NOTE: TRAFFIC TO BE CARRIED THROUGH PROJECT DURING CONSTRUCTION.
INDEX TO DRAWINGS

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<td>25</td>
<td>Traffic Control Quantities</td>
</tr>
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</table>

SUMMARY OF QUANTITIES

<table>
<thead>
<tr>
<th>ITEM</th>
<th>UNITS</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clearing and Grubbling</td>
<td>Lump Sum</td>
<td></td>
</tr>
<tr>
<td>Removal of Existing Structures</td>
<td>Lump Sum</td>
<td></td>
</tr>
<tr>
<td>Foundation Stabilization</td>
<td>Cu. Yds.</td>
<td>14</td>
</tr>
<tr>
<td>Concrete for Seal Course (Set Price)</td>
<td>Cu. Yds.</td>
<td>1</td>
</tr>
<tr>
<td>Granular Backfill (Wingwalls)</td>
<td>Cu. Yds.</td>
<td>89</td>
</tr>
<tr>
<td>*Bridge Repair</td>
<td>Lump Sum</td>
<td></td>
</tr>
<tr>
<td>Concrete (Grade 4.0)</td>
<td>Cu. Yds.</td>
<td>33.4</td>
</tr>
<tr>
<td>Reinforcing Steel (Grade 60)</td>
<td>Lbs.</td>
<td>3,40</td>
</tr>
<tr>
<td>Temporary Shoring</td>
<td>Lbs.</td>
<td>28</td>
</tr>
<tr>
<td>Drilling and Grouting</td>
<td>Each</td>
<td>28</td>
</tr>
<tr>
<td>Slope Protection (Shot Rock)</td>
<td>Cu. Yds.</td>
<td>30</td>
</tr>
<tr>
<td>Reinforcing Steel (Repair) (Grade 60) (Set Price)</td>
<td>Lbs.</td>
<td>1</td>
</tr>
<tr>
<td>Mobilization</td>
<td>Lump Sum</td>
<td></td>
</tr>
<tr>
<td>Mobilization (DBE)</td>
<td>Lump Sum</td>
<td></td>
</tr>
</tbody>
</table>

*Note: *-I.D. *I-D. - Install 58 each Maintainable Weephole System

See Page No. 16 for erosion control quantities.
See Page No. 25 for traffic control quantities.
GENERAL NOTES

EXISTING STRUCTURE: Plans of the existing structure are on file and available for inspection by qualified bidders at the State Bridge Office, KDOT, Eisenhower State Office Building, 700 SW Harrison, Topeka, KS.

EXISTING DIMENSION VERIFICATION: Dimensions of the existing structure are based on old plans. Verify, by field measurement, the as-built dimensions of the existing structure and submit such verification in writing to the Engineer. The verification will include sketches, drawings, photographs and descriptions as needed to clearly define the as-built dimensions that will be incorporated in the new construction.

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

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

BROKEN CONCRETE: Waste the broken concrete from the existing bridge on sites provided by the Contractor and approved by the Engineer. It may be broken up and used to supplement slope protection at the end of wings as detailed in these plans.

DEMOLITION PLANS: This is a Category A Demolition. Submit detailed Demolition Plans to the Field Engineer per KDOT Specifications. No Demolition work will begin without approved Demolition Plans. A Licensed Professional Engineer is not required.

EPOXY BONDING AGENT: Prepare all existing concrete surfaces which will be in contact with new concrete with an approved Epoxy Bonding Agent in accordance with the manufacturer's recommendations. This is subsidiary to the bid item "Concrete (Grade 4.0)".

SLOPE PROTECTION (Shot Rock): Place Slope Protection (Shot Rock) to the limits and thicknesses shown on the plans as shown by the Engineer.

TEMPORARY SHORING: The bid item "Temporary Shoring" includes all labor and material necessary to furnish shoring at the location shown on the plans for the temporary bracing of the embankment during excavation. Maintain the temporary shoring until the Engineer authorizes its removal. The temporary shoring plans are to be designed and sealed by a registered Professional Engineer. Submit design calculations and shoring plans to the Field Engineer for review 4 weeks before work is scheduled to begin. Work shall not begin until the Engineer grants approval.

Existing temporary shoring was installed as a cantilevered system with the majority of the soil remaining in place in front of the sheet pile. It was not designed to allow for excavation to the wingwall footing. While the existing temporary shoring may be incorporated into the new design, it is anticipated that it will not be used as-is without additional bracing.

REMOVAL OF EXISTING STRUCTURE: The bid item "Removal of Existing Structure" Lump Sum, includes the removal of the concrete to the limits shown on the plans.

All materials removed from the existing structure and the removed existing sheet pile shall become the property of the Contractor and be removed from the site.

TEMPORARY CONSTRUCTION LOADS: The Contractor will not stockpile construction materials, debris/rubble or place equipment weighing more than 20 tons or greater than culvert posted load limits on the bridge without prior written approval by the KDOT Area Engineer. For culverts with highway traffic on or under the culvert the Contractor will provide plans showing the location, quantity and weight of the proposed materials, debris or equipment weighing more than 20 tons or greater than culvert posted load limit. These plans will be reviewed and submitted by the Contractor's Engineer before approval is granted. The Contractor's Engineer will use AASHTO Specifications for limitations on structural capacities, as the structure is found in the field.

DRILLING AND GROUTING: This item shall consist of grouting reinforcing steel, anchor bolts, tie bars, or dowel bars into the existing concrete, where required by the Engineer, with an epoxy grout. Follow KDOT Specifications 842 and any associated Special Provisions. Follow the manufacturer's directions for mixing, application and curing. The tools, materials, labor and incidentals necessary to complete the work shall be paid for per each by the bid item "Drilling and Grouting".

