

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	54-87 K-6657-01	2002	435	1122

**SUMMARY OF QUANTITIES**

Item	Class III Excavation	Concrete (Grade 30) (AE) (SA)	Concrete (Grade 30) (AE)	Reinforcing Steel (Grade 420)	Reinforcing Steel (Grade 420) (Epoxy Coated)	Pile (Concrete) (325)	Test Pile (Concrete) (325)	Abutment Strip Drain	Bridge Backwall Protection System	Silica Fume Overlay (40mm)	Structural Steel (A709M Grade 250)	Structural Steel (M270M Grade 345 T2)	Headed Stud Anchors	Elastomeric Bearing Devices		Strip Seal Assembly	Special Surface Treatment	Surface Coating Finish
														TFE	Each			
Location	m <sup>3</sup>	m <sup>3</sup>	m <sup>3</sup>	kg	kg	m	m	m <sup>2</sup>	m <sup>2</sup>	m <sup>2</sup>	kg	kg	Each	TFE	Each	m	m <sup>2</sup>	m <sup>2</sup>
Abutment No. 1	***95		***129.9		***5965	363.2		114.8	139.5					8	8	17.1	76	38
Pier No. 1	160		117.1	13 660		569.4	17.6							8	8			
Pier No. 2	132		117.1	13 660		643.5	19.5							8	8			
Abutment No. 2	***114		***129.9		***5965	360.0		111.3	139.6					8	8	17.1	76	38
Substructure Total	501		494.0	27 320	11 930	1936.1	37.1											
Superstructure Total		502.4			71 840					1821	22 706	329 045	5472					
Total	501	502.4	494.0	27 320	83 770	1146	37.1	226.1	279.1	1821	22 706	329 045	5472	16	16	34.2	152	76

**DESIGN DATA**

**DESIGN SPECIFICATIONS:**  
AASHTO Specifications, 1996 Edition and latest Interim Specifications. Load Factor Design

**DESIGN LOADING:**  
MS18-44 with Kansas Overload Provision & Alternate Military Loading Specification.

Design Dead Load includes an allowance of 0.72 kPa for a future wearing surface.

**UNIT STRESSES:**

Concrete (Grade 30)	f'c = 30 MPa
Concrete (Grade 30)(AE)	f'c = 30 MPa
Concrete (Grade 30)(AE)(SA)	f'c = 30 MPa
Reinforcing Steel(Grade 420)	fy = 420 MPa
Structural Steel (A709M Grade 250)	Fy = 250 MPa
Structural Steel (M270M Grade 345 T2)	Fy = 345 MPa

\* Includes 16 @ 22.7m Abut. No. 1, 39 @ 14.6m Pier #1, 39 @ 16.5m Pier #2, and 16 @ 22.5m Abut. #2  
 \*\* Includes 16 @ 22.9m Abut. No. 1, 39 @ 14.6m Pier #1, 39 @ 16.5m Pier #2, and 16 @ 21.6m Abut. #2  
 \*\*\* Note: Circular wall quantities are included in the bridge substructure quantities.

**EMBANKMENT:** Complete the embankment at the abutments as shown on the Bridge Excavation sheet prior to driving the abutment piling or commencing with the abutment footing excavation.

**BRIDGE EXCAVATION:** All excavation shall be Class III. See the Bridge Excavation sheet for the limits of pay excavation.

**PILING:** All piling shall be driven to penetrate or bear upon the Pleistocene Deposits above the Wellington formation. If sufficient bearing and penetration into the denser sands of the Pleistocene Deposits are achieved before the design pile tip elevation is reached, driving should cease to avoid damage to the tip. All piling shall be driven to the minimum computed bearing value equal to the Allowable Pile Driving Load:

Abutment No. 1	440 kN
Pier No. 1	440 kN
Pier No. 2	440 kN
Abutment No. 2	440 kN

When using the pile driving formula in the KDOT Specifications, drive the pile to the Allowable Load and penetration, but in no case shall the pile be driven to MORE THAN 660 kN. At any location where problems are experienced, pile damage is suspected, or apparent refusal occurs significantly above the design pile tip elevation, the Engineer may request that the Pile Driving Analyzer (PDA) equipment be used.

