| STATE | PROJECT NO. | YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| KANSAS | 87 N-0566-01 | 2013 | 1 | 83 |
| F.A. NO. | STP-N056(601) | | | |

GRADING 707022
SURFACING 635813
SEEDING
SIGNING
PAVEMENT MARKING

STATE OF KANSAS

# DEPARTMENT OF TRANSPORTATION

# PART A: PLAN AND PROFILE OF PROPOSED 135TH ST. W. - KELLOGG AVE. TO ONEWOOD 87 N-0566-01

## CITY OF WICHITA PROJECT NO. 472-84915 O.C.A. NO. 707022

## FEDERAL AID PROJECT

# PART B: WATERLINE IMPROVEMENTS (NON-PARTICIPATING)

## CITY OF WICHITA PROJECT NO. 448-90579 O.C.A. NO. 635813

## SEDGWICK COUNTY

## CITY OF WICHITA

### INDEX OF SHEETS


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2. Typical Sections
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7. Coordinate Geometry Plans
8. - 12. Storm Sewer Plan & Profiles
13. Curb & Gutter Details
14. Drive Entrance Details
15. Wheelchair Ramp Details
16. Sidewalk and Steps
17. Std. Type I Curb Inlet (L=5' or 10')
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19. - 21. Concrete Manhole (Storm Sewer) Details
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23. Schedule of Inlets and Manholes
24. - 29. End Sections
30. - 34. RCB Details (2-10'x6' Sta. 220+25)
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49. SWPPP Plan
50. - 51. Landscape Plans
52. - 53. Signing & Marking Plans
54. Traffic Handling and Construction Sequence
55. - 68. Traffic Control Plans
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PART B: WATERLINE

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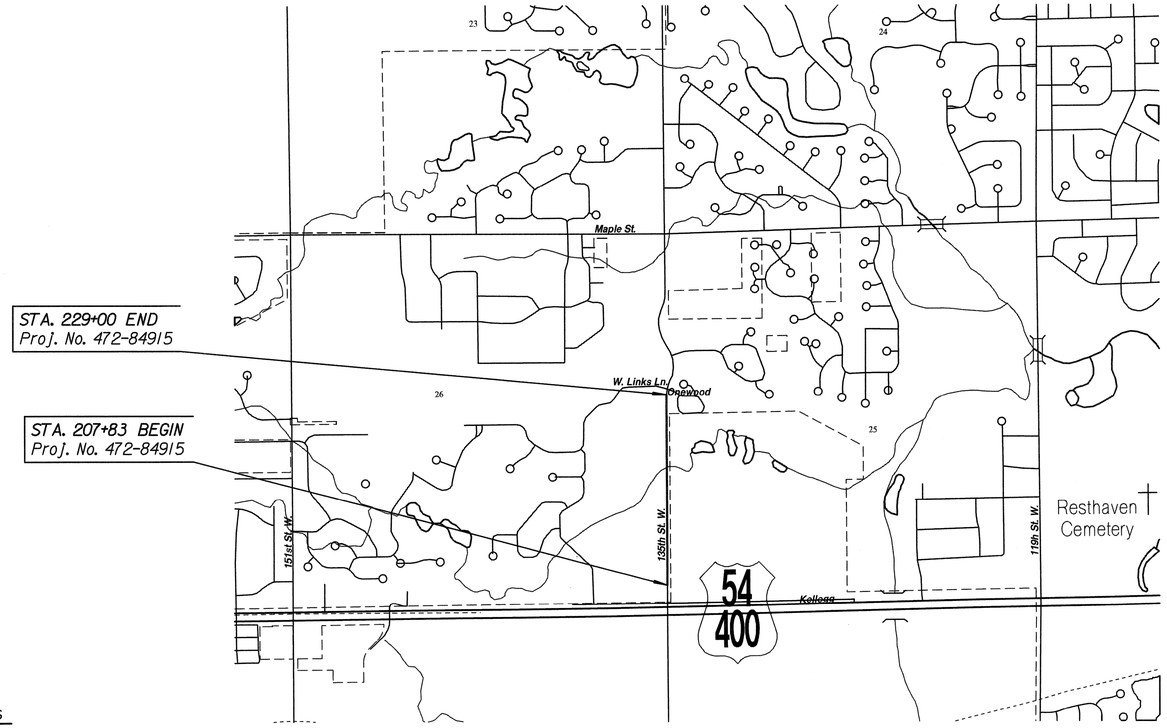
B2. Key Map and General Notes
B3. Standard Water Assembly Details
B4. Miscellaneous Water Details
B5. Miscellaneous Details
B6. - B9. Plan / Profile
B10. - B12. Soil Erosion BMP Details


STA. 229+00 END
Proj. No. 472-84915

STA. 207+83 BEGIN
Proj. No. 472-84915

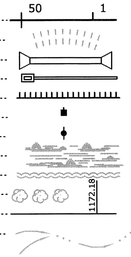
### DESIGN DESIGNATION

AADT (2012) = 7,605
AADT (2035) = 8,979
DHV = 9.4%
T = 1%
V = 40 MPH
C of A = PARTIAL
Clear Zone = 6'

### CONVENTIONAL SIGNS

COUNTY LINE
CITY LIMITS
STATE OR NATIONAL LINE
TOWNSHIP, SECTION or GRANT LINE
PROPERTY LINE
HIGHWAY FENCE
EXISTING FENCE
GUARDRAIL
CONSTRUCTION LIMITS
RIGHT OF WAY LINE
TRAVELED WAY
RAILROADS

CENTER LINE OF PROJECT
TERRACE
CULVERTS
DROP INLET & STORM SEWER
ACCESS CONTROL
POWER POLE
TELEPHONE POLE
MARSH
HEDGE
TREES
PROFILE ELEVATION
STREAM or CREEK




| | | |
|---|---|---|
| GROSS LENGTH OF PROJECT | 2117.00 FT. | |
| EXCEPTIONS | 0.00 FT. | |
| ADDITIONS | 0.00 FT. | |
| NET LENGTH OF PROJECT | 2117.00 FT. | 0.40 MILES |
| NET LENGTH OF BRIDGES | 0.00 FT. | 0.00 MILES |
| NET LENGTH OF ROAD | 2117.00 FT. | 0.40 MILES |

### GENERAL NOTES

ALL CONSTRUCTION WORK AND MATERIAL IN THIS PROJECT SHALL COMPLY WITH CITY OF WICHITA STANDARD SPECIFICATIONS FOR THE CONSTRUCTION OF CITY PROJECTS UNLESS OTHERWISE NOTED IN THE PLANS OR SPECIAL PROVISIONS.

UNDERGROUND UTILITY SERVICE LINES AND OVERHEAD UTILITY POLE LINES ARE TO BE ADJUSTED AS NECESSARY BY OTHERS PRIOR TO CONSTRUCTION UNLESS THE PLANS SPECIFICALLY CALL FOR THEIR ADJUSTMENT BY THE CONTRACTOR. EXISTING UTILITIES AND THEIR LOCATION, AS SHOWN ON THE PLANS, REPRESENT THE BEST INFORMATION OBTAINABLE FOR DESIGN. LOCATION INFORMATION HAS BEEN OBTAINED FROM THE VARIOUS UTILITY COMPANIES AND IS EITHER FROM COMPANY RECORD DRAWINGS OR COMPANY PROVIDED FIELD LOCATIONS. THE CONTRACTOR WILL BE REQUIRED TO WORK AROUND EXISTING UTILITIES WITHIN THE RIGHT-OF-WAY WHICH DO NOT CONFLICT WITH PROPOSED CONSTRUCTION.

TREES AND SHRUBS IN PUBLIC RIGHT-OF-WAY WHICH ARE IN DIRECT CONFLICT WITH PROPOSED NEW CONSTRUCTION SHALL BE REMOVED 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.

RUBBLE FROM THE REMOVAL OF MISCELLANEOUS STRUCTURES SHALL BE DISPOSED OF ON SITES TO BE PROVIDED BY THE CONTRACTOR AND APPROVED AS NOTED BELOW.

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 ARCHEOLOGICAL INVESTIGATIONS UNLESS BURIED IN A PREVIOUSLY APPROVED BORROW LOCATION.

CONTRACTOR SHALL SATISFY HIMSELF OF SURFACE AND SUBSURFACE CONDITIONS PRIOR TO BIDDING.

FIELD LOCATE ALL EXISTING UTILITIES PRIOR TO BEGINNING ANY EXCAVATION WORK. CONTACT THE KANSAS ONE-CALL SYSTEM AT 316-687-2470 AT LEAST 48 HOURS IN ADVANCE TO REQUEST FIELD LOCATES. FOR UTILITIES THAT ARE NOT MEMBERS OF THE KANSAS ONE-CALL SYSTEM, CONTACT THOSE COMPANIES DIRECTLY.

CONTRACTOR IS RESPONSIBLE FOR PRESERVING EXISTING PROPERTY IRONS. RE-ESTABLISH ANY EXISTING PROPERTY IRONS WHICH ARE DAMAGED OR DESTROYED BY CONSTRUCTION OPERATIONS, OR WHICH ARE COVERED BY 12" OR MORE OF FILL MATERIAL BY THIS PROJECT. SUCH IRONS SHALL BE RE-ESTABLISHED BY A LICENSED LAND SURVEYOR IN ACCORDANCE WITH STATE LAWS AND AT NO ADDITIONAL COST TO THE CITY.

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 METER BOXES OR FIRE HYDRANTS DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED BY THE CONTRACTOR AT HIS OWN EXPENSE.

WATER VALVES, METERS AND FIRE HYDRANTS SHALL BE ADJUSTED BY THE CONTRACTOR TO MEET FINAL GRADES, AS DIRECTED BY THE ENGINEER.

THE CONTRACTOR SHALL REMOVE EXISTING ROAD SIGNS THAT INTERFERE WITH CONSTRUCTION. SIGNS DAMAGED THRU NEGLIGENCE OF THE CONTRACTOR SHALL BE REPLACED BY THE CONTRACTOR AT NO COST TO THE CITY. THE CONTRACTOR SHALL STOCKPILE THE SIGNS ALONG THE R/W (AT A CENTRAL LOCATION) FOR REMOVAL BY CITY FORCES.

ALL EXISTING PAVEMENT AND CURB AND GUTTER WITHIN THE CONSTRUCTION LIMITS SHALL BE SAW CUT, FULL DEPTH, TO THE NEAT LINES SHOWN ON THE PLANS, OR TO THE NEAREST JOINT, AND REMOVED, UNLESS OTHERWISE NOTED. SAW CUTTING SHALL BE SUBSIDIARY TO THE BID ITEM "PAVEMENT REMOVAL".

ALL LABOR, MATERIALS, AND EQUIPMENT NECESSARY TO MAKE CONNECTIONS TO EXISTING PIPE OR EXISTING SMALL STRUCTURES SHALL NOT BE PAID FOR DIRECTLY; BUT SHALL BE SUBSIDIARY TO OTHER ITEMS OF THE CONTRACT.

JOSEPH P. SURMEIER LICENSED 13977 2-22-13 KANSAS PROFESSIONAL ENGINEER

### Construction Traffic Notes

*TRAFFIC TO BE CARRIED THROUGH CONSTRUCTION. FOR TRAFFIC HANDLING AND CONSTRUCTION SEQUENCE SEE SH. NO. 54*

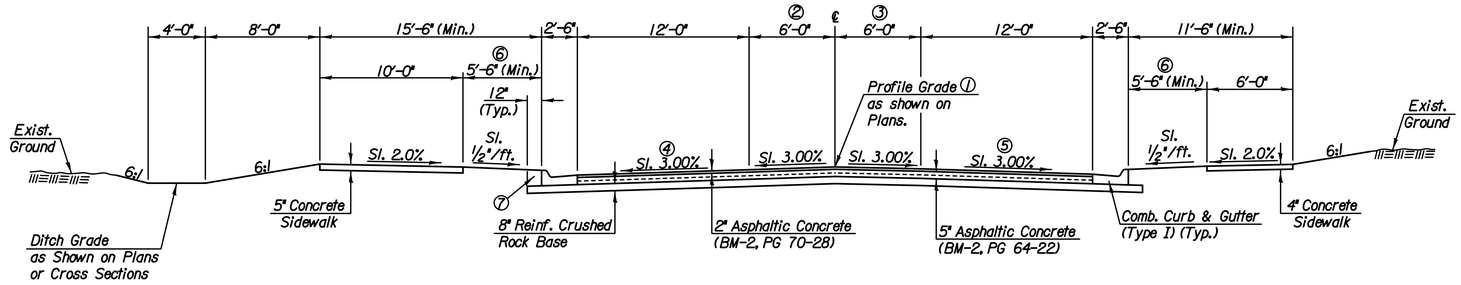
PLANS PREPARED BY:

Professional Engineering Consultants, P.A.
303 S. TOPEKA • WICHITA, KANSAS 67202
316-262-2691 • FAX 316-262-3003

RECOM. FOR APPROVAL-DATE
Gary Jonzon 02/22/13
LOCAL PUBLIC OFFICIAL

KANSAS DEPARTMENT OF TRANSPORTATION

| | DATE | BY |
|---|---|---|
| SURVEYED | | |
| PLOTTED | | |
| INKED | | |
| DESIGNED | | |
| SQUAD | | |




## TYPICAL SECTION

Sta. 207+83 to Sta. 229+00

① Profile Grade is the theoretical top of pavement elevation at ℄.

② 6'-0" at Sta. 207+83 to Sta. 228+10.
Varies from 6'-0" at Sta. 228+10 to 7'-3 3/8" at Sta. 229+00.

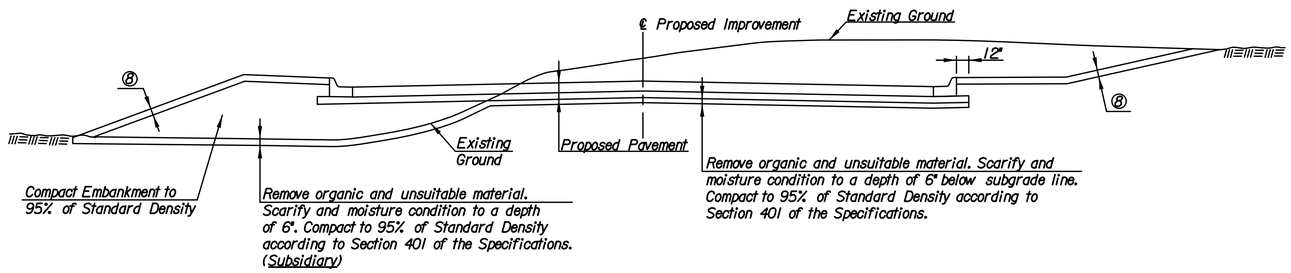
③ 6'-0" at Sta. 207+83 to Sta. 228+10.
Varies from 6'-0" at Sta. 228+10 to 6'-10 3/4" at Sta. 229+00.

④ Varies from 1.80% at Sta. 207+83 to 3.00%. at Sta. 208+33.
3.00% from Sta. 208+33 to Sta. 228+50.
Varies from 3.00% at Sta. 228+50 to 2.50% at Sta. 229+00.

⑤ Varies from 2.70% at Sta. 207+83 to 3.00% at Sta. 208+33.
3.00% from Sta. 208+33 to Sta. 228+50.
Varies from 3.00% at Sta. 228+50 to 2.40% at Sta. 229+00.

⑥ Location of Sidewalk Varies. See Plans.

⑦ Backfill behind curbs. Quantities for this work are included in the Earthwork Summary Table.




IN FILL IN CUT

## COMPACTION DIAGRAM

Note: All embankment, including sideroads and driveways shall be compacted.

⑧ The top 6" of all areas to be seeded shall be topsoiled with material suitable for growth of vegetation. Thru cuts, over excavate 6" for placement of topsoil. This work shall be Subsidiary to other earthwork items. In fill, the top 6" of embankment shall be topsoil. Quantities for this work are included in the contract bid items for earthwork. No measurement or payment will be made for material required to replace material excavated during stripping operations.

| No. | Revision | By | Date |
|---|---|---|---|
| | | | |

135TH ST.

# TYPICAL SECTION

GARY JANZEN, P.E.-CITY ENGINEER
CITY OF WICHITA PROJECT NO. 472-84915

PEC
PROFESSIONAL ENGINEERING CONSULTANTS, P.A.
303 SOUTH TOPEKA WICHITA, KS 67202
316-262-2691 www.pec1.com

| Designed by | RJS | Job No. | 10281 | Sht. 2 of 83 |
|---|---|---|---|---|
| Drawn by | JDT | Date | JAN., 2013 | |

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## UTILITIES

AT&T, Wichita Central Unit
154 N. Broadway Ave. Rm 210
Wichita, Ks. 67202
Jason Edwards (316) 268-2008

Black Hills Energy
1611 S. Hoover Rd.
Wichita, Ks. 67209
Daryl Keller (316) 941-1608

Cox Communications
901 George Washington Blvd.
Wichita, Ks. 67211
Marc Henderson (316) 260-7745

Kansas Gas Service
1021 E. 26th St. N.
Wichita, Ks. 67219
Jim Coe (316) 832-3126

Wichita Water Utilities
8th Floor - City Hall
455 N. Main St.
Wichita, Ks. 67202
Greg Lolley (Water)
(316) 268-4555

Westar Energy
1900 E. Central Ave.
P.O. Box 208
Wichita, Ks. 67201
Randy Truitt
(316) 261-6512

P.I. ℄ Sta. 200+00.00=
SW Cor. Sec. 25, T27S, R2W
1. See References Below

T.C. P.V.I. 1364.44 | -1.41% T.C. Lt. | T.C. P.V.C. 1363.73 | -1.41% T.C. Lt. | T.C. P.V.I. 1363.38 50' V.C. | -1.13% T.C. Lt. | T.C. P.V.T. 1363.10 | -1.13% T.C. Lt. | T.C. P.V.I. 1362.16 | -1.20% T.C. Lt. & Rt. | T.C. P.V.C. 1359.86 | -1.20% T.C. Lt. & Rt. | T.C. P.V.I. 1358.66 200' V.C. | -3.20% T.C. Lt. & Rt.

P.G. P.V.I. 1364.45 | -1.20% P.G. | P.G. P.V.C. 1360.05 | -1.20% P.G. | P.G. P.V.I. 1358.85 200' V.C. | -3.20% P.G.

+75 P.V.I. | +25 P.V.C. | +50 P.V.I. | +75 P.V.T. | +58 P.V.I. | +50 P.V.C. | +50 P.V.I.

+83 P.V.I. (Match Exist.)

Transition Cross-Slope Lt. from 1.80% to 3/8"/ft. +33

Jimmy & Karen L. Edgington
D-1047-UP

SE 1/4, Sec. 26, T27S, R2W

Kevin L. & Frances Nash
D-1046-UP

STA. 207+83 BEGIN
Project No. 472-84915

STA. 207+63 BEGIN
Construction

Section Line

Kellogg (US-54)

+63.28 Begin Sidewalk Lt.

P.I. +83 22' Lt.

R/W=Exist. R/W 65' ℄

+57.15 65' Lt.

+57.12 60' Lt.

P.I. +58 20' Lt.

Comb. Curb & Gutter (Type I)

R/W=Exist. R/W 60' ℄

+34 ℄ 20' Ent.

SWS Line 101

Const. Limits

Concrete

Fence

Gravel

(30" Water By Others)

10' Sidewalk

Saw Cut

Crown Line

Profile Grade Line

℄ 135th St.=Sec. Line (N 00°37'31" W)

Asphalt

MB

SWS Line 102

15" CMP

KGS (PE)

6' Sidewalk

SWS Line 100

16" Water

R/W=Exist. R/W 50' ℄

Temp. Esmt. 55' ℄

10' KG&E Easement

Wrought Iron

Masonry Fence

Masonry

+38.27 50' Rt.

+74.28 Begin Sidewalk Rt.

P.I. +83 14' Rt.

+06.26 50' Rt.

+06.36 55' Rt.

+28 ℄ 30' Ent.

+56.37 55' Rt.

+56.27 50' Rt.

+56.47 60' Rt.

P.I. +58 20' Rt.

+83 ℄ 20' Ent.

SW 1/4, Sec. 25, T27S, R2W

Tony W. & Kristen Weber
AT-546

WEBER ADDITION

Cross Road Fellowship Bible Inc.
AT-145-7

207+00 | 207+50 | 208+00 | 208+50 | 209+00 | 209+50 | 210+00 | 210+50 | 211+00 | 211+50 | 212+00 | 212+50 | 213+00

| | 207+00 | 207+50 | 208+00 | 208+50 | 209+00 | 209+50 | 210+00 | 210+50 | 211+00 | 211+50 | 212+00 | 212+50 | 213+00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 64.12 | 63.39 | 62.82 | 62.26 | 61.66 | 61.06 | 60.46 | | 59.14 | 58.16 | 56.94 |
| | | | 63.77 | 63.04 | 62.47 | 61.90 | 61.31 | 60.71 | 60.11 | 59.51 | 58.79 | 57.81 | 56.59 |
| | | | 64.27 | 63.65 | 63.05 | 62.45 | 61.85 | 61.25 | 60.65 | 60.05 | 59.33 | 58.35 | 57.13 |
| | | | 63.84 | 63.18 | 62.55 | 61.92 | 61.31 | 60.71 | 60.11 | 59.51 | 58.79 | 57.81 | 56.59 |
| | | | 64.20 | 63.54 | 62.90 | | 61.66 | 61.06 | 60.46 | 59.86 | 59.14 | 58.16 | |

+85 P.V.I. (Match Exist.) | -1.38% T.C. Rt. | +25 P.V.C. | -1.38% T.C. Rt. | +50 P.V.I. | -1.26% T.C. Rt. | +75 P.V.T. | -1.26% T.C. Rt. | +58

T.C. P.V.I. 1364.42 | T.C. P.V.C. 1363.87 | T.C. P.V.I. 1363.53 50' V.C. | T.C. P.V.T. 1363.21 | T.C. P.V.I. 1362.16

Note: Elevations shown along Curb and Gutter are to High Edge and Top of Curb.

| REMOVAL OF EXISTING STRUCTURES * | | |
|---|---|---|
| STATION | SIDE | ITEM |
| 211+32 | Lt. | 15" CMP |
| 212+82 | Rt. | 15" CMP |

* For Information Only

Note: All trees removed from within the construction limits shall be paid for as "Site Clearing".

Utilities

| | |
|---|---|
| Gas | Kansas Gas Service |
| Power | Westar Energy |
| Telephone | AT&T |

LEGEND

Pavement Removal

5' Transition from No Curb to Combined Curb & Gutter (Type I).

SCALE

PLAN: Lat. & Long. 20' 0 20' 40'

PROFILE: Horiz. same as above

Vert. 2' 0

SW Cor. Sec. 25, T27S, R2W
1. Found 5/8" rebar in thimble
2. Ctr. east bound lanes 6.46' S
3. Ctr. west bound lanes 47.93' N
4. KDOT nail/washer east face power pole 70.26' SW
5. KDOT nail/washer west face power pole 96.67' SE
6. 3 nails south face power pole 114.20' NW

BM#R16 Square Cut center front curb inlet on West Side 135th St. W., ± 350' N. of ℄ Kellogg. 135th St. W. ℄ Sta. 203+70.82, 38.34' Lt. Elev. 1358.48

| No. | Revision | By | Date |
|---|---|---|---|

135TH ST.

# PLAN
## STA. 207+00 TO STA. 213+00

GARY JANZEN, P.E.-CITY ENGINEER
CITY OF WICHITA PROJECT NO. 472-84915

PEC
PROFESSIONAL ENGINEERING CONSULTANTS, P.A.
303 SOUTH TOPEKA WICHITA, KS 67202
316-262-2691 www.pec1.com

| Designed by | RJS | Job No. | 10281 | Sht. 3 of 83 |
|---|---|---|---|---|
| Drawn by | JDT | Date | JAN., 2013 | |

Plotted By: svb Date: 2/25/2013 9:38:46 AM
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Scale: 1"=20'

T.C. P.V.T. 1355.46 | T.C. P.V.C. 1345.86

-3.20% T.C. Lt. & Rt. | -3.20% T.C. Lt. & Rt. | -3.20% T.C. Lt. & Rt.

P.G. P.V.T. 1355.65 | P.G. P.V.C. 1346.05

-3.20% P.G. | -3.20% P.G. | -3.20% P.G.

+50 P.V.T. | +50 P.V.C.

4' x Sp. Dt. Lt. @ -9.00% | 4' x Sp. Dt. Lt. @ -3.50% | 4' x Sp. Dt. Lt. @ -0.60%

+50 1348.00 | +00 1342.91 | +18.50 ℄ 20' Ent. | +00 1340.00 | +58.50 ℄ 20' Ent.

Sta. 216+18.50, 65' Lt. Install 15"x38' EP with End Sections See Sh. No. 24-29, 42

Sta. 218+58.50, 55' Lt. Install 15"x34' EP (Rotate 1° Rt.) with End Sections See Sh. No. 24-29, 42

Kevin L. & Frances Nash D-1046-UP

SE 1/4, Sec. 26, T27S, R2W

Marlo E. Goering Living Trust D-999-UP

Arnold J. & Mary Ann Eck D-1000-UP

2+13+00 | 2+13+50 | 2+14+00 | 2+14+50 | 2+15+00 | 2+15+50 | 2+16+00 | 2+16+50 | 2+17+00 | 2+17+50 | 2+18+00 | 2+18+50 | 2+19+00

+97.12 60' Lt. | +97.06 50' Lt. | +98.48 95' Lt. | +98.99 80' Lt. | +38.96 80' Lt. | +39.64 60' Lt. | +39.99 50' Lt. | +33.50 95' Lt. | +34.01 80' Lt. | +34.97 50' Lt.

R/W=Exist. R/W 60' ℄ | Const. Limits | Temp. Esmt. 60' ℄ | Comb. Curb & Gutter (Type I) | 2" Surfacing Material (SA-1) | R/W=Exist. R/W 50' ℄ | Temp. Esmt. 95' ℄ | Drainage Esmt. 80' ℄ | 8" Conc. Pvmt. (Reinf.) | San. Sewer Lateral Field | Const. Limits | 50' R/W | 2" Surfacing Material (SA-1) | 8" Conc. Pvmt. (Reinf.)

(30" Water By Others) 10' Sidewalk | 10' Sidewalk (30" Water By Others)

SWS Line 102 | SWS Line 103 | SWS Line 104 | SWS Line 100 | Crown Line | Profile Grade Line | 135th St.-Sec. Line

6' Sidewalk | Const. Limits | 16" Water | Masonry Fence | Wrought Iron | Gravel | Comb. Curb & Gutter (Type I) | R/W=Exist. R/W 60' ℄ | 2" KGS (PE) Easement | +51.94 50' Rt. | +52.08 60' Rt. | 16" Water 50' R/W

Cross Road Fellowship Bible Inc. AT-145-7

SW 1/4, Sec. 25, T27S, R2W

BM#R16A Set "T" Post E side 135th St. W., N of Kellogg adjacent to #1349 S. 135th St. W. in line with power line N-S. 135th St. W. ℄ Sta. 216+28.86, 32.08' Rt. Elev. 1345.91

Note: All trees removed from within the construction limits shall be paid for as "Site Clearing".

| REMOVAL OF EXISTING STRUCTURES * | | |
|---|---|---|
| STATION | SIDE | ITEM |
| 216+26 | Lt. | 21"x15" CMP |
| 218+86 | Lt. | 21"x15" CMP |
| | | |

* For Information Only

Utilities

| | |
|---|---|
| Gas | Kansas Gas Service |
| Power | Westar Energy |
| Telephone | AT&T |

| No. | Revision | By | Date |
|---|---|---|---|
| | | | |

135TH ST.

# PLAN
## STA. 213+00 TO STA. 219+00

GARY JANZEN, P.E.-CITY ENGINEER
CITY OF WICHITA PROJECT NO. 472-84915

PEC
PROFESSIONAL ENGINEERING CONSULTANTS, P.A.
303 SOUTH TOPEKA WICHITA, KS 67202
316-262-2691 www.pec1.com

| Designed by | RJS | Job No. | 10281 | Sht. 4 of 83 |
|---|---|---|---|---|
| Drawn by | JDT | Date | JAN., 2013 | |

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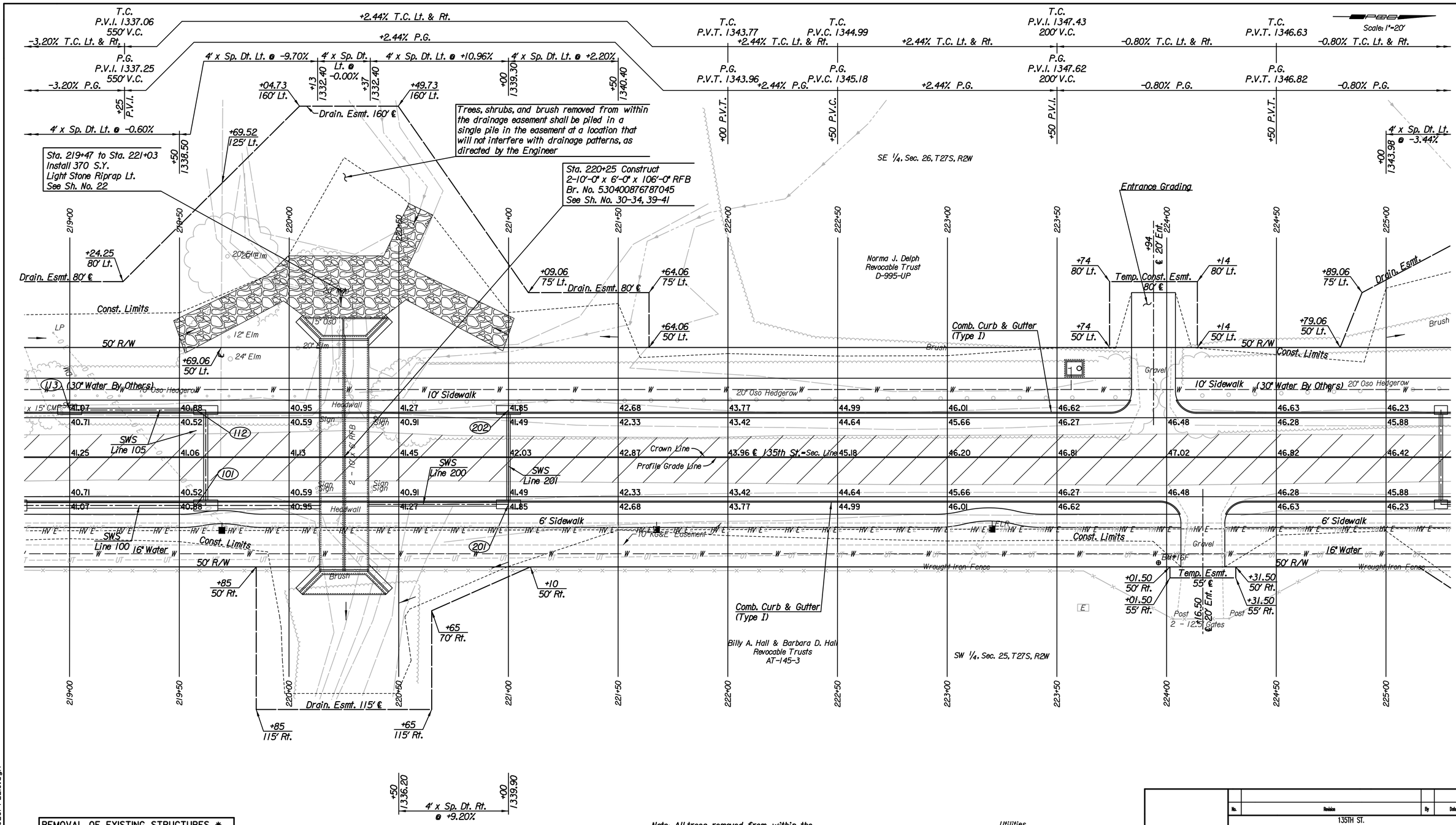


| REMOVAL OF EXISTING STRUCTURES * | | |
|---|---|---|
| STATION | SIDE | ITEM |
| 219+85 | Rt. | 125 L.F. Wrought Iron Fence (North) |
| 220+13 | Lt. | Sign |
| 220+13 | Rt. | 2-Signs |
| 220+25 | ℄ | 2-10'X5' RCB & Wingwalls |
| 220+38 | Lt. | 2-Signs |
| 220+38 | Rt. | 2-Signs |

* For Information Only

Note: All trees removed from within the construction limits shall be paid for as "Site Clearing".

*Utilities*

| | |
|---|---|
| Gas | Kansas Gas Service |
| Power | Westar Energy |
| Telephone | AT&T |

BM#16F Set "T" Post E side 135th St. W., N of Kellogg 300' S of #1151 S. 135th St. W., 15' E of power line N-S. 135th St. W. ℄ Sta. 223+96.28, 48.12' Rt. Elev. 1347.68

| No. | Revision | By | Date |
|---|---|---|---|

135TH ST.

# PLAN
## STA. 219+00 TO STA. 225+00

GARY JANZEN, P.E.-CITY ENGINEER
CITY OF WICHITA PROJECT NO. 472-84915

PEC
PROFESSIONAL ENGINEERING CONSULTANTS, P.A.
303 SOUTH TOPEKA WICHITA, KS 67202
316-262-2691 www.pec1.com

| Designed by | RJS | Job No. | 10281 | Sht. 5 of 83 |
|---|---|---|---|---|
| Drawn by | JDT | Date | JAN., 2013 | |

Plotted By: svb Date: 5/16/2013 11:27:27 AM
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T.C. P.V.C. 1346.03 -0.80% T.C. Lt. & Rt. | P.G. P.V.C. 1346.22 -0.80% P.G. | +00 1343.98 | +25 P.V.C.

-0.80% T.C. Lt. & Rt. | -0.80% P.G. | 4' x Sp. Dt. Lt. @ -3.44% | +00 1340.54

T.C. P.V.I. 1345.03 250' V.C. | P.G. P.V.I. 1345.22 250' V.C. | +50 P.V.I. | +10 1340.54

-0.80% T.C. Lt. & Rt. | +2.20% P.G. | 4' x Sp. Dt. Lt. @ +3.60% | +00 1343.78

+2.20% T.C. Lt. & Rt. | +50 1345.34

T.C. P.V.T. 1347.78 | P.G. P.V.T. 1347.97 | +75 P.V.T.

+2.20% T.C. Lt. & Rt. | +2.20% P.G. | 4' x Sp. Dt. Lt. @ +3.12%

T.C. P.V.I. 1348.54 | T.C. Lt. | +10

T.C. P.V.C. 1348.87 | +25 P.V.C.

+2.20% T.C. Lt. & Rt. | +2.20% P.G.

T.C. P.V.I. 1349.42 50' V.C. | P.G. P.V.I. 1349.62 | +50 P.V.I.

+2.18% T.C. Lt. | +2.20% P.G.

T.C. P.V.T. 1349.82 | P.G. P.V.C. 1349.07 50' V.C. P.V.T. 1349.99 | +75 P.V.T.

+1.58% T.C. Lt. | +1.46% P.G.

T.C. P.V.I. 1350.21 | P.G. P.V.I. 1350.35 | +00 P.V.I. (Match Exist.)

+1.58% T.C. Lt. | +1.46% P.G. | +50 1345.34

P.I. ℄ Sta. 226+28.76= W 1/4 Cor. Sec. 25, T27S, R2W
Deflection Angle = 00°03'56" Lt.
1. See References Below

P.C. ℄ Sta. 229+58.01
1. No References

Scale: 1"=20'

Transition Cross-Slope Lt. from 3/8"/ft. to +2.50%

Sta. 229+00 END PROJECT No. 472-84915

Sta. 230+73 END CONSTRUCTION

SE 1/4, Sec. 26, T27S, R2W
Norma J. Delph Revocable Trust
D-995-UP

Sta. 226+05 Construct 4'-0" x 3'-0" x 91'-0" RCB
See Sh. No. 35-41

Drainage Esmt. 115' ℄

+64.46 115' Lt.

+29.59 115' Lt.

Sec. Line

1/4

Sta. 226+44 to Sta. 226+57
Install 23 S.Y.
Light Stone Riprap Lt.
See Sh. No. 22

NE 1/4, Sec. 26, T27S, R2W
Todd Wiechman
D-991-UP

AUBURN HILLS 13TH ADDITION

Elaine R. Fleetwood, etal
D-56654

Const. Limits

+29.12 50' Lt.

+50 75' Lt.

+79.12 55' Lt.

+92 20' Exist. ℄

P.I. +10 18' Lt. (H.E.)

+09.12 55' Lt.

+09.12 50' Lt.

+79.12 50' Lt.

P.I. +28.76 20' Lt.

Comb. Curb & Gutter (Type I)

Temp. Esmt. 55' ℄

50' R/W

Planter

Brush

Gravel

Exist. R/W

30' ℄

15" CMP

Sign

Crown Line

Profile Grade Line

135th St. - Sec. Line (N 00°41'27" W)

P.I. +00 21.28' Lt. (Match Exist.)

+58.35 50' Lt.

R/W-Exist. R/W

10' Sidewalk

Const. Limits

1" Black Hills Energy (MDPE)

4" Black Hills Energy (MDPE)

20' Drainage & Utility Easement

15' Utility Easement

Exist. R/W

+63.09 50' Lt.

+64.65 End Sidewalk Lt.

W. Links Ln.

5' Wall Esmt.

Masonry Fence

Sight

YL

2" Bushes

6" Map

231+00

303 | 304 | 402 | 302 | 301 | 401

(30" Water By Others)

10' Sidewalk

6' Sidewalk

16" Water

50' R/W

SWS Line 301 | SWS Line 302 | SWS Line 300 | SWS Line 400 | SWS Line 401

2 - 57" x 38" CMMAC

179°56'04"

Wrought Iron Fence

Const. Limits

+14.77 50' Rt.

Drainage Esmt. 90' ℄

+75.57 90' Rt.

+29.71 50' Rt.

+30.47 90' Rt.

P.I. +28.76 20' Rt.

1/4 Section Line

20' Utility Easement

Billy A. Hall & Barbara D. Hall
Revocable Trusts
AT-145-3

SW 1/4, Sec. 25, T27S, R2W

Ronnie P. & Carol M. Sellens
Revocable Trust
D-53534
5

Patricia A. Hurley
D-53533
4

Stoneleigh Village Master Assoc.
D-53562

Stoneleigh Investments
D-53532
3

Timothy W. & Christina G. Bennett
D-53531
2

Paul A. Perkins
D-53530
1

NW 1/4, Sec. 25, T27S, R2W

Sta. 226+30 to 230+00 Rt.
Spare ALL trees between sidewalk and R/W line

Comb. Curb & Gutter (Type I)

10' Utility Easement

℄ 10' Util. Easement

℄ 20' Emergency Access Easement

P.I. +10 20' Rt.

P.I. +00 20.90' Rt. (Match Exist.)

+95.49 End Sidewalk Rt. (Match Exist.)

+58.01 50' Rt.

AUBURN HILLS 9TH ADDITION

15' Street, Drainage & Utility Easement

W. Onewood St.

R/W-Exist. R/W

135th St.

8" Waterline Rec. Info.

Masonry Fence

Sign

CMKR

10"

3" Spr

6" Spr

† Wheelchair Ramp w/Detectable Warning

+50 1341.77 | +00 1340.27 | +10 1340.27

4' x Sp. Dt. Rt. @ -3.00%

4' x Sp. Dt. Rt. @ -0.00%

| REMOVAL OF EXISTING STRUCTURES * | | |
|---|---|---|
| STATION | SIDE | ITEM |
| 225+15 | Rt. | 115 L.F. Wrought Iron Fence (North) |
| 226+21 | ℄ | 2-57"x38" CMMAC |
| 226+78 | Lt. | Sign |
| 227+92 | Lt. | 15" CMP |
| 228+99 | Rt. | Sign |

* For Information Only

W1/4 Cor. Sec. 25, T27S, R2W
1. Found 1" iron pipe
2. Chis. "+" East hdwl. RCB 15.01' SE
3. Chis. "+" West hdwl. RCB 15.03' SW
4. 60d nail NE face 10" Elm 34.32' NW
5. Nail/shiner NW face power pole 59.52' NE

T.C P.V.I. 1348.54 | T.C P.V.C. 1348.76 | +2.20% T.C. Rt. | +10 P.V.I.

+2.15% T.C. Rt. | +20 P.V.C.

T.C P.V.I. 1349.41 50' V.C. | +1.68% T.C. Rt. | +50 P.V.I.

T.C P.V.T. 1349.83 | +1.68% T.C. Rt. | +75 P.V.T.

T.C P.V.I. 1350.25 | +00 P.V.I. (Match Exist.)

Transition Cross-Slope Rt. from 3/8"/ft. to +2.40%

Utilities

| | |
|---|---|
| Gas | Black Hills Energy |
| Power | Westar Energy |
| Telephone | AT&T |
| Television | Cox Communications |
| Water | Wichita Water Utilities |

Note: All trees removed from within the construction limits shall be paid for as "Site Clearing".

BM#16G Square Cut on top of curb, W side of 135th St. W., 145' N. of ℄ Onewood St. 135th St. W. ℄ Sta. 232+47.76, 22.05' Lt. Elev. 1348.17

| No. | Revision | By | Date |
|---|---|---|---|

135TH ST.

# PLAN
## STA. 225+00 TO STA. 231+00

GARY JANZEN, P.E.-CITY ENGINEER
CITY OF WICHITA PROJECT NO. 472-84915

PEC
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303 SOUTH TOPEKA WICHITA, KS 67202
316-262-2691 www.pec1.com

| Designed by | RJS | Job No. | 10281 | Sht. 6 of 83 |
|---|---|---|---|---|
| Drawn by | JDT | Date | JAN., 2013 | |

Plotted By: svb Date: 2/25/2013 10:37:16 AM
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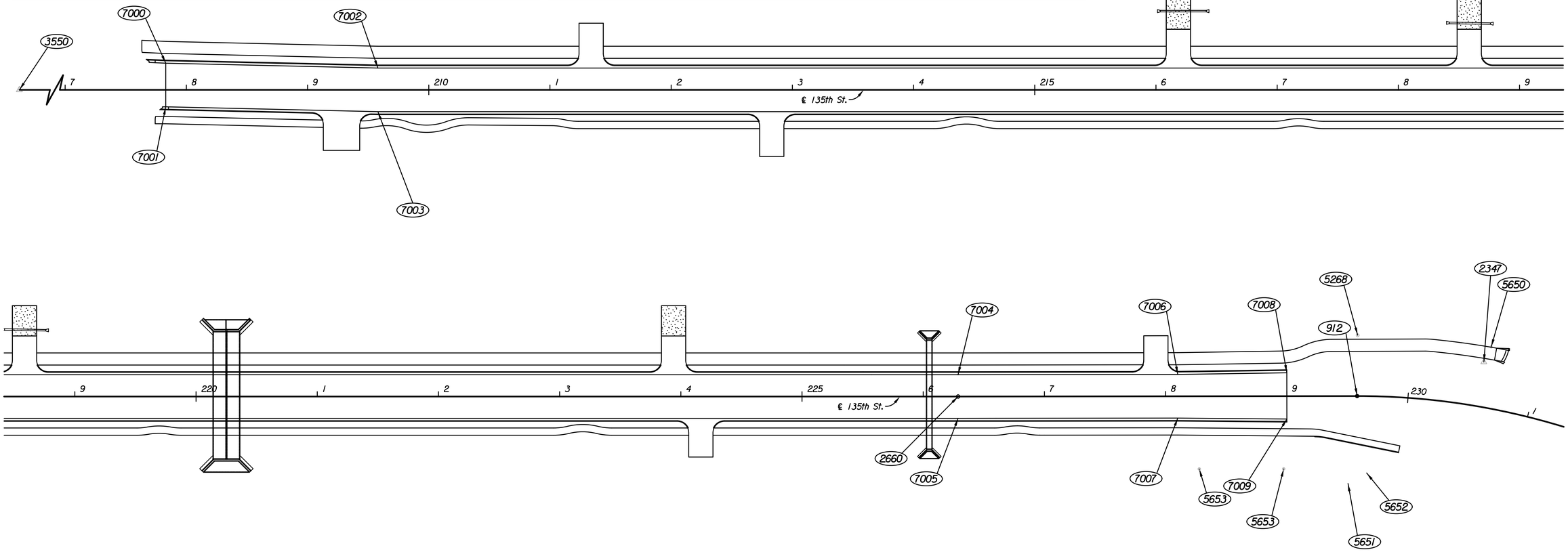
## CONTROL POINTS

| POINT NO. | NORTH COORDINATE | EAST COORDINATE | STATION | OFFSET | DESCRIPTION |
|---|---|---|---|---|---|
| 912 | 1,680,267.1260 | 1,602,329.0003 | 229+58.01 | 0 | ℄ Exist. 135th St. |
| 2660 | 1,679,937.9000 | 1,602,332.9699 | 226+28.76 | 0 | Section Corner-1" Iron pipe |
| 3550 | 1,677,309.2963 | 1,602,361.6608 | 200+00.00 | 0 | Section Corner-⅝" Rebar in Thimble |
| 2347 | 1,680,371.3453 | 1,602,299.8064 | 230+61.87 | 36.86' Lt. | MON, CP |
| 5268 | 1,680,267.0232 | 1,602,278.8022 | 229+63.54 | 50.20' Lt. | IRP, #4 BAR |
| 5650 | 1,680,377.2980 | 1,602,287.2162 | 230+65.46 | 50.25' Lt. | IRP, #5 BAR CAP |
| 5651 | 1,680,260.3677 | 1,602,401.2735 | 229+50.38 | 72.19' Rt. | COM, TEMP PT |
| 5652 | 1,680,275.7094 | 1,602,392.4524 | 229+71.86 | 63.49' Rt. | IRP, #4 BAR BENT |
| 5653 | 1,680,207.1796 | 1,602,389.7636 | 228+97.34 | 60.04' Rt. | IRP, #4 BAR CAP |
| 5654 | 1,680,137.5201 | 1,602,390.5936 | 228+27.67 | 60.03' Rt. | IRP, #4 BAR CAP |

## PAVEMENT COORDINATE TABLE

| POINT NO. | NORTH COORDINATE | EAST COORDINATE | STATION | OFFSET | DESCRIPTION |
|---|---|---|---|---|---|
| 7000 | 1,678,092.0095 | 1,602,331.1141 | 207+83.00 | 22.00' Lt. | Edge of Pavement / Edge of Curb |
| 7001 | 1,678,092.4024 | 1,602,367.1141 | 207+83.00 | 14.00' Rt. | Edge of Pavement / Edge of Curb |
| 7002 | 1,678,267.0428 | 1,602,333.2060 | 209+58.00 | 18.00' Lt. | Edge of Pavement / Edge of Curb |
| 7003 | 1,678,267.4357 | 1,602,369.2038 | 209+58.00 | 18.00' Rt. | Edge of Pavement / Edge of Curb |
| 7004 | 1,679,937.6829 | 1,602,314.9712 | 226+28.74 | 18.00' Lt. | Edge of Pavement / Edge of Curb |
| 7005 | 1,679,938.1170 | 1,602,350.9686 | 226+28.76 | 18.00' Rt. | Edge of Pavement / Edge of Curb |
| 7006 | 1,680,118.9095 | 1,602,312.7861 | 228+10.00 | 18.00' Lt. | Edge of Pavement / Edge of Curb |
| 7007 | 1,680,119.3436 | 1,602,348.7834 | 228+10.00 | 18.00' Rt. | Edge of Pavement / Edge of Curb |
| 7008 | 1,680,208.8875 | 1,602,310.4183 | 229+00.00 | 19.28' Lt. | Edge of Pavement / Edge of Curb |
| 7009 | 1,680,209.3478 | 1,602,348.5942 | 229+00.00 | 18.90' Rt. | Edge of Pavement / Edge of Curb |

SCALE
40' 0 40' 80'




| No. | Revision | By | Date |
|---|---|---|---|

135TH ST.

# COORDINATE GEOMETRY PLAN
## STA. 207+83 TO STA. 229+00

GARY JANZEN, P.E.-CITY ENGINEER
CITY OF WICHITA PROJECT NO. 472-84915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303 SOUTH TOPEKA WICHITA, KS 67202
316-262-2691 www.pec1.com


| | | | |
|---|---|---|---|
| Designed by | RJS | Job No. | 10281 |
| Drawn by | JDT | Date | JAN., 2013 |

Sht. 7 of 83

Plotted By: svb Date: 2/2/2013 5:34:33 PM
FILE: i:\2010\10281\Geometry\10281-cogo207.dgn

Sta. 100+00 SWS Line No. 100=
Sta. 220+14.5, 22.00' Rt. ℄ 135th St.
Begin SWS Line at 2-10'x6' RCB
Install 30"x52.5' SWS (RCP) (S)
See Sh. No. 23

Sta. 100+52.5 SWS Line No. 100=
Sta. 5+00 SWS Line No. 105=
Sta. 219+62, 22.00' Rt. ℄ 135th St.
Construct Std. Type I Curb Inlet
L=10'-0" W=4'-0"
Install 24"x87.0' SWS (RCP) (S)
Install 18"x43.5' SWS (RCP) (W)
See Sh. No. 17, 23

Sta. 101+39.5 SWS Line No. 100=
Sta. 218+75, 22.00' Rt. ℄ 135th St.
Construct Std. Type I Curb Inlet
L=10'-0" W=4'-0"
Install 18"x175.1' SWS (RCP, ACSP, PEP, or PVCP) (S)
See Sh. No. 17, 23

Sta. 103+14.6 SWS Line No. 100=
Sta. 5+00 SWS Line No. 104=
Sta. 217+00, 29.00' Rt. ℄ 135th St.
Construct R.C. Manhole
L=4'-0" W=4'-0" H=5'-4" $H_T$=1'-4"
Install 18"x200.1' SWS (RCP, ACSP, PEP, or PVCP) (S)
Install 15"x50.5' SWS (RCP) (W)
See Sh. No. 19, 20, 21, 23

Scale: 1"=20'

Sta. 5+50.5 SWS Line No. 104=
Sta. 217+00, 21.50' Lt. ℄ 135th St.
Construct Std. Type I Curb Inlet
L=10'-0" W=3'-0"
See Sh. No. 17, 23

100 101 102 103 104 105 110 111 112 114 200 201 202

50' R/W
R/W=Exist. R/W 60' ℄
R/W=Exist. R/W 50' ℄
Drain. Esmt. 80' ℄
Temp. Esmt. 60' ℄
℄ 135th St.=Section Line
CAUTION III Gas Line
CAUTION III Gas Line
Line 100
Line 200
Line 105
Line 104
Line 201
Line 105
Line 103
2 - 10'x 6' RCB
Headwall
Sign
Brush
MB
DM
LP
Gravel
Oak
Elm
Hic
Oso
Loc
Pec
Ash
Sewer
Lateral Field
San.
2" KGS (PE)
5/8" KGS (PE)
BM#RIGA
12" x 15" CMP
21" x 15" CMP
18" Oso Hedgerow
24" Oso Hedgerow
30" Oso Hedgerow
24" Elm Hedgerow
20" Elm Hedgerow
12" Elm Hedgerow
20" Oak Hedgerow
20" Oak
30" Elm
36" Elm
24" Loc
30" Oso
24" Oso
3" Brush
Sta. 100+00
SWS Line No. 100
Prop. 2-10'x6' RCB
Sta. 100+52.5
SWS Line No. 100
Const. Std. Type I Curb Inlet
Top Elev.=1340.87
Sta. 101+39.5
SWS Line No. 100
Const. Std. Type I Curb Inlet
Top Elev.=1341.26
Sta. 103+14.6
SWS Line No. 100
Const. R.C. Manhole
Top Elev.=1344.68
+73.27 Gasline (KGS)
+09.39 Tele. (AT&T)
50.53 Gasline (KGS)
+69.74 Gasline (KGS)
+92.40 Tele. (AT&T)
Proposed Ground Line
Existing Ground Line
℄=1336.15
18" SWS (W)
℄=1340.33
15" SWS (W)
52.5 L.F. Sand Fill, Flush & Vibrate
52.5 L.F. 30" SWS @ 3.30%
87.0 L.F. Sand Fill, Flush & Vibrate
87.0 L.F. 24" SWS @ 0.70%
175.1 L.F. 18" SWS @ 2.00%
200.1 L.F. 18" SWS @ 3.10%
℄ In=1338.44
℄ Out=1335.17
℄ In=1335.40
℄ Out=1336.01
℄ In=1336.56
℄ Out=1340.06
℄ In=1340.15
1335.09
1335.73
1336.77
1337.77
1338.77
1339.77
1341.24
1342.79
1344.34
1345.89
1328 1330 1332 1334 1336 1338 1340 1342 1344 1346
9 100 1 2 3 4 105

135TH STREET
STORM SEWER PLAN
LINE NO. 100
C.O.W. PROJ. NO. 472-84915

PROFESSIONAL ENGINEERING CONSULTANTS, P.A.
303 SOUTH TOPEKA WICHITA, KS 67202
316-262-2691 www.pec1.com

Job No. 10281
Date Jan., 2013
Designed by RJS
Drawn by JDT
Sheet 8 of 83

Plotted By: svb Date: 2/25/2013 11:23:45 AM
FILE: I:\2010\1028\SWS Profile\10281-swspp-100.dgn

Sta. 105+14.7 SWS Line No. 100=
Sta. 5+00 SWS Line No. 103=
Sta. 215+00, 21.50' Rt. ℄ 135th St.
Construct Std. Type I Curb Inlet
L=10'-0" W=3'-0"
Install 15"x200.1' SWS (RCP, ACSP, PEP, or PVCP) (S)
Install 15"x43' SWS (RCP) (W)
See Sh. No. 17, 23

(104)

Sta. 107+14.9 SWS Line No. 100=
Sta. 5+00 SWS Line No. 102
Sta. 213+00, 29.00' Rt. ℄ 135th St.
Construct R.C. Manhole
L=4'-0" W=4'-0" H=5'-4" H=1'-4"
Install 15"x200.1' SWS (RCP, ACSP, PEP, or PVCP) (S)
Install 15"x50.5' SWS (RCP) (W)
See Sh. No. 19, 20, 21, 23

(105)

Sta. 109+15.0 SWS Line No. 100=
Sta. 5+00 SWS Line No. 101=
Sta. 211+00, 21.50' Rt. ℄ 135th St.
Construct Std. Type I Curb Inlet
L=10'-0" W=3'-0"
Install 15"x43' SWS (RCP) (W)
See Sh. No. 17, 23

(106)

CAUTION !!!
Gas Line

CAUTION !!!
Gas Line

CAUTION !!!
Gas Line

R/W=Exist. R/W 60' ℄

R/W=Exist. R/W 50' ℄

Scale: 1"=20'

Line 100

Line 101

Line 101

Line 102

Line 103

℄ 135th St.= Section Line

Sta. 5+43 SWS Line No. 103=
Sta. 215+00, 21.50' Lt. ℄ 135th St.
Construct Std. Type I Curb Inlet
L=10'-0" W=3'-0"
See Sh. No. 17, 23

(110)

Temp. Esmt. 60' ℄

R/W=Exist. R/W 50' ℄

Sta. 5+50.5 SWS Line No. 102=
Sta. 213+00, 21.50' Lt. ℄ 135th St.
Construct Std. Type I Curb Inlet
L=10'-0" W=3'-0"
See Sh. No. 17, 23

(109)

R/W=Exist. R/W 60' ℄

(107)

(108)

R/W=Exist. R/W 65' ℄

Masonry Fence

Masonry Fence

Wrought Iron

Wrought Iron

Gravel

Gravel

Concrete

Concrete

Asphalt

Fence

12" - 8" Cap

15" CMP

Sta. 105+14.7
SWS Line No. 100
Const. Std. Type I Curb Inlet
Top Elev.=1350.66

Sta. 107+14.9
SWS Line No. 100
Const. R.C. Manhole
Top Elev.=1357.23

Sta. 109+15.0
SWS Line No. 100
Const. Std. Type I Curb Inlet
Top Elev.=1360.46

+66.11 Gasline (KGS)

+86.66 Tele. (AT&T)

+55.33 Gasline (KGS)

+53.17 Tele. (AT&T)

+62.46 Gasline (KGS)

Proposed Ground Line

Existing Ground Line

E=1346.59
15" SWS (W)

E=1352.67
15" SWS (W)

E=1356.72
15" SWS (W)

200.1 L.F. 15" SWS @ 3.00%

200.1 L.F. 15" SWS @ 2.00%

E Out=1346.35
E In=1346.59

E Out=1352.59
E In=1352.65

E Out=1356.65

1345.89 1347.64 1349.14 1350.64 1352.14 1353.35 1354.35 1355.35 1356.35

1360 1358 1356 1354 1352 1350 1348 1346 1344 1342

105 6 7 8 9

135TH STREET
STORM SEWER PLAN
LINE NO. 100
C.O.M. PROJ. NO. 472-84915

PROFESSIONAL ENGINEERING CONSULTANTS P.A.
303 SOUTH TOPEKA WICHITA, KS 67202
316-262-2691 www.pec1.com

Job No. 102811
Date Jan., 2013
Designed by RJS
Drawn by CP

Sheet 9 of 83

Plotted By: svb Date: 2/25/2013 11:26:36 AM
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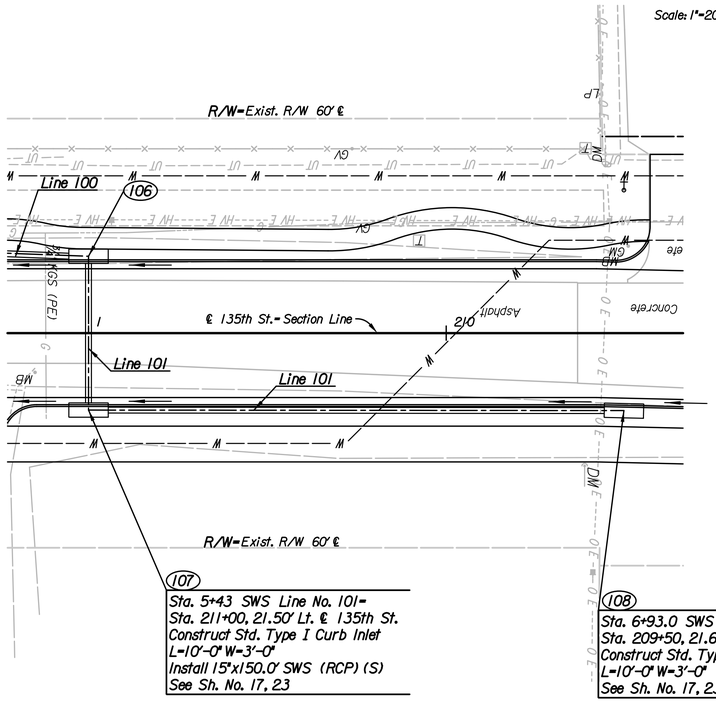


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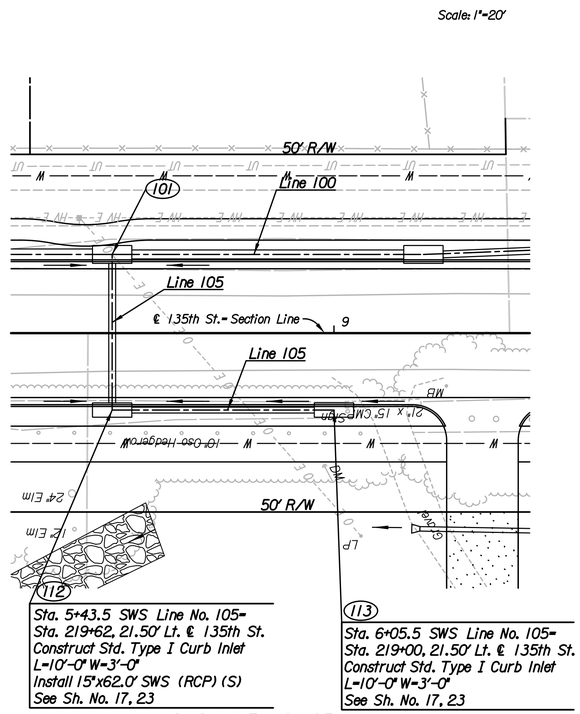


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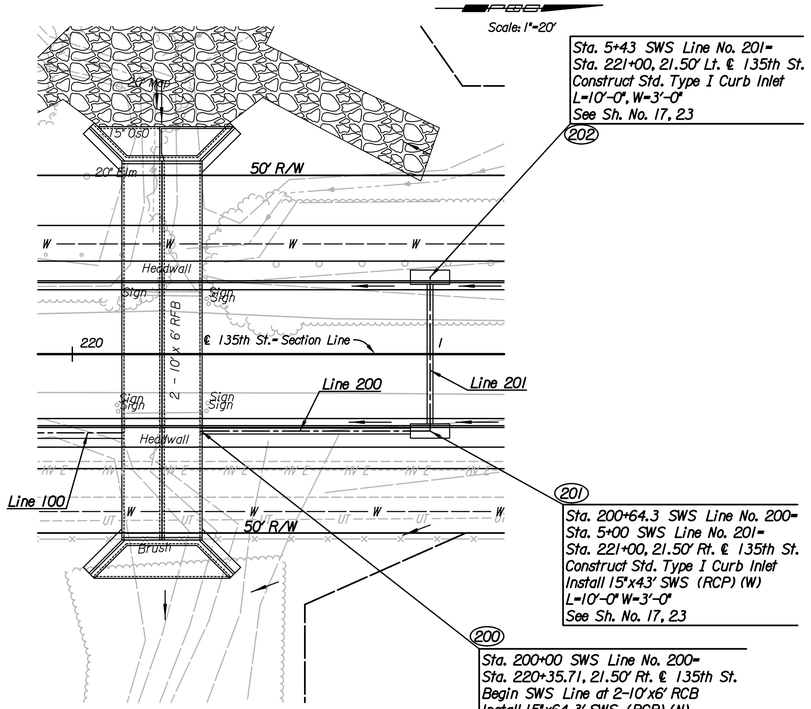


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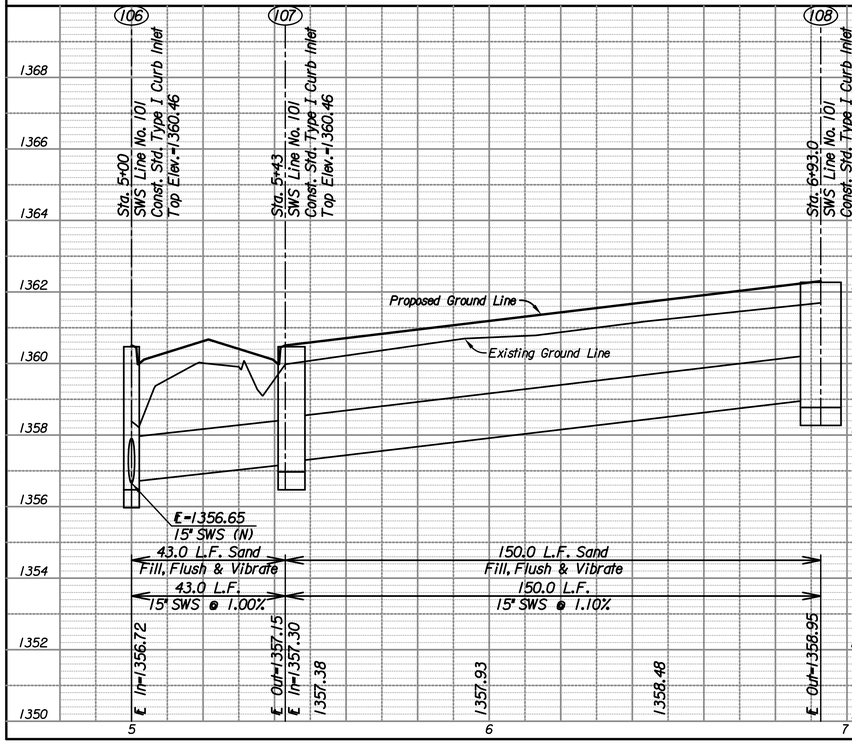


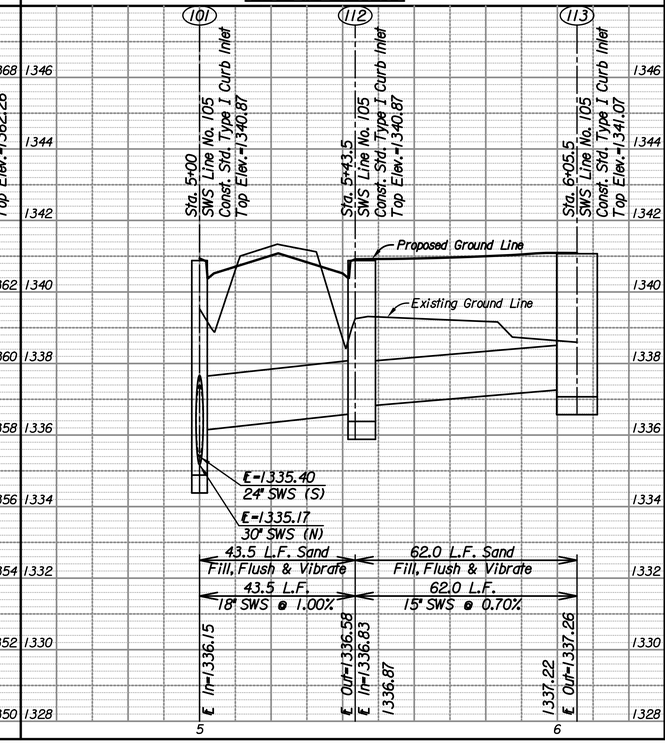


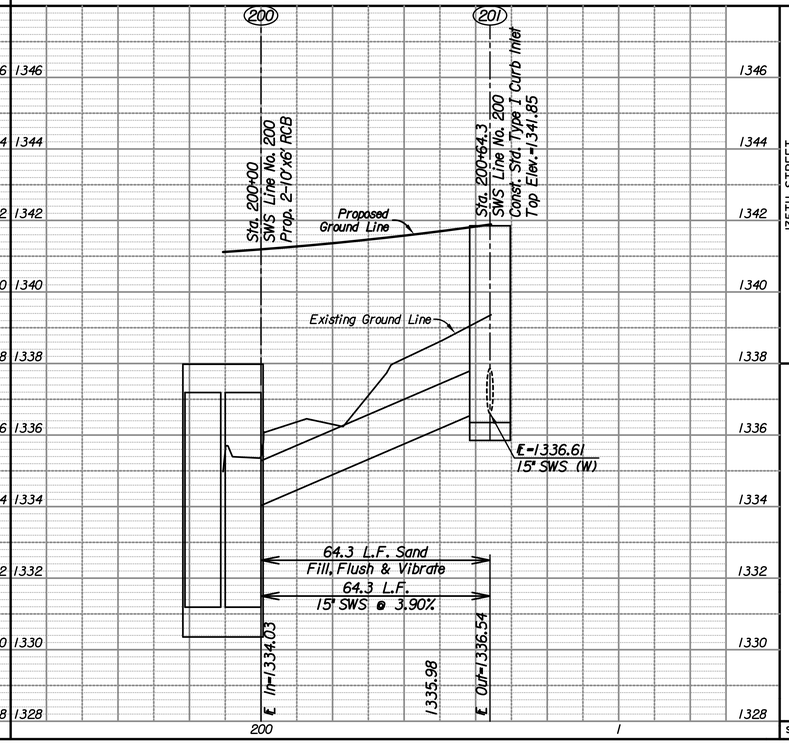


135TH STREET

# STORM SEWER PLAN

LINE NO. 101, 105, & 200

C.O.M. PROJ. NO. 472-84915

PROFESSIONAL ENGINEERING CONSULTANTS P.A.
303 SOUTH TOPEKA WICHITA, KS 67202
316-262-2691 www.pec1.com

| | |
|---|---|
| Job No. 10281 | |
| Date Jan., 2013 | |
| Designed by | RJS |
| Drawn by | JDT |



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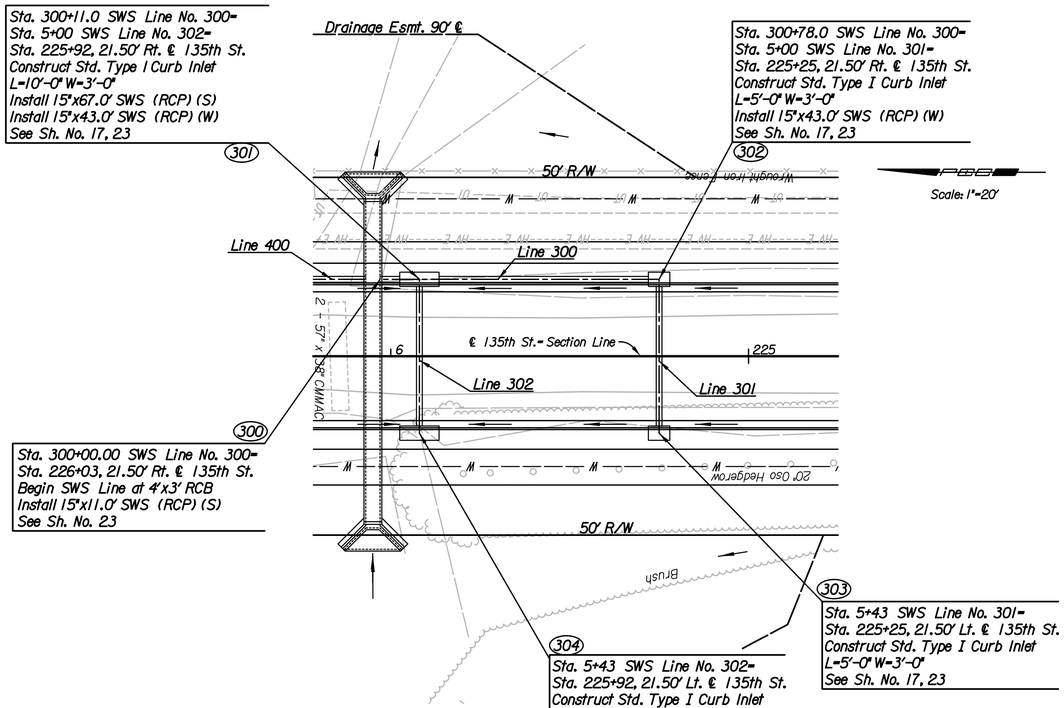
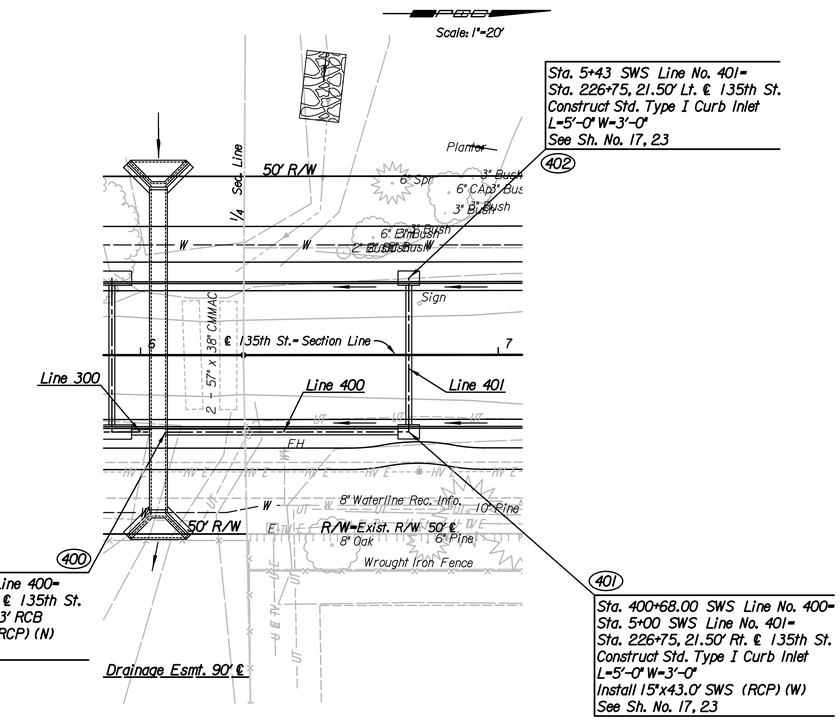
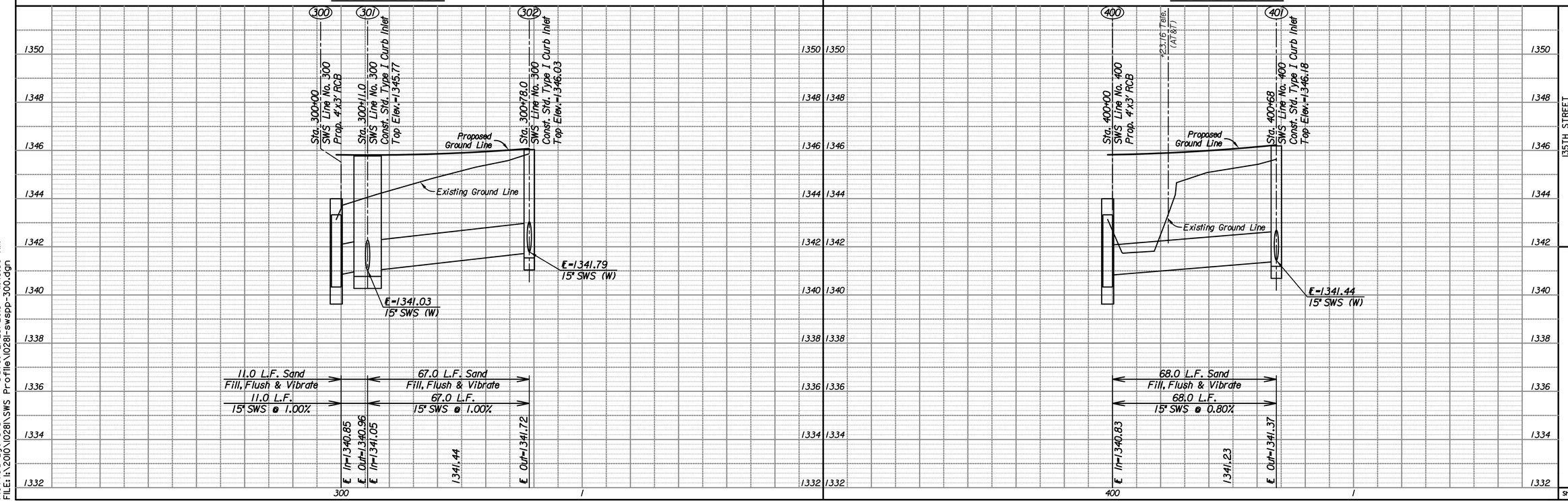



SWS LINE NO. 300




SWS LINE NO. 400




135TH STREET

# STORM SEWER PLAN

LINE NO. 300, & 400

C.O.M. PROJ. NO. 472-84915

PROFESSIONAL ENGINEERING CONSULTANTS, P.A.
300 SOUTH TOPEKA WICHITA, KS 67202
316-262-2691 www.pec1.com

PEC

| | |
|---|---|
| Job No. 10281 | |
| Date Jan., 2013 | |
| Designed by | RJS |
| Drawn by | CP |

Sheet 11 of 83

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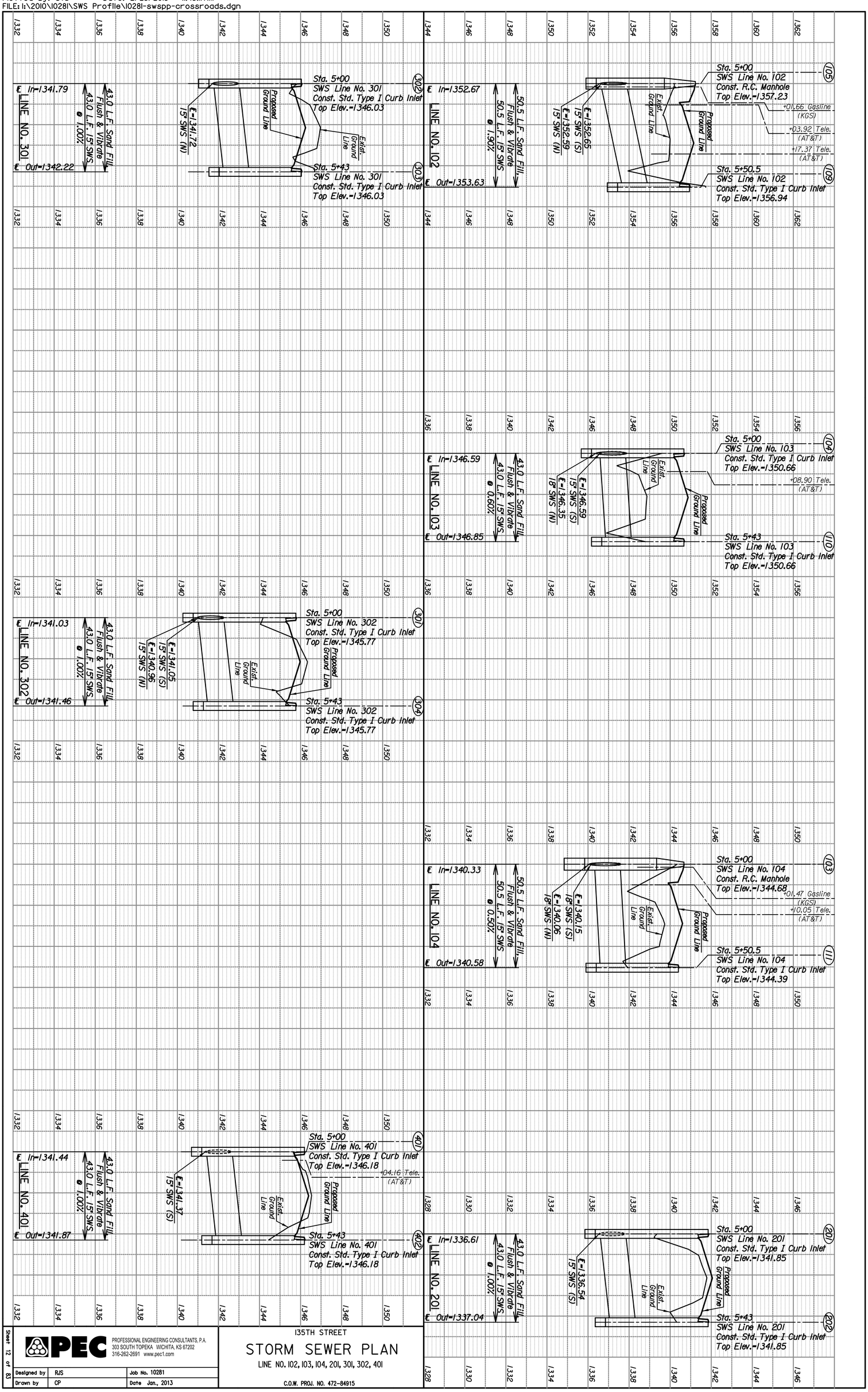



PROFESSIONAL ENGINEERING CONSULTANTS, P.A.
303 SOUTH TOPEKA WICHITA, KS 67202
316-262-2691 www.pec1.com

Designed by RJS | Job No. 10281
Drawn by CP | Date Jan., 2013

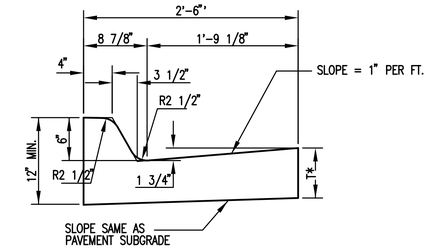
135TH STREET

# STORM SEWER PLAN

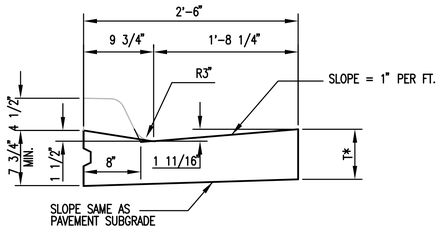
LINE NO. 102, 103, 104, 201, 301, 302, 401

C.O.W. PROJ. NO. 472-84915

## TYPE 1
(ARTERIAL CURB)

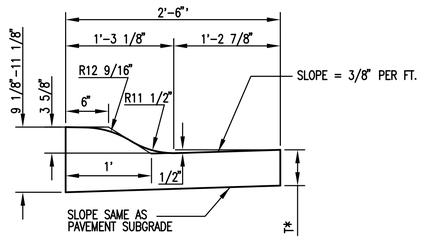



COMBINED CURB & GUTTER (6")

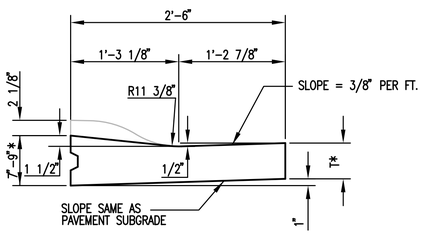



COMBINED CURB & GUTTER (1 1/2")

## TYPE 2
(ROLL CURB)

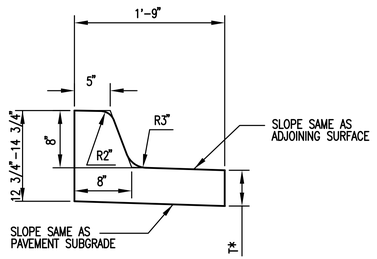



COMBINED CURB & GUTTER (3 5/8")

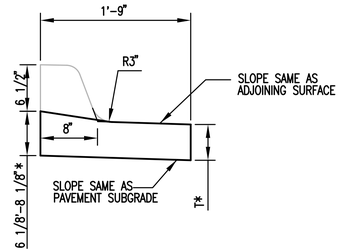



COMBINED CURB & GUTTER (1 1/2")

## TYPE 3
(MEDIAN CURB)

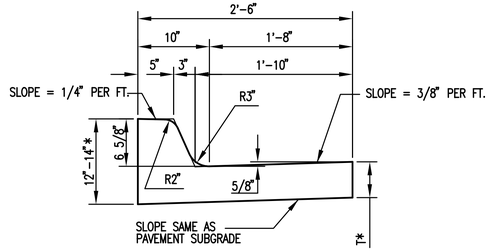



COMBINED CURB & GUTTER (8")

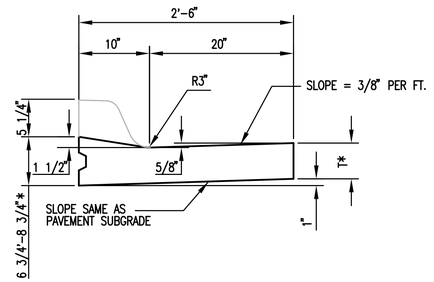



COMBINED CURB & GUTTER (1 1/2")

## TYPE 4
(RESIDENTIAL CURB)

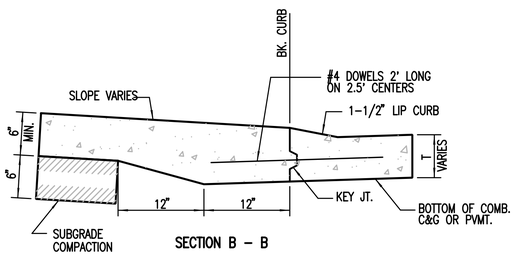



COMBINED CURB & GUTTER (6 5/8")

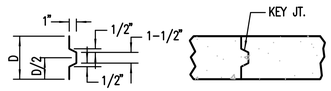



COMBINED CURB & GUTTER (1 1/2")

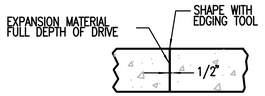
T* = THICKNESS OF CURB TO ADJUST WITH PAVEMENT THICKNESS




BACK OF CURB DETAIL




ALT. LONGITUDINAL CONSTRUCTION JOINT




EXPANSION JOINT (E.J.)