CONCRETE: Concrete is bid as Concrete (Grade 4.0). Bevel all exposed edges of all concrete with a 3/8 inch triangular molding, except as otherwise noted on the plans. Concrete mix shall be designed, using KDOT prequalified materials, to be full strength before the culvert is open to traffic.

GEOTECHNICAL REPORT: The geotechnical report (Dated March 16, 2020) includes soil parameters for sheet pile design. The report recommends a traffic surcharge of 250 lb/ft². The geotechnical information shown on the plans is the best information available. The report is available for inspection by qualified bidders at the State Bridge Office, KDOT, Eisenhower State Office Building, 700 SW Harrison, Topeka, KS.

TRAFFIC CONTROL: As per K-58001 latest edition, unless noted otherwise.

BRIDGE REPAIR: The bid item "Bridge Repair", Lump Sum, shall include installation of a Maintainable Weephole Filter System. All labor, equipment, and materials necessary to complete the work are included in the bid item. The Maintainable Weephole Filter System shall be a 3" diameter one-way backflow preventer maintainable weephole system by JET Filter System, L.L.C., or an approved equal. Acceptance of the material is based on receipt and acceptance of a Type D Certification as per KDOT Specifications.
NORTHWEST WINGWALL CONCRETE REMOVAL

NORTHEAST WINGWALL CONCRETE REMOVAL

NOTES:
See Sheet No. 6 for additional concrete removal details

CR = Concrete removal line. Sawcut 1" joints prior to beginning concrete removal.

Remove Existing Apron. Not shown for clarity.
NOTES:
Remove the entire wingwall, footing, and key to the existing construction joint. The footing shall be removed in its entirety along the outside face of the box. Any reinforcing that remains after removal of the existing footing may either be cut flush at the construction removal line or may be used in the new footing, if it is to be used, ensure it is securely embedded in the existing RFB and will not interfere in new construction. A minimum of 15 inches shall remain beyond the removal line for use in the new footing. Thoroughly clean existing reinforcing that is to remain. This work shall be paid for under the bid item “Removal of Existing Structures”.

The barrel wall and bottom 12 in. by 12 in. fillet shall be removed to the limits shown. Reuse existing reinforcing in the barrel wall and fillet. Trim as necessary to maintain 2 inch minimum clear from new 1/2 open joint. Keep 2'-0" minimum extension of existing reinforcing into new work. This work shall be paid for under the bid item “Removal of Existing Structures”.

If during removals, deteriorated existing reinforcing steel is encountered, and the Engineer requires it to be replaced, provide and place new reinforcing steel according to KDOT Standard Specifications. This will be paid for as “Reinforcing Steel (Repair) (Grade 60) (Set Price)”. CR = Concrete removal line. Sawcut 1” Joints prior to beginning concrete removal, subsidiary.
WINGWALL REPLACEMENT DETAILS

KANSAS DEPARTMENT OF TRANSPORTATION
PROJ. NO. 35-70 KA-5531-01
JEO CONSULTING GROUP
CULVERT NO. 35-70-4.31 (535)
OSAGE Co. 7
WINGWALL REPLACEMENT DETAILS

GENERAL NOTES


DESIGN LOADING: HL-93

UNIT STRESSES: Grade 4.0 Concrete; f'c = 4,000 p.s.i.

REINFORCING Steel; fy = 60,000 p.s.i.

CONCRETE: Grade 4.0 Concrete shall be used throughout. Bevel all exposed edges with a 1/8" triangular moulding.

CONCRETE: Grade 4.0 Concrete shall be used throughout. Bevel all exposed edges with a 1/8" triangular moulding.

WINGWALL QUANTITIES (One End Only)

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foundation Stabilization</td>
<td>26.4 C.Y.</td>
</tr>
<tr>
<td>Concrete</td>
<td>0.00 C.Y.</td>
</tr>
<tr>
<td>Soil Saver</td>
<td>0.00 C.Y.</td>
</tr>
</tbody>
</table>

Quantities listed below are included in the Summary of Quantities shown on Sheet No. 2.

WINGWALL QUANTITIES (One End Only)

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wingwalls</td>
<td>8 C.Y.</td>
</tr>
<tr>
<td>Apron</td>
<td>6 C.Y.</td>
</tr>
<tr>
<td>Soil Saver</td>
<td>0.00 C.Y.</td>
</tr>
<tr>
<td>Reinforcing Steel</td>
<td>2515 Lbs.</td>
</tr>
<tr>
<td>Welded Wire Fabric (Wings)</td>
<td>235 Lbs.</td>
</tr>
<tr>
<td>Welded Wire Fabric (Apron)</td>
<td>399 Lbs.</td>
</tr>
<tr>
<td>Granular Backfill (Wingwalls)</td>
<td>89 C.Y.</td>
</tr>
<tr>
<td>Filter Fabric (sub)</td>
<td>68 S.Y.</td>
</tr>
</tbody>
</table>

WINGWALL REPLACEMENT DETAILS

KANSAS DEPARTMENT OF TRANSPORTATION

PROJ. NO. 35-70 KA-5531-01

JEO CONSULTING GROUP

CULVERT NO. 35-70-4.31 (535)

OSAGE Co.

