MEMORANDUM TO:  GREG SCHIEBER, P.E., CHIEF
BUREAU OF CONSTRUCTION AND MATERIALS

We are handing you Final Plans for the project noted below for the June 15, 2020, letting.

Thomas Rhoads
Design Squad

135-87 KA-5130-02
HSIP-A513(002)  
Sedgwick  
1.850 miles

REMARKS:

1R project guardrail upgrades

I-135 beginning at the north edge wearing surface of the viaduct bridges thence north to the south end of the 37th Street Bridges in Sedgwick County

RECOMMENDED FOR SIGNATURE:  

APPROVED:

SR. ROAD DESIGN LEADER

CHIEF, BUREAU OF ROAD DESIGN
STATE OF KANSAS
DEPARTMENT OF TRANSPORTATION
GUARDRAIL
STATE HIGHWAY
FEDERAL AID PROJECT
SEDGWICK COUNTY
I-135

NOTE: TRAFFIC TO BE CARRIED THROUGH CONSTRUCTION AS DIRECTED BY THE ENGINEER.
GENERAL NOTE

REPAIR OF EXISTING SLOPES: All Contractor generated rutting or other damage to shoulders or other areas outside of the pavement shall be repaired and seeded by the Contractor at their expense.

TRAFFIC CONTROL: The Contractor shall not leave the work zone with a broad wall of barrier or guardrail lying on roadway. The Contractor shall only remove existing guardrail to the extent that it can be replaced during the same lane closure period. Should a full run of guardrail be replaced during a single lane closure period, it shall be temporarily spiked with existing rebar to avoid leaving a blunt end in place after the lane closure period has ended. The work zone shall be limited to one guardrail location at any given time for the duration of construction.

If any ramp closures are reached, a minimum of three days advance notice shall be given to the Engineer. Changeable Message Signs shall be placed a minimum of two days prior to and during the ramp closure. Advance notice shall be given to the Engineer between the hours of 7:00 AM and 7:00 AM or Monday thru Friday between the hours 7:00 AM and 3:00 PM.

UTILITIES: Utilities have not been located. The Contractor shall verify if any utilities exist or conflict with construction activities.

SEEDING: The project is considered "routine maintenance that disturbs less than 5 acres" according to section 1.1a of the NPDES General permit. The Contractor is required to follow Section 901.3a(2) of standard specifications. Stabilization shall be required before moving to the next location.

GUARDRAIL AND END TERMINALS: All guardrail and terminals shall be replaced with new and terminals unless specifically noted on the plans. All surveys and staking shall be subsidiary to the Contractor Construction Staking.

All guardrail shall be installed with flexible markers. After existing guardrail is removed, post holes shall be filled with sand and compacted unless specifically noted on the plans. Supplying and placing the sand shall be subsidiary to the bid item Removal of Steel Plate Guardrail.

TRAFFIC CONTROL: For Traffic Control Quantities, see Sheet No. 51. For Traffic Control Quantities, see Sheet No. 61.
Traffic Control Note

The 21st Street on ramp becomes a 4' continuous lane from 21st Street to the exit to EB K-96. Location is approx. 530' past end of on ramp gore striping. Close 3' lane of NB I-135 south of 21st Street per TS7444 to get through traffic into two lanes, close 4' lane for work area, use 3' mainline lane for ramp traffic merging onto NB lanes.

Note: Guardrail Pad 10:1 or flatter. Grading to achieve nominal Guardrail heights of 26' to 30'.

KANSAS DEPARTMENT OF TRANSPORTATION
I-135 GUARDRAIL PLAN
SITE 11 A
DIGITAL MESSAGE BOARD NB I-135
NORTH OF ON RAMP FROM E 21st ST. N
**GRADING AND AGGREGATE FOR SHOULDER (AS-1)**

<table>
<thead>
<tr>
<th>STATION TO STATION</th>
<th>LANES/SIDE</th>
<th>EXCAVATION</th>
<th>COMPACTION</th>
<th>AGGREGATE FOR SHOULDER (AS-1)</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>COMMON (CU. YDS.)</td>
<td>VMF</td>
<td>ROCK (CU. YDS.)</td>
<td>VMF</td>
</tr>
<tr>
<td>495+72.57</td>
<td>498+33.52</td>
<td>NS/ Outside</td>
<td>10</td>
<td>8</td>
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<tr>
<td></td>
<td></td>
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<td>10</td>
<td>8</td>
<td></td>
</tr>
</tbody>
</table>

Assumed VMF for contractor furnished excavation is 0.77.

Computed at the rate of 150 lbs/cu. ft.
**Steel Plate Guardrail, Removal (CGS)**

<table>
<thead>
<tr>
<th>Station to Station</th>
<th>Length (ft.)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>503+81.89 to 504+21.47</td>
<td>East 33</td>
<td>Steel Plate Guardrail, Removal (CGS)</td>
</tr>
<tr>
<td><strong>TOTALS</strong></td>
<td><strong>33</strong></td>
<td><strong>Steel Plate Guardrail, Removal (CGS)</strong></td>
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</table>

**Steel Guardrail (CGS)**

<table>
<thead>
<tr>
<th>Location</th>
<th>Side</th>
<th>Length (ft.)</th>
<th>Flare Rate</th>
<th>Guard Rail Alt.</th>
<th>Guard Rail Alt.</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>I-135</td>
<td>NB/Outside Lane</td>
<td>38</td>
<td>10:1</td>
<td>CGS-1RT</td>
<td>CGS-FLAT</td>
<td>Traffic Control Note</td>
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</table>

