



# **PROJECT MANUAL NKU-UC PLAZA PRECAST PANEL REPAIRS HIGHLAND HEIGHTS, KY**

## **APPENDIX #1**

September 2020

THP # 20005.00

DIVISION 02 – EXISTING CONDITIONS  
SECTION 024119  
SELECTIVE STRUCTURE DEMOLITION

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. All labor, material, equipment, special tools and services to complete selective demolition work required for the project, as indicated on the Drawings and in the Specifications, but not limited to:
  - a. Demolition of selected portions of the building as indicated in the Contract Documents.
  - b. Demolition and removal from the job site of miscellaneous features as indicated in the Contract Drawings.
  - c. Removal from the job site and legal disposal of existing debris and accessories as shown on the Drawings.
  - d. Supply and maintenance of dumpsters to accommodate debris removals.
  - e. Maintenance of drains to accommodate storm water during demolition.
2. Materials Ownership:
  - a. Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain the Owner's property, demolished materials shall become the Contractor's property and shall be removed from the site with further disposition at the Contractor's option.
  - b. Storage or sale of removed items or materials on-site will not be permitted.

1.2 REFERENCES AND REGULATORY REQUIREMENTS

- A. Conform to applicable laws, ordinances, and the State Building Code for demolition of structures, safety of adjacent structures, dust control, runoff control, and disposal.
- B. Comply with ANSI A10.6.
- C. Comply with applicable requirements of NFPA Standard No. 241.75 - Safeguarding Building Construction & Demolition Operations.
- D. Obtain required permits from authorities.
- E. Do not close or obstruct roadways, sidewalks, and hydrants without permits.
- F. Do not close or obstruct egress width to any building or site exit.

- G. Do not disable or disrupt building fire or life safety systems without three days prior written notice to the Owner.
- H. Conform to applicable regulatory procedures when discovering hazardous or contaminated materials.

### 1.3 SUBMITTALS

- A. Schedule of selective demolition activities indicating the following:
  - 1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity.
  - 2. Detailed sequence of selective demolition and removal work to ensure uninterrupted progress.
  - 3. Coordination of Owner's continuing occupancy of the Building.
- B. Inventory: After demolition is complete, submit a list of items that have been removed and salvaged for Owner.
- C. Pre-demolition Photographs or Videotape: Show existing conditions of adjoining construction and site improvements, including finish surfaces, which might be misconstrued as damage caused by demolition operations. This submittal should be delivered before Work begins.

### 1.4 QUALITY CONTROL

- A. Demolition Firm Qualifications: An experienced firm that has specialized in demolition work similar in material and extent to that indicated for this Project. The firm shall have successfully performed at least three verifiable projects, similar to this project, within the last seven years.
- B. Work in this Section shall be under the immediate control of a person (Contractor's superintendent or other designated person) experienced in this type of work. The person identified with immediate control of the work shall have supervised three verifiable projects of similar magnitude and type. Supervising person shall be present during all operations.
- C. Pre-Demolition Conference: Review methods and procedures related to selective demolition including, but not limited to, the following:
  - 1. Inspect and discuss condition of construction to be selectively demolished.
  - 2. Review and finalize selective demolition schedule; verify availability of all materials, demolition personnel, equipment, and facilities needed to maintain the schedule.
  - 3. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.
  - 4. Review areas where existing construction is to remain and requires protection.

- D. The Contractor shall comply with all Federal, State and Municipal laws, codes, ordinances and regulations applicable to the Work in this Contract and also with all requirements of the National Fire Protection Association, the National Electric Code, and the Occupational Safety and Health Administration (OSHA). If the above laws, codes or ordinances conflict with this Specification, then the laws, codes or ordinances shall govern, except in such cases where the Specification exceeds them in quality of materials or labor, then the Specifications shall be followed.

#### 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store materials under cover and keep them dry and protected against damage from weather, direct sunlight, surface contamination, corrosion, construction traffic, and other causes.

#### 1.6 PROJECT CONDITIONS

- A. Contractor shall coordinate with the Owner for the required access and staging areas needed to accommodate demolition operations at grade areas.
- B. The Owner will continue to occupy portions of the Plaza immediately beneath the selective demolition area. Conduct selective demolition so that the Owner's operations will not be disrupted. Provide not less than 72 hours' notice to the Owner of activities that will temporarily affect the Owner's operations.

##### C. Demolition Efforts:

- 1. The Contractor shall collect all debris generated by the demolition process and legally dispose of off the Owner's property. Do not stockpile debris on the plaza area. Remove dumpsters containing debris upon filling to capacity or completion of the work.
- 2. The Owner assumes no responsibility for actual condition of features and components to be selectively demolished.
  - a. Conditions existing at time of inspection for bidding purpose will be maintained by the Owner as far as practical.
- 3. Maximum loaded wheel load of 250 lbs per axle on the existing plaza.
- 4. Only air filled, rubber tired dollies will be allowed on the plaza surface. Wheel spacing shall be a minimum of 3' c/c. Axel spacing shall be a minimum of 6' c/c.
- 5. Movement of debris shall be limited to protected areas of the plaza. Refer to Paragraph 3.1.B.

##### D. Utility Services:

- 1. Maintain existing utilities required to remain, keep in service, and protect against damage during demolition operations.
- 2. Do not interrupt existing utilities serving occupied or used facilities, except when authorized in writing by authorities having jurisdiction and the Owner. Provide

- temporary services during interruptions to existing utilities, as acceptable to the governing authorities and Owner.
3. Disconnect, seal, and remove utilities or services in selective demolition area before starting selective demolition operations.
- E. Damages: Promptly repair damages to adjacent construction, on or off site, caused by demolition operations at no cost to the Owner.
- F. Prevent insect and rodent infiltration. If necessary, employ an exterminator and treat entire building in accordance with governing health regulations for rodent and insect control.
- G. Hazardous Materials:
1. Notify the Owner if asbestos-containing materials are encountered during demolition.

## PART 2 PRODUCTS - (NOT USED)

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Examine areas intended for demolition and note conditions or defects that will adversely affect the execution and/or quality of the work.
- B. Notify Owner in writing of any such conditions or defects. Do not begin work until unsatisfactory conditions are corrected. Failure to notify Owner prior to beginning work constitutes acceptance by Contractor of the surfaces and conditions under which the work is to be performed, and acceptance by Contractor for the performance of the work.
- C. Inventory and record the condition of items to be removed and salvaged.
- D. Engage a professional demolition engineer to perform an engineering survey of existing conditions of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective demolition operations.
- E. Verify that hazardous materials have been remedied before proceeding with selective demolition operations.

### 3.2 PREPARATION

- A. Protection:
1. Provide temporary protection during the course of the work to prevent water entry into the building and walls and to maintain the building in a weather tight condition. Ensure that protection is in place and water tight before ending day's work.
  2. Be prepared for unexpected weather changes so that temporary protection can be quickly installed.

3. Provide, erect, and maintain temporary barriers and security devices. Prevent spread of dust, odors, and noise to permit continued Owner's occupancy.
4. Provide protection on existing surfaces and features to remain. Secure protection to prevent wind events from shifting or moving temporary protection. Securement methods shall not penetrate the surfaces or features. Protection shall define the path over which demolished material will be transported.
5. Conduct demolition operations and remove debris to ensure minimum interference with the interior of the Building, roads, streets, walks, adjacent structures, and utilities.
6. Conduct operations with minimum interference to public or private accesses. Maintain protected egress and access at all times.
7. Protect existing landscaping materials, structures, and utilities which are not to be demolished.

### 3.3 DEMOLITION REQUIREMENTS

- A. Coordinate regular removal and replacement of filled dumpsters from the job site during off hours only, unless pre-approved by the Owner in advance.
- B. Do not remove any part of the work that will leave the remaining work unstable, until adequate temporary bracing and shoring have been provided, or until permanent bracing or construction is in place. Cease operations immediately if adjacent structures appear to be in danger. Notify Owner and authority having jurisdiction. Do not resume operations until directed.
- C. If deteriorated materials, not intended for removal, are encountered during demolition, stop all work in that area and notify the Owner immediately.
- D. Demolish and remove existing construction to the extent required and as indicated. Use methods required to complete work within limitations of governing regulations and as follows:
  1. Where required, neatly cut materials to be removed. Use cutting methods least likely to damage construction to remain or adjoining construction. To minimize disturbance of adjacent surfaces, use hand or small power tools designed for sawing or grinding, not hammering and chopping. Temporarily cover openings to remain.
  2. Remove temporary work.
- E. Explosives: The use of explosives will not be permitted.

### 3.4 DISPOSAL OF DEMOLISHED MATERIALS

- A. General: except for items to be salvaged, etc, remove demolished materials from project site and legally dispose of them in an EPA approved landfill.
  1. Do not allow demolished materials to accumulate on-site.

2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
  3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
- B. Separate recyclable demolished materials from other demolished materials to the maximum extent possible. Separate recyclable materials by type.
1. Provide containers or other storage method for controlling recyclable materials until they are removed from Project site.
  2. Stockpile processed materials on site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
  3. Stockpile materials away from demolition area. Do not store within the drip lines of remaining trees.
  4. Store components off the ground and protect from the weather.
  5. Transport materials off Owner's property and legally dispose of them.
- C. Remove from site and legally dispose of debris, rubbish, and other materials resulting from demolition operations.
- D. Burning of removed materials will not be permitted on the site.

### 3.5 PATCHING AND RESTORATION

- A. Neatly patch and finish disturbed existing surfaces damaged by demolition.
- B. Verify all patch locations, methods, and procedures with Engineer prior to beginning repairs.

### 3.6 STORM DRAINAGE MAINTENANCE

- A. Maintain all drains during construction. Keep free and clear of debris to allow for proper drainage. Construction and construction barriers should not impede normal site drainage.

### 3.7 CLEANING

- A. Clean adjacent floor and wall surfaces to remove dust, dirt, debris, sludge, etc., regardless of existing conditions prior to demolition.

END OF SECTION

DIVISION 03 – CONCRETE

SECTION 030100

CONCRETE REPAIRS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. All labor, material, tools, equipment and services to perform concrete repairs at areas indicated on the Drawings and in the Specifications, including but not limited to:
  - 1. Shallow concrete topping slab repairs.
  - 2. Vertical concrete column, vertical concrete wall, and concrete wall bottom repairs.
  - 3. Miscellaneous repairs indicated on the Drawings.

1.2 RELATED SECTIONS

- A. Section 071800 – Vehicular Traffic Membrane.
- B. Section 079200 – Sealants.
- C. Section 221400 – Drains and Piping.

1.3 REFERENCES

- A. American Concrete Institute (ACI):
  - 1. ACI 301 - Specification for Structural Concrete for Buildings.
  - 2. ACI 305R - Hot Weather Concreting.
  - 3. ACI 306R - Cold Weather Concreting.
  - 4. ACI 318 - Building Code Requirements for Reinforced Concrete.
- B. American Society for Testing and Materials (ASTM):
  - 1. ASTM A185 - Specification for Steel Welded Wire, Fabric, Plain, for Concrete Reinforcement.
  - 2. ASTM A615 - Specification for Deformed and Plain-Billet Steel Bars for Concrete Reinforcement.
  - 3. ASTM A775 – Standard Specification for Epoxy-Coated Reinforcing Steel Bars.



4. ASTM C33 - Concrete Aggregates.
5. ASTM C39 - Test Method for Compressive Strength of Cylindrical Concrete Specimens.
- C. Structural Steel Painting Council (SSPC):
  1. Surface Preparation Specification No. 3 (SP3) – Wire Wheel Cleaning.
  2. Surface Preparation Specification No. 6 (SP6) – Commercial Blast Cleaning.
- D. American Association of State Highway and Transportation Officials (AASHTO):  
AASHTO M182 - Specifications for Burlap Cloth Made from Jute or Kenaf.
- E. Keep a copy of the referenced specifications cited in this section in the on-site field office.

#### 1.4 SUBMITTALS

- A. Submit literature for manufactured products, including manufacturer's specifications, test data and installation instructions.
- B. Letter stating this Contractor and supplier are familiar with the referenced standards.
- C. Submit mix designs and test results conforming to the requirements of Section 4 of ACI 301. Submit request for approval to use admixtures, if any. A complete mix design submittal must be furnished at least three weeks before the planned use of that mix. The Contractor is cautioned to undertake mix design preparation and submittal procedures immediately after authorization to proceed with the project.
  1. Submitted mix design shall address weather conditions which are expected to occur during the concrete repair phases. Concrete mixes shall not only be designed for average temperature and humidity conditions, but also for adverse conditions (hot and cold weather), as applicable to this project.
- D. Provide the following in accordance with ACI 301.
  1. Mill test for cement.
  2. Admixture certification.
  3. Aggregate certification.
  4. Procedure for adding water to ready-mix at site, including method of measuring water.
  5. Method of adding admixtures.
  6. Materials and methods for curing.
  7. Ready-Mix delivery tickets.

8. Certificate of Conformance for concrete production facilities by NRMCA (National Ready-Mix Contractors Association).
  9. Field and laboratory tests that are the Contractor's responsibility.
- E. The Owner's review of details and construction operations shall not relieve this Contractor of his responsibility for completing the work successfully in accordance with the Contract Documents.

