APPENDIX A

TECHNICAL SPECIFICATIONS &
DRAWINGS

for

Community College of Philadelphia

Philadelphia, PA

BY: ***CARL WALKER, INC.***

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CARL WALKER, INC. **PROJECT NO. R1-2013-667**

Community College of Philadelphia RFP #

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DIVISION 16 ELECTRICAL

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SECTION 00005 - PROJECT DESCRIPTION

The Community College of Philadelphia Parking Garage 2013 Repairs scope of work will be in general accordance with the following, but not limited to:

1. Cast in place topping slab repairs throughout the garage.
2. Concrete repairs to various structural components (beams, columns, spandrel panel) throughout the garage.
3. Repair steel connections between precast elements.
4. Remove and replace construction and control joint sealants on top level to include tee to tee control joints, cove joints, and wall panel sealants.
5. Rout and seal random slab cracks on top level.
6. Apply concrete sealer/migrating corrosion inhibitor to the roof level and exposed portion of the fourth level.
7. Restripe the roof level and exposed portion of fourth level (same limits as migrating corrosion inhibitor).
8. Remove and replace 3 stair tower doors, frames, and hardware on top level of garage.
9. Repair approximately 12 feet of damaged expansion joint gland and related nosing spalls on north bay of top level.

END OF SECTION

SECTION 01020 - ALLOWANCES

PART 1 - GENERAL

1.1 Description

A. The conditions of the Contract for the General Requirements of Division I are hereby made a part of this Section.

B. This Section specifies procedures for allowances which shall be included in the Contract Price Base Bid per the Contract Documents. Allowances have been established to defer to a later date the determination of the actual cost for work which the exact quantity cannot be determined at the time of bidding and to defer selection of actual materials and equipment.

C. The Contractor shall advise the Engineer of the date when the final selection and purchase of each product or system included as an allowance must be completed in order not to delay the project of performance of the work.

D. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated with related work.

E. The following descriptions of the allowances describe the extent of the work in general. Detailed requirements may be specified in the various sections of the Specifications.

1. Allowance No. 1: Include a lump sum of $5,000 for the replacement of corroded/deteriorated conduit embedded in the cast-in-place concrete topping slab. This allowance does not cover damage to embedded conduit caused by demolition activities.

PART 2 - PRODUCTS

2.1 Not Used.

PART 3 - EXECUTION

3.1 Not Used.

END OF SECTION

SECTION 01300 - SUBMITTALS

PART 1 - GENERAL

1.1 Related Documents

A. The General Conditions of the Contract for Construction and the General Requirements of Division 1 of the Specifications apply to the Work of this Section.

1.2 Work Included

A. This Section specifies procedural requirements for submittals for review and approval including schedules, products, materials, samples, shop drawings, and other work-related submittals.

B. Submittals required for informational purposes, record and project closeout (normally two copies) are specified elsewhere and are not a part of this Section.

C. Submittals not requested from the Contractor will be returned stamped “No Architect/ Engineer’s Action Required.”

1.3 Engineer Responsibilities

A. The Engineer shall review and approve Contractor submittals such as schedules, products, materials, samples, and shop drawings for the limited purpose of conformance with the design concept and the information expressed in the Contract Documents.

B. The Engineer shall not be responsible for any deviations from the Contract Documents not brought to the attention of the Engineer in writing by the Contractor.

C. The Engineer shall not be required to review partial submittals or those for which submissions or correlated items have not been received. However, review of a specific item shall not indicate that the Engineer has reviewed the entire assembly of which the item is a component.

D. The "actions taken" appearing on the Engineer's Approval Stamp shall be defined as follows:

1. "Approved" – Fabrication and/or installation may be undertaken. Approval does not authorize changes to the Contract Sum or Contract Time unless stated in separate letter or Change Order.

2. "Furnish as Corrected" – Fabrication and/or installation may be undertaken. Exceptions as noted are to be incorporated. Approval does not authorize changes to the Contract Sum or Contract Time unless stated in separate letter or Change Order.
3. "Revise and Resubmit" – Fabrication and/or installation MAY NOT be undertaken until exceptions as noted are incorporated and resubmitted for approval. Revision does not authorize changes to the Contract Sum or Contract Time.
4. "Rejected" – Fabrication and/or installation MAY NOT be undertaken. Submittal is too incomplete or does not meet Contract Documents. Resubmit for approval. Rejection does not authorize changes to the Contract Sum or Contract Time.
5. “No Architect/Engineer’s Action Required” – Submittal not requested from the Contractor and was not reviewed.

1.4 Contractor Responsibilities

A. The submittals are not to be considered a part of the Contract Documents.

B. Submittals shall demonstrate that the Contractor understands and has interpreted the intent of the design as detailed and specified in the Contract Documents. The Contractor shall check and approve submittals for accuracy or completeness of details, such as quantities, dimensions, weights or gauges, fabrication processes, construction means or methods, coordination of the work with other trades, construction safety precautions and verification of field dimensions or conditions. The Contractor's responsibility for errors and omissions in submittals is not relieved by Engineer's review of submittals.

C. All submittals to the Engineer shall be routed through the Contractor and bear the Contractor's Approval Stamp certifying they have been checked. All submittals to the Engineer that are without this stamp of approval or that contain obvious errors or have not been checked or have been checked superficially will be returned unchecked and unstamped by the Engineer for resubmission by the Contractor.

D. The Contractor will begin no work which requires submittals until submittals bear the Contractor's and Engineer's stamp along with an "Issued For Construction For Field Use" notation by the supplier.

1.5 General Submittal Procedures

A. All submittals shall be received in an orderly sequence and sufficiently in advance of construction requirements to allow time for checking, resubmitting and rechecking.

1. The Engineer's review shall be conducted with reasonable promptness while allowing ten (10) working days for processing.

2. The Engineer will advise the Contractor and/or Engineer when it is determined that a submittal being processed must be delayed for coordination with other submittals.
3. No extension of time will be authorized because of the Contractor's failure to transmit submittals to the Engineer sufficiently in advance of the work.

B. Coordinate the submittal of different units of interrelated work so that one submittal will not be delayed by the Engineer's need to review a related submittal. The Engineer reserves the right to withhold action on any submittal requiring coordination with other submittals until related submittals are received.

C. Submittal Review Label.

1. Mark each submittal with a permanent label for identification. In the case of products, materials and samples, use the enclosed Submittal Review Label.

D. Package each submittal appropriately for transmittal and handling. Transmit each submittal from the Contractor to the Engineer, and to other destinations as indicated, by use of a transmittal form. Submittals received from sources other than the Contractor will be returned to the Sender "without action."

1.6 Specific Submittal Procedures

A. Schedules

1. Construction Progress Schedule:
   a. Within 10 days after execution of the Contract, submit for record five (5) copies of an estimated Construction Progress Schedule in Critical Path Method (CPM) (or bar chart) form.
   b. Scheduling shall include provisions for materials cure time, adverse weather, and materials procurement.
   c. Schedules for restoration work shall indicate the areas to be closed during each phase of construction and shall indicate the proposed traffic flow for each phase. (Restoration)
2. Shop Drawing Schedule
   a. Submit for record five (5) copies of the Shop Drawing Submissions Schedule.
3. After the initial review, submit revised and updated copies of schedules as may be required by current or projected status of the project on a monthly basis.

B. Products and Materials:

1. Submit for record five (5) copies of Manufacturer's Specifications and Product Data Sheets, Material Safety Data Sheets (MSDS), and recommended installation procedures.
2. Collect required product data into a single submittal for each unit of work or system.
3. Mark each copy to identify pertinent materials, products or models.
4. Show dimensions and clearances.
5. Modify drawings to delete information which is not applicable to project.
6. Supplement standard information to provide additional information applicable to project.

C. Samples

1. Submit physical samples for review and approval of kind, color, pattern and texture of the work. Samples are also to be submitted for quality control comparison between the final sample submittal and the actual work as it is delivered and installed.
2. Provide samples that are physically identical with the proposed material or product to be incorporated in the work. Provide fully fabricated samples cured and finished in the manner specified. Where variations in color, pattern or texture are inherent in the material or product represented by the sample, submit multiple units of the sample (not less than three (3) units) which show the approximate limits of variations. Mount, display or package samples in a manner to facilitate the review of indicated qualities.

D. Shop Drawings

1. Submit shop drawings for review and approval, include dimensions, identification of specific products and materials which are included in the work, compliance with specific standards and notations of coordination requirements with other work. Provide special notation of dimensions that have been established by field measurement. Highlight with notation, encircle, or otherwise indicate deviations from the Contract Documents on the shop drawings.
    a. Preparation: Submit shop drawings on sheets not less than 8-1/2" by 11"; the maximum sheet size shall not exceed 30" by 42".
    b. Reproducing Contract Documents or copying standard printed information as the basis for shop drawings is not permitted.
    c. Submit for Engineer's review one (1) reproducible and five (5) prints or copies. One (1) print will be retained by each party involved in the approval process for use in making comments. Each party will transfer comments to the reproducible and forward the reproducible and remaining unmarked prints to the next party involved in the approval process.

E. Test Reports

1. Promptly submit a written report of each test and inspection for record required of the Contractor, two (2) copies each to the Engineer and Owner. Each report shall include:
   a. Date issued
   b. Project title and number
   c. Testing laboratory name, address, and telephone number
   d. Name and signature of laboratory inspector
   e. Date and time of sampling or inspection
   f. Record of temperature and weather conditions
   g. Date of test
   h. Identification of product and Specification Section
   i. Location of sample or test in the Project
   j. Type of inspection or test
   k. Results of tests and compliance with Contract Documents
   l. Interpretation of test results, when requested by the Engineer

1.7 General Resubmission Requirements

A. Initial submittals shall be revised as required and resubmitted as specified for the initial submittal. Clearly indicate all changes which have been made, by clouding and use of revision number in a triangular symbol.

B. Review of resubmittals by the Engineer shall be limited to required corrections only, and the Contractor by resubmitting shall represent that the resubmittals contain no other alterations, additions or deletions. If additional changes have been made, same shall be specifically noted and described on the resubmittal.

1.8 Submittal Distribution

A. Contractor shall be responsible for distribution of "Field Use" drawings to the following:

1 copy - Owner
1 copy - Resident Engineer
1 copy - Architect
1 copy - Engineer

B. Contractor shall provide "Issued for Construction for Field Use" drawings as required for all field construction activities including distribution to subcontractors and material suppliers.

1.9 Carl Walker, Inc. Submittal Check List

A. The following list of submittals for review and approval by Division serve as a checklist for the Contractor and Engineer. Submittals for record are indicated by (R). Submittals required for record upon request are indicated by (UR). The checklist, however, does not relieve the Contractor for submittals specific to the Project and not listed herein.

