

**KANSAS DEPARTMENT OF TRANSPORTATION  
SPECIAL PROVISION TO THE  
STANDARD SPECIFICATIONS, 2007 EDITION**

Delete SECTION 824 and replace with the following:

**SECTION 824**

**CONCRETE SIDEWALK, STEPS AND RAMPS**

**824.1 DESCRIPTION**

Construct concrete sidewalk, steps and sidewalk ramps with detectable warning strips compliant with the Public Rights-of-Way Accessibility Guidelines (PROWAG) according to the Contract Documents.

Construct sidewalk ramps (detectable warning) compliant with PROWAG on existing sidewalk ramps according to the Contract Documents.

**BID ITEMS**

Sidewalk Construction (\*) (\*\*)  
Sidewalk Ramp  
Sidewalk Ramp (Detectable Warning)  
Grade 3.0 Concrete (Misc.)  
Reinforcing Steel  
\*Thickness  
\*\*"AE" denotes air-entrained concrete.  
No entry denotes concrete without air.

**UNITS**

Square Yard  
Square Yard  
Square Yard  
Cubic Yard  
Pound

**824.2 MATERIALS**

Provide materials that comply with the applicable requirements.

Concrete and Mortar .....	<b>DIVISION 400</b>
Paving Bricks Compliant with PROWAG .....	<b>DIVISION 1300</b>
Reinforcing Steel .....	<b>DIVISION 1600</b>
Preformed Joints Type B .....	<b>DIVISION 1500</b>
Joint Sealing Compound .....	<b>DIVISION 1500</b>
Mortar sand (FA-M) .....	<b>DIVISION 1100</b>
Silicon joint sealant (Type NS) .....	<b>DIVISION 1500</b>
Ramp Panels Compliant with PROWAG .....	<b>DIVISION 1700</b>

**824.3 CONSTRUCTION REQUIREMENTS**

**a. Excavation.** Excavate to the required depth and to a width that will permit the installation and bracing of the forms. Shape the foundation and compact to a firm even surface conforming to the section shown in the Contract Documents. Remove all soft and yielding material and replace with acceptable material.

**b. Forms.** Extend forms for the full depth of the concrete. Use straight forms, free from warp and of sufficient strength to resist the pressure of the concrete without springing. Brace and stake forms so the forms remain true to line and grade until their removal.

Slipform equipment may be approved by the Engineer and used on a satisfactory performance basis.

**c. Mixing and Placing Concrete.** Unless shown otherwise in the Contract Documents, construct concrete sidewalks, steps and ramps in a single course of Grade 3.0 concrete. Thoroughly moisten the foundation immediately prior to the placing of concrete. Place concrete according to **DIVISION 400**.

Finish the surface with a wooden float. Finish all outside edges of the slab and all joints with a ¼ inch radius edging tool.

**d. Reinforcement.** Place reinforcing steel for steps, sidewalks or ramps as shown in the Contract Documents. Support bars on metal bar chairs and securely wire to prevent displacement during concrete placement.

**e. Sidewalk Ramps with Detectable Warning Strips Compliant with PROWAG - New Construction.**

(1) Paving Brick. Set the truncated dome paving bricks in a mortar bed as detailed in the Contract Documents. Construct the surface of truncated dome paving brick between the truncated domes flush with the adjacent sidewalk ramp surface. Fill the joints between the truncated dome paving bricks with broomed-in mortar sand.

The Engineer will check the completed truncated dome paving brick surfaces with a 10 foot straightedge. The completed paving brick surfaces may not deviate more than ⅜ inch, unless the contour of the area exceeds this tolerance

(2) Cast-In-Place Prestressed Panels. Prior to the concrete achieving initial set, recess areas to receive prestressed panels below finished grade at locations shown in the Contract Documents. Use a wood float or tool recommended by the manufacturer to achieve the proper depth and refinish the disturbed area. Prior to placement, pre-dampen the back side of the panel with clean water. Follow the manufacturer's recommendations for preparing the panel when mortar is specified between the panel and fresh concrete.

Install the panels immediately in recess areas of fresh concrete and lightly tap the panels to grade using a rubber mallet to establish bond and 100% surface contact. Square the edges of the panels to provide a symmetrical alignment. Set the depth flush with the adjacent surfaces. Keep the tolerances between panels and surrounding surfaces within 1/16 inch.