## 1.5 QUALITY ASSURANCE

- A. The Contractor shall comply with all Federal, State and Municipal laws, codes, ordinances and regulations applicable to the Work in this Contract and also with all requirements of the National Fire Protection Association, the National Electric Code, and the Occupational Safety and Health Administration (OSHA). If the above laws, codes or ordinances conflict with this Specification, then the laws, codes or ordinances shall govern, except in such cases where the Specification exceeds them in quality of materials or labor, then the Specifications shall be followed.
- B. Concrete that does not conform to the specified requirements, including bond to substrate, strength, finish and tolerances shall be subject to removal and replacement, including necessary preparatory work, at no additional cost to the Owner and without extension to the Contract Time.
- C. Contractor shall be responsible for restoration of other components of the Work damaged during placement of concrete or damaged during removal of unsatisfactory concrete.
- D. ACI 301, ACI 305R and ACI 306R are a part of the Contract Documents, are incorporated herein as fully as if here set forth and are referred to as General Concreting Requirements.
- E. Chloride Ion Limitations: Maximum acid-soluble chloride ion concentration, in hardened concrete shall not exceed .10% by weight of cement.
- F. Concrete testing and certification shall be as described in ACI 301, Chapter 16.

## 1.6 WARRANTY

- A. A warranty period of two (2) years shall be provided for concrete work performed under this Section against defects, as determined by the Owner, including but not limited to debonding, excessive cracking and surface scaling.

## PART 2 PRODUCTS

### 2.1 MATERIALS

- A. General:
  1. Ready mixed materials used for concrete shall be furnished from the same

source throughout the project unless otherwise approved by the Owner.

B. Cement:

1. Use ASTM C150, Type I cement unless noted otherwise. Air-entrained cement shall not be used. Air requirements shall be met by separate admixtures.

C. Admixtures:

1. Air-entraining admixtures meeting the requirements of ASTM C260.
2. High range water reducer meeting the requirements of ASTM C494.
3. Calcium chloride, calcium nitrate and thiocyanates are not permitted. Admixtures containing more than 0.05% chloride ions are not permitted.
4. Use approved admixtures in accordance with manufacturer's recommendations.

D. Fine and Coarse Aggregates:

1. Meeting requirements of ASTM C-33.

E. Water:

1. Mixing water shall be potable meeting requirements of ASTM C-94.

F. Pre-packed Concrete Materials:

1. Horizontal Application – Typical Repair Areas (Patch Material Type A):
  - a. MasterEmaco T 310CI by BASF
  - b. SikaQuick 1000 by Sika Corp.
  - c. MasterEmaco T 1060/1061 by BASF
  - d. Planitop 18 ES by Mapei. (Planitop 18 TG is trowel grade for ramps)
2. Vertical and Overhead Repair Areas-Trowel Grade (Patch Material Type B.1):
  - a. MasterEmaco S 488CI by BASF
  - b. SikaQuick VOH by Sika Corp.
  - c. MasterEmaco N 425 by BASF
  - d. Planitop XS by Mapei
3. Vertical and Overhead Repair Areas-Form-and-Pour (Patch Material Type B.2):
  - a. MasterEmaco S 477CI by BASF

- b. SikaQuick FNP by Sika Corp.
  - c. MasterEmaco S 440 by BASF
  - d. Planitop 15 by Mapei
- G. Bar Coating:
  - 1. Sikadur 32, Hi-Mod LPL by Sika, Inc.
  - 2. MasterEmaco ADH 326 by BASF
- H. Bonding Agent (used for shallow floor patches if the patch is not deep enough for patch anchors; patch material must be placed while epoxy is still wet)
  - 1. Sikadur 32, Hi-Mod LPL by Sika, Inc.
- I. Welded Wire Reinforcement:
  - 1. Conforming to ASTM A185.
- J. Reinforcing Steel:
  - 1. All reinforcing steel shall have a minimum Fy of 60 ksi.
  - 2. Provide epoxy coated steel where shown on Drawings.
- K. Curing Materials:
  - 1. 10 oz. burlap meeting the requirements of AASHTO M-182.
  - 2. Visqueen: 6 mil polyethylene (white).
- L. Curing Compound:
  - 1. VOCOMP-25 by W.R. Meadows.
  - 2. MasterKure CC 1315WB by BASF
  - 3. Liquid membrane forming curing compound shall conform to the requirements of ASTM C1315, Type 1, Class A and have data from an independent laboratory indicating a maximum moisture loss of 0.40 grams per square cm. when applied at a coverage rate of 300 square feet per gallon.
- M. Form Lumber:
  - 1. New fire-retardant material, grade and size to adequately form, support and brace concrete and to provide finishes that match adjacent surfaces.
- N. Epoxy Grout:
  - 1. Sikadur 32, Hi-Mod LPL epoxy mixed with silica sand.
- O. Patch Anchors:

1. Stainless steel spikes by Powers Rawl.

## PART 3 EXECUTION

### 3.1 GENERAL

- A. Prior to the start of work, the Contractor shall survey areas to receive repair concrete to determine locations and approximate quantity of material.
- B. Prior to start of excavations, perform an on-site review of the work areas with the Owner. Provide a minimum of 2 working days' notice prior to the requested review day.
- C. Prior to performing operations such as jack hammer work, the Contractor shall make a careful and thorough survey of the underside of the level on which he intends to work and shall remove all loose soffit concrete which may fall as a result of those operations. The Contractor shall also be responsible for posting all signs and erecting all barricades as necessary to prevent pedestrians and vehicles from entering the area below hazardous work.
- D. During concrete removal work, Contractor shall not damage existing mild steel reinforcement. Mild steel reinforcement that is damaged by the Contractor, as determined by the Owner, shall have a new reinforcing bar the same size as the damaged bar lapped to each side of the damaged area. Lap lengths shall be determined by ACI 318. Cost of new reinforcing bar, concrete removal and patching for lap length shall be borne by the Contractor.
- E. It is intended that the existing reinforcement steel exposed during the work shall remain in place (unless noted on Drawing for removal) and undamaged during removal of the unsatisfactory concrete. Tie loose reinforcement bars in place in an approved manner prior to placing patch mix. If the reinforcement is deteriorated, as determined by the Owner, the Owner may direct that it be replaced and spliced in accordance with ACI splice and development requirements for reinforcement bars. Additional concrete removal may be required to expose undamaged reinforcing. If required, compensation will be made in accordance with the established Unit Prices.
- F. Concrete placement for patches or overlays on sloping surfaces shall begin on the low elevation end and proceed upwards to the high elevation end.
- G. Control joints to be either tooled or sawed into concrete slab. Confirm control joint pattern with Owner prior a minimum of 24 hours prior to placement of concrete. Tooled joints are to be cut while concrete is wet. Sawed joints to be cut within 6 hours of slab placement before slab begins to crack.

### 3.2 PROTECTION

- A. Contractor shall protect all open excavations, and reinforcing therein, from damage due to mechanical disturbance, weather conditions or other causes.

- B. Contractor shall protect occupied areas below the work area during all phases of the work including removal, preparation and placement of materials.
- C. Provide barricades to close areas immediately below the work area. Coordinate the time closing of required areas with the Owner.

### 3.3 SHALLOW FLOOR REPAIR PROCEDURE

- A. Refer to the Drawings for repair details. Contractor shall sound the concrete deck using chain drag method and hammer survey to identify the limits of deteriorated concrete within the Work Area. Mark with paint each area to be repaired. Location of paint marks must be approved by the Owner's representative.
- B. Before removal of floor concrete within a Work Area, the Contractor and the Owner's representative will record the area bounded by the paint marks. Take measurements to the nearest inch in such a way that results in a total plan area at each location.
- C. Contractor and Owner's representative shall affix their signatures to each measurement sheet completed, attesting to the agreed-upon accuracy of the measurements. Furnish copies of measurement sheets to both parties for their records.
- D. Sum and calculate the total repair area to yield total square feet. Measurements are the sole basis for calculation of final payment, based upon the item's unit price. Base unit price on the area of the repair and the depths indicated on the repair details.
- E. Remove floor concrete within the Work Area by conventional chipping methods.
- F. Conventional Chipping Method:
  - 1. Sawcut the concrete deck surface along the perimeter of the paint marks which define the removal area. Do not cut existing reinforcement. Depth of sawcuts shall be 3/4 inch. Cut perimeter of removal area before beginning chipping hammer work. Do not over cut corners of patch area.
  - 2. Perform concrete removal with no larger than 18 pound chipping hammers.
  - 3. Begin concrete removal at the center of the removal area and work towards the sawcut perimeter. Maintain vertical sawcut edge at perimeter. Re-saw if necessary, to maintain required edge.
  - 4. Contractor shall use due diligence to perform concrete chipping operation in a manner to avoid punching through slab. Means such as utilizing wide chipping blades and performing chipping procedures on a low angle are recommended.
- G. The surface of the sound, exposed concrete shall be relatively flat with 1/4" amplitude over the repair area for new concrete patches and overlays. Contractor is responsible for ensuring that the final concrete repair area is sound.

- H. Within 24 hours of concrete repair material placement, media blast the excavation and the immediately adjacent surface. Reinforcing steel shall be cleaned to a SSPC-SP6 condition unless otherwise indicated.
- I. After completion of all cleaning operations, blow-out excavations with oil-free and water-free compressed air. Previously cleaned excavations that are subjected to contamination must be re-cleaned.
- J. The Owner will inspect excavations prior to coating reinforcing steel. Final touch-up of excavations and reinforcing steel shall be performed before proceeding.
- K. Within 8 hours after cleaning, coat all surfaces of exposed steel with one coat of bar coating. Allow coating to become tack free before proceeding with second coat.
- L. Apply second coat of bar coating to previously coated steel. Do not apply coating to substrate or allow coating to puddle in low areas of excavation.
- M. Thoroughly saturate all concrete surfaces to be in contact with new concrete as necessary to provide a saturated surface dry condition.
- N. Just prior to concrete placement blow-down area with oil-free compressed air to remove standing and puddled water.
- O. Place Patch Material Type A in the excavations. Vibrate new patch material to ensure consolidation in maximum-depth areas and at the excavation's perimeter. Screed material flush with adjacent surfaces and finish with a float or light trowel.
- P. After finishing, fog concrete surfaces with water using approved fog spray device (hose not permitted) to prevent surface drying prior to start of curing.
- Q. Cure Patch Material Type A in accordance with manufacturer's written instructions.

#### 3.4 OVERHEAD AND VERTICAL REPAIR PROCEDURE

- A. Refer to the Drawings for repair details. Contractor shall sound overhead and vertical concrete surfaces using hammer sounding techniques to identify the limits of deteriorated concrete within the Work Area. Mark with paint each area to be repaired. Location of paint marks must be approved by the Owner's representative.
- B. Before removal of overhead or vertical concrete within a Work Area, the Contractor and the Owner's representative will record the area bounded by the paint marks. Take measurements to the nearest inch in such a way that results in a total plan area at each location.
- C. Contractor and Owner's representative shall affix their signatures to each measurement sheet completed, attesting to the agreed-upon accuracy of the measurements. Furnish copies of measurement sheets to both parties for their records.

- D. Calculate and sum the total repair area to yield total square feet. Measurements are the sole basis for calculation of final payment, based upon the item's unit price. Base unit price on the area of the repair and the depths indicated on the repair details.
- E. Remove concrete within the Work Area by conventional chipping methods.
- F. Conventional Chipping Method:
  - 1. Saw cut the concrete surface along the perimeter of the paint marks which define the removal area. Do not cut existing reinforcement. Depth of saw cuts shall be 1/2 inch. Cut perimeter of removal area before beginning chipping hammer work. Do not over cut corners of patch area.
  - 2. Perform concrete removal with no larger than 18-pound chipping hammers.
  - 3. Begin concrete removal at the center of the removal area and work towards the saw cut perimeter. Maintain vertical saw cut edge at perimeter. Resaw if necessary, to maintain required edge.
  - 4. Contractor shall use due diligence to perform concrete chipping operation in a manner to avoid punching through a slab. Means such as utilizing wide chipping blades and performing chipping procedures on a low angle are recommended.
- G. The surface of sound, exposed concrete shall be relatively flat with a 1/4" amplitude over the repair area. Contractor is responsible for ensuring that the final concrete repair area is sound.
- H. Within 24 hours of concrete repair material placement, media blast the excavation and the immediately adjacent surface. Reinforcing steel shall be cleaned to a SSPC-SP6 condition unless otherwise indicated.
- I. After completion of all cleaning operations, blow-out excavations with oil-free and water-free compressed air. Previously cleaned excavations that are subjected to contamination must be re-cleaned.
- J. The Owner will inspect excavations prior to coating reinforcing steel. Final touch-up of excavations and reinforcing steel shall be performed before proceeding.
- K. Within 8 hours after cleaning, coat all surfaces of exposed steel with one coat of bar coating. Allow coating to become tack free before proceeding with second coat.
- L. Apply second coat of bar coating to previously coated steel. Do not apply coating to substrate.
- M. Maintain all concrete surfaces of repair areas in a wet condition to provide a surface saturated dry condition.
- N. Just prior to material placement, blow-down area with oil-free compressed air to



remove any standing water near vertical repair locations.

- O. Place Patch Material Type B in the excavations per manufacturer's written instructions. Vibrate new patch material at vertical repairs to ensure consolidation in maximum-depth areas. Screed material flush with adjacent surfaces and finish with a light trowel.
- P. After finishing, fog concrete surfaces with water using approved fog spray device (hose not permitted) to prevent surface drying prior to start of curing.
- Q. Cure Patch Material Type B in accordance with manufacturer's written instructions.