1. Division 1
   a. Section 01300, Submittals
      - ☐ Construction progress schedule (R)
      - ☐ Shop drawing submissions schedule (R)
2. Division 2
   a. Section 02050, Demolition
      - ☐ Sequencing plan (R)
      - ☐ Types of equipment (R)
3. Division 3
   a. Concrete Repair, Section 03370
      - ☐ Manufacturer's Spec Data Sheets
      - ☐ Material Safety Data Sheets (R)
   b. Chemical Treatment – Migrating Corrosion Inhibitor, Section 03555
      - ☐ Certification of Compatibility (R)
      - ☐ Manufacturer's Spec Data Sheets
      - ☐ Material Safety Data Sheets (R)
      - ☐ Manufacturer’s representative qualifications
4. Division 5
   a. Section 05990, Miscellaneous Metals
      - ☐ Shop drawings
        - ☐ Location
        - ☐ Dimensions and weight of members
        - ☐ Type, location field and shop connections
        - ☐ Paint system
      - ☐ Manufacturer’s specifications and installation instructions
      - ☐ AWS certification (R)
5. Division 7
   a. Section 07900, Joint Sealants
      - ☐ Installation schedule
      - ☐ Manufacturer's Spec Data Sheets

- ☐ Material Safety Data Sheets and Code Certification (R)
- ☐ Description joint sealant system (R)
- ☐ Sample warranty
- ☐ Samples of materials including color

5. Division 8
   a. Section 08110, Hollow Metal Doors and Frames
      - ☐ Manufacturer's product data, specifications, fabrication, shop painting and installation (R)
      - ☐ Shop drawings
        - ☐ Frame type
        - ☐ Elevations
        - ☐ Opening conditions
        - ☐ Construction details
        - ☐ Installation requirements for finish hardware and reinforcement
        - ☐ Joint and connection details
        - ☐ Anchorages and accessories
   b. Section 08700, Finish Hardware, General
      - ☐ Finish hardware schedule
      - ☐ Manufacturer's product data (R)
6. Division 9
   a. Section 09900, Painting
      - ☐ Manufacturer's Spec Data Sheets
      - ☐ Material Safety Data Sheets (R)
      - ☐ Preparation and painting procedure (R)
        - ☐ Surface preparation (R)
        - ☐ Mixing and application (R)
        - ☐ Dust and fume control (R)
        - ☐ Compatibility (R)
      - ☐ Color chart
      - ☐ Sample color chips
   b. Section 09920, Pavement Marking
      - ☐ Manufacturer's Spec Data Sheets
      - ☐ Material Safety Data Sheets (R)
      - ☐ Sample color chip

PART 2 - PRODUCTS

2.1 Not Used

PART 3 - EXECUTION

3.1 Not Used

END OF SECTION

May 8, 2013

CARL WALKER, INC
CONTRACTOR SUBMITTAL REVIEW LABEL

Project:_____ Project No:_____
Contractor:_____ Subcontractor:_____
Supplier:_____ Manufacturer: _____
Date:_____ Revision Date:_____

Submitted Product: _____
Specification Section: _____ ASTM NO or Federal Spec _____
Specified Material?: Yes / No
Product Use: _____ Ref Drwg # and Detail _____
Date Submittal Received by Carl Walker, Inc.: _____
Carl Walker, Inc. Comments:_____

_____

Contractor Comments:_____

_____

_____

Contractor's Approval

❑ Approved ❑ Furnish as Corrected
❑ Rejected ❑ Revise and Resubmit
❑ No Architect/Engineer's Action Required

This review is only for general conformance with the design concept of the project and the information given in the Construction Documents. Corrections or comments made on the shop drawings during this review do not relieve the contractor from compliance with the requirements of the drawings and specifications. Approval of a specific item shall not include approval of an assembly of which the item is a component. The contractor is responsible for: dimensions to be confirmed and correlated at the jobsite; information that pertains solely to the fabrication processes or to the means, methods, techniques, sequences and procedures of construction; coordination of the Work with that of all other trades and performing all Work in a safe and satisfactory manner.

By:_____ Date:_____
CARL WALKER, INC.

Comments:

SECTION 01700 - PROJECT CLOSEOUT AND WARRANTIES

PART 1 - GENERAL

1.1 Related Documents

A. The Terms and Conditions of the Contract for Construction and the General Requirements of Division I of these Specifications apply to the Work in this Section.

1.2 Cleaning and Closeout

A. A punch list consisting of copies of the plans showing locations of unacceptable items and an attached explanation of the nature of the unacceptable work shall be delivered to the Contractor after substantial completion of the Project.

B. Closeout submittals include, but are not limited to, the following:

1. Maintenance manuals
2. Warranties

1.3 Warranties and Bonds

A. The act of the Contractor in executing the Agreement for this Work shall be considered as his acceptance of the following guarantee covering the Project:

1. Any materials, workmanship or equipment furnished as a part of this Project which prove defective or fail to operate properly, within one (1) year, or as otherwise specified in the Contract Documents, of the date of acceptance of the Work required under this (or substantial completion of the) Project (damage by wear and tear, violence or casualty not the fault of the Contractor excepted), shall be repaired and replaced by the Contractor promptly upon notification from the Owner and without cost to the Owner.
2. This guarantee provision shall apply regardless of whether or not such defective workmanship, materials or equipment are listed in the final punch list. Date of acceptance (or substantial completion) will be established by the Owner and Engineer upon finding all items of this Project substantially complete as to quality of workmanship and materials. Also see Division 7 for additional guarantees.
3. Contractor shall provide warranty commencing on the date of Project acceptance. Completion of various Project phases shall not initiate commencement of warranty in these specific areas. A single Project warranty date, at Project acceptance, will constitute commencement of warranty,

   NOTE: Some areas of Project may be open to vehicular traffic and subject to wear (i.e. coatings, sealants) prior to commencement of warranty.

PART 2 - PRODUCTS

2.1 Not used.

PART 3 - EXECUTION

3.1 Not used.

END OF SECTION

SECTION 02050 - DEMOLITION

PART 1 - GENERAL

1.1 Related Documents

A. The Conditions of the Contract for Construction and the General Requirements of Division 1 of these Specifications apply to the Work in this Section.

1.2 Work Included

A. The Work of this Section shall include furnishing all labor, materials, equipment, and supervision to demolish, haul, and dispose of concrete in accordance with the Drawings and as specified herein.

1. Concrete delaminations to the depth as indicated on the Drawings.

1.3 Related Work

A. The following Work is related to this Section:

1.	Submittals	Section 01300
2.	Concrete Reinforcement	Section 03200
3.	Concrete Repair	Section 03370

1.4 Quality Control

A. After demolition is complete but prior to final cleaning, the cavities and all exposed reinforcement shall be reviewed by the Engineer. The review shall include sounding the exposed concrete to determine completeness of delamination removals, examination of dressed edges to verify depth and vertical edge of cut, and uniformity of excavation to insure compliance with minimum limits specified.

B. The Engineer shall review all reinforcement exposed within the cavities for corrosion or damage resulting from Contractor's removal operations. Replacement of defective or damaged reinforcement bars shall be performed in accordance with Section 03200, “Concrete Reinforcement.”

1.5 Safety

A. The concrete topping slab has embedded electrical conduit. Contractor shall take all necessary precautions to prevent damage to the conduit. Contractor shall coordinate with Owner to shut off power if repairs are located near conduit.

1.6 Submittals

A. Submit for review and approval prior to beginning Work a copy of the proposed restoration sequencing plan.

B. Submit for record types of equipment proposed for use.

1.7 Basis of payment

A. Demolition cost to be included in repair costs, unless otherwise noted.

PART 2 - PRODUCTS

2.1 Not Used

PART 3 - EXECUTION

3.1 Inspection

A. Examine areas and conditions under which the Work is to occur. Notify the Engineer immediately in writing as required in the General Conditions of any conditions detrimental to the proper and timely completion of this Work.

3.2 General

A. Review with the Owner and Engineer the types of equipment proposed for use.

B. Conduct demolition operations to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities. Do not close or obstruct streets, walks or other occupied or used facilities without permission from authorities having jurisdiction.

C. Protect Owner's property which is to remain including; facades, signs, windows, doors, plantings, parking equipment, electrical and mechanical lines and fixtures.

D. Protect adjoining properties, public thoroughfares, sidewalks and utilities from damage due to this operation.

E. Take adequate precautions and provide protection as required to prevent damage to remaining existing elements of the parking structure and all adjoining building elements, and all vehicles using the facility.

F. At no cost to the Owner, promptly repair damage to adjacent facilities resulting from demolition operations.

G. Clean adjacent facilities of dust, dirt and debris resulting from demolition operations.

H. Authority for performing necessary work on public and private property adjoining Owner's property shall be obtained by the Contractor.

I. Remove all temporary protection and devices when no longer needed and when directed by the Owner.

3.3 Delaminated Concrete Surface Preparation

A. Location and Marking of Work Areas

1. Locate floor slab delaminations by sounding the surface with a hammer or rod, or dragging a chain. The Contractor shall sound all floor slabs. Delaminated areas once located by the Contractor will be further sounded to define their limits. These limits or "boundaries" shall be marked with chalk or paint.
2. Beam, wall, column, and slab delaminations shall be located by sounding the appropriate member with a hammer or rod. Cracks, usually horizontal in orientation along beam faces and vertical in orientation near corners of columns, are reliable indicators of delaminated concrete. Delaminated areas once located by the Contractor will be further sounded to define their limits. These limits or "boundaries" shall be marked with chalk or paint.
3. Prior to concrete removal locate reinforcing bars and electrical conduits in the vicinity of the repairs. Take the necessary precautions to prevent damage to reinforcement electrical conduits.

B. Concrete Removal and Surface Preparation

1. All concrete shall be removed from within the marked boundary to a minimum depth as indicated on the Drawings using 15 to 30 pound chipping hammers equipped with chisel point bits. Larger chipping hammers with a maximum stroke of 4 inches shall not be used without approval from the Engineer. If delaminations exist beyond the minimum removal depth, then chipping shall continue until all unsound and delaminated concrete has been removed from the cavity.
2. Where reinforcing bars (and tendons) are exposed by concrete removal, extra caution shall be exercised to avoid damaging them during removal of additional unsound concrete. The minimum depth of concrete removal around and beyond the perimeter of the bar for the entire exposed length shall be as indicated on the Drawings.
3. If rust is present on reinforcing bars where they enter sound concrete, then additional removal of concrete along the reinforcement is required. Such additional removal shall continue until grey reinforcement is exposed. If rust persists beyond the removal limits, the Engineer shall be advised and will direct further removals.

4. Delaminated, spalled and unsound concrete shall have their marked boundaries sawcut to a depth as indicated on the Drawings. All edges shall be straight and patch areas polygon shaped. A diamond blade saw or grinder with abrasive disk suitable for cutting concrete is acceptable for performing this work. The edge cut at the delamination boundary shall be dressed perpendicular to the member face. It shall also be of uniform depth for the entire length of the cut.

C. Preparation of Concrete Bonding Surface

1. Abrasive blast or high pressure waterblast all exposed concrete surfaces to remove laitance and any foreign material that may impair bonding prior to concrete placement.

D. Cleaning and Securing of Reinforcing

1. Refer to Section 03200, “Concrete Reinforcement.” Existing reinforcing and miscellaneous metals shall be cleaned of rust and laitance to near white metal.

E. Final Preparation

1. Airblasting is required as a final step to remove dust and debris.

3.4 Disposal

A. Remove and properly dispose of concrete and debris from areas exposed to public view on a daily basis.

END OF SECTION

SECTION 03200 - CONCRETE REINFORCEMENT

PART 1 - GENERAL

1.1 Related Documents

A. Conditions of Contract for Construction and General Requirements of Division 1 of these Specifications apply to Work in this Section.

