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SECTION 01300 - SUBMITTALS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The drawings and general provisions of the Contract, including General and Supplementary Conditions, Division 1 Specification Sections and relevant sections of these Specifications, apply to the work specified in this Section.

1.2 SUMMARY

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

1.3 PLANNING AND SCHEDULING

- A. The Contractor shall submit to the Owner for its review four (4) copies of a construction schedule indicating his proposed plan to complete the work within the Contract completion time.
- B. The construction schedule shall clearly indicate the Contractor's sequencing of the work, and within each sequence the start and finish dates of critical activities and events shall be indicated. Identify each major area of construction for each major portion of the Work. Indicate where each construction activity with a major area must be sequenced or integrated with other construction activities.
 - 1. The Contractor shall indicate on the construction schedule the specific time periods of work elements.
 - 2. Identify in the schedule the key times when events directly effect the Owner's and occupants' use of the building.
 - 3. The Construction Schedule shall be a horizontal bar chart. Provide separate bars for each trade or operation and identify each bar by specification section number.

Update the construction schedule to reflect actual construction activity and issue the updated schedule at each job meeting. The Owner, Architect and the Contractor will jointly review the progress of the work at scheduled job meetings as specified herein. Should this review, in the opinion of the Owner or Architect, indicate that the work is behind the currently approved schedule, the Contractor shall provide a suitable, detailed explanation to the Owner of the steps proposed in order to conform to the construction schedule and shall submit to the Owner for its review, within seven calendar days of the

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review, a revised construction schedule for completion of the work remaining within the Contract completion time.

1.4 REPORTS

- A. **Daily Construction Reports:** Prepare a daily construction report recording Information concerning events at the Project site:
1. List of subcontractors at Project site.
 2. Count of personnel at the Project site.
 3. High and low temperatures and general weather conditions.
 4. Accidents.
 5. Meetings and significant decisions.
 6. Unusual events (refer to special reports).
 7. Stoppages, delays, shortages, and losses.
 8. Meter readings and similar recordings.
 9. Emergency procedures.
 10. Orders and requests of authorities.
 11. Change Orders received and implemented.
 12. Construction Change Directives received.
- B. **Field Condition Reports:** Immediately upon discovery of a difference between field conditions and Contract Documents, prepare a detailed report. Submit with a request for information. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.
- C. **Special Reports:** Submit special reports directly to the Owner within one day of an occurrence. Distribute copies of report to parties affected by the occurrence. When an event of an unusual and significant nature occurs at the Project site, whether or not related directly to the Work, prepare and submit a special report. List chain of events, persons participating, response by Contractor's personnel, evaluation of results or effects, and similar pertinent information. Advise the Owner in advance when these events are known or predictable.

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1.5 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

- A. The Contractor shall furnish to the Architect shop drawings, product data and/or samples for all work:
1. Where specifically called for in the specifications.
 2. Where shop drawings, product data and/or samples are normally submitted for Architect's approval prior to the actual fabrication or installation of the Work.
 3. Where specifically requested by the Architect.
- B. Submittals shall be clearly identified as to project name, Owner, Architect, Contractor, Subcontractor, Supplier, Manufacturer or Fabricator, and the item's name and location. Shop Drawings shall clearly show all significant details of materials, fabrications, finish, and installation. Product data shall be sufficient to provide full verbal and pictorial description of physical, technical, and performance characteristics, and complete installation instructions. Samples shall be of adequate size to permit proper evaluation and show full range of variations of color, texture, dimensions, and other characteristics that will appear in the finished work. Adequacy of submittals shall be subject to the Architect's approval. Allow sufficient time for processing and review of submittals. No extension of Contract Time will be authorized because of failure to transmit submittals enough in advance of Work to permit processing.
- C. Shop Drawings: The following procedure for submission and approval of shop drawings shall be followed:
1. The Contractor shall receive shop drawings from the various Subcontractors and Suppliers. Contractor shall date-stamp them, make any corrections necessary, highlight any deviations from the Contract Documents, and verify under signature that they have been checked for dimensions, fit, and conformance with Contract Documents. The Contractor shall submit six (4) sets to the Architect.
 2. The Architect will check shop drawings for compliance with the design concept of the project and for general compliance with information given in the Contract Documents only.
 3. The Contractor shall resubmit shop drawings for approval if requested to do so. Upon approval, Contractor shall

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furnish at his own expense all printings of drawings for all trades as required to properly carry out the work.

