A d d e n d u m

Iowa Department of Transportation
Office of Contracts

Date of Letting: September 20, 2016
Date of Addendum: August 26, 2016

B.O.	Proposal ID	Proposal Work Type	County	Project Number	Addendum
005	85-0354-183	BRIDGE NEW - STEEL GIRDER	STORY	IM-035-4(182)112--13-85 IM-035-4(183)112--13-85 IM-035-4(184)112--13-85 IM-035-4(185)112--13-85 IM-035-4(226)112--13-85	20SEP005A02

Make the following change to the PROPOSAL;

Replace SP-150126 with the attached SP-150126a

SP-150126a
(Replaces SP-150126)

SPECIAL PROVISIONS
FOR
AESTHETIC TREATMENT OF MSE RETAINING WALL CONCRETE PANELS

Story County
IM-035-4(182)112--13-85

Effective Date
September 20, 2016

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.

150126a.01 DESCRIPTION.
This work consists of furnishing all labor, material, and equipment for integrally colored concrete, rustication and concrete finishes utilized on precast concrete panels, wall corners and slip joint covers (if required) for Mechanically Stabilized Earth (MSE) retaining walls, as specified herein, shown on the plans, or as directed by the Engineer.

150126a.02 MATERIALS.

A. Integrally Colored Concrete.
MSE retaining wall precast concrete panels shall utilize integrally colored concrete to provide a uniform aesthetic appearance. The contractor shall take particular care in all aspects of manufacturing the wall panels in order to achieve consistent color and quality in the finished panels. Integral color is not required for panels, wall corners and slip joint covers that will be entirely below the final grade line. Fully exposed and partially exposed units shall be integrally colored.

1. Concrete Strength: Concrete strength shall be as specified in the plans or Standard Specifications.

2. Color: Two differently colored panels shall be required as shown in the plans. Panel Type “0” and all wall corners and slip joint covers (if required) shall be a red-brown tone matching Federal Standard No. 595C Color Number 10076 as closely as possible using gray Portland cement. Panel Type “1” shall be a buff gold tone matching Federal Standard No. 595C Color Number 33434 as closely as possible using gray Portland cement. The Engineer will compare these colors to the thin veneer brick colors chosen for use on the adjacent bridge abutments and piers. Some adjustment of the specified colors may be required to ensure compatibility with brick colors.

3. Cement pigments shall comply with ASTM C 979. Pigments shall be lightfast, wettable, weather resistant, alkali resistant and free of deleterious fillers and extenders. The pigments shall be composed of inorganic natural and/or synthetic iron oxides to obtain the specified color. The amount of incorporated cement pigment shall not exceed 7% by weight of Portland cement in the concrete mix.

4. The contractor shall verify with the pigment manufacturer the compatibility of cement pigment with concrete admixtures, form release compounds and cleaning and curing methods. The sources and composition of sands and aggregate shall remain consistent for all applications involving integrally colored concrete.

5. For integrally colored concrete, Class 3 durability coarse aggregate is required. Fly ash and calcium chloride shall not be used. Slag (GGBFS) may be used if it is in accordance with the pigment manufacturer's recommendations.

6. Water to cement ratio shall be kept consistent with a maximum variation of +/- 0.02%.

7. Approved cement pigment suppliers include the following:
- **a.** Scofield Systems (800) 800-9900
- **b.** Davis Colors (800) 835-0849
- **c.** Dynamic Color Solutions (800) 657-0737
- **d.** Other suppliers submitted to and approved by the Iowa DOT Office of Materials.

B. Concrete Rustication.

1. Inserts used within the forms to create the rustication features may be made of wood, steel, plastic or other nonporous material capable of withstanding anticipated concrete pour pressures without physical defects. Wood inserts, if used, shall be free of warp, twist, checks or cracks, and shall be presoaked prior to placement of concrete in the forms. Wood inserts, if used, shall not leave wood grain or other patterns in the finished panel surfaces.

2. Rustication inserts shall not allow leakage of concrete between the form and the insert. When steel forms are used, rustication inserts may be rigidly attached to the inside form surface. When steel forms are not used, fasten rustication inserts to the forms in a manner which will permit them to remain in the concrete when the forms are removed. Leave inserts in place until they can be removed without damaging surrounding concrete.

3. The inserts shall be designed to form surfaces and features conforming to the shape, lines, depths and dimensions shown in the plans. Rustication features on partial and oversize panels shall retain dimensions of rustication features on full size panels and be positioned identically to the rustication features on adjacent full size panels.

4. Rustication is not required on panels that will be entirely below the final grade line. Fully exposed and partially exposed panels shall include rustication.

C. Acid-etched Finish.

1. The front faces of the panels, wall corners and slip joint covers (if required) shall be acid-etched in order to deepen the color and create consistent color and texture across the exposed surfaces.

2. Acid-etch concrete panels using techniques in accordance with ASTM D 4260 to obtain a "light exposure" finish in accordance with Precast/Prestressed Concrete Institute (PCI) "Architectural Precast Concrete". Do not expose coarse aggregate during acid-etching operations.

