All relating utility locations shown are approximated only and are not a guarantee of the actual field conditions. Contractor shall be responsible for clearing all utility companies and verifying the actual locations of all utilities prior to any construction activity. Contractor shall keep all utility locations current. Utilities damaged through negligence of the contractor to either the public or to the company will be the responsibility of the contractor to repair or replace at their expense and at the direction of the utility company.

The Contractor shall complete the Embankment as shown on the bridge excavation sheet prior to the driving of the abutment piles. All trees, hedge rows, and shrubs in the temporary construction easement area from Sta. 100+52 Lt. to Sta. 102+46 Rt. shall be removed.

All areas of the existing structure shall become property of the Contractor and shall be removed from the site. The Contractor shall complete the Embankment as shown on the bridge excavation sheet prior to the driving of the abutment piles. All trees, hedge rows, and shrubs in the temporary construction easement area from Sta. 100+52 Lt. to Sta. 102+46 Rt. shall be removed.

The Contractor shall remove the existing 13' concrete approach span and 3' 13' bridge has been constructed bridge (10'-0" roadway) with 4' 13' Bridge. No. 001306830.146. All trees, of the existing structure shall become property of the Contractor and shall be removed from the site.

Note: The Contractor shall remove all trees and shrubs in the temporary construction easement area from Sta. 100+52 Lt. to Sta. 102+46 Rt. Do not disturb the fence in this area.
### GENERAL NOTE

The Contractor shall provide shop drawings to install W-beam guardrail on the outside bridge side. Guardrail posts shall be steel and shall be welded to the outside bridge side. Blocks will not be required between the steel posts and the W-beam guardrail across the bridge. All labor, material, and incidental necessary to install the guardrail shall be subsidiary to the bid item "Guardrail, Steel Plate".

Generalize all steel posts after fabrication.

Lap guardrail splices, including terminal connector, in the direction of traffic. Where traffic is temporarily carried in the opposite direction of final configuration, lap rail splices in the direction of traffic.

Use galvanized 15 gauge steel rail elements unless otherwise noted. Use galvanized anchor bolts and post rail fittings, see Standard Specifications. Supply guard rail parts that are interchangeable with similar parts regardless of source of manufacturer.

### REFERENCE NOTE

For Information Only

---

### SUMMARY OF STEEL PLATE GUARDRAIL

<table>
<thead>
<tr>
<th>Location</th>
<th>Bridge</th>
<th>Bridge</th>
<th>TOTAL</th>
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</thead>
<tbody>
<tr>
<td>Guardrail Length</td>
<td>68'-9&quot;</td>
<td>68'-9&quot;</td>
<td>68'-9&quot;</td>
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<tr>
<td>Type II End Terminal</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Pay Length</td>
<td>68'-9&quot;</td>
<td>68'-9&quot;</td>
<td>68'-9&quot;</td>
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<tr>
<td>TOTAL</td>
<td>68'-9&quot;</td>
<td>68'-9&quot;</td>
<td>68'-9&quot;</td>
</tr>
</tbody>
</table>

*From Information Only.*

---

### GUARDRAIL LAYOUT

The Contractor has the option of providing either standard wood or steel posts for the guardrail posts spaced off of the structure. No blocks required. See Standard Drawing RD611 for details.
**WOOD POSTS**

1. All wood posts and wood blocks are a preservative treatment, see standard specifications. Thoroughly saturate all cut, sanded, and bolt holes in wood posts and blocks with preservative.

2. Use one type of preservative treatment on a project. Use S4S rectangular posts and wood blocks, see standard specifications. Use only one post/blockout type within guardrail run, this excludes the guardrail end terminals. Set guardrail posts by digging or by driving. Use post caps to protect the post from crushing during driving operations. Contractor must notify KDOT’s Standard Specifications for erection of Guardrail is subsidiary to various bid items for which payment is made. Where guardrail posts are installed in pavement, form openings in the pavement for the guardrail posts.

3. Use S4S rectangular posts and wood blocks, see standard specifications. Use only one post/blockout type within guardrail run, this excludes the guardrail end terminals. Use only one type of preservative treatment on a project. Use S4S rectangular posts and wood blocks, see standard specifications. Use only one post/blockout type within guardrail run, this excludes the guardrail end terminals. Use only one type of preservative treatment on a project. Use S4S rectangular posts and wood blocks, see standard specifications. Use only one post/blockout type within guardrail run, this excludes the guardrail end terminals.

4. Use S4S rectangular posts and wood blocks, see standard specifications. Use only one post/blockout type within guardrail run, this excludes the guardrail end terminals. Use only one type of preservative treatment on a project. Use S4S rectangular posts and wood blocks, see standard specifications. Use only one post/blockout type within guardrail run, this excludes the guardrail end terminals.

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**STEEL POSTS**

1. Use S4S rectangular posts and wood blocks, see standard specifications. Use only one post/blockout type within guardrail run, this excludes the guardrail end terminals. Use only one type of preservative treatment on a project. Use S4S rectangular posts and wood blocks, see standard specifications. Use only one post/blockout type within guardrail run, this excludes the guardrail end terminals.

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**THREE BEAM POST DETAILS**

1. Lap guardrail splices, including terminal connector, in the direction of traffic. Where traffic is temporarily carried in the opposite direction of final configuration, lap rail splices in the direction of permanent traffic.

2. Lap guardrail splices, including terminal connector, in the direction of traffic. Where traffic is temporarily carried in the opposite direction of final configuration, lap rail splices in the direction of permanent traffic.

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10. Lap guardrail splices, including terminal connector, in the direction of traffic. Where traffic is temporarily carried in the opposite direction of final configuration, lap rail splices in the direction of permanent traffic.
### PIPE CULVERT SUMMARY

<table>
<thead>
<tr>
<th>Sheet No.</th>
<th>Type</th>
<th>Size of Culvert</th>
<th>Flow Line</th>
<th>Crown Grade</th>
<th>Length of Pipe</th>
<th>Pipe Gauge</th>
<th>Pipe Corrugations</th>
<th>Remarks</th>
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</thead>
<tbody>
<tr>
<td>SCW0144</td>
<td>CRP</td>
<td>24&quot; w/ES</td>
<td>1105.03</td>
<td>1101.34</td>
<td>1101.81</td>
<td>0</td>
<td>17.75</td>
<td></td>
</tr>
<tr>
<td>SCW0145</td>
<td>CRP</td>
<td>24&quot; w/ES</td>
<td>1105.03</td>
<td>1101.34</td>
<td>1101.81</td>
<td>0</td>
<td>17.75</td>
<td></td>
</tr>
</tbody>
</table>

---

**Notes to Designer:**
- SOP: Site Plan & Topography
- The design must be consistent with the Standard Specifications for Highway Construction.
- Use AASHTO Class No. for all pipe. See the Standard Specifications for Highway Construction for more details.

---

**Summary of Quantities**

- **Type of Culvert:** CRP
- **Size:** 24" w/ES
- **Flow Line:** 1105.03
- **Crown Grade:** 1101.34
- **Length of Pipe:** 1101.81
- **Pipe Gauge:** 0
- **Pipe Corrugations:** 17.75

---

**Remarks:**
- **Notes:**
  - When inside diameter of pipe is 36" or less.
  - When inside diameter of pipe is 60" or less.
- **Design:**
  - Design side slope to intersect inside diameter of pipe outside of Clear Zone.
- **Exception:**
  - Type IV End Sections are only made of CS or ACS. See Figure 4.5 for details.
- **Additional Information:**
  - See Summary of Quantities for End Section information.
  - Unless otherwise noted, minimum pipe gauge is not to be less than 1068.
  - See Summary of Quantities for End Section information.
  - Only include flow sections for embedded pipe. See RD668 for details. For structures not embedded, the flow elevations may be omitted.