- D. **Product Data:** The following procedure for submission and approval of descriptive data shall be followed:
1. The Contractor shall receive the descriptive data from the various Subcontractors and Suppliers. The Contractor shall verify under signature on a letter of transmittal that it has been checked for agreement with the Contract requirements.
 2. The Architect will review the descriptive data for general compliance with the information given in the Contract Documents only.
- E. **Samples:** The following procedure for submission and approval of samples shall be followed:
1. The Contractor shall receive samples from the various Subcontractors and Suppliers. The Contractor shall verify under signature on a letter of transmittal that they have been checked for agreement with the Contract requirements. The Contractor shall then forward two samples to the Architect for approval, testing, etc. One sample will be retained by the Architect and one sample retained at the Contractor's site office.
 2. The Architect will review the samples for general appearance and arrangement and for general compliance with the information given in the Contract Documents only. The Architect will indicate which colors and finishes, or other variable factors within the ranges specified, will be required. The Architect will, within a reasonable time after receipt of samples, notify the Contractor in writing of his acceptance or rejection of samples and basis for his decision. Rejected samples shall be replaced with acceptable materials, as approved by the Architect.
- F. It shall be the responsibility of the Contractor to submit shop drawings, product data, and samples in accordance with the above schedules. Failure to do so will not justify a delay in time of completion of the work.
- G. **Emergency Contacts:** The Contractor shall submit to the Owner and Architect a list including the names, addresses and telephone numbers of key members of their organization including Superintendent, Company

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Owner, and personnel at the site to be contacted in the event of emergencies
at the building site which may occur during non-working hours.

END OF SECTION 01300

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SECTION 01500 - CONSTRUCTION FACILITIES & TEMPORARY CONTROLS

PART 1 - GENERAL

1.1 RESPONSIBILITY AND COMPLIANCE

- A. All requirements set forth under this Section are directed to the Contractor except where otherwise noted.
- B. The Contractor shall be responsible for facilities as specified herein and as required for proper and expeditious prosecution of the work.
- C. The requirements of Section 01500 are in addition to, not in lieu of other protection and temporary controls contained elsewhere in these specifications.

1.2 SECURITY AND PROTECTION

- A. The site will be open to the public during this Contract.
- B. Provide and maintain all security precautions and proper protective measures as may be required to adequately protect the site, adjacent properties, and Owner's personnel, the public, and other interests of the Owner from hazards resulting from or related to the work performed hereunder.
- C. Repair any damage to the building or property which takes place during the contract period to the satisfaction of the Owner and Architect.
- D. Construct safety barricades and protective facilities in accordance with local and State regulations. Furnish and install all signs, lights, reflectors, and all such protection facilities as may be required.
- E. Keep all roads and walks clear of debris, materials and construction equipment during building operations. Repair streets, drives, curbs, sidewalks, fences, poles and the like where disturbed during the construction operations, and leave them in as good condition after completion of the Work as before operations started.
- F. Protect all planting, landscaping, trees and site improvements to remain or to be relocated.
- G. Remove all snow and ice which may impede the work, damage the finishes or materials or be detrimental to workmen.

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- H. Contractor shall be responsible for all glass breakage
- I. Maintain a weathertight building at all times.

1.3 ACCIDENT PREVENTION

- A. Comply with all Federal, State and municipal recommendations and requirements for safety, and accident prevention, and those of the Associated General Contractors of America, and the American Standards Association Standard A10.2. Ensure that the Field Superintendent conducts regular, frequent inspections of the site for compliance with safety regulations.
- B. Neither the Owner nor the Architect shall be responsible for providing a safe working place for the Contractor, Subcontractors, or their employees, or any individual responsible to them for the work.