### 3.5 EPOXY GROUT INSTALLATION PROCEDURE

- A. Saw cut the concrete deck surface along the perimeter of the paint marks which define the removal area. Do not cut existing reinforcement. Depth of saw cuts shall be  $\frac{3}{4}$  inch. Cut perimeter of removal area before beginning chipping hammer work.
- B. Begin concrete removal at the center of the removal area and work towards the saw cut perimeter. Maintain vertical saw cut edge at perimeter. Resaw if necessary, to maintain required edge.
- C. Prior to epoxy grout placement, media blast the excavation and the immediately adjacent surface. Reinforcing steel shall be cleaned to a SSPC-SP6 condition unless otherwise indicated.
- D. Mix epoxy mortar using 2 parts epoxy and 1 part clean over dried silica sand.
- E. Apply neat epoxy worked into substrate for positive adhesion. Immediately follow with application of the epoxy mortar. Follow manufacturer's instructions for mixing and installation.
- F. Do not allow traffic on epoxy mortar patch for a minimum of 24 hours.

### 3.6 FIELD QUALITY CONTROL

- A. All excavations shall be inspected and approved prior to placing concrete. The Contractor shall notify the Owner 2 working days in advance of required inspection.
- B. Notify the Owner at least 2 working days prior to placing concrete.
- C. Acceptance of Structure:
  - 1. Acceptance of Structure shall be in accordance with ACI 301 Chapter 18.
  - 2. Contractor shall bear all costs of correcting rejected work, including the cost of Owner's services thereby made necessary.

### 3.7 CLEANING

- A. Empty containers shall be removed from the Work Area at the end of each working day. Cloths soiled with adhesive materials that might constitute a fire hazard shall be placed in suitable metal safety containers or shall be removed from the building at the end of each working day. Special care shall be taken in storage of disposal of flammable materials. Comply with health, fire and environmental regulations.
- B. All spilled materials shall be completely removed from hardware, adjacent floor areas, metal work, etc. Remove spilled coating by approved methods.
- C. Repaint in matching color all curbs, columns, walls, etc., where existing paint was removed during preparation of adhesive materials installations.
- D. All hardware, adjacent floor areas, metal work, etc., and the general premises shall be left clean and free of all construction dust, dirt and debris.

END OF SECTION

DIVISION 05 – METALS  
SECTION 055000  
MISCELLANEOUS METALS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. All labor, material, equipment, tools and services to complete the miscellaneous metals work required for the project as indicated on the Drawings and in the Specifications, including but not limited to:
  - 1. Supplemental angle bracing supports to reinforce existing concrete wall.

1.2 RELATED SECTIONS

- A. Concrete Repairs - Refer Section 030100.

1.3 REFERENCES

- A. The following codes and standards are hereby incorporated as part of the Project Specifications. These codes and standards including all supplements, apply to all miscellaneous metal work as if fully reproduced herein. Modifications in this Specification when in conflict with the referenced codes and standards, shall take precedence over the referenced codes and standards.
  - 1. AISI Code of Standard Practice for Steel Buildings and Bridges, and including the Commentary on the Code of Standard Practice, 1986 Edition.
  - 2. AISC Code of Standard Practice for Steel Buildings and Bridges, 2000 Edition.
  - 3. American Welding Society (AWS) Structural Welding Code - Steel, 1990 Edition.
  - 4. ASTM A6 - General Requirements for Delivery of Rolled Steel Plates, Shapes, Sheet Piling and Bars for Structural Use.
  - 5. ASTM A123 - Zinc (Hot Dipped Galvanized) Coatings on Iron and Steel.
  - 6. ASTM A153 - Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
  - 7. ASTM B221-88 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Shapes and Tubes.
  - 8. ASTM B209-88 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
- B. Structural Steel Painting Council (SSPC):
  - 1. Surface Preparation Specification No. 3 (SP3) – Wire Wheel Cleaning.

2. Surface Preparation Specification No. 6 (SP6) – Commercial Blast Cleaning.

1.4 SUBMITTALS

- A. Submit literature for manufactured products, including manufacturer's specifications, test data and installation instructions.
- B. Submit shop drawings for review of all fabricated items. Include complete details and schedules. Submit field measurements of existing conditions with shop drawings.

1.5 QUALITY ASSURANCE

- A. Steel Fabricator shall have not less than 5 years experience in the fabrication of miscellaneous steel.
- B. All welders, welding operators, tackers and inspectors shall be fully qualified in accordance with the requirements of the American Welding Society for the type of work they are to perform. Copies of certification shall be submitted prior to performing that work.
- C. Modifications to the AISC Code of Standard Practice:
  - 1. Restoration drawings and details are to be used in place of more detailed structural steel plans. Requirements for structural steel work may be shown on restoration drawings and details.
  - 2. Contract drawings may be made to a scale less than 1/8-inch to the foot. With approval, shop drawings may also be made to a lesser scale.
  - 3. Section 4.2 is to be replaced with the following sections:
    - 4.2 Review of Shop Drawings - Shop drawings shall be made by the Contractor and submitted to the Owner for review. The Owner will endeavor to complete his review of a shop drawings submittal within 7 days of his receipt of a submittal. Shop drawings shall be returned noted: "No exceptions noted", or "Exceptions noted", or "Exceptions noted: revise and resubmit". Fabrication of material before the receipt of shop drawings for that material noted "No exceptions noted" shall be at the Contractor's risk.
    - 4.2.1 Review of shop drawings does not relieve the Contractor of the responsibility for: accuracy of detail dimensions: the general fit-up of parts to be assembled in the field; the ability to erect the material; the adequacy of any members or connections designed by the Contractor.
    - 4.2.2 Any notations by the Owner made on the shop drawings do not authorize additional compensation for the Contractor without the issuance of a formal change order.
- D. The Contractor shall comply with all Federal, State and Municipal laws, codes,

ordinances and regulations applicable to the Work in this Contract and also with all requirements of the National Fire Protection Association, the National Electric Code, and the Occupational Safety and Health Administration (OSHA). If the above laws, codes or ordinances conflict with this Specification, then the laws, codes or ordinances shall govern, except in such cases where the Specification exceeds them in quality of materials or labor, then the Specifications shall be followed.

## 1.6 MATERIAL STORAGE AND HANDLING

- A. Protect metal from damage and deterioration.
- B. Support continuous lengths of material as necessary to keep from deflecting and bending.
- C. Store material off ground and keep covered and out of weather.

## 1.7 WARRANTY

- A. A warranty period of two (2) years shall be provided for all repair work of existing steel connections performed under this Section, against defects, as determined by the Owner, including but not limited to weld failures, rust formation at field galvanized or painted surfaces, and embedment failures.
- B. A warranty period of five (5) years shall be provided for all new steel fabrication and installation work performed under this Section, against defects, as determined by the Owner, including but not limited to weld failures, rust formation at field galvanized or painted surfaces, and embedment failures.

## PART 2 PRODUCTS

### 2.1 MATERIALS

- A. Wide Flange Shapes: ASTM A992.
- B. Rolled Steel Plates, Shapes and Bars: ASTM A36.
- C. Steel Tubes: ASTM A500, Grade B
- D. Expansion Anchors – Stud Type:
  - 1. Stud type with wedge meeting requirements of Federal Specification A-A 1923A, Type 4. Zinc plated in accordance with ASTM B633.
  - 2. Basis of Design: Kwik Bolt TZ Expansion Anchor by Hilti.
- E. Adhesive Anchors
  - 1. Injectable adhesive shall be used for installation of steel reinforcing dowels or threaded anchor rods into new or existing solid base materials, such as concrete, grout, stone or solid masonry. Only injection tools and static mixing nozzles as recommended by manufacturer shall be used.

2. Basis of Design: HIT HY 200 Injection Adhesive Anchors by Hilti.

F. Threaded Fasteners:

1. Steel Framing - High strength, heavy hexagon structural bolts, heavy hexagon nuts and hardened washers, quenched and tempered medium-carbon steel, complying with ASTM A325.
2. Dywidag Threadbar – Threads shall be deformed, not cut, conforming to ASTM A615. Dywidag bar material (grade 160) shall conform to ASTM A722.
3. All-Thread Bars – Stainless steel, fully threaded bars meeting AISI 316.
4. All Other Bolts – Regular low carbon steel hexagonal bolts and hexagonal nuts with washers, complying with ASTM A307.

- G. Welding: The Contractor shall determine, in accordance with AWS requirements, and submit to the Owner review, appropriate welding materials and procedures for the base metals involved for all welding in both new and existing structures.

## 2.2 FABRICATION

A. General:

1. Fabricate items in accordance with AISC Specifications and as indicated on the final shop drawings.
2. Properly mark and match-mark materials for field assembly. Fabricate for delivery sequence which will expedite installation and minimize field handling of materials.
3. Where finishing is required, complete the assembly, including connections and welding of units, before start of finishing operations.
4. Mill all surfaces in contact bearing.

B. Connections:

1. Provide welded shop connections unless otherwise shown. Grind smooth and flush all welds to match curve of joints. Grind welded area to remove weld flux, slag and spatter.
2. Provide field bolted or field welded connections as indicated.
3. Comply with AWS Code for procedures, appearance and quality of welds, and methods used in correcting welding work. Assemble and weld sections by methods which will produce true alignment of axis without warp.

C. Surface Preparation:

1. After inspection and before shipping, clean all metal fabrications to be painted or galvanized. Remove loose rust, mill-scale and splatter. Clean metal

fabrications in accordance with SSPC SP-6.

2. Immediately after surface preparation, apply to all painted metal fabrications primer paint in accordance with paint manufacturer's written instructions. Use painting methods which will result in full coverage of joints, corners, edges and all exposed surfaces. No sags or runs permitted on steel that will be exposed in the finish work. Do not shop paint items to be galvanized.
3. Clean and touch-up with galvanizing repair paint all abrasions on galvanized items before shipment.

## PART 3 EXECUTIONS

### 3.1 EXAMINATION AND PREPARATION

- A. Field measure all existing dimensions and be aware of all existing conditions which relate to the work prior to fabrication. Items fabricated without prior field verification shall not be the responsibility of the Owner and the Contractor shall fabricate new items at no additional cost to the Owner and no time extension shall be granted.
- B. Examine the areas and conditions under which the work is to be installed and notify the Owner in writing of conditions detrimental to the proper and timely completion of the work.
- C. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the Engineer.

### 3.2 INSTALLATION

- A. Comply with AISC Specifications and Code of Standard Practice, and with specified requirements.
- B. Provide erection equipment, hoists, temporary shoring and bracing, and other equipment required for proper and safe erection of the work. Do not remove temporary members and connections until permanent construction required to make installation self-supporting is in place and final connections are made.
- C. Provide temporary planking and working platforms as required and as necessary to effectively and safely complete the work.
- D. Field Assembly:
  1. Set metal fabrications accurately to the lines and elevations indicated. Align and adjust the various members forming a part of a complete installation before permanently fastening. Perform necessary adjustment to compensate for discrepancies in elevations and alignment.
  2. After metal fabrications installations are complete, foul threaded anchors.
- E. Following installation of metal fabrications clean all mud, dirt and debris

accumulated during installation. Inspect all items for abrasions and touch up with specified primer.

### 3.3 EXISTING CONNECTION REPAIRS

- A. Identify existing connections potentially requiring repairs in accordance with the drawings. Confirm work locations with the Owner prior to starting repair efforts.
- B. Remove and discard all components of broken connections, including weld materials and connection plates or rods. Do not reuse. Grind embedded connection plates scheduled to remain to assure all weld remnants are removed.
- C. Confirm size, or range of sizes, of replacement connection plates or rods, and the size and length of repair welds with the Owner in advance.
- D. Coordinate repairs of connections impacted by daily temperature induced volume changes with Owner to allow for repair work to be performed as early as possible in the morning, at or near the coolest portion of the day. Do not perform repair of connections impacted by volume changes after 10:00 AM. Confirm connection repairs governed by these restrictions in advance with the Owner.
- E. Perform repairs in accordance with the Drawings and this Section.
- F. Contractor superintendent or project manager not involved in execution of weld repairs shall provide quality control review of all field welds of existing connections repairs, and submit a report to the Owner regarding the inspection, including data regarding the repair locations, date and other pertinent information.

END OF SECTION



DIVISION 07 – THERMAL AND MOISTURE PROTECTION

SECTION 071400

FLUID APPLIED WATERPROOFING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Hot-applied waterproofing system.

1.2 RELATED SECTIONS

- A. Section 030100 – Concrete Repair.
- B. Section 079200 – Sealants.
- C. Section 221400 – Drains and Piping.

1.3 REFERENCES

- A. American Society for Testing and Materials (ASTM):
  - 1. ASTM D-1621: Standard Test Method for Compressive Properties of Rigid Cellular Plastics.
  - 2. ASTM D-4491: Standard Test Method for Water Permeability of Geotextiles by Permittivity.
  - 3. ASTM D-4632: Standard Test Method for Grab Breaking Load and Elongation of Geotextiles.
  - 4. ASTM D-4716: Standard Test Method for Determining the (in-plane) Flow Rate per Unit Width and Hydraulic Transmissivity of Geosynthetic Using a Constant Head.
  - 5. ASTM D-4751: Standard Test Method for Determining Apparent Opening Size of a Geotextile.
  - 6. ASTM D-4833: Standard Test Method for Index Puncture Resistance of Geotextiles, Geomembranes and Related Products.

1.4 DEFINITIONS

- A. The term "manufacturer's recommendations," or variations thereon shall mean "manufacturer's recommendations which are found in publications available to and commonly used by the general architectural and consulting professions."

1.5 SUBMITTALS

- A. Literature for manufactured products, including manufacturer's specifications, test data, installation instructions and applicator's manual.