---

**Additional Information:**

- **Flow Line:**
  - Length of Pipe
  - Horiz. to Roadway
  - Vertical to Roadway
- **Type of Culvert:**
  - CRP
  - CS
  - ACS
  - PE
  - CAP
  - CSP
- **Design:**
  - Roadway
  - Vertical
  - Horizontal

---

**References:**

- AASHTO Standard Specifications for Highway Construction
- Kansas Department of Transportation Design Manual
- Standard Specifications for Highway Construction
- AASHTO Class No.
- Type of Culvert
- Size of Culvert
- Flow Line
- Crown Grade
- Length of Pipe
- Pipe Gauge
- Pipe Corrugations
- Remarks

---

**Summary of PIPE CULVERTS**

- **RD659**
  - Date: 2-23-16
  - Rev.: T.T.R.
  - S.W.K.
  - Added footnote for Shop Drawing
  - 8-9-17
  - Added Floor Elev.
  - FHWA APPROVAL
  - DESIGNED
  - DETAILED
  - DESIGN CK.
  - DETAIL CK.
  - QUAN.CK.
  - TRACED
  - TRACE CK.
  - QUANTITIES
  - APP'D.
  - FHWA APPROVAL
  - DESIGNED
  - DETAILED
  - DESIGN CK.
  - DETAIL CK.
  - QUAN.CK.
  - TRACED
  - TRACE CK.
  - QUANTITIES
  - APP'D.

---

**Additional Notes:**

- **When inside diameter of pipe is 36" or less:**
  - Angle of Rotation (Left angle shown)
- **When inside diameter of pipe is 60" or less:**
  - Provide End Sections of the same material and coating type as the pipe.
- **Exception:**
  - Type IV End Sections are only made of CS or ACS. See Figure 4.5 for details.
  - Note to Designer: KDOT Pipe Policy provides guidance in identifying prohibited and restricted uses of CS, ACS, PE, CAP, RCP, PVCP, CSP, PE, and ACS. See the KDOT Design Manual for more information.
CONSTRUCTION SPECIFICATIONS:

SUMMARY OF QUANTITIES:

<table>
<thead>
<tr>
<th>Location</th>
<th>Type</th>
<th>Design Loading (Tons/Pile)</th>
<th>Strength 1</th>
<th>Service 1</th>
<th>Phi</th>
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</thead>
<tbody>
<tr>
<td>Abutment 1</td>
<td>3706</td>
<td>63 Tons</td>
<td>A709 (Grade 50)</td>
<td>1.0</td>
<td>1.0</td>
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<tr>
<td>Abutment 2</td>
<td>3706</td>
<td>63 Tons</td>
<td>A709 (Grade 50)</td>
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<td>1.0</td>
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</table>

NOTE: Pile lengths may need to be adjusted depending on the thickness of the predrilled concrete bridge piles.

GENERAL NOTES:

REMOVAL OF EXISTING STRUCTURE: The Contractor shall remove the existing concrete bridge approach span and 2 1/2 steel beam continuous bridge (19.4' roadway) with timber pile and stone substructure (2014 Version, and Special Provisions).

ASBESTOS INFORMATION: Samples of this structure were tested to determine the amount of Asbestos Containing Materials (ACM) present in the components. The results are listed below:

<table>
<thead>
<tr>
<th>Material</th>
<th>ACM Presence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concrete</td>
<td>No ACM found</td>
</tr>
</tbody>
</table>

PRECAST REINFORCED CONCRETE BRIDGE SLABS: The Contractor shall provide shop drawings detailing the connection of the bridge slabs to the pile cap for approval by the Engineer. The bridge slabs shall be connected to transfer loads between adjacent bridge slabs such that the individual slabs act as a unit. The Contractor shall provide shop drawings detailing the connection between bridge slabs. The bridge slabs shall be designed for LRFD HL-93 loading and a load rating stamped by a Registered Professional Engineer licensed to the State of Kansas shall be provided. The maximum longitudinal load shall be a minimum of 1.0 and the rating factor shall be 7.3, 1.15, 7.3 = 2000 kips.

SHEET NO. 03/02/09

INDEX TO DRAWINGS:

<table>
<thead>
<tr>
<th>Project</th>
<th>Drawing</th>
<th>Date</th>
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<tr>
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<tr>
<td>3</td>
<td>1</td>
<td>03/02/09</td>
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<tr>
<td>4</td>
<td>1</td>
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CONSTRUCTION DRAWINGS:

<table>
<thead>
<tr>
<th>Bridge Details</th>
<th>Design Loading (Foot/Pile)</th>
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<tr>
<td></td>
<td>Service 1</td>
</tr>
<tr>
<td>1</td>
<td>4028</td>
</tr>
<tr>
<td>2</td>
<td>4028</td>
</tr>
</tbody>
</table>

Total Excavation:

- Class I: 825 Cubic Yards
- Class II: 3706 Cubic Yards
- Total Excavation: 4531 Cubic Yards

CONTRACTOR:

The Contractor shall provide shop drawings detailing the connection of the bridge slabs to the pile cap for approval by the Engineer. All labor, materials, and Contractor equipment necessary to install the precast reinforced concrete bridge slabs shall be submitted to the bid.

GLASSDBRIDGE PLATE:

The Contractor shall provide shop drawings detailing the connection of the bridge slabs to the pile cap for approval by the Engineer. All labor, materials, and Contractor equipment necessary to install the precast reinforced concrete bridge slabs shall be submitted to the bid.

GUSSET:

The Contractor shall provide shop drawings detailing the connection of the bridge slabs to the pile cap for approval by the Engineer. All labor, materials, and Contractor equipment necessary to install the precast reinforced concrete bridge slabs shall be submitted to the bid.

WINGWALL:

The Contractor shall provide shop drawings detailing the connection of the bridge slabs to the pile cap for approval by the Engineer. All labor, materials, and Contractor equipment necessary to install the precast reinforced concrete bridge slabs shall be submitted to the bid.

HOLE:

The Contractor shall provide shop drawings detailing the connection of the bridge slabs to the pile cap for approval by the Engineer. All labor, materials, and Contractor equipment necessary to install the precast reinforced concrete bridge slabs shall be submitted to the bid.
The Contractor shall excavate the channel at the bridge site to the limits shown prior to construction of the bridge.

The Contractor shall complete the Embankment as shown on the bridge excavation sheet prior to the driving of the abutment pile.

All trees, hedge rows, and woody shrubs not shown to be removed and located between the construction limits and the right-of-way line or easement lines shall be spared unless directed by the engineer to be removed.