1.4 TEMPORARY ELECTRIC LIGHT AND POWER

- A. The General Contractor shall furnish and install all work required to provide adequate light and power during construction. General Contractor shall furnish all temporary wiring, fixtures, and extension, and shall remove them upon completion. The Owner shall pay electric utility costs.

1.5 PREVENTION OF FIRE

- A. Before beginning any work on the site, the Contractor shall confer with the Owner's Project Representative and local fire department to outline the precautions which the Contractor proposes to take against fire, including his methods of ensuring that the minimum fire prevention requirements listed herein will be complied with at all times.
- B. The Contractor shall take all necessary precautions for the prevention of fire during construction. The Contractor shall be responsible that the area within contract limits is kept orderly and clean and that combustible rubbish is promptly removed from the site. The Contractor shall comply with all official recommendations of the local fire department.
- C. The Contractor shall provide and maintain in good working order under all conditions, suitable and adequate fire protection equipment and services.
- D. Strict safety precautions shall be observed when burning with a torch or using other open flames. The Contractor shall provide adequate type and number of portable fire extinguishers so that wherever and whenever a torch

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or open flame is used a fire watch armed with an appropriate fire extinguisher shall be used in accordance with all local authorities.

1.6 TEMPORARY HOISTING EQUIPMENT AND MACHINERY

- A. Each Sub-Contractor or trade shall furnish, install, operate, and maintain in safe condition all hoisting equipment and machinery required to properly carry out and complete the Work.
- B. All hoisting equipment and machinery, and operation shall comply in all respects to all applicable Federal (including OSHA), State and local laws, rules, regulations, codes and ordinances.

1.7 TEMPORARY STAGING AND SCAFFOLDING

- A. The Contractor shall furnish, erect, and maintain in safe condition all exterior staging and scaffolding for his own use as required to properly carry out and complete the Work and for the use of all trades for execution of work over eight feet above ground level. The Contractor shall provide working platforms at the height required by each Sub-Contractor or trade. Relocation of planking as required to access work shall be done by the Sub-Contractor who requires the relocation.
- B. Staging and scaffolding shall comply in all respects to all applicable Federal (including OSHA), State and local laws, rules, regulations, codes, ordinances and shall be designed to withstand local wind loading.

1.8 TEMPORARY CONTROLS

- A. Dust, Noise and Pollution Control: Protect the public from dust, noise and pollution. All work shall comply with applicable Federal, State and local codes.
- B. Debris Collection and Removal: The Contractor shall provide a dumpster on site throughout construction for use by all Sub-Contractors and trades. Prevent the accumulation of rubbish or debris at the site. Schedule collection and legal off-site disposal of all dumpsters in order to keep the site clean. Prevent dumpsters from damaging paved areas. No dumpsters shall be placed on non-paved areas.

1.9 OVERLOADING

- A. Do not permit any section of the building, staging or scaffolding to be loaded beyond designed live loads.

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END OF SECTION 01500

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SECTION 01520 - STAGING, LIFTS & ACCESS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

The general provisions of the Contract, including General and Supplementary Conditions, and all Division 1 sections of the Specifications apply to the work specified in this section.

1.2 SCOPE

- A. All staging, stairs, hoisting, rigging, lifts and access required to complete the work shall be the responsibility of the Contractor.
- B. The Contractor is responsible for obtaining and paying for permits, erecting and maintaining, in safe condition, all scaffolding, stairs and hoisting, and associated equipment required on the job. All work shall comply with OSHA requirements and the requirements of all applicable state and local laws, codes, regulations and ordinances. Specifically, the Contractor must designate a safety supervisor who is familiar with OSHA Publications 2202, 3077, and 3072, and those that deal with construction industry safety standards, personal protective equipment, and sling safety and labor. No swing staging shall be permitted without specific written approval of the Owner.
- C. The Contractor shall control access to the work area and prevent unauthorized access to the work area and any area where there is danger from falling objects. The Contractor shall control access to the fenced side yards and enclose the work area with an four (4) foot (min.) height snow fence as required to protect the public. The enclosed area shall be kept locked at all times except when workmen are at the site and have direct control over the construction area.
- D. Contractor to allow access by Owner and Architect at all times.
- E. The Contractor shall submit a written safety plan to the Owner with detail for full protection along with a list of onsite competent persons.