Maintain a 3/16 inch caulk joint between panels and seal with a Type NS silicon joint sealant.

Edge around the panels as shown in the Contract Documents. Clean any concrete residue off of the panels with a damp sponge to provide a clean appearance.

Protect the panels from concrete curing compound overspray.

(3) Hardened Concrete Placement of Prestressed Panels. Recess the area 3/16 inch more than the thickness of the prestressed panels.

Clean the surfaces of all dust, oil, grease, curing or sealing compounds, laitance or other surface contaminants. Mechanically abrade the concrete surface to provide a smooth surface profile.

Fill cracks or voids with compounds that are approved by the panel manufacturer.

Remove any high spots on the substrate by mechanical methods.

Cut a large enough opening to permit expansion joints, when applicable.

Install panels with a high-strength polymer modified concrete according to the manufacturer's installation instructions.

(4) Cast-In-Place Composite Panels. Install according to the manufacturer's instructions. Provide a manufacturer's representative on site to instruct the Contractor and KDOT personnel in the correct installation procedures for the composite panels used.

Prior to the concrete achieving initial set, finish the concrete and recess areas to receive the composite panels below finished grade according to the manufacturer's instructions. Use a wood float or tool recommended by the manufacturer to achieve the proper depth, and refinish the disturbed area. When possible, install a single, standard size panel large enough to comply with the length and width requirements in the Contract Documents. If installation of a single panel will not satisfy the dimensional requirements in the Contract Documents, arrange the installation of standard size panels so the total joint length and panel cutting is minimized. Cut only those prequalified panels listed as used for "all applications".

When cutting panels, utilize auxiliary anchor points, as recommended by the panel manufacturer. Select enough additional anchor points so that no anchor is more than 5 inches from the edge (measured perpendicular to the nearest edge) and adjacent anchors are no more than 24 inches apart.

**f. Sidewalk Ramps (Detectable Warning).** Construct the detectable warning section on an existing sidewalk ramp, according to the manufacturer's instructions and this specification, including **subsection 824.3e**. Construct according to slopes and tolerances in the Contract Documents. Perform any necessary sidewalk ramp removal required to construct the detectable warning, without damaging the subgrade or sub-base. Install any necessary Grade 3.0 concrete required to construct the detectable warning.

Properly dispose of all waste material, and leave the area in a neat presentable condition.

**g. Curing.** Immediately after the finishing operation, cure the sidewalk, ramps and steps according to **DIVISION 700**.

**h. Contraction, Construction and Expansion Joints.** Form contraction joints at intervals shown in the Contract Documents. If not shown, form by placing a metal template having a minimum thickness of  $\frac{1}{8}$  inch into the concrete a minimum of  $\frac{1}{3}$  of the depth of the concrete, or by cutting entirely through the fresh concrete with a trowel.

Construct expansion joints as shown in the Contract Documents.

Form construction joints around all appurtenances such as manholes, utility poles, etc., extending into and through the sidewalk, and install  $\frac{1}{4}$  inch Type B preformed joint filler in these joints. Install expansion joint filler of the thickness shown in the Contract Documents between concrete sidewalks and any fixed structures such as a building or bridge. Extend the joint filler or expansion joint material for the full depth of the walk.

Round the edges of contraction, construction and expansion joints with a  $\frac{1}{4}$  inch radius edging tool.

**i. Backfilling.** Backfill the area adjacent to new sidewalks, ramps or steps and satisfactorily compact with suitable material. Observe adequate precautions to prevent injury to the sidewalks, ramps or steps during the compacting operations.

Dispose of excess excavated material as shown in the Contract Documents or as directed by the Engineer.

#### **824.4 MEASUREMENT AND PAYMENT**

Excavation for the construction of sidewalks, ramps and steps will not be measured separately for payment, but will be considered subsidiary work, except when such excavation may be considered as a part of, and may be measured in conjunction with the embankment excavation. In such instances, the excavation will be included in the quantity of embankment excavation computed as a line item on the contract.

The Engineer will measure sidewalk and sidewalk ramps by the square yard of the various thickness indicated.