- B. Letter of applicator approval from the manufacturer per Paragraph 1.6.B.
- C. Letters of experience per Paragraph 1.6.C.
- D. Letter from manufacturer stating their system as specified is suitable for use in this project.
- E. Material Safety Data Sheets on all materials.
- F. Upon completion of the work and before final payment provide fully executed warranties.
- G. Materials and procedures to be used in the repair of the existing waterproofing membrane and expansion joint flashing.

## 1.6 QUALITY ASSURANCE

### A. Applicable Codes:

- 1. The Contractor shall comply with all Federal, State and Municipal laws, codes, ordinances and regulations applicable to the Work in this Contract and also with all requirements of the National Fire Protection Association, the National Electric Code, and the Occupational Safety and Health Administration (OSHA). If the above laws, codes or ordinances conflict with this Specification, then the laws, codes or ordinances shall govern, except in such cases where the Specification exceeds them in quality of materials or labor, then the Specifications shall be followed.
- 2. If the above laws, codes or ordinances conflict with the Specification, then the laws, codes or ordinances shall govern, except in such cases where the Specification exceeds them in quality of materials or labor, then the Specifications shall be followed.

### B. The membrane system applicator shall be approved by the manufacturer prior to the start of work.

### C. Membrane applicator's lead personnel (field superintendent and foreman) in charge of the work shall each have the following experience:

- 1. Three (3) verifiable years of experience supervising the application of the membrane system being provided on this project.
- 2. Successfully installed three (3) membrane projects of similar size, type and using the same membrane system being provided on this project.

### D. Membrane applicator's lead personnel shall be present for all field operation pertaining to this waterproofing system installation.

### E. The Owner reserves the right to request different lead personnel if, in the Owner's opinion, those assigned to the project are not qualified by way of experience or ability to perform the Work. Comply with the Owner's request at no additional cost.

F. Substrate Compatibility:

1. The manufacturer and contractor shall:
  - a. Jointly review and inspect the substrate materials to which the new waterproofing membrane is intended to be applied.
  - b. Perform tests as necessary to ensure compatibility and verify the absence of materials - visible and invisible - detrimental to the application or performance of the waterproofing membrane.
  - c. Review materials specified elsewhere in the Construction Documents to which the waterproofing membrane is intended to be applied.
2. If inspections, tests or review of materials and substrate reveal conflicts of compatibility with the intended waterproofing membrane provide written evidence of the compatibility conflict to the Owner prior to ordering of materials.
3. By beginning the waterproofing system (including substrate preparation), the Contractor accepts the responsibility for ensuring the performance of the waterproofing system.
4. If the Contractor fails to submit proof of incompatible materials, and if failure of the waterproofing system is a result of chemical or physical incompatibilities with existing or specified products or materials, the Contractor is responsible for all costs related to correcting the deficient work and for all direct and indirect costs to the Owner.

G. Testing:

1. The Owner may perform tests to ensure compliance with the Contract Documents and manufacturer's requirements.
2. If tests reveal noncompliance, correct deficiencies in a manner approved by the Owner and the manufacturer at no additional cost.
3. Except as otherwise specified, the Owner will pay the cost of the tests, including repair and patching of test areas.
4. Where tests reveal deficiencies in the membrane materials or installation, the costs of the tests, and repair and patching of the test areas shall be borne by the Contractor.

H. Air compressors shall be equipped with functional oil and water separators.

1.7 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to job site in sealed, undamaged containers. Identify each container with the material's name, lot number and date of manufacture.
- B. Store membrane materials in a place specifically assigned for that purpose and

which is well ventilated, lighted and not subject to direct sunlight.

- C. Heat or cool the storage area to maintain temperatures within the range recommended by the membrane manufacturer.
- D. Keep membrane materials sealed in original containers when not in use.
- E. Keep storage area neat and clean.
- F. Do not overload or otherwise distress the structure.
- G. Handle membrane system materials in strict accordance with safety and weather limitations required by product literature or as modified by applicable rules and regulations of Local, State and Federal authorities having jurisdiction.
- H. When using toxic or flammable solvents, take necessary precautions as recommended by the manufacturer. The handling and use of toxic or flammable solvents, including adequate ventilation and personal protective equipment, shall conform to the requirements of the applicable safety regulatory agencies.

#### 1.8 JOB CONDITIONS – WEIGHT RESTRICTIONS AND MOVEMENT

- A. The Contractor shall use equipment for membrane installation on structured concrete slab areas with the following weight restrictions:
  - 1. The maximum wheel load shall not exceed 2,000 lbs.
  - 2. The maximum distributed load shall not exceed 90 psf.
  - 3. Wheel base of loaded equipment shall not exceed 5 feet.
  - 4. Equipment positioning, movement and orientation is subject to Engineer and Owner review.

#### 1.9 WARRANTY

- A. The completed installation shall be warranted by the manufacturer against defects of materials, and by the Contractor for defects in workmanship for a period of ten (10) years, beginning with the date of substantial completion for the Project.
- B. The warranty shall not require the signature of the Owner.

### PART 2 PRODUCTS

#### 2.1 MEMBRANE MATERIALS

- A. Hot applied reinforced waterproofing membrane, approved products:
  - 1. Monolithic Membrane 6125 by Hydrotech, Inc.
- B. Primer: Required. Product as recommended by the waterproofing membrane manufacturer.

- C. Flashing/reinforcing sheet: Spunbonded polyester fabric as recommended by the membrane manufacturer. Use uncured neoprene reinforcement sheet where required by the waterproofing manufacturer and at all membrane penetrations.
- D. Protection Course: Required. Product as recommended by the waterproofing membrane manufacturer.
- E. Drainage Board:
  - 1. Profile – Dimple board with high impact polystyrene core and woven filter fabric bonded to individual dimples.
  - 2. Board Thickness – 0.25 to 0.38 inches.
  - 3. Board Compressive Strength – Minimum 30,000 psf.
  - 4. Board Flow Rate – 15 gallons/min./sq.ft at 3600 psf and hydraulic gradient 1.0 per ASTM D-4716.
  - 5. Fabric opening size – US standard sieve 80 per ASTM D-4751.
  - 6. Fabric Tensile Strength – 205 lbs. per ASTM D-4632.
  - 7. Fabric Flow Rate – 95 gallons/sq.ft. per ASTM D-4491.
- F. Filter Fabric: Woven drainage fabric with the following characteristics:
  - 1. Weight – 6.5 oz/sq.yd.
  - 2. Grab Strength – 400x250 per ASTM D-4632.
  - 3. Puncture Strength – 80 lbs. per ASTM D-4833.
  - 4. Equivalent Opening Size – 70-100 US Standard sieve per ASTM D-4751.
  - 5. Water
- G. Adhesives and Sealants: As recommended and approved by the membrane manufacturer.
- H. Neoprene Flashing Sheet: Fabric reinforced, minimum 60 mil thick material as recommended by waterproofing membrane manufacturer.

### PART 3 EXECUTION

#### 3.1 PROTECTION

- A. Do not allow construction equipment or other trades on prepared concrete substrate or existing waterproofing system.
- B. Do not store materials or equipment on prepared concrete substrate or existing waterproofing system.

- C. Do not allow construction traffic personnel to traverse across prepared concrete substrate or existing waterproofing system.

### 3.2 PREPARATION

#### A. General:

1. Perform surface preparation and cleaning procedures in accordance with this Section unless the waterproofing system manufacturer has more stringent requirements. Apply membrane to clean, dry, prepared surfaces.
2. Patch or detail voids and other surface defects as required providing a uniform, smooth substrate for the membrane application. Follow the membrane manufacturer's written recommendations.
3. Clean substrate surfaces to the standard of cleanliness required by the membrane manufacturer.
4. Clean substrate surfaces free of oil, grease, loose concrete, dirt, and any other debris that will inhibit bond or be detrimental to the system. Leave the prepared surface with a uniform texture and no more than 1% of the total surface area in noncompliance.
5. Do not use acids for surface preparation.
6. Do not use water (high pressure or low pressure) for surface preparation.

#### B. New Concrete:

1. Do not prepare substrate surfaces until the new concrete has reached adequate cure. Verify in writing the acceptable cure time from the membrane manufacturer.
2. Immediately prior to waterproofing installation, mechanically sweep and blush surfaces to loosen laitance and debris. Blow clean with oil-water free compressed air.

#### C. Existing Concrete:

1. Hand scrape to remove all remaining remnants of the previous waterproofing membrane not removed during demolition.
2. Shotblast with vacuum process or grind and vacuum surfaces to remove previous membrane residue from the concrete surfaces.
3. Immediately prior to waterproofing installation, clean surfaces to remove laitance and debris per manufacturer's requirements.

#### D. Metals:

1. Sandblast metal surfaces that will be in contact with membrane system.

### 3.3 APPLICATION OF NEW MEMBRANE SYSTEM

#### A. General:

1. Provide a total membrane system which the manufacturer recommends for this project. This Section specifies the minimum membrane mil thickness and system installation specifics required for the work.
2. Heat and apply the membrane in accordance with the manufacturer's instructions. Use materials and application techniques to prevent pinholing and blistering.
3. Terminate membrane on vertical surfaces 1/2" below the top of finish surfaces or grade which will be installed after the work of this Section.
4. Mask vertical surfaces as required to protect the adjacent surface finishes. Use temporary steel sleeves to protect newly installed reinforcing dowels, rods and tree tie-down eyelets during membrane installation.
5. Provide surface condition or primers on substrate as required by the membrane manufacturer.
6. Ensure specified application rates of liquid products on vertical and steeply sloped surfaces by using multiple applications of material over previous applications which are fully cured.

#### B. Reinforced Membrane Waterproofing:

1. In general floor areas, provide a minimum 90 dry mil membrane detail coat and continuous reinforcement sheet as required by the membrane manufacturer.
2. Provide a minimum 90 dry mil membrane detail coat and reinforcement sheet at interior and exterior corners and other changes in the substrate direction.
3. Provide a minimum 90 dry mil membrane detail coat and reinforcement sheet on all unit masonry walls, continuous with detail coat at adjacent wall to floor intersections.
4. Provide a minimum 90 dry mil membrane coat and uncured neoprene flashing sheet around drains and other slab penetrations at interior corners where slabs meet perimeter retaining walls, and at metal angles at expansion joints.
5. While membrane is hot, install reinforcing fabric and completely embed into liquid membrane.
6. Provide a minimum 125 dry mils second coating of membrane, for a total reinforced membrane thickness including the detailing of 215 dry mils. Modify coverage to account for existing surface roughness.

7. Otherwise refer to requirements of paragraph 3.3.A.

C. Protection Course:

1. Soon as possible following second coating of membrane, provide protection board on the membrane in compliance with the membrane manufacturer's recommendations.
2. Install no piece less than ten (10) square feet in size.
3. Ensure the protection board lays flat and in contact with the membrane.

D. Drainage Board:

1. Provide drainage board on all surfaces, including vertical surfaces, as indicated.
2. Begin installation at low point of deck area and proceed to high point. Panels shall be butted tightly.
3. Overlap drainage fabric in shingle fashion between abutting panels. Minimum overlap of fabric onto adjoining panel shall be 2".
4. Seal fabric overlap to abutting panel fabric with mastic as approved by the drainage board manufacturer. Install a minimum 1/4" wide continuous bead of mastic between overlap areas.
5. Where drainage board terminates at walls or other projections, wrap filter fabric over exposed edge and terminate on underside of board. Extend filter fabric a minimum of 1-1/2 inches onto underside of board.
6. Temporarily weight drainage board to maintain in place until next phase of work. Size and type of weight provided shall not damage previously complete waterproofing work or drainage board.
7. Cover drainage board promptly with next phase of work. Do not allow drainage board to be exposed for more than seven days. If drainage board is scheduled for exposure beyond seven days, install a supplemental layer of filter fabric to protect against excessive dirt and debris buildup as well as UV exposure. Remove and discard filter fabric prior to the installation of permanent overburden materials.

### 3.4 FIELD QUALITY CONTROL

A. Site Tests:

1. Water test:
  - a. Prior to installation of drainage board, water test membrane by ponding a minimum of 2 inches for a period of 24 hours to ensure a watertight system.



- b. At sloped areas of greater than 2% or ramp areas, maintain a curtain of water flowing continuously over the area for a period of 48 hours.
  - c. Provide means of water containment during water testing to prevent flooding of adjoining areas and areas below the plaza.
  - d. Verify that the structure can support the dead load weight of the water prior to testing.
  - e. If leaks occur, drain area and repair membrane. Retest.
  - f. Construct water containment barriers as approved by the membrane manufacturer.
  - g. Water tests can be waived jointly by the Owner and the Manufacturer, only after the Contractor has demonstrated the ability to provide successful system installation in previous application areas.
2. Application monitoring:
- a. Keep at the site and maintain in proper condition an adequate number (at least one per application crew) of durable, wet film thickness gauges.
  - b. Continuously use gauges during the application process to ensure the specified thickness.
  - c. Owner will periodically monitor the application rates of the membrane components and will notify the job foreman of noted discrepancies.
  - d. Owner's periodic monitoring of the application rates shall not relieve the Contractor of the responsibility to provide the specified membrane thickness.

B. Manufacturer's Field Service:

- 1. A technically competent employee of the waterproofing membrane manufacturer (the technician), not associated with the Contractor, the installation crew, product distributor or sales representative shall be on site before the first installation of the membrane system. Provide resume of experience and credentials for approval by the Owner.
- 2. The technician shall remain on site for the length of time necessary to observe the preparation and installation of 50% of the waterproofing membrane system (including drainage board).
- 3. Do not begin application of the waterproofing membrane system until the technician has approved the preparation, cleanliness and surface texture of the substrate.
- 4. The technician shall review all Contractor application techniques and procedures and shall advise the Contractor when, where and as required to

obtain specification compliance.