8
### BILL OF REINFORCING STEEL
**Grade 60 (Two Wingwalls)**

<table>
<thead>
<tr>
<th>Mark</th>
<th>Size</th>
<th>Number</th>
<th>Length</th>
<th>Mark</th>
<th>Size</th>
<th>Number</th>
<th>Length</th>
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<tbody>
<tr>
<td>C1</td>
<td>4</td>
<td>8</td>
<td>20'-0&quot;</td>
<td>D1</td>
<td>6</td>
<td>34</td>
<td>*9'-5&quot;</td>
</tr>
<tr>
<td>C2</td>
<td>4</td>
<td>16</td>
<td>7'-0&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E1</td>
<td>4</td>
<td>6</td>
<td>21'-0&quot;</td>
<td>E2</td>
<td>4</td>
<td>8</td>
<td>*3'-5&quot;</td>
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<tr>
<td>H1</td>
<td>4</td>
<td>20</td>
<td>19'-4&quot;</td>
<td>H5</td>
<td>4</td>
<td>14</td>
<td>*2'-9&quot;</td>
</tr>
<tr>
<td>H2</td>
<td>4</td>
<td>4</td>
<td>14'-9&quot;</td>
<td>H6</td>
<td>4</td>
<td>14</td>
<td>*3'-1&quot;</td>
</tr>
<tr>
<td>H3</td>
<td>4</td>
<td>4</td>
<td>7'-6&quot;</td>
<td>H7</td>
<td>4</td>
<td>14</td>
<td>*3'-0&quot;</td>
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<td>H4</td>
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<td>19'-9&quot;</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>V3</td>
<td>5</td>
<td>28</td>
<td></td>
<td>V1</td>
<td>5</td>
<td>38</td>
<td>*5'-0&quot;</td>
</tr>
<tr>
<td>V4</td>
<td>5</td>
<td>28</td>
<td>2'-2&quot;</td>
<td>V2</td>
<td>6</td>
<td>36</td>
<td>*7'-6&quot;</td>
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<tr>
<td>V5</td>
<td>4</td>
<td>28</td>
<td></td>
<td>V6</td>
<td>4</td>
<td>6</td>
<td>11'-0&quot;</td>
</tr>
</tbody>
</table>

*See Bending Diagram*

#### BENDING DIAGRAM

All dimensions are out to out of bars.

† † Bend in Field

---

**KANSAS DEPARTMENT OF TRANSPORTATION**

**BILL OF BARS AND BENDING DIAGRAMS**

**PROJ. NO. 35-70 KA-553I-01**

**JE O CONSULTING GROUP**

**CULVERT NO. 35-70-4.31 (535)**

**OSAGE Co.**
INSTALLATION: This work is the drilling of new weepholes to allow drainage from behind the existing culvert wall and installation of maintainable weephole components to contain existing backfill and provide for accessibility for future maintenance. This work includes all tools, material, and labor to drill the new weepholes and install the maintainable weephole components.

The maintainable weephole component is a filter assembly consisting of a housing containing a flat flange and a perforated conical shell with the shell adapted to extend into the hole with its apex extending toward the landward side, the flange having a frontward side adapted to fit flush against the existing culvert wall, the flange having a landward side connected to the shell, and the flange having an opening that defines an open base for the shell.

The work also includes access to the new weephole locations to perform the work.

MATERIAL: Stainless steel, 3" diameter Jet Filter as manufactured by JET Filter System L.L.C. or approved equal.

Jet Filter System, L.L.C.
Post Office Box 31 Casey, IL 62420
Phone: 1-800-475-2029
Fax: 1-800-475-2136 David Gentry, President

Filter assembly:
- Housing - ASTM A316L stainless steel
- Face plate - ASTM A316L stainless steel
- Ring plate - ASTM A316L stainless steel
- Cage - 16 ga. ASTM A316L stainless steel with 1/4" diameter perforated holes at 5/16" Filter cartridge - ABS, flame retardant polycarbonate/acrylonitrile-butadiene-styrene
- Filter media - Tencate Mirafi FW 300
- No. 8 Coarse Aggregate - Conform to Section 1107 of the Standard Specifications. Crushed stone is not allowed.

CONSTRUCTION: Utilize JET Filter System installation partner or experienced vendor to construct in accordance with Manufacturer’s recommendations.

Drilling of new weepholes - Minimize rebar influence by rebar mapping or weephole placement at Engineer’s approval. Drill holes for the new weepholes at the locations and size approved by Engineer, and to the diameter and depth indicated. The wall should be smooth at the location of the JET Filters, and the core should be level to allow the new filter housing to install flush with the wall. Core through the entire thickness of the culvert wall.

Installation of maintainable filter component - If indicated by Engineer, after drilling of the new weephole is completed, eliminate water from cored weephole, pack the void between the end of the filter and the backfill with No. 8 aggregate or other approved backfill aggregate. Then insert the Jet Filter assembly into the weephole and install Jet Filter per manufacturer’s recommendations. If wall is not smooth at JET Filter location, epoxy/seal around the housing for any possible openings of the core.

Installable Backfill with No. 8 Aggregate

SECTION A-A

Front View

1/4-20 x 1 1/2" Self Tapping Screw Permanent Mount

1/4-20 x 1 1/2" Screw Removable for Cleaning and Replacing Filter Cartridge

Filter Cartridge Assembly
- Removable for Maintenance
- Bulkhead Cage Assembly
- Permanent Mount

Face of Existing Culvert Wall

Existing Backfill
Note: Adjust the location of the weepholes to avoid reinforcing and maintain a minimum of 12" clear from existing cracks in the culvert barrel and any existing weepholes in the culvert barrel or wingwalls.

Maintainable Weephole System details in Sheet Nos. 10-11 will override all weephole details on RCB Auxiliary Details on Sheet Nos. 13-15.
Excavation for box bridges shall be below the "cleared" channel unless otherwise noted on the plans.