3. Acid-etching is not required on panels, wall corners and slip joint covers that will be entirely below the final grade line. Fully exposed and partially exposed units shall be acid-etched.

150126a.03 CONSTRUCTION.

A. Submittals.

1. Provide manufacturer's literature and two colored concrete manufacturer's chip samples for each proposed concrete color pigment.

2. Provide shop drawings for proposed precast concrete panel surface treatment showing rustication details, including rustication features on partial and oversize panels. Provide full MSE wall elevation views that indicate positions of Panel Type '1' panels as illustrated in the plans. Minor adjustments to positions of Panel Type '1' panels may be made during shop drawing review prior to approval. See the drawings for further information.

B. Mockup Panel.

1. The contractor shall construct two full size mockup precast concrete MSE panels. One mockup of each of the two panel types (Panel Type "0" and Panel Type "1" as shown in the plans) are required for review by the Engineer. The mockups shall utilize integrally colored concrete with the proposed mix proportions and pigment color that are intended for use in final production work. The mockups shall also utilize the proposed form materials and inserts, shall demonstrate typical forming operations, use and position of ties, if required, and shall demonstrate typical rustication details as specified in the plans. The mockups shall also include the required acid-etched finish. Following removal of mockup forms, patching methods for defects and form tie holes shall be demonstrated on the mockups. Patching of voids and tie holes may require adjustment of the mortar mix proportions so that the patches match or are slightly lighter than the surrounding concrete. White cement may be required to lighten the patching mix.

2. Mockups shall be produced at least 10 days before start of production precast concrete wall panel work to allow for adequate curing and final color evaluation by the Engineer. Additional mockup(s) may be ordered by the Engineer until an acceptable result is achieved. Actual precast panel production may not proceed until final approval of the mockup following curing time deemed adequate by the Engineer for assessing the final concrete colors.

3. The mockups shall remain at the precast panel production site for comparison to actual production panels as they are cast. Upon completion of the production panel casting operations, and if approved for use by the Engineer, the mockup panels may be incorporated into the project.

4. Complete records of the casting process, including mix design, water content, cement pigment and rate of incorporation, mixing sequence, form release compounds and patching, curing and cleaning methods used on the approved mockups shall be submitted to the Engineer prior to the start of production panel casting work.

C. Execution.

1. The Contractor shall take particular care in all aspects of casting the precast concrete MSE wall panels in order to achieve a consistent color and quality in the finished panels.

2. Each continuous rusticated surface on the panel shall be formed using a single continuous insert with no joints. The formed concrete surfaces shall appear uniform and continuous

without visible seams and form marks. Use adequate sealing or other means in order to prevent mortar leakage behind inserts. Forms shall be watertight.

3. Concrete mixing, batching and transporting equipment shall be thoroughly rinsed prior to mixing and delivering colored concrete to the forms. The contractor shall follow pigment manufacturer's specifications for measuring pigment and distribution throughout the concrete prior to placement.

4. During loading of forms with concrete, take extra care to adequately vibrate concrete in order to maintain all intended features of the rustication in the formed surfaces. The completed surface shall be free of blemishes, surface voids and conspicuous form marks to the satisfaction of the Engineer. The Contractor shall correct any surface defects at no additional cost to the project. Panels of unacceptable visual quality may be rejected by the Engineer and shall not be used on the project.

5. Strip formwork after the concrete has achieved the strengths and cure times required by the plans and applicable specifications**.** Clean and repair form surfaces prior to re-use. Do not re-use damaged rustication inserts on the project.

6. Patching of voids and tie holes may require adjustment of the mortar mix proportions so that the patches match or are slightly lighter than the surrounding concrete. White cement may be required to lighten the patching mix. Finish minor defects to match the surrounding surface texture.

7. Acid-etch the front faces of the panels following patching (if any) and initial curing. Perform acid-etching in accordance with ASTM D 4260. Acid-etch surfaces to light exposure of fine aggregate in accordance with PCI "Architectural Precast Concrete". Do not expose coarse aggregate. The purpose of acid-etch finishing is to deepen the color and make color and texture consistent across entire panel surface. Finished surface shall have the texture of fine sand.

8. If further cleaning is necessary after acid-etching, the colored concrete surfaces shall be cleaned with potable water and a non-staining stiff brush only. Do not stain or damage the surfaces during cleaning operations.

9. Cure concrete using a method preventing moisture loss and at a uniform temperature above 40°F during the curing period. Panels are to be stored face down during initial cure and covered with wet burlap for the first 24 hours. Continued wet curing methods may be required to reduce the incidence of shrinkage cracks and to enhance cement hydration for achieving required concrete strengths in shorter time periods. No sealers shall be applied to completed panels.

150126a.04 METHOD OF MEASUREMENT.

Aesthetic treatment of MSE retaining wall precast concrete panels shall not be measured for individual payment.

150126a.05 BASIS OF PAYMENT.

All costs associated with integrally colored concrete for MSE retaining wall precast concrete panels, furnishing and placing rustication inserts, acid-etch finishing, constructing mockup panels, and all labor, equipment and incidentals needed to complete the described work shall be considered incidental to the Mechanically Stabilized Earth Retaining Wall.