### GENERAL NOTES

1. EXPANSION (ISOLATION) JOINTS SHALL BE CONSTRUCTED A MAXIMUM OF 300' APART AND AT ALL PIS, PCS, CUL-DE-SAC QUADRANTS, AND ENDS OF RETURNS.

2. CONTRACTION JOINTS SHALL BE CONSTRUCTED A MINIMUM OF 12' APART.

3. JOINT SEALER SHALL BE REQUIRED AT ALL JOINTS ON ARTERIAL AND INDUSTRIAL STREETS AND AT INTERSECTIONS ON RESIDENTIAL STREETS.

CITY OF WICHITA
PUBLIC WORKS & UTILITIES
ENGINEERING DIVISION

CURB & GUTTER DETAILS

CITY ENGINEER
GARY JANZEN, P.E.

| PROJECT NUMBER | OCA NUMBER | DATE |
|---|---|---|
| 472-84915 | 707022 | 12/2010 |

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

DESIGN | DRAWN

SHEET
13 of 83

PV-101

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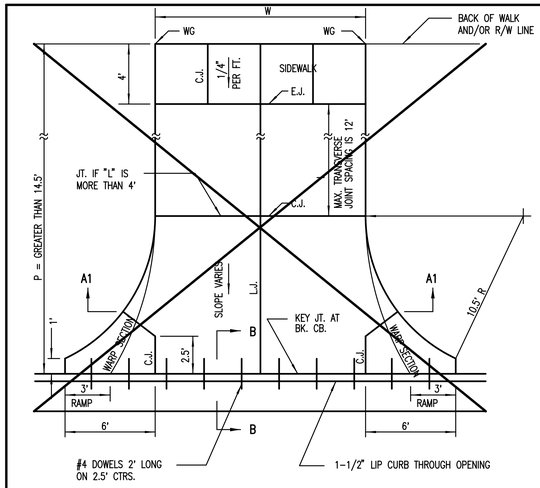
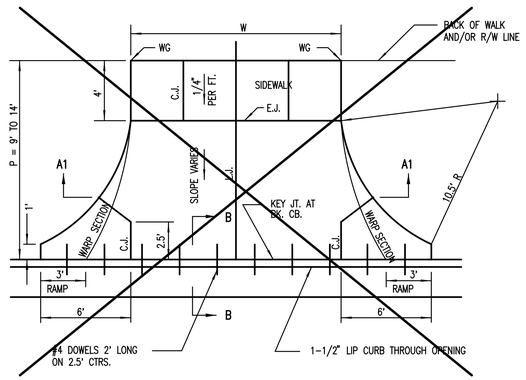
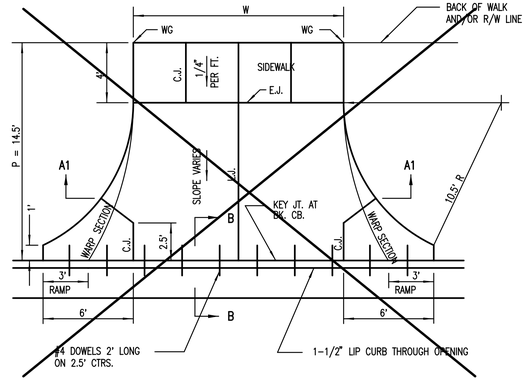
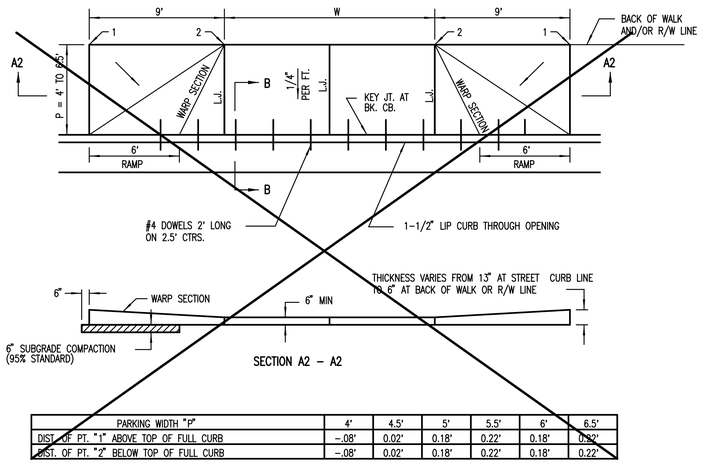
Plot Scale: 1:0 ____ by RFJ
L:\2010\10281\Standards\10281-PV-101_Curb_&_Gutter



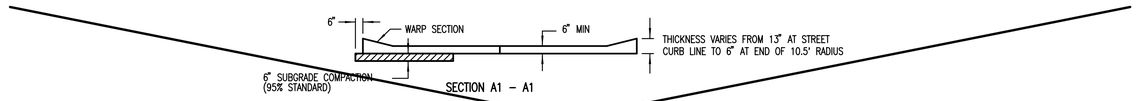



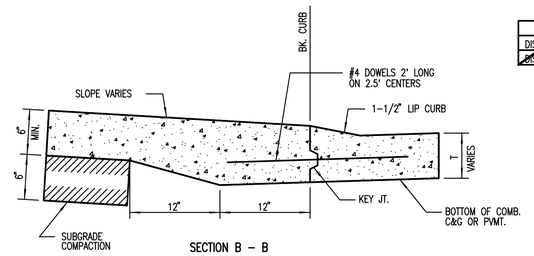

| PARKING WIDTH "P" | 4' | 4.5' | 5' | 5.5' | 6' | 6.5' |
|---|---|---|---|---|---|---|
| DIST. OF PT. "1" ABOVE TOP OF FULL CURB | –.08' | 0.02' | 0.18' | 0.22' | 0.18' | 0.22' |
| DIST. OF PT. "2" BELOW TOP OF FULL CURB | –.08' | 0.02' | 0.18' | 0.22' | 0.18' | 0.22' |

## FULL RAMP DRIVE (P = 4.0' TO 6.5')

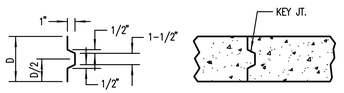



| PARKING WIDTH "P" | 9' | 10' | 11' | 12' | 13' | 14.5' | 20' | 25' | 30' | 35' | 40' | 45' | 50' |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ABSOLUTE MAX. DIST. OF PT. "WG" ABOVE OR BELOW TOP OF FULL CURB | 0.27' | 0.27' | 0.32' | 0.37' | 0.52' | 0.80' | 1.35' | 1.85' | 2.35' | 2.85' | 3.35' | 3.85' | 4.35' |
| OPTIMUM MAX. DIST. OF PT. "WG" ABOVE OR BELOW TOP OF FULL CURB | 0.27' | 0.27' | 0.32' | 0.37' | 0.52' | 0.62' | 0.96' | 1.22' | 1.48' | 1.74' | 2.00' | 2.26' | 2.52' |
| OPTIMUM MIN. DIST. OF PT. "WG" ABOVE OR BELOW TOP OF FULL CURB | 0.19' | 0.21' | 0.23' | 0.25' | 0.30' | 0.30' | 0.42' | 0.52' | 0.62' | 0.72' | 0.82' | 0.92' | 1.02' |
| ABSOLUTE MIN. DIST. OF PT. "WG" ABOVE OR BELOW TOP OF FULL CURB | –.19' | –.16' | –.13' | –.10' | –.06' | 0.00' | 0.00' | 0.15' | 0.25' | 0.35' | 0.45' | 0.55' | 0.65' |

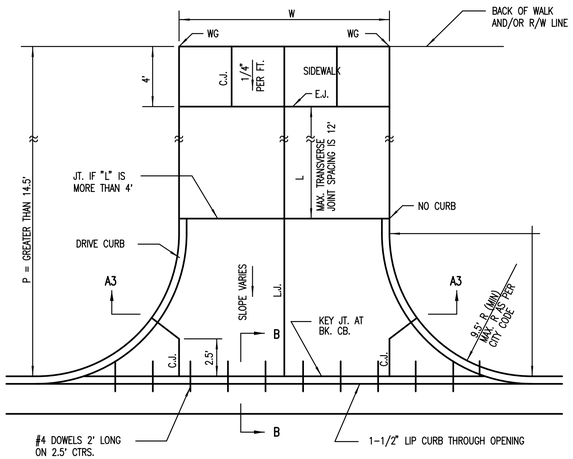
## RADIUS RAMP DRIVES (P = 9.0' & GREATER)

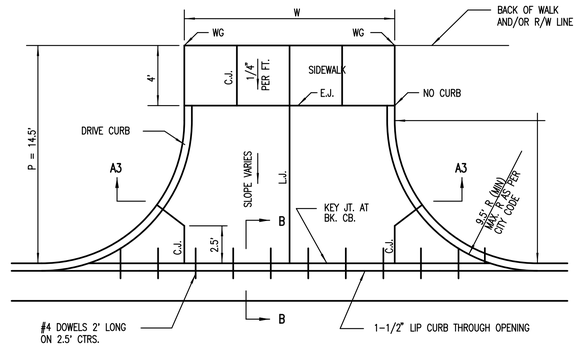


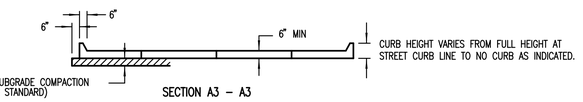

## BACK OF CURB DETAIL




ALT. LONGITUDINAL CONSTRUCTION JOINT

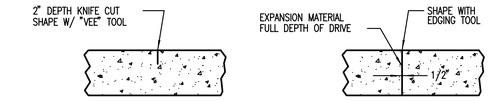


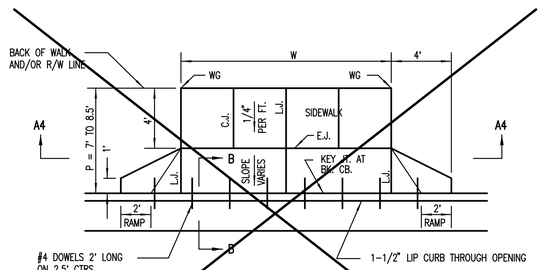




| PARKING WIDTH "P" | 14.5' | 20' | 25' | 30' | 35' | 40' | 45' | 50' |
|---|---|---|---|---|---|---|---|---|
| ABSOLUTE MAX. DIST. OF PT. "WG" ABOVE OR BELOW TOP OF FULL CURB | 0.72' | 1.27' | 1.77' | 2.27' | 2.77' | 3.27' | 3.77' | 4.27' |
| OPTIMUM MAX. DIST. OF PT. "WG" ABOVE OR BELOW TOP OF FULL CURB | 0.70' | 1.04' | 1.30' | 1.56' | 1.82' | 2.08' | 2.34' | 2.60' |
| OPTIMUM MIN. DIST. OF PT. "WG" ABOVE OR BELOW TOP OF FULL CURB | 0.30' | 0.42' | 0.52' | 0.62' | 0.72' | 0.82' | 0.92' | 1.02' |
| ABSOLUTE MIN. DIST. OF PT. "WG" ABOVE OR BELOW TOP OF FULL CURB | 0.00' | 0.00' | 0.15' | 0.25' | 0.35' | 0.45' | 0.55' | 0.65' |

## FULL RADIUS DRIVES (P = 14.5' & GREATER)




| PARKING WIDTH "P" | 7' | 7.5' | 8' | 8.5' |
|---|---|---|---|---|
| ABSOLUTE MAX. DIST. OF PT. "WG" ABOVE OR BELOW TOP OF FULL CURB | –.08' | 0.02' | 0.18' | 0.22' |
| OPTIMUM MAX. DIST. OF PT. "WG" ABOVE OR BELOW TOP OF FULL CURB | –.08' | 0.02' | 0.18' | 0.22' |
| OPTIMUM MIN. DIST. OF PT. "WG" ABOVE OR BELOW TOP OF FULL CURB | –.15' | –.16' | –.17' | –.17' |
| ABSOLUTE MIN. DIST. OF PT. "WG" ABOVE OR BELOW TOP OF FULL CURB | –.25' | –.20' | –.20' | –.20' |

## FULL RAMP DRIVE (P = 7.0' TO 8.5')

1. DRIVEWAY CONSTRUCTION DETAILED ON THIS SHEET IS FOR USE WITH FULL HEIGHT STREET CURBS AND IN AREAS WITHOUT FULL WALK CONSTRUCTION IN THE PARKING. SEE OTHER DETAIL SHEETS FOR DRIVEWAY CONSTRUCTION WITH FULL WALK.
2. ONE LONGITUDINAL JOINT SHALL BE CONSTRUCTED ALONG THE CENTERLINE OF DRIVES HAVING A "W" DIMENSION OF 24' OR LESS. TWO LONGITUDINAL JOINTS SHALL BE CONSTRUCTED WITH EQUAL SPACINGS NOT TO EXCEED 10' FOR DRIVES WITH A "W" DIMENSION GREATER THAN 24'.
3. DRIVEWAY WIDTH DENOTED AS "W" ON THE DETAIL DRAWINGS SHALL BE A MINIMUM OF 10' AND A MAXIMUM OF 30'. THE MAXIMUM OPENING FOR RADIUS TYPE DRIVES WITH CURBS THROUGH THE RADIUS SHALL NOT EXCEED 52' AT THE STREET CURB LINE.
4. CONTRACTION JOINT SPACING IN THE DRIVEWAY WALK SECTION SHALL BE A MINIMUM OF 3' AND A MAXIMUM OF 6' AND ARE TO BE EQUALLY SPACED WITHIN THIS RANGE. WALK SECTION SHALL BE CONSTRUCTED TO THE SAME THICKNESS AS THE DRIVEWAY.
5. DOWEL BARS SHALL BE OMITTED FROM THE KEYED CONSTRUCTION JOINT ALONG THE BACK OF THE STREET CURB LINE WHEN DRIVEWAYS ARE CONSTRUCTED IN CONJUNCTION WITH NEW CONCRETE PAVEMENT CONSTRUCTION.
6. ADDITIONAL THICKNESS OF DRIVE AS INDICATED IN THE DRAWINGS WILL NOT BE PAID FOR DIRECTLY AND THIS COST SHALL BE INCLUDED IN THE UNIT PRICE BID FOR THE DRIVEWAY CONSTRUCTION.
7. ONE HALF INCH EXPANSION JOINTS SHALL BE INSTALLED WHEREVER DRIVE CONSTRUCTION ABUTS SIDEWALK. ONE HALF INCH EXPANSION JOINTS SHALL ALSO BE INSTALLED ALONG THE PROPERTY LINE AND/OR BACK OF WALK LINE WHEN DRIVE CONSTRUCTION ALONG THIS LINE ABUTS CONCRETE PARKING LOTS OR CONCRETE DRIVE EXTENSION.
8. ALL DRIVEWAYS SHALL BE A MINIMUM OF 6" IN THICKNESS AND SHALL BE WITHOUT REINFORCEMENT. DRIVEWAYS MAY BE CONSTRUCTED THICKER THAN 6" AND THEY MAY BE REINFORCED WITH 6"X12" W4–W4 WELDED WIRE FABRIC WHEN PROPERLY AUTHORIZED BY THE PROPERTY OWNER WITH THE ENGINEER'S CONCURRENCE.
9. OPTIMUM DRIVEWAY ELEVATIONS SHOWN IN THE TABLES ARE TO BE USED WHEREVER POSSIBLE. ABSOLUTE MAXIMUM AND MINIMUM ELEVATIONS ARE TO BE USED ONLY WHEN THESE VALUES WILL PERMIT NEW CONSTRUCTION TO MATCH EXISTING DRIVES OR PARKING LOTS. VALUES SHOWN IN THE TABLES ARE BASED ON A FULL CURB HEIGHT ELEVATION OF 0.55' ABOVE THE GUTTER FLOW LINE AND MUST BE ADJUSTED ACCORDINGLY FOR OTHER CURB HEIGHTS. VALUES SHOWN IN THE TABLES WITH MINUS SIGNS INDICATE ELEVATIONS BELOW TOP OF FULL HEIGHT CURB.

THE CITY OF WICHITA
CITY ENGINEER'S OFFICE
CITY HALL – SEVENTH FLOOR
455 NORTH MAIN STREET
WICHITA, KANSAS 67202
(316) 268-4501
(316) 268-4184 FAX

# STANDARD DRIVE ENTRANCES FULL HEIGHT CURB

GARY JANZEN, P.E.

| PROJECT NUMBER | INDEX CODE |
|---|---|
| 472-84915 | 707022 |

| DATE | SHEET |
|---|---|
| MAR 96 | 14 OF 83 |

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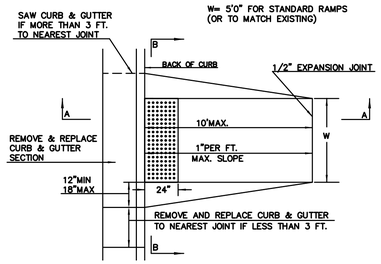
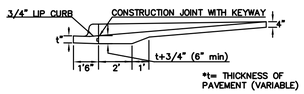
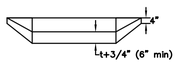
## STANDARD WHEELCHAIR RAMP CONSTRUCTION DETAIL FOR STREETS WITH COMBINED CURB & GUTTER (CLASS A)



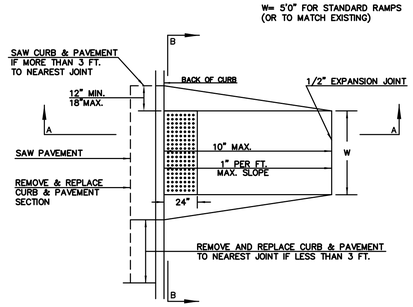



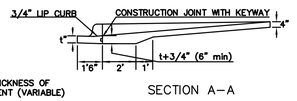

SECTION A–A



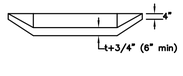

SECTION B–B

## STANDARD WHEELCHAIR RAMP CONSTRUCTION DETAIL FOR CONCRETE STREETS WITH MONOLITHIC CURB (CLASS A)



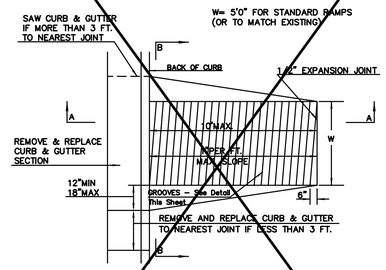



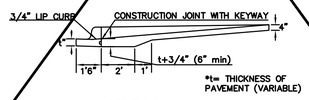

SECTION A–A



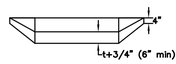

SECTION B–B

## STANDARD WHEELCHAIR RAMP CONSTRUCTION DETAIL FOR ENTRANCES WITH COMBINED CURB & GUTTER (CLASS B)



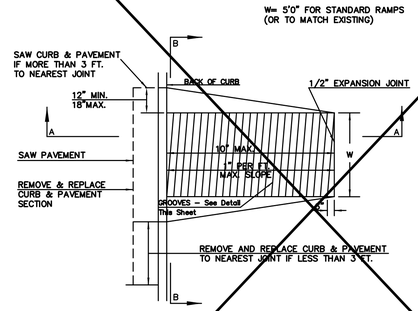



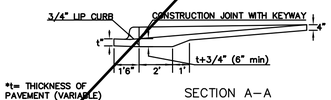

SECTION A–A



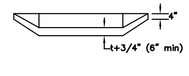

SECTION B–B

## STANDARD WHEELCHAIR RAMP CONSTRUCTION DETAIL FOR ENTRANCES WITH MONOLITHIC CURB (CLASS B)

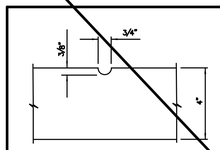



SECTION A–A

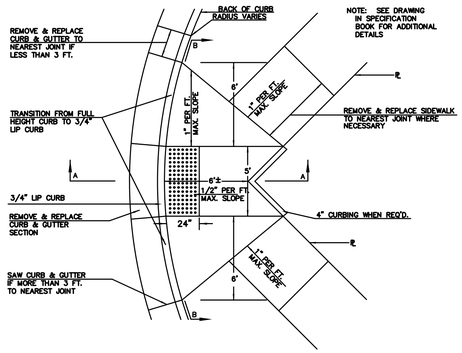


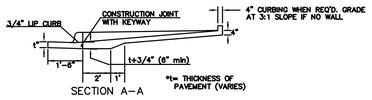

SECTION B–B



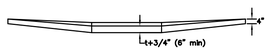

GROOVE DETAIL

## STANDARD WHEELCHAIR RAMP CONSTRUCTION DETAIL FOR STREET WITH COMBINED CURB AND GUTTER ON RADIUS WITH 6'± FROM BACK OF CURB TO PROPERTY CORNER (CLASS C)



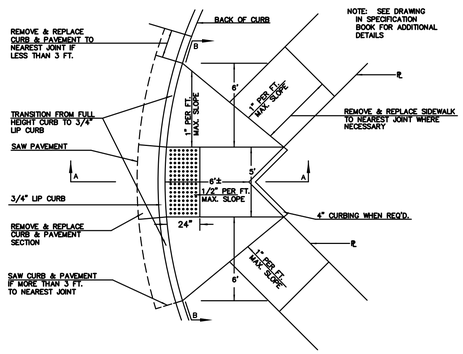



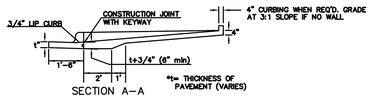

SECTION A–A



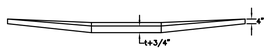

SECTION B–B

## STANDARD WHEELCHAIR RAMP CONSTRUCTION DETAIL FOR STREET WITH MONOLITHIC CURB ON RADIUS WITH 6'± FROM BACK OF CURB TO PROPERTY CORNER (CLASS C)



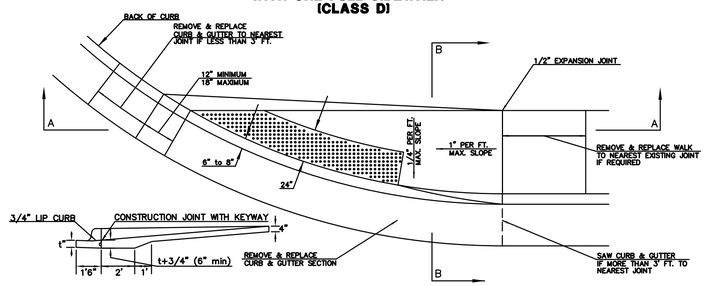




SECTION A–A

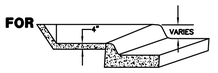



SECTION B–B

## STANDARD WHEELCHAIR RAMP CONSTRUCTION DETAIL FOR STREETS WITH COMBINED CURB & GUTTER WITH ONE FULL SIDEWALK (CLASS D)

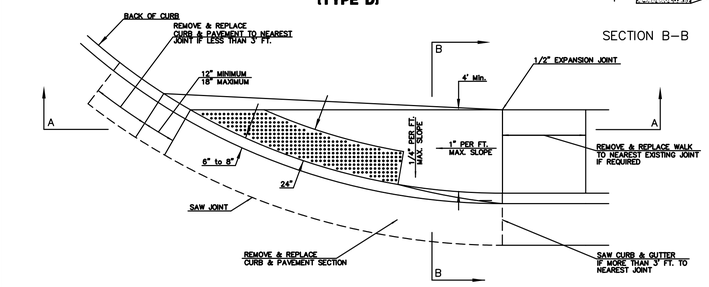


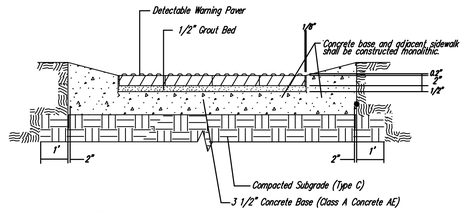

SECTION A–A




SECTION B–B

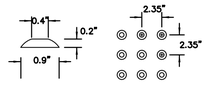
## STANDARD WHEELCHAIR RAMP CONSTRUCTION DETAIL FOR STREETS WITH MONOLITHIC CURB WITH ONE FULL SIDEWALK (TYPE D)




TYPICAL SECTION DETECTABLE WARNING PAVER
SECTION A–A

NOTE: HANOVER DETECTABLE WARNING PAVERS (OR AN APPROVED ALTERNATE) SHALL BE USED IN ALL WHEELCHAIR RAMPS. THE 11 3/4" "RED 15" PAVER SHALL BE USED IN ALL APPLICATIONS.
HANOVER ARCHITECTURAL PRODUCTS
240 BENDER ROAD
HANOVER, PA 17331
1-717-637-0500
www.hanoverpavers.com




DOME DETAIL

REV. 7-21-03

CITY OF WICHITA PUBLIC WORKS ENGINEERING

# WHEELCHAIR RAMP DETAILS

CITY ENGINEER
JAMES L. ARMOUR, P.E., L.S.

| PROJECT NUMBER | OCA NUMBER | DATE |
|---|---|---|
| 472-84915 | 707022 | 07/03 |

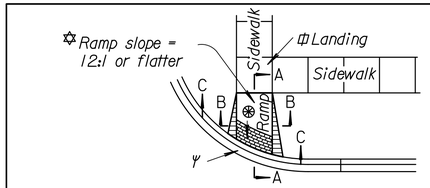
| DESIGN | DRAWN |
|---|---|
| City | City |

SHEET 15 OF 83

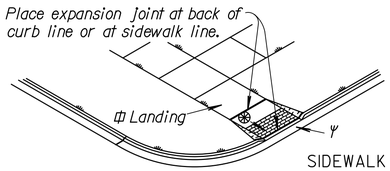
CITY ENGINEER'S OFFICE
CITY HALL – SEVENTH FLOOR
455 NORTH MAIN STREET
WICHITA, KANSAS 67202-1620
(316) 268-4501
(316) 268-4114 FAX

Plotted By: svb Date: 2/25/2013 11:48:56 AM
FILE: I:\2010\1028\Standards\1028I-WCR-with Detectable Warning.dgn

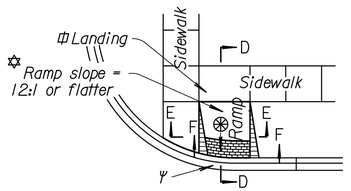
| STATE | PROJECT NO. | YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| KANSAS | 472-84915 | 2013 | 16 | 83 |



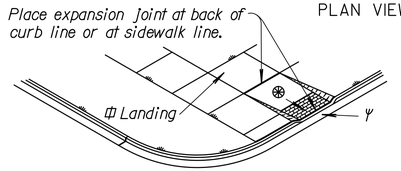

PLAN VIEW



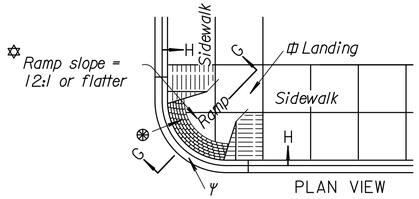

SIDEWALK RAMP TYPE 1



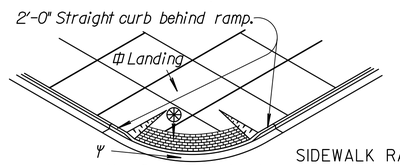

PLAN VIEW




SIDEWALK RAMP TYPE 2

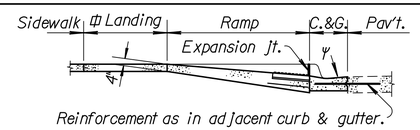



PLAN VIEW



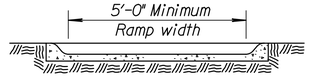

SIDEWALK RAMP TYPE 3

Use Ramp Type 3 where sidewalk occupies entire area between curb and property line.

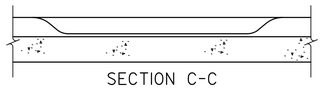



Reinforcement as in adjacent curb & gutter.

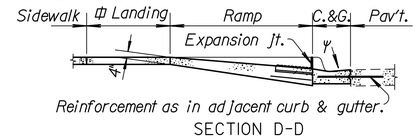
SECTION A-A




SECTION B-B

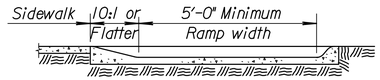


SECTION C-C

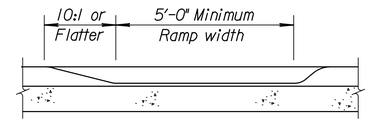



Reinforcement as in adjacent curb & gutter.

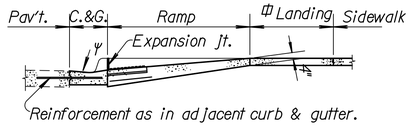
SECTION D-D




SECTION E-E

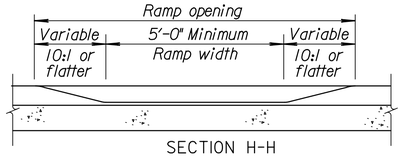



SECTION F-F



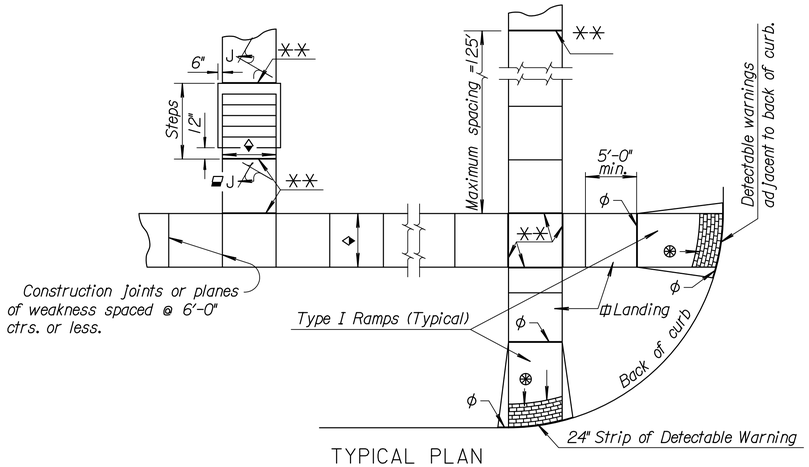

Reinforcement as in adjacent curb & gutter.

SECTION G-G

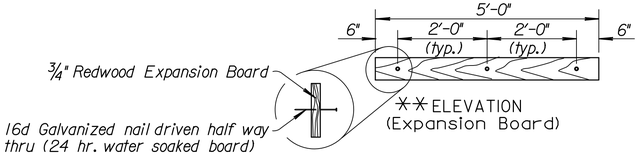



SECTION H-H

SECTION J-J ~~see standard drawing RD725B for details of Steps and Handrail.~~




TYPICAL PLAN




For other than 5'-0" (width) use 6" from the end and balanced (3'-0" max.) nail spacing.

ϕ Expansion Joint (3/4" Redwood board) placed at either back of curb line or at sidewalk back of curb line or at sidewalk line.

✳✳ Expansion Joint (3/4" redwood board) located as shown.

♦ Variable width (5'-0" min.). Entrance walk to be same width as approach walk. Use sidewalk width of 4'-0" where existing conditions prohibit use of 5'-0".

✡ New construction ramp slopes are 12:1 or flatter. Desirable ramp slopes for existing sites are 12:1 or flatter. Where space limitations prohibit construction of a 12:1 slope on existing sites, use the following slopes:
8:1 or flatter for a maximum rise of 3 inches
10:1 or flatter for a maximum rise of 6 inches

Landing Use a landing slope of 50:1 or flatter. Landings are the same width as ramp and a minimum 5'-0" in length.

ψ Use a counter slope of 20:1 or flatter at the base of sidewalk ramps. ~~Refer to standard drawing RD725A for additional curb and gutter details.~~

⊛ Detectable warning installation is typical and required on Sidewalk Ramps Type 1, Type 2, Type 3, median ramp crossings and other locations as shown in the plans. ~~See standard drawing RD725A for additional details.~~

## GENERAL NOTES

The details depicted here may not be appropriate for all locations. Designs shall meet this criteria on all new construction projects unless impracticable by site restrictions. For an existing sidewalk facility where the sidewalk will be replaced, sidewalk will be replaced according to this drawing to the maximum extent feasible.

Provide ramps at all corners street intersections where there is an existing or proposed sidewalk and curb. Provide ramps at mid-block walk locations for hospitals, medical centers and athletic stadiums.

Details shown on this sheet apply to all constrcution or reconstruction of streets, curbs or sidewalks. See standard specifications for additional information.

Restrict use of sidewalk ramp Type 2 to locations where it is not feasible to use Types 1 or 3.

Curb cut ramps are to be located as shown on the plans or as directed by the Engineer.

Do not place drainage structures in line with ramps except where existing drainage structures are being utilized in the new construction. Ramp locations should take precedence over the location of drainage structures.

Ramp sidewalks where the driveway curb is extended across the walk.

Construct ramp with uniform grade free of sags and short grade changes.

Place 3/4" redwood expansion joints flush with the surface at a maximum spacing of 125'. Place 3/4" redwood expansion joints at sidewalk junctions, see plan details. Where sidewalk abuts a curb place 3/4" redwood board expansion joint flush with the surface.

Place 1/2" premolded (Non-extruding, Type B) joint filler where sidewalk is parallel and adjacent to a rigid surface.

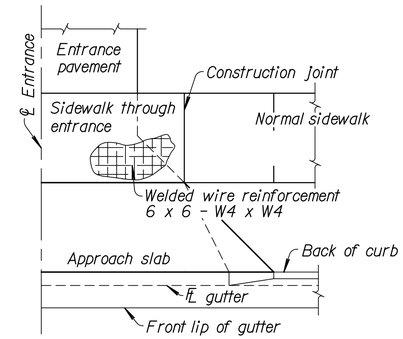
Slope sidewalk toward the street at a 50:1 or flatter. Slope or depress sidewalk where necessary to fit alleys and entrances see plans or at Engineer's direction.

Where clear width of sidewalk between top of ramp and building or other obstruction is less than 48 inches, slope the flared sides 12:1 or flatter.

Sidewalk shown to be constructed in back of an entrance shall be placed 6" thick with welded wire mesh reinforcement. Gauge and spacing of wires are the same as entrance pavement (See Reinforcement Diagram). Bid item will be "Sidewalk Construction (6") either with or without air entrainment.

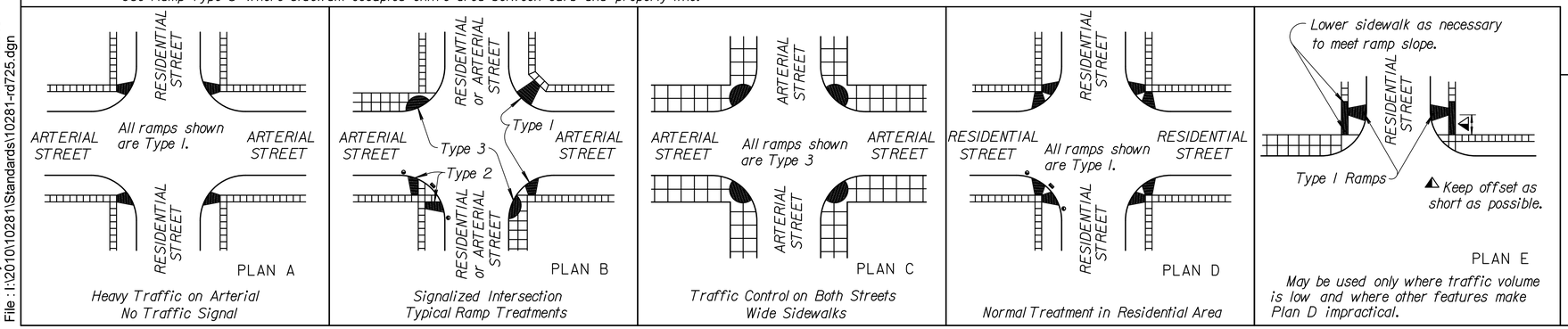
Contractor may opt to use Concrete Grade 3.0 (AE) throughout for construction of steps, but all work and materials are paid for under the bid item "Grade 3.0 Conc. (Misc.)".

Surface texture ramp slope with a wooden float or brushed finish.




REINFORCEMENT DIAGRAM
SIDEWALK THROUGH ENTRANCE

~~See standard drawing RD726 for details of Alley and Entrance Pavement.~~




LEGEND

- Sidewalk Ramp Type 1
- Sidewalk Ramp Type 2
- Sidewalk Ramp Type 3
- Preferred location of drainage inlet (Typical)
- Alternate location of drainage inlet (Typical)
- Sidewalk

| NO. | DATE | REVISIONS | BY | APP'D |
|---|---|---|---|---|
| 11 | 10-17-11 | Revised General Note | S.W.K. | J.O.B. |
| 10 | 5-23-11 | Revised notes | S.W.K. | J.O.B. |
| 9 | 2-10-10 | Revised notes & General Note | S.W.K. | J.O.B. |
| 8 | 7-30-08 | Reorg. layout, added steps sheet | S.W.K. | J.O.B. |

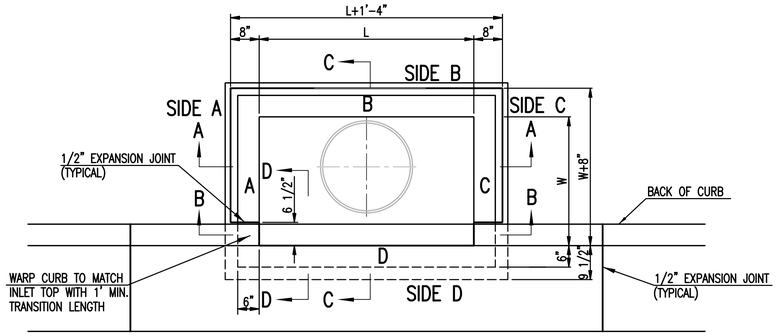
KANSAS DEPARTMENT OF TRANSPORTATION

# SIDEWALK & STEPS

~~RD725~~

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

Plotted : 5/16/2013
Drawn By : svb
File : I:\2010\10281\Standards\10281-rd725.dgn




TOP VIEW

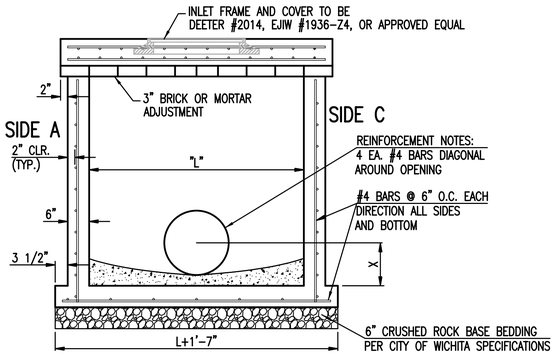
| BAR SCHEDULE | | |
|---|---|---|
| INLET OPENING | B1 BARS | SPACING |
| 5'-0" | #4 | 4" |
| 10'-0" | #6 | 3.5" |

| PRECAST CURB INLET WIDTHS | | | | |
|---|---|---|---|---|
| W | PRE-CAST TOP SIZE | | | PIPE DIA.** |
| | WIDTH | LENGTH | TOP | |
| 3'-0" | W+8" | L+1'-4" | 7 1/2" | 21" & SMALLER |
| 4'-0" | W+8" | L+1'-4" | 7 1/2" | 24" & 30" |
| 5'-0" | W+8" | L+1'-4" | 7 1/2" | 36" & 42" |
| 6'-0" | W+8" | L+1'-4" | 7 1/2" | 48" & 54" |
| 7'-0" | W+8" | L+1'-4" | 7 1/2" | 60" & 66" |

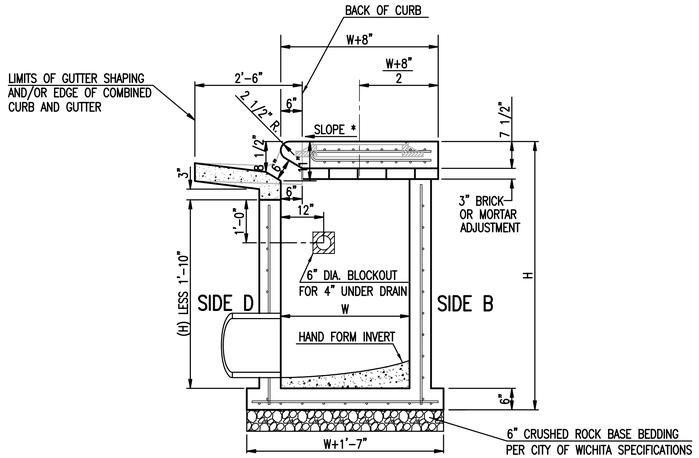
** FOR PIPES PERPENDICULAR TO INLET WALL

## GENERAL NOTES

1. CONCRETE TOPS TO BE INSTALLED ON THIN MORTAR CUSHION TO INSURE FULL SUPPORT ALONG BRICK. CONCRETE TOPS MAY BE CAST IN PLACE OR PRECAST. CONCRETE USED FOR INLET CONSTRUCTION SHALL CONFORM TO CITY OF WICHITA SPECIFICATIONS FOR CONCRETE PAVEMENT MIX.
2. CONTRACTOR SHALL HAVE THE OPTION OF CONSTRUCTING 8" BRICK MASONRY WALLS BETWEEN THE CONCRETE INLET BASE AND TOP OF THIS INLET WHEN W=5'-0" AND H=7'-0" OR LESS.
3. INLET INVERT SHALL BE SHAPED WITH 8 SACK SAND MIX CONCRETE TO CREATE FLOW CHANNELS AND TO INCREASE HYDRAULIC EFFICIENCY SUCH THAT THE INLET WILL BE SELF CLEANING BETWEEN ALL INLET AND/OR OUTLET PIPES.
4. THE ENDS OF ALL PIPES INSTALLED IN INLETS SHALL BE CUT OFF FLUSH WITH THE INSIDE FACE OF THE INLET WALL.
5. INLET FRAME AND COVER TO BE DEETER #2014, EJIW #1936 Z4, OR APPROVED EQUAL, SEE SW-303.
6. CONTRACTOR SHALL REMOVE LIFTING HOOKS AFTER INSTALLATION. RECESSES IN INLET WALL SHALL BE GROUTED FLUSH TO THE INLET WALL WITH HYDRAULIC CEMENT AFTER THE INLET IS IN PLACE. LIFTING HOLES THRU THE INLET WALL WILL NOT BE ACCEPTED.

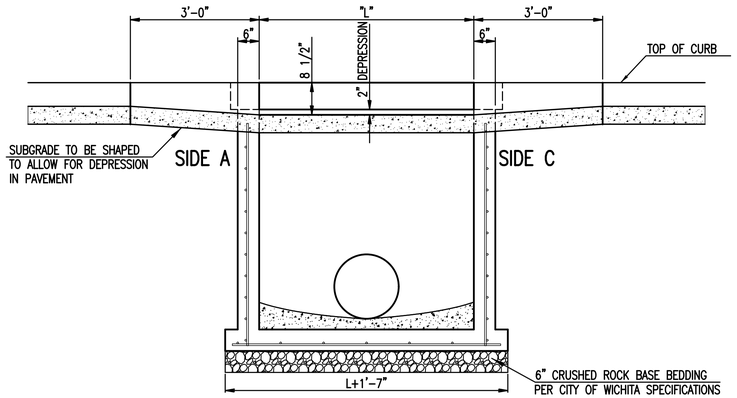



SECTION "A-A"

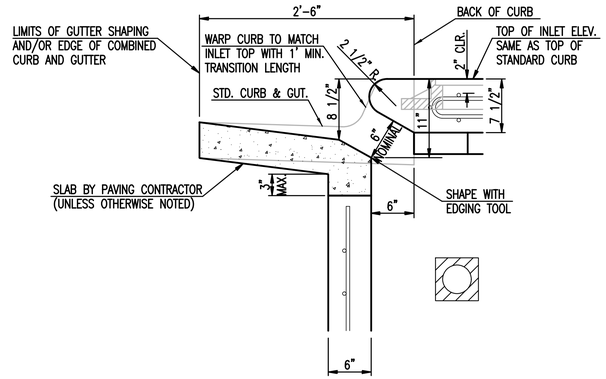



SECTION "C-C"

NOTES:
* SLOPE OF INLET TOP TO MATCH SIDEWALK OR PARKING SLOPES WITHIN LIMITS INDICATED.




SECTION "B-B"

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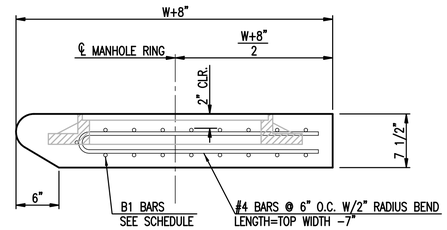



CITY OF WICHITA
PUBLIC WORKS & UTILITIES
ENGINEERING DIVISION

# STANDARD TYPE 1 CURB INLET 5'-0" OR 10'-0" OPENING

CITY ENGINEER
GARY JANZEN, P.E.

| PROJECT NUMBER | OCA NUMBER | DATE |
|---|---|---|
| 472-84915 | 707022 | 11/2010 |

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

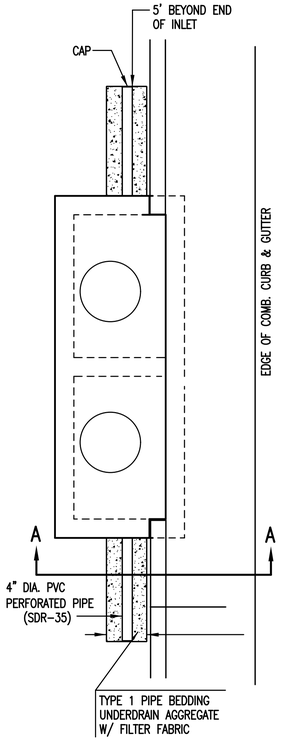
DESIGN | DRAWN

SHEET 17 of 83

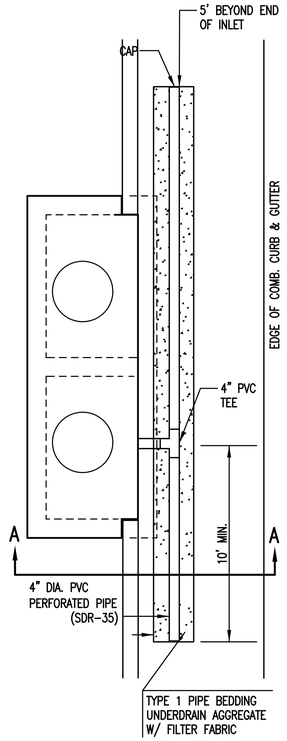
SW-101

Saved 10/22/2012 4:54:15 PM by BFJ
Plot Scale 1.250 ---- Plot By BOB F JOHNSON
L:\2010\10281\Standards\10281-SW-101-Type 1 Inlet L=5' and 10'

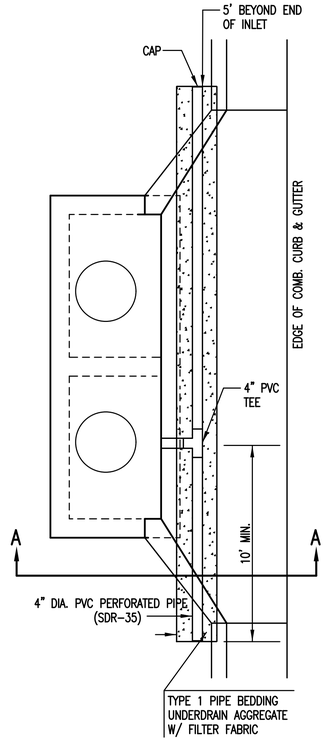
**PAVEMENT UNDERDRAIN SHALL BE INSTALLED ON ALL CURB INLETS.**



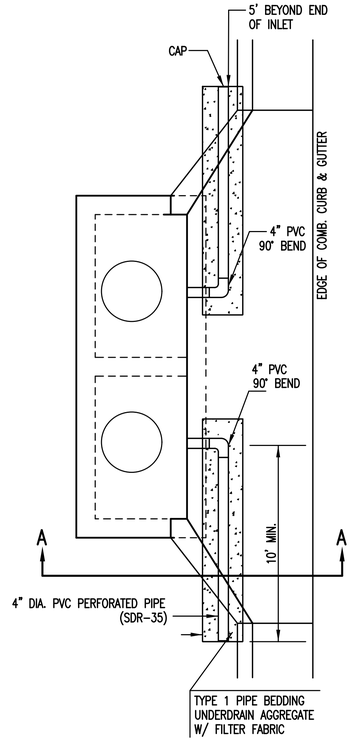

TYPE 1
OPTION 1



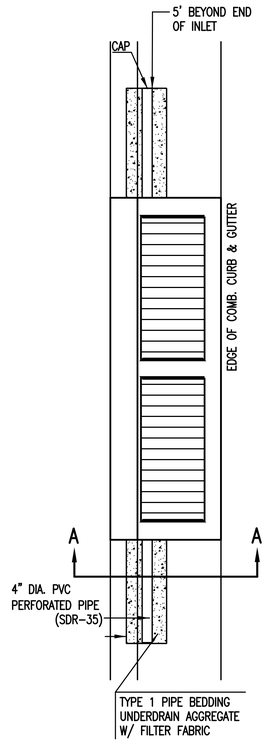

TYPE 1
OPTION 2



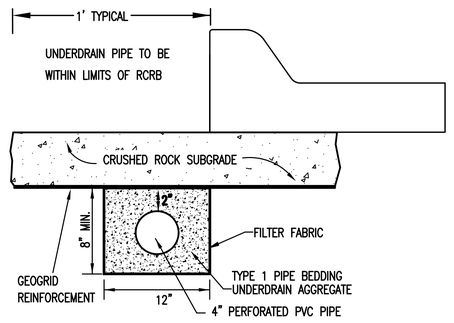

TYPE 1-A INLET
OPTION 1



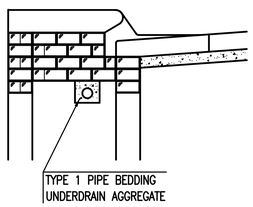

TYPE 1-A INLET
OPTION 2

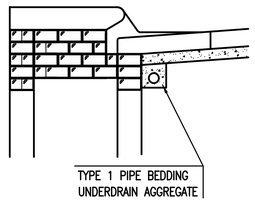



TYPE 2



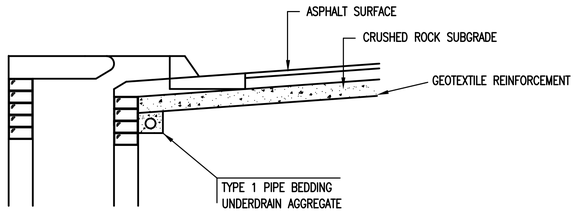

SECTION A-A (TYPICAL)




(MIN. 16 PERFORATIONS PER LIN. FT. @ 1/4" DIA.)
PERFORATIONS TO BE ON BOTTOM HALF

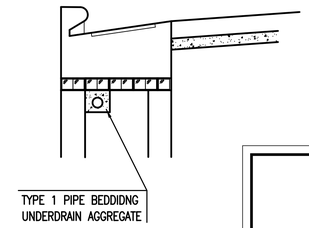
SECTION A-A




SECTION A-A

## PAVEMENT UNDERDRAIN DETAIL

BID ITEM TO BE PROVIDED PER 4" PERFORATED UNDERDRAIN PIPE.




SECTION A-A

**GENERAL NOTES**

1. PAVEMENT CONTRACTOR WILL BE REQUIRED TO INSTALL SDR 35, 4" PERFORATED DRAIN PIPE AND TEE AS INDICATED IN THE DETAILS.
2. WHEN SWS CONSTRUCTED BY SEPARATE PROJECT, SWS CONTRACTOR SHALL INSTALL SDR 35, 4" DRAIN PIPE STUB ONLY THROUGH WALLS OF CURB INLETS AND CAP TO ALLOW FUTURE CONNECTION OF TEE AND ADDITIONAL DRAIN PIPE BY OTHERS.
2. UNDERDRAIN PIPE SHALL BE PAID AS A MEASURED QUANTITY BY THE LINEAL FOOT.

CITY OF WICHITA
PUBLIC WORKS & UTILITIES
ENGINEERING DIVISION

CURB INLET
PAVEMENT UNDERDRAIN
DETAIL

CITY ENGINEER
GARY JANZEN, P.E.

| PROJECT NUMBER | OCA NUMBER | DATE |
|---|---|---|
| 472-84915 | 707022 | 10/2012 |

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

SHEET
18 of 83

SW-111

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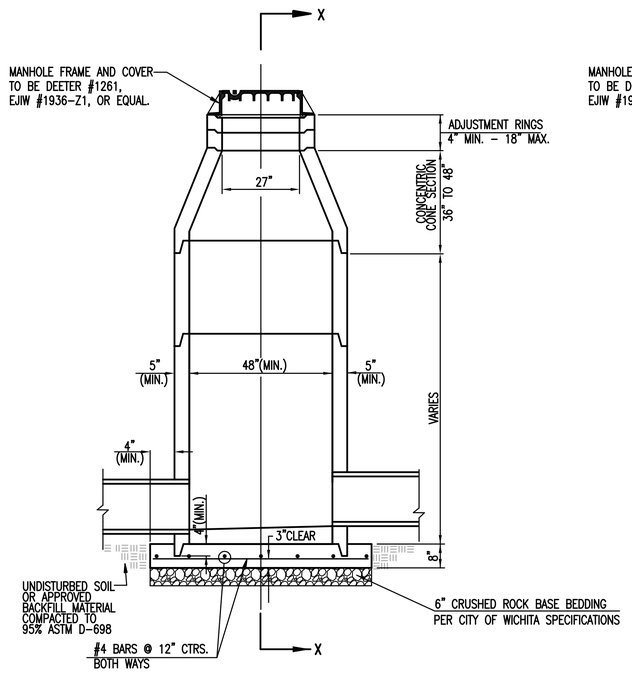
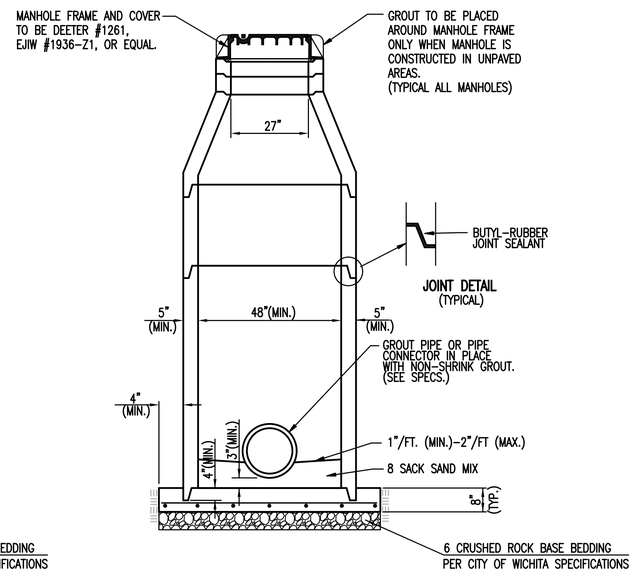
Plot Scale 1:1.0 ---- by ROB F. JOHNSON
I:\2010\10281\Standards\10281-SW-111-Pavement Underdrain



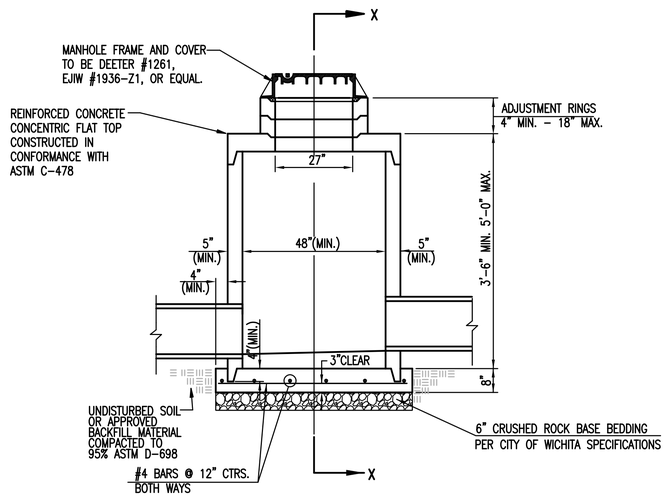

PRECAST
STANDARD MANHOLE
TYPE "A"



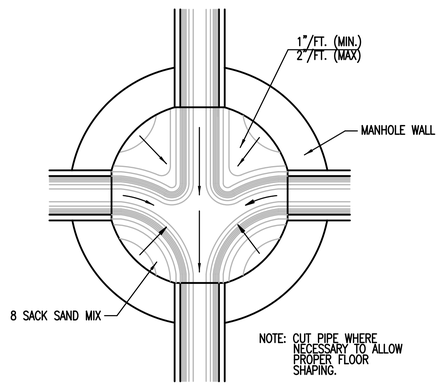

SECTION X-X
(TYPICAL)

## 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.




PRECAST
SHALLOW MANHOLE
TYPE "B"




TYPICAL MANHOLE
FLOOR SHAPING

CITY OF WICHITA
PUBLIC WORKS & UTILITIES
ENGINEERING DIVISION

PRECAST CONCRETE MANHOLE (STORM SEWER)

CITY ENGINEER
GARY JANZEN, P.E.

| PROJECT NUMBER | OCA NUMBER | DATE |
|---|---|---|
| 472-84915 | 707022 | 11/2010 |

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

DESIGN | DRAWN

SHEET
19 of 83

SW-301

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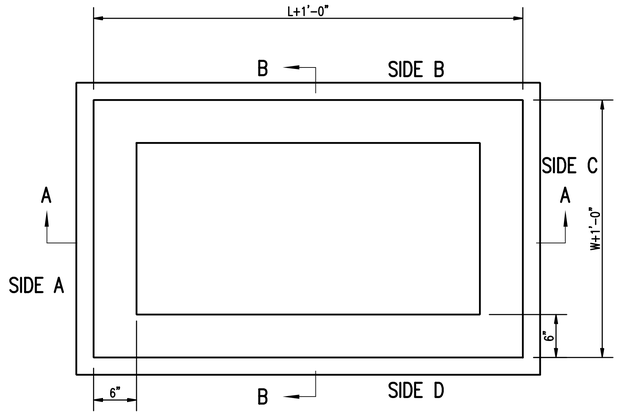
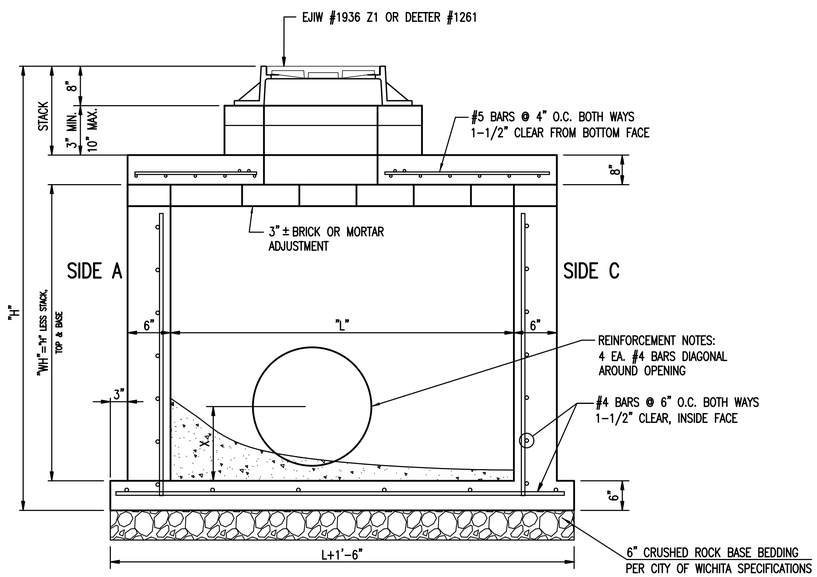
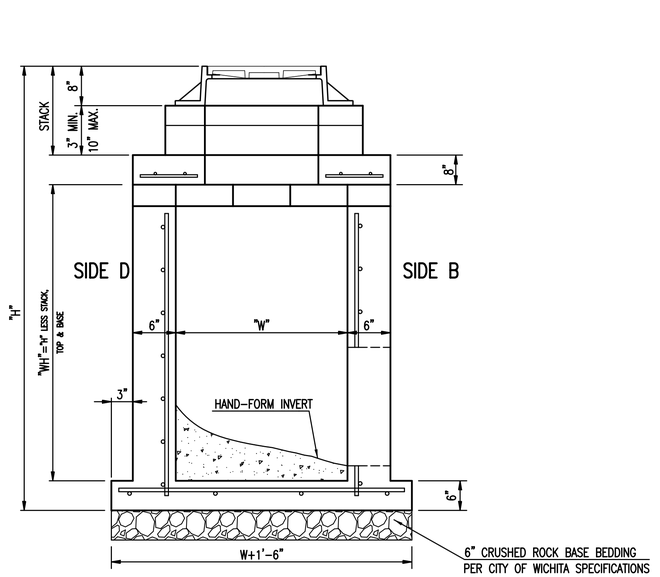
L:\2010\10281\Standards\10281-SW-301-Precast Conc MH




TOP VIEW




SECTION "A-A"




SECTION "B-B"

**GENERAL NOTES**

1. GRATE FRAME TO BE INSTALLED ON THIN MORTAR CUSHION TO INSURE FULL SUPPORT ALONG BRICK. CONCRETE USED FOR INLET CONSTRUCTION SHALL CONFORM TO CITY OF WICHITA SPECIFICATIONS FOR CONCRETE PAVEMENT MIX.
2. INLET INVERT SHALL BE SHAPED WITH 8 SACK SAND MIX CONCRETE TO CREATE FLOW CHANNELS AND TO INCREASE HYDRAULIC EFFICIENCY SUCH THAT THE INLET WILL BE SELF CLEANING BETWEEN ALL INLET AND/OR OUTLET PIPES.
3. THE ENDS OF ALL PIPES INSTALLED IN INLETS SHALL BE CUT OFF FLUSH WITH THE INSIDE FACE OF THE INLET WALL.
4. INLET FRAME AND GRATE TO BE DEETER #1261, EJIW #1936-Z1 OR APPROVED EQUAL, SEE SW-303.
5. 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.

CITY OF WICHITA
PUBLIC WORKS & UTILITIES
ENGINEERING DIVISION

# REINFORCED CONCRETE MANHOLE (STORM SEWER)

CITY ENGINEER
GARY JANZEN, P.E.

| PROJECT NUMBER | OCA NUMBER | DATE |
|---|---|---|
| 472-84915 | 707022 | 11/2010 |

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

DESIGN | DRAWN

SHEET
20 of 83

SW-302

Saved: 10/22/2012, 6:51:24 PM by: RFJ
Plot: Scale: 1:1, L6538 by: ROB F. JOHNSON
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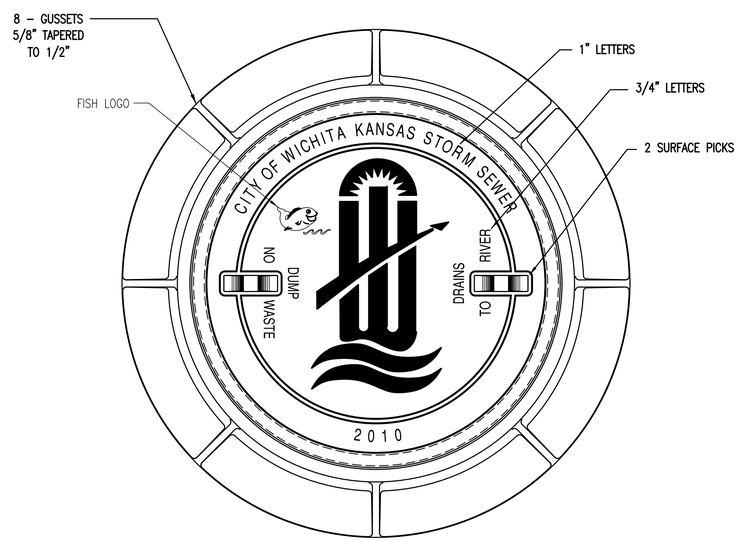
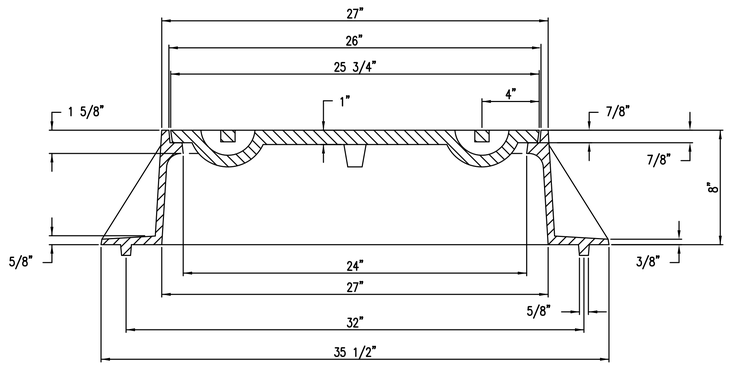
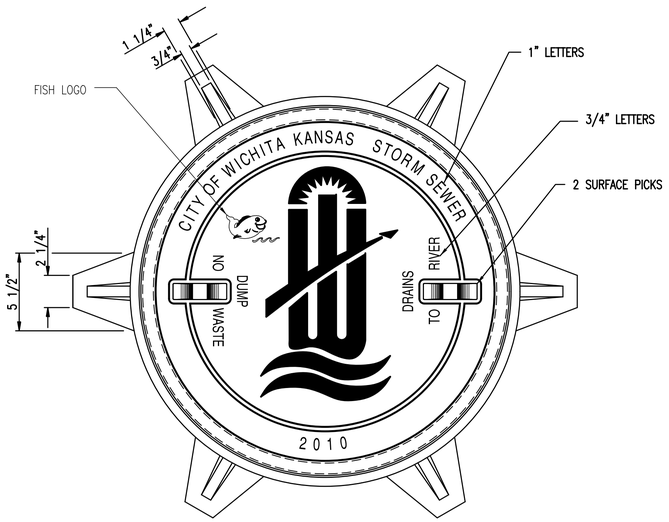
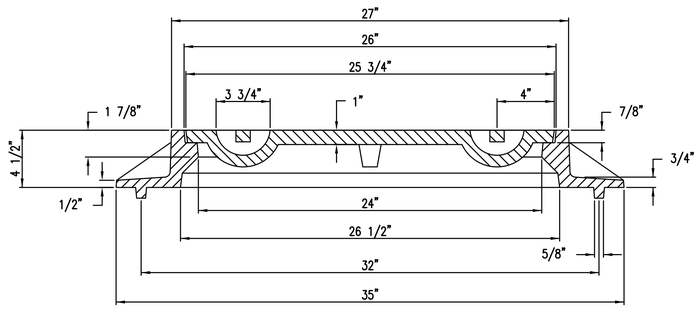



## MANHOLE FRAME
## DEETER #1261 OR EJIW #1936–Z1

NOTE:
1. FURNISHED WITH MACHINED HORIZONTAL BEARING SURFACE.
2. COVER TO BE DEETER #1261 OR EJIW #1936A.