Note: The Grading Contractor shall excavate the channel to the limits shown prior to the construction of the box bridge, unless otherwise noted on the plans.

Note: Typical Class III Excavation for box bridges shall be below the "cleared" channel unless otherwise noted on the plans.

Note: Excavation below the elevation of the bottom of the box floor and/or wingwalls is subsidiary to "Foundation Stabilization".

Excavation Details for Reinforced Concrete Box Culvert

Note: Excavation for culverts less than bridge length and the additional excavation for "Embedded Structures" shall not be paid for as Class III Excavation, but shall be subsidiary to Grade 4.0 Concrete.

Excavation Details for Abutments with Flared Wingwalls

Note: All bridge excavation shall be computed on the basis of the cross-hatch areas and boundary lines indicated on this sheet and the Excavation Boundary Plane on the Construction Layout.

Sides of trenches in hard or compacted soil including embankments shall be shored, sheeted, braced or otherwise supported when the trench is more than 5 feet in depth and 8 feet or more in length. In lieu of the shoring, the sides of the trench above the 5 foot level may be sloped to preclude collapses. The slope for average soils shall be 1:1. If the angle of repose of the soil is less, flatter slopes shall be required.

Excavation Detail for Footings in Rock or Shale (Rock)

Note: Excavation below top of rock, hard shale or below top of footing, whichever is lower, shall be to neat lines of the concrete construction.

Dimension "X" shall be 2'-0" unless indicated otherwise on the general plans.

Dimension "Y" shall be 1'-6" unless indicated otherwise on the general plans.
Longitudinal bars shall extend through the joint to provide a minimum lap equal to the required splice length. See RCB Details Sh. for required splice length.

NOTE: Vertical construction joints shall be perpendicular to the longitudinal axis of the RCB and shall be placed at any location as needed for construction and as approved by the Engineer.

NOTE: Horizontal construction joints shall be a roughened finish.

Vertical construction joints shall be at locations specified by the Engineer, shall be protected by a bentonite based system as shown. Place the bentonite on the exterior walls and top slab. See requirements for bentonite in the KDOT Specifications for "Bridge Backwall Protection System", Material and installation of the bentonite system shall be subsidiary to the bid item "Grade 4.0 Concrete".

The Contractor shall have the option of using Dowel Bars to match vertical wall bars as shown, however no allowance will be made for additional steel required for bar laps.

The Contractor has the option of placing the Lower Horizontal Construction Joint at the top of the slab for RCB's or at the top of the fillet for RFB's

NOTE: Barrel Construction Joints located in a median with less than 5 ft. of fill or at locations specified by the Engineer, shall be protected by a bentonite based system as shown. Place the bentonite on the exterior walls and top slab. See requirements for bentonite in the KDOT Specifications for "Bridge Backwall Protection System", Material and installation of the bentonite system shall be subsidiary to the bid item "Grade 4.0 Concrete".

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Longitudinal bars shall extend through the joint to provide a minimum lap equal to the required splice length. See RCB Details Sh. for required splice length.

NOTE: Vertical construction joints shall be perpendicular to the longitudinal axis of the RCB and shall be placed at any location as needed for construction and as approved by the Engineer.

NOTE: Horizontal construction joints shall be a roughened finish.

Vertical construction joints shall be at locations specified by the Engineer, shall be protected by a bentonite based system as shown. Place the bentonite on the exterior walls and top slab. See requirements for bentonite in the KDOT Specifications for "Bridge Backwall Protection System", Material and installation of the bentonite system shall be subsidiary to the bid item "Grade 4.0 Concrete".

The Contractor shall have the option of using Dowel Bars to match vertical wall bars as shown, however no allowance will be made for additional steel required for bar laps.

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NOTE: Vertical construction joints shall be perpendicular to the longitudinal axis of the RCB and shall be placed at any location as needed for construction and as approved by the Engineer.

NOTE: Horizontal construction joints shall be a roughened finish.

Vertical construction joints shall be at locations specified by the Engineer, shall be protected by a bentonite based system as shown. Place the bentonite on the exterior walls and top slab. See requirements for bentonite in the KDOT Specifications for "Bridge Backwall Protection System", Material and installation of the bentonite system shall be subsidiary to the bid item "Grade 4.0 Concrete".

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The Contractor has the option of placing the Lower Horizontal Construction Joint at the top of the slab for RCB's or at the top of the fillet for RFB's

NOTE: Barrel Construction Joints located in a median with less than 5 ft. of fill or at locations specified by the Engineer, shall be protected by a bentonite based system as shown. Place the bentonite on the exterior walls and top slab. See requirements for bentonite in the KDOT Specifications for "Bridge Backwall Protection System", Material and installation of the bentonite system shall be subsidiary to the bid item "Grade 4.0 Concrete".

Longitudinal bars shall extend through the joint to provide a minimum lap equal to the required splice length. See RCB Details Sh. for required splice length.

NOTE: Vertical construction joints shall be perpendicular to the longitudinal axis of the RCB and shall be placed at any location as needed for construction and as approved by the Engineer.

NOTE: Horizontal construction joints shall be a roughened finish.

Vertical construction joints shall be at locations specified by the Engineer, shall be protected by a bentonite based system as shown. Place the bentonite on the exterior walls and top slab. See requirements for bentonite in the KDOT Specifications for "Bridge Backwall Protection System", Material and installation of the bentonite system shall be subsidiary to the bid item "Grade 4.0 Concrete".

The Contractor shall have the option of using Dowel Bars to match vertical wall bars as shown, however no allowance will be made for additional steel required for bar laps.