B. ACI 301 Standard Specifications for Structural Concrete and ACI 117 Standard Specifications for Tolerances for Concrete Construction and Materials are hereby a part of this Section. Specific project requirements or modifications are specified herein.

C. A copy of ACI SP-15 Field Reference Manual; Standard Specifications for Structural Concrete ACI 301 with selected ACI and ASTM references shall be kept in Contractor's field office.

1.2 Work Included

A. Work of this Section shall include materials, fabrication, delivery, and installation of reinforcement for cast-in-place concrete.

B. Field application of epoxy modified coating to exposed reinforcement and other embedded metals in concrete cavities.

1.3 Related Work

A. Work related to this Section:

1.	Submittals	Section 01300
2.	Demolition	Section 02050
3.	Concrete Repairs	Section 03370

1.4 Reference Standards

A. Comply with following reference standards, except where more stringent requirements are indicated on Drawings or specified herein.

1. American Concrete Institute as specified herein.
2. American Welding Society
   a. AWS D1.4 Structural Welding Code - Reinforcing Steel, latest edition.
3. Concrete Reinforcing Steel Institute, latest edition.
   a. Placing Reinforcing Bars, Seventh Edition
   b. Reinforcement Anchorages and Splices, Fourth Edition

c. Fabrication of Epoxy-Coated Rebar
d. Field Handling Techniques for Epoxy-Coated Rebar at the Job Site
e. Manual of Standard Practice, 26 Edition

4. Wire Reinforcement Institute
   a. Manual of Standard Practice - Structural Welded Wire Fabric, latest edition.
   b. Structural Detailing Manual, latest edition.
5. American Society for Testing and Materials
   a. As specified herein.

1.5 Quality Control

A. Materials and installed Work may be reviewed by Engineer at any time during progress of Work. Allow free access to facilities for this purpose. Provide 48 hours notice to inspect completed reinforcing prior to placement of concrete.

B. If in opinion of Engineer, cross-sectional area loss of bars is greater than 15 percent, Contractor shall splice as directed by Engineer. Minimal splice lap shall be 24” or as indicated in General Notes.

1.6 Submittals (ACI 301 3.1.1) Additional requirements as follows:

A. For review and approval, Health and Safety Data Sheets and Manufacturer's Spec Data Sheets for field-applied epoxy modified coating.

1.7 Transportation and Handling (ACI 301 3.12) Additional requirements as follows:

A. Store reinforcement on supports above ground level. Protect from weather.

1.8 Basis of Payment

A. Reinforcement (if required) is to be included in cost of concrete repair.

PART 2 - PRODUCTS

2.1 Materials (ACI 301 3.2.1) Additional requirements as follows:

A. Reinforcement

1. ASTM A615, grade 60, unless noted.

B. Welded Wire Fabric Reinforcement (rolls not accepted)

1. ASTM A884, epoxy-coated welded wire reinforcement.

C. Wire Reinforcement Supports (ACI 301 3.2.1.8)

1. Provide CRSI Class 1 plastic-protected wire bar supports for reinforcement in contact with formwork, including bolsters, chairs, spacers and other devices for spacing, supporting, and fastening reinforcing bars in place.

D. Field-Applied Epoxy Modified Coating

1. Field-applied epoxy modified coating with Anti-Corrosion Agent (two coats at 10 mils) for existing reinforcement and miscellaneous metals embedded in concrete.
2. Acceptable field applied epoxy modified coatings are:
   a. Sika Armatec 110 Epo Cem, Sika Corporation.
   b. Emaco P24, BASF.

E. Reinforcement Chemical Anchorages

1. If required by field conditions or contractor damage to existing reinforcement, provide sizes and types of anchorages as follows:
2. Acceptable embedded anchor systems are:
   a. HILTI-HY HIT Fastening System, HILTI, Inc. Fastening Systems.
   b. HILTI HVZ Adhesive Anchors, HILTI, Inc. Fastening Systems.
   c. Power-Fast +, Power Fasteners.
   d. Chem Stud, Power Fasteners.
   e. or Approved Equivalent.

PART 3 - EXECUTION

3.1 Inspection

A. Inspect area to receive Work and report immediately in writing to Engineer, as required in General Conditions, any unacceptable conditions.

3.2 Fabrication

A. Fabrication tolerances shall be in accordance with ACI 117 2.1.

3.3 Placement (ACI 301 3.3.2) Additional requirements as follows:

A. Tolerances (ACI 301 3.3.2.1)

1. Comply with Concrete Reinforcing Steel Institute's recommended practice for Placing Reinforcing Bars, for details and methods of reinforcement placement and supports, and as herein specified.

B. Reinforcement supports (ACI 301 3.3.2.4)

1. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement operations. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces so that concrete cover for tie wire matches cover for reinforcement.
2. Supports for bars shall be placed at 4'-0" maximum spacing. Supports shall be placed a maximum of 6 inches from ends of the reinforcement.

C. Welded wire reinforcement (ACI 301 3.3.2.5)

1. Install in lengths as long as practical. Offset end laps in adjacent widths to prevent continuous laps in either direction.
2. Supports for welded wire fabric shall be placed at 2'-0" maximum spacing.

D. Splices

1. Mechanical splices may be used in lieu of lap splices where required by project conditions.
2. Welded splices may not be used.

3.4 Existing Reinforcement

A. Existing reinforcement and miscellaneous metal to remain shall be cleaned of rust and laitance to Near White Metal and field epoxy coated (with epoxy modified coating) in accordance with epoxy coating Manufacturer's recommendations.

B. Loose reinforcement bars shall be secured by either tying to bonded reinforcement or drilling supplemental anchors and installing tie downs. Lead anchors are not permitted.

C. Field-applied epoxy cure time must be extended as directed by Engineer during cold weather application.

D. Field-applied epoxy must be properly cured in a non "tacky" condition prior to concrete placement.

E. Remove epoxy spillage from adjacent concrete surfaces.

END OF SECTION

SECTION 03370 - CONCRETE REPAIR

PART 1 - GENERAL

1.1 Related Documents

A. The Conditions of the Contract for Construction and the General Requirements of Division 1 of these Specifications apply to the Work in this Section.

1.2 Work Included

A. The Work of this Section shall include providing and installing concrete patching materials, as indicated on the Drawings and as herein specified.

1.3 Related Work

A. The following work is related to this Section:

1.	Submittals	Section 01300
2.	Demolition	Section 02050
3.	Concrete Reinforcement	Section 03200
4.	Chemical Treatment	Section 03555
5.	Joint Sealants	Section 07900
6.	Pavement Marking	Section 09920

1.4 Reference Standards

A. Comply with the following reference Standards; except where more stringent requirements are indicated on the Drawings or specified herein:

1. American Concrete Institute (ACI)

   a. ACI 117-90 Standard Tolerances for Concrete Construction and Materials.
   b. ACI 201.2R-92 Guide to Durable Concrete.
   c. ACI 222R-89 Corrosion of Metals in Concrete.
   d. ACI-301-96 Specifications for Structural Concrete for Buildings.
   e. ACI-302.1R-89 Guide for Concrete Floor and Slab Construction.
   f. ACI 304R-89 Guide for Measuring, Mixing, Transporting and Placing Concrete.
   g. ACI 305R-91 Hot Weather Concreting.
   h. ACI 306R-88 Cold Weather Concreting.
   i. ACI 306.1-90 Standard Specification for Cold Weather Concreting.
   j. ACI 318-95 Building Code Requirements for Structural Concrete and Commentary.

k. ACI 347R-94 Guide to Formwork for Concrete.

1.5 Quality Control

A. The patched areas shall be sounded with a hammer 7 days after placement. Repair all detected hollowness by removing and replacing the patch or affected area at no extra cost to the Owner.

B. If shrinkage cracks appear in the repair material within 72 hours after placement, the repairs shall be considered defective, and shall be removed and replaced at no extra cost to the Owner.

C. As-Built drawings shall be maintained locating all repairs performed under this Section. Location and size of patches must be located on drawings. Separate drawings shall be maintained for each Level and Ceiling plan.

1.6 Environmental Requirements

A. Cold weather concreting: In accordance with ACI 306.1 or as specified herein.

B. Hot weather concreting: In accordance with ACI 305 or as specified herein.

C. Inclement Weather:

1. Unless adequate protection is provided, concrete shall not be placed during rain, sleet or snow.

2. Rain water shall not be allowed to increase the mixing water nor to damage the surface finish.

1.7 Submittals

A. Submit for record the Manufacturer's Spec “Data Sheets” and “Health and Safety Data Sheets”.

B. Submit for record upon request, a written description of the Contractor’s concrete repair ability, including equipment, facilities, personnel, and a list of similar completed projects.

1.8 Transportation and Handling

A. Store materials on platforms off ground, protected from the elements.

B. Handle and store aggregates in a manner to prevent intrusion of foreign material. Protect all material until used.

C. Material which has deteriorated or which has been damaged shall not be used.

1.9 Basis of Payment

A. All patching quantities shall be measured on a unit cost basis. Refer to Section 00300, Bid Forms.

B. Depths of patches are as indicated on the Drawings.

PART 2 – PRODUCTS

2.1 Horizontal Repair Mortar (Thin) ¼" – 1" deep

A. Repair mortar for thin surfaces to be traffic bearing polymer modified cementitious, type and thickness to meet conditions as indicated on the Drawings.

B. Acceptable repair mortars for patching thin horizontal surfaces are:

1. Sto Skim Coat, Sto Concrete Restoration Div., Atlanta, GA.
2. Tamms Thin Patch, The Euclid Chemical Co., Cleveland, OH.
3. Master Builders EMACO R300 CI (Pedestrian Traffic areas only), BASF Construction Chemicals, Shakopee, MN
4. Or Approved Equivalent.

2.2 Horizontal Repair Mortar (with Corrosion Inhibitor)

A. Repair mortar to be traffic bearing, polymer modified with corrosion inhibitor, cementitious, type and thickness to meet conditions as indicated on the Drawings.

B. For deeper patches add aggregate per Manufacturer's recommendation.

C. Acceptable repair mortar with corrosion inhibitor for patching horizontal surfaces is:

1. Sikatop 121 Plus or 122 Plus, Sika Chemical Corp., Lyndhurst, NJ.
2. Duraltop Flowable Mortar, Euclid Chemical Company, Cleveland, OH
3. Master Builders Emaco R310 CI, BASF Construction Chemicals

D. Ready mix concrete may also be used at Contractor's option. Mix design shall be based on:

1. f'c = 5,000 p.s.i.
2. Concrete mix shall contain a minimum of 564 lbs of cement per cubic yard of concrete. Fly ash and silica fume admixtures weight may be included with the weight of cement.
3. Air Entrainment = 6 ½% +/- 1 ½%

4. Maximum w/c ratio = 0.40
5. Corrosion Inhibitor at 2.5 gallons/Cubic Yard
6. Additional requirements per General Notes

2.3 Vertical Overhead Repair Mortar (Corrosion Inhibitor)

A. Repair mortar to be polymer modified cementitious, with corrosion inhibitor, type and thickness to meet conditions as indicated on the Drawings.

