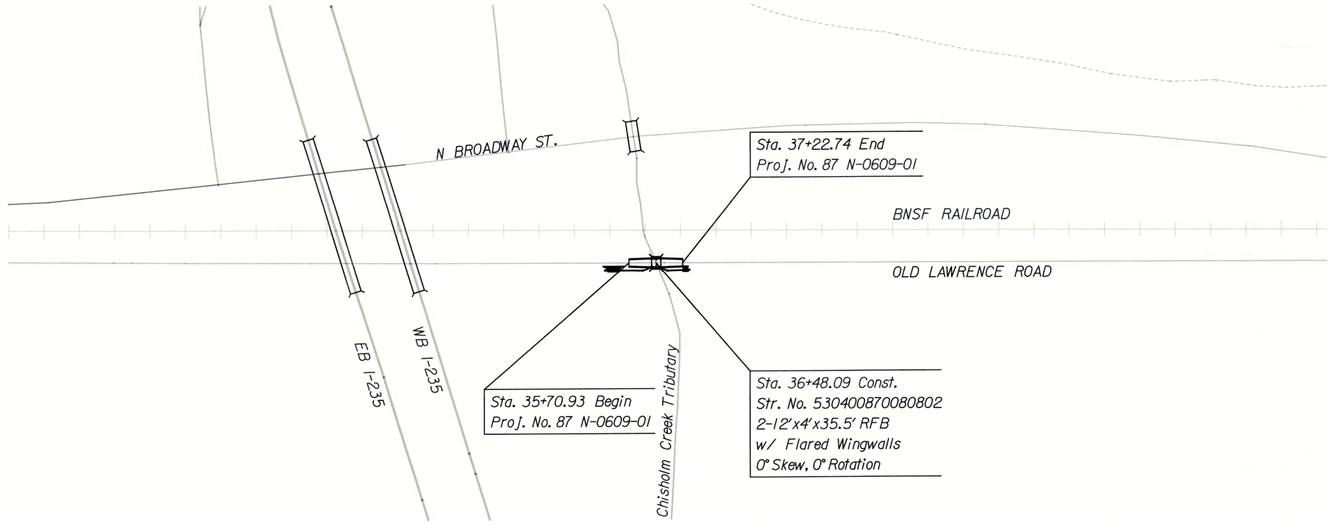
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	87 N-0609-01	2014	1	52
F.A. Number: STP-N060(901)				

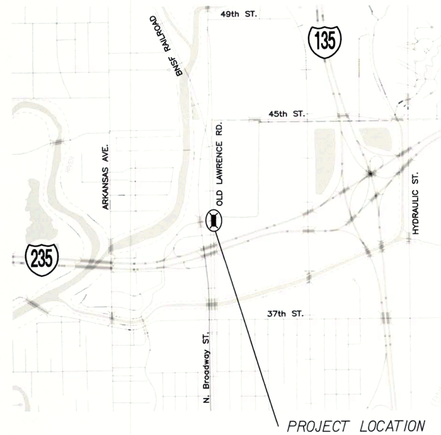
BRIDGE
GRADING
SURFACING

CITY OF WICHITA, KANSAS
PLAN AND PROFILE OF PROPOSED
C.O.W. PROJECT NO. 472-85116
O.C.A. No. 715729
OLD LAWRENCE ROAD
BRIDGE REPLACEMENT

INDEX OF SHEETS

Scale: 1" = 200'





ROAD SHALL BE CLOSED DURING CONSTRUCTION. A SIGNED DETOUR WILL BE PROVIDED.

EPOXY PAVEMENT MARKING.

DESIGN DESIGNATION

AADT (2013)	100
AADT (2043)	150
DHV	10%
D	50%
T	20%
V	40 MPH
C of A	NONE
Clear Zone	7 FT.

CONVENTIONAL SIGNS

COUNTY LINE	CENTER LINE OF PROJECT
CITY LIMITS	TERRACE
STATE OR NATIONAL LINE	CULVERTS
TOWNSHIP, SECTION or GRANT LINE	DROP INLET & STORM SEWER
PROPERTY LINE	ACCESS CONTROL
HIGHWAY FENCE	POWER POLE
EXISTING FENCE	TELEPHONE POLE
GUARDRAIL	MARSH
CONSTRUCTION LIMITS	HEDGE
RIGHT OF WAY LINE	TREES
TRAVELED WAY	PROFILE ELEVATION
RAILROADS	STREAM or CREEK

JADE G. ENGSTROM — LICENSED — 19771 — KANSAS — PROFESSIONAL ENGINEER — 4-2-2014

APPROVED - DATE
Gary Janzen 08/21/14
GARY JANZEN, P.E.
CITY ENGINEER
CITY OF WICHITA

TranSystems
245 N. Waco, Suite 222
Wichita, KS 67202
Main: (316) 303-3000
Fax: (316) 303-0156

	BY	DATE
SURVEY	CORNERSTONE REGIONAL SURVEYING	
CADD TECHNICIAN	ADAM EMERSON	
DESIGNERS	SLADE ENGSTROM, P.E., ADAM EMERSON	
SQUAD	WICHITA DESIGN TEAM	

Drawn By : ROAD
File : G:\W1130022\Road\C-COV-M01-101.dgn
Plotted : 8/15/2014

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	87 N-0609-01	2014	2	52

GENERAL NOTES

The contractor shall erect and maintain traffic control devices in accordance with the Manual on Uniform Traffic Control Devices subject to the Engineer's approval.

Utility service lines, poles, valve boxes, gas meters and etcetera are to be adjusted as necessary by others prior to construction unless the plans specifically call for their adjustment by the Contractor or unless the plans specifically identify a utility to be adjusted by its owner during construction. Existing utilities and their location, as shown on the plans, represent the best information obtainable for design. The Contractor will be required to work around existing utilities within the right-of-way which do not conflict with proposed construction.

The Contractor will be required to provide a minimum advance notice of forty-eight (48) hours to utility companies prior to excavation or working adjacent to utilities.

A saw cut the full depth of the existing pavement thickness shall be provided at locations where proposed construction abuts an existing surface course of pavement where the existing pavement is to be removed. Sawed joint to facilitate removal within six (6) feet of existing joints will not be permitted and for such instances the limits of sidewalk removal shall extend to the existing joint. Such saw cuts will not be paid for directly and this cost shall be considered INCIDENTAL to the removal of the surface or surface or pavement.

All project waste including any trees, milled asphalt, rubble from miscellaneous structures, abandoned pipes, excess excavation and etc. shall be disposed of on sites to be provided by the Contractor. These sites shall be approved by the engineer as to suitability, appearance and site location. Locations that, in the opinion of the engineer, will leave an unsightly appearance will not be approved. All disposal sites must be approved by the Kansas Department of Health and Environment. Material either stockpiled or disposed of in a flood plain would require a Kansas State Board of Agriculture permit. Any material dumped in waters of the United States or wetlands is subject to U.S. Corps. of Engineers permitting regulations. Any material buried or stockpiled beyond approved construction limits would require additional archaeological investigations unless buried in a previously approved borrow location.

Trees and shrubs in public right-of-way which are in direct conflict with proposed new construction shall be removed and disposed of by the Contractor with the engineer's approval. Trees and shrubs which are not in direct conflict with proposed new construction shall be saved and protected from damage. Trees larger than 15" dia. as measured 24" above the ground level shall be bid as 'Large Tree Removal', trees less than 15" shall be bid as 'Small Tree Removal'.

The Contractor shall be responsible for preserving shown property irons. The Contractor will be required to re-establish any shown property irons or quarter section corners which are damaged or destroyed by his construction operations. Such irons shall be re-established by a licensed land surveyor in accordance with state laws. This work will not be paid for directly, but shall be considered SUBSIDIARY to other pay items of work in the contract.

The Water Department shall field locate water valves one time during construction when requested by the Contractor. It shall be the Contractor's responsibility to preserve such field locations during the construction process. Water valves, water boxes or fire hydrants damaged during construction shall be repaired by the Contractor at his own expense.

Where water valves are shown to be adjusted, the work shall include only the adjustment of the water box to the finished grade as shown or as directed by the Engineer. At locations where available adjustment is insufficient to match design grade, the Contractor shall notify the Wichita Water Department at 268-4908 and obtain or coordinate placement of a new valve box capable of meeting final grade.

Construction of temporary pavement required for business access during construction shall be INCLUDED in the lump sum bid item 'TRAFFIC CONTROL' and shall include all grading, fill, compaction, soil scarification, removal, disposal and etc. necessary for business access.

The Contractor shall give all property owners and/or tenants of developed property abutting the project limits a minimum of 10 days advance notice prior to the start of construction.

The Contractor shall comply with all applicable safety regulations.

The Contractor is made aware that he will be working in close proximity of existing utilities. Any conflicts with such utilities shall be reported to the Engineer. The Contractor shall coordinate the construction of this project with the relocation of any existing utilities by the utility companies.

Areas over-excavated in pavement removal shall be filled to subgrade elevation and compacted to 95% Std. Density. This work shall be considered SUBSIDIARY to other items of the contract.

Only existing private drains shown to be reconnected shall be reconnected to the proposed storm sewer system. The Contractor shall notify immediately the Project Engineer and/or the Project Inspector if he discovers any private drain connection not shown on the storm sewer plans.

The crushed rock base under valley gutter, concrete pavement and bituminous pavement shall conform to the following limits:

SIEVE SIZE	% PASSING
2-1/2"	100
3/4"	40-80
No. 4	20-50
No. 40	6-20
No. 200	2-10

Rock quality shall conform to the requirements specified by the KDOT 2007 Edition Standard Specification, Subsections 1102 for Durability Class 1.

Geogrid Reinforcement for the rock base shall be Tensar BX1100 as manufactured by the Tensar Corporation, or approved equal. Geogrid fabric shall be INCIDENTAL to the crushed rock base.

Prior to bidding the project, each bidder shall visit the site and satisfy himself of surface and subsurface conditions. Each bidder shall also fully inform himself as to the extent of Site Clearing and Site Restoration to be performed.

The lump sum Bid item 'Site Clearing' shall INCLUDE all costs for the removal of signs, foundations, light pole bases, abandoned water meters, manholes, pole bases, fences, traffic service boxes, planter boxes, trees, shrubs, stumps, traffic signal appurtenances, sprinkler heads, irrigation control devices, drain pipes (<10"), aprons, flumes, valve boxes, pavement markings, guard posts, wheel chair ramps, concrete barriers, monitoring wells, abandoned pipes, parking blocks, and any other item(s) slated for removal for which a pay item is not provided for in the proposal.

The Contractor shall be responsible for implementing erosion control methods during construction to prevent unnecessary silt/sediment discharge through downstream properties and/or storm sewer systems. The Contractor shall install and maintain erosion controls per plan approved by the Engineer.

The Contractor shall be aware that some gas lines within the project corridor may be abandoned in place as new lines are installed. The Contractor shall be responsible for contacting the appropriate owners to determine the status of said lines.

FL Elevations shown on plans are to the FL of gutter, unless specified otherwise. No allowance is made for drops at inlet.

All pavement markings shall be epoxy. Pavement markings shall be installed per manufacturer's recommendations. Full traffic may not be restored (and substantial project completion achieved) until all pavement markings are in place. Should construction timing be such that restoration of traffic becomes necessary during temperatures prohibiting the installation of epoxy markings, the contractor shall install and maintain temporary markings until such time that epoxy markings may be properly installed. Except for the material requirement, temporary pavement markings shall be placed equivalent, in every manner (i.e. dimension, frequency, spacing, etc.), to the permanent marking layout. The cost for temporary pavement markings will not be paid for directly, but shall be considered SUBSIDIARY to the bid item for 'Pavement Markings'.

Inlet Length and Width Callouts are to the inside face of structure unless shown otherwise.

The contractor shall avoid tearing or ripping all tree roots; especially those over 4" in diameter. A clean-cut root will callous over better so it is preferred that the use of a saw grinder or axe be used on roots needing removal. If more than 1/3 of the tree roots are removed or damaged, or if more than 1/3 of the ground area is removed or excavated, then please contact Forestry for inspection. If it is apparent that work around the tree has taken place in recent years and more work involving the removal of roots is necessary, then ask for inspection by forestry staff. If removal of roots larger than 4" diameter is necessary, ask for a forestry inspection. Notification should be done prior to root removal, however in the event that the root is removed prior to inspection, leave the root on site, and leave the hole open for the forestry staff to view.

During installation of storm sewer, the contractor shall maintain a minimum at least 24" of vertical clearance when crossing existing pipelines.

The contractor shall physically locate existing Conoco Phillips and KPC Pipelines prior to beginning construction or excavation. During excavation, KPC and Conoco Phillips will require personnel to be on site. Contact KPC and Conoco Phillips representatives to determine exact requirements for excavation within 10' of the utilities. All work associated with this work shall be Subsidiary to mobilization.

PROJECT SURVEY CONTROL

PROJECT SURVEY CONTROL
Horiz. Proj. Datum:
Kansas State Plane Coordinates
NAD1983 (1997) CSF = 0.99989916

Vert. Proj. Datum:
Datum Bench Mark: NAVD88 -
RR Spike set in Concrete Sign Base -
KDOT Proj. 235-87KA - HWY 235
Elev. 1325.62

UTILITIES

AT&T
Jason Edwards
154 N. Broadway
Room 210
Wichita, KS 67202
(316) 268-2008

Westar Energy
Shane Price
1900 E. Central
P.O. Box 208
Wichita, KS 67201
(316) 261-6315

City of Wichita Water Dept.
Greg Lolley
455 N. Main
Wichita, KS 67202
(316) 268-4504

Cox Communications
Jess Parker
901 George Washington Blvd.
Wichita, KS 67211
(316) 260-7740

Conoco Phillips Pipeline
Gordon Stands
2400 E. 37th Street North
Wichita, KS 67219
(316) 323-3974

Oneok-Kansas Gas Service
James Coe
1021 E. 26th Street North
Wichita, KS 67219
(316) 832-3126

KPC Pipeline
Adam Cowart
19970 W. 161st Street
Olathe, KS 66062
(620) 886-0082

Utility Notes:

Visual indications of utilities are as shown. Underground locations shown, as furnished by their lessors, are approximate and should be verified in the field at the time of construction. For actual field locations of underground utilities, call 1-800-344-7233. Verification of utilities is the Contractor's responsibility.

KANSAS DEPARTMENT OF TRANSPORTATION

GENERAL NOTES

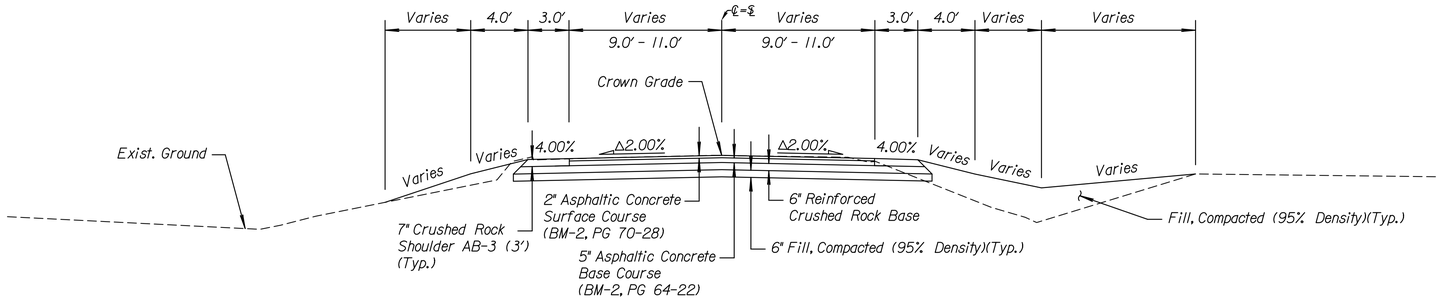
OLD LAWRENCE ROAD BRIDGE

DATE	BY	
		REFERENCES NOTED
		REFERENCES CHECKED

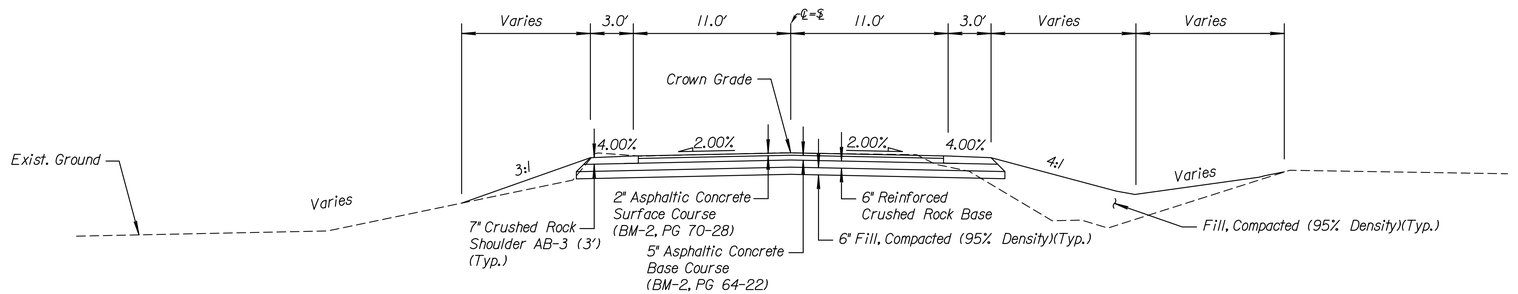
Drawn By : ROAD Plotted : 9/3/2014
File : G:\W13\0022\Road\C-GEN-S01-101.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	87 N-0609-01	2014	3	52

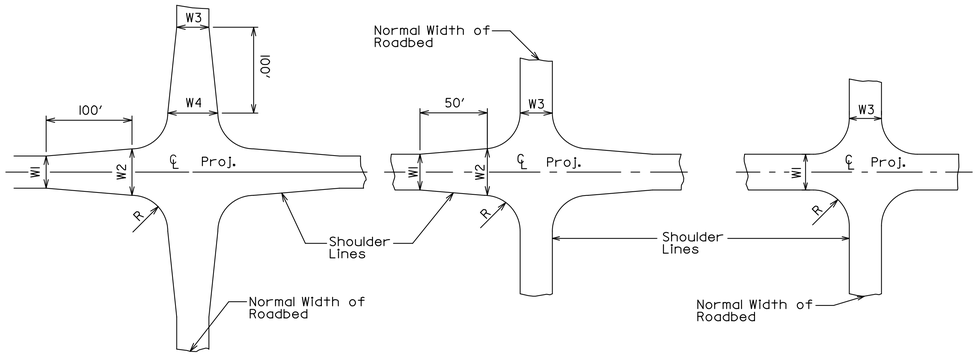
Note:
The sections shown are typical. See plans and cross sections for variations.



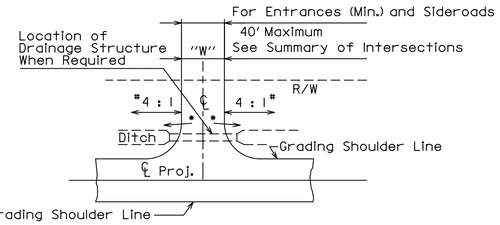
Old Lawrence Road
Sta. 35+70.93 to Sta. 36+29.63
Sta. 36+66.55 to Sta. 37+22.74
Δ Sta. 35+70.93 to Sta. 36+29.63 transition from existing cross slope to 2.00%
Δ Sta. 36+66.55 to Sta. 37+22.74 transition from 2.00% to existing cross slope.



Old Lawrence Road
Sta. 36+29.63 to Sta. 36+66.55



TYPICAL INTERSECTION DETAILS



TYPICAL SIDE ROAD OR ENTRANCE DETAIL

• On side roads and entrances which slope toward the roadway, construct a low point approx. 6" deep to divert surface drainage into the roadway ditch.

On ditch plugs and side roads or entrances without drainage structures use 8 : 1 slopes where feasible.

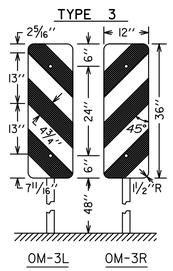
GENERAL NOTES

All signs shown on the plans, and other signs furnished and installed by the City with their own forces and funds will be installed in conformance with the Manual of Uniform Traffic Control Devices (latest edition).

Owners will move and adjust public and private utility facilities as necessary to fit the new construction unless noted otherwise on the plans or in the proposal.

Consider stations shown for all drainage structures as approximate only. The Project Engineer will be responsible to place all structures in locations that fit the natural drainage and meet the grade requirements.

Cut channels at all box structures (except where otherwise noted) to flowline elevations and to a width of 2' outside of each outside wall and with slopes 2 :1 prior to installation or construction of box structure. Excavation and embankment required for this work are included in the earthwork quantities.



OBJECT MARKER

Furnish 5/16" x 2 1/4" SF Truss Head or Round Head Machine Screw STEEL Bolts with Plain Washer STEEL on front and 5/16" Reg. SF Hex NutSTEEL with Light Lock Washer STEEL on back.
12" x 36" Steel Blank (16 Ga. Metal)

SUMMARY OF OBJECT MARKERS AND SIGNS

STATION TO STATION	SIDE	TYPE OF STRUCT.	TYPE OF SIGN	OBJECT * MARKER TYPE	OBJECT * MARKER NO.	REMARKS Ø
NW Quadrant	Lt.	Br.		OM3-R	1	@ Br. Quadrant
SW Quadrant	Lt.	Br.		OM3-L	1	@ Br. Quadrant
NE Quadrant	Rt.	Br.		OM3-L	1	@ Br. Quadrant
SE Quadrant	Rt.	Br.		OM3-R	1	@ Br. Quadrant
Ø As you face bridge end from approach						
* Back-to-Back [Sign(s) on Both Sides of Post]						

Install Object Markers Type OM-3(R)(L) at all span bridges and when indicated on the plans at box structures. Install with the inside edge of the marker in line with the inside clearance line of the structure. Install an object marker retroreflectorized on one side on both left and right sides of each end of a structure.

Mount object markers on 11' galvanized flanged channel posts (2 lbs./ft.) punched with 3/8" diameter holes on 1" centers for the top 4'.

Pay for Object Markers directly.

All items of fastening accessories will be zinc or cadmium plated. The machine screws, nuts, and washers will comply with the current Standard Specifications for State Road and Bridge Construction. All sign blanks will have rounded corners.

SUMMARY OF ENTRANCES AND SIDEROADS

STATION	SIDE OR QUADRANT	TYPE	W	W1	W2	W3	W4	R	C	S	D	BS
35+27.64	Rt.	C				33.5'		29'				
37+30.83	Rt.	C				16.8'		22'				

KANSAS DEPARTMENT OF TRANSPORTATION

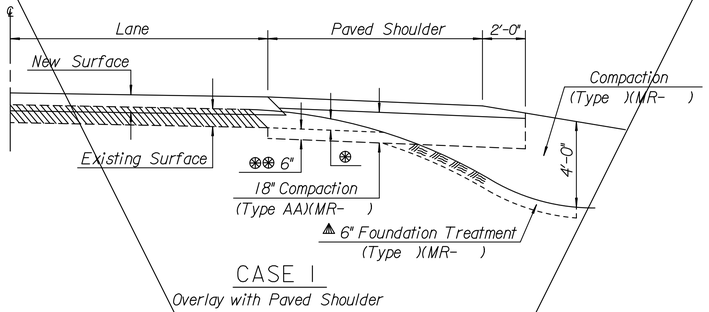
TYPICAL SECTIONS

DATE | BY | REFERENCES NOTED | REFERENCES CHECKED

Drawn By : ROAD
File : G:\W13\0022\Road\C-TYP-S01-101.dgn
Plotted : 9/3/2014

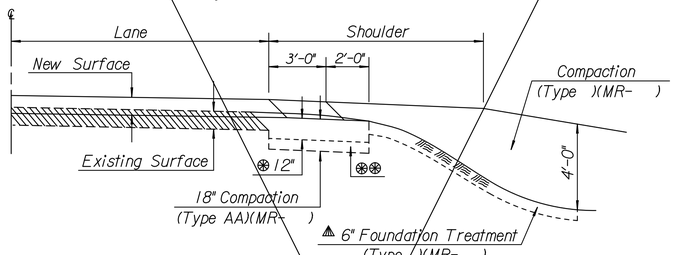
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	87 N-0609-01	2014	4	52

REHABILITATION



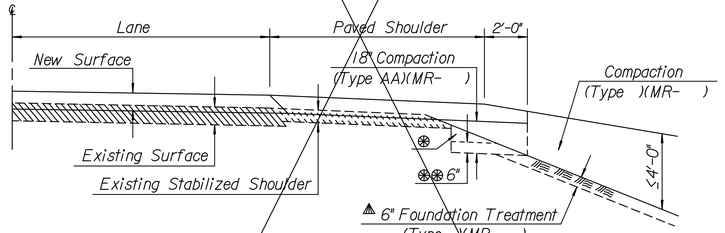
CASE 1

Overlay with Paved Shoulder



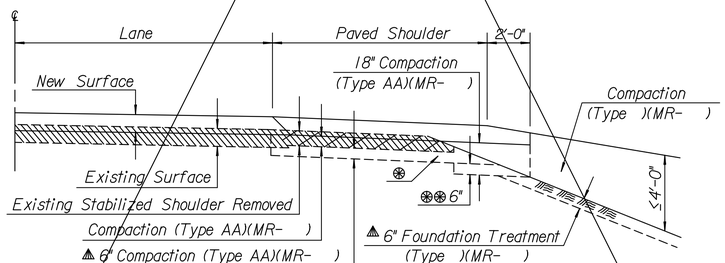
CASE 2

Overlay with Composite Shoulder



CASE 3

Overlay with Existing Paved Shoulder



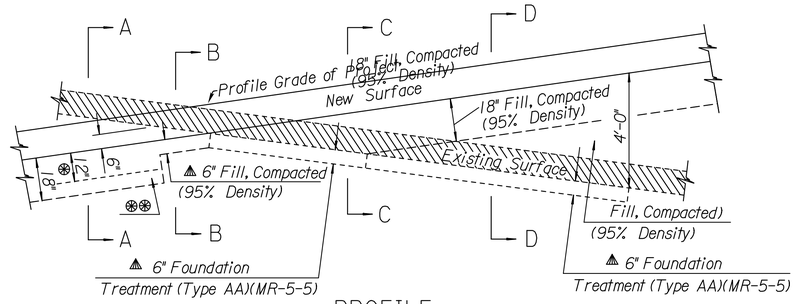
CASE 4

Overlay with Shoulder Replacement

⊛ Excavation thru Cuts not Subgraded
⊛⊛ The lower 6" of Compaction is subsidiary.
⚠ Compaction of this material shall be subsidiary.

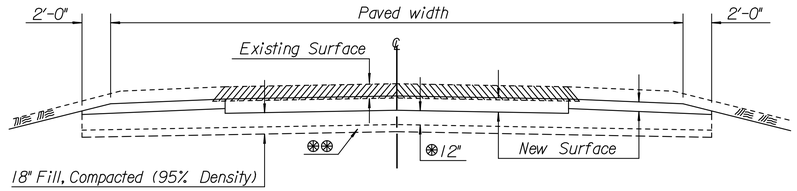
Note: These are 4 general cases. Specific compaction requirements are determined on a project-by-project basis.

RECONSTRUCTION



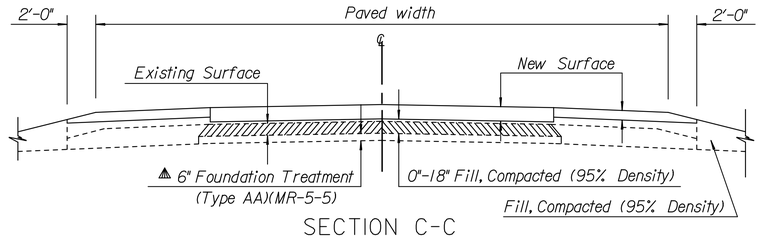
PROFILE

⊛ Excavation thru Cuts not Subgraded
⊛⊛ The lower 6" of Compaction is subsidiary.
⚠ Compaction of this material shall be subsidiary.

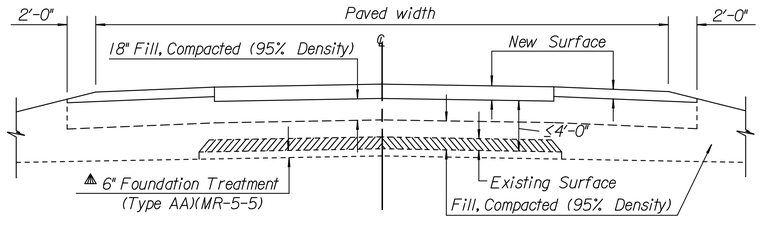


SECTION A-A

SECTION B-B

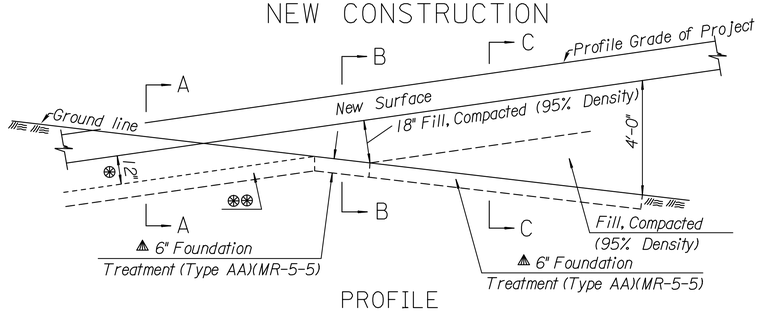


SECTION C-C



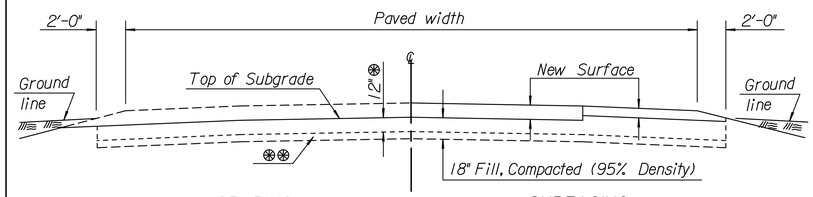
SECTION D-D

NEW CONSTRUCTION



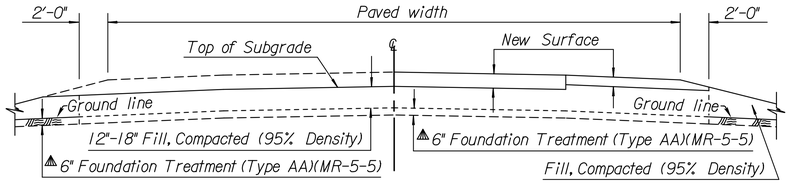
PROFILE

⊛ Excavation thru Cuts not Subgraded
⊛⊛ The lower 6" of Compaction is subsidiary.
⚠ Compaction of this material shall be subsidiary.



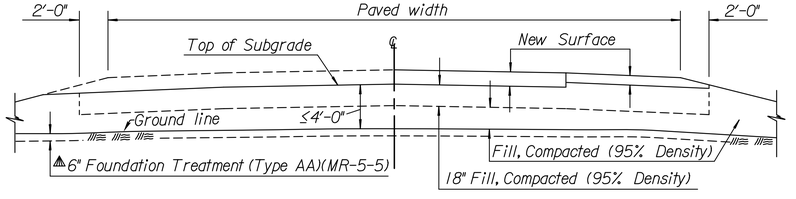
GRADING SURFACING

SECTION A-A



GRADING SURFACING

SECTION B-B



GRADING SURFACING

SECTION C-C

General Note

For materials designated to be subgraded, compaction of soils, including shales, designated for backfill refer to Standard Drawing RD605A for details.

Unless otherwise noted on the Plans, compact all embankment, including side roads and entrances.

NO.	DATE	REVISIONS	BY	APP'D
5	10-17-11	Revised General Note	S.W.K.	J.O.B.
4	1-05-10	Added additional subsidiary comp.	S.W.K.	J.O.B.
3	2-16-05	Redrawn, Rev. Recon. Sec. C-C & D-D	S.W.K.	J.O.B.
2	5-29-98	Revised Reconstruction Section B-B	R.J.S.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

FOUNDATION TREATMENT & COMPACTION OF EARTHWORK

~~RD605~~

FHWA APPROVAL	12-5-11	APP'D. James O. Brewer	
DESIGNED	DETAILED	QUANTITIES	TRACED Bowser
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK. King

Drawn By : ROAD Plotted : 9/3/2014
File : G:\W13\0022\Road\rd605.dgn

C.P. #101
N 1712052.574 E 1649167.421
@ Sta. 121+50.21, 83.98' Rt.
Sta. 31+50.18, 0.00' Rt.
Set Cotton Gin Spindle in ℄ of Exist. Roadway

1. Top Center F.H.	40.18' NW
2. NW Corner of North Headwall	29.80' NNE
3. Top Corner Concrete R/W Marker	25.75' ENE

SW 1/4 Sec. Corner Sec. 28 T26S 1E
℄ = @ Sta. 100+00.00
N 1709901.3250 E 1649116.7390
Found Existing 1/2" iron bar with PEC cap.

1. Centerline of 37th Street	3.5' N
2. PK nail in NE face power pole	40.03' NW
3. Found nail and shiner in S face power pole	68.95' NE
4. Center W rail railroad tracks	8.59' E
5. NE bolt of railroad sign base	24.66' SSW

W 1/4 Sec. Corner Sec. 28 T26S 1E
℄ = @ Sta. 126+73.65
N 1712574.6500 E 1649075.3500
Found Existing 1" pipe, no cap 12"± deep.

1. Found 3 nails in W end railroad tie	4.47' E
2. Found pk nail in NW corner railroad trestle	13.76' S
3. NW corner concrete bridge	68.78' E
4. Center W rail of tracks	6.30' E

SW Corner Sec. 21 T26S 1E
℄ = @ Sta. 153+32.50
N 1715233.2040 E 1649035.6140
Found Existing 1" pipe, no cap.

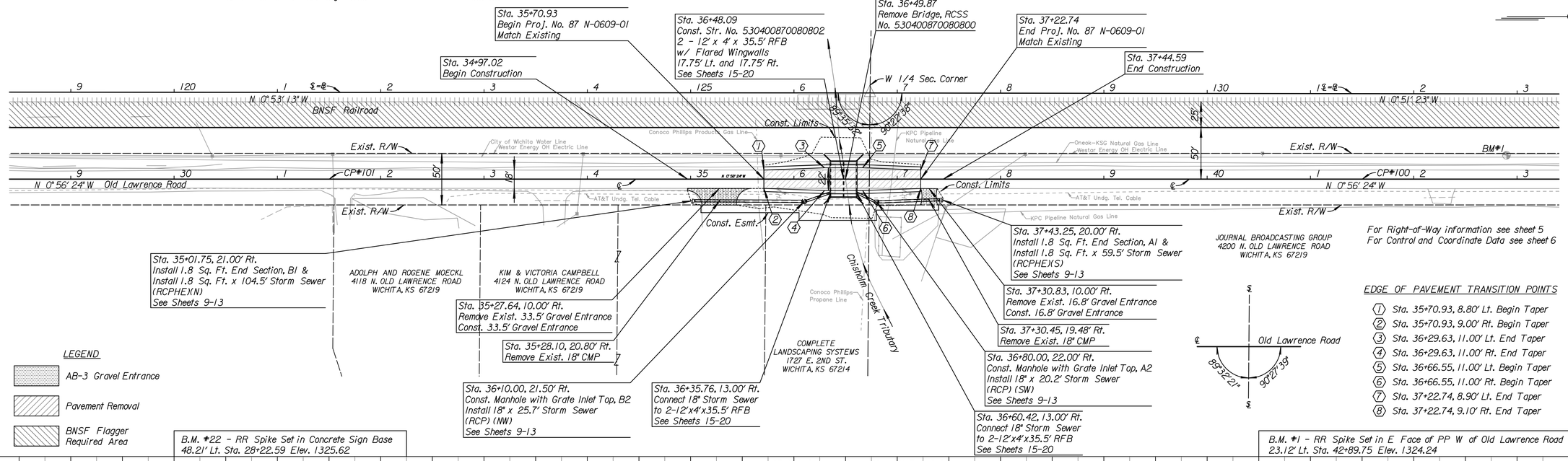
1. SE corner house foundation	55.21' NE
2. SW corner garage	42.61' NW
3. Found 60D nail in W face 20" elm	27.90' NNE
4. Centerline Old Lawrence Road	80.3' E

C.P. #100
N 1713052.299 E 1649151.144
@ Sta. 131+50.11, 82.92' Rt.
Sta. 41+50.03, 0.13' Rt.
Set Cotton Gin in Exist. Roadway

1. Set Mag & Shiner E. Face P.P.	99.39' SSW
2. Top R.R. Spike 3m Set In E. Face P.P.	141.65' NNW
3. ℄ Pipe Gate Post at Base	67.70' NNE

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	87 N-0609-01	2014	5	52

SCALE
50' 0 50' 100'
1" = 50'



For Right-of-Way information see sheet 5
For Control and Coordinate Data see sheet 6

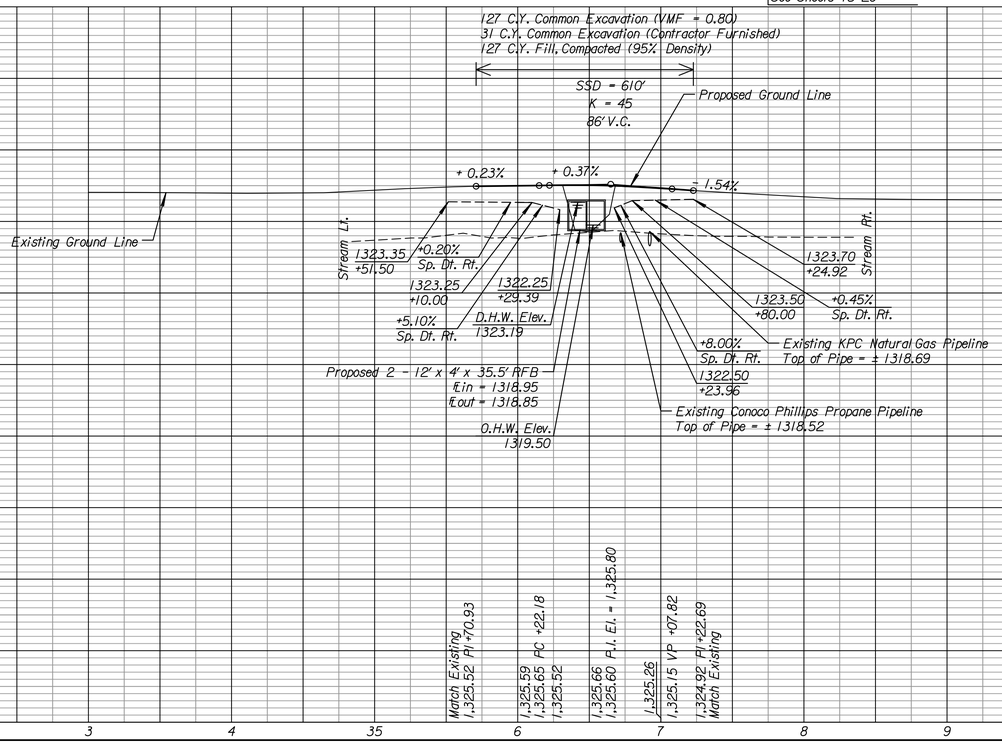
EDGE OF PAVEMENT TRANSITION POINTS

1. Sta. 35+70.93, 8.80' Lt. Begin Taper
2. Sta. 35+70.93, 9.00' Rt. Begin Taper
3. Sta. 36+29.63, 11.00' Lt. End Taper
4. Sta. 36+29.63, 11.00' Rt. End Taper
5. Sta. 36+66.55, 11.00' Lt. Begin Taper
6. Sta. 36+66.55, 11.00' Rt. Begin Taper
7. Sta. 37+22.74, 8.90' Lt. End Taper
8. Sta. 37+22.74, 9.10' Rt. End Taper

LEGEND
- AB-3 Gravel Entrance
- Pavement Removal
- BNSF Flagger Required Area

B.M. #22 - RR Spike Set in Concrete Sign Base
48.21' Lt. Sta. 28+22.59 Elev. 1325.62

B.M. #1 - RR Spike Set in E Face of PP W of Old Lawrence Road
23.12' Lt. Sta. 42+89.75 Elev. 1324.24



KANSAS DEPARTMENT OF TRANSPORTATION
PLAN AND PROFILE
OLD LAWRENCE ROAD BRIDGE

DATE | BY | REFERENCES NOTED | REFERENCES CHECKED

Drawn By : ROAD Plotted : 9/3/2014
File : G:\W1310022\Road\C-RDW-S01-101.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	87 N-0609-01	2014	6	52

SW 1/4 Sec. Corner Sec. 28 T26S 1E
℄ = @ Sta. 100+00.00
N 1709901.3250 E 1649116.7390
Found Existing 1/2" iron bar with PEC cap.

1. Centerline of 37th Street	*3.5' N*
2. PK nail in NE face power pole	*40.03' NW*
3. Found nail and shiner in S face power pole	*68.95' NE*
4. Center W rail railroad tracks	*8.59' E*
5. NE bolt of railroad sign base	*24.66' SSW*

W 1/4 Sec. Corner Sec. 28 T26S 1E
℄ = @ Sta. 126+73.65
N 1712574.6500 E 1649075.3500
Found Existing 1" pipe, no cap 12"± deep.

1. Found 3 nails in W end railroad tie	*4.47' E*
2. Found pk nail in NW corner railroad trestle	*13.76' S*
3. NW corner concrete bridge	*68.78' E*
4. Center W rail of tracks	*6.30' E*

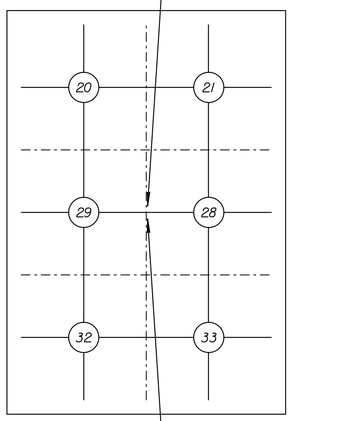
SW Corner Sec. 21 T26S 1E
℄ = @ Sta. 153+32.50
N 1715233.2040 E 1649035.6140
Found Existing 1" pipe, no cap.

1. SE corner house foundation	*55.21' NE*
2. SW corner garage	*42.61' NW*
3. Found 60D nail in W face 20" elm	*27.90' NNE*
4. Centerline Old Lawrence Road	*80.3' E*

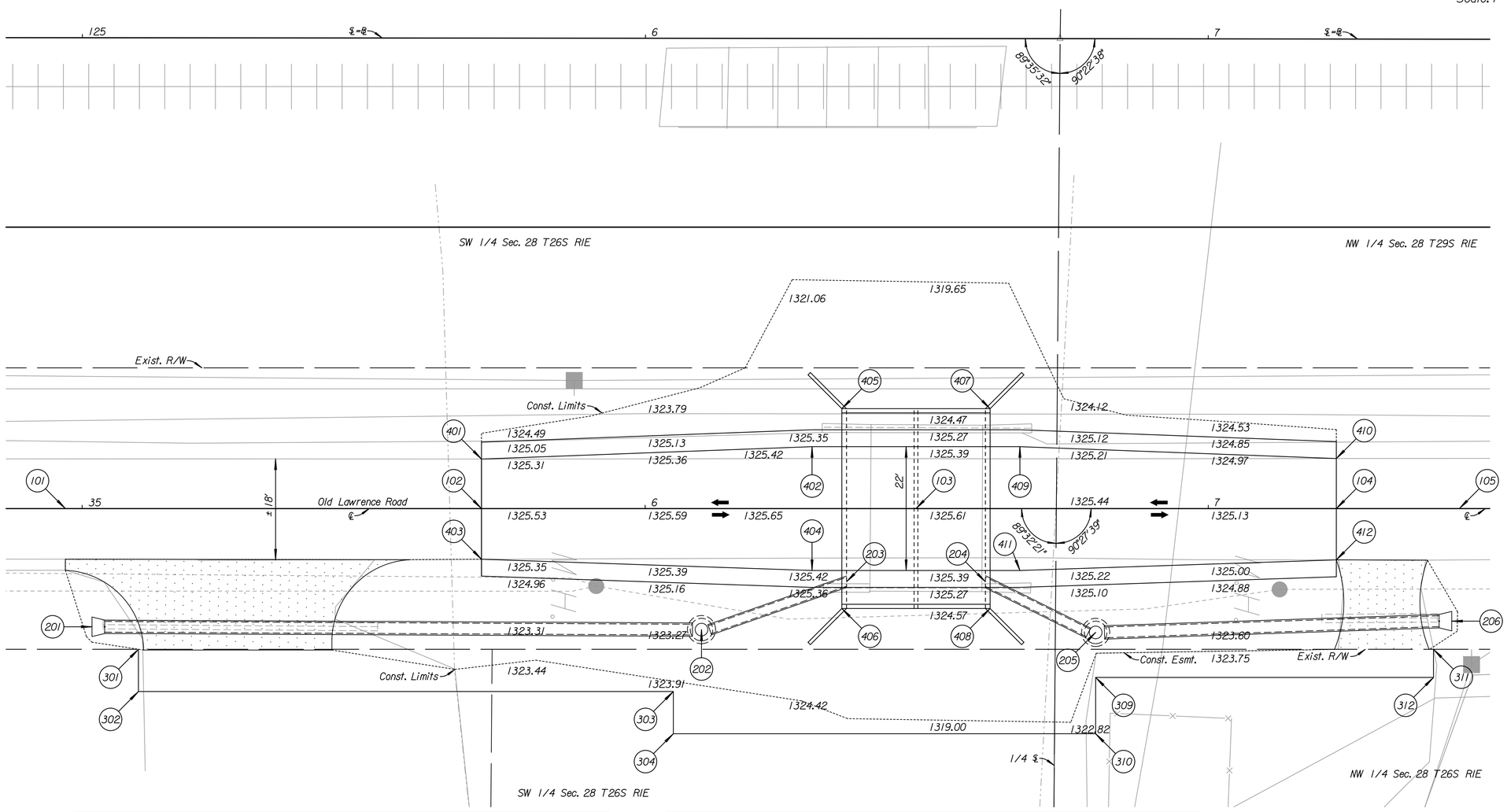
Center Sec. Corner Sec. 28 T26S 01E
℄ = @ Sta. 126+54.83, 2,642.43' Rt.
N 1712596.7460 E 1651717.7560
Found Existing 1/2" bar with PEC cap.