**Traffic Control Note**

*Note: Guardrail Pad 10:1 or flatter. Grading to achieve nominal Guardrail Height of (10:1) to 20°.*
## Grading and Aggregate for Shoulder (AS-1)

<table>
<thead>
<tr>
<th>STATION TO STATION</th>
<th>LANES/SIDE</th>
<th>EXCAVATION</th>
<th>COMPACTION</th>
<th>AGGREGATE FOR SHOULDER (AS-1)</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>COMMON (CU. YDS.)</td>
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Assumed VMF for contractor furnished excavation is 0.77.
Computed at the rate of 150 lbs/cu. ft.
### Grading and Aggregate for Shoulder (AS-1)

<table>
<thead>
<tr>
<th>Station to Station</th>
<th>Lanes/Side</th>
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<th>Compaction</th>
<th>Aggregate for Shoulder (AS-1)</th>
<th>Remarks</th>
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</thead>
<tbody>
<tr>
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<td>Rock (cu. yds.)</td>
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<td>0.77</td>
<td>6</td>
<td>299</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>TOTALS</strong></td>
<td></td>
<td>60</td>
<td></td>
<td>6</td>
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<tr>
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<td></td>
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</tbody>
</table>

- Assumed VMF for contractor furnished excavation is 0.77.
- Computed at the rate of 150 lbs/cu. ft.
NB I-135

SITE 14 A

Scale: 1" = 60'

Legend

- Limits of AS-1

Note: Guardrail Pad 10:1 or flatter. Grading to achieve nominal guardrail heights of 30" to 36".

Traffic Control Note

Contractor shall close continuous lane for EB K-96 from E.O.S. to Const. Limits and provide a separate continuous lane from 21st St. to EB K-96 per KSDOT specifications.

KANSAS DEPARTMENT OF TRANSPORTATION
I-135 GUARDRAIL PLAN
SITE 14 A
NB I-135 OVER N. HYDRAULIC ST.
AND SOUTH OF BRIDGE OVER RAILROAD

*Note: Guardrail Pad 10:1 or flatter. Grading to achieve nominal guardrail heights of 30" to 36".

Drawn By: J. Sims
Plotted: 5/11/2020
## Grading and Aggregate for Shoulder (AS-1)

<table>
<thead>
<tr>
<th>Station to Station</th>
<th>Lanes/Side</th>
<th>Excavation</th>
<th>Compaction</th>
<th>Aggregate for Shoulder (AS-1)</th>
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</thead>
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<tr>
<td></td>
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<td>ViM</td>
<td>ViM</td>
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<td>TOTALS</td>
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<td>528</td>
<td>547</td>
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<td>212.6</td>
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- Assumed ViM for contractor furnished excavation is 0.77.
- Computed at the rate of 150 lbs/cu. ft.
Note: Guardrail Pad 10:1 or flatter. Grading to achieve nominal Guardrail heights of 26' to 30' for regrade without removing guardrail.

LEGAL

LIMITS OF AS-1
GRADING AND AGGREGATE FOR SHOULDER (AS-1)

<table>
<thead>
<tr>
<th>STATION TO STATION</th>
<th>LANES/SIDE</th>
<th>EXCAVATION</th>
<th>COMPACTION</th>
<th>AGGREGATE FOR SHOULDER (AS-1)</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMMON (CU. YDS.)</td>
<td>VMF</td>
<td>ROCK (CU. YDS.)</td>
<td>VMF</td>
<td>TYPE B MR-30 (CU. YDS.)</td>
<td>TYPE AA MR-5-5 (CU. YDS.)</td>
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<td></td>
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<td>TOTALS</td>
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<td>4</td>
<td></td>
<td>174</td>
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</table>

Assumed VMF for contractor furnished excavation is 0.77.

Computed at the rate of 150 lbs/cu. ft.
Keep Area free of Stakedout Material, Equipment, or other Obstacles. Such as Temporary Signs, Regardless of Crash Worthiness. This Clear Area Extends 50 Feet in Advance of and 50 Feet beyond the First Post of the Guardrail End Terminal and at the 10:1 or Flatter Post Spacing. Continues 5 Feet behind the Face of the Guardrail through the W-Beam Portion of the Installation as shown in the Guardrail Clear Area Details on this Sheet.

**Normal Project Side Slopes**

<table>
<thead>
<tr>
<th>Description</th>
<th>Design Length</th>
<th>Note to Designer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mid-Span Splice</td>
<td>2020'</td>
<td>Uses approved polymer (preferred) or wood blockouts provided by the Manufacturer. The guardrail end terminal post type may be independent of the post type used in the remainder of the installation. However, no mixing of post types is permitted in the remaining w-beam and thrie-beam portion of the installation; see the details shown on KDOT’s Guardrail Post Details and Guardrail Thrie-Beam Transition Details standard drawings.</td>
</tr>
</tbody>
</table>