B. Acceptable repair mortar with corrosion inhibitor for patching vertical surfaces is:

1. Sikatop 123 Plus, Sika Chemical Corp., Lyndhurst, NJ.
2. Master Builders EMACO R350 CI, BASF Construction Chemicals, Shakopee, MN

2.4 Surface Applied Bonding Agent

A. Bonding Agent to be epoxy-modified, with corrosion inhibitor.

B. Acceptable bonding agent with corrosion inhibitor for preparation of concrete bonding surfaces is:

1. Sika Armatec 110 EpoCem 123 Plus, Sika Chemical Corp., Lyndhurst, NJ.
2. EMACO P24, BASF Construction Chemicals, Shakopee, MN

PART 3 - EXECUTION

3.1 Inspection

A. Before commencing work, examine all adjoining work on which this work is dependent and report in writing to the Engineer any condition which prevents Contractor from performing the work. Starting work constitutes acceptance of adjoining work.

3.2 Surface Preparation, Refer to Section 02050, "Demolition"

3.3 Existing Reinforcement, Refer to Section 03200, "Concrete Reinforcement"

3.4 Placing Concrete Patching Materials

A. The mixing and installing of the concrete patching materials and the priming of the existing concrete surface (use of bonding agent) shall be in accordance with the Manufacturer's recommendations.

B. If ready-mix concrete is used, bonding agent shall be scrubbed (or spray applied) into Saturated Surface Dry concrete bonding surface prior to concrete placement.

C. Concrete patching materials shall be cured according to the Manufacturer's recommendations.

END OF SECTION

SECTION 03555 – CHEMICAL TREATMENT – MIGRATING CORROSION INHIBITOR

PART 1 – GENERAL

1.1 Related Documents

A. The Conditions of the Contract for Construction and the General Requirements of Division 1 of these Specifications apply to the Work in this Section.

1.2 Work Included

A. The Work of this Section shall include furnishing all labor, materials, equipment and supervision to install chemical treatment to the existing structural concrete slab, including surface preparation, in accordance with the Drawings and Specifications.

1.3 Related Work

A. The following Work is related to this Section:

1.	Submittals	Section 01300
2.	Concrete Repair	Section 03370
3.	Joint Sealants	Section 07900
4.	Pavement Marking	Section 09920

1.4 Quality Control

A. General

1. The chemical treatment Installer shall be approved by the chemical treatment Manufacturer.

2. The sealer Installer shall have a minimum of five (5) years experience in application of the approved chemical treatment and have experience for a project in size of 25,000 SF or greater.

3. The Manufacturer shall make available a qualified Representative to assist the Installer and Engineer as specified herein. The Representative shall be experienced in the placement of the chemical treatment. As a minimum, the Representative shall be on site to review the following:

   a. Make regular visits to the project site during the course of construction to ensure that surface preparation and method of installation is acceptable.

4. Contractor shall notify Engineer 5 days in advance prior to installing chemical treatment.

B. Trial Area Requirements

1. Prepare a 100 SF trial area of the concrete surface incorporating all of the required preparation. The Engineer, Manufacturer's Representative, and Installer shall be in agreement that the surface preparation in the trial areas is satisfactory before preparation of concrete surfaces is continued.

2. Apply the chemical treatment on the trial area to review the method of application. The Engineer, Manufacturer's Representative, and the Installer shall be in agreement that the application in the trial area is satisfactory before further application of the sealer.

1.5 Submittals

A. Submit for record certification that the chemical treatment is compatible with all of the products in Divisions 3, 7, and 9 to which it will come in contact.

B. Submit for review and approval Manufacturer's Spec Data Sheets of each product to be used.

C. Submit for record Material Safety Data Sheets of each product, solvent, or related chemicals to be used and certification that the materials conform to local, state, and federal environmental and worker's safety laws and regulations.

D. Upon request, submit for review and approval qualifications of the Manufacturer's Representative.

E. Submit for record certification of trial area acceptance.

F. Submit for record copies of purchase orders indicating quantities of chemical treatment.

1.6 Environmental Requirements

A. Manufacturer and Installer are required to confirm that all materials used in accordance with this Section conform to local, state, and federal environmental and workers' safety laws and regulations.

B. The Installer is solely responsible for fume control and shall take all necessary precautions against injury to personnel or adjacent building occupants during application. As a minimum, Installer shall take the following precautions:

1. Provide and maintain barricades.
2. Locate and protect building air intakes during application.
3. Follow all state, federal, and local safety regulations.
4. Follow all Manufacturers' safety requirements.
5. Dispose empty containers immediately and properly.
6. Use protective equipment.
7. Ensure work area is well vented to the exterior.

1.7 Transportation and Handling

A. Deliver chemical treatment to site in original, unopened containers, bearing the following information:

1. Name of product
2. Name of Manufacturer
3. Date of manufacture
4. Lot or batch number
5. Shelf life of product
6. Mix ration if applicable.

B. Store chemical treatment under cover and protected from the weather. Keep containers tightly closed when not in use. Comply with manufacture's printed instructions for storing and protecting materials.

C. Do not store liquid material in hot sun. Keep material from freezing.

D. Replace containers showing any signs of damage with new material at no additional cost to the Owner.

E. At no time shall the weight of the stored material placed on a slab area exceed 30 PSF or 2,000 lbs. over 20 square inches.

1.8 Basis of Payment

A. Chemical treatment preparation and application will be paid on a Lump Sum basis. Refer to Section 00300, Bid Form.

PART 2 - PRODUCTS

2.1 Chemical Treatment

A. Approved chemical treatments are:

1. Surtreat TPS II or Surtreat TPS IV, Surtreat, Houston, TX.
2. Protectisil CIT, Evonik Degussa Corp. Parsippany, NJ.

PART 3 – EXECUTION

3.1 General

A. Inspect surfaces and adjoining work on which this work is in anyway dependent for proper installation and workmanship and report immediately in writing to the Engineer as required in the General Conditions any deficiencies in the surface which render it unsuitable for proper execution of this work. Do not proceed with work until unsatisfactory conditions have been corrected in an acceptable manner. Commencement of work implies acceptance of related work.

B. Coordinate and verify that related work meets the following requirements:

1. Concrete surfaces have been finished, cleaned and prepped, as recommended by the Manufacturer for the system to be installed.

2. Concrete surfaces have completed the proper curing period for the system selected.

3. All concrete repairs are completed in accordance with Section 03370, “Concrete Repairs”.

3.2 Preparation

A. Remove all oil, grease, and contaminants in accordance with the Manufacturer's recommendations.

B. Remove all existing loose or flaking striping not removed by Shotblasting operations.

C. Shotblast all concrete surfaces to receive sealer application. Shotblast equipment performance requirements are as follows:

1. Equipment shall be capable of traveling at a constant speed to provide a uniform profile. The speed and the size of the equipment and the size of the steel shot shall be selected to provide desired preparation without causing unnecessary damage to the concrete surface.

2. Equipment shall vacuum up, or otherwise retain all dirt, dust, and debris from the blasting operation.

3. Equipment used during floor slab preparation cleaning shall not exceed the weight limitation of 30 PSF.

4. Areas inaccessible to shotblaster (i.e. vertical surfaces, against walls, columns, stairways, etc.) are to be abrasive blasted to the same performance.

5. Shotblasted surface must be clean with a profile in which a minimum 1/16 inch of the existing concrete surface is removed. Fine aggregates must be exposed, however, large aggregate must not be exposed. All laitance must be removed. Surface profile to match ICRI CSP3 in accordance with ICRI Guideline No. 03732 Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings and Polymer Overlays.

6. Remove debris immediately after the surface preparation. Debris includes, but is not limited to, shot, aggregate and dust. Debris shall be placed in a covered dumpster or a covered area where it will not be rebroadcast by wind or weather.

D. All surfaces shall be air blown with sufficient pressure to remove excess dirt, dust and debris, and to assure that the concrete is clean prior to application of chemical treatment.

E. Remove all standing water. Although a surface-saturated dry condition is acceptable, the dryer the substrate, the better the penetration and effectiveness.

F. The Installer shall be responsible for repair or replacement of all materials damaged by surface preparation operations.

3.3 Field Quality Control

A. The Engineer is to review the mixing, surface preparation and proper application of all materials.

B. The manufacturer’s representative is to instruct in the proper usage of the material and to inspect the work throughout the project.

C. Any defective areas shall be fixed at the contractor's expense.

3.4 Installation/Application

A. Do all work in strict accordance with Manufacturer's written instructions and specifications and as indicated on the Drawings.

B. Protect adjacent surfaces not to be restored from material droppings and spraying. Protect area from overspray from mechanical preparation.

C. Selected material shall be applied in multiple cycles using a fine (light) spray or roller so that the material is applied at a rate about equal to the absorption rate of concrete to avoid paneling in the deck surface recesses. It is important that the application be performed so that all of the material penetrates the concrete surface.

D. Adhere to all procedures, limitations and cautions for the product in the manufacturer's current printed literature.

E. Follow the manufacturer's latest recommendations for curing.

F. Protect material from freezing and from rainfall prior to final set.

3.5 Cleanup

A. Clean all surfaces subjected to chemical treatment overspray and repair all damage caused by overspray to adjacent construction or property at no cost to the Owner.

B. Remove misplaced materials from surfaces immediately.

END OF SECTION

SECTION 05990 - MISCELLANEOUS METALS

PART 1 - GENERAL

1.1 Related Documents

A. Conditions of Contract for Construction and General Requirements of Division 1 of these Specifications apply to Work in this Section.

1.2 Work Included

A. Work of this Section shall include all labor, materials, equipment, and supervision necessary to complete installation of miscellaneous metals as indicated on Drawings and listed below:

1. Precast Connection Repairs

1.3 Related Work

A. Following Work is related to this Section:

1. Submittals Section 01300

1.4 Design

A. Design of miscellaneous metals in accordance with American Institute of Steel Construction's (AISC) Manual of Steel Construction, including Specification for the Design, Fabrication and Erection of Structural Steel for Buildings.

1.5 Reference Standards

A. Comply with provisions of following codes and standards, latest editions except where more stringent requirements are indicated on Drawings or Specifications.

1. American Institute Steel Construction

a. AISC Manual of Steel Construction, including Specification for Structural Steel Buildings.

2. American Welding Society

a. AWS D 1.1 Structural Welding Code - Steel.
b. AWS D 1.3 Structural Welding Code - Sheet Steel.
c. AWS D 1.6 Structural Welding Code - Stainless Steel.

3. American Concrete Institute.

    a. ACI 301, Standard Specification for Structural Concrete.

4. American Society Testing Materials

    a. As specified herein.

1.6 Quality Control

A. Use welders with current AWS certifications for required welding Work.

1.7 Submittals

A. For review and approval detailed shop drawings indicating all information necessary for fabrication and erection of miscellaneous metals. Include following:

1. Material data
2. Erection marks and location
3. Dimensions and weight of member(s)
4. Shop and field connections
5. Erection details
6. Paint Primer

B. For review and approval AWS welder certification.

1.8 Transportation and Handling

A. Deliver all miscellaneous metals to Project site and handle and store in such a manner as not to damage or distort material.