[Diagram of bridge and surrounding area with details on excavation and embankment.]
DRAINAGE DATA:

- Drainage Area
- Overtopping Frequency
- Design High Water Elevation
- Total Waterway Provided
- Design Frequency
- Design Backwater
- Design Backwater Elevation
- Overtopping Discharge
- Historic Highwater Elevation
- Ordinary Highwater Elevation
- Design Waterway Provided
- Backwater @ (QÓÒÒ)
- Backwater Elevation @ (QÓÒÒ)
- Discharge @ (QÓÒÒ)

- Estimated Ordinary Highwater Discharge

```
ributary to S alt C reek

(Ent. Rt. at Sta. 100+40)
```

SLOPE PROTECTION (Riprap Stone): Place Slope Protection (Riprap Stone) to the limits and thicknesses shown on the plans or as directed by the Engineer. Use Light 200 Lb. as described in Division 1100.

```
SLOPE PROTECTION (Riprap Stone) (100 lb)

<table>
<thead>
<tr>
<th>Location</th>
<th>Size</th>
<th>Description</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abut 1</td>
<td>2</td>
<td></td>
<td>Lb.</td>
</tr>
<tr>
<td>Abut 2</td>
<td>2</td>
<td></td>
<td>Lb.</td>
</tr>
<tr>
<td>Abut 1</td>
<td>2</td>
<td></td>
<td>Lb.</td>
</tr>
<tr>
<td>Abut 2</td>
<td>2</td>
<td></td>
<td>Lb.</td>
</tr>
<tr>
<td>TOTAL</td>
<td>70</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
```
Each wingwall shall be constructed with HP12x53 piles (20' each). Wingwall tops shall be sloped so that the end of the wing is 6" lower than the edge of roadway elevation. The wingwall top shall be capped with channel iron C5x6.7. Wingwalls and backwalls shall be interlocking galvanized 1 ga corrugated metal sheet piling driven to a minimum elevation of 1091.50. The abutment and wingwall sheet piling shall be tight against the whaler supports. The sheet piling shall be welded to the whalers, end plates and wing caps. The top of beam shall be sloped so that the end of the wing is 6" lower than the edge of roadway elevation. The wingwall top shall be capped with channel iron C5x6.7. Wingwalls and backwalls shall be interlocking galvanized 1 ga corrugated metal sheet piling driven to a minimum elevation of 1091.50. The abutment and wingwall sheet piling shall be tight against the whaler supports. The sheet piling shall be welded to the whalers, end plates and wing caps.
**Bridge Details**

**Bridge Rail Line Post Section**

- **Exterior Bridge Slab**
  - Dimensions shown at outside face of bridge slab.
  - BRIDGE SLAB
  - SHEET NO. 37

- **W-Beam Guardrail**
  - Dimensions shown at outside face of bridge slab.
  - GUARDRAIL POST SPACING
  - Dimensions shown at outside face of bridge slab.

**Minimum Fillet Weld Sizes**

<table>
<thead>
<tr>
<th>Material Thickness of Thicker Port Joined</th>
<th>Minimum Size of Fillet Weld</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/8&quot; to 1/4&quot; inclusive</td>
<td>1/4&quot;</td>
</tr>
<tr>
<td>Over 1/4&quot;</td>
<td>1/8&quot;</td>
</tr>
</tbody>
</table>

**Note:** Bridge slabs shall be anchored to the abutment. The Contractor shall adjust the top of pile elevations for the final design bridge slab thickness.

**Weld Detail**

- Welding to Sheeting
- Welding to Sheeting

**Weld to Sheeting**

- Weld Sheeting to Whaler

**Stiffeners**

- Stiffeners to be placed at the bridge opening side of the abutment pile cap only. Stiffeners to be placed perpendicular to centerline of abutment.

**Ref to the table of Minimum Fillet Weld Sizes shown on this sheet.**

**Preformed Elastomeric Bearing Pad**

- Joint Filler

**Precast Reinforced Concrete Bridge Slabs @ 50'-0" ea.**

- (Assumed)

**Abutment Details**

- Piles (Corrugated Metal Sheet)
  - HP12x53 Pile
- ... Gusset Plates (C8x11.5)

- Channel Whaler
  - x 6" x 38'-0" Backwall Plate

- Pile Cap
  - HP12x53 x 38'-0"
  - " " x 6" x 38'

- Elastomeric Bearing Pad

- Joint Filler

**Installation Notes:**

- Bridge slabs are assumed to be 2'-0" thick.
- The Contractor shall adjust the top of pile elevations for the final design bridge slab thickness.

**Drawn By:**

- jbeckman

**PlotteD:**

- 10-SEP-2020 13:46

**References Noted**

**References Checked by**

**Date**

**KANSAS DEPARTMENT OF TRANSPORTATION**
**EXCAVATION DETAILS FOR REINFORCED CONCRETE BOX CULVERT**

Note: Excavation for culverts less than bridge length and the additional excavation for "Embedded Structures" shall be paid for as Class III Excavation, but shall be subsidiary to Grade 4.0 Concrete.

**EXCAVATION DETAILS FOR TYPICAL PIERS**

See detail when rock or shale (rock) is encountered.

**EXCAVATION DETAILS FOR TYPICAL ABUTMENTS**

See detail when rock or shale (rock) is encountered.

**EXCAVATION DETAILS FOR REINFORCED CONCRETE ABUTMENTS**

See detail when rock or shale (rock) is encountered.

**EXCAVATION DETAILS FOR PILE BENTS**

See detail when rock or shale (rock) is encountered.

**EXCAVATION DETAILS FOR PEDESTAL TYPE ABUTMENT**

Note: Any sheeting required shall be subsidiary to the bid item for Excavation.

**EXCAVATION DETAILS FOR BRIDGE EXCAVATION**

Note: Bridge Contractor shall excavate the chambers to the limits shown prior to the construction of the box bridge, unless otherwise noted in the plans.

**SHARED ELEVATION**

Note: All bridge excavations shall be computed on the basis of the cross-hatch volume of whatever material found below the "Excavation Boundary Plane," within the limits specified for measurement. This may include water or air.

**SECTION A-A**

For H > 5' ; 2:1 Slope

For H ≤ 5' ; 1:1 Slope

**SECTION B-B**

**SECTION C-C**

**SECTION D-D**

**SECTION THRU WING**

See detail when rock or shale (rock) is encountered.
PRESTRESSED PILES: Field-installed prestressed concrete pile splices to accommodate thediameter variations as per the Manufacturer's recommendations, subject to the approval of the Engineer.

Method of attachment of piles to build-up may be by any of the techniques given in the "Alternate Methods." If field reinforcing steel is used for attachment, the area shall be less than that used in the building process.

ALTERNATE METHODS: Method of attachment of a pile to build-up may be any of the following methods:
1. Cut off at least 2'-0" of pile and expose a minimum of 2'-0" of strand.
2. Cast 6'-0" or 6'-6" bars (equally spaced) into pile head. Allow excess length to be cut off after pile head is formed. Cut out of pile head and prestress from pile head, leaving a minimum of 2'-0".
3. Drill holes in pile head (equally spaced) for installation of barrel bars of same size and length as in 2. Fix plate or collar to bar ends in the pile cap and unless approved by the Engineer.

TEST PILES: Drive test piles where called for on the bridge project. The test piles located within the limits of the substructure will become part of the bridge piles.

WELDING: All field welding shall meet the requirements of the Standard Specifications.

Special notes are to be purchased for each KDOT project. The standard specifications on core samples are to be tested in the laboratory within 7 days after the samples are taken. The results of the tests shall be reported to the Engineer and the contractor shall be notified of the results. The core samples shall be stored in a suitable container and shall be submitted to the Engineer for testing at the same time as the bridge is tested. The core samples shall be stored at a temperature of 70°F during testing.

Use only hydrogen ET/A131, TO3, TO3 series welding rods (best suited) for all welding applications during pile splicing. See General Notes at the beginning of this section. Use low hydrogen TIG welding for field welding of splices.

PRESTRESSED CONCRETE PILES:

The following items are covered in Division 1000 of the Standard Specifications:

- Reinforcement: Use reinforcing steel conforming to ASTM A615, Grade 60. Splices may be either smooth or deformed bars.