The Contractor has the option of placing the Lower Horizontal Construction Joint at the top of the slab for RCB's or at the top of the fillet for RFB's

NOTE: Barrel Construction Joints located in a median with less than 5 ft. of fill or at locations specified by the Engineer, shall be protected by a bentonite based system as shown. Place the bentonite on the exterior walls and top slab. See requirements for bentonite in the KDOT Specifications for "Bridge Backwall Protection System", Material and installation of the bentonite system shall be subsidiary to the bid item "Grade 4.0 Concrete".

Longitudinal bars shall extend through the joint to provide a minimum lap equal to the required splice length. See RCB Details Sh. for required splice length.
**GENERAL NOTES**

**Wingwall Drainage:**

1. All wingwalls with weepholes shall have horizontal and vertical wingwall drainage as shown. Strip drain will be used. See KDOT Specifications for "Abutment Strip Drain" for strip drain requirements.

2. Construction and materials for wingwall drainage, including weepholes, and strip drain shall be subsidiary to the bid item, "Grade 4.0 Concrete". Weepholes may be a formed opening or corrugated polyethylene tubing.

**Wingwall Foundation Stabilization:**

The Foundation Stabilization quantity has been calculated to the limits shown in the Section Thru Wingwall. The depth may be increased by the Engineer. Use Foundation Stabilization on all wingwalls unless founded on rock or granular material.

**Seal Course:**

1. Seal Course consisting of 3" min. of Commercial Grade Concrete shall be constructed to the limits directed by the Engineer. No reinforcing in the floor of the slab or wall footing shall be placed until the Seal Course has gained sufficient strength to permit working upon it without injury.

**GENERAL NOTES**

**Foundation Stabilization:**

The depth of Foundation Stabilization may be increased by the Engineer. The Contractor may underrun Foundation Stabilization under the barrel if founded on firm material and with the Engineer’s approval. Use Foundation Stabilization on all wingwalls unless founded on rock or granular material.

**Granular Backfill (Wingwalls):**

1. Granular Backfill shall be used to backfill behind wingwalls to the limits shown in the WINGWALL PLAN detail. Granular Backfill construction may be used separately or combined with Foundation Stabilization as directed by the Engineer.

2. Measurement for the bid item, "Granular Backfill (Wingwalls)", shall be measured in Cubic Yards to the theoretical limits as shown.

3. Material for Granular Backfill (Wingwalls) shall conform to the requirements of SB-1, SB-2, SCA-1, SCA-2.

4. Consolidate Granular Backfill using hand equipment only. Avoid over consolidation.

5. Use filter fabric complying with Section 1710. Use only within the limits of Granular Backfill to separate from the In-Situ Material. Filter Fabric is subsidiary to "Granular Backfill".

**In-Situ Backfill (Wingwalls):**

1. Use any material found within the project limits except Highly Plastic Clay(s) or organic material. The material is subsidiary to "Granular Backfill".

2. Use Type "B" Compaction.

3. Use only hand or walk behind equipment for Compaction.

**Bridge Backwall Protection System:**

1. For all structures with less than or equal to 2'-0" of fill, apply a "Bridge Backwall Protection System" from Section 1700 to the limits shown. Do not place hot mix asphalt directly on this material.

2. Use a "non-coal tar" material from KDOT’s approved list.

3. Protect this material from damage during backfilling. Repair at no additional cost.

4. When the Plans show hot mix asphalt placed directly on the slab, substitute "Pavement Water Proofing" material from Section 800. This material shall be subsidiary. Wait 28 days after top slab is completed before applying this material.

5. Bridge Backwall Protection System is subsidiary to "Grade 4.0 Concrete".
KANSAS DEPARTMENT OF TRANSPORTATION

Fertilize, Seed & Mulch

NAME: 543
SHS: 64
QUANTITY: 3
UNIT: 20

BUFFALO GRASS (TREATED)

Dug:

FILE: kbs35510/brp-13.dgn

SQUAD: JEO Consulting Group, Inc.

ROCK IS EXPOSED AT THE BOTTOM OF A DITCH, IT SHALL BE LEFT IN PLACE.

FUTURE TEMPORARY EROSION AND SURFACE BID ITEM

FULL NAME/ ACRE

ACRES

UNIT

FERTILIZER A NITROGEN RATES AND APPLICATION RATES FOR AGRI CULTURAL PRODUCTS, SUCH AS NATIVE PRAIRIE HAY, USED FOR MULCHING AND EROSION CONTROL PRACTICES, EXCLUDING WOOD-BASED MULCH, SHALL MEET THE NORTH AMERICAN WEED FELLER'S GUIDE Lines.

THE ENTIRE DISTURBED AREA EXCEPT THE PAVED OR SURFACED AREAS, ROCKY SLOPES AND AREAS OF UNDISTURBED NATIVE VEGETATION OTHER THAN WILD GRASSES, TRUE GRASSES, AND TALL FESCUE, WHICH ARE陸 TO BE FERTILIZED IN Accordance WITH THE STANDARDS SPECIFICATIONS.