**TEST PILING:** Piling shall be driven at the locations shown on the plans or as directed by the Engineer. The test piling shall remain in place as part of the permanent structure.

**ABUTMENT DEADMAN ANCHOR:** Pay quantities for deadman anchor materials will be based on design plan quantities.

**CONCRETE:** Superstructure concrete is bid as Concrete (Grade 30)(AE) (SA). Substructure concrete is bid as Concrete (Grade 30)(AE). If desired, the Contractor may use Concrete (Grade 30) in the pier footings. Bevel all exposed edges of all concrete with a 20 mm triangular molding, except where noted on the plans. Construction joints are optional, but if used, place only at locations shown, or at locations approved by the Engineer.

**REINFORCING STEEL:** All reinforcing steel dimensions are to the centerline of bars unless otherwise noted. All reinforcing steel bars, shall conform to the requirements of ASTM A615M-96, Grade 420.

**BACKFILL COMPACTION:** Compact backfill at the abutments and piers.

**STRUCTURAL STEEL:** All structural steel shall conform to the requirements of AASHTO M270M (Grade 345 T2) unless otherwise designated on the plans. Steel in members designated AASHTO M270M (Grade 345 T2) shall conform to mandatory supplemental impact properties for Zone 2. All other steel shall conform to the requirements of ASTM A709M Grade 250 unless otherwise noted.

**FALSEWORK PLANS:** A licensed Professional Engineer shall design the falsework details. Details shall bear the seal of a licensed Professional Engineer. Submit seven sets of details in compliance with KDOT Specifications to the Field Engineer for review.

**FALSEWORK PLANS:** Use the SI system of units on falsework plans.

**DIMENSIONS:** All dimensions shown on the design plans are horizontal dimensions unless otherwise noted. Make necessary allowances for roadway grade and cross slope.

**Debris Removal:** The interior of all box girders shall be cleaned of all material prior final acceptance.

**TEMPERATURE:** The design temperature for all dimensions is 15°C.

**BOLTED CONNECTIONS (SECONDARY MEMBERS):** Use M22 (7/8" dia. A325 H.S.) heavy hex structural bolts for the secondary member connections. Bolt holes will be 24 mm diameter. Oversized and/or slotted holes having a nominal diameter up to 5 mm larger may be used on one of the two members connected if shown on Contract plans and approved shop drawings. Oversized and/or slotted holes may require additional standard hardened washers or plate washers. Report to the Engineer any reaming required that will remove more than 5 mm of material before any reaming is done.

Use Direct Tension Indicators (DTIs) on all high strength bolts. Place the DTI under the bolt head and turn the nut to tighten. This method is preferred whenever possible. Face the protrusions on the DTI to the underside of the bolt head. Place a hardened flat washer under the nut. See KDOT Specifications.

**TEMPORARY CONNECTIONS:** For erection purposes, the Contractor may, at his own expense, provide erection bolt holes. Such proposals shall be shown on the shop details. Erection holes in the girder webs shall be filled with bolts. The heads of bolts shall be placed on the outside faces of the webs.

**GIRDER FIELD SPLICES:** All girder field splices shall be welded connections. No field splice bolted connections will be allowed.

**SHOP SPLICES:** Shop splices are to be made as shown on the plans or as approved by the Engineer.

**RADIOGRAPHIC INSPECTION OF GIRDERS:** Radiograph all butt welds in the flanges and all but the middle one-third of the web butt welds in each span.

Specifications and ANSI/AASHTO/AWS D1.5-00, Bridge Welding Code. Where referenced in the Bridge Welding Code, the following substitutions shall apply:  
 ASTM A709M Grade 250 for ASTM A36  
 AASHTO M270M Grade 345 T2 for AASHTO M223 Grade 50 (Charpy tests required, Zone 2)

Material not covered by the Bridge Welding Code will be covered by ANSI/AWS D1.1-00. The Contractor shall show on the shop drawings at the tail of the weld symbol a code or symbol which refers to an approved prequalified weld procedure. Unless otherwise noted all fillet welds to be 6 mm.