## 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 #1261 OR EJIW #1936A.

CITY OF WICHITA
PUBLIC WORKS & UTILITIES
ENGINEERING DIVISION

MANHOLE/INLET FRAME AND COVER (STORM SEWER)

CITY ENGINEER
GARY JANZEN, P.E.

| PROJECT NUMBER | OCA NUMBER | DATE |
|---|---|---|
| 472-84915 | 707022 | 11/2010 |

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

| DESIGN | DRAWN |
|---|---|
| | |

SHEET
21 of 83

SW–303

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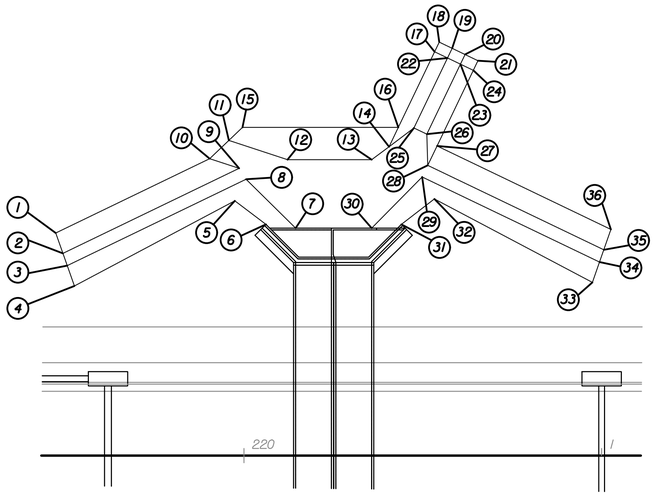
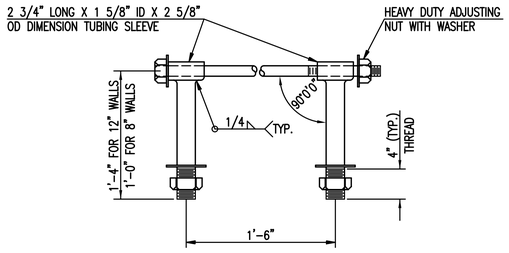
Plot: Scale 1:1.0,832 by ROB F. JOHNSON
I:\2010\10281\Standards\10281–SW–303–MH–Inlet Frame & Cover




STA. 220+25 LT.

| RIPRAP LAYOUT | | | |
|---|---|---|---|
| LOCATION | STATION | OFFSET | ELEVATION |
| 1 | 219+47.39 | 62.25' Lt. | 1338.81 |
| 2 | 219+49.40 | 56.56' Lt. | 1337.81 |
| 3 | 219+50.60 | 53.14' Lt. | 1337.81 |
| 4 | 219+52.61 | 47.44' Lt. | 1338.81 |
| 5 | 219+97.45 | 71.25' Lt. | 1334.74 |
| 6 | 220+06.15 | 64.67' Lt. | 1334.40 |
| 7 | 220+14.45 | 63.60' Lt. | 1332.40 |
| 8 | 220+00.61 | 77.29' Lt. | 1333.46 |
| 9 | 219+98.64 | 80.34' Lt. | 1333.46 |
| 10 | 219+90.42 | 83.03' Lt. | 1334.13 |
| 11 | 219+95.78 | 88.12' Lt. | 1333.81 |
| 12 | 220+12.18 | 82.75' Lt. | 1332.40 |
| 13 | 220+35.70 | 82.75' Lt. | 1332.40 |
| 14 | 220+40.57 | 86.36' Lt. | 1332.79 |
| 15 | 219+99.60 | 91.77' Lt. | 1335.71 |
| 16 | 220+43.16 | 91.77' Lt. | 1335.48 |
| 17 | 220+53.30 | 112.91' Lt. | 1340.01 |
| 18 | 220+54.60 | 115.62' Lt. | 1340.09 |
| 19 | 220+58.21 | 113.89' Lt. | 1336.25 |
| 20 | 220+61.82 | 112.16' Lt. | 1336.25 |
| 21 | 220+65.42 | 110.43' Lt. | 1339.85 |
| 22 | 220+56.91 | 111.18' Lt. | 1336.25 |
| 23 | 220+60.52 | 109.45' Lt. | 1336.25 |
| 24 | 220+64.12 | 107.72' Lt. | 1339.72 |
| 25 | 220+47.52 | 91.61' Lt. | 1333.99 |
| 26 | 220+51.13 | 89.88' Lt. | 1333.99 |
| 27 | 220+53.98 | 86.58' Lt. | 1334.82 |
| 28 | 220+51.39 | 81.17' Lt. | 1333.82 |
| 29 | 220+49.83 | 77.91' Lt. | 1333.82 |
| 30 | 220+35.70 | 63.60' Lt. | 1332.40 |
| 31 | 220+44.01 | 64.67' Lt. | 1334.40 |
| 32 | 220+53.24 | 71.77' Lt. | 1335.18 |
| 33 | 220+97.40 | 48.44' Lt. | 1340.30 |
| 34 | 220+99.40 | 54.13' Lt. | 1339.30 |
| 35 | 221+00.60 | 57.56' Lt. | 1339.30 |
| 36 | 221+02.60 | 63.26' Lt. | 1340.30 |

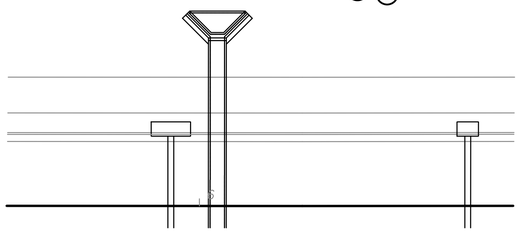



HEAVY DUTY (H.D.) COUPLER

NO SCALE

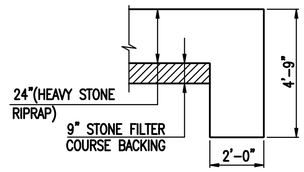
NOTES

1. BOLTS TO BE A-36 1 1/2" DIAMETER.
2. BOLTS, NUTS, WASHERS AND SLEEVES TO BE ZINC PLATED.
3. WASHERS TO BE 3 1/2" O.D. X 7 GAUGE.
4. SHIP WITH NUTS AND WASHERS PLACED ON BOLTS.




STA. 226+05 LT.

| RIPRAP LAYOUT | | | |
|---|---|---|---|
| LOCATION | STATION | OFFSET | ELEVATION |
| A | 226+44.52 | 66.26' Lt. | 1341.78 |
| B | 226+48.84 | 68.86' Lt. | 1341.94 |
| C | 226+51.82 | 68.52' Lt. | 1342.05 |
| D | 226+55.45 | 65.05' Lt. | 1342.18 |
| E | 226+46.32 | 82.22' Lt. | 1445.09 |
| F | 226+50.30 | 81.77' Lt. | 1344.47 |
| G | 226+53.28 | 81.44' Lt. | 1344.47 |
| H | 226+57.25 | 80.99' Lt. | 1345.11 |
| I | 226+46.66 | 85.20' Lt. | 1345.34 |
| J | 226+50.63 | 84.75' Lt. | 1344.47 |
| K | 226+53.61 | 84.42' Lt. | 1344.47 |
| L | 226+57.59 | 83.97' Lt. | 1345.30 |



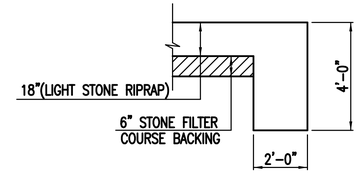

TYPICAL SECTION THRU TOEWALL

NO SCALE

NOTES

1. ALL RIPRAP FOR THIS PROJECT SHALL BE NATURAL STONE. NEITHER BROKEN CONCRETE, FABRIC ENVELOPE, NOR PREMIXED DRY PACKAGED CONCRETE BAG ALTERNATES WILL BE ALLOWED, UNLESS INDICATED OTHERWISE.
2. TOEWALLS SHALL BE INSTALLED ALONG ALL UNPROTECTED EDGES OF STONE RIPRAP.
3. GROUTING OF THE SURFACE OF THE RIPRAP SHALL NOT BE PERFORMED, UNLESS INDICATED OTHERWISE. GROUTING OF THE TOEWALLS SHALL BE PERFORMED PER CITY SPECIFICATIONS.

HEAVY STONE RIPRAP DETAILS




TYPICAL SECTION THRU TOEWALL

NO SCALE

NOTES

1. ALL RIPRAP FOR THIS PROJECT SHALL BE NATURAL STONE. NEITHER BROKEN CONCRETE, FABRIC ENVELOPE, NOR PREMIXED DRY PACKAGED CONCRETE BAG ALTERNATES WILL BE ALLOWED, UNLESS INDICATED OTHERWISE.
2. TOEWALLS SHALL BE INSTALLED ALONG ALL UNPROTECTED EDGES OF STONE RIPRAP.
3. GROUTING OF THE SURFACE OF THE RIPRAP SHALL NOT BE PERFORMED, UNLESS INDICATED OTHERWISE. GROUTING OF THE TOEWALLS SHALL BE PERFORMED PER CITY SPECIFICATIONS.

LIGHT STONE RIPRAP DETAILS

CITY OF WICHITA

PUBLIC WORKS & UTILITIES
ENGINEERING DIVISION

MISCELLANEOUS DETAILS (STORM SEWER)

CITY ENGINEER
GARY JANZEN, P.E.

| PROJECT NUMBER | OCA NUMBER | DATE |
|---|---|---|
| 472-84915 | 707022 | 11/2010 |

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

| DESIGN | DRAWN |
|---|---|
| | |

SHEET
22 of 83

SW-401

Scout 10/22/2012 6:45:58 PM by JEFJ
Plot Scale 1:2.1664 '---' by ROB F. JOHNSON
L:\2010\10281\Standards\10281-SW-401-Miscellaneous Details

## INLET AND MANHOLE DATA

| ROUTING SEQUENCE FROM | ROUTING SEQUENCE TO | LOCATIONS OF INSTALLATIONS STATION | ROUTE IDENTIFICATION | DISTANCE LEFT/RIGHT | NORTH COORDINATE | EAST COORDINATE | CONSTRUCT OR INSTALL CURB INLET (TYPE I) | R.C. MANHOLE | | | | END SECTION | G&F TYPE | L&F TYPE | DIMENSIONS L (FT.) | W (FT.) | H (FT.) | STACK (FT.) | ELEVATIONS TOP⊛ | FLOOR | INFLOW CONDUITS SIZE DIRECT. | FLOWLINE ELEV. | SIZE DIRECT. | FLOWLINE ELEV. | SIZE DIRECT. | FLOWLINE ELEV. | OUTFLOW CONDUITS SIZE DIRECTION | FLOWLINE ELEV. | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 100 | – | 220+14.46 | 135th St. | 22.00' Rt. | 1,679,323.8714 | 1,602,361.6732 | | | | | | | | | | | | | | | 30" (S) | 1333.44 | | | | | | | Connect to RCB |
| 101 | 100 | 219+62 | 135th St. | 22.00' Rt. | 1,679,271.4195 | 1,602,362.2457 | 1 | | | | | | | | 10.00 | 4.00 | 6.50 | | 1340.87 | 1334.87 | 24" (S) | 1335.40 | 18" (W) | 1336.15 | | | 30" (N) | 1335.17 | |
| 102 | 101 | 218+75 | 135th St. | 22.00' Rt. | 1,679,184.4247 | 1,602,363.1953 | 1 | | | | | | | | 10.00 | 4.00 | 6.00 | | 1341.26 | 1335.76 | 18" (S) | 1336.56 | | | | | 24" (N) | 1336.01 | |
| 103 | 102 | 217+00 | 135th St. | 29.00' Rt. | 1,679,009.5116 | 1,602,372.1048 | | 1 | | | | | | | 4.00 | 4.00 | 5.33 | 1.33 | 1344.68 | 1339.85 | 18" (S) | 1340.15 | 15" (W) | 1340.33 | | | 18" (N) | 1340.06 | |
| 104 | 103 | 215+00 | 135th St. | 21.50' Rt. | 1,678,809.4416 | 1,602,366.7881 | 1 | | | | | | | | 10.00 | 3.00 | 5.00 | | 1350.66 | 1346.16 | 15" (S) | 1346.59 | 15" (W) | 1346.59 | | | 18" (N) | 1346.35 | |
| 105 | 104 | 213+00 | 135th St. | 29.00' Rt. | 1,678,609.5354 | 1,602,376.4705 | | 1 | | | | | | | 4.00 | 4.00 | 5.33 | 1.33 | 1357.23 | 1352.40 | 15" (S) | 1352.65 | 15" (W) | 1352.67 | | | 15" (N) | 1352.59 | |
| 106 | 105 | 211+00 | 135th St. | 21.50' Rt. | 1,678,409.4654 | 1,602,371.1538 | 1 | | | | | | | | 10.00 | 3.00 | 4.50 | | 1360.46 | 1356.46 | 15" (W) | 1356.72 | | | | | 15" (N) | 1356.65 | |
| 107 | 106 | 211+00 | 135th St. | 21.50' Lt. | 1,678,408.9961 | 1,602,328.1564 | 1 | | | | | | | | 10.00 | 3.00 | 4.00 | | 1360.46 | 1356.96 | 15" (S) | 1357.30 | | | | | 15" (E) | 1357.15 | |
| 108 | 107 | 209+50 | 135th St. | 21.68' Lt. | 1,678,259.0030 | 1,602,329.6097 | 1 | | | | | | | | 10.00 | 3.00 | 4.00 | | 1362.26 | 1358.76 | | | | | | | 15" (N) | 1358.95 | |
| 109 | 105 | 213+00 | 135th St. | 21.50' Lt. | 1,678,608.9842 | 1,602,325.9736 | 1 | | | | | | | | 10.00 | 3.00 | 4.00 | | 1356.94 | 1353.44 | | | | | | | 15" (E) | 1353.63 | |
| 110 | 104 | 215+00 | 135th St. | 21.50' Lt. | 1,678,808.9723 | 1,602,323.7907 | 1 | | | | | | | | 10.00 | 3.00 | 4.50 | | 1350.66 | 1346.66 | | | | | | | 15" (E) | 1346.85 | |
| 111 | 103 | 217+00 | 135th St. | 21.50' Lt. | 1,679,008.9604 | 1,602,321.6079 | 1 | | | | | | | | 10.00 | 3.00 | 4.50 | | 1344.39 | 1340.39 | | | | | | | 15" (E) | 1340.58 | |
| 112 | 101 | 219+62 | 135th St. | 21.50' Lt. | 1,679,270.9448 | 1,602,318.7483 | 1 | | | | | | | | 10.00 | 3.00 | 5.00 | | 1340.87 | 1336.37 | 15" (S) | 1336.83 | | | | | 18" (E) | 1336.58 | |
| 113 | 112 | 219+00 | 135th St. | 21.50' Lt. | 1,679,208.9485 | 1,602,319.4250 | 1 | | | | | | | | 10.00 | 3.00 | 4.50 | | 1341.07 | 1337.07 | | | | | | | 15" (N) | 1337.26 | |
| 200 | – | 220+35.71 | 135th St. | 21.50' Rt. | 1,679,345.1147 | 1,602,360.9413 | | | | | | | | | | | | | | | 15" (N) | 1334.03 | | | | | | | Connect to RCB |
| 201 | 200 | 221+00 | 135th St. | 21.50' Rt. | 1,679,409.4059 | 1,602,360.2396 | 1 | | | | | | | | 10.00 | 3.00 | 6.00 | | 1341.85 | 1336.35 | 15" (W) | 1336.61 | | | | | 15" (S) | 1336.54 | |
| 202 | 201 | 221+00 | 135th St. | 21.50' Lt. | 1,679,408.9366 | 1,602,317.2422 | 1 | | | | | | | | 10.00 | 3.00 | 5.50 | | 1341.85 | 1336.85 | | | | | | | 15" (E) | 1337.04 | |
| 300 | – | 226+03 | 135th St. | 21.50' Rt. | 1,679,912.3759 | 1,602,354.7479 | | | | | | | | | | | | | | | 15" (S) | 1340.85 | | | | | | | Connect to RCB |
| 301 | 300 | 225+92 | 135th St. | 21.50' Rt. | 1,679,901.3766 | 1,602,354.8698 | 1 | | | | | | | | 10.00 | 3.00 | 5.50 | | 1345.77 | 1340.77 | 15" (S) | 1341.05 | 15" (W) | 1341.03 | | | 15" (N) | 1340.96 | |
| 302 | 301 | 225+25 | 135th St. | 21.50' Rt. | 1,679,834.3806 | 1,602,355.6010 | 1 | | | | | | | | 5.00 | 3.00 | 5.00 | | 1346.03 | 1341.53 | 15" (W) | 1341.79 | | | | | 15" (N) | 1341.72 | |
| 303 | 302 | 225+25 | 135th St. | 21.50' Lt. | 1,679,833.9112 | 1,602,312.6036 | 1 | | | | | | | | 5.00 | 3.00 | 4.50 | | 1346.03 | 1342.03 | | | | | | | 15" (E) | 1342.22 | |
| 304 | 301 | 225+92 | 135th St. | 21.50' Lt. | 1,679,900.9073 | 1,602,311.8724 | 1 | | | | | | | | 10.00 | 3.00 | 5.00 | | 1345.77 | 1341.27 | | | | | | | 15" (E) | 1341.46 | |
| 400 | – | 226+07 | 135th St. | 21.50' Rt. | 1,679,916.3757 | 1,602,354.7061 | | | | | | | | | | | | | | | 15" (N) | 1340.83 | | | | | | | Connect to RCB |
| 401 | 400 | 226+75 | 135th St. | 21.50' Rt. | 1,679,984.3956 | 1,602,353.9108 | 1 | | | | | | | | 5.00 | 3.00 | 5.50 | | 1346.18 | 1341.18 | 15" (W) | 1341.44 | | | | | 15" (S) | 1341.37 | |
| 402 | 401 | 226+75 | 135th St. | 21.50' Lt. | 1,679,983.8771 | 1,602,310.9139 | 1 | | | | | | | | 5.00 | 3.00 | 5.00 | | 1346.18 | 1341.68 | | | | | | | 15" (E) | 1341.87 | |
| TOTALS | | | | | | | 19 | 2 | | | | * | | | | | | | | | | | | | | | | | |

* End Sections are recapitulated with the Conduits below.

## CONDUIT DATA

| ROUTING SEQUENCE FROM | ROUTING SEQUENCE TO | LOCATIONS OF INSTALLATIONS STATION | ROUTE IDENTIFICATION | DISTANCE LEFT/RIGHT | CONSTRUCT OR INSTALL TYPE OF CONDUIT SIZE | TYPE OF CONDUIT MATERIAL | LENGTH (L.F.) | CONDUIT FLOWLINES INFLOW ELEV. | OUTFLOW ELEV. | SEWER EXCAVATION ROCK (CU. YD) | COMMON (CU. YD) | STORM SEWER (LIN. FT.) 15" | 18" | 24" | 30" | | | END SECTIONS (EACH) | | | | AASHTO CONC. CLASS | SAND FILL, FLUSH & VIBRATE (L.F.) | | | | | | | | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 101 | 100 | 219+62 | 135th St. | 22.00' Rt. | 30" | RCP | 52.5 | 1335.17 | 1333.44 | | | | | | 52.5 | | | | | | | | | 52.5 | | | | | | | Connect to RCB |
| 102 | 101 | 218+75 | 135th St. | 22.00' Rt. | 24" | RCP | 87.0 | 1336.01 | 1335.40 | | | | | 87.0 | | | | | | | | | | 87.0 | | | | | | | |
| 103 | 102 | 217+00 | 135th St. | 29.00' Rt. | 18" | RCP, ACSP, PEP, or PVCP | 175.1 | 1340.06 | 1336.56 | | | | 175.1 | | | | | | | | | | | | | | | | | | |
| 104 | 103 | 215+00 | 135th St. | 21.50' Rt. | 18" | RCP, ACSP, PEP, or PVCP | 200.1 | 1346.35 | 1340.15 | | | | 200.1 | | | | | | | | | | | | | | | | | | |
| 105 | 104 | 213+00 | 135th St. | 29.00' Rt. | 15" | RCP, ACSP, PEP, or PVCP | 200.1 | 1352.59 | 1346.59 | | | 200.1 | | | | | | | | | | | | | | | | | | | |
| 106 | 105 | 211+00 | 135th St. | 21.50' Rt. | 15" | RCP, ACSP, PEP, or PVCP | 200.1 | 1356.65 | 1352.65 | | | 200.1 | | | | | | | | | | | | | | | | | | | |
| 107 | 106 | 211+00 | 135th St. | 21.50' Lt. | 15" | RCP | 43.0 | 1357.15 | 1356.72 | | | 43.0 | | | | | | | | | | | | 43.0 | | | | | | | |
| 108 | 107 | 209+50 | 135th St. | 21.68' Lt. | 15" | RCP | 150.0 | 1358.95 | 1357.30 | | | 150.0 | | | | | | | | | | | | 150.0 | | | | | | | |
| 109 | 105 | 213+00 | 135th St. | 21.50' Lt. | 15" | RCP | 50.5 | 1353.63 | 1352.67 | | | 50.5 | | | | | | | | | | | | 50.5 | | | | | | | |
| 110 | 104 | 215+00 | 135th St. | 21.50' Lt. | 15" | RCP | 43.0 | 1346.85 | 1346.59 | | | 43.0 | | | | | | | | | | | | 43.0 | | | | | | | |
| 111 | 103 | 217+00 | 135th St. | 21.50' Lt. | 15" | RCP | 50.5 | 1340.58 | 1340.33 | | | 50.5 | | | | | | | | | | | | 50.5 | | | | | | | |
| 112 | 101 | 219+62 | 135th St. | 21.50' Lt. | 18" | RCP | 43.5 | 1336.58 | 1336.15 | | | | 43.5 | | | | | | | | | | | 43.5 | | | | | | | |
| 113 | 112 | 219+00 | 135th St. | 21.50' Lt. | 15" | RCP | 62.0 | 1337.26 | 1336.83 | | | 62.0 | | | | | | | | | | | | 62.0 | | | | | | | |
| 201 | 200 | 221+00 | 135th St. | 21.50' Rt. | 15" | RCP | 64.3 | 1336.54 | 1334.03 | | | 64.3 | | | | | | | | | | | | 64.3 | | | | | | | Connect to RCB |
| 202 | 201 | 221+00 | 135th St. | 21.50' Lt. | 15" | RCP | 43.0 | 1337.04 | 1336.61 | | | 43.0 | | | | | | | | | | | | 43.0 | | | | | | | |
| 301 | 300 | 225+92 | 135th St. | 21.50' Rt. | 15" | RCP | 11.0 | 1340.96 | 1340.85 | | | 11.0 | | | | | | | | | | | | 11.0 | | | | | | | Connect to RCB |
| 302 | 301 | 225+25 | 135th St. | 21.50' Rt. | 15" | RCP | 67.0 | 1341.72 | 1341.05 | | | 67.0 | | | | | | | | | | | | 67.0 | | | | | | | |
| 303 | 302 | 225+25 | 135th St. | 21.50' Lt. | 15" | RCP | 43.0 | 1342.22 | 1341.79 | | | 43.0 | | | | | | | | | | | | 43.0 | | | | | | | |
| 304 | 301 | 225+92 | 135th St. | 21.50' Lt. | 15" | RCP | 43.0 | 1341.46 | 1341.03 | | | 43.0 | | | | | | | | | | | | 43.0 | | | | | | | |
| 401 | 400 | 226+75 | 135th St. | 21.50' Rt. | 15" | RCP | 68.0 | 1341.37 | 1340.83 | | | 68.0 | | | | | | | | | | | | 68.0 | | | | | | | Connect to RCB |
| 402 | 401 | 226+75 | 135th St. | 21.50' Lt. | 15" | RCP | 43.0 | 1341.87 | 1341.44 | | | 43.0 | | | | | | | | | | | | 43.0 | | | | | | | |
| TOTALS | | | | | | | | | | | | 1181.5 | 418.7 | 87.0 | 52.5 | | | | | | | | | 964.3 | | | | | | | |

The use of Aluminized Corrugated Steel Pipe (ACSP) will only be approved after the Contractor submits verification that ACSP meets KDOT Pipe Policy service life criteria. Prior to using ACSP on this project, the Contractor will need to submit to the Engineer the certified lab reports for the soil and water ph and resistivity values as well as determine the resulting service life value based on instructions in the KDOT Pipe Policy for each pipe location. All work, labor, materials and incidentals for this evaluation shall be subsidiary.

THE PIPES ON THIS PROJECT ARE IN ACCORDANCE WITH THE CURRENT KDOT PIPE POLICY OR LOCAL PIPE POLICY THAT HAS BEEN APPROVED BY KDOT. ALL PIPES SHALL BE INSTALLED PER THE MANUFACTURER'S SPECIFICATIONS.

⊛ Note: Top Elevation is located as follows:
1. Manhole - Top of Manhole Ring
2. Curb Inlet - Top of Curb

| No. | Revision | By | Date |
|---|---|---|---|

135TH ST.

# SCHEDULE OF INLETS AND MANHOLES

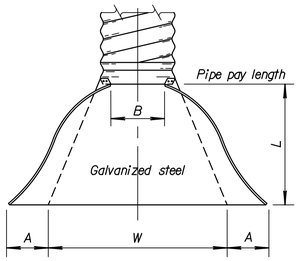
GARY JANZEN, P.E.–CITY ENGINEER
CITY OF WICHITA PROJECT NO. 472-84915

PEC PROFESSIONAL ENGINEERING CONSULTANTS, P.A.
303 SOUTH TOPEKA WICHITA, KS 67202
316-262-2691 www.pec1.com

| Designed by | RJS | Job No. | 10281 | Sht. 23 of 83 |
|---|---|---|---|---|
| Drawn by | JDT | Date | JAN., 2013 | |

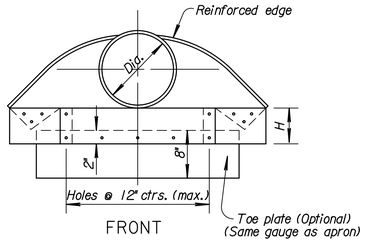
Plotted By: svb Date: 2/5/2013 6:13:49 PM
FILE: i:\2010\10281\SWS Profile\10281-swspp-Schedule.dgn

| STATE | PROJECT NO. | YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| KANSAS | 472-84915 | 2013 | 24 | 83 |

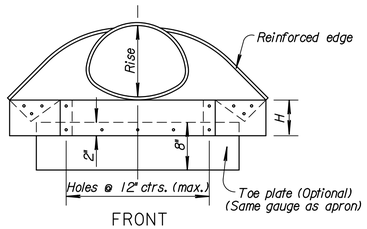



PLAN

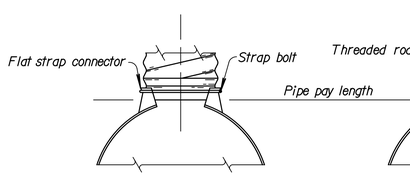
(Illustrated with Type #3 Connection)




FRONT

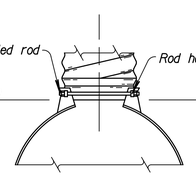



FRONT



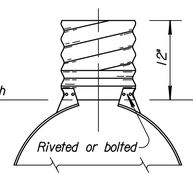

TYPE 1

Available in sizes 12" through 24" only.



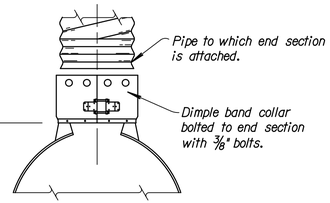

TYPE 2

Available in sizes 30" and 36" Round and 17"x13" through 57"x38" Pipe-Arches.




TYPE 3

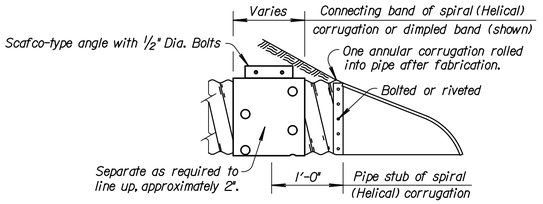
Available in sizes 42" through 96" Round and 60"x46" through 81"x59" Pipe-Arches.




TYPE 5

Available for all Round and equivalent Pipe-Arch sizes, (Type 1 and Type 2 connections are recommended for the smaller sizes with annular ends).

Note: Type 3 connection may be furnished instead of Type 1 or Type 2 for smaller round or arch pipe.




SPIRAL (HELICAL) CORRUGATION

For all sizes of round and arch culvert pipes having Spiral (Helical) corrugations, the end sections and connecting bands shall be as shown above.

| Thickness CSP/ACSP | Thickness CAP | Gauge |
|---|---|---|
| 0.064" | 0.060" | 16 ga. |
| 0.079" | 0.075" | 14 ga. |
| 0.109" | 0.105" | 12 ga. |
| 0.138" | 0.135" | 10 ga. |
| 0.168" | 0.164" | 8 ga. |

| Pipe Dia. (In.) | CS,ACS or CA Gauge | Dimensions in Inches A (min.) | B (max.) | H (min.) | L (+/-2") | W (min.) | Approx. Slope |
|---|---|---|---|---|---|---|---|
| 12" | 16 | 5 | 7 | 6 | 21 | 22 | 2½:1 |
| 15" | 16 | 6 | 8 | 6 | 26 | 28 | 2½:1 |
| 18" | 16 | 7 | 10 | 6 | 31 | 34 | 2½:1 |
| 21" | 16 | 8 | 12 | 6 | 36 | 40 | 2½:1 |
| 24" | 16 | 9 | 13 | 6 | 41 | 46 | 2½:1 |
| 30" | 14 | 11 | 16 | 8 | 51 | 55 | 2½:1 |
| 36" | 14 | 13 | 19 | 9 | 60 | 70 | 2½:1 |
| 42" | 12 | 15 | 25 | 10 | 69 | 82 | 2½:1 |
| 48" | 12 | 17 | 29 | 12 | 78 | 88 | 2¼:1 |
| 54" | 12 | 17 | 33 | 12 | 84 | 100 | 2¼:1 |
| 60" | 12/10 | 17 | 36 | 12 | 87 | 112 | 2:1 |
| 66" | 12/10 | 17 | 39 | 12 | 87 | 118 | 2:1 |
| 72" | 12/10 | 17 | 44 | 12 | 87 | 120 | 2:1 |
| 78" | 12/10 | 17 | 48 | 12 | 87 | 130 | 1½:1 |
| 84" | 12/10 | 17 | 52 | 12 | 87 | 136 | 1½:1 |
| 90" | 12/10 | 17 | 58 | 12 | 87 | 142 | 1½:1 |
| 96" | 12/10 | 17 | 58 | 12 | 87 | 144 | 1½:1 |

| Bid Designation Sq. Ft. | Nom. W.W. Area Sq. Ft. | Pipe Arch Span & Rise | Dimensions in Inches 2⅔"x ½" Corrugations CS,ACS or CA Gauge | A (min.) | B (max.) | H (min.) | L (+/-2") | W (min.) | Dimensions in Inches 3" x 1" or 5" x 1" Corr. CS,ACS or CA Gauge | A (min.) | B (max.) | H (min.) | L (+/-2") | W (min.) | Approx. Slope |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.0 | 1.1 | 17" x 13" | 16 | 5 | 9 | 6 | 20 | 28 | | | | | | | 2½:1 |
| 1.5 | 1.6 | 21" x 15" | 16 | 6 | 11 | 6 | 24 | 34 | | | | | | | 2½:1 |
| 2.0 | 2.2 | 24" x 18" | 16 | 7 | 12 | 6 | 28 | 40 | | | | | | | 2½:1 |
| 2.5 | 2.9 | 28" x 20" | 16 | 7 | 16 | 6 | 32 | 46 | | | | | | | 2½:1 |
| 3.0 or 4.0 | 4.5 | 35" x 24" | 14 | 9 | 16 | 6 | 39 | 58 | | | | | | | 2½:1 |
| 5.0 or 6.0 | 6.5 | 42" x 29" | 14 | 11 | 18 | 7 | 46 | 73 | | | | | | | 2½:1 |
| 7.0 or 8.5 | 8.9 | 49" x 33" | 12 | 12 | 21 | 9 | 53 | 82 | | | | | | | 2½:1 |
| 10.0 or 11.0 | 11.7 | 53" x 41" | | | | | | | 12 | 17 | 26 | 12 | 63 | 88 | 2 :1 |
| 10.0 or 11.0 | 11.6 | 57" x 38" | 12 | 16 | 26 | 12 | 62 | 88 | | | | | | | 2 :1 |
| 12.5 or 14.0 | 15.6 | 60" x 46" | | | | | | | 12 | 17 | 36 | 12 | 70 | 100 | 2 :1 |
| 12.5 or 14.0 | 14.7 | 64" x 43" | 12 | 17 | 30 | 12 | 69 | 100 | | | | | | | 2 :1 |
| 16.5 | 19.3 | 66" x 51" | | | | | | | 12/10 | 17 | 36 | 12 | 70 | 112 | 1½:1 |
| 16.5 | 18.1 | 71" x 47" | 12/10 | 17 | 36 | 12 | 77 | 112 | | | | | | | 1½:1 |
| 21.0 | 23.2 | 73" x 55" | | | | | | | 12/10 | 17 | 36 | 12 | 77 | 124 | 1½:1 |
| 21.0 | 21.9 | 77" x 52" | 12/10 | 17 | 36 | 12 | 77 | 124 | | | | | | | 1½:1 |
| 25.0 | 27.4 | 81" x 59" | | | | | | | 12/10 | 17 | 44 | 12 | 77 | 136 | 1½:1 |
| 25.0 | 26.0 | 83" x 57" | 12/10 | 17 | 44 | 12 | 77 | 130 | | | | | | | 1½:1 |
| 32.0 | 32.1 | 87" x 63" | | | | | | | 12/10 | 17 | 44 | 12 | 77 | 136 | 1½:1 |
| 36.0 | 37.0 | 95" x 67" | | | | | | | 12/10 | 17 | 44 | 12 | 87 | 160 | 1½:1 |
| 42.0 | 42.4 | 103" x 71" | | | | | | | 12/10 | 17 | 44 | 12 | 87 | 172 | 1½:1 |
| 47.0 | 48.0 | 112" x 75" | | | | | | | 12/10 | 17 | 44 | 12 | 87 | 172 | 1½:1 |

(Information listed in these tables are nominal and may vary by manufacturer.)

GENERAL NOTE for END SECTIONS

End section material shall follow KDOT Pipe Policy for geographic location. Location shall govern use of CS (Galvanized), ACS (Aluminized) or CA (Aluminum) (Type I) End Section. Pipe material and End Section material shall be the same with no mixing of types per location.

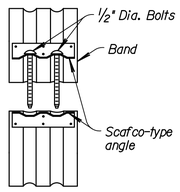
Toe plate extension, when specified, is an accessory and shall be the same gauge and metal as end section. Toe plate shall be punched to match holes in apron lip and attached with furnished ⅜" diameter nuts & bolts.

W + 10" for 12" to 30" diameter pipes inclusive.
W + 20" for 36" to 84" diameter pipes inclusive.
W + 10" for pipe-arches with a rise of 13" to 29" inclusive.
W + 20" for pipe-arches with a rise of 33" to 59" inclusive.

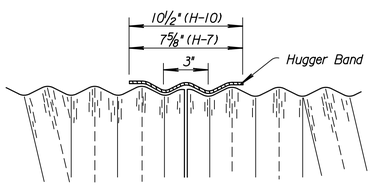
Multiple panel end sections may contain dual gauges of like metal and shall have lap seams which are tightly joined with rivets or bolts. For 60" and larger diameter round pipe end sections and 77"x52" arch pipe end sections, the reinforced edges are supplemented with stiffener angles. The angles are attached with nuts and bolts. Angle reinforcement may be required uder the center panel seams of 73"x55" and larger arch pipe end sections depending on manufacturer.

Other approved designs may be used in lieu of type shown.

Connection of end sections by welding will not be permitted.




CONNECTION DETAIL
H-7 or H-10 BAND




UNIVERSAL REFORMED END with
H-7 or H-10 HUGGER BAND

DETAILS FOR H-7 HUGGER BAND (12" thru 36")
or H-10 HUGGER BAND (12" thru 120")

| Pipe Dia. Inches | Minimum Gauge of Round Pipe 2⅔"x ½" Corr. CSP or ACSP | 3" x 1" Corr. CSP or ACSP | 5" x 1" Corr. CSP or ACSP | 2⅔"x ½" Corr. CAP | 3" x 1" Corr. CAP |
|---|---|---|---|---|---|
| 12" | 14 | | | 16 | |
| 15" | 14 | | | 16 | |
| 18" | 14 | | | 16 | |
| 21" | 14 | | | 16 | |
| 24" | 14 | | | 16 | |
| 30" | 14 | | | 14 | |
| 36" | 14 | | | 14 | 16 |
| 42" | 14 | | | 12 | 16 |
| 48" | 12 | 14 16 | 14 16 | 12 | 16 |
| 54" | 12 | 14 16 | 14 16 | 12 | 16 |
| 60" | 10 | 14 16 | 14 16 | 10 | 16 |
| 66" | 10 | 14 16 | 14 16 | 8 | 16 |
| 72" | 10 | 14 16 | 14 16 | 8 | 16 |
| 78" | 8 | 14 14 | 14 14 | | 14 |
| 84" | 8 | 14 14 | 14 14 | | 12 |
| 90" | | 14 14 | 14 14 | | 12 |
| 96" | | 12 12 | 12 12 | | 12 |
| 102" | | 12 12 | 12 12 | | 10 |
| 108" | | 12 12 | 12 12 | | 10 |
| 114" | | 12 12 | 12 12 | | 8 |
| 120" | | 10 10 | 10 10 | | 8 |

| Bid Designation Sq. Ft. | Pipe Dimension Span & Rise | Sq. Ft. | Equiv. Round Pipe Diameter | Minimum Gauge of Arch Pipe 2⅔"x ½" Corr. CSP or ACSP | 3" x 1" Corr. CSP or ACSP | 5" x 1" Corr. CSP or ACSP | 2⅔"x ½" Corr. CAP | 3" x 1" Corr. CAP |
|---|---|---|---|---|---|---|---|---|
| 1.0 | 17" x 13" | 1.1 | 15" | 14 | | | 16 | |
| 1.5 | 21" x 15" | 1.6 | 18" | 14 | | | 16 | |
| 2.0 | 24" x 18" | 2.2 | 21" | 14 | | | 16 | |
| 2.5 | 28" x 20" | 2.9 | 24" | 14 | | | 14 | |
| 3.0 or 4.0 | 35" x 24" | 4.5 | 30" | 14 | | | 14 | |
| 5.0 or 6.0 | 42" x 29" | 6.5 | 36" | 14 | | | 12 | |
| 7.0 or 8.5 | 49" x 33" | 8.9 | 42" | 14 | | | 12 | |
| 10.0 or 11.0 | 53" x 41" | 11.7 | 48" | | 14 | | | |
| 10.0 or 11.0 | 57" x 38" | 11.6 | 48" | 12 | | | 10 | |
| 12.5 or 14.0 | 60" x 46" | 15.6 | 54" | | 14 | | | 14 |
| 12.5 or 14.0 | 64" x 43" | 14.7 | 54" | 12 | | | 10 | |
| 16.5 | 66" x 51" | 19.3 | 60" | | 14 | | | 14 |
| 16.5 | 71" x 47" | 18.1 | 60" | 10 | | | 8 | |
| 21.0 | 73" x 55" | 23.2 | 66" | | 14 | | | 14 |
| 21.0 | 77" x 52" | 21.9 | 66" | 8 | | | | |
| 25.0 | 81" x 59" | 27.4 | 72" | | 14 | 12 | | 12 |
| 25.0 | 83" x 57" | 26.0 | 72" | 8 | | | | |
| 32.0 | 87" x 63" | 32.1 | 78" | | 12 | 12 | | 12 |
| 36.0 | 95" x 67" | 37.0 | 84" | | 12 | 12 | | 12 |
| 42.0 | 103" x 71" | 42.4 | 90" | | 12 | 12 | | 10 |
| 47.0 | 112" x 75" | 48.0 | 96" | | 12 | 12 | | 8 |
| 54.0 | 117" x 79" | 54.2 | 102" | | 10 | 10 | | |
| 60.0 | 128" x 83" | 60.5 | 108" | | 10 | 10 | | |
| 67.0 | 137" x 87" | 67.4 | 114" | | 10 | 10 | | |
| 74.0 | 142" x 91" | 74.5 | 120" | | 8 | 8 | | |

GENERAL NOTE for METAL PIPE

Culvert "Type" listed may be CSP, ACSP, CAP, RCP, PVCP & PEP within guidelines of KDOT Pipe Policy for geographic location. More than one pipe "Type" may be acceptable for a design location with allowable types listed for each site.

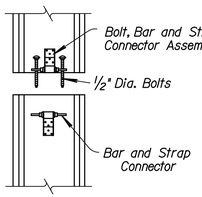
There shall be no payment for gain in pipe length due to fit of pipe at connecting band.

When Hugger Bands are used, the H-7 Hugger Band may be used on circular pipes 36" diameter and smaller or pipe arches 42"x 29" and smaller. The H-10 Hugger Band may be used on 12" thru 120" pipe. The H-12 or H-13 Hugger Band are for pipe sizes larger than 36" diameter or 42"x29" arch pipe.

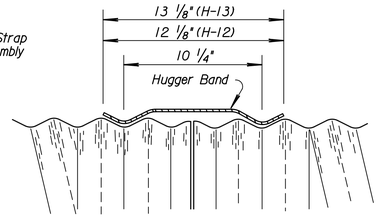
⊛ Pipe gauge listed in the tables on this sheet are minimum for E'=750 p.s.i. soil. Pipe gauge will be determined for each site based on the Design Manual Volume I- Part C Fill Height Tables and shall shall be listed in the Pipe Culvert Summary. Gauges shown on this Standard Drawing are KDOT minimum and may not be industry minimum gauge.

In geographic areas that allow CSP (24" or smaller arched or round pipe) for entrance and side road installation with less than 3,000 AADT, 16 gauge ACSP may be substituted for 14 gauge CSP.

Aluminum or aluminized pipes or end sections shall be coated with an asphaltic paint when in contact with fresh concrete in accordance with the Standard Specifications.

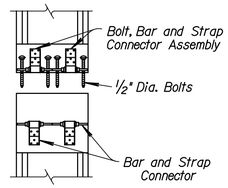



CONNECTION DETAIL
SINGLE HARNESS




UNIVERSAL REFORMED END with
HUGGER BAND

DETAILS FOR H-12 or H-13 HUGGER BAND




CONNECTION DETAIL
DOUBLE HARNESS

| NO. | DATE | REVISIONS | BY | APP'D |
|---|---|---|---|---|
| 4 | 9-10-09 | Rev. Round and Arch tables, add. Alum. | S.W.K. | J.O.B. |
| 3 | 1-20-09 | Rev. Round Pipe Gauges | S.W.K | J.O.B. |
| 2 | 4-18-08 | Rev. layout, details, tables and notes | S.W.K. | J.O.B. |
| 1 | 4-27-98 | Added pipe corrugation option note | R.J.S. | J.O.B. |

KANSAS DEPARTMENT OF TRANSPORTATION

# METAL END SECTION FOR ROUND & ARCH METAL CULVERTS (TYPE I) & PIPE GAUGE TABLES

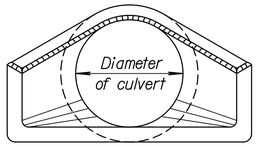
RD660

| | | | |
|---|---|---|---|
| FHWA APPROVAL | 12-16-09 | APP'D. James O. Brewer | |
| DESIGNED | DETAILED | QUANTITIES | TRACED Bowser |
| DESIGN CK. | DETAIL CK. | QUAN.CK. | TRACE CK. King |

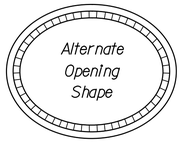
Note to Designer: KDOT Pipe Policy provides guidance in identifying the prohibited and/or restricted uses of CSP, ACSP, PEP, PVCP, CAP & RCP. Provide end sections of the same type and coating as the pipe. Exceptions to this are noted in the Standard Specifications. Refer to the KDOT Design Manual, Volume 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.

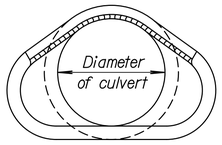
Drawn By : svb
File : I:\2010\10281\Standards\10281-rd660.dgn
Plotted : 2/5/2013

| STATE | PROJECT NO. | YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| KANSAS | 472-84915 | 2013 | 25 | 83 |



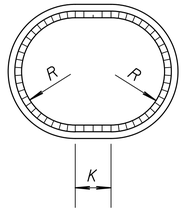

END ELEVATION (TYPE I)



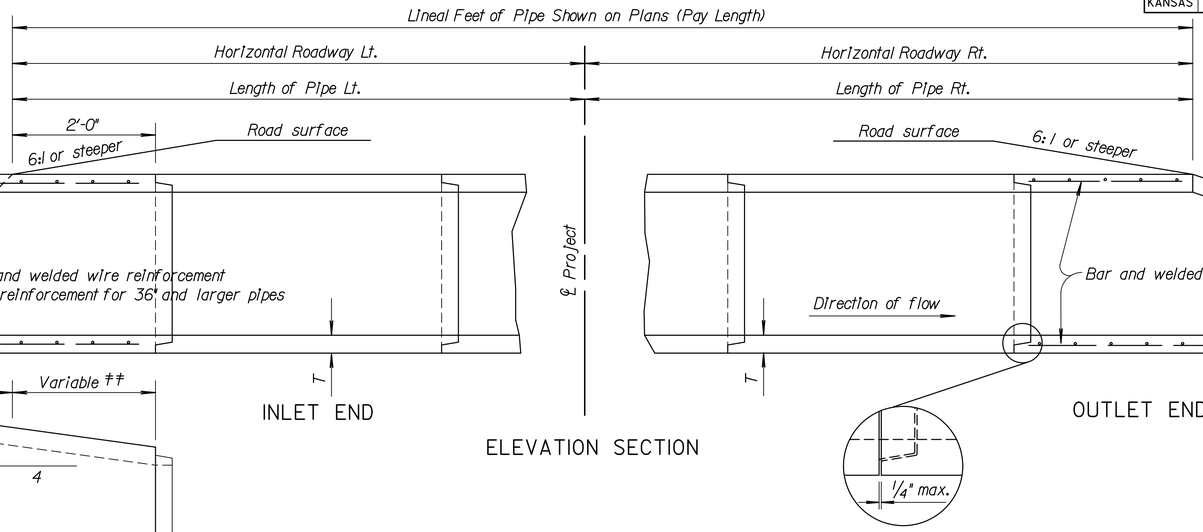



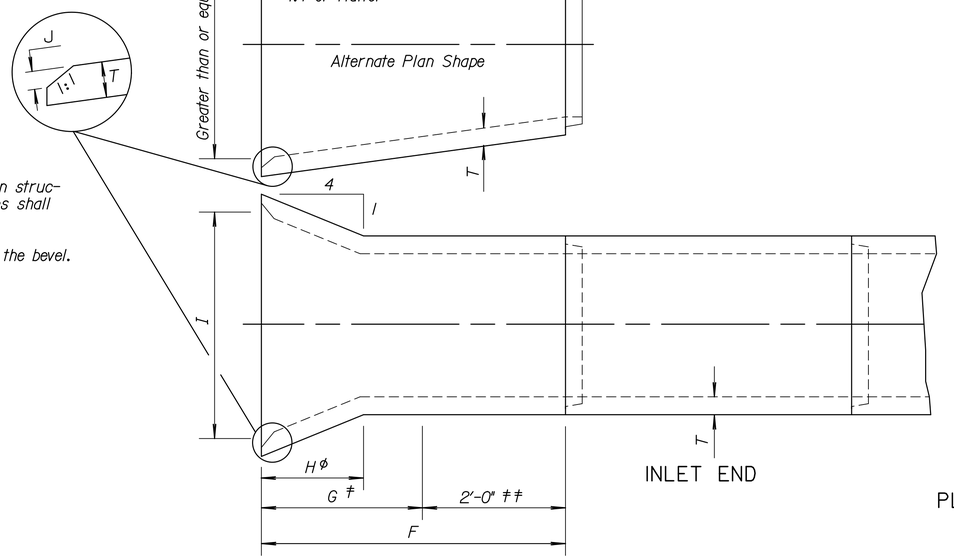

SECTION A-A

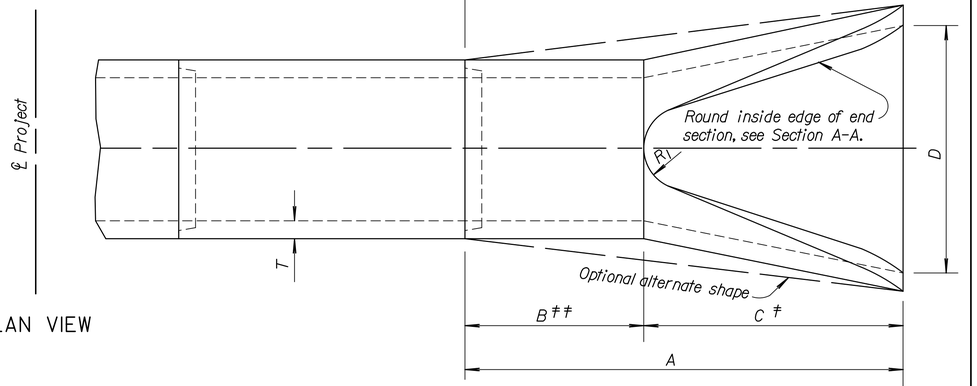
*Showing rounding of inside edge of end section.*




END ELEVATION (TYPE III)




ø *Transition to round pipe.*

ǂ *Paid for as separate item of End Section, except when structures shall bid as alternates. In that case End Sections shall be subsidiary to bid item. "Drainage Structure No. ".*

ǂǂ *Included in pay length of pipe.*

⚹ *Minimum waterway area is calculated at the inside of the bevel.*

## END SECTION (TYPE I) NOMINAL DIMENSIONS

| Diam. | A | B ǂǂ | C ǂ | D | E | $R_1$ | Slope | T |
|---|---|---|---|---|---|---|---|---|
| 12" | 6'-0 7/8" | 4'-0 7/8" | 2'-0" | 2'-0" | 4" | 9 | 3:1 | 2" |
| 15" | 6'-1" | 3'-10" | 2'-3" | 2'-6" | 6" | 11 | 3:1 | 2 1/4" |
| 18" | 6'-1" | 3'-10" | 2'-3" | 3'-0" | 9" | 12 | 3:1 | 2 1/2" |
| 24" | 6'-1 1/2" | 2'-6" | 3'-7 1/2" | 4'-0" | 9 1/2" | 14 | 3:1 | 3" |
| 30" | 6'-1 3/4" | 1'-7 3/4" | 4'-6" | 5'-0" | 1'-0" | 15 | 3:1 | 3 1/2" |
| 36" | 8'-1 3/4" | 2'-10 3/4" | 5'-3" | 6'-0" | 1'-3" | 20 | 3:1 | 4" |
| 42" | 8'-2" | 2'-11" | 5'-3" | 6'-6" | 1'-9" | 22 | 3:1 | 4 1/2" |
| 48" | 8'-2" | 2'-2" | 6'-0" | 7'-0" | 2'-0" | 22 | 3:1 | 5" |
| 54" | 8'-2 1/4" | 2'-9 1/4" | 5'-5" | 7'-6" | 2'-3" | 24 | 2.4 :1 | 5 1/2" |
| 60" | 8'-3" | 3'-3" | 5'-0" | 8'-0" | 2'-11" | 24 | 2:1 | 6" |
| 72" | 8'-3" | 1'-9" | 6'-6" | 9'-0" | 3'-0" | 24 | 1.86 :1 | 7" |
| 84" | 9'-3 1/2" | 1'-9" | 7'-6 1/2" | 10'-0" | 3'-0" | 24 | 1.6 :1 | 8" |

## SIDE TAPERED INLET SECTION (TYPE III)-NOMINAL DIMENSIONS

| Diam. | Min. W.W. ⚹ Area Sq.Ft. | F | G | H | I | J | K | R | T |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |
| 24" | 4.5 | 4'-3" | 2'-3" | 1'-5 1/8" | 2'-8" | 1 1/2" | 8" | 1'-0" | 3" |
| 30" | 7.0 | 4'-9 1/2" | 2'-9 1/2" | 1'-9 1/2" | 3'-4" | 2" | 10" | 1'-3" | 3 1/2" |
| 36" | 10.1 | 5'-4" | 3'-4" | 2'-1 1/2" | 4'-0" | 2" | 1'-0" | 1'-6" | 4" |
| 42" | 13.7 | 5'-10 1/2" | 3'-10 1/2" | 2'-5 7/8" | 4'-8" | 2 1/2" | 1'-2" | 1'-9" | 4 1/2" |
| 48" | 17.9 | 6'-5" | 4'-5" | 2'-10 1/8" | 5'-4" | 3" | 1'-4" | 2'-0" | 5" |
| 54" | 22.7 | 6'-11 1/2" | 4'-11 1/2" | 3'-2 1/2" | 6'-0" | 3 1/2" | 1'-6" | 2'-3" | 5 1/2" |
| 60" | 28.0 | 7'-6" | 5'-6" | 3'-6 7/8" | 6'-8" | 4" | 1'-8" | 2'-6" | 6" |
| 72" | 40.3 | 8'-7" | 6'-7" | 4'-3 5/8" | 8'-0" | 5" | 2'-0" | 3'-0" | 7" |
| 84" | 54.8 | 9'-8" | 7'-8" | 5'-0 3/8" | 9'-4" | 6" | 2'-4" | 3'-6" | 8" |
| | | | | | | | | | |

*Dimensions for alternate shapes shall be equal to or greater than those shown in the table, unless otherwise shown.*

*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 : svb
File : I:\2010\10281\Standards\10281-rd662.dgn
Plotted : 2/5/2013

| NO. | DATE | REVISIONS | BY | APP'D |
|---|---|---|---|---|
| 2 | 4-18-08 | Added ref. to KDOT Pipe Policy | S.W.K. | J.O.B. |
| 1 | 4- 5-05 | Revised reinforcement callout | S.W.K. | J.O.B. |

KANSAS DEPARTMENT OF TRANSPORTATION

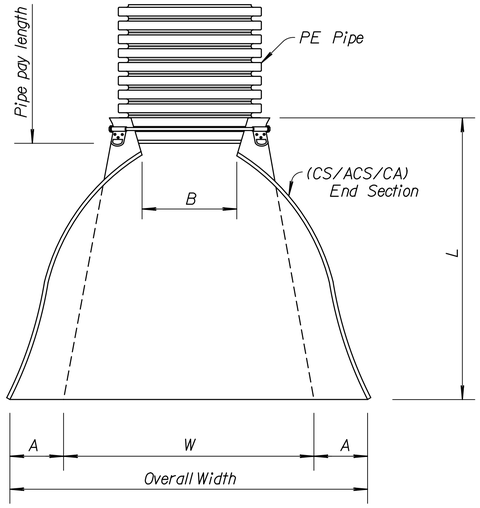
# CONCRETE END SECTIONS FOR CONCRETE PIPES TYPE I & SIDE TAPERED INLET SECTION (TYPE III)

RD662

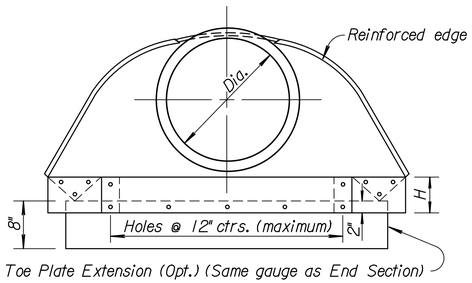
| | | | |
|---|---|---|---|
| FHWA APPROVAL | 6-27-08 | APP'D. James O. Brewer | |
| DESIGNED | DETAILED | QUANTITIES | TRACED Bowser |
| DESIGN CK. | DETAIL CK. | QUAN.CK. | TRACE CK. King |

| STATE | PROJECT NO. | YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| KANSAS | 472-84915 | 2013 | 26 | 83 |

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.

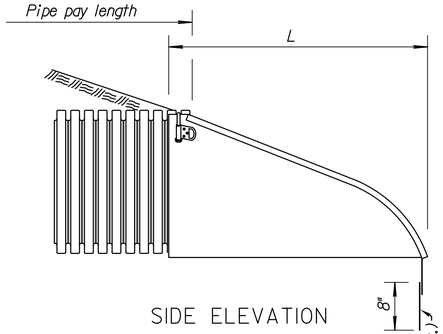



PLAN
*(Illustrated with Type 2 Connector)*



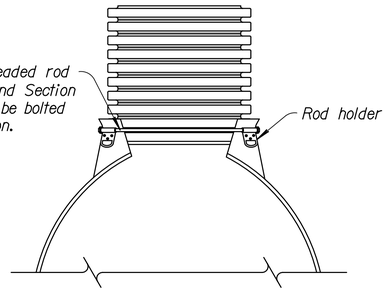

*Toe Plate Extension (Opt.) (Same gauge as End Section)*

FRONT ELEVATION

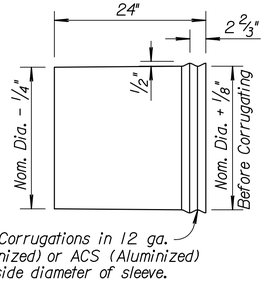



SIDE ELEVATION

*Toe plate extensions where specified, to be punched to match holes in apron lip and bolted with 3/8" dia. bolts. The length of toe plate to be as follows:*
*W + 10" for 12" to 30" diameter pipe inclusive.*
*W + 20" for 36" to 60" diameter pipe inclusive.*

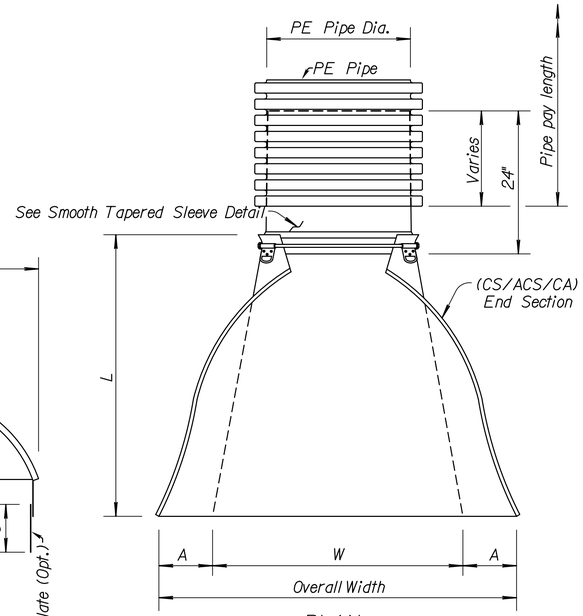



TYPE 2 CONNECTOR
*(12" & Larger)*



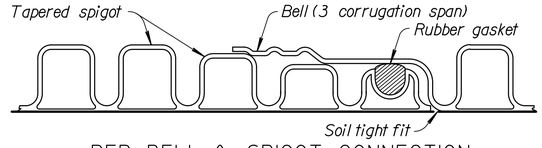

*Form 1/2" x 2 2/3" Corrugations in 12 ga. smooth CS (Galvanized) or ACS (Aluminized) metal, maintain inside diameter of sleeve.*

SMOOTH TAPERED SLEEVE DETAIL
*(Optional)*

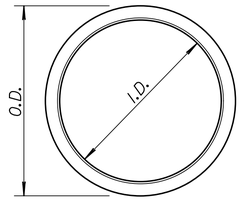



PLAN

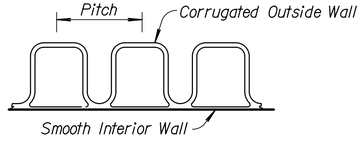
TAPERED SLEEVE FOR ATTACHING METAL END SECTION TO PE PIPE
*(Illustrated with Type 2 Connector)*



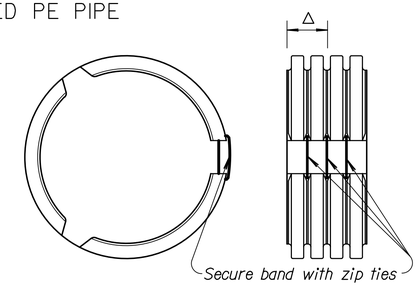

PEP BELL & SPIGOT CONNECTION
SOIL TIGHT JOINT




DETAILS OF
CORRUGATED PE PIPE

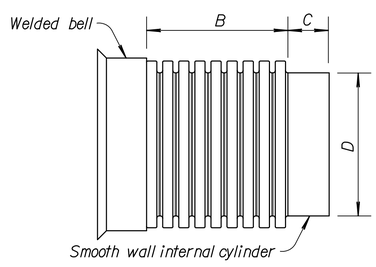



TYPICAL SECTION
CORRUGATED PE PIPE



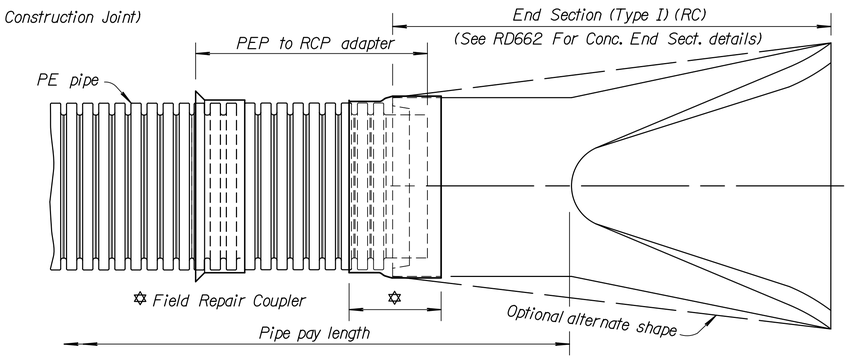

*Δ Two Full Corrugations (Minimum Overlap)*

PEP SPLIT BAND COUPLER
SOIL TIGHT JOINT
*This band is used for (Field Splice Construction Joint)*




PEP to RCP ADAPTER

| PEP TO RCP ADAPTER | | | |
|---|---|---|---|
| Pipe Dia. (In.) | B | C | D |
| 18" | 18 1/4" | 6" | 18" |
| 24" | 25" | 6" | 24" |
| 30" | 32 13/16" | 6" | 30" |
| 36" | 36 3/4" | 6" | 36" |
| 42" | 36" | 6" | 41 1/4" |
| 48" | 36 3/4" | 6" | 41 1/4" |
| 60" | 36" | 6" | 59" |




PEP to RCP ADAPTER to CONCRETE END SECTION
*(This installation is for Acidic Soil Conditions)*

GENERAL NOTES

*The culvert type shall meet the KDOT Pipe Policy & Standard Specifications.*

*The size of pipe designated on the plan shall be the nominal inside diameter of a two wall corrugated PE pipe (Type S).*

*PE pipe couplings shall be designed to cover at least two full corrugations on each side of a joint.*

*No additional payment shall be made for any gain in length due to the fit of the pipe at connections.*

*All corrugated PE pipe, end sections, couplings, and fittings shall conform with the Standard Specifications.*

*See Standard Specifications for PE Pipe bedding and backfill.*

*Multiple panel end sections shall have lap seams which are to be tightly joined by bolts & nuts. Corner plate and toe plate to be same gauge and material as end section. When required optional toe plate extension shall be overall width less 6" x 8" high.*

*Attachment to PE pipe 12" diameter and up shall be made with Type 2 Connector.*

*All work and materials required for construction and installation of end section shall be included in the bid item "End Section".*

| (CS/ACS/CA) END SECTION FOR PE PIPE | | | | | | | |
|---|---|---|---|---|---|---|---|
| Pipe Dia. (In.) | Min. Gauge Ends | Dimensions in Inches | | | | | Slope |
| | | A (min.) | B (max.) | H (min.) | L (+/-2") | W (min.) | |
| 12" | 16 | 6 | 7 | 6 | 21 | 24 | 2 1/2:1 |
| 15" | 16 | 7 | 8 | 6 | 26 | 30 | 2 1/2:1 |
| 18" | 16 | 8 | 10 | 6 | 31 | 36 | 2 1/2:1 |
| 21" | 16 | 9 | 12 | 6 | 36 | 42 | 2 1/2:1 |
| 24" | 16 | 10 | 13 | 6 | 41 | 48 | 2 1/2:1 |
| 30" | 14 | 12 | 16 | 8 | 51 | 60 | 2 1/2:1 |
| 36" | 14 | 14 | 19 | 9 | 60 | 72 | 2 1/2:1 |
| 42" | 12 | 16 | 25 | 11 | 69 | 84 | 2 1/2:1 |
| 48" | 12 | 18 | 29 | 12 | 78 | 90 | 2 1/4:1 |
| 54" | 12 | 18 | 33 | 12 | 84 | 102 | 2 1/4:1 |
| 60" | 12/10 | 18 | 36 | 12 | 87 | 114 | 2:1 |

| NO. | DATE | REVISIONS | BY | APP'D |
|---|---|---|---|---|
| 1 | 2-8-08 | Added ref. to KDOT pipe policy | S.W.K | J.O.B |

KANSAS DEPARTMENT OF TRANSPORTATION

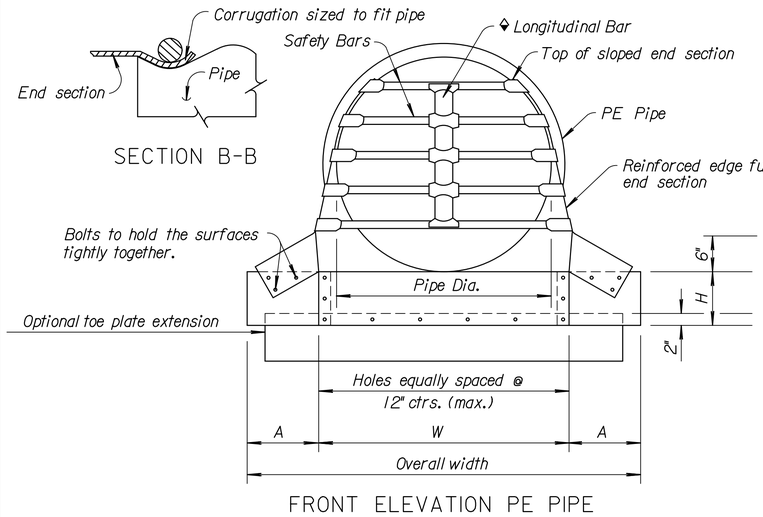
# METAL/CONCRETE END SECTION (TYPE I) for PE PIPE

RD667

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

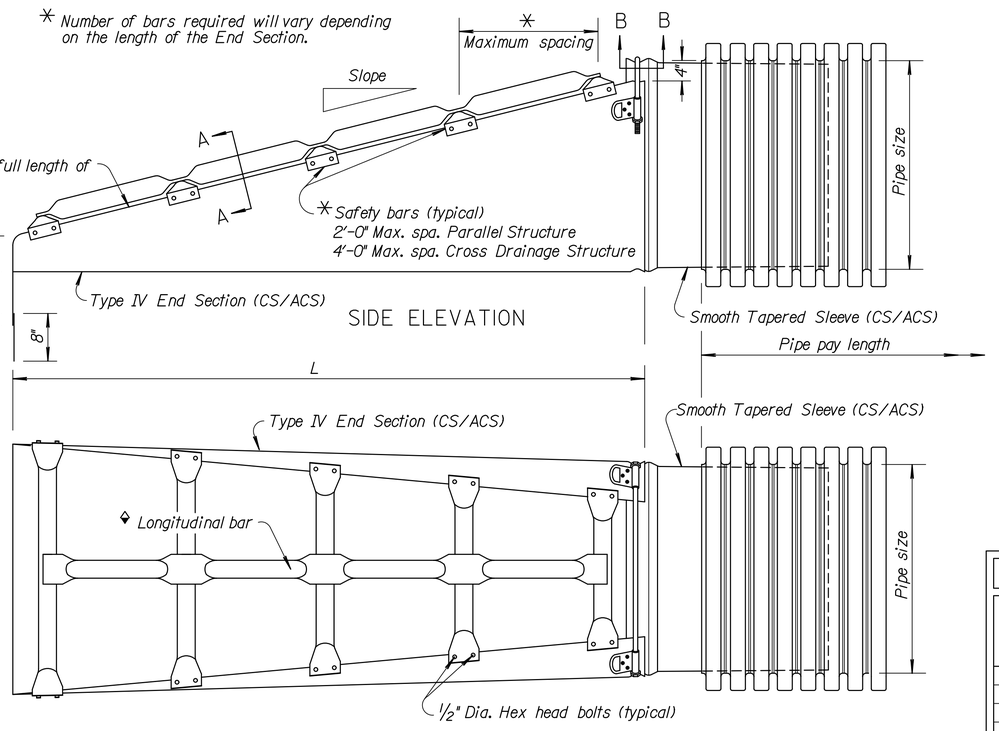
Drawn By: svb
Plotted: 2/5/2013
File: I:\2010\10281\Standards\10281-rd667.dgn

| STATE | PROJECT NO. | YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| KANSAS | 472-84915 | 2013 | 27 | 83 |




SECTION B-B

FRONT ELEVATION PE PIPE




SIDE ELEVATION

PLAN

*GENERAL NOTES*

*The culvert type shall meet the KDOT Pipe Policy & Standard Specifications.*

*The size of pipe designated on the plan shall be the nominal inside diameter of a two wall corrugated PE pipe (Type S).*

*Couplings shall be designed to cover at least two full corrugation on each side of a joint.*

*No additional payment shall be made for any gain in length due to the fit of the pipe at connections.*

*All corrugated PE pipe, end sections, couplings, and fittings shall conform with the Standard Specifications.*

*See Standard Specifications for PE Pipe bedding and backfill.*

*Multiple panel end sections shall have lap seams which are to be tightly joined by bolts & nuts. Corner plate and toe plate to be same gauge and material as end section. When required optional toe plate extension shall be overall width less 6" x 8" high.*

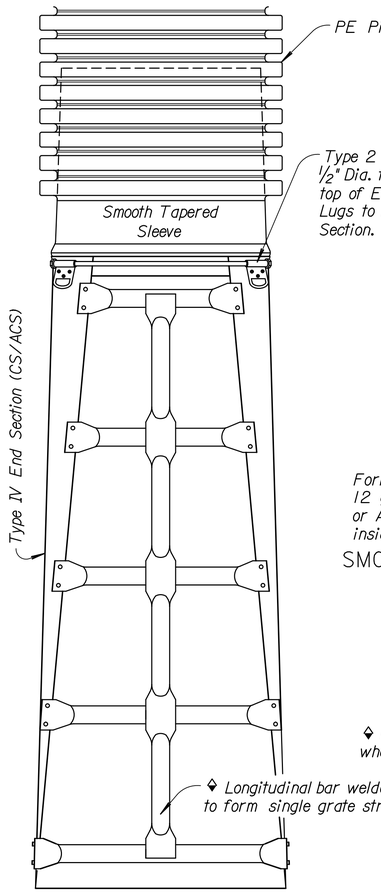
*Safety bars shall be fabricated from steel pipe meeting the requirements of ASTM A-53 Schedule 40 Specifications. Safety bars shall be hot dipped galvanized after fabrication.*

*Attachment to PE pipe shall be made with Smooth Tapered Sleeve.*

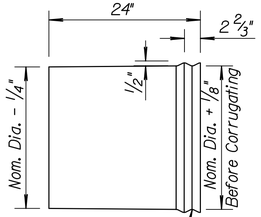
*All work and materials required for construction and installation of safety slope end section shall be included in the bid item "End Section (Type IV)".*

TYPE IV END SECTIONS (CS or ACS) FOR PE PIPE

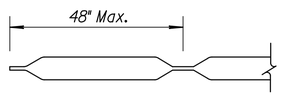
| Pipe Dia. (In.) | Min. Gauge Ends | Dimensions + or - 2" | | | | L Dimensions + or - 2" | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | A | H | W | Overall Width | Slope | Length (In.) | Slope | Length (In.) |
| 30" | 12 | 12 | 9 | 36 | 60 | 4:1 | 80 | 6:1 | 120 |
| 36" | 12 | 12 | 9 | 42 | 66 | 4:1 | 104 | 6:1 | 156 |
| 42" | 12 | 16 | 12 | 48 | 80 | 4:1 | 128 | 6:1 | 192 |
| 48" | 12 | 16 | 12 | 54 | 86 | 4:1 | 152 | 6:1 | 228 |
| 54" | 12 | 16 | 12 | 60 | 92 | 4:1 | 176 | 6:1 | 264 |
| 60" | 12 | 16 | 12 | 66 | 98 | 4:1 | 200 | 6:1 | 300 |




TYPE 2 CONNECTOR DETAILS
*(For 30" and larger pipe)*

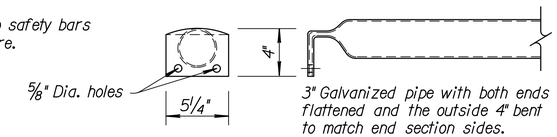



SMOOTH TAPERED SLEEVE DETAIL
*(Required with Type IV on PE Pipe)*

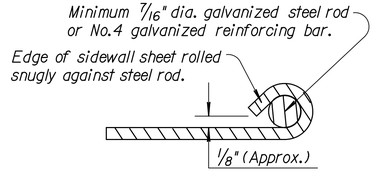



LONGITUDINAL BAR DETAIL

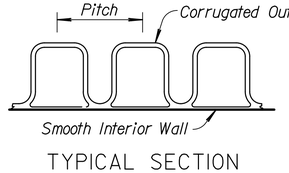
*Longitudinal bar required for cross drainage structures when span is greater than 30".*



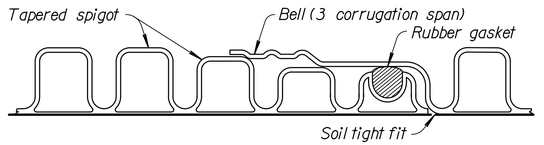

DETAIL OF SAFETY BAR
*(Optional)*



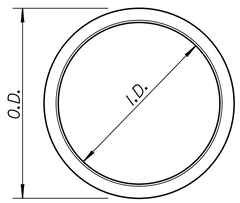

SECTION A-A



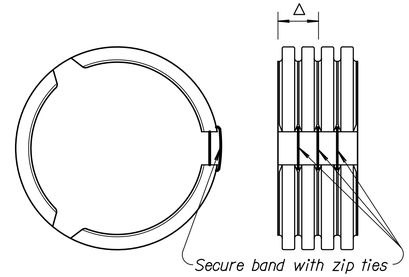

TYPICAL SECTION
CORRUGATED PE PIPE




PEP BELL & SPIGOT CONNECTION
SOIL TIGHT JOINT




DETAILS OF
CORRUGATED PE PIPE




Δ *Two Full Corrugations (Minimum Overlap)*

PEP SPLIT BAND COUPLER
SOIL TIGHT JOINT
*This band is used for (Field Splice Construction Joint)*

*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 : svb
File : I:\2010\10281\Standards\10281-rd667a.dgn
Plotted : 2/5/2013

| NO. | DATE | REVISIONS | BY | APP'D |
|---|---|---|---|---|
| 1 | 2-8-08 | Add ref. to KDOT pipe policy | S.W.K | J.O.B |

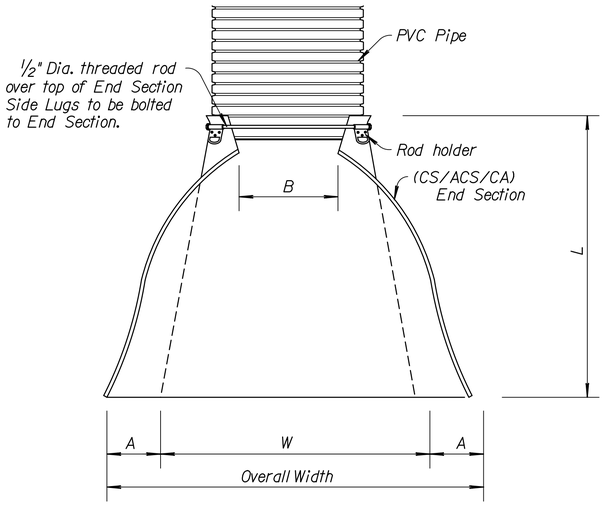
KANSAS DEPARTMENT OF TRANSPORTATION

# TYPE IV END SECTION FOR PE PIPE

RD667 A

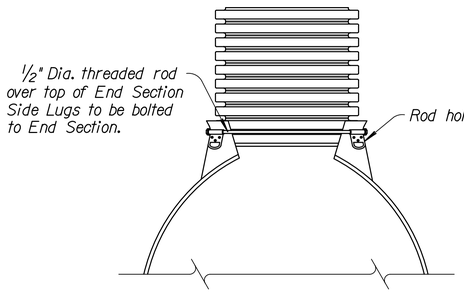
| | | | |
|---|---|---|---|
| FHWA APPROVAL | 6-27-08 | APP'D. James O. Brewer | |
| DESIGNED | DETAILED | QUANTITIES | TRACED Bowser |
| DESIGN CK. | DETAIL CK. | QUAN.CK. | TRACE CK. King |

| STATE | PROJECT NO. | YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| KANSAS | 472-84915 | 2013 | 28 | 83 |



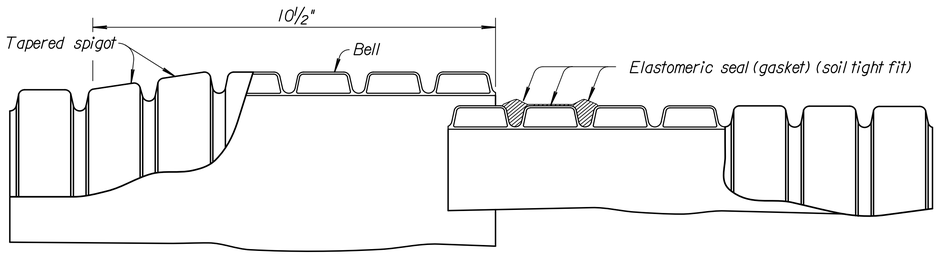

PLAN

(Illustrated with Type 2 Connector on 12" or larger)




TYPE 2 CONNECTOR

(12" & Larger)




PVC BELL & SPIGOT CONNECTION
SOIL TIGHT JOINT




FRONT ELEVATION

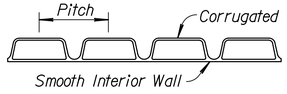



SIDE ELEVATION

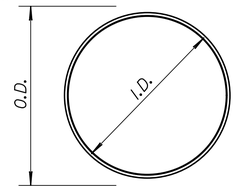
⊛ Toe plate extensions where specified, to be punched to match holes in apron lip and bolted with ⅜" dia. bolts. The length of toe plate to be as follows:

W + 10" for 12" to 30" diameter pipe inclusive.