5. Owner reserves the right to request the presence of the same technician on site for installation of the remainder of the waterproofing membrane system or related work if difficulties are encountered, as determined by the Owner, at no additional cost to the Owner.
6. Owner reserves the right to request a different technician if the one at the site fails to perform the duties herein specified. The Contractor and manufacturer shall comply with the Owner's request at no additional cost to the Owner.

### 3.5 CLEAN-UP

- A. During the progress of the work, remove from the project all discarded materials and debris.
- B. Clean all surfaces affected by work of this Section and repair all damage caused to adjacent construction or property, at no cost to the Owner.
- C. Leave adjacent premises clean and free of construction dirt and debris which resulted as part of the construction process.
- D. Remove empty containers from the facility at the end of each working day.
- E. Place soiled cloths that constitute fire hazards in suitable metal safety containers or remove them from the site at the end of each working day. Take special care in storage or disposal of flammable materials. Comply with health and fire regulations.

END OF SECTION

DIVISION 07 – THERMAL AND MOISTURE PROTECTION

SECTION 071800

PEDESTRIAN TRAFFIC MEMBRANE

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Medium duty vehicular traffic membrane system

1.2 RELATED SECTIONS

- A. Section 030100 – Concrete Repairs.
- B. Section 079200 – Sealants.

1.3 DEFINITIONS

- A. The term "manufacturer's recommendations", or variations thereon it shall mean "manufacturer's recommendations which are found in publications available to and commonly used by the general architectural and consulting professions."

1.4 SUBMITTALS

- A. Joint and Several Warranty Form meeting the requirements of Article 1.8.
- B. Skid Resistance Addenda Form to Joint and Several Warranty meeting the requirements of Articles 1.8 and 3.4.
- C. Bond Test Addenda Form to Joint and Several Warranty meeting the requirements of Articles 1.8 and 3.4.
- D. Literature for all manufactured products, including manufacturer's specifications, test data and installation instructions or applicator's manual.
- E. If requested, copy of letter of approval per Article 1.5 Paragraph B.
- F. If requested, resume per Article 1.5 Paragraph C.
- G. Material Safety Data Sheets on all materials which are classified as hazardous materials.
- H. Maintenance manuals with the following information.
  - 1. Project name.
  - 2. Project location.
  - 3. Date.
  - 4. Owner's name.

5. Coating system(s).
6. Drawings indicating the coating systems and their location in the structure.
7. Schematic drawing of each membrane type identifying each element of the membrane system by dry film thickness and manufacturer's reference number or name.
8. Recommendations for routine care and maintenance.
9. List of three (3) approved Contractors nearest the project location authorized to perform repairs.
10. Identify common causes of damage and instructions for temporary patching until permanent repair can be made.
11. Upon completion of the Work and prior to final payment, provide a fully executed warranty.

## 1.5 QUALITY ASSURANCE

### A. Applicable Codes:

1. The Contractor shall comply with all Federal, State and Municipal laws, codes, ordinances and regulations applicable to the Work in this Contract and also with all requirements of the National Fire Protection Association, the National Electric Code, and the Occupational Safety and Health Administration (OSHA). If the above laws, codes or ordinances conflict with this Specification, then the laws, codes or ordinances shall govern, except in such cases where the Specification exceeds them in quality of materials or labor, then the Specifications shall be followed.

### B. The membrane applicator shall be approved by the manufacturer and shall have been an approved manufacturer's applicator for the membrane products, as identified on the subcontractor supplemental proposal form, for a minimum of three consecutive years. If requested, the contractor shall provide written confirmation from the manufacturer within three calendar days of the request.

### C. The membrane applicator and its superintendent shall meet the following minimum requirements:

1. Installed the approved membrane materials as identified on the Bid Form in a traffic membrane system in three previous similar projects. Each of the three projects shall have been a minimum of 2,000 square feet in size.
2. Installed the approved membrane materials as identified on the Bid Form in a traffic membrane system currently in use within the last two years.

### D. Conform to the Field Quality Control requirements in Part 3 of this Section.

### E. An employee of the applicator who has been trained by the membrane

manufacturer on the installation of the approved membrane system shall be present during all applications of the membrane system.

- F. Within twenty-four hours of application of membrane materials submit log required by Article 3.4 Paragraph F to Engineer.

#### 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to job site in sealed, undamaged containers. Each container shall be identified with material's name, date of manufacture and lot number.
- B. Only those materials being used during any one work shift may be stored in the current work area. Materials being used for shift work shall be uniformly distributed throughout the intended work area so as to not overload or otherwise distress the structural system. All other materials, if stored on site, shall be stored at the designated staging area.
- C. Coating materials shall be kept sealed when not in use.
- D. Storage and handling of materials shall conform to the manufacturer's requirements and the requirements of the applicable environmental protection and safety regulatory agencies.
- E. Storage areas shall be heated or cooled as required to maintain the temperatures within the range recommended by the coating manufacturer.
- F. The handling and use of toxic or flammable solvents shall conform to the requirements of the applicable safety regulatory agencies, recommended by the manufacturer.

#### 1.7 WARRANTY

- A. Completed installation shall be warranted jointly and severally on a single document by manufacturer and applicator against defects of materials and workmanship. The length of the warranty period shall not be less than (5) years from the date of substantial completion of the Project.
- B. Manufacturer and installer shall further warrant the skid resistance and bond strength of the installed systems. The test may be measured at any single location, and shall meet the specified criteria in Part 3, Article 3.4. The length of the warranty period shall not be less than five (5) years from the date of substantial completion of the Project.
- C. Warranty documents shall not require the signature of the Owner to be effective, shall not limit the Owner's legal remedies otherwise allowed per the project contract, and shall not limit the venue of any potential legal jurisdiction.

## PART 2 PRODUCTS

### 2.1 APPROVED MANUFACTURERS

- A. Lymtal International
- B. Neogard Corporation
- C. Sika Corporation

### 2.2 MATERIALS

#### A. Medium Duty Vehicular Traffic Membrane System (Type A):

1. Iso-flex 760 Aliphatic System by Lymtal International, comprised of:
  - a. Primer
    - Iso-Flex Epoxy SF, Primer 750, or Primer 757.
    - Apply at manufacturer's recommended application rate.
  - b. Base Coat
    - Iso-Flex 750 Base Coat
    - Apply at 40 mils dry film thickness.
  - c. Top Coat
    - Iso-Flex 760 Aliphatic Top Coat
    - Apply at 18 mils dry film thickness.
    - Aggregate seeded and back rolled to provide slip resistant surface.
  - d. Aggregate
    - Unimin 12/20 by US Silica, either Ottawa, MN or Voca, Texas.
    - Install at membrane manufacturer's maximum application rate.
    - Uniformly distributed with no bare spots.
2. FC System by Neogard Corporation, comprised of:
  - a. Primer
    - Neogard 7760/7761 VOC
    - Apply at manufacturer's recommended application rate.
  - b. Base Coat
    - Neogard FC7500/FC7960
    - Apply at 40 mils dry film thickness.
  - c. Top Coat

- Neogard FC7540/FC7964
  - Apply at 18 mils dry film thickness.
  - Aggregate seeded and back rolled to provide slip resistant surface.
  - d. Aggregate
    - 12/20 silica by Carmeuse Industrial Sands, Brady, Texas
    - Install at membrane manufacturer's maximum application rate.
    - Uniformly distributed with no bare spots.
3. Sikalastic Traffic System by Sika Corporation, comprised of:
- a. Primer
    - Sikalastic FTP Lo-VOC Primer or MT Primer.
    - Apply at manufacturer's recommended application rate.
  - b. Base Coat
    - Sikalastic 720 Base Coat
    - Apply at 40 mils dry film thickness.
  - c. Top Coat
    - Sikalastic 745 Aliphatic Top Coat
    - Apply at 18 mils dry film thickness.
    - Aggregate seeded and back rolled to provide slip resistant surface.
  - d. Aggregate
    - Unimin 12/20 by US Silica, either Ottawa, MN or Voca, Texas.
    - Install at membrane manufacturer's maximum application rate.
    - Uniformly distributed with no bare spots.
  - e. Aggregate
    - Badger 12/20 by Badger Corporation, Fairwater, WI.
    - Install at membrane manufacturer's maximum application rate.
    - Uniformly distributed with no bare spots.
- B. Individual steps of any systems inclusive of greater than 5 percent solvents by either weight or volume calculations shall require monitoring by a licensed industrial hygienist for fumes and odors within work areas, at open air intakes within 200 ft. of work areas, and inside occupied spaces adjacent to work areas. Credentials of licensed hygienist and a monitoring plan must be approved by the Engineer in advance of the start of any membrane work.
- C. Membrane color to match existing membrane.

- D. Intermediate coat and lock coat materials shall be U.V. stable.

## PART 3 EXECUTIONS

### 3.1 EXAMINATION

- A. Contractor and membrane manufacturer shall jointly review existing substrates (original concrete, past or new concrete repairs or overlays, past membrane or coating systems) to ensure compatibility with the specified membrane system. Submit in writing any materials which may cause membrane adhesion to substrate less than normally anticipated or other compatibility or performance difficulties. Failure to review and identify deleterious products/materials, and if failure of the membrane is a result of adhesion difficulties or chemical or physical incompatibilities with substrate materials, the Contractor and Manufacturer shall be responsible for all costs related to correcting the deficient Work. Manufacturer is bound to meet the above noted responsibilities equally with the Contractor regardless of the provisions of other agreements.
- B. Inspect deck surface for any visibly distressed concrete. If encountered, chain drag area to determine extent of distressed or delaminated area and repair as indicated on the Drawings, and Specification Section 030100.
- C. Examine areas for slab cracks to be routed and sealed.

### 3.2 PREPARATION

A. Protection:

1. Erect barriers and barricades to protect adjoining areas from dirt, steel shot and debris generated from this work. Refer to Section 015600.
2. Cover exposed drain grates during shotblasting/grinding operations. Recoat with approved rust inhibitive or galvanizing paint grates damaged by blasting operations. Similarly protect and recoat if necessary other, in place metal elements. Drains to be functional during non-working hours and during periods of inclement weather.
3. Cover exposed drain grates to protect from membrane material. Drains to be functional during non-working hours and during periods of inclement weather. Do not allow membrane material to enter drain piping system.

B. Concrete (General):

1. Preparation and cleaning procedures shall be in strict accordance with this Specification, unless more stringent requirements are recommended by the system manufacturer.
2. Surface must be dry. New concrete shall be at least 28 days old and proven dry via mat tests, to be considered for membrane system installation without installation of a vapor barrier. Review manufacturer requirements relative to



site conditions in advance of performing the work.

3. Surfaces shall be free from all traces of dirt, salt, grease, oil, asphalt, laitance, curing compounds, paint stripes, coatings and other foreign materials. Use manufacturer approved degreasing agents if necessary.
4. Concrete surfaces shall be cleaned using shotblast equipment (with integral vacuum process) to achieve standard of cleanliness per Article 1.5 Paragraph G. The size of shot and travel speed of the equipment shall be chosen to provide a uniformly clean surface and profile; basis for bid must be two perpendicular normal speed passes, or one slow speed pass.
5. Areas which cannot be adequately cleaned by shotblasting shall be cleaned by grinding with accompanying vacuum procedures.
6. Surfaces that become contaminated by dirt or moisture after initial shotblasting or grinding, shall be cleaned again by shotblasting or grinding to manufacturer's requirements at no additional cost to the Owner.
7. Minimum standard of acceptability applies to all surfaces intended to receive membrane regardless of surface preparation procedure or process.
8. The use of acids in surface preparation procedures and techniques is prohibited.
9. After completion of shotblasting/grinding, and prior to application of membrane materials, repair all scaled, freeze-thaw damaged and loose, pop-out areas, cracks and all damage made apparent by the shotblasting/grinding procedures, in a manner approved by the Engineer. Such repair work shall be part of the Base Bid without unit price adjustment. Areas requiring patching will be subject to re-shotblast or re-grinding where a patch exceeds one (1) square foot in area.
10. Grind all high spots or transition grind all depressions per details, and clean to manufacturer's requirements.

C. Membrane Removal:

1. If existing membrane system scheduled to be removed, the criteria for acceptance are 0% of the existing membrane remaining on horizontal surfaces. 5% of the existing membrane may remain on the vertical curb faces with no area larger than 3 square inches.
2. The membrane removal is to be done with a dry cutting process only.
3. After removal, perform surface preparation the same as for Concrete, Part 3, Article 3.2 Paragraph B.