**PAINTING:** The shop and field coats applied to Structural Steel shall conform to the Inorganic Zinc Acrylic System except as follows:  
 6 mil total (2 coats).

**Box Girder Inside Surfaces:** The inside surfaces of the box girders shall be painted with a 6-mil zinc coating. One coat of inorganic zinc and a shop or field coat of waterborne acrylic shall be provided. The final coat shall provide a white surface.

**Near Welded Field Connections:** Girder surfaces within 150 mm of field splice welded connections shall not receive the shop coat of primer but shall be coated with a rust preventative coating in the shop in accordance with KDOT Specifications.

One approved paint supplier shall be as provided by Carboline; 350 Hanley Industrial Ct., St. Louis, Missouri.  
 The inorganic zinc primer would be Carboline INOC with the waterborne acrylic being Carboline 3350 with Federal Spec. color #20372. An allowed substitute, for the waterborne acrylic, would be Carbothane 134 HG applied with 1 mil (misc) plus 3 mil finish coat. A paint supply substitute may be made with the approval of the Engineer. (Tint Primer to nearly match final color. Final color to be Graffiti resistant).

**WELDING OF HEADED STUD ANCHORS:** Weld Headed Stud Anchors with automatically timed stud welding equipment connected to a suitable power source. All stud welding shall conform to KDOT Specifications.

**Top Flanges (Studs applied in the shop)** Apply a 75 µm primer coat of an approved inorganic zinc primer to the tops of the top flanges and to the studs.

**Top Flanges (Studs applied in the field) Shop Work - Blast clean the tops of the top flanges to SSPC-SP10 Specifications (latest Revision). Apply a minimum 35 µm prime coat of inorganic zinc primer to the tops of the top flanges. Blast clean the faying surfaces of the field splices and apply a 75 µm prime coat of inorganic zinc primer.**

**Field Work - Blast clean the tops of the top flanges to SSPC-SP6 Specifications (latest Revision) before the studs are applied. After the studs are applied, blast clean the tops of the top flanges and the studs to SSPC-SP6 Specifications and paint with an approved organic zinc primer to a minimum dry film thickness of 75 µm.**

**Touch-up:** All bolts, nuts studs and other small areas of damaged paint (0.930 Sq. M. or less) requiring touch-up will be prepared and painted with an approved Organic Zinc Primer (Carboline 859 or approved equal). permanent diaphragm connections shall be verified in the shop laydown.

**SHOP ASSEMBLY:** Shop layout shall be "Type B" Assembly. In addition permanent diaphragm connections shall be verified in the shop laydown.

**BLOCKING DIAGRAMS:** Blocking diagrams on the shop details shall be referenced to a level line running the entire length of the girder.

**ERECTION:** Bring each line of girders to the correct line, grade (or relative grade) and camber, and secure in place prior to connection of the girder field splices. Provide falsework bents as necessary to maintain the correct line and elevation. Leave the falsework bents in place until all girder splice connections are completed. Submit information which clearly shows the proposed layout and use of falsework bents. The Engineer shall approve such information prior to erection of structural steel.

**ERECTION ELEVATION CHECKS:** After the abutment and pier concrete has cured and before setting any structural steel, present verification to the Engineer that the elevations at the bearings match plan elevation (+/- 6mm).

**CAMBER:** Camber the steel girders for the total dead load deflection and the vertical curvature, if necessary. The ordinates shown for the concrete dead load deflection represent the amount of camber that should be in the girders after they are erected and bolted but prior to placing the floor forms. Construct the finished deck to plan grade by varying the depth of the fillet over the girder to provide for girder camber, concrete dead load deflection and, if necessary, vertical curvature. After the girders are completely erected and the falsework is removed, measure the camber in the field by taking a profile of each girder. Correct any variation between the actual camber and the concrete dead load deflection shown in the plans by varying the depth of the concrete fillets over the girders so that the finished floor is constructed to the theoretical grade. The minimum depth of the slab over the girder shall be 220 mm including overlay.  
 The theoretical amount of concrete required for the fillets is 15.7 m<sup>3</sup> per bridge. This amount of concrete is included in the Summary of Quantities. Any additional concrete required to construct the fillets will be subsidiary.