END OF SECTION 01520

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SECTION 01700 - CONTRACT CLOSEOUT

PART 1 - GENERAL

1.1 SUMMARY

- A. The following are prerequisites to issues of Certificate of substantial completion. Provide the following:
1. Punch list.
 2. Supporting documentation.
 3. Certifications.
 4. Warranties
- B. Provide the following requisites to final acceptance:
1. Final payment request with supporting affidavits.
 2. Completed punch list.
 3. Consent of Surety for Final Payment
 4. Release of Liens
 5. AIA forms 706, 706G, 707
 6. Certified payrolls
 7. All warranty and close out documents
 8. MBE/WBE where required
- C. Provide the following close out procedures:
1. Final cleaning and touch-up.
 2. Removal of temporary facilities, including all restoration and repair work required.

PART 2 - PRODUCTS. (Not used)

PART 3 - EXECUTION (Not used)

END OF SECTION 01700

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SECTION 02050 – SELECTIVE DISMANTLING AND DEMOLITION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The general provisions of the Contract, including General and Supplementary Conditions, and relevant sections of these Specifications, apply to the work specified in this Section.
 - 1. Section 05500 – Misc Metals

1.2 INCLUDED IN THIS SECTION

- A. Dismantling and salvaging for re-use all cast iron fence and gate components.

1.3 REFERENCES

- A. Comply with Massachusetts Department of Public Works (MDPW) Standard Specifications for Bridges, Demolition Requirements.
- B. Comply with all applicable requirements of other sections.

1.4 SUBMITTALS

- A. Submit certificates attesting to legal disposal of refuse materials if requested by the engineer.

1.5 PROTECTION

- A. Provide for the uninterrupted safety of workers and adjacent structures to remain as well as the general public during all phases of the work. Provide warning signs, and barricades as required to maintain a separated, safe, secure site.
- B. Protect all elements that are to remain and all historic elements to be retained and/or re-set. Do not dismantle anything other than what is specifically indicated on the contract documents unless specifically requested to do so in writing by the Engineer.

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PART 2 - PRODUCTS AND MATERIALS

2.1 PRODUCTS AND MATERIALS:

- A. Provide products and materials which are incidental to the dismantling and demolition work, disposing of these or salvaging them for re-use as best suits the project conditions.

PART 3 - EXECUTION

3.1 SITE REVIEW:

- A. Perform full review of site to verify extent of dismantling and to plan for coordination with other trades.

3.2 OPERATIONS

- A. Carefully study each item to be dismantled or demolished and determine the safest, least disturbing and potentially damaging method of disassembly.
- B. Where items are to be reassembled, number the items, photograph them and make a sketch of assembled items for re-use during re-assembly. Number each component with an appropriate non-permanent method of marking, and note the points of contact or intersection and their orientation. Take photographs of all elements to be worked on before and after the work.
- C. Notify the Engineer immediately if any damage has occurred to any of the dismantled items and propose appropriate methods of repair.

END OF SECTION 02050

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SECTION 05500 - MISCELLANEOUS METALS

PART 1 GENERAL

1.01 RELATED DOCUMENTS

- A. The general provisions of the Contract, including General and Supplementary Conditions, and relevant sections of these Specifications, apply to the work specified in this Section.
 - 1. Section 02050 – Selective Dismantling and Demolition
 - 2. Section 09900 - Painting

1.02 SCOPE OF WORK

- A. Provide and install shop restoration of fencing, and gates.
- B. Provide replacement for all missing and damaged cast iron elements as identified on the drawings and unit prices
- C. Provide all stainless steel connections, fabrications, nuts, bolts, threaded rod and lugs.
- D. Coordinate with painting and material prep to de-lead all existing fencing and gate components to be reused prior to the restoration of the fence.