W + 20" for 36" to 60" diameter pipe inclusive.




TYPICAL SECTION
CORRUGATED PVC PIPE




DETAILS OF
CORRUGATED PVC PIPE

## GENERAL NOTES

The culvert type shall meet the KDOT Pipe Policy & Standard Specifications.

The size of pipe designated on the plan shall be the nominal inside diameter of a two wall corrugated PVC pipe.

PVC pipe shall be joined with an integral bell gasket joint and Flexible Elastomeric Seals. PVC Pipe is available in lengths of 2.5' to 20'. PVC pipe can be field cut to length, cut through a corrugation valley using a hand or power saw. Gaskets are shipped loose and fitted on spigot/cut pipe end following Manufacturer's installation instructions.

No additional payment shall be made for any gain in length due to the fit of the pipe at connections.

All corrugated PVC pipe, end sections and fittings shall conform with the Standard Specifications.

See Standard Specifications for PVC Pipe bedding and backfill.

Multiple panel end sections shall have lap seams which are to be tightly joined by bolts & nuts. Corner plate and toe plate to be same gauge and material as end section. When required optional toe plate extension shall be overall width less 6" x 8" high.

The End Section attachment to PVC pipe shall be made with a Type 2 Connector for 12" or greater pipe size.

All work and materials required for construction and installation of end section shall be included in the bid item "End Section".

(CS/ACS/CA) END SECTION FOR PVC PIPE

| Pipe Dia. (In.) | Min. Gauge Ends | Dimensions in Inches A ±" Tol. | B (max.) | H (min.) | L (+/- 2") | W (min.) | Slope |
|---|---|---|---|---|---|---|---|
| 12" | 16 | 6 | 7 | 6 | 21 | 24 | 2½:1 |
| 15" | 16 | 7 | 8 | 6 | 26 | 30 | 2½:1 |
| 18" | 16 | 8 | 10 | 6 | 31 | 36 | 2½:1 |
| 21" | 16 | 9 | 12 | 6 | 36 | 42 | 2½:1 |
| 24" | 16 | 10 | 13 | 6 | 41 | 48 | 2½:1 |
| 30" | 14 | 12 | 16 | 8 | 51 | 60 | 2½:1 |
| 36" | 14 | 14 | 19 | 9 | 60 | 72 | 2½:1 |

| NO. | DATE | REVISIONS | BY | APP'D |
|---|---|---|---|---|
| | 2-8-08 | Added ref. to KDOT Pipe Policy | S.W.K | J.O.B |

KANSAS DEPARTMENT OF TRANSPORTATION

# METAL END SECTION (TYPE I) for PVC PIPE

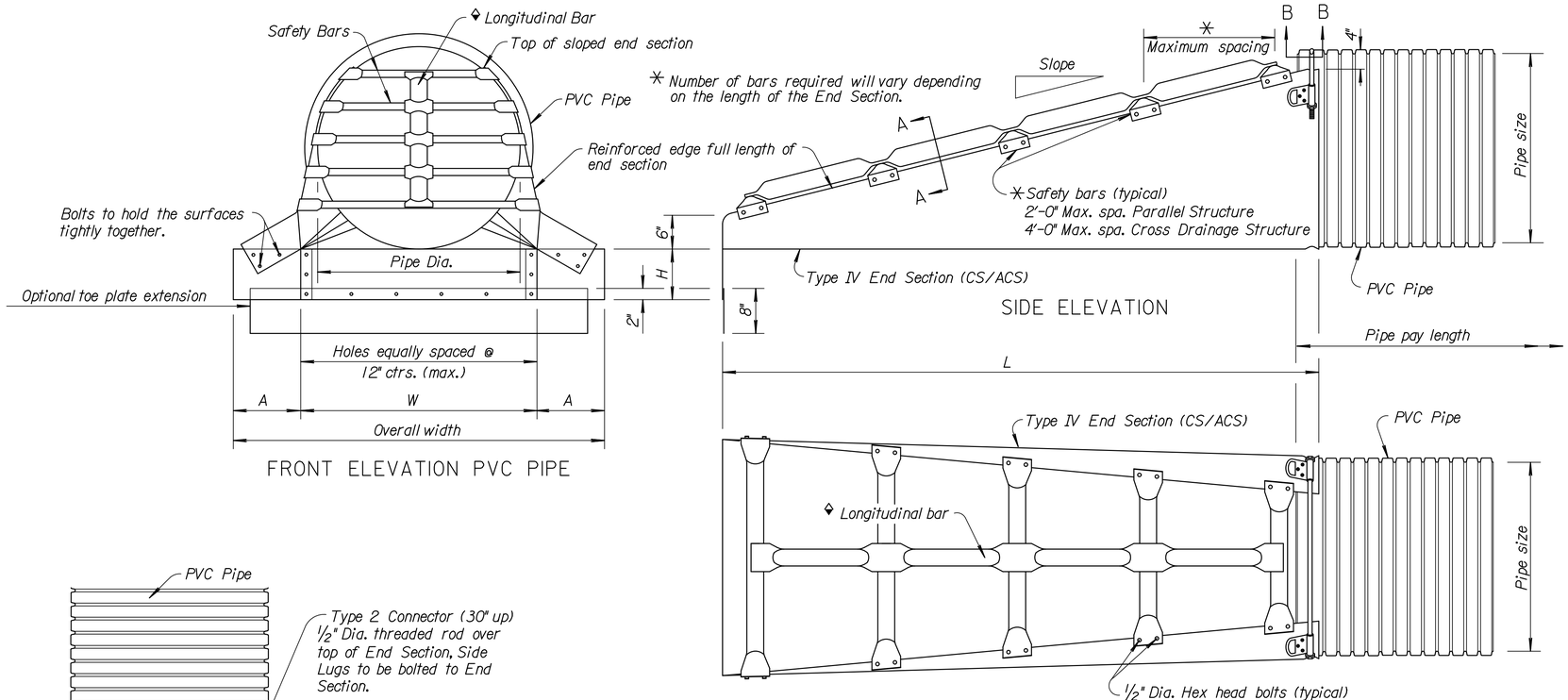
RD667 B

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

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 : svb
Plotted : 2/5/2013
File : I:\2010\10281\Standards\10281-rd667b.dgn

| STATE | PROJECT NO. | YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| KANSAS | 472-84915 | 2013 | 29 | 83 |

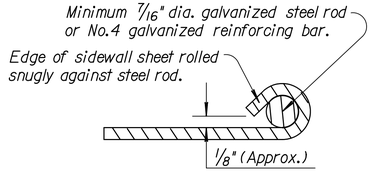




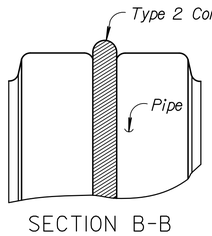


TYPE 2 CONNECTOR DETAILS

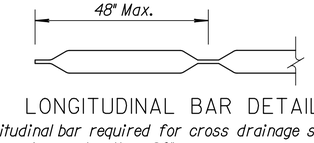
Note: Bars shown are for Cross Drainage Structures.




SECTION A-A

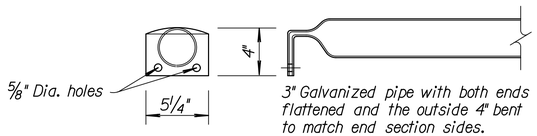



SECTION B-B




LONGITUDINAL BAR DETAIL

Longitudinal bar required for cross drainage structures when span is greater than 30".




DETAIL OF SAFETY BAR
(Optional)

GENERAL NOTES

The culvert type shall meet the KDOT Pipe Policy & Standard Specifications.

The size of pipe designated on the plan shall be the nominal inside diameter of a two wall corrugated PVC pipe.

PVC pipe shall be joined with an integral bell gasket joint and Flexible Elastomeric Seals. PVC Pipe is available in lengths of 2.5' to 20'. PVC pipe can be field cut to length, cut through a corrugation valley using a hand or power saw. Gaskets are shipped loose and fitted on spigot/cut pipe end following Manufacturer's installation instructions.

No additional payment shall be made for any gain in length due to the fit of the pipe at connections.

All corrugated PVC pipe, end sections and fittings shall conform with the Standard Specifications.

See Standard Specifications for PVC Pipe bedding and backfill.

Multiple panel end sections shall have lap seams which are to be tightly joined by bolts & nuts. Corner plate and toe plate to be same gauge and material as end section. When required optional toe plate extension shall be overall width less 6" x 8" high.

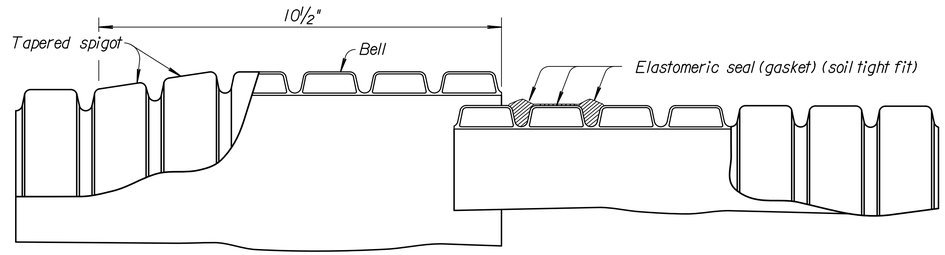
Safety bars shall be fabricated from steel pipe meeting the requirements of ASTM A-53 Schedule 40 Specifications. Safety bars shall be hot dipped galvanized after fabrication.

Type IV End Section attachment to PVC pipe shall be made with Type 2 Connector.

All work and materials required for construction and installation of safety slope end section shall be included in the bid item "End Section (Type IV)".

TYPE IV END SECTIONS (CS or ACS) FOR PVC PIPE

| Pipe Dia. (In.) | Min. Gauge Ends | Dimensions + or - 2" | | | | L Dimensions + or - 2" | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | A | H | W | Overall Width | Slope | Length (In.) | Slope | Length (In.) |
| 30" | 12 | 12 | 9 | 36 | 60 | 4:1 | 80 | 6:1 | 120 |
| 36" | 12 | 12 | 9 | 42 | 66 | 4:1 | 104 | 6:1 | 156 |




PVCP BELL & SPIGOT CONNECTION
SOIL TIGHT JOINT

| NO. | DATE | REVISIONS | BY | APP'D |
|---|---|---|---|---|
| 1 | 2-8-08 | Added ref. to KDOT pipe policy | S.W.K | J.O.B |

KANSAS DEPARTMENT OF TRANSPORTATION

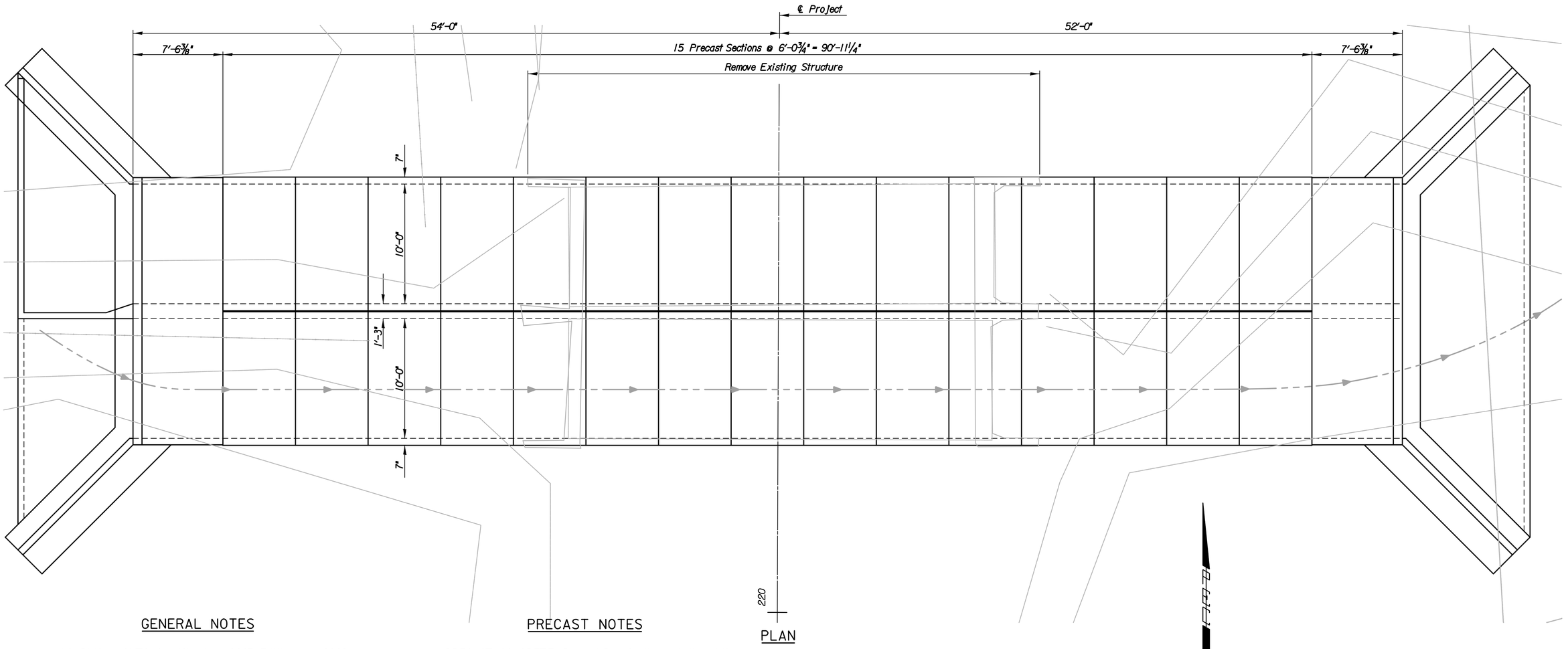
TYPE IV END SECTION FOR PVC PIPE

RD667 C

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

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 : svb Plotted : 2/5/2013
File : I:\2010\10281\Standards\10281-rd667c.dgn




## GENERAL NOTES

*LOADING:* AASHTO Specifications, 2007 Edition and 2009 Interim Specifications. Load and Resistance Factor Design

*UNIT STRESSES:*
Concrete F'c = 4,000 p.s.i.
Reinforcing Steel Fy = 60,000 p.s.i.

*CONSTRUCTION:* The Contractor must use precast construction plus cast-in-place end sections.

*JOINTS:* Construction Joints shall only be formed at locations shown or as approved by the Engineer

*EXCAVATION:* All excavation and backfill shall extend 2 feet beyond the sides of the box and wingwall.

*CONFLICT:* If RCB plan notes conflict with the General Notes from this sheet, then these General Notes will govern.

*PAYMENT:* The RCB shall be bid as a Linear Feet and shall include all labor, material, excavation, concrete, reinforcing steel, seal course, precast box sections, and any other incidentals necessary to complete the work as described in the plans. Quantities shown are for information only.

*REMOVAL OF EXISTING STRUCTURE:* See Sheet No. 5 for Clarification.

## PRECAST NOTES

*PRECAST CONCRETE:* Precast Box Sections shall meet the appropriate design and inspection requirements of A.S.T.M. Designation C850, Table 2 or C789, Table 2 whichever is critical and the Loading Specifications. The intermediate Joints shall be sealed with a mastic compound which shall be provided for approval with the shop detail submittal. The Contractor shall furnish, to the Engineer, detail plans and shop drawings showing the proposed precast layout and all other details for manufacture and delivery of any precast items to be incorporated into the work.

*SEAL COURSE:* A Seal Course shall be constructed below the R.C.B. as shown in the Plans. The Seal Course below Precast Sections shall consist of a 6 inch Granular Base (ASTM 67). No reinforcing shall be placed until the Seal Course has gained sufficient strength to permit working upon it without injury.

*REINFORCING STEEL:* All dimensions relative to reinforcing are to centerline of bars unless otherwise noted. Bar bending and dimensions shall be as shown and noted on the Bar Bending Diagrams. Reinforcing used in the Precast Sections is not required to be epoxy coated. The concrete cover for all reinforcing shall be 1 1/2" minimum unless otherwise noted. A revised bar schedule will be required at shop detail submittal for any deviation from plan scope.

*Doweling details between pre-cast and cast-in-place ends must be submitted for approval by the Engineer.*

## DRAINAGE DATA

| | |
|---|---|
| Drainage Area | 0.70 Sq. Mi. |
| Design Frequency | 25 Yr. |
| Design Discharge $Q_{10}$ | 709 CFS |
| Design High Water Elevation | 1340.15 Ft. |
| Change in Design Backwater | -0.10 Ft. |
| Design Backwater Elevation | 1341.39 Ft. |
| Overtopping Elevation (219+62.00) | 1341.30 Ft. |
| Overtopping Discharge | 890 CFS |
| Overtopping Frequency | 55 Yr. |
| Discharge at $Q_{100}$ | 1027 CFS |
| Change in Backwater at $Q_{100}$ | -0.07 Ft. |
| Backwater Elevation at $Q_{100}$ | 1342.08 Ft. |
| Historic High Water Elevation | Unknown Ft. |
| Ordinary High Water Elevation | 1341.32 Ft. |
| Total Waterway Provided | 100 Sq. Ft. |
| Design Waterway Provided | 100 Sq. Ft. |
| Estimated Ordinary High Water Discharge | 300 CFS |

| No. | Revision | By | Date |
|---|---|---|---|
| | | | |

135TH ST. Sta. 220+25.08

# RCB LAYOUT
## 2-10'x6'

GARY JANZEN, P.E.-CITY ENGINEER
CITY OF WICHITA PROJECT NO. 472-84915

PEC
PROFESSIONAL ENGINEERING CONSULTANTS, P.A.
303 SOUTH TOPEKA WICHITA, KS 67202
316-262-2691 www.pec1.com

| | | | |
|---|---|---|---|
| Designed by | MLB | Job No. | 10281 |
| Drawn by | CP | Date | JAN., 2013 |

Sht. 30 of 83

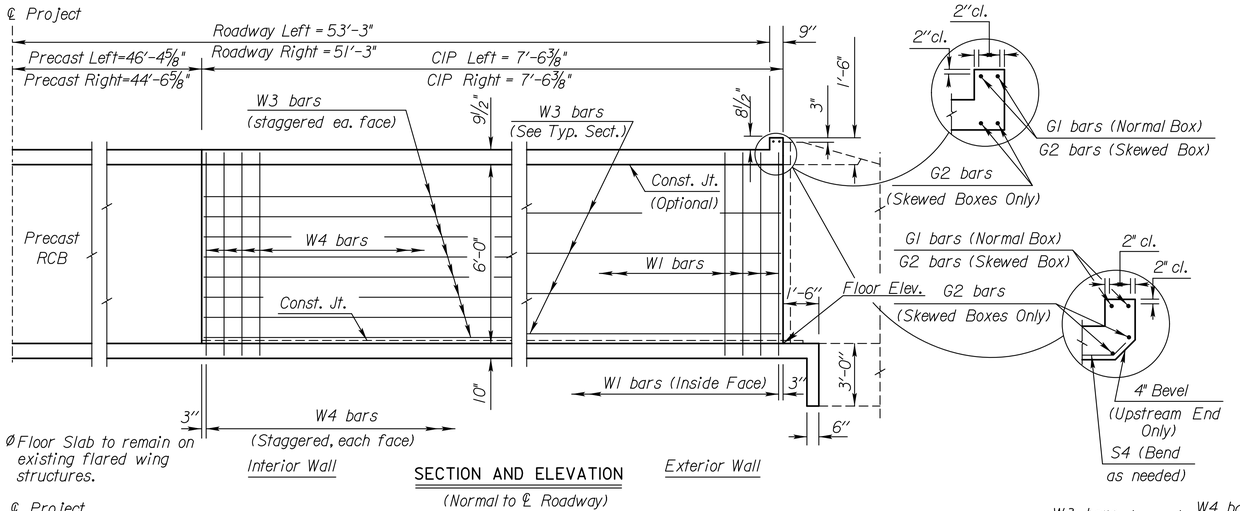
Plotted By: mlb Date: 4/18/2013 4:09:37 PM
FILE: I:\2010\1028\Bridge\LRFD Boxes\1028I-2-10x6 GeneralNotes.dgn

| STATE | PROJECT NO. | YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| KANSAS | 472-84915 | 2013 | 31 | 83 |

| SYSTEM PART | VERSION/ID |
|---|---|
| CADD V8A | 12/6/2000 |
| DATABASE | 4/25/2012 |
| RCB PROGRAM | 7.1.12 |
| KBOX MODEL ID | 1086 |
| CELL LIBRARY | 1/9/2012 |

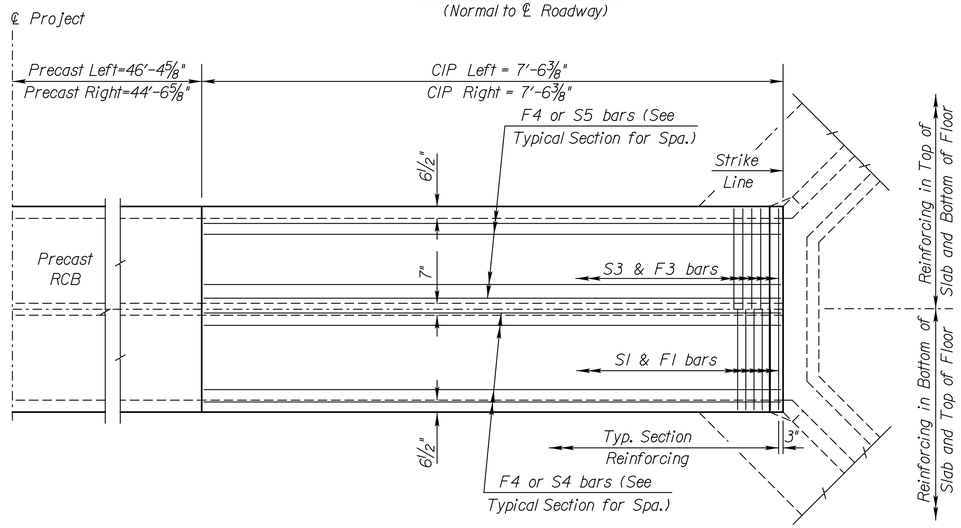
06

Plot Location:
File: I:\2010\V\028I\Bridge\LRFD Boxes\2013-04-16_10281_2-10x6fBox1.dgn
Plotted By: mlb
Plot Date: 18-APR-2013 16:17

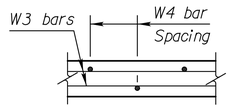



SECTION AND ELEVATION

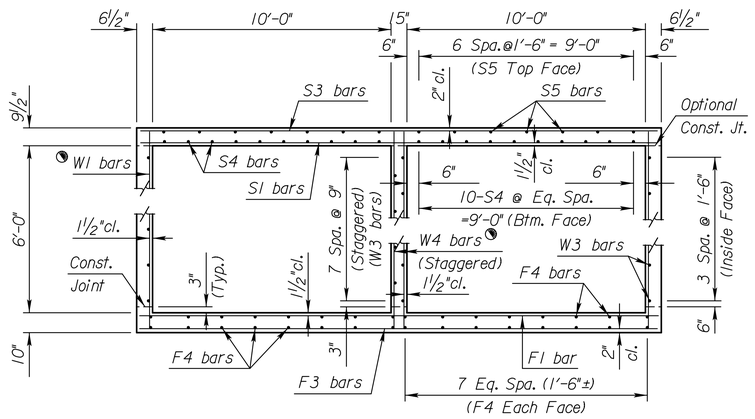
(Normal to ℄ Roadway)




PLAN




PLAN OF INTERIOR WALL




TYPICAL SECTION

◔ See RCB Auxiliary Details for Optional Splice.

See Standard No. RD 080 for additional details.

## 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 includes the surfacing.

CONCRETE: Use concrete conforming to Grade 4.0 Concrete. Bevel all exposed edges with a ¾" triangular molding. Where Grade 4.0(AE) is specified, place this concrete in the top slab above the Construction Joint.

REINFORCING: Use reinforcing steel conforming to ASTM A615, Grade 60. All dimensions relative to reinforcing steel are to the centerline of the 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.

SEAL COURSE: The Engineer may require a seal course. The seal course shall be unreinforced Concrete(Commercial Grade) with a minimum depth of 3 inches or as determined by the Engineer. Concrete for the seal course shall be paid for at the unit price set for Concrete for Seal Course.

FOUNDATION STABILIZATION: The Foundation Stabilization quantity has been calculated to the limits shown on the "RCB Auxiliary Details" sheet. The depth 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.

QUANTITIES: The quantities shown in the Culvert Summary include apron and/or soil saver quantities when they are required by the plans. Payment for additional quantities that result from including a seal course and/or a floating apron, as a change in the 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: Construct the wingwalls and that portion of the RCB outside the Strike Line level. Construct the wingwall footings with the culvert floor. See the wingwall detail sheets.

BRIDGE BACKWALL PROTECTION SYSTEM: For structures with two foot of fill or less that have this bid item in the Summary of Quantities. See the "Auxiliary Details" sheet.

* Includes Soil Saver

CULVERT SUMMARY

⧖ For design purposes ONLY. Do NOT use for Construction ◔ includes any welded wire fabric

| | Floor Elev. | Crown Gr. Elev. | ⧖Design Fill Ht. | Skew | 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 | Operating |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ext.Lt. | 1331.40 | 1341.29 | 2 | 0 | Flared | Yes | Yes | 14.43 | *16.62 | 31.05 | 2420 | * 1178 | 3598 | 1.30 | 1.66 |
| Ext.Rt. | 1331.10 | | | | Flared | | | 14.43 | 15.97 | 30.40 | 2420 | 1435 | 3855 | | |

** For Information Only

BAR SCHEDULE

| | F1 Size | F1 Spa. | F1 No. | F1 Length | F3 Size | F3 Spa. | F3 No. | F3 Length | F4 Size | F4 No. | F4 Length | S1 Size | S1 Spa. | S1 No. | S1 Length | S3 Size | S3 Spa. | S3 No. | S3 Length | S4 Size | S4 No. | S4 Length | S5 Size | S5 No. | S5 Length |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ext.Lt. | 6 | 6" | 15 | 22'-0" | N/A | N/A | N/A | N/A | 6 | 6" | 15 | 22'-0" | 4 | 32 | 7'-2" | 6 | 6" | 15 | 22'-0" | N/A | N/A | N/A | N/A | 6 | 6" | 15 | 22'-0" | 5 | 20 | 7'-2" | 4 | 14 | 7'-2" |
| Ext.Rt. | 6 | 6" | 15 | 22'-0" | N/A | N/A | N/A | N/A | 6 | 6" | 15 | 22'-0" | 4 | 32 | 7'-2" | 6 | 6" | 15 | 22'-0" | N/A | N/A | N/A | N/A | 6 | 6" | 15 | 22'-0" | 5 | 20 | 7'-2" | 4 | 14 | 7'-2" |

| | K1 Size | K1 Spa. | K1 No. | K1 Length | K2 Size | K2 Spa. | K2 No. | K2 Length | W1 Size | W1 Spa. | W1 No. | W1 Length | W2 Size | W2 Spa. | W2 No. | W2 Length | W3 Size | W3 No. | W3 Length | W4 Size | W4 Spa. | W4 No. | W4 Length | G1 Size | G1 No. | G1 Length | G2 Size | G2 No. | G2 Length |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ext.Lt. | N/A | N/A | N/A | | N/A | N/A | N/A | | 5 | 9" | 22 | 7'-3" | N/A | N/A | N/A | N/A | 4 | 16 | 7'-2" | 4 | 9" | 11 | 7'-3" | 5 | 2 | 22'-0" | N/A | N/A | N/A |
| Ext.Rt. | N/A | N/A | N/A | | N/A | N/A | N/A | | 5 | 9" | 22 | 7'-3" | N/A | N/A | N/A | N/A | 4 | 16 | 7'-2" | 4 | 9" | 11 | 7'-3" | 5 | 2 | 22'-0" | N/A | N/A | N/A |

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

SUMMARY OF QUANTITIES **

| | |
|---|---|
| Concrete (Grade 4.0) | 61.5 C.Y. |
| Concrete (Grade 4.0)(AE) | 0.0 C.Y. |
| Bridge Backwall Protection System (Subsidiary) | --- S.Y. |
| Reinforcing Steel (Gr. 60) | 7453 Lbs. |
| Reinforcing Steel (Gr. 60)(Epoxy Coated) | 0 Lbs. |
| Class III Excavation | 190 C.Y. |
| Foundation Stabilization | 16 C.Y. |
| Concrete for Seal Course (Set) | 1 C.Y. |
| Granular Backfill (Wingwalls) | 44 C.Y. |

| NO. | DATE | REVISIONS | BY | APP'D |
|---|---|---|---|---|
| 1 | | | | |

KANSAS DEPARTMENT OF TRANSPORTATION

Br. No. 530400876787045 Sta. 220+25.08

DOUBLE 10 ft x 6 ft RCB

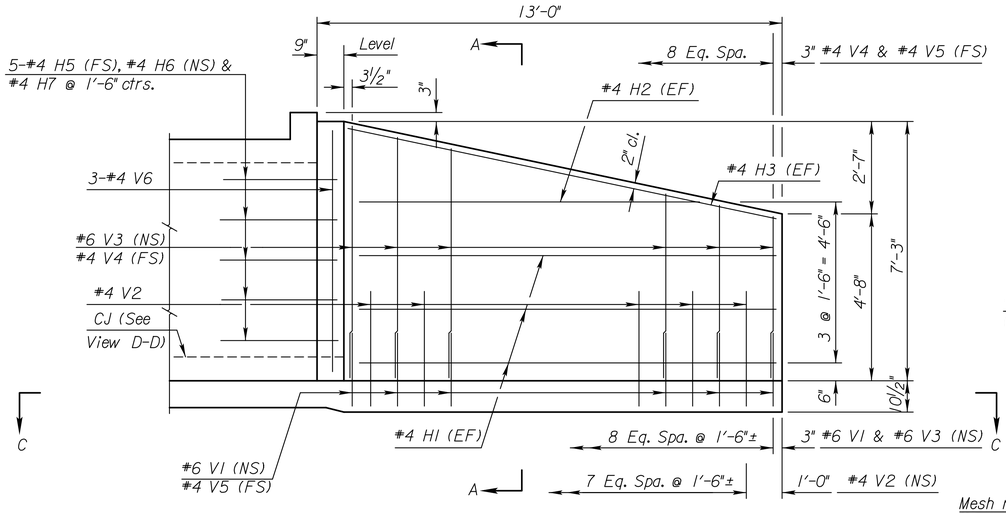
52.0 ft EXT. RT.

54.0 ft EXT. LT.

~~BR 2.10.6 P~~ Sedgwick Co.

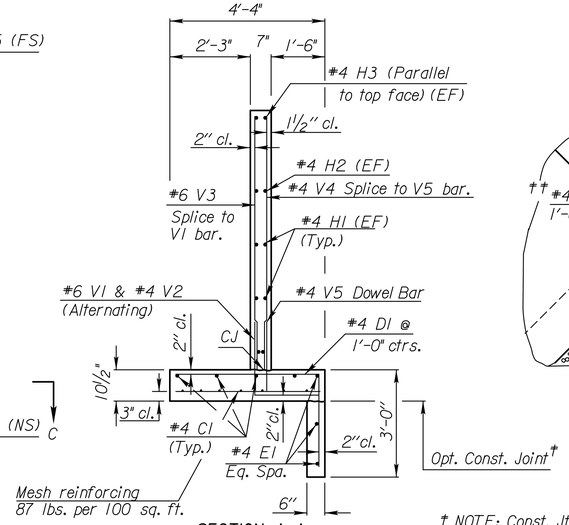
| FHWA APPROVAL | 10-20-10 | APP'D | Terry L. Fleck |
|---|---|---|---|
| DESIGNED | DETAILED | QUANTITIES | CADD |
| DESIGN CK. | DETAIL CK. | QUAN. CK. | CADD CK. |

| STATE | PROJECT NO. | YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| KANSAS | 472-84915 | 2013 | 32 | 83 |




ELEVATION OF WINGWALL

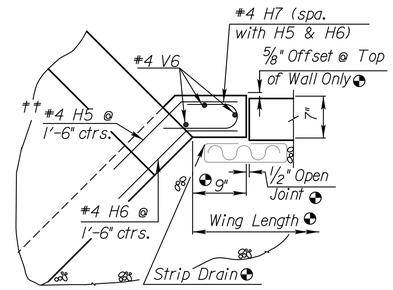
(Backface Shown)




SECTION A-A

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

Typical both wings



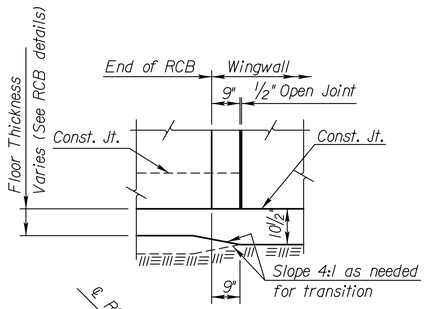

WINGWALL JOINT DETAIL

(Plan View)

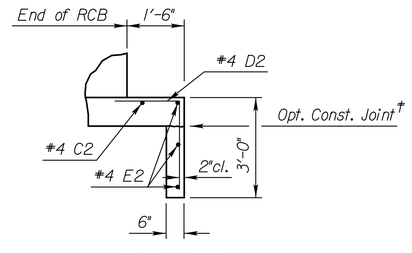
† NOTE: Const. Jt. may be used at Contractor's option when approved by the Engineer. DI bars or mesh may be spliced thus: ⌐¬ Minimum overlap shall be 1'-3". No increase in quantities or cost shall be allowed when Contractor elects this option.

## 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.
APRON: A 5" concrete slab shall be constructed between the down-stream wings in locations subject to scour only when specified on the plans or by the Engineer.
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 Foundation Stabilization on all wingwalls unless founded on rock or granular material.

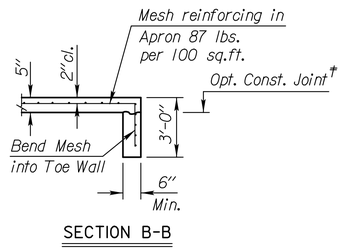



VIEW D-D

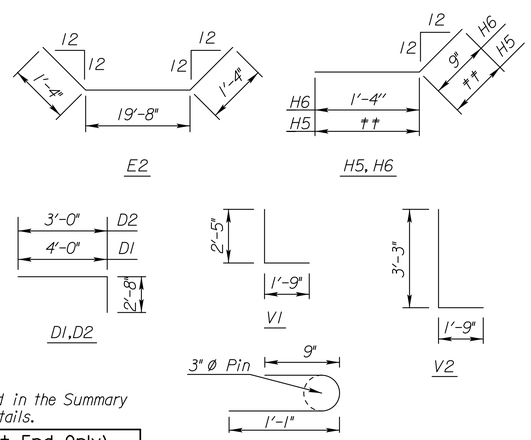


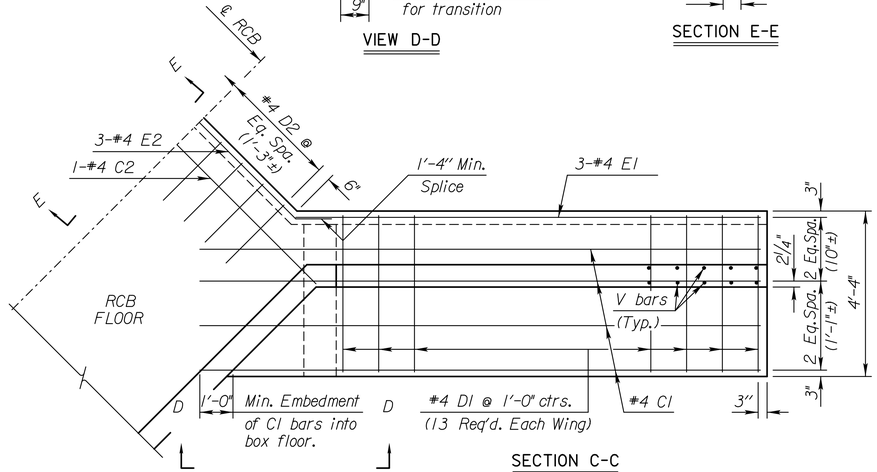

SECTION E-E

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



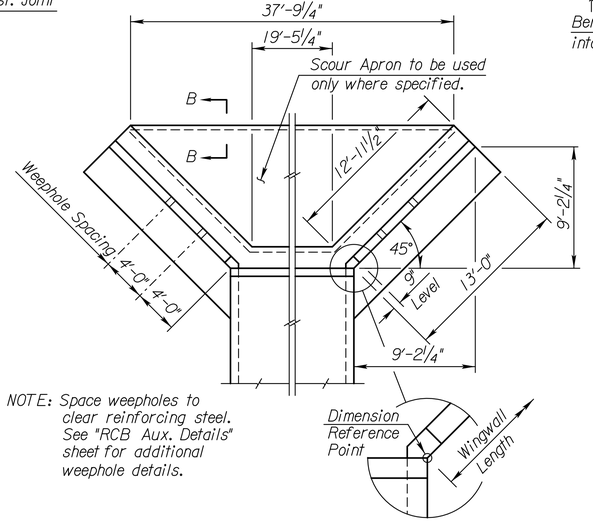

SECTION B-B




SECTION C-C

(Plan of Footing)




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

WING DIMENSIONS FOR NORMAL BOX

(3½:1 Embankment Slope)

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

| WINGWALL QUANTITIES (Left End Only) | | |
|---|---|---|
| | Foundation Stabilization | Concrete (Gr. 4.0) |
| Wingwalls | 3.11 (C.Y.) | 10.14 (C.Y.) |
| Apron | ---- | ---- |
| Soil Saver | 3.81 (C.Y.) | 6.48 (C.Y.) |
| Reinforcing Steel (Gr. 60) | | 1010 Lbs. |
| Welded Wire Fabric (Wings) | | 98 Lbs. |
| Welded Wire Fabric (Soil Saver) | | 70 Lbs. |
| Granular Backfill (Wingwalls) | | 22.00 C.Y. |
| Filter Fabric (subsidiary) | | 36.00 S.Y. |

| WINGWALL QUANTITIES (Right End Only) | | |
|---|---|---|
| | Foundation Stabilization | Concrete (Gr. 4.0) |
| Wingwalls | 3.11 (C.Y.) | 10.14 (C.Y.) |
| Apron | 4.51 (C.Y.) | 5.83 (C.Y.) |
| Soil Saver | ---- | ---- |
| Reinforcing Steel (Gr. 60) | | 1010 Lbs. |
| Welded Wire Fabric (Wings) | | 98 Lbs. |
| Welded Wire Fabric (Apron) | | 327 Lbs. |
| Granular Backfill (Wingwalls) | | 22.00 C.Y. |
| Filter Fabric (subsidiary) | | 36.00 S.Y. |

V3, V4 — Var. 4'-5" to 7'-0" by equal increments (4"±) — 2 Req'd. each length

V3, V4

BENDING DIAGRAM

(All dimensions are out to out of bars.)

†† Bend in Field

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

✳ See Bending Diagram

| 0° Skew | Mark | #4C1 | #4D1 | #4E1 | #4C2 | #4D2 | #4E2 | #6V1 | #4V2 | #6V3 | #4H1 | #4H2 | #4H3 | #4H5 | #4H6 | #4H7 | #4V4 | #4V5 | #4V6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Number | 8 | 26✳ | 6 | 1 | 16 ✳ | 3✳ | 18✳ | 16✳ | 18 | 12 | 4 | 4 | 10 ✳ | 10 ✳ | 10 ✳ | 18 | 18 | 6 |
| | Length | 15'-10" | 6'-8" | 12'-10" | 22'-0" | 5'-8" | 22'-4" | 4'-2" | 5'-0" | ✳ | 11'-10" | 9'-3" | 13'-0" | 1'-10" | 2'-1" | 1'-11" | ✳ | 2'-2" | 7'-0" |

| NO. | DATE | REVISIONS | BY | APP'D |
|---|---|---|---|---|
| 3 | | | | |
| 2 | | | | |
| 1 | | | | |

KANSAS DEPARTMENT OF TRANSPORTATION

Br. No. 530400876787045 Sta. 220+25.08

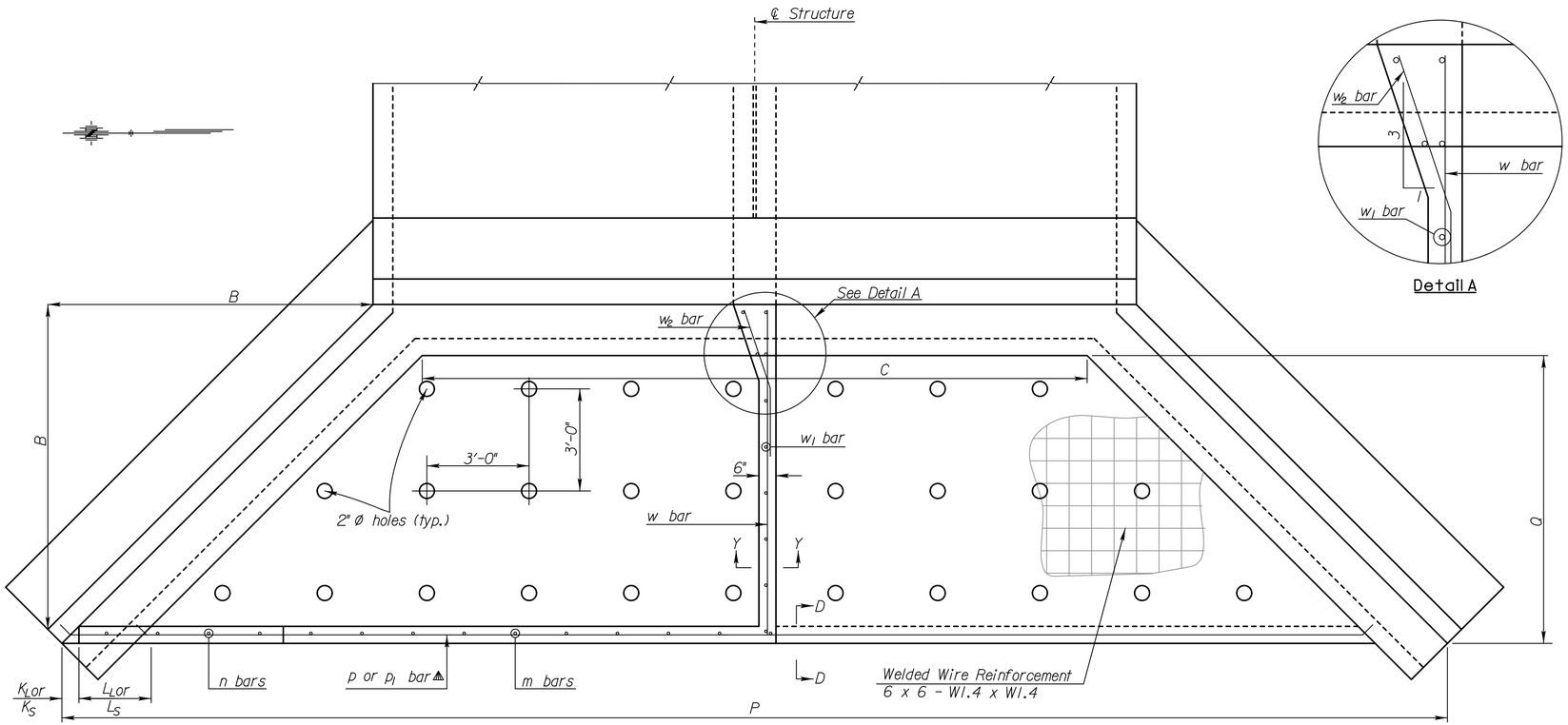
FLARED WINGWALLS
6 ft Rise (0°SKEW)

~~BR 10.00.06~~ 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: mlb
Plot Location:
File: I:\2010\1028\NBridge\LRFD Boxes\2013-04-16_1028I_2-10x6WingI.dgn
Plot Date: 18-APR-2013 16:17

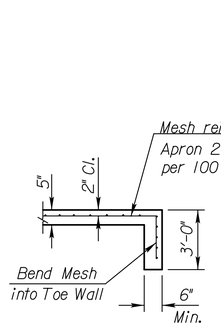
| STATE | PROJECT NO. | YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| KANSAS | 472-84915 | 2013 | 33 | 83 |



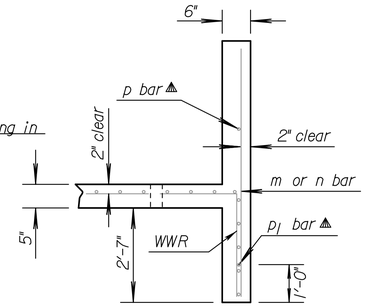

PLAN




Detail A




SECTION D-D




SECTION X-X

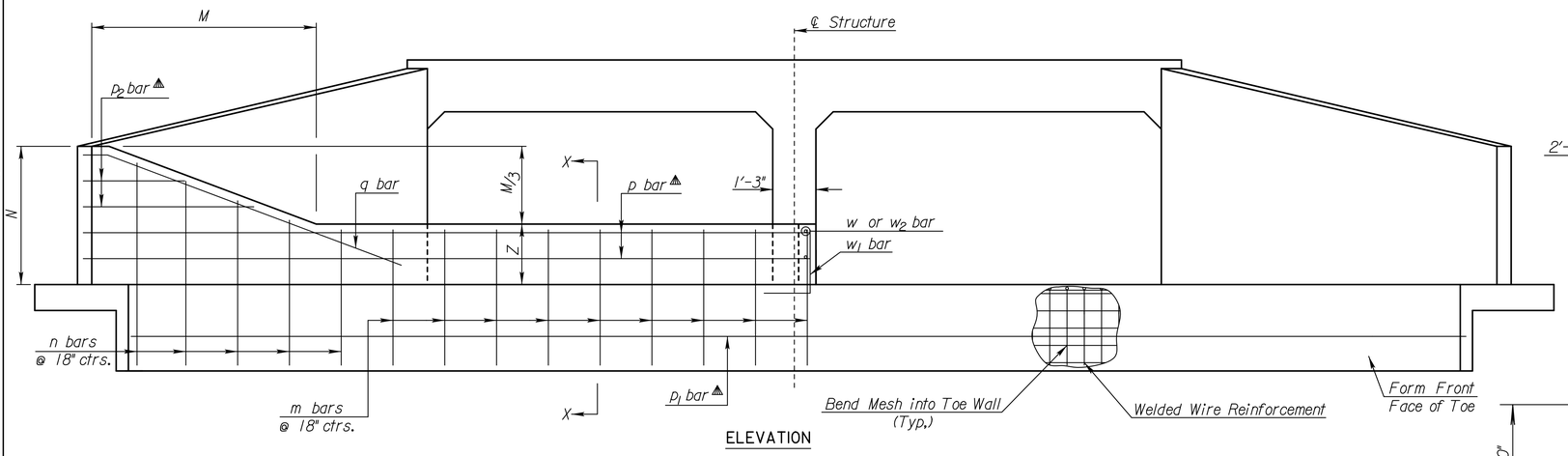
GENERAL NOTE

CONCRETE: Concrete Grade 4.0 shall be used throughout. All exposed edges shall be finished with an edging tool.

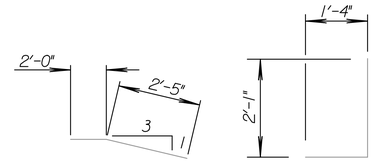
REINFORCING: All dimensions are to ℄ of bar except where noted. All reinforcing bars are No. 4. Reinforcing bars shall be Grade 60 billet steel. Minimum clearance on all reinforcement shall be 2".

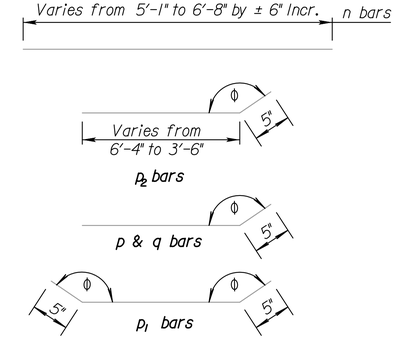
Welded wire reinforcement shall be paid as pounds of reinforcing steel. When holes in the apron are warranted by drainage conditions they shall be constructed as directed by the Engineer.

▲ Drill and grout p and q bars into wingwalls and $p_1$ bar into wing footings when the soil saver end wall is constructed separately from the wingwalls. Drilling and grouting shall be Subsidiary to the bid item "Reinforcing Steel".



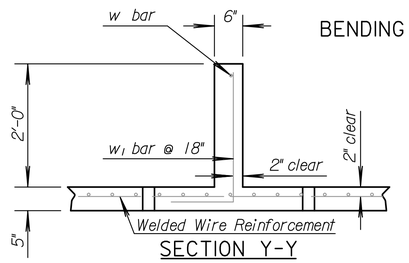

ELEVATION




Ø Angle varies according to skew of RCB. Bars shall be field bent.

BENDING DIAGRAMS




SECTION Y-Y

✱See Bending Diagram

| STATION 220+25.08 | | | | SIDE Left | | | Skew 0° | | | Z=2'-0" | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Letter | B | C | $K_L$ | $K_S$ | $L_L$ | $L_S$ | M | N | P | $P_1$ | $P_S$ | Q |
| Dimension | 9'-2 1/4" | 19'-6 1/4" | 0'-6" | 0'-6" | 2'-1 1/2" | 2'-1 1/2" | 8'-0" | 4'-8" | 39'-10 3/4" | N/A | N/A | 8'-11 1/4" |
| Bar | m | n ✱ | p ✱ | $p_1$ ✱ | $p_2$ ✱ | q ✱ | W | $W_1$ | $W_2$ | Sq. Ft. WWR | | 331 Sq. Ft. |
| Number | 10 | 4 | 2 | 1 | 2 | 1 | 2 | 10 | 2 | Grade 4.0 Conc. | | 6.48 Cu. Yd |
| Length | 4'-8" | Varies | 20'-10" | 36'-3" | Varies | 10'-5" | 9'-2" | 3'-5" | 4'-5" | Reinf. steel | | 223 Lbs. |

Quantities include apron and soil saver end wall.

| NO. | DATE | REVISIONS | BY | APP'D |
|---|---|---|---|---|
| 2 | 04-28-05 | Chg. Class to Grade concrete, WWR | S.W.K. | J.O.B. |
| 1 | 08-01-00 | Revised Drill & Grout Note | R.J.S. | J.O.B. |

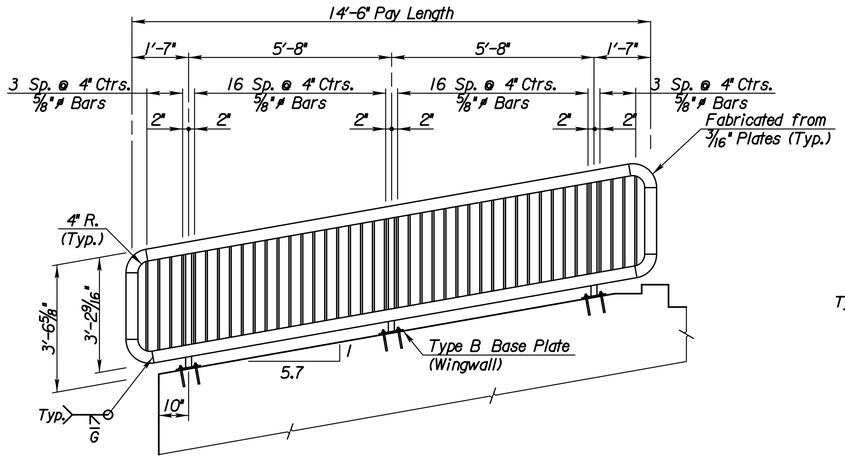
KANSAS DEPARTMENT OF TRANSPORTATION

# SOIL SAVER FOR R.C. CULVERTS

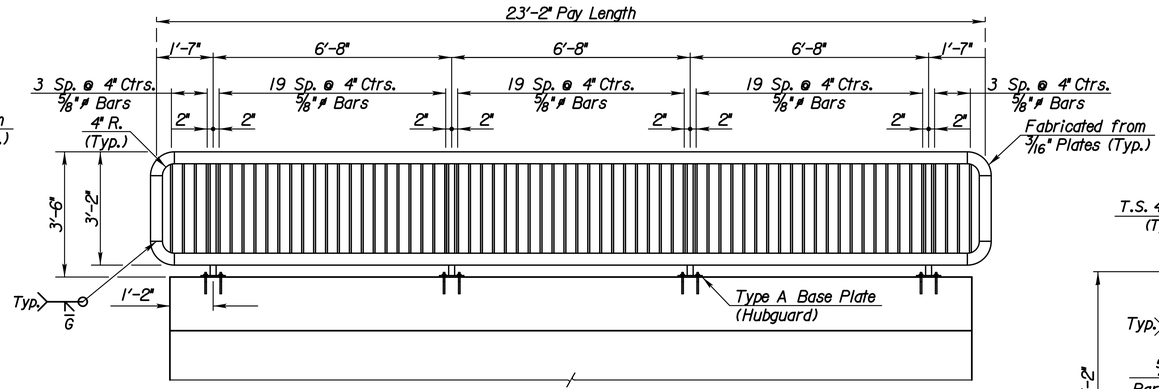
~~RD520~~

| | | | |
|---|---|---|---|
| FHWA APPROVAL | 6-10-05 | APP'D. James O. Brewer | |
| DESIGNED KJW | DETAILED KJW | QUANTITIES KJW | TRACED Bowser |
| DESIGN CK. | DETAIL CK. | QUAN.CK. | TRACE CK. Seltz |

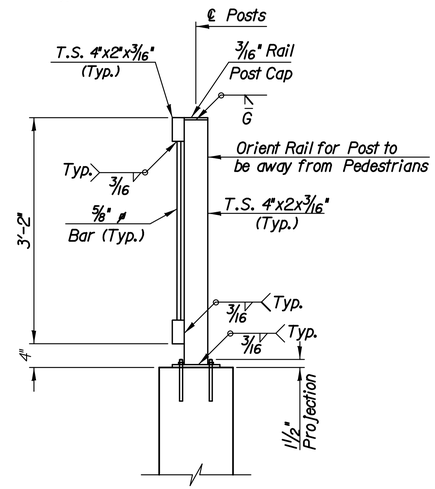
Plotted : 18-APR-2013 16:26
Drawn By : mlb
File : I:\2010\10281\Bridge\LRFD Boxes\10281-2-10x6-Soil Saver.dgn




RAIL ELEVATION
AT TYPICAL WING
*(4 Required)*



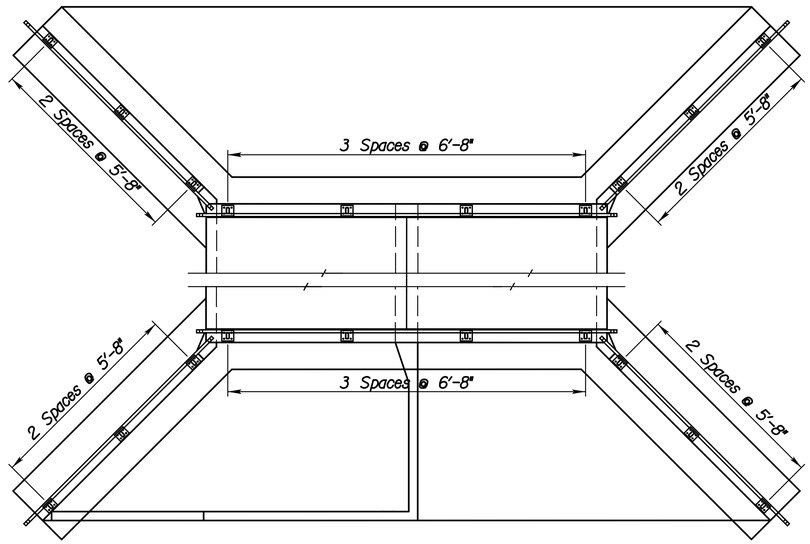

RAIL ELEVATION
AT HUBGAURD
*(2 Required)*




TYPICAL POST
*Center Posts on Hubguard or Wingwall*

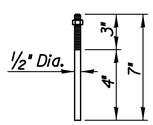
| BILL OF MATERIALS | | | |
|---|---|---|---|
| | Item | Quantity | Unit |
| | 3'-6" Rail | 104'-4" | Lin. Ft. |
| * | Type A Base Plate | 8 | Each |
| * | Type B Base Plate | 12 | Each |

* *For Information Only*




PEDESTRIAN RAIL LAYOUT

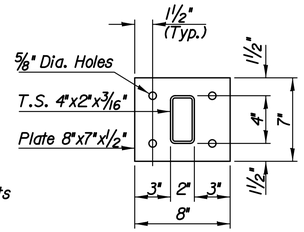
Scale: 1" = 4'



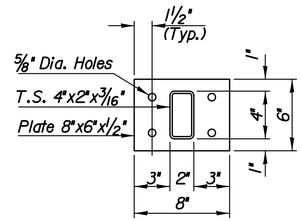

*Galvanized (ASTM A153)*

*(May substitute expandable anchor bolts when approved by the Engineer)*

ANCHOR BOLT




TYPE A BASE PLATE
*(8 Required)*




TYPE B BASE PLATE
*(12 Required)*

## GENERAL NOTES

*The horizontal members of the Rail and Posts shall be hollow structural tubing. All structural steel tubing shall comply to A.S.T.M. designation A36 or A500 Grade B respectively.*
*Rail shall be fabricated in lengths as shown from Joint to Joint and Joint to end.*
*Post and Bars shall bet set vertical and shimmed if required.*
*Prior to painting abrasive blast to commercial finish SSPC-SP6 to obtain a surface profile of 1-1/2 Mils. The shop and field coats applied to structural steel shall conform to an inorganic Zinc Primer with water-borne Acrylic finish coat. (The finish coat shall match Carboline #C900, Ebony Black). Provide a color sample to the Engineer with shop drawing submittal.*
*Material and construction shall conform to the structural welding code A.W.S. D1.1-01.*
*Shop details must be submitted and approved by the Engineer.*

| No. | Revision | By | Date |
|---|---|---|---|

135TH ST.

# PEDESTRIAN RAIL DETAILS
## STA. 220+25.08

GARY JANZEN, P.E.-CITY ENGINEER
CITY OF WICHITA PROJECT NO. 472-84915

PEC
PROFESSIONAL ENGINEERING CONSULTANTS, P.A.
303 SOUTH TOPEKA WICHITA, KS 67202
316-262-2691 www.pec1.com

| | | | |
|---|---|---|---|
| Designed by | KJW | Job No. | 10281 |
| Drawn by | KJW | Date | JAN. 2013 |

Sht. 34 of 83

Plotted By: mlb Date: 4/18/2013 4:10:13 PM
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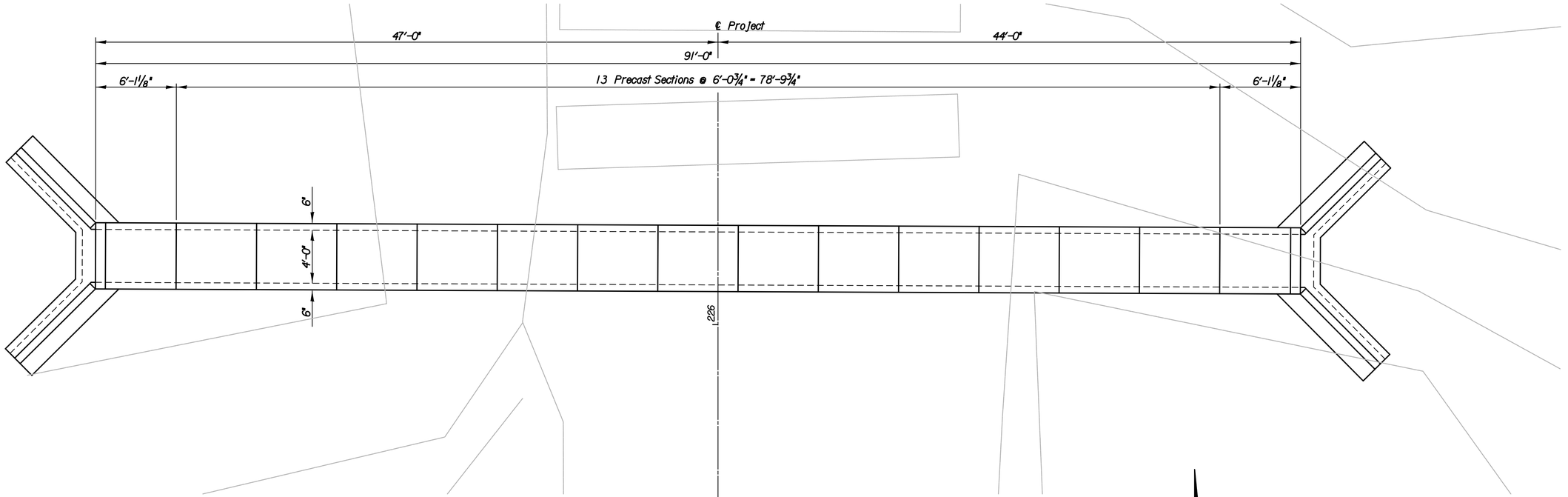



PLAN

## GENERAL NOTES

*LOADING:* AASHTO Specifications, 2007 Edition and 2009 Interim Specifications. Load and Resistance Factor Design

*UNIT STRESSES:*
Concrete F'c = 4,000 p.s.i.
Reinforcing Steel Fy = 60,000 p.s.i.

*CONSTRUCTION:* The Contractor must use precast construction plus cast-in-place end sections.

*JOINTS:* Construction Joints shall only be formed at locations shown or as approved by the Engineer

*EXCAVATION:* All excavation and backfill shall extend 2 feet beyond the sides of the box and wingwall.

*CONFLICT:* If RCB plan notes conflict with the General Notes from this sheet, then these General Notes will govern.

*PAYMENT:* The RCB shall be bid as a Linear Feet and shall include all labor, material, excavation, concrete, reinforcing steel, seal course, precast box sections, and any other incidentals necessary to complete the work as described in the plans. Quantities shown are for information only.

## PRECAST NOTES

*PRECAST CONCRETE:* Precast Box Sections shall meet the appropriate design and inspection requirements of A.S.T.M. Designation C850, Table 2 or C789, Table 2 whichever is critical and the Loading Specifications. The intermediate joints shall be sealed with a mastic compound which shall be provided for approval with the shop detail submittal. The Contractor shall furnish, to the Engineer, detail plans and shop drawings showing the proposed precast layout and all other details for manufacture and delivery of any precast items to be incorporated into the work.

*SEAL COURSE:* A Seal Course shall be constructed below the R.C.B. as shown in the Plans. The Seal Course below Precast Sections shall consist of a 6 inch Granular Base (ASTM 67). No reinforcing shall be placed until the Seal Course has gained sufficient strength to permit working upon it without injury.

*REINFORCING STEEL:* All dimensions relative to reinforcing are to centerline of bars unless otherwise noted. Bar bending and dimensions shall be as shown and noted on the Bar Bending Diagrams. Reinforcing used in the Precast Sections is not required to be epoxy coated. The concrete cover for all reinforcing shall be 1½" minimum unless otherwise noted. A revised bar schedule will be required at shop detail submittal for any deviation from plan scope.

*Doweling details between pre-cast and cast-in-place ends must be submitted for approval by the Engineer.*

| No. | Revision | By | Date |
|---|---|---|---|
| | | | |

135TH ST. Sta. 226+05.00

# RCB LAYOUT
## 4'X3'

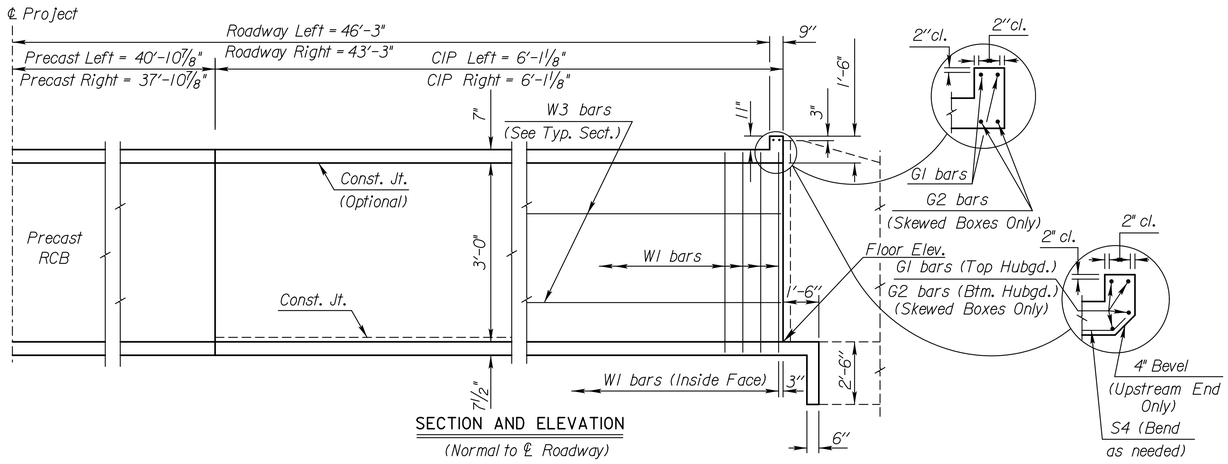
GARY JANZEN, P.E.–CITY ENGINEER
CITY OF WICHITA PROJECT NO. 472-84915

PEC PROFESSIONAL ENGINEERING CONSULTANTS, P.A.
303 SOUTH TOPEKA WICHITA, KS 67202
316-262-2691 www.pec1.com

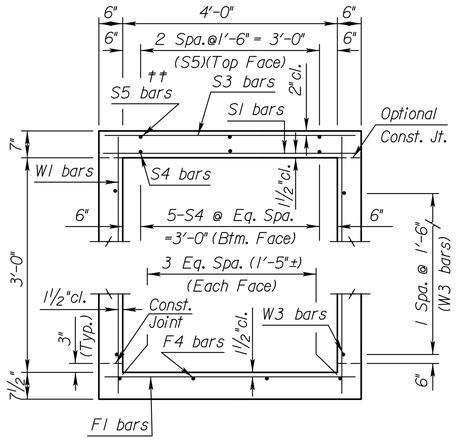
| | | | | |
|---|---|---|---|---|
| Designed by | MLB | Job No. | 10281 | Sht. 35 of 83 |
| Drawn by | MLB | Date | JAN., 2013 | |

Plotted By: mlb Date: 4/18/2013 4:10:43 PM
FILE: i:\2010\1028i\Bridge\LRFD Boxes\1028i-4X3 GeneralNotes.dgn

| STATE | PROJECT NO. | YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| KANSAS | 472-84915 | 2013 | 36 | 83 |




SECTION AND ELEVATION
(Normal to ℄ Roadway)

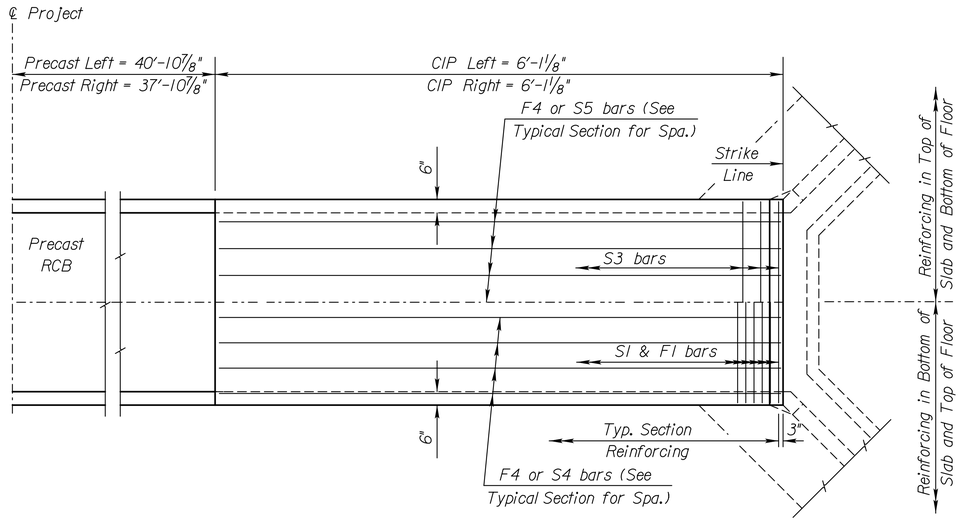



TYPICAL SECTION

Note:
S3 bars omitted unless grade box or slab thickness is greater than or equal to 12".

†† Omit S5 bars when S3 bars are omitted

See Standard No. RD 080 for additional details.




PLAN

## 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 includes the surfacing.

CONCRETE: Use concrete conforming to Grade 4.0 Concrete. Bevel all exposed edges with a ¾" triangular molding. Where Grade 4.0(AE) is specified, place this concrete in the top slab above the Construction Joint.

REINFORCING: Use reinforcing steel conforming to ASTM A615, Grade 60. All dimensions relative to reinforcing steel are to the centerline of the 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.

SEAL COURSE: The Engineer may require a seal course. The seal course shall be unreinforced Concrete(Commercial Grade) with a minimum depth of 3 inches or as determined by the Engineer. Concrete for the seal course shall be paid for at the unit price set for Concrete for Seal Course.

FOUNDATION STABILIZATION: The Foundation Stabilization quantity has been calculated to the limits shown on the "RCB Auxiliary Details" sheet. The depth 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.

QUANTITIES: The quantities shown in the Culvert Summary include apron and/or soil saver quantities when they are required by the plans. Payment for additional quantities that result from including a seal course and/or a floating apron, as a change in the 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: Construct the wingwalls and that portion of the RCB outside the Strike Line level. Construct the wingwall footings with the culvert floor. See the wingwall detail sheets.

BRIDGE BACKWALL PROTECTION SYSTEM: For structures with two foot of fill or less that have 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. | Crown Gr. Elev. | ⧗Design Fill Ht. | Skew | 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 | HL-93 Loading: Operating |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ext.Lt. | 1340.54 | 1341.29 | 0 | 0 | Flared | No | No | 2.16 | 3.36 | 5.52 | 269 | 430 | 699 | 1.85 | 2.39 |
| Ext.Rt. | 1340.27 | | | | Flared | | | 2.16 | 3.36 | 5.52 | 269 | 430 | 699 | | |

** For Information Only

BAR SCHEDULE

| | F1 Size | F1 Spa. | F1 No. | F1 Length | | F4 Size | F4 Spa. | F4 No. | F4 Length | S1 Size | S1 Spa. | S1 No. | S1 Length | F4 Size | F4 No. | F4 Length | S1 Size | S1 Spa. | S1 No. | S1 Length | S3 Size | S3 Spa. | S3 No. | S3 Length | S4 Size | S4 No. | S4 Length | S5 Size | S5 No. | S5 Length |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ext.Lt. | 5 | 5½" | 16 | 4'-8" | | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 4 | 4 | 5'-11" | 5 | 5½" | 16 | 4'-8" | N/A | N/A | N/A | N/A | 5 | 5 | 5'-11" | 4 | N/A | N/A |
| Ext.Rt. | 5 | 5½" | 16 | 4'-8" | | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 4 | 4 | 5'-11" | 5 | 5½" | 16 | 4'-8" | N/A | N/A | N/A | N/A | 5 | 5 | 5'-11" | 4 | N/A | N/A |

| | K1 Size | K1 Spa. | K1 No. | K1 Length | K2 Size | K2 Spa. | K2 No. | K2 Length | W1 Size | W1 Spa. | W1 No. | W1 Length | W3 Size | W3 No. | W3 Length | G1 Size | G1 No. | G1 Length | G2 Size | G2 No. | G2 Length | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ext.Lt. | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 4 | 9" | 16 | 3'-10" | 4 | 4 | 5'-11" | 5 | 2 | 4'-8" | N/A | N/A | N/A | | | |
| Ext.Rt. | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 4 | 9" | 16 | 3'-10" | 4 | 4 | 5'-11" | 5 | 2 | 4'-8" | N/A | N/A | N/A | | | |

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

SUMMARY OF QUANTITIES **

| | |
|---|---|
| Concrete (Grade 4.0) | 11.1 C.Y. |
| Concrete (Grade 4.0)(AE) | 0.0 C.Y. |
| Bridge Backwall Protection System (Subsidiary) | S.Y. |
| Reinforcing Steel (Gr. 60) | 1400 Lbs. |
| Reinforcing Steel (Gr. 60)(Epoxy Coated) | 0 Lbs. |
| Class III Excavation | C.Y. |
| Foundation Stabilization | 0 C.Y. |
| Concrete for Seal Course (Set) | 1 C.Y. |
| Granular Backfill (Wingwalls) | 10 C.Y. |

| NO. | DATE | REVISIONS | BY | APP'D |
|---|---|---|---|---|
| 1 | | | | |

KANSAS DEPARTMENT OF TRANSPORTATION
135th Street Sta. 226+05

SINGLE 4 ft x 3 ft RCB

~~BR 1.4.3 P~~ Sedgwick Co.

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

| SYSTEM PART | VERSION/ID |
|---|---|
| CADD V8A | 12/6/2000 |
| DATABASE | 4/25/2012 |
| RCB PROGRAM | 7.1.12 |
| KBOX MODEL ID | 39 |
| CELL LIBRARY | 1/9/2012 |

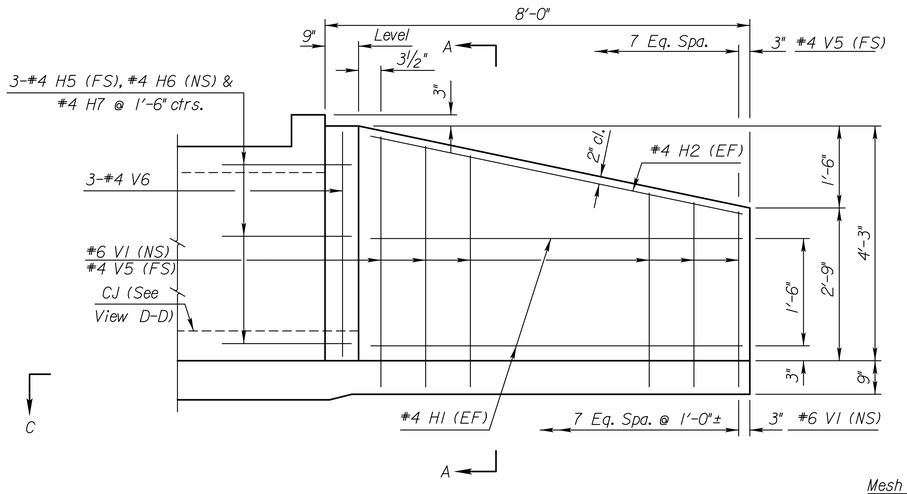
06

Plotted By: mlb
Plot Location:
File: \A2010\0028\BridgeLRFD Boxes\2013-04-15_1028I_I-4x3IBoxI.dgn
Plot Date: 18-APR-2013 16:17

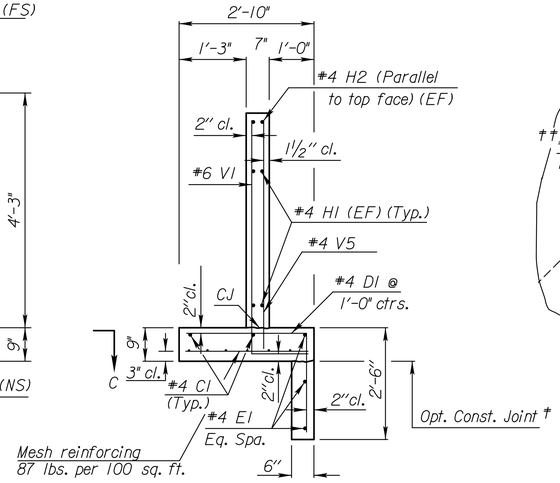
| STATE | PROJECT NO. | YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| KANSAS | 472-84915 | 2013 | 37 | 83 |

## 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.
APRON: A 5" concrete slab shall be constructed between the down-stream wings in locations subject to scour only when speci-fied on the plans or by the Engineer.
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 Foundation Stabilization on all wingwalls unless founded on rock or granular material.



