SP-150025
(New)

SPECIAL PROVISIONS
FOR
TERRA COTTA ORNAMENTAL PANELS

Woodbury County
IM-NHS-029-6(206)147--03-97

Effective Date
December 15, 2015

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

150025.01 DESCRIPTION.

These Special Provisions cover the handling, preparation and installation of existing salvaged terra cotta ornamental panels. Refer to details and notes in the plans for the locations and dimensions of the cavities in new structural concrete that are intended to receive the terra cotta units. Take extreme care in all aspects of handling, transport, storage and construction associated with the salvaged terra cotta units.

150025.02 MATERIALS.

A. Salvaged Terra Cotta Ornamental Panels.

1. Use only the salvaged terra cotta panels supplied by the Iowa DOT for incorporation into the project. Terra cotta panels shall remain in the Iowa DOT storage location until the commencement of associated panel preparation work by the Contractor. Notify the Engineer a minimum of 2 weeks before the start of related work to arrange for access to the panels. The terra cotta panels are currently in storage at the following location:

Iowa DOT District 3 Office
2800 Gordon Drive, P.O. Box 987
Sioux City, IA 51102-0987

2. Handling, Transport and Storage: Packing and padding of terra cotta panels for handling and transport shall fully and individually protect each unit from damage. Do not drop the terra cotta panels. Do not stack items of any kind on top of terra cotta panels during transport or storage. Packing shall remain in place during storage unless condensation could occur within the packing during the storage period. Store only on secure, flat and smooth surfaces or pallets. Protect panels from soil, other contaminants, and from the weather at all times to prevent staining prior to installation.

B. Mortar and Grout Materials.

1. Mortars shall comply with ASTM C 270.

2. Grouts shall comply with ASTM C 476.

3. Portland Cement: ASTM C 150, Type I or II, low alkali per ASTM C 150 Table 2.

4. Hydrated Lime shall comply with ASTM C 207, Type S.

5. Masonry cements, gypsum Portland cements, or blended cements shall not be used.

C. Aggregates.

1. Sand: use only clean, washed natural or manufactured silica sand, graded according to ASTM C 144. Sand shall contain no more than 50 parts per million of chloride ions, and shall be free of organic contaminants.

2. Coarse Aggregates: in accordance with ASTM C 404 with a maximum size of 3/8 inch diameter. Aggregate shall contain no more than 50 parts per million of chloride ions, and shall be free of organic contaminants.

D. Water: Potable, clean and free from oil, alkali, organic matter or other deleterious material.

E. Weeps: Cotton or polyester rope, 1/4 to 3/8 inch diameter.

F. Accessories: All accessories shall be non-corrosive and in accordance with applicable specifications and with best practices for terra cotta work of the type described by the plans and these Special Provisions.

150025.03 CONSTRUCTION.

A. Installer Qualifications.
All work in preparing, cleaning and installing terra cotta ornamental panels shall be performed by personnel qualified in installing terra cotta, specialty natural stone or ornamental cast stone masonry. All workers directly involved in preparing or installing terra cotta panels shall have a minimum of 5 years of experience in this type of specialty masonry work. At the Engineer's request, submit photographs, work references and job descriptions for at least three relevant previous installations.

B. Preparation of Terra Cotta Ornamental Panels.
The general condition of the individual terra cotta panels varies. Prior to delivery to the jobsite for installation, carefully clean the terra cotta panels of existing mortar and laitance on all surfaces including within cells on the backs of the units. Use a work location with adequate light and protection from the weather. Prepare a level, smooth and padded work surface for the cleaning operations, using thickly padded carpet or other suitable material to protect the terra cotta panels from damage during mortar removal. Do not work directly over concrete, asphalt or other hard surfaces that may damage the terra cotta faces. Carefully remove all existing mortar and laitance using sharpened wooden or plastic paddles only. Do not use metal chisels, grinders, saws, hammers, wire brushes or other metal tools directly on the terra cotta. Do not use acid cleaners or detergents on the terra cotta. Potable water and soft natural bristle brushes may be used to aid in the cleaning operation.

C. Project Conditions and Wall Cavity Preparation.
Do not begin terra cotta ornamental panel installation at the jobsite until all construction operations that could pose a risk of damage to the terra cotta have ceased. Secure the work area

using suitable control measures to ensure that the public and workers not involved in the installation cannot disturb the work during the entire mortar curing period (minimum 30 days).

1. Cold Weather: Perform work in accordance with ACI 530.1 current edition.

2. Hot Weather: Perform work in accordance with ACI 530.1 current edition.

3. At the end of the working day, or during rainy weather, cover terra cotta masonry work with waterproof coverage and securely anchor as necessary.

4. Protect surrounding surfaces from damage including staining from mortar or grout.

5. Prior to terra cotta panel installation, place supporting hardware in accordance with the plans and applicable specifications. Epoxy anchorage, if used, shall be fully cured prior to setting terra cotta panels. Test fit the panels in prepared cavities to ensure that they do not directly contact the steel angles when in their final positions. See the plan details for additional information. Clean and degrease the steel angles prior to setting terra cotta.

6. Prior to terra cotta panel installation, place weep ropes in cavities. Two weeps for each terra cotta unit are required, placed at 1/3 points along the length of each panel. Secure weep ropes to the back and along the bottom of cavity, with enough length to reach the top of the cavity and to obtain 1 inch minimum exposure beyond the face of the wall.