1. Nails and shiner in N face power pole	*81.60' SW*
2. E rail of railroad tracks	*22.96' W*
3. Found "+" cut on N end culvert	*134.15' S*
4. Found "+" cut on S end culvert	*124.58' N*

Scale: 1" = 10'



SECTION MAP
T26S R1E



ROADWAY COORDINATES

POINT	STATION	OFFSET	SIDE	DESCRIPTION	NORTHING	EASTING
101	34+97.02	00.00'	-	Begin Construction	1712399.37	1649161.73
102	35+70.93	00.00'	-	Begin Project	1712473.27	1649160.51
103	36+48.09	00.00'	-	℄ of Structure	1712550.42	1649159.25
104	37+22.74	00.00'	-	End Project	1712625.06	1649158.02
105	37+44.59	00.00'	-	End Construction	1712646.91	1649157.66
201	35+01.75	21.00'	Rt.	Front of End Section	1712404.45	1649182.65
202	36+10.00	21.50'	Rt.	Top of Manhole	1712512.69	1649181.37
203	36+35.76	13.00'	Rt.	Tie In, Inside Face of RFB	1712538.30	1649172.44
204	36+60.42	13.00'	Rt.	Tie In, Inside Face of RFB	1712562.97	1649172.04
205	36+80.00	22.00'	Rt.	Top of Manhole	1712582.69	1649180.72
206	37+43.25	20.00'	Rt.	Front of End Section	1712645.89	1649177.68
301	35+10.00	25.00'	Rt.	Exist. R/W = Const. Esmt.	1712412.76	1649186.51
302	35+10.00	32.50'	Rt.	Const. Esmt. Corner	1712412.88	1649194.01
303	36+05.00	32.50'	Rt.	Const. Esmt. Corner	1712507.87	1649192.45
304	36+05.00	40.00'	Rt.	Const. Esmt. Corner	1712507.99	1649199.95
309	36+80.00	30.00'	Rt.	Const. Esmt. Corner	1712582.82	1649188.72

ROADWAY COORDINATES

POINT	STATION	OFFSET	SIDE	DESCRIPTION	NORTHING	EASTING
310	36+80.00	40.00'	Rt.	Const. Esmt. Corner	1712582.72	1649198.72
311	37+40.00	25.00'	Rt.	Exist. R/W = Const. Esmt.	1712642.73	1649182.74
312	37+40.00	30.00'	Rt.	Const. Esmt. Corner	1712642.81	1649187.74
401	35+70.93	8.80'	Lt.	Begin Taper (Edge of Pavement)	1712473.12	1649151.72
402	36+29.63	11.00'	Lt.	End Taper (Edge of Pavement)	1712531.78	1649148.55
403	35+70.93	9.00'	Rt.	Begin Taper (Edge of Pavement)	1712473.41	1649169.51
404	36+29.63	11.00'	Rt.	End Taper (Edge of Pavement)	1712532.14	1649170.55
405	36+34.92	17.75'	Lt.	SW Outside Corner of RFB	1712536.96	1649141.72
406	36+34.92	17.75'	Rt.	SE Outside Corner of RFB	1712537.55	1649177.21
407	36+61.26	17.75'	Lt.	NW Outside Corner of RFB	1712563.29	1649141.28
408	36+61.26	17.75'	Rt.	NE Outside Corner of RFB	1712563.88	1649176.78
409	36+66.55	11.00'	Lt.	Begin Taper (Edge of Pavement)	1712568.70	1649147.95
410	37+22.74	8.90'	Lt.	End Taper (Edge of Pavement)	1712624.92	1649149.13
411	36+66.55	11.00'	Rt.	Begin Taper (Edge of Pavement)	1712569.06	1649169.94
412	37+22.74	9.10'	Rt.	End Taper (Edge of Pavement)	1712625.21	1649167.13

KANSAS DEPARTMENT OF TRANSPORTATION

COORDINATE DATA

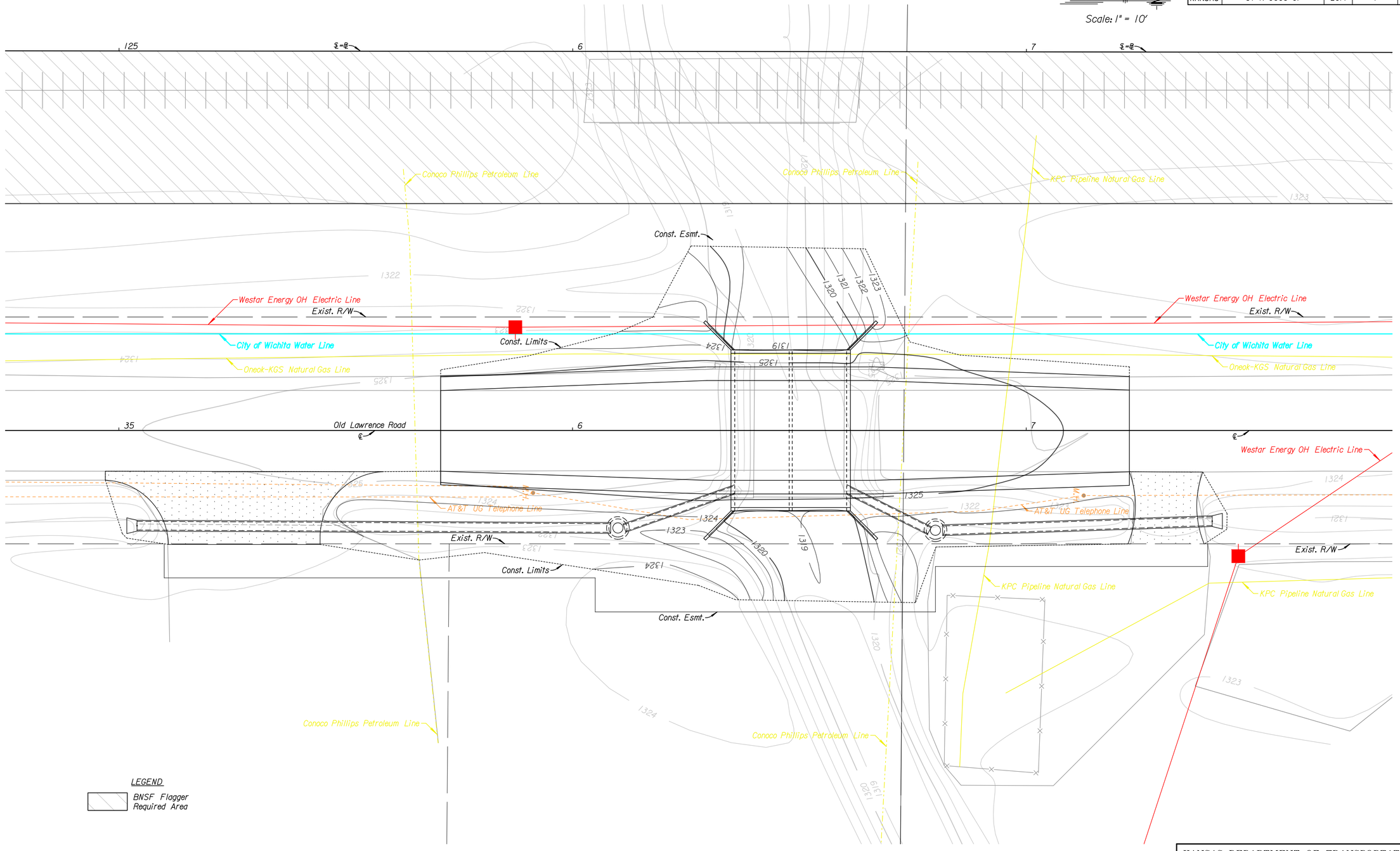
OLD LAWRENCE ROAD BRIDGE

DATE	BY	
		REFERENCES NOTED
		REFERENCES CHECKED

Drawn By : ROAD Plotted : 9/3/2014
File : G:\WI130022\Road\C-CDS-S01-101.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	87 N-0609-01	2014	7	52

Scale: 1" = 10'



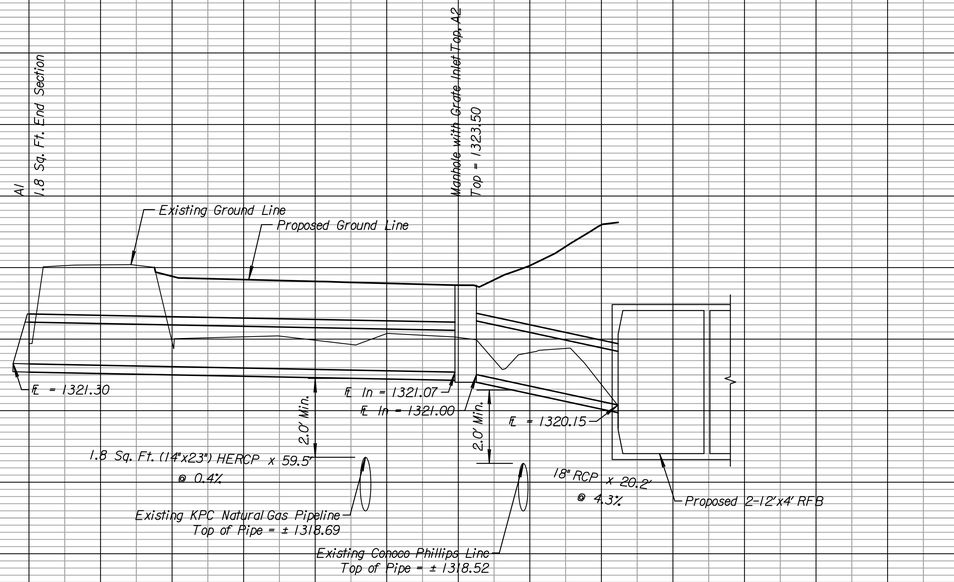
DATE | BY | REFERENCES NOTED | REFERENCES CHECKED

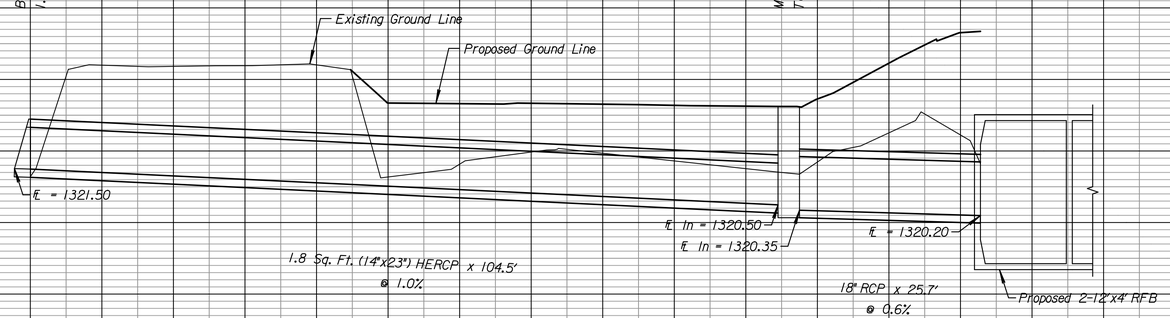
Drawn By : ROAD
Plotted : 9/3/2014
File : G:\W13\0022\Road\C-UTL-M01-101.dgn

KANSAS DEPARTMENT OF TRANSPORTATION

UTILITY INFORMATION
OLD LAWRENCE ROAD BRIDGE

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	87 N-0609-01	2014	8	52





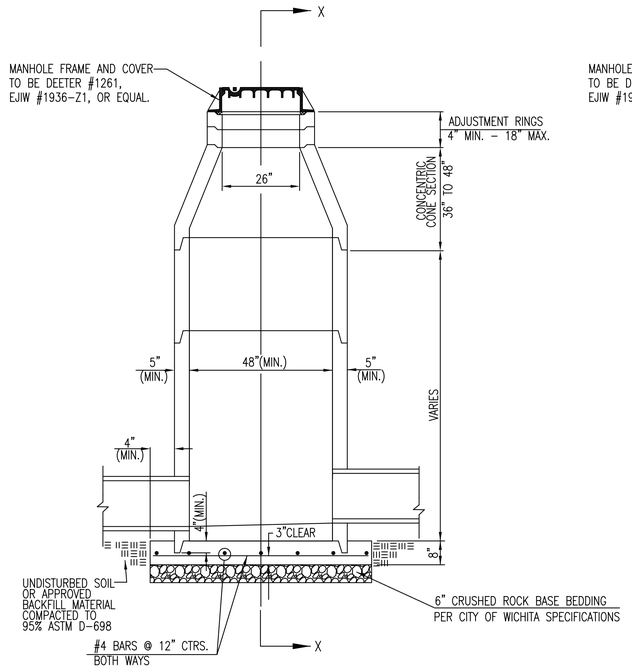
Note:
AT&T utility duct not shown on plans.
Top of duct elevation = ± 1313.61

KANSAS DEPARTMENT OF TRANSPORTATION

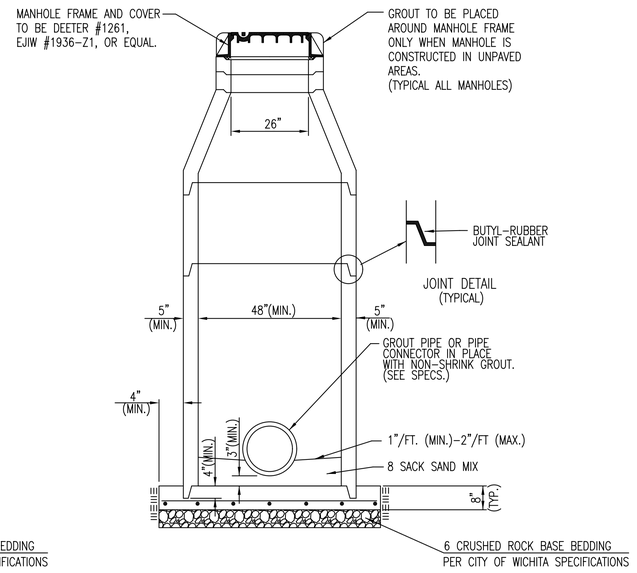
OLD LAWRENCE ROAD

STORM SEWER PROFILES

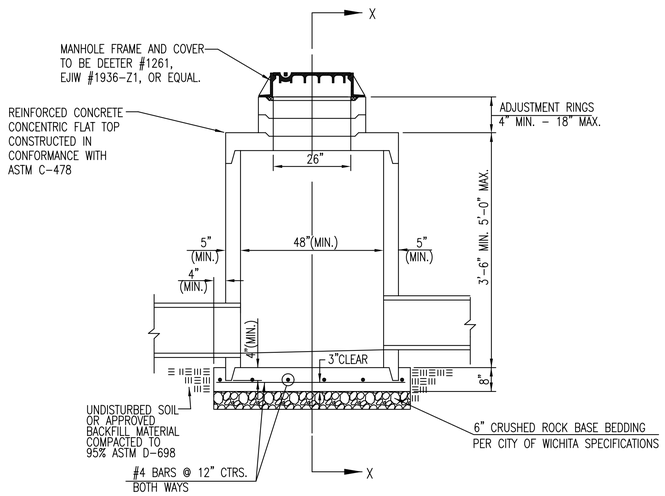
Drawn By : ROAD Plotted : 9/3/2014
File : G:\W13\0022\Road\C-STM-S01-101.dgn



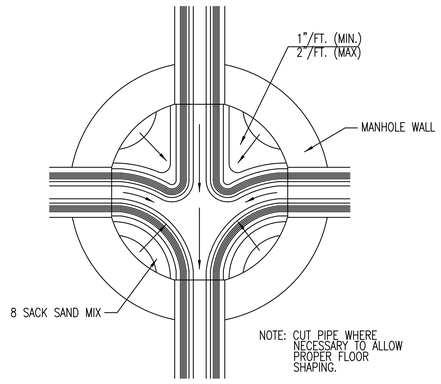
PRECAST
STANDARD MANHOLE
TYPE "A"



SECTION X-X
(TYPICAL)



PRECAST
SHALLOW MANHOLE
TYPE "B"



TYPICAL MANHOLE
FLOOR SHAPING

GENERAL NOTES

1. IF, IN THE OPINION OF THE ENGINEER, THE MANHOLE SUBGRADE APPEARS UNSTABLE, THE CONTRACTOR WILL HAVE THE OPTION TO COMPACT SUBGRADE AS SHOWN OR INCREASE THE THICKNESS OF THE MANHOLE BASE AS DIRECTED BY THE ENGINEER.
2. STEEL REINFORCING WILL BE REQUIRED IN ALL MANHOLE BASES.
3. ALL MANHOLE CONSTRUCTION SHALL BE WATER TIGHT.
4. TOP OF MANHOLE FLOOR SLAB SHALL BE AT LEAST 3 INCHES BELOW THE FLOW LINE OF THE OUTLET PIPE TO INSURE SUFFICIENT MINIMUM THICKNESS OF SHAPED INVERT.
5. ALL PRECAST CONCRETE MANHOLE SECTIONS SHALL CONFORM TO THE LATEST REVISION OF ASTM C-478 AS MODIFIED BY THE SPECIFICATIONS.
6. CONCRETE USED FOR MANHOLE CONSTRUCTION SHALL CONFORM TO CITY OF WICHITA SPECIFICATIONS FOR CONCRETE PAVEMENT MIX.
7. PRECAST MANHOLES SHALL BE SET AT LEAST 4 INCHES INTO MANHOLE BASE.
8. MANHOLES WITH PIPE SIZES 24" AND LARGER SHALL HAVE 5 FOOT INSIDE DIAMETER (MIN.)
9. MANHOLES WITH PRECAST BASES MAY BE USED AT THE CONTRACTORS OPTION. THESE MANHOLES SHALL HAVE AN 8" MINIMUM BASE THICKNESS AND SHALL BE PLACED ON AN 8" MIN. CRUSHED ROCK BASE. PIPES SHALL BE ENCASED WITH CRUSHED ROCK TO AT LEAST 3 FEET FROM THE MANHOLE WALL.
10. CONTRACTOR SHALL REMOVE LIFTING HOOKS AFTER INSTALLATION. RECESSES IN MANHOLE WALL SHALL BE GROUTED FLUSH TO THE MANHOLE WALL WITH HYDRAULIC CEMENT AFTER THE MANHOLE IS IN PLACE. LIFTING HOLES THRU THE MANHOLE WALL WILL NOT BE ACCEPTED.
11. THE ENDS OF ALL PIPES IN MANHOLES SHALL BE CUT OFF FLUSH WITH THE INSIDE FACE OF THE MANHOLE WALL.
12. MANHOLE INVERT SHALL BE SHAPED WITH 8 SACK SAND MIX CONCRETE TO CREATE FLOW CHANNELS AND TO INCREASE HYDRAULIC EFFICIENCY SUCH THAT THE MANHOLE WILL BE SELF CLEANING BETWEEN ALL INLET AND/OR OUTLET PIPES.

~~13. MANHOLE FRAME AND COVER TO BE DEETER #1261, EJIW #1936-Z1, OR APPROVED EQUAL, SEE SW-303.~~

14. FOR FLAT GRATED INLET APPLICATION, GRATE TO BE DEETER #1933, EJIW #1205 MDI, OR APPROVED EQUAL.

~~15. FOR BEEHIVE GRATE APPLICATION, GRATE TO BE DEETER #4495, EJIW #120545, OR APPROVED EQUAL.~~

CITY OF WICHITA
PUBLIC WORKS & UTILITIES
ENGINEERING DIVISION

PRECAST CONCRETE MANHOLE (STORM SEWER)

CITY ENGINEER
GARY JANZEN, P.E.

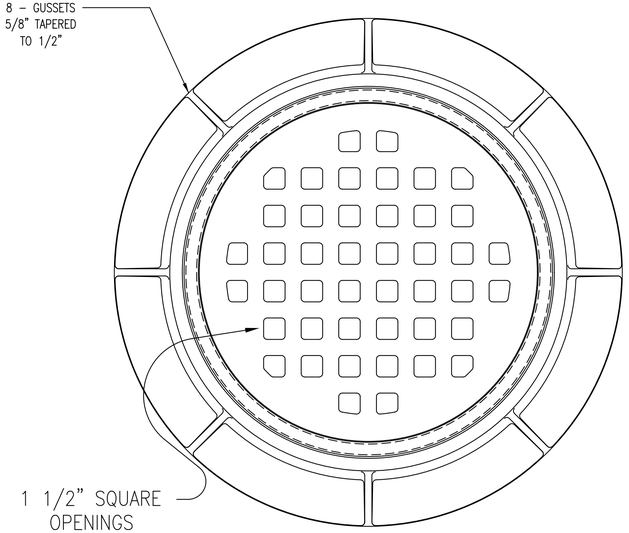
PROJECT NUMBER	OCA NUMBER	DATE
87 N-0609-01		*11/2010*

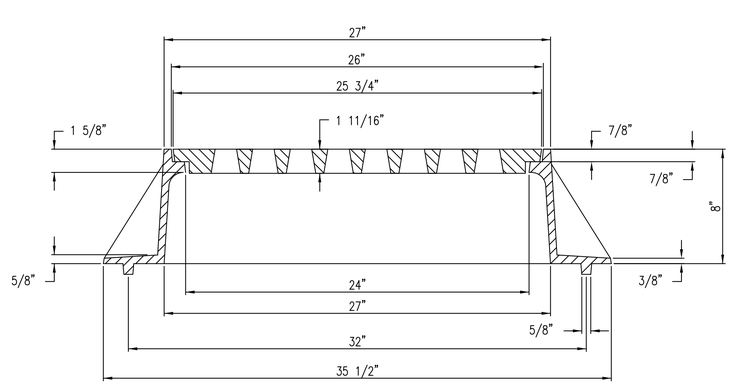
CITY ENGINEER'S OFFICE
CITY HALL - SEVENTH FLOOR
455 NORTH MAIN STREET
WICHITA, KANSAS 67202-1620
(316) 268-4501

SHEET
9 of 52

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	87 N-0609-01	2014	10	52

DATE	BY	REFERENCES NOTED	REFERENCES CHECKED

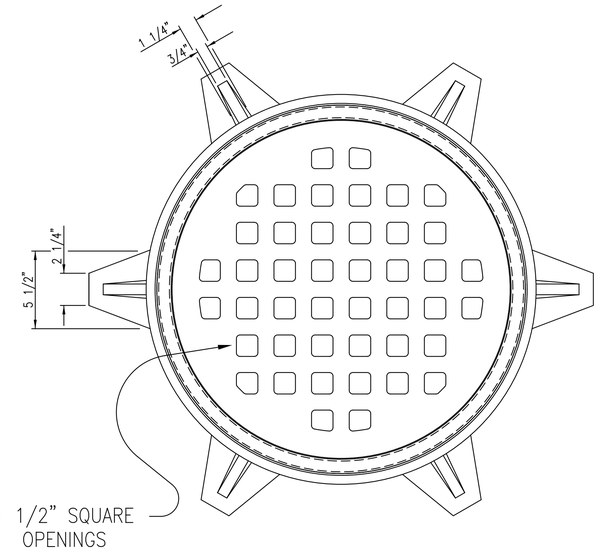


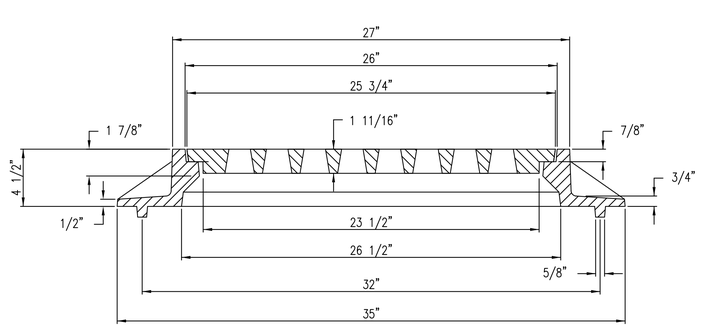


MANHOLE FRAME

DEETER #1261 OR EJIW #1936-Z1

NOTE:
1. FURNISHED WITH MACHINED HORIZONTAL BEARING SURFACE.
2. COVER TO BE DEETER #1933





INLET FRAME

DEETER #2014 OR EJIW #1936-Z4

NOTE:
1. FURNISHED WITH MACHINED HORIZONTAL BEARING SURFACES.
2. NOT TO BE USED UNDER PAVEMENT.
3. COVER TO BE DEETER #1933

KANSAS DEPARTMENT OF TRANSPORTATION

MANHOLE/INLET FRAME AND COVER (STORM SEWER)

Drawn By : ROAD Plotted : 9/3/2014
File : G:\WI13\0022\Road\SW-303.bak

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	87 N-0609-01	2014	11	52

SCHEDULE OF STORM SEWER INSTALLATIONS (SMOOTH PIPE SYSTEM)

ROUTING SEQUENCE FROM	ROUTING SEQUENCE TO	LOCATIONS OF INSTALL: STATIONING REF.	STATIONING NUMBER	ROUTE	DISTANCE LT./RT.	TYPE OF INSTALLATION: END SECTION	Ø MANHOLE (SPECIAL)	DIMENSIONS: L (FT.)	W (FT.)	H (FT.)	ELEVATIONS: TOP ⊛	FLOOR	INFLOW CONDUITS: CONDUIT SIZE	FLOWLINE ELEV.	CONDUIT SIZE	FLOWLINE ELEV.	OUTFLOW CONDUIT SIZE	CONDUIT FLOWLINE ELEV.	PIPE LENGTHS: 18" RCP	I.8 SQ. FT. RCPHE	END SECT. I.8 SF
A1	A2	37	43.25	Old Lawrence Road	20.00' Rt.	1		-	-	-	1322.65	1321.30	-	-	-	-	1.8 SF	1321.25		59.5	1.0
A2	RFB	36	80.00	Old Lawrence Road	22.00' Rt.		1	4.0	4.0	3.0	1323.50	1321.00	1.8 SF	1321.07	-	-	18"	1321.00	20.2		
B1	B2	35	01.75	Old Lawrence Road	21.00' Rt.	1		-	-	-	1322.90	1321.50	-	-	-	-	1.8 SF	1321.50		104.5	1.0
B2	RFB	36	10.00	Old Lawrence Road	21.50' Rt.		1	4.0	4.0	3.0	1323.25	1320.35	1.8 SF	1320.50	-	-	18"	1320.35	25.7		
				TOTAL		2	2											TOTAL	45.9	164	2.0

Ø 4' Diameter. See Sheet 9

GENERAL NOTE:
The quantities, dimensions and flowlines given on this sheet are to be used if the following types of "SMOOTH PIPES" are furnished: RCP, VCP - ES, BCCMP - FP, RCPHE.

⊛ Note: Top Elevation is located as follows:
1. Manhole - Top of Manhole Ring
2. Curb Inlet - Top of curb.
3. Gutter Inlet - Top back of gutter.
4. Inlet - Manhole, Special - Top of Grate.
5. Ditch Inlet - Top of Concrete at Cover Plate.

NO.	DATE	REVISIONS	BY	APP'D
3	1-28-05	Changed Class to Grade concrete	S.W.K.	J.O.B.
2	5-21-99	Added top elevation location note	R.J.S.	J.O.B.
1	10-8-90	Detailed on CADD	R.J.S.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

SCHEDULE OF STORM SEWER INSTALLATIONS (Smooth Pipe System)

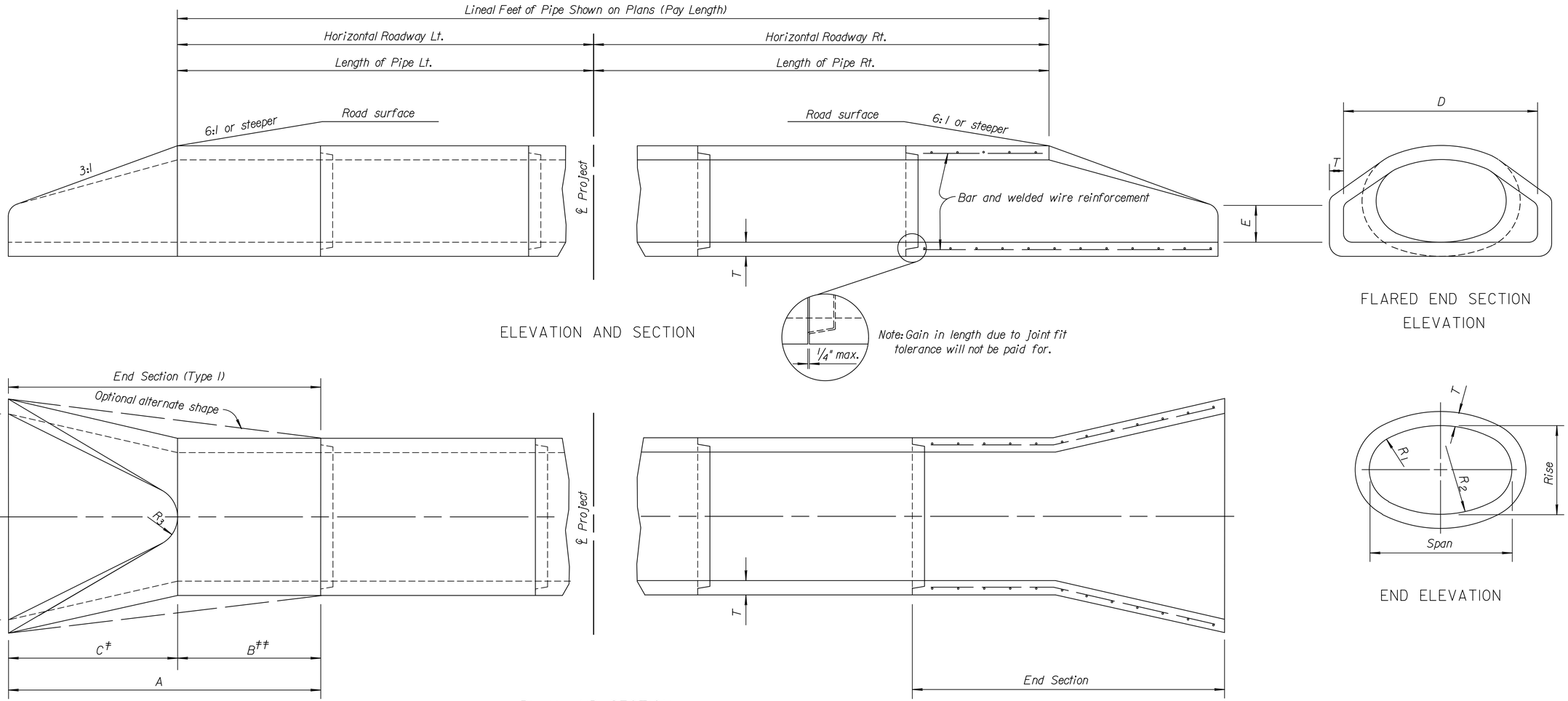
~~RD653C~~

FHWA APPROVAL	06-10-05	APP'D. James O. Brewer	
DESIGNED	DETAILED	QUANTITIES	TRACED B.N.B.
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK. R.J.S.

Drawn By : ROAD Plotted : 9/3/2014
File : G:\W1130022\Roadlvd653c.dgn

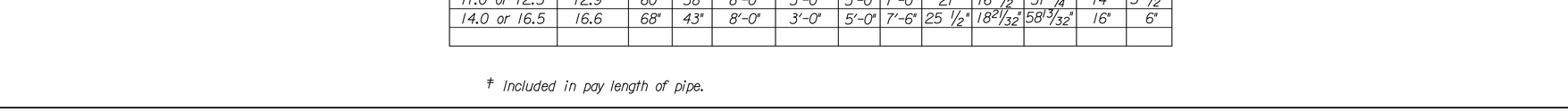
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	87 N-0609-01	2014	12	52

Note to Designer: KDOT Pipe Policy provides guidance in identifying the prohibited and/or restricted uses of CSP, ACSP, PEP, PVCP, CAP & RCP. Provide end sections of the same type and coating as the pipe. Exceptions to this are noted in the Standard Specifications. Refer to the KDOT Design Manual, Volume I (Part C), Road Section, "Elements of Drainage & Culvert Design" for structural pipe design information which includes: corrugations, sizes, gauges, maximum/minimum fill heights and classes of pipe.

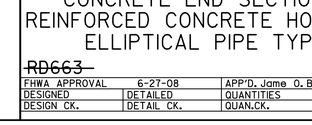


ELEVATION AND SECTION

FLARED END SECTION ELEVATION



PLAN AND SECTION



END ELEVATION

END SECTION (TYPE I) NOMINAL DIMENSIONS												
Bid Designation Sq. Ft.	Min. W.W. Area Sq. Ft.	Span	Rise	Overall Length A ‡	Barrel Length B	C	D	E	R_1	R_2	R_3	T
1.0 or 1.5	1.8	23"	14"	6'-0"	3'-9"	2'-3"	3'-0"	8"	6"	20"	6"	2 3/4"
2.0,2.5 or 3.0	3.3	30"	19"	6'-0"	2'-9"	3'-3"	4'-0"	8 1/2"	8 1/4"	26 1/4"	7"	3 1/4"
4.0	4.1	34"	22"	6'-0"	2'-2"	3'-10"	4'-6"	9"	9 1/4"	29 17/32	8"	3 1/2"
5.0	5.1	38"	24"	6'-0"	1'-6"	4'-6"	5'-0"	9 1/2"	10 1/4"	32 3/4"	9"	3 3/4"
6.0	6.3	42"	27"	6'-0"	1'-3"	4'-9"	5'-6"	10 3/8"	11 7/16"	36 3/16"	10 1/2"	3 3/4"
7.0	7.4	45"	29"	8'-0"	3'-0"	5'-0"	6'-0"	11 1/4"	12 1/4"	39 1/4"	12"	4 1/2"
8.5	8.8	49"	32"	8'-0"	3'-0"	5'-0"	6'-3"	12"	13 9/16"	42 21/32	12 1/2"	4 3/4"
10.0	10.2	53"	34"	8'-0"	3'-0"	5'-0"	6'-6"	15 3/4"	14 3/4"	46"	13"	5"
11.0 or 12.5	12.9	60"	38"	8'-0"	3'-0"	5'-0"	7'-0"	21"	16 1/2"	51 3/4"	14"	5 1/2"
14.0 or 16.5	16.6	68"	43"	8'-0"	3'-0"	5'-0"	7'-6"	25 1/2"	18 21/32"	58 13/32"	16"	6"

‡ Included in pay length of pipe.

Design of end section shall conform to standard reinforced concrete horizontal elliptical pipe. Slight variations in the dimensions specified will be allowed.

NO.	DATE	REVISIONS	BY	APP'D
3	4-18-08	Added ref. to KDOT Pipe Policy	S.W.K.	J.O.B.
2	4- 6-05	Revised reinforcement callout	S.W.K.	J.O.B.
1	6-16-95	Revised table & labeling	R.J.S.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

CONCRETE END SECTION FOR REINFORCED CONCRETE HORIZONTAL ELLIPTICAL PIPE TYPE I

~~RD663~~

FHWA APPROVAL	6-27-08	APP'D. Jame O. Brewer	
DESIGNED	DETAILED	QUANTITIES	TRACED Bowser
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK. King

Drawn By : ROAD Plotted : 9/3/2014
File : G:\W13\0022\Road\rd663.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	87 N-0609-01	2014	13	52

Note to Designer: KDOT Pipe Policy provides guidance in identifying the prohibited and/or restricted uses of CSP, ACSP, PEP, PVCP, CAP & RCP. Provide end sections of the same type and coating as the pipe. Exceptions to this are noted in the Standard Specifications. Refer to the KDOT Design Manual, Volume I (Part C), Road Section, "Elements of Drainage & Culvert Design" for structural pipe design information which includes: corrugations, sizes, gauges, maximum/minimum fill heights and classes of pipe.

Drawn By : ROAD Plotted : 9/3/2014
File : G:\WH13\0022\Roadlrd659.dgn

PIPE CULVERT SUMMARY

Station	Type	Size or Bid Designation Sq. Ft.	Crown Grade Elev.	Flow Line Lt.	Flow Line Rt.	Horizontal Roadway Lt.	Horizontal Roadway Rt.	Degree of Rotation	Length of Pipe Lt.	Length of Pipe Rt.	Lin. Ft. of Pipe	Height of Fill (max.) Ft.	Concrete Pipe AASHTO Class No.	Pipe Gauge ◔ Steel	Pipe Gauge ◔ Alum.	Pipe Corrugations ◔ Steel	Pipe Corrugations ◔ Alum.	Remarks
36+48.09	RFB	2 - 12' x 4'	1325.66	1318.85	1318.95	17.75'	17.75'	0.0°	17.75'	17.75'	71.0	2.0						

◔ Unless otherwise noted, minimum pipe gauge & corrugations to be as shown in RD660.
See Summary of Quantities for End Section information.

Type	ALLOWABLE LOCATION ⚠ Mainline	Side Road	Entrance	Storm Sewer Under ML	Storm Sewer Not Under ML
✡ PVCP					
⊟ PEP					
CSP					
ACSP					
CAP					
RCP					

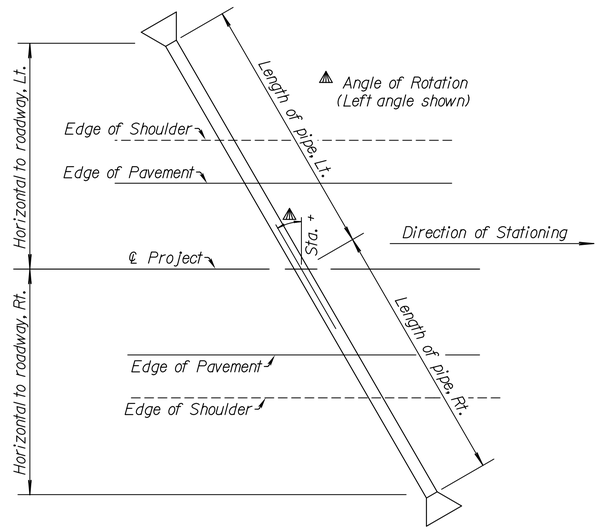
✡ When inside diameter of pipe is 36" or less.

⚠ Unless otherwise specified in the plans. Some pipe types may not be allowed at a location if the fill height exceeds the maximum allowable or is less than the minimum allowable cover.

⊟ When inside diameter of pipe is 60" or less.

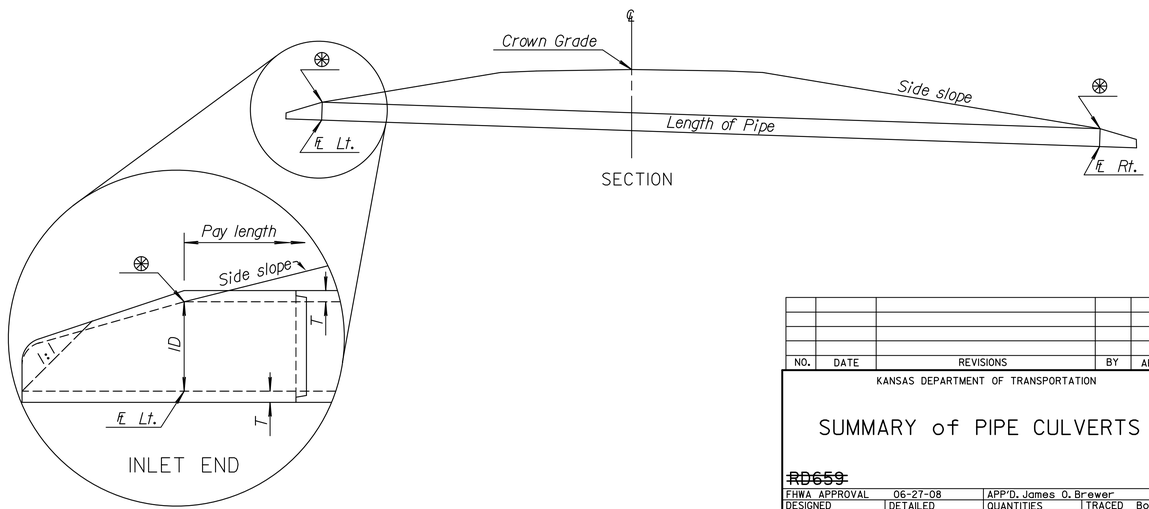
Type	ALLOWABLE END SECTIONS ◊ CS	◊ ACS	CA	RC
PVCP				
PEP				
RCP				
ACSP CAP CSP	Provide End Sections of the same material and coating type as the pipe.			

◊ Type IV End Sections are only made of CS or ACS.



PLAN
(Showing Rotation about ℄)

⊛ Design side slope to intersect inside diameter of pipe outside of Clear Zone.



NO.	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION

SUMMARY of PIPE CULVERTS

~~RD659~~

FHWA APPROVAL	06-27-08	APP'D. James O. Brewer	
DESIGNED	DETAILED	QUANTITIES	TRACED Bowser
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK. King

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	87 N-0609-01	2014	14	52

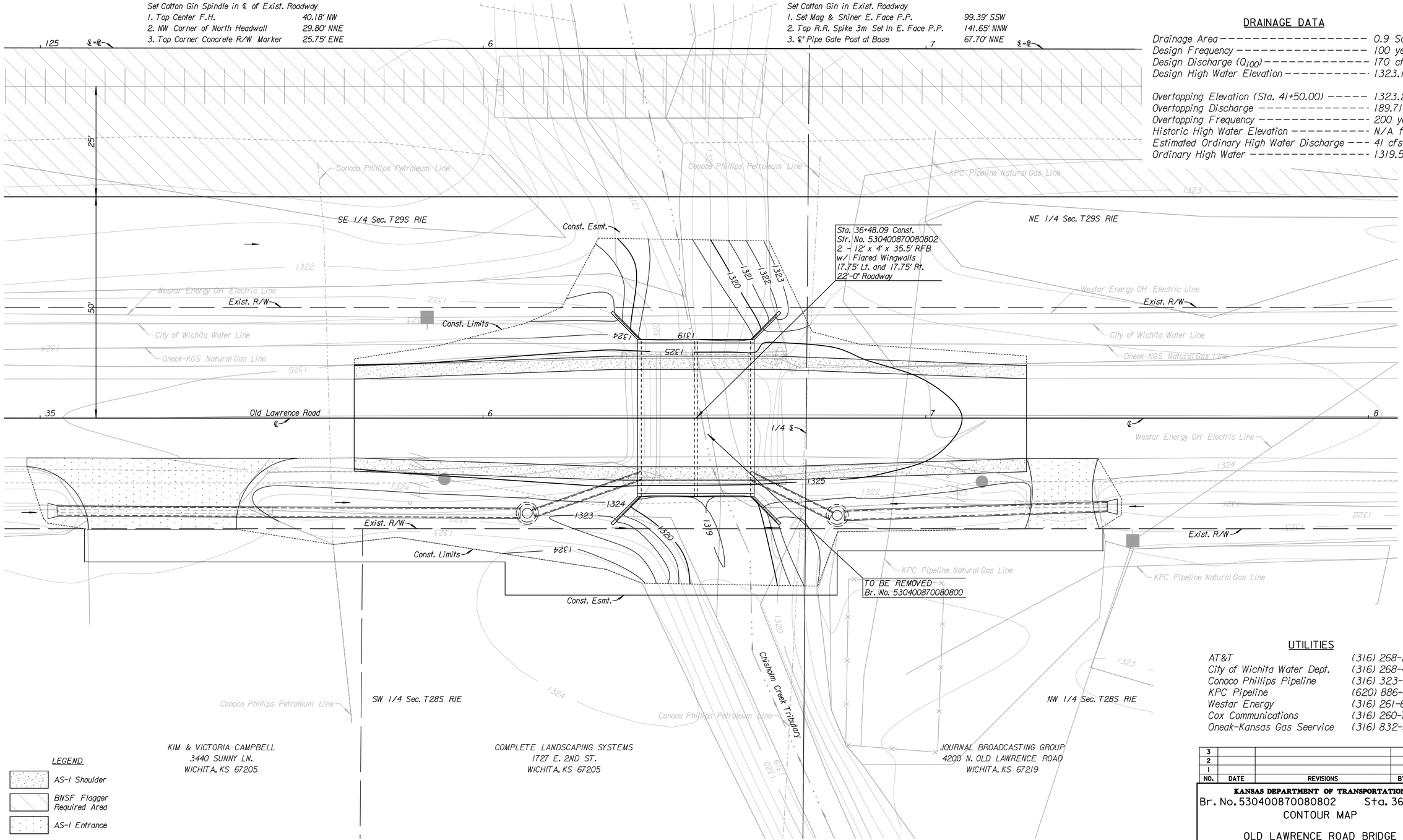
C.P. #101
N 1712052.574 E 1649167.421
@ Sta. 121+50.21, 83.98' Rt.
Sta. 31+50.18, 0.00' Rt.
Set Cotton Gin Spindle in ℄ of Exist. Roadway
1. Top Center F.H. 40.18' NW
2. NW Corner of North Headwall 29.80' NNE
3. Top Corner Concrete R/W Marker 25.75' ENE

C.P. #100
N 1713052.299 E 1649151.144
@ Sta. 131+50.11, 82.92' Rt.
Sta. 41+50.03, 0.13' Rt.
Set Cotton Gin in Exist. Roadway
1. Set Mag & Shiner E. Face P.P. 99.39' SSW
2. Top R.R. Spike 3m Set In E. Face P.P. 141.65' NNW
3. ℄" Pipe Gate Post at Base 67.70' NNE

Scale: 1" = 10'

DRAINAGE DATA

Drainage Area	0.9 Sq Mi
Design Frequency	100 years
Design Discharge (Q_{100})	170 cfs
Design High Water Elevation	1323.19
Overtopping Elevation (Sta. 41+50.00)	1323.21
Overtopping Discharge	189.71 cfs
Overtopping Frequency	200 years
Historic High Water Elevation	N/A ft
Estimated Ordinary High Water Discharge	41 cfs
Ordinary High Water	1319.50



UTILITIES

AT&T	(316) 268-2008
City of Wichita Water Dept.	(316) 268-4504
Conoco Phillips Pipeline	(316) 323-3974
KPC Pipeline	(620) 886-0082
Westar Energy	(316) 261-6315
Cox Communications	(316) 260-7740
Oneak-Kansas Gas Seervice	(316) 832-3126

LEGEND
- AS-1 Shoulder
- BNSF Flagger Required Area
- AS-1 Entrance

B.M. #22 - RR Spike Set in Concrete Sign Base
48.21' Lt. Sta. 28+22.59 Elev. 1325.62

B.M. - RR Spike Set in E Face of PP W of Old Lawrence Road
23.12' Lt. Sta. 42+89.75 Elev. 1324.24

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION
Br. No. 530400870080802 Sta. 36+48.09
CONTOUR MAP
OLD LAWRENCE ROAD BRIDGE
Proj. No. 87 N-0609-01 Sedgwick Co.

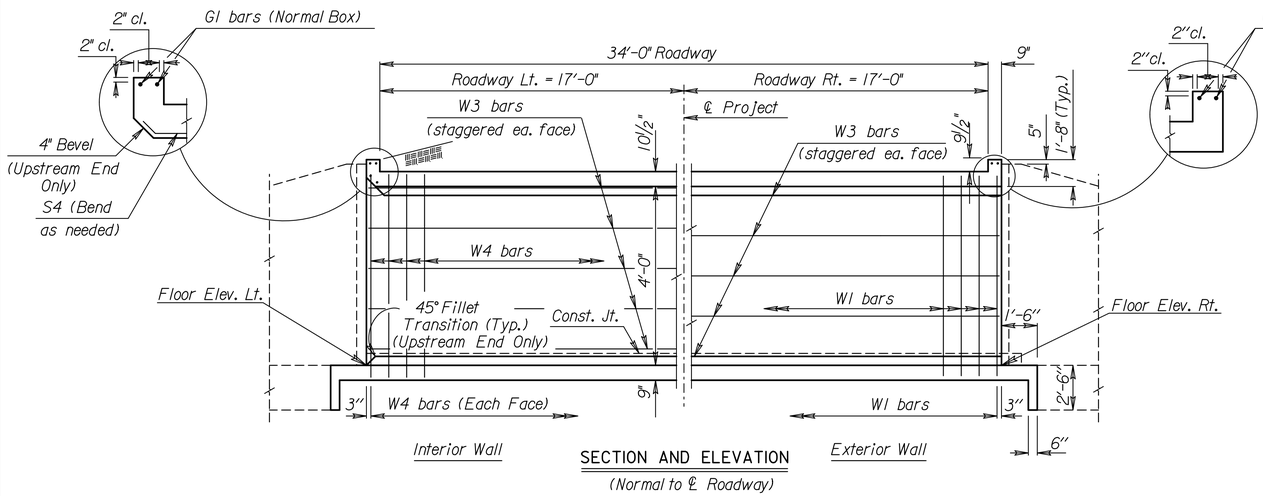
SHEET NO.	OF	SCALE		APP'D			
DESIGNED	XXX	DETAILED	XXX	QUANTITIES	XXX	CADD	XXX
DESIGN CK.	XXX	DETAIL CK.	XXX	QUAN. CK.	XXX	CADD CK.	XXX

Plotted By: ROAD
Plot Location:
File: G:\WI\310022\Road\C-CTM-S01-101.dgn
Plot Date: 9/3/2014

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	87 N-0609-01	2014	15	52

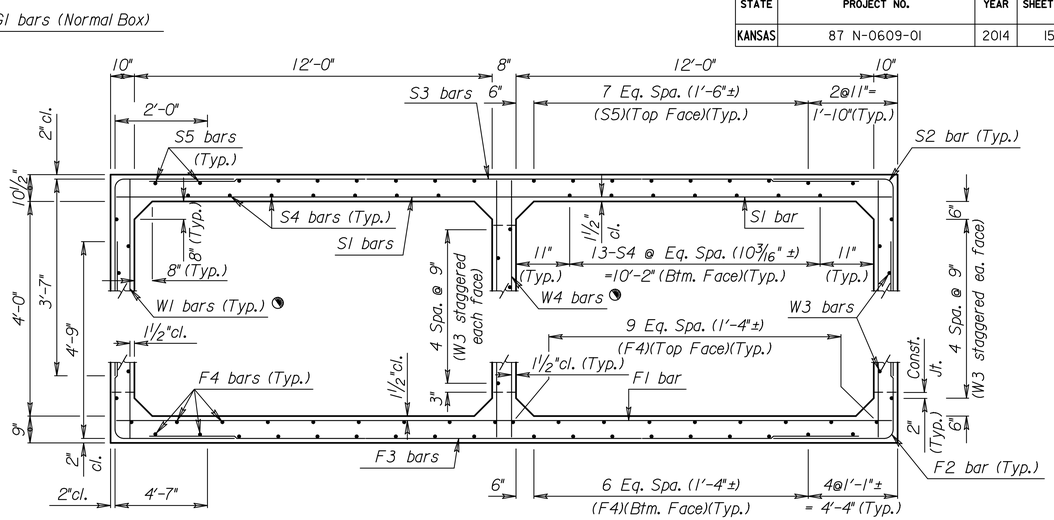
	SYSTEM PART	VERSION/ID
06	CADD V8A	12/6/2010
	DATABASE	10/6/2013
	RCB PROGRAM	7.1.14
	KBOX MODEL ID	727
	CELL LIBRARY	10/6/2013

Plotted By: ROAD
File: c:\WII\30022\Road\C-DET-M01-101.dgn
Plot Location:
Plot Date: 9/3/2014



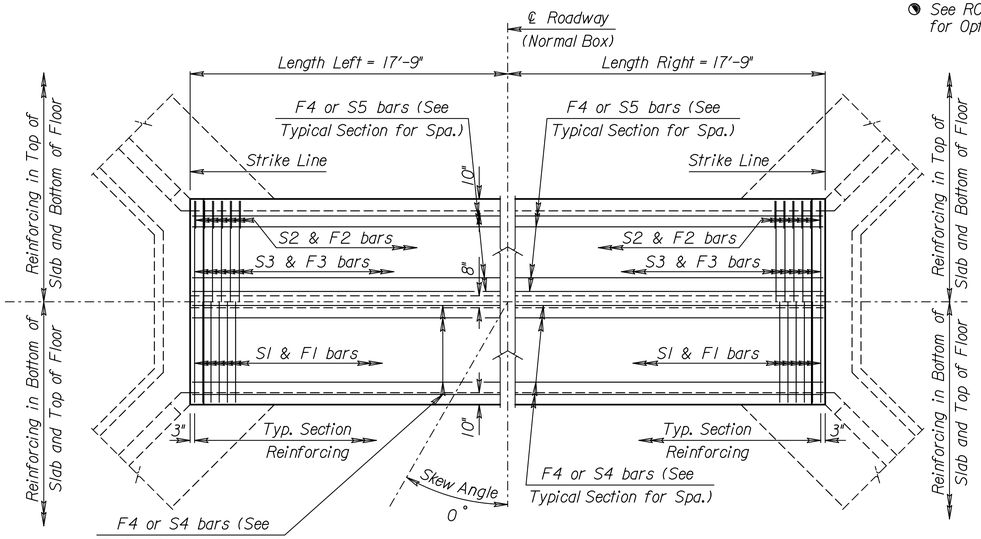
SECTION AND ELEVATION

(Normal to ℄ Roadway)



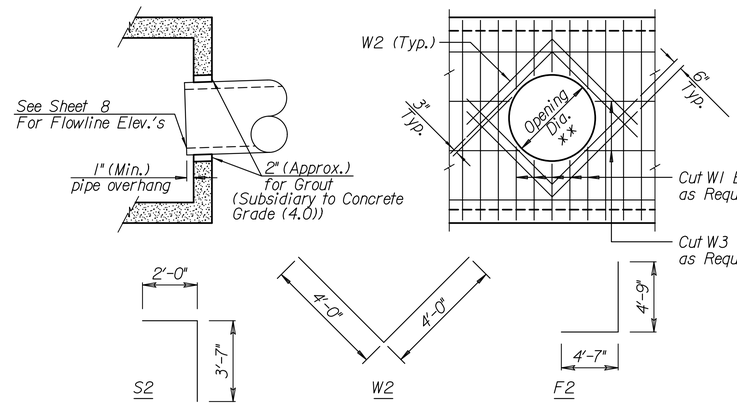
TYPICAL SECTION

See RCB Auxiliary Details for Optional Splice.