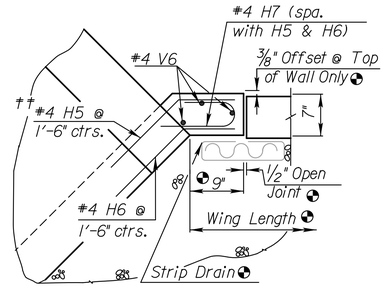

ELEVATION OF WINGWALL
(Backface Shown)




SECTION A-A

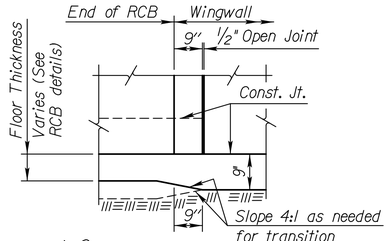
See "RCB Aux. Details" sheet for additional requirements.

Typical both wings

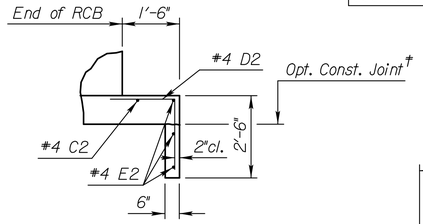



WINGWALL JOINT DETAIL
(Plan View)

† 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.

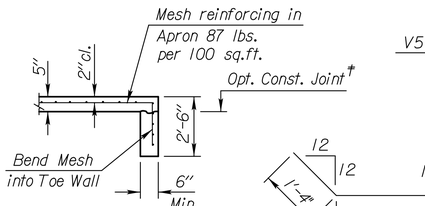



VIEW D-D

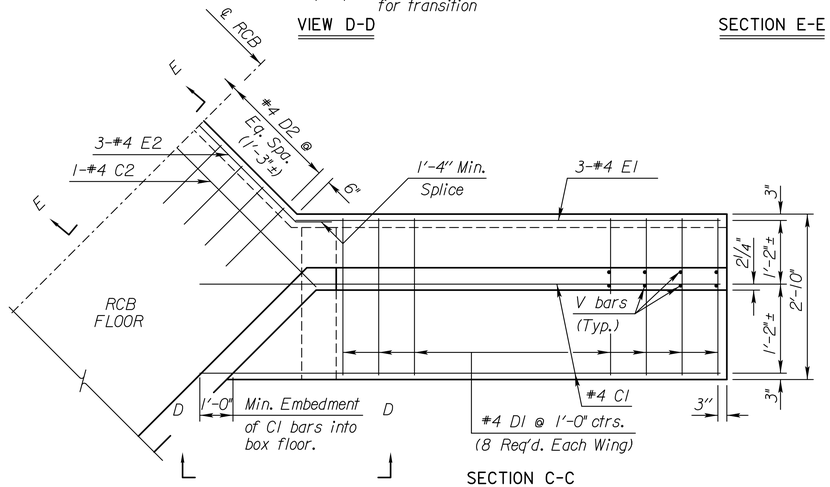



SECTION E-E

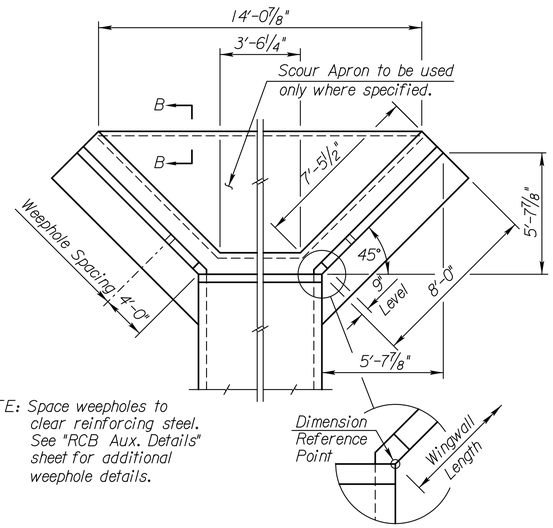
NOTE:
EF = Each Face
NS = Near Side
FS = Far Side
CJ = Const. Joint




SECTION B-B

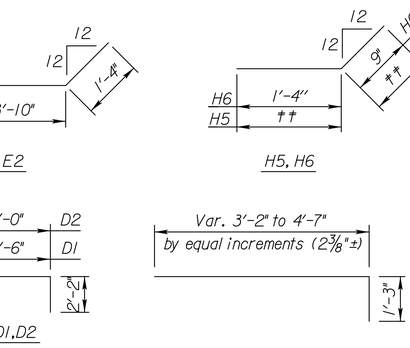



SECTION C-C
(Plan of Footing)




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

WING DIMENSIONS FOR NORMAL BOX
(3½:1 Embankment Slope)




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 | 1.44 | (C.Y.) | 3.36 | (C.Y.) |
| Apron | 0.00 | (C.Y.) | 0.00 | (C.Y.) |
| Soil Saver | 0.00 | (C.Y.) | 0.00 | (C.Y.) |
| Reinforcing Steel (Gr. 60) | | | 390 | Lbs. |
| Welded Wire Fabric (Wings) | | | 39 | Lbs. |
| Welded Wire Fabric (Apron) | | | 0 | Lbs. |
| Granular Backfill (Wingwalls) | | | 5.00 | C.Y. |
| Filter Fabric (subsidiary) | | | 13.00 | S.Y. |

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

✳ See Bending Diagram

| 0° Skew | | #4C1 | #4D1 | #4E1 | #4C2 | #4D2 | #4E2 | #6V1 | #4H1 | #4H2 | #4H5 | #4H6 | #4H7 | #4V5 | #4V6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | No. | 4 | 16✳ | 6 | 1 | 3 ✳ | 3✳ | 16 | 8 | 4 | 6✳ | 6 ✳ | 6 ✳ | 16 | 6 |
| | Length | 9'-10" | 4'-8" | 7'-3" | 4'-8" | 5'-2" | 6'-6" | ✳ | 6'-10" | 7'-0" | 1'-10" | 2'-1" | 1'-9" | ✳ | 4'-0" |

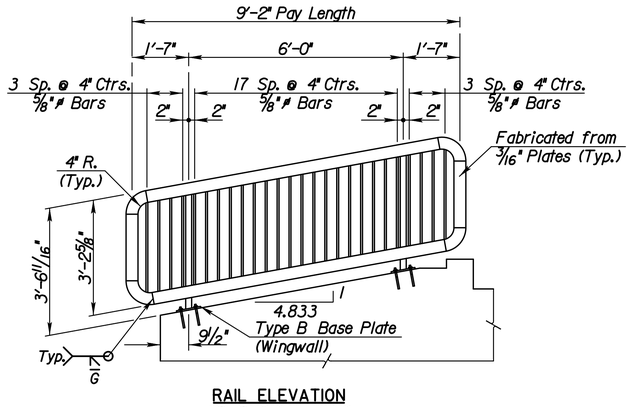
| NO. | DATE | REVISIONS | BY | APP'D |
|---|---|---|---|---|
| 3 | | | | |
| 2 | | | | |
| 1 | | | | |

KANSAS DEPARTMENT OF TRANSPORTATION
135th Street Sta. 226+05
FLARED WINGWALLS
3 ft Rise (0*SKEW)

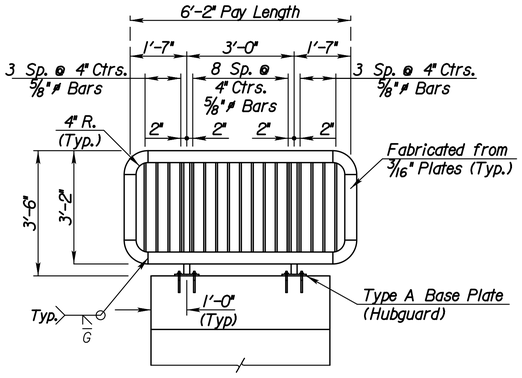
~~BR 10.00.03~~ Sedgwick Co.

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

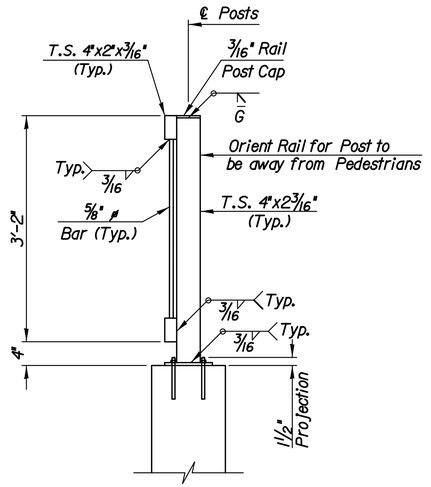
Plotted By: mlb Plot Location:
File: I:\2010\0028\Bridge\LRFD Boxes\2013-04-15_1028I_J-4x3IWingI.dgn
Plot Date: 18-APR-2013 16:17



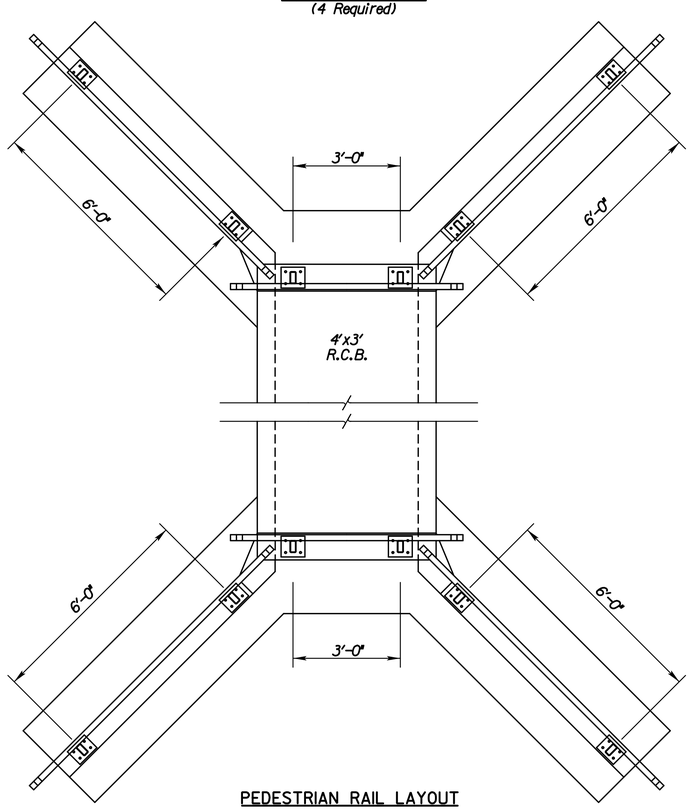

RAIL ELEVATION
AT TYPICAL WING
(4 Required)




RAIL ELEVATION
AT HUBGAURD 4X3' RCB
(2 Required)




TYPICAL POST
Center Posts on Hubguard or Wingwall




PEDESTRIAN RAIL LAYOUT

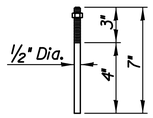
Scale: 1" = 4'

| BILL OF MATERIALS | | | |
|---|---|---|---|
| | Item | Quantity | Unit |
| | 3'-6" Rail | 49'-0" | Lin. Ft. |
| * | Type A Base Plate | 4 | Each |
| * | Type B Base Plate | 8 | Each |

* For Information Only

## GENERAL NOTES

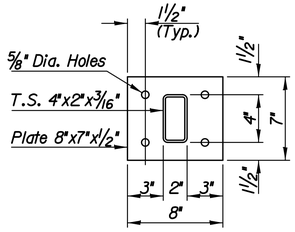
The horizontal members of the Rail and Posts shall be hollow structural tubing. All structural steel tubing shall comply to A.S.T.M. designation A36 or A500 Grade B respectively.
Rail shall be fabricated in lengths as shown from joint to joint and joint to end.
Post and Bars shall bet set vertical and shimmed if required.
Prior to painting abrasive blast to commercial finish SSPC-SP6 to obtain a surface profile of 1-1/2 Mils. The shop and field coats applied to structural steel shall conform to an inorganic Zinc Primer with water-borne Acrylic finish coat. (The finish coat shall match Carboline #C900, Ebony Black). Provide a color sample to the Engineer with shop drawing submittal.
Material and construction shall conform to the structural welding code A.W.S. D1.1-01.
Shop details must be submitted and approved by the Engineer.



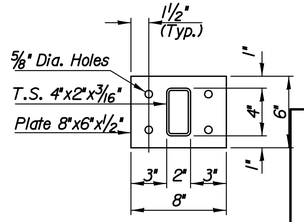

Galvanized (ASTM A153)

(May substitute expandable anchor bolts when approved by the Engineer)

ANCHOR BOLT




TYPE A BASE PLATE
(4 Required)




TYPE B BASE PLATE
(8 Required)

| No. | Revision | By | Date |
|---|---|---|---|
| | | | |

135TH ST.

# PEDESTRIAN RAIL DETAILS
STA. 226+05.00

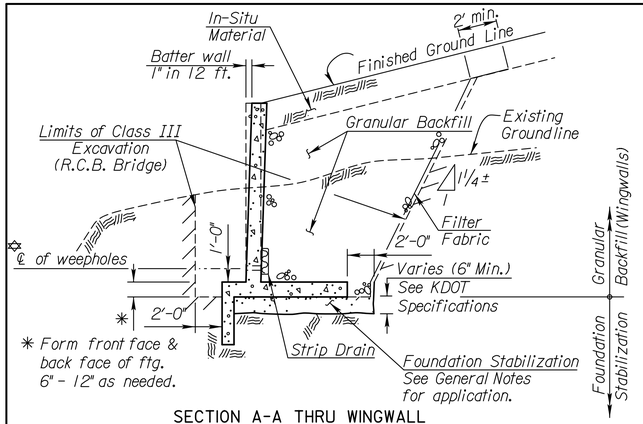
GARY JANZEN, P.E.-CITY ENGINEER
CITY OF WICHITA PROJECT NO. 472-84915

PEC
PROFESSIONAL ENGINEERING CONSULTANTS, P.A.
303 SOUTH TOPEKA WICHITA, KS 67202
316-262-2691 www.pec1.com

| | | | | |
|---|---|---|---|---|
| Designed by | KJW | Job No. | 10281 | Sht. 38 of 83 |
| Drawn by | KJW | Date | JAN. 2013 | |

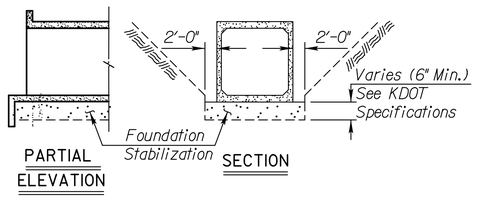
Plotted By: mlb Date: 4/18/2013 4:11:33 PM
FILE: I:\2010\028I\Bridge\LRFD Boxes\028I-4X3 Handrail 8ft wall.dgn

| STATE | PROJECT NO. | YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| KANSAS | 472-84915 | 2013 | 39 | 83 |

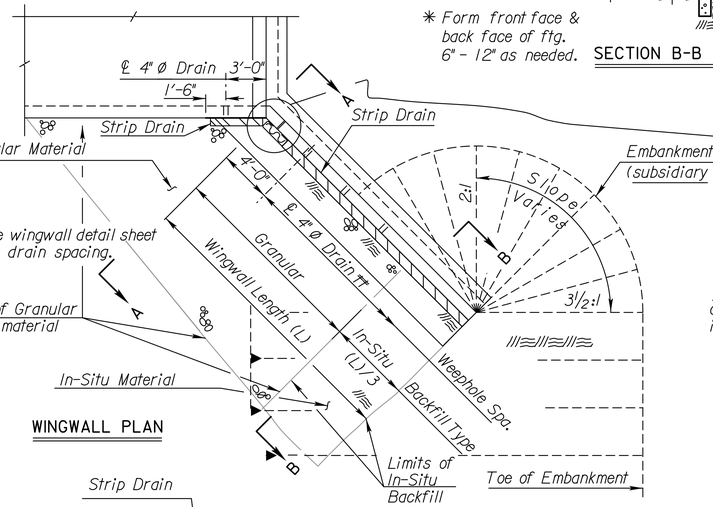



SECTION A-A THRU WINGWALL

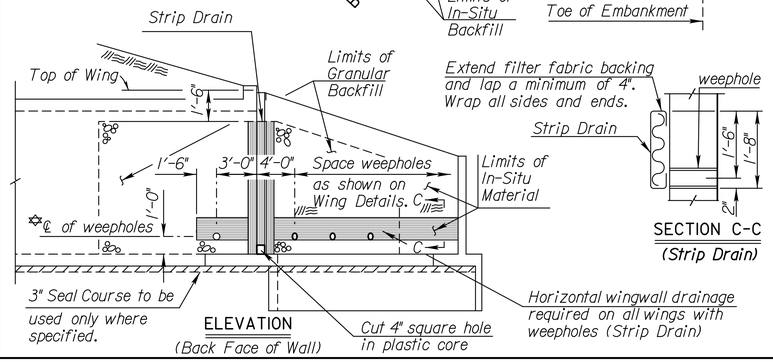
*Granular Backfill And Foundation Stabilization*

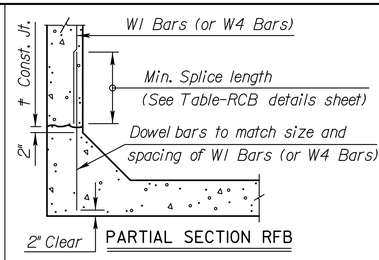



PARTIAL ELEVATION SECTION




WINGWALL PLAN



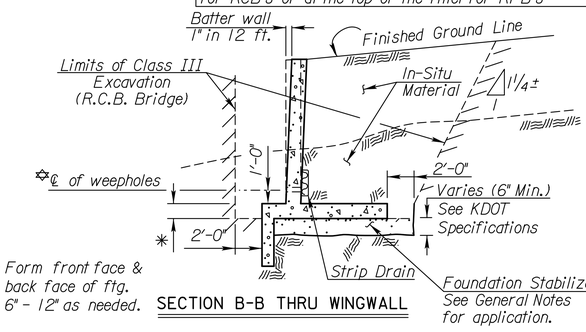

PARTIAL SECTION RFB

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.*

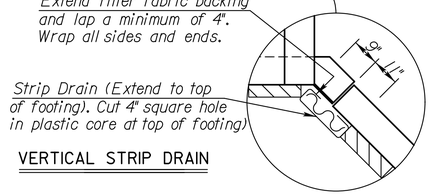
† OPTIONAL COLD JOINT

*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*

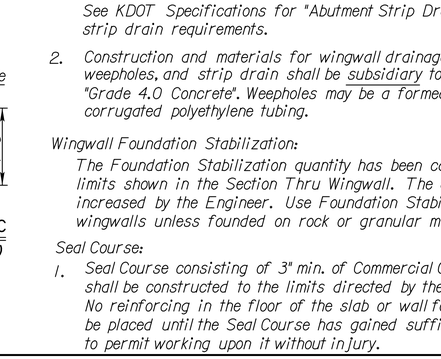



SECTION B-B THRU WINGWALL

✡ *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.*

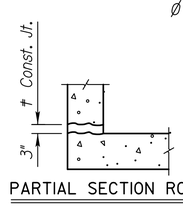
*Wingwall Foundation Stabilization:*

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

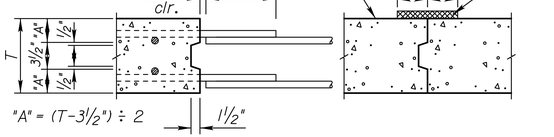
*Seal Course:*

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

Ø *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

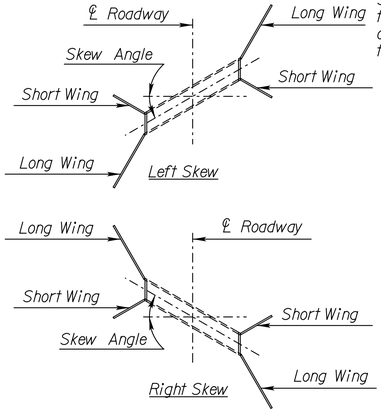



VERTICAL CONSTRUCTION JOINTS

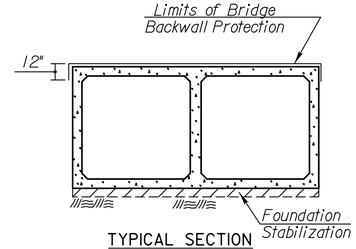
*NOTE: Vertical construction joints shall be perpendicular to the longitudinal axis of the RCB and shall be placed at any location as needed for construction and as approved by the Engineer.*

*NOTE: Horizontal construction joints shall be a roughened finish.*

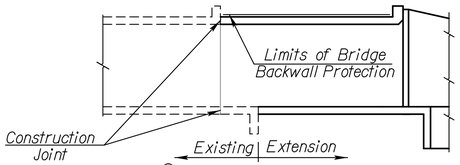
*NOTE: Barrel Construction Joints located in a median with less than 5 ft. of fill or at locations specified by the Engineer, shall be protected by a bentonite based system as shown. Place the bentonite on the exterior walls and top slab. See requirements for bentonite in the KDOT Specifications for "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.

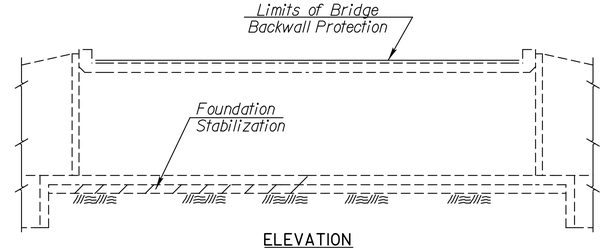



TYPICAL SECTION




⊗ BOX EXTENSION

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




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 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.*
5. *Bridge Backwall Protection System is subsidiary to "Grade 4.0 Concrete".*

| NO. | DATE | REVISIONS | BY | APP'D |
|---|---|---|---|---|
| 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

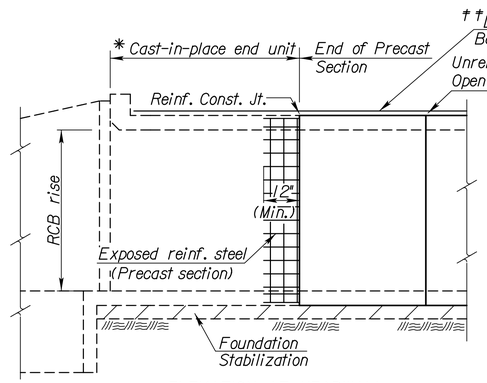
RCB AUXILIARY DETAILS (LRFD)

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 |

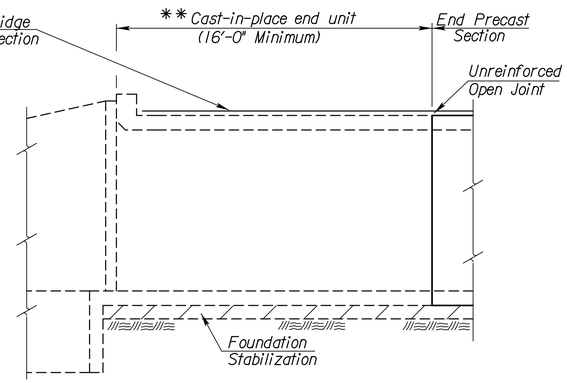
Std. Base File: br020.dgn
Plotted By: mlb
Plot Location:
File: I:\2010\0228I\Bridge\LRFD Boxes\br020b.dgn
Plot Date: 18-APR-2013 16:17

| STATE | PROJECT NO. | YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| KANSAS | 472-84915 | 2013 | 40 | 83 |



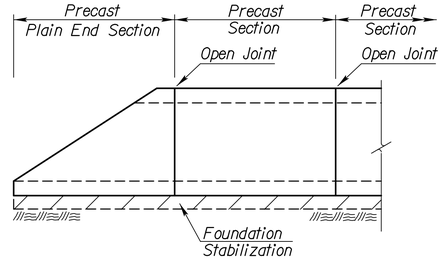

ELEVATION AT HEADWALL

* 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:

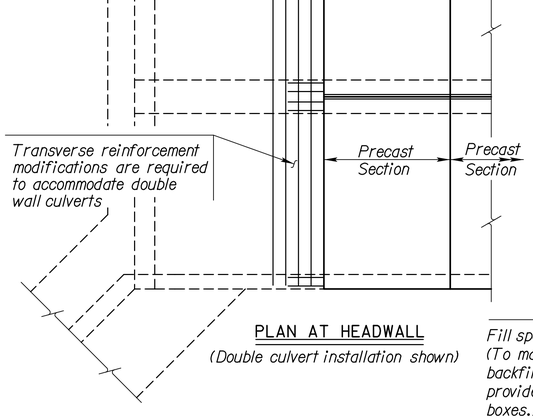
A distribution slab shall be a minimum of 6 inches thick, reinforced with #4 bars spaced at 18 inches, placed perpendicular to centerline of the box and with #5 bars spaced at 12 inches, placed parallel to centerline of the box. Substitution of an equivalent welded wire fabric is acceptable. Place a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

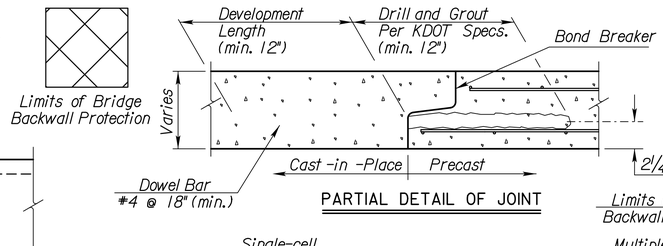
1) Use the cast-in-place criteria above.
2) Use precast distribution slabs with same criteria as the cast-in-place above. Center the joints in slabs over the box segments. Provide a minimum of 3 inches of granular material between the box and the slabs.
3) Reinforced concrete pavement (min. 6 inches 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 a geogrid on top of the granular material.

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

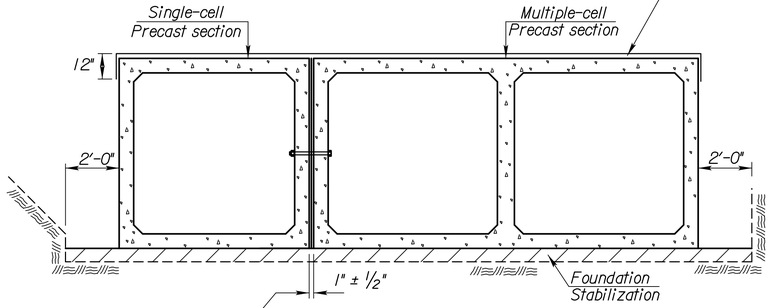



PLAN AT HEADWALL

(Double culvert installation shown)



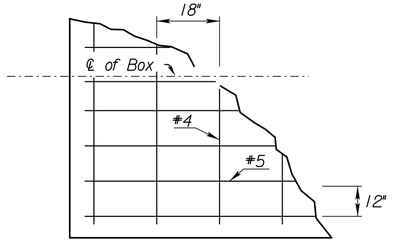

PARTIAL DETAIL OF JOINT




TYPICAL INSTALLATION DETAILS

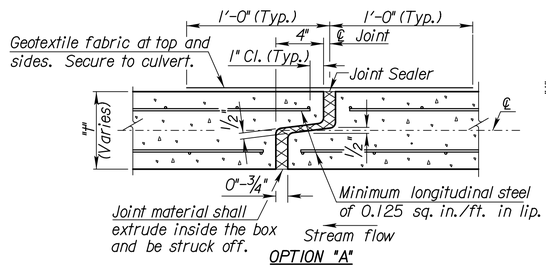
Fill space between boxes with grout. (To maintain proper joint gap, partially backfill boxes prior to grouting or provide a mechanical connection between boxes.)

Bridge Backwall Protection not shown for clarity

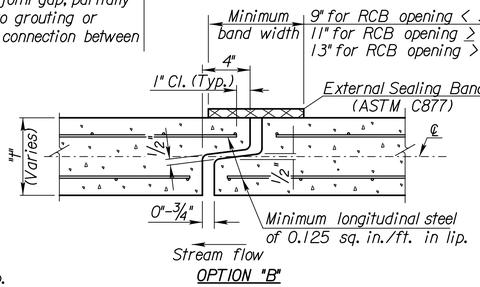



CAST IN PLACE DISTRIBUTION SLAB

(Partial plan of reinforcement)

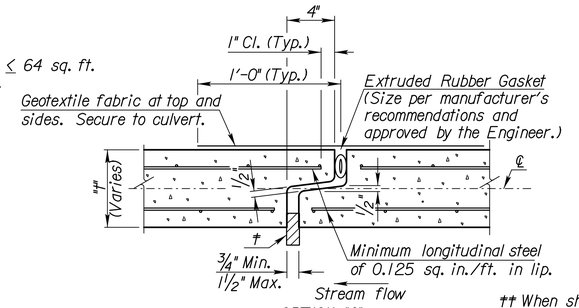



OPTION "A"




OPTION "B"

OPEN JOINT DETAIL




OPTION "C"

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

†† 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 | 07-28-11 | Added Bridge Backwall Protection | JPJ | TLF |
| 4 | 03-10-10 | Clarification of Extension | JPJ | KFH |
| 3 | 12-03-09 | Revised ASTM / Added Note | JPJ | KFH |
| 2 | 4-07-09 | Clarified Distribution Slab | JPJ | LRR |
| 1 | 07-31-01 | Revised Notes | RAM | KFH |

KANSAS DEPARTMENT OF TRANSPORTATION

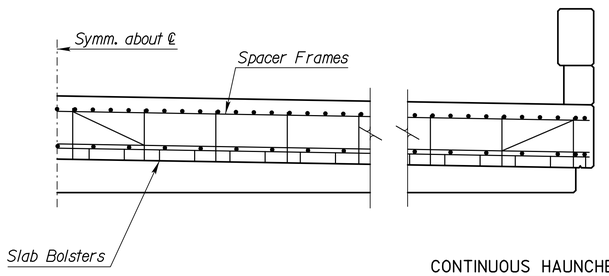
PRECAST CONCRETE BOX CULVERT DETAILS

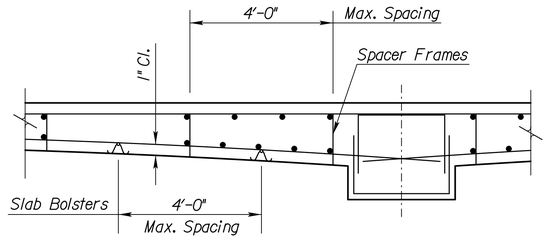
BR031

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

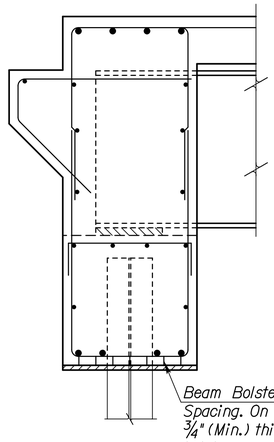
Std. Base File: br031.dgn
Plotted By: svb
File: I:\2010\0028\Bridge\0028i-br031.dgn
Plot Location:
Plot Date: 2/5/2013

| STATE | PROJECT NO. | YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| KANSAS | 472-84915 | 2013 | 41 | 83 |



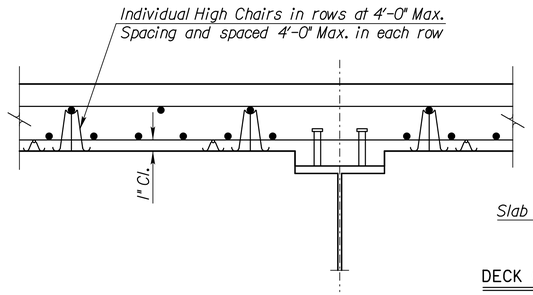



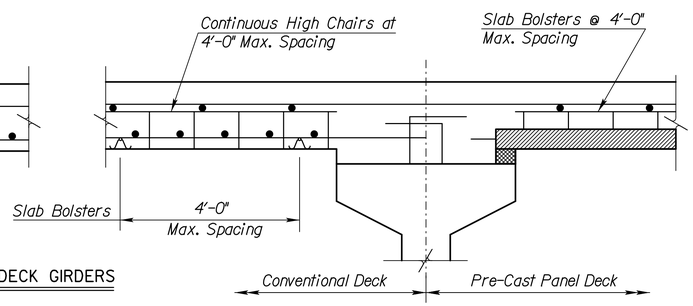

CONTINUOUS HAUNCHED SLAB



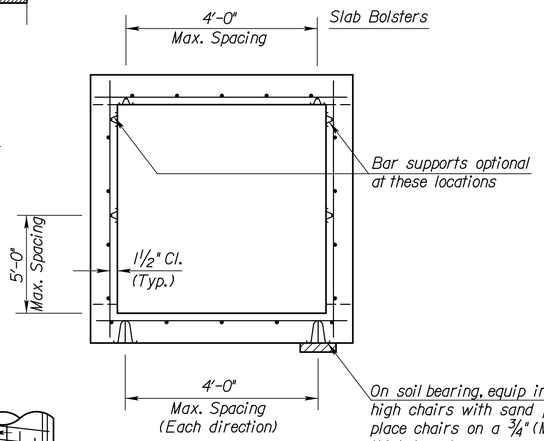
Beam Bolster at 4'-0" Max. Spacing. On soil bearing, place a 3/4" (Min.) thick board under bolster.

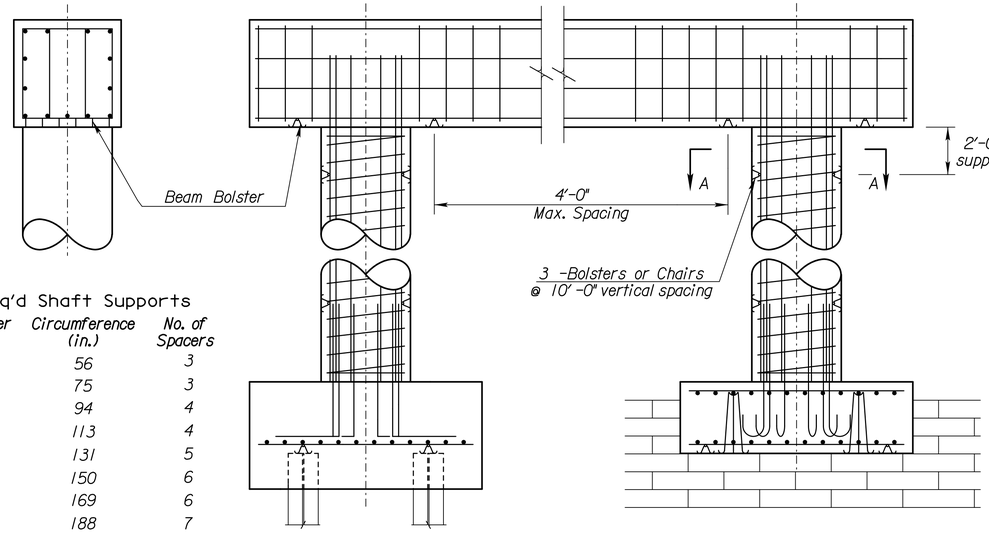
ABUTMENT




DECK GIRDERS

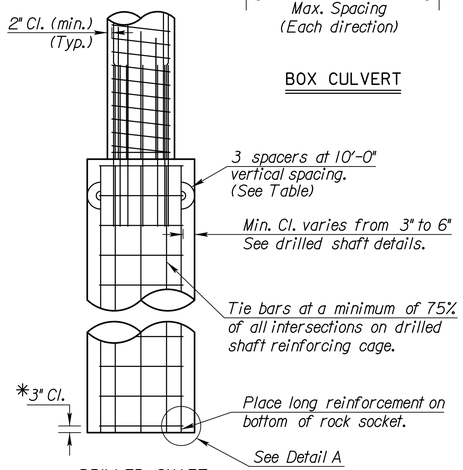


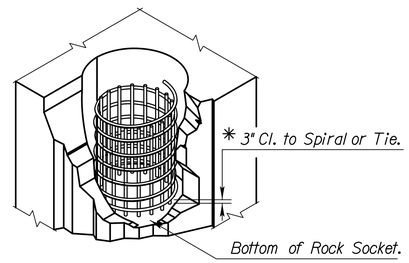

PIER

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 |

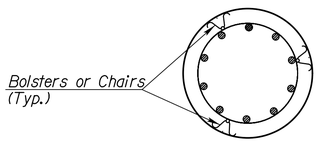



DRILLED SHAFT




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

## TYPICAL SECTION

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: svb
File: I:\2010\1028\Bridge\1028i-bri20.dgn
Plot Date: 2/25/2013
Plot Location:

| 4" SIDEWALK PAVEMENT (MEASURED QTY.) | | | | | |
|---|---|---|---|---|---|
| LOCATION | STATION TO STATION | | SIDE | WIDTH (FT.) | QUANTITY (S.F.) |
| 135th St. | 207+74.28 | 213+00.00 | Rt. | 6 | 2859.60 |
| 135th St. | 213+00.00 | 219+00.00 | Rt. | 6 | 3605.99 |
| 135th St. | 219+00.00 | 225+00.00 | Rt. | 6 | 3481.72 |
| 135th St. | 225+00.00 | 229+95.49 | Rt. | 6 | 2918.77 |
| Total | | | | | 12866.08 |

| 5" SIDEWALK PAVEMENT (MEASURED QTY.) | | | | | |
|---|---|---|---|---|---|
| LOCATION | STATION TO STATION | | SIDE | WIDTH (FT.) | QUANTITY (S.F.) |
| 135th St. | 207+63.28 | 213+00.00 | Lt. | 10 | 5165.11 |
| 135th St. | 213+00.00 | 219+00.00 | Lt. | 10 | 5595.37 |
| 135th St. | 219+00.00 | 225+00.00 | Lt. | 10 | 5797.68 |
| 135th St. | 225+00.00 | 230+64.65 | Lt. | 10 | 5539.81 |
| Total | | | | | 22097.97 |

| SIDEWALK PROTECTION CURB (MEASURED QTY.) | | | | |
|---|---|---|---|---|
| LOCATION | STATION TO STATION | | SIDE | QUANTITY (S.F.) |
| 135th St. | 229+23.03 | 230+64.65 | Rt. | 70.44 |
| Total | | | | 70.44 |

| WHEELCHAIR RAMPS | | | | |
|---|---|---|---|---|
| LOCATION | STATION | SIDE | WIDTH (FT.) | QUANTITY (EACH) |
| 135th St. | 230+64.65 | Lt. | 10 | 1 |
| Total | | | | 1 |

| LIGHT STONE RIPRAP (MEASURED QTY.) | | | | |
|---|---|---|---|---|
| LOCATION | STATION TO STATION | | SIDE | QUANTITY (S.Y.) |
| 135th St. | 219+47.39 | 221+02.60 | Lt. | 369.74 |
| 135th St. | 226+44.44 | 226+57.49 | Lt. | 23.29 |
| Total | | | | 393.02 |

| STORM SEWER CONDUIT DATA SUMMARY (L.F.) | | | | | | |
|---|---|---|---|---|---|---|
| SWS LINE NO. | 15" | 18" | REINF. CONC. PIPE | | | |
| | | | 15" | 18" | 24" | 30" |
| 100 | 400.2 | 375.2 | | | 87.0 | 52.5 |
| 101 | | | 193.0 | | | |
| 102 | | | 50.5 | | | |
| 103 | | | 43.0 | | | |
| 104 | | | 50.5 | | | |
| 105 | | | 62.0 | 43.5 | | |
| 200 | | | 64.3 | | | |
| 201 | | | 43.0 | | | |
| 300 | | | 78.0 | | | |
| 301 | | | 43.0 | | | |
| 302 | | | 43.0 | | | |
| 400 | | | 68.0 | | | |
| 401 | | | 43.0 | | | |
| Totals | 400.2 | 375.2 | 781.3 | 43.5 | 87.0 | 52.5 |

| INLET SUMMARY (EACH) | | | | |
|---|---|---|---|---|
| SWS LINE NO. | CURB INLET (TYPE I) | | | UNDERDRAIN 4" PVC (L.F.) |
| | 5'x3' | 10'x3' | 10'x4' | |
| 100 | | 2 | 2 | 44 |
| 101 | | 2 | | 22 |
| 102 | | 1 | | 11 |
| 103 | | 1 | | 11 |
| 104 | | 1 | | 11 |
| 105 | | 2 | | 22 |
| 200 | | 1 | | 11 |
| 201 | | 1 | | 11 |
| 300 | 1 | 1 | | 22 |
| 301 | 1 | | | 11 |
| 302 | | 1 | | 11 |
| 400 | 1 | | | 11 |
| 401 | 1 | | | 11 |
| Totals | 4 | 13 | 2 | 209 |

| MANHOLE SUMMARY (EACH) | | | |
|---|---|---|---|
| SWS LINE NO. | REINF. CONC. MANHOLE | | |
| | LENGTH | WIDTH | QUANTITY |
| 100 | 4'-0" | 4'-0" | 2 |
| Total | | | 2 |

| DRIVEWAY ENTRANCES (MEASURED QTY.) | | | | | | | |
|---|---|---|---|---|---|---|---|
| ROADWAY | STATION | SIDE | RADIUS (FT.) | W (FT.) | P (FT.) | CONC. PVMT. (8") (REINF.) (S.F.) | SURFACING MAT. (2") (SA-I) (S.F.) |
| 135th St. | 209+28.00 | Rt. | 9.50 | 30 | 30.19 | 944.35 | |
| 135th St. | 211+34.00 | Lt. | 9.50 | 20 | 34.50 | 728.74 | |
| 135th St. | 212+83.00 | Rt. | 9.50 | 20 | 34.50 | 728.74 | |
| 135th St. | 216+18.50 | Lt. | 9.50 | 20 | 29.50 | 628.74 | 800.00 |
| 135th St. | 218+58.50 | Lt. | 9.50 | 20 | 29.50 | 628.74 | 500.00 |
| 135th St. | 223+94.00 | Lt. | 9.50 | 20 | 29.50 | 628.74 | |
| 135th St. | 224+16.50 | Rt. | 9.50 | 20 | 29.50 | 628.74 | |
| 135th St. | 227+92.00 | Lt. | 9.50 | 20 | 29.50 | 628.93 | |
| Totals | | | | | | 5545.72 | 1300.00 |

| REINFORCED CRUSHED ROCK BASE | | | |
|---|---|---|---|
| LOCATION | STATION TO STATION | | 8" RCRB QUANTITY (S.Y.) |
| 135th St. | 207+83.00 | 213+00.00 | 2477.65 |
| 135th St. | 213+00.00 | 219+00.00 | 2866.67 |
| 135th St. | 219+00.00 | 225+00.00 | 2866.67 |
| 135th St. | 225+00.00 | 229+00.00 | 1922.01 |
| Total | | | 10133.00 |

| 7" A.C. PAVEMENT (BM-2) | | | |
|---|---|---|---|
| LOCATION | STATION TO STATION | | QUANTITY (S.Y.) |
| 135th St. | 207+83.00 | 213+00.00 | 2068.02 |
| 135th St. | 213+00.00 | 219+00.00 | 2400.00 |
| 135th St. | 219+00.00 | 225+00.00 | 2400.00 |
| 135th St. | 225+00.00 | 229+00.00 | 1610.89 |
| Total | | | 8478.91 |

| CURB AND GUTTER | | | | |
|---|---|---|---|---|
| LOCATION | STATION TO STATION | | SIDE | TYPE I (L.F.) |
| 135th St. | 207+69.33 | 213+00.00 | Lt. | 530.73 |
| 135th St. | 207+80.28 | 213+00.00 | Rt. | 519.76 |
| 135th St. | 213+00.00 | 219+00.00 | Lt. | 600.00 |
| 135th St. | 213+00.00 | 219+00.00 | Rt. | 600.00 |
| 135th St. | 219+00.00 | 225+00.00 | Lt. | 600.00 |
| 135th St. | 219+00.00 | 225+00.00 | Rt. | 600.00 |
| 135th St. | 225+00.00 | 229+00.00 | Lt. | 399.98 |
| 135th St. | 225+00.00 | 229+00.00 | Rt. | 400.03 |
| Total | | | | 4250.50 |

| PIPE CULVERT SUMMARY | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ROADWAY | STATION | SIDE | TYPE | MATERIAL | SIZE | CROWN GRADE ELEVATION | FLOW LINE | | HORIZ. ROADWAY | | DEGREE OF ROTATION | PIPE LENGTH | | LINEAR FT. OF PIPE | END SECTIONS | |
| | | | | | | | LT. | RT. | LT. | RT. | | LT. | RT. | | LT. | RT. |
| 135th St. | 216+18.50 | Lt. | EP | RCP, ACSP, PEP, or PVCP | 15" | 1345.48 | 1343.38 | 1342.05 | 15.00 | 23.00 | 0 | 15.00 | 23.00 | 38 | 1 | 1 |
| 135th St. | 218+58.50 | Lt. | EP | RCP, ACSP, PEP, or PVCP | 15" | 1341.39 | 1339.15 | 1338.94 | 16.50 | 17.50 | 1 Rt. | 16.50 | 17.50 | 34 | 1 | 1 |
| Totals | | | | | | | | | | | | | | 72 | 2 | 2 |

| SUMMARY OF EARTHWORK QUANTITIES | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| STAGE | LOCATION | STATION TO STATION | | EXCAVATION (C.Y.) | BORROW EXCAVATION (CONTRACTOR FURNISHED) (C.Y.) | FILL (C.Y.) | FILL (BEHIND CURBS) (C.Y.) | COMPACTION THRU CUTS (C.Y.) | WASTE (C.Y.) |
| 1 | 135th St. | 210+09.00 | 227+06.00 | 591 | - | 350 | - | - | 154 |
| 2 | 135th St. | 207+74.28 | 229+95.00 | 1090 | 1060 | 1641 | 79 | 608 | - |
| 3 | 135th St. | 207+63.28 | 230+71.58 | 4245 | - | 1844 | 75 | 1081 | 1846 |
| Totals | | | | 5926 | 1060 | 3835 | 154 | 1689 | 2000 |

Note: Fill, Backfill Behind Curbs, and Compaction thru Cuts are all paid for as "Compacted Fill (95%)". Total Amount = 5,678 CY.

| No. | Revision | By | Date |
|---|---|---|---|
| | | | |

135TH ST.

# SUMMARY OF QUANTITIES

GARY JANZEN, P.E.–CITY ENGINEER
CITY OF WICHITA PROJECT NO. 472-84915

PEC
PROFESSIONAL ENGINEERING CONSULTANTS, P.A.
303 SOUTH TOPEKA WICHITA, KS 67202
316-262-2691 www.pec1.com

| Designed by | RJS | Job No. | 10281 | Sht. 42 of 83 |
|---|---|---|---|---|
| Drawn by | CP | Date | JAN., 2013 | |

Plotted By: svb Date: 2/25/2013 12:11:15 PM
FILE: I:\2010\1028\Quantities\1028I-SumQty.dgn

## RECAPITULATION OF QUANTITIES

| ITEM | QUANTITY | UNIT |
|---|---|---|
| *LUMP SUM BID ITEMS - PAVING (707022)* | | |
| Mobilization | 1 | LS |
| Mobilization (DBE) | 1 | LS |
| Field Office & Laboratory (Type A) | 1 | ea |
| Site Clearing | 1 | LS |
| Removal of Existing Structures | 1 | LS |
| Concrete &/or Asphalt Pavement Removed | 6183 | sy |
| Concrete Sidewalk Removed | 19 | sy |
| Excavation | 5926 | cy |
| Excavation, Borrow (Contractor Furnished) | 1060 | cy |
| Fill, Compacted (95% Density) | 5678 | cy |
| AC Pavement 7" (5" Bit Base) (BM-2) | 8479 | sy |
| Crushed Rock Base 8", Reinforced | 10133 | sy |
| Concrete C&G, Comb Type 1 (6" & 1-1/2") | 4251 | lf |
| Wheelchair Ramp w/Detectable Warnings | 1 | ea |
| Signing | 1 | LS |
| Pavement Marking | 1 | LS |
| Traffic Control | 1 | LS |
| | | |
| *LUMP SUM BID ITEMS - DRAINAGE (707022)* | | |
| Inlet, Curb (Type 1) (L=5' W=3') | 4 | ea |
| Inlet, Curb (Type 1) (L=10' W=3') | 13 | ea |
| Inlet, Curb (Type 1) (L=10' W=4') | 2 | ea |
| Inlet Hookup | 19 | ea |
| MH, Reinforced Concrete (4' x 4') | 2 | ea |
| Pipe, PVC 4", Perforated (Inlet Underdrain) | 209 | lf |
| Pipe, SWS 15" | 400 | lf |
| Pipe, SWS 15" (RCP) | 781 | lf |
| Pipe, SWS 18" | 375 | lf |
| Pipe, SWS 18" (RCP) | 44 | lf |
| Pipe, SWS 24" (RCP) | 87 | lf |
| Pipe, SWS 30" (RCP) | 53 | lf |
| Pipe, Entrance 15" | 72 | lf |
| Pipe, 15" End Section | 4 | ea |
| Pipe, RCBC (2-10' x 6') w/ Wingwalls (Sta. 220+25) | 106 | lf |
| Handrail (Steel), Pedestrian (3'-6") (Sta. 220+25) | 104 | lf |
| Pipe, RCBC (4' x 3') w/ Wingwalls (Sta. 226+05) | 91 | lf |
| Handrail (Steel), Pedestrian (3'-6") (Sta. 226+05) | 49 | lf |
| Fill, Sand (Flushed & Vibrated) | 1161 | lf |
| | | |
| *LUMP SUM BID ITEMS - LANDSCAPE (707022)* | | |
| Seeding | 1 | LS |
| Sodding, Fescue | 1 | LS |
| | | |
| *MEASURED QUANTITY BID ITEMS - PAVING (707022)* | | |
| Concrete Sidewalk 4" | 12866 | sf |
| Concrete Sidewalk 5" | 22098 | sf |
| Concrete Sidewalk Protection Curb | 70 | lf |
| Concrete Driveway 8" (Reinforced) | 5546 | sf |
| Surfacing Material 2" (SA-1) (Driveway) | 1300 | sf |
| AC Pvmt 6" (4" Bit Base), Temp for Widening (w/5" Crushed Rock Base) | 354 | sy |
| AC Pvmt 6", Temp for Patching | 117 | sy |
| Riprap, Light Stone | 393 | sy |
| Sign, Electronic Portable Message | 50 | day |
| | | |
| *MEASURED QUANTITY BID ITEMS - LANDSCAPE (707022)* | | |
| Tree, Japanese Tree Lilac - 2.5" caliper | 12 | ea |
| Tree, Oklahoma Redbud - 2.5" caliper | 14 | ea |
| Tree, Professor Sprenger Crabapple - 2.5" caliper | 20 | ea |
| Tree, Zumi Crabapple - 2.5" caliper | 16 | ea |
| Tree, Goldenraintree - 2.5" caliper | 7 | ea |
| Tree, Hedge Maple - 2.5" caliper | 7 | ea |
| Tree, Chinquapin Oak - 3" caliper | 13 | ea |
| | | |
| *MEASURED QUANTITY BID ITEMS - BMP's (707022)* | | |
| BMP, Curb Inlet Protection | 19 | ea |
| BMP, Silt Fence | 4250 | lf |
| BMP, Construction Entrance | 2 | ea |
| BMP, Back of Curb protection | 4081 | lf |
| *WATERLINE IMPROVEMENTS - NON-PARTICIPATING MEASURED QUANTITY BID ITEMS (635813)* | | |
| Pipe, WL 16" | 1778 | lf |
| Pipe, DICL RJ 16" | 113 | lf |
| Pipe, DICL SJ 16" | 48 | lf |
| Valve Assembly, Anchored, 16" (Tied) | 2 | ea |
| Fire Hydrant Assembly | 4 | ea |
| Fill, Sand (Flushed & Vibrated) | 82 | lf |
| Conc. Pvmt. Rem. - Asph. Repl. | 30 | lf |
| Concrete Driveway Removed & Replaced | 30 | lf |
| Gravel Streets/Drives Removed & Replaced | 41 | lf |
| BMP, Silt Fence | 346 | lf |

*See Sh. No. 52 for Summary of Pavement Markings.*
*See Sh. No. 53 for Sign Assembly Tables.*
*See Sh. No. 62 for List of Traffic Control Devices.*

Plotted By: svb Date: 4/22/2013 10:47:02 AM
FILE: I:\2010\10281\Quantities\10281-Recap.dgn

| No. | Revision | By | Date |
|---|---|---|---|
| | | | |

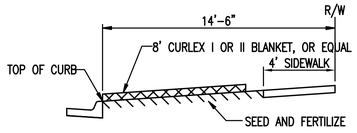
135TH ST.

# RECAP OF QUANTITIES

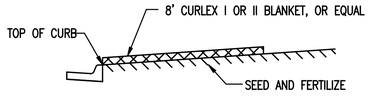
GARY JANZEN, P.E.-CITY ENGINEER
CITY OF WICHITA PROJECT NO. 472-84915

PEC
PROFESSIONAL ENGINEERING CONSULTANTS, P.A.
303 SOUTH TOPEKA WICHITA, KS 67202
316-262-2691 www.pec1.com

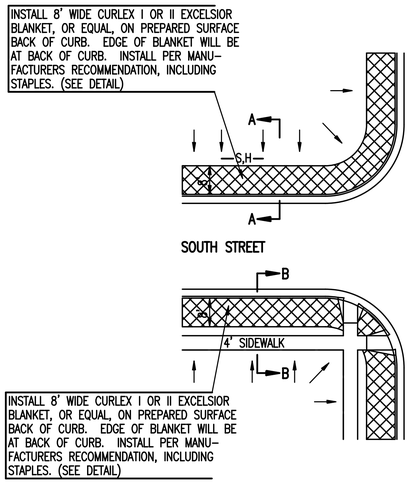
| | | | |
|---|---|---|---|
| Designed by | RJS | Job No. | 10281 |
| Drawn by | JDT | Date | JAN., 2013 |




SECTION B-B



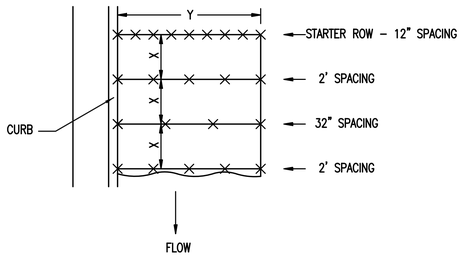

SECTION A-A




GENERAL NOTES

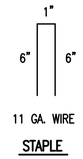
1. EXCELSIOR MAT TO BE INSTALLED WHEN SOD IS NOT SPECIFIED ON PROJECT.
2. EXCELSIOR BLANKET TO BE INSTALLED OVER SEED AND FERTILIZER, AS SPECIFIED IN THE PROJECT SPECIFICATIONS.
3. AFTER INSTALLATION OF EXCELSIOR BLANKET, AT LOCATIONS WHERE CONCENTRATED FLOW CARRIES SEDIMENT OVER THE CURB AND INTO THE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

## BACK OF CURB PROTECTION DETAIL



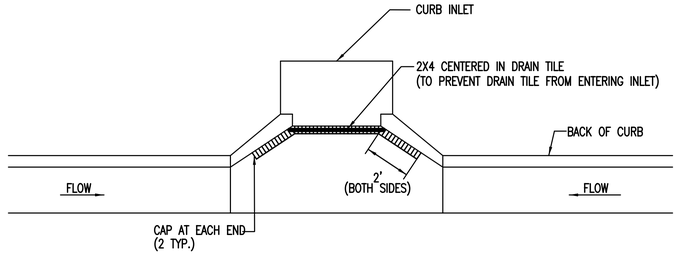

STAPLE PATTERN

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



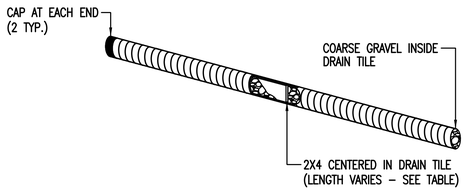

STAPLE

## DETAILS FOR APPROVED EROSION CONTROL MAT

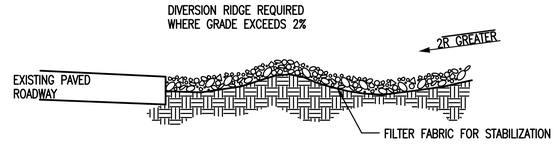



NOTE:
PLACE 4" PERFORATED PVC PIPE, FILLED WITH 1/2"-1" DIA. GRAVEL, IN FRONT OF CURB INLET AS SHOWN.

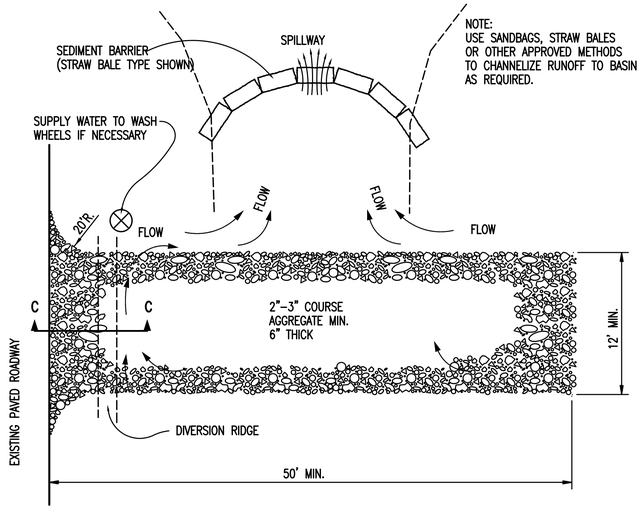
| 2X4 LENGTH | INLET TYPE | INLET OPENING |
|---|---|---|
| 5'-6" | 1-A | 5'-0" |
| 10'-6" | 1-A | 10'-0" |
| 15'-6" | 1-A | 15'-0" |




## 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.

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 |
|---|---|---|
| 472-84915 | 707022 | 08/2012 |

DESIGN | DRAWN

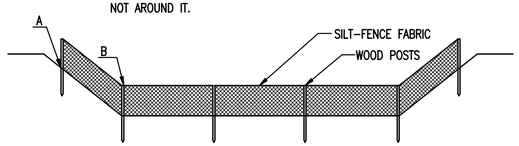
CITY ENGINEER'S OFFICE
CITY HALL - SEVENTH FLOOR
455 NORTH MAIN STREET
WICHITA, KANSAS 67202-1620
(316) 268-4501

SHEET
44 of 83

SW-501

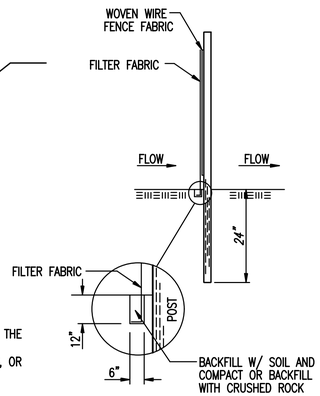
Saved 11/20/2012 10:46:29 PM by RFJ
Plot Scale 1/1 ---- By RFJ
I:\2010\10281\Standards\10281-SW-501-Back of Curb Prot, Curb Inlet Prot and Const. Entr

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 6R 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.

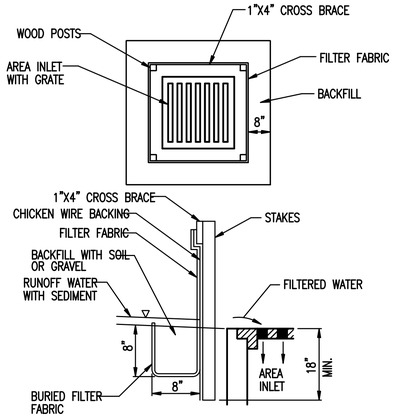
LIST OF COMMON PLACEMENT/INSTALLATION MISTAKES TO AVOID:

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.

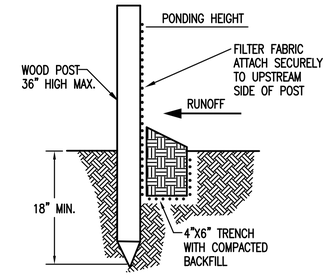
LIST OF COMMON PLACEMENT/INSTALLATION MISTAKES TO AVOID:

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?

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 |
|---|---|---|
| 472-84915 | 707022 | 11/2010 |

CITY ENGINEER'S OFFICE
CITY HALL - SEVENTH FLOOR
455 NORTH MAIN STREET
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| DESIGN | DRAWN |
|---|---|
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SHEET
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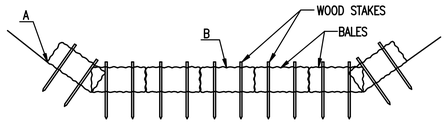
NOTE: POINT A MUST BE HIGHER THAN POINT B
SO THAT WATER FLOWS OVER THE BALES AND
NOT AROUND THEM.




## 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% 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".

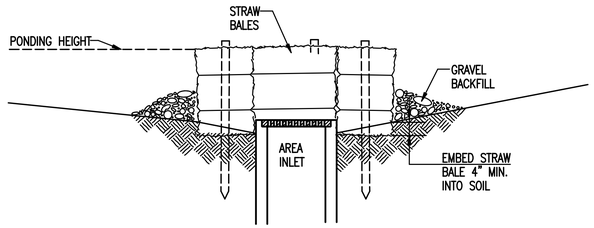
LIST OF COMMON PLACEMENT/INSTALLATION MISTAKES TO AVOID:

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.

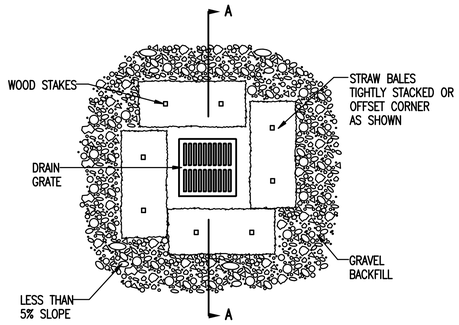
INSPECTION AND MAINTENANCE:

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.

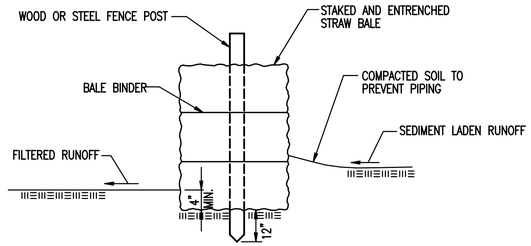
LIST OF COMMON PLACEMENT INSTALLATION MISTAKES TO AVOID:

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?

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 |
|---|---|---|
| 472-84915 | 707022 | 11/2010 |

DESIGN | DRAWN

CITY ENGINEER'S OFFICE
CITY HALL - SEVENTH FLOOR
455 NORTH MAIN STREET
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SHEET
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SW-503

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## 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.

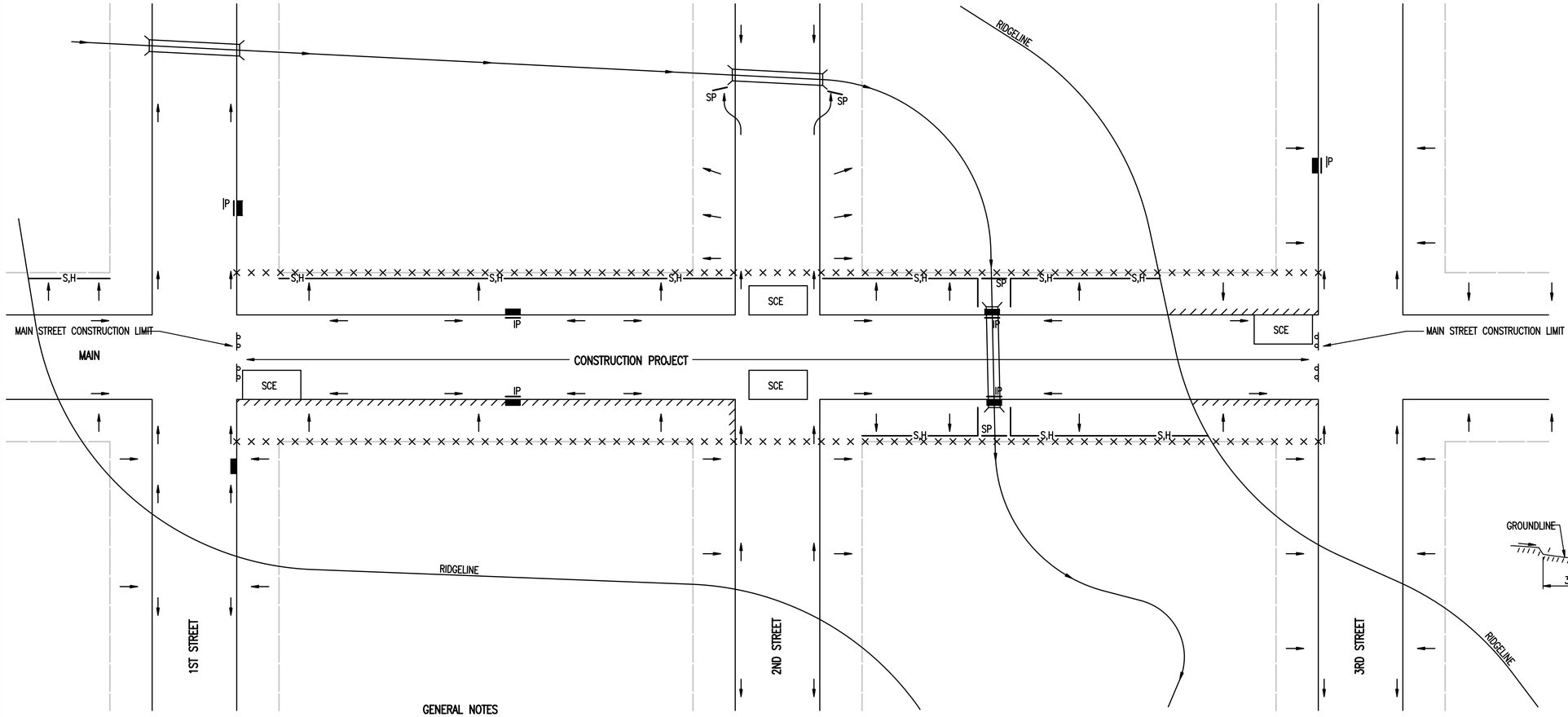
2. EROSION CONTROL DEVICES MUST BE MAINTAINED BY THE CONTRACTOR THROUGHOUT THE CONSTRUCTION PROCESS AND UNTIL THE DISTURBED EARTH IS RESTABILIZED.

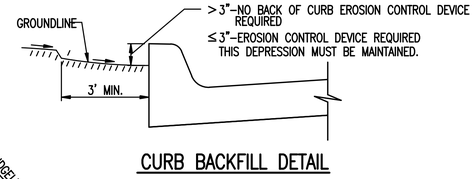
3. IF THE PROJECT WILL DISTURB 1 ACRE OR MORE, A FEDERAL/STATE NPDES STORMWATER PERMIT IS REQUIRED. A DETAILED STORMWATER POLLUTION PREVENTION PLAN, IS REQUIRED. THE EROSION CONTROL DEVICES SHOWN ON THIS SHEET ARE CONSIDERED TO BE THE MINIMUM TO BE SHOWN IN THE POLLUTION PREVENTION PLAN.

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

### 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)

CITY OF WICHITA
PUBLIC WORKS & UTILITIES
ENGINEERING DIVISION

STREET IMPROVEMENT PROJECTS

CITY ENGINEER
GARY JANZEN, P.E.

| PROJECT NUMBER | OCA NUMBER | DATE |
|---|---|---|
| 472-84915 | 707022 | 08/2012 |

CITY ENGINEER'S OFFICE
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WICHITA, KANSAS 67202-1620
(316) 268-4501

| DESIGN | DRAWN |
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SW-504

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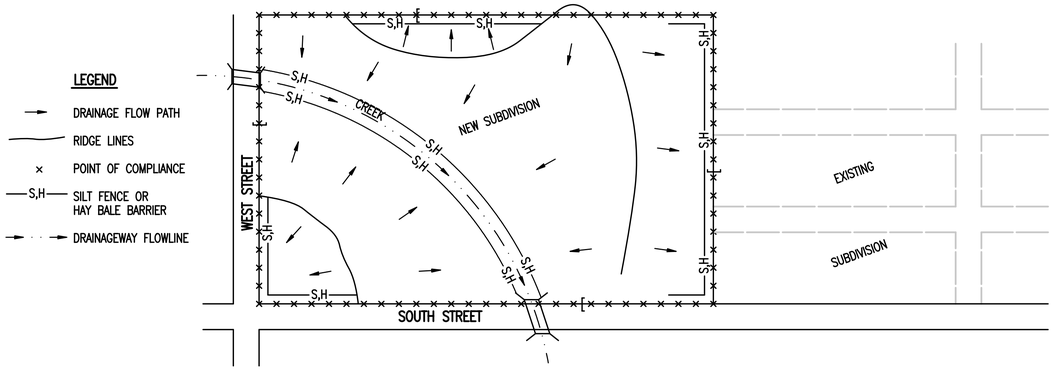
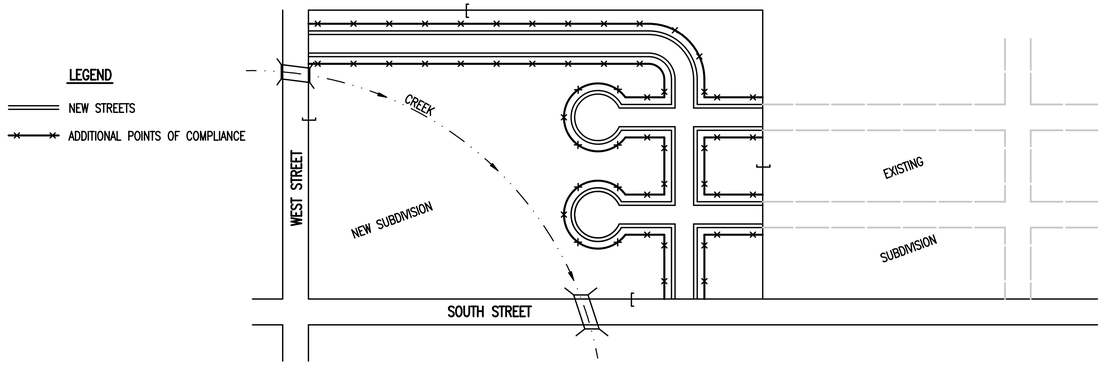
## PHASE 1 – INITIAL EARTHWORK AND UTILITIES (EXCEPT STORM SEWER)



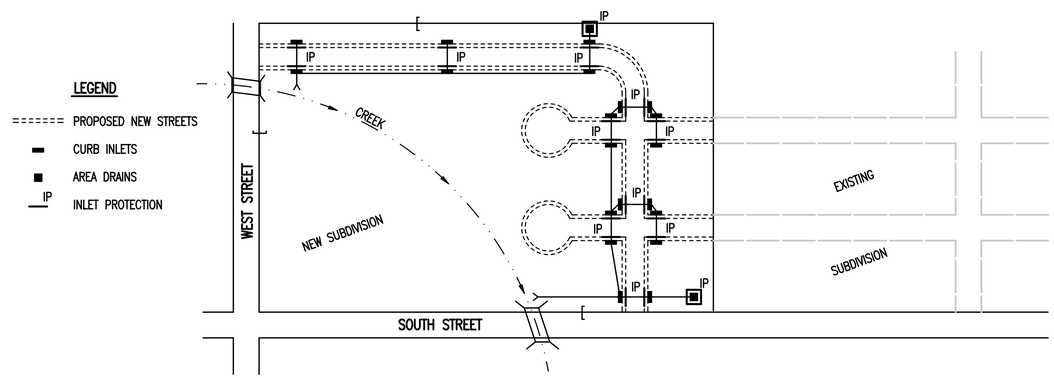

1. DURING THIS PHASE OF SUBDIVISION CONSTRUCTION, THE POINTS OF COMPLIANCE ARE THE PERIMETER BOUNDARIES AND ANY DRAINAGE WAYS OR STORM SEWERS DRAINING THROUGH OR FROM THE SITE. SHOULD LAKES BE CONSTRUCTED WITHIN THE SUBDIVISION THAT WILL DISCHARGE DURING STORMS, THEY ARE ALSO A POINT OF COMPLIANCE.
2. HAY BALES OR SILT FENCE MUST BE CONSTRUCTED ALONG THE PROPERTY LINE WHERE ON SITE WATER CAN DRAIN OFF THE PROPERTY. THESE EROSION CONTROL DEVICES WILL ALSO BE INSTALLED ALONG ANY DRAINAGE DITCH OR LAKE THAT CAN DISCHARGE.
3. SHOULD SILT OR SEDIMENT ENTER THE DITCHES OR STREETS ON THE ADJACENT BOUNDARY STREETS, APPROPRIATE EROSION CONTROL DEVICES WILL BE PLACED WITHIN THE SUBDIVISION TO PREVENT THIS.
4. ANY MUD TRACKED ONTO ADJACENT STREETS WILL BE REMOVED WITHIN 48 HOURS OR BY FRIDAY AT 6:00 PM, WHICHEVER IS EARLIER.
5. CONTRACTORS WORKING WITHIN THE SITE WILL NOT BE REQUIRED TO USE INDIVIDUAL EROSION CONTROL DEVICES AS LONG AS THOSE SPECIFIED ABOVE ARE IN PLACE AND EFFECTIVE. CONTRACTORS WORKING ON THE BOUNDARY LINE STREETS OR ON ADJACENT PROPERTIES TO EXTEND UTILITIES ARE EXPECTED TO USE EROSION CONTROL DEVICES AT THEIR WORK LOCATIONS, AS NEEDED.
6. UTILIZE STABILIZED CONSTRUCTION ENTRANCE AT ENTRANCE AND EXIT ONTO ANY EXISTING PUBLIC STREETS.
7. IF THE INITIAL EARTH WORK AND UTILITIES ARE DONE AS PART OF A PUBLIC IMPROVEMENT PROJECT, THESE EROSION CONTROL DEVICES WILL BE INSTALLED BY THE CONTRACTOR AS SPECIFIED IN THE INDIVIDUAL PROJECT CONTRACTS. THE CONTRACTOR WILL MAINTAIN THE DEVICES UNTIL COMPLETION OF THE CONTRACT, AT WHICH TIME THE DEVELOPER WILL ASSUME MAINTENANCE RESPONSIBILITIES. IF THESE CONTRACTS ARE NOT PUBLIC IMPROVEMENT PROJECTS, THE DEVELOPER WILL BE RESPONSIBLE FOR INSTALLING AND MAINTAINING THESE DEVICES.
8. WITHIN 14 DAYS OF COMPLETION OF EARTHWORK ACTIVITIES IN ANY GIVEN AREA, THAT AREA SHALL BE TEMPORARILY OR PERMANENTLY SEEDED AND MULCHED.

## PHASE 3 – STREET CONSTRUCTION




1. DURING THIS PHASE OF SUBDIVISION CONSTRUCTION, NEW STREETS ARE INSTALLED. ALL EROSION CONTROL DEVICES INSTALLED DURING PHASE 1 AND 2 MUST STILL BE MAINTAINED. THE POINT OF COMPLIANCE NOW SHIFTS TO THE BACK OF CURB ALONG EACH STREET.
2. CURB OPENING INLET PROTECTION:
   A. SUMP AREAS – INLET PROTECTION SHALL BE PROVIDED WHEN STREET SUBGRADE WORK IS COMPLETED.
   B. NON–SUMP LOCATIONS – PROVIDE INLET PROTECTION AS SOON AS BASE COURSE ASPHALT IS INSTALLED, BEFORE THE SURFACE COURSE LIFT.
3. EROSION CONTROL DEVICES WILL BE REQUIRED BACK OF CURB WHEREVER WATER CAN FLOW OVER THE CURB AND THE CURB HAS BEEN BACKFILLED TO WITHIN 3" OR LESS OF THE TOP OF CURB (SEE CURB BACKFILL DETAIL). FOR CURBS NOT YET ENTIRELY BACKFILLED (3" OR MORE BELOW TOP OF CURB), ADDITIONAL DEVICES WILL BE REQUIRED AT POINTS WHERE WATER BREAKS OVER CURB WHICH COULD RESULT IN THE PLACEMENT OF SEDIMENT IN THE GUTTER.
4. SEE DETAIL SHEET FOR BACK OF CURB PROTECTION.
5. THE BACK OF CURB PROTECTION SPECIFIED ON THIS PLAN MAY HAVE TO BE SUPPLEMENTED WITH HAY BALE OR SILT FENCE EROSION CONTROL DEVICES AT LOCATIONS WHERE CONCENTRATED FLOW RESULTS IN SEDIMENT BEING CARRIED OVER THE EXCELSIOR MATS.
6. THE STREET CONTRACTOR WILL BE RESPONSIBLE FOR INSTALLING BACK OF CURB EROSION CONTROL DEVICES.
7. THE INDIVIDUAL LOT OWNERS WILL BE RESPONSIBLE FOR MAINTAINING THE BACK OF CURB EROSION CONTROL DEVICES IN FRONT OF THEIR LOTS UNTIL SUCH TIME AS ADJACENT DISTURBED EARTH IS STABILIZED WITH GRASS OR SOD.