1.02 QUALIFICATIONS

- A. All cast iron work shall be performed by a “specialist” or “specialty contractor as defined herein, and who can demonstrate previous trade restoration experience on buildings or structures that are listed on the National Register of Historic Places (either individually or as part of a district) or are designated as National Historic Landmarks.

Further, this “Specialist” or “Specialty Contractor” shall demonstrate that they have done substantial cast iron restoration, repair on “monumental” buildings or “site work projects”. “Monumental” buildings would include Museums, Libraries, Courthouses, Town and City Halls, and historic office buildings; site work projects include cemeteries and parks. Substantial shall be minimum of 3 projects with a value exceeding \$100,000 of historic cast iron restoration work.

1.03 SUBMITTALS

- A. Shop Drawings: Provide large scale shop drawings for fabrication, installation and erection of all parts of the work. Provide plans, elevations, and details of anchorages, connections and accessory items. Provide installation templates for work installed by others.
- B. Field Measurements: Take accurate field measurements before preparation of shop drawings and fabrication. Do not delay job progress; allow for field cutting and fitting

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where taking field measurements before fabrication is not possible. Do not field cut or fit items that have been hot-dip galvanized after fabrication.

1.04 REFERENCE STANDARDS

A. Comply with the following standard material specifications:

AISC - Code of Standard Practice - Manual of Steel Construction - Allowable Stress Design (ASD).

ASTM A123 - Zinc (Hot Dipped Galvanized) Coatings on Iron and Steel Products.

ASTM A563 - Carbon and Alloy Steel Nuts.

ASTM A588 – High Strength Low Alloy Structural Steel (Corrosion Resistant)

ASTM A992- Structural Steel

ASTM A276, Type 304 - Threaded Round Stainless Steel Bar Stock.

ASTM A240, Type 304 – Stainless Steel Plate Stock.

AWS A2.4 - Symbols for Welding, Brazing, and Nondestructive Examination.

AWS D1.1 - Structural Welding Code.

1.05 QUALITY ASSURANCE

A. Shop-fabricate work to the greatest extent possible. Clearly label pieces in shop to facilitate field assembly.

B. Perform welding in compliance with American Welding Society Code.

C. Perform galvanizing in accordance with the following:

ASTM A123 Standard Specification for Zinc (Hot Dip Galvanized)
Coatings on Iron and Steel Products

ASTM A143 Safeguarding Against Embrittlement

ASTM A153 Standard Specification for Zinc (Hot Dip Galvanized) On
Iron and Steel Hardware

ASTM A384 Safeguarding Against Warpage

ASTM A385 Providing High Quality Zinc Coatings

ASTM A780 Repair of Hot Dip Galvanizing

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- D. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for application of finishes.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Store work off of the ground and under cover. Protect from damage. Protect and maintain shop applied coatings. Sequence deliveries to avoid delays, but minimize on-site storage.

1.07 PROJECT CONDITIONS

- A. Do not permit overloading of any miscellaneous metal system.

PART 2 PRODUCTS

2.01 MATERIALS AND PRODUCTS

- A. Steel Shapes: ASTM A36
- B. Steel Tubing: ASTM A500 or A501, hot or cold rolled.
- C. Steel Sheet: ASTM A366, A570 or A611, of grade required for design loading.
- D. Steel Pipe: ASTM A53, black schedule 40, unless indicated otherwise. Type and grade as required for design loading.
- E. Grout: Pre-mixed, non-staining, non-corrosive, non-shrink, non-metallic complying with CE CRD-C588, type D.
- F. Bolts and Fasteners: ASTM A307 and other types as appropriate and approved by the Architect.
- G. New Castings:
New cast iron shall be ductile iron and shall meet requirements of ASTM A536. The castings shall be free of all typical foundry defects, such as warpage, cold shuts, porosity, and all fins at sand joints are to be removed and ground flush to match adjacent surfaces.
- H. Welding, Brazing, Electrodes and Filler Metal: Comply with AWS Code.