Normal Box

PLAN



BENDING DIAGRAM

All Dimensions are out to out of bars.

* Contractor shall coordinate location of pipe connections prior to construction of RFB and modify construction joint as necessary to accommodate for Pipe and collar reinforcing steel. Place collar reinforcing around opening as shown. Reinforcing shall be placed near the inside face of wall. Field cut or bend vertical and horizontal wall reinforcing to clear opening and provide min. 2" concrete cover over end of cut bars.

** Opening Dia. for 18" RCP = 28" (2 Req'd)

RCP CONNECTION TO RFB TYPICAL DETAIL

All Work Shall be Subsidiary to Concrete Grade (4.0).

GENERAL NOTES

DESIGN SPECIFICATION: AASHTO LRFD Spec., 2007 Ed., 2009 Int.
DESIGN LOADING: HL93
UNIT STRESSES: Grade 4.0 Concrete; f'c = 4,000 p.s.i.
Reinforcing Steel; fy = 60,000 p.s.i.

FILL HEIGHT: Unless otherwise noted, the Design Fill Height is measured from the riding surface at the culvert and shall include the surfacing.

CONCRETE: Grade 4.0 Concrete shall be used throughout. Bevel all exposed edges with a ¾inch triangular moulding. Where Grade 4.0 Concrete (AE) is specified, it shall be placed in the top slab above the Construction Joint.

REINFORCING: All reinforcing shall conform to ASTM A615, Grade 60. All dimensions relative to reinforcing steel shall be to centerline of bar unless otherwise noted.

EXCAVATION: Excavation for culverts less than bridge length shall not be paid for directly but shall be subsidiary to Grade 4.0 Concrete. Excavation for RCB Bridges shall be paid for as Class III Excavation.

FOUNDATION STABILIZATION: Foundation Stabilization shall be 6" Type I bedding. This bedding is REQUIRED and will not be paid for directly but shall be SUBSIDIARY to other items of the contract.

QUANTITIES: The quantities shown in the Culvert Summary include apron and/or soil saver quantities when their construction is required by the plans. Payment for additional quantities that result from including floating apron, as a change in original plans, shall be made at the Unit Price bid for the various items involved.

GRANULAR BACKFILL (WINGWALLS): See the "Auxiliary Details" sheet.

STRIKE LINE: Wingwalls and that portion of the RCB outside the Strike Line shall be constructed level. Footing for wingwalls shall be constructed with the culvert floor. See wingwall detail sheet.

BRIDGE BACKWALL PROTECTION SYSTEM: For structures with this bid item in the Summary of Quantities. See the "Auxiliary Details" sheet.

⧖ For design purposes ONLY. Do NOT use for Construction — CULVERT SUMMARY — ⊕ includes any welded wire fabric

Floor Elev. Lt.	Floor Elev. Rt.	Crown Gr. Elev.	⧖ Design Fill Ht.	Skew	Left Wings	Right Wings	Scour Apron	Soil Saver	Concrete Barrel (Cu.Yds.)	Concrete Wings (Cu.Yds.)	Concrete Total (Cu.Yds.)	Reinf. Steel (Gr. 60) Barrel (Lbs.)	Reinf. Steel (Gr. 60) ⊕Wings (Lbs.)	Reinf. Steel (Gr. 60) Total (Lbs.)	LRFR RATING FACTORS HL-93 Loading Inventory	LRFR RATING FACTORS HL-93 Loading Operating
1318.85	1318.95	1325.66	0	0	Flared	Flared	No	No	71.1	11.2	82.3	19865	1227	21092	1.02	1.31

BAR SCHEDULE

△ F1 Size	Spa.	No.	Length	△ F2 * Size	Spa.	No.	Length	△ F3 Size	Spa.	No.	Length	△ F4 Size	No.	Length	△ S1 Size	Spa.	No.	Length	△ S2 * Size	Spa.	No.	Length	△ S3 Size	Spa.	No.	Length	△ S4 Size	No.	Length	△ S5 Size	No.	Length
5	6½"	65	26'-0"	7	7"	122	9'-4"	7	7"	61	26'-0"	4	40	35'-2"	7	6½"	65	26'-0"	5	7"	122	5'-7"	8	7"	61	26'-0"	5	26	35'-2"	4	18	35'-2"

△ W1 Size	Spa.	No.	Length	△ W2 Size	Spa.	No.	Length	△ W3 Size	No.	Length	△ W4 Size	Spa.	No.	Length	△ GI Size	No.	Length
4	1'-1"	66	5'-3½"	4	6"	8	8'-0"	4	15	35'-2"	6	6½"	130	5'-3½"	6	4	26'-0"

△ Epoxy Coated Bars
* See Bending Diagram

Minimum Splice Lengths	
#4	1'-5"
#5	1'-9"

SUMMARY OF QUANTITIES

Concrete (Grade 4.0)	39.4 C.Y.
Concrete (Grade 4.0)(AE)	42.9 C.Y.
Bridge Backwall Protection System	107 S.Y.
Reinforcing Steel (Gr. 60)	1227 Lbs.
Reinforcing Steel (Gr.60)(Epoxy Coated)	19865 Lbs.
Class III Excavation	120 C.Y.
Granular Backfill (Wingwalls)	24 C.Y.

NO.	DATE	REVISIONS	BY	APP'D
1				

KANSAS DEPARTMENT OF TRANSPORTATION

Br. No. 530400870080802 Sta. 36+48.09

DOUBLE 12 ft x 4 ft RFB

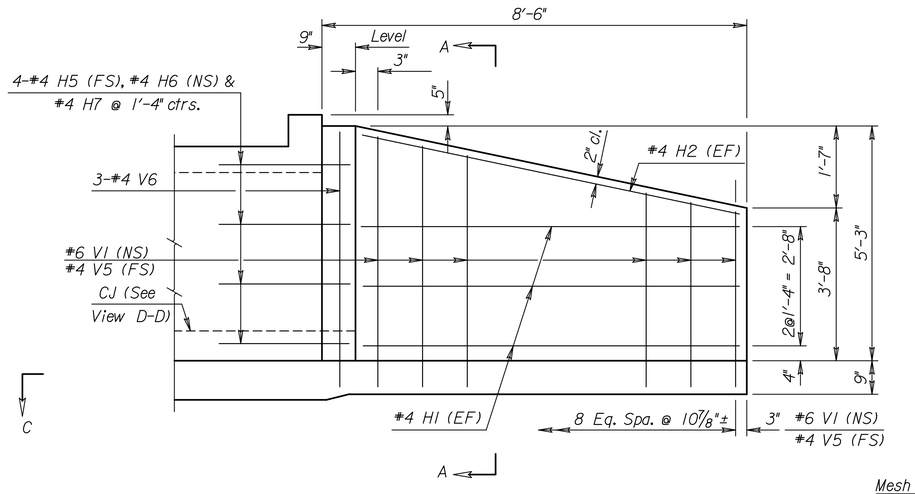
~~BR 2.12.4 F~~ Sedgwick Co.

FHWA APPROVAL		10-20-10	APP'D	Terry L. Fleck
DESIGNED	DETAILED		QUANTITIES	CADD
DESIGN CK.	DETAIL CK.		QUAN. CK.	CADD CK.

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	87 N-0609-01	2014	16	52

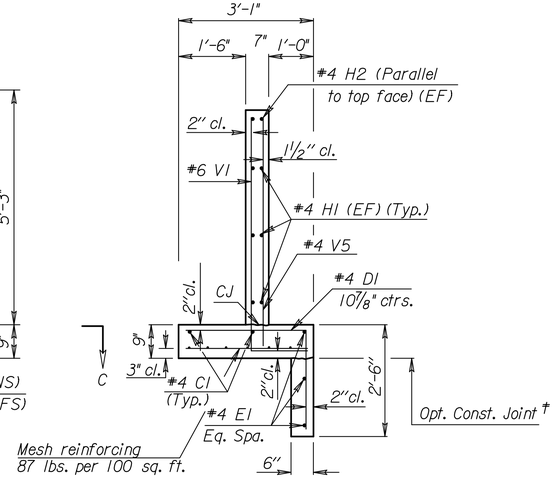
GENERAL NOTES

DESIGN SPECIFICATION: AASHTO LRFD Spec., 2007 Ed., 2009 Int.
DESIGN LOADING: HL93
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 ¾" triangular moulding.
REINFORCING: All reinforcing shall conform to ASTM A615, Grade 60. Welded Wire Fabric shall conform to ASTM A185. All dimensions relative to reinforcing steel shall be to center-line of bar unless otherwise noted. Wire Reinforcing mesh shall be electrically welded and shall be composed of 6 x 6- W6 x W6 welded wire fabric and shall be classified as pounds of reinforcing and included in the total quantity for the bid item Reinforcing Steel (Gr. 60)
QUANTITIES: Wingwall Quantities include all quantities outside the neat lines of the box, excluding the hubguard.
BACKFILL MATERIAL: Use Granular Backfill material meeting the requirements of SB-1, SB-2, SCA-2, SCA-3 or SCA-5. Backfill all wings to limits shown on the "RCB Auxiliary Sheet".
FILTER FABRIC: Separate in-situ material from granular backfill with approved filter fabric complying with Section 1710. Filter Fabric is subsidiary to "Granular Backfill".
FOUNDATION STABILIZATION: Use Type I bedding on all wingwalls unless founded on rock or granular material. Type I bedding is SUBSIDIARY to other items of the contract.



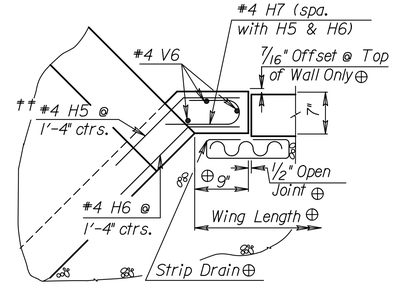
ELEVATION OF WINGWALL
(Backface Shown)

⊕ Typical both wings



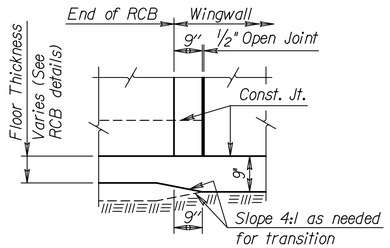
SECTION A-A

See "RCB Aux. Details" sheet for additional requirements.

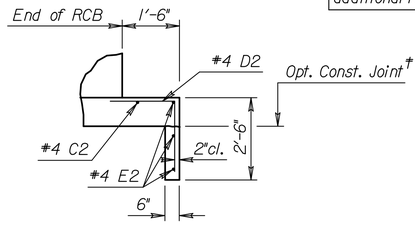


WINGWALL JOINT DETAIL
(Plan View)

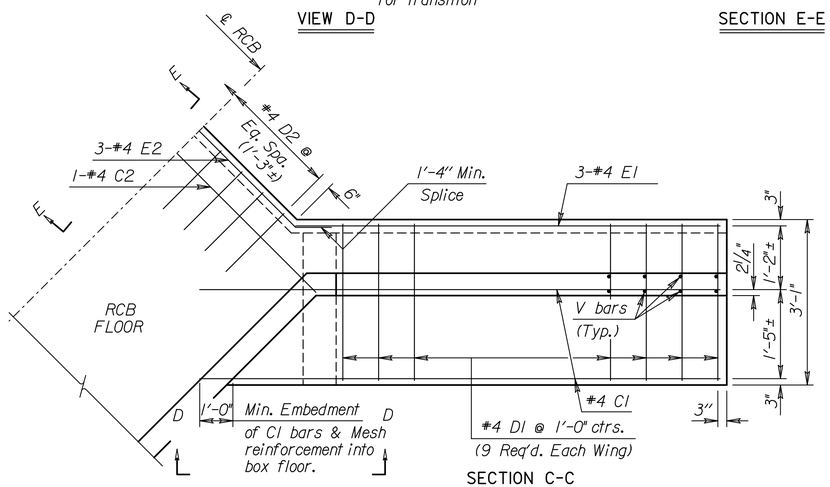
† NOTE: Const. Jt. may be used at Contractor's option when approved by the Engineer. D1 bars or mesh may be spliced thus: ⌐ Minimum overlap shall be 1'-3". No increase in quantities or cost shall be allowed when Contractor elects this option.



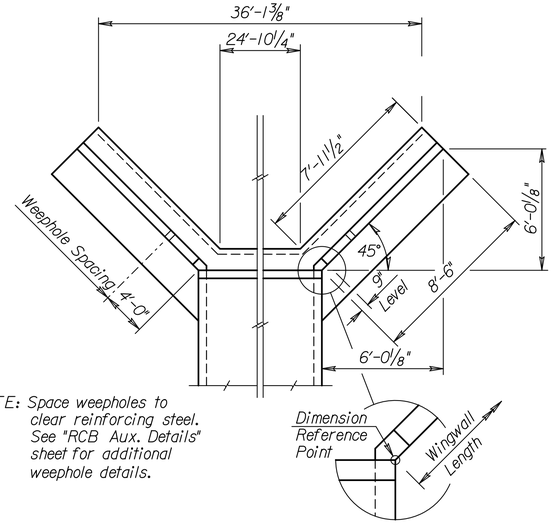
VIEW D-D



SECTION E-E



SECTION C-C



NOTE: Space weepholes to clear reinforcing steel. See "RCB Aux. Details" sheet for additional weephole details.

WING DIMENSIONS FOR NORMAL BOX
(3:1 Embankment Slope
See Typical and Cross Sections for more details)

△ Average Length
✱ See Bending Diagram

NOTE: Reinforcing Bar List is for both wings at one end of box only.

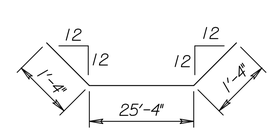
		#4C1	#4D1	#4E1	#4C2	#4D2	#4E2	#6V1	#4H1	#4H2	#4H5	#4H6	#4H7	#4V5	#4V6
0° Skew	No.	4	18 ✱	6	1	20 ✱	3 ✱	18	12	4	8 ✱	8 ✱	8 ✱	18	6
	Length	10'-7"	4'-11"	7'-9"	26'-0"	5'-2"	28'-0"	△ ✱6'-0½"	7'-4"	7'-6"	1'-10"	2'-1"	1'-9"	△ ✱4'-9½"	5'-6"

Welded Wire Fabric
87 lbs. per 100 sq. ft.
60.5 sq. ft.

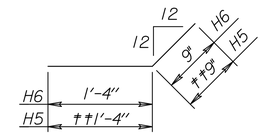
NOTE:
EF = Each Face
NS = Near Side
FS = Far Side
CJ = Const. Joint

V5 | Var. 4'-0" to 5'-7" by equal increments (2¾") | 2 Req'd. each length

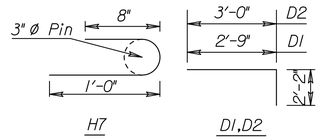
V5



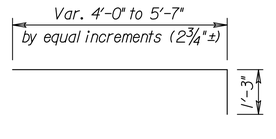
E2



H5, H6



H7 D1,D2



V1
(2 Req'd., each length)

BENDING DIAGRAM
(All dimensions are out to out of bars.)
†† Bend in Field

Quantities listed below are included in the Summary of Quantities shown on the RCB details.

WINGWALL QUANTITIES (One End Only)				
	Foundation Stabilization		Concrete (Gr. 4.0)	
Wingwalls	2.2	(C.Y.)	5.6	(C.Y.)
Reinforcing Steel (Gr. 60)			613	Lbs.
Welded Wire Fabric (Wings)			53	Lbs.
Granular Backfill (Wingwalls)			12.00	C.Y.
Filter Fabric (SUBSIDIARY) (For Information Only)			18.00	S.Y.

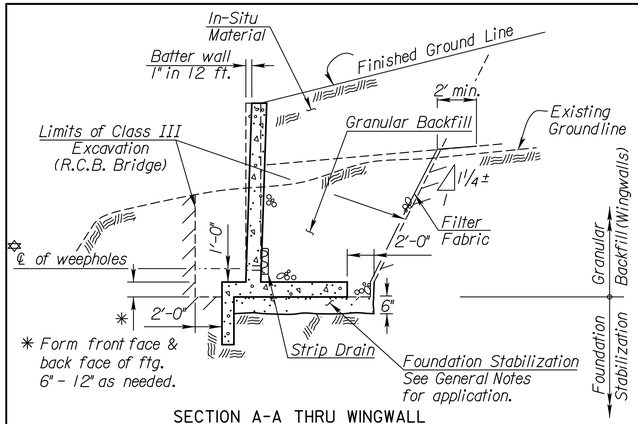
NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION
Br. No. 530400870080802 Sta. 36+48.09
FLARED WINGWALLS
4 †† Rise (0°SKEW)
~~BR 10.00.04~~ Sedgwick Co.

FHWA APPROVAL		10-20-10	APP'D	Terry L. Fleck
DESIGNED	DETAILED		QUANTITIES	CADD
DESIGN CK.	DETAIL CK.		QUAN. CK.	CADD CK.

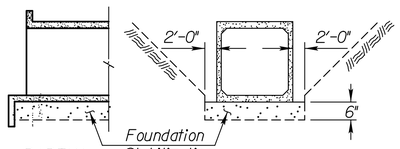
Plotted By: ROAD
Plot Location:
File: G:\WI\30022\Road\C-DET-M01-102.dgn
Plot Date: 9/3/2014

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	87 N-0609-01	2014	17	52

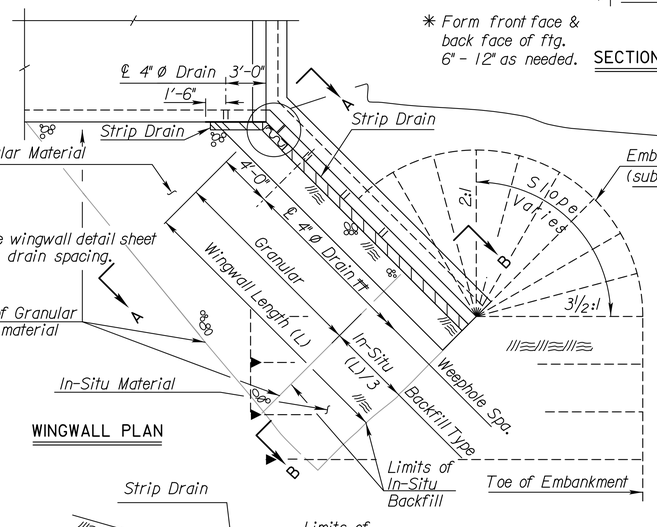


SECTION A-A THRU WINGWALL

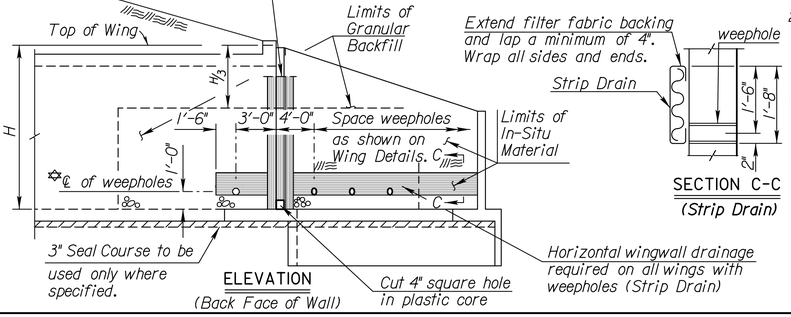
Granular Backfill And Foundation Stabilization



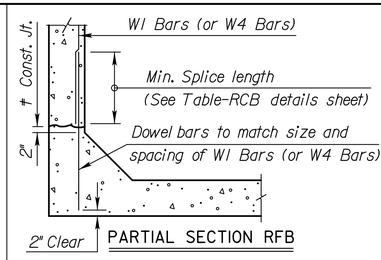
PARTIAL ELEVATION SECTION



WINGWALL PLAN



ELEVATION (Back Face of Wall)



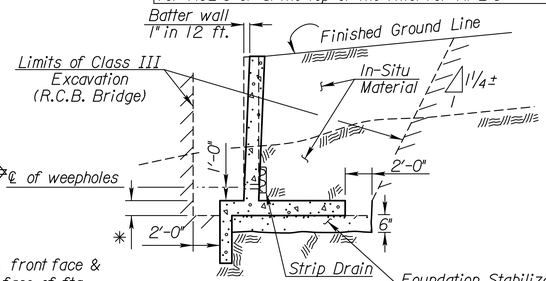
PARTIAL SECTION RFB

OPTIONAL BAR DETAIL

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.

† OPTIONAL COLD JOINT

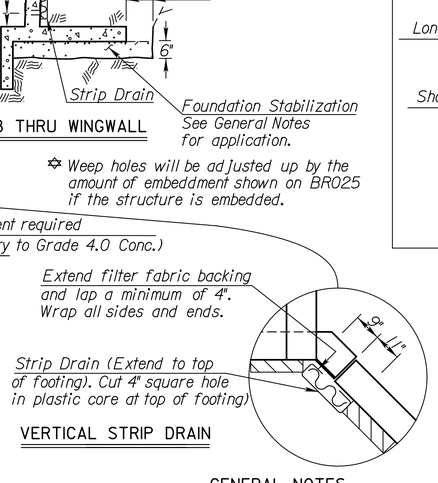
The Contractor has the option of placing the Lower Horizontal Construction Joint at the top of the slab for RCB's or at the top of the fillet for RFB's



✳ Form front face & back face of ftg. 6" - 12" as needed.

SECTION B-B THRU WINGWALL

✡ Weep holes will be adjusted up by the amount of embeddment shown on BR025 if the structure is embedded.



VERTICAL STRIP DRAIN

SECTION C-C (Strip Drain)

GENERAL NOTES

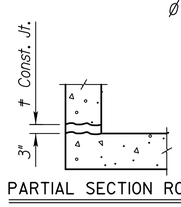
Wingwall Drainage:

1. *All wingwalls with weepholes shall have horizontal and vertical wingwall drainage as shown. Strip drains will be used. See KDOT Specifications for "Abutment Strip Drains" 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.*

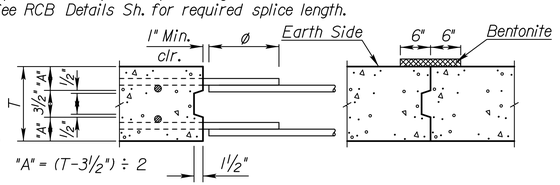
Wingwall Foundation Stabilization:

Use Type I bedding on all wingwalls unless founded on rock or granular material. The depth may be increased by the Engineer.

✡ *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.*



PARTIAL SECTION RCB

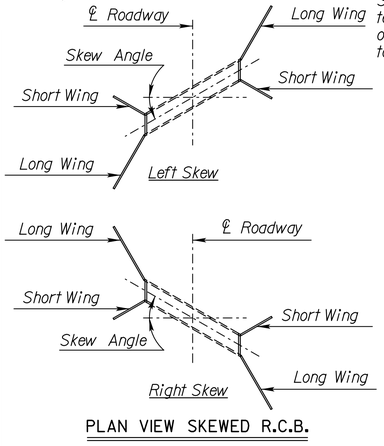


VERTICAL CONSTRUCTION JOINTS

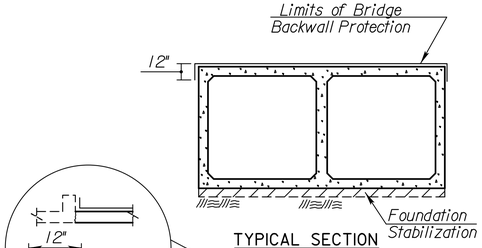
NOTE: Vertical construction joints shall be perpendicular to the longitudinal axis of the RCB and shall be placed at any location as needed for construction and as approved by the Engineer.

NOTE: Horizontal construction joints shall be a roughened finish.

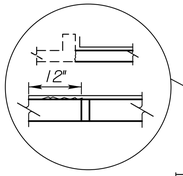
NOTE: Barrel Construction Joints located in a median with less than 5 ft. of fill or at locations specified by the Engineer, shall be protected by a bentonite based system as shown. Place the bentonite on the exterior walls and top slab. See requirements for bentonite in the KDOT Specifications for "Bridge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

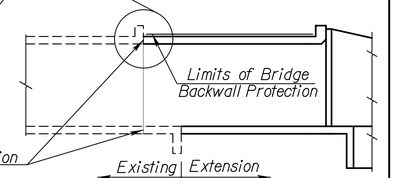


PLAN VIEW SKEWED R.C.B.



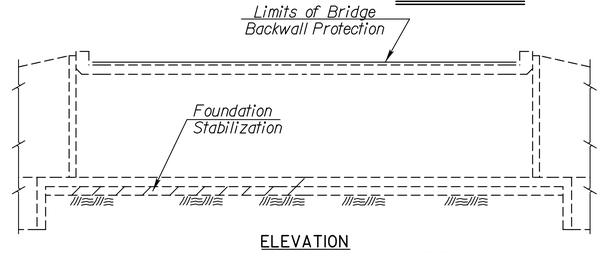
TYPICAL SECTION





⊗ See "Typical Culvert Extension" RD080 for additional information.

⊗ BOX EXTENSION



ELEVATION (New Construction)

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 and Elevation 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-2, SCA-3 or SCA-5.*
4. *Consolidate Granular Backfill using hand equipment only. Avoid over consolidation.*
5. *Use filter fabric complying with Section 1710. Filter Fabric is subsidiary to "Granular Backfill". Use only within the limits of 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.*

GENERAL NOTES

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.*

NO.	DATE	REVISIONS	BY	APP'D
7	10/11/13	Granular Backfill Limits	JPJ	LRR
6	10/11/12	Added Weep Hole Note	JPJ	TLF
5	8/2/12	Modified Backwall Notes	JPJ	TLF
4	3/7/12	Added Filter Fabric to Detail	JPJ	TLF
3	12/15/11	Added Bridge Backwall Protection	JPJ	TLF
2	3/3/10	Modified Backfill Details	JPJ	TLF
1	7/14/08	Change Type 'C' Compaction to 'B'	JPJ	KFH

KANSAS DEPARTMENT OF TRANSPORTATION

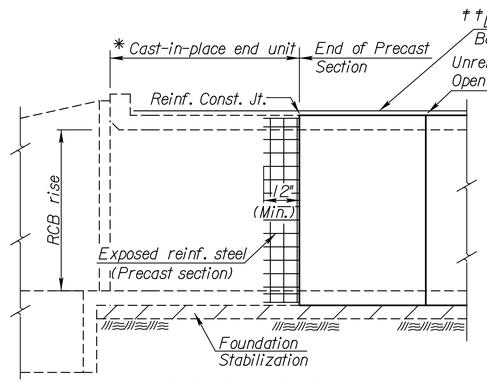
RCB AUXILIARY DETAILS (LRFD)

~~BR020B~~

FHWA APPROVAL		4/17/10	APP'D	TERRY L. FLECK	
DESIGNED	JPJ	DETAILED	RAA	QUANTITIES	CADD RAA
DESIGN CK.	JSR	DETAIL CK.	JPJ	QUAN.CK.	CADD CK. JPJ

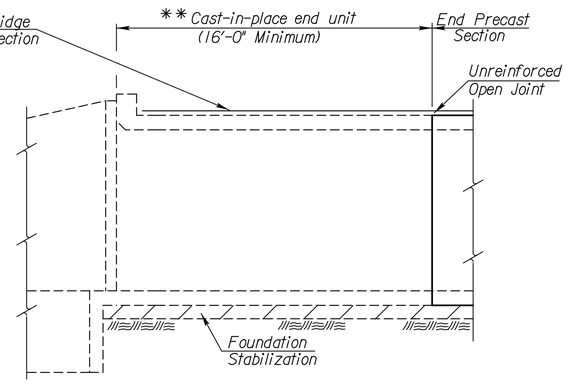
Std. Base File: br020.dgn
Plotted By: ROAD
File: G:\WI13\0022\Road\br020b.dgn
Plot Date: 9/3/2014
Plot Location:

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	87 N-0609-01	2014	18	52



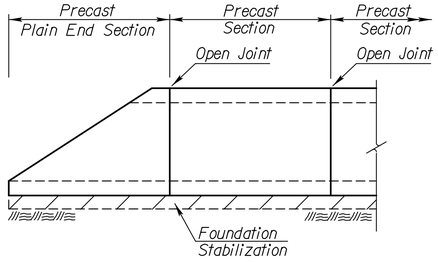
ELEVATION AT HEADWALL

* Minimum barrel length of cast-in-place end unit shall equal the RCB rise or 8'-0", whichever is less. This length can be used when the joint between the cast-in-place end unit and the pre-cast section is reinforced as shown.



ELEVATION AT HEADWALL

** Minimum barrel length of cast-in-place end unit shall be 16'-0" when using an unreinforced open joint at the end of the precast section.



ELEVATION AT PRECAST END SECTION

(Precast End Sections are permitted where straight wings are shown in the plans or at the downstream end for single cell RCB with a rise of six feet or less.)

NOTE: See "Bridge Excavation" sheet, (Std. No. BR100), for excavation details and basis of payment.

NOTE: Minimum length of precast section shall be 4'-0".

NOTE: A single cell box of equivalent area may be substituted for a double cell box with cell spans less than or equal to 6'-0". Any revision in the cell height from that shown on the plans will not be permitted, unless approved by the Engineer. Two single cell boxes may be substituted for a double cell box, when approved by the Engineer.

NOTE: See respective RCB Standard Sheets for cast-in-place details.

NOTE: When the fill height is 2'-0" or less "Bridge Backwall Protection" is required.

GENERAL NOTES

(All Items on this sheet are subsidiary)

PRECAST BOX CULVERTS: If precast boxes are specified, construct them at the locations shown in the plans and according to the requirement shown on this sheet. When approved by the Engineer, precast box culverts may be used in lieu of cast-in-place box culverts. If the Contractor chooses the precast option, use the cast-in-place quantities as the cost basis. This cost includes all labor equipment, material and incidentals necessary to complete the installation.

Unless otherwise approved by the Engineer, use cast-in-place collars at horizontal and vertical changes in RCB alignment. Use cast-in-place end sections and wingwalls except as noted on this sheet. The Engineer may require cast-in-place sections at junctions of drainage structures.

Cast-in-place concrete work shall conform to the requirements of the KDOT Specifications and KDOT's "Guidelines for Structural Design and Detail of Reinforced Concrete Box Culverts". Use Grade 4.0 concrete and Grade 60 reinforcing steel conforming to ASTM A615 for cast-in-place construction.

Cast-in-place box sections shall have member thicknesses and reinforcement not less than the RCB Standard from the original design. Connections between the cast-in-place and precast members shall be drilled and grouted according to details shown on this sheet. When the wall thicknesses differ between the cast-in-place and precast, transition at a 4:1 without reducing the box opening size. See KDOT Specifications for further requirements.

SPECIFICATIONS: Single-cell Precast Concrete Box Culverts shall conform to the requirements of the following specifications except as noted in the KDOT Specifications. Design multiple-cell precast boxes in accordance with the criteria used to develop the single-cell precast boxes. (See Appendix of ASTM Specification C 1577-08, Table 2 and the latest AASHTO LRFD Specifications.)

DISTRIBUTION SLAB: Fill heights less than 2 feet require a distribution slab. Construct the distribution slab over the width of the exterior walls of the barrel to the outside edges of the roadway shoulders. Terminate the slab a minimum of 2 feet from the edge of a barrel segment.

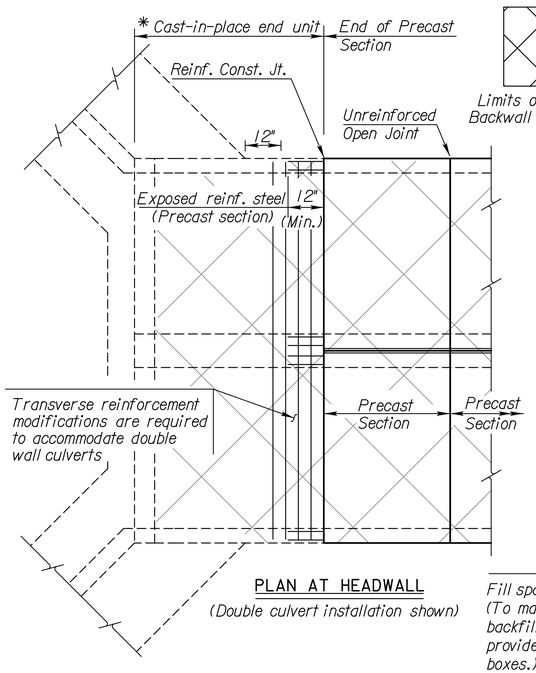
If the fill height is less than or equal to one foot then:

A distribution slab shall be a minimum of 6 inches thick, reinforced with #4 bars spaced at 18 inches, placed perpendicular to centerline of the box and with #5 bars spaced at 12 inches, placed parallel to centerline of the box. Substitution of an equivalent welded wire fabric is acceptable. Place a min. of 3" of granular material between the box and slab.

If the fill height is greater than one foot then:
(Use one of the following options)

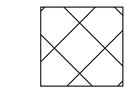
1) Use the cast-in-place criteria above.
2) Use precast distribution slabs with same criteria as the cast-in-place above. Center the joints in slabs over the box segments. Provide a minimum of 3 inches of granular material between the box and the slabs.
3) Reinforced concrete pavement (min. 6 inches thick) will meet the requirements of a distribution slab. Reinforce as noted above. Provide a minimum of 3 inches of granular material between the concrete pavement and the precast boxes.
4) Asphalt pavement (min. 6 inches thick) will meet the requirements of a distribution slab. Provide a minimum of 6 inches of granular material between the asphalt and the precast boxes. Also provide geogrid with 4" of cover to the asphalt within the granular material.

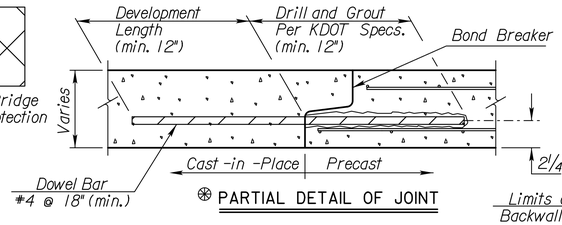
A special design will be required when the above options are not geometrically possible.



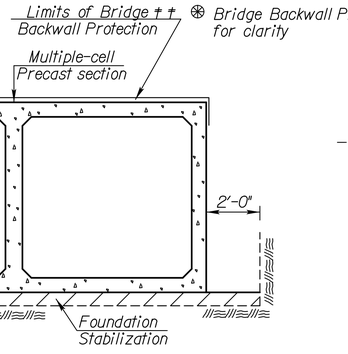
PLAN AT HEADWALL

(Double culvert installation shown)





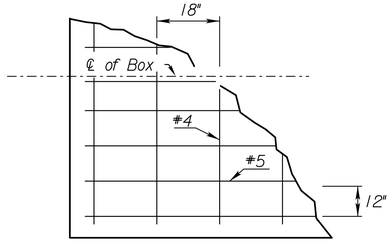
⊛ PARTIAL DETAIL OF JOINT



TYPICAL INSTALLATION DETAILS

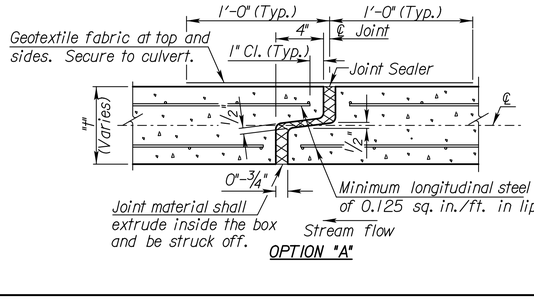
Fill space between boxes with grout. (To maintain proper joint gap, partially backfill boxes prior to grouting or provide a mechanical connection between boxes.)

⊛ Bridge Backwall Protection not shown for clarity

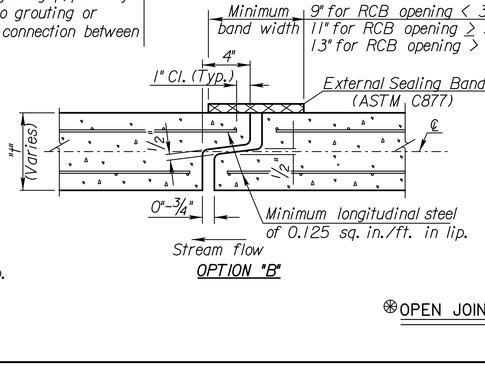


CAST IN PLACE DISTRIBUTION SLAB

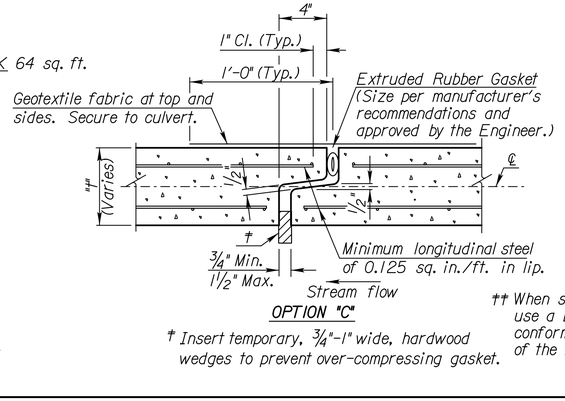
(Partial plan of reinforcement)



OPTION "A"



OPTION "B"



OPTION "C"

† Insert temporary, 3/4"-1" wide, hardwood wedges to prevent over-compressing gasket.

⊛ OPEN JOINT DETAIL

†† When shown on the shop details use a Bridge Backwall Protection conforming to Section 1700 of the KDOT Specifications.

NO.	DATE	REVISIONS	BY	APP'D
5	08-19-13	Edit Geogrid Placement	JPJ	TLF
4	07-28-11	Added Bridge Backwall Protection	JPJ	KFH
3	03-10-10	Clarification of Extension	JPJ	KFH
2	12-03-09	Revised ASTM / Added Note	JPJ	LRR
1	4-07-09	Clarified Distribution Slab	RAM	KFH

KANSAS DEPARTMENT OF TRANSPORTATION

PRECAST CONCRETE BOX CULVERT DETAILS

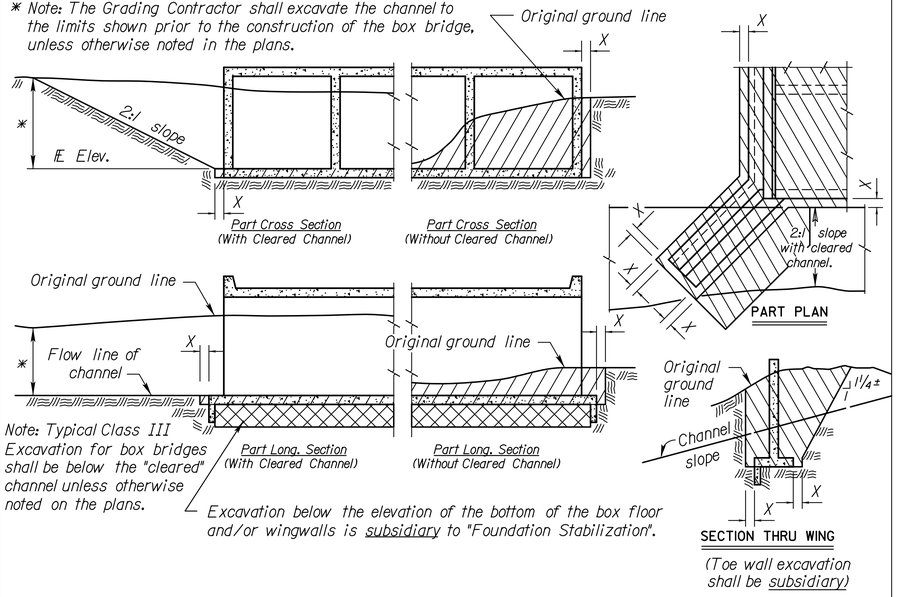
BR031

FHWA APPROVAL		9-20-11	APP'D	KENNETH F. HURST	
DESIGNED	DETAILED	PF	QUANTITIES	CADD	
DESIGN CK.	DETAIL CK.	RAM	QUAN.CK.	CADD CK.	

Std. Base File: br031.dgn
Plotted By: ROAD
File: G:\WII\3\0022\Road\br031.dgn
Plot Date: 9/3/2014
Plot Location:

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	87 N-0609-01	2014	19	52

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

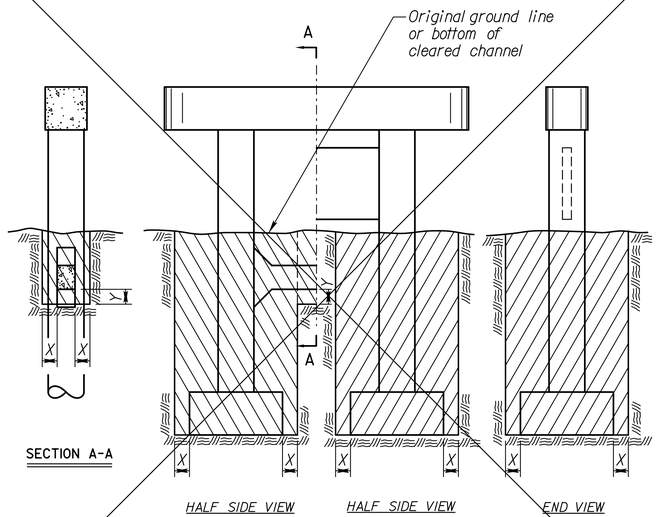


Note: Typical Class III Excavation for box bridges shall be below the "cleared" channel unless otherwise noted on the plans.

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

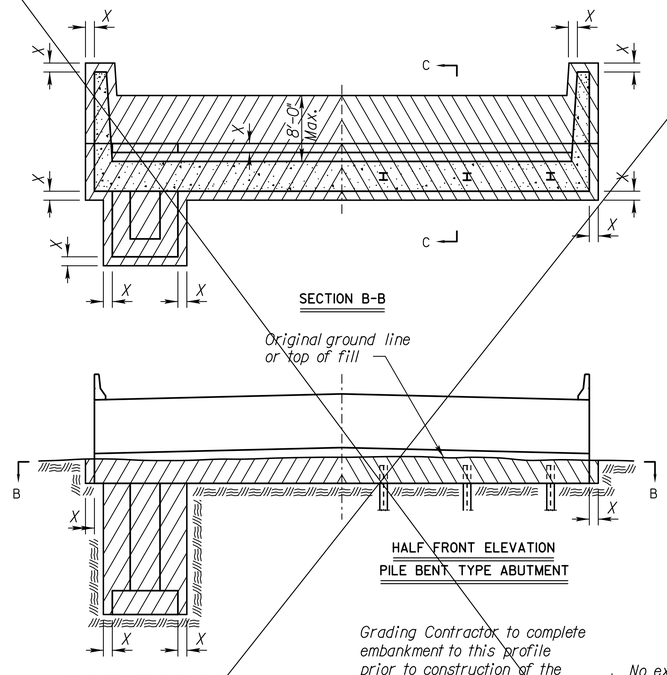
EXCAVATION DETAILS FOR REINFORCED CONCRETE BOX CULVERT

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 TYPICAL PIERS

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

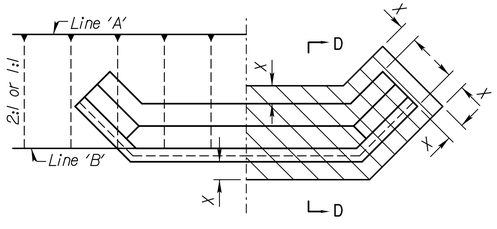


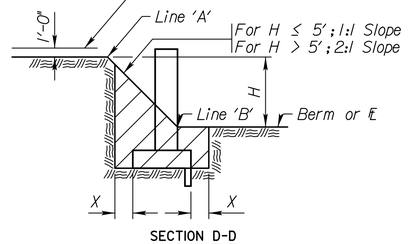
Note: Bridge Contractor shall finish the embankment and berms after the construction of the abutment and dispose of any excess material as approved by the Engineer.

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

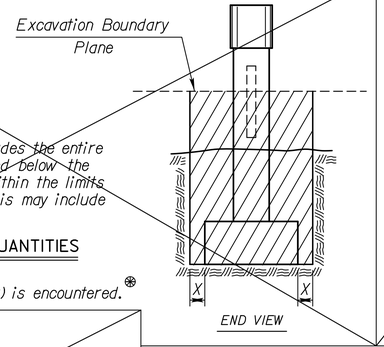
EXCAVATION DETAILS FOR TYPICAL ABUTMENTS

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





EXCAVATION DETAILS FOR ABUTMENTS WITH FLARED WINGWALLS



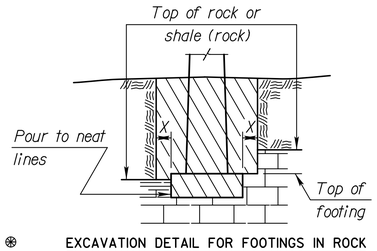
Note: Class II Excavation includes the entire volume of whatever nature found below the "Excavation Boundary Plane", within the limits specified for measurement. This may include water or air.

CLASS II EXCAVATION QUANTITIES

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

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.

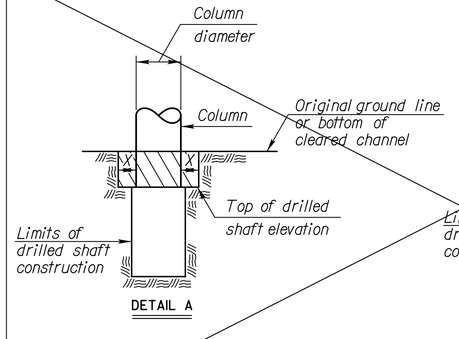
Sides of trenches in hard or compacted soil including embankments shall be shored, sheeted, braced or otherwise supported when the trench is more than 5 feet in depth and 8 feet or more in length. In lieu of the shoring, the sides of the trench above the 5 foot level may be sloped to preclude collapse. 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)

(Piers and Abutments)

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.



DRILLED SHAFT DETAILS

Note: Whenever the limits of the drilled shaft construction are greater than the Column Diameter + 2X, the limits of Class I, II or III Excavation shall be the limits of the drilled shaft construction. (See Detail B)

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.

NO.	DATE	REVISIONS	BY	APP'D
7				
6	8-15-12	Embeddement Excavation Subsidiary	JPJ	TLF
5	5-15-12	Revised Wing Excavation	JPJ	TLF
4	3-3-10	Revised Wing Excavation	JPJ	TLF
3	10-16-06	Revised 'Foundation Stab.' Note	JPJ	KFH
2	10-19-04	Concrete - Class to Grade	RAM	KFH
1	4-10-02	Added 'Foundation Stab.' Note	RAM	KFH

KANSAS DEPARTMENT OF TRANSPORTATION

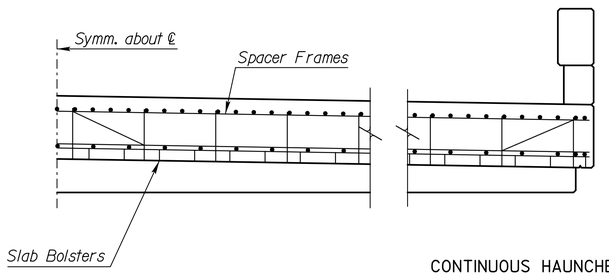
BRIDGE EXCAVATION (LRFD)

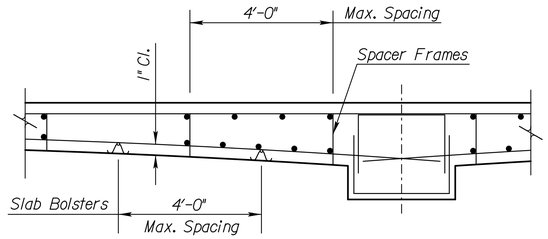
~~BRIOOB~~

FHWA APPROVAL		4/17/10	APP'D		TERRY L. FLECK
DESIGNED	DETAILED	RDR	QUANTITIES		CADD
DESIGN CK.	DETAIL CK.	LRR	QUAN.CK.		CADD CK.

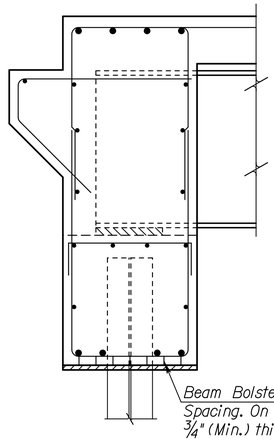
Std. Base File: br100.dgn
Plotted By: ROAD
Plot Location:
File: G:\WI\3\0022\Road\br100b.dgn
Plot Date: 9/3/2014

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	87 N-0609-01	2014	20	52



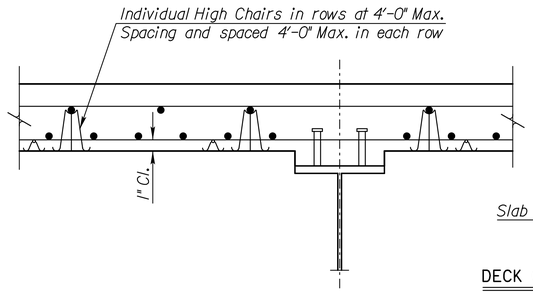


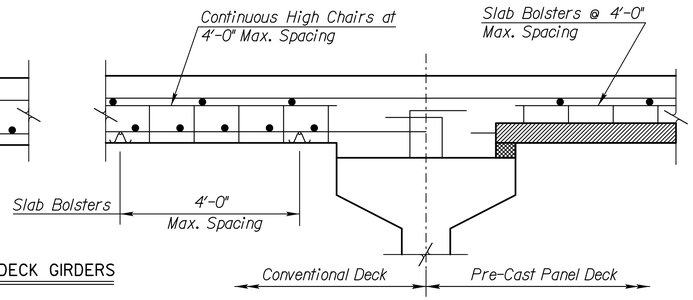
CONTINUOUS HAUNCHED SLAB



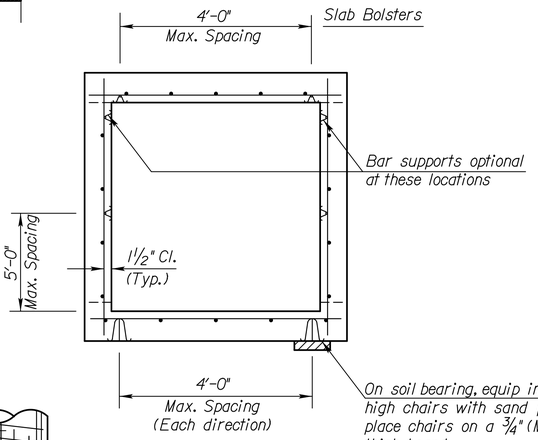
Beam Bolster at 4'-0" Max. Spacing. On soil bearing, place a 3/4" (Min.) thick board under bolster.