D. Terra Cotta Ornamental Panel Installation.

1. Soak terra cotta units in a container of clean water for a minimum of 1 hour immediately prior to installation. Units shall be noticeably damp but not dripping at the time of setting. Drain the units sufficiently to eliminate surface water.

2. At the beginning of setting units each working day, soak wall cavities with clean water applied by a hose and spray nozzle. Soak cavity surfaces with water no more than one hour before setting of terra cotta unit(s).

3. Mix and proportion the cementitious materials for setting beds and grout:
   a. **Setting Mortar.**
      Use Type N mortar in accordance with ASTM C 270 with the following material mix proportions by volume:
      - Portland Cement: 1 part
      - Hydrated Lime: 1 part
      - Sand: 6 parts
   b. **Mortar Grout.**
      Setting mortar with sufficient additional water to cause the mixture to flow readily without segregation. This grout shall be used where the spacing between the terra cotta panel and the wall cavity is between 5/8 inch and 3/4 inch.
   c. **Pea Gravel Grout.**
      This grout may be used only where the spacing between the terra cotta panel and the wall cavity is more than 3/4 inch and when filling large cells. Proportions by volume:
      - Portland Cement: 1 part
      - Sand: 3 parts
      - Pea Gravel: 2 parts, graded 100% passing 3/8 inch sieve
   d. **Pointing Mortar.**
      Color of pointing mortar shall be light grey and made consistent for the entire job. Use Type O mortar (pre-hydrated for repointing) in accordance with ASTM C 270, with the following material mix proportions by volume:
      - Portland Cement: 1 part

- Hydrated Lime: 2 parts
- Sand: 9 parts

4. Fill large cells on the back of the terra cotta panel with appropriate mortar grout or pea gravel grout.

5. Immediately prior to commencement of unit setting, brush a coat of neat Portland Cement and water onto the affected wall cavity surfaces and the entire back and embedded sides of the soaked terra cotta unit to be set.

6. Spread half of the setting mortar coat onto the affected wall cavity surfaces and the other half over the back and embedded sides of the terra cotta unit.

7. Screed the setting mortar on the terra cotta unit to a uniform thickness, except where filling gaps, frogs, voids or other inconsistencies. Screed the setting mortar in the wall cavity to a true and plumb level.

8. Use sufficient mortar to create a slight excess, which will be forced out at the joints around the edges of the unit when tapped into place.

9. Firmly place the unit within the cavity by repeated gentle tapping with a rubber mallet to eliminate all voids in the setting bed. Take care to embed the unit to the position indicated in the plan details.

10. Completely fill all voids and joints within the cavity with appropriate mortar grout or pea gravel grout and make watertight. Rake out the face joints to 1/2 inch to allow for pointing.

11. Remove any terra cotta unit that is tipped away from the cavity for readjustment, is too deeply embedded, or is improperly set for any reason. Remove and clean away all mortar from units and cavity surfaces, and reset in accordance with the above procedures.

12. Support each terra cotta unit, in addition to any non-corrosive centers or wedges, with braced wooden shores exerting a constant upward pressure until the mortar has set for several days.

13. After setting and mortar curing, but prior to pointing, clean all exposed surfaces with natural-fiber brushes, non-ionic mild soap powder or detergent and clean water.

14. Pointing.
- **a.** Refer to ACI 530.1 current edition for Hot and Cold Weather Construction.
- **b.** Wet joint thoroughly and repeatedly prior to pointing and between pointing lifts. Allow water to soak in so that no surface water is visible.
- **c.** Point in 2 lifts; pack joints to within 3/8 inch of surface on first lift; allow first lift to set prior to pointing second lift.
- **d.** As soon as mortar has taken its initial set, tool joint surfaces to be slightly concave. Do not allow mortar to extend over the edges of terra cotta units.
- **e.** After initial 24 hour set, moisten until cured. Allow mortar to cure completely prior to cleaning operations, with a minimum cure time of 30 days.
- **f.** Clean up after pointing operations are complete. Remove mortar stains, excess mortar, etc. from surrounding surfaces. Remove lumps of mortar from terra cotta only with sharpened wood or plastic paddles. Do not use acid cleaners. Rinse thoroughly with clean water after cleanup.

15. Clean-up: Upon completion of terra cotta installation operations, remove tools, equipment, shoring, debris and other materials resulting from these operations from the site. Leave the area broom clean.

E. Inspection.
The Engineer will inspect all phases of the work to verify that it is in accordance with the requirements of these Special Provisions. The Contractor shall facilitate this inspection as required, including providing the Engineer with advance notice of scheduled work, allowing ample time for the inspections and access to the work. Inspections may include, but are not limited to, terra cotta panel preparation, mortar preparation, unit setting, mortar curing, pointing, cleanup and final appearance. The inspection by the Engineer does not relieve the Contractor of the responsibility to comply with all requirements of this section.

150025.04 METHOD OF MEASUREMENT.
No measurement of installed work shall be made.

150025.05 BASIS OF PAYMENT.

A. Payment will be Lump Sum for “Terra Cotta Panels, Prepare and Install Only”.

B. Payment is full compensation for furnishing all labor, equipment, transport, and materials used to prepare and install the furnished terra cotta ornamental panel units in accordance with all requirements listed in the plans and these Special Provisions.