**General Notes**

- **Design Length**
  - 50'-0" (Min.) between Omitted Post Locations
  - 40'-7½" between Omitted Post and End Terminal Post No. 1
- **Flared Guardrail**
  - Applies to all guardrail installations unless otherwise shown in the plan.
  - Applies to CGS AND MGS
  - Guardrail End Terminal (MGS-FLEAT)
  - Guardrail End Terminal (MGS-SRT)
  - Guardrail End Terminal (MGS-MITK)
  - Guardrail End Terminal (MGS-SPSTTOP)
- **Parallel Guardrail**
  - Applies to CGS AND MGS
  - Guardrail End Terminal (MGS-FLEAT)
  - Guardrail End Terminal (MGS-SRT)
  - Guardrail End Terminal (MGS-MITK)
  - Guardrail End Terminal (MGS-SPSTTOP)
- **Flared Guardrail Details**
  - Applies to CGS AND MGS (MGS Shown)
  - See Guardrail Layout Sheets for Details
  - On Guardrail Layout Sheets, Show Station AND Offset from the Roadway Alignment to the Face of Post at these Locations.
  - Length of Neck (Beginning at Post 3)
- **Parallel Guardrail Details**
  - Applies to CGS AND MGS (MGS Shown)
  - See Guardrail Layout Sheets for Details
  - On Guardrail Layout Sheets, Show Station AND Offset from the Roadway Alignment to the Face of Post at these Locations.
  - Length of Neck (Beginning at Post 3)
- **Crash Testing**
  - MASH
  - NCHRP 350
  - FHWA Approval

**Manufacturers System Details**

- **Midwest Guardrail System (MGS) End Terminals**
  - End Terminal Bid Item
  - Flared or Parallel
  - Mounting Height
  - Crash Test Criteria
  - Steel Post Design Available
  - Wood Post Design Available
  - Energy Absorbing
  - Manufacturer
  - Design Length
  - Manufacturer’s System Length

<table>
<thead>
<tr>
<th>End Terminal Bid Item</th>
<th>Flared or Parallel</th>
<th>Mounting Height</th>
<th>Crash Test Criteria</th>
<th>Steel Post Design Available</th>
<th>Wood Post Design Available</th>
<th>Energy Absorbing</th>
<th>Manufacturer</th>
<th>Design Length</th>
<th>Manufacturer’s System Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guardrail End Terminal (MGS-FLAT)</td>
<td>Flared</td>
<td>31'</td>
<td>NCHRP 350</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Road Systems</td>
<td>40' 7½&quot;</td>
<td>37'-0&quot;</td>
</tr>
<tr>
<td>Guardrail End Terminal (MGS-SRT)</td>
<td>Flared</td>
<td>31'</td>
<td>NCHRP 350</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Trinity Industries</td>
<td>40' 7½&quot;</td>
<td>37'-0&quot;</td>
</tr>
<tr>
<td>Guardrail End Terminal (MGS-MT-1)</td>
<td>Parallel</td>
<td>31'</td>
<td>MASH</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Road Systems</td>
<td>46'-10½&quot;</td>
<td>46'-10½&quot;</td>
</tr>
<tr>
<td>Guardrail End Terminal (MGS-SPSTTOP)</td>
<td>Parallel</td>
<td>31'</td>
<td>MASH</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Trinity Industries</td>
<td>46'-10½&quot;</td>
<td>46'-10½&quot;</td>
</tr>
</tbody>
</table>

**Typical Rails and Splices**

- **Midwest Guardrail System (MGS)**
  - End Terminal Bid Item
  - Flared or Parallel
  - Mounting Height
  - Crash Test Criteria
  - Steel Post Design Available
  - Wood Post Design Available
  - Energy Absorbing
  - Manufacturer
  - Design Length
  - Manufacturer’s System Length

<table>
<thead>
<tr>
<th>End Terminal Bid Item</th>
<th>Flared or Parallel</th>
<th>Mounting Height</th>
<th>Crash Test Criteria</th>
<th>Steel Post Design Available</th>
<th>Wood Post Design Available</th>
<th>Energy Absorbing</th>
<th>Manufacturer</th>
<th>Design Length</th>
<th>Manufacturer’s System Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guardrail End Terminal (FLAT)</td>
<td>Flared</td>
<td>26'</td>
<td>NCHRP 350</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Road Systems</td>
<td>37'-0&quot;</td>
<td>37'-0&quot;</td>
</tr>
<tr>
<td>Guardrail End Terminal (SRT)</td>
<td>Flared</td>
<td>26'</td>
<td>NCHRP 350</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Trinity Industries</td>
<td>37'-0&quot;</td>
<td>37'-0&quot;</td>
</tr>
<tr>
<td>Guardrail End Terminal (SKY)</td>
<td>Parallel</td>
<td>26'</td>
<td>NCHRP 350</td>
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<td>Yes</td>
<td>Road Systems</td>
<td>50'-0&quot;</td>
<td>50'-0&quot;</td>
</tr>
</tbody>
</table>
**Typical Mounting on W-Beam**

- **Bracket**
  - High Intensity Reflective Sheeting (Yellow/Amber or White/Silver)
- **Flexible Marker**
  - One-Way Traffic
  - High Intensity Reflective Sheeting (Match Pavement Marking Adjacent to Traffic)
- **Flexible Marker**
  - Median Locations
  - High Intensity Reflective Sheeting (White/Silver)
- **Flexible Marker**
  - Two-Way Traffic
  - High Intensity Reflective Sheeting (White/Silver)