ABUTMENT

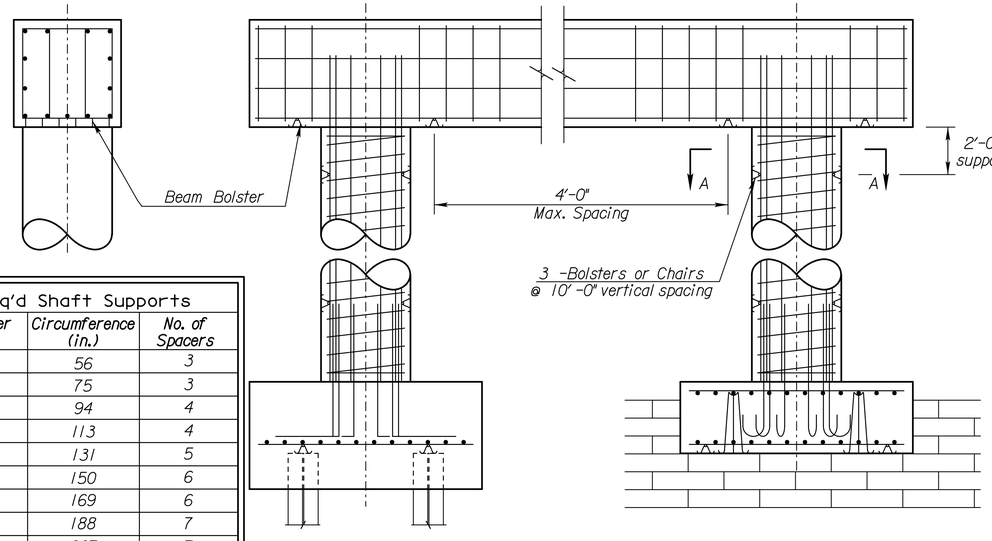




DECK GIRDERS

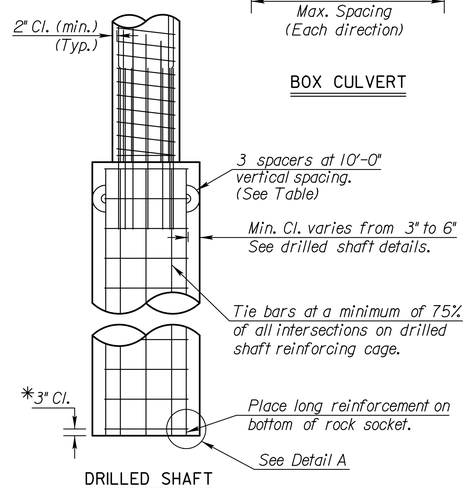


BOX CULVERT

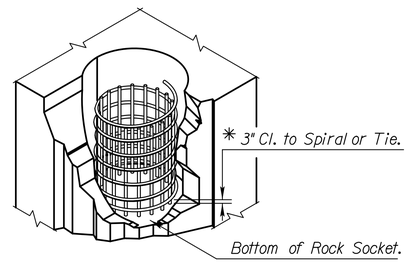


PIER

Req'd Shaft Supports		
Diameter (in.)	Circumference (in.)	No. of Spacers
18	56	3
24	75	3
30	94	4
36	113	4
42	131	5
48	150	6
54	169	6
60	188	7
66	207	7
72	226	8
78	244	9
84	263	9
90	282	10
96	301	11
102	320	11
108	339	12

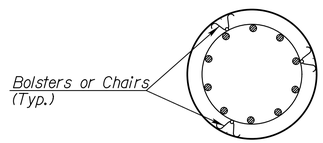


DRILLED SHAFT



DETAIL A

* Note: Longitudinal reinforcing steel is placed on the bottom of the rock socket. Maintain 3" clearance from the bottom of rock socket to the first spiral or tie bar.



SECTION A-A

GENERAL NOTES

Reference is made to the latest edition of the CRSI "Manual of Standard Practice" for recommended industry practices concerning reinforcing steel.

Use only the following types of bar supports:

1) Wire Bar Supports:

a) Epoxy coated reinforcing: Class 1 Protection
b) Non-epoxy coated reinforcing: Class 1, 2, or 3 Protection

2) Plastic Bar Supports

3) Supplementary bars

When securing epoxy coated reinforcement, use tie wires or metal clips that are epoxy or plastic coated.

Do not weld reinforcing steel to bar supports or to other reinforcing steel. Shop weld spacer frames for haunched slabs.

Tie bars at all intersections around the perimeter of each mat and at not less than 2'-0" centers or at every intersection, whichever is greater.

Where more than one length of bar support is required, lap the end legs so they are locked or tied together.

Use proper height supports to maintain the distance between the reinforcing and the formed surface or the top surface of deck slabs within 1/4" of that indicated on the plans.

Spacings shown are maximums. Use sufficient supports, as determined by the Engineer, to retain the reinforcing steel in position.

Construct any platforms, required for the support of workers and/or equipment during concrete placement, directly on the forms and not on the reinforcing steel.

Designs and arrangements of Supports or Spacers other than as shown on this sheet, may be used with the permission of the Engineer.

NO.	DATE	REVISIONS	BY	APP'D
5	11-10-10	Column Bar Supports Req'd	JPJ	TLF
4	12-01-05	Drilled Shaft Spiral Steel Placement	JPJ	KFH
3	8-21-00	Added Pre-Cast Panel Detail	RAM	KFH
2	12-20-99	Added Haunched Slab Bolsters	RAM	KFH
1	12-09-99	Revised Drilled Shaft Clearance	RAM	KFH

KANSAS DEPARTMENT OF TRANSPORTATION

SUPPORTS AND SPACERS FOR REINFORCING STEEL

BRI20

FHWA APPROVAL		11-17-10	APP'D	Terry L. Fleck	
DESIGNED	RAM	DETAILED	RAA	QUANTITIES	CADD RAA
DESIGN CK.	LRR	DETAIL CK.	RAM	QUAN.CK.	CADD CK. RAM

Std. Base File: bri20.dgn
Plotted By: ROAD
File: G:\W\13\0022\Road\bri20.dgn
Plot Date: 9/3/2014
Plot Location:

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	87 N-0609-01	2014	21	52

EARTHWORK

STATION to STATION	EXCAVATION				CONTR. FURN.	COMPACTION			THROUGH CUTS NOT SUBGRADED			✳EMBANKMENT (CU.YDS.)		⚠PLACE. SELECT SOIL
	COMMON		✳ ROCK			FILL COMPACTED	TYPE B MR-	TOPSOIL	COMM.	TYPE AA		INITIAL	SETTLE-	
	CU.YDS.	VMF	CU.YDS.	VMF	CU.YDS.	(95% DENSITY)	CU.YDS.	CU.YDS.	CU.YDS.	CU.YDS.		CONSOL.	MENT	CU.YDS.
345+70.93 to 37+22.74	*127*	*0.8*	*55*	*1.0*	*31*	*127*								
TOTALS	127	0.8	55	1.0	31	127								

✳*For information only. Pavement removal will be paid for under the bid item "Pavement Removal" and will be paid for by the Sq. Yd.*

RECAPITULATION OF BRIDGE QUANTITIES

BRIDGE NUMBER	QUANTITY	SEE SHEET NO.
Removal of Existing Structures	*1*	*5*
Class III Excavation	*120*	*15*
Concrete (Grade 4.0)	*39*	*15*
Concrete (Grade 4.0)(AE)	*43*	*15*
Reinforcing Steel (Grade 60)	*1227*	*15*
Reinforcing Steel (Grade 60)(Epoxy Coated)	*19865*	*15*
Granular Backfill (Wingwalls)	*24*	*15*
Bridge Backwall Protection System	*107*	*15*

RECAPITULATION OF ROAD QUANTITIES

ITEM	QUANTITY	UNIT
Mobilization	*1*	*LSUM*
Mobilization (DBE)	*1*	*LSUM*
Site Clearing & Restoration	*1*	*LSUM*
Excavation	*127*	*C.Y.*
Pavement Removal	*300*	*S.Y.*
Fill, Compaceted (95% Density)	*127*	*C.Y.*
Borrow Excavation, (Contractor Furnished)	*31*	*C.Y.*
AC Surface Course (BM-2, PG 70-28) 2"	*345*	*S.Y.*
AC Base Course (BM-2, PG 64-22) 5"	*345*	*S.Y.*
Reinforced Crushed Rock Base (6")	*446*	*S.Y.*
AB-3 Rock Shoulder (3')	*304*	*L.F.*
Gravel Drive Removed and Replaced	*78*	*L.F.*
SWS Pipe, RCP 18"	*47*	*L.F.*
SWS Pipe, HERCP (14"x23") (18) w/ End Sections	*167*	*L.F.*
Fill, Sand (Flushed & Vibrated)	*47*	*L.F.*
MH, Standard	*2*	*EA.*
BMP, Erosion Control Mat	*290*	*S.Y.*
BMP, Silt Fence	*500*	*L.F.*
Seeding	*1*	*LSUM*
Object Marker (Type III)	*4*	*EA.*

For Pavement Marking Quantities see sheet 28
For Traffic Control Quantities see sheet 47

NO.	DATE	REVISIONS	BY	APP'D
2	1-14-08	Rem. Drainage Structure summary	S.W.K.	J.O.B.
1	1-9-91	Detailed on CADD	R.J.S	J.O.B.

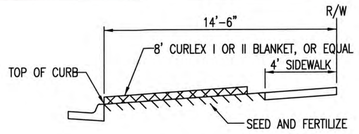
KANSAS DEPARTMENT OF TRANSPORTATION

SUMMARY OF QUANTITIES

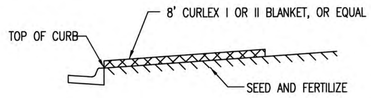
RD050

FHWA APPROVAL	5-28-08	APP'D. James O. Brewer	
DESIGNED	DETAILED	QUANTITIES	TRACED B.N.B.
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK. S.W.K.

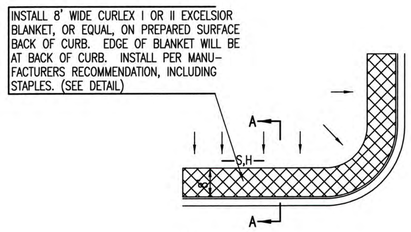
Drawn By : ROAD Plotted : 9/3/2014
File : G:\W13\0022\Road\rd050.dgn



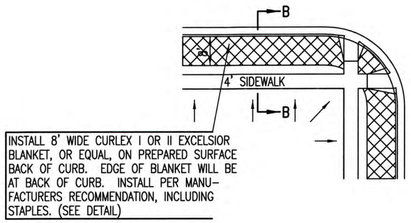
SECTION B–B



SECTION A–A



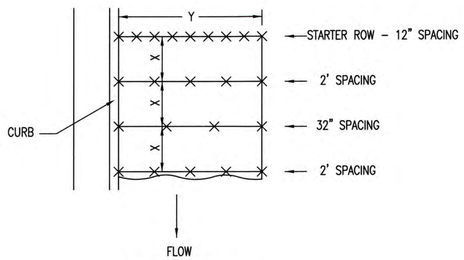
SOUTH STREET

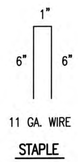


GENERAL NOTES

1. EXCELSIOR MAT TO BE INSTALLED WHEN SOD IS NOT SPECIFIED ON PROJECT.
2. EXCELSIOR BLANKET TO BE INSTALLED OVER SEED AND FERTILIZER, AS SPECIFIED IN THE PROJECT SPECIFICATIONS.
3. AFTER INSTALLATION OF EXCELSIOR BLANKET, AT LOCATIONS WHERE CONCENTRATED FLOW CARRIES SEDIMENT OVER THE CURB AND INTO THE GUTTER, SUPPLEMENTAL EROSION CONTROL DEVICES WILL BE INSTALLED BY THE CONTRACTOR AS NEEDED, TO FIX THE PROBLEM.

BACK OF CURB PROTECTION DETAIL



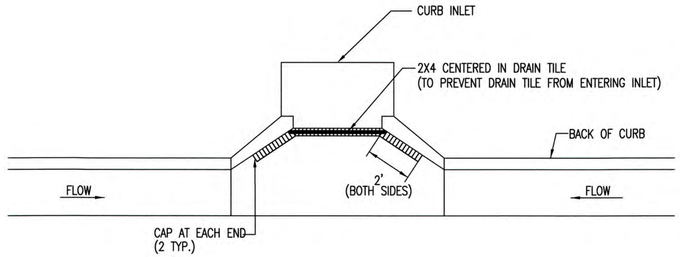


STAPLE

STAPLE PATTERN

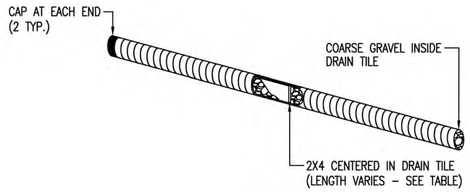
NOTES: USE 6" SEAM OVERLAP
(X & Y = RECOMMENDED BY MANUFACTURE)

DETAILS FOR APPROVED EROSION CONTROL MAT

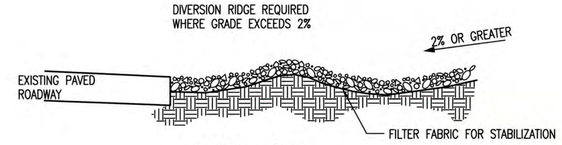


NOTE:
PLACE 4" PERFORATED PVC PIPE, FILLED WITH 1/2"–1" DIA. GRAVEL, IN FRONT OF CURB INLET AS SHOWN.

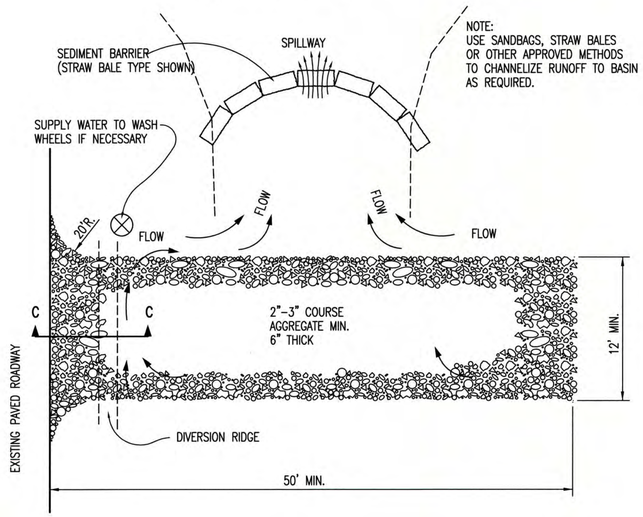
2X4 LENGTH	INLET TYPE	INLET OPENING
5'–6"	1–A	5'–0"
10'–6"	1–A	10'–0"
15'–6"	1–A	15'–0"



CURB INLET PROTECTION
4" PERFORATED PIPE W/ GRAVEL



SECTION C–C



STABILIZED CONSTRUCTION ENTRANCE

GENERAL NOTES

1. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE TOP DRESSING, REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT.
2. WHEN NECESSARY, WHEELS SHALL BE CLEANED PRIOR TO ENTRANCE ONTO PUBLIC RIGHT-OF-WAY.
3. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN, AS SHOWN ABOVE.
4. DRIVE ENTRANCES ONTO RESIDENTIAL LOTS WILL NOT BE REQUIRED TO HAVE THE SEDIMENT BARRIER SHOWN, BUT WHEEL WASHING MAY BE REQUIRED IF STABILIZED ENTRANCE IS NOT SUFFICIENT TO KEEP MUD FROM BEING TRACKED ONTO ADJACENT STREET. ENTRANCE SHALL EXTEND FROM BACK OF CURB TO DWELLING.

REVISION DATE: MAY 2013

GARY L. JANZEN LICENSED PROFESSIONAL ENGINEER 16224 KANSAS
05/30/13

CITY OF WICHITA
PUBLIC WORKS & UTILITIES
ENGINEERING DIVISION

BACK OF CURB PROTECTION, CURB INLET PROTECTION AND CONSTRUCTION ENTRANCE

CITY ENGINEER
GARY JANZEN, P.E.

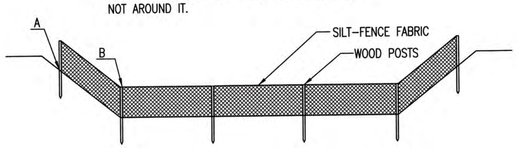
PROJECT NUMBER	OCA NUMBER	DATE
472-85116	715729	08/07/2014

CITY ENGINEER'S OFFICE
CITY HALL - SEVENTH FLOOR
455 NORTH MAIN STREET
WICHITA, KANSAS 67202-1620
(316) 268-4501

SHEET
22 of 52

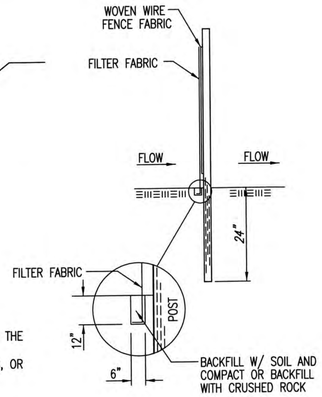
SW-501

NOTE: POINT A MUST BE HIGHER THAN POINT B SO THAT WATER FLOWS OVER THE SILT FENCE FABRIC AND NOT AROUND IT.



ELEVATION

SILT FENCE DITCH CHECKS
(STREAM PROTECTION)



ANCHOR TRENCH DETAIL

MATERIAL SPECIFICATION:

SILT FENCE FABRIC SHOULD CONFORM TO THE AASHTO M288 96 SILT FENCE SPECIFICATION.
THE POSTS USED TO SUPPORT THE SILT FENCE FABRIC SHOULD BE A HARDWOOD MATERIAL WITH THE FOLLOWING MINIMUM DIMENSIONS: 2" SQUARE (NOMINAL) BY 4' LONG.
SILT FENCE FABRIC SHOULD BE ATTACHED TO THE WOODEN POSTS WITH STAPLES, WIRE, ZIP TIES, OR NAILS.

PLACEMENT:

PLACE SILT FENCE IN DITCHES WHERE IT IS UNLIKELY THAT IT WILL BE OVERTOPPED.
WATER SHOULD FLOW THROUGH A SILT FENCE DITCH CHECK, NOT OVER IT. SILT FENCE DITCH CHECKS OFTEN FAIL WHEN OVERTOPPED.
SILT FENCE DITCH CHECKS SHOULD BE PLACED PERPENDICULAR TO THE FLOWLINE OF THE DITCH.
THE SILT FENCE SHOULD EXTEND FAR ENOUGH SO THAT THE GROUND LEVEL AT THE ENDS OF THE FENCE IS HIGHER THAN THE TOP OF THE LOW POINT OF THE FENCE. THIS PREVENTS WATER FROM FLOWING AROUND THE CHECK.
SILT FENCE DITCH CHECKS SHOULD NOT BE PLACED IN DITCHES WHERE HIGH FLOWS ARE EXPECTED. ROCK CHECKS SHOULD BE USED INSTEAD.
SILT FENCE SHOULD BE PLACED IN DITCHES WITH SLOPES OF 6% OR LESS. FOR SLOPES STEEPER THAN 6%, ROCK CHECKS SHOULD BE USED.

THE FOLLOWING TABLE PROVIDES CHECK SPACING FOR A GIVEN DITCH GRADE:

DITCH CHECK DITCH GRADE (%)	SPACING CHECK SPACING (FEET)
0.5	200
1.0	200
2.0	100
3.0	65
4.0	50
5.0	40
6.0	30

PROPER INSTALLATION METHOD:

EXCAVATE A TRENCH PERPENDICULAR TO THE DITCH FLOWLINE THAT IS AT LEAST 12" DEEP BY 6" WIDE.
EXTEND THE TRENCH IN A STRAIGHT LINE ALONG THE ENTIRE LENGTH OF THE PROPOSED DITCH CHECK.
PLACE THE SOIL ON THE UPSTREAM SIDE OF THE TRENCH FOR LATER USE.
ROLL OUT A CONTINUOUS LENGTH OF SILT FENCE FABRIC ON THE DOWNSTREAM SIDE OF THE TRENCH.
PLACE THE EDGE OF THE FABRIC IN THE TRENCH STARTING AT THE TOP UPSTREAM EDGE OF THE TRENCH.
LINE TWO SIDES OF THE TRENCH WITH THE FABRIC AS SHOWN ON DETAIL. BACKFILL OVER THE FABRIC IN THE TRENCH WITH THE EXCAVATED SOIL AND COMPACT. AFTER FILLING THE TRENCH, APPROXIMATELY 24" TO 36" OF SILT FENCE FABRIC SHOULD REMAIN EXPOSED.
LAY THE EXPOSED SILT FENCE ON THE UPSTREAM SIDE OF THE TRENCH TO CLEAR AN AREA FOR DRIVING IN THE POSTS. JUST DOWNSTREAM OF THE TRENCH, DRIVE POSTS INTO THE GROUND TO A DEPTH OF AT LEAST 24". PLACE POSTS NO MORE THAN 4' APART.
ATTACH THE SILT FENCE TO THE ANCHORED POST WITH STAPLES, WIRE, ZIP TIES, OR NAILS.

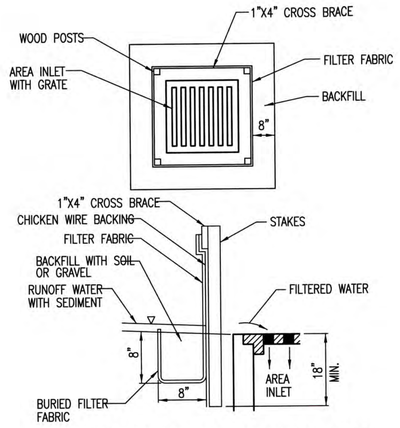
LIST OF COMMON PLACEMENT/INSTALLATION MISTAKES TO AVOID:

WATER SHOULD FLOW THROUGH A SILT FENCE DITCH CHECK–NOT OVER IT. PLACE SILT FENCE IN DITCHES WHERE IT IS UNLIKELY THAT IT WILL BE OVERTOPPED. SILT FENCE INSTALLATIONS QUICKLY DETERIORATE WHEN WATER OVERTOPS THEM.
DO NOT PLACE SILT FENCE POSTS ON THE UPSTREAM SIDE OF THE SILT FENCE FABRIC. IN THIS CONFIGURATION, THE FORCE OF THE WATER IS NOT RESTRICTED BY THE POSTS, BUT ONLY BY THE STAPLES (WIRE, ZIP TIES, NAILS, ETC.). THE SILT FENCE WILL RIP AND FAIL.
DO NOT PLACE A SILT FENCE DITCH CHECK DIRECTLY IN FRONT OF A CULVERT OUTLET. IT WILL NOT STAND UP TO THE CONCENTRATED FLOW.
DO NOT PLACE SILT FENCE DITCH CHECKS IN DITCHES THAT WILL LIKELY EXPERIENCE HIGH FLOWS. THEY WILL NOT STAND UP TO CONCENTRATED FLOW.
FOLLOW PRESCRIBED DITCH CHECK SPACING GUIDELINES. IF SPACING GUIDELINES ARE EXCEEDED, EROSION WILL OCCUR BETWEEN THE DITCH CHECKS.
DO NOT ALLOW WATER TO FLOW AROUND THE DITCH CHECK. MAKE SURE THAT THE DITCH CHECK IS LONG ENOUGH SO THAT THE GROUND LEVEL AT THE ENDS OF THE FENCE IS HIGHER THAN THE LOW POINT ON THE TOP OF THE FENCE.
DO NOT PLACE SILT FENCE DITCH CHECKS IN CHANNELS WITH SHALLOW SOILS UNDERLAIN BY ROCK. IF THE CHECK IS NOT ANCHORED SUFFICIENTLY, IT WILL WASH OUT.

INSPECTION AND MAINTENANCE:

SILT FENCE DITCH CHECKS SHOULD BE INSPECTED EVERY 7 DAYS AND WITHIN 24 HOURS OF A RAINFALL OF 1/2" OR MORE. THE FOLLOWING IS A LIST OF QUESTIONS THAT SHOULD BE ADDRESSED DURING EACH INSPECTION:

DOES WATER FLOW AROUND THE DITCH CHECK?
DOES WATER FLOW UNDER THE DITCH CHECK?
DOES THE SILT FENCE SAG EXCESSIVELY?
HAS THE SILT FENCE TORN OR BECOME DETACHED FROM THE POSTS?
DOES SEDIMENT NEED TO BE REMOVED FROM BEHIND THE DITCH CHECK?



SILT FENCE BARRIERS FOR AREA INLETS
(INLET PROTECTION)

MATERIAL SPECIFICATION:

SILT FENCE FABRIC SHOULD CONFORM TO THE AASHTO M288 96 SILT FENCE SPECIFICATION.
THE WIRE OR POLYMERIC MESH BACKING USED TO HELP SUPPORT THE SILT FENCE FABRIC SHOULD CONFORM TO THE AASHTO M288 96 SILT FENCE SPECIFICATION.
THE POSTS USED TO SUPPORT THE SILT FENCE FABRIC SHOULD BE A HARDWOOD MATERIAL WITH THE FOLLOWING MINIMUM DIMENSIONS: 2" SQUARE (NOMINAL) BY 4' LONG.
THE MATERIAL USED TO FRAME THE TOPS OF THE POSTS SHOULD BE 1" BY 4" BOARDS.
SILT FENCE FABRIC AND SUPPORT BACKING SHOULD BE ATTACHED TO THE WOODEN POSTS AND FRAME WITH STAPLES, WIRE, ZIP TIES, OR NAILS.

PLACEMENT:

PLACE A SILT FENCE DROP INLET BARRIER IN A LOCATION WHERE IT IS UNLIKELY TO BE OVERTOPPED.
WATER SHOULD FLOW THROUGH SILT FENCE, NOT OVER IT. SILT FENCE BARRIERS FOR AREA INLETS OFTEN FAIL WHEN REPEATEDLY OVERTOPPED.
WHEN USED AS A BARRIER FOR AREA INLETS, SILT FENCE FABRIC AND POSTS MUST BE SUPPORTED AT THE TOP BY A WOODEN FRAME.
WHEN A SILT FENCE BARRIER FOR AREA INLETS IS LOCATED NEAR AN INLET THAT HAS STEEP APPROACH SLOPES, THE STORAGE CAPACITY BEHIND THE BARRIER IS DRASTICALLY REDUCED. TIMELY REMOVAL OF SEDIMENT MUST OCCUR FOR A BARRIER TO OPERATE PROPERLY IN THIS LOCATION.

PROPER INSTALLATION METHOD:

EXCAVATE A TRENCH AROUND THE PERIMETER OF THE AREA INLET THAT IS AT LEAST 8" DEEP BY 8" WIDE.
DRIVE POSTS TO A DEPTH OF AT LEAST 18" AROUND THE PERIMETER OF THE AREA INLET.
THE DISTANCE BETWEEN POSTS SHOULD BE 4' OR LESS. IF THE DISTANCE BETWEEN TWO ADJACENT CORNER POSTS IS MORE THAN 4', ADD ANOTHER POST(S) BETWEEN THEM.
CONNECT THE TOPS OF ALL THE POSTS WITH A WOODEN FRAME MADE OF 1" BY 4" BOARDS. USE NAILS OR SCREWS FOR FASTENING.
ATTACH THE WIRE OR POLYMERIC–MESH BACKING TO THE OUTSIDE OF THE POST/FRAME STRUCTURE WITH STAPLES, WIRE, ZIP TIES, OR NAILS.
ROLL OUT A CONTINUOUS LENGTH OF SILT FENCE FABRIC LONG ENOUGH TO WRAP AROUND THE PERIMETER OF THE AREA INLET. ADD MORE LENGTH FOR OVERLAPPING THE FABRIC JOINT. PLACE THE EDGE OF THE FABRIC IN THE TRENCH, STARTING AT THE OUTSIDE EDGE OF THE TRENCH. LINE ALL THREE SIDES OF THE TRENCH WITH THE FABRIC. BACKFILL OVER THE FABRIC IN THE TRENCH WITH THE EXCAVATED SOIL AND COMPACT. AFTER FILLING THE TRENCH, APPROXIMATELY 24" TO 36" OF SILT FENCE FABRIC SHOULD REMAIN EXPOSED.
ATTACH THE SILT FENCE TO THE OUTSIDE OF THE POST/FRAME STRUCTURE WITH STAPLES, WIRE, ZIP TIES, OR NAILS. THE JOINT SHOULD BE OVERLAPPED TO THE NEXT POST.

NOTE: WHEN A SILT FENCE BARRIER FOR AREA INLET IS PLACED IN A SHALLOW MEDIAN DITCH, MAKE SURE THAT THE TOP OF THE BARRIER IS NOT HIGHER THAN THE PAVED ROAD. IN THIS CONFIGURATION, WATER MAY SPREAD ONTO THE ROADWAY CAUSING A HAZARDOUS CONDITION.

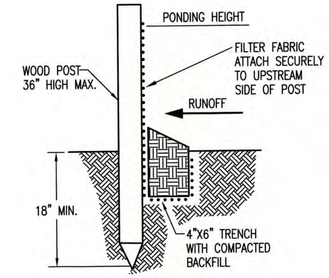
LIST OF COMMON PLACEMENT/INSTALLATION MISTAKES TO AVOID:

WATER SHOULD FLOW THROUGH A SILT FENCE BARRIER FOR AREA INLET–NOT OVER IT. PLACE A SILT FENCE BARRIER FOR AREA INLET IN A LOCATION WHERE IT IS UNLIKELY TO BE OVERTOPPED. SILT FENCE BARRIER FOR AREA INLETS OFTEN FAIL WHEN REPEATEDLY OVERTOPPED.
DO NOT PLACE POSTS ON THE OUTSIDE OF THE SILT FENCE BARRIER FOR AREA INLET. IN THIS CONFIGURATION, THE FORCE OF THE WATER IS NOT RESISTED BY THE POSTS, BUT ONLY BY THE STAPLES (WIRE, ZIP TIES, NAILS, ETC.). THE SILT FENCE WILL RIP AND FAIL.
DO NOT INSTALL SILT FENCE BARRIER FOR AREA INLETS WITHOUT FRAMING THE TOP OF THE POSTS. THE CORNER POSTS AROUND AREA INLETS ARE STRESSED IN TWO DIRECTIONS WHEREAS A NORMAL SILT FENCE IS ONLY STRESSED IN ONE DIRECTION. THIS ADDED STRESS REQUIRES MORE SUPPORT.

INSPECTION AND MAINTENANCE:

SILT FENCE BARRIER FOR AREA INLETS SHOULD BE INSPECTED EVERY 7 DAYS AND WITHIN 24 HOURS OF A RAINFALL OF 1/2" OR MORE. THE FOLLOWING IS A LIST OF QUESTIONS THAT SHOULD BE ADDRESSED DURING EACH INSPECTION:

DOES WATER FLOW UNDER THE SILT FENCE?
DOES THE SILT FENCE SAG EXCESSIVELY?
HAS THE SILT FENCE TORN OR BECOME DETACHED FROM THE POSTS?
DOES SEDIMENT NEED TO BE REMOVED FROM BEHIND THE AREA INLET BARRIER?



SILT FENCE BARRIERS

MATERIAL SPECIFICATION:

SILT FENCE FABRIC SHOULD CONFORM TO THE AASHTO M288 96 SILT FENCE SPECIFICATION.
THE POSTS USED TO SUPPORT THE SILT FENCE FABRIC SHOULD BE A HARDWOOD MATERIAL WITH THE FOLLOWING MINIMUM DIMENSIONS: 2" SQUARE (NOMINAL) BY 4' LONG.
SILT FENCE FABRIC SHOULD BE ATTACHED TO THE WOODEN POSTS WITH STAPLES, WIRE, ZIP TIES, OR NAILS.

PLACEMENT:

A SLOPE BARRIER SHOULD BE USED AT THE TOE OF A SLOPE WHEN A DITCH DOES NOT EXIST. THE SLOPE BARRIER SHOULD BE PLACED ON NEARLY LEVEL GROUND 5' TO 10' AWAY FROM THE TOE OF A SLOPE. THE BARRIER IS PLACED AWAY FROM THE TOE OF THE SLOPE TO PROVIDE ADEQUATE STORAGE FOR SETTLING OUT SEDIMENT.
WHEN PRACTICABLE, SILT FENCE SLOPE BARRIERS SHOULD BE PLACED ALONG CONTOURS TO AVOID A CONCENTRATION OF FLOW.
SILT FENCE SLOPE BARRIERS CAN ALSO BE PLACED ALONG RIGHT–OF–WAY FENCE LINES TO KEEP SEDIMENT FROM CROSSING ONTO ADJACENT PROPERTY. WHEN PLACED IN THIS MANNER, THE SLOPE BARRIER WILL NOT LIKELY FOLLOW CONTOURS.

PROPER INSTALLATION METHOD:

EXCAVATE A TRENCH THE LENGTH OF THE PLANNED SLOPE BARRIER THAT IS 6" DEEP BY 4" WIDE.
MAKE SURE THAT THE TRENCH IS EXCAVATED ALONG A SINGLE CONTOUR. WHEN PRACTICABLE, SLOPE BARRIERS SHOULD BE PLACED ALONG CONTOURS TO AVOID A CONCENTRATION OF FLOW. PLACE THE SOIL ON THE UPSLOPE SIDE OF THE TRENCH FOR LATER USE.
ROLL OUT A CONTINUOUS LENGTH OF SILT FENCE FABRIC ON THE DOWNSLOPE SIDE OF THE TRENCH.
PLACE THE EDGE OF THE FABRIC IN THE TRENCH STARTING AT THE TOP UPSLOPE EDGE. LINE ALL THREE SIDES OF THE TRENCH WITH THE FABRIC. BACKFILL OVER THE FABRIC IN THE TRENCH WITH THE EXCAVATED SOIL AND COMPACT. AFTER FILLING THE TRENCH, APPROXIMATELY 24" TO 36" OF SILT–FENCE FABRIC SHOULD REMAIN EXPOSED.
LAY THE EXPOSED SILT FENCE UPSLOPE OF THE TRENCH TO CLEAR AN AREA FOR DRIVING IN THE POSTS. JUST DOWNSLOPE OF THE TRENCH, DRIVE POSTS INTO THE GROUND TO A DEPTH OF AT LEAST 18".
PLACE POSTS NO MORE THAN 4' APART.
ATTACH THE SILT FENCE TO THE ANCHORED POST WITH STAPLES, WIRE, ZIP TIES, OR NAILS.

LIST OF COMMON PLACEMENT/INSTALLATION MISTAKES TO AVOID:

WHEN PRACTICABLE, DO NOT PLACE SILT FENCE SLOPE BARRIERS ACROSS CONTOURS. SLOPE BARRIERS SHOULD BE PLACED ALONG CONTOURS TO AVOID A CONCENTRATION OF FLOW. WHEN THE FLOW CONCENTRATES, IT OVERTOPS THE BARRIER AND THE SILT FENCE SLOPE BARRIER QUICKLY DETERIORATES.
DO NOT PLACE SILT–FENCE POSTS ON THE UPSLOPE SIDE OF THE SILT FENCE FABRIC. IN THIS CONFIGURATION, THE FORCE OF THE WATER IS NOT RESTRICTED BY THE POSTS, BUT ONLY BY THE STAPLES (WIRE, ZIP TIES, NAILS, ETC.). THE SILT FENCE WILL RIP AND FAIL.
DO NOT PLACE SILT FENCE SLOPE BARRIERS IN AREAS WITH SHALLOW SOILS UNDERLAIN BY ROCK. IF THE BARRIER IS NOT SUFFICIENTLY ANCHORED, IT WILL WASH OUT.
SILT FENCE SLOPE BARRIERS MUST BE DUG INTO THE GROUND–SILT FENCE AT GROUND LEVEL DOES NOT WORK BECAUSE WATER WILL FLOW UNDERNEATH.

INSPECTION AND MAINTENANCE:

SILT FENCE SLOPE BARRIERS SHOULD BE INSPECTED EVERY 7 DAYS AND WITHIN 24 HOURS OF A RAINFALL OF 1/2" OR MORE. THE FOLLOWING IS A LIST OF QUESTIONS THAT SHOULD BE ADDRESSED DURING EACH INSPECTION:

ARE THERE ANY POINTS ALONG THE SLOPE BARRIER WHERE WATER IS CONCENTRATING?
DOES WATER FLOW UNDER THE SLOPE BARRIER?
DO THE SILT FENCES SAG EXCESSIVELY?
HAS THE SILT FENCE TORN OR BECOME DETACHED FROM THE POSTS?
DOES SEDIMENT NEED TO BE REMOVED FROM BEHIND THE SLOPE BARRIER?

GARY L. JANZEN LICENSED 16294 PROFESSIONAL ENGINEER KANSAS
05/2/13

REVISION DATE: MAY 2013

CITY OF WICHITA
PUBLIC WORKS & UTILITIES ENGINEERING DIVISION

SILT FENCE DITCH CHECK AND BARRIER DETAILS

CITY ENGINEER
GARY JANZEN, P.E.

PROJECT NUMBER	OCA NUMBER	DATE
472-85116	715729	08/07/2014

CITY ENGINEER'S OFFICE
CITY HALL - SEVENTH FLOOR
455 NORTH MAIN STREET
WICHITA, KANSAS 67202-1620
(316) 268-4501

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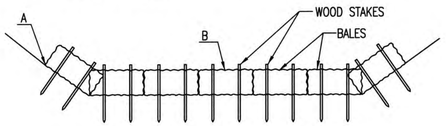
NOTE: POINT A MUST BE HIGHER THAN POINT B
SO THAT WATER FLOWS OVER THE BALES AND
NOT AROUND THEM.



STRAW BALE DITCH CHECKS

MATERIAL SPECIFICATION:

BALE DITCH CHECKS MAY BE CONSTRUCTED OF WHEAT STRAW, OAT STRAW, PRAIRIE HAY, OR BROMEGRASS HAY THAT IS FREE OF WEEDS DECLARED NOXIOUS BY THE KANSAS STATE BOARD OF AGRICULTURE.
THE STAKES USED TO ANCHOR THE BALES SHOULD BE A HARDWOOD MATERIAL WITH THE FOLLOWING MINIMUM DIMENSIONS: 2" SQUARE (NOMINAL) BY 4' LONG.
OPTIONAL: THE DOWNSTREAM SCOUR APRON SHOULD BE CONSTRUCTED OF A DOUBLE-NETTED STRAW EROSION-CONTROL BLANKET AT LEAST 6' WIDE.
OPTIONAL: THE METAL LANDSCAPE STAPLES USED TO ANCHOR THE EROSION-CONTROL BLANKET SHOULD BE AT LEAST 8" LONG.

PLACEMENT:

BALE DITCH CHECKS SHOULD BE PLACED PERPENDICULAR TO THE FLOWLINE OF THE DITCH.
THE DITCH CHECK SHOULD EXTEND FAR ENOUGH SO THAT THE GROUND LEVEL AT THE ENDS OF THE CHECK IS HIGHER THAN THE TOP OF THE LOWEST CENTER BALE. THIS PREVENTS WATER FROM FLOWING AROUND THE CHECK.
STRAW BALE DITCH CHECKS SHOULD NOT BE PLACED IN DITCHES WHERE HIGH FLOWS ARE EXPECTED. ROCK CHECKS SHOULD BE USED INSTEAD.
BALES SHOULD BE PLACED IN DITCHES WITH SLOPES OF 6% OR LESS. FOR SLOPES STEEPER THAN 6%, ROCK CHECKS SHOULD BE USED.
THE FOLLOWING TABLE PROVIDES CHECK SPACING FOR A GIVEN DITCH GRADE:

DITCH GRADE (%)	CHECK SPACING (FEET)
0.5	200
1.0	200
2.0	100
3.0	65
4.0	50
5.0	40
6.0	30

PROPER INSTALLATION METHOD:

EXCAVATE A TRENCH PERPENDICULAR TO THE DITCH FLOWLINE THAT IS 4" DEEP AND A BALE'S WIDTH WIDE. EXTEND THE TRENCH IN A STRAIGHT LINE ALONG THE ENTIRE LENGTH OF THE PROPOSED DITCH CHECK. PLACE THE SOIL ON THE UPSTREAM SIDE OF THE TRENCH-IT WILL BE USED LATER.
OPTIONAL: ON THE DOWNSTREAM SIDE OF THE TRENCH, ROLL OUT A LENGTH OF EROSION-CONTROL BLANKET (SCOUR APRON) EQUAL TO THE LENGTH OF THE TRENCH. PLACE THE UPSTREAM EDGE OF THE EROSION-CONTROL BLANKET ALONG THE BOTTOM UPSTREAM EDGE OF THE TRENCH. THE EROSION CONTROL BLANKET SHOULD BE ANCHORED IN THE TRENCH WITH ONE ROW OF 8" LANDSCAPE STAPLES PLACED ON 18" CENTERS. THE REMAINDER OF THE EROSION-CONTROL BLANKET (THE PORTION THAT IS NOT LYING IN THE TRENCH) WILL SERVE AS THE DOWNSTREAM SCOUR APRON. THIS SECTION OF THE BLANKET SHOULD BE ANCHORED TO THE GROUND WITH 8" LANDSCAPE STAPLES PLACED AROUND THE PERIMETER OF THE BLANKET ON 18" CENTERS. THE REMAINDER OF THE BLANKET SHOULD BE ANCHORED USING TWO EVENLY SPACED ROWS OF 8" LANDSCAPE STAPLES ON 18" CENTERS PLACED PERPENDICULAR TO THE FLOWLINE OF THE DITCH.
PLACE THE BALES IN THE TRENCH, MAKING SURE THAT THEY ARE BUTTED TIGHTLY. TWO STAKES SHOULD BE DRIVEN THROUGH EACH BALE ALONG THE CENTERLINE OF THE DITCH CHECK, APPROXIMATELY 6" TO 8" IN FROM THE BALE ENDS. STAKES SHOULD BE DRIVEN AT LEAST 12" INTO THE GROUND.
ONCE ALL THE BALES HAVE BEEN INSTALLED AND ANCHORED, PLACE THE EXCAVATED SOIL AGAINST THE UPSTREAM SIDE OF THE CHECK AND COMPACT IT. THE COMPACTED SOIL SHOULD BE NO MORE THAN 3" TO 4" DEEP AND EXTEND UPSTREAM NO MORE THAN 24".

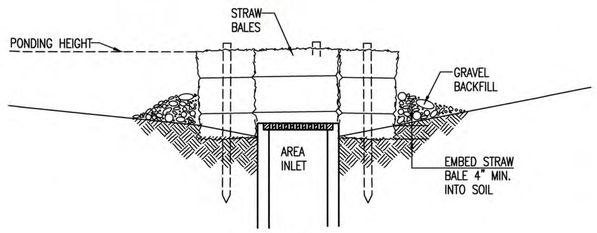
LIST OF COMMON PLACEMENT/INSTALLATION MISTAKES TO AVOID:

DO NOT PLACE A BALE DITCH CHECK DIRECTLY IN FRONT OF A CULVERT OUTLET. IT WILL NOT STAND UP TO THE CONCENTRATED FLOW.
DO NOT PLACE BALE DITCH CHECKS IN DITCHES THAT WILL LIKELY EXPERIENCE HIGH FLOWS. THEY WILL NOT STAND UP TO CONCENTRATED FLOW.
FOLLOW PRESCRIBED DITCH-CHECK SPACING GUIDELINES. IF SPACING GUIDELINES ARE EXCEEDED, EROSION WILL OCCUR BETWEEN THE DITCH CHECKS.
DO NOT ALLOW WATER TO FLOW AROUND THE DITCH CHECK. MAKE SURE THAT THE DITCH CHECK IS LONG ENOUGH SO THAT THE GROUND LEVEL AT THE ENDS OF THE CHECK IS HIGHER THAN THE TOP OF THE LOWEST CENTER BALE.
DO NOT PLACE BALE DITCH CHECKS IN CHANNELS WITH SHALLOW SOILS UNDERLAIN BY ROCK. IF THE CHECK IS NOT ANCHORED SUFFICIENTLY, IT WILL WASH OUT.
BALE DITCH CHECKS MUST BE DUG INTO THE GROUND. BALES AT GROUND LEVEL DO NOT WORK BECAUSE THEY ALLOW WATER TO FLOW UNDER THE CHECK.

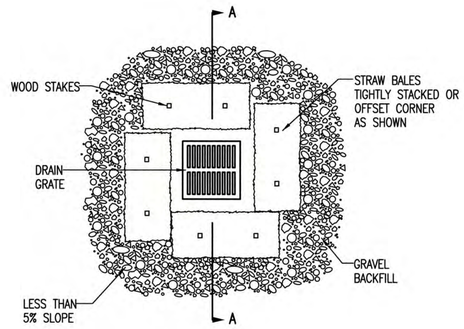
INSPECTION AND MAINTENANCE:

BALE DITCH CHECKS SHOULD BE INSPECTED EVERY 7 DAYS AND WITHIN 24 HOURS OF A RAINFALL OF 1/2" OR MORE. THE FOLLOWING IS A LIST OF QUESTIONS THAT SHOULD BE ADDRESSED DURING EACH INSPECTION:

DOES WATER FLOW AROUND THE DITCH CHECK?
DOES WATER FLOW UNDER THE DITCH CHECK?
DOES WATER FLOW THROUGH SPACES BETWEEN ABUTTING BALES?
ARE ANY BALES AND/OR SCOUR APRONS (OPTIONAL) DISLODGED?
ARE BALES DECOMPOSING DUE TO AGE AND/OR WATER DAMAGE?
DOES SEDIMENT NEED TO BE REMOVED FROM BEHIND THE DITCH CHECK?



SECTION A-A



STRAW BALE BARRIERS FOR AREA INLETS
(INLET PROTECTION)

MATERIAL SPECIFICATION:

BALE AREA INLET BARRIERS SHOULD BE CONSTRUCTED OF WHEAT STRAW, OAT STRAW, PRAIRIE HAY, OR BROMEGRASS HAY THAT IS FREE OF WEEDS DECLARED NOXIOUS BY THE KANSAS STATE BOARD OF AGRICULTURE.
THE STAKES USED TO ANCHOR THE BALES SHOULD BE A HARDWOOD MATERIAL WITH THE FOLLOWING MINIMUM DIMENSIONS: 2" SQUARE (NOMINAL) BY 4' LONG.
TWINE SHOULD BE USED TO BIND BALES. THE USE OF WIRE BINDING IS PROHIBITED BECAUSE IT DOES NOT BIODEGRADE READILY.

PLACEMENT:

BALE AREA INLET BARRIERS SHOULD BE PLACED DIRECTLY AROUND THE PERIMETER OF A DROP INLET.
WHEN A BALE AREA INLET BARRIER IS LOCATED NEAR AN INLET THAT HAS STEEP APPROACH SLOPES, THE STORAGE CAPACITY BEHIND THE BARRIER IS DRASTICALLY REDUCED. TIMELY REMOVAL OF SEDIMENT MUST OCCUR FOR A BARRIER TO OPERATE PROPERLY IN THIS LOCATION.

PROPER INSTALLATION METHOD:

EXCAVATE A TRENCH AROUND THE PERIMETER OF THE AREA INLET THAT IS AT LEAST 4" DEEP BY A BALE'S WIDTH WIDE.
PLACE THE BALES IN THE TRENCH, MAKING SURE THAT THEY ARE BUTTED TIGHTLY. SOME BALES MAY NEED TO BE SHORTENED TO FIT INTO THE TRENCH AROUND THE AREA INLET. TWO STAKES SHOULD BE DRIVEN THROUGH EACH BALE, APPROXIMATELY 6" TO 8" IN FROM THE BALE ENDS.
STAKES SHOULD BE DRIVEN AT LEAST 12" INTO THE GROUND.
ONCE ALL THE BALES HAVE BEEN INSTALLED AND ANCHORED, PLACE THE EXCAVATED SOIL AGAINST THE RECEIVING SIDE OF THE BARRIER AND COMPACT IT. THE COMPACTED SOIL SHOULD BE NO MORE THAN 3" TO 4" DEEP.
NOTE: WHEN A BALE AREA INLET BARRIER IS PLACED IN A SHALLOW MEDIAN DITCH, MAKE SURE THAT THE TOP OF THE BARRIER IS NOT HIGHER THAN THE PAVED ROAD. IN THIS CONFIGURATION, WATER MAY SPREAD ONTO THE ROADWAY CAUSING A HAZARDOUS CONDITION.