The Engineer will measure sidewalk ramp (detectable warning) by the square yard when it is a bid item in the contract. When sidewalk ramp (detectable warning) is not a bid item in the contract, the work is subsidiary to the bid item sidewalk ramp.

The Engineer will measure steps by the cubic yard of Grade 3.0 concrete (misc.).

The Engineer will measure reinforcement by the pound according to **SECTION 711**.

Payment for "Sidewalk Construction", "Sidewalk Ramp", "Grade 3.0 Concrete (Misc.)" and "Reinforcing Steel" at the contract unit prices is full compensation for the specified work.

Payment for "Sidewalk Ramp (Detectable Warning)" at the contract set unit price includes all excavation, compaction of subgrade or subbase if required, removal of sidewalk ramp, concrete construction, disposal of waste material, and all material, labor, equipment, tools, supplies, incidentals and mobilization necessary to complete the work.

**Delete SECTION 1725 and replace with the following:**

#### **SECTION 1725**

##### **DETECTABLE WARNING SURFACE PANELS FOR CURB RAMPS AND MEDIANS**

#### **1725.1 DESCRIPTION**

This specification governs fabrication of panels compliant with the Public Rights-of-Way Accessibility Guidelines (PROWAG). The panels are required to comply with all dimensional requirements as stipulated within the PROWAG.

**1725.2 REQUIREMENTS**

**a. General.**

- (1) Any manufacturer producing panels under this specification must be currently prequalified. Procedures for prequalification are outlined in **subsection 1725.4**.
- (2) Unless shown otherwise in the Contract Documents, manufacture all panels provided under this specification to comply with the applicable subsections.
- (3) Provide in the appropriate color stipulated in the Contract Documents. Warrant the color for 10 years.

**b. Prestressed Concrete Panels.**

- (1) Provide a non-rusting prestressed support system integrated into the lower portion of the panel. The system is required to impart pressure in excess of 200 psi in both horizontal directions on a fully cured panel.
- (2) Dimensions. Provide a 2 X 2 foot panels that comply with the dimensions and details specified by the PROWAG. Larger panels may be used if approved by the Engineer.
- (3) Material Specifications. Provide panels that comply with **TABLE 1725-1**.

<b>Table 1725-1: REQUIREMENTS FOR PRESTRESSED CONCRETE PANELS</b>		
<b>Property</b>	<b>Test Method</b>	<b>Requirement</b>
Accelerated Weathering	ASTM G 155	No visible change (2915 hrs)
Compressive Strength	ASTM C 39	≥ 8,000 psi
Slip Resistance	ASTM D 2047	≥ 0.80

**c. Polymer Concrete Panels.**

- (1) Provide a polymer concrete panel. For this specification, polymer concrete is defined as having a cementitious material blended with an epoxy material to create a high-strength, tough and durable panel. Fibers may be used.
- (2) Dimensions. Provide a 2 X 2 foot panels that comply with the dimensions and details specified by the PROWAG. Larger panels may be used if approved by the Engineer.
- (3) Material Specifications. Provide a polymer concrete panel that complies with **TABLE 1725-2**.

<b>Table 1725-2: REQUIREMENTS FOR POLYMER CONCRETE PANELS</b>		
<b>Property</b>	<b>Test Method</b>	<b>Requirement</b>
Accelerated Weathering	ASTM G 155	No visible change (2915 hrs)
Compressive Strength	ASTM C 39 or ASTM C 170	≥ 8,000 psi
Slip Resistance	ASTM D 2047 or ASTM C 1028	≥ 0.80

**d. Composite Panels.**

- (1) Provide an anchored cast-in-place design that is replaceable without removing or damaging the surrounding hardened concrete.
- (2) Panel. Provide a homogeneous, monolithic, glass-reinforced polymer composite panel that is colorfast and UV stable. Disperse coloring pigments and chemicals to enhance UV stability uniformly throughout the product. Panels using a coating to achieve color fastness or UV stability will not be approved.  
 If provided, a reinforcing flange or wedge along the perimeter of the panel can be no more than 0.75 inch deep (total depth, including panel thickness) and must be shaped in such a fashion so that it does not prevent panel removal and replacement in hardened concrete. Provide breaks in the perimeter flange to allow for air evacuation from under the panel during installation.  
 Cast the manufacturer's name into the top surface of the panel.
- (3) Dimensions. If possible, provide a single, standard size panel large enough to comply with the length and width requirements in the contract documents. If a single panel will not satisfy the dimensional requirements in the contract documents, arrange the fewest number of standard size panels to minimize total joint length and panel cutting.