TYPICAL SECTION - DUAL PAVEMENT

FERTILIZER A NITROGEN RATES AND APPLICATION RATES FOR AGRICULTURAL PRODUCTS, SUCH AS NATIVE PRAIRIE HAY, USED FOR MULCHING AND EROSION CONTROL PRACTICES, EXCLUDING WOOD-BASED MULCH, SHALL MEET THE NORTH AMERICAN WEED FELLER'S GUIDE

GENERAL NOTES

SUMMARY OF SEEDING / EROSION CONTROL QUANTITIES

<table>
<thead>
<tr>
<th>FULL NAME/ ACRE</th>
<th>ACRES</th>
<th>UNIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLF 543 SHS</td>
<td></td>
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<tr>
<td>TEMPORARY FERTILIZER L (553-15)</td>
<td>20</td>
<td>LD</td>
</tr>
<tr>
<td>TEMPORARY SEED SOD GRASS</td>
<td>10</td>
<td>LA</td>
</tr>
<tr>
<td>TEMPORARY SEED (STELLA WHEATGRASS)</td>
<td>10</td>
<td>LA</td>
</tr>
<tr>
<td>SUE</td>
<td>543</td>
<td>SD</td>
</tr>
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<td>EROSION CONTROL CLOTH</td>
<td>15</td>
<td>LD</td>
</tr>
<tr>
<td>TEMPORARY SHEET</td>
<td>100</td>
<td>LD</td>
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<td>TEMPORARY STRAW</td>
<td>10</td>
<td>LD</td>
</tr>
<tr>
<td>TOURMALINE BARRIER</td>
<td>10</td>
<td>LD</td>
</tr>
<tr>
<td>TEMPORARY DITCH CHECK</td>
<td>10</td>
<td>LD</td>
</tr>
<tr>
<td>PERMANENT SEED M S</td>
<td>10</td>
<td>LD</td>
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<tr>
<td>BIODIGRATABLE LOG (12&quot;)</td>
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<td>GEOTEXILE (EROSION CONTROL)</td>
<td>50</td>
<td>LD</td>
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<td>SWPPP INSPECTION</td>
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<td>WATER POLLUTION CONTROL ITEM</td>
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<td>LD</td>
</tr>
<tr>
<td>MULTIPLE CHECK</td>
<td>1</td>
<td>LD</td>
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</tbody>
</table>

NOTE: Products less than 1 acre shall be bid as "Seeding" by the lump sum. See Permanent Seeding Summary of Seeding Quantities sheet LASSO for further details.

GREATFUL EROSION CONTROL shall be removed prior to placement of permanent slope protection.

Regrown and Guard Dry are the approved sterile wheatgrass products.

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

----- Provide around RCD Riprap and other disturbed areas per LASSO.

The amount of mulch and erosion control supply in the bid quantities is estimated. (Acres of Seeding X 1.5 X 2 Tons/Acre).

The estimated quantity includes planting associated with both temporary and permanent seeding operations. The uncut rock and seed drilling supply required shall be determined in the field. The bid item for planting and mulch drilling supply shall be paid for according to the Standard Specifications.

SOIL EROSION MIX

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<tr>
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<th>UNIT</th>
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<tbody>
<tr>
<td>543 SHS</td>
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<tr>
<td>64 LD</td>
<td></td>
</tr>
<tr>
<td>100 LD</td>
<td></td>
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</table>

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

The Soil Erosion Mix consists of the Should of the Permanent Seed Mix used on the project.
**Temporary Erosion and Pollution Control**

**Typical Profile of Temporary Slope Drain**

- **Temporary Slope Drain**
  - Length as required to contain and direct run-off to slope drain.
  - Other Approved Material
  - Pipe size may vary

**Temporary Berm**

- **Temporary Berm**
  - Metal, Plastic or Flexible Rubber Pipe
  - Rock Dissipator or Other Approved Material

**NOTES:**

1. Temporary Slope Drain and Temporary Berm may be used on either project frontages or project backfenses.
2. Discharge of Slope Drains shall be into stabilized ditch or area, or into sediment basin.
3. Pipe shall be secured in place as approved by Engineer.
4. Temporary Berm under 2,000 feet shall be bid at set prices.

**Typical Plan View of Temporary Berm and Temporary Slope Drain**

- Articulated Concrete Blocks w/ Filter Fabric

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

- Clean Aggregate Fill
- Clean Aggregate
- Clean Aggregate

**Temporary Stream Crossing (Aggregate)**

- Clean Aggregate Fill
- Clean Aggregate
- Clean Aggregate
TEMPORARY INLET SEDIMENT BARRIER
(TRIANGULAR SILT FENCE METHOD)

NO SCALE

SECTION A - A

Cross Section I

1. Silt Fence
   - Silt Fence shall be #4 (4 mm) gauge and made of one of the following materials:
     a. Nontreated - 1 ½" x 1 ½" x ¾"
     b. Southern Pine (No. 2) - 1 ½" x 1 ½" x ¾"
     c. Steel (1") or C-Section - 95 lbs. per 1000 ft.
     d. Synthetic - same strength as wood stakes.
   - Chain Link shall be of same material as stakes.
   - Mesh Fence Fabric securely tied at 7 ½" centers (1/2" mesh).
   - Use of high flow material is acceptable.
   - Refer to plan sheets to estimate the length of silt fence required.

CUBIC INLET PROTECTION

1. If multiple gravel bags are required, place them in such a way that no gaps are evident.
2. Height of bags (18 minimum 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. Curbing protection will be measured and paid for as Filter Sock.

Carton Requirements

- Use 100% shredded mulch or other non-composted biodegradable material as fill for bags.
- No compost or fines.
- No hay or straw.
- Do not use material which prohibits SHREDDING.

Log Mesh

- Use mesh with ½" openings or larger.

Material Requirements

- Use 100% shredded mulch or other non-composted biodegradable material as fill for bags.
- No compost or fines.
- No hay or straw.
- Do not use material which prohibits SHREDDING.