- Prestressing Steel: Use uncoated strand stressed in addition to the reinforcement prestressing strands conforming to ASTM A416, Grade 70.
### Earthwork Recapitulation

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
<th>Unit</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excavation (Common)</td>
<td>VFM 775</td>
<td>CF.YDS.</td>
<td>Common Excavation</td>
</tr>
<tr>
<td>Compaction (VFM)</td>
<td>VFM 780</td>
<td>CF.YDS.</td>
<td>Compaction of Earthwork</td>
</tr>
</tbody>
</table>

### Removal of Existing Structures

- **Station 97+00 to 103+00**
  - **Removal of Existing Structures**: For Information Only

### Drainage Structures

<table>
<thead>
<tr>
<th>Station</th>
<th>Size</th>
<th>Type</th>
<th>Material</th>
<th>Concrete</th>
<th>Diameter</th>
<th>Road Type</th>
<th>Road Width</th>
<th>Entrance Flare</th>
<th>Exit Flare</th>
<th>End Section</th>
</tr>
</thead>
</table>

### Light Type Surfacing (SA-2)

For Traffic Control Plan & Quantities See Sheet No. 33
For Seeding Quantities See Sheet No. 27
For Temporary Erosion & Pollution Control Quantities See Sheet No. 33
For Summary of Guardrail See Sheet No. 4
### SUMMARY OF SEEDING / EROSION CONTROL QUANTITIES

<table>
<thead>
<tr>
<th>QUANTITY</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>900 lbs / acre</strong></td>
<td>Fertilizer, Seed &amp; Mulch</td>
</tr>
<tr>
<td><strong>2 tons / acre</strong></td>
<td>Fertilizer, Seed &amp; Mulch</td>
</tr>
<tr>
<td><strong>24.2</strong></td>
<td>Soil Erosion Mix</td>
</tr>
</tbody>
</table>

**Notes:** Projects less than 1 acre shall be bid as "Seeding" by the lump sum. See Permanent Seeding Summary of Seed Quantities sheet LA850 for further details.

**Geotechnical Erosion Control** shall be removed prior to placement of permanent slope protection.

**Regrown and Stocked** are the approved small/woody products.

### GENERAL NOTES

The entire disturbed areas, excepting the paved or surfaced areas, steep roadsides, and areas of unplanted native sod or other desirable vegetation shall be fertilized (limed when required) and seeded, and mulched. Soil preparation shall conform to the Standard Specifications.

Temporary seeding shall be done during any time of the year that the soil can be cultivated. The estimated quantity includes mulching associated with both temporary and permanent seeding operations. The total mulch and erosion control material to be provided shall be included.

The estimated quantities include miscellaneous associated with both temporary and permanent seeding operations. The temporary and permanent seeding shall be done during the normal seeding season.

### SOIL EROSION MIX

<table>
<thead>
<tr>
<th>QUANTITY</th>
<th>DESCRIPTION</th>
</tr>
</thead>
</table>
| **1-1/4 cu yd** | Soil Erosion Mix (i.e.) pavement, gravel, riprap, etc.) shall not be included in this measurement. Channels = Defined by the area of the project that requires Class 2 erosion control material to be placed. This area shall be seeded using the Soil Erosion Mix prior to placement of the material. Drilling seed is preferred, however, broadcasting is acceptable if drilling is not possible. A ratio and application rate that equals or exceeds the required minimum rate per acre of N, P, K listed in Summary of Quantities will be acceptable.

\[
- N = \text{Nitrogen Rate of Application} \\
- P = \text{Phosphorous Rate of Application} \\
- K = \text{Potassium Rate of Application}
\]

The above rates are as guidelines, it will be at the discretion of the Engineer to determine what rate is sufficient for adequate protection of newly seeded areas.
## Erosion Control - Class 1, Type C

<table>
<thead>
<tr>
<th>Station to Station</th>
<th>Side</th>
<th>Length</th>
<th>Width</th>
<th>SQ Yards</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>RT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>LT</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total Erosion Control, Class 1, Type C: 838.3

## Erosion Control - Class 2, Type E

<table>
<thead>
<tr>
<th>Station to Station</th>
<th>Side</th>
<th>Length</th>
<th>Width</th>
<th>SQ Yards</th>
</tr>
</thead>
<tbody>
<tr>
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<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>LT</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total Erosion Control, Class 2, Type E: 233.8
Temporary Stream Crossing (Articulated Concrete Blocks)

**NOTES:**

1. Temporary Slope Drain and Temporary Berm may be used on either project forelands or project backslopes.
2. Discharge of Slope Drains shall be into stabilized drain or area or into Sediment Basins.
3. Pipe shall be secured in place as approved by Engineer.
4. Temporary Berms under 2,000 feet shall be bid by 5W Prices.

**Temporary Slope Drain:**
- Place 1 pipe buried 6" into stream bottom, in the lowest point of the channel, to allow the passage of aquatic organisms, with additional pipes placed along the remainder of the stream channel bottom such that ordinary high water (OHW) flows designated in the Contract Documents shall flow through the pipes without overlapping the crossing.
- See KDOT Specifications for more information.

**Temporary Berm:**
- Pipe size may vary.
- Place 1 pipe buried 6" into stream bottom, in the lowest point of the channel, to allow the passage of aquatic organisms, with additional pipes placed along the remainder of the stream channel bottom such that ordinary high water (OHW) flows designated in the Contract Documents shall flow through the pipes without overlapping the crossing.
- See KDOT Specifications for more information.
**Temporary Inlet Sediment Barrier**

**Silt Fence Method**

1. Stakes shall be 4' (min.) long and of one of the following materials:
   - Hardwood - 1" x 1"; or
   - Southern Pine (No. 2) - 2\" x 2\"; or
   - Steel U, T, L, or C Section - .95 lbs. per linear ft.

2. Cross pieces shall be of same material as stakes.

3. Stakes and cross pieces shall be driven 6' to 21' o/c in Anchor Trench.

4. Chicken Wire Backing
   - Silt Fence Fabric over Chicken Wire Backing
   - Main Flowline of Ditch
   - Anchor Trench

5. Wire Staples: 6" long

6. Attach Fence Fabric securely on 6" centers (max). Wire Staples:
   - 6" long

**SILT FENCE**

- Material Requirements:
  - Use 100% shredded mulch or other non-compost biodegradable material for filter bags.
  - Do not use material which prohibits water infiltration.

- Installation:
  - Liner (filter sock): 4" & 6" diameter
  - Log Mesh:
  - Mesh must allow water infiltration but also hold fill material in place.
  - Use mesh with ".165" openings or larger.

- Use of high flow material is acceptable.

- Minimum overlap ends:
  - Tightly overlap ends

- Bags:
  - Synthetic or mesh (min.) & burlap bags
  - Rock = approximately 1" to 2" diameter

- Use of high flow material is acceptable.

- Height of bags (8" minimum diameter) must not be above top of curb.

- Multiple gravel bags are required, placed in such a way that no gaps are evident.

- Product must be approved by the Engineer.

- Alternative products may be used other than gravel bags such as the "Gutter Buddy". Products must be approved by the Engineer.

- Curb inlet protection will be measured and paid for as Filter sock.
**SILT FENCE**

Installation Notes:

1. Stakes shall be 4\(\text{ft}\) (min.) long and one of the following materials:
   a. Hardwood - 1 1/2\(\text{in}\) x 3\(\text{in}\)
   b. Southern Pine No. 2 - 2\(\text{in}\) x 2\(\text{in}\)
   c. Steel U, T, L, or C Section - 16\(\text{lbs}\) per \(\text{ft}\)
   d. Synthetic - same strength as wood stakes.
2. Attach fence fabric with 3 zip ties within the top 8\(\text{in}\) of the fence.

Additional attachment methods may be approved by the Engineer on a performance basis.