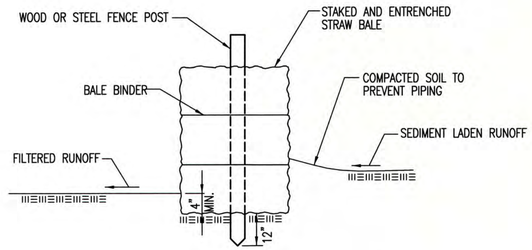
LIST OF COMMON PLACEMENT INSTALLATION MISTAKES TO AVOID:

BALES SHOULD BE PLACED DIRECTLY AGAINST THE PERIMETER OF THE AREA INLET. THIS ALLOWS OVERTOPPING WATER TO FLOW DIRECTLY INTO THE INLET INSTEAD OF ONTO NEARBY SOIL CAUSING SCOUR.
BALE AREA INLET BARRIERS MUST BE DUG INTO THE GROUND. BALES AT GROUND LEVEL DO NOT WORK BECAUSE THEY ALLOW WATER TO FLOW UNDER THE BARRIER.

INSPECTION AND MAINTENANCE:

BALE AREA INLET BARRIERS SHOULD BE INSPECTED EVERY 7 DAYS AND WITHIN 24 HOURS OF A RAINFALL OF 1/2" OR MORE. THE FOLLOWING IS A LIST OF QUESTIONS THAT SHOULD BE ADDRESSED DURING EACH INSPECTION:

DOES WATER FLOW UNDER THE AREA INLET BARRIER?
DOES WATER FLOW THROUGH SPACES BETWEEN ABUTTING BALES?
ARE ANY BALES DISLODGED?
ARE BALES DECOMPOSING DUE TO AGE AND/OR WATER DAMAGE?
DOES SEDIMENT NEED TO BE REMOVED FROM BEHIND THE AREA INLET BARRIER?



STRAW BALE BARRIERS

MATERIAL SPECIFICATION:

BALE SLOPE BARRIERS MAY BE CONSTRUCTED OF WHEAT STRAW, OAT STRAW, PRAIRIE HAY, OR BROMEGRASS HAY THAT IS FREE OF WEEDS DECLARED NOXIOUS BY THE KANSAS STATE BOARD OF AGRICULTURE.
THE STAKES USED TO ANCHOR THE BALES SHOULD BE A HARDWOOD MATERIAL WITH THE FOLLOWING MINIMUM DIMENSIONS: 2" SQUARE (NOMINAL) BY 4' LONG.
TWINE SHOULD BE USED TO BIND BALES. THE USE OF WIRE BINDING IS PROHIBITED BECAUSE IT DOES NOT BIODEGRADE READILY.

PLACEMENT:

A SLOPE BARRIER SHOULD BE USED AT THE TOE OF A SLOPE WHEN A DITCH DOES NOT EXIST. THE SLOPE BARRIER SHOULD BE PLACED ON NEARLY LEVEL GROUND 5' TO 10' AWAY FROM THE TOE OF A SLOPE. THE BARRIER IS PLACED AWAY FROM THE TOE OF THE SLOPE TO PROVIDE ADEQUATE STORAGE FOR SETTLING OUT SEDIMENT.
WHEN PRACTICABLE, BALE SLOPE BARRIERS SHOULD BE PLACED ALONG CONTOURS TO AVOID A CONCENTRATION OF FLOW.
BALE SLOPE BARRIERS CAN ALSO BE PLACED ALONG RIGHT-OF-WAY FENCE LINES TO KEEP SEDIMENT FROM CROSSING ONTO ADJACENT PROPERTY. WHEN PLACED IN THIS MANNER, THE SLOPE BARRIER WILL NOT LIKELY FOLLOW CONTOURS.

PROPER INSTALLATION METHOD:

EXCAVATE A TRENCH THE LENGTH OF THE PLANNED SLOPE BARRIER THAT IS 4" DEEP AND A BALE'S WIDTH WIDE. MAKE SURE THAT THE TRENCH IS EXCAVATED ALONG A SINGLE CONTOUR. WHEN PRACTICABLE, SLOPE BARRIERS SHOULD BE PLACED ALONG CONTOURS TO AVOID A CONCENTRATION OF FLOW. PLACE THE SOIL ON THE UPSLOPE SIDE OF THE TRENCH FOR LATER USE.
PLACE THE BALES IN THE TRENCH, MAKING SURE THAT THEY ARE BUTTED TIGHTLY. TWO STAKES SHOULD BE DRIVEN THROUGH EACH BALE ALONG THE CENTERLINE OF THE DITCH CHECK, APPROXIMATELY 6" TO 8" IN FROM THE BALE ENDS. STAKES SHOULD BE DRIVEN AT LEAST 12" INTO THE GROUND.
ONCE ALL THE BALES HAVE BEEN INSTALLED AND ANCHORED, PLACE THE EXCAVATED SOIL AGAINST THE UPSLOPE SIDE OF THE CHECK AND COMPACT IT. THE COMPACTED SOIL SHOULD BE NO MORE THAN 3" TO 4" DEEP.

LIST OF COMMON PLACEMENT/INSTALLATION MISTAKES TO AVOID:

WHEN PRACTICAL, DO NOT PLACE BALE SLOPE BARRIERS ACROSS CONTOURS. SLOPE BARRIERS SHOULD BE PLACED ALONG CONTOURS TO AVOID A CONCENTRATION OF FLOW. CONCENTRATED FLOW OVER A SLOPE BARRIER CREATES A SCOUR HOLE ON THE DOWNSLOPE SIDE OF THE BARRIER. THE SCOUR HOLE EVENTUALLY UNDERMINES THE BALES AND THE BARRIER FAILS.
DO NOT PLACE BALE SLOPE BARRIERS IN AREAS WITH SHALLOW SOILS UNDERLAIN BY ROCK. IF THE BARRIER IS NOT ANCHORED SUFFICIENTLY, IT WILL WASH OUT.
BALE SLOPE BARRIERS MUST BE DUG INTO THE GROUND. BALES AT GROUND LEVEL DO NOT WORK BECAUSE THEY ALLOW WATER TO FLOW UNDER THE BARRIER.

INSPECTION AND MAINTENANCE:

BALE SLOPE BARRIERS SHOULD BE INSPECTED EVERY 7 DAYS AND WITHIN 24 HOURS OF A RAINFALL OF 1/2" OR MORE. THE FOLLOWING IS A LIST OF QUESTIONS THAT SHOULD BE ADDRESSED DURING EACH INSPECTION:

ARE THERE ANY POINTS ALONG THE SLOPE BARRIER WHERE WATER IS CONCENTRATING?
DOES WATER FLOW UNDER THE SLOPE BARRIER?
DOES WATER FLOW THROUGH SPACES BETWEEN ABUTTING BALES?
ARE ANY BALES DISLODGED?
ARE BALES DECOMPOSING DUE TO AGE AND/OR WATER DAMAGE?
DOES SEDIMENT NEED TO BE REMOVED FROM BEHIND THE SLOPE BARRIER?

REVISION DATE: MAY 2013

GARY L. JANZEN LICENSED 16284 KANSAS PROFESSIONAL ENGINEER
05/13/13

CITY OF WICHITA
PUBLIC WORKS & UTILITIES ENGINEERING DIVISION

STRAW BALE DITCH CHECK AND BARRIER DETAILS

CITY ENGINEER
GARY JANZEN, P.E.

PROJECT NUMBER	OCA NUMBER	DATE
472-85116	715729	08/07/2014

CITY ENGINEER'S OFFICE
CITY HALL - SEVENTH FLOOR
455 NORTH MAIN STREET
WICHITA, KANSAS 67202-1620
(316) 268-4501

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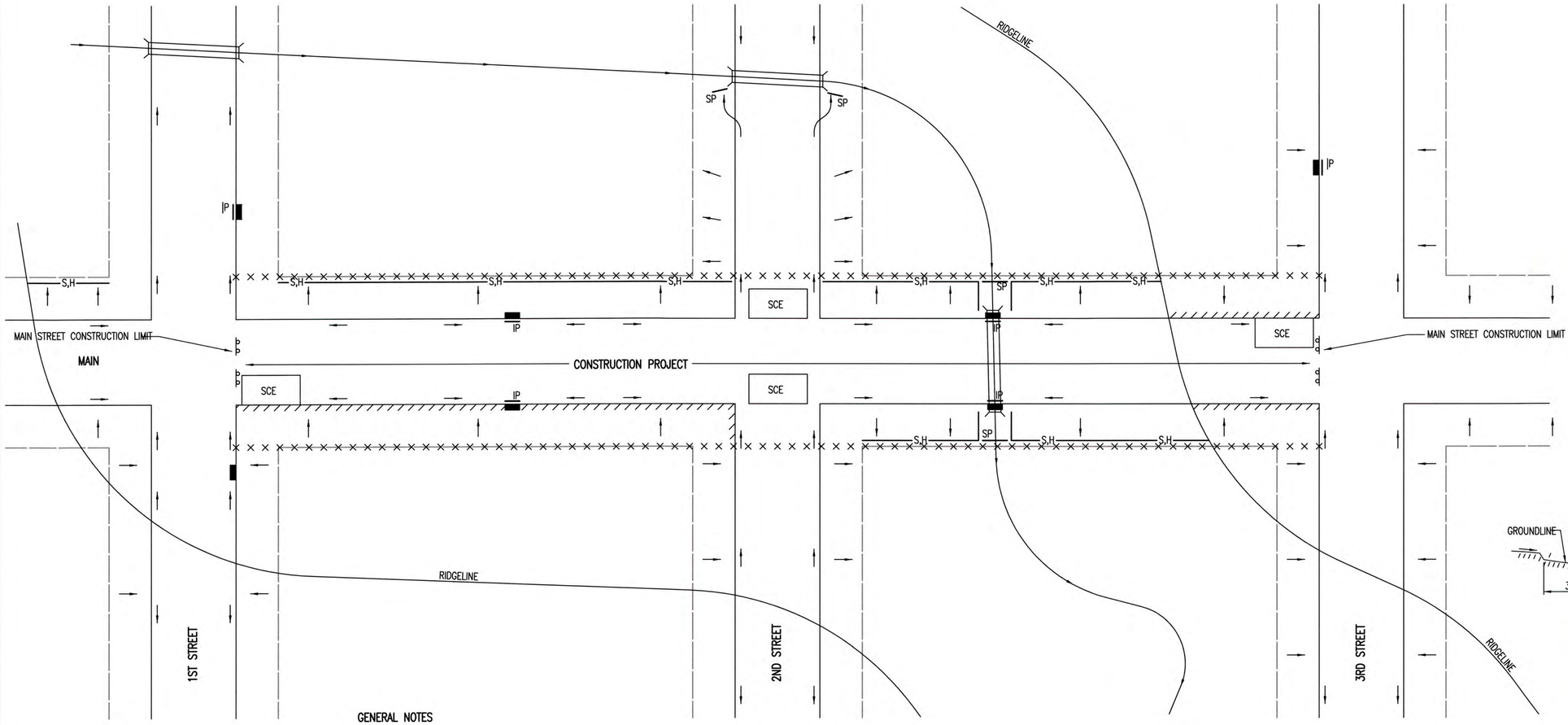
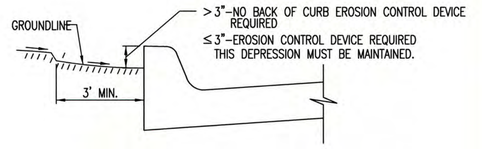
SW-503

GENERAL NOTES

1. THIS SHEET IS INTENDED TO PROVIDE GUIDELINES AS TO WHAT TYPES OF EROSION CONTROL DEVICES WILL BE INSTALLED DURING THE CONSTRUCTION PROCESS. CONTRACTORS ARE EXPECTED TO BID PROJECTS ACCORDINGLY.
2. EROSION CONTROL DEVICES MUST BE MAINTAINED BY THE CONTRACTOR THROUGHOUT THE CONSTRUCTION PROCESS AND UNTIL THE DISTURBED EARTH IS RESTABILIZED.
3. IF THE PROJECT WILL DISTURB 1 ACRE OR MORE, A FEDERAL/STATE NPDES STORMWATER PERMIT IS REQUIRED. A DETAILED STORMWATER POLLUTION PREVENTION PLAN, IS REQUIRED. THE EROSION CONTROL DEVICES SHOWN ON THIS SHEET ARE CONSIDERED TO BE THE MINIMUM TO BE SHOWN IN THE POLLUTION PREVENTION PLAN.
4. FOR PROJECTS DISTURBING LESS THAN 1 ACRE, CONTRACTORS ARE ENCOURAGED TO PREPARE STORMWATER POLLUTION PREVENTION PLANS PRIOR TO CONSTRUCTION. EROSION CONTROL DEVICES MUST BE USED ON ALL PROJECTS.
5. FAILURE TO USE AND MAINTAIN EROSION CONTROL DEVICES IS A VIOLATION OF SECTION 16.32 OF THE CITY CODE AND WILL SUBJECT THE CONTRACTOR TO THE PENALTIES PROVIDED FOR THEREIN.
6. THE APPLICATION OF EROSION CONTROL DEVICES SHOWN ON THIS SHEET IS FOR SITUATIONS NORMALLY ENCOUNTERED. FROM TIME TO TIME, SITUATIONS WILL ARISE THAT MAY REQUIRE A DIFFERENT DEVICE OTHER THAN THOSE SHOWN. EROSION CONTROL DEVICES, OTHER THAN THOSE SHOWN, MAY BE UTILIZED AS LONG AS THEY ARE EFFECTIVE AND MAINTAINED.





CURB BACKFILL DETAIL

THIS IS A TEMPORARY MEASURE ONLY, WHEN APPROVED BY THE PROJECT ENGINEER. THE DIRT GRADE BEHIND THE CURB SHALL BE BROUGHT TO THE TOP OF CURB, WITH TEMPORARY EROSION CONTROL MAT OR PERMANENT VEGETATION PLACED, PRIOR TO THE COMPLETION OF ALL PROJECTS.

LEGEND

- R-O-W LIMITS
- DRAINAGE FLOW PATH
- R/W LIMIT WITHIN CONSTRUCTION LIMIT
- STORM WATER INLETS
- IP — INLET PROTECTION
- S,H — SILT FENCE OR HAY BALE BARRIER
- SP — STREAM PROTECTION
- SCE — STABILIZED CONSTRUCTION ENTRANCE
- BACK OF CURB PROTECTION

GENERAL NOTES

1. THE INTENT OF ALL EROSION CONTROL DEVICES IS TO KEEP ALL SEDIMENT CONFINED TO THE CONSTRUCTION SITE, AND OUT OF ALL UNDERGROUND PIPES, DITCHES, LAKES, AND OTHER DRAINAGE FACILITIES, AND OFF OF STREETS.
2. THE POINT OF COMPLIANCE IS GENERALLY THE RIGHT-OF-WAY LINES WITHIN THE LIMITS OF CONSTRUCTION.
3. EROSION CONTROL DEVICES WILL BE REQUIRED AT ALL POINTS ALONG THE PROJECT WHERE DISTURBED EARTH CAN DRAIN ONTO PRIVATE PROPERTY.
4. INLET PROTECTION DEVICES WILL BE REQUIRED WHEREVER WATER CAN DRAIN OFF THE PROJECT SITE INTO AN INLET, INCLUDING ANY SIDE STREET INLETS.
5. EROSION CONTROL DEVICES SHALL BE INSTALLED AT CREEK CROSSINGS SO AS TO PREVENT SEDIMENT FROM ENTERING THEREIN.
6. STABILIZED CONSTRUCTION ENTRANCES SHALL BE PROVIDED, AS NEEDED, TO PREVENT MUD FROM TRACKING ONTO STREETS NOT UNDER CONSTRUCTION AND ON STREETS WITHIN THE PROJECT LIMITS IF TRAFFIC IS BEING MAINTAINED THROUGH THE PROJECT.
7. ANY MUD TRACKED ONTO STREETS MUST BE REMOVED AT THE END OF EACH WORK DAY.
8. THE CONTACTOR WILL BE REQUIRED TO PLACE EROSION CONTROL DEVICES BACK OF CURB, WHENEVER WATER CAN DRAIN OVER CURB, TO KEEP ERODED SOIL OUT OF THE GUTTERLINES, IN ACCORDANCE WITH THE FOLLOWING:
   A. THE DEVICE REQUIRED WILL BE APPROVED EROSION CONTROL MAT LISTED ON THE CITY'S APPROVED MATERIAL LIST. SAID BLANKET SHALL BE PLACED OVER THE APPROPRIATE SEED AND FERTILIZER, AS SPECIFIED IN THE PROJECT SPECIFICATIONS. (SEE SOIL EROSION BMPs – BACK OF CURB SEDIMENT BARRIER DETAILS)
   B. THIS DEVICE SHALL BE INSTALLED IMMEDIATELY WHENEVER THE CURB IS BACKFILLED TO WITHIN 3" OF THE TOP OF CURB. (SEE CURB BACKFILL DETAIL) OTHER BMP'S MAY BE REQUIRED AT LOCATIONS WHERE CONCENTRATED FLOW CARRIES SEDIMENT OVER THE CURB.
   C. ADDITIONALLY, OTHER EROSION CONTROL DEVICES (HAY BALES, SILT FENCE, ETC.) WILL BE INSTALLED AT LOCATIONS OF CONCENTRATED FLOW RESULTING IN SEDIMENT OVERRUNNING THE MAT.
   D. SHOULD THE PROJECT PLANS SPECIFY THAT THE RIGHT-OF-WAY IS TO BE SODDED, THE EXCELSIOR MAT WILL NOT BE REQUIRED SO LONG AS THE SOD IS PLACED WITHIN 48 HOURS AFTER CURB BACKFILL REACHES A HEIGHT OF 3" OR LESS FROM TOP OF CURB. (SEE CURB BACKFILL DETAIL)

GARY L. JANZEN LICENSED 16294 KANSAS PROFESSIONAL ENGINEER
05/12/13

REVISION DATE: 2013

CITY OF WICHITA
PUBLIC WORKS & UTILITIES ENGINEERING DIVISION

STREET IMPROVEMENT PROJECTS

CITY ENGINEER
GARY JANZEN, P.E.

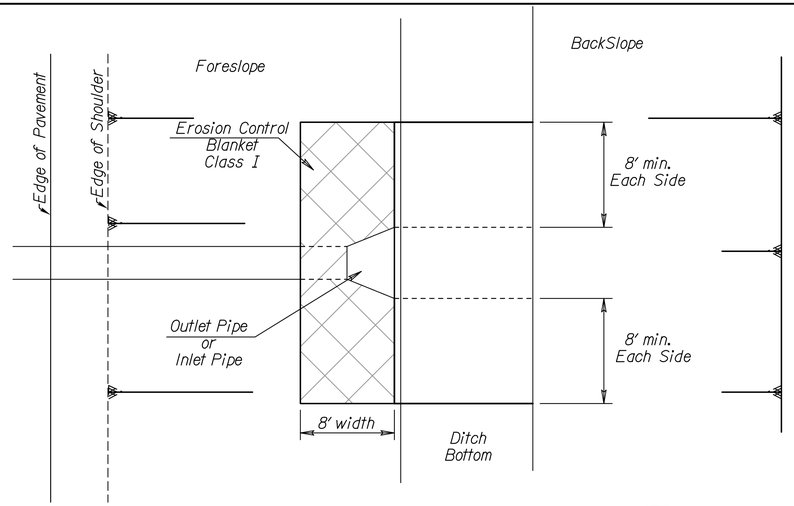
PROJECT NUMBER	OCA NUMBER	DATE
472-85116	715729	08/07/2014

CITY ENGINEER'S OFFICE
CITY HALL - SEVENTH FLOOR
455 NORTH MAIN STREET
WICHITA, KANSAS 67202-1620
(316) 268-4501

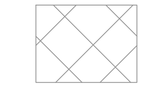
SHEET
25 of 52

SW-504

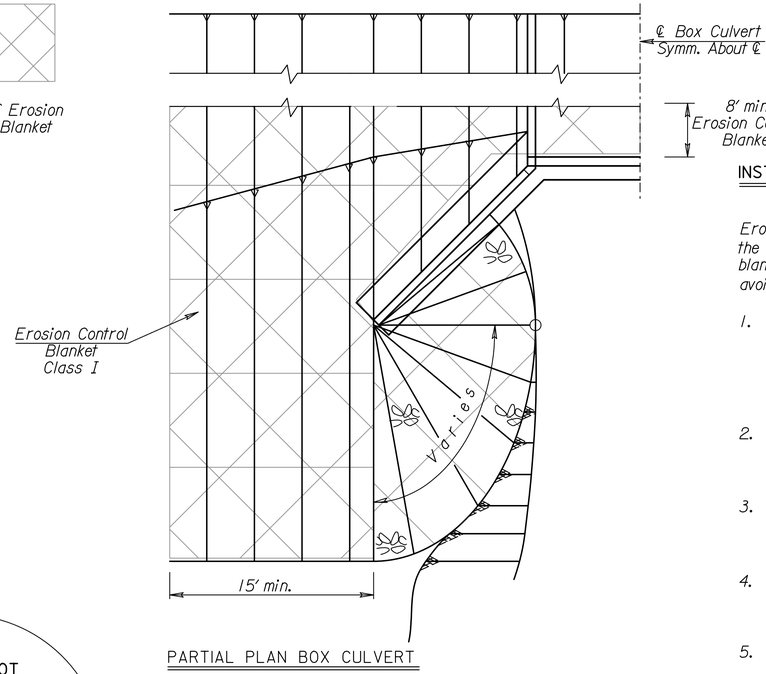
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	87 N-0609-01	2014	26	52



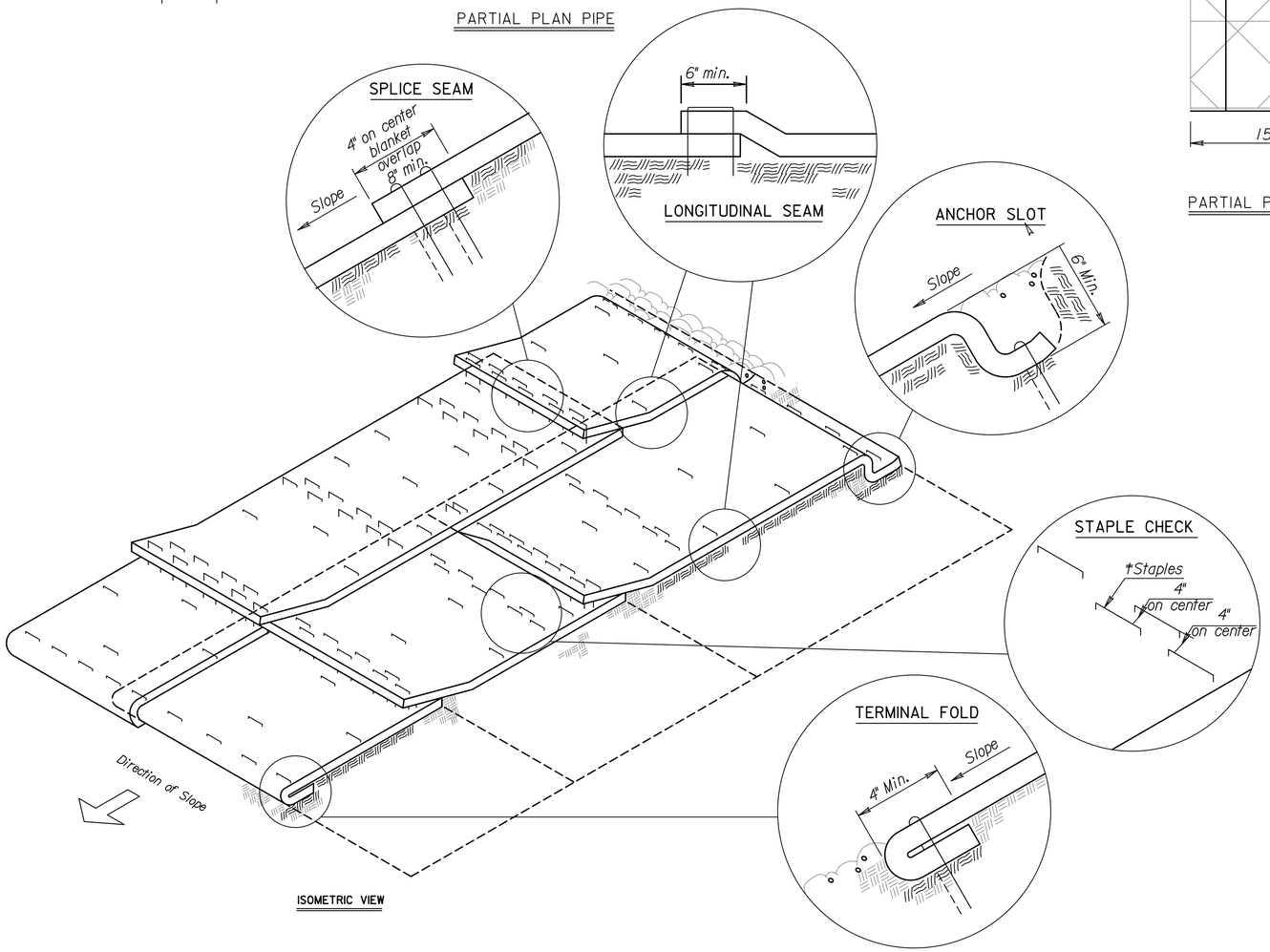
PARTIAL PLAN PIPE



Limits of Erosion Control Blanket



PARTIAL PLAN BOX CULVERT

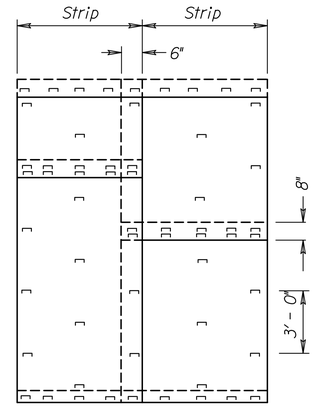


ISOMETRIC VIEW

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, lay blanket loosely, avoiding stretching.

1. *ANCHOR SLOTS: The top of the blanket should be "slotted in" at the top of the slope and anchored in place with anchors 6 inches apart. The slots should be 6 inches wide x 6 inches deep with the blanket anchored in the bottom of the slot, then backfilled, tamped and seeded.*
2. *LONGITUDINAL SEAMS: The edges of the blanket should overlap each other a minimum of 6 inches, with anchors catching the edges of both blankets.*
3. *SPLICE SEAM: When splices are necessary, overlap end a minimum of 8 inches in direction of water flow. Stagger 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 30' apart.*



PLAN VIEW - ANCHORING DIAGRAM

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

Single post ring and shank staple is acceptable.

NO.	DATE	REVISIONS	BY	APP'D
3	2/12/14	Revised Standard	MRM	SHS
2	9/10/07	Revised Standard	MRM	SHS
1	6/16/05	Revised Standard	MRM	SHS

KANSAS DEPARTMENT OF TRANSPORTATION

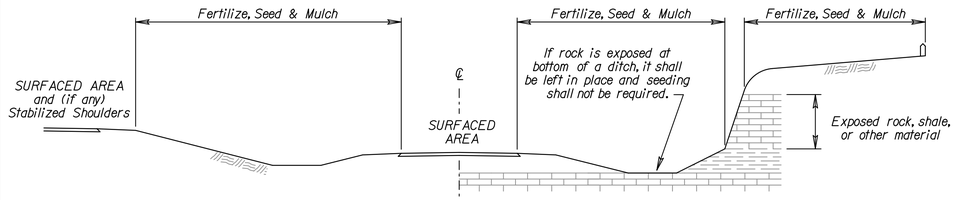
INSTALLATION DETAIL
EROSION CONTROL CLASS I
SLOPE PROTECTION

~~LA855~~

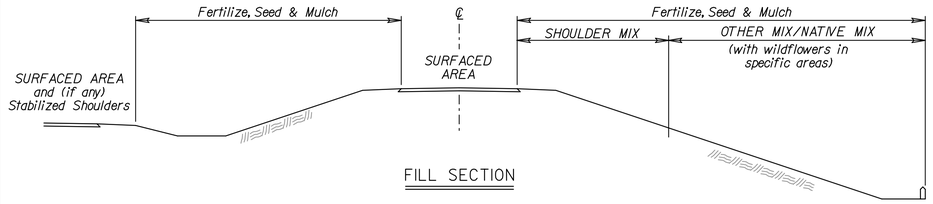
FHWA APPROVAL		2/18/2014	APP'D	Scott H. Shields	
DESIGNED	SHS	DETAILED RAA	QUANTITIES	CADD	RAA
DESIGN CK.		DETAIL CK.	QUAN.CK.	CADD CK.	RAA

Std. Base File: *la855.dgn*
Plotted By: *ROAD* Plot Location:
File: *G:\WI\13\0022\Road\la855.dgn*
Plot Date: *9/3/2014*

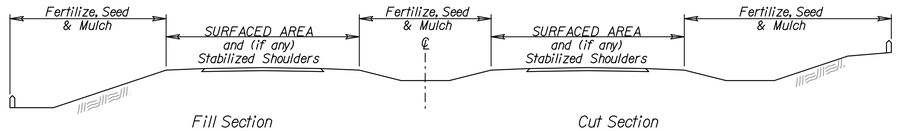
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	87 N-0609-01	2014	27	52



CUT SECTION



FILL SECTION



Fill Section Cut Section

TYPICAL SECTION - DUAL PAVEMENT

SEEDING PERIODS

COOL SEASON February 15 to April 20 and August 15 to Sept. 30	WARM SEASON November 15 to June 1
SPECIES	SPECIES
Bluegrasses	Big Bluestem
Bromegrasses	Blue Grama
Canada Wildrye	Buffalograss
Fescues	Eastern Gamagrass
Prairie Junegrass	Indiangrass
Reed Canarygrass	Little Bluestem
Ryegrasses	Sand Bluestem
Sterile Wheatgrass	Sand Dropseed
Tall Dropseed	Sand Lovegrass
Western Wheatgrass	Side Oats Grama
	Switchgrass
	Wildflower Mixes

When "Cool Season" species are mixed with "Warm Season" species, in areas of 1 acre or more, the mixture shall be seeded during the "Warm Season". In areas of less than 1 acre, the mixture of "Cool Season" and "Warm Season" species may be seeded during the "Warm or Cool Seasons".

SODDING PERIODS
March 1 to April 15 and September 1 to November 15

GENERAL NOTES

The entire disturbed area, excepting the paved or surfaced areas, steep rocky slopes and areas of undisturbed native sod or other desirable vegetation shall be fertilized (limed when required), seeded, and mulched. Soil preparation shall conform to the Standard Specifications except as noted below.

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

It shall not be required to till the area to bare ground prior to permanent seeding. If temporary cover has provided stable slopes with no erosion, seed the permanent grasses into the existing cover. If there has been erosion that requires repair prior to seeding, then it may be necessary to regrade the area, resulting in bare ground.

FERTILIZER: A ratio and application rate that equals or exceeds the required minimum rate per acre of N, P_2O_5, K_2O listed in Summary of Seeding Quantities will be acceptable.

MULCHING: Mulch shall be spread uniformly over all disturbed areas and punched in the soil, unless otherwise noted on the plans. The rate of application per acre, thickness in place, for the mulching material is as follows:

1¾ - 2¼ Tons per Acre = 1½" loose depth spread uniformly over acre.

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

Other vegetative mulches 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 seeded areas.

The amount of mulch in the quantities is estimated. The total mulch required shall be determined in the field. ~~The bid item for mulching shall be paid for according to Standard Specification Section 904.~~

NATIVE WILDFLOWER MIX 1

PLS RATE	NAME	QTY (lb)
0.1	Black Eyed Susan	
1.8	Illinois Bundleflower	
0.15	Maximilian Sunflower	
0.4	Purple Prairie Clover	
2.9	Showy Partridge Pea	
0.1	Upright Prairie Coneflower	
0.3	Butterfly Milkweed	
0.1	Stiff Goldenrod	
0.05	Pinnate Prairie Coneflower	
0.1	Lance-leaf Coreopsis	
0.05	New England Aster	
0.2	Pale Purple Coneflower	
0.05	Plains Coreopsis	
0.05	Hoary Verbena	
0.3	Roundhead Lespedeza	
0.4	Thickspike Gayfeather	
0.05	Wild Bergamot	
0.2	Smooth Oxeye	
0.05	Lemon Mint	
7.35	Total (lb)	

NATIVE WILDFLOWER MIX 2

PLS RATE	NAME	QTY (lb)
0.1	Black Eyed Susan	
1.8	Illinois Bundleflower	
0.15	Maximilian Sunflower	
0.4	Purple Prairie Clover	
2.9	Showy Partridge Pea	
0.1	Upright Prairie Coneflower	
0.3	Butterfly Milkweed	
0.4	Dotted Blazing Star	
0.4	Annual Gaillardia	
0.05	Stiff Goldenrod	
0.05	New England Aster	
0.3	Missouri Evening Primrose	
0.05	Plains Coreopsis	
0.15	White Prairie Clover	
0.3	Roundhead Lespedeza	
0.05	Lemon Mint	
0.15	Pitcher Sage	
7.65	Total (lb)	

NATIVE WILDFLOWER MIX 3

PLS RATE	NAME	QTY (lb)
0.15	Black Eyed Susan	
1.9	Illinois Bundleflower	
0.15	Maximilian Sunflower	
0.05	Western Yarrow	
0.5	Black Sampson Echinacea	
0.05	Upright Prairie Coneflower	
0.3	Butterfly Milkweed	
0.4	Dotted Blazing Star	
0.75	Annual Gaillardia	
0.05	Stiff Goldenrod	
0.05	New England Aster	
0.4	Pitcher Sage	
0.01	Plains Coreopsis	
0.15	White Prairie Clover	
0.2	Purple Prairie Clover	
0.4	Leadplant	
0.02	White Heath Aster	
1	Blue Wild Indigo	
0.05	Lemon Mint	
6.58	Total (lb)	

NATIVE WILDFLOWER MIX 4

PLS RATE	NAME	QTY (lb)
1.9	Illinois Bundleflower	
0.4	Maximilian Sunflower	
0.05	Western Yarrow	
1	Black Sampson Echinacea	
0.1	Upright Prairie Coneflower	
0.1	Scarlet Globemallow	
0.4	Dotted Blazing Star	
1.1	Annual Gaillardia (Firewheel)	
0.1	Hoary Vervain	
0.3	White Prairie Clover	
0.4	Purple Prairie Clover	
0.4	Perennial Gaillardia (Blanket Flower)	
0.02	White Heath Aster	
0.05	Lemon Mint	
6.32	Total (lb)	

Package and deliver the wildflower seed separately from the grass seed mix. Package and deliver the Tall Drop Seed separately from the grass seed and the wildflower mix. Place the grass seed (except Tall Drop Seed) in the large seed box and drill (cover) seed ⅛" - ¼". Place the wildflower seed in a separate seed box and drill (cover) seed 1/16" maximum. Place the Tall Drop Seed in a separate (third) seed box and place the seed (using the seed drill) on the soil surface. OPTION: Broadcast Tall Drop Seed on the soil surface.

SUMMARY OF SEEDING QUANTITIES

P.L.S. RATE/ACRE				ACRES				BID ITEM	QUANTITY	UNIT
SHLDR	OTHER			SHLDR	OTHER					
250				0.12				Fertilizer (13-13-13)	-	LSUM
0.5				0.12				Blue Grama Grass Seed (Lovington)	-	LSUM
4.5				0.12				Buffalograss Seed (Treated)	-	LSUM
45				0.12				Perennial Ryegrass	-	LSUM
0.5				0.12				Sand Dropseed Grass Seed	-	LSUM
7				0.12				Side Oats Grama Grass Seed (El Reno)	-	LSUM
45				0.12				Tall Fescue (Endophyte Free)	-	LSUM
6				0.12				Western Wheatgrass Seed (Barton)	-	LSUM
2.6				0.12				Prairie Junegrass	-	LSUM
								Seeding/Mulching/Fertilizing	0.12	ACRE

SHLDR = Shoulder Turf Mix: Includes a 30 foot wide strip along the stabilized shoulder on each side of each traveled way, plus all median areas less than 60 feet wide.

OTHER = All other turf areas except Shoulder, Guardrail, and Native areas usually include the Native Wildflower Mix.

◔ *For Information Only, Seeding shall be paid as "Lump Sum".*

NO.	DATE	REVISIONS	BY	APP'D
4	6/01/13	Revised Standard	MRM	SHS
3	3/01/13	Revised Standard	MRM	SHS
2	2/24/12	Revised Standard	MRM	SHS
1	6/01/10	Revised Standard	MRM	SHS

KANSAS DEPARTMENT OF TRANSPORTATION

PERMANENT SEEDING
SUMMARY OF SEEDING QUANTITIES

~~LA850~~

FHWA APPROVAL	5/14/2013	APP'D	Scott H. Shields
DESIGNED MRM	DETAILED MRM	QUANTITIES	CADD
DESIGN CK.	DETAIL CK.	QUAN.CK.	CADD CK.

Std. Base File:
Plotted By: ROAD Plot Location:
File: G:\W\13\0022\Road\v850.dgn
Plot Date: 9/3/2014

CADconform Certify This File

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	87 N-0609-01	2014	28	52

SUMMARY OF PAVEMENT MARKINGS

LOCATION	4" Solid WHITE Edge Line	6" Solid WHITE Edge Line	6" Broken WHITE Lane Line	6" Broken WHITE Lane Line (PCP)	6" Dotted WHITE Extension Line	6" Broken WHITE Lane Drop Line	6" Solid WHITE Lane Line	8" Broken WHITE Lane Drop Line	8" Solid WHITE Gore Line	8" Dotted WHITE Extension Line	12" Solid WHITE Diagonal Line	12" Solid WHITE Chevron Line	12" Solid WHITE Type I Crosswalk Line	24" Solid WHITE Type II Crosswalk Line	24" Solid WHITE Stop Line	4" Solid YELLOW Edge Line	4" Solid YELLOW Double Line	4" Solid YELLOW Line	4" Broken YELLOW Line	6" Solid YELLOW Edge Line	12" Solid YELLOW Diagonal Line
Station 36+71 to Station 37+23		*152*																			
Station 36+71 to Station 37+23																	*152*				
Station 36+71 to Station 37+23		*152*																			
TOTALS		*304*															*304*				

∗RECAPITULATION OF QUANTITIES

ITEMS	TOTAL	UNITS
PAVEMENT MARKING (MULTI-COMPONENT)(WHITE)(4")		FT
PAVEMENT MARKING (MULTI-COMPONENT)(WHITE)(6")		FT
PAVEMENT MARKING (MULTI-COMPONENT)(WHITE)(8")		FT
PAVEMENT MARKING (MULTI-COMPONENT)(WHITE)(12")		FT
PAVEMENT MARKING (MULTI-COMPONENT)(YELLOW)(4")		FT
PAVEMENT MARKING (MULTI-COMPONENT)(YELLOW)(6")		FT
PAVEMENT MARKING (MULTI-COMPONENT)(YELLOW)(12")		FT
PAVEMENT MARKING (THERMOPLASTIC)(WHITE)(4")		FT
PAVEMENT MARKING (THERMOPLASTIC)(WHITE)(6")		FT
PAVEMENT MARKING (THERMOPLASTIC)(WHITE)(8")		FT
PAVEMENT MARKING (THERMOPLASTIC)(WHITE)(12")		FT
PAVEMENT MARKING (THERMOPLASTIC)(YELLOW)(4")		FT
PAVEMENT MARKING (THERMOPLASTIC)(YELLOW)(6")		FT
PAVEMENT MARKING (THERMOPLASTIC)(YELLOW)(12")		FT
PAVEMENT MARKING (EPOXY)(WHITE)(4")		FT
PAVEMENT MARKING (EPOXY)(WHITE)(6")	*304*	FT
PAVEMENT MARKING (EPOXY)(WHITE)(8")		FT
PAVEMENT MARKING (EPOXY)(WHITE)(12")		FT
PAVEMENT MARKING (EPOXY)(YELLOW)(4")	*304*	FT
PAVEMENT MARKING (EPOXY)(YELLOW)(6")		FT
PAVEMENT MARKING (EPOXY)(YELLOW)(12")		FT
PAVEMENT MARKING (INTERSECTION GRADE)(WHITE)(12")		FT
PAVEMENT MARKING (INTERSECTION GRADE)(WHITE)(24")		FT
PAVEMENT MARKING (INTERSECTION GRADE)(YELLOW)(12")		FT
PAVEMENT MARKING SYMBOL (INTERSECTION GRADE)(WHITE)( )		EACH
PAVEMENT MARKING SYMBOL (INTERSECTION GRADE)(WHITE)( )		EACH
PAVEMENT MARKING SYMBOL (INTERSECTION GRADE)(WHITE)( )		EACH
PAVEMENT MARKING SYMBOL (INTERSECTION GRADE)(WHITE)( )		EACH
PAVEMENT MARKING SYMBOL (INTERSECTION GRADE)(WHITE)( )		EACH
PAVEMENT MARKING SYMBOL (INTERSECTION GRADE)(US-SHIELD)( )		EACH
PAVEMENT MARKING SYMBOL (INTERSECTION GRADE)(K-SHIELD)( )		EACH
PAVEMENT MARKING SYMBOL (INTERSECTION GRADE)(I-SHIELD)( )		EACH
PAVEMENT MARKING (PATTERNED COLD PLASTIC)(WHITE)(6")		FT
PAVEMENT MARKING (PATTERNED COLD PLASTIC)(WHITE)(8")		FT
PAVEMENT MARKING (PATTERNED COLD PLASTIC)(WHITE)(12")		FT
PAVEMENT MARKING REMOVAL		FT

∗ FOR INFORMATION ONLY, PAVEMENT MARKING WILL BE PAID AS "LUMP SUM" COMPLETE IN PLACE.

SUMMARY OF WORD & SYMBOL MARKINGS

LOCATION	↱	↰	↑	↱	↰	♿	STOP	ONLY	X-ING	SCHOOL	70	435	24	400	18	↑	↑	↑	↑	↗	RR
TOTALS																					

NOTE:
WORDS & SYMBOLS SHALL CONFORM TO THE LATEST EDITION OF "STANDARD ALPHABETS FOR HIGHWAY SIGNS AND PAVEMENT MARKINGS" PRINTED BY THE U.S. DEPARTMENT OF TRANSPORTATION, FEDERAL HIGHWAY ADMINISTRATION.

PRIOR TO COMMENCEMENT OF PAVEMENT MARKING WORK THE ENGINEER WILL ESTABLISH THE LIMITS FOR "NO PASSING" ZONES. THESE LIMITS SHALL BE USED FOR THE LOCATION OF "NO PASSING" LINES AND FOR THE COMPUTATION OF ACTUAL MARKING QUANTITIES FOR THIS LINE TYPE.

NOTE: FOR SPECIFIC PAVEMENT MARKING DETAILS AND DIMENSIONS SEE PLAN SHEETS

NOTE: ALL TOTALS REFLECT ACTUAL QUANTITY OF PAVEMENT MARKING MATERIALS REQUIRED.

NO.	DATE	REVISIONS	BY	APP'D
2	5/25/12	Added Line Types, Symbols, and Shields	B.A.H.	B.D.G.
1	7/26/05	New FHWA Approval Date	J.F.F.	B.D.G.

KANSAS DEPARTMENT OF TRANSPORTATION

SUMMARY AND RECAPITULATION OF PAVEMENT MARKING QUANTITIES

~~TE311~~

FHWA APPROVAL 5/25/2012		APP'D Brian D. Gower	
DESIGNED J.F.F.	DETAILED J.F.F.	QUANTITIES	TRACED
DESIGN CK. B.D.G.	DETAIL CK. B.D.G.	QUAN. CK.	TRACE CK.

Plotted : 03-SEP-2014 11:00

Drawn By : ROAD
File : te311.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	87 N-0609-01	2014	29	52

SYMBOL KEY

- REMOVE SIGN
- REMOVE POST
- REMOVE FOOTING
- REMOVE SIGN & POST
- REMOVE POST & FOOTING
- REMOVE SIGN, POST, & FOOTING
- MOUNT ON WOOD POST IN CONCRETE FOOTING
- MOUNT ON WOOD POST IN SOIL
- MOUNT ON STEEL BEAM BREAKAWAY POST
- MOUNT ON STEEL U-POST
- MOUNT ON PSST POST
- MOUNT ON PSST POST WITH COUPLER
- MOUNT ON PSST POST WITH COUPLER AND FOOTING
- MOUNT ON EXISTING POST
- MOUNT ON VERTICAL SUPPORT
- SHOULDER MOUNTED INSTALLATION
- OFFSET MOUNTED INSTALLATION
- EXISTING SIGN
- EXISTING SIGN TO BE OVERLAID
- SIGN IS NOT PART OF PROJECT
- TYPE 'A' DELINEATOR (RIGID)
- TYPE 'B' DELINEATOR (RIGID)
- TYPE 'A' DELINEATOR (FLEXIBLE)
- TYPE 'B' DELINEATOR (FLEXIBLE)
- TYPE 2 OBJECT MARKER
- TYPE 3 OBJECT MARKER

GENERAL NOTES

IN ORDER TO EXPEDITE THE COMPLETION OF THE PROJECT FOR TRAFFIC SERVICE, THE SIGNING AND DELINEATOR WORK SHALL BE SEQUENCED WITH ANY OTHER CONTRACT WORK SUCH THAT THE PHASES OF CONSTRUCTION MAY PROCEED AND BE COMPLETED AT THE SAME TIME.

NEW SIGNS ERECTED ON THE PROJECT WHICH ARE IN CONFLICT WITH EXISTING SIGNING ARE TO BE COMPLETELY COVERED UNTIL THE EXISTING SIGNS ARE REMOVED OR THE NEW SIGNING IS APPLICABLE. THE EXISTING SIGNS THAT ARE BEING REPLACED, REMOVED, OR DO NOT FOLLOW THE CURRENT MUTCD SIGNING STANDARDS ARE TO BE REMOVED WHEN THE PROJECT IS COMPLETED OR AS DETERMINED BY THE ENGINEER.

THE CONTRACTOR SHALL EXERCISE CAUTION AT ALL TIMES WHEN INSTALLING SIGN SUPPORTS IN AND AROUND AREAS WHERE UTILITIES EXIST, EITHER UNDERGROUND OR OVERHEAD, AND WILL BE HELD RESPONSIBLE FOR ANY DAMAGE INCURRED TO THE SYSTEM. THE INSTALLATION OF SIGN SUPPORTS SHALL INCLUDE THE EXCAVATION, DRILLING, OR DRIVING THE SUPPORT FOOTING AND THE ERECTION OF THE SIGN SUPPORT. THE CONTRACTOR SHALL EXERCISE CAUTION WHEN WORKING AROUND ANY EXISTING SIGNS THAT ARE TO REMAIN AND WILL BE HELD RESPONSIBLE FOR ANY DAMAGE TO THE SIGNS, SUPPORTS, OR FOOTINGS. THE CONTRACTOR SHALL EXERCISE CARE WHEN WORKING AROUND SHRUBBERY WHILE REMOVING OR INSTALLING SIGNS OR SIGN SUPPORTS.

AN EXISTING SIGN POST INSTALLATION SHALL BE PLUMB AND THE COMPACTION OF THE BACKFILL SOIL SHALL COMPLY WITH THE SPECIFICATIONS AFTER THE REMOVAL AND RESETTING OF A SIGN, THE REMOVAL AND REPLACEMENT OF A SIGN, OR THE INSTALLATION OF A NEW SIGN.

THE CONTRACTOR SHALL PROVIDE MOUNTING BOLTS THAT ARE OF A LENGTH THAT DOES NOT EXTEND MORE THAN A NOMINAL 1 INCH BEYOND THE SIGN POST. THE CONTRACTOR SHALL NOT MAKE ANY FIELD MODIFICATIONS TO THE MOUNTING BOLT PRIOR TO OR AFTER THE SIGN IS INSTALLED.

SPECIFIC SERVICE, LOGO, SIGNS THAT ARE TO BE REMOVED SHALL HAVE THE BUSINESS LOGO PLAQUES REMOVED AND TRANSPORTED TO LOCATION DETERMINED BY KDOT, AT WHICH TIME THE PLAQUES BECOME THE PROPERTY OF KDOT. THE CONTRACTOR WILL BE ASSESSED A REPLACEMENT COST FOR ANY DAMAGE TO A BUSINESS LOGO PLAQUE PRIOR TO THE PLAQUE BECOMING THE PROPERTY OF KDOT.

THE MATERIALS AND FABRICATION FOR SIGNING AND DELINEATION WORK SHALL CONFORM TO THE STANDARD SPECIFICATIONS FOR STATE ROAD AND BRIDGE CONSTRUCTION (2007 EDITION) AND SPECIAL PROVISIONS.

INDEX OF SHEETS

NO.	DATE	REVISIONS	BY	APP'D
1	7/23/10	Changed General Notes and Spec Book Date	D.D.G.	D.B.

KANSAS DEPARTMENT OF TRANSPORTATION

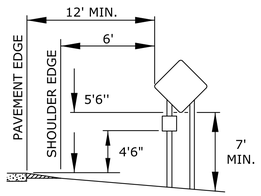
SIGNING SYMBOL KEY
GENERAL NOTES
AND INDEX

TE402 7/1/03

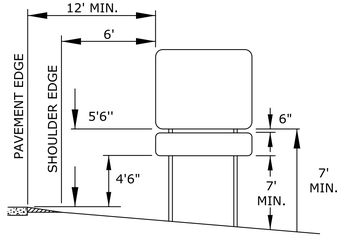
FHWA APPROVAL			7/23/2010	APP'D	Steven A. Buckley		
DESIGNED	D.D.G.	DETAILED	W.S.B.	QUANTITIES		TRACED	
DESIGN CK.	S.A.B.	DETAIL CK.	D.D.G.	QUAN. CK.		TRACE CK.	