Provide a panel whose dome size and in-line spacing is compliant with PROWAG.

(4) Anchor. Provide nylon composite or HDPE, corrosion resistant anchors. Provide a self-threading anchor design that allows for repeated panel removal and re-installations.

Provide a minimum 2.0 inch long spike type anchor whose shape facilitates insertion into stiff, plastic concrete by minimizing concrete displacement while maximizing aggregate/anchor interlock. Other anchor shapes and lengths will be considered as part of the prequalification review on a case-by-case basis provided the panel manufacturer can provide a 3-year history of satisfactory anchor performance, especially in relation to anchor insertion under less than ideal concrete conditions and anchor pullout.

The outer “ring” of anchors can be centered no more than 5 inches from the nearest edge of the panel, measured perpendicular to the edge. The center-to-center spacing between adjacent anchors can be no more than 24 inches in any direction.

(5) Anchor Fastener. Provide minimum #10 size, tamper-proof, countersunk, flathead, stainless steel fasteners that sets flush with the dome or field surface and provides at least 1 inch of embedment into the anchor. As part of the prequalification review of alternate anchors as described in **subsection 1725.2d.(4)**, a shorter fastener embedment or different type of fastener will be considered on a case-by-case basis.

(6) Panel Modification. Provide a panel which, when cut, is engineered to conveniently facilitate the drilling of additional countersunk holes at thickened auxiliary anchor points to accommodate the maximum anchor spacing and edge distance requirements of **subsection 1725.2d.(4)**. If this requirement cannot be met, the panel will be approved for uncut applications only.

(7) Surface Protection. Provide a removable plastic film to protect the panel surface during installation.

(8) Material Specifications. Provide a composite panel that complies with **TABLE 1725-3**.

<b>Table 1725-3: REQUIREMENTS FOR COMPOSITE PANELS</b>		
<b>Property</b>	<b>Test Method</b>	<b>Requirement</b>
Water Absorption	ASTM D 570	≤ 0.50%
Accelerated Weathering	ASTM G 155	No visible change (2915 hrs)
Flexural Strength	ASTM D 790, Procedure A	≥ 15,000 psi
Slip Resistance	ASTM C 1028	≥ 0.80 wet or dry
Abrasion Resistance	ASTM C 501	I <sub>w</sub> > 130
Salt Spray	ASTM B 117	No visible change (120 hrs)
Freeze/Thaw/Heat	ASTM C 1026	No chipping, cracking, or peeling

### 1725.3 TEST METHODS

Perform all test methods as specified in **subsection 1725.2** for the given product.

### 1725.4 PREQUALIFICATION

To prequalify concrete panels, send three (3) 6 x 6 inch samples of each color to be prequalified to the Engineer of Tests along with test results from a certified laboratory (CCRL, A2LA or NVLP).

To prequalify composite panels, send a single 1 x 1 foot panel (w/installed anchors) of any color and three (3) 6 x 6 inch sample of each color to be prequalified to the Bureau Chief of Construction and Materials along with test results from an approved laboratory. In addition, provide detailed product information, including all dimensional information, and step-by-step procedures covering original installation and panel removal/re-installation. Consideration of alternate anchors shapes will require additional information as described in **subsection 1725.2d.(4)**. Material or physical changes to panels or anchors requires re-prequalification. Changes in panel size or additions to the number of standard panel sizes does not require re-prequalification as long as the spacing and edge distance requirements of **subsection 1725.2d.(4)** continue to be satisfied.

Panels must be able to comply with the general and product specific requirements of **subsection 1725.2**.

The Bureau of Construction and Materials will maintain a prequalified list of all complying manufacturers. Products will remain on the prequalified list as long as performance in the field is satisfactory.

**1725.5 BASIS OF ACCEPTANCE**

The manufacturer must be currently prequalified as specified in **subsection 1725.4**.  
Receipt and approval of a Type C certification as specified in **DIVISION 2600**.  
Visual inspection for cracked or damaged panels.

11-04-13 C&M (SML)  
May-14 Letting