3. Use of high flow material is acceptable.
4. Refer to plans sheets to estimate length of silt fence required.

**BIODEGRADABLE LOG OR FILTER SOCK**

1. Place biodegradable logs or filter sock tightly together minimum overlap of 18\(\text{in}\).
2. Wood stakes shall be 2\(\text{in}\) x 2\(\text{in}\) (nom).
3. Use of high flow material is acceptable.
4. Each log or sock (except compact filter socks) shall be keyed into the ground at a minimum of 20\(\text{in}\) of its length. Compact filter socks should be placed on smooth prepared ground with no gaps between the sock and soil.
5. Length of stakes shall be 2 times the height of the log at a minimum with maximum ground embedment equal to the height of the log / sock.

**GENERAL NOTES**

1. Slope interruptions shall be placed along contour lines, with a short section turned upgrade at each end of the barrier.
2. The maximum length of the slope interruptions shall not exceed 24\(\text{ft}\) feet, and the barrier ends need to be staggered.
3. Slope interruptions damaged by Contractor's negligence, including improper maintenance or lack of maintenance, shall be repaired immediately by Contractor at no additional cost to KDOT.
4. Each log or sock (except compact filter socks) should be placed on smooth prepared ground with no gaps between the sock and soil.
5. Each log or sock (except compact filter socks) should be placed in the top 8\(\text{in}\).

Decisions should be approved by the Field Engineer.
**GENERAL NOTES**

1) The choice of ditch check methods is at the option of the Contractor.

2) Use only rock checks in situations where the ditch slope is 6 percent or greater.

3) Ditch checks damaged by Contractor's negligence, including improper maintenance or lack of maintenance, shall be repaired by Contractor at no extra cost to KDOT.
ROCK DITCH CHECK NOTES
1. Rock shall be clean aggregate, D50 = 6".
2. Place rock in such manner that water will flow over, not around ditch check.
3. Do not use rock ditch checks in clear zone.
4. Excavation: The ditch area shall be reshaped to fill any eroded areas. Prior to placement of the rock, the ditch shall be excavated to the dimensions of the Rock Ditch Check and to a minimum depth of 6' (1500mm). After placement of the rock, backfill and compact any eroded soil to ditch grade. This work shall be subsidiary to the Old Item Temporary Ditch Check (Rocks).
5. Aggregate excavated on site may be used as an alternate to the 6" rock, if approved by the Engineer.
6. The Engineer may approve the use of larger aggregates for the downstream portion of the check when conditions warrant their use.
7. When the use of larger rock is approved, the upstream portion of the check should be constructed of 50 = 6" or smaller.

BIODEGRADABLE LOG DITCH CHECK NOTES
1. Use as many biodegradable log sections as necessary to ensure water does not flow around end of ditch check.
2. Overlap sections a minimum of 10'.
3. Stakes shall be wood or steel according to Section 2114 of the Standard Specifications. Length of stakes shall be a minimum of 2 x the diameter of the log.
4. Use Erosion Control (Class 1) (Type C) as the downstream apron when required.
5. A downstream apron is required when directed by the Engineer. Apron material will be paid at 25% of the contract unit price.
6. Each log or sock (except compost filter socks) should be keyed into the ground at a minimum of 20% of its height. Compost filter socks should be placed on smooth prepared ground with no gaps between the sock and soil.
Sediment Storage Basin Locations

<table>
<thead>
<tr>
<th>Station to Station</th>
<th>Side</th>
<th>Required Storage Capacity</th>
</tr>
</thead>
</table>

Notes:
1. All P.V.C. pipes are to be schedule 40.
2. HDPE flexible drain pipe is to be attached to the pond outlet structure with water-tight connections.
3. The orifice shall be sized to provide drawdown time to 2 to 5 days and approved by the engineer.
4. Other skimmer designs maybe used that dewater from the surface at a controlled rate.

Sediment Storage Basin

- **Plan**: Shows the layout of the basin.
- **CROSS SECTION (EMERGENCY SPILLWAY)**: Details the emergency spillway design.
- **CONCRETE ANTI-SEEP COLLAR**: Illustration of the collar design.
- **SECTION A-A**: Detailed section of the basin.

**Temporary Erosion and Pollution Control**

- **La852h**: Reference to the project.
- **2.5:1 or flatter**: Slope ratio.
- **6'-0" Top (min.)**: Minimum top width.
- **Embankment stabilized with vegetation**: Vegetation for stabilization.
- **Existing ground line**: Existing ground level.
- **Stormwater Storage**: Storage area for stormwater.
- **Sediment Storage**: Area for sediment storage.
- **Trash Rack**: Device for removing debris.

**Dimensions and Requirements**

- **1'-0" diameter**: Minimum diameter for pipes.
- **3:1 (typ.)**: Slope ratio.
- **18" pipe**: Minimum pipe diameter.
- **3 x Pipe Diameter**: Minimum pipe diameter for drainage.
- **1'-0" overlap**: Minimum overlap for connections.
- **4'-6" min.**: Minimum depth for basins.
- **3 x Pipe Diameter**: Minimum diameter for risers.

**ConcreteAnti-Flotation Concrete Block**

- **Anti-Flotation**: Anti-flotation measures for stability.

**Anti-Floatation Collar**

- **6" conc.**: Concrete collar dimensions.
- **#4 u bars**: Reinforcement bars.
- **1" Cl.**: Concrete class.

**Emergency Spillway (Shot rock)**

- **Embankment stabilized with vegetation**: Vegetation for stabilization.

**Construction Procedure**

1. Temporary Sediment Basins shall be constructed at locations as directed by the Engineer or as approved in the SWPPP Schedule. All work and materials necessary, including but not limited to, the fill material, compaction, drainage pipes, aggregates and all other incidentals necessary to construct the basin, shall be paid as "Temporary Sediment Basin".
2. Lengths and top dimensions shall be determined in the field by the Engineer.
3. Skimmer dewatering device required and must be used regardless the size of the drainage area.
Erosion Control Blankets shall be laid loosely in the direction of the slope, beginning at the bottom of the slope, in order for blanket to be in contact with the soil. Blankets shall then be backfilled, tamped and seeded.

1. ANCHOR SLOTS: The top of the blanket should be slotted at the top of the slope and anchored in place with anchors 6 inches apart. The slots should be 6 inches wide x 6 inches deep with the blanket anchored in the bottom of the slot, then backfilled, tamped and seeded.

2. LONGITUDINAL SEAMS: The edges of the blanket should overlap each other a minimum of 6 inches, with anchors capturing the edges of both blankets.

3. SPLICE SEAM: When splices are necessary, overlap end seams in 6 inches apart. The slots should be 6 inches wide x 6 inches deep with the blanket anchored in the bottom of the slot, then backfilled, tamped and seeded.

4. TERMINAL FOLD: The bottom edge of the blanket shall be turned under a minimum of 4 inches, then anchored with anchors 9 inches apart.

5. TYPICAL ANCHORS: Anchor design shall be as recommended by the manufacturer.

6. STAPLE CHECK: Establish Staples in 2 rows 4" on center apart. Staple Checks - shall be 30' apart.

NOTE: Agricultural products, such as native perennial hay, used for mulching and erosion control practices, excluding wood based mulch, shall meet the North American Weed Free Forage Standards. Single post ring and shank staple is acceptable.
INSTALLATION DETAILS FOR EROSION CONTROL CLASS 2

Erosion Control Mats shall be laid loosely in the direction of the flow, with the first course of the channel on the shoulder, without overlapping. In order for the mat to be in contact with the soil, lay the mat loosely avoiding stretching.

1. **Anchor Fold:** The top of the mat should be folded under, buried, and secured with approved anchors placed 6 inches apart. The top edge of the mat should be buried in a slot, 6 inches wide × 6 inches deep, anchored in the bottom of the slot, backfilled, and the mat folded over the top as shown in detail.

