



**SPECIAL PROVISIONS  
FOR  
FLOOD PROTECTION SYSTEM**

**Black Hawk County  
BRM-CHBP-8155(770)--NB-07  
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**Effective Date  
September 21, 2021**

**THE STANDARD SPECIFICATIONS, SERIES 2015, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE SPECIAL PROVISIONS AND THEY SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.**

**152055.01 DESCRIPTION.**

The special provision applies to the partial removal and reconstruction of the USACE Flood Protection System

- Near the north end of the 11th Street bridge over the Cedar River. Also includes the south abutment and wings of the bridge that will be integral to the flood protection system.
- Near each end of the Park Avenue bridge over the Cedar River.

**152055.02 REMOVALS**

**A. Partial Removals**

1. Complete partial removals of the flood protection system as shown in contract documents. Partial removals shall be in accordance with Section 2401 of the Standard Specifications or as required in this Special Provision.
2. Take necessary precautions to avoid damage to existing items to remain in place, to be reused, or to remain the property of the USACE. Repair or replace damaged items as approved by the Engineer. Coordinate the work of this section with all other work indicated. Construct and maintain shoring, bracing, and supports as required. Ensure that structural elements are not overloaded. Increase structural supports or add new supports as may be required as a result of any cutting, removal, or demolition work performed under this contract. Do not overload flood protection to remain. Provide new supports and reinforcement for existing construction weakened by removal work. Repairs, reinforcement, or structural replacement require approval by the Engineer prior to performing such work.
3. Do not disturb existing construction beyond the extent indicated or necessary for installation of new construction. Provide temporary shoring and bracing for support of structural components to prevent settlement or other movement. Provide protective measures to control accumulation and migration of dust and dirt in all work areas. Remove snow, dust, dirt, and debris from work areas daily.

4. Contractor shall coordinate with private utility owners and the City of Waterloo to de-activate or relocate existing and proposed utilities through flood protection system.
5. The use of burning at the project site for the disposal will not be permitted.

**B. Demolition Plan**

Prepare a Demolition Plan and submit proposed demolition and removal procedures for approval before work is started. Include in the plan procedures for careful removal and disposition of materials specified to be salvaged, coordination with other work in progress and a disconnection schedule of utility services, a detailed description of methods and equipment to be used for each operation and of the sequence of operations.

**C. Survey Existing Conditions**

Before beginning any demolition work, survey the site and examine the contract documents to determine the extent of the work. Record existing conditions in the presence of the Engineer showing the condition of structures and other facilities adjacent to areas of alteration or removal. Photographs sized 4 inch will be acceptable as a record of existing conditions. Include in the record the elevation of the top of flood protection and extent of existing cracks and other damage and description of surface conditions that exist prior to before starting work. It is the Contractor's responsibility to verify and document all required outages which will be required during the course of work, and to note these outages on the record document. Submit survey results to Engineer.

**D. Execution**

1. Remove existing structures indicated to be removed as shown in construction plans. Demolish structures in a systematic manner from the top of the structure to lowest point of removal. Locate demolition equipment throughout the structure and remove materials so as to not impose excessive loads on flood protection.
2. Sawcut and remove masonry so as to prevent damage to surfaces to remain and to facilitate the installation of new work. Where new masonry adjoins existing, the new work shall abut or tie into the existing construction as specified for the new work. Provide square, straight edges and corners where existing masonry adjoins new work and other locations.
3. Saw concrete along straight lines to a depth of a minimum 2 inch. Make each cut in walls perpendicular to the face and in alignment with the cut in the opposite face. Break out the remainder of the concrete provided that the broken area is concealed in the finished work, and the remaining concrete is sound. At locations where the broken face cannot be concealed, grind smooth or saw cut entirely through the concrete.
4. Where removals leave holes and damaged surfaces exposed in the finished work, patch and repair these holes and damaged surfaces to match adjacent finished surfaces, using on-site materials when available. Where new work is to be applied to existing surfaces, perform removals and patching in a manner to produce surfaces suitable for receiving new work. Finished surfaces of patched area shall be flush with the adjacent existing surface and shall match the existing adjacent surface as closely as possible as to texture and finish. Patching shall be as specified and indicated, and shall include completely fill holes and depressions, [caused by previous physical damage or] left as a result of removals in existing masonry walls to remain, with an approved masonry patching material, applied in accordance with the manufacturer's printed instructions.
5. Dispose of debris, rubbish, scrap, and other non salvageable materials resulting from removal operations with all applicable federal, state and local regulations as contractually specified.