Plotted : 03-SEP-2014 11:00
Drawn By : ROAD
File : TE402.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	87 N-0609-01	2014	30	52

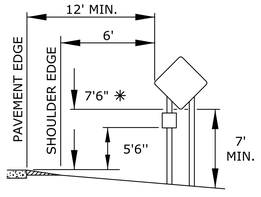


SHOULDER MOUNT



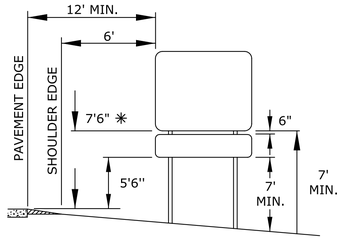
SHOULDER MOUNT

CONVENTIONAL ROADWAY



* - 8'6" WITH SECONDARY SIGN

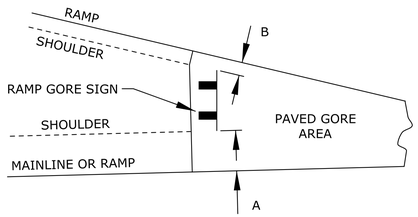
SHOULDER MOUNT



* - 8'6" WITH SECONDARY SIGN

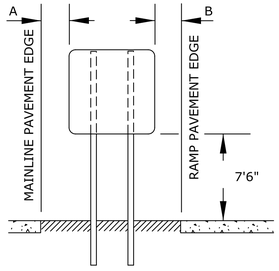
SHOULDER MOUNT

FREEWAY AND EXPRESSWAY ROADWAY
RAMPS AND SIDE ROADS

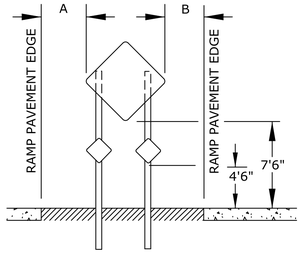


GORE TYPE	A (FT)	B (FT)
MAINLINE/ RAMP	6	3
RAMP/RAMP	3	3

(DIMENSIONS ARE MINIMUMS)



GORE INSTALLED SIGN
(MAINLINE/RAMP)

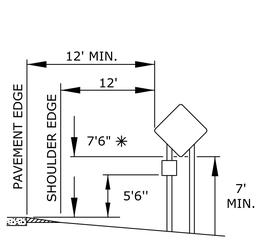


GORE INSTALLED SIGN
WITH TWO T1/OM'S
(RAMP/RAMP)

NOTES:
THE OUTER EDGE OF THE SIGN, ON EXPRESSWAYS AND FREEWAYS, SHALL BE A MINIMUM OF 10 FEET FROM THE RIGHT OF WAY LINE.
IN BUSINESS, COMMERCIAL, OR RESIDENTIAL DISTRICTS WHERE LATERAL OFFSETS ARE LIMITED, A MINIMUM LATERAL CLEARANCE OF 2 FEET WITH A 7'6" MINIMUM MOUNTING HEIGHT MAY BE USED.
WHEN SIGNS ARE MOUNTED BEHIND GUARD FENCE, THE NEAR EDGE OF THE SIGN SHALL NOT EXTEND BEYOND THE BACK SIDE OF THE GUARD FENCE AND THE NEAREST SIGN POST SHALL BE A MINIMUM OF 5 FEET FROM THE FACE OF THE GUARD FENCE. THERE SHALL NOT BE ANY SHOULDER MOUNTED SIGNS LOCATED BETWEEN 100 FEET IN ADVANCE OF AND 50 FEET BEYOND THE NOSE OF THE GUARD FENCE.
WHEN SIGNS ARE MOUNTED IN A MEDIAN, THE LATERAL PLACEMENT SHOULD BE THE SAME AS A SHOULDER MOUNT. IF THE MEDIAN IS TOO NARROW FOR THIS PLACEMENT THE SIGN MAY BE PLACED A MINIMUM OF 2 FEET FROM THE BACK OF THE CURB, BUT IN NO CASE SHALL THE SIGN EDGE EXTEND BEYOND THE BACK EDGE OF THE CURB. SIGNS LOCATED AT THE MEDIAN NOSE SHOULD BE SET THE SAME DISTANCE FROM THE BACK OF THE CURB AS THE RADIUS OF THE MEDIA NOSE, BUT SHOULD NOT EXCEED THE DISTANCE OF THE SHOULDER MOUNT OR BE CLOSER THAN 2 FEET FROM THE BACK OF THE CURB.

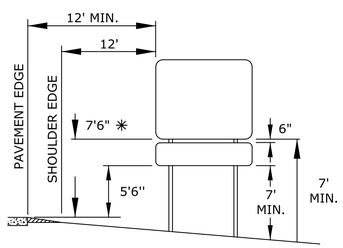
THE GORE SIGN SHALL BE INSTALLED IN THE FOOTING BLOCKOUT IN THE PAVED GORE AREA. IF NO BLOCKOUT IS PROVIDED, THEN LOCATE THE GORE SIGN AT THE PLAN STATION. THE EDGES OF THE GORE SIGN SHALL NOT EXTEND BEYOND THE SHOULDER EDGE. THE MINIMUM DISTANCE FROM THE POST CENTERLINE TO THE BACK EDGE OF THE PAVED GORE AREA IS 3 FEET.

ADJUSTMENTS:
SIGNS MAY BE MOVED LATERALLY OR LONGITUDINALLY IF IT WILL IMPROVE THE VISIBILITY OF THE SIGN OR OTHER SIGNS AND IF IT WILL PROTECT THE SIGN MORE.
THE MAXIMUM ALLOWABLE LONGITUDINAL ADJUSTMENTS OF SIGNS ARE:
ADVANCE GUIDE - 1320 FEET
SUPPLEMENTAL GUIDE - 1320 FEET
MOTORIST SERVICE - 1320 FEET
EXIT DIRECTION - 100 FEET
MILEAGE - 2640 FEET
MERGE OR ANY SIGNS IN AN INTERCHANGE - 50 FEET
MILEPOST - 50 FEET
IF ANY SIGN WITH A DISTANCE IS LONGITUDINALLY ADJUSTED, THE DISTANCE TO THE DESTINATION SHALL BE CHECKED AND MODIFIED AS NEEDED.
THE MINIMUM SPACING BETWEEN GUIDE SIGNS ON AN EXPRESSWAY OR FREEWAY IS 800 FEET.
THE MINIMUM SPACING BETWEEN SIGNS ON A RAMP OR CONVENTIONAL ROADWAY IS 100 FEET.



* - 8'6" WITH SECONDARY SIGN

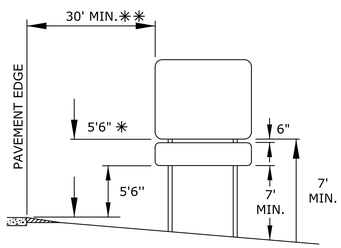
SHOULDER MOUNT



* - 8'6" WITH SECONDARY SIGN

SHOULDER MOUNT

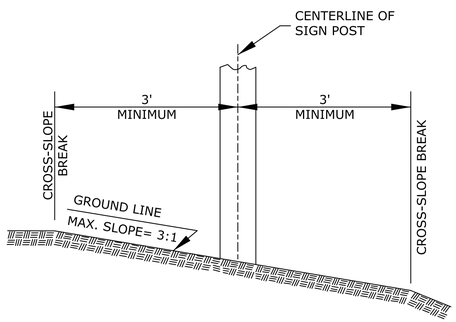
FREEWAY AND EXPRESSWAY ROADWAY



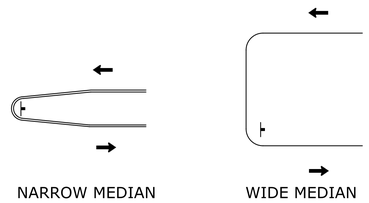
* - 8'6" WITH SECONDARY SIGN
** - 60' MAX.

OFFSET MOUNT

FREEWAY AND EXPRESSWAY ROADWAY

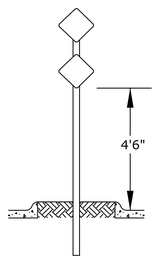


POST PLACEMENT CRITERIA
(CROSS-SLOPE BREAK)

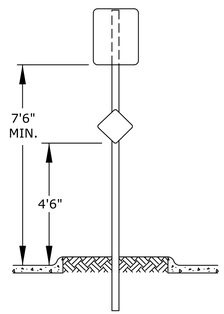


NARROW MEDIAN WIDE MEDIAN

TYPICAL MEDIAN SIGN LOCATION



ONE OR TWO OM1-3



PRIMARY SIGN WITH OM1-3

NO.	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION

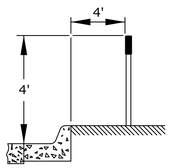
DETAILS FOR MOUNTING HEIGHTS LATERAL OFFSETS AND LONGITUDINAL ADJUSTMENTS

TE406 7/1/03

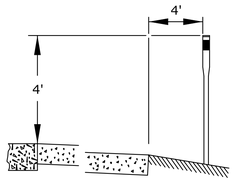
FHWA APPROVAL			7/22/2003	APP'D	Steven A. Buckley		
DESIGNED	D.D.G.	DETAILED	W.S.B.	QUANTITIES		TRACED	
DESIGN CK.	S.A.B.	DETAIL CK.	D.D.G.	QUAN. CK.		TRACE CK.	

Plotted : 03-SEP-2014 11:00
Drawn By : ROAD
File : TE406.dgn

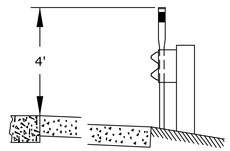
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	87 N-0609-01	2014	31	52



CURB SECTION

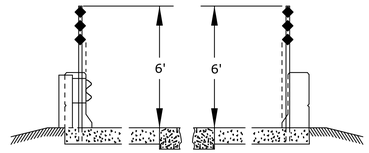


SHOULDER SECTION

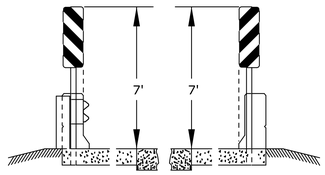


GUARD FENCE SECTION

TYPICAL DELINEATOR LOCATION FOR ROADSIDE MOUNTING

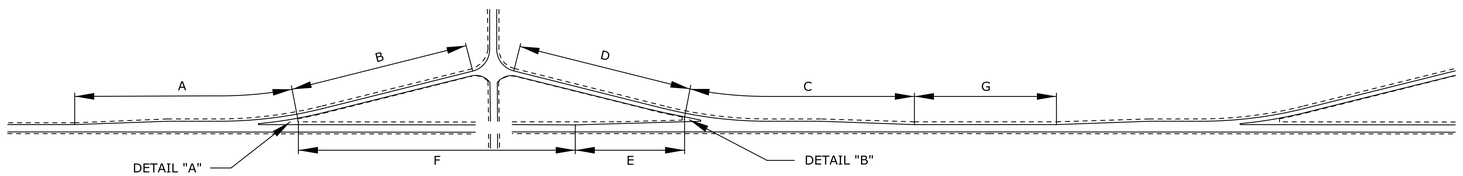


TYPE 2 OBJECT MARKERS
SHOULDER WIDTH 6 FT OR GREATER



TYPE 3 OBJECT MARKERS
SHOULDER WIDTH LESS THAN 6 FT

TYPICAL OBJECT MARKER LOCATION FOR BRIDGE AND CULVERT STRUCTURES



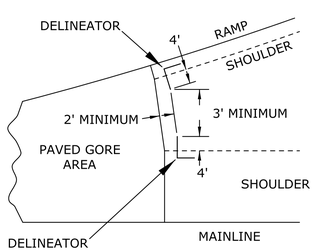
DELINEATION SPACING TABLE

	BEGINNING POINT	ENDING POINT	TYPICAL SPACINGS(1)	DELINEATOR TYPE AND COLOR	
				RIGHT EDGE	LEFT EDGE
A	END OF ACCELERATION LANE TAPER	PERPENDICULAR TO ENTRANCE RAMP GORE	100 FEET	"B" WHITE	"B" YELLOW
B	PERPENDICULAR TO ENTRANCE RAMP GORE	RAMP TERMINAL RADIUS	100 FEET	"A" WHITE	"A" YELLOW
C	END OF DECELERATION LANE TAPER	PERPENDICULAR TO EXIT RAMP GORE SIGN	100 FEET	"B" WHITE	"B" YELLOW
D	PERPENDICULAR TO EXIT RAMP GORE SIGN	RAMP TERMINAL RADIUS	100 FEET	"A" WHITE	"A" YELLOW
E	PERPENDICULAR TO EXIT RAMP GORE SIGN	END OF EXIT GORE TAPER	75-100 FT	"A" WHITE	"A" YELLOW
F	END OF EXIT GORE TAPER	ENTRANCE RAMP GORE	400-500 FT	"A" WHITE	"A" YELLOW
G	END OF ACCELERATION OR DECELERATION LANE TAPER	END OF ACCELERATION OR DECELERATION LANE TAPER	528 FT	"A" WHITE	"A" YELLOW
	BEGINNING OF CURVE FOR DIRECTION OF TRAVEL	END OF CURVE FOR DIRECTION OF TRAVEL	20-300 FT (2)	"A" WHITE	"A" YELLOW

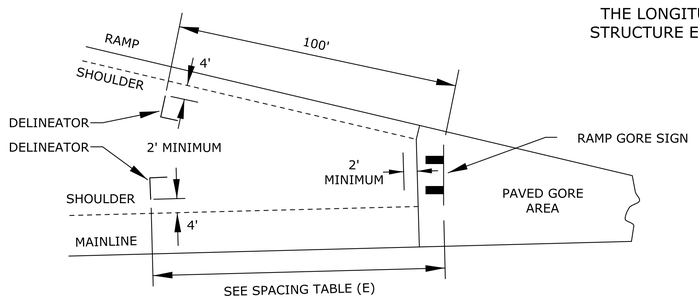
(1) SPACINGS SHALL BE CONTINOUS AND UNIFORM.

(2) SPACING IS ROUNDED TO NEAREST FOOT USING THE FORMULA:

SPACING = 3 X $\sqrt{(\text{RADIUS} - 50)}$



DETAIL "A"



DETAIL "B"

NOTE:
SEE 'DELINEATION SPACING' AND 'PATTERN OF DELINEATION' TABLES AND/OR PLAN SHEET FOR TYPE, COLOR, AND SPACING OF DELINEATION. THE COLOR OF DELINEATION SHALL MATCH THE COLOR OF THE PAVEMENT MARKING EDGELINE.

DELINEATION SHALL BE LOCATED ON THE OUTSIDE EDGE OF MAINLINE, ACCELERATION LANES, DECELERATION LANES, RAMPS, AND CURVES. DELINEATION SHALL NOT BE USED ON CURVES OR LOOPS WHEN CHEVRONS (W1-8 SIGNS) ARE USED, EXCEPT AT THE ENTRANCE AND EXIT GORE AREAS. WHEN CHANGING FROM DELINEATING ONE EDGE OF THE ROADWAY TO THE OTHER EDGE, THE DELINEATION ON BOTH EDGES SHALL OVERLAP THE TYPICAL SPACING SHOWN IN THE DELINEATION SPACING TABLE.

WHEN DELINEATING A CURVE, THE FIRST DELINEATOR SHOULD BE LOCATED AT THE BEGINNING OF THE CURVE. THE SPACING ON THE CURVE SHALL NOT EXCEED THE TYPICAL SPACING FOR THE ROAD TYPE.

ALL DELINEATION USED WITHIN 100 FEET IN ADVANCE OF THE NOSE OF GUARD FENCE AND THROUGHOUT THE AREA WITH GUARD FENCE SHALL BE FLEXIBLE POST MOUNTED.

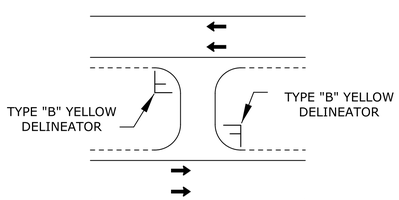
DELINEATION LOCATED ON A MEDIAN BETWEEN THE ENTRANCE AND EXIT RAMPS SHOULD BE INSTALLED ACCORDING TO MEDIAN WIDTH:

MEDIAN WIDTH LESS THAN 6 FT: DELINEATION INSTALLED BACK-TO-BACK ON A SINGLE POST ALONG THE MEDIAN CENTERLINE.

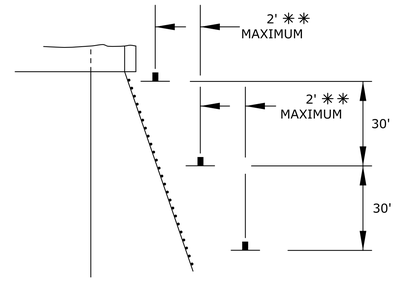
MEDIAN WIDTH GREATER THAN OR EQUAL TO 6 FT: DELINEATION INSTALLED AS SHOWN FOR THE TYPICAL DELINEATOR LOCATIONS.

THE SPACING SHALL BE AS SHOWN IN THE DELINEATION SPACING TABLE.

THE LONGITUDINAL LOCATION OF THE OBJECT MARKERS FROM THE STRUCTURE END SHALL BE A MAXIMUM SPACING OF 42"



TYPICAL DELINEATOR LOCATION FOR MEDIAN CROSS-OVER



TYPICAL PLACEMENT OF TYPE 3 OBJECT MARKERS

** - GUARD FENCE OR BARRIER

TYPE 3 OBJECT MARKERS USAGE		
TWO-WAY ROADWAY (TWO LANES)		
WIDTH OF STRUCTURE	LEFT	RIGHT
LESS THAN 20 FT	3 (1)	3 (1)
20 FT TO LESS THAN 25 FT	1	3 (1)
25 FT TO LESS THAN 28 FT	1	3 (1)
28 FT TO LESS THAN 30 FT	1	3 (1)
30 FT TO LESS THAN 33 FT	1 (2)	1
ONE-WAY ROADWAY (ONE LANE)		
WIDTH OF STRUCTURE	LEFT	RIGHT
LESS THAN 25 FT	3 (1)	3 (1)
ONE-WAY ROADWAY (TWO LANES)		
WIDTH OF STRUCTURE	LEFT	RIGHT
LESS THAN 20 FT	-	-
20 FT TO LESS THAN 25 FT	3 (1)	3 (1)
25 FT TO LESS THAN 28 FT	3 (1)	3 (1)
28 FT TO LESS THAN 30 FT	3 (1)	3 (1)
30 FT TO LESS THAN 33 FT	1 (2)	1

NOTES:
THE TYPE 3 OBJECT MARKERS USAGE TABLE IS BASED ON BOTH SHOULDERS BEING EQUAL WIDTH. IF ONE SHOULDER WIDTH IS GREATER THAN OR EQUAL TO 6 FT, THEN INSTALL A TYPE 2 OBJECT MARKER ON THAT SIDE AND INSTALL A TYPE 3 OBJECT MARKER ON THE OTHER SIDE.
(1) - THE FIRST TWO TYPE 3 OBJECT MARKERS NOT REQUIRED IF THE GUARD FENCE HAS DELINEATION.
(2) - THE LEFT TYPE 3 OBJECT MARKER NOT REQUIRED IF STRUCTURE LESS THAN 10 FEET LONG.

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION

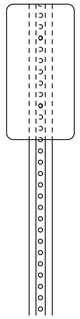
DESIGN DETAILS FOR POSITIONING OF DELINEATORS & OBJECT MARKERS (TYPES 2 & 3)

TE409 7/1/03

FHWA APPROVAL		7/22/2003	APP'D	Steven A. Buckley	
DESIGNED	D.D.G.	DETAILED	W.S.B.	QUANTITIES	TRACED
DESIGN CK.	S.A.B.	DETAIL CK.	D.D.G.	QUAN. CK.	TRACE CK.

Plotted : 03-SEP-2014 11:00
Drawn By : ROAD
File : TE409.dgn

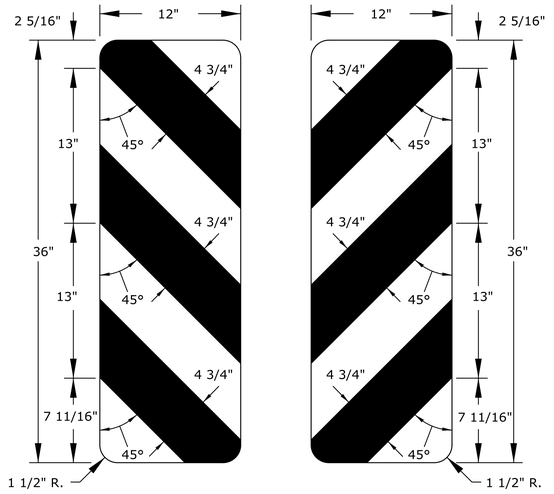
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	87 N-0609-01	2014	32	52



TYPE 2 OBJECT MARKER ASSEMBLY POSITIONS

FLAT SHEET OBJECT MARKERS:
SEE FLAT SHEET SIGN BLANK DETAIL SHEETS FOR THE ALUMINUM ALLOYS AND THICKNESS.

THE 6" X 12" OBJECT MARKER SIGN FACES SHALL BE COVERED WITH TYPE IV HIGH INTENSITY YELLOW RETROREFLECTIVE SHEETING.



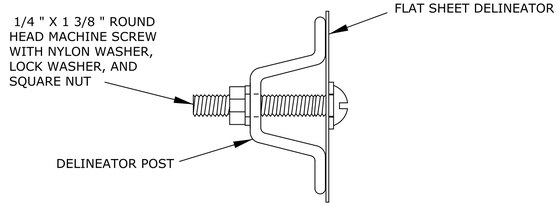
T3/OM-L T3/OM-R

COLORS:
YELLOW (RETROREFLECTIVE)
BLACK (NON-REFLECTIVE)

FLAT SHEET OBJECT MARKERS:
SEE FLAT SHEET SIGN BLANK DETAIL SHEETS FOR THE ALUMINUM ALLOYS AND THICKNESS.

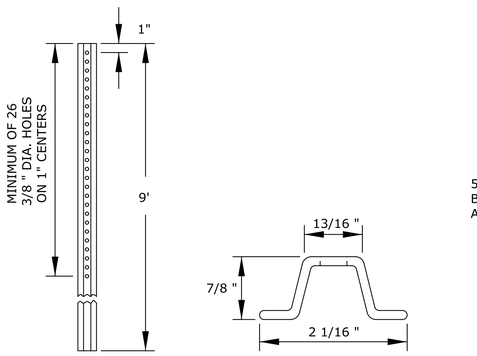
THE OBJECT MARKER SIGN FACE SHALL BE COVERED WITH TYPE IV HIGH INTENSITY YELLOW RETROREFLECTIVE SHEETING.

DETAILS FOR ATTACHING OBJECT MARKERS TO STEEL 'U' POSTS



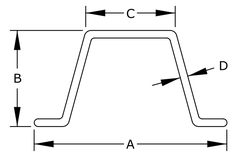
FLAT SHEET DELINEATOR MOUNTING

DETAILS FOR ATTACHING DELINEATORS TO STEEL DELINEATOR POSTS



PUNCHING DETAILS POST DIMENSIONS
(ALL DIMENSIONS SHOWN ARE NOMINAL)

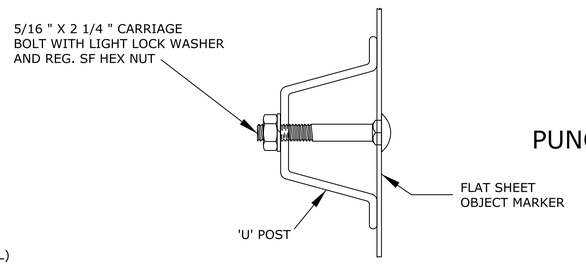
STEEL 'U' POST DETAILS



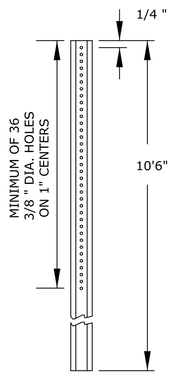
DIM.	2 LB/FT
A	3 1/8
B	1 17/32
C	1 1/4
D	1/8

(DIMENSIONS ARE NOMINAL)

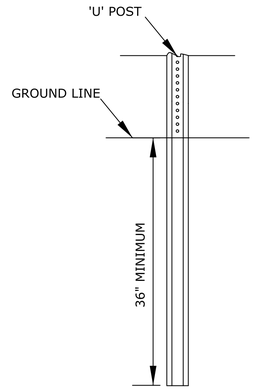
2LB. 'U' POST DETAILS



'U' POST MOUNTING DETAILS



'U' POST PUNCHING DETAILS



'U' POST INSTALLATION DETAIL

ALL DIMENSIONS ARE IN INCHES UNLESS OTHERWISE NOTED.

NO.	DATE	REVISIONS	BY	APP'D
1	7/23/10	Changed Sheeting Type	D.D.G.	D.B.

KANSAS DEPARTMENT OF TRANSPORTATION

DESIGN DETAILS FOR OBJECT MARKERS TYPE 2 AND TYPE 3

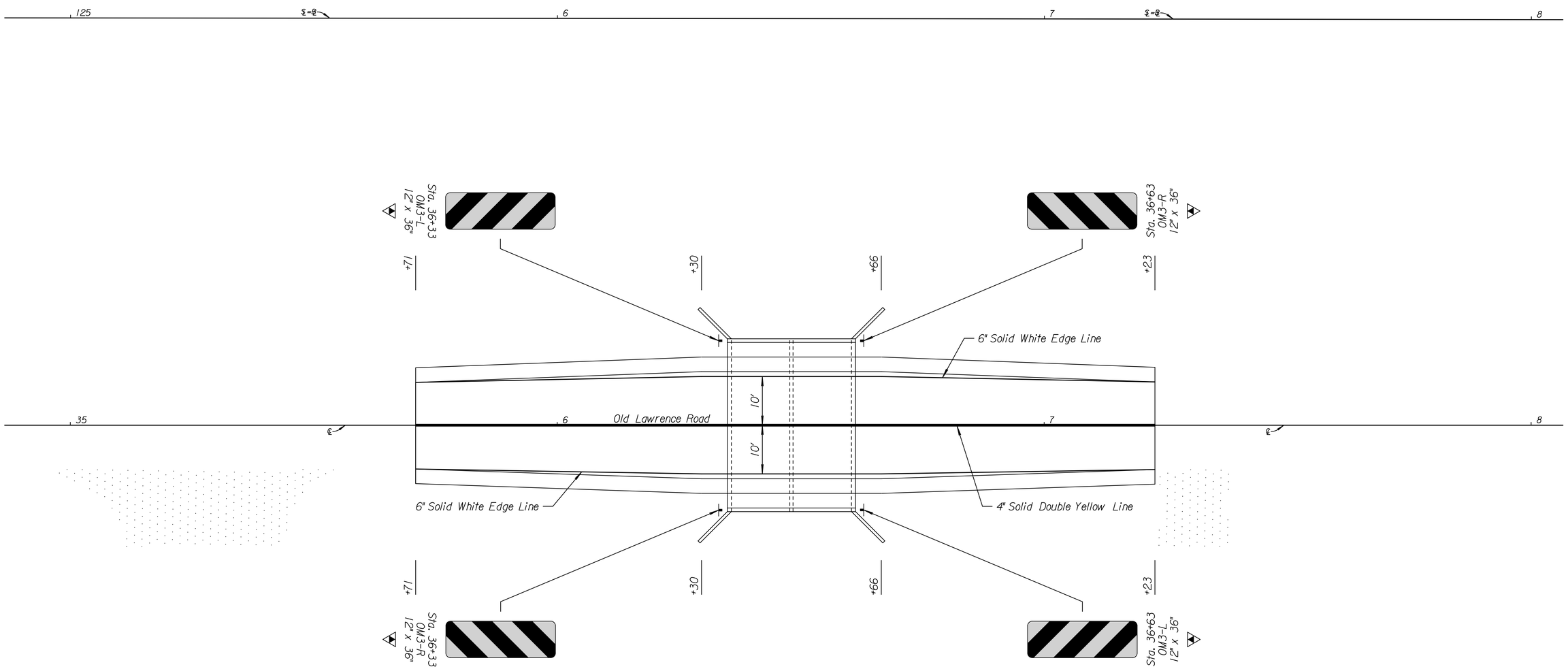
~~TE415~~ 7/1/03

FHWA APPROVAL			7/23/2010	APP'D	Steven A. Buckley		
DESIGNED	D.D.G.	DETAILED	W.S.B.	QUANTITIES		TRACED	
DESIGN CK.	S.A.B.	DETAIL CK.	D.D.G.	QUAN. CK.		TRACE CK.	

Plotted : 03-SEP-2014 11:00
Drawn By : ROAD
File : TE415.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	87 N-0609-01	2014	33	52

Scale: 1" = 10'



DATE	BY	REFERENCES NOTED
		REFERENCES CHECKED

Drawn By : ROAD Plotted : 9/3/2014
File : G:\W13\0022\Road\C-PMK-M01-101.dgn

KANSAS DEPARTMENT OF TRANSPORTATION

SIGNING AND PAVEMENT MARKING
OLD LAWRENCE ROAD BRIDGE

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	87 N-0609-01	2014	34	52

QUANTITIES SHEET

SIGNS, POSTS, & FOOTINGS TO BE INSTALLED ON PROJECT

PLAN SHEET NUMBER	PLAN STATION NUMBER	(CL) LOCATION / LATERAL POSITION	SIGN DESIGNATION	SIGN SIZE	SIGN LAYOUT SHEET NUMBER	TYPE OF SIGN			4" X 6" POSTS			312.25 ALUMINUM BEAM	U-POSTS		GALVANIZED STEEL BEAM POSTS						PERFORATED SQUARE STEEL TUBE (PSST) POSTS								CONCRETE FOOTINGS					TYPE OF SIGN STRUCTURE OR SUPPORT MOUNT						MOUNT ABOVE SIGN DESIGNATION
									WOOD		STEEL				W6x9		W10x12		W10x22		1 3/4"		2"		2 1/4"				2 1/2"		WOOD POST	STEEL BEAM POST									
																															A36		A572 (ALT)							
						FLAT SHEET	REINFORCED PANEL	OVERLAY	FLAT SHEET SIGN	REINFORCED PANEL SIGN	STRUCTURAL TUBING		2 LB PER FT	3 LB PER FT	A36 STEEL	A572 STEEL (ALT)	A36 STEEL	A572 STEEL (ALT)	A36 STEEL	A572 STEEL (ALT)	POST	FOOTING	POST	FOOTING	POST	FOOTING	COUPLER	COUPLER & FOOTING	POST	FOOTING	18" DIA.	24" DIA.	30" DIA.	24" DIA.	30" DIA.	OVERHEAD	CANTILEVER	BUTTERFLY	BRIDGE MOUNT	MAST ARM	VERT. SUPPORT	
33	36+33	L/S	OM3-L	12"x36"		X							I																											
33	36+33	R/S	OM3-R	12"x36"		X							I																												
33	36+63	L/S	OM3-R	12"x36"		X							I																												
33	36+63	R/S	OM3-L	12"x36"		X							I																												

CENTERLINE LOCATION
L - LEFT OF CENTERLINE
R - RIGHT OF CENTERLINE
C - ON THE CENTERLINE

LATERAL POSITION
S - SHOULDER MOUNT
O - OFFSET MOUNT
G - GORE MOUNT
M - MEDIAN MOUNT

NOTE: SEE STANDARD PLAN SHEET TE590 FOR DETAILED SPECIFICATIONS.

NO.	DATE	REVISIONS	BY	APP'D
I	7/23/10	Added Coupler and Coupler/Footing Quantity	D.D.G.	D.B.

FHWA APPROVAL		7/23/2010	APP'D	Steven A. Buckley	
DESIGNED	D.D.G.	DETAILED	K.S.	QUANTITIES	TRACED B.B.
DESIGN CK.	S.A.B.	DETAIL CK.	D.D.G.	QUAN. CK.	TRACE CK.

TE430

7/1/03

Plotted : 03-SEP-2014 11:00

Drawn By : ROAD
File : TE430.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	87 N-0609-01	2014	35	52

SUMMARY OF QUANTITIES

SIGNS

TYPE	NUMBER	SQUARE FEET
FLAT SHEET	4	12.0
REINFORCED PANEL		
OVERLAY		

OBJECT MARKERS

TYPE	NUMBER
TYPE 2 ("U" POST)	
TYPE 3 ("U" POST)	4

SIGN STRUCTURES

TYPE	NEW	MODIFIED
OVERHEAD STRUCTURE		
CANTILEVER STRUCTURE		
BUTTERFLY STRUCTURE		
BRIDGE MOUNT ATTACHMENT		
MAST ARM SIGN SUPPORT		

DELINEATORS

TYPE	FLEXIBLE DELINEATOR		RIGID DELINEATOR	
	TYPE I ANCHOR	TYPE III ANCHOR	"U" POST	BRACKET MOUNT
TYPE 'A' WHITE				
TYPE 'A' YELLOW				
TYPE 'B' WHITE				
TYPE 'B' YELLOW				
TYPE 'A' WHITE (BACK TO BACK)				
TYPE 'A' YELLOW (BACK TO BACK)				

REMOVALS

TYPE	NUMBER
SIGNS	
POSTS	
FOOTINGS	
SIGN STRUCTURES	

POSTS AND ALUMINUM BEAMS

	4" x 6" POST				"U" POST		GALVANIZED STEEL BEAM POST						PERFORATED SQUARE STEEL TUBE (PSST)			
	WOOD		STEEL				W6x9		W10x12		W10x22					
	FLAT SHEET SIGN	REINFORCED PANEL SIGN	STRUCTURAL TUBING	312.25 ALUMINUM BEAM	2 LBS/FT	3 LBS/FT	A36 STEEL	A572 STEEL (ALT)	A36 STEEL	A572 STEEL (ALT)	A36 STEEL	A572 STEEL (ALT)	1-3/4"	2"	2-1/4"	2-1/2"
NUMBER					4											
FEET					40											

POST FOOTINGS AND PSST COUPLERS

	CONCRETE FOOTING (DIA.)					PERFORATED SQUARE STEEL TUBE (PSST)					
	WOOD	A36 STEEL		A572 STEEL (ALT)		PERFORATED SQUARE STEEL TUBE FOOTING				COUPLER	COUPLER WITH FOOTING
	18"	24"	30"	24"	30"	1-3/4"	2"	2-1/4"	2-1/2"		
NUMBER											
FEET											

BASE PLATES AND STUB POSTS

	W6x9		W10x12		W10x22	
	A36 STEEL	A572 STEEL (ALT)	A36 STEEL	A572 STEEL (ALT)	A36 STEEL	A572 STEEL (ALT)
BREAKAWAY BASES						
BASE PLATE (TOP)						
STUB POST WITH BASE PLATE						
NON-BREAKAWAY BASES						
BASE PLATE						

NUMBER & LENGTHS OF POSTS & ALUMINUM BEAMS (INFORMATION ONLY)

LENGTH OF POST OR BEAM	4" x 6" POST				"U" POST		GALVANIZED STEEL BEAM POST						PERFORATED SQUARE STEEL TUBE (PSST)			
	WOOD		STEEL				W6x9		W10x12		W10x22					
	FLAT SHEET SIGN	REINFORCED PANEL SIGN	STRUCTURAL TUBING	312.25 ALUMINUM BEAM	2 LBS/FT	3 LBS/FT	A36 STEEL	A572 STEEL (ALT)	A36 STEEL	A572 STEEL (ALT)	A36 STEEL	A572 STEEL (ALT)	1-3/4"	2"	2-1/4"	2-1/2"
2.1' - 4'																
4.1' - 6'																
6.1' - 8'																
8.1' - 10'					4											
10.1' - 12'																
12.1' - 14'																
14.1' - 16'																
16.1' - 18'																
18.1' - 20'																
20.1' - 22'																
22.1' - 24'																
24.1' - 26'																
26.1' - 28'																
28.1' - 30'																
30.1' - 32'																

NO.	DATE	REVISIONS	BY	APP'D
1	7/23/10	Revised Tables	D.D.G.	D.B.

KANSAS DEPARTMENT OF TRANSPORTATION

SUMMARY OF QUANTITIES
FOR
INSTALLATIONS AND REMOVALS

TE439 7/1/03

FHWA APPROVAL		7/23/2010	APP'D	Steven A. Buckley	
DESIGNED	D.D.G.	DETAILED	K.D.S.	QUANTITIES	TRACED
DESIGN CK.	S.A.B.	DETAIL CK.	D.D.G.	QUAN. CK.	TRACE CK.

Plotted : 03-SEP-2014 11:00
Drawn By : ROAD
File : TE439.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	87 N-0609-01	2014	36	52

RECAPITULATION OF SIGNING & DELINEATION BID ITEMS

BID ITEMS	APPROXIMATE QUANTITIES		UNITS
SIGN (FLAT SHEET) (HIGH PERFORMANCE)	12.0		SQUARE FOOT
SIGN (REINFORCED PANEL) (HIGH PERFORMANCE)			SQUARE FOOT
SIGN (OVERLAY) (HIGH PERFORMANCE)			SQUARE FOOT
SIGN POST (4" x 6" WOOD) (FLAT SHEET SIGN)			LINEAR FOOT
SIGN POST (4" x 6" WOOD) (REINFORCED PANEL SIGN)			LINEAR FOOT
SIGN POST (2 LB/FT "U" STEEL)			LINEAR FOOT
SIGN POST (3 LB/FT "U" STEEL)	40.0		LINEAR FOOT
SIGN POST (1-3/4" PERFORATED SQUARE STEEL TUBE)			LINEAR FOOT
SIGN POST (2" PERFORATED SQUARE STEEL TUBE)			LINEAR FOOT
SIGN POST (2-1/4" PERFORATED SQUARE STEEL TUBE)			LINEAR FOOT
SIGN POST (2-1/2" PERFORATED SQUARE STEEL TUBE)			LINEAR FOOT
SIGN POST (4" X 6" STRUCTURAL STEEL)			LINEAR FOOT
SIGN POST (3 I 2.25 ALUMINUM)			LINEAR FOOT
	A36	A572(ALT)	
SIGN POST (W6X9 STEEL BEAM)			LINEAR FOOT
SIGN POST (W10X12 STEEL BEAM)			LINEAR FOOT
SIGN POST (W10X22 STEEL BEAM)			LINEAR FOOT
SIGN POST STUB WITH BREAKAWAY BASE PLATE (W6X9)			EACH
SIGN POST STUB WITH BREAKAWAY BASE PLATE (W10X12)			EACH
SIGN POST STUB WITH BREAKAWAY BASE PLATE (W10X22)			EACH
SIGN POST BREAKAWAY BASE PLATE (W6X9)			EACH
SIGN POST BREAKAWAY BASE PLATE (W10X12)			EACH
SIGN POST BREAKAWAY BASE PLATE (W10X22)			EACH
SIGN POST FOOTING (24" Dia. CONCRETE)(STEEL BEAM POST)			LINEAR FOOT
SIGN POST FOOTING (30" Dia. CONCRETE)(STEEL BEAM POST)			LINEAR FOOT
SIGN POST FOOTING (18" Dia. CONCRETE)(WOOD POST)			LINEAR FOOT
SIGN POST FOOTING (1-3/4" PERFORATED SQUARE STEEL TUBE)			EACH
SIGN POST FOOTING (2" PERFORATED SQUARE STEEL TUBE)			EACH
SIGN POST FOOTING (2-1/4" PERFORATED SQUARE STEEL TUBE)			EACH
SIGN POST FOOTING (2-1/2" PERFORATED SQUARE STEEL TUBE)			EACH
SIGN POST FOOTING (SIGN POST SQUARE COUPLER) (2-1/4")			EACH
SIGN POST SQUARE COUPLER (2-1/4")			
SIGNING OBJECT MARKER (TYPE 2)			EACH
SIGNING OBJECT MARKER (TYPE 3)	4		EACH
SIGNING DELINEATOR (TYPE A)(WHITE RIGID, "U" POST)			EACH
SIGNING DELINEATOR (TYPE A)(YELLOW RIGID, "U" POST)			EACH
SIGNING DELINEATOR (TYPE B)(WHITE RIGID, "U" POST)			EACH
SIGNING DELINEATOR (TYPE B)(YELLOW RIGID, "U" POST)			EACH
SIGNING DELINEATOR (TYPE A)(WHITE FLEXIBLE)(TYPE I ANCHOR)			EACH
SIGNING DELINEATOR (TYPE A)(YELLOW FLEXIBLE)(TYPE I ANCHOR)			EACH
SIGNING DELINEATOR (TYPE B)(WHITE FLEXIBLE)(TYPE I ANCHOR)			EACH
SIGNING DELINEATOR (TYPE B)(YELLOW FLEXIBLE)(TYPE I ANCHOR)			EACH
SIGNING DELINEATOR (TYPE A)(WHITE FLEXIBLE)(TYPE 3 ANCHOR)			EACH
SIGNING DELINEATOR (TYPE A)(YELLOW FLEXIBLE)(TYPE 3 ANCHOR)			EACH
SIGNING DELINEATOR (TYPE B)(WHITE FLEXIBLE)(TYPE 3 ANCHOR)			EACH
SIGNING DELINEATOR (TYPE B)(YELLOW FLEXIBLE)(TYPE 3 ANCHOR)			EACH

BID ITEMS	APPROXIMATE QUANTITIES	UNITS

NOTE:
THE QUANTITIES FOR STEEL BEAM POSTS, STUB POSTS, BASE PLATES, AND FOOTINGS IN THE CONTRACT ARE FOR A36 STEEL. WHEN FURNISHING A572 ALTERNATE STEEL BEAM POSTS, STUB POSTS, BASE PLATES, AND FOOTINGS, PAYMENT FOR THESE ITEMS WILL BE BASED ON THE A36 STEEL UNIT PRICES INCLUDED IN THE CONTRACT.

NO.	DATE	REVISIONS	BY	APP'D
1	7/23/10	Changed Bid Items as per Spec Book (2007)	D.D.G.	D.B.

KANSAS DEPARTMENT OF TRANSPORTATION

RECAPITULATION OF SIGNING & DELINEATION BID ITEMS

TE450 7/1/03

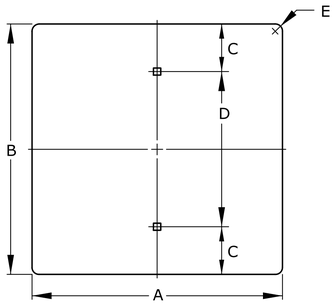
FHWA APPROVAL 7/23/2010 APP'D Steven A. Buckley

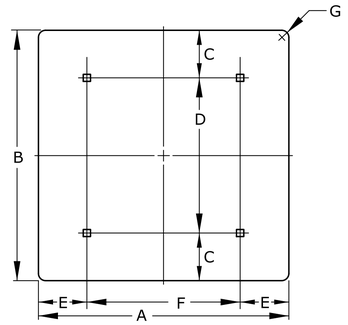
DESIGNED	D.D.G.	DETAILED	K.D.S.	QUANTITIES		TRACED	
DESIGN CK.	S.A.B.	DETAIL CK.	D.D.G.	QUAN. CK.		TRACE CK.	

Plotted : 03-SEP-2014 11:00

Drawn By : ROAD
File : TE450.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	87 N-0609-01	2014	37	52





	SIGN SIZE	A	B	C	D	E	T	AREA
(1)	3 X 8	3	8	1	6	3/8	0.040	0.17
	6 X 12	6	12	3	6	3/8	0.040	0.50
	12 X 6	12	6	1 1/2	3	3/8	0.063	0.50
	12 X 18	12	18	3	12	1 1/2	0.063	1.50
	12 X 24	12	24	3	18	1 1/2	0.080	2.00
	12 X 36	12	36	6	24	1 1/2	0.080	3.00
	12 X 48	12	48	6	36	1 1/2	0.080	4.00
	15 X 15	15	15	1 1/2	12	1 1/2	0.063	1.56
	18 X 6	18	6	1 1/2	3	1 1/2	0.063	0.75
	18 X 12	18	12	3	6	1 1/2	0.063	1.50
	18 X 18	18	18	3	12	1 1/2	0.063	2.25
	18 X 24	18	24	3	18	1 1/2	0.080	3.00
	21 X 15	21	15	1 1/2	12	1 1/2	0.080	2.19
	24 X 6	24	6	1 1/2	3	1 1/2	0.080	1.00
	24 X 12	24	12	3	6	1 1/2	0.080	2.00
	24 X 18	24	18	3	12	1 1/2	0.080	3.00
	24 X 24	24	24	3	18	1 1/2	0.080	4.00
	24 X 30	24	30	3	24	1 1/2	0.080	5.00
	24 X 36	24	36	6	24	1 1/2	0.080	6.00
	30 X 15	30	15	1 1/2	12	1 1/2	0.080	3.13
	30 X 18	30	18	3	12	1 1/2	0.080	3.75
	30 X 24	30	24	3	18	1 1/2	0.080	5.00
	30 X 30	30	30	3	24	1 1/2	0.080	6.25
	30 X 36	30	36	6	24	1 1/2	0.080	7.50
	36 X 12	36	12	3	6	1 1/2	0.080	3.00
	36 X 18	36	18	3	12	1 1/2	0.080	4.50
	36 X 24	36	24	3	18	1 1/2	0.080	6.00
	36 X 30	36	30	3	24	1 1/2	0.080	7.50
	36 X 36	36	36	6	24	2	0.080	9.00

	SIGN SIZE	A	B	C	D	E	F	G	T	AREA
	36 X 12	36	12	3	6	6	24	1 1/2	0.080	3.00
	36 X 18	36	18	6	12	6	30	1 1/2	0.080	4.50
	36 X 24	36	24	6	12	6	24	1 1/2	0.080	6.00
	36 X 30	36	30	6	18	6	30	1 1/2	0.080	7.50
	36 X 36	36	36	6	24	6	24	1 1/2	0.080	9.00
	36 X 42	36	42	6	30	6	30	1 1/2	0.080	10.50
	48 X 12	48	12	3	6	9	30	1 1/2	0.080	4.00
	48 X 18	48	18	3	12	9	30	1 1/2	0.080	6.00
	48 X 24	48	24	6	12	9	30	2	0.080	8.00
	48 X 30	48	30	6	18	9	30	0	0.100	10.00
	48 X 36	48	36	6	24	9	30	0	0.100	12.00
	48 X 42	48	42	6	30	9	30	0	0.100	14.00
	48 X 48	48	48	9	30	9	30	0	0.100	16.00
(2)	48 X 72	48	72	15	42	9	30	0	0.100	24.00
(2)	48 X 96	48	96	21	54	9	30	0	0.100	32.00
	54 X 36	54	36	6	30	12	30	0	0.100	13.50
	54 X 42	54	42	6	30	12	30	0	0.100	15.75
	60 X 12	60	12	3	6	12	36	0	0.100	5.00
	60 X 18	60	18	3	12	12	36	0	0.100	7.50

SIGN SIZE	A	B	C	D	E	F	G	T	AREA
60 X 24	60	24	6	12	12	36	0	0.100	10.00
60 X 30	60	30	6	18	12	36	0	0.100	12.50
60 X 36	60	36	6	24	12	36	0	0.100	15.00
60 X 42	60	42	6	30	12	36	0	0.100	17.50
60 X 48	60	48	9	30	12	36	0	0.100	20.00
60 X 60	60	60	12	36	12	36	0	0.100	25.00
72 X 12	72	12	3	6	15	42	0	0.100	6.00
72 X 18	72	18	3	12	15	42	0	0.100	9.00
72 X 24	72	24	6	12	15	42	0	0.100	12.00
72 X 30	72	30	6	18	15	36	0	0.100	15.00
72 X 36	72	36	6	24	15	42	0	0.100	18.00
72 X 42	72	42	6	30	15	42	0	0.100	21.00
72 X 48	72	48	9	30	15	42	0	0.100	24.00
84 X 18	84	18	6	12	15	48	0	0.100	10.50
84 X 30	84	30	6	18	18	48	0	0.100	17.50
84 X 36	84	36	6	24	18	48	0	0.100	21.00
84 X 42	84	42	6	30	18	48	0	0.100	24.50
84 X 48	84	48	9	30	18	48	0	0.100	28.00

NOTE:
ALL HOLES ARE 3/8 " SQUARE, UNLESS OTHERWISE NOTED.

THE DIMENSION "T" IS THE THICKNESS OF THE ALUMINUM BLANK.

(1) HOLES SHALL BE 5/16 " DIAMETER.

(2) DIMENSION "D" REQUIRES A CENTER HOLE.

ALL DIMENSIONS ARE IN INCHES.

NO.	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION

SIGN BLANK DETAILS FOR FLAT SHEET SIGNS

TE506 7/1/03

FHWA APPROVAL		7/22/2003	APP'D	Steven A. Buckley	
DESIGNED	D.D.G.	DETAILED	A.A.D.	QUANTITIES	TRACED
DESIGN CK.	S.A.B.	DETAIL CK.	D.D.G.	QUAN. CK.	TRACE CK.

Plotted : 03-SEP-2014 11:00
Drawn By : ROAD
File : TE506.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	87 N-0609-01	2014	38	52

DETAILED SPECIFICATIONS FOR FLAT SHEET SIGNS

ALL NEW FLAT SHEET SIGN BLANKS SHALL BE OF THE ALUMINUM ALLOY AND THICKNESS SHOWN ON THE FLAT SHEET BLANK DETAIL SHEETS.

FLAT SHEET BLANKS SHALL BE USED FOR SIGNS THAT ARE LESS THAN OR EQUAL TO 7'-0" IN LENGTH AND/OR LESS THAN OR EQUAL TO 4'-0" IN HEIGHT. FLAT SHEET BLANKS SHALL ALSO BE USED FOR SIGNS THAT ARE 4'-0" IN LENGTH AND LESS THAN OR EQUAL TO 8'-0" IN HEIGHT.

THE DESIGN DETAILS FOR SIGNS (COLOR, LETTER HEIGHT, AND LETTER SERIES) SHALL BE AS SHOWN IN THE 'STANDARD HIGHWAY SIGNS' MANUAL (2004 EDITION), UNLESS OTHER DETAILS ARE SHOWN IN THE PLANS.

ALL SIGN FACES WITH BLUE, GREEN, RED, YELLOW, FLUORESCENT YELLOW GREEN, BROWN, OR WHITE BACKGROUND SHALL BE COVERED WITH TYPE IV HIGH INTENSITY RETROREFLECTIVE SHEETING.