## PHASE 2 – INSTALLATION OF STORM SEWER

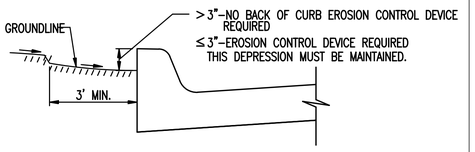



1. DURING THIS PHASE OF SUBDIVISION DEVELOPMENT, ALL EROSION CONTROL DEVICES REQUIRED IN PHASE 1 SHALL REMAIN IN PLACE AND BE MAINTAINED.
2. AS NEW STORM SEWERS, WITH INLETS, ARE INSTALLED, THE STORM SEWERS MUST NOW BE PROTECTED SO ALL NEW INLETS BECOME POINTS OF COMPLIANCE.
3. AREA DRAINS – AS SOON AS WATER CAN FLOW INTO THESE DRAINS, HAY BALE OR SILT FENCE PROTECTION WILL BE INSTALLED AROUND THEM.
4. CURB OPENING INLETS – AS SOON AS WATER CAN FLOW INTO THESE DRAINS, INLET PROTECTION DEVICES MUST BE INSTALLED. IF WATER CANNOT FLOW INTO CURB INLETS UNTIL STREET CONSTRUCTION IS COMPLETE, THEN STREET CONTRACTOR WILL INSTALL INLET PROTECTION. SEE PHASE 3 – STREET CONSTRUCTION.
5. THE STORM SEWER CONTRACTOR WILL BE RESPONSIBLE FOR INSTALLING THESE DEVICES.
6. THE SUBDIVISION DEVELOPER WILL MAINTAIN THESE EROSION CONTROL DEVICES ONCE INSTALLED.
7. ALL DISTURBED GROUND WILL BE FINAL GRADED AND TEMPORARILY OR PERMANENTLY SEEDED WITHIN 14 DAYS IF COMPLETION OF WORK IN ANY GIVEN PART OF THE SUBDIVISION.
8. ONCE ALL DISTURBED GROUND DRAINING TO AN INLET HAS BEEN RESTABILIZED WITH GRASS OR SOD, THE SUBDIVISION DEVELOPER WILL BE RESPONSIBLE FOR PERMANENTLY REMOVING THE INLET PROTECTION.

### GENERAL NOTES

1. THE INTENT OF ALL EROSION CONTROL DEVICES IS TO PREVENT ERODED SOIL FROM ENTERING DITCHES, STORM SEWERS, LAKES, STREETS OR ANY OTHER OTHER DRAINAGE FEATURE.
2. THIS SHEET IS INTENDED TO PROVIDE GUIDELINES AS TO WHAT TYPE OF EROSION CONTROL DEVICES WILL BE INSTALLED DURING THE CONSTRUCTION PROCESS. CONTRACTORS ARE EXPECTED TO BID PROJECTS ACCORDINGLY.
3. EROSION CONTROL DEVICES SHALL BE MAINTAINED DURING THE CONSTRUCTION PROCESS TO REMAIN EFFECTIVE. MAINTENANCE SHALL BE AS INDICATED ON SOIL EROSION BMP'S DETAIL SHEETS.
4. PERSONS DESTROYING EROSION CONTROL DEVICES SHALL BE RESPONSIBLE FOR IMMEDIATELY REPAIRING THEM OR INSTALLING SUITABLE REPLACEMENT DEVICES.
5. THE DEVELOPMENT OF ANY SUBDIVISION THAT DISTURBS 1 ACRE OR MORE WILL REQUIRE A FEDERAL/STATE NPDES STORMWATER PERMIT. THE PREPARATION OF A STORMWATER POLLUTION PREVENTION PLAN IS REQUIRED. EROSION CONTROL DEVICES ARE REQUIRED. THE DETAILS SHOWN ON THIS SHEET ARE THE MINIMUM STANDARDS TO BE SHOWN ON POLLUTION PREVENTION PLANS.
6. FOR SUBDIVISIONS SMALLER THAN 1 ACRE, SOIL EROSION DEVICES ARE REQUIRED. ALSO, DEVELOPERS AND CONTRACTORS ARE ENCOURAGED TO DEVELOP POLLUTION PREVENTION PLANS FOR EACH PROJECT PRIOR TO CONSTRUCTION.
7. FAILURE TO USE AND MAINTAIN SOIL EROSION DEVICES IS A VIOLATION OF SECTION 16.32 OF THE CITY CODE AND WILL SUBJECT THE SUBDIVISION DEVELOPER AND CONTRACTORS TO THE PENALTIES PROVIDED THEREIN.
8. 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 DEVICES OTHER THAN THAT SHOWN. EROSION CONTROL DEVICES, OTHER THAN THOSE SHOWN, MAY BE UTILIZED SO LONG AS THEY ARE EFFECTIVE AND MAINTAINED.
9. A STABILIZED EARTH SURFACE IS DEFINED AS ONE THAT IS HARD SURFACED WITH CONCRETE, ASPHALT, OR THE LIKE, OR ONE ON WHICH 70% OF THE GRASS HAS GERMINATED ON THE ENTIRE SURFACE.

**SEE DETAIL SHEET FOR BACK OF CURB PROTECTION DETAIL**




### CURB BACKFILL DETAIL (STREET CONSTRUCTION ONLY)

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.

CITY OF WICHITA
PUBLIC WORKS & UTILITIES ENGINEERING DIVISION

SUBDIVISION DEVELOPMENT PROCESS

CITY ENGINEER
GARY JANZEN, P.E.

| PROJECT NUMBER | OCA NUMBER | DATE |
|---|---|---|
| 472-84915 | 707022 | 08/2012 |

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

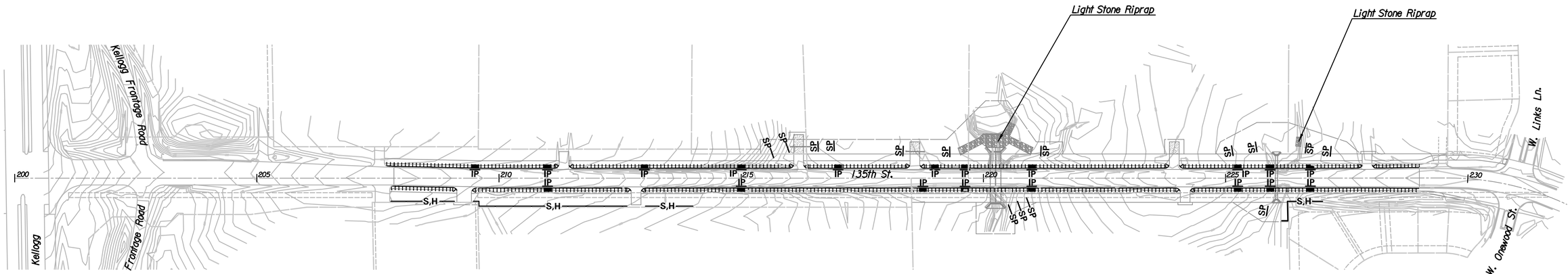
| DESIGN | DRAWN |
|---|---|
| | |

SHEET
48 of 83

SW–505

Saved: 12/20/2012 8:12:09 PM by BJS
Plot: Scale 1:1 – by BJS
L:\20101\10281\Standards\10281–SW–505–Subdivision Development Process

SCALE
100' 0 100' 200'




See Sh. No. 47 for Additional Notes.

Legend

- Storm Water Inlet
- IP — Inlet Protection
- S,H — Silt Fence or Haybale BMP
- SP — Stream Protection
- Back of Curb Protection

| No. | Revision | By | Date |
|---|---|---|---|
| | | | |

135TH ST.

# SWPPP

GARY JANZEN, P.E.–CITY ENGINEER
CITY OF WICHITA PROJECT NO. 472-84915

PEC
PROFESSIONAL ENGINEERING CONSULTANTS, P.A.
303 SOUTH TOPEKA WICHITA, KS 67202
316-262-2691 www.pec1.com

| | | | |
|---|---|---|---|
| Designed by JPS | Job No. 10281 | Sht. 49 of 83 |
| Drawn by SVB | Date JAN., 2013 | |

Plotted By: svb Date: 2/6/2013 2:14:40 PM
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## GENERAL NOTES:

1. CONTRACTOR SHALL PROVIDE A MINIMUM FORTY-EIGHT (48) HOURS ADVANCE NOTICE (EXCLUDING WEEKENDS AND HOLIDAYS) PRIOR TO BEGINNING ANY EXCAVATION, TO KANSAS ONE-CALL SYSTEM, A UTILITY LOCATION SERVICE, AT (316) 687-2470 TO REQUEST THE FOLLOWING UTILITY COMPANIES TO LOCATE ALL EXISTING LINES WITHIN THE PROJECT AREA: K.G.S. GAS, AQUILA, WESTAR, SBC, COX COMMUNICATIONS, CITY OF WICHITA SEWER MAINTENANCE AND CITY OF WICHITA WATER DEPARTMENT.

2. CONTRACTOR SHALL SATISFY HIMSELF OF SURFACE AND SUBSURFACE CONDITIONS PRIOR TO BIDDING.

3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PRESERVING PROPERTY IRONS. THE CONTRACTOR WILL BE REQUIRED TO RE-ESTABLISH ANY PROPERTY IRONS 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.

4. THE CONTRACTOR WILL BE REQUIRED TO WORK AROUND IMPROVEMENTS CONSTRUCTED UNDER OTHER PROJECTS AND SHALL BE RESPONSIBLE FOR REPAIR OF DAMAGE TO IMPROVEMENTS IN PLACE. COSTS FOR COORDINATION AND REPAIRS TO IMPROVEMENTS IN PLACE, IF REQUIRED, SHALL BE BORNE BY THE CONTRACTOR.

5. ALL PLANT MATERIAL SHALL BE HIGH-QUALITY NURSERY GROWN STOCK WHICH MEETS THE "AMERICAN ASSOCIATION OF NURSERYMEN" STANDARDS AS SPECIFIED BY THE "AMERICAN NATIONAL STANDARDS INSTITUTE" IN ANSI Z60.1-1986 OR AS MAY BE AMENDED IN THE FUTURE.

6. ALL PLANT MATERIAL AND TURF SHALL BE INSTALLED IN ACCORDANCE WITH THE CITY OF WICHITA SPECIFICATIONS.

**PLANT MATERIALS LIST**

| KEY | QUANTITY | COMMON NAME | BOTANICAL NAME | SIZE | CONDITION |
|---|---|---|---|---|---|
| SMALL DECIDUOUS TREES | | | | | |
| JTL | 12 | Japanese Tree Lilac | Syringa reticulata | 2-2.5" Cal. | B & B |
| ORB | 14 | Oklahoma Redbud | Cercis reniformis | 2-2.5" Cal. | B & B |
| PCA | 20 | Professor Sprenger Crabapple | Malus 'Professor Sprenger' | 2-2.5" Cal. | B & B |
| ZCA | 16 | Zumi Crabapple | Malus x zumi 'Calocarpa' | 2-2.5" Cal. | B & B |
| | | | | | |
| MEDIUM DECIDUOUS TREES | | | | | |
| GRT | 7 | Goldenraintree | Koelreuteria paniculata | 2-2.5" Cal. | B & B |
| HM | 7 | Hedge Maple | Acer campestre | 2-2.5" Cal. | B & B |
| | | | | | |
| LARGE DECIDUOUS TREES | | | | | |
| CHO | 13 | Chinquapin Oak | Quercus muehlenbergii | 2.5-3" Cal. | B & B |
| | | | | | |
| | | | | | |

ALL TREES TO BE SINGLE TRUNK ONLY

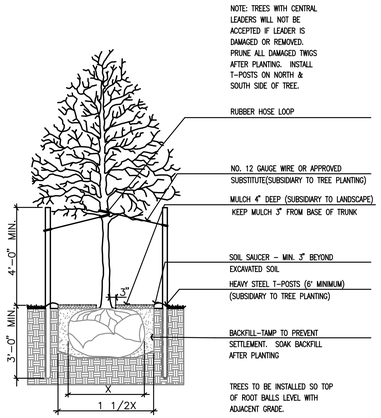
**ADDITIONAL LANDSCAPE QUANTITIES**

| ITEM | QUANTITY | NOTES |
|---|---|---|
| ⑤ SEEDING | ② 15,268 SQ. YDS. | TO BE INSTALLED FROM BACK OF CURB TO LIMITS OF CONSTRUCTION AT LOCATIONS |
| | | SHOWN ON PLANS. |
| | | |
| ① EROSION CONTROL MAT | ② 4,081 LF | BACK OF CURB PROTECTION |
| | | |
| PREMIUM BLEND FESCUE SOD | ② 2,038 SQ.YDS. | TO BE INSTALLED FROM BACK OF CURB TO LIMITS OF CONSTRUCTION AT LOCATIONS |
| | | SHOWN ON PLANS. |

⑤ SEED SHALL BE A MIX OF RYEGRASS APPLIED AT A RATE OF 50 LBS. PER ACRE AND BUFFALO GRASS APPLIED AT A RATE OF 200 LBS PER ACRE.

① EROSION CONTROL MAT SHALL BE CURLEX I EXCELSIOR BLANKET, OR APPROVED EQUAL.

② QUANTITY SHOWN FOR INFORMATION ONLY. THE CONTRACTOR WILL BE REQUIRED TO SEED OR SOD ALL NON-PAVED AREAS DISTURBED BY CONSTRUCTION.




TREE PLANTING & STAKING DETAIL
2" CALIPER AND LARGER — NO SCALE

| No. | Revision | By | Date |
|---|---|---|---|
| | | | |

135TH ST.

# LANDSCAPE DETAILS
## LANDSCAPE NOTES AND DETAILS

GARY JANZEN, P.E.-CITY ENGINEER
CITY OF WICHITA PROJECT NO. 472-84915

PEC
PROFESSIONAL ENGINEERING CONSULTANTS, P.A.
303 SOUTH TOPEKA WICHITA, KS 67202
316-262-2691 www.pec1.com

| | | | |
|---|---|---|---|
| Designed by | IDK | Job No. | 10281 |
| Drawn by | SVB | Date | Jan., 2013 |

Sht. 50 of 83

Plotted By: svb Date: 2/25/2013 2:35:01 PM
FILE: i:\2010\10281\Landscape\10281-Landscape-dtl.dgn

SCALE
40' 0 40' 80'

Jimmy & Karen L. Edgington
D-1047-UP

Kevin L. & Frances Nash
D-1046-UP

Marlo E. Goering Living Trust
D-999-UP

Arnold J. & Mary Ann Eck
D-1000-UP

Exist. R/W 65' ℄

Exist. R/W 60' ℄

Exist. R/W 50' ℄

3-PCA 2-GRT 3-HM 4-CHO 4-CHO 3-ZCA 2-HM

SEED

7 8 9 210 1 2 3 ℄ 135th St. 4 215 6 7 8 9

Sanitary Sewer Lateral Field

Dali Investment, LC
AT-145-2

Tony W. & Kristen Weber
AT-546

WEBER ADDITION

5' Utility Esmt.

5' Utility Esmt.

10' KG&E Easement

Wrought Iron

Masonry Fence

Exist. R/W 60' ℄

3-ZCA 1-ZCA 3-ORB 1-PCA 4-JTL 3-JTL 1-ORB 3-ZCA 1-JTL 3-PCA 1-ZCA 3-ORB 1-JTL 3-PCA 1-ZCA 3-ORB 3-ORB

Cross Road Fellowship
Bible Inc.
AT-145-7

SEED FESCUE SOD

+29 1/4 Sec. Line

2-HM 5-GRT 2-CHO 3-CHO

Norma J. Delph
Revocable Trust
D-995-UP

Todd Wiechman
D-991-UP

AUBURN HILLS
13TH ADDITION

20' Drain. & Util. Esmt.

Elaine R. Fleetwood, et al
D-56654

15' Utility Easement

5' Wall Esmt.

Exist. R/W

W. Orenwood St.

Black Hills Energy (NGPE)

FESCUE SOD

Headwall

9 220 1 2 3 ℄ 135th St. 4 225 6 7 8 9 230

10' KG&E Easement

Exist. R/W 50' ℄

Stoneleigh Village Master Assoc. D-53562

St Wateline Rec. Info.

Wrought Iron Fence

Masonry Fence

Post
2 - 12.5' Gates
Post

2-PCA 1-ZCA 3-PCA 1-ORB 3-ZCA 2-JTL 2-PCA 3-PCA 1-JTL

Billy A. Hall & Barbara D. Hall
Revocable Trusts
AT-145-3

Ronnie P. & Carol M. Sellens
Revocable Trust
D-53534
5

Patricia A. Hurley
D-53533
4

20' Emergency Access Esmt.

10' Utility Easement

Stoneleigh Investments
D-53532
3

Timothy W. & Christina G. Bennett
D-53531
2

Paul A. Perkins
D-53530
1

AUBURN HILLS 9TH ADDITION

W. Links Lane

Exist. R/W

1/4 Sec. Line +29

SEED FESCUE SOD

| No. | Revision | By | Date |
|---|---|---|---|
| | | | |

135TH ST.

# LANDSCAPE PLAN

GARY JANZEN, P.E.-CITY ENGINEER
CITY OF WICHITA PROJECT NO. 472-84915

PEC
PROFESSIONAL ENGINEERING CONSULTANTS, P.A.
303 SOUTH TOPEKA WICHITA, KS 67202
316-262-2691 www.pec1.com

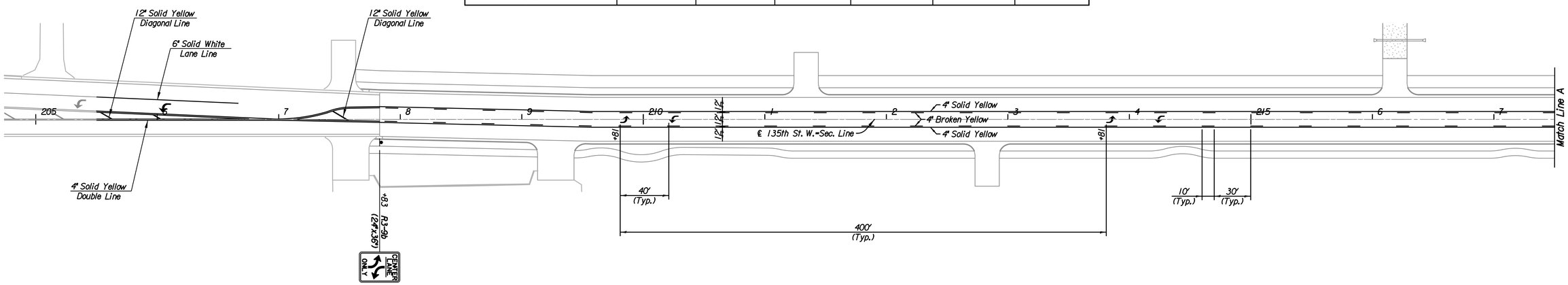
| Designed by | IDK | Job No. | 10281 | Sht. 51 of 83 |
|---|---|---|---|---|
| Drawn by | SVB | Date | Jan., 2013 | |

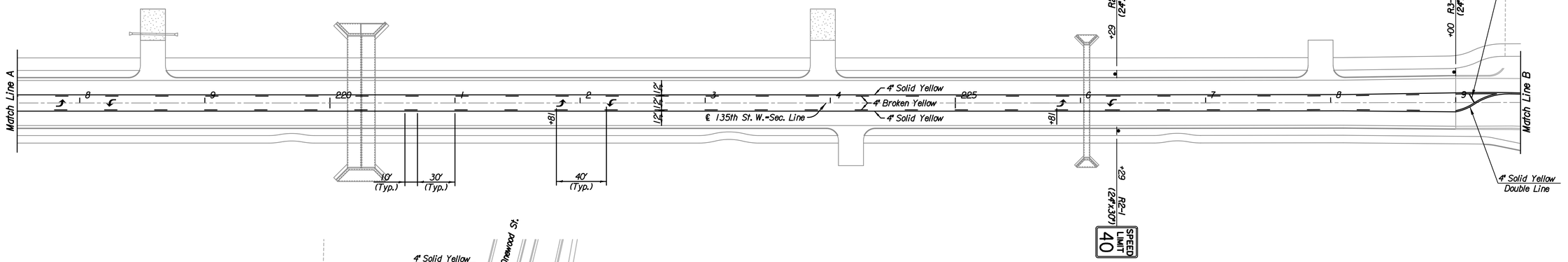
Plotted By: svb Date: 2/25/2013 2:44:37 PM
FILE: I:\2010\1028I\Landscape\1028I-Landscape Plan.dgn

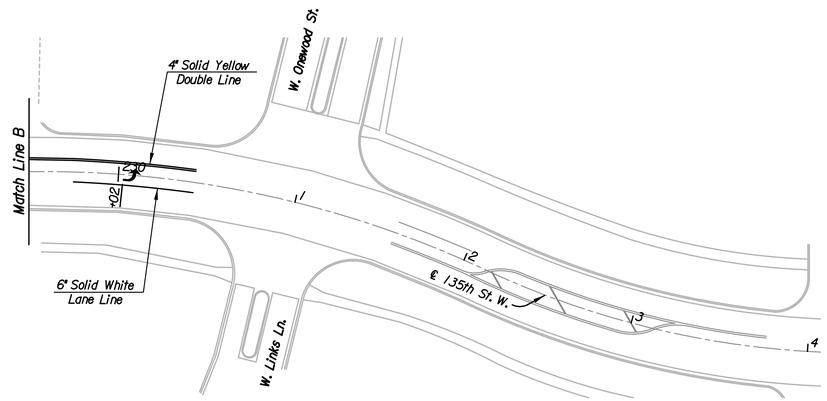
## SUMMARY OF PAVEMENT MARKINGS

| LOCATION | 4" Broken Yellow Lane Line (ft) | 4" Solid Yellow Lane Line (ft) | 4" Solid Yellow Double Line (ft) | 6" Solid White Lane Line (ft) | 12" Solid Yellow Diagonal Line (ft) | Left Turn Arrows (each) |
|---|---|---|---|---|---|---|
| 205+50 to 230+43 | 1060 | 4234 | 1218 | 184 | 47 | 12 |
| | | | | | | |
| Total | 1060 | 4234 | 1218 | 184 | 47 | 12 |

Scale: 1"=40'




| No. | Revision | By | Date |
|---|---|---|---|
| | | | |

135TH ST.

# SIGNING AND MARKING PLAN STA. 205+50 TO STA. 230+43

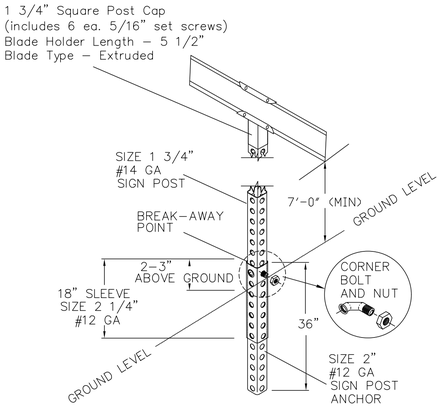
GARY JANZEN, P.E.-CITY ENGINEER
CITY OF WICHITA PROJECT NO. 472-84915

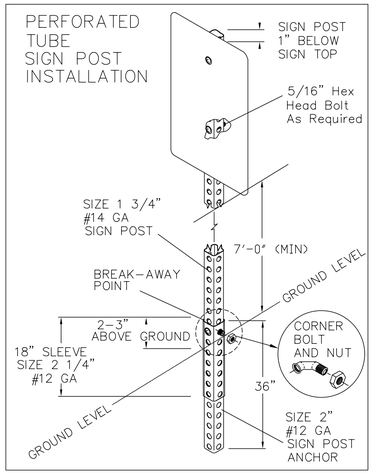

PEC
PROFESSIONAL ENGINEERING CONSULTANTS, P.A.
303 SOUTH TOPEKA WICHITA, KS 67202
316-262-2691 www.pec1.com

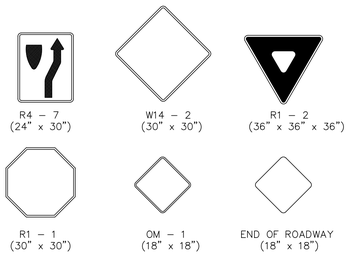

| | | | | |
|---|---|---|---|---|
| Designed by | RJS | Job No. | 10281 | Sht. 52 of 83 |
| Drawn by | DRP | Date | JAN., 2013 | |

Plotted By: svb Date: 2/6/2013 2:33:58 PM
FILE: I:\2010\1028I\Signing-Marking\1028I-sgmk01.dgn

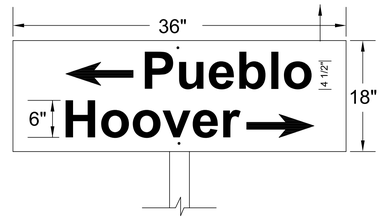
| FHWA REG NO. | STATE | PROJECT NO. | YEAR | SHEET NO. | SHEETS |
|---|---|---|---|---|---|
| 7 | KANSAS | 472-84915 | 2013 | 53 | 83 |



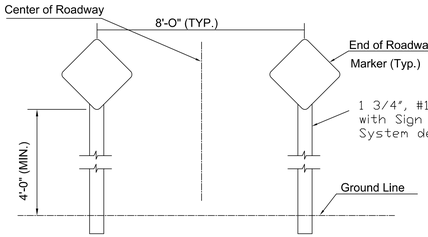



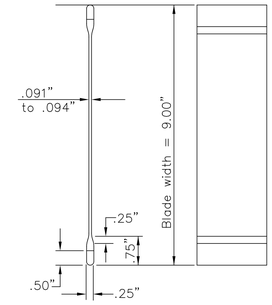

* IN NO CASE SHALL THE SPECIFICATIONS BE LESS THAN REQUIRED BY THE CURRENT MUTCD.




FLAT PLATE STREET NAME SIGN




TYPICAL END OF ROADWAY SIGN MOUNTING INSTALLATION




STREET NAME SIGN
BLADE DETAILS

## TYPICAL TRAFFIC CONTROL AND STREET NAME SIGN MOUNTING INSTALLATION

### CURB AND GUTTER SECTION




DETAIL A
9" STANDARD




TYPE I BARRICADE DETAIL W/ E.O.R. MARKERS




DETAIL B
9" METRO




SIGN POST ANCHOR SYSTEM

### SIGN ASSEMBLY TABLE

| STATION | OFFSET | SIGN | QUANTITY* |
|---|---|---|---|
| 207+83 | Rt. | R3-9b | 1 |
| 226+29 | Lt. | R2-1 | 1 |
| 226+29 | Rt. | R2-1 | 1 |
| 229+00 | Lt. | R3-9b | 1 |
| | | | |
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| | | | |
| | | | |
| | | | |
| TOTAL | | | 4 |

| STREET NAME | NO. BLADES REQ'D | |
|---|---|---|
| | 6 3/4" STD. | 9" METRO |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

NOTE: REFERENCES BELOW TO "STANDARD SPECIFICATIONS" DENOTE "STANDARD SPECIFICATION FOR STATE ROAD AND BRIDGE CONSTRUCTION EDITION 1990" BY THE KANSAS DEPARTMENT OF TRANSPORTATION.

* IN NO CASE SHALL THE SPECIFICATIONS BE LESS THAN REQUIRED BY THE CURRENT MUTCD.

1. POST ANCHORS: POSTS SHALL BE ANCHORED WITH A YIELDING BASE POST SUPPORT AS DETAILED.
2. POSTS FOR TRAFFIC CONTROL SIGNS: POSTS SHALL BE GALVANIZED AND CONFORM TO THE REQUIREMENTS OF SUBSECTION 1620 OF THE STANDARD SPECIFICATIONS, EXCEPT THAT ALL POSTS SHALL WEIGH 3 LBS./FT. MINIMUM.
3. POSTS FOR STREET NAME SIGNS (SNS): POSTS SHALL BE 9 FEET LONG, CONSTRUCTED FROM #14 GALVANIZED STEEL PIPE AND SHALL BE 1 3/4" SQUARE WEIGHING A MINIMUM OF 3 LBS/FT. POSTS SHALL BE POSITIONED SO THAT THE BOTTOM BLADE IS 7 FEET ABOVE GRADE.
4. POSTS FOR END OF ROADWAY SIGN TO BE 8' LONG AND INSTALLED A MINIMUM OF 4' FROM ROADWAY TO BOTTOM OF SIGN.
5. SIGN BLANKS FOR TRAFFIC CONTROL SIGNS: SIGN BLANKS SHALL BE FABRICATED FROM 0.080" ALUMINUM ALLOY 6063-T6 CONFORMING TO THE REQUIREMENTS OF SUBSECTION 1626 OF THE STANDARD SPECIFICATIONS.
6. SIGN BLADES FOR STREET NAME SIGNS: EXTRUDED ALUMINUM BLADES SHALL BE ALUMINUM ALLOY CONFORMING TO 6063-T6 OR 5052-H38 (ASTM SPECIFICATION B221, LATEST ISSUE). BLADES SHALL HAVE AN ALODINE OR PHOSPHATE ETCHED FINISH. BLADES SHALL HAVE SQUARE CORNERS AND NO HOLES.

   MINIMUM BLADE LENGTH SHALL BE 24". MAXIMUM BLADE LENGTH SHALL BE 48". LENGTH VARIES BY INCREMENTS OF 6".

   BLADES BEARING THE STREET NAMES SHALL BE FIRMLY ATTACHED TO THE MOUNTING BRACKETS USING ALLEN-TYPE CONICAL SET SCREWS. THE BLADES SHALL BE ORIENTED PARALLEL TO THE STREET.
7. MOUNTING BRACKETS FOR SIGNS: DIE-CAST ALUMINUM BRACKETS SHALL BE ALUMINUM ALLOY 360 HAVING A TENSILE STRENGTH OF 44,000 PSI. THE BRACKETS SHALL BE SMOOTHLY FINISHED FREE OF PITS, BURRS, AND FLAWS. EACH BRACKET SHALL BE TAPPED AND DRILLED FOR 5/16" ZINC-PLATED ALLEN-TYPE SET SCREWS HAVING SELF-LOCKING SAW-TOOTH ENDS.
8. FASTENERS: ALL STEEL FASTENERS FOR TRAFFIC CONTROL SIGNS SHALL BE GALVANIZED AND SHALL CONFORM TO THE REQUIREMENTS OF SUBSECTION 1614 OF THE STANDARD SPECIFICATIONS.
9. REFLECTIVE SHEETING: REFLECTIVE SHEETING SHALL BE A MINIMUM OF HIGH INTENSITY PRISMATIC.
10. PROCESS INK: ALL PROCESS INK SHALL CONFORM TO THE REQUIREMENTS OF SUBSECTION 2202 OF THE STANDARD SPECIFICATIONS.
11. FABRICATION AND INSTALLATION OF ALL SIGNS SHALL CONFORM TO THE LATEST ADDITION OF THE MUTCD.
12. DETAILS - SNS: THE REFLECTIVE SHEETING FOR THE 9" STANDARD SIZE SNS IS TO BE THE HIGHWAY GREEN BACKGOUND WITH SILVER-WHITE #2 COPY WITH 6" UPPER CASE AND 4 1/2" LOWER CASE PRIMARY COPY AND SUFFIX COPY. BOTH SERIES "C". FACES TO TRIM TO A 8 1/2". (SEE DETAIL A.)

    THE REFLECTIVE SHEETING FOR THE 9" METRO SIZE SNS IS TO BE THE HIGHWAY GREEN BACKGROUND WITH SILVERWHITE #2 COPY WITH 6" UPPER CASE AND 4 1/2" LOWER CASE PRIMARY COPY AND SUFFIX COPY, BOTH SERIES "C". THE CARDINAL DIRECTION CENTERED DIRECTLY BELOW THE BLOCK NUMBER SHALL BE AN UPPER CASE, 3" SERIES "C" LETTER. FACES TO TRIM TO A 8 1/2" WIDTH. (SEE DETAIL B.)

    FOR CUL-DE-SAC STREETS, A 9" METRO SIZE BLADE SHALL BE USED WITH THE BLOCK NUMBERS DISPLAYED BENEATH THE STREET NAME.

    IF BLOCK NUMBERS ARE NOT SHOWN ON THE PLANS THE CONTRACTOR SHALL CONTACT THE TRAFFIC ENGINEER AT 268-4501 PRIOR TO MANUFACTURING THE SIGN.

    SHOP DRAWINGS OF LAYOUT FOR SNS SHALL BE SUBMITTED TO THE TRAFFIC ENGINEERING DIVISION OF THE CITY OF WICHITA FOR APPROVAL PRIOR TO FABRICATION. THE FINISHED SIGNS AS SUPPLIED SHALL BE OF GOOD APPEARANCE, FREE FROM RAGGED EDGES, CRACKS SCALES OR BLISTERS AND SHALL BE CLEAN-CUT. SIGNS SHALL BE PACKED IN SUCH MANNER AS TO PREVENT DAMAGE OR DEFACEMENT DURING SHIPMENT OR STORAGE.
13. PERMANENT TRAFFIC CONTROL AND SNS: PERMANENT TRAFFIC CONTROL AND SNS SHALL BE MEASURED AND PAID FOR AT THE LUMP SUM PRICE FOR SIGNING. THE PAYMENT AS SET FORTH ABOVE SHALL BE CONSIDERED FULL COMPENSATION FOR ALL EXCAVATION, BACKFILLING, POSTS, ANCHORS, FASTENERS, MATERIALS, LABOR, TOOLS AND INCIDENTALS NECESSARY TO COMPLETE THIS WORK.

CITY OF WICHITA
PUBLIC WORKS & UTILITIES
ENGINEERING DIVISION

# SIGN DETAILS

TRAFFIC ENGINEER
PAUL GUNZELMAN, P.E.

| PROJECT NUMBER | OCA NUMBER | DATE |
|---|---|---|
| 472-84915 | 707022 | 10/2012 |

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

SHEET
53 of 83

TR-106

Saved: 12/20/2012 8:27:55 PM by BJS
Print: Scale: 1:1 by BJS
L:\2010\10281\Standards\10281-TR-106 SIGN DETAIL

## GENERAL NOTES

THE SEQUENCE SHOWN IS INTENDED AS A GUIDE FOR MAJOR ITEMS ONLY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COORDINATION OF ALL MINOR ITEMS. VARIATIONS TO THE SEQUENCE SHOWN MAY BE USED AS APPROVED BY THE ENGINEER. REGARDLESS OF THE SEQUENCE USED, TRAFFIC HANDLING SHALL BE ESSENTIALLY IN ACCORDANCE WITH THAT SHOWN. PART OF THE WORK SHOWN FOR A SPECIFIC STAGE MAY BE ACCOMPLISHED IN OTHER STAGES. MAJOR WORK NOT CONSTRUCTED WITHIN THE INDICATED STAGE SHALL BE APPROVED BY THE ENGINEER. TRAFFIC CONTROL FOR CONSTRUCTION ACTIVITIES SHALL BE IN ACCORDANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) FOR STREETS AND HIGHWAYS (LATEST EDITION).

TEMPORARY STRIPING SHOWN ON NEW ROADWAYS BEING USED TO CARRY DIVERTED TRAFFIC DURING CONSTRUCTION SHALL BE APPLIED BEFORE PLACEMENT OF THE FINAL SURFACE COURSE. PRIOR TO THE FINAL OPENING, THE SURFACE COURSE SHALL BE PLACED COVERING THE TEMPORARY STRIPING.

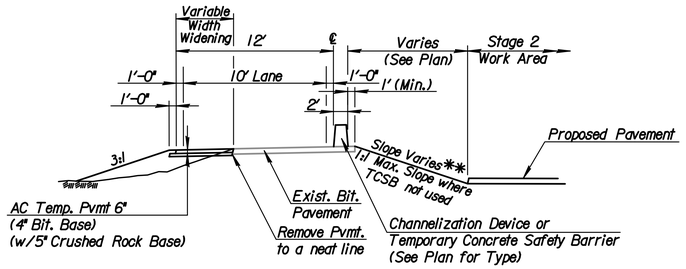
TEMPORARY PAVEMENT SHALL BE AC TEMPORARY PAVEMENT 6". THIS BID ITEM SHALL INCLUDE CONSTRUCTION OF PAVEMENT INCLUDING SUBGRADE PREPARATION, AC PLACEMENT, ALL COSTS INCURRED TO PROPERLY MAINTAIN THE TEMPORARY PAVEMENT WHILE IN USE, REMOVAL AND DISPOSAL OF TEMPORARY PAVEMENT WHEN NO LONGER NEEDED.

INSTALLATION AND REMOVAL OF TEMPORARY DRAINAGE AND ENTRANCE PIPES AS SHOWN ON THE TRAFFIC CONTROL PLANS WILL NOT BE MEASURED OR PAID FOR SEPARATELY BUT SHALL BE CONSIDERED SUBSIDIARY TO THE CONTRACT LUMP SUM PRICE BID FOR "TRAFFIC CONTROL".

ADDITIONAL SIGNS, BARRICADES AND ANY OTHER TRAFFIC CONTROL DEVICES NOT SHOWN ON THE PLANS WHICH MAY BE DEEMED NECESSARY BY THE ENGINEER FOR TRAFFIC CONTROL DURING CONSTRUCTION WILL NOT BE MEASURED OR PAID FOR SEPARATELY BUT SHALL BE SUBSIDIARY TO THE CONTRACT LUMP SUM PRICE BID FOR "TRAFFIC CONTROL".

THE CONTRACTOR SHALL PROVIDE ALL WEATHER ACCESS DRIVES TO ALL PROPERTIES ADJACENT TO THE PROJECT. ALL COSTS ASSOCIATED WITH PROVIDING ACCESS TO ADJACENT PROPERTIES DURING CONSTRUCTION SHALL BE INCLUDED IN THE CONTRACT LUMP SUM PRICE BID FOR "TRAFFIC CONTROL".

| STAGE | MAJOR CONSTRUCTION ITEMS | HANDLING OF TRAFFIC | REMARKS |
|---|---|---|---|
| I | Construct Waterline. | Existing traffic configuration with the use of flaggers as needed for road crossing. | Use of flaggers to comply with Manual on Uniform Traffic Control Devices (MUTCD) for Streets and Highways (Latest Edition). |
| IB | Construct 2-10'x6' RCB at Sta. 220+25.<br>Construct 4'x3' RCB at Sta. 226+05. | Road Closed with 2-way, 2-lane local traffic only.<br>Detour thru traffic to 119th St. | Road Closure is for a Maximum of 14 calendar days. Provide minimum 2 weeks advance notice to Project Engineer prior to closure. |
| IC | Temporary Pavement Lt. on 135th St. from Sta. 210+09 to Sta. 227+06. | 1-lane, Northbound traffic on 135th St. using existing Northbound lane. | Traffic control for temporary widening to comply with the Manual on Uniform Traffic Control Devices (MUTCD) for Streets and Highways (Latest Edition). |
| 2 | Permanent Pavement Rt. on 135th St. from Sta. 207+83 to Sta. 229+00. | 1-lane, Northbound traffic on 135th St. using Stage IC temporary pavement widening and existing Southbound lane. | |
| 3 | Permanent Pavement Lt. on 135th St. from Sta. 207+83 to Sta. 229+00. | 1-lane, Northbound traffic on 135th St. using new Northbound lanes. | |
| 4 | Surface Course, final seeding, marking, and other miscellaneous items. | Open lanes to traffic as surface course is completed. | Lane closures with the use of flaggers will be permitted during daylight hours with the approval of the Engineer. All Traffic control shall be in accordance with the MUTCD (Latest Edition). |




** See Cross Sections for Variations.

TYPICAL SECTION – STAGE 1C TEMPORARY WIDENING

| No. | Revision | By | Date |
|---|---|---|---|

135TH ST.

# TRAFFIC HANDLING AND CONSTRUCTION SEQUENCE

GARY JANZEN, P.E.–CITY ENGINEER
CITY OF WICHITA PROJECT NO. 472-84915

PEC
PROFESSIONAL ENGINEERING CONSULTANTS, P.A.
303 SOUTH TOPEKA WICHITA, KS 67202
316-262-2691 www.pec1.com

| Designed by | RJS | Job No. | 10281 | Sht. 54 of 83 |
|---|---|---|---|---|
| Drawn by | JDT | Date | JAN., 2013 | |

Plotted By: svb Date: 2/25/2013 3:00:49 PM
FILE: I:\2010\1028I\Traffic Control\1028I-TC Sequence.dgn

Not to Scale

151st St. West

135th St. West

119th St. West

Kellogg Fr. Rd. (E)

US-54/400 (Kellogg)

Pawnee

W. Onewood St.

W. Links Ln.

Maple

Central

Sta. 220+25.08 Construct 2-10'x6' RCB ①

Sta. 226+05 Construct 4'x3' RCB ①

750'

1000'

500'

135TH ST W CLOSED SOUTH OF MAPLE
G20-SPECIAL (72"x36")
6" SERIES "C" LETTERS

135TH ST W CLOSED NORTH OF US-54/400
G20-SPECIAL (96"x48")
10" SERIES "D" LETTERS

135TH ST W CLOSED SOUTH OF MAPLE
G20-SPECIAL (72"x36")
6" SERIES "C" LETTERS

135TH ST W CLOSED NORTH OF US-54/400
G20-SPECIAL (96"x48")
10" SERIES "D" LETTERS

ROAD CLOSED
*R11-2 (48"x30")

ROAD CLOSED AHEAD
W20-3 (48"x48")

ROAD CLOSED TO THRU TRAFFIC
*R11-4 (60"x30")

DETOUR
*M4-10(L) (48"x18")

DETOUR AHEAD
W20-2 (48"x48")

ROAD CLOSED AHEAD
W20-3 (48"x48")

135TH ST DETOUR
Special M4-9(L) (30"x24")

END DETOUR
M4-8a (24"x18")

DETOUR
M4-9(L) (30"x24")

135TH ST DETOUR
Special M4-9 (30"x24")

DETOUR
M4-9(R) (30"x24")

135TH ST DETOUR
Special M4-9(R) (24"x30")

DETOUR
M4-9(L) (30"x24")

135TH ST DETOUR
Special M4-9 (30"x24")

135TH ST DETOUR
Special M4-9(L) (30"x24")

135TH ST DETOUR
Special M4-9 (30"x24")

DETOUR
M4-9 (30"x24")

135TH ST DETOUR
Special M4-9 (30"x24")

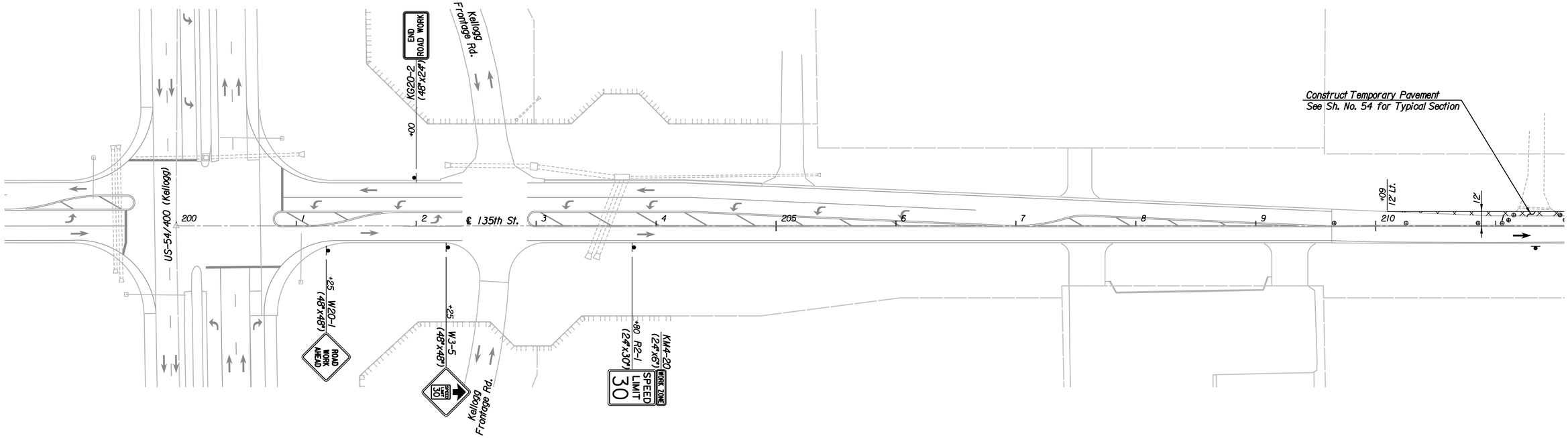
DETOUR
M4-9(L) (30"x24")

135TH ST DETOUR
Special M4-9(L) (30"x24")

135TH ST DETOUR
Special M4-9 (30"x24")

135TH ST DETOUR
Special M4-9 

SCALE
40' 0 40' 80'




LEGEND

- ⊕ Channelizing Device at 60' Spacing unless otherwise Noted.
- ● Traffic Control Sign
- Temporary Pavement for Detours
- → Direction of Traffic

Note: Utilities are not shown on Traffic Control Plans. The Contractor is responsible for verification as to type and location of underground utilities as may be necessary to avoid damage thereto. The Contractor is responsible for repairing any damage to underground utilities.

Note: Signs and barricades are shown diagrammatically only. Contractor will be responsible to install the required number of posts to support the installation.

| No. | Revision | By | Date |
|---|---|---|---|

135TH ST.

# TRAFFIC CONTROL PLAN
## STAGE IC - STA. 203+00 TO STA. 211+00

GARY JANZEN, P.E.-CITY ENGINEER
CITY OF WICHITA PROJECT NO. 472-84915

PEC
PROFESSIONAL ENGINEERING CONSULTANTS, P.A.
303 SOUTH TOPEKA WICHITA, KS 67202
316-262-2691 www.pec1.com

| Designed by | JPS | Job No. | 10281 | Sht. 56 of 83 |
|---|---|---|---|---|
| Drawn by | SVB | Date | JAN., 2013 | |

Plotted By: svb Date: 2/6/2013 3:00:48 PM
FILE: I:\2010\1028\Traffic Control\1028I-TC StageIC-203.dgn

SCALE
40' 0 40' 80'

Construct Temporary Pavement
See Sh. No. 54 for Typical Section

R6-1(R) (36"x12") ONE WAY

12'

3 4 215 ℄ 135th St. 6 7 8 9 220 2 3

R6-1(L) (36"x12") ONE WAY

+50

KM4-20 (24"x6") WORK ZONE

R2-1 (24"x30") SPEED LIMIT 30

ROAD CLOSED

R3-1 (24"x24")

R11-2 (48"x30")

STOP

W. Onewood St.

All Signs and Barricades relating to 135th St. Closure South of Maple from Stage 1B Traffic Control to Remain this Stage. See Sh. No. 55

Construct Temporary Pavement
See Sh. No. 54 for Typical Section

R6-1(R) (36"x12") ONE WAY

12'

+06
12' Lt.

3 4 225 6 ℄ 135th St. 7 8 9 230 1 2 3 4 235

R6-1(L) (36"x12") ONE WAY

ROAD CLOSED

R11-2 (48"x30")

R6-1(L) (36"x12") ONE WAY

R6-1(L) (36"x12") ONE WAY

R5-1 (30"x30") DO NOT ENTER

+45

W. Links Lane

STOP

R3-2 (24"x24")

+00

KG20-2 (48"x24") END ROAD WORK

LEGEND

- Channelizing Device at 60' Spacing unless otherwise Noted.
- Traffic Control Sign
- Type III Barricades
- Temporary Pavement for Detours
- Direction of Traffic

Note: Signs and barricades are shown diagrammatically only. Contractor will be responsible to install the required number of posts to support the installation.

Moving channelizing devices and signs, and additional traffic control may be necessary to construct entrances. Maintain all weather access at all times during construction. This shall be considered Subsidiary.

(1) Place channelizing devices as necessary during construction to restrict access to work area.

Note: Utilities are not shown on Traffic Control Plans. The Contractor is responsible for verification as to type and location of underground utilities as may be necessary to avoid damage thereto. The Contractor is responsible for repairing any damage to underground utilities.

| No. | Revision | By | Date |
|---|---|---|---|
| | | | |

135TH ST.

# TRAFFIC CONTROL PLAN
## STAGE IC - STA. 211+00 TO STA. 235+00

GARY JANZEN, P.E.-CITY ENGINEER
CITY OF WICHITA PROJECT NO. 472-84915

PEC
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316-262-2691 www.pec1.com

| Designed by | JPS | Job No. | 10281 | Sht. 57 of 83 |
|---|---|---|---|---|
| Drawn by | SVB | Date | JAN., 2013 | |

Plotted By: svb Date: 2/6/2013 3:04:09 PM
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SCALE
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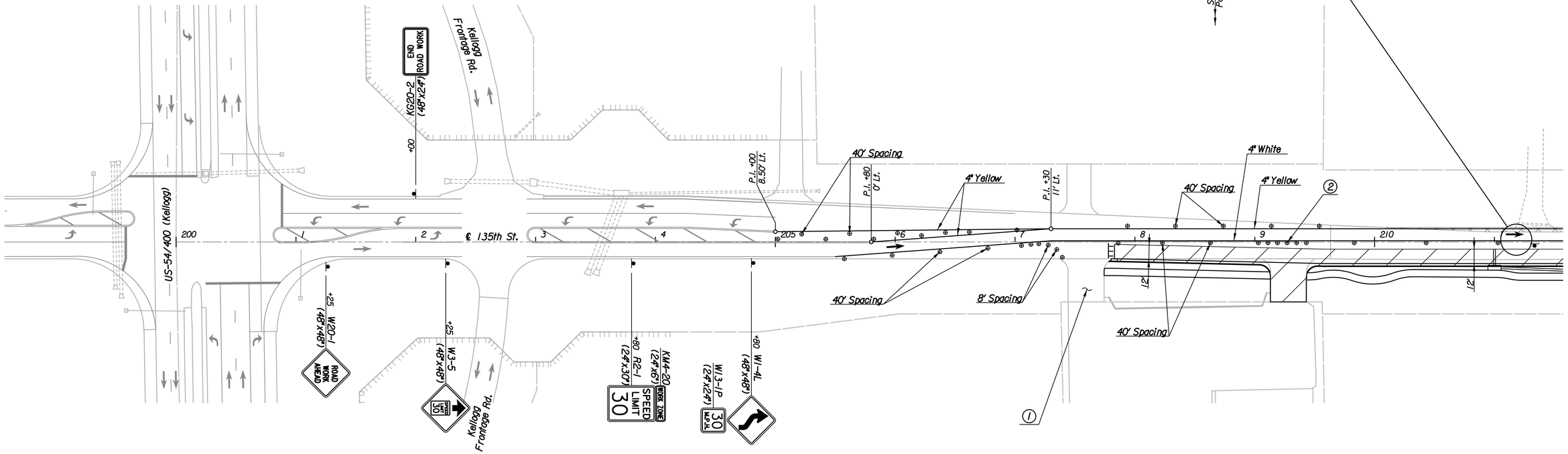


LEGEND

- Channelizing Device at 60' Spacing unless otherwise Noted.
- Traffic Control Sign
- Type III Barricades
- Work Area (New Pavement)
- Direction of Traffic

Note: Signs and barricades are shown diagrammatically only. Contractor will be responsible to install the required number of posts to support the installation.

Note: Utilities are not shown on Traffic Control Plans. The Contractor is responsible for verification as to type and location of underground utilities as may be necessary to avoid damage thereto. The Contractor is responsible for repairing any damage to underground utilities.

(1) Provide access to entrance at all times during construction.

(2) Place channelizing devices as necessary during construction to restrict access to work area.

| No. | Revision | By | Date |
|---|---|---|---|
| | | | |

135TH ST.

# TRAFFIC CONTROL PLAN
## STAGE 2 - STA. 203+00 TO STA. 211+00

GARY JANZEN, P.E.-CITY ENGINEER
CITY OF WICHITA PROJECT NO. 472-84915

PEC
PROFESSIONAL ENGINEERING CONSULTANTS, P.A.
303 SOUTH TOPEKA WICHITA, KS 67202
316-262-2691 www.pec1.com

| Designed by | JPS | Job No. | 10281 | Sht. | 58 of 83 |
|---|---|---|---|---|---|
| Drawn by | SVB | Date | JAN., 2013 | | |

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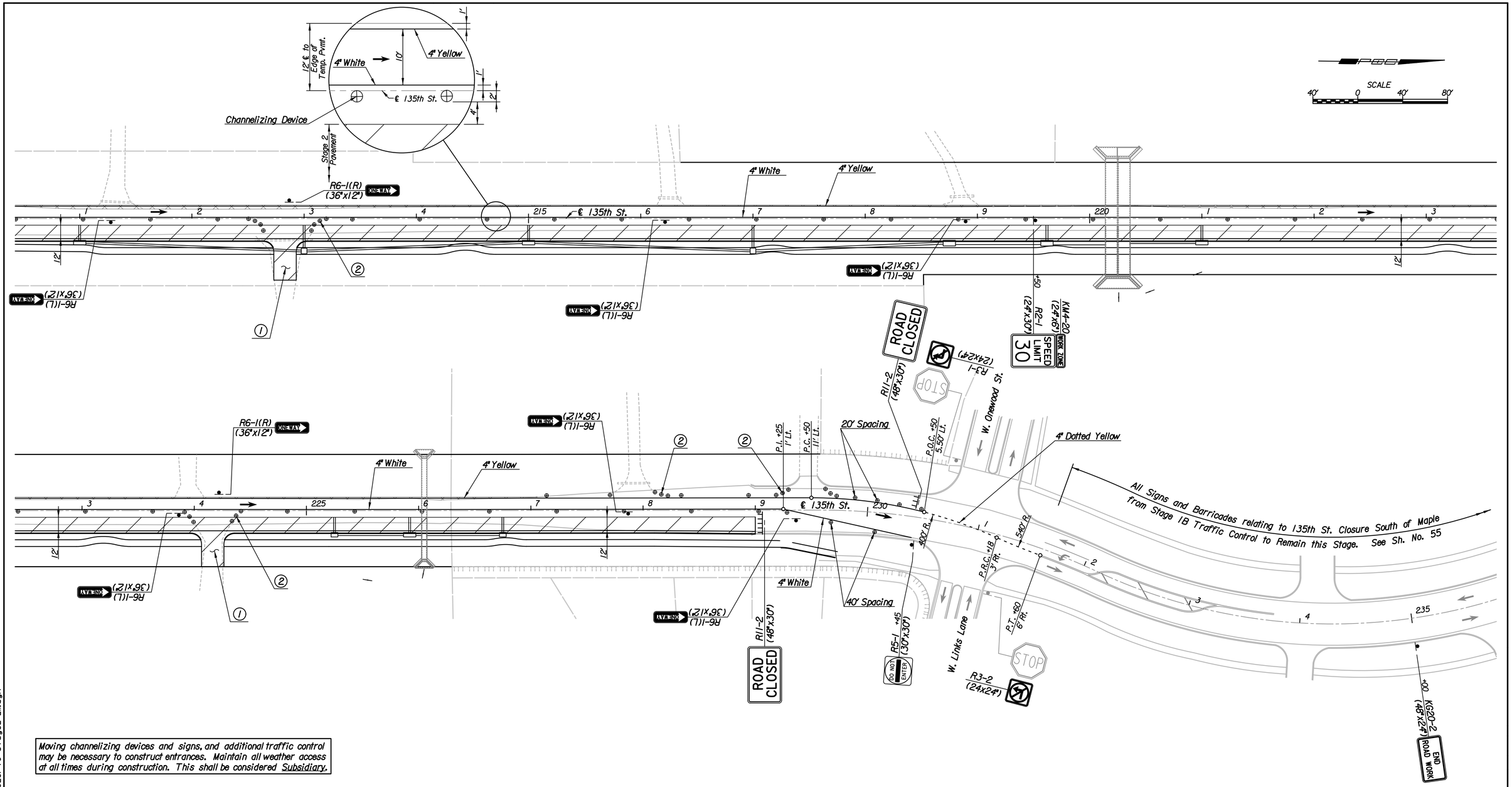


*Moving channelizing devices and signs, and additional traffic control may be necessary to construct entrances. Maintain all weather access at all times during construction. This shall be considered Subsidiary.*

① *Provide temporary all weather access to entrance at all times during construction.*

② *Place channelizing devices as necessary during construction to restrict access to work area.*

LEGEND

- *Channelizing Device at 60' Spacing unless otherwise Noted.*
- *Traffic Control Sign*
- *Type III Barricades*
- *Work Area (New Pavement)*
- *Direction of Traffic*

*Note: Signs and barricades are shown diagrammatically only. Contractor will be responsible to install the required number of posts to support the installation.*

*Note: Utilities are not shown on Traffic Control Plans. The Contractor is responsible for verification as to type and location of underground utilities as may be necessary to avoid damage thereto. The Contractor is responsible for repairing any damage to underground utilities.*

| No. | Revision | By | Date |
|---|---|---|---|
| | | | |

135TH ST.

# TRAFFIC CONTROL PLAN
## STAGE 2 - STA. 211+00 TO STA. 235+00

GARY JANZEN, P.E.-CITY ENGINEER
CITY OF WICHITA PROJECT NO. 472-84915

PEC
PROFESSIONAL ENGINEERING CONSULTANTS, P.A.
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316-262-2691 www.pec1.com

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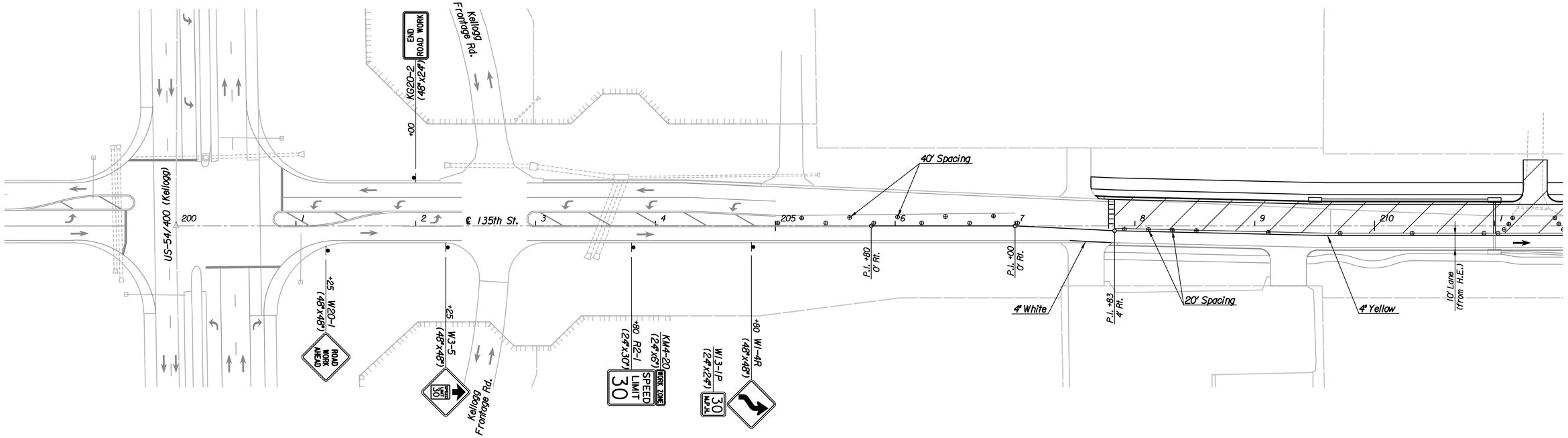
|---|---|---|---|
| Designed by | JPS | Job No. | 10281 |
| Drawn by | SVB | Date | JAN., 2013 |

Sht. 59 of 83

Plotted By: svb Date: 2/6/2013 3:09:28 PM
FILE: I:\2010\1028\Traffic Control\1028i-TC Stage2-211.dgn

SCALE
40' 0 40' 80'




LEGEND

- Channelizing Device at 60' Spacing unless otherwise Noted.
- Traffic Control Sign
- Type III Barricades
- Work Area (New Pavement)
- Direction of Traffic

Note: Signs and barricades are shown diagrammatically only. Contractor will be responsible to install the required number of posts to support the installation.

Note: Utilities are not shown on Traffic Control Plans. The Contractor is responsible for verification as to type and location of underground utilities as may be necessary to avoid damage thereto. The Contractor is responsible for repairing any damage to underground utilities.

| No. | Revision | By | Date |
|---|---|---|---|

135TH ST.

# TRAFFIC CONTROL PLAN
## STAGE 3 - STA. 203+00 TO STA. 211+00

GARY JANZEN, P.E.-CITY ENGINEER
CITY OF WICHITA PROJECT NO. 472-84915

PEC
PROFESSIONAL ENGINEERING CONSULTANTS, P.A.
303 SOUTH TOPEKA WICHITA, KS 67202
316-262-2691 www.pec1.com

| Designed by | JPS | Job No. | 10281 | Sht. 60 of 83 |
|---|---|---|---|---|
| Drawn by | SVB | Date | JAN., 2013 | |

Plotted By: svb Date: 2/6/2013 3:14:09 PM
FILE: I:\2010\028I\Traffic Control\028I-TC Stage3-203.dgn

SCALE
40' 0 40' 80'

R6-1(R) (36"x12") ONE WAY
4" Yellow
10' Lane (from H.E.)
℄ 135th St.
R6-1(L) (36"x12") ONE WAY
ROAD CLOSED
R11-2 (48"x30")
20' Spacing
P.I. +75 7' Lt.
P.I. +42 7' Lt.
R3-1 (24x24")
STOP
W. Onewood St.
R2-1 (24"x30") SPEED LIMIT 30
K14-20 (24"x60") WORK ZONE
+50
+05
230'
14'
All Signs and Barricades relating to 135th St. Closure South of Maple from Stage 1B Traffic Control to Remain this Stage. See Sh. No. 55
P.I. +25 8' Rt.
4" White
R5-1 (30"x30") DO NOT ENTER
W. Links Lane
R3-2 (24x24") STOP
+00
K6-20-2 (48"x24") END ROAD WORK

Moving channelizing devices and signs, and additional traffic control may be necessary to construct entrances. Maintain all weather access at all times during construction. This shall be considered Subsidiary.

LEGEND

- Channelizing Device at 60' Spacing unless otherwise Noted.
- Traffic Control Sign
- TTTTT Type III Barricades
- Work Area (New Pavement)
- → Direction of Traffic

Note: Utilities are not shown on Traffic Control Plans. The Contractor is responsible for verification as to type and location of underground utilities as may be necessary to avoid damage thereto. The Contractor is responsible for repairing any damage to underground utilities.

Note: Signs and barricades are shown diagrammatically only. Contractor will be responsible to install the required number of posts to support the installation.

(1) Provide temporary all weather access to entrance at all times during construction.

(2) Provide access to entrance at all times during construction.

(3) Place channelizing devices as necessary during construction to restrict access to work area.

| No. | Revision | By | Date |
|---|---|---|---|

135TH ST.

# TRAFFIC CONTROL PLAN
## STAGE 3 - STA. 211+00 TO STA. 235+00

GARY JANZEN, P.E.-CITY ENGINEER
CITY OF WICHITA PROJECT NO. 472-84915

PEC
PROFESSIONAL ENGINEERING CONSULTANTS, P.A.
303 SOUTH TOPEKA WICHITA, KS 67202
316-262-2691 www.pec1.com

| | | | |
|---|---|---|---|
| Designed by | JPS | Job No. | 10281 |
| Drawn by | SVB | Date | JAN., 2013 |

Sht. 61 of 83

Plotted By: svb Date: 2/6/2013 3:17:25 PM
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| COUNTY | STATE | PROJECT NUMBER | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|
| SEDGWICK | KANSAS | 472-84915 | 2013 | 62 | 83 |

W8-1
48"x48"

BUMP SIGN
(AS REQUIRED BY THE ENGINEER)

W8-11
48"x48"

UNEVEN LANES SIGN
(SPACED @ 1/4 MILE THROUGHOUT PROJECT AS REQUIRED)

W8-9a
48"x48"

SHOULDER DROP-OFF SIGN
(SPACED @ 1/4 MILE THROUGHOUT PROJECT AS REQUIRED)

(LEGEND TO BE DETERMINED BY THE ENGINEER)

G20-SPECIAL
72"x36" 6" SERIES "C" LETTERS
or
96"x48" 10" SERIES "D" LETTERS

# LIST OF TRAFFIC CONTROL DEVICES *

| MUTCD DEVICE NO. | NO. | FLASHERS TYPE A | FLASHERS TYPE B | REMARKS |
|---|---|---|---|---|
| R2-1 | 2 | | | SPEED LIMIT |
| R3-1 | 1 | | | NO TURN |
| R3-2 | 1 | | | NO TURN |
| R5-1 | 1 | | | DO NOT ENTER |
| R6-1(L) | 6 | | | ONE WAY |
| R6-1(R) | 2 | | | ONE WAY |
| R11-2 | 2 | | | ROAD (OR BRIDGE) CLOSED |
| R11-4 | 2 | | | ROAD CLOSED (THRU TRAFFIC) |
| | | | | |
| KG20-2 | 2 | | | END ROAD WORK |
| KM4-20 | 2 | | | WORK ZONE |
| | | | | |
| M4-8a | 2 | | | END DETOUR |
| M4-9 | 6 | | | DETOUR DIRECTION |
| M4-9(L) | 3 | | | DETOUR DIRECTION |
| M4-9(R) | 3 | | | DETOUR DIRECTION |
| M4-10(L) | 1 | | | DETOUR ARROW |
| M4-10(R) | 1 | | | DETOUR ARROW |
| | | | | |
| | | | | |
| | | | | |

| MUTCD DEVICE NO. | NO. | FLASHERS TYPE A | FLASHERS TYPE B | REMARKS |
|---|---|---|---|---|
| W1-4L | 1 | 1 | | ROADWAY SHIFT |
| W1-4R | 1 | 1 | | ROADWAY SHIFT |
| W3-5 | 1 | 1 | | SPEED LIMIT AHEAD |
| W13-1P | 1 | | | SPEED ADVISORY |
| W20-1 | 1 | 1 | | ROAD WORK AHEAD |
| W20-2 | 2 | 2 | | DETOUR AHEAD |
| W20-3 | 4 | 4 | | ROAD (OR BRIDGE) CLOSED AHEAD |
| | | | | |
| G20 SPEC. | 12 | | | LEGEND |
| SPECIAL | 12 | | | 135TH ST |

* FOR INFORMATION ONLY  QUANTITY SHOWN REPRESENTS MAXIMUM REQUIRED DURING ANY SINGLE STAGE.

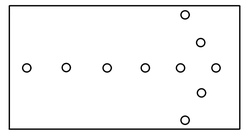
**DELINEATORS & CHANNELIZATION DEVICES**

| DEVICE | NO. | SIZE | FLASHERS TYPE A | FLASHERS TYPE B | FLASHERS TYPE C |
|---|---|---|---|---|---|
| BARRICADES | | | | | |
| TYPE III | 9 | 12' | 8 | | |
| TYPE II | | | | | |
| TYPE I | | | | | |
| DRUMS | 85 | | | | |
| CONES | 22 | | | | |
| TUBES | | | | | |
| VERTICAL PANELS | | | | | |
| SINGLE | | | | | |
| BACK TO BACK | | | | | |
| PAVEMENT MARKING ø | WHITE | YELLOW | | | |
| TYPE I 4" SOLID (Lin. Ft.) | 420 | 3000 | | | |
| TYPE I 4" BROKEN (Lin. Ft.) | | | | | |
| TYPE I 4" DOTTED (Lin. Ft.) | | 100 | | | |
| TYPE II 4" SOLID (Lin. Ft.) | 2190 | 2120 | | | |
| TYPE II 4" BROKEN (Lin. Ft.) | | | | | |
| TURN ARROW | | | | | |
| 12" WHITE STOP BAR | As Required | | | | |
| TEMP. CONCRETE SAFETY BARRIER | | (Lin. Ft.) | | | |
| ARROW DISPLAY | | | | | |
| INERTIAL BARRIER SYSTEM | | | | | |

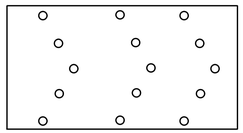
SEE SHEET NO. 63 FOR TRAFFIC CONTROL NOTES

*Note: See Traffic Control Plans for drainage pipes which are Subsidiary to bid item "Traffic Control" - Lump Sum.*

ARROW DISPLAY



FLASHING ARROW



SEQUENTIAL CHEVRON

ARROW DISPLAY ELEMENTS SHALL BE CAPABLE OF A MINIMUM 50 PERCENT DIMMING FROM THEIR FULL-RATED LAMP VOLTAGE. FULL LAMP VOLTAGE SHOULD BE USED FOR DAY AND DIMMED MODE SHALL BE USED FOR NIGHT.

ø PAVEMENT MARKINGS:

(A) TYPE I TAPE IS TO BE APPLIED TO A FINAL SURFACE AS A TEMPORARY MARKING WHEN THE PATTERN OF THE PERMANENT MARKINGS WILL BE DIFFERENT THAN THE TEMPORARY MARKING.
TYPE II TAPE IS TO BE APPLIED TO A TEMPORARY SURFACE THAT IS TO BE REMOVED OR COVERED BY FUTURE CONSTRUCTION. TYPE II TAPE IS ALSO TO BE APPLIED TO A FINAL SURFACE WHERE IT IS KNOWN THERE WILL BE PERMANENT MARKINGS PLACED IN THE SAME PATTERN AS THE TEMPORARY TYPE II TAPE.

(B) ALL CONFLICTING PAVEMENT MARKINGS SHALL BE REMOVED AND ALL TRANSITION TAPERS, CROSSOVERS, AND EDGE LINES ALONG CHANNELIZING DEVICES SHALL BE MARKED WITH SOLID FOUR-INCH WIDE PAVEMENT MARKING TAPE WHEN THE WORK WILL OCCUPY A LOCATION MORE THAN THREE DAYS.

## SUMMARY OF BID ITEMS

| BID ITEM | QUANTITY | UNIT |
|---|---|---|
| TRAFFIC CONTROL | 1 | LUMP SUM |
| | | |
| | | |

DSNR: I:/2008/08208/STANDARDS/08208-TC-2-0.DGN  OPER: SVB  SCALE:  LAST REV: 6-3-2010  BY: svb

| 11/94 | CHG W8-9a & ADDED W8-11 | DRS |
|---|---|---|

# SUMMARY OF TRAFFIC CONTROL DEVICES

T.C. NO. 2.0

PREPARED BY
SEDGWICK COUNTY PUBLIC WORKS
HIGHWAY DIVISION

DAVID C. SPEARS, P.E.  DIRECTOR/COUNTY ENGINEER

| REVISED | SCALE | DESIGNED | TRACED | CHECKED | SHEET NO. |
|---|---|---|---|---|---|
| | | M.R.B. | D.R.S. | M.R.B. | 62 |
| | DATE | 6/88 | 3/94 | 3/94 | |
| | PLANFILE ~~TC-2-0~~ | | TOTAL SHEETS | | |

| STATE | PROJECT NO. | YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| KANSAS | 472-84915 | 2013 | 63 | 83 |

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/

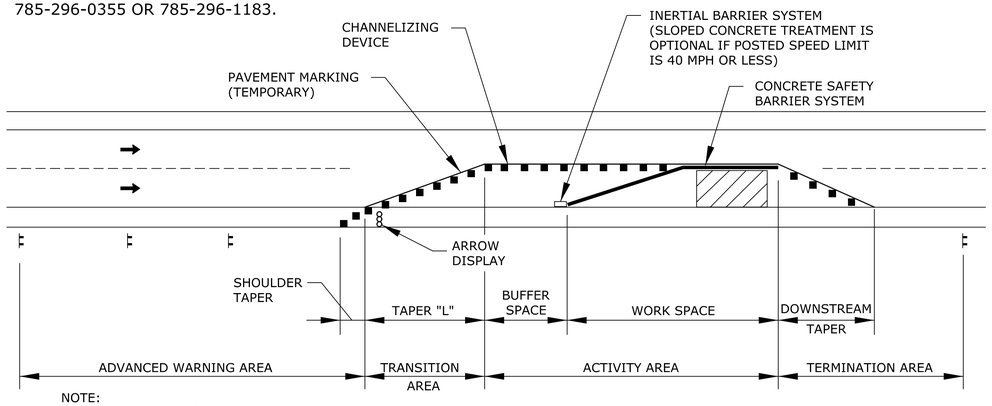
3) CERTIFY THAT THE TRUCK MOUNTED ATTENUATORS (TMA'S) (WHICH ARE DEFINED AS CATEGORY 3 DEVICES BY THE FHWA MEMORANDUM) MEET CURRENT CRASHWORTHY SPECIFICATIONS AS DEFINED ABOVE AND INCLUDE A COPY OF THE ENTIRE FHWA ACCEPTANCE LETTER. ALL CATEGORY 1 & 2 DEVICES SHALL BE NCHRP REPORT 350 OR MASH REPORT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

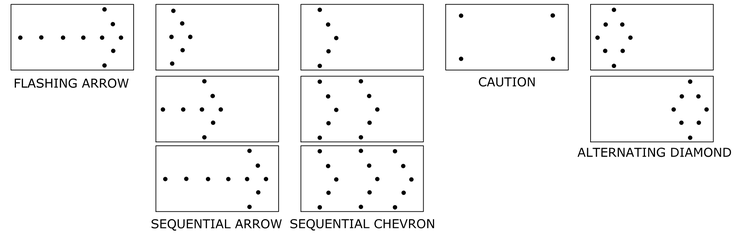
ALTERNATIVE TEMPORARY RUMBLE STRIP OPTIONS MAY BE AVAILABLE. PLEASE CONTACT THE TEMPORARY TRAFFIC CONTROL UNIT FOR MORE INFORMATION AT 785-296-0355 OR 785-296-1183.




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

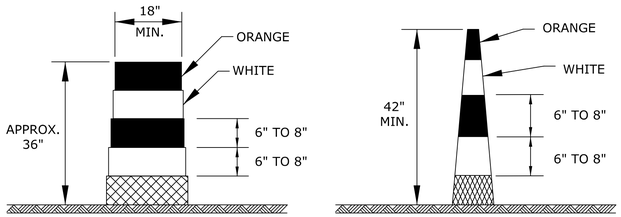
GENERAL TRAFFIC CONTROL

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. |

Drawn By : svb
File : I:\2010\10281\Standards\10281-te700.dgn
Plotted : 5/16/2013

| STATE | PROJECT NO. | YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| KANSAS | 472-84915 | 2013 | 64 | 83 |



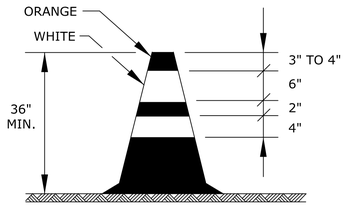

DRUM




CONICAL DELINEATOR

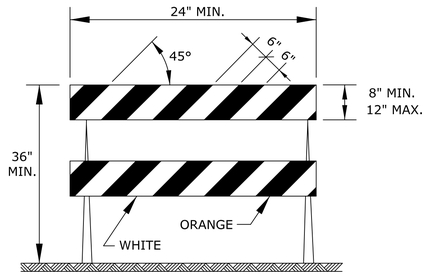
DRUMS AND CONICAL DELINEATORS SHALL HAVE AT LEAST TWO ORANGE AND TWO WHITE 6" TO 8" WIDE RETROREFLECTIVE STRIPES. ADDITIONAL STRIPES MAY BE NON-RETROREFLECTIVE. IF THERE ARE NON-RETROREFLECTIVE SPACES BETWEEN ADJACENT STRIPES, THEY SHALL BE NO MORE THAN 3" WIDE.

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.

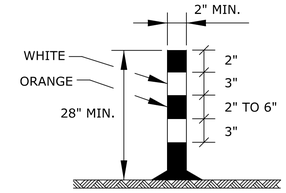



TYPE II BARRICADE

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

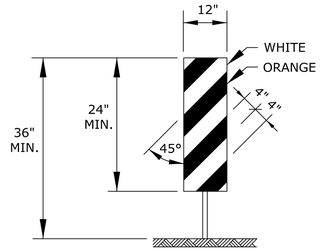
THE ENTIRE AREA OF BARRICADE RAILS, BOTH FRONT AND BACK, SHALL BE ASTM TYPE III SHEETING.