**Method of Attaching Flexible Marker to Barrier/Bridge Rail**

1. **Flexible Guardrail Marker**
   - High Intensity Reflective Sheeting (Silver or Amber, one or both sides)
2. **Epoxy cement bracket to barrier/bridge rail**
3. **Flexible Marker**
   - Variable (4'-0" Minimum) - 5" Expansion Anchor and Bolt

**General Notes**

- Install flexible markers on a post behind the guardrail bolt head on the traffic side of the guardrail installations at a spacing not to exceed 25'.
- Use high impact polycarbonate approx. .085" thick, 5½" x 3")
- Use High Impact Polycarbonate Flexible Guardrail Marker with high intensity reflective sheeting or an approved equivalent, see Standard Specifications.
- Install markers on the top of bridge rails at a spacing not to exceed 50', except for on ramps.
- For on ramps, the spacing may be increased to 100'.
- Install Flexible Markers on the top of Concrete Safety Barrier at a spacing not to exceed 100', except for barriers along a horizontal curve or as part of ramp terminations, where spacing is not to exceed 50'.

**FlexiGuard Markers with Reflective Sheeting Installed**

- Where the height of the bridge rail or concrete barrier is greater than 32", mount the Flexible markers on the side of the barrier as a height of 32", as shown on this sheet.
- For guardrail, bridge rail, or concrete safety barrier located on two-way roadways, use flexible markers with both Silver/Silver high intensity reflective sheeting on both sides.
- Use flexible markers with reflective sheeting installed on both sides of the bracket only. For bridge or concrete safety barrier, located on the outside edge of one way or divided roadways, use flexible markers with reflective sheeting installed on the approach traffic side of the bracket only. For bridge rail or concrete safety barrier located in the median, use flexible markers with reflective sheeting installed on the approach traffic side of the bracket only. For bridge rail or concrete safety barrier located on two-way roadways, use flexible markers with reflective sheeting installed on the approach traffic side of the bracket only. For bridge rail or concrete safety barrier located on two-way roadways, use flexible markers with reflective sheeting installed on the approach traffic side of the bracket only.

**Flexible Marker Details for Guardrail, Barrier, and Bridge Rails**

- **Marker Details for Guardrail**
  - Use High Impact Polycarbonate Flexible Guardrail Marker with high intensity reflective sheeting or an approved equivalent, see Standard Specifications.

**Flexible Marker Details for Guardrail, Barrier, and Bridge Rails**

- **Flexible Marker Details for Guardrail**
  - Use High Impact Polycarbonate Flexible Guardrail Marker with high intensity reflective sheeting or an approved equivalent, see Standard Specifications.

- **Markers Required for Installation**
  - Use High Impact Polycarbonate Flexible Guardrail Marker with high intensity reflective sheeting or an approved equivalent, see Standard Specifications.

For guardrail, bridge rail, or concrete safety barrier located on one-way or divided roadways, use flexible markers with reflective sheeting installed on both sides of the bracket only. For bridge rail or concrete safety barrier located in the median, use flexible markers with reflective sheeting installed on the approach traffic side of the bracket only. For bridge rail or concrete safety barrier located on two-way roadways, use flexible markers with reflective sheeting installed on the approach traffic side of the bracket only. For bridge rail or concrete safety barrier located on two-way roadways, use flexible markers with reflective sheeting installed on the approach traffic side of the bracket only.
[Drawing and text content related to the design and installation of guardrail systems, including details on wood and steel posts, bolt sizes, and ground line setup. The text and diagrams are technical and specific to the project's requirements, detailing the placement of guardrail posts, bolt sizes, and other specifications as per KDOT's Standard Specifications.]
### GENERAL NOTES

The entire disturbed area, excepting the paved or surfaced areas, steep rocky slopes and areas of undisturbed native soil or other desirable vegetation shall be fertilized and mulched where required, 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. After the temporary seeding has been completed on the entire project, permanent seeding shall be done during the normal seeding season.

Mulching shall be spread uniformly over all disturbed areas and placed in the soil unless otherwise noted on the plans. The rate of application per acre thickness in place for the mulching materials is generally as follows:

- 1.6 = 2½ Tons per Acre = 1½" loose depth spread uniformly over one.

Agricultural products, such as native prairie hay, used for mulching and erosion control practices, excluding wood based mulches, shall meet the American elm, western white elm, and rape material.

Other ground cover materials are acceptable only with the Engineer's concurrence.

The above rate is a guide, it will be at the discretion of the Engineer to determine what rate is sufficient for adequate protection of newly disturbed areas.

### SOIL EROSION MIX

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
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<tbody>
<tr>
<td>1</td>
<td>Temporary Fertilizer (N - P - K)</td>
</tr>
<tr>
<td>2</td>
<td>Temporary Fertilizer (20%)</td>
</tr>
</tbody>
</table>
| 3 | Temporary Seed 
| 4 | Temporary Seed (Grain Oats) |
| 5 | Temporary Seed (Sterile Wheatgrass) |
| 6 | Temporary Seed (Regreen and Quick Guard) |
| 7 | Fertilizer (15-30-15) |
| 8 | Fertilizer (15-30-15) |
| 9 | Fertilizer (15-30-15) |
| 10 | Fertilizer (15-30-15) |
| 11 | Fertilizer (15-30-15) |

The Soil Erosion Mix is to be placed under the Class 1 and/or Class 2 erosion control material.

The Soil Erosion Mix consists of the Shoulder Area of the Permanent Seed Mix used in the project.