THE TYPE OF ADHESIVE USED FOR RETROREFLECTIVE SHEETING OR LETTERING FILM SHALL BE HEAT ACTIVATED OR PRESSURE SENSITIVE.

THE SIGN FACES SHALL BE DIRECT SCREEN PROCESS, REVERSE SCREEN PROCESS, OR DIRECT APPLIED LEGEND.

DETAILED SPECIFICATIONS FOR STRUCTURAL EXTRUDED PANEL SIGNS

ALL NEW REINFORCED SIGN PANELS SHALL BE OF THE FABRICATION, ALUMINUM ALLOY, AND THICKNESS SHOWN ON THE REINFORCED PANEL DETAIL SHEETS. IF EXTRUSHEET FABRICATED SIGN PANELS ARE USED, THEY SHALL BE OF THE LENGTH, WIDTH AND IN THE POSITION SHOWN. IF EXTRUSHEET FABRICATED PANEL DIMENSIONS ARE NOT SHOWN, A LINE OF LEGEND SHOULD BE PLACED ENTIRELY ON ONE PANEL. IF EXTRUDED FABRICATED SIGN PANELS ARE USED, EITHER 1'-0" OR 6" PANELS SHALL BE USED. THE 1'-0" PANELS SHALL BE USED ONLY AT THE TOP OR BOTTOM OF SIGNS.

REINFORCED PANELS SHALL BE USED FOR SIGNS THAT ARE GREATER THAN 7'-0" IN LENGTH OR GREATER THAN 4'-0" IN HEIGHT.

ALL SIGN FACES SHALL BE COVERED WITH TYPE IV HIGH INTENSITY RETROREFLECTIVE SHEETING.

THE RETROREFLECTIVE SHEETING USED FOR THE DIRECT APPLIED LEGEND, AND DIRECT APPLIED BORDERS SHALL BE TYPE IV HIGH INTENSITY RETROREFLECTIVE SHEETING.

THE TYPE OF ADHESIVE USED FOR RETROREFLECTIVE SHEETING OR LETTERING FILM SHALL BE HEAT ACTIVATED OR PRESSURE SENSITIVE.

LETTERS AND NUMBERS ON REINFORCED PANEL SIGNS ARE MODIFIED SERIES "E" UNLESS OTHERWISE SHOWN.

SPACING TABLE DIMENSIONS ARE IN INCHES.

NO.	DATE	REVISIONS	BY	APP'D
1	7/23/10	Changed Notes and Sheeting Type	D.D.G.	D.B.

KANSAS DEPARTMENT OF TRANSPORTATION

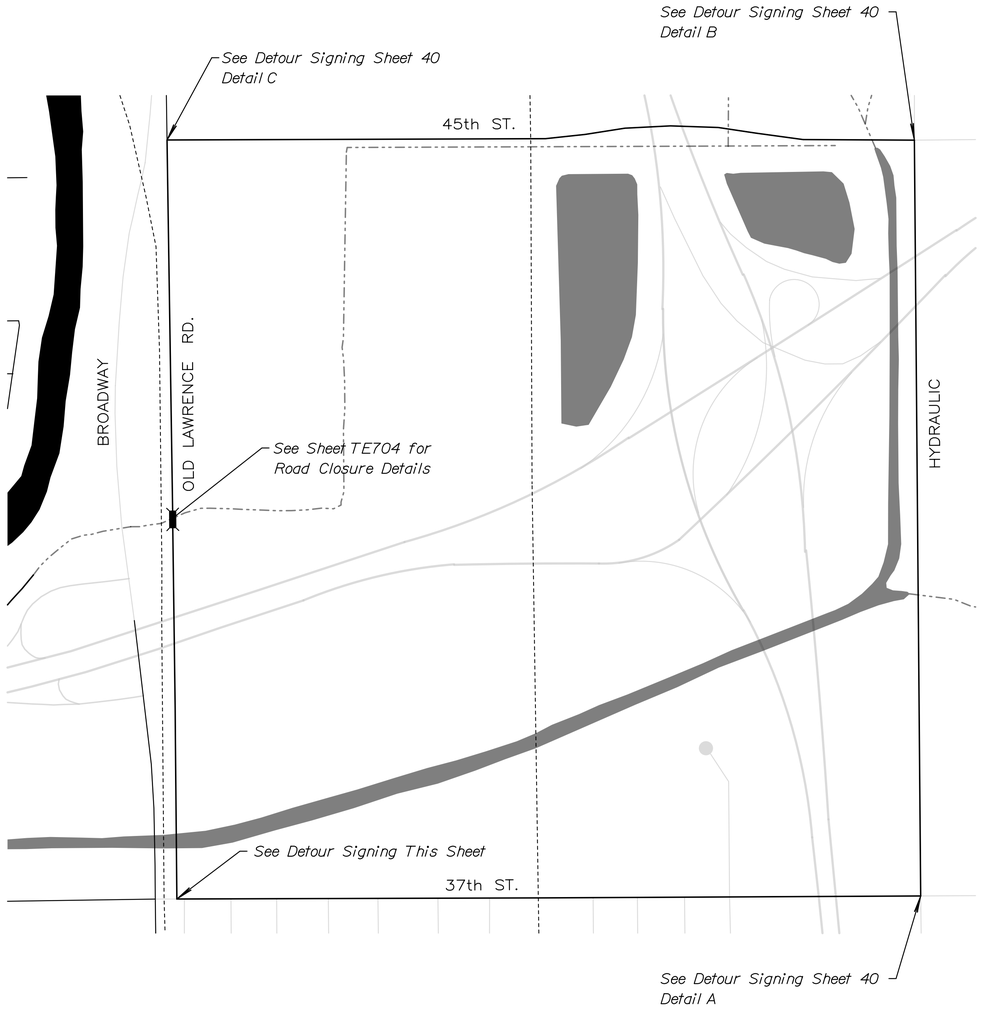
DETAILS SPECIFICATIONS FOR REINFORCED SIGN PANELS AND FLAT SHEET SIGNS

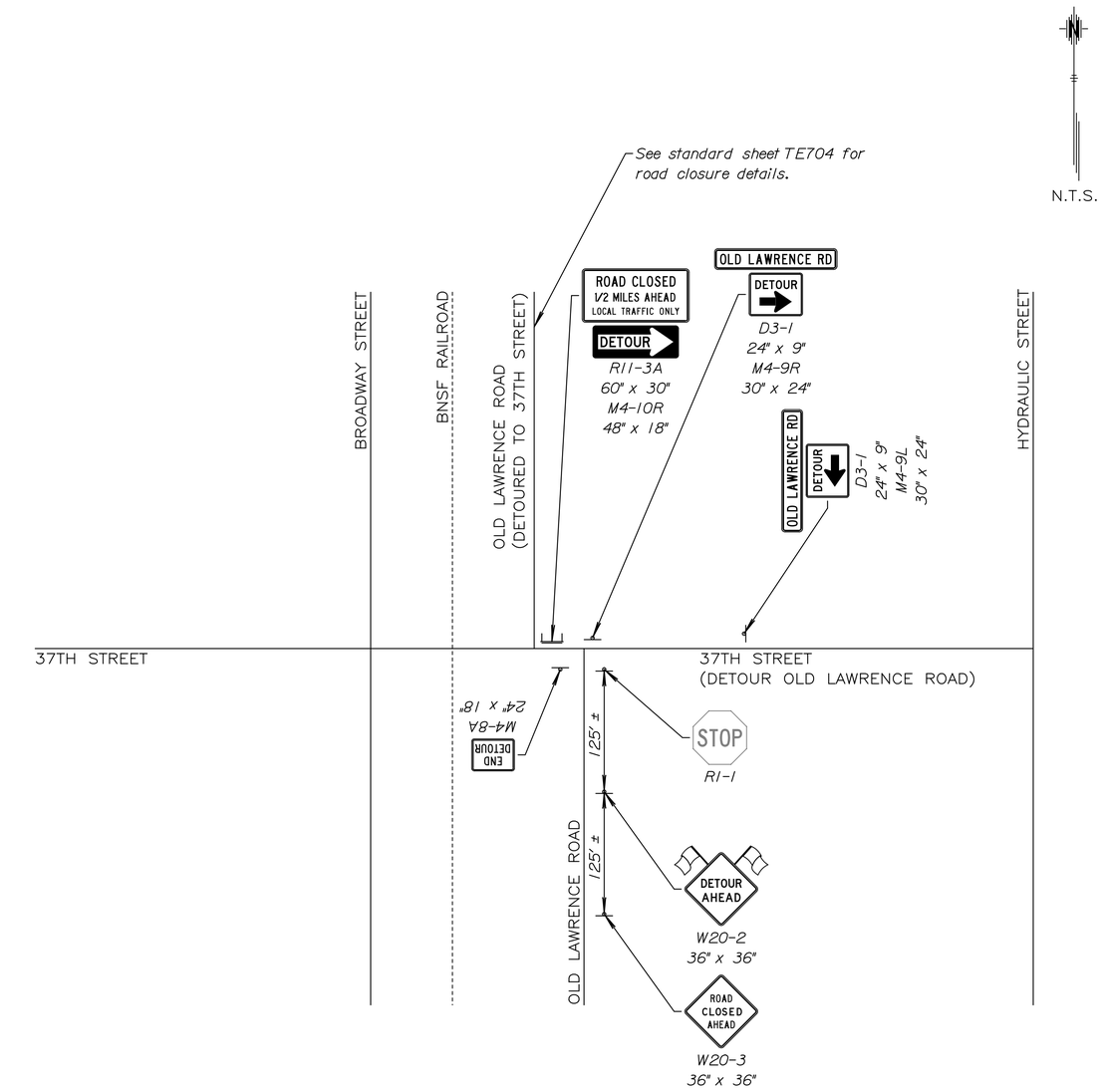
~~TE590~~ 7/1/03

FHWA APPROVAL		7/23/2010	APP'D	Steven A. Buckley	
DESIGNED	D.D.G.	DETAILED	K.D.S.	QUANTITIES	TRACED
DESIGN CK.	S.A.B.	DETAIL CK.	D.D.G.	QUAN. CK.	TRACE CK.

Plotted : 03-SEP-2014 11:00
Drawn By : ROAD
File : TE590.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	87 N-0609-01	2014	39	52





DETOUR SIGNING LAYOUT

Notes

1. Existing Signs not Shown at these Junctions Shall Remain in Place Unless Otherwise Directed by the Engineer.

2. The Spacing between any Signs may be Adjusted as Approved by the Engineer in Order to Maximize Visibility.

LEGEND

- *Proposed Traffic Control Sign*
- *Type III Barricade with Sign*
- *Temporary Sign Post*
- *Traffic Signal Mast Arm*
- *Existing Sign To Remain*

KANSAS DEPARTMENT OF TRANSPORTATION

DETOUR MAP

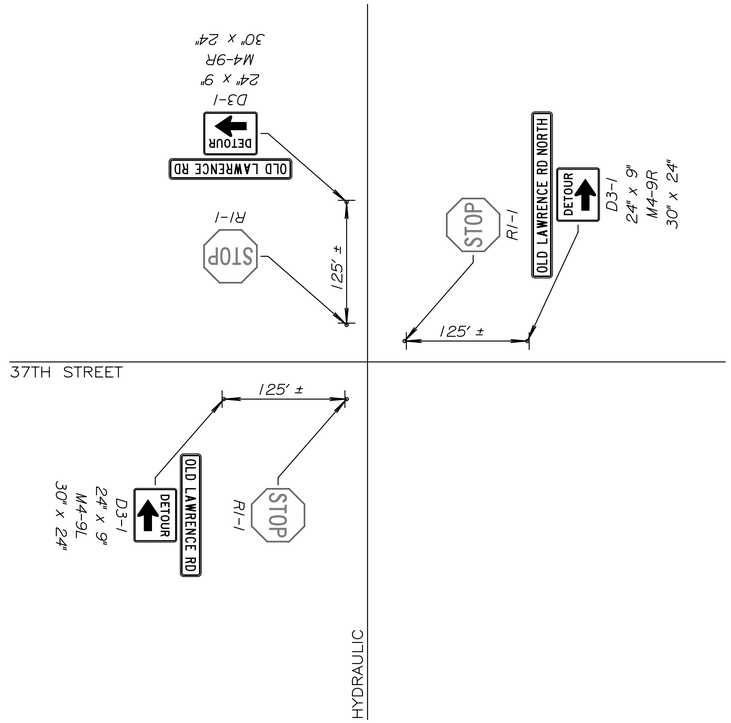
OLD LAWRENCE ROAD DETOUR

BY	DATE
REFERENCES NOTED	
REFERENCES CHECKED	

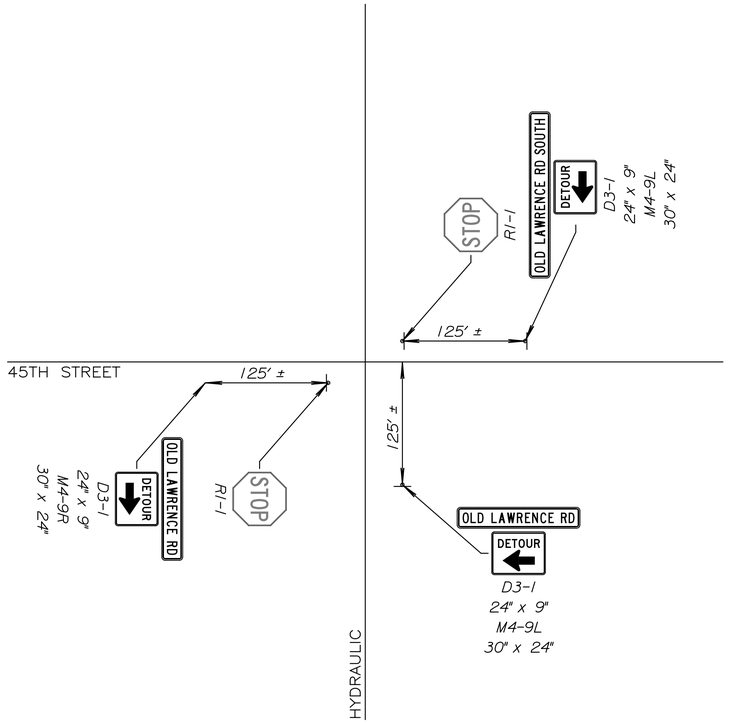
Drawn By : ROAD Plotted :9/3/2014
File : G:\WI13\0022\Road\C-TCP-S01-101.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	87 N-0609-01	2014	40	52

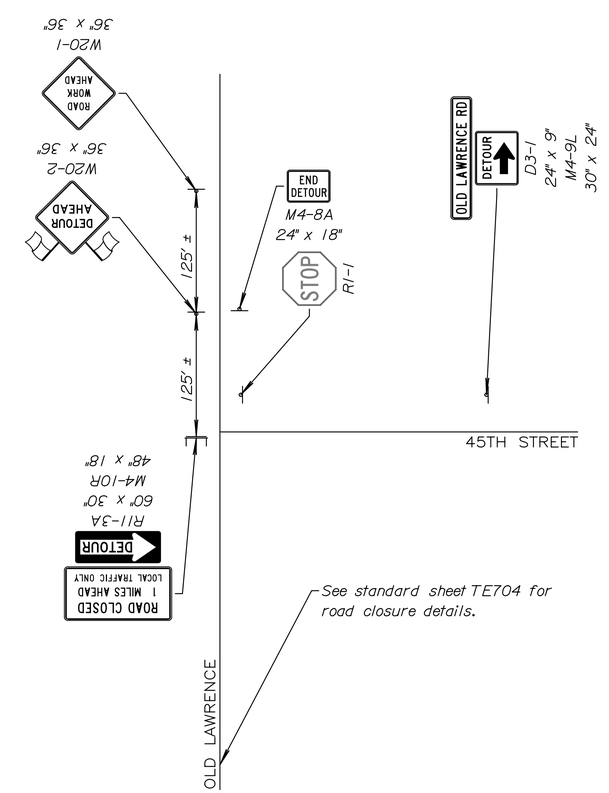
BY	DATE
REFERENCES NOTED	
REFERENCES CHECKED	



DETAIL A
37th Street and Hydraulic Street



DETAIL B
45th Street and Hydraulic Street



DETAIL C
45th Street and Old Lawrence Road

LEGEND

- Proposed Traffic Control Sign
- Type III Barricade with Sign
- Temporary Sign Post
- Traffic Signal Mast Arm
- Existing Sign To Remain

KANSAS DEPARTMENT OF TRANSPORTATION

DETOUR MAP

OLD LAWRENCE ROAD DETOUR

Drawn By : ROAD Plotted : 9/3/2014
File : G:\WI130022\Road\C-TCP-S01-102.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	87 N-0609-01	2014	41	52

1. MUTCD COMPLIANCE:

ALL TEMPORARY TRAFFIC CONTROL DEVICES AND THEIR INSTALLATION AND MAINTENANCE SHALL COMPLY WITH THE LATEST EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) FOR STREETS AND HIGHWAYS WHICH HAS BEEN ADOPTED BY THE SECRETARY OF TRANSPORTATION. WHENEVER THE TEMPORARY TRAFFIC CONTROL STANDARDS CONFLICT WITH THE MUTCD, THE STANDARDS SHALL GOVERN.

2. DESIGN SPEED:

THOSE ITEMS DELEGATED TO TEMPORARY TRAFFIC CONTROL SHOULD BE DESIGNED AND INSTALLED USING THE POSTED/LEGAL SPEED OF THE ROADWAY PRIOR TO WORK STARTING.

3. CLEAR ZONE:

ALL CONSTRUCTION EQUIPMENT (INCLUDING VEHICLES), MATERIALS, AND DEBRIS SHALL BE STORED OUT OF THE CLEAR ZONE. WHERE THIS CANNOT BE ACHIEVED, THE CONTRACTOR SHALL PLACE APPROPRIATE SIGNS, OBJECT IDENTIFIERS, AND/OR BARRICADES AS DESIGNATED BY THE ENGINEER. TEMPORARY TRAFFIC CONTROL DEVICES NEEDED FOR THIS CONDITION SHALL BE CONSIDERED SUBSIDIARY TO OTHER BID ITEMS.

4. MINIMUM LANE WIDTHS:

LANE WIDTHS SHALL BE A MINIMUM OF 11' (MEASURED BETWEEN CENTERLINES OF PAVEMENT MARKINGS) OR AS SHOWN ON THE PLANS, OR AS DIRECTED BY THE ENGINEER. A LANE WIDTH LESS THAN 11' MAY REQUIRE RESTRICTED ROADWAY WIDTH SIGNING.

5. FLAGGER:

A MINIMUM OF ONE FLAGGER SHALL 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.

6. PAVEMENT MARKING:

WHEN THE WORK WILL OCCUPY A LOCATION MORE THAN THREE DAYS, ALL CONFLICTING PAVEMENT MARKINGS SHALL BE REMOVED OR MASKED AND ALL TRANSITION TAPERS, CROSSOVERS, AND EDGE LINES ALONG CHANNELIZING DEVICES SHALL BE MARKED WITH SOLID 4" WIDE PAVEMENT MARKING.

7. FIRST MODULE OF IBS:

THE FIRST MODULE OF EACH INERTIAL BARRIER SYSTEM (IBS) SHALL HAVE A MINIMUM OF 2 SQ. FT. OF FLUORESCENT ORANGE ASTM TYPE IV SHEETING FACING TRAFFIC. EITHER A VERTICAL RECTANGLE OR DIAMOND SHAPE MAY BE USED.

8. PEDESTRIAN / BICYCLE SAFETY:

WORK ZONE SIGNS SHALL NOT INHIBIT PEDESTRIAN AND BICYCLE TRAFFIC ON SIDEWALKS OR OTHER AREAS DESIGNATED FOR PEDESTRIAN OR BICYCLE USE.

CONSIDERATION SHOULD BE MADE TO SEPARATE PEDESTRIAN AND BICYCLE MOVEMENTS FROM BOTH WORK SITE ACTIVITY AND VEHICULAR TRAFFIC. UNLESS A REASONABLE SAFE ROUTE THAT DOES NOT INVOLVE CROSSING THE ROADWAY CAN BE PROVIDED, PEDESTRIANS AND BICYCLISTS SHOULD BE APPROPRIATELY DIRECTED WITH ADVANCE SIGNING THAT ENCOURAGES THEM TO CROSS TO THE OPPOSITE SIDE OF THE ROADWAY. IN URBAN AND SUBURBAN AREAS WITH HIGH VEHICULAR TRAFFIC VOLUMES, THESE SIGNS SHOULD BE PLACED AT INTERSECTIONS (RATHER THAN MIDBLOCK LOCATIONS) SO THAT PEDESTRIANS AND BICYCLISTS ARE NOT CONFRONTED WITH MIDBLOCK WORK SITES THAT WILL INDUCE THEM TO ATTEMPT SKIRTING THE WORK SITE OR MAKING A MIDBLOCK CROSSING.

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.

9. CHANGED STOP CONDITIONS:

ATTACH TWO FLUORESCENT RED-ORANGE FLAGS AND A RED TYPE "B" HIGH INTENSITY WARNING LIGHT TO ANY STOP SIGN THAT CREATES A NEW STOP CONDITION OR MOVES THE STOP CONDITION TO A NEW LOCATION. LEAVE FLAGS AND LIGHTS IN PLACE FOR AT LEAST THE FIRST 30 DAYS. INSTALL W3-1 (SYMBOLIC STOP AHEAD) SIGN IN ADVANCE OF STOP SIGN IF STOP SIGN IS NOT VISIBLE FOR A MINIMUM OF DISTANCE 'A' (SEE CHART ON TE710) OR IF STOP CONDITION IS MOVED TO LESS THAN DISTANCE 'A' FROM AN EXISTING STOP AHEAD SIGN.

10. LUMP SUM BIDDING:

WHEN TRAFFIC CONTROL IS BID LUMP SUM, ADDITIONAL DEVICES WILL BE PAID FOR AS EXTRA WORK.

11. NIGHTTIME LIGHTING:

WHEN NIGHTTIME WORK IS REQUIRED, FLOODLIGHTS SHOULD BE USED TO ILLUMINATE FLAGGER STATIONS, EQUIPMENT CROSSINGS, AND OTHER AREAS WHERE EXISTING LIGHTING IS NOT ADEQUATE FOR THE WORK TO BE PERFORMED SAFELY.

IN NO CASE SHALL FLOODLIGHTS BE PERMITTED TO CREATE A DISABLING GLARE FOR THE DRIVER. THE ADEQUACY OF THE FLOODLIGHT PLACEMENT AND ELIMINATION OF POTENTIAL GLARE SHOULD BE CHECKED BY DRIVING THROUGH THE PROJECT.

12. NCHRP REPORT 350 CRASHWORTHY REQUIREMENTS:

TRAFFIC CONTROL DEVICES SHALL MEET THE EVALUATION CRITERIA IN NCHRP REPORT 350 OR IN MASH REPORT 2009 AS SUPPLEMENTED BY FHWA MEMORANDUM "IDENTIFYING ACCEPTABLE HIGHWAY SAFETY FEATURES," DATED JULY 25, 1997. AVAILABLE ON THE INTERNET AT http://safety.fhwa.dot.gov/roadway_dept/policy_guide/road_hardware/policy_memo/

ANY DEVICE NOT ADDRESSED BY THE TE STANDARDS MAY BE APPROVED ON A CASE BY CASE BASIS BY THE ENGINEER. THE DEVICE SHALL BE ACCOMPANIED BY AND INSTALLED ACCORDING TO MASH REPORT 2009. ANY DEVICE ACCEPTED PRIOR TO THE ADOPTION OF MASH REPORT 2009 USING CRITERIA FROM NCHRP REPORT 350 MAY REMAIN IN PLACE AND CONTINUE TO BE USED. ANY TRAFFIC CONTROL DEVICE ACCEPTED USING NCHRP REPORT 350 CRITERIA IS NOT REQUIRED TO BE TESTED UNDER MASH REPORT 2009. HOWEVER, NEW TRAFFIC CONTROL DEVICES NOT PREVIOUSLY EVALUATED MUST UTILIZE MASH REPORT 2009 FOR TESTING AND EVALUATION.

THE CONTRACTOR SHALL:

1) PROVIDE TO THE ENGINEER A COPY OF THE MANUFACTURER'S SELF-CERTIFICATION THAT ANY CATEGORY 1 (i.e. - PLASTIC CONICAL DELINEATORS, TUBULAR MARKERS, DRUMS WITHOUT ATTACHMENTS) AND CATEGORY 2 (i.e. - PORTABLE SIGN STANDS (WITH SIGNS), TYPE II AND III BARRICADES, AND VERTICAL PANELS) DEVICES USED ON THE PROJECT ARE NCHRP REPORT 350 OR MASH REPORT 2009 COMPLIANT.

2) PROVIDE TO THE ENGINEER A COPY OF THE ENTIRE FHWA ACCEPTANCE LETTER (WZ-xxx) FOR ANY CATEGORY 2 DEVICE (i.e. - PORTABLE SIGN STANDS (WITH SIGNS), TYPE II AND III BARRICADES, AND VERTICAL PANELS) USED ON THE PROJECT. WORK ZONE FHWA ACCEPTANCE LETTERS (WZ-xxx) ARE AVAILABLE ON THE INTERNET AT: http://safety.fhwa.dot.gov/roadway_dept/policy_guide/road_hardware/wzd/

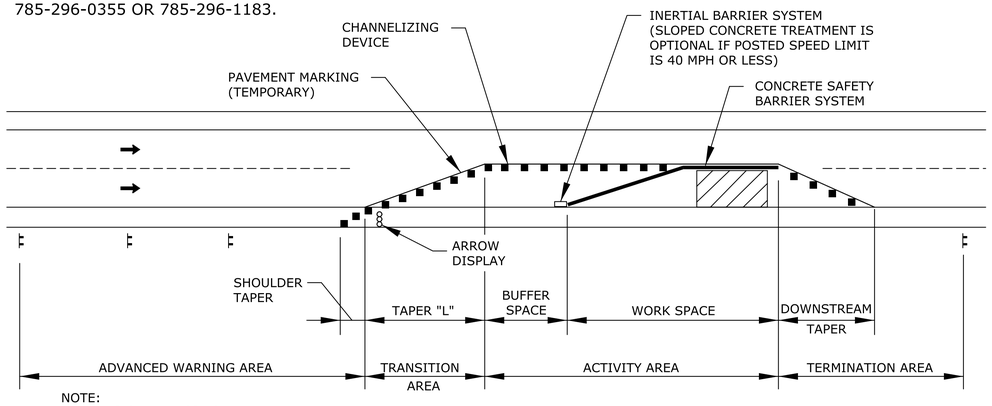
3) CERTIFY THAT THE TRUCK MOUNTED ATTENUATORS (TMA'S) (WHICH ARE DEFINED AS CATEGORY 3 DEVICES BY THE FHWA MEMORANDUM) MEET CURRENT CRASHWORTHY SPECIFICATIONS AS DEFINED ABOVE AND INCLUDE A COPY OF THE ENTIRE FHWA ACCEPTANCE LETTER. ALL CATEGORY 1 & 2 DEVICES SHALL BE NCHRP REPORT 350 OR MASH REPORT 2009 COMPLIANT.

13. LEAD IN CHANNELIZING DEVICES ON CENTERLINE:

TEMPORARY RUMBLE STRIPS MAY BE USED IN LIEU OF LEAD IN CENTERLINE CHANNELIZING DEVICES WHEN THE ROADWAY IS LESS THAN OR EQUAL TO 30' (FEET) INCLUDING PAVED SHOULDERS. WHEN EXTENUATING CIRCUMSTANCES EXIST, THE AREA ENGINEER MAY ELECT TO ELIMINATE BOTH THE LEAD IN CHANNELIZERS AND THE RUMBLE STRIPS.

14. TEMPORARY RUMBLE STRIPS:

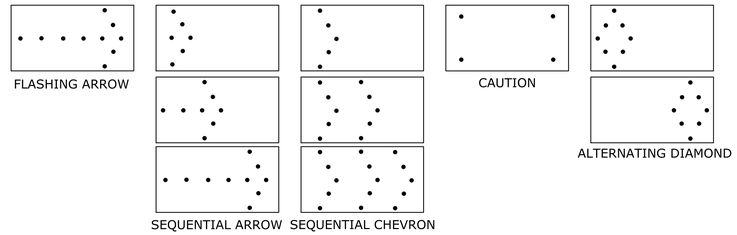
ALTERNATIVE TEMPORARY RUMBLE STRIP OPTIONS MAY BE AVAILABLE. PLEASE CONTACT THE TEMPORARY TRAFFIC CONTROL UNIT FOR MORE INFORMATION AT 785-296-0355 OR 785-296-1183.



NOTE:
REFER TO STD. TE702 FOR TAPER "L" FORMULA.

TYPICAL WORK ZONE COMPONENTS

ARROW DISPLAYS



ARROW DISPLAY ELEMENTS SHALL BE CAPABLE OF A MINIMUM 50 PERCENT DIMMING FROM THEIR FULL-RATED LAMP VOLTAGE. FULL LAMP VOLTAGE SHOULD BE USED DURING THE DAY AND DIMMED MODE SHALL BE USED AT NIGHT. FOR SHOULDER WORK, ROADSIDE WORK NEAR THE SHOULDER, BLOCKING THE SHOULDER, OR FOR TEMPORARY CLOSING ONE LANE ON A TWO-LANE, TWO-WAY ROADWAY, AN ARROW PANEL SHALL BE USED ONLY IN THE CAUTION MODE.

BUFFER SPACE

SPEED (MPH) ✳	*20*	*25*	*30*	*35*	*40*	*45*	*50*	*55*	*60*	*65*	*70*	*75*
LENGTH (ft)	*115*	*155*	*200*	*250*	*305*	*360*	*425*	*495*	*570*	*645*	*730*	*820*

✳ POSTED SPEED PRIOR TO WORK STARTING

NEITHER WORK ACTIVITY NOR STORAGE OF EQUIPMENT, VEHICLES, OR MATERIAL SHOULD OCCUR IN THE BUFFER SPACE. WHEN A PROTECTION VEHICLE IS PLACED IN ADVANCE OF THE WORK SPACE, ONLY THE SPACE UPSTREAM OF THE VEHICLE CONSTITUTES THE BUFFER SPACE.

IF TEMPORARY CONCRETE SAFETY BARRIER SYSTEM IS USED TO SEPARATE APPROACHING TRAFFIC FROM THE WORK SPACE, THE BARRIER SYSTEM SHALL BE CONSIDERED PART OF THE ACTIVITY AREA. A FULL LANE WIDTH SHOULD BE AVAILABLE THROUGHOUT THE LENGTH OF THE BUFFER SPACE. SEE TYPICAL WORK ZONE COMPONENTS.

NO.	DATE	REVISIONS	BY	APP'D
3	10/16/12	Removed Note 13. Added Alternating Diamonds	J.A.M.	K.P.
2	10/4/11	Modified Notes 9,12 & 15. Added Note 15	J.A.M.	K.P.
1	11/30/09	Added Note 14	J.A.M.	A.A.A.

KANSAS DEPARTMENT OF TRANSPORTATION

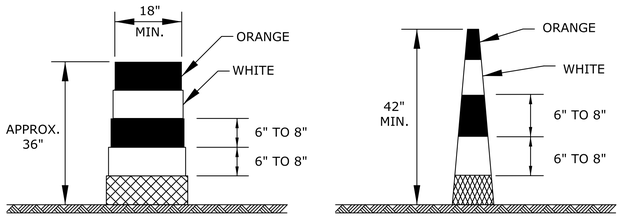
GENERAL TRAFFIC CONTROL

TE700

FHWA APPROVAL	10/16/12	APP'D	Kristina Pyle
DESIGNED B.A.H.	DETAILED B.A.H.	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN. CK.	TRACE CK.

Plotted : 03-SEP-2014 11:01
Drawn By : ROAD
File : te700.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	87 N-0609-01	2014	42	52

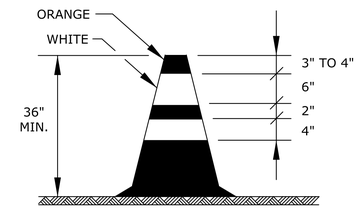


DRUM

CONICAL DELINEATOR

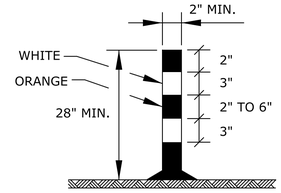
DRUMS AND CONICAL DELINEATORS SHALL HAVE AT LEAST TWO ORANGE AND TWO WHITE 6" TO 8" WIDE RETROREFLECTIVE STRIPES. ADDITIONAL STRIPES MAY BE NON-RETROREFLECTIVE. IF THERE ARE NON-RETROREFLECTIVE SPACES BETWEEN ADJACENT STRIPES, THEY SHALL BE NO MORE THAN 3" WIDE.

ALL RETROREFLECTIVE STRIPES ON DRUMS SHALL BE ASTM TYPE III SHEETING. THE WHITE STRIPES ON CONICAL DELINEATORS SHALL BE ASTM TYPE III SHEETING. ORANGE STRIPES ON ALL CONICAL DELINEATORS SHALL BE FLUORESCENT ORANGE ASTM TYPE IV SHEETING.



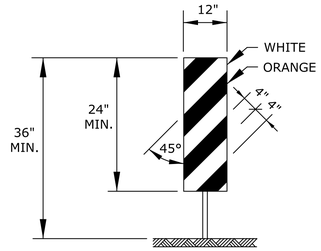
TRAFFIC CONE

TRAFFIC CONES MAY BE USED AS CHANNELIZING DEVICES FOR DAYTIME OPERATIONS ONLY. THEY WILL NOT BE PAID FOR SEPARATELY, BUT WILL BE SUBSIDIARY TO OTHER TRAFFIC CONTROL BID ITEMS. THE ENGINEER MAY REQUIRE THAT TRAFFIC CONES BE SUPPLEMENTED BY OTHER TRAFFIC CONTROL DEVICES IN CERTAIN SITUATIONS.



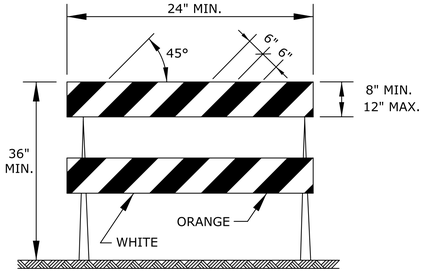
TUBULAR MARKER

THE TWO WHITE RETROREFLECTIVE STRIPES SHALL BE ASTM TYPE III SHEETING. STRIPING AS SHOWN FOR UP TO 42".



VERTICAL PANEL

THE ENTIRE AREA OF VERTICAL PANELS, BOTH FRONT AND BACK, SHALL HAVE ASTM TYPE III SHEETING. THE STRIPES SHALL SLOPE DOWNWARD TO THE TRAFFIC SIDE FOR CHANNELIZATION.

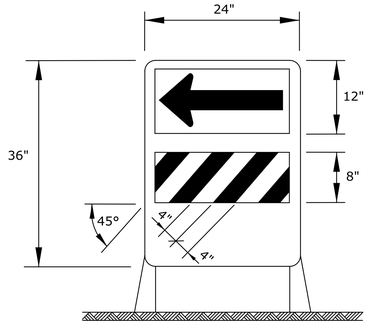


TYPE II BARRICADE

FOR RAILS LESS THAN 36" LONG, 4" WIDE STRIPES MAY BE USED.

THE ENTIRE AREA OF BARRICADE RAILS, BOTH FRONT AND BACK, SHALL BE ASTM TYPE III SHEETING.

THE STRIPES SHALL SLOPE DOWNWARD TO THE TRAFFIC SIDE FOR CHANNELIZATION.



DIRECTION INDICATOR BARRICADE

THE ARROW PANEL SHALL BE BLACK ON FLUORESCENT ORANGE ASTM TYPE IV SHEETING. THE STRIPES SHALL BE ORANGE AND WHITE ASTM TYPE III SHEETING SLOPING DOWNWARD IN THE DIRECTION TRAFFIC IS TO PASS.

THE DIRECTION INDICATOR BARRICADE SHALL BE USED IN SERIES TO DIRECT THE MOTORIST INTO THE INTENDED LANE OF TRAVEL.

THE ARROW PANEL SHOULD NOT BE VISIBLE TO OPPOSING TRAFFIC.

TAPER FORMULAS:

L = WS FOR SPEEDS OF 45 MPH OR MORE

$L = WS^2/60$ FOR SPEEDS OF 40 MPH OR LESS

WHERE: L = MINIMUM LENGTH OF TAPER IN FEET
S = NUMERICAL VALUE OF POSTED SPEED PRIOR TO WORK STARTING IN MPH
W = WIDTH OF OFFSET IN FEET

CHANNELIZER PLACEMENT:

(A) 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.

(B) 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.

(C) CHANNELIZING DEVICES SHALL BE PLACED FOR OPTIMUM VISIBILITY, NORMALLY AT RIGHT ANGLES TO THE TRAFFIC FLOW.

(D) CHANNELIZING DEVICES PLACED ALONG SHOULDER EDGES OR IN DROPOFFS SHALL HAVE A MINIMUM OF 24" FROM THE TOP OF THE CHANNELIZING DEVICE TO THE TOP OF THE PAVEMENT.

ITEM / LOCATION		CROSS-OVERS	SHOOFLY DIVERSIONS	TANGENTS	TAPERS	RAMPS	HEAD TO HEAD	OBJECT IDENTIFIER	LEAD IN DEVICES	GORES
PORTABLE										
	DRUMS	YES	YES	YES	YES	YES	(1)	YES	YES	YES
	CONICAL DELINEATORS	YES	YES	YES	YES	YES	(1)	YES	YES	YES
	VERTICAL PANELS	(2)	(2)	(2)	(2)	(2)	(1,2)	YES	(2)	(2)
	DIRECTION INDICATOR BARRICADE	NO	NO	NO	YES	NO	NO	NO	NO	NO
	TYPE II BARRICADE	(2)	(2)	(2)	(2)	NO	NO	YES	NO	NO
FIXED										
	TUBULAR MARKERS	(3)	(3)	(3)	NO	(3)	YES	NO	YES	YES
	VERTICAL PANELS	(3)	(3)	(3)	(3)	(3)	(3)	YES	(2,3)	(2)

(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.

NO.	DATE	REVISIONS	BY	APP'D
3	10/16/12	Added Lead In Devices Into Matrix Table	J.A.M.	K.P.
2	10/4/11	Added Dimension To Tubular Marker Detail	J.A.M.	K.P.
1	4/20/09	Channellzer Placement & Traffic Cone Detail	J.A.M.	A.A.A.

KANSAS DEPARTMENT OF TRANSPORTATION

CHANNELIZING DEVICES

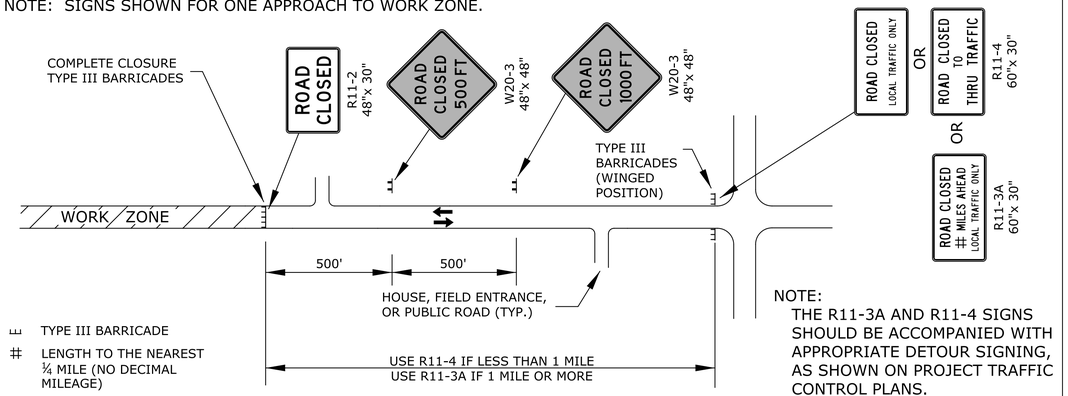
TE702

FHWA APPROVAL		10/16/12	APP'D	Kristina Pyle	
DESIGNED	L.E.R.	DETAILED	B.A.H.	QUANTITIES	TRACED
DESIGN CK.		DETAIL CK.		QUAN. CK.	TRACE CK.

Plotted : 03-SEP-2014 11:01
Drawn By : ROAD
File : te702.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	87 N-0609-01	2014	43	52

NOTE: SIGNS SHOWN FOR ONE APPROACH TO WORK ZONE.



NOTE:
THE R11-3A AND R11-4 SIGNS SHOULD BE ACCOMPANIED WITH APPROPRIATE DETOUR SIGNING, AS SHOWN ON PROJECT TRAFFIC CONTROL PLANS.

FIGURE 1: TYPICAL SIGNING FOR ROAD CLOSURE

NOTE: SIGNS SHOWN FOR ONE APPROACH TO INTERSECTION (WORK ZONE).

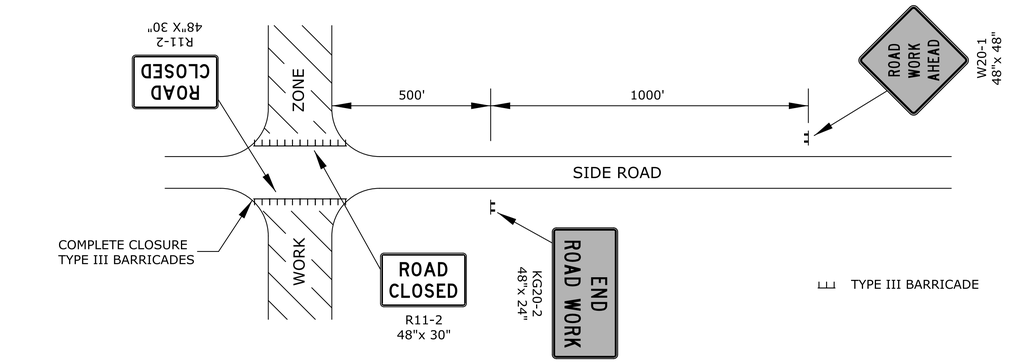


FIGURE 2: TYPICAL SIGNING FOR SIDE ROAD OPEN

NOTE: SIGNS SHOWN FOR ONE APPROACH TO INTERSECTION (WORK ZONE).

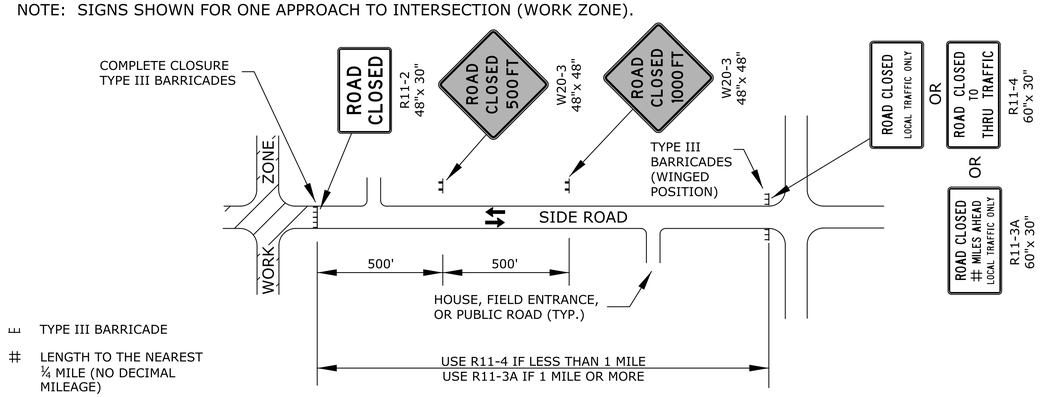


FIGURE 3: TYPICAL SIGNING FOR SIDE ROAD CLOSED

NOTE: SIGNS SHOWN FOR ONE APPROACH TO WORK ZONE.

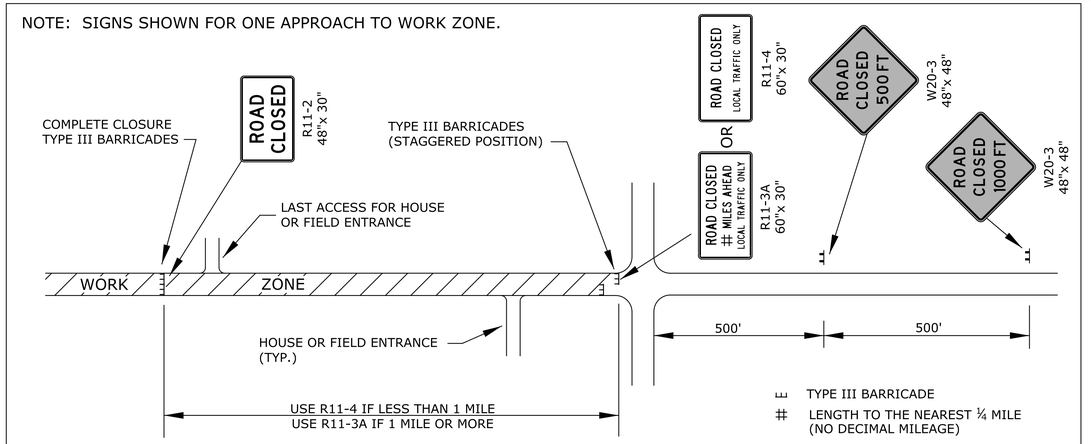


FIGURE 4: TYPICAL SIGNING FOR ROAD CLOSURE - LOCAL TRAFFIC ACCESS

NOTES:

1. SIGNS:

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 LESS THAN 1 MILE.

THE R11-3A (ROAD CLOSED # MILES AHEAD LOCAL TRAFFIC ONLY) SIGN SHALL BE USED WHEN THE DISTANCE TO THE POINT OF COMPLETE CLOSURE OF THE ROADWAY IS 1 MILE OR GREATER.

THE WORDS "BRIDGE OUT" (OR BRIDGE CLOSED) MAY BE SUBSTITUTED FOR THE WORDS "ROAD CLOSED" ON THE R11-3A OR R11-4 SIGN WHERE APPLICABLE.

2. BARRICADE PLACEMENT:

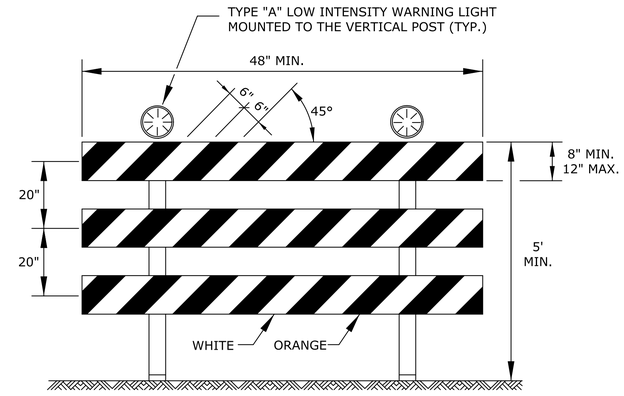
A) COMPLETE ROAD CLOSURE

WHEN A ROADWAY IS CLOSED, TYPE III BARRICADES SHALL BE PLACED END-TO-END TO COMPLETELY COVER THE ROADWAY AND SHOULDERS. WHEN ACCESS MUST BE ALLOWED FOR CONSTRUCTION OR OTHER OFFICIAL/GOVERNMENT VEHICLES, TYPE III BARRICADES SHALL BE LONGITUDINALLY STAGGERED FAR ENOUGH APART FROM ONE ANOTHER TO ALLOW SAFE PASSAGE OF VEHICLES AND MAINTAIN THE APPEARANCE OF A CLOSED ROADWAY. TYPE III BARRICADES SHALL BE REALIGNED AND PLACED END-TO-END TO DENY ANY ACCESS WHEN THE CONSTRUCTION ACTIVITY HAS CEASED FOR THE DAY.

B) ROAD CLOSED - LOCAL TRAFFIC

AS SHOWN IN FIGURE 4, WHEN LOCAL TRAFFIC MUST BE ALLOWED ACCESS INTO THE WORK ZONE, TYPE III BARRICADES SHALL BE LONGITUDINALLY STAGGERED TO MAINTAIN THE APPEARANCE OF A CLOSED ROADWAY. A SECOND LINE OF END-TO-END TYPE III BARRICADES SHALL BE PLACED JUST BEYOND THE LAST ACCESS POINT IN THE WORK ZONE, TO COMPLETELY CLOSE THE ROADWAY AS DESCRIBED IN NOTE 2-A.

AS SHOWN IN FIGURE 1 AND FIGURE 3, AT THE POINT WHERE THRU TRAFFIC MUST DETOUR AND LOCAL TRAFFIC CAN PROCEED TO THE LOCATION WHERE THE ROADWAY IS COMPLETELY CLOSED, THE R11-3A (ROAD CLOSED # MILES AHEAD LOCAL TRAFFIC ONLY) OR R11-4 (ROAD CLOSED LOCAL TRAFFIC ONLY OR ROAD CLOSED TO THRU TRAFFIC) SIGN SHALL BE USED WITH TYPE III BARRICADES (WINGED POSITION), PLACED ON THE SHOULDERS OF ROADWAY.



TYPE III BARRICADE WITH LIGHTS

THE ENTIRE AREA OF BARRICADE RAILS, BOTH FRONT AND BACK, SHALL HAVE ASTM TYPE III SHEETING.

THE STRIPES SHALL SLOPE DOWNWARD TO THE SIDE TRAFFIC IS TO PROCEED OR TOWARD THE CENTER OF THE ROADWAY AT ROAD CLOSURES.

APPROVED SIGNS MOUNTED ON TYPE III BARRICADES SHOULD NOT COVER MORE THAN 50% OF THE TOP TWO RAILS OR 33% OF THE TOTAL AREA OF THE THREE RAILS.

WHEN BARRICADES ARE PLACED END-TO-END OR STAGGERED, A TYPE "A" LOW INTENSITY WARNING LIGHT SHALL BE MOUNTED TO THE VERTICAL POST NEAR EACH OUTSIDE CORNER OF THE END BARRICADES.