PART 3 - EXECUTION

3.1 DISMANTLING

- A. Dismantling of the railing system shall be performed by a the same contractor that is performing the restoration. Dismantling shall follow the reverse order of construction. Each piece shall be numbered and keyed to inventory drawings and labeled as, "to be refurbished", "to be repaired", or "to be replicated." When work must be carried out in

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cold weather, care shall be taken to avoid fracturing the iron elements by uneven heating of the members. All elements shall be labeled to their exact location, and shall be reassembled in the same location from where they were dismantled.

3.2 FABRICATION

- A. General Fabrication: Fabricate work to be truly straight, plumb, level and square and to sizes, shapes, and profiles indicated on approved shop drawings. Ease exposed edges. Cut, reinforce, drill, and tap metalwork as necessary for proper assembly and use.
1. Fabricate all miscellaneous metal supports, brackets, braces and the like required to fully complete the work of this project.
 2. Coordinate miscellaneous metal requirements with other specification sections to ensure proper interface of various parts of the work.
 3. Mill joints to a tight, hairline fit. Cope or miter corner joints. Form joints exposed to weather to exclude water penetration.
 4. Remove mill scale, dirt, grease and other foreign matter prior to welding. Protect adjacent surfaces from damage due to weld sparks, spatter or tramp metal.
 5. Comply with AWS for recommended practices in shop welding and brazing. Clamp members and alternate welds to prevent warping or misalignment. Provide welds and brazes behind finished surfaces without distortion or discoloration or exposed side. Fully weld continuously and ground flush and smooth connections in a uniform manner.
 6. Use mechanical connections whenever possible. Match all existing connections. The foundry pattern-maker shall look at the entire piece (i.e. a railing/balustrade) before attempting to replicate any missing portions of the Ornamental Pedestrian Rail and adhere to the following:
 7. Use a two-part mold for a solid casting with relief on both sides, or an open top mold for casting; in this type of casting, the parts are bolted, brazed or welded together; "Green sand" shall be used for all new castings.
 8. Form ornamental metal work to the required shapes and sizes, with true curves, lines and angles. Provide necessary rebates, lugs and brackets for assembly of units. Use concealed fasteners wherever possible.
 9. Design components to allow for expansion and contraction for a minimum ambient temperature range of 100 F (37.8 C) without causing buckling, excessive opening of joint or over stressing of welds and fasteners.

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10. Comply with AWS D1.5 for recommended practices in shop welding. Provide welds behind finished surfaces without distortion or discoloration of the exposed side. Clean exposed welded joints of all welding flux, and dress on all exposed and contact surfaces.
 11. Mill joints to a tight, hairline fit. Cope or miter corner joints. Form joints exposed to weather to exclude water penetration.
 12. Provide castings that are sound and free of warp or defects which impair strength and appearance. Mill joints to a close fit and finish exposed surfaces to smooth, sharp, well-defined lines and arises.
 13. Comply with NAAMM "Metal Finishes Manual" for finish designations and application recommendations.
- B. Work Exposed to View: Take special care in choosing materials that are smooth and free of blemishes such as pits, roller marks, trade names, scale and roughness. Fabricate work with uniform, hairline tight joints. Form welded joints and seams continuously and grind flush and smooth to be invisible after painting. For exposed fasteners, use hex head bolts or Phillips head machine screws.
- C. Galvanizing: Hot-dip galvanize all miscellaneous metalwork in strict compliance with ASTM A123, ASTM A153, or ASTM A386. Provide at least 1.5 oz/ft² zinc coating. Galvanize after fabrication is completed.
- D. Rough Hardware: Provide standard and custom fabricated bolts, anchors, hangers, dowels and other miscellaneous metal items as needed to properly complete the work of the project.

3.3 TOLERANCES

- A. The following installed tolerances are allowable variations from locations and dimensions indicated by the Contract Document and shall not be added to allowable tolerances indicated for other work.
1. Allowable Variation from True Plumb, Level and Line: $\pm 1/8$ " in 20'-0."

3.4 REPAIRING, CLEANING AND PROTECTION

- A. Touch up damaged coatings and finishes to eliminate evidence of repair.
- B. Repair minor damage to eliminate all evidence of repair. Remove and replace work that cannot be satisfactorily repaired.