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



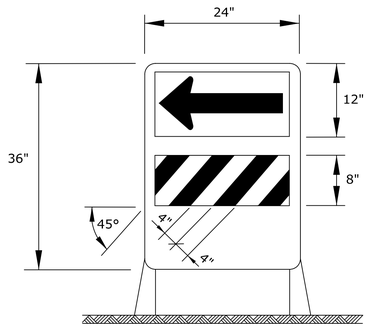

TUBULAR MARKER

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.




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 | Channelizer Placement & Traffic Cone Detail | J.A.M. | A.A.A. |

KANSAS DEPARTMENT OF TRANSPORTATION

CHANNELIZING DEVICES

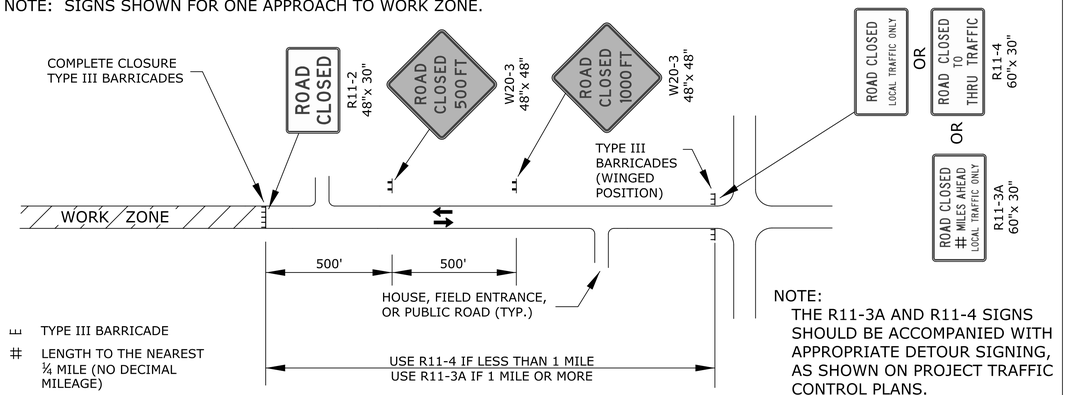
TE702

| | | | | | |
|---|---|---|---|---|---|
| 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 : 5/16/2013
Drawn By : svb
File : I:\2010\10281\Standards\10281-te702.dgn

| STATE | PROJECT NO. | YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| KANSAS | 472-84915 | 2013 | 65 | 83 |

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).

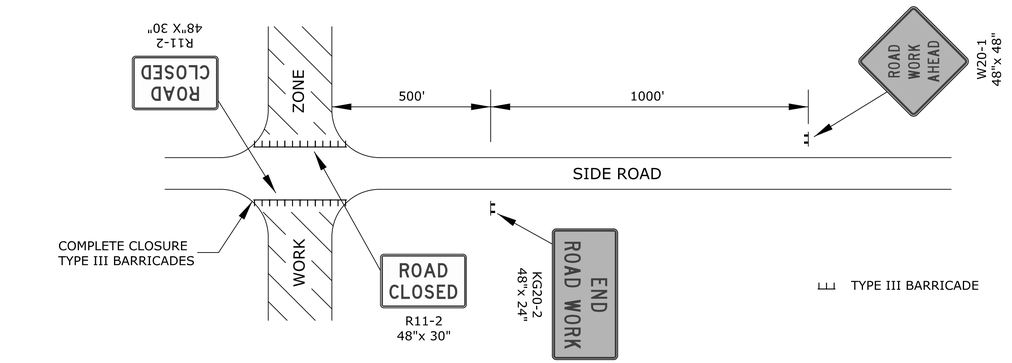



FIGURE 2: TYPICAL SIGNING FOR SIDE ROAD OPEN

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

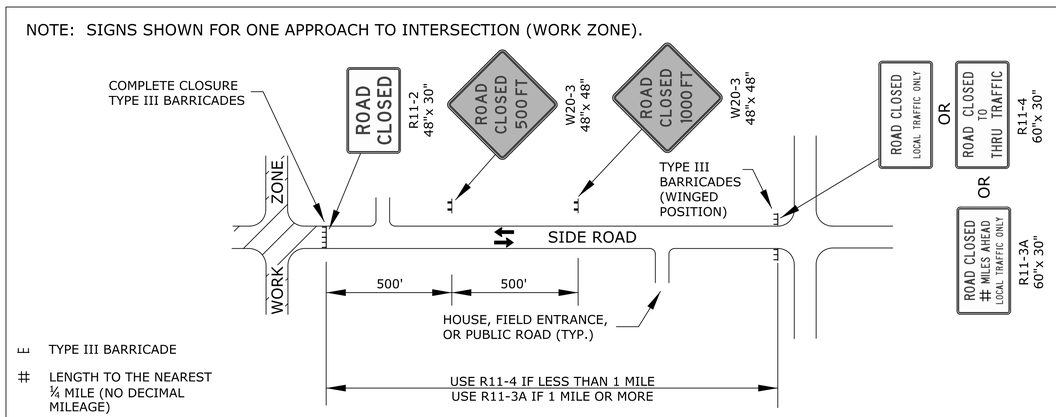



FIGURE 3: TYPICAL SIGNING FOR SIDE ROAD CLOSED

NOTE: SIGNS SHOWN FOR ONE APPROACH TO WORK ZONE.

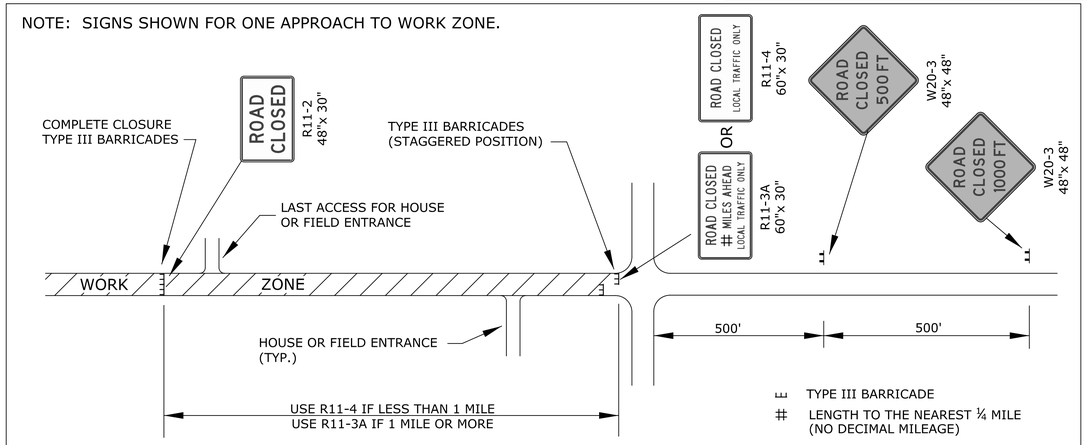



FIGURE 4: TYPICAL SIGNING FOR ROAD CLOSURE - LOCAL TRAFFIC ACCESS

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:

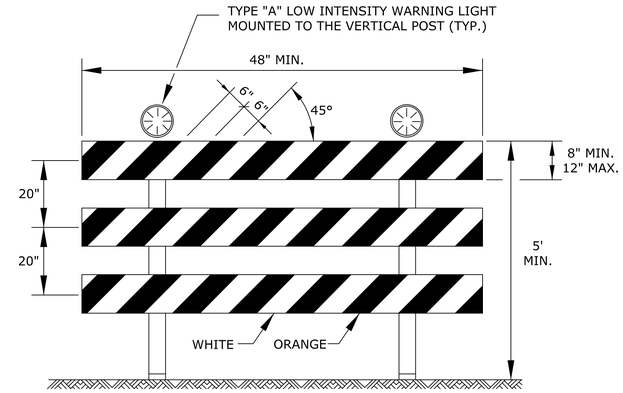
A) COMPLETE ROAD CLOSURE

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. |

Drawn By : svb
File : I:\2010\10281\Standards\10281-te704.dgn
Plotted : 5/16/2013

| STATE | PROJECT NO. | YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| KANSAS | 472-84915 | 2013 | 66 | 83 |

## 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

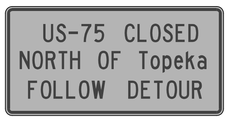
STD. SIZE EXPWY/FREEWAY
48"x 48"

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:

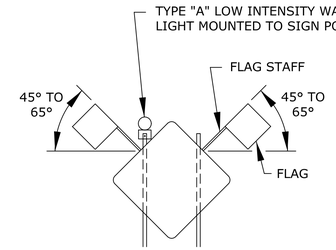
THE KG20-2(END ROAD WORK) SHOULD BE PLACED 500' FROM THE END OF THE ACTUAL WORK SPACE, NOT NECESSARILY AT THE EXTREME LIMITS OF THE PROJECT. THE KG20-2 SHOULD BE MOUNTED ON TWO POSTS. THE KG20-2 MAY BE MOUNTED ON ONE POST IF IN URBAN AREAS WHERE UTILITIES ARE A PROBLEM AND WIND LOADS ARE NOT AN ISSUE.

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

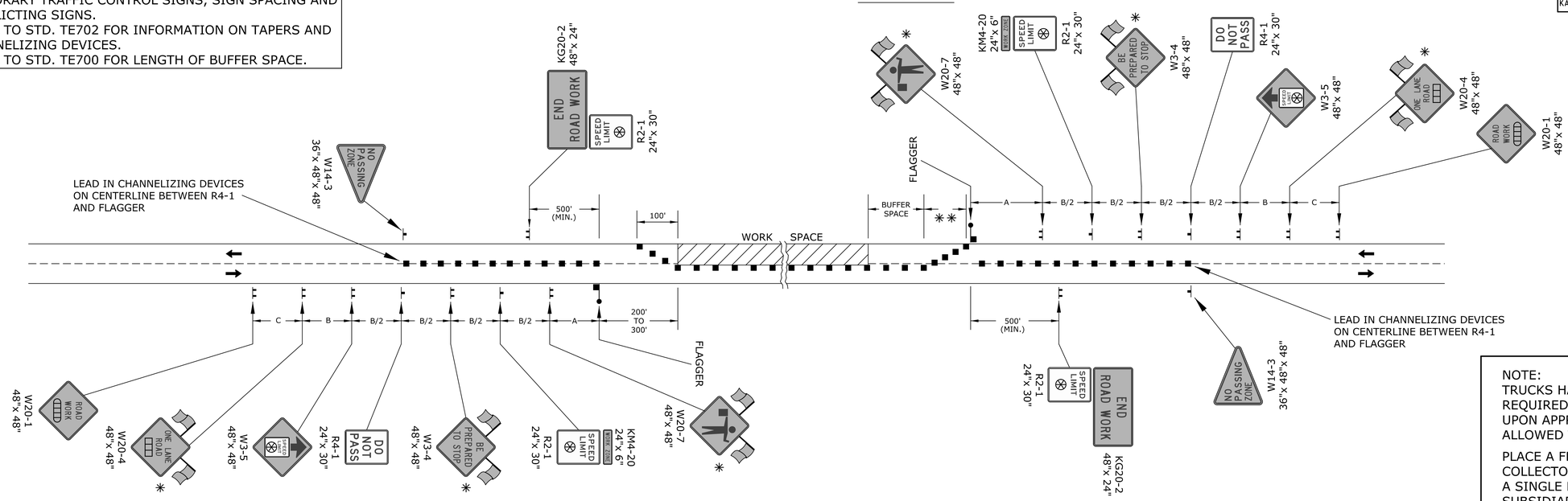
| | | | | | |
|---|---|---|---|---|---|
| FHWA APPROVAL | | | 10/16/12 | APP'D | Kristina Pyle |
| DESIGNED | B.A.H. | DETAILED | B.A.H. | QUANTITIES | TRACED |
| DESIGN CK. | | DETAIL CK. | | QUAN. CK. | TRACE CK. |

Plotted : 5/16/2013
Drawn By : svb
File : I:\2010\10281\Standards\10281-te710.dgn

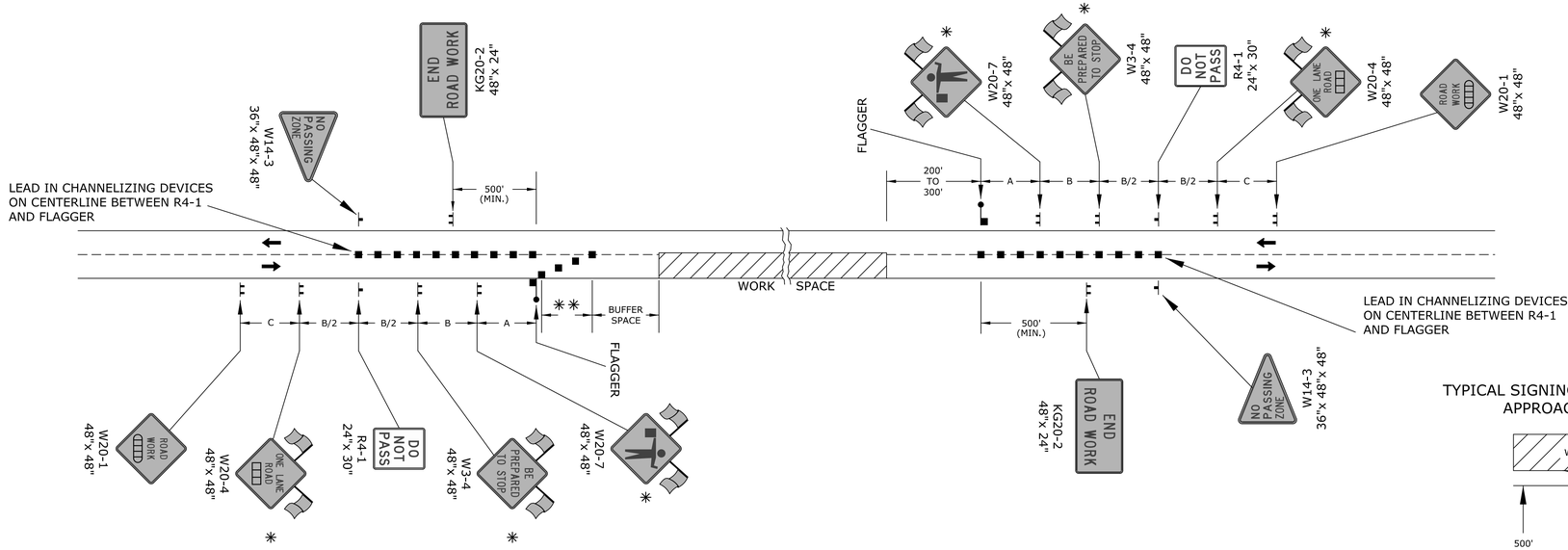
REFER TO STD. TE710 FOR ADDITIONAL INFORMATION ON TEMPORARY TRAFFIC CONTROL SIGNS, SIGN SPACING AND CONFLICTING SIGNS.
REFER TO STD. TE702 FOR INFORMATION ON TAPERS AND CHANNELIZING DEVICES.
REFER TO STD. TE700 FOR LENGTH OF BUFFER SPACE.

| STATE | PROJECT NO. | YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| KANSAS | 472-84915 | 2013 | 67 | 83 |

## FLAGGER




## FLAGGER AND PILOT CAR




NOTE:
TRUCKS HAULING MATERIAL TO THE PROJECT ARE REQUIRED TO STOP AT FLAGGER. AFTER STOPPING, UPON APPROVAL OF ENGINEER, TRUCKS MAY BE ALLOWED TO MOVE AROUND FLAGGER.

PLACE A FLAGGER AT ALL HIGHWAY AND MAJOR COLLECTOR INTERSECTIONS IN THE WORK SPACE. A SINGLE FLAGGER AT EACH INTERSECTION IS SUBSIDIARY TO OTHER ITEMS. THE NEED FOR A FLAGGER AT A MINOR SIDE ROAD INTERSECTION SHALL BE DETERMINED BY THE ENGINEER. IF REQUESTED BY THE ENGINEER, EACH ADDITIONAL FLAGGER WILL BE MEASURED AND PAID FOR EACH HOUR THEY ARE REQUIRED. PLACE A W20-7 (FLAGGER SYMBOL) SIGN ON EACH SIDE ROAD APPROACH THAT IS CONTROLLED BY A FLAGGER.

EXISTING SIGNS SHALL NOT BE COVERED OR REMOVED BETWEEN FLAGGER STATIONS.

✳ WHEN APPLICABLE, USE TYPE "A" LOW INTENSITY WARNING LIGHTS FOR NIGHTTIME OPERATIONS ONLY OR AS DIRECTED BY ENGINEER.

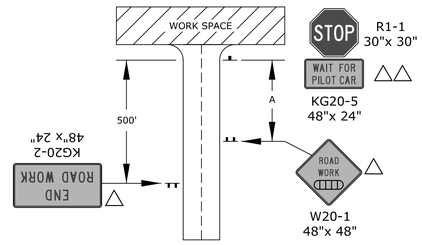
✳✳ THERE SHOULD BE A MINIMUM OF SIX (6) CHANNELIZERS SPACED AT 20' INTERVALS.

△ NOT REQUIRED ON SUBSTANTIAL MAINTENANCE PROJECTS (1R)

△△ THE KG20-5 (WAIT FOR PILOT CAR) SIGN SHALL BE MOUNTED ON AN APPROVED PORTABLE SUPPORT AND NOT ATTACHED TO THE EXISTING STOP SIGN POST.

THE KG20-5 SIGN SHALL BE PLACED IMMEDIATELY IN FRONT OF THE EXISTING STOP SIGN, A MINIMUM OF 6" BELOW THE BOTTOM OF THE STOP SIGN. THE SIGN SHOULD BE REMOVED OR COVERED WHEN THERE IS NO PILOT CAR.

TYPICAL SIGNING FOR A MINOR SIDE ROAD APPROACH TO WORK SPACE




■ CHANNELIZING DEVICE
AHEAD, 1500 FT, OR 1 MILE
AHEAD, 1000 FT, 1500 FT, OR ½ MILE
SPEED TO BE DETERMINED BY THE ENGINEER
TYPE "A" LOW INTENSITY WARNING LIGHT

| NO. | DATE | REVISIONS | BY | APP'D |
|---|---|---|---|---|
| 3 | 10/16/12 | Modified Lead In Channelizer Note | J.A.M. | K.P. |
| 2 | 10/4/11 | Removed Conflicting Signs Note | J.A.M. | K.P. |
| 1 | 4/20/09 | Changed Location Of Centerline Delineation | J.A.M. | A.A.A. |

KANSAS DEPARTMENT OF TRANSPORTATION

TYPICAL TRAFFIC CONTROL FLAGGER OR PILOT CAR
TWO-LANE ONE LANE CLOSED
EXCLUDING CONCRETE SHOULDERS
EQUAL TO OR GREATER THAN 8 FT

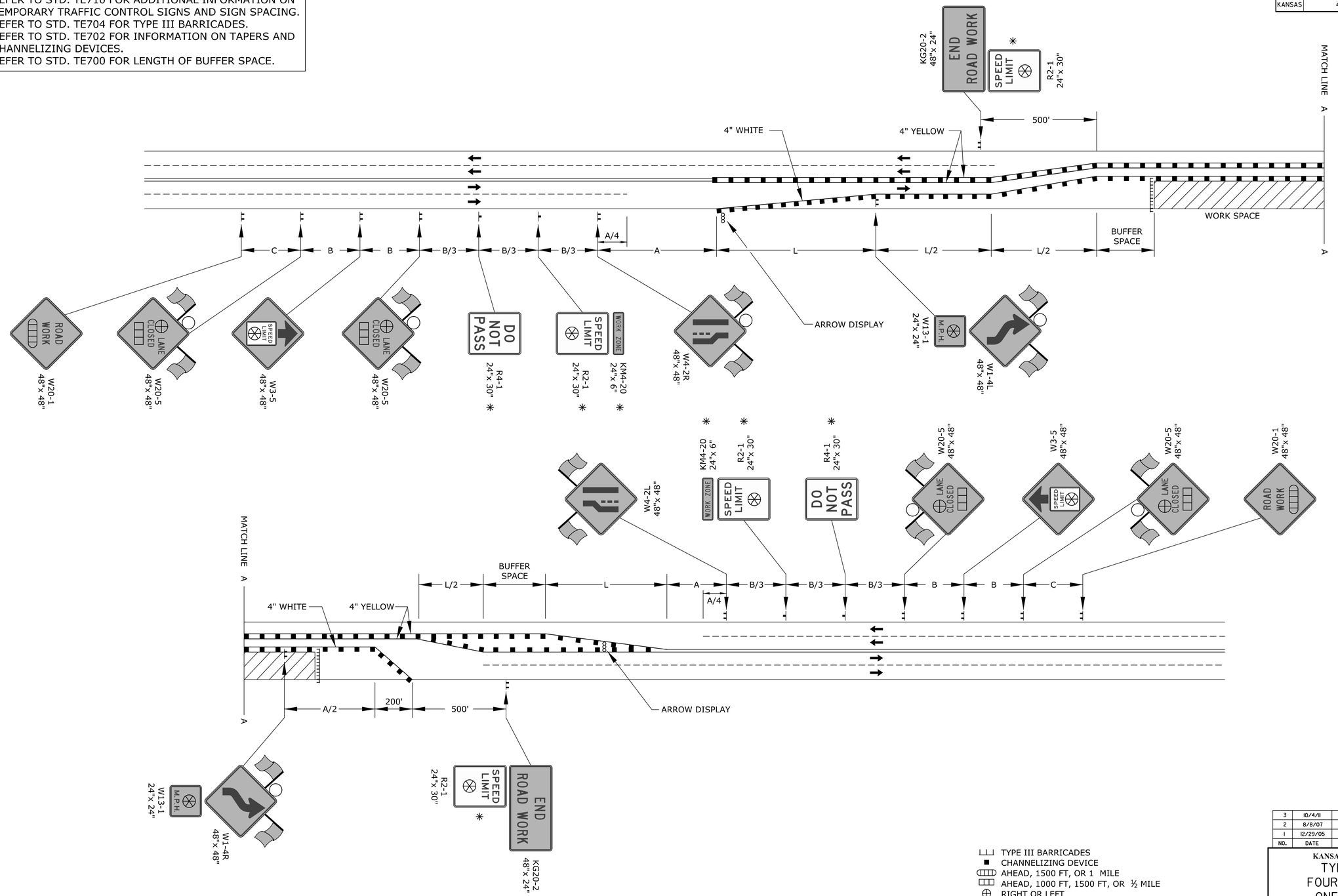
TE730

| | | | | | |
|---|---|---|---|---|---|
| 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. |

Drawn By : svb
File : I:\2010\10281\Standards\10281-te730.dgn
Plotted : 5/16/2013

| STATE | PROJECT NO. | YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| KANSAS | 472-84915 | 2013 | 68 | 83 |

REFER TO STD. TE710 FOR ADDITIONAL INFORMATION ON TEMPORARY TRAFFIC CONTROL SIGNS AND SIGN SPACING.
REFER TO STD. TE704 FOR TYPE III BARRICADES.
REFER TO STD. TE702 FOR INFORMATION ON TAPERS AND CHANNELIZING DEVICES.
REFER TO STD. TE700 FOR LENGTH OF BUFFER SPACE.




* FOR SPEEDS GREATER THAN 45 MPH USE FREEWAY / EXPRESSWAY SIZE SIGNS.

- TYPE III BARRICADES
- CHANNELIZING DEVICE
- AHEAD, 1500 FT, OR 1 MILE
- AHEAD, 1000 FT, 1500 FT, OR ½ MILE
- RIGHT OR LEFT
- SPEED TO BE DETERMINED BY THE ENGINEER
- TYPE "A" LOW INTENSITY WARNING LIGHT

| NO. | DATE | REVISIONS | BY | APP'D |
|---|---|---|---|---|
| 3 | 10/4/11 | Adjusted R2-1 and KM4-20 Sign Sizes | J.A.M. | K.P. |
| 2 | 8/8/07 | Sign Spacing Change | M.B. | A.A.A. |
| 1 | 12/29/05 | M4-20 Changed to KM4-20 | M.B. | A.A.A. |

KANSAS DEPARTMENT OF TRANSPORTATION

# TYPICAL TRAFFIC CONTROL FOUR-LANE UNDIVIDED HIGHWAY ONE-HALF ROADWAY CLOSED

TE748 9/1/00

| | | | | | |
|---|---|---|---|---|---|
| FHWA APPROVAL | | 10/4/11 | APP'D | Kristina Pyle | |
| DESIGNED | B.A.H. | DETAILED | B.A.H. | QUANTITIES | TRACED |
| DESIGN CK. | | DETAIL CK. | | QUAN. CK. | TRACE CK. |

Plotted : 5/16/2013
Drawn By : svb
File : I:\2010\10281\Standards\10281-te748.dgn

| PROJECT NO. | YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|
| 472-84915 | 2013 | 69 | 83 |

160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160

1380
1370
1360

208+00.00

R/W

6:1 2.0% 4.2% 2.2% 2.2% 1364.25 2.8% 2.8% 4.2% 2.0% 6:1

R/W

208+00.00

STAGE1 C=0 F=0 | STAGE2 C=14 F=7 | STAGE3 C=27 F=2

207+83.00

R/W

6:1 2.0% 4.2% 1.8% 1.8% 1364.45 2.7% 2.7% 4.2% 1.0% 6:1

R/W

207+83.00

STAGE1 C=0 F=0 | STAGE2 C=13 F=4 | STAGE3 C=23 F=3

207+74.28

R/W

6:1 2.0% 4.2%

0.7%

R/W

207+74.28

STAGE1 C=0 F=0 | STAGE2 C=2 F=0 | STAGE3 C=7 F=2

207+63.28

R/W

6:1 2.0% 7.3%

R/W

207+63.28

STAGE1 C=0 F=0 | STAGE2 C=0 F=0 | STAGE3 C=5 F=1

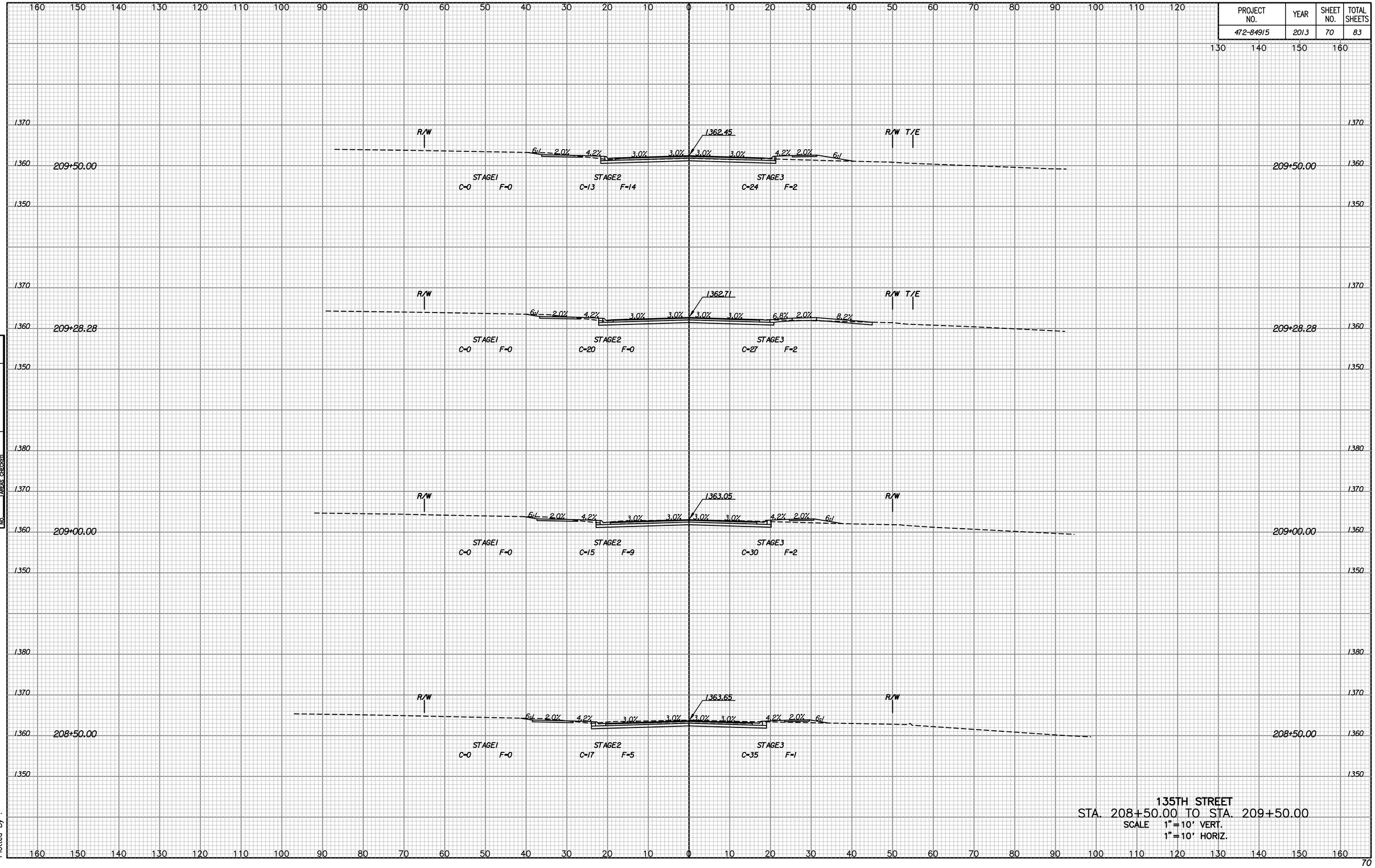
| NO. | NOTE BOOK | TEMPLATE AREAS | AREAS CHECKED |
|---|---|---|---|

Drawn By :
Plotted By :

## 135TH STREET
## STA. 207+63.28 TO STA. 208+00.00

SCALE 1"=10' VERT.
1"=10' HORIZ.

| PROJECT NO. | YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|
| 472-84915 | 2013 | 70 | 83 |




NOTE BOOK
TEMPLATE AREAS
AREAS CHECKED
NO.

Drawn By :
Plotted By :

**135TH STREET**
STA. 208+50.00 TO STA. 209+50.00
SCALE 1"=10' VERT.
1"=10' HORIZ.

| PROJECT NO. | YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|
| 472-84915 | 2013 | 71 | 83 |

160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160

1370
1360
1350

R/W

211+33.71

7.3% 2.0% 6.8% 3.0% 3.0% 1360.25 3.0% 3.0% 4.2% 2.0% 6:1

STAGE1 C=3 F=0
STAGE2 C=0 F=38
STAGE3 C=56 F=1

211+00.00

6:1 2.0% 4.2% 3.0% 3.0% 1360.65 3.0% 3.0% 4.2% 2.0% 6:1

STAGE1 C=2 F=0
STAGE2 C=0 F=33
STAGE3 C=16 F=1

210+50.00

6:1 2.0% 4.2% 3.0% 3.0% 1361.25 3.0% 3.0% 4.2% 2.0% 6:1

STAGE1 C=1 F=0
STAGE2 C=2 F=22
STAGE3 C=18 F=1

210+00.00

6:1 2.0% 4.2% 3.0% 3.0% 1361.85 3.0% 3.0% 4.2% 2.0% 6:1

STAGE1 C=0 F=0
STAGE2 C=6 F=33
STAGE3 C=20 F=2

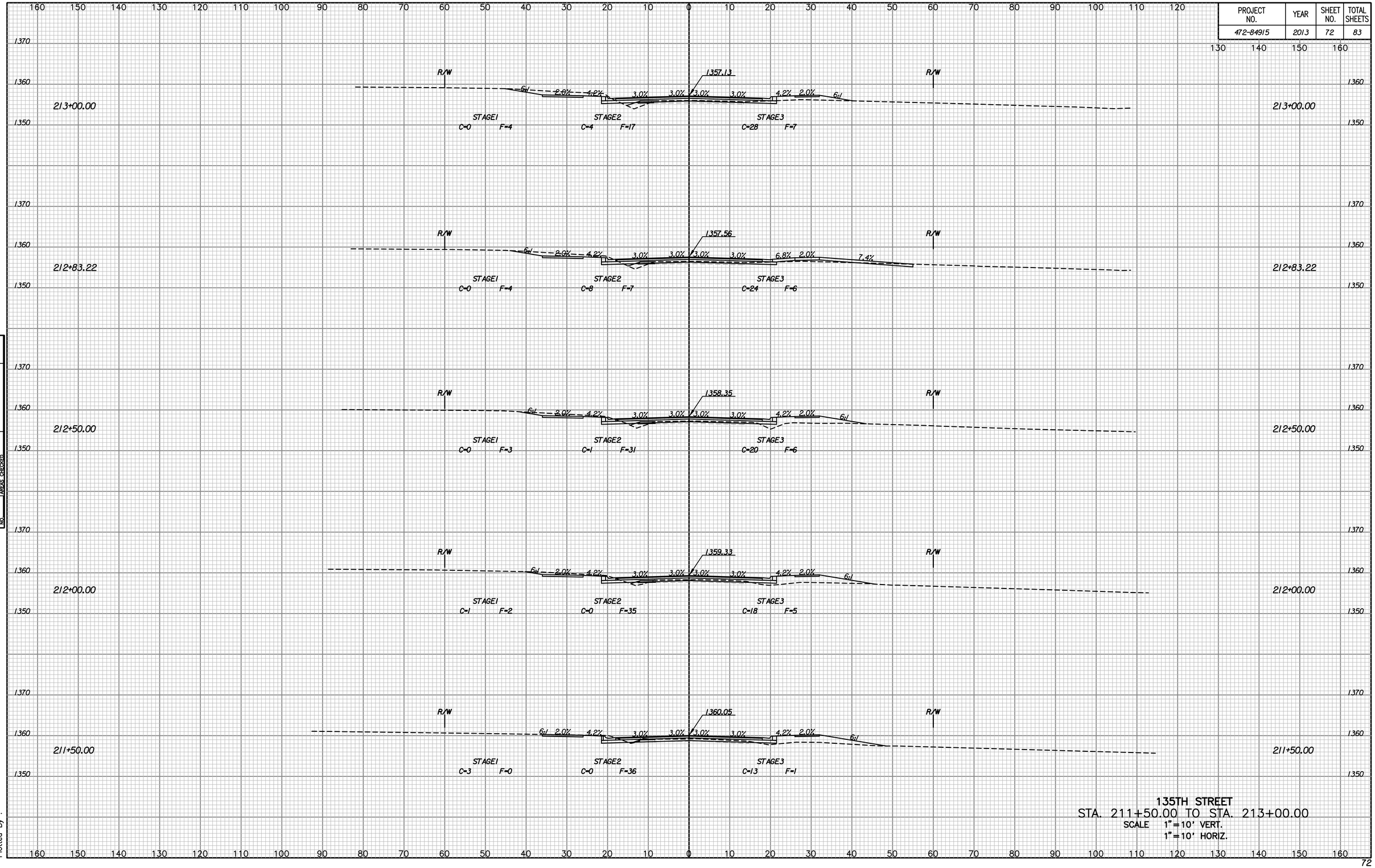
NOTE BOOK
TEMPLATE AREAS
AREAS CHECKED
NO.

Drawn By :
Plotted By :

# 135TH STREET
## STA. 210+00.00 TO STA. 211+33.71

SCALE 1"=10' VERT.
1"=10' HORIZ.

| PROJECT NO. | YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|
| 472-84915 | 2013 | 72 | 83 |

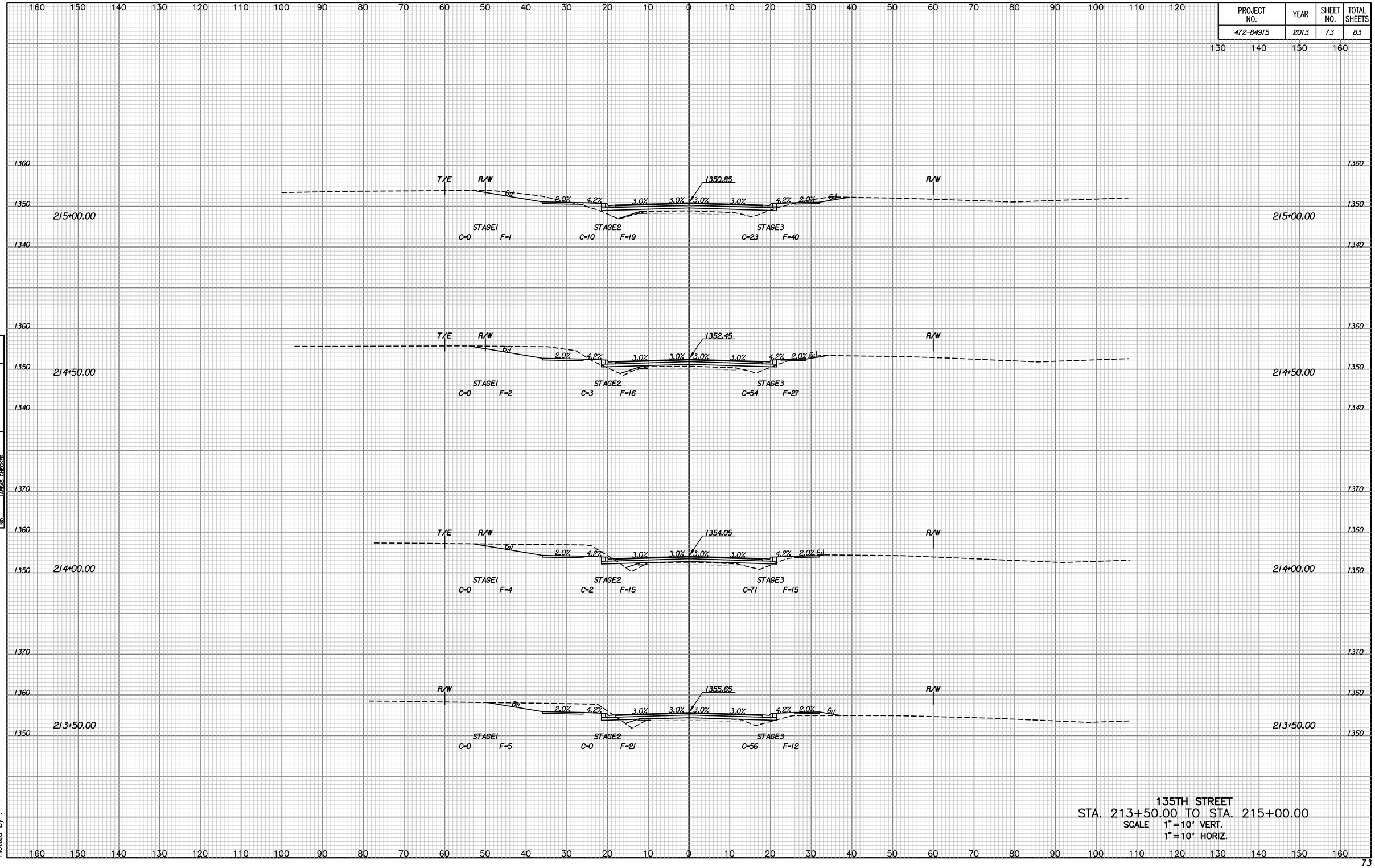



NOTE BOOK TEMPLATE
NO. AREAS AREAS CHECKED

Drawn By :
Plotted By :

135TH STREET
STA. 211+50.00 TO STA. 213+00.00
SCALE 1"=10' VERT.
1"=10' HORIZ.

| PROJECT NO. | YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|
| 472-84915 | 2013 | 73 | 83 |

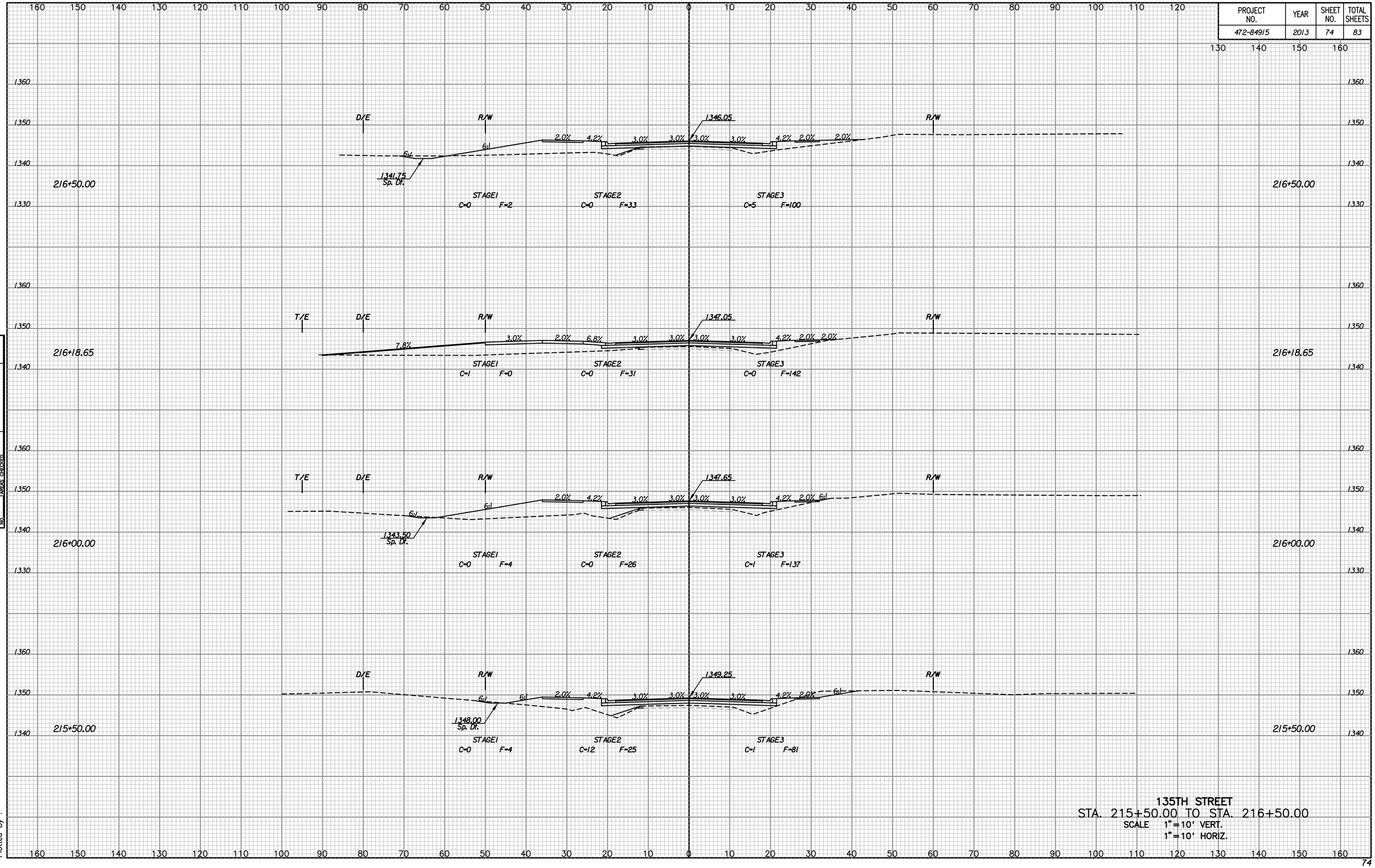



NOTE BOOK
TEMPLATE AREAS
AREAS CHECKED
NO.

Drawn By :
Plotted By :

**135TH STREET**
STA. 213+50.00 TO STA. 215+00.00
SCALE 1"=10' VERT.
1"=10' HORIZ.

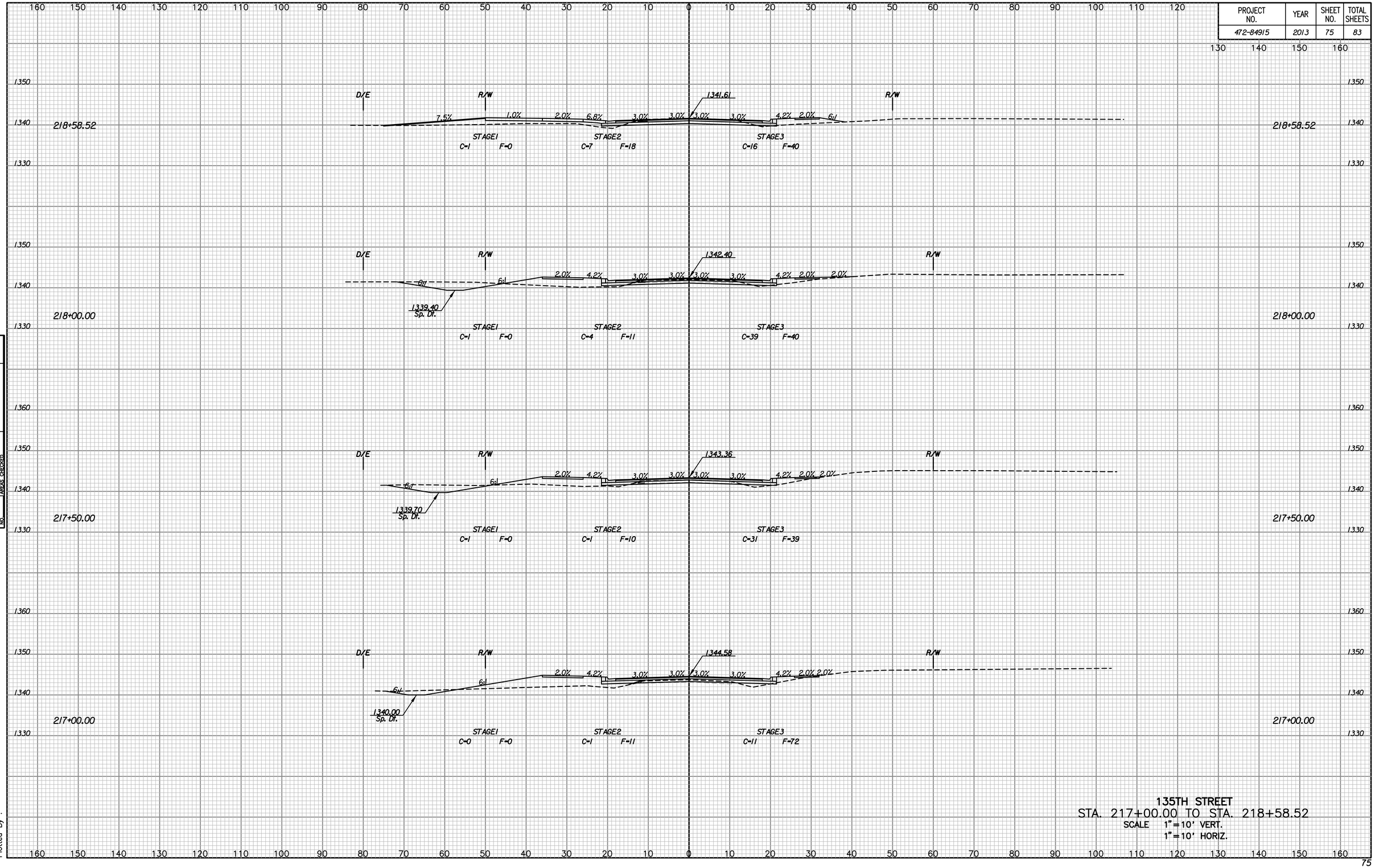
| PROJECT NO. | YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|
| 472-84915 | 2013 | 74 | 83 |




NOTE BOOK
TEMPLATE AREAS
AREAS CHECKED
NO.

Drawn By :
Plotted By :

| PROJECT NO. | YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|
| 472-84915 | 2013 | 75 | 83 |

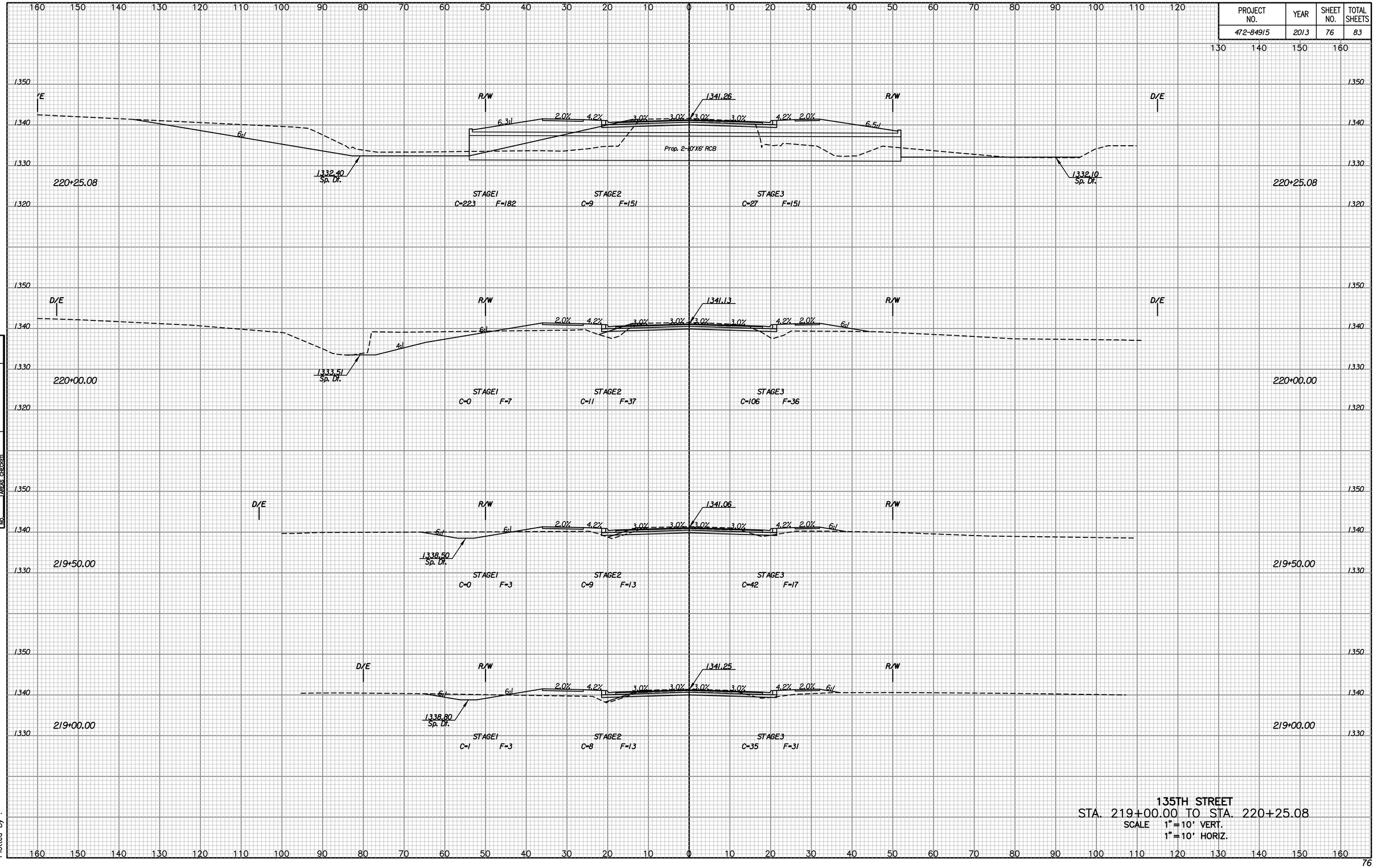



NOTE BOOK
TEMPLATE AREAS
AREAS CHECKED
NO.

Drawn By :
Plotted By :

**135TH STREET**
STA. 217+00.00 TO STA. 218+58.52
SCALE 1"=10' VERT.
1"=10' HORIZ.

| PROJECT NO. | YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|
| 472-84915 | 2013 | 76 | 83 |



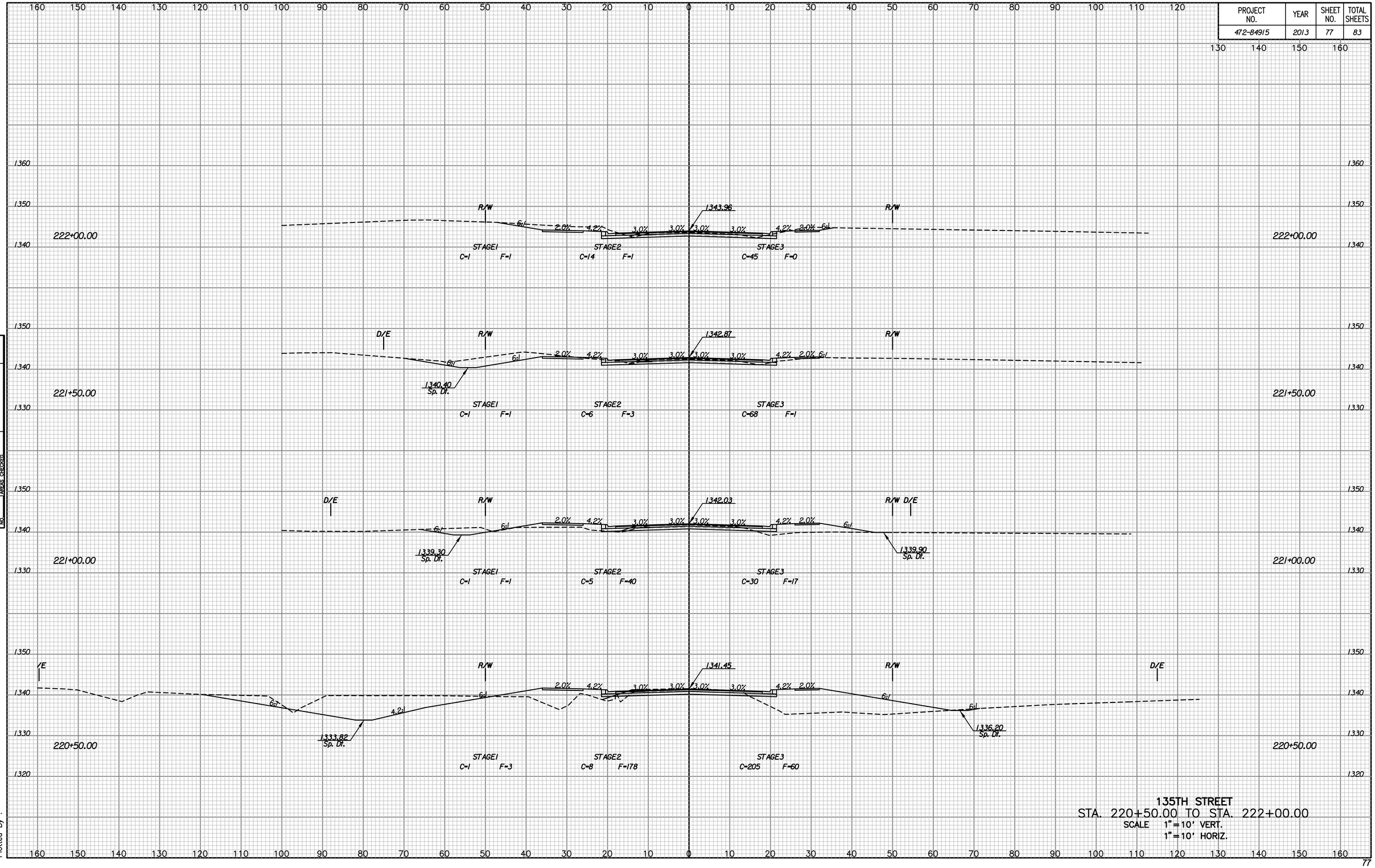

NOTE BOOK TEMPLATE AREAS AREAS CHECKED
NO.

Drawn By :
Plotted By :

135TH STREET
STA. 219+00.00 TO STA. 220+25.08
SCALE 1"=10' VERT.
1"=10' HORIZ.

| PROJECT NO. | YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|
| 472-84915 | 2013 | 77 | 83 |

| NO. | NOTE BOOK | TEMPLATE |
|---|---|---|
| | | AREAS |
| | | AREAS CHECKED |

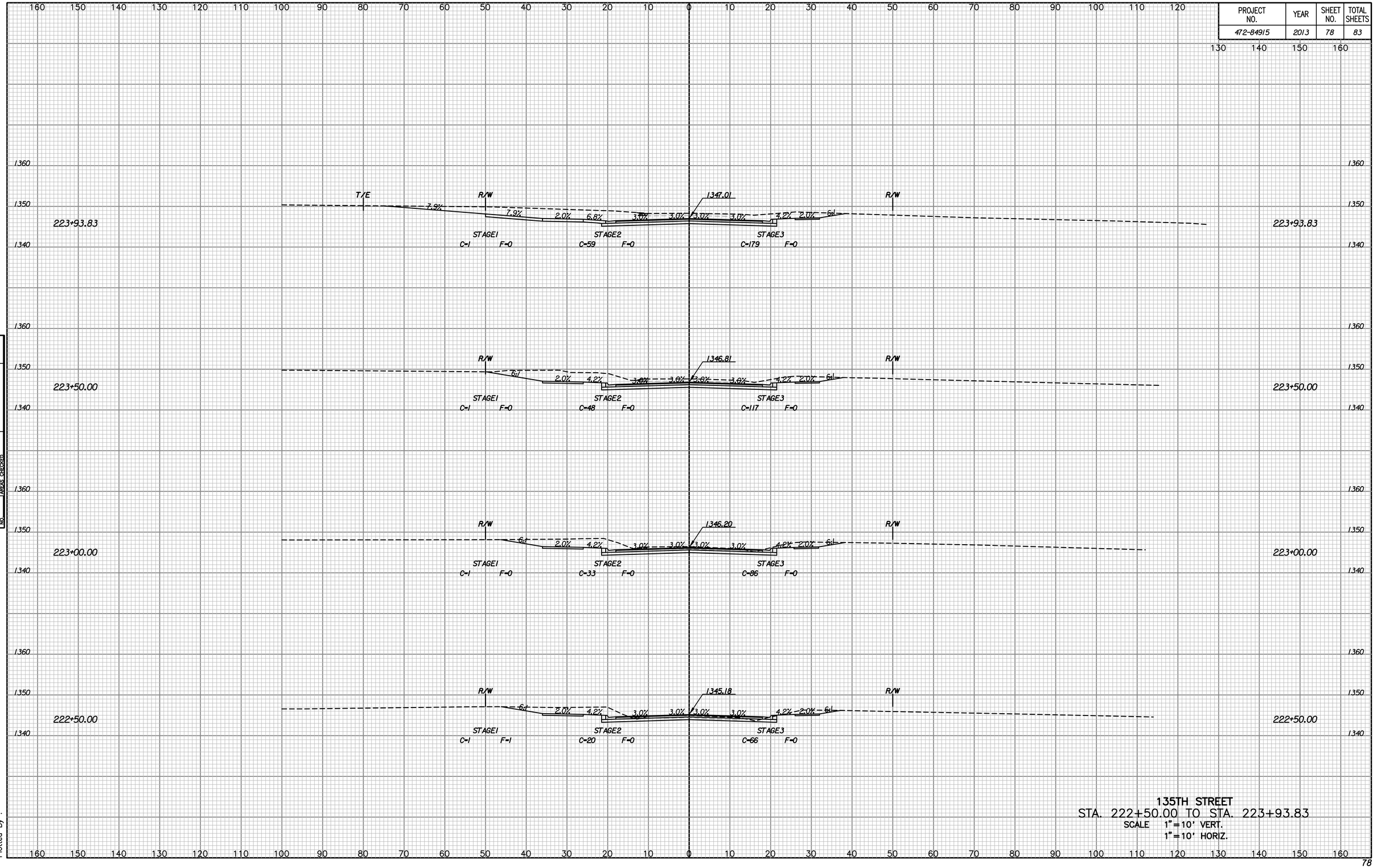



Drawn By :
Plotted By :

## 135TH STREET
## STA. 220+50.00 TO STA. 222+00.00

SCALE 1"=10' VERT.
1"=10' HORIZ.

| PROJECT NO. | YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|
| 472-84915 | 2013 | 78 | 83 |

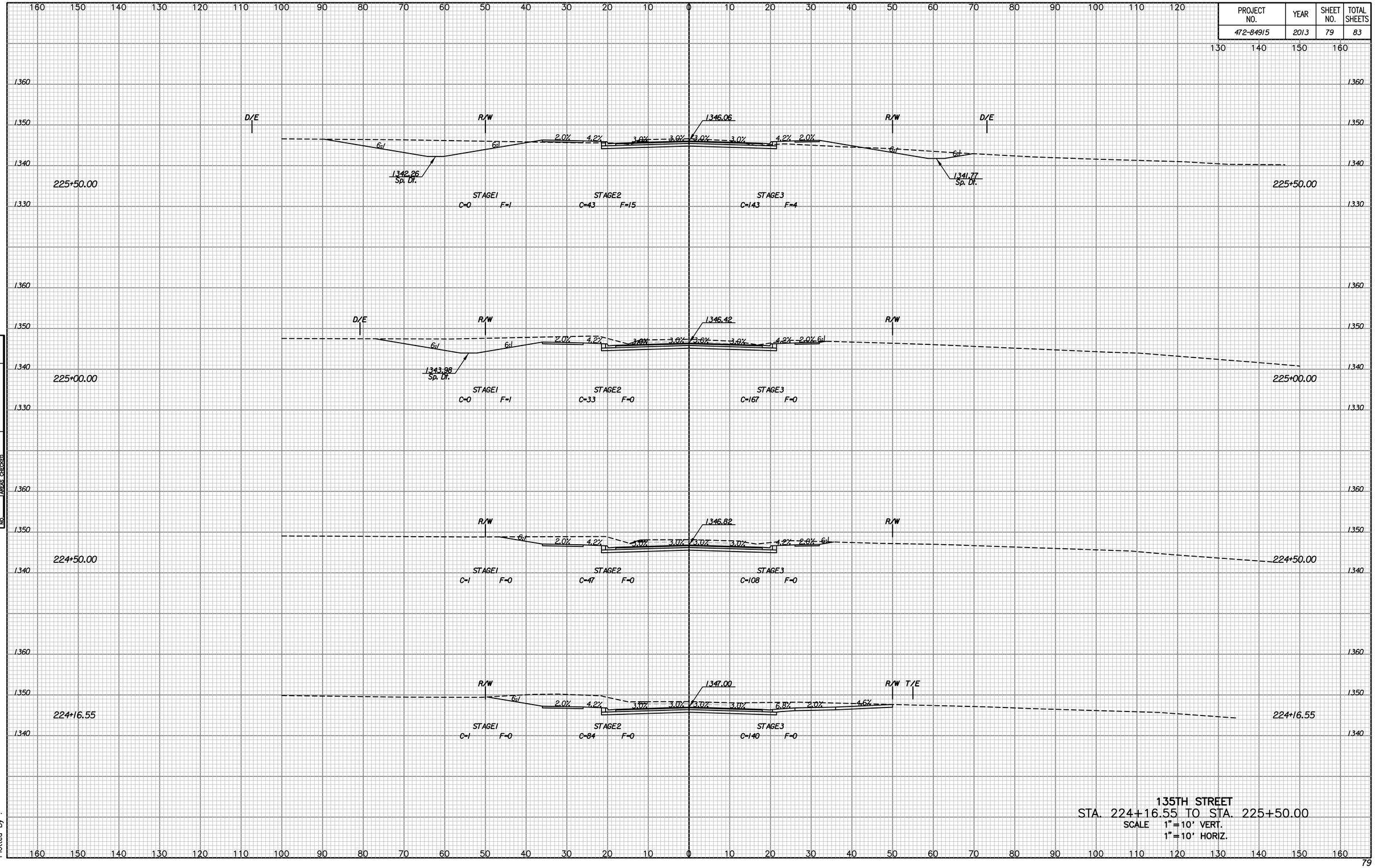



NOTE BOOK
TEMPLATE AREAS
AREAS CHECKED
NO.

Drawn By :
Plotted By :

135TH STREET
STA. 222+50.00 TO STA. 223+93.83
SCALE 1"=10' VERT.
1"=10' HORIZ.

| PROJECT NO. | YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|
| 472-84915 | 2013 | 79 | 83 |

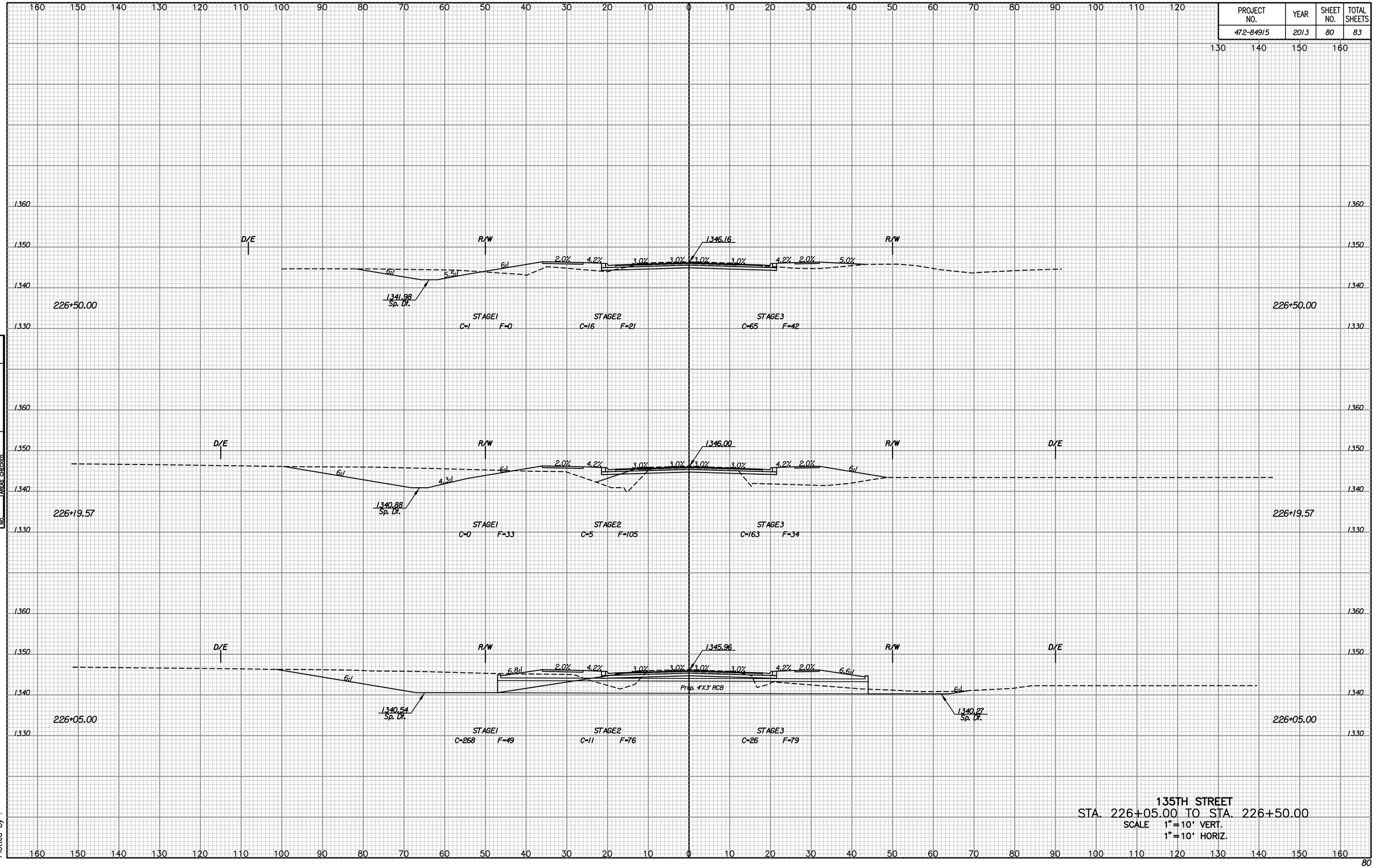



NOTE BOOK
TEMPLATE AREAS
AREAS CHECKED
NO.

Drawn By :
Plotted By :

**135TH STREET**
**STA. 224+16.55 TO STA. 225+50.00**
SCALE 1"=10' VERT.
1"=10' HORIZ.

| PROJECT NO. | YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|
| 472-84915 | 2013 | 80 | 83 |

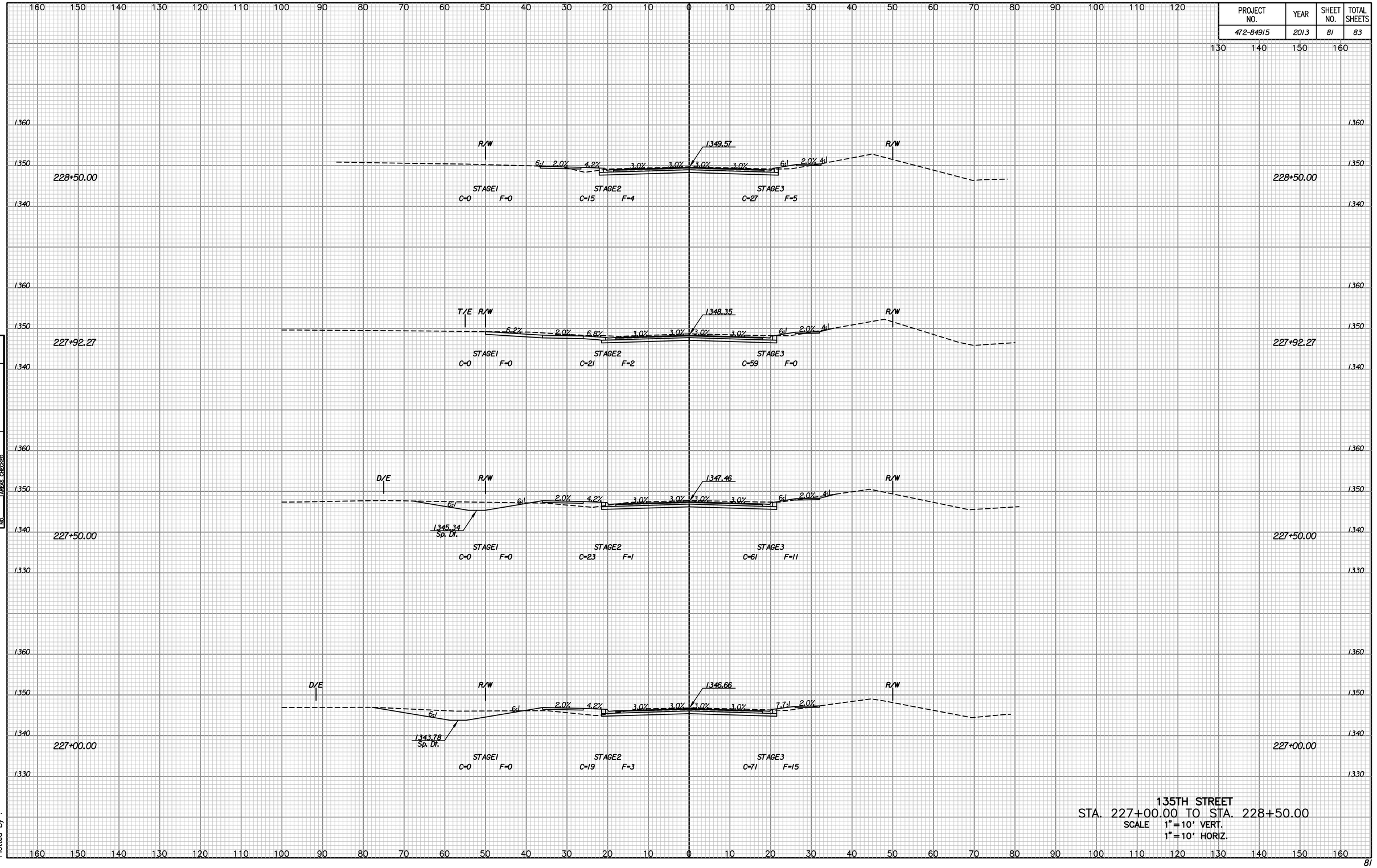



NOTE BOOK
TEMPLATE AREAS:
AREAS CHECKED
NO.

Drawn By :
Plotted By :

**135TH STREET**
**STA. 226+05.00 TO STA. 226+50.00**
SCALE 1"=10' VERT.
1"=10' HORIZ.

| PROJECT NO. | YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|
| 472-84915 | 2013 | 81 | 83 |




NOTE BOOK
TEMPLATE AREAS
AREAS CHECKED
NO.

Drawn By :
Plotted By :

**135TH STREET**
STA. 227+00.00 TO STA. 228+50.00
SCALE 1"=10' VERT.
1"=10' HORIZ.

| PROJECT NO. | YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|
| 472-84915 | 2013 | 82 | 83 |

160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160

1360
1350
1340

229+95.00

R/W
2.0% 6:1
STAGE1 C=0 F=0
STAGE2 C=2 F=0
STAGE3 C=3 F=0
R/W
2.0%

229+95.00

229+50.00

R/W
8.0% 2.0%
STAGE1 C=0 F=0
STAGE2 C=3 F=0
STAGE3 C=4 F=0
R/W
2.0%

229+50.00

229+33.00

R/W
8.0% 2.0%
STAGE1 C=0 F=0
STAGE2 C=3 F=0
STAGE3 C=4 F=0
R/W
2.0%

229+33.00

229+00.00

R/W
1350.35
6:1 2.0% 4.2% 2.5% 2.5% 2.4% 2.4% 6:1 2.0% 4:1
STAGE1 C=0 F=0
STAGE2 C=12 F=2
STAGE3 C=24 F=0
R/W

229+00.00

| NO. | NOTE BOOK | TEMPLATE AREAS | AREAS CHECKED |
|---|---|---|---|

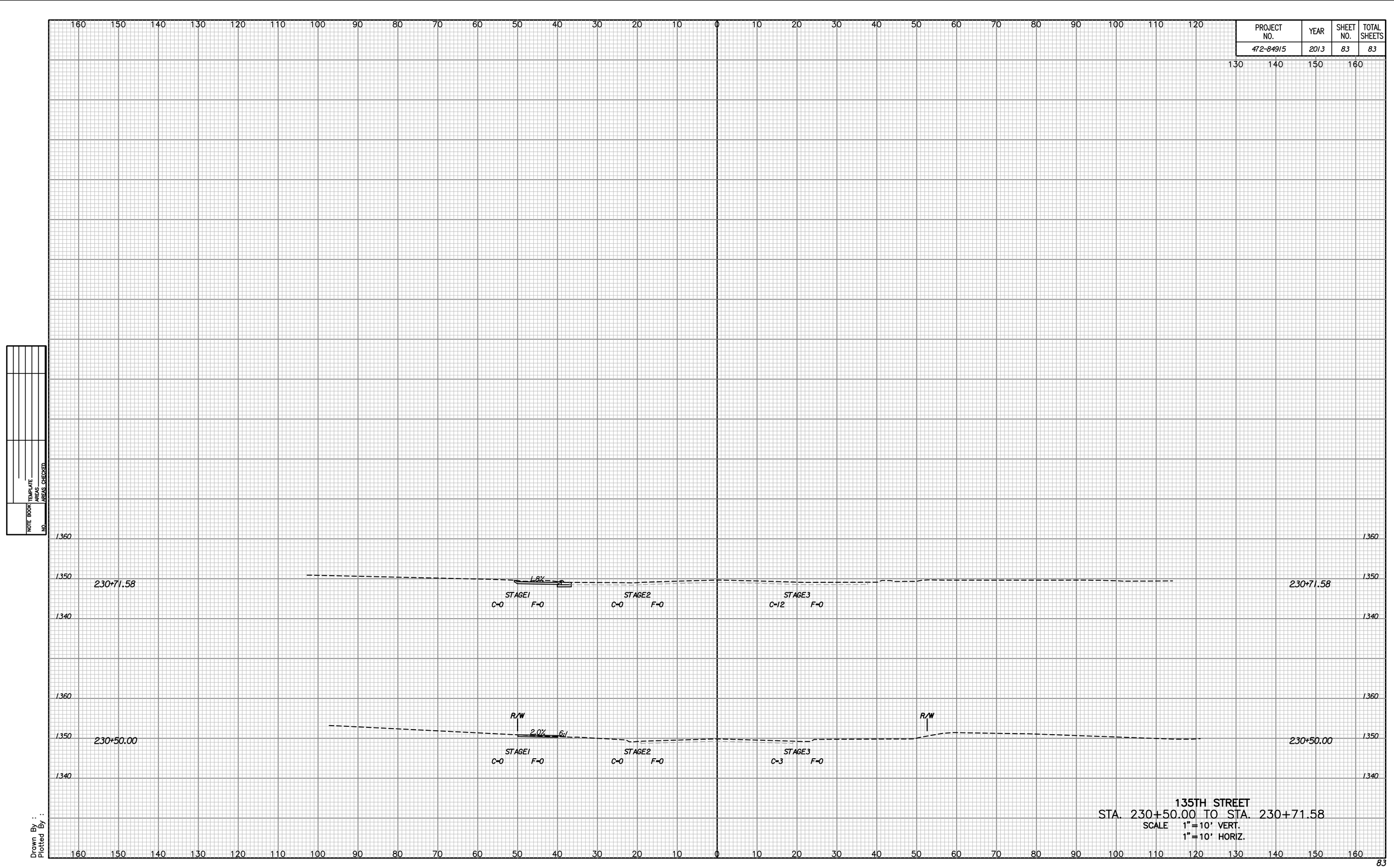
Drawn By :
Plotted By :

## 135TH STREET
STA. 229+00.00 TO STA. 229+95.00
SCALE 1"=10' VERT.
1"=10' HORIZ.

| PROJECT NO. | YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|
| 472-84915 | 2013 | 83 | 83 |

NOTE BOOK
TEMPLATE AREAS
AREAS CHECKED
NO.