**PERMANENT STEEL DECK FORMS:** Use Type I steel deck forms conforming to ASTM A446M. Support hangers shall be a non-welded system. Do not weld to any flange. Compute the pay quantity of the concrete slab based on nominal slab dimension with no allowance for corrugations. No direct payment will be made for deck forms or any additional concrete. These items will be considered subsidiary to "Concrete (Grade 30)(AE)(SA)". Use permanent steel deck forms inside the box girders (non-exposed area) only.

**CONCRETE PLACING SEQUENCE:** The sequence of placing concrete in the slab and barrier rails shall be as shown, or the Contractor may submit an alternate placing sequence for review. Submit the alternate placing sequence to the Engineer at the Preconstruction Conference. Include the proposed rate of concrete placement in m<sup>3</sup>/h, the plant capacity, placement direction, construction joint location, a description of the equipment used in placing the concrete, proposed admixtures, and the quantity of concrete in each placing segment. Any additional cost for the Contractor's alternate plan of placing concrete, including admixtures, shall be at the Contractor's expense and shall be considered subsidiary to the bid item, "Concrete (Grade 30) (AE) (SA)". Approval of the Contractor's alternate sequence is required prior to placement of concrete in the deck.

**SLAB CURING PERIOD:** No traffic is permitted on a deck, sub-deck or overlay until the seven day curing period is complete. Operations necessary to complete placement of the deck, sub-deck, or overlay are permitted, for a minimum practical time, as noted in the Standard Specifications. No work to place reinforcing steel or forms for the bridge rail or barrier is allowed during this curing period.

**CONSTRUCTION LOADS:** Only foot traffic is permitted on the deck, subdeck or overlay during the seven day curing period. No work to place reinforcing steel or forms for the bridge rail or barrier is allowed during this curing period. Light truck traffic (i.e. pick-up) is allowed 14 days after the pour is completed. Legal loads and heavy stationary loads are permitted after 21 days. No overloads will be permitted prior to 28 days. Overloads require submittal of axle spacing, weight, footprint pressure and approval by the Engineer.

**DECK PROTECTIVE SYSTEM:** Epoxy coat all reinforcing steel in the deck slab and rails. Place a 40 mm Silica Fume Overlay over the entire deck as shown on the plans.

**CONSTRUCTION JOINTS:** Construction Joints shall be made only at locations indicated or as approved by the Engineer.

**SURFACE COATING FINISH:** A special finish will be applied to all vertical and horizontal concrete surfaces visible from the Maize side road surface, with the exception of the bottom of deck between girder flanges. The final color shall be Federal Spec. Color #20372. See Special Provision for additional information.

**QUANTITIES:** Items not listed separately in the Summary of Quantities are subsidiary to other items in the proposal.

See Sheet No. 435A for ADDENDUM NOTES.

No.	Revisions	By	Date
CITY OF WICHITA			
BR. NO. 54-87-19.05(489) W.B.		STA. 15+612.397	
BR. NO. 54-87-19.06(491) E.B.		STA. 15+612.397	
<b>GENERAL NOTES AND SUMMARY OF QUANTITIES</b>			
<b>KELLOGG (US 54) OVER MAIZE ROAD</b>			
<b>SEDGWICK COUNTY</b>			
Professional Engineering Consultants, P.A. 303 S. TOPEKA • WICHITA, KANSAS 67202 916-262-2691 • FAX 316-262-3003			
Designed by	P.D.F.	Checked by	R.A.S.
Drawn by	W.L.L.	Date	April, 2002
		Job No.	97362

**RECORD DRAWING**

Drawn by: wil  
 Plotted by: ras 4-10-2002  
 1/1997/97362/As-Built/dgn/s/Vol\_3/Sh\_435-gennote.dgn Last Rev: 8-29-07 By: gdr