B. Handle so as not to damage the coating system.

C. Replace damaged material at no additional expense to Owner.

PART 2 - PRODUCTS

2.1 Steel Plates, Shapes, and Bars

A. Channels, Angles: ASTM A 36.

B. Plates and Bars: ASTM A 36.

2.2 Fasteners

A. Stainless Steel Bolts, Nuts, and Washers: ASTM F 593 for bolts, ASTM F 594 for nuts and washers.

B. Chemical Anchorages:

1. Acceptable embedded anchor systems are:
   a. HILTI-HY HIT Fastening System, HILTI, Inc. Fastening Systems.
   b. HILTI HVZ Adhesive Anchors, HILTI, Inc. Fastening Systems.
   c. Power-Fast +, Power Fasteners.
   d. Chem Stud, Power Fasteners.
   e. or Approved Equivalent.

2.3 Galvanizing

A. Provide a zinc coating for those items as indicated on Drawings or specified herein to be galvanized; comply with following:

1. Rolled, pressed and forged steel shapes, plates, bars and strip 1/8 inch thick and heavier: ASTM A 123. (1.25 oz./sq. ft. min.)
2. Assembled Steel Products: ASTM A 386. (1.25 oz./sq. ft. min.)

B. Field-Applied Cold Galvanizing

1. Acceptable Cold Galvanizing compounds are:
   a. Z.R.C. Cold Galvanizing Compound, ZRC Worldwide, Marshfield, MA.
   b. or Approved Equivalent.

2.4 Grout

A. Non-Shrink Non-Metallic Grout:

1. Premixed, factory packaged, non-staining, non-corrosive, non-gaseous grout complying with CE CRD-C588. Provide grout specifically recommended by Manufacturer for interior and exterior applications of type specified in this Section.

PART 3 - EXECUTION

3.1 Inspection

A. Inspect area to receive Work and report immediately in writing to Engineer, as required in General Conditions, any unacceptable conditions. Do not proceed with Work until unsatisfactory conditions have been corrected in an acceptable manner. Commencement of erection implies acceptance of related Work.

B. Take field measurements prior to preparation of Shop Drawings and fabrication, wherever possible, but do not delay job progress by waiting for field measurements. Make an allowance for trimming and fitting where the taking of field measurements before fabrication might delay either completion of the miscellaneous metals work in particular or Substantial Completion of the Work in general.

3.2 Fabrication

A. Preassemble miscellaneous metal items in the fabricating shop to the greatest extent possible to minimize field splicing and assembly. Disassemble units only to the extent necessary because of shipping and handling limitations. Clearly mark the units for later reassembly and coordinated installation. Field cutting of miscellaneous metal items not allowed. Field punched holes in metal items for purposes of attachment or other reasons is not allowed.

B. All steel miscellaneous metals shall be hot dip galvanized unless noted.

C. Weld corners and seams continuously and in accordance with requirements of AWS Code.

D. Grind exposed welds smooth and flush to match and blend with adjoining surfaces.

E. Work to be performed only by welders qualified in accordance with requirements of AWS Code.

F. Fabricate Work exposed to view true to line and level with accurate angles and surfaces and straight sharp edges. Ease exposed edges to a radius of approximately 1/32 inch, unless otherwise indicated on Drawings.

G. Cut, reinforce, drill and tap miscellaneous metal as may be required to receive finish hardware and similar items of Work.

H. Fabricate miscellaneous metal to sizes, shapes and profiles and of dimensions to receive adjacent Work.

3.3 Installation – General

A. Install manufactured items in strict accordance with Manufacturer's current written instructions.

B. Set all Work accurately to lines and levels, plumb and secure.

C. Provide anchorage devices and fasteners where necessary for securing miscellaneous metal items to in-place construction.

D. Provide all other Work as indicated on Drawings or necessary to complete miscellaneous metal Work.

E. Fit exposed connections accurately together to form tight hairline joints. Weld connections which are not to be left as exposed joints, but cannot be shop welded because of shipping size limitations.

F. Grind exposed joints smooth and touch-up shop paint coat. Do not weld, cut or abrade surfaces of exterior units which have been hot-dip galvanized after fabrication, and are intended for bolted or screwed field connections.

G. Perform cutting, drilling and fitting required for installation. Set Work accurately in location, alignment and elevation, plumb, level, true and free of rack, measured from established lines and levels.

H. Comply with AWS Code for procedures of manual shielded metal-arc welding, appearance and quality of welds made, and methods used in correcting welding Work.

3.4 Field Painting

A. Field Touch Up: Damaged galvanized surfaces apply cold-galvanizing to clean and dry surfaces.

1. Apply three (3) coats of cold-galvanizing according to Manufacturer's instructions.

3.5 Cleanup

A. Remove all dirt, tags, and foreign materials from miscellaneous metals.

END OF SECTION

SECTION 07900 - JOINT SEALANTS

PART 1 - GENERAL

1.1 Related Documents

A. Conditions of Contract for Construction and General Requirements of Division 1 of these Specifications apply to Work in this Section.

1.2 Work Included

A. Work of this Section shall include furnishing all labor, materials, equipment, and supervision to install joint sealants, including surface preparation.

1.3 Related Work

A. Following Work is related to this Section:

1.	Concrete Repair	Section 03370
2.	Chemical Treatment	Section 03555
3.	Pavement Marking	Section 09920

1.4 Quality Control

A. General

1. Joint sealant Installer shall be approved by joint sealant Manufacturer.

2. Manufacturer shall make available a qualified Representative to assist Installer and Engineer as specified herein. Representative shall be experienced in placement of sealant material.

B. Testing Requirements

1. Installer to perform adhesion test in presence of Engineer at rate of one test per 500 lineal feet of joint. Adhesion test to be performed a minimum of 7 days after installation. Procedure per Manufacturer's standard or as follows:

   a. Make a knife cut from one side of joint to other.
   b. Make two cuts approximately two inches long at sides of joint, meeting first cut at top of two-inch cuts.
   c. Grasp two-inch piece of sealant and try to pull uncut sealant out of joint.
   d. If adhesion is adequate, sealant should tear cohesively in itself or be very difficult to adhesively remove from surface.
   e. Sealant shall be replaced by applying more sealant in same manner as original.

2. If test results are unsatisfactory, more frequent testing will be required until satisfactory results are consistently obtained.

3. Replace all sealant which proves defective per above test at no additional cost to Owner.

1.5 Submittals

A. For review and approval Manufacturer's Spec Data Sheets of each product to be used.

B. For record Material Safety Data Sheets of each product, solvent, or related chemicals to be used and certification that materials conform to local, state and federal environmental and worker's safety laws and regulations.

1.6 Transportation and Handling

A. Deliver all materials to site in original, unopened containers, bearing following information:

1. Name of product
2. Name of Manufacturer
3. Date of manufacture
4. Lot or batch number
5. UL labels

B. Store materials under cover and protected from weather, within Manufacturer's recommended temperature ranges.

C. Replace packages or materials indicating any signs of damage with new material at no additional cost to Owner.

D. At no time shall the weight of stored material placed on a slab area exceed 30 PSF or 2,000 lbs. over 20 square inches.

1.7 Warranty

A. Provide to Owner a Warranty by Installer that joint sealant system will be free of defects, water penetration, and chemical damage related to design, workmanship, or material deficiency, consisting of, but not limited to:

1. Surface crazing or other weathering deficiency.
2. Abrasion or tear failure resulting from normal traffic use.
3. Tear failure resulting from anticipated movement.
4. Debonding from substrate or delaminating between layers.
5. Defective installation.

B. Warranty shall include and provide at no charge to Owner materials and labor needed to properly repair or replace product within duration of Warranty.

C. Normal traffic is considered to include snow removal equipment with rubber tipped blades as described in the National Parking Association publication, *Parking Garage Maintenance Manual.*

D. Vandalism, abrasive maintenance equipment, and construction traffic are not normal traffic use and are exempt from Warranty.

1.8 Warranty Duration

A. Bid price shall include a three (3) year Warranty commencing with date of project acceptance.

B. Although completed areas of facility may be opened to traffic and parking, commencement of Warranty period will not occur prior to acceptance of entire project.

C. A single Warranty commencement date will apply to all waterproofing.

1.9 Basis of Payment

A. Cove sealants, control joint sealants, wall/panel sealants, and routing and sealing of random cracks will be paid on a unit price basis. Refer to Section 00300, “Bid Forms.”

B. Joint widening or other necessary modifications shall be incidental to system cost.

PART 2 - PRODUCTS

2.1 Joint Sealant System - Polyurethane

A. Horizontal Joint Sealant (except cove joints)

1. Traffic-bearing, multi-component, self-leveling or non-sag unmodified polyurethane sealant, gray in color unless noted otherwise, containing no coal tar, asphalt, or other adulterants and conforming to ASTM C 920, Standard Specification for Elastomeric Joint Sealants, Type M, Grade P or NS, Class 25, use T and Federal Specification TT-S-00227, Type I or II, Class A.

2. On slopes greater than 2%, slope grade versions of specified self-leveling sealants or non-sag sealants, as specified for vertical and cove joint sealants, are to be used per Manufacturer's recommendations.

3. Approved Horizontal Joint Sealants are:

    a. Iso-Flex 880GB or 881, LymTal International, Inc., Orion, MI.
    b. Sikaflex - 2c NS/SL, Sika Corp., Lyndhurst, NJ.
    c. Sonneborn Sonolastic SL2, BASF Building Systems, Shakopee, MN.
    d. THC 900 or THC 901, Tremco Inc., Cleveland, OH.

B. Vertical and Cove Joint Sealants

1. Multi-component, non-sag unmodified polyurethane sealant, gray in color unless otherwise noted, containing no coal tar, asphalt, or other adulterants and conforming to ASTM C 920, Type M, Grade NS, Class 25, use NT and Federal Specification TT-S-00227E , Type II, Class A.

2. Approved Vertical and Cove Joint Sealants are:

    a. ISO-FLEX 881, LymTal International, Inc., Orion, MI.
    b. Sikaflex - 2c NS, Sika Corp., Lyndhurst, NJ.
    c. Sonneborn Sonolastic NP2, BASF Building Systems, Shakopee, MN.
    d. Dymeric 240 or Dymeric 511, Tremco Inc., Cleveland, OH.

2.2 Backer Rod

A. Backer rod diameter shall be as recommended by Manufacturer for joint sizes indicated on Drawings.

B. Backer rod shall be extruded round, closed cell, low-density polyethylene or polyolefin foam material with a skin-like outer texture.

C. Approved closed cell backer rods are:

1. Mile High Foam Backer Rod, Backer Rod Manufacturing, Inc., Denver, CO.
2. ITP Standard Backer Rod Insulation, Industrial Thermo Polymers Limited, Buffalo, NY.
3. HBR, Nomaco, Inc., Zebulon, NC.
4. Sonneborn Sonolastic Closed-Cell Backer-Rod, BASF Building Systems, Shakopee, MN.

PART 3 - EXECUTION

3.1 Inspection

A. Inspect surfaces to receive Work and report immediately in writing to Engineer as required in General Conditions any deficiencies in surface which render it unsuitable for proper execution of this Work. Do not proceed with Work until unsatisfactory conditions have been corrected in an acceptable manner. Commencement of Work implies acceptance of related Work.