This project is considered "routine maintenance that disturbs less than 5 acres" according to section 1.1a of the NPDES General Permit. The contractor is required to follow Section 5.1 of the standard specifications. Stabilization is required before moving to the next location.

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

Regreen and Quick Guard are the approved sterile wheatgrass products.

If the total disturbed area of the project, not just the seeding area, is 1 acre or more, then these bid items must be included.

### SUMMARY OF SEEDING / EROSION CONTROL QUANTITIES

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<th>ACRES</th>
<th>QUANTITY</th>
<th>UNIT</th>
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</tbody>
</table>

This project is light grading behind quadrant locations using 1:35 Sedgwick County, Kansas.

The Class I, Type C blanket will be placed over all newly seeded areas. Locations information typically found on LABS/EC is not needed on this project.
**Temporary Slope Drain**

1. 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 overtopping the crossing.

2. Discharge of Slope Drains shall be into stabilized ditch 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 set price.

**NOTES:**

1. Temporary Slope Drain and Temporary Berms may be used on other project foreslopes or project backslopes.

2. Discharge of Slope Drains shall be into stabilized ditch 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 set price.

**Other Approved Material**

Rock Dissipator or earthwork operations progress.

- 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 overtopping the crossing.

- See KDOT Specifications for more information.

**Temporary Erosion and Polluton Control**

- Temporary Slope Drain
- Temporary Stream Crossing (Articulated Concrete Blocks)
- 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 overtopping the crossing.

- See KDOT Specifications for more information.

- 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 overtopping the crossing.

- See KDOT Specifications for more information.

**Temporary Stream Crossing (Articulated Concrete Blocks)**

- 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 overtopping 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" (min.)
   - Southern Pine (No. 2) - 2" x 2" (min.)
   - Steel U, T, L, or C Section - .95 lbs. per ft.
   - Synthetic - same strength as wood stakes.
   - Other - keyed into ground during installation.

2. Cross pieces shall be of same material as stakes.
3. Cross pieces shall be of same material as stakes.
4. Cross pieces shall be of same material as stakes.
5. Cross pieces shall be of same material as stakes.

**Material Requirements**

Use 100% shredded mulch or other non-compost, biodegradable material as fill for bags. No compost or fines. No hay or straw. Log mesh:

1. If multiple gravel bags are required, place them in such a way that no gaps are evident.
2. Height of bags (min. diameter) must not be above top of curb.
3. Alternative products may be used other than gravel bags such as the "Gutter Buddy". Products must be approved by the Engineer.
4. Curb inlet protection will be measured and paid for as Filter Sock.

**CURB INLET PROTECTION**

- Use mesh with 1/4" openings or larger. Mesh must allow water infiltration but also hold fill material in place.
- Bags must be anchored into ground during installation. Stakes every 4'.
- Bags = synthetic net 1.3mm mesh or burlap bags
- Rock = approximately 1" to 2" diameter

**Drop Inlet Protection**

- 1'-6" TO 1'-8" diameter log
- Log mesh:
  - Use mesh with 1/4" openings or larger. Mesh must allow water infiltration but also hold fill material in place.
  - Bags must be anchored into ground during installation. Stakes every 4'.
  - Bags = synthetic net 1.3mm mesh or burlap bags
  - Rock = approximately 1" to 2" diameter

**Temporary Erosion and Pollution Control**

- Use mesh with 1/4" openings or larger. Mesh must allow water infiltration but also hold fill material in place.
SILT FENCE:

1. Stakes shall be 4' (min.) long and of one of the following materials:
   a. Hardwood - 1 3/4" x 1 3/4".
   b. Southern Pine (No. 2) - 2" x 2".
   c. Steel U, T, L, or C Section - 80 lbs, per 1' - 4 corr.
   d. Synthetic - same strength as wood stakes.

2. Attach fence fabric with 3 zip ties within the top 8" of the fence.

3. Use of high flow material is acceptable.

4. Refer to plan sheets to estimate the length of silt fence required.

BIODEGRADABLE LOG OR FILTER SOCK

1. Place biodegradable logs or filter sock tightly together minimum overlap of 18".

2. Wood stakes shall be 2' x 2' (nom.).

3. Refer to plan sheets to estimate length of biodegradable log and filter sock required.

4. Each log or sock (except compost filter socks) should be keyed into the ground at a minimum of 25% of its height. Compost filter socks should be placed on smooth prepared ground with no gaps between the sock and soil.

5. Length of stakes should be 2 times the height of the log at a minimum with minimum 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 250 feet, and the barrier ends need to be staggered.

3) 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) Agricultural products, such as native prairie hay, used for mulching and erosion control practices, including wood based mulch, shall meet the North American Weed Free Forage Standards.

<table>
<thead>
<tr>
<th>LOW FLOW</th>
<th>HIGH FLOW</th>
</tr>
</thead>
<tbody>
<tr>
<td>4&quot; Straw/Compost</td>
<td>Excelsior / Wood Chips / Coconut Fiber</td>
</tr>
<tr>
<td>6&quot; Straw/Compost</td>
<td>Excelsior / Wood Chips / Coconut Fiber</td>
</tr>
<tr>
<td>8&quot; Straw/Compost</td>
<td>Excelsior / Wood Chips / Coconut Fiber</td>
</tr>
</tbody>
</table>

Deviations should be approved by the Field Engineer.
TYPICAL DITCH CHECK LAYOUT PLAN

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.
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 dry 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' (150mm). After placement of the rock, backfill and compact any over excavated soil to ditch grade. This work shall be subsidiary to the bid 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 D50 = 6" or smaller.