2. **Longitudinal Seams:** The side folded edges of the mat should overlap a minimum of 6 inches, with anchors catching the edges of both mats.

3. **Splice Seam:** When splices are necessary, overlap end applicable.

4. **Staple Check:** Establish Staples in 2 rows 4" on center apart. Staple Checks = shall be 30 apart.

5. **Edge Anchor:** Lay outside edge of mat into trench at top of side slope. Anchor at 3 feet intervals along trench.

6. **Terminals:** The bottom edge of the mat shall be anchored in place with anchors spaced 9 inches intervals along the terminating edge.

7. **Typical Anchors:** Anchor design shall be as recommended by the manufacturer.
### Native Wildflower Mixes

<table>
<thead>
<tr>
<th>Mix</th>
<th>Seed Name</th>
<th>Percentage</th>
<th>Lbs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mix 1</td>
<td>Blanket Flower</td>
<td>10</td>
<td>0.2</td>
</tr>
<tr>
<td></td>
<td>Blanket Flower</td>
<td>20</td>
<td>0.4</td>
</tr>
<tr>
<td></td>
<td>Blanket Flower</td>
<td>40</td>
<td>0.8</td>
</tr>
<tr>
<td></td>
<td>Blanket Flower</td>
<td>60</td>
<td>1.2</td>
</tr>
<tr>
<td></td>
<td>Blanket Flower</td>
<td>80</td>
<td>1.6</td>
</tr>
<tr>
<td></td>
<td>Blanket Flower</td>
<td>100</td>
<td>2.0</td>
</tr>
<tr>
<td>Mix 2</td>
<td>Side Oats Grama</td>
<td>10</td>
<td>0.2</td>
</tr>
<tr>
<td></td>
<td>Side Oats Grama</td>
<td>20</td>
<td>0.4</td>
</tr>
<tr>
<td></td>
<td>Side Oats Grama</td>
<td>40</td>
<td>0.8</td>
</tr>
<tr>
<td></td>
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<td>60</td>
<td>1.2</td>
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<tr>
<td></td>
<td>Side Oats Grama</td>
<td>100</td>
<td>2.0</td>
</tr>
</tbody>
</table>

OPTION: Broadcast Tall Drop Seed on the soil surface.

### Native Wildflower Mix

<table>
<thead>
<tr>
<th>Mix</th>
<th>Seed Name</th>
<th>Percentage</th>
<th>Lbs.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cut Section</td>
<td>10</td>
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<tr>
<td></td>
<td>Cut Section</td>
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<td>0.4</td>
</tr>
<tr>
<td></td>
<td>Cut Section</td>
<td>40</td>
<td>0.8</td>
</tr>
<tr>
<td></td>
<td>Cut Section</td>
<td>60</td>
<td>1.2</td>
</tr>
<tr>
<td></td>
<td>Cut Section</td>
<td>80</td>
<td>1.6</td>
</tr>
<tr>
<td></td>
<td>Cut Section</td>
<td>100</td>
<td>2.0</td>
</tr>
</tbody>
</table>

### Other Mixes

<table>
<thead>
<tr>
<th>Mix</th>
<th>Seed Name</th>
<th>Percentage</th>
<th>Lbs.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Wildflower Mix</td>
<td>10</td>
<td>0.2</td>
</tr>
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<tr>
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<td>Wildflower Mix</td>
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<tr>
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<td>1.6</td>
</tr>
<tr>
<td></td>
<td>Wildflower Mix</td>
<td>100</td>
<td>2.0</td>
</tr>
</tbody>
</table>

### SUMMARY OF SEEDING QUANTITIES

<table>
<thead>
<tr>
<th>Mix</th>
<th>Seed Name</th>
<th>Percentage</th>
<th>Lbs.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Seed (Native Wildflower Mix 1)</td>
<td>10</td>
<td>0.2</td>
</tr>
<tr>
<td></td>
<td>Seed (Native Wildflower Mix 2)</td>
<td>20</td>
<td>0.4</td>
</tr>
<tr>
<td></td>
<td>Seed (Western Wheatgrass Seed)(Barton)</td>
<td>40</td>
<td>0.8</td>
</tr>
<tr>
<td></td>
<td>Seed (Side Oats Grama Seed) (El Reno)</td>
<td>60</td>
<td>1.2</td>
</tr>
<tr>
<td></td>
<td>Seed (Little Bluestem Grass Seed) (Aldous)</td>
<td>80</td>
<td>1.6</td>
</tr>
<tr>
<td></td>
<td>Seed (Indiangrass Seed) (Osage)</td>
<td>100</td>
<td>2.0</td>
</tr>
</tbody>
</table>

OPTION: Broadcast Tall Drop Seed on the soil surface.

### GENERAL NOTES

- The total disturbed area, assuming the power of surface areas, does not exceed areas of constructed roads and other paved areas, should be fertilized for 2 years. The rate of application is generally as follows:
- **Seeding**: The rate of application per acre, thickness in place, for the mulching material is generally as follows:
- Mulching: Mulch shall be spread uniformly over all disturbed areas and punched in the soil, unless otherwise noted on the plans. The rate of application per acre thickness is as follows:
- When the area is to be seeded to the same level as the road, temporary and permanent seeding shall be combined and seeded at the same time.

### DESIGNATED MIXES

- **SHLDR** = Seeded with the Shoulder Mix. Typically 15 feet for 2-lane roads and 30 feet for 4-lane roads.
- **OTHER** = Seeded with the "Other" Mix. Designated as all other turf areas, except the Shoulder. Usually includes a Native Wildflower Mix.
- ** fill** = Seeded with the "Other" Mix. Designated as all other turf areas, except the Shoulder. Usually includes a Native Wildflower Mix.

### SUMMARY OF SEEDING QUANTITIES

<table>
<thead>
<tr>
<th>Mix</th>
<th>Seed Name</th>
<th>Percentage</th>
<th>Lbs.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Seed (Native Wildflower Mix 1)</td>
<td>10</td>
<td>0.2</td>
</tr>
<tr>
<td></td>
<td>Seed (Native Wildflower Mix 2)</td>
<td>20</td>
<td>0.4</td>
</tr>
<tr>
<td></td>
<td>Seed (Western Wheatgrass Seed)(Barton)</td>
<td>40</td>
<td>0.8</td>
</tr>
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<td>Seed (Side Oats Grama Seed) (El Reno)</td>
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</tr>
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<td></td>
<td>Seed (Indiangrass Seed) (Osage)</td>
<td>100</td>
<td>2.0</td>
</tr>
</tbody>
</table>

OPTION: Broadcast Tall Drop Seed on the soil surface.
1) Design Speed: Those items delegated to temporary traffic control should be designed and installed using the posted/legal speed of the roadway prior to work starting.

2) Minimum Lane Width: Lane widths shall be a minimum of 11' (measured between centerlines of pavement markings) or as shown on the plans, or as directed by the engineer. A lane width less than 11' may require restricted roadway width signing.

3) Consideration should be made to separate pedestrian and, if needed, bicycle movements from both work site activity and vehicular traffic. Unless a reasonable safe route that does not involve crossing the roadway can be provided, pedestrians should be appropriately directed with advance signing that encourages them to cross to the opposite side of the roadway. In urban and suburban areas with high vehicular traffic volumes, these signs should be placed at intersections (other than midblock locations) so that pedestrians are not confronted with midblock work sites that will induce them to attempt skirt the work site or crossing a midblock crossing.

4) When existing pedestrian facilities are disrupted, closed, or relocated, the temporary facilities shall be detectable and include accessibility features consistent with the features present in the existing pedestrian facility.