3.2 General

A. Coordinate and verify that related Work meets following requirements.

1. Concrete surfaces are finished, cleaned and prepped, as specified by Manufacturer for system to be installed.

2. Curing compounds used on concrete surfaces are compatible with Work to be installed.

3. Systems selected for use are compatible with each other.

B. Installer shall take necessary precautions against injury to personnel or adjacent building occupants during installation of joint sealants. Installer personnel shall use protective equipment and area shall be well vented to outside.

3.3 Preparation

A. Grind joint edges smooth and straight prior to installation.

B. All surfaces that are to receive joint sealant shall be dry and thoroughly cleaned by mechanical means of all loose particles, existing joint sealant, laitance, dirt, dust, oil, grease or other foreign matter. Mechanical methods, such as grinding or sandblasting, shall be used to clean joint surfaces to sound, virgin concrete.

C. Check preparation of substrate to ensure adhesion of joint sealant.

D. Correct unsatisfactory conditions in a manner acceptable to Manufacturer and Engineer before installation of joint sealant system.

E. Rout cracks with a grinding tool to produce the profile indicated on Drawings. Crack must be centered in the routed notch.

3.4 Installation/Application

A. Do all Work in strict accordance with Manufacturer's written instructions and specifications and as indicated on Drawings.

B. Do not apply joint sealant system until concrete has been air dried at temperatures at or above 40 degrees F. for at least 28 days after curing period specified in Section 03370, Concrete Repair, or as otherwise approved by Manufacturer.

C. Install bond breaker or backer rod as indicated on Drawings.

D. Prime all joints and cracks.

E. Completely fill joint with sealant, without sagging or smearing onto adjacent surfaces.

F. Fill horizontal joints and cracks until slightly recessed to avoid direct contact with wheel traffic.

G. Cease installation under adverse weather conditions, or when temperatures are below 40 degrees F or below or above Manufacturer's recommended limitations.

H. Protect joint sealant as required until sealant is fully cured.

3.5 Cleanup

A. Remove all excess primer, sealant, and masking materials from structure.

END OF SECTION

SECTION 08110 - HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 Related Documents

A. The Conditions of the Contract for construction and the General Requirements of Division 1 of these Specifications apply to the Work in this Section.

1.2 Work Included

A. The Work of this Section includes all labor, material, equipment and supervision to manufacture, transport and install hollow metal doors and frames as indicated on the Drawings and in the schedules.

1.3 Related Work

A. The following Work is related to this Section:

1.	Submittals	Section 01300
2.	Finish Hardware, General	Section 08700
3.	Painting	Section 09900

1.4 Quality Control

A. Provide hollow metal doors and frames manufactured by a single firm specializing in the production of this type of work, all in accord with the Steel Door Institute requirements.

B. Wherever a fire-resistance classification, 1-1/2 hour, or as indicated on the Drawings and schedules, provide fire-rated hollow metal doors and frames that have been investigated and tested as a fire door assembly, complete with the type of fire door hardware to be used in the work. Identify each fire door and frame with UL labels, indicating the applicable fire rating of both the door and the frame.

C. Construct and install assemblies to comply with NFPA No. 80, and as herein specified.

1.5 Submittals

A. Submit for record manufacturer's product specifications, technical data, fabrication, shop-painting, and installation instructions.

B. Submit for review and approval Shop Drawings including the following:

1. Details of each frame type.
2. Elevations of door design types
3. Conditions at openings
4. Details of construction
5. Location and installation requirements of finish hardware and reinforcements.
6. Details of joints and connections.
7. Provide details at 3" to 1'-0" scale.
8. Provide dimensioned elevations at not less than 1" to 1'-0" scale.
9. Indicate anchorages and accessory items.

1.6 Transportation and Handling

A. Deliver all doors in manufacturer's original, unopened containers with the door size clearly marked on the container.

B. Fire doors requiring labels shall be clearly marked with permanent identification.

C. Deliver materials in sufficient time and quantity to allow continuity of work and compliance with approved construction schedule.

D. Handle doors in manner to prevent damage to edges and ends.

E. Store all materials indoors on raised 2 x 4 wood skids with the door side on edge.

F. Provide continuous protection of materials against damage.

G. Remove damaged and defective materials from site.

PART 2 - PRODUCTS

2.1 Hollow Metal Doors

A. Furnish flush design heavy duty, model 3 hollow metal doors, swing type, 1-3/4 inches thick, seamless hollow construction, to suit the existing door opening sizes and the door design, as indicated on the Drawings and specified herein.

B. Face sheet gauge not less than No. 18 gauge.

C. Steel Sheets shall be zinc-coated of commercial quality, complying with ASTM A526, A525, G60 zinc coating mill phosphatized.

D. Provide stretcher-leveled standard of flatness where indicated.

2.2 Hollow Metal Frames

A. Provide hollow metal, Masonry/Flush frames suitable for existing field conditions. Conceal all fastenings unless otherwise indicated. Counter-sink exposed screws using Phillips flat-head screws.

B. Gauge: Not less than No. 16 (manufacturer's standard gauge).

C. Steel frames shall be zinc-coated of commercial quality, complying with ASTM A526, A525, G60 zinc-coating mill phosphatized.

2.3 Supports and Anchors

A. Provide supports and anchors fabricated of not less than 16 gauge sheet steel. Galvanize after fabrication where units will be built into exterior walls, complying with ASTM A153, Class B.

C. Monolithic Concrete Openings: Existing Opening Anchors.

D. Separate Topping Concrete Slabs: Adjustable type with extension clips. Terminate the bottom of frames at the finish floor surface.

E. Provide two removable spreader bars across the bottom of frames, tack welded to jambs and mullions.

2.4 Inserts, Bolts and Fasteners

A. Provide manufacturer's standard Inserts, Bolts and Fasteners except hot-dip galvanize all items to be built into exterior walls, complying with ASTM A153.

B. In-place Concrete: 3/8 inch concealed bolts into expansion shields or inserts.

2.5 Shop-Applied Paint

A. Provide manufacturer's standard baked on epoxy or enamel (gray).

2.6 Acceptable Manufacturers are:

A. CECO Corporation

B. Fenestra

C. Assa Abloy

D. Steelcraft

PART 3 - EXECUTION

3.1 Inspection

A. Inspect area to receive the work and report immediately in writing to the Architect any unacceptable conditions, as required in the General Conditions.

3.2 Fabrication

A. Fabricated hollow metal doors and frames to be rigid, neat in appearance and free from defects, accurately formed to the required sizes and profiles. Wherever practicable, fit and assemble units in the manufacturer's plant. Clearly identify work that cannot be permanently plant-assembled before shipment, to assure proper assembly at the project site. Dress all welded joints on exposed surfaces flush and smooth, to be invisible when prime painted. Use of metallic filler to conceal manufacturing defects is not acceptable.

B. Fabricate exterior doors of two outer cold-rolled steel sheets with edges continuously welded and finished flush. Construct doors with smooth, flush surfaces without visible joints or seams on exposed faces of stile edges, except around glazed or louvered panel inserts.

C. Reinforce inside of doors with vertical, steel channel-shaped sections not less than 0.0396 inch thick. Space vertical reinforcing 6 inches o.c. and extend the full door height. Spot-weld at 4 inches o.c. to both outer sheets.

D. Continuous truss-form inner core of 28 gauge sheet metal reinforcing may be provided as inner reinforcement in lieu of above. Spot-weld truss-form reinforcement 3 inches o.c. vertically and horizontally over the entire surface of both sides.

E. Provide sound insulation filler of fiberboard mineral-wool board, solidly packed the full door height to fill the voids between the inner core reinforcing members.

F. Reinforce tops and bottoms of doors with 16 gauge horizontal steel channels welded continuously to the outer sheets. Close top and bottom edges to provide a weather seal, as an integral part of the door construction or by the addition of inverted steel channels.

G. Provide rectangular shape steel moldings around glazed openings in doors, with non-removable moldings, either an integral part of the door construction, or welded thereto with all welds ground smooth. Assemble removable moldings with butted corners, and secure to door with countersunk Phillips flat-head machine screws uniformly spaced at 12 inches o.c.

H. Form door moldings of 0.0359 inch thick cold-rolled steel sheets.

I. Fabricate louvers and mount flush into doors without overlapping moldings on the surface of the door-facing sheets.

J. For fire-rated openings, provide tightly fitted automatic closing, operable blades, equipped with fusible links, arranged so that metal overlaps metal at every joint.

K. Provide moldings around solid, glazed or louvered panels in hollow metal doors for a rigid and secure installation.

L. Fabricate assemblies of doors and frames to provide the door installation clearances specified.

M. Prepare hollow metal units at the manufacturers to receive mortised and concealed finish hardware, including cutouts, reinforcing, drilling and tapping. Comply with applicable requirements of ANSI S115, "Specifications for Door and Frame Preparation." Prepare for other mortised and concealed finish hardware to the templates of the manufacturer of each finish hardware item required in the work.

N. Reinforce hollow metal units at the manufacturer's plant to receive surface-applied hardware. Drilling and tapping for surface-applied finish hardware may be done at the project site.

O. Locate finish hardware as indicated on the final shop drawings, with the template furnished by the hardware supplier.

P. Fabricate frames of full-welded unit construction, with corners mitered, reinforced, continuously welded the full depth and width of frame, with welds dressed smooth and flush.

Q. Reinforce each door for finish hardware, as follows:

1. Hinges: Steel plate 3/16" thick x 1-1/2" wide x 6" longer than hinge, secured by not less than six spot-welds.

2. Mortise Locksets and Dead Bolts: Steel sheet 0.0747" thick (14 gauge) secured with not less than two spot-welds.

   Cylinder Locks: Steel sheet 0.0747" thick (14 gauge) secured with not less than two spot-welds.

3. Flush Bolts: Steel sheet .0747" thick (14 gauge) secured with not less than two spot-welds.

4. Surface-Applied Closers: Steel sheet 0.1406" (16 gauge), except when through bolts are shown or specified, secured with not less than two spot-welds.

5. Push Plates and Bars: Steel sheet 0.058" thick (16 gauge), except when through bolts are shown or specified, secured with not less than two spot-welds.

6. Surface Panic Devices: Sheet steel 0.0747" thick (14 gauge), except when through bolts are shown or specified, secured with not less than two spot-welds.

R. Provide reinforcing for finish hardware as follows:

1. Hinges: Steel plate 3/16" thick x 1-1/2" wide x 6" longer than hinge, secured by not less than six spot-welds.

2. Strike Plate Clips: Steel plate 3/16" thick x 1-1/2" wide x 3" long.

3. Surface-Applied Closers: Steel sheet 0.1046" thick (12 gauge), size and shape as required, secured with not less than six spot-welds.

4. Drill stops to receive three silencers on single door frames and four silencers on double door frames. Install plastic plugs to keep holes clear during construction.

S. Shop Painting

1. Clean, treat, and paint all surfaces of fabricated hollow metal doors and frames including galvanized surfaces, whether concealed or exposed in the finish work.