**E. Existing Utilities**

1. Do not interrupt existing utilities serving occupied or used facilities, except when authorized by the utility owner. Do not begin demolition work until all utility disconnections have been made. Shut off and cap utilities for future use, as indicated.
2. Remove existing utilities, as indicated, and terminate in a manner conforming to the nationally recognized code covering the specific utility and approved by the Engineer. When utility lines are encountered but are not indicated on the drawings, notify the Engineer prior to further work in that area.

### **152055.03 MATERIALS**

#### **A. Backfill Material**

1. Comply with excavating, backfilling, and compacting procedures for soils used as backfill material to backfill excavations resulting from demolition of structures. Fill material shall be waste products from demolition until all waste appropriate for this purpose is consumed.
2. Additional fill material shall be in accordance with the requirements of the contract documents.

#### **B. Concrete**

1. Concrete materials shall be Class C Portland cement concrete with 4.5 KSI minimum compressive strength.
2. Submit shop drawings to Engineer for formwork as required for construction. Drawings showing details of formwork including, but not limited to; joints, supports, studding and shoring, and sequence of form and shoring removal. Indicate placement schedule, construction, location and method of forming control joints. Include locations of inserts, conduit, sleeves and other embedded items. Reproductions of contract drawings are unacceptable. Submit form removal schedule indicating element and minimum length of time for form removal. Design, fabricate, erect, support, brace, and maintain formwork so that it is able to support, without failure, all vertical and lateral loads that may reasonably be anticipated to be applied to the formwork.
3. Sixty days minimum prior to concrete placement, submit a mix design for each strength and type of concrete. Submit a complete list of materials including type; brand; source and amount of cement, supplementary cementitious materials, and admixtures; and applicable reference specifications. Submit mill test and all other test for cement, supplementary cementitious materials, aggregates, and admixtures. Provide documentation of maximum nominal aggregate size, gradation analysis, percentage retained and passing sieve, and a graph of percentage retained verses sieve size. Provide mix proportion data using at least three different water-cementitious material ratios for each type of mixture, which produce a range of strength encompassing those required for each type of concrete required. If source material changes, resubmit mix proportion data using revised source material. Provide only materials that have been proven by trial mix studies to meet the requirements of this specification, unless otherwise approved in writing by the Engineer. Indicate clearly in the submittal where each mix design is used when more than one mix design is submitted. Resubmit data on concrete components if the qualities or source of components changes. For previously approved concrete mix designs used within the past 12 months, the previous mix design may be re-submitted without further trial batch testing if accompanied by material test data conducted within the last 6 months. Obtain mix design approval from the Engineer prior to concrete placement.
4. Nonshrink grout shall be in accordance with ASTM C1107/C1107M.

5. Expansion Joint and Contraction Joint Material shall be in accordance with ASTM D1751 or ASTM D1752 Type I or Type II. Material must be 1/2 inch thick, unless otherwise indicated.
6. Submit manufacturer's product data, indicating VOC content for joint sealants. Horizontal Surfaces less than 3 % slope shall be in accordance with ASTM D6690 or ASTM C920, Type M, Class 25, Use T. Vertical Surfaces Greater Than 3 % Slope shall be in accordance with ASTM C920, Type M, Grade NS, Class 25, Use T.

### **C. Reinforcing Steel**

1. Shop drawing showing reinforcing layout shall be developed and submitted to the Engineer. Indicate bending diagrams, assembly diagrams, splicing and laps of bars, shapes, dimensions, and details of bar reinforcing, accessories, and concrete cover. Do not scale dimensions from structural drawings to determine lengths of reinforcing bars. Reproductions of contract drawings are unacceptable.
2. Store reinforcement of different sizes and shapes in separate piles or racks raised above the ground to avoid excessive rusting. Protect from contaminants such as grease, oil, and dirt. Ensure bar sizes can be accurately identified after bundles are broken and tags removed.
3. Record coating lot on each shipping notice and carefully identify and re-tag bar bundles from bending plant. Provide systems for handling coated bars which have padded contact areas such as, nylon slings, all free of dirt and grit. Lift bundled coated bars with strong back, multiple supports, or platform bridge to prevent sagging and abrasion. Pad bundling bands where in contact with bars. Do not drop or drag bars or bundles. Store coated bars both in shop and in field, aboveground, on wooden or padded cribbing. Space the dunnage close enough to prevent excessive sags. Stack large quantities of straight bars with adequate protective blocking between layers. Schedule deliveries of epoxy coated bars to the job site to avoid the need for long term storage. Protect from direct sunlight and weather. Cover bars to be stored longer than 12 hours at the job site with opaque polyethylene sheeting or other suitable equivalent protective material.