### 3.3 INSTALLATION

A. General:

1. Install materials in strict accordance with all safety and weather conditions required by product literature and Local, State and Federal regulations.
  2. Fumes and dust shall be controlled to prevent harmful or undesirable effects in surrounding areas. All potential avenues for penetration of fumes or dust into surrounding occupied areas shall be sealed prior to the start of the work.
  3. All exposed membrane edges and termination details shall be taped to provide straight, neat edges.
  4. Install base coat membrane materials on concrete surfaces only when concrete temperature has stabilized or is falling. Do not install base coat membrane on concrete surfaces when surface temperature is rising.
  5. Install membrane materials only if the temperature of the surfaces to be coated is 5 degrees or higher than the dew point temperature measured at the job site.
- B. Sealants - Refer to Section 079200.
- C. Membrane:
1. Where necessary to locally level surfaces and after approval by Owner, install membrane leveling materials in depressed areas. Refer to Part 2, Article 2.2 Paragraph G.
  2. Install detail coat 4" wide by 20 mil thick (dry film thickness) over properly primed cracks, caulked joints, joints between concrete pours, or leveling repairs, junctures and other locations in the membrane area which is a deviation from the nominal membrane plane, except where otherwise indicated by the Specifications or Drawings.
  3. The membrane system shall turn up 4" at all vertical surfaces unless shown otherwise on the drawings. Detail coat is required at all turn-ups to vertical surfaces. Detail coat at turn-ups shall be the same as the detail coat required by Part 3, Article 3.3 Paragraph C.1.
  4. Contractor shall ensure the specified/recommended application rates of all components of the membrane system. Base coat(s), intermediate coat, and lock coat of each application of the membrane system shall be distributed onto the deck by calibrated, notched squeegees. Squeegees showing signs of wear shall be discarded.
  5. Contractor shall ensure specified/recommended application rates of liquid products on vertical or sloped surfaces by the use of non-sag grade materials or by multiple applications of material over previous applications which are fully cured.
  6. Each fluid-applied component of the membrane system shall be back-rolled to properly distribute materials across the deck and eliminate squeegee marks.

7. Use of power rollers either to distribute the membrane system or to backroll squeegee marks shall not be permitted.
8. No vehicular traffic shall be allowed on membrane areas for at least 48 hours after completion of membrane installation. Provide extended cure time with no vehicular traffic exposure if temperatures fall below 50°F.

### 3.4 FIELD QUALITY CONTROL

#### A. Bond Test:

1. Bond tests of the installed membrane systems may be performed by the Engineer during and after the membrane work on this project. Tests shall be conducted using a calibrated instrument which measures in-place bond strength by applying a direct axial pull on a 3 inch diameter steel disk epoxied to the completed membrane top surface.
2. A membrane phase for the purpose of bond testing is an area of base coat installed in a single work shift. If examined, a membrane phase will be tested at (3) locations per phase no sooner than 10 days after completion of the entire membrane system and no sooner than 14 days if temperatures fall below 40°F for two or more days. Contractor shall assume a total of 1 test locations in the Base Bid.
3. The acceptance criteria for initial tests of a Phase shall average bond strength of 200 psi for all locations, with no single location testing below 150 psi. Any Phase failing to meet the initial acceptance criteria may be retested at a later date by the Engineer. Retests of Phase shall include at least 4 separate test locations not sooner than 14 days after the initial tests. The acceptance criteria for retests of a Phase shall average bond strength of 200 psi for all locations, with no single location testing below 175 psi.
4. Any Phase failing to meet the initial test and retest acceptance criteria shall be considered "deficient" and shall be cause for the Contractor to execute or provide one of the following remedies:
  - a. Extend Standard Guarantee to include an additional 5 years (for a total of 10 years) on membrane system intercoat bond and bond to the concrete for the "deficient" areas.
  - b. Removal and replacement of the "deficient" area, including all necessary preparatory work and Engineering costs to coordinate and observe the work, at no additional cost to the Owner.
5. Any additional bond testing requested by the Contractor to limit the extent of the "deficient" area(s) as determined by initial tests and retests as defined above shall be paid for by the Contractor.
6. Contractor shall include as part of his proposal the costs of repairing all test locations.

B. Skid Test:

1. Prior to any membrane preparation work and after membrane installation, the Engineer may conduct tests to determine values of the static coefficient of friction between the coated and uncoated floor surfaces and the neoprene base of the Engineer's test equipment.
2. Determination of the coefficient of friction will consist of a series of individual tests for each surface type. The initial coefficient of friction is defined as the average of the tests performed on the concrete surfaces prior to membrane preparatory work. The final coefficient of friction is defined as the averages of the tests performed on each type of completed membrane system surface.
3. The final, average static coefficient of friction shall be a minimum of 0.85 under wet and dry conditions and equal to or greater than 110% of the initial coefficient of friction. No individual test area shall have a coefficient less than 0.80 or 95% of the initial coefficient of friction. Any membrane system that does not conform, as determined by the Engineer, to the specified acceptance criteria shall be subject to rework, upgrading or replacement of the deficient areas, including necessary preparatory work, at no additional cost to the Owner.

C. The Engineer may direct the Contractor to make test cuts in the membrane for testing purposes. Tests cuts shall be 2" x 2" and will be in partially-completed or fully-completed membrane. A maximum of 3 total tests per separate installation phase may be made. Contractor shall include as part of his Proposal the costs of taking test cuts as and where directed by the Engineer and the costs of patching test cut areas.

D. The Engineer will periodically monitor application rates of the membrane system individual components and will notify job foremen of discrepancies noted.

E. The Contractor shall keep at the site and maintain in proper condition an adequate number (at least one per application crew) of wet film thickness gages and shall continuously use such to ensure the specified thickness of each membrane coat is uniformly maintained. The periodic monitoring of application rates per Article 3.4 Paragraph D shall not relieve the Contractor of the responsibility of verifying specified coating thickness.

F. Contractor shall provide information required by Part 3, Article 3.6.

3.5 CLEANING

A. Empty containers shall be removed from the project work areas at the end of each working day. Cloths soiled with coating that might constitute a fire hazard shall be placed in suitable metal safety containers or shall be removed from the building at the end of each working day. Special care shall be taken in storage or disposal of flammable materials. Comply with health, fire and environmental regulations.

B. All spilled coating material shall be completely removed from hardware, adjacent

floor areas, metal work, etc. Remove spilled coating by approved methods.

- C. Repaint in matching color all curbs, columns, walls, etc., where existing paint was removed during preparation for membrane application.
- D. All hardware, adjacent floor areas, metal work, etc., and the general premises shall be left clean and free of all construction dirt and debris.

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3.6 MEMBRANE APPLICATION LOG FORM EXAMPLE

DAILY MEMBRANE APPLICATION LOG					
Project:					
Date:	Time Start	Time End			
Work Area (Give Description)					
Membrane Materials Applied Type and Quantity					
Crew Size	Size of Area Materials Applied (in Square Feet)				
Temperature Data ( °F)					
	Start				End
Deck					
Air					
Relative Humidity (%)					
Dewpoint					
Note: Contractor shall estimate quarter points in time between the start and end of membrane application. Record air and deck temperatures at those times.					
Superintendent's Signature:					

END OF SECTION

DIVISION 07 – THERMAL AND MOISTURE PROTECTION

SECTION 079200

SEALANTS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Spandrel panel isolation joint sealant.
- B. Cove joint sealant.

1.2 RELATED SECTIONS

- A. Section 030100 – Concrete Repairs.
- B. Section 099100 – High Performance Coatings.
- C. Section 221400 – Drains and Piping.

1.3 DEFINITIONS

- A. Where the term "manufacturer's recommendations," or variations thereon, are found in this Specification, it shall mean "manufacturer's recommendations which are found in publications available to and commonly used by the general architectural and consulting professions."

1.4 SUBMITTALS

- A. Copies of literature for all manufactured products, including manufacturer's specifications, test data and installation instructions or applicator's manual.
- B. Letter per Paragraph 1.5.B.
- C. Resume of contractor superintendent or employee per Paragraph 1.5.D.
- D. Manufacturer's certification per Paragraph 1.5.F.
- E. Proof samples of sealants intended to be installed per Paragraph 1.5.G.
- F. If requested, Field samples of sealants installed on site per Paragraph 1.5.H.
- G. Material Safety Data Sheets on all materials which are classified as hazardous materials.
- H. Upon completion of the Work and prior to final payment, provide written recommendations for routine care and maintenance. Provide list of three Contractors nearest the project location who are qualified to perform repairs to the sealants. Identify common causes of damage and include instructions for temporary patching until permanent repair can be made by qualified personnel.

- I. Upon completion of the Work and prior to final payment, provide a fully executed warranty.

## 1.5 QUALITY ASSURANCE

### A. Applicable Codes:

1. The Contractor shall comply with all Federal, State and Municipal laws, codes, ordinances and regulations applicable to the Work in this Contract and also with all requirements of the National Fire Protection Association, the National Electric Code, and the Occupational Safety and Health Administration (OSHA). If the above laws, codes or ordinances conflict with the Specification, then the laws, codes or ordinances shall govern, except in such cases where the Specification exceeds them in quality of materials or labor, then the Specifications shall be followed.

- B. The sealant installer must be acceptable to the manufacturer. Provide written confirmation that the intended sealant installer is acceptable to the manufacturer.

- C. The Contractor shall review locations where joint sealant work is specified and shall submit in writing existing conditions and newly specified details which would cause sealant material to fail. Failure to review existing conditions or identify details or procedures which will cause failure of sealant material to perform as specified, the Contractor shall become responsible for all costs relating to correcting the deficient work, including all direct and indirect costs to the Owner.

- D. The Contractor's superintendent, or another technically competent employee of the Contractor approved by the Owner and Manufacturer, shall be on site and supervise installation of all sealant on this project. Sealant identified as being installed not under the direct supervision of this person shall be subject to removal and replacement, at the direction of the Owner. This person identified for supervision of the work shall have supervised at least three prior projects of similar magnitude and type.

- E. The Owner may, at his discretion, choose to remove up to a six-inch length of sealant in locations at a time after installation and initial curing of sealant to verify installation as specified. The Contractor shall include in his Bid the costs to repair one such location for each 100 ft. of sealant installation. If inspections of these locations by the Owner reveal deficient installation of sealant, the Owner may remove additional sealant to further quantify the length of deficient sealant. The Contractor shall repair all deficient locations of sealant found by the Owner at no additional cost and no extension of time for the work.

- F. Sealant materials shall be certified to be compatible by the manufacturer for use with the membrane system.

- G. Proof Samples of all sealant materials used on the job site shall be prepared in advance of the work by the Contractor and submitted to the Owner for purposes of testing and examination. Samples shall be manufactured with a unit of material from the first batch intended for use on the project. Samples (4 total) shall be at



least 2-inch x 2-inch square and 1/2-inch-thick, with troweled top surfaces, identified with manufacturer's batch numbers, date and location of preparation.

H. Mock-ups:

1. Sealant foreman and crew assigned to project to complete all mock-ups listed.
  - a. The Owner may, at his discretion, direct the Contractor to prepare and submit Field Samples of sealant materials used on the job site during the work. Samples shall be manufactured on site, from a unit of material from the same batch in use that day. Samples (2 total) shall be at least 2-inch x 2-inch square and 1/2-inch-thick, with troweled top surfaces, identified with manufacturer's batch numbers, date and location on the project where the sealants represented in the samples were installed. Up to three sets of Field Samples may be requested on this project in the Base Bid.
2. Control, Isolation, and Cover Joints:
  - a. Demonstrative removal and cleaning technique.
  - b. Demonstrate backer rod installation.
  - c. Demonstrate sealant installation and tooling technique.
3. Preformed silicone strip installation:
  - a. Demonstrative stone cleaning and preparation technique.
  - b. Demonstrate installation and tooling technique.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to job site in sealed, undamaged containers. Each container shall be identified with material's name, date of manufacture and lot number.
- B. Only those materials being used during any one work shift may be stored in the Work area. Coordinate location of storage area with the Owner.
- C. Sealant materials shall be kept sealed when not in use.
- D. Storage and handling of materials shall conform to the requirements of the applicable safety regulatory agencies.
- E. Storage areas shall be heated or cooled as required for maintaining the product temperatures within the range recommended by the manufacturer.

1.7 PROJECT CONDITIONS

- A. Install sealant materials in strict accordance with all safety and weather conditions required by product literature or as modified by applicable rules and regulations of Local, State and Federal authorities having jurisdiction.

- B. Fumes and debris shall be controlled to prevent harmful or undesirable effects in surrounding areas.
- C. When toxic or flammable solvents are used, the Contractor shall take all necessary precautions as recommended by the manufacturer. In all cases, the handling and use of toxic or flammable solvents, including adequate ventilation and personal protective equipment, shall conform to the requirements of the applicable safety regulatory agencies.

## 1.8 SEQUENCING

- A. Install sealants after any required concrete repairs.
- B. Install sealants after adequate cure of concrete repairs. Confirm required cure time with sealant manufacturer.
- C. Install all sealants after installation of high performance coating systems.

## 1.9 WARRANTY

- A. New exposed sealant work shall be warranted for a period of five (5) years against defects due to installation or material deficiencies, including but not limited to excessive softness, excessive entrapped air in cured cross sections, disbonding, cohesive failure, leakage and ultraviolet exposure degradation.
- B. Sealant work under membrane systems shall be warranted as part of and included in the membrane system guarantee. Refer to Section 071800.
- C. In addition to the (5) year warranty the silicone manufacturer is to furnish a warranty of (15) years for all types of new sealant joints to the Owner. New sealant work shall be warranted against defects due to material failure, including but not limited to excessive softness, excessive entrapped air in cured material, disbonding, cohesive failure, leakage and ultraviolet exposure degradation.
- D. All required testing and quality assurance operations necessary to furnish the warranty are Contractor and manufacturer's responsibility.

## PART 2 PRODUCTS

### 2.1 CRACK AND JOINT SEALANTS

- A. Multi-component, unmodified, polyurethane. Approved products manufacturers include:
  - 1. Sika 2c NS-TG/SL by Sika Corp.
  - 2. Dymeric 240FC by Tremco, Inc.
  - 3. Isoflex 880/881 by Lymtal International.
- B. Minimum compression or extension of 25% of the nominal joint width without

adhesive or cohesive failure.