2. Clean steel surfaces of all mill scale, rust, oil, grease, dirt and other foreign materials before the application of the shop coat of paint. Remove mill scale and rust by hand tool methods complying with SSPC-SP 2, and solvent clean all metal complying with SSPC-SP 1.

3. Apply pretreatment to cleaned metal surfaces, using cold phosphate solution (SSPC-PT 2), hot phosphate solution (SSPC-PT 4) or basic zinc chromate-vinyl butyryl solution (SSPC-PT 3).

4. Apply shop coat of prime paint within the time limits recommended by the pretreatment manufacturer. Apply a smooth coat of even consistency to provide a uniform dry film thickness of not less than 1.25 mils.

3.3 Placing Frames

A. Install hollow metal frames and accessories in accordance with the final shop drawings and manufacturer's data, and as herein specified. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After anchoring is completed, remove temporary braces and spreaders leaving surfaces smooth and undamaged. Comply with SDI-105.

B. Provide masonry anchorage devices where required for securing hollow metal frames to in-place concrete or masonry construction.

C. Set anchorage devices opposite each anchor location, in accordance with the anchorage device manufacturer's printed instructions. Leave drilled holes rough, not reamed, and free from dust and debris.

D. Place fire-rated frames in accordance with NFPA Standard No. 80.

3.4 Placing Doors

A. All hollow metal doors shall fit accurately in their respective frames, within the following clearances (comply with SDI-100):

1. Jambs and head: 3/32"

2. Meeting edges, pairs of doors: 1/8"

3. Bottom: 3/8", where no threshold or carpet

4. Bottom: At threshold 1/8"

5. Fire-rated doors with clearances as specified in NFPA Standard No. 80.

B. After proper door operation has been confirmed and all anchors have been adjusted and finalized, apply bead of polyurethane cove sealant around top and sides of frame on interior and exterior sides per specification 07900.

3.5 Clean-Up

A. Check and readjust all hollow metal work just prior to final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including doors or frames which are warped, bowed, or otherwise damaged.

END OF SECTION

SECTION 08700 - FINISH HARDWARE, GENERAL

PART 1 - GENERAL

1.1 Related Documents

A. The Conditions of the Contract and the General Requirements of Division 1 of these Specifications apply to the Work in this Section.

1.2 Work Included

A. The Work of this Section includes all material, manufacturing, and transportation of finish hardware as indicated on the Drawings and in schedules. Finish hardware is hereby defined to include all items known commercially as builder's hardware, as required for swing and other doors, including screws, bolts, expansion shields, etc.

B. Furnish hardware templates to each fabricator of doors, frames, and other work to be factory-prepared for the installation of hardware. Upon request, check the shop drawings of such other work, to confirm that adequate provisions will be made for the proper installation of hardware.

1.3 Related Work

A. The following Work is related to this Section:

1. Hollow Metal Doors and Frames Section 08110

1.4 Quality Control

A. Finish hardware supplier shall have been furnishing hardware in the same area as the project for a period of not less than two years, and have in their employment an experienced hardware consultant who is available at all reasonable times during the course of the work, for project hardware consultation to the Engineer, Contractor, and Owner.

B. Assign the installation of hardware to an experienced tradesman in compliance with trade union jurisdictions.

C. To the greatest extent possible, obtain each kind of hardware (latch sets, hinges, closers, etc.), from only one manufacturer, even though several are specified as acceptable Manufacturers.

D. Except as otherwise indicated, the use of one Manufacturer's numeric designation system in schedules does not imply that another Manufacturer's products will not be acceptable, unless they are not equal in design, size, weight, finish, function, or

other quality of significance. However, do not make substitutions after Engineer's acceptance of hardware supplier's complete hardware schedule.

1.5 Submittals

A. Submit for review and approval a final finish hardware schedule indicating complete designation of every item required for each door or opening. Hardware schedules are intended for coordination of the work. Review and acceptance by the Engineer and Owner does not relieve the Contractor of responsibility to fulfill the requirements as indicated and specified herein.

B. Submit for record manufacturer's data for each item of finish hardware. Include whatever information may be necessary to indicate compliance with requirements, and include instructions for installation and for maintenance of operating parts and exposed finishes.

1.6 Transportation and Handling

A. Provide secure lock-up for hardware delivered to the project, but not yet installed. Control the handling and installation of hardware items which cannot be immediately replaced, so that the completion of the work will not be delayed by hardware losses, both before and after installation.

PART 2 - PRODUCTS

2.1 Finish Hardware

A. The Drawings indicate the direction of swing for each door. Furnish each item of hardware for proper installation and operation of the door swing.

B. Provide hardware for fire-rated openings in compliance with AIA (NBFU) Pamphlet No. 80 and NFPA Standard No. 80. These requirements takes precedence over other requirements for such hardware. Provide only hardware which has been tested and listed by UL for the types and sizes of doors required, and complies with the requirements of the door and door frame labels.

C. Match the finish of every hardware unit at each door or opening, to the greatest extent possible, and except as otherwise indicated. Reduce differences in color and textures as much as commercially possible where the base metal or metal forming process is different for individual units of hardware exposed at the same door or opening. In general, match all items to the manufacturer's standard finish for the latch and lock-set for color and texture.

D. Products below are for items listed in hardware sets. Equivalent products of Manufacturers in parentheses will be accepted.

1.	Hinges	Hager
2.	Closers	LCN
3.	Latches	Schlage
4.	Thresholds & Weather Stripping	Pemko

2.3 Hardware Adjustment Tools

A. In addition to those tools furnished with the hardware for installation, furnish and deliver to the Owner, the following items:

1. Two closer adjustment wrenches

2.4 Hardware Sets

A. Set #1 (To Match Door at Elevator Lobby)

3	Hinges	BB 1279 4.5 X 4.5
1	Closer	LCN 4040 Series
1	Latch Set	ND10S (ANSI F75), Rhodes Style, 626 Finish
1	Door Sweep	3452 AV
1	Threshold	Saddle Threshold Style 271A
1	Perimeter gasketing	303AV

PART 3 - EXECUTION

3.1 Inspection

A. Inspect area to receive the work and report immediately in writing to the Engineer, as required in the General Conditions, any unacceptable conditions.

3.2 Installation

A. Install each hardware item in compliance with the manufacturer's instructions and recommendations. Wherever cutting and fitting is required to install hardware onto or into surfaces which are later to be painted or finished in another way, install each item completely and then remove and store in a secure place during the finish application. After completion of the finishes, re-install each item. Do not install surface-mounted items until finishes have been completed on the substrate.

B. Adjust and check each operating item or hardware and each door to ensure proper operation or function of every unit. Lubricate moving parts with type of lubrication recommended by manufacturer (graphite-type, if no other recommended). Replace units which cannot be adjusted and lubricated to operate freely and smoothly as intended for the application made.

C. Final Adjustment: Wherever hardware installation is made more than one month prior to acceptance or occupancy of a space or area, return to the work during the week prior to acceptance or occupancy, and make a final check and adjustment of all hardware items in such space or area. Clean and re-lubricate operating items as necessary to restore proper function and finish of hardware and doors. Adjust door control devices to compensate for final operation of heating and ventilating equipment.

D. Instruct Owner's personnel in proper adjustment and maintenance of hardware and hardware finishes, during the final adjustment of hardware.

END OF SECTION

SECTION 09900 - PAINTING

PART 1 - GENERAL

1.1 Related Documents

A. The Conditions of the Contract for Construction and the General Requirements of Division 1 of these specifications apply to the Work in this Section.

1.2 Work Included

A. The Work of this Section shall include furnishing all permits, labor, materials, equipment, and services to prepare and paint and/or stain as indicated on the repair drawings.

1. Hollow metal doors and frames

1.3 Related Work

A. The following Work is related to this Section:

1.	Submittals	Section 01300
2.	Doors and Windows	Section 08110

1.4 Reference Standards

A. Comply with the requirements of the current edition of the specifications or standard listed, except where more stringent requirements are indicated on the Drawings or specified herein:

1. Steel Structures Painting Council (SSPC), Volume I, Good Painting Practices and Volume II, Systems and Specifications

2. Local, state, or federal laws and regulations governing Volatile Organic Compounds (VOC) in paint or paint products.

3. Standards of the American Society for Testing and Materials (ASTM), as cited herein.

1.5 Quality Control

A. Samples for testing shall be supplied not less than 30 days before work on the job is started. Samples of all coatings to be used under these specifications shall have received approval from the Engineer. Failure of the Contractor to obtain prior

approval shall not reflect upon any proposed product, nor shall such failure be used in order to obtain an extension of time for completion of the work.

B. Provide coating systems produced by the same Manufacturer.

1.6 Submittals

A. Submit for review and approval Manufacturer's "Spec Data Sheets for paint systems; including primer, intermediate, and final coats.

B. Submit for record "Material Safety Data Sheets" for all materials used.

C. Submit for record certification that paint system is compatible with shop applied primer.

D. Submit for record complete preparation and painting procedure to be followed. As a minimum, the following items must be included:

1. Surface preparation
2. Paint mixing and application
3. Inspection criteria
4. Paint characteristics
5. Dust and fume control
6. Storage and handling
7. Repair to paint system
8. Paint curing
9. Compatibility of all components

E. Submit for record certification of compliance with local and federal guidelines governing paint application.

F. Submit for review and approval Manufacturer's standard color chart. Topcoat color to be chosen by Owner.

1.7 Samples

A. Submit upon request for review and approval sample color chips for each topcoat color. Samples are to measure 12" x 12", are to be on hardboard, and to have a texture to simulate actual conditions.

1.8 Environmental Requirements

A. Manufacturer and Contractor are required to confirm that all materials used in accordance with this Section conform to local, state, and federal environmental and workers' safety laws and regulations.

B. It shall be the sole responsibility of the Contractor to provide any and all necessary containment to protect on site and adjoining property from damage during cleaning and coating operations.

C. It shall also be the sole responsibility of the Contractor to meet all regulations regarding air quality emission standards, OSHA, NFPA, EPA and other governing law set by local, state and federal agencies.

1.9 Transportation and Handling

A. Deliver all materials to site in original, unopened containers designated by the Contractor.

B. Store materials under cover and protected from the weather. Replace packages of materials showing any signs of damage with new material at no additional cost to Owner.

C. Mix and prepare coatings only in areas designated by the Contractor for that purpose.

D. Provide clean cans and buckets required for mixing coatings and for receiving rags and other waste materials associated with painting. Clean buckets regularly. At the close of each day's work remove used rags and other waste materials associated with painting.

E. Take precautions to prevent fire in or around coatings materials. Provide and maintain hand fire extinguisher near storage and mixing area.

1.10 Basis of Payment

A. Pay unit cost for painting is lump sum. The lump sum price shall include all costs associated with painting, including but not limited to preparation, disposal, etc. Refer to Section 00300, “Bid Forms”.

PART 2 - MATERIALS

2.1 Steel Coating Systems with shop applied primer (New Hollow Metal Doors and Frames)

A. Provide coating system consisting of epoxy intermediate coat 3-5 mils dry film thickness and urethane finish coat 2-3 mils dry film thickness all in accordance with Manufacturer’s recommendations.