5) When the driving surface open to traffic is milled or is a temporary surface made of loose material, or when directed by the engineer, a W8-15 (Grooved Pavement) or W8-7 (Loose Gravel) sign shall be used on mainline approaches. This sign should be placed a "C" distance after the W20-1 (Road Work Ahead) sign. A W8-15p motorcycle plaque shall be used to supplement the W8-15 or W8-7 signs. All signs shall be displayed as long as the condition is present.

6) Alternative temporary rumble strip options may be available. Please contact the Temporary Traffic Control Unit for more information at 785-296-1179 or 785-296-1183.

TYPICAL WORK ZONE COMPONENTS

- When concrete barrier system is used, portable channelizing devices are not needed along the tangent barrier section.

<table>
<thead>
<tr>
<th>SPEED (MPH)</th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>URBAN (40 MPH OR LOWER)</td>
<td>100</td>
<td>700</td>
<td>100</td>
</tr>
<tr>
<td>URBAN (45 MPH OR HIGHER)</td>
<td>250</td>
<td>350</td>
<td>250</td>
</tr>
<tr>
<td>RURAL (55 MPH OR LOWER)</td>
<td>500</td>
<td>500</td>
<td>500</td>
</tr>
<tr>
<td>RURAL (60 MPH OR HIGHER)</td>
<td>750</td>
<td>750</td>
<td>750</td>
</tr>
<tr>
<td>EXPRESSWAY/FREEWAY</td>
<td>1000</td>
<td>1800</td>
<td>2840</td>
</tr>
</tbody>
</table>

Taper Formulas:

L = WS/60 for speeds of 40 MPH or less

L = WS/60 for speeds of 40 MPH or less

When concrete barrier system is used, portable channelizing devices are optional if posted speed limit is 40 mph or less (sloped concrete treatment is optional if posted speed limit is 40 mph or less)

Where:

L = Minimum length of taper in feet
S = Numerical value of posted speed prior to work starting in MPH
W = Width in offset feet

Shifting Taper=1/2 L
Shoulder Taper=1/3 L

Channelizer Placement:

1) The spacing between devices in the transition area (taper) should not exceed a distance in feet equal to 1/2 the posted speed limit in mph prior to work starting.

2) The spacing between devices in the advanced warning area and the activity area should not exceed a distance in feet equal to two times the posted speed limit in mph prior to work starting.

3) Channelizing devices shall be placed for optimum visibility, normally at right angles to the traffic flow.

4) Place directional indicator barricades in series to direct traffic onto the new path. The arrow sign should not be visible to opposing traffic.

5) Alternating diagonal orange and white striping must slope downward in the direction traffic is expected to pass.

Minimum advance warning sign spacing (in feet):

<table>
<thead>
<tr>
<th>SPEED (MPH)</th>
<th>20</th>
<th>25</th>
<th>30</th>
<th>35</th>
<th>40</th>
<th>45</th>
<th>50</th>
<th>55</th>
<th>60</th>
<th>65</th>
<th>70</th>
<th>75</th>
</tr>
</thead>
<tbody>
<tr>
<td>LENGTH [ft]</td>
<td>115</td>
<td>125</td>
<td>200</td>
<td>250</td>
<td>305</td>
<td>360</td>
<td>425</td>
<td>450</td>
<td>570</td>
<td>645</td>
<td>750</td>
<td>820</td>
</tr>
</tbody>
</table>

4) Post-ed speed prior to work starting

Neither work activity nor storage of equipment, vehicles, or material should occur in the buffer space. When a protection vehicle is placed in advance of the work space, only the space upstream of the vehicle constitutes the buffer space.

If temporary concrete safety barrier system is used to separate approaching traffic from the work space, the barrier system shall be considered part of the activity area. A full lane width should be available throughout the length of the buffer space. See typical work zone components above.
For rails less than 36" long, 4" wide stripes may be used. All stripes shall slope downward to the traffic side for channelization.

The stripes shall slope downward to the traffic side for channelization.

The direction indicator barricade shall be used in series to direct the motorist into the intended lane of travel.

The direction indicator barricade shall be used in series to direct the motorist into the intended lane of travel.

1. Support device shall not project beyond the detection plate into the pathway.
2. Hand trailing edges and detection plates are optional for continuous walls.
3. Interconnect pedestrian channelizers to prevent displacement and to provide continuous guidance through or around work.
4. Alternate pathways shall be firm, stable, and slip resistant.
5. Treat height differentials > 1/2" in the surfaces of alternate paths with a firm, stable, and slip resistant temporary ramp having a slope of 1:12:1 or flatter and having a width equal to the alternate path.
6. Use alternating orange/white on interconnected devices.

(1) Not allowed on centerline delineation along freeways or expressways.
(2) The stripes shall slope downward to the traffic side for channelization.
(3) May be used upon the approval of the engineer.
(4) Daytime operations only.
Note: Signs shown for one approach to work zone.

**FIGURE 1: TYPICAL SIGNING FOR ROAD CLOSURE (MAINLINE OR SIDE ROAD)**

- Complete closure Type 3 barricades
- Last access for house or field entrance (if applicable)
- House, field entrance, or public road (top)
- Type 3 barricade (winged position)
- Length to the nearest 1/2 mile (no decal mileage)

**FIGURE 2: TYPICAL SIGNING FOR SIDE ROAD OPEN**

- Complete closure Type 3 barricades
- Length to the nearest 1/2 mile (no decal mileage)
- HOUSE OR FIELD ENTRANCE
- TYPE 3 BARRICADE
- CLOSURE
- HOUSE OR FIELD ENTRANCE
- HOLE KIT 1-1/8
- 24" x 18"
- ORANGE RAIL

**FIGURE 3: TYPICAL SIGNING FOR ROAD CLOSURE - LOCAL TRAFFIC ACCESS**

- Complete closure Type 3 barricades
- Last access for house or field entrance (if applicable)
- HOUSE OR FIELD ENTRANCE
- TYPE 3 BARRICADE
- CLOSURE
- HOUSE OR FIELD ENTRANCE
- HOLE KIT 1-1/8
- 24" x 18"
- ORANGE RAIL

**ROAD CLOSED GENERAL NOTES**

As shown in Figure 1, at the point where thru traffic must detour and local traffic can proceed to the location where the roadway is completely closed, the R11-3a (ROAD CLOSED # MILES AHEAD LOCAL TRAFFIC ONLY) or R11-4 (ROAD CLOSED LOCAL TRAFFIC ONLY or ROAD CLOSED TO THRU TRAFFIC) sign shall be used with Type 3 barricades (winged position), placed on the shoulders of roadway.

As shown in Figure 3, when local traffic must be allowed access into the work zone, Type 3 barricades shall be longitudinally staggered to maintain the appearance of a closed roadway. A second line of end-to-end Type 3 barricades shall be placed just beyond the last access point in the work zone, to complete the roadway.

The R11-4 (ROAD CLOSED TO THRU TRAFFIC or ROAD CLOSED LOCAL TRAFFIC ONLY) sign shall be used with the distance to the point of complete closure of the roadway is less than 1 mile.

The R11-3a (ROAD CLOSED # MILES AHEAD LOCAL TRAFFIC ONLY) sign shall be used when the distance to the point of complete closure of the roadway is 1 mile or greater.