### **D. Waterstops**

1. Submit manufacturer's data sheet on waterstop materials and splices.
2. Polyvinylchloride (PVC) waterstops shall conform to COE CRD-C 572.
3. Rubber waterstops must conform to COE CRD-C 513.
4. Thermoplastic elastomeric rubber waterstops must conform to ASTM D471.
5. Swellable strip type compound of polymer modified chloroprene rubber that swells upon contact with water must conform to the following requirements when tested in accordance to ASTM D412: Tensile strength 420 psi minimum; ultimate elongation 600% minimum. Hardness must be 50 minimum on the type A durometer and the volumetric expansion ratio in distilled water at 70°F must be 3 to 1 minimum.

### **E. Stop Logs**

1. Submit manufacturer's data sheet for stoplog materials.
2. Submit detail drawings of stop log closure.
3. Store rubber seals in a place which permits free circulation of air, maintains a temperature

of 70°F or less, and prevents the rubber from being exposed to the direct rays of the sun. Rubber seals shall be kept free of oils, grease, and other materials which would deteriorate the rubber. Rubber seals shall not be distorted during handling.

4. Submit an Identification System which shows the disposition of specific lots of approved materials and fabricated items in the work, before completion of the contract.
5. Structural steel, structural aluminum, and other metal materials sections and standard articles shall be as shown and as specified herein and in the Standard Specifications.
6. Structural steel shall conform to ASTM A36/A36M, Grade 50, unless otherwise shown in contract documents.
7. Structural aluminum shall conform to ASTM B221M ASTM B221, unless otherwise shown in contract documents.
8. Rubber seals shall be compounded of natural rubber, synthetic polyisoprene, or a blend of both, and shall contain reinforcing carbon black, zinc oxide, accelerators, antioxidants, vulcanizing agents, and plasticizers. Physical characteristics of the seals shall meet the following requirements:

| PHYSICAL TEST                         | TEST VALUE                   | TEST METHOD SPECIFICATION |
|---------------------------------------|------------------------------|---------------------------|
| Tensile Strength                      | 2500 psi (min.)              | ASTM D412                 |
| Elongation at Break                   | 450 % (min.)                 | ASTM D412                 |
| 300 percent Modulus                   | 900 psi (min.)               | ASTM D412                 |
| Durometer Hardness (Shore Type A)     | 60 to 70                     | ASTM D2240                |
| *Water Absorption                     | 5 % by weight (max.)         | ASTM D471                 |
| Compression Set                       | 30 % (max.)                  | ASTM D395                 |
| Tensile Strength (after aging 48 hrs) | 80 % tensile strength (min.) | ASTM D572                 |

9. The "Water Absorption" test shall be performed with distilled water. The washed specimen shall be blotted dry with filter paper or other absorbent material and suspended by means of small glass rods in the oven at a temperature of 70°C ±2°C for 22 hours ±1/4 hour. The specimen shall be removed, allowed to cool to room temperature in air, and weighed. The weight shall be recorded to the nearest 1 mg as W1 (W1 is defined in ASTM D471). The immersion temperature shall be 70°C ±1°C and the duration of immersion shall be 166 hours.
10. Rubber seals shall have a fluorocarbon film vulcanized and bonded to the sealing surface of the bulb. The film shall be 0.030 inch thick Huntington Abrasion Resistant Fluorocarbon Film No. 4508, or equal, and shall have the following physical properties unless stated otherwise in contract documents:

|                  |                 |
|------------------|-----------------|
| Tensile strength | 2000 psi (min.) |
| Elongation       | 250 % (min.)    |

11. The outside surface of the bonded film shall be flush with the surface of the rubber seal and shall be free of adhering or bonded rubber. Strips and corner seals shall be molded in lengths suitable for obtaining the finish lengths shown and with sufficient excess length to provide test specimens for testing the adequacy of the adhesion bond between the film and bulb of the seal. At one end of each strip or corner seal to be tested, the fluorocarbon film shall be masked during bonding to prevent a bond for a length sufficient to hold the film securely during testing.