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END OF SECTION

SECTION 09900 - PAINTING

PART I GENERAL

1.01 RELATED DOCUMENTS

- A. The general provisions of the Contract, including General and Supplementary Conditions, and relevant sections of these Specifications, apply to the work specified in this Section.
 - 1. Section 05500 – Misc. Metals
 - 2. Section 09900 - Painting

1.01 GENERAL REQUIREMENTS

- A. The General Conditions and Division 1, General Requirements, are a part of this Division.
- B. Review all other Contract Documents for requirements and/or conditions affecting or relating to work described in this Section.

1.02 SCOPE

- A. Provide all labor, materials, equipment, supervision and related services and items necessary to perform all PAINTING work.
- B. Work Included:
 - 1. Prep, Prime and Paint all fencing, and gates.
 - 2. Shop sand blast and existing elements to be restored
 - 3. Alternate #1: Provide zinc, epoxy, urethane paint system

1.03 SUBMITTALS

- A. Submit manufacturer's specifications, including paint label and analysis for each material specified and/or used.

1.04 DELIVERY AND STORAGE

- A. Deliver all materials to the job site in original, new and unopened packages and containers bearing manufacturers name and label.

1.05 JOB CONDITIONS

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- A. Do not apply paint materials when the temperature of surfaces to be painted and the surrounding air temperatures are below 50 degrees F, unless otherwise permitted by the paint manufacturers printed instructions.
- B. Do not apply paint materials in snow, rain, fog, or mist, or when the relative humidity exceeds 85%, or to damp or wet surfaces.

1.06 SAMPLES

- A. Provide (3) 6" long samples of each material finish on the material each finish will be applied.

PART II - PRODUCTS

2.01 COLORS AND FINISHES

- A. Architect shall select paint colors. Submit samples, as specified herein, before proceeding with the work.

2.02 MATERIAL QUALITY

- A. Provide the best quality of the various types of coatings as regularly manufactured by approved paint materials manufacturers. Material not displaying the manufacturer's identifications as a standard, best-grade product will not be acceptable.
- B. Provide undercoat paints that are compatible with the finish coats. Use only thinners approved by the paint manufacturer and use only within recommended limits.

2.03 MATERIALS

- A. The products listed are manufactured by Sherwin Williams. Equivalent products by other manufacturers may be submitted for review and approval by Owner and Architect.
- B. Base bid Paint System: Color Galvanized finish.
 - a. Hot-dip galvanize all metal in strict compliance with ASTM A123, ASTM A153, or ASTM A386. Provide at least 1.5 oz/ft² zinc coating.
 - b. Touch Up: Touch up damaged or abraded galvanized surfaces with ZRC Cold Galvanizing Compound, as manufactured by ZRC Chemical Products Company.

c. Shop applied color system:

The fully fabricated steel railing assemblies shall be galvanized, prime coated and painted and warranted for twenty (20) years. The paint color shall be formulated to match other shop and field painting. Acceptable systems are:

1. ColorGalv®, The Duncan Group, 69 Norman Street, Everett, MA 02149, 800.638.1011
2. ColorZinc®, Voigt & Schweitzer, Inc., 585 John Hancock Rd, Taunton, MA 02780, 508.828.9499
3. ColorCoat®, Bay State Galvanizing Co. Inc., 128-132 Spring Street, Everett, MA 02149

C. Alternate #1 Paint System

- a. Primer 1st Coat: Zinc rich primer by International Coatings Ltd.
- b. Primer 2nd Coat: Intertuf (modified epoxy, high build, high solids) primer by International Coatings Ltd.
- c. Topcoat: Interthane 990HS (polyurethane) by International Coatings Ltd.

PART III - EXECUTION

3.01 INSPECTION

- A. The Contractor must examine the areas and conditions under which painting work is to be applied. Notify in writing of conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the Contractor.
- B. Starting of painting work will be construed as the Contractor's acceptance of the surfaces and conditions.
- C. Do not paint over dirt, rust, scale, grease, moisture scuffed surfaces, or conditions otherwise detrimental to the formation of a durable paint film.