NO.	DATE	REVISIONS	BY	APP'D
3	10/16/12	Modified Type III Barricade Note	J.A.M.	K.P.
2	8/8/07	Added Position To Type III Barricade	M.B.	A.A.A.
1	12/29/05	Note #1 Modified	M.B.	A.A.A.

KANSAS DEPARTMENT OF TRANSPORTATION

TYPICAL TRAFFIC CONTROL
ROAD CLOSURES

TE704

FHWA APPROVAL		10/16/12	APP'D	Kristina Pyle	
DESIGNED	B.A.H.	DETAILED	B.A.H.	QUANTITIES	TRACED
DESIGN CK.		DETAIL CK.		QUAN. CK.	TRACE CK.

Plotted : 03-SEP-2014 11:01
Drawn By : ROAD
File : te704.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	87 N-0609-01	2014	44	52

SIGN LAYOUT INFORMATION

KG20-2

STD. SIZE EXPWY/FREEWAY
6" C
48"x 24"

KG20-5

STD. SIZE EXPWY/FREEWAY
6" C
48"x 24"

KM4-2O

STD. SIZE	EXPWY/FREEWAY
3" C	6" C
24"x 6"	48"x 12"

W7-3a

MILEAGE TO BE DETERMINED BY THE ENGINEER.

W8-11

STD. SIZE EXPWY/FREEWAY
8" D
48"x 48"

W8-17

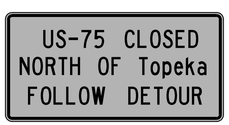
STD. SIZE EXPWY/FREEWAY
48"x 48"

W8-17P
(OPTIONAL)

STD. SIZE EXPWY/FREEWAY
30"x 24"

SP-01
(SPECIAL SIGN)

STD. SIZE	EXPWY/FREEWAY
6" C	10" D



SP-02
(SPECIAL SIGN)

STD. SIZE	EXPWY/FREEWAY
UPPERCASE: 6" C	UPPERCASE: 10" D
LOWERCASE: 4.5" C	LOWERCASE: 8" D

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

ALL SIGNS SHALL BE BLACK ON ORANGE RETROREFLECTIVE SHEETING.

GENERAL NOTES

1. MAINTENANCE:

THE CONTRACTOR SHALL MAINTAIN ALL SIGNS AND DEVICES IN AN UPRIGHT POSITION. THE CONTRACTOR SHALL CLEAN OR REPLACE ANY DAMAGED OR ILLEGIBLE SIGN OR DEVICE AS DIRECTED BY THE ENGINEER.

2. EXISTING SIGNS:

IF EXISTING SIGNS THAT ARE TO REMAIN (WHETHER DENOTED ON THE PLANS OR NOT) INTERFERE WITH CONSTRUCTION WORK, THE CONTRACTOR SHALL REMOVE, STORE, AND RESET THE SIGNS. THIS SHALL BE SUBSIDIARY TO OTHER TRAFFIC CONTROL BID ITEMS. SIGNING DAMAGED BY THE CONTRACTOR SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE.

3. CONFLICTING SIGNS, SIGNS NOT IN USE, AND TRAFFIC SIGNALS:

SIGNS AND TRAFFIC SIGNALS THAT ARE IN CONFLICT WITH THE TRAFFIC CONTROL PLAN OR DO NOT APPLY TO THE TRAFFIC OPERATIONS SHALL BE IMMEDIATELY REMOVED, TURNED SO NOT VISIBLE TO TRAFFIC FROM ANY DIRECTION, OR COMPLETELY COVERED WITH ADEQUATE OPAQUE BREATHABLE MATERIAL. TAPE SHALL NOT BE APPLIED TO THE FACE OF THE SIGN.

4. PORTABLE AND POST MOUNTED SIGNS:

TEMPORARY TRAFFIC CONTROL SIGNS THAT ARE ANTICIPATED TO REMAIN IN PLACE FOR 3 DAYS OR LESS ARE CONSIDERED "PORTABLE." PORTABLE SIGNS SHALL BE MOUNTED ON AN APPROVED SUPPORT AT A MINIMUM HEIGHT OF 12" ABOVE THE TRAVELED WAY. TRAFFIC CONTROL SIGNS IN PLACE FOR OVER 3 DAYS ARE REQUIRED TO BE MOUNTED ON APPROVED POSTS. A MINIMUM OF 42" OF THE APPROVED POST MUST BE BELOW THE GROUND SURFACE WITH ADEQUATE BACKFILL AND COMPACTION. ALL POSTS AT MINIMUM SHALL EXTEND TO THE TOP EDGE OF THE SIGN AND NO GREATER THAN 6" ABOVE THE SIGN.

WHEN THE SIGN WIDTH IS EQUAL TO OR GREATER THAN 9', THREE OR MORE WOOD POSTS MAY BE USED WITH A MINIMUM OF 4' BETWEEN THE CENTERLINE OF EACH POST. ALL SIGNS LESS THAN 9' IN WIDTH SHALL USE A MAXIMUM OF TWO WOOD POSTS.

"ROLL-UP" SIGNS MAY BE USED FOR PORTABLE WARNING SIGNS. THEY MUST BE FLUORESCENT ORANGE ASTM TYPE IV SIGNS OF OPAQUE MATERIAL. MESH SIGNS ARE NOT ALLOWED.

IN THE CASE OF HITTING ROCK WHEN DRIVING POSTS
1. SHIFT THE SIGN LOCATION. DO NOT VIOLATE MINIMUM SIGN SPACING.
2. WITH THE ENGINEER'S APPROVAL, USE ACCEPTABLE ALTERNATIVE SIGN STANDS.

5. SHEETING:

ALL ORANGE SIGNS SHALL HAVE FLUORESCENT ORANGE ASTM TYPE IV SHEETING. ALL OTHER SIGNS SHALL HAVE ASTM TYPE III SHEETING OF STANDARD COLORS.

6. SIGNS INVOLVING SPEEDS:

THE W3-5 (SPEED REDUCTION) SHOULD BE USED ONLY IF THE ENGINEER DETERMINES THAT A REDUCED SPEED IS REQUIRED ON THE PROJECT.

THE KM4-20 (WORK ZONE) PLAQUE SHALL BE PLACED ABOVE ALL SPEED LIMIT SIGNS, (R2-1), EXISTING AND TEMPORARY. MOUNT THE WORK ZONE PLAQUES TO THE POST. DO NOT OVERLAP THE R2-1 AND KM4-20 SIGNS.

FOR SPEEDS OF 30 MPH OR LESS, THE W1-1(TURN) OR W1-3(REVERSE TURN) SHOULD BE USED. FOR SPEEDS OF 35 MPH OR MORE, THE W1-2(CURVE) OR W1-4(REVERSE CURVE) SHOULD BE USED. THE W13-1(MPH) IS TO BE ELIMINATED IF THE ADVISORY SPEED IS WITHIN 5 MPH OF THE SPEED LIMIT.

7. SIGNS CONTROLLING WORK ZONE:

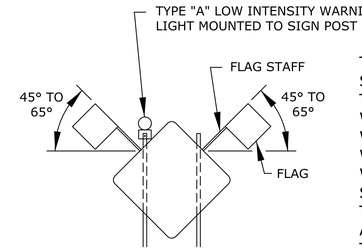
THE KG20-2(END ROAD WORK) SHOULD BE PLACED 500' FROM THE END OF THE ACTUAL WORK SPACE, NOT NECESSARILY AT THE EXTREME LIMITS OF THE PROJECT. THE KG20-2 SHOULD BE MOUNTED ON TWO POSTS. THE KG20-2 MAY BE MOUNTED ON ONE POST IF IN URBAN AREAS WHERE UTILITIES ARE A PROBLEM AND WIND LOADS ARE NOT AN ISSUE.

WHERE TWO WORK ZONES ARE LESS THAN 1 MILE APART IN RURAL AREAS OR ¼ MILE APART IN URBAN AREAS, THE KG20-2(END ROAD WORK) FOR THE FIRST WORK ZONE AND THE W20-1(ROAD WORK) FOR THE SECOND WORK ZONE SHOULD BE ELIMINATED.

8. WARNING LIGHTS ON SIGNS:

A TYPE "A" LOW INTENSITY WARNING LIGHT IS AN L.E.D. BI-DIRECTIONAL FLASHING WORK ZONE WARNING LIGHT. TYPE "A" LOW INTENSITY WARNING LIGHTS SHOULD BE USED WITH ALL CONSTRUCTION ACTION WARNING SIGNS AND SHALL NOT BE USED ON SIGNS MOUNTED LESS THAN 5' HIGH ON TEMPORARY SUPPORTS. ON ALL OTHER CONSTRUCTION WARNING SIGNS, TYPE "A" LOW INTENSITY WARNING LIGHTS ARE TO BE USED AS DIRECTED BY THE ENGINEER.

TYPE "A" LOW INTENSITY WARNING LIGHTS SHALL BE MAINTAINED SO AS TO BE CAPABLE OF BEING VISIBLE ON A CLEAR NIGHT FROM A DISTANCE OF 3000 FT. IF A TYPE "A" LOW INTENSITY WARNING LIGHT HAS A SEPARATE BATTERY CASE, THE BATTERY CASE SHALL BE MOUNTED NO HIGHER THAN 12" ABOVE THE GROUND AND MOUNTED BEHIND THE SIGN POST. A TYPE "A" LOW INTENSITY WARNING LIGHT WHERE THE LENS AND BATTERY ARE ONE UNIT SHALL BE MOUNTED ON THE TEMPORARY SIGN POST NEAREST TO THE TRAVELED WAY. FLAGS SHALL NOT INTERFERE WITH THE VISABILITY OF THE TYPE "A" LOW INTENSITY WARNING LIGHT.



TWO (2) 18" x 18" FLUORESCENT RED-ORANGE FLAGS SHALL BE ATTACHED (IN THE POSITION SHOWN) ON THE W20-2(DETOUR),W1-1(TURN), W1-2(CURVE), W1-3(REVERSE TURN), W1-4(REVERSE CURVE), W3-3(SIGNAL AHEAD), W4-2(LANE REDUCTION), W20-4(ONE LANE ROAD), W20-5(LANE CLOSED), W20-7A(FLAGGER), AND W3-4 (BE PREPARED TO STOP) SIGNS AND ANY OTHER ACTION SIGNS AS SHOWN ON THE PLANS OR DIRECTED BY THE ENGINEER. THE FLAGS AND STAFFS ARE TO BE ATTACHED IN SUCH A MANNER THAT THE SIGN WILL NOT BE OBSCURED. THE FLAGS MAY BE EITHER A CLOTH OR VINYL MATERIAL. THE FLAGS SHALL BE SUBSIDIARY TO THE CONSTRUCTION SIGN BID ITEMS.

MINIMUM ADVANCE WARNING SIGN SPACING (IN FEET):

	A	*B*	*C*
URBAN (40 MPH OR LOWER)	*100*	*100*	*100*
URBAN (45 MPH OR HIGHER)	*350*	*350*	*350*
RURAL (55 MPH OR LOWER)	*500*	*500*	*500*
RURAL (60 MPH OR HIGHER)	*750*	*750*	*750*
EXPRESSWAY/FREEWAY	*1000*	*1500*	*2640*

THE MINIMUM SPACING BETWEEN SIGNS SHALL BE NO LESS THAN 100', UNLESS DIRECTED BY THE ENGINEER.

THE SPACING BETWEEN ANY SIGNS MAY BE INCREASED BEYOND THE MINIMUM VALUES IN THE TABLE ABOVE AS APPROVED BY THE ENGINEER IN ORDER TO MAXIMIZE VISIBILITY.

NO.	DATE	REVISIONS	BY	APP'D
3	10/16/12	Removed Note 9, Modified Sign Layout Detail	J.A.M.	K.P.
2	10/4/11	Modified Note 3	J.A.M.	K.P.
1	2/24/10	Modified AFAD Note	J.A.M.	A.A.A.

KANSAS DEPARTMENT OF TRANSPORTATION

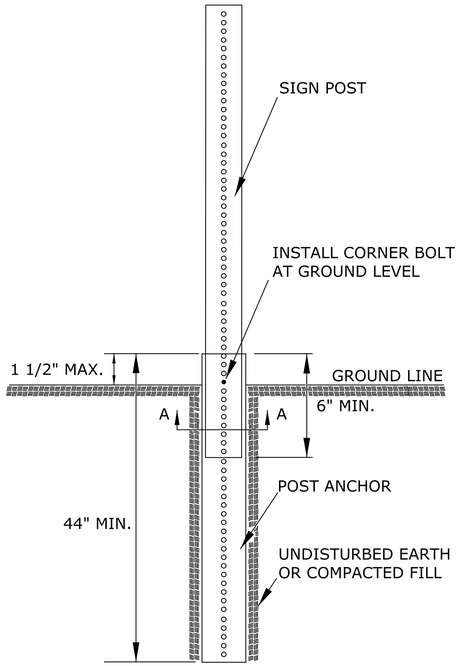
TRAFFIC CONTROL SIGNS

TE710

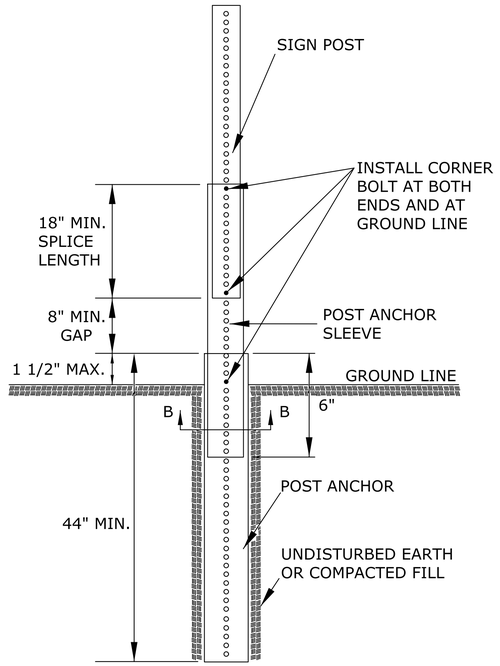
FHWA APPROVAL		10/16/12	APP'D	Kristina Pyle	
DESIGNED	B.A.H.	DETAILED	B.A.H.	QUANTITIES	TRACED
DESIGN CK.		DETAIL CK.		QUAN. CK.	TRACE CK.

Plotted : 03-SEP-2014 11:01
Drawn By : ROAD
File : te710.dgn

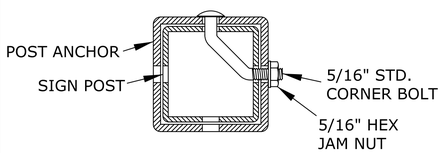
PERFORATED SQUARE STEEL TUBE (P.S.S.T.) POST SETUP



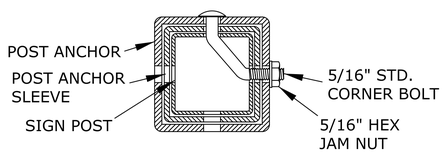
P.S.S.T. DETAIL



TELESCOPING P.S.S.T. DETAIL



SECTION A-A

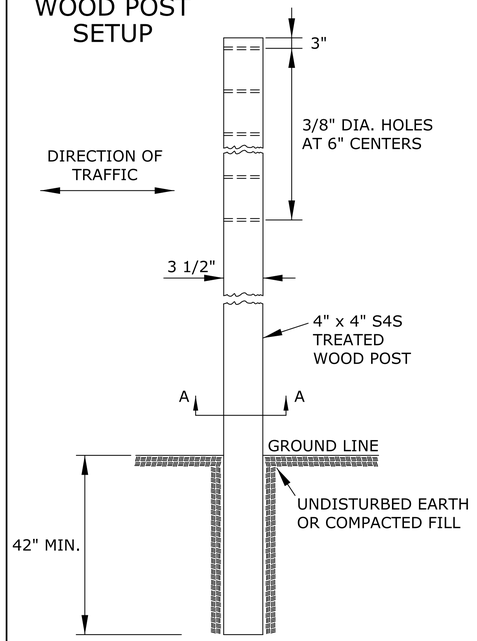


SECTION B-B

DETAILS FOR 2", 2 1/4", OR 2 1/2" SIGN POST

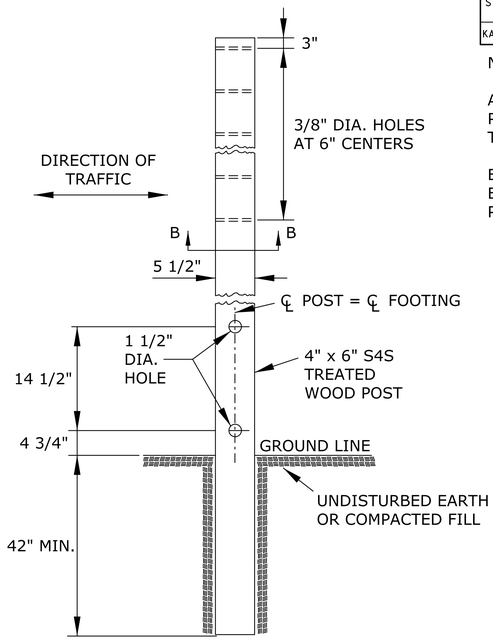
PLACE BOLTS IN THE SAME CORNER ALONG EACH SIGN POST.

WOOD POST SETUP



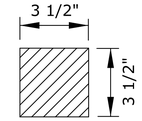
SIDE ELEVATION

4" X 4" WOOD POST IN SOIL

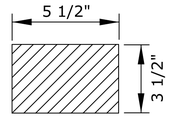


SIDE ELEVATION

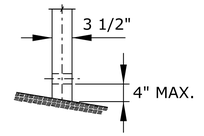
4" X 6" WOOD POST IN SOIL



SECTION A-A



SECTION B-B



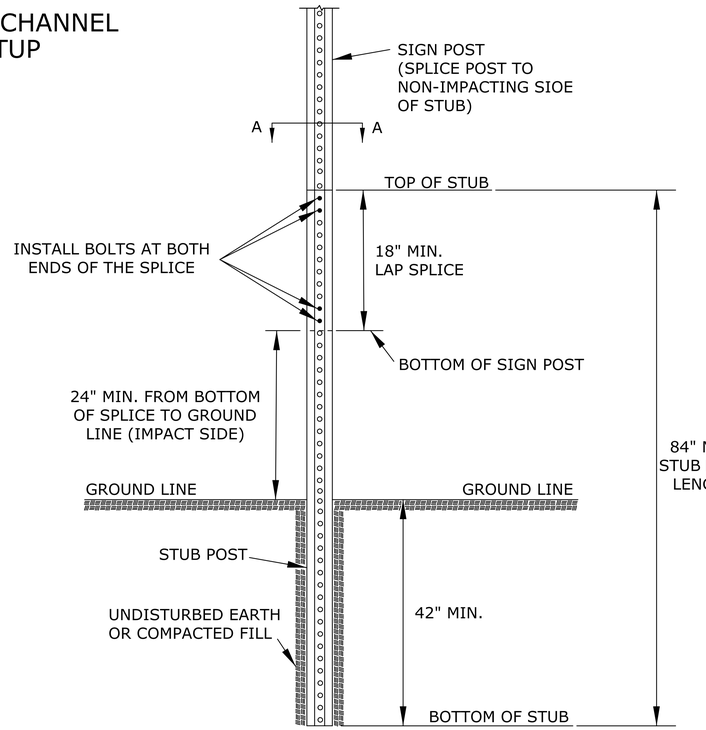
FRONT ELEVATION

NOTES:

ALL SIGN MOUNTING HOLES IN THE WOOD POSTS SHALL BE DRILLED PRIOR TO TREATING.

BREAKAWAY HOLES AND FIELD CUTS SHALL BE TREATED IN ACCORDANCE WITH THE PRESERVATIVE TREATMENT SPECIFICATIONS.

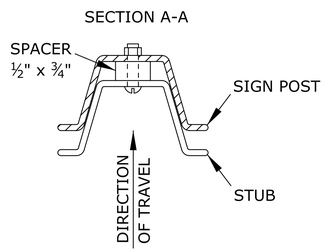
3 LB/F U-CHANNEL SETUP



NOTES:

PLACE TWO BOLTS AT BOTH ENDS OF THE SPLICE THROUGH THE HOLES NEAREST THE ENDS OF THE SPLICE.

SPACERS WILL BE USED OVER THE BOLTS BETWEEN THE SPLICED PIECES OF U-CHANNEL. THREADED OR UNTHREADED SPACERS MAY BE USED. DO NOT SUBSTITUTE PIPE OR OTHER "ITEMS" FOR THE SPACERS.



STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	87 N-0609-01	2014	45	52

NO.	DATE	REVISIONS	BY	APP'D
3	10/16/12	Added Spacer Dimension, Removed PSST Note	J.A.M.	K.P.
2	10/4/11	Removed Washer On PSST Detail	J.A.M.	K.P.
1	6/1/10	Modified Post Anchor Sleeve Dimension	J.A.M.	A.A.A.

KANSAS DEPARTMENT OF TRANSPORTATION

APPROVED TEMPORARY POST SETUPS

TE712

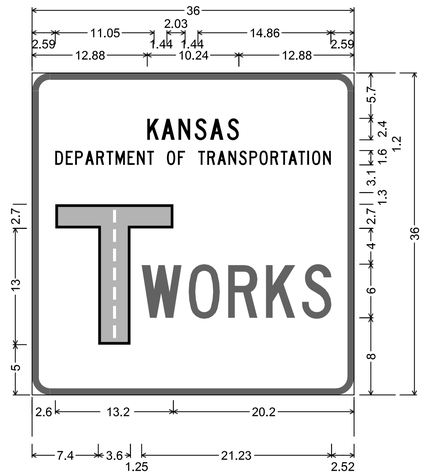
FHWA APPROVAL		10/16/12	APP'D	Kristina Pyle	
DESIGNED	B.A.H.	DETAILED	B.A.H.	QUANTITIES	TRACED
DESIGN CK.		DETAIL CK.		QUAN. CK.	TRACE CK.

Plotted : 03-SEP-2014 11:01

Drawn By : ROAD

File : te712.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	87 N-0609-01	2014	46	52



TWORKS SIGN 8
2.00" RADIUS, 0.75" BORDER, BLUE ON WHITE;
[KANSAS] BLACK C;
[DEPARTMENT OF TRANSPORTATION] BLACK C 90% SPACING;
[T] ORANGE; 0.3" BLACK BORDER
LANE LINES: .3"X1.4" WHITE; 0.75" SPACING FROM BOTTOM
[WORKS] C 75% SPACING;
TABLE OF DISTANCES BETWEEN LETTER AND OBJECT LEFTS.

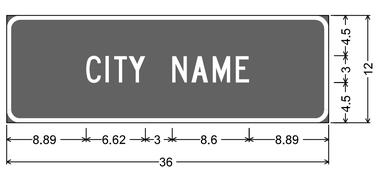
12.88	K 1.58	A 1.91	N 1.82	S 1.71	A 1.91	S 1.31	12.88

2.59	D 1.18	E 1.04	P 1.12	A 1.24	R 1.12	T 1.05	M 1.34	E 1.04	N 1.12	T 2.24	O 1.23	F 2.24

T 1.04	R 1.12	A 1.24	N 1.18	S 1.18	P 1.11	O 1.23	R 1.12	T 0.88	A 1.08	T 1.05	I 0.53	O 1.22	N 0.88	2.59

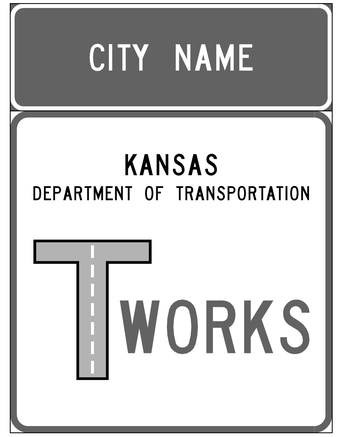
2.6	T 13.2	20.2

12.25	W 5.26	O 4.42	R 4.22	K 4.05	S 3.28	2.52



TWORKS SIGN 7
1.50" RADIUS, 0.50" BORDER, WHITE ON BLUE;
[CITY NAME] C;
TABLE OF DISTANCES BETWEEN LETTER AND OBJECT LEFTS.

8.89	C 2.14	I 0.93	T 1.67	Y 4.88	N 2.14	A 2.39	M 2.57	E 1.50	8.89



TYPICAL SIGN ASSEMBLY

GENERAL NOTES

THE "TWORKS" SIGN BLANK MATERIAL SHALL BE ALUMINUM, WOOD, OR FIBERGLASS REINFORCED PLASTIC.

THE "TWORKS" SIGN FACES SHALL BE COVERED WITH TYPE IV HIGH INTENSITY RETROREFLECTIVE SHEETING.

THE "TWORKS" SIGNS SHOULD BE MOUNTED ON APPROVED POSTS, AS SHOWN ON TE712 WITHOUT THE USE OF BRACING, GUY WIRES, OR TIE-DOWNS. THE "TWORKS" SIGNS MAY ALSO BE MOUNTED ON SKIDS. THE MOUNTING HEIGHTS AND LATERAL OFFSETS ARE TO BE SHOWN ON TE714.

THE "TWORKS" SIGNS SHOULD BE INSTALLED IN ADVANCE OF THE FIRST TRAFFIC CONTROL SIGN A DISTANCE OF 500' FOR A TWO-WAY ROADWAY IN A RURAL LOCATION AND 100' TO 350' IN AN URBAN AREA DEPENDING UPON THE SPEED. THE FIRST TRAFFIC CONTROL SIGN IS EITHER THE "ROAD WORK AHEAD" OR THE "GIVE 'EM A BRAKE" SIGN. THE ENGINEER MAY DESIGNATE A MORE APPROPRIATE LOCATION IF CONDITIONS DICTATE.

THE "TWORKS" SIGNS SHALL NOT INTERFERE WITH THE TRAFFIC CONTROL SIGNS FOR THE PROJECT OR WITH ANY OTHER REGULATORY, WARNING, OR GUIDE SIGN THAT IS TO REMAIN IN PLACE DURING CONSTRUCTION.

THE TWORKS SIGN ASSEMBLY CONSISTS OF A TWORKS SIGN 7 AND AND TWORKS SIGN 8. THE BID ITEM FOR THIS ASSEMBLY IS "TWORKS SIGN ASSEMBLY" WITH A BID UNIT OF "EACH".

THE TWORKS SIGN ASSEMBLY SHOULD REMAIN IN PLACE FOR SIX (6) MONTHS FOLLOWING THE COMPLETION OF THE PROJECT AND BECOME THE PROPERTY OF KDOT OR THE LOCAL JURISDICTION.

NO.	DATE	REVISIONS	BY	APP'D
3	10/16/12	Modified General Note	J.A.M.	K.P.
2	10/4/11	Removed Swoosh From TWork Sign	J.A.M.	K.P.
1	9/1/10	Modified Bid Item	J.A.M.	K.P.

KANSAS DEPARTMENT OF TRANSPORTATION

DETAILS FOR THE TRANSPORTATION WORKS FOR THE KANSAS (TWORKS) SIGNS LOCAL PROJECTS

TE715C

FHWA APPROVAL		10/16/12	APP'D	Kristina Pyle	
DESIGNED	D.G.	DETAILED	D.G.	QUANTITIES	TRACED
DESIGN CK.	J.A.M.	DETAIL CK.	J.A.M.	QUAN. CK.	TRACE CK.

Plotted : 03-SEP-2014 11:01
Drawn By : ROAD
File : te715c.dgn

SUMMARY OF TRAFFIC CONTROL DEVICES (EACH)

IBS REPLACEMENT MODULES	
REPLACEMENT MODULE SIZES	QUANTITY
REPLACEMENT MODULES (F2OO)	
REPLACEMENT MODULES (F4OO)	
REPLACEMENT MODULES (F7OO)	
REPLACEMENT MODULES (F14OO)	
REPLACEMENT MODULES (F21O0)	

WORK ZONE SIGN (SPECIAL)		
SIGN NO.	16.25 SQ.FT. & LESS	16.26 SQ.FT. & OVER

SUMMARY OF TRAFFIC CONTROL DEVICES (EACH PER DAY)

✳ QUANTITY MOST USED ON THE PROJECT AT ANY ONE TIME

WORK ZONE SIGNS ✳			
SIGN NO.	SIZE - SQ.FT.		
	0-9.25	9.26-16.25	16.26 & OVER

BARRICADES✳	CHANNELIZING DEVICES✳	
TYPE III (4' TO 12')	FIXED	PORTABLE

LIGHTED DEVICES ✳	
WORK ZONE WARNING LIGHT (TYPE "A" LOW INTENSITY)	
WORK ZONE WARNING LIGHT (RED TYPE "B" HIGH INTENSITY)	
ARROW DISPLAY	
PORTABLE CHANGEABLE MESSAGE SIGN	

RECAPITULATION OF QUANTITIES		
ITEM	QUANTITY	UNIT
WORK ZONE SIGNS (O TO 9.25 SQ.FT.)		EACH PER DAY
WORK ZONE SIGNS (9.26 TO 16.25 SQ.FT.)		EACH PER DAY
WORK ZONE SIGNS (16.26 SQ.FT. & OVER)		EACH PER DAY
WORK ZONE BARRICADES (TYPE III - 4' TO 12')		EACH PER DAY
CHANNELIZER (FIXED)		EACH PER DAY
CHANNELIZER (PORTABLE)		EACH PER DAY
WORK ZONE WARNING LIGHT (TYPE "A" LOW INTENSITY)		EACH PER DAY
WORK ZONE WARNING LIGHT (RED TYPE "B" HIGH INTENSITY)		EACH PER DAY
ARROW DISPLAY		EACH PER DAY
PORTABLE CHANGEABLE MESSAGE SIGN		EACH PER DAY
PAVEMENT MARKING (TEMPORARY)		
4" SOLID (TYPE I TAPE OR PAINT)		STA./LINE
4" SOLID (TYPE II TAPE OR PAINT)		STA./LINE
4" BROKEN (8.0') (TYPE I TAPE OR PAINT)		STA./LINE
4" BROKEN (8.0') (TYPE II TAPE OR PAINT)		STA./LINE
4" BROKEN (8.0') (FLEXIBLE RAISED PAVEMENT MARKER)		STA./LINE
4" BROKEN (3.0') (TYPE I TAPE OR PAINT)		STA./LINE
4" BROKEN (3.0') (TYPE II TAPE PAINT)		STA./LINE
4" BROKEN (3.0') (FLEXIBLE RAISED PAVEMENT MARKER)		STA./LINE
4" DOTTED EXTENSION (TYPE I TAPE OR PAINT)		STA./LINE
4" DOTTED EXTENSION (TYPE II TAPE OR PAINT)		STA./LINE
SOLID (LINE MASKING TAPE)		STA./LINE
BROKEN (LINE MASKING TAPE)		STA./LINE
PAVEMENT MARKING REMOVAL		LIN. FT.
CONCRETE SAFETY BARRIER (TYPE F3)(TEMPORARY)		LIN. FT.
CONCRETE SAFETY BARRIER (TYPE F3)(TEMP.-INSTALL ONLY)		LIN. FT.
CONCRETE SAFETY BARRIER (TYPE F3)(TEMP.-RELOCATE)		LIN. FT.
INERTIAL BARRIER SYSTEM		EACH
REPLACEMENT MODULES		EACH
WORK ZONE SIGN (SPECIAL) (16.25 SQ. FT. & LESS)		EACH
WORK ZONE SIGN (SPECIAL) (16.26 SQ. FT. & MORE)		EACH
TEMPORARY RAISED PAVEMENT MARKER (TYPE I)		EACH
TEMPORARY RAISED PAVEMENT MARKER (TYPE II)		EACH
TRAFFIC SIGNAL INSTALLATION (TEMPORARY)		LUMP SUM
TRAFFIC CONTROL (INITIAL SET UP)		LUMP SUM
TRAFFIC CONTROL	1	LUMP SUM
TWORKS SIGN ASSEMBLY		EACH
SIGN, ELECTRONIC PORTABLE MESSAGE	10	DAY

NO.	DATE	REVISIONS	BY	APP'D
3	10/16/12	Modified Pavement Marking Requirements	J.A.M.	K.P.
2	10/4/11	Added IBS Quantities, Added TWorks Quanity	J.A.M.	K.P.
1	8/8/07	2007 Spec Revision	M.B.	A.A.A.

KANSAS DEPARTMENT OF TRANSPORTATION

SUMMARY OF DEVICES AND RECAPITULATION OF QUANTITIES

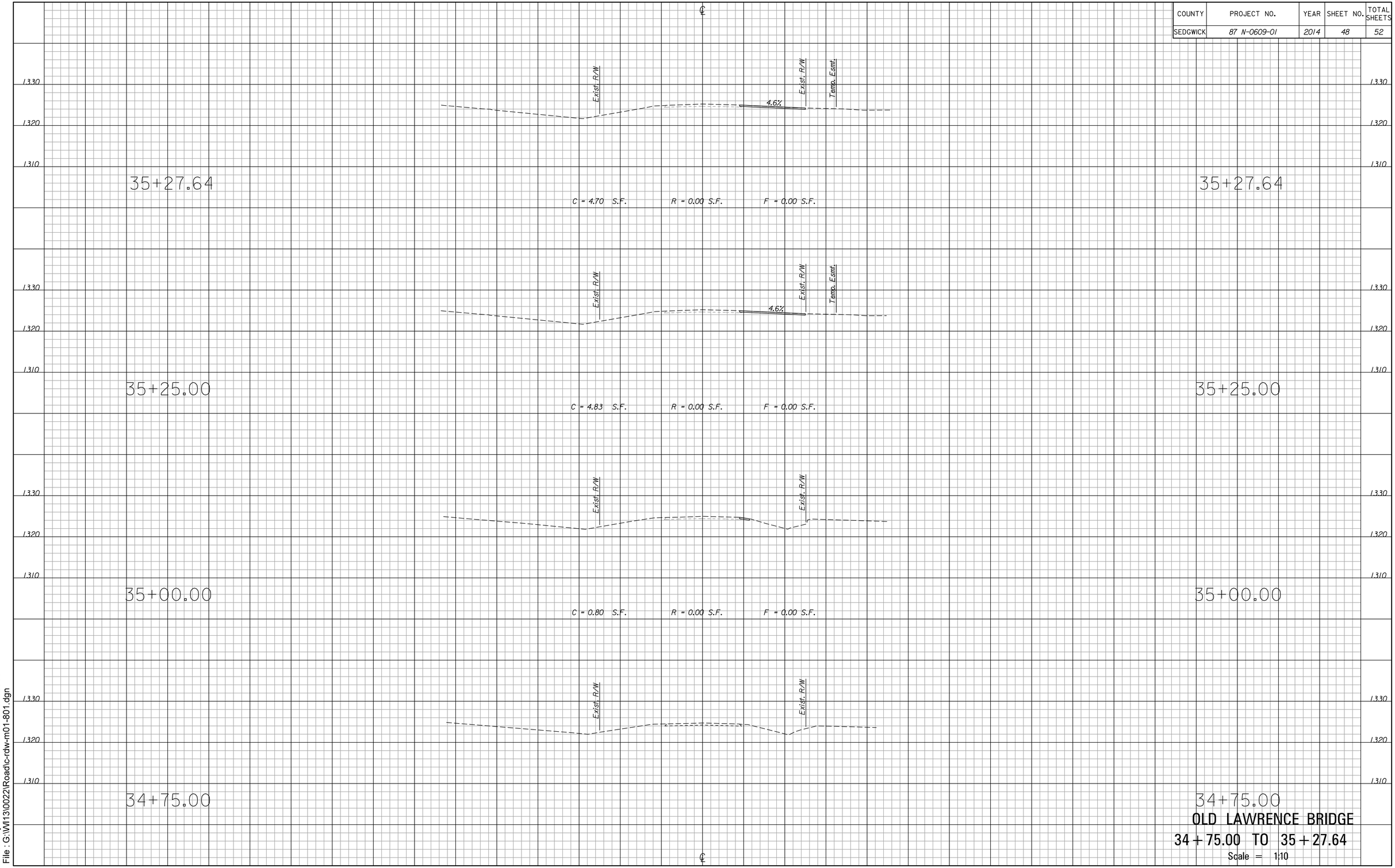
TE795

FHWA APPROVAL	10/16/12	APP'D	
DESIGNED	DETAILED	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN. CK.	TRACE CK.

Plotted : 03-SEP-2014 11:01

Drawn By : ROAD
File : te795.dgn

COUNTY	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
SEDGWICK	87 N-0609-01	2014	48	52



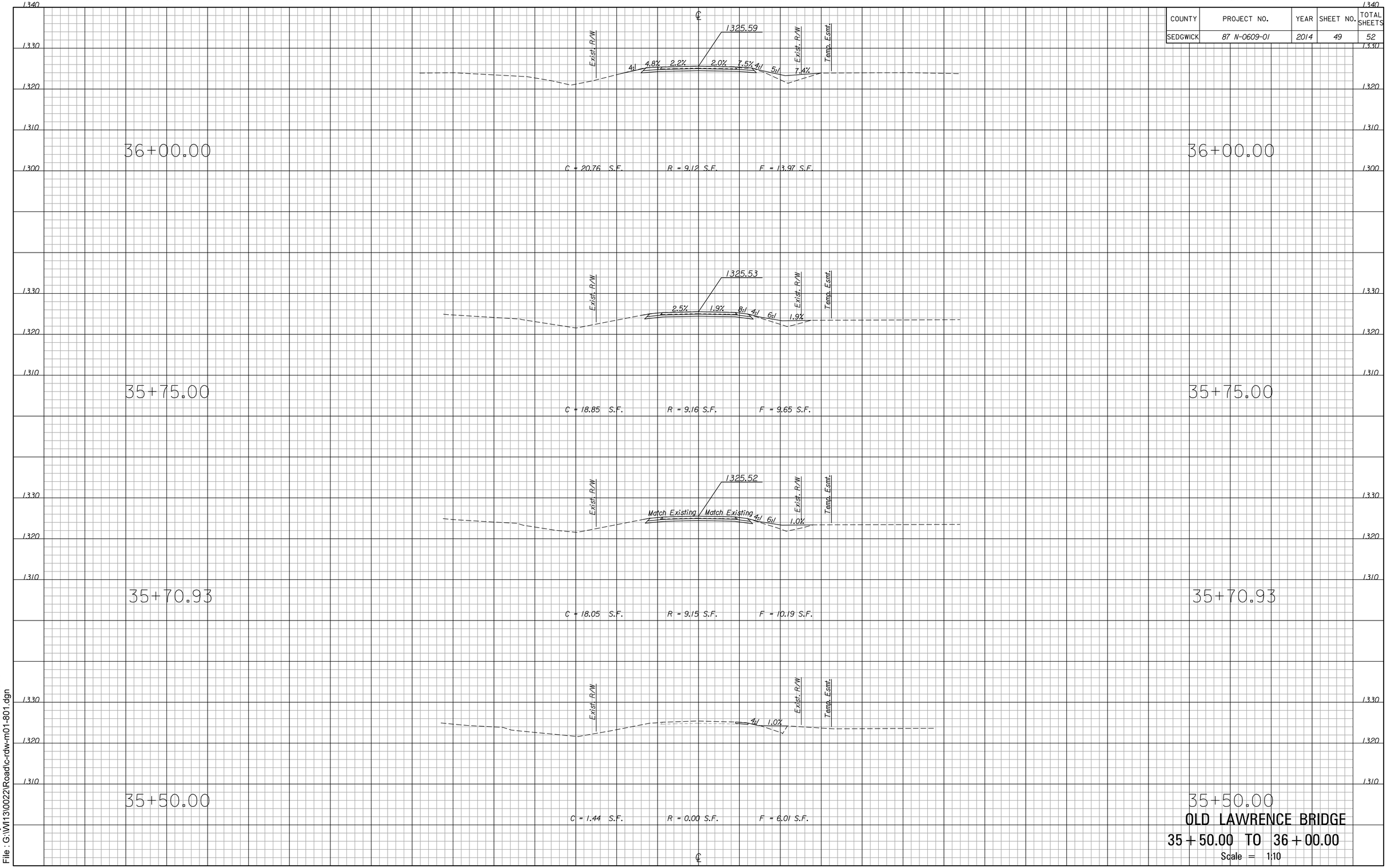
Drawn By: ; ROAD
File : G:\W13\0022\Road\c-rdw-m01-801.dgn
Plotted : 9/3/2014

OLD LAWRENCE BRIDGE

34+75.00 TO 35+27.64

Scale = 1:10

COUNTY	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
SEDGWICK	87 N-0609-01	2014	49	52



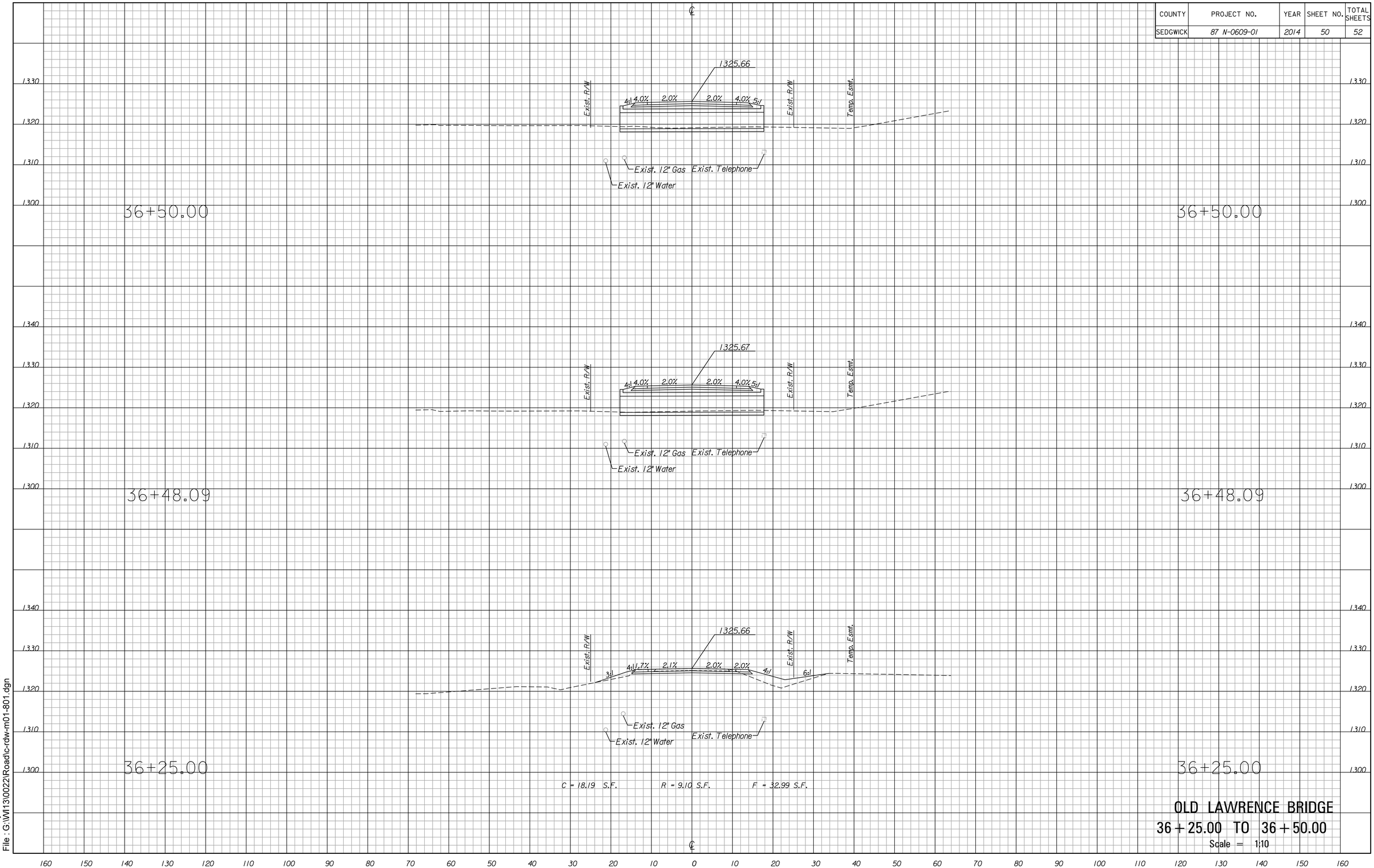
Drawn By: ; ROAD
File : G:\W13\0022\Road\c-rdw-m01-801.dgn
Plotted : 9/3/2014

OLD LAWRENCE BRIDGE

35+50.00 TO 36+00.00

Scale = 1:10

COUNTY	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
SEDGWICK	87 N-0609-01	2014	50	52



OLD LAWRENCE BRIDGE
36 + 25.00 TO 36 + 50.00
Scale = 1:10

Drawn By: ROAD
File: G:\W13\0022\Road\c-rdw-m01-801.dgn
Plotted: 9/3/2014

COUNTY	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
SEDGWICK	87 N-0609-01	2014	51	52

℄

1324.92

Exist. R/W

Match Existing

5:1

1.0%

Exist. R/W

Temp. Esmt.

37+22.74

C = 18.37 S.F. R = 9.25 S.F. F = 4.27 S.F.

37+22.74

1325.26

Exist. R/W

4.0% 1.6% 1.4% 4.0% 4:1 10.0% 4.0%

Exist. R/W

Temp. Esmt.

37+00.00

C = 16.75 S.F. R = 9.23 S.F. F = 18.08 S.F.

37+00.00

1325.53

Exist. R/W

3:1 3.2% 2.1% 2.1% 4.0% 4:1

9:1

Exist. R/W

4.3%

Temp. Esmt.

Exist. 12" Gas

Exist. 12" Water

Exist. Telephone

36+75.00

C = 16.09 S.F. R = 9.08 S.F. F = 30.95 S.F.

36+75.00

℄

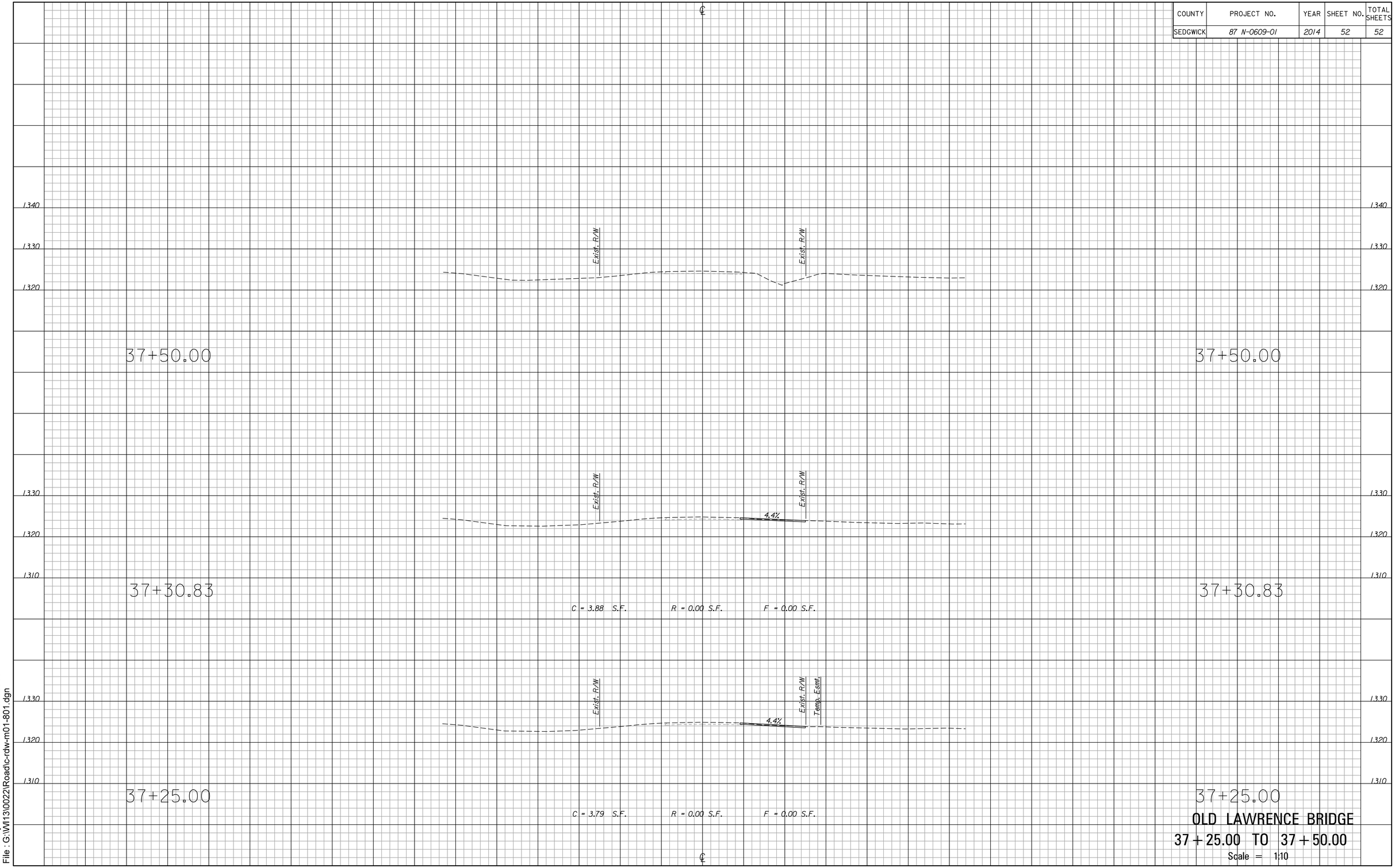
OLD LAWRENCE BRIDGE

36+75.00 TO 37+22.74

Scale = 1:10

Drawn By: : ROAD
File : G:\W13\0022\Road\c-rdw-m01-801.dgn
Plotted : 9/3/2014

COUNTY	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
SEDGWICK	87 N-0609-01	2014	52	52



Plotted : 9/3/2014
Drawn By : ROAD
File : G:\W13\0022\Road\c-rdw-m01-801.dgn

OLD LAWRENCE BRIDGE
37+25.00 TO 37+50.00

Scale = 1:10