Drawn By :
Plotted By :




135TH STREET
STA. 230+50.00 TO STA. 230+71.58
SCALE 1"=10' VERT.
1"=10' HORIZ.

635813

# WATER DISTRIBUTION SYSTEM IMPROVEMENTS

IN

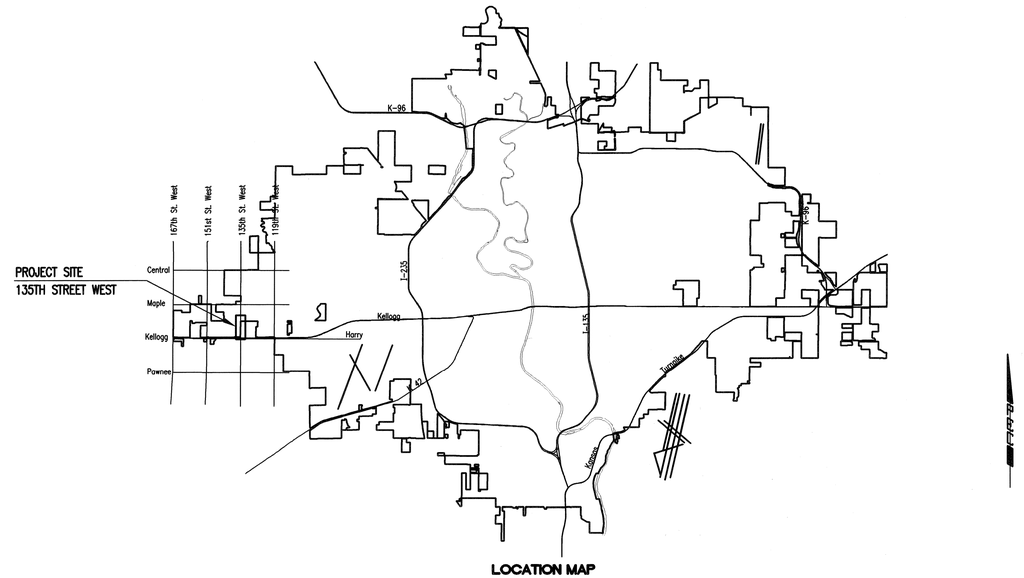
# 135TH ST. W. - KELLOGG AVENUE (U.S. 54) TO ONEWOOD

CITY OF WICHITA PROJECT NO. 448-90579

OCA NO. 635813

# CITY OF WICHITA, KANSAS

GARY JANZEN, P.E. - CITY ENGINEER




LOCATION MAP

PART B

INDEX OF SHEETS


| | |
|---|---|
| SHEET NO. B1 | TITLE SHEET |
| SHEET NO. B2 | KEY MAP AND GENERAL NOTES |
| SHEET NO. B3 | STANDARD WATER ASSEMBLY DETAILS |
| SHEET NO. B4 | MISCELLANEOUS WATER DETAILS |
| SHEET NO. B5 | MISCELLANEOUS DETAILS |
| SHEET NO. B6-B9 | PLAN/PROFILE |
| SHEET NO. B10-B12 | SOIL EROSION BMP DETAILS |


# FEBRUARY 2013

PLANS PREPARED BY

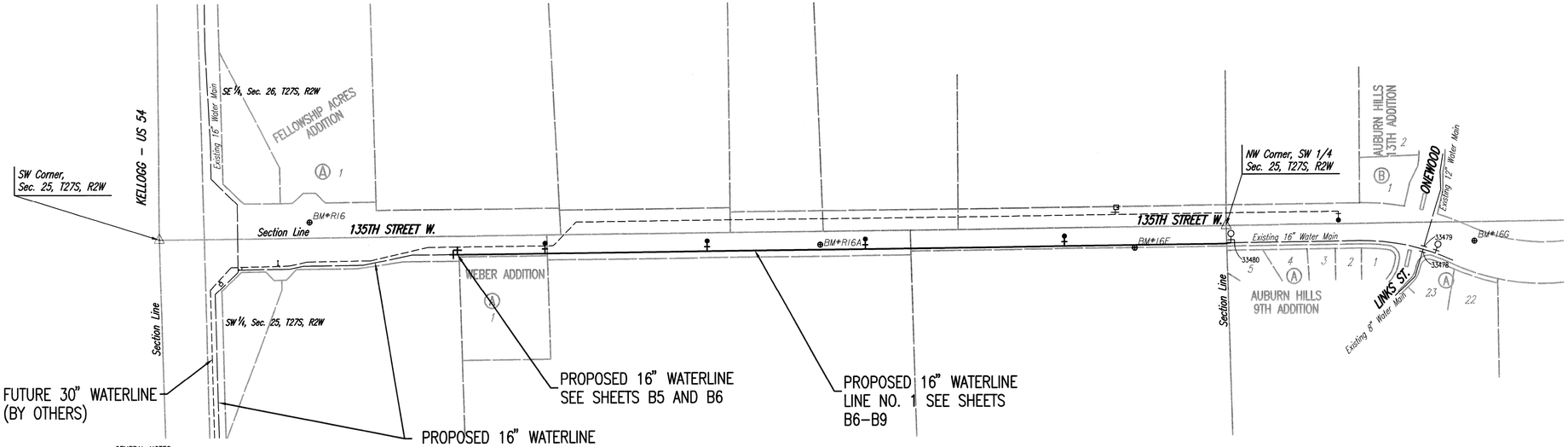
## PROFESSIONAL ENGINEERING CONSULTANTS, P.A.

ENGINEERS

WICHITA, KANSAS

MICHAEL D. KELSEY
LICENSED
13944
2/22/13
KANSAS
PROFESSIONAL ENGINEER

Saved 02-22-2013 8:13:26 AM by RFI
Plotted: 02-22-2013 8:13:48 AM by BOB F. JOHNSON
G:\2010\10281\001\10281-001 C1 WL Title




SCALE:
0 150 300
PEC

GENERAL NOTES

1. ALL ELEVATIONS SHOWN ARE U.S.G.S. DATUM (NGVD29).

2. CONTRACTOR WILL BE REQUIRED TO PROVIDE A MINIMUM ADVANCE NOTICE OF SEVENTY-TWO (72) HOURS TO UTILITY COMPANIES PRIOR TO STARTING ANY EXCAVATION AS FOLLOWS:

| | |
|---|---|
| KANSAS ONE-CALL | 687-2470 |

THE CONTRACTOR MUST NOTIFY THE FOLLOWING IN CASE OF AN EMERGENCY:

| | |
|---|---|
| EMERGENCY DISPATCH | 911 |
| COX COMMUNICATIONS | 1(800)778-9140 |
| KANSAS GAS SERVICE | 1(888)-482-4950 |
| WESTAR ENERGY | 1(800)383-1183 |
| BLACK HILLS ENERGY | 1(800)-694-8989 |
| AT&T | 1(800)-286-8313 |
| CITY OF WICHITA WATER DEPARTMENT | 262-6000 |
| CITY OF WICHITA SEWER MAINTENANCE | 262-6000 |

3. ALL WATER MAINS AND APPURTENANCES SHALL BE INSTALLED IN ACCORDANCE WITH CITY OF WICHITA, KANSAS STANDARD SPECIFICATIONS.

4. THE WATER MAIN SHALL BE CONSTRUCTED ON THE ALIGNMENT SHOWN BY THE PLANS. TREES AND SHRUBS IN PUBLIC RIGHT-OF-WAY WHICH ARE IN DIRECT CONFLICT WITH PROPOSED NEW CONSTRUCTION SHALL BE REMOVED 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. THE COST FOR ANY NECESSARY TREE TRIMMING, CLEARING AND/OR GRUBBING SHALL BE SUBSIDIARY TO "SITE CLEARING".

5. OPENING AND CLOSING WATER VALVES SHALL BE DONE SLOWLY TO PREVENT DAMAGE TO THE WATER DISTRIBUTION SYSTEM FROM WATER HAMMER. ALL VALVES CLOSED BY THE CONTRACTOR MUST BE REOPENED AS NEW CONSTRUCTION PERMITS. PROJECT INSPECTOR MUST ASCERTAIN THAT ANY VALVE CLOSED BY THE CONTRACTOR IS REOPENED. CONTRACTOR WILL BE PERMITTED TO OPERATE WATER VALVES ONLY WHEN THE PROJECT INSPECTOR ASSIGNED TO THE PROJECT IS PRESENT.

6. THE CONTRACTOR SHALL NOT START WORK ON THE PROJECT UNTIL THE PROJECT INSPECTOR IS ASSIGNED TO THE PROJECT AND IS PRESENT ON THE SITE. ANY WORK DONE WITHOUT INSPECTION WILL BE REQUIRED TO BE UNCOVERED FOR INSPECTION.

7. THE CONTRACTOR SHALL GIVE ALL PROPERTY OWNERS AND/OR TENANTS OF DEVELOPED PROPERTY DIRECTLY ABUTTING THE CONSTRUCTION OF THIS PROJECT A MINIMUM OF TEN (10) DAYS ADVANCE NOTICE PRIOR TO START OF CONSTRUCTION.

8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PRESERVING PROPERTY IRONS. THE CONTRACTOR SHALL BE REQUIRED TO RE-ESTABLISH ANY PROPERTY IRONS 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. ALL COSTS FOR THIS WORK SHALL BE SUBSIDIARY TO SITE RESTORATION.

9. THE CONTRACTOR SHALL RESTORE ALL DITCHES, SWALES, ROAD SHOULDERS, ENTRANCES, AND BANKLINES TO THEIR ORIGINAL SLOPES AND GRADES EXCEPT AS SHOWN OTHERWISE.

10. NO SERVICES WILL BE INSTALLED AS PART OF THIS PROJECT.

11. INTERURBAN TRAFFIC GENERATED OUTSIDE THE PROJECT AREA AND LOCAL BUSINESS OR RESIDENTIAL TRAFFIC GENERATED WITHIN THE PROJECT AREA ARE TO BE CARRIED THROUGH CONSTRUCTION AS FURTHER PROMULGATED BY PROJECT SPECIAL PROVISIONS. THE CONTRACTOR SHALL UTILIZE BARRICADES, SIGNS, GUARDS, AND FLAGMEN IN ACCORDANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES. ALL TRAFFIC CONTROL REQUIRED TO COMPLETE WATERLINE CONSTRUCTION SHALL BE SUBSIDIARY TO WATERLINE PROJECT COSTS. TRAFFIC CONTROL REQUIRED FOR WATERLINE CONSTRUCTION IS INDEPENDENT OF TRAFFIC CONTROL REQUIRED FOR THE HIGHWAY IMPROVEMENT.

12. RUBBLE FROM THE REMOVAL OF MISCELLANEOUS STRUCTURES INCLUDING ANY TREES REMOVED AND TREE TRIMMINGS AND EXCESS EXCAVATED MATERIAL SHALL BE DISPOSED OF ON SITES PROVIDED BY THE CONTRACTOR. THESE SITES SHALL ALSO BE APPROVED OF BY THE ENGINEER AS TO SUITABILITY, APPEARANCE, AND SITE LOCATION. LOCATIONS THAT, IN THE OPINION OF THE ENGINEER, 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 WILL 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 MAY REQUIRE ARCHAEOLOGICAL INVESTIGATIONS UNLESS BURIED IN A PREVIOUSLY APPROVED DISPOSAL LOCATION.

13. THE CONTRACTOR SHALL AVOID REMOVAL OR TRIMMING OF ANY TREES OR SHRUBS WHERE POSSIBLE. WHERE THE CONTRACTOR BELIEVES THE REMOVAL OR TRIMMING IS UNAVOIDABLE, HE SHALL COORDINATE SUCH WORK WITH THE ENGINEER. COSTS FOR TREE/SHRUB REMOVAL AND TRIMMING REGARDLESS OF SIZE SHALL BE CONSIDERED SUBSIDIARY TO THE LUMP SUM PRICE BID FOR "SITE CLEARING".

14. EACH BIDDER SHALL VISIT THE SITE OF THE PROJECT BEFORE SUBMITTING THE PROPOSAL FOR THIS WORK SO THAT HE WILL BE FULLY INFORMED OF THE EXISTING FIELD CONDITIONS AND THE OBSTACLES WHICH MIGHT BE ENCOUNTERED. UPON AWARD OF THE CONTRACT THE CONTRACTOR WILL NOT BE GRANTED ANY ADDITIONAL COMPENSATION WITH REGARDS TO TIME AND MONEY FOR CONDITIONS THAT MAY HAVE BEEN EVALUATED DURING ANY INSPECTION OF THE SITE.

15. CONTRACTOR SHALL PROVIDE MATERIALS FOR TEMPORARY BLOWOFF OF WATERLINES. CONNECTIONS TO THE EXISTING WATERLINE SHALL BE MADE WITH CLEAN, SWABBED PIPE, AND FLUSHED UPON COMPLETION OF TIE-INS.

16. REQUESTS FOR SHORT TERM WATER SERVICE INTERRUPTIONS SHALL BE MADE TO THE CITY WATER AND SEWER DEPARTMENT AND WILL BE SUBJECT TO THEIR APPROVAL. SUBJECT TO THEIR APPROVAL, THE CONTRACTOR SHALL GIVE WRITTEN NOTICE TO ANY PROPERTY OWNER, BUSINESS, AND/OR TENANTS THAT WILL HAVE WATER SERVICE INTERRUPTED AT LEAST 5 DAYS IN ADVANCE. SUCH NOTIFICATIONS SHOULD INDICATE THE TIME AND DATE THAT THE WATER WILL BE TURNED OFF AND WHEN THE SERVICE WILL BE RESTORED. NO BUSINESS, PROPERTY OWNER, AND/OR TENANT SHALL BE WITHOUT WATER SERVICE FOR MORE THAN 8 HOURS. PROPOSED TIE IN LOCATIONS WHICH WILL AFFECT WATER SERVICE TO PROPERTY OWNERS SHALL BE PERFORMED DURING NON-PEAK HOURS. THE CONTRACTOR'S PROPOSED SEQUENCING FOR TAPPING THE EXISTING WATER MAINS SHALL BE FURNISHED TO THE ENGINEER FOR APPROVAL.

17. PAVEMENT REMOVAL AND/OR REPLACEMENT WILL BE MEASURED AND PAID FOR ON THE LINEAL FOOT BASIS AS MEASURED ALONG THE CENTERLINE OF THE WATER LINE REGARDLESS OF WIDTH, PAVEMENT TYPE AND/OR PAVEMENT THICKNESS. MINIMUM LIMITS OF SUCH PAVEMENT REMOVAL AND REPLACEMENT SHALL BE 1.0 FOOT BEYOND THE LIMITS OF THE EXCAVATION MADE FOR THE WATER LINE OR THE STRUCTURE, EXCEPT WHEN SUCH SAW CUTS ARE WITHIN ONE 3.0 FEET OF AN EXISTING JOINT THE LIMITS OF REMOVAL SHALL BE EXTENDED TO THE EXISTING JOINT. REMOVAL AND REPLACEMENT OF EXISTING PAVEMENT SHALL CONFORM TO THE APPLICABLE SECTIONS OF THE CITY OF WICHITA STANDARD SPECIFICATION. PAVEMENT REMOVAL AND REPLACEMENT FOR THE WATERLINE CONSTRUCTION SHALL BE INDEPENDENT OF THE STREET CONSTRUCTION.

18. A SAW CUT OF AT LEAST ONE-HALF THE DEPTH OF EXISTING SURFACE COURSES OR ONE FOURTH THE DEPTH OF THE EXISTING TOTAL PAVEMENT THICKNESS SHALL BE PROVIDED AT LOCATIONS WHERE PROPOSED CONSTRUCTION ABUTS AN EXISTING SURFACE COURSE OR PAVEMENT FOR WHICH PARTIAL REMOVAL OF THAT SURFACE OR PAVEMENT IS REQUIRED, WHEN SUCH SAW CUTS ARE WITHIN ONE 3.0 FEET OF AN EXISTING JOINT THE LIMITS OF REMOVAL SHALL BE EXTENDED TO THE EXISTING JOINT. SUCH SAW CUTS WILL NOT BE PAID FOR DIRECTLY AND THIS COST SHALL BE CONSIDERED AS SUBSIDIARY TO THE REMOVAL OF THE SURFACE OR PAVEMENT.

19. THE CONTRACTOR MUST SCHEDULE THE CONNECTIONS TO THE EXISTING MAINS WITH THE CITY SUCH THAT THERE IS A MINIMUM DISRUPTION OF SERVICE CONNECTIONS SHALL BE MADE DURING PERIODS OF LOW WATER USAGE. THE CONTRACTOR SHALL SUBMIT HIS PROPOSED SCHEDULE FOR CITY APPROVAL FOR COMPLETING WORK AT LEAST 10 DAYS PRIOR TO BEGINNING CONSTRUCTION.

20. THE CONTACTOR SHALL MAINTAIN ACCESS TO THE PROPERTIES IN THE PROJECT AREA DURING CONSTRUCTION OF THE WATER MAINS. THE TEMPORARY CLOSINGS OF ANY STREETS OR ACCESS DRIVES SHALL BE KEPT TO A MINIMUM AND APPROVED BY THE ENGINEER. CONSTRUCTION AFFECTING ACCESS TO PROPERTIES MAY BE REQUIRED TO BE PERFORMED DURING NON-PEAK HOURS. REMOVAL OF DRIVEWAYS SHALL BE APPROVED BY THE ENGINEER.

21. ALL VALVE BOXES SHALL BE ADJUSTED TO FINAL GRADE AS DIRECTED BY THE ENGINEER. ALL VALVE BOXES SHALL HAVE CAST IRON RING AND LID AND SUCH LID SHALL HAVE THE WORD "WATER" EMBEDDED INTO ITS SURFACE. ALL VALVE BOX PARTS (UNLESS EXPLICITLY STATED OTHERWISE) SHALL BE MADE OF DUCTILE IRON OR POLYIRON MATERIALS. ANY VALVE WITH ITS OPERATING NUT MORE THAN 5 FEET BELOW FINAL GRADE SHALL HAVE A KEY EXTENSION INSTALLED AND THE TOP OF SUCH KEY EXTENSION SHALL BE 3 FEET BELOW FINAL GRADE. SUCH KEY EXTENSION SHALL BE MADE FROM 2 INCH STRUCTURAL STEEL TUBING WITH A BASE TO FIT OVER, AROUND, AND ATTACH TO THE VALVE OPERATING NUT. THE KEY EXTENSION SHALL BE SECURELY FASTENED TO THE VALVE BY BOLTING OR WELDING TO THE VALVE OPERATOR AND/OR THE VALVE STEM. THE TOP WILL BE ENCLOSED SQUARE STEEL TUBING THE SIZE OF THE STANDARD OPERATING NUT AND SHALL HAVE A CIRCULAR PIECE OF 1/2 INCH FLAT STEEL AS A DIRT COLLAR AND TO PREVENT EXCESSIVE MOVEMENT IN THE VALVE BOX. THE INSPECTOR SHALL SEE THAT THIS REQUIREMENT IS MET AND SHALL NOTE KEY EXTENSION LENGTHS ON AS-BUILTS.

22. THE CONTRACTOR SHALL INSTALL AND/OR MAINTAIN EROSION CONTROL METHODS AS SPECIFIED ON THE PLANS. THE FOLLOWING QUANTITIES ARE ESTIMATED, AND SHOULD BE CONSIDERED THE MINIMUM EFFORT REQUIRED. THE GENERAL LOCATION OF THE REQUIRED EROSION CONTROL IS ILLUSTRATED IN THE PLANS. THE WATERLINE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE EROSION CONTROL SHOWN THROUGH THE COMPLETION OF THIS PROJECT. INSTALLATION OF THESE BMP'S DOES NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY OF ABATING SOIL EROSION.

| | |
|---|---|
| SILT FENCE BARRIER | 346 L.F. |

23. DEFLECTIONS AT PIPE JOINTS OR COUPLINGS SHALL NOT NOT EXCEED THE PIPE MANUFACTURER'S RECOMMENDED MAXIMUM. WHERE REQUIRED DEFLECTIONS ARE GREATER THAN THE MAXIMUM ALLOWED, THE CONTRACTOR SHALL UTILIZE CI MJ LONG SLEEVES OR MULTIPLE JOINTS.

24. THE CONTRACTOR SHALL PROVIDE THREADED RODS AND COLLARS TO ANCHOR VALVES AND SLEEVES TO PROPOSED RESTRAINED JOINT PIPING, AS SHOWN IN THE PLANS. THREADED RODS AND COLLARS SHALL BE HIGH STRENGTH, HEAT TREATED CORTEN STEEL AND SHALL CONFORM TO ASTM A242, TYPE 2, AS MANUFACTURED BY STAR NATIONAL PRODUCTS OR APPROVED EQUAL. THE NUMBER OF TIEBOLT RESTRAINERS AND FASTENING METHOD SHALL BE IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS. TIE BOLTS SHALL BE DESIGNED FOR A TOTAL DESIGN PRESSURE OF 200 PSI.

25. SEE STREET PLANS (472-84915) FOR ADDITIONAL HORIZONTAL AND VERTICAL CONTROL INFORMATION.

SECTION CORNERS

Southwest Cor. Sec. 25, T27S, R2W
5/8" Rebar in thimble
1. N: 1,677,309.2963, E: 1,602,361.6608

| | | |
|---|---|---|
| 2. Ctr. east bound lanes | 6.46' | S |
| 3. Ctr. west bound lanes | 47.93' | N |
| 4. KDOT nail/washer east face power pole | 70.26' | SW |
| 5. KDOT nail/washer west face power pole | 96.67' | SE |
| 6. 3 nails south face power pole | 114.20' | NW |

Northwest Cor., Southwest 1/4 Sec. 25, T27S, R2W
1" Iron pipe
1. N: 1,679,937.9000, E: 1,602,332.9699

| | | |
|---|---|---|
| 2. Chis. "+" east hdwl. RCB | 15.01' | SE |
| 3. Chis. "+" west hdwl. RCB | 15.03' | SW |
| 4. 60d nail NE face 10" elm | 34.32' | NW |
| 5. Nail/shiner NW face power pole | 59.52' | NE |

BENCHMARK LIST ⊕ BM#

BM#R16 – SQUARE CUT CENTER FRONT CURB INLET ON WEST SIDE 135TH ST. W., ± 350FT. N OF ℄ KELLOGG.
135TH ST. W. ℄ STA. 203+70.82, 38.34' LT.
ELEV.=1358.48 (NGVD29)

BM#R16A – SET "T" POST EAST SIDE 135TH ST. W., NORTH OF KELLOGG ADJACENT TO #1349 S. 135TH ST. W. IN LINE WITH POWER LINE N-S.
135TH ST. W. ℄ STA. 216+28.86, 32.08' RT.
ELEV.=1345.91 (NGVD29)

BM#16F – SET "T" POST E SIDE 135TH ST. W., N OF KELLOGG 300' S OF #1151 S. 135th W., 15' E OF POWER LINE N-S,
135TH ST. W. ℄ STA. 223+96.28, 48.12' RT.
ELEV.=1347.68 (NGVD29)

BM#16G – SQUARE CUT ON TOP OF CURB, W SIDE OF 135TH ST. W., 145' S TO ℄ ONEWOOD ST.,
135TH ST. W. ℄ STA. 232+47.76, 22.05' LT.
ELEV.=1348.17 (NGVD29)

LEGEND

| | |
|---|---|
| EXISTING WATER MAIN | ——— |
| PROPOSED WATER MAIN | ——— |
| EXISTING WATER VALVE | ——+—— |
| PROPOSED WATER VALVE | ——+—— |
| EXISTING FIRE HYDRANT | ——♀—— |
| PROPOSED FIRE HYDRANT | ——•—— |
| EXISTING BLOW OFF | ——⊣—— |
| PROPOSED BLOW OFF | ——⊣—— |
| FUTURE WATER MAIN (BY OTHERS) | - - - - - |
| FUTURE FIRE HYDRANT (BY OTHERS) | - - - •- - - |

MICHAEL D. KEBER LICENSED POLICY 13944 4/22/13 KANSAS PROFESSIONAL ENGINEER

| No. | Revision | By | Date |
|---|---|---|---|
| | | | |

135TH ST. W. – KELLOGG AVENUE (U.S. 54) TO ONEWOOD
WATERLINE IMPROVEMENTS

# KEY MAP AND GENERAL NOTES

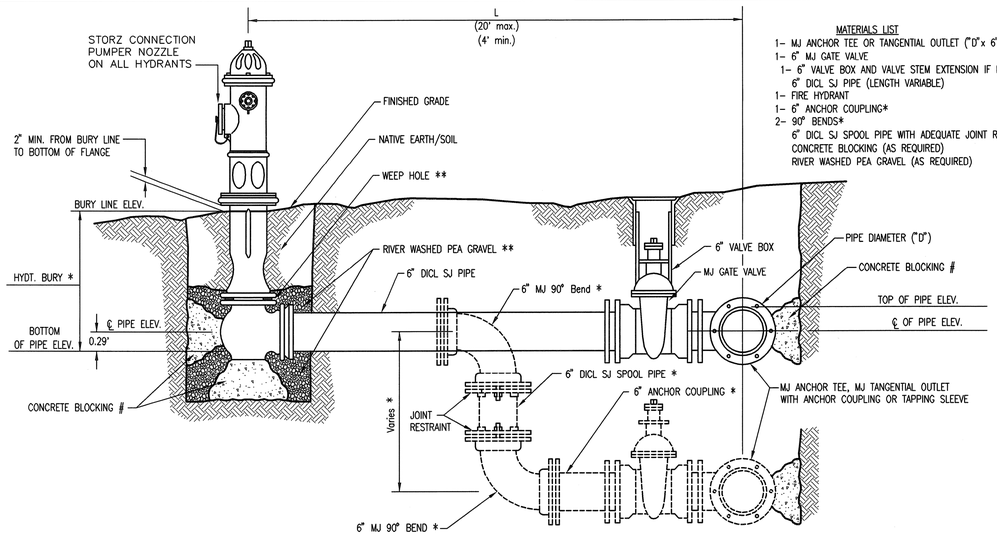
GARY JANZEN, P.E. – CITY ENGINEER
CITY OF WICHITA PROJECT NO. 448-90579

PEC
PROFESSIONAL ENGINEERING CONSULTANTS, P.A.
303 SOUTH TOPEKA WICHITA, KS 67202
316-262-2691 www.pec1.com

| | | | |
|---|---|---|---|
| Designed by | MDK | Job No. | 35-10281-001 |
| Drawn by | TDS | Date | July 2011 |

Sht. B2 of 12

Saved: 02-22-2013 8:09:47 AM by: REJ
Plotted: 02-22-2013 8:15:24 AM by: REJ
Q:\2010\10281\001\10281-001 C2 Key Map & General Notes




MATERIALS LIST

1- MJ ANCHOR TEE OR TANGENTIAL OUTLET ("D"x 6")
1- 6" MJ GATE VALVE
1- 6" VALVE BOX AND VALVE STEM EXTENSION IF REQUIRED *
6" DICL SJ PIPE (LENGTH VARIABLE)
1- FIRE HYDRANT
1- 6" ANCHOR COUPLING*
2- 90° BENDS*
6" DICL SJ SPOOL PIPE WITH ADEQUATE JOINT RESTRAINT *
CONCRETE BLOCKING (AS REQUIRED)
RIVER WASHED PEA GRAVEL (AS REQUIRED)

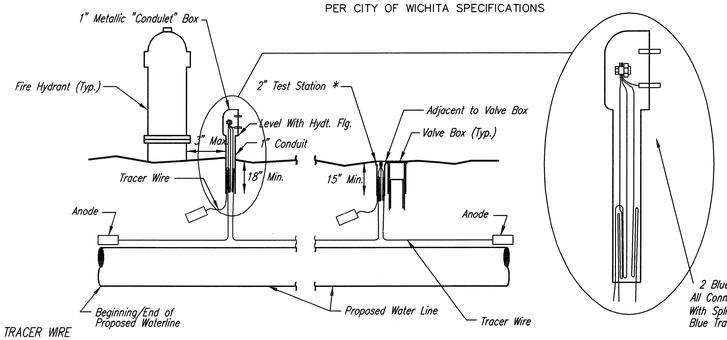
* IF THE REQUIRED HYDRANT BURY IS IN EXCESS OF 5', BUT LESS THAN 7', CONTRACTOR SHALL USE STANDARD 5' HYDRANT BURY AND HYDRANT BARREL EXTENSIONS AS NECESSARY. IF THE REQUIRED HYDRANT BURY IS GREATER THAN 7', CONTRACTOR SHALL USE 5' HYDRANT BURY, 2-MJ 90° BENDS, 6" ANCHOR COUPLING AND 6" DICL SPOOL PIPE AS NECESSARY FOR VERTICAL ADJUSTMENT. THE CONTRACTOR SHALL PROVIDE ADEQUATE THRUST BLOCKING AT HYDRANT AND MEGALUGS, ROD AND LUG OR SIMILAR RESTRAINT BETWEEN 90° BENDS TO SECURE ALL FITTINGS DURING TESTING AND OPERATION. THE CONTRACTOR SHALL PROVIDE A VALVE STEM EXTENSION PER DETAIL THIS SHEET.

** CAUTION!!! WEEP HOLES TO BE KEPT CLEAR DURING CONSTRUCTION AND BACKFILL. CONCRETE FOR THRUST BLOCKING SHALL NOT OBSTRUCT WEEP HOLES. PLACE 1 CUBIC FOOT OF RIVER WASHED PEA GRAVEL AROUND EACH WEEP HOLE.

\# CONCRETE THRUST BLOCKING SHALL BE KEPT CLEAR OF BOLTS, NUTS, AND MJ ACCESSORIES.

## FIRE HYDRANT ASSEMBLY

PER CITY OF WICHITA SPECIFICATIONS







* FLUSH STYLE TEST STATIONS SHALL ONLY BE USED IN PAVEMENT.

*TRACER WIRE*

*Conductive type pipe locator/tracer wire shall be installed to locate all waterline pipe regardless of pipe material. The wire shall extend the entire length of the proposed pipe. The wire shall be taped to the waterline and pulled with the pipe. Split-bolt connectors shall be used at splice locations. Electrical tape shall cover all splices so no bare wire is exposed. Test stations shall be installed adjacent to all fire hydrants along the waterline and at blowoffs or valves near the ends of the waterlines. Any exceptions to the location of test stations shall be approved by the engineer. At each test station, the tracer wire shall be connected to a 3 lb. Zinc or magnesium anode. Anodes shall also be attached to the tracer wire at both the beginning and the end of the proposed waterline. A typical layout of the tracer wire and test station is provided in the above figure.*

*WIRE*

*The tracer wire shall be Blue No. 12 THHN annealed soft copper wire with thermal plastic insulation or Blue No. 12 AWG CCS with 30 mil HDPE insulation. The insulation shall be heat, oil, and gasoline resistant as manufactured by Temple Electric or approved equal. To allow for grade adjustment, a minimum of 12" of excess wire shall be coiled at the bottom of the test station for all wires. The insulation sheathing shall be removed such that 1" bare copper wire at all points of connection. Contractor shall attach wire being installed with proposed water main to any tracer wire installed with adjacent waterline projects.*

*TEST STATIONS*

*The test station for fire hydrant applications shall be a 1 inch galvanized "condulet" style test station as manufactured by AGRA Industries with a removable solid cover having two leads extending from the face or approved equal. The test station for valve applications shall be 2 inch flush style test station T2PS3B as manufactured by HANDLEY Industries or approved equal. The "condulet" style test station shall be attached to a 1 inch rigid galvanized conduit with a minimum length of 36" and plastic end bushing. The flush style shall have the word "WATER" stamped or molded into the lid. All test stations shall be manufactured using molded blue tops or sufficiently coated with blue enamel paint. The tracer wire and the anode wire shall be installed to allow 10 inches of wire within the test station. In concrete environments such as sidewalks or in the downtown area the contractor shall use the flush style test station. The location of all test stations shall be approved by the engineer, recorded, and shown in the as-built drawings.*

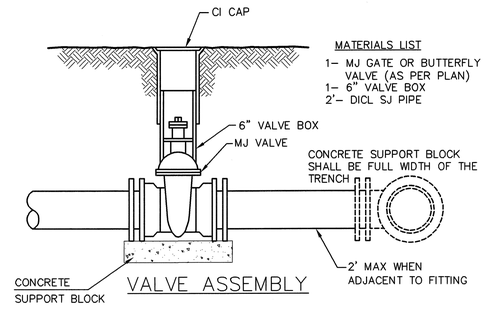
*ANODES*

*The anodes shall be 3 lb. bare zinc or magnesium. The anodes shall be buried at the same elevation as the waterline at each test station. The anodes shall be connected to Black No. 12 THHN annealed soft copper wire which shall be extended to the test station.*

## TRACER WIRE DETAIL

COST IS SUBSIDIARY TO PIPE INSTALLATION

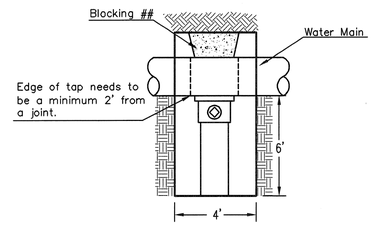
| FIRE HYDRANTS REQUIRED | | | | |
|---|---|---|---|---|
| STATION | BURY LINE ELEVATION | TOP OF PIPE ELEVATION | FIRE HYDRANT BURY REQUIRED* | VALVE STEM EXT. REQUIRED (ft)* |
| WL1, Sta. 2+20.28 | 1362.2 | 1357.21 | 6' | 1' |
| WL1, Sta. 6+20.00 | 1355.5 | 1350.56 | 6' | 1' |
| WL1, Sta. 10+10.00 | 1344.1 | 1340.11 | 5' | |
| WL1, Sta. 15+00.00 | 1345.2 | 1340.00 | 6' | 1' |




MATERIALS LIST

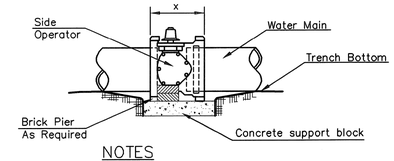
1- MJ GATE OR BUTTERFLY
VALVE (AS PER PLAN)
1- 6" VALVE BOX
2'- DICL SJ PIPE

## VALVE ASSEMBLY




## CITY TAP

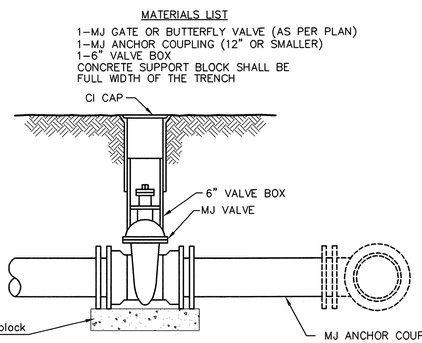
## When the City of Wichita makes tap, blocking is to be done by Contractor




## NOTES

1. This detail covers Butterfly Valve installation, inclusive, regardless of type of pipe or joint used. 24" and larger lines to be detailed on plans.
2. 6" Valve Box and Cover required per City of Wichita Std. Specifications.
3. Conc. Support Block to be full width of trench.

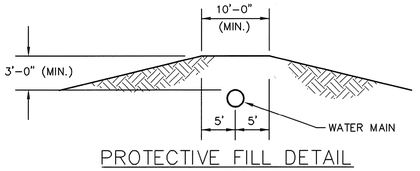
## CONCRETE SUPPORT BLOCKING FOR BUTTERFLY VALVE INSTALLATION




MATERIALS LIST

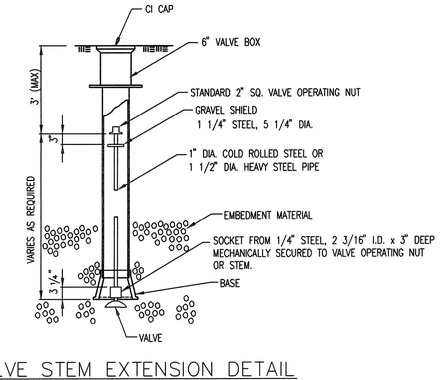
1-MJ GATE OR BUTTERFLY VALVE (AS PER PLAN)
1-MJ ANCHOR COUPLING (12" OR SMALLER)
1-6" VALVE BOX
CONCRETE SUPPORT BLOCK SHALL BE
FULL WIDTH OF THE TRENCH

## ANCHORED VALVE ASSEMBLY



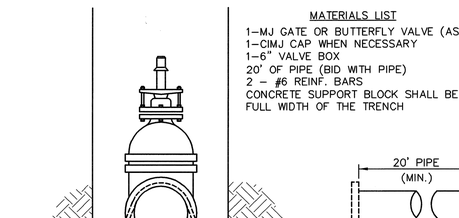

## PROTECTIVE FILL DETAIL

MINIMUM PROTECTIVE FILL SHALL BE PROVIDED IN ALL INSTANCES WHERE COVER OVER THE PROP. WATER LINE IS LESS THAN 3'.
(COST SUBSIDIARY TO PIPE INSTALLATION)




## VALVE STEM EXTENSION DETAIL

NOTE: ONE VALVE STEM EXTENSION FOR EACH VALVE BURIED GREATER THAN 5'.

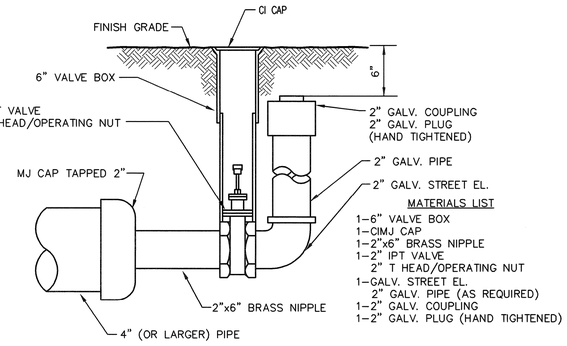



Notes:

1. Concrete Block at Valve to have sufficient bearing in undisturbed soil to prevent thrust movement as shown in table at right. Field Engineer to determine thrust loading of undisturbed soil and final size of thrust block.
2. The thrust block shall be constructed such that bolts, nuts, and other MJ accessories are kept clear of concrete.
3. All valves at dead ends and at other locations as called out on the plans shall be blocked as shown here.

| THRUST AT VALVES | |
|---|---|
| VALVE | THRUST AT 150 #/in² |
| 4" | 1809 lbs. |
| 6" | 4245 lbs. |
| 8" | 7540 lbs. |
| 12" | 16965 lbs. |

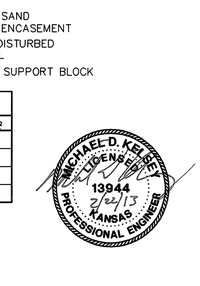
## ANCHORED VALVE ASSEMBLY, SPECIAL




MATERIALS LIST

1-6" VALVE BOX
1-CIMJ CAP
1-2"x6" BRASS NIPPLE
1-2" IPT VALVE
2" T HEAD/OPERATING NUT
1-GALV. STREET EL.
2" GALV. PIPE (AS REQUIRED)
1-2" GALV. COUPLING
1-2" GALV. PLUG (HAND TIGHTENED)

## 2" BLOWOFF ASSEMBLY




CITY OF WICHITA

PUBLIC WORKS & UTILITIES
ENGINEERING DIVISION

# STANDARD WATER ASSEMBLY DETAIL

CITY ENGINEER
GARY JANZEN, P.E.

| PROJECT NUMBER | OCA NUMBER | DATE |
|---|---|---|
| 448-90579 | 635813 | 12/2011 |

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

SHEET
B3 of 12

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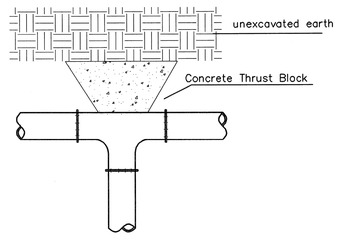
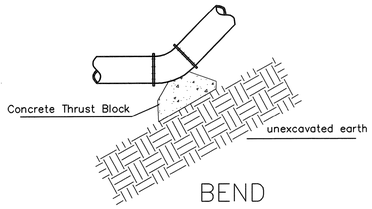
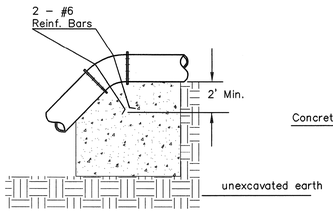
Print Date: 02-21-2013 2:01:44 PM by JEJ
Q:\2010\10281\001\10281-001-C3 Std Water Assembly Details



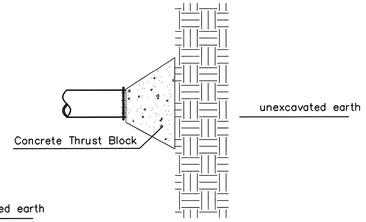

TEE




BEND



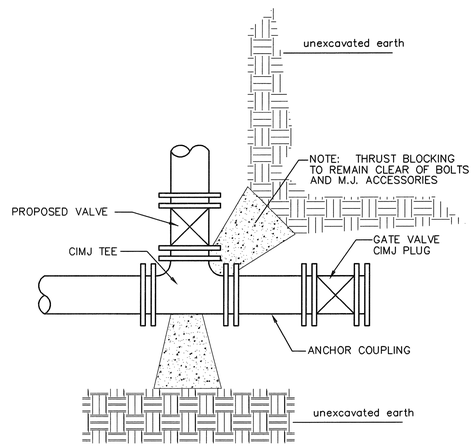

VERTICAL BEND



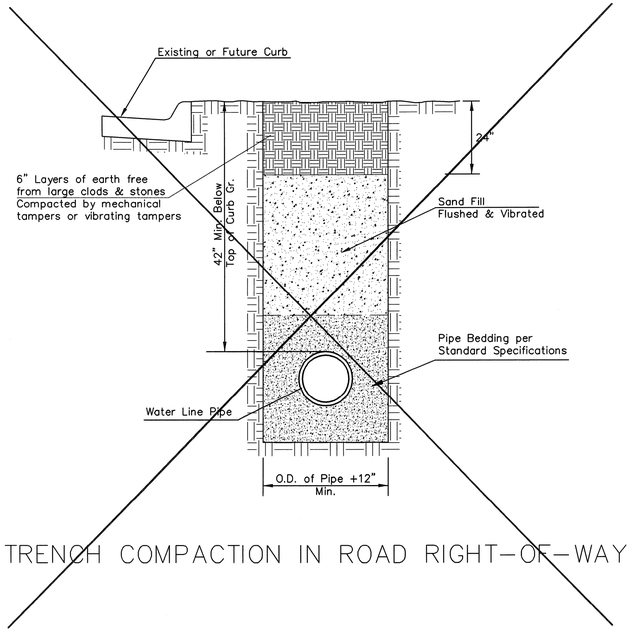

PLUG

| PIPE SIZE | THRUST AT FITTINGS IN TONS–AT 150#/IN$^2$P | | | | | |
|---|---|---|---|---|---|---|
| | PLUG | 90° | 45° | 22 1/2° | 11 1/4° | TEE |
| 6" | 2.8 | 3.95 | 2.15 | 1.09 | .55 | 2.8 |
| 8" | 4.9 | 6.95 | 3.75 | 1.90 | .96 | 4.9 |
| 12" | 11.4 | 16.1 | 8.75 | 4.45 | 2.25 | 11.4 |
| 16" | 20.15 | 28.5 | 15.4 | 7.85 | 3.95 | 20.15 |
| 20" | 31.15 | 44.0 | 23.85 | 12.15 | 6.10 | 31.15 |
| 24" | 44.55 | 63.0 | 34.1 | 17.4 | 8.75 | 44.55 |

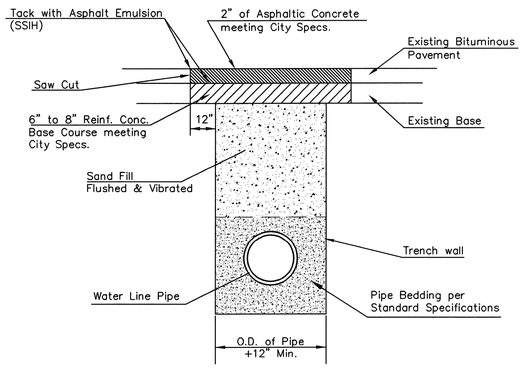
TYPICAL THRUST BLOCKS




KEY BLOCK DETAIL

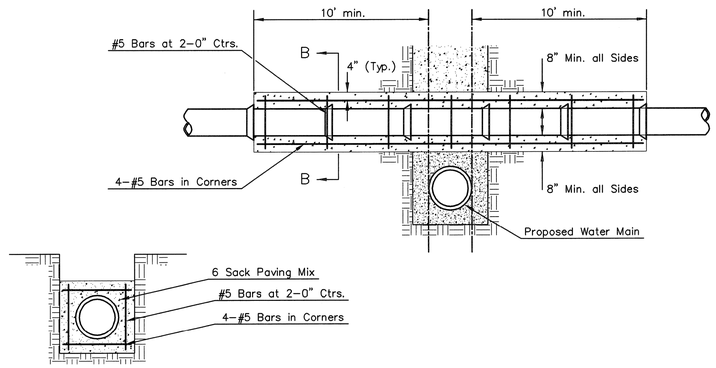



TRENCH COMPACTION IN ROAD RIGHT–OF–WAY




PAVEMENT REPLACEMENT & TRENCH COMPACTION UNDER
EXISTING AND PROPOSED CITY ROADS

* UNLESS OTHERWISE NOTED ON PLANS




Note: Encasement to begin and end at a Bell on Sanitary Sewer Pipe.

SECTION B–B

REINFORCED CONCRETE ENCASEMENT
OF SANITARY SEWER

CITY OF WICHITA
PUBLIC WORKS & UTILITIES
ENGINEERING DIVISION

MISCELLANEOUS
WATER
DETAILS

CITY ENGINEER
GARY JANZEN, P.E.

| PROJECT NUMBER | OCA NUMBER | DATE |
|---|---|---|
| 448-90579 | 635813 | 01/2012 |

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

SHEET
B4 of 12

Saved: 01-07-2013 10:54:27 AM by JAN
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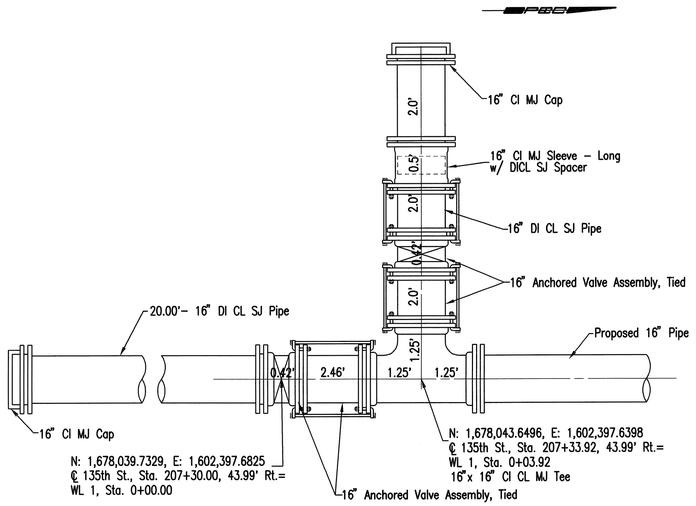
O:\2010\10281\001\10281-001-C4 Miscellaneous Water Details




## PIPING DETAIL

(WL 1, Sta. 0+03.92)

Saved 02-22-2013 8:16:50 AM by RFJ
Plot Scale 1:2 02-22-2013 8:17:39 AM by RBB F. JOHNSON
O:\2010\10281\001\10281-001-45 Misc. Details

MICHAEL D. KELLY LICENSE NO. 13944 KANSAS PROFESSIONAL ENGINEER
7/24/13

| No. | Revision | By | Date |
|---|---|---|---|
| | | | |

135TH ST. W. – KELLOGG AVENUE (U.S. 54) TO ONEWOOD
WATERLINE IMPROVEMENTS

# MISCELLANEOUS DETAILS

GARY JANZEN, P.E. – CITY ENGINEER
CITY OF WICHITA PROJECT NO. 448-90579

PEC
PROFESSIONAL ENGINEERING CONSULTANTS, P.A.
303 SOUTH TOPEKA WICHITA, KS 67202
316-262-2691 www.pec1.com

| | | | |
|---|---|---|---|
| Designed by MDK | Job No. 35-10281-001 | Sht. B5 of 12 |
| Drawn by TDS | Date July 2011 | |

CAUTION !!!
2" Gas Line
(KGS)

CAUTION !!!
Overhead High Voltage Electric
(Westar Energy)

N: 1,678,019.5211, E: 1,602,397.9043
℄ 135th St., Sta. 207+09.79, 43.99' Rt.=
WL 1, Sta. 0-20.21
See Sheet B5 for Piping Details

N: 1,678,043.6496, E: 1,602,397.6398
135th St., Sta. 207+33.92, 43.99' Rt.=
WL 1, Sta. 0+03.92
Begin 16" Water Main installation
1-16"x 16" CI CL MJ Tee
2-16" Anchored Valve Assemblies, Tied (S&W)
(MJ Butterfly Valves)
24.13'- 16" DI CL SJ Pipe (S)
1- 16" CI MJ Cap (S)
8.17'- 16" DI CL SJ Pipe (W)
1- 16" CI MJ Cap
Top Valve Box El=1363.73
See Sheet B5 for Piping Detail

Remove and replace
30 L.F. Concrete
drive in kind.

CAUTION !!!
Overhead Electric
(Westar Energy)

CAUTION !!!
Buried Telephone
(AT&T)

Remove 30 L.F.
Concrete drive
replace with Temporary
Asphalt patch.

N: 1,678,260.0026, E: 1,602,395.2761
℄ 135th St., Sta. 209+50.28, 43.99' Rt.=
WL 1, Sta. 2+20.28
1- Fire Hydrant Assembly
L= 10'
Top Valve Box El.= 1362.2
FH Bury Line El.= 1362.2

CAUTION !!!
Overhead Electric
(Westar Energy)

CAUTION !!!
Buried Telephone
(AT&T)

N: 1,678,539.7032
E: 1,602,392.2258
℄ 135th St., Sta. 212+30.00,
43.99' Rt.=
WL 1, Sta. 5+00.00
MATCH LINE

SCALE:
PLAN: LAT. & LONG. 0 20 40
PROFILE: HORIZ. SAME AS ABOVE
VERT.

Asphalt
℄ 135TH ST. W.
Future 30" Water Main (By Others)
Concrete
Proposed 6' Sidewalk
TMKR
10' KG&E Easement
Exist. R/W 50' ℄
Prop. Overhead High Voltage Electric (by Westar)
15" CMP
Plastic
Gravel
Wrought Iron
Masonry Fence
Exist. R/W 60' ℄
Prop. R/W 60' ℄ (C.O.W. 472-84840)
5' Utility Esmt.
Install Silt Fence
Barrier (typ.)
Tony W. & Kristen Weber
AT-546
216.36'- 16" Pipe
WEBER ADDITION
279.72'- 16" Pipe
Cross Road Fellowship
Bible Inc.
AT-145-7
15" Pine

WATERLINE NO. 1

Unless noted otherwise, elevations shown are top of pipe

END OF PIPE -20.21
BEGIN LINE NO. 1 +03.92
+80.00
Fire Hydrant +20.28
+80.00
Buried Telephone
MATCH LINE

Proposed Top of Curb
Existing Ground
Proposed Ground over ℄ Waterline
Top Proposed 16" Water Main
Sta. 1+81.0 to Sta. 2+15.0
Place 34.0 L.F. Fill, Sand (Flushed & Vibrated) from top pipe bedding to 2' below bottom of pavement.

1359.55 1359.55 1359.50 1359.17 1357.54 1357.21 1355.61 1354.00 1353.81 1352.84

1375 1370 1365 1360 1355 1350 1345 1340 1335

0+00 1+00 2+00 3+00 4+00 5+00

PLAN | DATE | BY | CHECKED | CHECKED

PROFILE | DATE | BY | CHECKED | CHECKED

MICHAEL D. KEISER
LICENSED
13944
2/22/13
KANSAS
PROFESSIONAL ENGINEER

135TH ST. W. – KELLOGG AVENUE (U.S. 54) TO ONEWOOD
WATERLINE IMPROVEMENTS

WATERLINE NO. 1

GARY JANZEN, P.E. – CITY ENGINEER
CITY OF WICHITA PROJECT NO. 448-90579

PROFESSIONAL ENGINEERING CONSULTANTS, P.A.
303 SOUTH TOPEKA WICHITA, KS 67202
316-262-2691 www.pec1.com

Designed By MDK
Drawn By TDS
Job No. 10281-001-042
Date July 2011

Sheet B6 of 13

Saved 02-21-2013 2:53:16 PM by RFJ
Plot Scale 1:20 02-22-2013 8:16:38 AM by RFJ
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SCALE:
PLAN: LAT. & LONG. 0 20 40
PROFILE: HORIZ. SAME AS ABOVE
VERT.

N: 1,678,539.7032
E: 1,602,392.2259
℄ 135th St., Sta. 212+30.00,
43.99' Rt.=
WL 1, Sta. 5+00.00
MATCH LINE

Remove and replace 23 L.F. Gravel drive in kind.

CAUTION !!!
Buried Telephone (AT&T)

N: 1,678,659.6961, E: 1,602,390.9175
℄ 135th St., Sta. 213+50.00, 43.99' Rt.=
WL 1, Sta. 6+20.00
1- Fire Hydrant Assembly
L= 10'
Top Valve Box El.=1354.9
FH Bury Line El.=1355.5

CAUTION !!!
Buried Telephone (AT&T)

N: 1,679,039.6735
E: 1,602,386.7743
℄ 135th St., Sta. 217+30.00,
44.00' Rt.=
WL 1, Sta. 10+00.00
MATCH LINE

℄ 135TH ST. W.
15" CMP
12" Plastic
Proposed 6' Sidewalk
Prop. Overhead High Voltage Electric (by Westar)
Gravel
Wrought Iron
Masonry Fence
Exist. R/W 60' ℄
Prop. R/W 60' ℄ (C.O.W. 472-84840)
27 x 15" HP
215
18" Plastic
KGS
10' KG&E Easement
Cross Road Fellowship Bible Inc. AT-145-7
500.00'- 16" Pipe
Install Silt Fence Barrier (typ.)

RACHAEL D. KEISER
LICENSED
13944
7/22/13
KANSAS
PROFESSIONAL ENGINEER

Unless noted otherwise, elevations shown are top of pipe

## WATERLINE NO. 1

MATCH LINE
Buried Telephone
Fire Hydrant
Buried Telephone
Buried Telephone
MATCH LINE

Proposed Ground over ℄ of Waterline
Proposed Top of Curb
Existing Ground
Top Proposed 16" Water Main
Sta. 5+41.0 to Sta. 5+65.0
Place 24.0 L.F. Fill, Sand (Flushed & Vibrated) from top pipe bedding to 2" below bottom of pavement.

1370 1365 1360 1355 1350 1345 1340 1335 1330

5+00 6+00 7+00 8+00 9+00 10+00

+00.00 1352.84
+00.00 1350.95
+20.00 1350.56
+50.00 1350.00
+00.00 1348.56
+00.00 1345.67
+00.00 1342.79
+10.00 1342.50
+00.00 1340.27

135TH ST. W. - KELLOGG AVENUE (U.S. 54) TO ONEWOOD
WATERLINE IMPROVEMENTS

WATERLINE NO. 1

GARY JANZEN, P.E. - CITY ENGINEER
CITY OF WICHITA PROJECT NO. 448-90579

PROFESSIONAL ENGINEERING CONSULTANTS, P.A.
303 SOUTH TOPEKA WICHITA, KS 67202
316-262-2691 www.pec1.com

Job No. 10281-001-042
Date July 2011
Designed By MDK
Drawn By TDS
Sheet B7 of 13

| PLAN | BY | DATE |
|---|---|---|
| CHECKED | | |
| CHECKED | | |

| PROFILE | BY | DATE |
|---|---|---|
| CHECKED | | |
| CHECKED | | |

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Plot Scale 1:20 02-22-2013 8:19:24 AM by RFJ
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SCALE:
PLAN: LAT. & LONG. 0 20 40
PROFILE: HORIZ. SAME AS ABOVE
VERT.

N: 1,679,039.6735
E: 1,602,396.7743
℄ 135th St., Sta. 217+30.00,
44.00' Rt.=
WL 1, Sta. 10+00.00
MATCH LINE

N: 1,679,049.6729, E: 1,602,396.6652
℄ 135th St., Sta. 217+40.00, 40.00' Rt.=
WL 1, Sta. 10+10.00
1- Fire Hydrant Assembly
L= 10'
Top Valve Box El.=1343.5
FH Bury Line El.=1344.1

CAUTION !!!
Buried Telephone
(AT&T)

N: 1,679,293.2184, E: 1,602,384.0082
WL 1, Sta. 12+53.56 to
N: 1,679,376.4934, E: 1,602,383.0993
WL 1, Sta. 13+36.84
Install 83.28 L.F. 16" RJ DI Pipe**

CAUTION !!!
Buried Telephone
(AT&T)

N: 1,679,539.6437
E: 1,602,381.3185
℄ 135th St., Sta. 222+30.00,
44.00' Rt.=
WL 1, Sta. 15+00.00
MATCH LINE

N: 1,679,539.6437, E: 1,602,381.3185
℄ 135th St., Sta. 222+30.00, 44.00' Rt.=
WL 1, Sta. 15+00.00
1- Fire Hydrant Assembly
L= 10'
Top Valve Box El.=1345.5
FH Bury Line El.=1345.2

21" x 15" CMP
MB
℄ 135TH ST. W.
Sign
Prop. 2-10'x 6' RCB
Headwall
Prop. 6' Sidewalk
Prop. Overhead High Voltage Electric (by Westar)
10' KG&E Easement
Prop. R/W 50' ℄
Prop. R/W 60' ℄ (C.O.W. 472-84840)
Install Silt Fence Barrier (typ.)
Prop. Concrete
10.00'- 16" Pipe
243.56'- 16" Pipe
163.16'- 16" Pipe

Billy A. Hall & Barbara D. Hall
Revocable Trusts
AT-145-3

** RJ DI Pipe shall be Griffin Snap-Lok, American Flex Ring, or approved equal, in accordance with City of Wichita Specifications.

PLAN | CHECKED | CHECKED | BY | DATE

Unless noted otherwise, elevations shown are top of pipe

# WATERLINE NO. 1

16" RJ DI Pipe
Prop. 2-10'x 5' RCB
℄= 1332.10
MATCH LINE
Fire Hydrant
Fire Hydrant
MATCH POINT
Existing Ground
Proposed Top of Curb
Proposed Ground over ℄ of Waterline
Top Proposed 16" Water Main
Proposed Ditch ℄

| | 10+00 | 11+00 | 12+00 | 13+00 | 14+00 | 15+00 |
|---|---|---|---|---|---|---|
| | +00.00 | +80.00 | +00.00 | +30.00 | +53.56 | +73.89 |
| | +10.00 | +80.00 | +13.77 | +33.61 | +00.00 | +16.51 |
| Existing Ground | 1340.27 | 1337.91 | 1337.35 | 1336.50 | 1329.00 | 1328.60 |
| Proposed Top of Curb | 1340.11 | 1334.36 | 1332.92 | 1330.44 | 1328.60 | 1328.60 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | +93.82 | +13.77 | +33.61 | +53.56 | +73.89 | +00.00 |
| | +00.00 | +13.77 | +33.61 | +53.56 | +73.89 | +00.00 |
| Existing Ground | 1329.00 | 1328.60 | 1329.00 | 1330.66 | 1333.37 | 1335.03 |
| Proposed Top of Curb | 1328.60 | 1328.60 | 1329.00 | 1330.66 | 1333.37 | 1335.03 |

PROFILE | CHECKED | CHECKED | BY | DATE

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Plotted: 02-22-2013, 8:31:18 AM by RKJ
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135TH ST. W. - KELLOGG AVENUE (U.S. 54) TO ONEWOOD
WATERLINE IMPROVEMENTS
WATERLINE NO. 1
GARY JANZEN, P.E. - CITY ENGINEER
CITY OF WICHITA PROJECT NO. 448-90579

PEC
PROFESSIONAL ENGINEERING CONSULTANTS, P.A.
303 SOUTH TOPEKA WICHITA, KS 67202
316-262-2691 www.pec1.com

Job No. 10281-001-042
Date July 2011
Designed By MDK
Drawn By TDS

Sheet B8 of 13

MICHAEL D. KELSEY
LICENSED
13944
2/22/13
KANSAS
PROFESSIONAL ENGINEER

SCALE:
0 20 40
PLAN: LAT. & LONG.
PROFILE: HORIZ. SAME AS ABOVE
VERT.
0 5

N: 1,679,539.6437, E: 1,602,381.3185
℄ 135th. St., Sta. 222+30.00, 44.00' Rt.=
WL 1, Sta. 15+00.00
MATCH LINE

N: 1,679,539.6437, E: 1,602,381.3185
℄ 135th St., Sta. 222+30.00, 44.00' Rt.=
WL 1, Sta. 15+00.00
Fire Hydrant Assembly

CAUTION !!! Buried Telephone (AT&T)

CAUTION !!! Buried Electric (Westar)

Remove and replace 18 L.F. Gravel drive in kind.

CAUTION !!! Buried Telephone (AT&T)

N: 1,674,942.9963, E: 1,607,528.9431
WL 1, Sta. 18+65.00 to
N: 1,675,082.8614, E: 1,607,529.3422
WL 1, Sta. 18+94.13
Install 29.13 L.F. 16" RJ DI Pipe**

N: 1,679,933.7514, E: 1,602,377.0169
℄ 135th. St., Sta. 226+25.74, 44.00' Rt.=
WL 1, Sta. 18+94.13
1– 16" CI CL MJ 22 1/2° Bend(Rot.)
Horiz. Defl.= 11°06'24"

N: 1,679,943.9444, E: 1,602,374.9000
℄ 135th. St., Sta. 226+35.78, 42.00' Rt.=
WL 1, Sta. 19+04.54
1– 16" CI CL MJ 22 1/2° Bend(Rot.)
Horiz. Defl.= 11°02'29"

N: 1,679,948.4441, E: 1,602,374.8458
℄ 135th. St., Sta. 226+38.80, 42.00' Rt.=
WL 1, Sta. 19+09.04
Remove existing 16" Plug and connect new pipe to existing main.

℄ 135TH ST. W.

225

Prop. 6' Sidewalk

Prop. Overhead High Voltage Electric (by Westar)

Gravel

BM#16

Prop. R/W 50' ℄

Wrought Iron Fence

Post

2 – 12.5' Gates

Post

Prop. Drng. Esmt.

Existing R/W 50' ℄

10' KG&E Easement

10" Ced.

.8" Oak

.6" Pine

.10" Pine

.6" Dec

.8" Dec

.8" Dec

.6" Dec

Wrought Iron Fence

℄ 10' Util. Easement

365.00'– 16" Pipe

Billy A. Hall & Barbara D. Hall
Revocable Trusts
AT-145-3

Install Silt Fence Barrier (typ.)

CAUTION !!! 4' x 3' RCB Storm Water Sewer

CAUTION !!! Buried Telephone (AT&T)

Billy A. Hall & Barbara D. Hall
Revocable Trusts
AT-145-3

1/4 Section Line

1/4 Section Line

20' Utility Easement

Ronnie P. & Carol M. Sellens
Revocable Trust
D-53534

4.50'– 16" DI CL SJ Pipe

11.06'– 16" DI CL SJ Pipe

Patricia A.
D-53
4

MICHAEL D. KEBERLY
LICENSED
13944
12/31/13
KANSAS
PROFESSIONAL ENGINEER

** RJ DI Pipe shall be Griffin Snap-Lok, American Flex Ring, or approved equal, in accordance with City of Wichita Specifications.

* PRIOR TO BEGINNING CONSTRUCTION, THE CONTRACTOR SHALL EXCAVATE THE EXISTING 16" WATERLINE AT STATION 19+09.04 TO VERIFY PIPE SIZE, TYPE, FITTINGS, AND HORIZONTAL AND VERTICAL LOCATION. THE CONTRACTOR SHALL REPORT HIS FINDINGS TO THE ENGINEER SO THAT ANY NECESSARY PLAN MODIFICATIONS CAN BE MADE. ANY ADDITIONAL LABOR OR MATERIALS NECESSARY TO COMPLETE THE CONNECTION SHALL BE CONSIDERED SUBSIDIARY TO THE PROJECT.

## WATERLINE NO. 1

PLAN | BY | DATE | CHECKED | CHECKED

Unless noted otherwise, elevations shown are top of pipe

PROFILE | CHECKED | CHECKED

16" RJ DI Pipe

4" x 3" RCB
E= 1340.27

Buried Telephone

22 1/2° Bend(Rot.)

22 1/2° Bend(Rot.)

End Line No. 1

Existing 16" Water Main

Fire Hydrant
MATCH LINE

Buried Electric

Existing Ground

Proposed Top of Curb

Proposed Ground over ℄ of Waterline

Proposed Ditch ℄

Top Proposed 16" Water Main

Sta. 16+74.55 to Sta. 16+98.5
Place 24.0 L.F. Fill, Sand(Flushed & Vibrated) from top pipe bedding to 2" below bottom of pavement.

1355 1350 1345 1340 1335 1330 1325 1320 1315

+00.00 1340.00
1339.82
1339.64
+80.00 1339.50
1340.13
+65.00 1336.77
+94.13 1336.77
1338.87
+04.54 1340.50
+09.04 1340.50

15+00 16+00 17+00 18+00 19+00

135TH ST. W. – KELLOGG AVENUE (U.S. 54) TO ONEWOOD
WATERLINE IMPROVEMENTS

# WATERLINE NO. 1

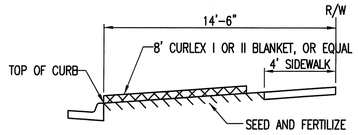
GARY JANZEN, P.E. – CITY ENGINEER
CITY OF WICHITA PROJECT NO. 448-90579

PEC
PROFESSIONAL ENGINEERING CONSULTANTS, P.A.
303 SOUTH TOPEKA WICHITA, KS 67202
316-262-2691 www.pec1.com

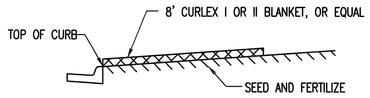
Job No. 10281-001-042
Date July 2011
Designed By MDK
Drawn By TDS

Sheet B9 of 13

Saved: 12-27-2013 9:10:32 AM by RFJ
Print: 12-27-2013 9:10:43 AM by RFJ
O:\2010\10281\001-042\B1-B13 Plan PP&P




SECTION B-B

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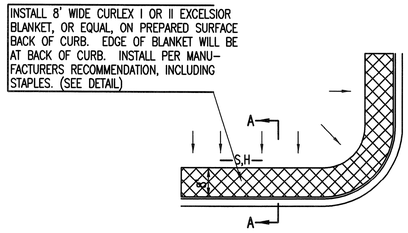
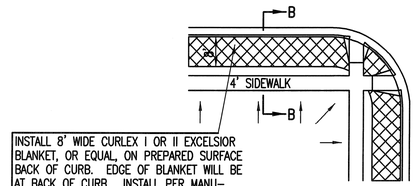


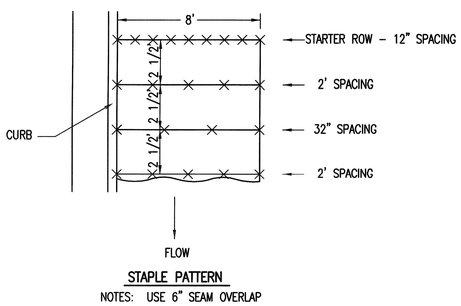

SOUTH STREET

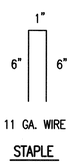



GENERAL NOTES

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

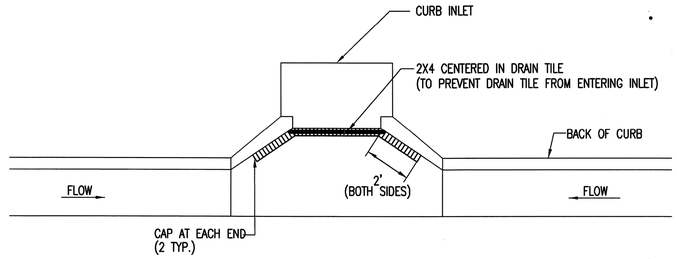



STAPLE PATTERN

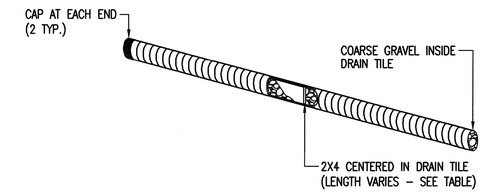
NOTES: USE 6" SEAM OVERLAP

## DETAILS FOR CURLEX I OR II BLANKETS



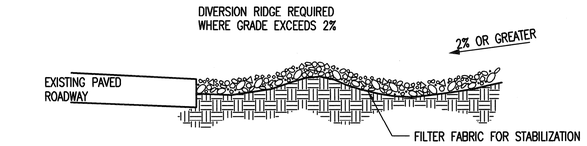

NOTE:
PLACE 4" PERFORATED PVC PIPE, FILLED WITH 1/2"-1" DIA. GRAVEL, IN FRONT OF CURB INLET AS SHOWN.

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

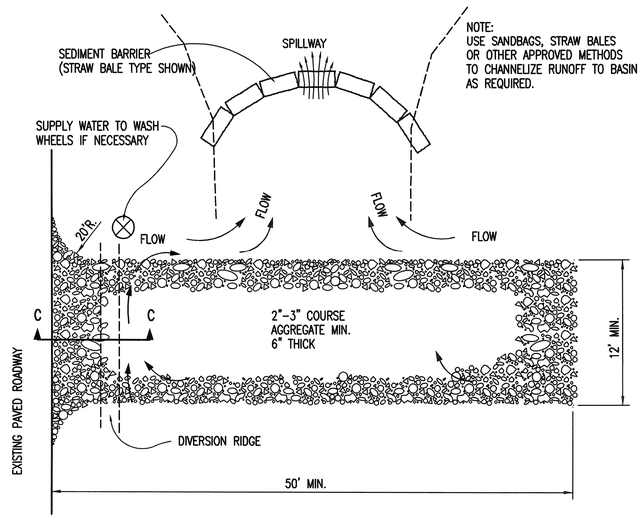



## CURB INLET PROTECTION

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.

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 |
|---|---|---|
| 448-90579 | 635813 | 11/2010 |

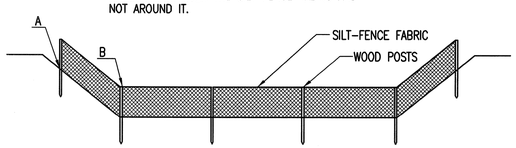
CITY ENGINEER'S OFFICE
CITY HALL - SEVENTH FLOOR
455 NORTH MAIN STREET
WICHITA, KANSAS 67202-1620
(316) 268-4501

| DESIGN | DRAWN |
|---|---|
| | |

SHEET
B10 of 12

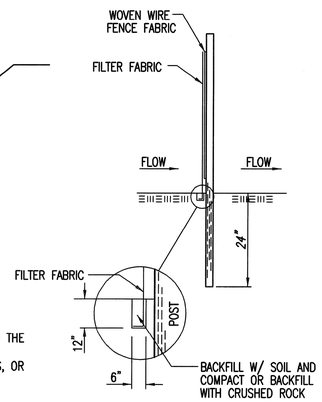
Saved 01-03-2013 11:08:41 AM by CSL
Print Date: 1/3/2013 11:09:20 AM by BOB F. JOHNSON
Q:\2010\1028\001\10281-001-C10 SW-501-SEDIMENTDETAILS

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.

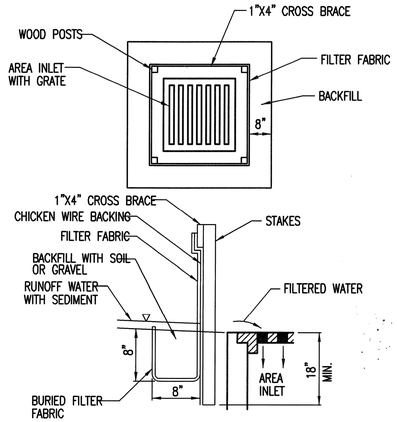
LIST OF COMMON PLACEMENT/INSTALLATION MISTAKES TO AVOID:

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.

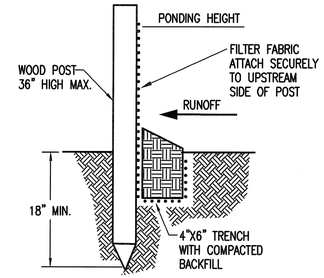
LIST OF COMMON PLACEMENT/INSTALLATION MISTAKES TO AVOID:

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?

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 |
|---|---|---|
| 448-90579 | 635813 | 11/2010 |

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

| DESIGN | DRAWN |
|---|---|
| | |

SHEET
B11 of 12

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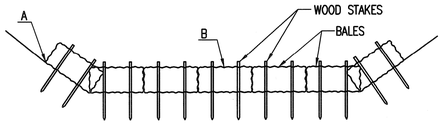
Plot Scale 1:1 02-22-2013 11:21:35 AM by BOB.F.JOHNSON
Q:\2010\10281\001\10281-001-C11 SW-502-SEDMP DETAILS

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 CHECK SPACING

| 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".

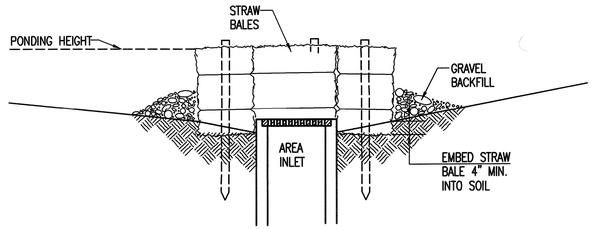
LIST OF COMMON PLACEMENT/INSTALLATION MISTAKES TO AVOID:

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.

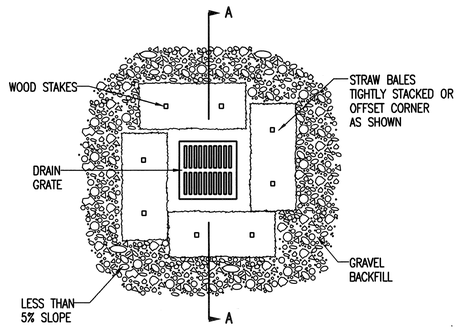
INSPECTION AND MAINTENANCE:

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.

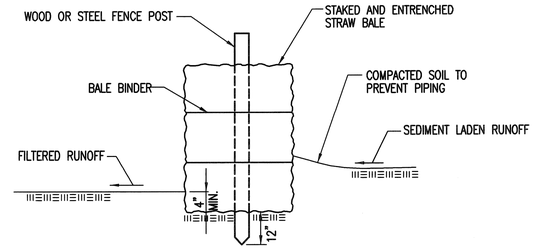
LIST OF COMMON PLACEMENT INSTALLATION MISTAKES TO AVOID:

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?

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 |
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