3.02 SURFACE PREPARATION

- A. General: Perform preparation and cleaning procedures in strict accordance with the paint manufacturers instructions and as herein specified, for each particular substrate condition.

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1. Preparation for Shop Priming: Prepare uncoated ferrous-metal surfaces to comply with minimum requirements indicated below and SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning" for surface preparation specifications and environmental exposure conditions of installed metal fabrications:
 - i. Remove all loose scale by blasting in accordance with SSPC-SP6. Perform blasting with an air compressor having a minimum capacity of 200 C.F.M. and an air dryer with a minimum capacity of 250 C.F.M.. Use cast steel grit blast media G25, G40, or G50 in accordance with SAE J1993.
 - ii. Apply coating system within four hours of blasting, in a suitably designed spray booth capable of controlling environmental conditions. Do not apply paint when the air, steel or paint materials are below 50 degrees F. or the humidity is above 80 percent.
 1. Do not apply paint when the relative humidity exceeds 80 percent or when the temperature is less than 5 degrees above the dew point. The temperature of the material to be coated must be within 5 degrees of the ambient temperature with minimum material temperature to be above 50 degrees. Monitor and record temperature and relative humidity on a daily basis during each application.
 2. Galvanizing: Hot-dip galvanize all exterior miscellaneous metalwork in strict compliance with ASTM A123, ASTM A153, or ASTM A386. Provide at least 1.5 oz/ft² zinc coating. Galvanize after fabrication is completed.
- b. Shop Priming (Alternate #1): Shop apply epoxy primer, *within four hours of blasting*, to uncoated surfaces of metal at 4.0 to 6.0 mils DFT. Comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.
 - i. Prime surfaces prior to application of finish coat. Surfaces to be painted shall be clean and free of oil and dirt. Fill cracks and crevices at scrolls, circles, and at sandwiched components, with Dymonic polyurethane caulking after priming has cured and prior to application of the finish paint coat.
 - ii. Stripe paint corners, crevices, bolts, welds, and sharp edges.
- c. Finish Coat: Shop apply one finish coat of polyurethane applied at 2.0 to 3.0 mils DFT.
 - i. Color: Black, high gloss.

- d. Provide finished product free of runs, sags, pinholes and holidays. Allow paint to fully cure before installation.

3.03 MATERIALS PREPARATION

- A. Mix and prepare painting materials in accordance with manufacturers directions.
- B. Store materials not in actual use in tightly covered containers. Maintain containers used in storage, mixing and application of paint in a clean condition free of foreign materials and residue.
- C. Stir materials before application to produce a mixture of uniform density, and stir as required during the application of the materials. Do not stir surface film into the material. Remove the film and if necessary, strain the material before using.

3.04 APPLICATION

- A. Apply paint materials in accordance with the manufacturers directions. Use applicators and techniques best suited for the type of material being applied.
- B. Apply paint materials so as to completely cover all surfaces with an opaque, smooth surface of uniform finish, color, appearance and coverage. Cloudiness, spotting, laps, refinish, or repaint work not in compliance with specified requirements.
- C. Apply additional coats when undercoats, stains or other conditions show through the final coat of paint, until the paint film is of uniform finish, color and appearance.
- D. Prime Coats: Apply a prime coat to those areas which are badly worn or where there is exposed bare substrate.
- E. Completed Work: Match approved samples for color, texture and coverage. Remove, refinish or paint work not in compliance with specified requirements.

3.05 CLEAN-UP PROTECTION

- A. During the progress of the work, remove from the project daily all discarded paint materials, rubbish, cans and rags.
- B. Protect all areas of the building and site, whether to be painted or not, against damage by painting and finishing work. Correct any damages by cleaning, repairing or replacing and repainting, as directed by the Architect.
- C. Provide "Wet Paint" signs as required to protect newly painted finishes

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- D. Upon completion of painting work, clean all paint spattered surfaces. Remove spattered paint by proper methods of washing and scraping, using care not to scratch or otherwise damage finished surfaces.

END OF SECTION