12. Clips and clip bolts for panels shall be approved standard manufactured stock items.
13. Submit detailed drawings of stoplogs and appurtenant shop fabricated items, including fabrication drawings, shop assembly drawings, delivery drawings, and field installation drawings.
14. Show on the fabrication drawings complete details of materials, tolerances, connections, and proposed welding sequences which clearly differentiate shop welds and field welds.
15. Show on the shop assembly drawings details for connecting the adjoining fabricated components in the shop to assure satisfactory field installation.
16. Show on the delivery drawings descriptions of methods of delivering components to the site, including details for supporting fabricated components during shipping to prevent distortion or other damages.
17. Show on the field installation drawings a detailed description of the field installation procedures. The description shall include the location and method of support of installation and handling equipment; provisions to be taken to protect concrete and other work during installation; method of maintaining components in correct alignment; and methods for installing appurtenant items.
18. Structural fabrication, welding, bolted connections, shall conform to the requirements specified in the Standard Specifications.
19. Stoplogs shall be fabricated of structural steel conforming to ASTM A36/A36M Grade 50. Steel items shall be galvanized where indicated. Furnish all other materials and equipment as required for fabrication. Stoplog guides shall be fabricated of structural steel conforming to ASTM A36/A36M, Grade 50. Corner protection angles, frames, base plates, and other embedded metal items required for complete installation shall conform to the details shown.
20. Seal assemblies shall consist of rubber seals, stainless steel retainer and spacer bars, and fasteners. Rubber seals shall be continuous over the full length. Seals shall be accurately fitted and drilled for proper installation. Bolt holes shall be drilled in the rubber seals by using prepared templates or the retainer bars as templates. Splices in seals shall be fully molded, develop a minimum tensile strength of 50% of the unspliced seal, and occur only at locations shown. All vulcanizing of splices shall be done in the shop. The vulcanized splices between molded corners and straight lengths shall be located as close to the corners as practicable. Splices shall be on a 45 degree bevel related to the "thickness" of the seal. The surfaces of finished splices shall be smooth and free of irregularities. Stainless steel retainer bars shall be field-spliced only where shown and machine-finished after splicing.
21. Submit certified test reports for material tests, with all materials delivered to the site.
22. The fluorocarbon film of rubber seals shall be tested for adhesion bond in accordance with ASTM D413 using either the machine method or the deadweight method. A 1 inch long piece of seal shall be cut from the end of the seal which has been masked and subjected to tension at an angle approximately 90 degrees to the rubber surface. There shall be no separation between the fluorocarbon film and the rubber when subjected to the following loads:

| THICKNESS OF FLUOROCARBON FILM | MACHINE METHOD AT 2 INCHES PER MINUTE | DEADWEIGHT METHOD        |
|--------------------------------|---------------------------------------|--------------------------|
| 0.030 inch                     | 30 pounds per inch width              | 30 pounds per inch width |
| 0.060 inch                     | 30 pounds                             | 30 pounds                |

23. Failure of any specimen to meet the requirements of the test used will be cause for rejection of the piece from which the test specimen was taken.

**F. Temporary Flood Protection System**

Contractor shall furnish temporary flood protection system in accordance with these plans. The system shall be Invisible Flood Control Wall by Flood Control America, LLC unless otherwise approved in writing by the Engineer. Materials for temporary flood protection system shall comply with other articles of this special provision as required.

**152055.04 CONSTRUCTION****A. Backfill Material**

The installation of the backfill material shall be in accordance with Standard Specifications.

**B. Concrete**

1. The installation of concrete for the reconstruction of the flood protection shall be in accordance with Standard Specifications.
2. Documentation of the testing procedure to be submitted to the Engineer.
3. Submit details and locations of construction joints in accordance with the requirements herein. Make construction joints perpendicular to main reinforcement. Provide movement joints where indicated in contract documents or in accepted alternate locations. Submit location and detail of movement joints if different from those indicated in contract documents. Submit manufacturer's data sheet on expansion joint materials. Provide keyways where indicated in contract documents.
4. Use sleeves, inserts, anchors, and other embedded items of material and design indicated in contract documents.

**C. Reinforcing Steel**

The installation of the reinforcing steel shall be in accordance with Standard Specifications.

**D. Waterstops**

1. Provide waterstops in construction joints as indicated. Install formwork to accommodate waterstop materials. Locate waterstops in joints where indicated in contract documents. Minimize number of splices in waterstop. Splice waterstops in accordance with manufacturer's written instructions. Install factory-manufactured premolded mitered corners. Install waterstops to form a continuous diaphragm in each joint. Make adequate provisions to support and protect waterstops during progress of work. Protect waterstops protruding from joints from damage.
2. For PVC Waterstops, make splices by heat sealing the adjacent waterstop edges together using a thermoplastic splicing iron utilizing a non-stick surface specifically designed for waterstop welding. Reform waterstops at splices with a remolding iron with ribs or corrugations to match the pattern of the waterstop. The spliced area, when cooled, must show no signs of separation, holes, or other imperfections when bent by hand in as sharp an angle as possible.
3. Rubber waterstops must be spliced using cold bond adhesive as recommended by the manufacturer.
4. Thermoplastic Elastomeric Rubber Waterstop fittings must be shop made using a machine specifically designed to mechanically weld the waterstop. A portable power saw must be used to miter or straight cut the ends to be joined to ensure good alignment and contact between joined surfaces. Maintain continuity of the characteristic features of the cross section of the waterstop (for example ribs, tabular center axis, and protrusions) across the splice.