B. Intermediate coat and finish coat shall be from same Manufacturer and of a different color.

C. Contractor to confirm epoxy intermediate coat is compatible with shop applied primer.

D. Approved epoxy intermediate and urethane finish coat systems are:

1. Carboguard 893, Carbothane 134 HS, Carboline Company
2. Amercoat 385, Amershield, PPG Protective & Marine Coatings
3. Super Spec HP P36, Super Spec HP P74, Benjamin Moore & Co.

PART 3 - EXECUTION

3.1 General

A. Inspect surfaces to which paint will be applied and report immediately in writing to the Engineer as required in the General Conditions any conditions detrimental to the proper execution of this work.

B. Do not proceed until unsatisfactory conditions are acceptably remedied. Commencement of work implies acceptance of related work.

C. No coating system shall be applied without the approval of the Engineer as to the proposed method of the surface preparation.

D. Before commencing work, make certain that the surface is in proper condition to receive coating system, that surfaces are clean, dry, smooth, and at proper temperature as recommended by Manufacturer.

E. Provide adequate ventilation to remove fumes to a safe location and to confine and control fumes so that life or property is not endangered.

F. Protect all adjacent surfaces, vehicles and equipment from overspray.

3.2 Preparation

A. Mask all boundaries to provide straight edges.

B. Do not intermix materials of different character or different Manufacturer.

C. Do not thin material except as recommended by Manufacturer.

3.3 Application

A. Work shall be done by skilled craftsmen who are qualified to perform the required work and shall be done in a manner comparable to the best standards of practice found in that trade. All material shall be evenly applied so as to be free from sags, runs, crawls, wrinkles, holidays, or any other application defects. All brushed coats shall be of the proper consistency and properly brushed out so as to show the minimum of brush marks. When finished and dried, brush strokes shall appear in the vertical direction only, and there shall be no curved brush marks showing. All coats shall be thoroughly dry before the succeeding coat is applied.

B. In applying coatings by spray gun, the material shall be applied in a wet coating that remains glossy wet for at least twenty seconds after application. Spraying shall be done in the crisscross lap method of spraying, striking first in one direction and shortly thereafter spraying across this same section at right angles to the first set of passes, so as to provide a continuous wet film of the finish coat.

C. Coating systems shall be applied in accordance with the Manufacturer's printed instructions for that particular coating.

D. Where more than two coats are specified, each subsequent coat shall be of sufficient color difference that holidays, skips, thin spots, etc. can be easily be seen in contrast with the preceding coat.

3.4 Repair

A. Paint damage is to be repaired by the re-application of the paint system in accordance with the Manufacturer's recommendations.

B. Apply additional coats if the coating does not completely hide the undercoat.

END OF SECTION

SECTION 09920 - PAVEMENT MARKING

PART 1 - GENERAL

1.1 Related Documents

A. The Conditions of the Contract for Construction and the General Requirements of Division 1 of these Specifications apply to the Work in this Section.

1.2 Work Included

A. The Work of this Section includes furnishing all material, labor, equipment and services to paint the following items of the types, patterns, sizes and colors as indicated on the Drawings.

1. Parking stripes
2. Traffic arrows
3. Text

1.3 Related Work

A. The following Work is related to this Section:

1.	Submittals	Section 01300
2.	Concrete Repairs	Section 03370
3.	Chemical Treatment	Section 03555
4.	Joint Sealants	Section 07900

1.4 Submittals

A. Submit for review and approval Manufacturer's Spec Data Sheets of each product to be used.

B. Submit for record Material Safety Data Sheets of each product, solvent, or related chemicals to be used, and certification that the materials conform to local, state, and federal environmental and worker’s safety laws and regulations.

C. Submit for record standard color chip.

D. Submit for review and approval shop drawings indicating stall size, spacing, etc.

1.5 Environmental Requirements

A. Manufacturer and Installer are required to confirm that all materials used in accordance with this Section conform to local, state, and federal environmental and workers' safety laws and regulations.

1. VOC content of materials shall not exceed the limits per Environmental Protection Agency National Volatile Organic Compound Emission Standards for Architectural Coatings (40CFR59).

B. The Installer is solely responsible for fume control and shall take all necessary precautions against injury to personnel or adjacent building occupants during application. As a minimum, Installer shall take the following precautions:

1. Provide and maintain barricades.
2. Locate and protect building air intakes during application.
3. Follow all state, federal, and local safety regulations.
4. Follow all Manufacturers' safety requirements.
5. Dispose empty containers immediately and properly.
6. Use protective equipment.
7. Ensure work area is well vented to the exterior.

1.6 Transportation and Handling

A. Deliver all materials to site in original, unopened containers bearing the following information:

1. Name of Product
2. Name of Manufacturer
3. Date of Manufacture
4. Lot or Batch Number

B. Store materials under cover and protected from the weather.

C. Replace containers showing any signs of damage with new material at no additional cost to Owner.

D. Mix and prepare coatings only in areas designated by the Contractor for that purpose.

E. Take precautions to prevent fire in or around coatings materials. Provide and maintain hand fire extinguisher near storage and mixing area.

F. At no time shall the weight of the stored material placed on a slab area exceed 30 PSF or 2,000 lbs. over 20 square inches.

1.7 Basis of Payment

A. Pavement marking preparation and application will be paid on a lump sum basis. Refer to Section 00300, “Bid Forms.”

PART 2 - PRODUCTS

2.1 Pavement Markings – Acrylic Waterborne

A. All materials shall meet Federal Specification TT-P-1952B.

B. Provide pavement markings as indicated on the Drawings.

C. Approved acrylic waterborne pavement markings are:

1. SetFast Acrylic Waterborne Traffic Marking Paint, The Sherwin Williams Company, Cleveland, Ohio.

   a. TM226 White
   b. TM227 Lead-Free Yellow
   c. TM2133 Low VOC Latex Traffic Marking Paint Handicap Blue

2. Water Reducible Acrylic Traffic Paint, ICI Paints, Cleveland, Ohio.

   a. 25524/22683 White
   b. 20087/20088 Lead-Free Yellow
   c. 26563/26564 Red
   d. 26565/26566 Black
   e. 20089/20090 Handicap Blue

3. Or approved equal.

PART 3 - EXECUTION

3.1 Inspection

A. Inspect surfaces to which paint will be applied and report immediately in writing to the Engineer as required in the General Conditions any conditions detrimental to the proper execution of this work.

B. Do not proceed until unsatisfactory conditions are acceptably remedied. Commencement of work implies acceptance of related work.

3.2 Preparation

A. Before commencing work, make certain that surfaces are thoroughly cleaned, dry, and in sound condition. The cleaning of concrete floor surfaces shall meet the requirements of ASTM Designation: D 4258 for Water Cleaning and Detergent Water Cleaning.

B. Any existing loose or flaking paint stripes shall be removed by grinding or scarifying so that loose paint stripe remains.

C. Do not paint any surface that is wet or damp.

D. Remove all oil, dust, grease, dirt, and other foreign material to ensure adequate adhesion.

E. Lay out all striping on each level using the existing layout. Paint Contractor shall be required to remove paint, repair surface and repaint stripes not applied in strict accordance with the Drawings.

F. Verify compatibility with concrete sealer/migrating corrosion inhibitor, joint sealant, and all other surface treatments as specified in Division 7.

3.3 Mixing

A. Do not mix different types of materials or materials from different Manufacturers.

B. Do not thin material except as recommended by Manufacturer for spray application.

C. Mix paint thoroughly by boxing, stirring or power agitation before use.

3.4 Application

A. Apply painting and finishing materials in accordance with the Manufacturer's directions. Use techniques best suited for the material and surfaces to which applied. Apply at 15 mils wet thickness.

B. Do not apply paint when the air and/or surface temperature is below 50 degrees F, when relative humidity exceeds 85%, when rain is threatening or late in the evening when dew might form before drying.

C. Allow concrete to age 60 days (asphalt 90 days) before coating.

D. Parking space striping dimensions indicated on the Drawings are nominal dimensions. Tolerances shall be as follows:

1. Parking space length shall equal indicated length ± 2 inches.

2. Parking space width (or base line dimension) shall equal indicated width ± 1 inch.

3. A string of parking spaces shall equal indicated dimension ± 2 inches per run.

4. Stripe width shall equal 4 inches ± 1/4 inch.

E. For traffic arrows add glass beads on wet paint so that proper bead embedment and retention is achieved.

3.5 Cleaning

A. Immediately upon completion of work, clean up all paint spots, remove excess materials and equipment, and repair all paint damage to other finishes.

END OF SECTION

SECTION 16010 - GENERAL ELECTRICAL REQUIREMENTS

PART 1 - GENERAL

1.1 Related Documents

A. The Condition of the Contract for Construction and the General Requirements of Division 1 of these Specifications apply to the Work in this Section.

1.2 Work Included

A. The Work of this Section shall include all materials, labor, equipment and services required to furnish, fabricate, deliver to site and install all electrical work required to repair deteriorated conduit and wiring as a result of corrosion based deterioration uncovered during concrete repairs.

1.3 Related Work

A. The following work is related to this Section:

1	Allowances	Section 01020
2.	Submittals	Section 01300
3.	Demolition	Section 02050
4.	Concrete Repair	Section 03370

1.4 Quality Control

A. Use skilled workers experienced in the area of Work.

1.5 Reference Standards

A. Comply with the provisions of the latest editions of the following Standards and Codes:

1. The state electrical administration or a local inspection department recognized by the state as having jurisdiction.
2. Requirements of state and federal Occupation Safety and Health Acts.
3. The National Electrical Code as described in detail in the "National Electrical Contractors Association Standard of Installation."

B. All materials are to conform with:

1. National Electrical Manufacturers Association (NEMA).
2. National Board of Fire Underwriters (NBFU).
3. National Electrical Code.
4. All local and state codes.

1.7 Transportation and Handling

A. Deliver material to the project in good condition. Store materials off the ground and protected from the elements.

1.8 Guarantee

A. Leave entire electrical system in proper working order.

B. Provide a one-year guarantee from the date of acceptance of the work that all the material, equipment and wiring, except lamps, furnished and installed are free from all electrical and mechanical defects.

C. Make good any defects which become apparent within that time.

D. Provide the Owner with any other guarantees extended by manufacturers of equipment furnished and installed in the Project.

PART 2 - PRODUCTS

2.1 Electrical Material

A. Products are referenced in this Specification to establish a standard of quality, style, design and function of materials, equipment, apparatus or product.

B. Provide materials that are new and listed by the Underwriters Laboratories, Inc. bearing their label wherever standards have been established.

C. Provide materials suitable for the environment and exposure.

D. Provide weatherproof or rain-tight outdoor equipment.

PART 3 - EXECUTION

3.1 Inspection

A. Inspect area to receive work and report immediately in writing to the Engineer as required in the General Conditions, any unacceptable conditions.

3.2 General

A. Minimum concrete cover requirements for reinforcing shall apply to all embedded electrical items unless indicated otherwise on the Drawings or specified otherwise herein.

3.3 Installation

A. Provide the installation free from any faults or grounds and in operation condition.

B. Provide all equipment necessary to make tests.

C. Test all completed electrical systems.

D. If faults or grounds are present, correct the trouble and retest the system.

3.4 Cleanup

A. At the completion of Work, remove from the building all rubbish and accumulated materials.

END OF SECTION