<table>
<thead>
<tr>
<th>SPACING (FEET)</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.0</td>
<td>33</td>
<td>29</td>
</tr>
<tr>
<td>6.0</td>
<td>36</td>
<td>33</td>
</tr>
<tr>
<td>7.0</td>
<td>43</td>
<td>36</td>
</tr>
<tr>
<td>8.0</td>
<td>50</td>
<td>43</td>
</tr>
<tr>
<td>9.0</td>
<td>53</td>
<td>46</td>
</tr>
<tr>
<td>10.0</td>
<td>60</td>
<td>53</td>
</tr>
</tbody>
</table>

- **Direction of Flow**
- **Temporary Rock Ditch Check Spacing**

**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 18".
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 I) (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 the contract unit price.
6. Each log or sock (except compost filter socks) should be keyed into the ground at a minimum of 25% of its height. Compost filter socks should be placed on a smooth prepared ground with no gaps between the sock and soil.

**Biodegradable Log Ditch Check Spacing**

- **Direction of Flow**
- **Temporary Rock Ditch Check Spacing**

**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 18".
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 I) (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 the contract unit price.
6. Each log or sock (except compost filter socks) should be keyed into the ground at a minimum of 25% of its height. Compost filter socks should be placed on a smooth prepared ground with no gaps between the sock and soil.
POLLUTION CONTROL

TEMPORARY EROSION AND SEDIMENT CONTROL

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NOTES:

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.

---

SEDIMENT STORAGE BASIN LOCATIONS

<table>
<thead>
<tr>
<th>STATION TO STATION</th>
<th>SIDE</th>
<th>REQUIRED STORAGE CAPACITY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**SEDIMENT STORAGE BASIN LOCATIONS**

**NOTES:**

1. All P.V.C. pipes are to be schedule 40.
2. HDPE flexible drain pipes 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 dewaters from the surface at a controlled rate. The design must be approved by the engineer.

---

**SEDIMENT STORAGE BASIN LOCATIONS**

**NOTES:**

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, lay blanket loosely, avoiding stretching.

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 5 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 catching the edges of both blankets.

3. **SPLICE SEAM:** When splices are necessary, overlap end 6 inches apart. The slots should be 6 inches wide x 5 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 in place with anchors 9 inches apart.

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

6. **STAPLE CHECK:** Install staples in 2 rows 4" on center apart. Staple Checks shall be 30' apart.

NOTE:
- Agricultural products, such as native and/or hay, used for mulching and erosion control practices, excluding wood based mulch, shall meet the North American Weed Free Forage Standards.
- Staple pinning and shank staple is acceptable.
The work on this project is considered to be routine infrastructure improvements. The temporary and permanent seeding should be combined and seeded at the same time.

There is no second restriction for seeding this project.

**GENERAL NOTES**

The entire disturbed area, excepting the paved or surfaced areas, road and shoulder areas, and areas of undisturbed native sod or other vegetation shall be fertilized when required, seeded and mulched. Soil preparation and surface in the Standard Specifications is noted below.

All areas as shown on the plans are to be fertilized, seeded, and mulched. However, operation in borrow areas where areas are growing may be delayed when requested by the owner.

If temporary cover has provided adequate cover with no erosion, the permanent process is initiated when the cover is established. If there has been erosion that requires initial seeding, it may be necessary to regrade the area, resulting in some grading.

**FERTILIZER** A ratio and application rate that equals or exceeds the required minimum rate per acre of N, P2O5, K2O listed in Summary of Seeding Quantities will be acceptable.

**MUDDLING** Muddling shall be applied uniformly over all disturbed areas and placed in the soil, unless otherwise noted on the plans. The rate of application per acre shown on the plans for the muddling material is generally as follows:

- 1/4 Ton per Acre *1/6" loose depth spread uniformly over area.

**PLANTS**

Farm products, such as native prairie hay, used for muddling and erosion control practices, excluding wood mulches, shall meet the North American Weed Free Forage Standards.

**OTHER VEGETATIVE**

Other vegetative mulches are acceptable only with the Engineer's concurrence.

**SEEDING**

The seed rates are in a guide. It will be at the discretion of the Engineer to determine what rate is sufficient for adequate production of a desired area.

**SUMMARY OF SEEDING QUANTITIES**

<table>
<thead>
<tr>
<th>BID ITEM</th>
<th>CODE</th>
<th>ACM</th>
<th>DESCRIPTION</th>
<th>QUANTITY</th>
<th>UNIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>BC002</td>
<td>1200</td>
<td>CL</td>
<td>Seed (Tall Fescue (Endophyte Free))</td>
<td>200</td>
<td>lbs</td>
</tr>
<tr>
<td>1000</td>
<td>CL</td>
<td>60</td>
<td>Seed (Side Oats Grama (El Reno))</td>
<td>100</td>
<td>lbs</td>
</tr>
<tr>
<td>800</td>
<td>CL</td>
<td>45</td>
<td>Seed (Buffalograss (Treated))</td>
<td>45</td>
<td>lbs</td>
</tr>
<tr>
<td>600</td>
<td>CL</td>
<td>50</td>
<td>Seed (Blue Grama (Lovingtion))</td>
<td>50</td>
<td>lbs</td>
</tr>
<tr>
<td>400</td>
<td>CL</td>
<td>75</td>
<td>Seed (Western Wheatgrass)</td>
<td>75</td>
<td>lbs</td>
</tr>
<tr>
<td>200</td>
<td>CL</td>
<td>25</td>
<td>Seed (Swamp Clover (Treated))</td>
<td>25</td>
<td>lbs</td>
</tr>
<tr>
<td>100</td>
<td>CL</td>
<td>50</td>
<td>Seed (Red Crown Vetch)</td>
<td>50</td>
<td>lbs</td>
</tr>
<tr>
<td>100</td>
<td>CL</td>
<td>50</td>
<td>Seed (Tall Dropseed)</td>
<td>50</td>
<td>lbs</td>
</tr>
</tbody>
</table>