5. Hydrophilic Waterstop miter cut ends to be joined with sharp knife or shears. The ends must be adhered with adhesive.

**E. Stop Logs**

1. Installation shall conform to the manufacturer's recommendations.
2. Corner protection angles, frames, base plates, and other embedded metal items required for complete installation shall be accurately installed to the alignment and grade required to ensure accurate fitting and matching of components. Embedded metals shall be given a primer coat of the required paint on all surfaces prior to installation in concrete forms. Anchors for embedded metals shall be installed as shown. Items requiring two concrete pours for installation shall be attached to the embedded anchors after the initial pour, adjusted to the proper alignment, and concreted in place with the second pour.
3. Rubber seal assemblies shall be installed after the embedded metal components have been concreted in place and the gate installation, including painting, completed. Rubber seals shall be fastened securely to metal retainers. Before operating the gate, a suitable lubricant shall be applied to the rubber seal rubbing plates to protect the rubber.
4. After completion of installation, the Engineer will examine the stoplog installation for final acceptance. The individual components of the stoplog installation will be examined first to determine whether or not the workmanship conforms to the specification requirements. The Contractor will be required to place the stoplogs in the guides a sufficient number of times to demonstrate that the stoplogs fit properly and seal uniformly. Required repairs or replacements to correct defects, shall be made at no cost to the Contracting Authority. The trial operation shall be repeated after defects are corrected.

**F. Temporary Flood Protection System**

1. Installation shall conform to other articles of this Special Provision.
2. Permanent bulkheads shall be embedded in the concrete pedestals.
3. Sill channel shall be embedded in the flood protection wall along the surface of the roadway. Sill channel shall be continuous and follow the crown of the roadway and sidewalks including curbs.
4. The temporary, removable supports shall bolt into sill channel and be located at midspan of panels.
5. Panels and temporary supports shall be stored in the existing storage vaults at the project site when not in use.
6. After completion of installation, the Engineer will examine the temporary flood protection system installation for final acceptance. The individual components of the installation will be examined first to determine whether or not the workmanship conforms to the specification requirements. The Contractor will be required to place the system a sufficient number of times to demonstrate that the system will fit properly and seal uniformly. Required repairs or replacements to correct defects, shall be made at no cost to the Contracting Authority. The trial operation shall be repeated after defects are corrected.

**152055.05 METHOD OF MEASUREMENT AND BASIS OF PAYMENT.**

**A. Partial Removals**

The partial removals as defined in the contract documents shall be included in the lump sum price bid for Partial Removals, As Per Plan. This payment shall be full compensation for all equipment, tools, labor, and materials necessary to complete partial removals of the existing



flood protection systems. Cost to develop and submit Demolition Plan shall be incidental to this item.

**B. Replacement and reconstruction of Flood Protection System**

Method of measurement for floodwall reconstruction shall be by cubic yard of structural concrete installed in accordance with these plans. The partial reconstruction of the floodwall protection as defined in the contract documents shall be included in the unit price bid for Structural Concrete (Miscellaneous). This payment shall be full compensation for all equipment, tools, labor, and materials necessary to complete partial reconstruction of the flood protection systems. Materials include concrete, epoxy coated reinforcing steel, joint material, waterstops, formwork, and any other materials required in accordance with these plans. Cost to develop and submit shop drawings shall be incidental to this item.

**C. Stop Logs**

Method of measurement shall be by each stop log closure installed in accordance with the contract documents. The fabrication and installation of the stop log closure including stop logs embedded plates, embedded bent plates, anchors, and all required miscellaneous hardware shall be included in the price bid for Stop Log Closure. Includes all costs to fabricate, deliver, and install stop log closure at trail. Payment shall constitute full compensation for furnishing all plant, labor, materials, and equipment and performing all operations necessary for installing the stoplogs as specified.

**D. Temporary Flood Protection System**

Method of measurement shall be by each temporary flood protection system installed in accordance with the contract documents. The fabrication and installation of the temporary flood protection system including panel, supports, embedded plates, embedded bent plates, anchors, and all required miscellaneous hardware shall be included in the price bid for Temporary Flood Protection System. Includes all costs to fabricate, deliver, and install temporary flood protection system. Payment shall constitute full compensation for furnishing all plant, labor, materials and equipment and performing all operations necessary for installing the stoplogs as specified.