- C. Primer(s) as recommended by sealant manufacturer for each substrate.
- D. Sealants in areas to be coated with membrane per Section 071800 shall be gun grade (non-sag) unless otherwise noted on the Drawings or in this Section.
- E. Cove sealants shall be gun grade (non-sag).
- F. Backer Rod or Bond Breaker Tape: Backer Rod shall be closed-cell, polyethylene in sizes to maintain 25 percent compression. Backer rod shall not be used except where indicated on the Drawings or unless approval for each intended application location is obtained from the Owner. Alternative use of bond breaker tape in size appropriate for the width of joint and approved for use by the sealant manufacturer will be allowed on a case-by-case basis.
- G. For joint edge repairs refer to Specification Section 030100.

## 2.2 SILICONE SEALANTS

- A. Approved for horizontal or vertical sealant installations. Products and manufacturers include:
  - 1. Dowsil 888 by Dow Corning, Inc.
  - 2. Spectrem 800 NS by Tremco Sealant Waterproofing Division.
- B. Minimum compression or extension of 50% of the nominal joint width without adhesive or adhesive failure.
- C. Primer(s) as recommended by the sealant manufacturer for each substrate.
- D. Sealants shall be gun grade (non-sag) unless otherwise noted on the Drawings or in this Section.
- E. Backer Rod. Backer Rod shall be closed-cell, polyethylene in sizes to maintain 50 percent compression. Backer rod shall not be used except where indicated on the Drawings or unless approved for each intended application location is obtained by the Owner.
- F. For joint edge repairs refer to Specification Section 030100.

## PART 3 EXECUTIONS

### 3.1 GENERAL

- A. Remove existing sealants in joint cavities, coves and other locations and clean surfaces to remove residue. Rout any new joint cavities scheduled for new sealant. Grind and vacuum clean all joint cavities, coves and other locations scheduled for new sealant as required by the sealant manufacturer within 24 hours of sealant installation.

- B. Primer shall be used for all sealant installations regardless of manufacturer's requirements, unless a letter from the manufacturer states use of a primer is detrimental. Allow primer to cure per manufacturer's recommendation prior to sealant installation.
- C. Joint cavities that become contaminated by dirt or moisture after initial preparation, shall be cleaned again at no additional cost to the Owner.
- D. Modify the depth of existing joints by additional routing or positioning of backer rod to maintain a width to depth ratio of 2 to 1 unless otherwise noted on the drawings. At no location is the sealant width allowed to exceed 1-1/2".
- E. In areas indicated on the Drawings or otherwise directed by the Owner, remove existing failed and deteriorated sealant, all existing cove sealants and existing sealants to be covered by urethane traffic membrane.
- F. Reinstall new sealant where existing sealant is removed. Refer to Article 3.2 for new sealant installation requirements in membrane areas and Article 3.3 for repair sealant requirements.
- G. Where necessary, square up joint edges and execute repairs with epoxy repair mortar in accordance with manufacturer's recommendations.
- H. Rout cracks per details in surfaces at locations directed by the Owner.
- I. Rout joints per details.

### 3.2 NEW SEALANT

- A. Refer to Article 3.1 for joint cavity preparation requirements.
- B. Clean joint cavity and apply primer as recommended by the sealant manufacturer.
- C. Install backer rod or bond-breaker tape where required. Vary size of backer rod if necessary, based on field conditions per Article 2.1.F or Article 2.2.F.
- D. Install sealant as indicated in details on the Drawings.

### 3.3 JOINT EDGE REPAIRS

- A. Identify joint edge spalls which are too large to be filled with new sealant. Review repair locations with Owner in advance of the work.
- B. Square edges of spall with diamond blade as indicated on Drawings.
- C. Clean cavity per Article 3.1.
- D. Mix epoxy and clean, dry sand to form grout material, and install per Specification Section 030100.
- E. Allow for cure prior to sealant installation.

### 3.4 MISCELLANEOUS SEALANTS

- A. Install miscellaneous sealants around drains, pipe penetrations in floors, and elsewhere. Install per Article 3.2 and as indicated on the Drawings.

### 3.5 CLEAN-UP

- A. During the progress of the Work, remove from the project all discarded coating materials, rubbish, cans and rags.
- B. All sealant material and drops shall be completely removed from hardware, adjacent floor areas, metal work, etc., and the premises shall be left clean and in orderly condition.
- C. All hardware, adjacent floor areas, metal work, etc., and the general premises shall be left clean and free of all construction dirt and debris. This includes removal of all debris from pipes, etc., which resulted from work specified herein.
- D. Repaint in matching color all curbs, columns, walls, etc., where existing paint was removed during preparation for sealant installation. Refer to Section 321723.
- E. Empty containers shall be removed from the garage at the end of each working day. All cloths soiled with coating that might constitute a fire hazard shall be placed in suitable metal safety containers or shall be removed from the building at the end of each working day. Special care shall be taken in storage or disposal of flammable materials. Comply with health and fire regulations.

END OF SECTION

DIVISION 9 – FINISHES  
SECTION 099100  
HIGH PERFORMANCE COATINGS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. All labor, material, equipment, special tools and services required to clean and/or prepare surfaces and apply new coatings, as required by the Drawings and this Specification, including but not limited to the following:
  - a. Complete cleaning, surface preparation, primer installation where necessary and new coating on steel and metal surfaces.
  - b. Complete cleaning, including removal of abandoned forms, conduit and junction boxes of exterior façade concrete surfaces.
  - c. Surface preparation, priming, and coating or finishing of metal handrails, stairs, bollards, EIFS, Concrete, and Masonry as indicated on drawings.
  - d. Surface preparation, priming, and coating or finishing of precast concrete panels as indicated on drawings.
  - e. Temporary protection of doors, windows, roof areas, and interior spaces during construction.
  - f. Provide access to work area for Owner representative or Engineer.

B. Related Sections:

1. Section 030100 – Concrete Repairs.
2. Section 079200 – Sealants.

1.2 REFERENCES

- A. ASTM D 16 – Terminology Related to Paint, Varnish, Lacquer, and Related Products.
- B. The Society for Protective Coatings (SSPC): SSPC-SP 1 – Solvent Cleaning.
- C. The Society for Protective Coatings (SSPC): SSPC-SP 2 – Hand Tool Cleaning.
- D. The Society for Protective Coatings (SSPC): SSPC-SP 3 – Power Tool Cleaning.
- E. The Society for Protective Coatings (SSPC): SSPC-SP 6/NACE 3 – Commercial Blast Cleaning.
- F. The Society for Protective Coatings (SSPC): SSPC-SP 13/NACE 6 – Surface Preparation of Concrete.

### 1.3 DEFINITIONS

- A. "Coating" as used herein means all paint systems materials, including primers, emulsions, enamels, stains, sealers and fillers, and other applied materials whether used as prime, intermediate or finish coats.
- B. "Dry Film Thickness" as used herein means the thickness of a coat in a fully cured state measured in mils (1/1000 inch).
- C. "Well-adhered" as used herein means materials that cannot be removed by lifting with a dull putty knife.

### 1.4 SUBMITTALS

- A. Submit manufacturer's technical information including coating label analyses and application instructions.
- B. Submit complete line of manufacturer's color samples for each product.
- C. Letter of approval per Paragraph 1.5.A.
- D. Prior project experience per Paragraph 1.5.B.
- E. Name and resume of persons per Paragraph 1.5.C.
- F. Manufacturer's sample warranty.

### 1.5 QUALITY ASSURANCE

- A. The contractor shall be a certified installer by the manufacturer.
- B. The contractor shall be approved by the manufacturer and shall have no less than (5) years experience in performance of similar work in size and complexity.
- C. All work under this Section shall be under the immediate control of the Contractor's superintendent(s) experienced in this type of work. The person(s) shall have supervised three prior projects of similar magnitude and type, and shall be present during all operations. This person(s) shall be approved by the Owner.
- D. Regulatory Requirements:
  - 1. The Contractor shall comply with all Federal, State and Municipal laws, codes, ordinances and regulations applicable to the Work in this Contract and also with all requirements of the National Fire Protection Association, the National Electric Code, and the Occupational Safety and Health Administration (OSHA). If the above laws, codes or ordinances conflict with this Specification, then the laws, codes or ordinances shall govern, except in such cases where the Specification exceeds them in quality of materials or labor, then the Specifications shall be followed.
- E. Mock-Up:

1. Provide mockup of coating preparation and coating system for review by Owner and Engineer. Maintain approved mock-ups during the job as reference for minimal standard of acceptance and quality of coating application.

F. Pre-installation meeting.

G. Provide access to work area for Owner representative or Engineer to inspect quality of work, progress, unit price items and field conditions. Access to be completed during normal working hours. If access requires mechanical equipment (man-lift, swing stage, etc.), provide necessary operators.

#### 1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to job site in original, new and unopened packages and containers bearing manufacturer's name and label, and following information:

1. Name or title of material.
2. Fed. Spec. number, if applicable.
3. Manufacturer's stock number and date of manufacture.
4. Manufacturer's name.
5. Contents by volume, for major pigment and vehicle constituents.
6. Thinning instructions.
7. Application instructions.
8. Color name and number.

B. Storage and Protection:

1. Protect materials in a dry place, off ground and under cover to protect them from moisture and other damage.
2. Do not use materials showing evidence of water or other damage.
3. Storage and handling of materials shall conform to the requirements of the applicable safety regulatory agencies.
4. Storage areas shall be heated or cooled as required to maintain the temperatures within the range recommended by the manufacturer.

#### 1.7 PROTECTION

- A. Place coating or solvent soaked rags, waste, or other materials which might constitute a fire hazard in metal containers and remove from premises at the close of each day's work.
- B. Protect the work of all other trades against damage, marking or injury by suitable covering during the progress of the coating and finishing work. Repair any damage



done.

- C. Protect and filter debris and chemicals from entering storm drains. Direct water runoff from all cleaning processes to the filtration system before allowing it to enter the storm drain system.
- D. During all cleaning operations, coordinate drain protection with the local municipality.

## 1.8 PROJECT CONDITIONS

### A. Environmental requirements:

- 1. Install coating materials in strict accordance with all safety and weather conditions required by product literature or as modified by applicable rules and regulations of Local, State and Federal authorities having jurisdiction.
- 2. Fumes and dust shall be controlled to prevent harmful or undesirable effects in surrounding areas. Do not allow fumes, dirt, dust or debris to enter building.
- 3. When toxic or flammable solvents are used, the Contractor shall take all necessary precautions as recommended by the manufacturer. In all cases, the handling and use of toxic or flammable solvents, including adequate ventilation and personal protective equipment, shall conform to the requirements of the applicable safety regulatory agencies.
- 4. Apply water base coatings only when temperature of surfaces to be coated and surrounding air temperatures are between 50 Deg. F. (10 Deg. C.) and 90 Deg. F. (32 Deg. C.), unless otherwise permitted by coating manufacturer's printed instructions.
- 5. Apply solvent-thinned coatings only when temperature of surfaces to be coated and surrounding air temperatures are between 45 Deg. F. (7 Deg. C.) and 95 Deg. F. (35 Deg. C.), unless otherwise permitted by coating manufacturer's printed instructions.
- 6. Do not apply coating in snow, rain, fog or mist; or when relative humidity exceeds 85 percent or to damp or wet surfaces unless otherwise permitted by coating manufacturer's printed instructions.
- 7. Apply coating to surfaces that are cured and dry per manufacturer's tolerances.

## 1.9 SEQUENCE

- A. Prior to beginning coating preparation complete all concrete and sealant repairs including curing periods.

## 1.10 WARRANTY

### A. Coating System Warranty:

- 1. The applicator shall furnish a (5) year warranty to the Owner for all types of new coating installed. New coating work shall be warranted against defects due to

installation, including but not limited to debonding and inadequate preparation.

- a. All required testing and quality assurance operations necessary to furnish warranty are Contractor and manufacturer's responsibility.
2. The manufacturer shall furnish a (5) year warranty to the Owner for all types of new coating installed. New coating work shall be warranted against material defects, including but not limited to debonding, cohesive failure, cracking, and ultra violet exposure degradation.
  - a. All required testing and quality assurance operations necessary to furnish warranty are Contractor and manufacturer's responsibility.

#### 1.11 MAINTENANCE

- A. Extra Materials

### PART 2 PRODUCTS

#### 2.1 MANUFACTURERS

- A. Sherwin Williams.
- B. Tnemec Company.
- C. Devoe Coatings.

#### 2.2 MATERIALS

- A. No lead-based products are permitted.
- B. Use no thinners other than those specified by manufacturer.
- C. Use only paints and coatings that are compatible with concrete and previously coated surfaces.
- D. Use only primers and undercoats that are suitable for each surface to be covered and that are compatible with finish coating required.
- E. Notify Engineer in writing of any anticipated problems in using coating systems specified on existing substrates.
- F. Provide cleaners for removal of loose paint, dirt, and pollutants; which are compatible with all primers, intermediate coats, and finish coat. Thoroughly rinse all clean agents before applying primer or finish coats. Pre-approve cleaning agents with paint manufacturer.
- G. All products must be provided by a single manufacturer.