The words "BRIDGE OUT" (or BRIDGE CLOSED) may be substituted for the words "ROAD CLOSED" on the R11-3a or R11-4 sign where applicable.
**SIGN LAYOUT INFORMATION**

**END ROAD WORK**
- KG20-1
- EXPWY/FREEWAY
- STD. SIZE EXPWY/FREEWAY
  - 6" C
- GROOVED PAVEMENT
  - Wa-15
  - STD. SIZE EXPWY/FREEWAY
    - 8" D
    - 48"x48"

**WAIT FOR PILOT CAR**
- KG20-3
- EXPWY/FREEWAY
- STD. SIZE EXPWY/FREEWAY
  - 6" C
- LOOSE GRAVEL
  - WB-2
  - STD. SIZE EXPWY/FREEWAY
    - 8" D
    - 48"x48"
  - STD. SIZE EXPWY/FREEWAY
    - 6" C
    - 48"x24"

**NEXT MILES**
- KG4-20
- EXPWY/FREEWAY
- 24"x6" 48"x12"

**SHOULDER DROP-OFF**
- WB-17
- EXPWY/FREEWAY
- STD. SIZE EXPWY/FREEWAY
  - 48"x48"

**NB US-75 CLOSED FOLLOW DETOUR**
- SP-01
- SPECIAL SIGN
- EXPWY/FREEWAY
- STD. SIZE
  - 6" C
  - 10" D

**US-75 CLOSED NORTH OF Topeka FOLLOW DETOUR**
- SP-02
- SPECIAL SIGN
- EXPWY/FREEWAY
  - 6" C
  - UPPERCASE: 10" D
  - LOWERCASE: 8" D

**ALL CITY NAMES AND STREET NAMES ON SPECIAL SIGNS AND DESTINATION SIGNS MUST HAVE UPER AND LOWER CASE LETTERS.**

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**Rural**

1) Ground-mounted signs shall be mounted at a minimum height of 7' measured from the bottom of the sign to the near edge of the pavement.

2) Large signs having an area exceeding 50 square feet installed on multiple breakaway posts shall be mounted a minimum of 7’ above the ground.

3) The height of the secondary sign mounted below another sign may be 4' measured from the bottom of the sign to the near edge of the pavement. Signs shall not overlap each other.

---

**Urban**

1) Signs shall be mounted at a minimum height of 7' measured from the bottom of sign to the near edge of the pavement.

2) Neither portable nor permanent sign supports should be located on sidewalks or areas designated for pedestrian or bicycle traffic.

3) Signs mounted lower than 7' should not project more than 4' into pedestrian facilities.

4) The height from of the secondary sign mounted below another sign may be 4' measured from the bottom of the sign to the near edge of the pavement. Signs shall not overlap each other.

5) Large signs having an area exceeding 50 square feet installed on multiple breakaway posts shall be mounted a minimum of 7' above the ground.

6) Pedestrian detour signing shall be a minimum of 2' measured from the top of the pedestrian pathway to the bottom of the sign and shall not protrude into the walkway or shall project beyond the back of curb.

---

**Notes:**

- Typically, there are two sets of informational signs installed per project: one for each direction of traffic.
- Install signs a minimum of 500' in advance of the road work ahead sign. The engineer may designate a more appropriate location if conditions dictate.

The informational signs are not to interfere with the traffic control signs for the project.

---

**FINES Double in Work Zones**

**DIMENSIONS IN INCHES**

<table>
<thead>
<tr>
<th>SIGN NUMBER</th>
<th>FINES DOUBLE</th>
<th>WIDTH x HEIGHT</th>
<th>COLOR</th>
<th>REFLECTIVE</th>
</tr>
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<tbody>
<tr>
<td>SP-01</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SP-02</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**FINES**

<table>
<thead>
<tr>
<th>SIGN NUMBER</th>
<th>FINES OR WORK ZONE</th>
</tr>
</thead>
<tbody>
<tr>
<td>KG105a</td>
<td></td>
</tr>
</tbody>
</table>

**EXIT SIGNS**

- 50 DEGREE SLANT
- DUTCH 801 ROMAN SWC

**COLOR:**

- BLACK
- ORANGE
- WHITE
- REFLECTIVE

**DESIGNED:**

- 06/01/15

**DATE:**

- 06/01/15

**TOTAL SHEETS:**

- 37

**TRACED:**

- Kristina Pyle

**REVISIONS:**

- R.W.B.

**DETAIL CK..Trace:**

- 31

**TRACED:**

- 31

**QUANTITIES:**

- 37

**DRAWN BY:**

- jb e c k m a n

**SIGNED ON:**

- 10 -SEP -2020 13:46

---

**GIVE 'EM A BRAKE**

**FINES DOUBLE IN WORK ZONES**

---

**KI-104a**

---

**KI-105a**

---

**FINES**

**FINES OR WORK ZONE**

---

**NOTES:**

Typically, there are two sets of informational signs installed per project: one for each direction of traffic.

Install signs a minimum of 500' in advance of the road work ahead sign. The engineer may designate a more appropriate location if conditions dictate.

The informational signs are not to interfere with the traffic control signs for the project.
Perforated square steel tube (P.S.S.T.) post setup

Wood post setup

3 lb/f U-Channel setup

Details for 2", 2 1/4", or 2 1/2" sign posts

Place bolts in the same corner along each sign post.
Recapitulation Of Quantities

<table>
<thead>
<tr>
<th>Work Zone Sign (Special)</th>
<th>Sign No.</th>
<th>Size - Sq.Ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>16.25 Sq.Ft. &amp; Less</td>
<td>W20-7</td>
<td>2</td>
</tr>
<tr>
<td>16.26 Sq.Ft. &amp; Over</td>
<td>W20-3</td>
<td>4</td>
</tr>
<tr>
<td>9.26-16.25</td>
<td>R11-2</td>
<td>4</td>
</tr>
<tr>
<td>16.26 &amp; Over</td>
<td>R11-4</td>
<td>2</td>
</tr>
</tbody>
</table>

Summary Of Traffic Control Devices (Each Per Day)

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work Zone Sign (0 To 9.25 Sq.Ft.)</td>
<td>Each Per Day</td>
</tr>
<tr>
<td>Work Zone Signs (16.26 Sq.Ft. &amp; Over)</td>
<td>Each Per Day</td>
</tr>
<tr>
<td>Work Zone Barriers (Type 3 - 4 To 12)</td>
<td>Each Per Day</td>
</tr>
<tr>
<td>Channelizer (Fixed)</td>
<td>Each Per Day</td>
</tr>
<tr>
<td>Channelizer (Portable)</td>
<td>Each Per Day</td>
</tr>
<tr>
<td>Work Zone Warning Light (Type &quot;A&quot; Low Intensity)</td>
<td>Each Per Day</td>
</tr>
<tr>
<td>Work Zone Warning Light (Red Type &quot;B&quot; High Intensity)</td>
<td>Each Per Day</td>
</tr>
<tr>
<td>Traffic Control Devices</td>
<td>Each Per Day</td>
</tr>
<tr>
<td>Flagger (Set Price)</td>
<td>1 Hour</td>
</tr>
</tbody>
</table>

Lighted Devices

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work Zone Warning Light</td>
<td>8</td>
</tr>
<tr>
<td>Work Zone Warning Light (Type &quot;A&quot; Low Intensity)</td>
<td>Each</td>
</tr>
<tr>
<td>Work Zone Warning Light (Red Type &quot;B&quot; High Intensity)</td>
<td>Each</td>
</tr>
<tr>
<td>Arrow Display</td>
<td>Each</td>
</tr>
<tr>
<td>Portable Changeable Message Sign</td>
<td>Each</td>
</tr>
</tbody>
</table>

Traffic Control Devices

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
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</thead>
<tbody>
<tr>
<td>Barricades</td>
<td>10</td>
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<tr>
<td>Type 3 (4' To 12')</td>
<td>4</td>
</tr>
<tr>
<td>Channelizing Devices</td>
<td></td>
</tr>
<tr>
<td>Fixed</td>
<td></td>
</tr>
<tr>
<td>Portable</td>
<td></td>
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</tbody>
</table>