**SHOULDER MIX**

The shoulder mix shall meet the Standard Specifications. Office products, such as native prairie hay, used for muddling and erosion control practices, excluding wood mulches, shall meet the North American Weed Free Forage Standards.

**PERMANENT SEEDING**

SUMMARY OF SEEDING QUANTITIES
1) **Design Speed:** Those items delegated to temporary traffic control should be designed and installed using the posted or legal speed of the roadway prior to work starting.

2) **Minimum Lane Width:** Lane widths shall be a minimum of 11' (measured between centers 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 zone activity and vehicular traffic. Unless a reasonable safe route that does not involve crossing the roadway can be provided, it is recommended that pedestrians be directed to the opposite side of the roadway. In urban and suburban areas with high vehicular traffic volumes, these signs should be placed at intersections (rather than midblock locations) so that pedestrians are not confronted with midblock work sites that would induce them to attempt walking in the work site or making 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 (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.

**Table: Taper Formulas**

<table>
<thead>
<tr>
<th>Taper Type</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shoulder Taper=1/3 L</td>
<td>L = WS /60 for speeds of 40 MPH or less</td>
</tr>
<tr>
<td>Shifting Taper=1/2 L</td>
<td>L = WS for speeds of 45 MPH or more</td>
</tr>
</tbody>
</table>

**Channelizer Placement:**

1. **The spacing between devices in 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.**

**List of Device Placement:**

- **Buffer Space:**
  - **Speed (MPH):** 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75
  - **Length (%):** 115, 155, 200, 250, 300, 360, 425, 495, 570, 645, 730, 820
  - **While speed prior to work starting.**

- **Post-taper:**
  - **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.

- **Temporary concrete safety barrier system should be 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.
The stripes shall slope downward to the traffic side for channelization.

For rails less than 36" long, 4" wide stripes may be used.

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

The stripes shall slope downward in the direction traffic is to pass.

### TABLE 1: CHANNELIZING DEVICES

<table>
<thead>
<tr>
<th>Location</th>
<th>Portable</th>
<th>Fixed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drums</td>
<td>Yes, Yes, Yes, Yes, Yes, Yes, Yes</td>
<td>No, No, No, No, No, No, No</td>
</tr>
<tr>
<td>Conical Delineator</td>
<td>Yes, Yes, Yes, Yes, Yes, Yes, Yes</td>
<td>No, No, No, No, No, No, No</td>
</tr>
<tr>
<td>Vertical Panel</td>
<td>No, No, Yes, Yes, Yes, Yes, Yes</td>
<td>No, No, No, No, No, No, No</td>
</tr>
<tr>
<td>Type 2 Barricade</td>
<td>(2), (2), (2), (2), No, No, Yes</td>
<td>(2)</td>
</tr>
<tr>
<td>Traffic Cones</td>
<td>No, No, (4), (4), (4), No, No, No, No</td>
<td>No, No, No, No, No, No, No, No</td>
</tr>
<tr>
<td>Tubular Markers</td>
<td>(3), (3), (3), No, No, Yes, Yes</td>
<td>(3)</td>
</tr>
<tr>
<td>Vertical Panels</td>
<td>(2), (2), (2), (2), (2), Yes, Yes</td>
<td>(2)</td>
</tr>
</tbody>
</table>

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 or flatter and having a width equal to the alternate path.
6. Use alternating orange/white on interconnected devices.

### TRAFFIC CONTROL

- **CHANNELIZING DEVICES**
  - **Drum**
  - **Conical Delineator**
  - **Tubular Marker**
  - **Direction Indicator Barricade**
  - **Type 2 Barricade**
  - **Traffic Cone**

- **PEDESTRIAN CHANNELIZER**
  - **Support Device**
  - **Hand Trailing Edge**
  - **Detection Plate**
  - **Support Edge**

---

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

Note: Sign shown for one approach to work zone.

Complete Closure Type 3 Barricades

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

Note: Sign shown for one approach to intersection (work zone).

Complete Closure Type 3 Barricades

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

Note: Signs shown for one approach to work zone.

Complete Closure Type 3 Barricades

**FIGURE 4: TYPICAL SIGNING FOR SIDEWALK CLOSED WITH OPPOSITE SIDEWALK AVAILABLE**

Audible device location when used

Type 'A' Low Intensity Warning Light Mounted to the Vertical Post (Typ.)

*DETECTABLE BARRICADE*

1. Support device shall not project beyond the detection plate into the pathway.
2. Barricades shall be used to close the entire width of the pathway.
3. Do not use warning lights on pedestrian barricades.
4. Do not use warning lights on audible devices.