Log Mesh

- Use mesh with ½" openings or larger.
**INSTALLATION NOTES**

1. Slopes shall be 4 ft (max.) long and one of the following materials:
   a. Hardwood - 1 1/2" x 1 1/2"
   b. Southern Pine 2" x 2 1/2"
   c. Steel, Galvanized, or C Section - 99 lbs. per f.t.
   d. Synthetic - same strength as wood stakes.
2. Attach fence fabric with 3 zip ties within the top 8" of the fence.
   Afternoon at elevated sites may be approved by the Engineer on a performance basis.
3. Use of high fiber 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 kept 4' apart.
5. Length of stakes should be 5 times the height of the log at a minimum with minimum ground embedded equal to the height of the log / sock.

**GENERAL NOTES**

1. Slope interruptions shall be placed along contour lines, with a short section turned up grade 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. Intermittent weirs of Contractor's design, including improved materials, are outside the scope of this project, to be reviewed immediately by Contractor at no additional cost to KDOT.
4. Agricultural products, such as native prairie hay, are used for stockpiling and erosion control practices, including soil based mulch, shall meet the North American Weed Free Seed Standards.
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.

NOTES:

- Use filter sock for all except rock ditch checks.
- Note: Use this spacing for all except rock ditch checks.
- Note: Use the spacing for all except rock ditch checks.

Typical Arrangement of Ditch Checks

KANSAS DEPARTMENT OF TRANSPORTATION

PROJ. NO. 35-70 KA-5531-01

CULVERT NO. 35-70-4.31 (535)

JEO CONSULTING GROUP

OSAGE CO.

20
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 excavated 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' (180cm). After placement of the rock, backfill and compact any over excavated soil to ditch grade. This work shall be subheader to the bid for Temporary Ditch Check (Rock).
5. Aggregates 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 aggregate 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 shall be constructed of D50 = 6'' or smaller.

ROCK DITCH CHECK SPACING

<table>
<thead>
<tr>
<th>Width of Section (ft)</th>
<th>Spacing Between Ditches (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>15</td>
</tr>
<tr>
<td>5</td>
<td>20</td>
</tr>
<tr>
<td>6</td>
<td>25</td>
</tr>
</tbody>
</table>

NOTE: Use this spacing only for Rock Ditch Checks.

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. Shakes shall be wood or steel according to Section B14 of the Standard Specifications. Length of shake shall be a minimum of 2 x the diameter of the log.
4. Use Erosion Control (Type C) or 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 shake (except comped filter sock) should be placed on smooth prepared ground with no gaps between the shake and soil.

TYPICAL ELEVATION

| DIRECTION OF FLOW |
|-------------------|------------------|
| 5'' (min.)        | 6'' (min.)       |
| 6'' (max.)        | 6'' (max.)       |

ALTERNATIVE SHAKING (optional)
NOTES:
1) 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 materials 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 (Plan)

CROSS SECTION (EMERGENCY SPILLWAY)

Concrete Anti-seep Collar

SECTION A-A

SEDIMENT STORAGE BASIN (ELEVATION)

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>
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<tr>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Notes:
1. All P.V.C. pipes are to be schedule 40.
2. HDPE flexible drain pipes are to be attached to the pond outlet structure with watertight connections.
3. The surface shall be sloped to provide stormwater flow to a minimum grade of 2%.
4. Other aesthetic designs may be used that deter seaweeds from the surface at a controlled rate.
5. The design must be approved by the engineer.
KANSAS DEPARTMENT OF TRANSPORTATION
PROJ. NO. 35-70 KA-5531-01
OSAGE Co.

EROSION CONTROL CLASS I SLOPE PROTECTION

IN S T A L L A T I O N  D E T A I L

EROSION CONTROL BLANKET

INSTALLATION DETAILS FOR EROSION CONTROL CLASS I

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, by blanked loosely,
avoiding stretching.

1. ANCHOR SLOTS: The top of the blanket should be notched
   at the top of the slope and anchored in place with anchors
   6 inches apart. The slots should be 6 inches wide, 6 inches
   deep, with the blanket anchored at 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 edge of both blankets.

3. SPLICE SEAMS: When overlaps are necessary, overlaps
   shall be a minimum of 6 inches in direction of water flow.
   Snapper splice seams.

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: establish Staples in 2 rows 4" on center apart.
   Staple Checks - shall be 3D apart.

NOTE:
Agricultural products, such as native sterile top, used for mulching,
and erosion control practices, excluding wood based mulch, shall
meet the North American Wood Free Forage Standards.
Single post ring and sheet shape is acceptable.
GENERAL TRAFFIC CONTROL NOTES

SEE TE744 FOR TRAFFIC CONTROL REQUIREMENTS TO CLOSE THE OUTSIDE SOUTHBOUND LANE. WORK AREA SHALL CONSIST OF THE DISTANCE BEGINNING AT THE EASTERN TERMINAL OF EXISTING GUARDRAIL AT RPB 535 EXTENDING TO A DISTANCE OF 100 FEET WEST OF THE GUARDRAIL.

TRAFFIC CONTROL QUANTITIES INCLUDE SIGNAGE TO ACCOMMODATE TWO WORK ZONE SPEED REDUCTIONS - TO BE INSTALLED AS APPROVED BY THE ENGINEER. DESIGNATED WORK ZONE SPEED LIMITS WILL BE DETERMINED BY THE ENGINEER.

CONTRACTOR WILL MAINTAIN SOUTHBOUND EXIT 160 ACCESS AT ALL TIMES. "EXIT OPEN" SIGN E5-2 SHALL BE UTILIZED.

CONTRACTOR SHALL NOT DISTURB EXISTING GUARDRAIL; ANY DAMAGE CAUSED BY CONTRACTOR ACTIVITIES TO EXISTING GUARDRAIL SHALL BE REPAIRED AT CONTRACTOR EXPENSE AS DIRECTED BY THE ENGINEER.