#### 2.3 MATERIALS AND PROCEDURES

- A. General Cleaning Requirements:

1. All existing garage area drains shall be clear and protected prior to beginning any work.
  2. All biological growth must be removed prior to coating.
  3. All efflorescence, lime run, and surface contaminants should be removed prior to application of new coating.
  4. If previously coated, existing coating must be adhered to the substrate per the manufacturer's requirements. Manufacturer shall approve the surface preparation and existing conditions before the contractor applies coating to ensure the product warranty will be honored.
- B. Exterior Concrete: materials and procedures are listed in order of process/application. Apply per manufacturers recommendations.
1. Surface Preparation:
    - a. SSPC-SP13 – Low pressure, warm water cleaning.
    - b. Cleaner: Provide cleaners for removal of soot, dirt, and pollutants, which are compatible with all primers, intermediate coats, and finish coat. Thoroughly rinse all clean agents before applying primer or finish coats.
  2. Approved manufacturer's systems:
    - a. Sherwin Williams:
      - 1) Primer: Loxon Concrete & Masonry Primer – One (1) Primer coat. Application rate recommended by the manufacturer to achieve a total dry film thickness of 4.0-6.0 mils.
      - 2) Finish Coats: Conflex XL – Two (2) Finish coats. Application rate recommended by the manufacturer to achieve a total dry film thickness of 6.0-7.5 mils per coat.
    - b. Tnemec:
      - 1) Primer: Elastogrip FC 151 – One (1) Primer coat. Application rate recommended by the manufacturer to achieve a total dry film thickness of 4.0-6.0 mils.
      - 2) Finish Coats: Enviro-Crete 156 – Two (2) Finish coats. Application rate recommended by the manufacturer to achieve a total dry film thickness of 4.0-8.0 mils per coat.
    - c. Devoe Coatings:
      - 1) Primer: Dulux Professional Primer 2000 - One (1) Primer coat. Application rate recommended by the manufacturer to achieve a total dry film thickness of 4.0-6.0 mils.

- 2) Finish Coats: Devflex 4206 – Two (2) Finish coats. Application rate recommended by the manufacturer to achieve a total dry film thickness of 5.0-8.0 mils per coat.
- C. Exterior Ferrous Metal for New Steel: materials and procedures are listed in order of process/application. Apply per manufacturers recommendations.
1. Surface Preparation:
    - a. SSPC-SP1 Solvent Cleaning.
  2. Approved manufacturer's systems:
    - a. Sherwin Williams:
      - 1) Primer: One (1) Coat: Macropoxy 646 FC; 3.0 to 4.0 mils DFT.
      - 2) Finish Coats: Two (2) Coats: HiSolids Polyurethane, 2.0 to 3.0 mils DFT per coat.
    - b. Tnemec:
      - 1) Primer: One (1) Coats: Series N27 S.T. Epoxy; 4.0 to 6.0 mils DFT.
      - 2) Finish Coats: Two (2) Coats: Endura-Shield Series 1074/1075; 2.0 to 3.0 mils DFT per coat.
    - c. Devoe Coatings:
      - 1) Primer: One (2) Coats: Devran 224HS; 4.0 to 6.0 mils DFT.
      - 2) Finish Coat: Two (2) Coats: Devthane 379UVA; 2.0 to 3.0 mils DFT per coat.
- D. Rusted Exterior Metal: materials and procedures are listed in order of process/application. Apply per manufacturers recommendations.
1. Surface Preparation:
    - a. SSPC-SP3 Power Tool Clean to remove all loose mill scale, loose rust, and other foreign matter.
    - b. SSPC-SP1 Solvent Clean to remove all visible oil, grease, soil, and other contaminants.
  2. Approved coating systems:
    - a. Sherwin Williams:
      - 1) Primer: One (1) Coat Macropoxy 646 FC - 4.0 to 6.0 mils DFT.
      - 2) Polyurethane Finish Coat: Two (2) Coats: HiSolids Polyurethane – 2.0 to 4.0 mils DFT.

- 3) Acrylic Finish Coat: Two (2) Coats: Sherccryl HPA – 2.0 to 4.0 mils DFT.

b. Tnemec:

- 1) Primer: One (1) Coat: Chembuild Series 135; 4.0 to 6.0 mils DFT.
- 2) Polyurethane Finish Coat: Two (2) Coats: Endura-Shield Series 1074/1075; 2.0 to 4.0 mils DFT.
- 3) Acrylic Finish Coat: Two (2) Coats: Endura-Tone Series 1028; – 2.0 to 4.0 mils DFT.

### PART 3 EXECUTION

#### 3.1 EXAMINATION

- A. Examine surfaces intended to receive coatings and note conditions or defects that will adversely affect the execution and/or quality of the work.
- B. Starting of cleaning and coating work will be construed as applicator's acceptance of surfaces and conditions within any particular area.
- C. Notify Owner in writing of any such conditions or defects. Do not begin work until unsatisfactory conditions are corrected. Failure to notify Owner prior to beginning work constitutes acceptance by Contractor of the surfaces and conditions under which the work is to be performed, and acceptance by Contractor for the performance of the work.

#### 3.2 PREPARATION

- A. Protection
  1. Provide adequate protection of all surrounding surfaces not intended to receive coating from damage due to preparation, cleaning or coating procedures. Repair damage at no cost to the Owner.
  2. Program coating so that construction dirt, dust, and debris will not fall onto wet, newly coated surfaces.
  3. When toxic or flammable solvents are used, the coating contractor shall take all necessary precautions as recommended by the manufacturer. In all cases, the handling and use of toxic or flammable solvents, including adequate ventilation and personal protective equipment, shall conform to the requirements of the applicable safety regulatory agencies.
  4. Provide the necessary protection to contain all dust, dirt, debris and coating chips within work area. Do not allow to migrate into building interior spaces or storm drain system.
  5. Provide "Wet Paint" signs as required to protect newly coated finishes. Remove

temporary protective wrappings provided by others for protection of their work, after completion of coating operations.

#### B. Surface Preparation

1. Perform preparation and cleaning procedures in accordance with coating manufacturer's instructions and as herein specified, for each particular substrate condition.
2. Remove all surface contamination such as chalk, loose coating, mill scale dirt, foreign matter, rust, rust stains, mold, mildew, mortar, efflorescence, weld splatter and slag, and sealers from surfaces to be coated.
3. Remove hardware, hardware accessories, machined surfaces, plates, lighting fixtures, and similar items in place and not to be finish-coated, or provide surface-applied protection prior to surface preparation and coating operations. Remove, if necessary, for complete coating of items and adjacent surfaces. Following completion of coating of each space or area, reinstall removed items.
4. Prepare hair line cracks (1/64" or less) per manufacturer's instructions. Reference the Details to repair cracks larger than 1/64".
5. Do not field coat the following work:
  - a. Sealant Joints
  - b. Prefinished and natural finished items including but not limited to prefinished equipment, acoustic materials, finished mechanical and electrical equipment such as light fixtures and grilles.
  - c. Non-ferrous metal surfaces including aluminum, stainless steel, chromium plate, copper, and tern coated stainless steel except where noted coated.
  - d. Operating parts and labels.

#### C. MATERIALS PREPARATION

1. Mix and prepare coating materials in accordance with manufacturer's directions.
2. Stir materials before application to produce a mixture of uniform density, and stir as required during application. Do not stir surface film into material. Remove film and, if necessary, strain material before using. Continuously agitate zinc-rich primers.
3. Store materials not in actual use in tightly covered containers. Maintain containers used in storage, mixing and application of coating in a clean condition, free of foreign materials and residue.

### 3.3 APPLICATION

A. General:

1. Apply coating in accordance with manufacturer's directions. Use applicators and techniques best suited for substrate and type of material being applied.
2. Apply additional coats when undercoats, stains, or other conditions show through final coat of coating, until coating film is of uniform finish, color, and appearance. Give special attention to ensure that surfaces, including edges, corners, crevices, welds, and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.
3. Generally, coating surfaces behind movable equipment same as similar exposed surfaces. Coating surfaces behind permanently-fixed equipment or furniture with prime coat only before final installation of equipment.
4. Do not coat over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions otherwise detrimental to formation of a durable coating film.

B. Scheduling Coating:

1. All caulking and sealants shall be in place and thoroughly cured prior to application of coatings.
2. Apply first-coat material to surfaces that have been cleaned, pretreated, or otherwise prepared for coating as soon as practicable after preparation and before subsequent surface deterioration.
3. Allow sufficient time between successive coatings to permit proper drying. Do not recoat until coating has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure, and application of another coat of coating does not cause lifting or loss of adhesion of the undercoat.
4. Minimum Coating Thickness: Apply materials at not less than manufacturer's recommended spreading rate to establish a total dry film thickness as indicated.

C. Application:

1. Apply prime coat of materials which is required to be coated or finished, and which has not been prime coated by others.
2. Recoat primed and sealed surfaces where there is evidence of suction spots or unsealed areas in first coat, to assure a finish coat with no burn-through or other defects due to insufficient sealing.
3. Pigmented (Opaque) Finishes: Complete cover to provide an opaque, smooth surface of uniform finish, color, appearance and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness or other surface imperfections will not be acceptable.
4. Completed Work: Match approved samples for color, texture and coverage. Remove, refinish, or recoat work not in compliance with specified requirements.

### 3.4 CLEANING

- A. During progress of work, remove from site discarded coating materials, rubbish, cans, and rags at end of each work day.
- B. Upon completion of coating work, clean window glass and other coating-spattered surfaces. Remove spattered coating by proper methods of washing and scraping, using care not to scratch or otherwise damage finished surfaces.

### 3.5 SCHEDULES

- A. Coating colors shall be as indicated below:
  - 1. Color to be selected by Owner.

END OF SECTION



DIVISION 22 – PLUMBING  
SECTION 221400  
DRAINS AND PIPING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Floor Drains.

1.2 RELATED SECTIONS

- A. Section 030100 – Concrete Repairs.
- B. Section 079200 – Sealants.

1.3 REFERENCES

- A. American Society for Testing and Materials (ASTM).
  - 1. ASTM A74-94: Standard Specification for Cast Iron Soil Pipe and Fittings.
  - 2. ASTM A888-94: Standard Specification for Hubless Cast Iron Soil Pipe for Sanitary and Storm Drain, Waste, and Vent Piping Applications.

1.4 SUBMITTALS

- A. Submit four copies of literature for all manufactured products, including installation instructions, if appropriate.

1.5 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Deliver all caulking materials, and/or prepackaged grout or filler materials to job site in sealed, undamaged containers. Deliver all drain, piping, fittings and hanger hardware in closed packages which will prevent damage to the hardware during storage and handling prior to installation.

1.6 QUALITY ASSURANCE

- A. Applicable Codes:
  - 1. The Contractor shall comply with all Federal, State and Municipal laws, codes, ordinances and regulations applicable to the Work in this Contract and also with all requirements of the National Fire Protection Association, the National Electric Code, and the Occupational Safety and Health Administration (OSHA). If the above laws, codes or ordinances conflict with this Specification, then the laws, codes or ordinances shall govern, except in such cases where the Specification exceeds them in quality of materials or labor, then the Specifications shall be followed.
  - 2. If the above laws, codes or ordinances conflict with the Specification, then the

laws, codes or ordinances shall govern, except in such cases where the Specification exceeds them in quality of materials or labor, then the Specifications shall be followed.

## 1.7 SEQUENCING

- A. Coordinate location of floor drain assembly with concrete repairs. Refer to Drawings for drain locations.

## PART 2 PRODUCTS

### 2.1 FLOOR DRAIN, PIPING AND ACCESSORIES

- A. Supplemental Drain grating: Zurn-Z400B – 4B, heel-proof nickel bronze top, 4" diameter strainer.
- B. Existing Drain Line Repairs: Cast iron pipe and fittings per ASTM A74 – 4" diameter, or alternative galvanized steel pipe and fittings.
- C. Supplemental Drain Line: Schedule 40 PVC Pipe and Fittings per ASTM D1785 and D2466
- D. Galvanized steel adjustable band pipe hanger.
- E. 3/8" dia. Galvanized hanger rods, threaded both ends. Provide necessary nuts and washers.
- F. Steel beam anchors to be "C" clamp with locknut.
- G. Concrete anchors to be Rawl Pipe Spike by Rawlplug Co., Inc.

### 2.2 EPOXY GROUT

- A. One part epoxy mixed with two parts clean dry coarse sand.
- B. Epoxy to be Sikadur 32, Hi-Mod by Sika Corp., or approved substitution.

## PART 3 EXECUTION

### 3.1 PREPARATION

- A. Locate existing slab reinforcement via pachometer prior to core drilling of deck for drain installation. Verify that soffit mounted electrical conduit is not in the vicinity at the core drilling work. If necessary, repair cut or damaged conduit in accordance with the NEC.

### 3.2 INSTALLATION

- A. New Floor Drain:
  - 1. Install new floor drain in accordance with the Details and Manufacturer's written recommendations.

2. Selectively demolish the concrete slab as necessary to accommodate the new drain body installation. Do not cut or damage existing structural members, embedded or suspended soffit mounted conduit. Verify clear site for demolition via pachometer and visual layout.
3. Set new floor drain assembly and install patch materials. Refer to details on Drawings and Specification Section 030100.
4. Install suspended pipes as close to the soffit as possible, and maintain prevailing code required clearances throughout the area affected by this Work. Install piping such that it will drain as indicated on the Drawings.
5. Attach piping to soffit and beams with specified attachments. Maximum spacing of attachments to be 4'-0" O.C.
6. Do not force piping into position, and do not tighten hangers or affix permanent fasteners until the entire length of piping has been positioned.
7. Remove all debris generated for this work from the job site.

### 3.3 VERIFICATION

- A. After completion of work, verify proper operation by flooding the area serviced by the new drain with water for 15 minutes, and visually confirm a leak-free condition.

END OF SECTION