**ROAD CLOSED GENERAL NOTES**

As shown in Figure 1, at the point where thru traffic must detour and local traffic can proceed to the point of complete closure of the roadway is less than 1 mile. 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)

As shown in Figure 3, when local traffic must be allowed access into the work zone, Type 3 barricades shall be placed beyond the last access point in the work zone, to completely close the roadway.

The R11-4 (ROAD CLOSED TO THRU TRAFFIC or ROAD CLOSED 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 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 less than 1 mile.  The R11-3a or R11-4 sign where applicable.

The R9-11-3a (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.

Type 3 BARRICADE WITH LIGHTS

Approved signs mounted on Type 3 barricades should not cover more than 50% of the top two rails or 33% of the total area of the barricade.

When barricades are placed end to end or staggered, a Type 4 low intensity warning light shall be mounted to the vertical post near each outside corner of the end barricades.

The R9-11 (ROAD CLOSED TO THRU TRAFFIC or ROAD CLOSED LOCAL TRAFFIC ONLY) sign shall be used when the distance to the point of complete closure of the roadway is less than 1 mile.
SIGN LAYOUT INFORMATION

END ROAD WORK
K020-2

WAIT FOR PILOT CAR
K020-5

GROOVED PAVEMENT
W8-15

LOOSE GRAVEL
W8-7

UNEVEN LANES
W8-11

SHOULDER DROP-OFF
W8-17

NB US-75 CLOSED
SP-01 (Special Sign)

US-75 CLOSED
SP-02 (Special Sign)

Signage to be Determined by the Engineer.

ROADWAY

RURAL
1) Ground-mounted signs shall be mounted at a minimum height of 6' measured from the bottom of 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 shall 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 the top of the secondary sign mounted below another sign may be 6' measured from the bottom of 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 signage 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 sidewalk nor shall it project beyond the back of curb.

FINES DOUBLE IN WORK ZONES

Dimensions in inches

FINES
Type: Reflective
Black

DOUBLE
Type: Reflective
Orange

IN WORK ZONES
Type: Reflective
Black

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.
4" x 4" Wood Post in Soil

4" x 6" Wood Post in Soil

44" Min.

44" Min.

Length

Stub Post

84" Min.
at Ground Level

Install Corner Bolt

Ground Line

Ends and at

Bolt at Both

Install Corner

of Stub)

Non-Impacting Side

(Splice Post to

Sign Post

Gap

8" Min.

Telescoping P.S.S.T. Detail

P.S.S.T. Detail

Side Elevation

4" x 4" Wood Post in Soil

4" x 6" Wood Post in Soil

3 LB/F U-CHANNEL

SETUP

3 LB/F U-CHANNEL

SETUP

See TE710 for Additional

Details and Requirements

Notes:

Place two bolts at both ends of the splice through the holes nearest the ends of the splice.

Use manufacturer recommended spacers over the bolts between the spliced pieces of U-Channel.
Notes:

For work in the median, install signs and channelizing devices for each direction of traffic according to the applicable typical drawing.

No traffic control is required if the Work Space is located outside of the clear zone.

For operations of 60 minutes or less, all signs and channelizing devices may be eliminated if a vehicle with a high-intensity rotating, flashing, oscillating, or strobe light is used.

For work in the median, install signs and channelizing devices for each direction of traffic according to the applicable typical drawing.

Omit taper if paved shoulder is less than 8' wide.

Eliminate W7-3b if shoulder is closed for less than 2 miles.
SHIFTING TAPER DETAIL

Add signs and devices as shown for work inside a closed lane that extends near to (or into) the open traffic lane.

The double reverse curve (W24-1, W24-1a or W24-1b) should be used if the tangent distance between the two reverse curves is less than 600 ft. Only one W24-1 is required to be placed at an "A" distance in advance of the shifting taper.

For left lane closures use W4-2L and yellow edge line that extends near to (or into) the open traffic lane.

Add signs and devices as shown for work inside a closed lane adjacent to traffic activity area where work is in a closed lane adjacent to traffic and not separated by a concrete safety barrier system.

One flagger should be stationed within each multi-lane roadway activity area where work is in a closed lane adjacent to traffic and not separated by a concrete safety barrier system.

For left lane closures use W4-2L and yellow edge line that extends near to (or into) the open traffic lane.

Left-side signs shall be omitted for a four-lane undivided highway.

The W20-5 (Lane Closed) and W7-3A (Next X Miles) signs should be placed at 2 mile increments on a project of 4 miles or longer.
### Recapitulation of Quantities

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
<th>Unit</th>
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</thead>
<tbody>
<tr>
<td>Work Zone Signs (Special)</td>
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</tr>
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<td>Work Zone Signs (16.25 Sq. Ft. &amp; Less)</td>
<td></td>
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<tr>
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<tr>
<td>Work Zone Barricades (Pedestrian)</td>
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<td>Work Zone Barricades (Fixed)</td>
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<td>Work Zone Barricades (Portable)</td>
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<td>Work Zone Warning Light (Type &quot;A&quot; Low Intensity)</td>
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<tr>
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<tr>
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<tr>
<td>Pavement Marking (Temporary)</td>
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<tr>
<td>4&quot; Solid (Type I)</td>
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<td>Sta/Lane</td>
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<tr>
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**Note:**
Traffic control quantities are provided for information only. Traffic control to be for as "Traffic Control" Lump Sum.

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