CONTRACTOR SHALL MASK ALL CONFLICTING PAVEMENT MARKINGS.

TEMPORARY EXIT SIGN E5-1 MAY BE EITHER BLACK ON ORANGE OR WHITE ON GREEN

SUMMARY OF TRAFFIC ENGINEERING STANDARD DRAWINGS APPLICABLE TO THE PROJECT

STD. TE700: TRAFFIC CONTROL GENERAL NOTES
STD. TE702: CHANNELIZING DEVICES
STD. TE704: CLOSURES
STD. TE710: SIGN INFORMATION
STD. TE712: SIGN POSTS
STD. TE744: LANE CLOSURE ON MULTILANE HIGHWAY
### 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 (0 to 9.25 Sq.Ft.)</td>
<td>--</td>
<td>Each Per Day</td>
</tr>
<tr>
<td>Work Zone Signs (9.26 to 16.25 Sq.Ft.)</td>
<td>--</td>
<td>Each Per Day</td>
</tr>
<tr>
<td>Work Zone Signs (16.26 Sq.Ft. &amp; Over)</td>
<td>--</td>
<td>Each Per Day</td>
</tr>
<tr>
<td>Work Zone Barricades (Type 3 - 4' to 12')</td>
<td>--</td>
<td>Each Per Day</td>
</tr>
<tr>
<td>Work Zone Barricades (Pedestrian)</td>
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<td>Each Per Day</td>
</tr>
<tr>
<td>Channelizer (Fixed)</td>
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<td>Each Per Day</td>
</tr>
<tr>
<td>Channelizer (Portable)</td>
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<td>Each Per Day</td>
</tr>
<tr>
<td>Channelizer (Pedestrian)</td>
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<tr>
<td>Work Zone Warning Light (Type 'A' Low Intensity)</td>
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<td>Work Zone Warning Light (Red Type 'B' High Intensity)</td>
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<tr>
<td>Arrow Display</td>
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<tr>
<td>Portable Changeable Message Sign</td>
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<tr>
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<td>35.6</td>
<td>Sta./Line</td>
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<tr>
<td>4' Solid (Type I)</td>
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<tr>
<td>4' Broken (8.0') (Type I)</td>
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<tr>
<td>4' Broken (8.0') (Type II)</td>
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<tr>
<td>4' Broken (3.0') (Type I)</td>
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<td>4' Broken (3.0') (Type II)</td>
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<td>Sta./Line</td>
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<td>Symbol (Type I)</td>
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<tr>
<td>Symbol (Type II)</td>
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<tr>
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<tr>
<td>Rigid Raised Pavement Marker (Type I)</td>
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<tr>
<td>Rigid Raised Pavement Marker (Type II)</td>
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</tr>
<tr>
<td>Traffic Signal Installation (Temporary)</td>
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<td>Lump Sum</td>
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<tr>
<td>Traffic Control (Initial Set Up)</td>
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<tr>
<td>Traffic Control</td>
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<tr>
<td>Flagger (Set Price)</td>
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<td>Hour</td>
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* Quantity most used on the project at any one time

### Summary of Traffic Control Devices

#### Work Zone Signs

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<tr>
<th>Sign No.</th>
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<td>Each Per Day</td>
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<tr>
<td>E5-1</td>
<td>1</td>
<td>1</td>
<td>Each Per Day</td>
</tr>
<tr>
<td>KG20-2</td>
<td>1</td>
<td>1</td>
<td>Each Per Day</td>
</tr>
<tr>
<td>KM4-20</td>
<td>4</td>
<td>5</td>
<td>Each Per Day</td>
</tr>
<tr>
<td>R2-1</td>
<td>4</td>
<td>4</td>
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</tr>
<tr>
<td>W20-1</td>
<td>2</td>
<td>2</td>
<td>Each Per Day</td>
</tr>
<tr>
<td>W20-5</td>
<td>4</td>
<td>4</td>
<td>Each Per Day</td>
</tr>
<tr>
<td>W3-5</td>
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<td>2</td>
<td>Each Per Day</td>
</tr>
<tr>
<td>W4-2R</td>
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<td>1</td>
<td>Each Per Day</td>
</tr>
<tr>
<td>KI-104a</td>
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<td>Each Per Day</td>
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</tbody>
</table>

#### Barricades

<table>
<thead>
<tr>
<th>Type 3 (4' to 12')</th>
<th>Pedestrian</th>
<th>Quantity</th>
<th>Unit</th>
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<tr>
<td>6</td>
<td>59</td>
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#### Channelizing Devices

<table>
<thead>
<tr>
<th>Fixed</th>
<th>Portable</th>
<th>Pedestrian</th>
<th>Quantity</th>
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</thead>
<tbody>
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<td></td>
<td></td>
<td></td>
<td>59</td>
</tr>
</tbody>
</table>

#### Lighted Devices

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
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</thead>
<tbody>
<tr>
<td>Work Zone Warning Light (Type &quot;A&quot; Low Intensity)</td>
<td>17</td>
</tr>
<tr>
<td>Work Zone Warning Light (Red Type &quot;B&quot; High Intensity)</td>
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</tr>
<tr>
<td>Arrow Display</td>
<td>1</td>
</tr>
<tr>
<td>Portable Changeable Message Sign</td>
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</tbody>
</table>

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**KANSAS DEPARTMENT OF TRANSPORTATION**

**TRAFFIC CONTROL QUANTITIES**

**PROJ. NO. 35-70 KA-5531-01**

**JE0 CONSULTING GROUP**

**CULVERT NO. 35-70-4.3I (535)**

**OSAGE Co.**