SHEET NO.	TOTAL SHEETS
1	23

CITY OF WICHITA, KANSAS
MICHAEL E. LINDEBAK, P.E., CITY ENGINEER

STORM WATER SEWER NO. 566

IN

BALTHROP 4TH ADDITION

CITY OF WICHITA PROJECT NO. 468-83392
OCA NO. 751313

BOOKED
8-5-02
MCG
C-223

INDEX OF SHEETS

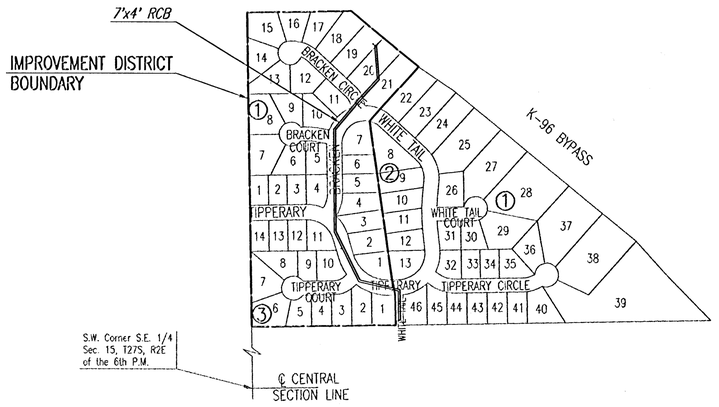
PROJECT SURVEY CONTROL

BM E-2: RAILROAD SPIKE IN NORTH FACE OF 12" HEDGE TREE SOUTH OF NORTH GAP IN EAST HEDGE ROW NEAR SOUTHEAST CORNER OF LOT 13, BLOCK 4 OF BALTHROP ADDITION.
ELEV.=1375.00

BM 4-1: T POST SET 6"± BELOW SURFACE, 10'± EAST OF NORTHWEST CORNER, LOT 46, BLOCK 1 BALTHROP 4TH ADDITION.
ELEV.=1355.70

BM 4-2: T POST SET 6"± BELOW SURFACE, 10'± SOUTH OF POINT OF CURVATURE OF CUL-DE-SAC LOT 30, BLOCK 1 OF BALTHROP 4TH ADDITION.
ELEV.=1365.28

BM 4-3: T POST SET 6"± BELOW SURFACE, 10'± EAST OF POINT OF CURVATURE, LOT 7, BLOCK 2 OF BALTHROP 4TH ADDITION.
ELEV.=1361.37



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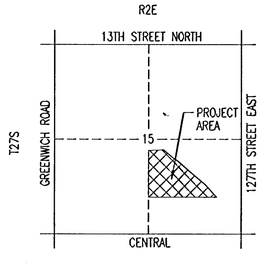

VICINITY MAP

GENERAL NOTES

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

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.

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.

EXCESS EXCAVATED MATERIAL AND EXCESS TOPSOIL SHALL BE WASTED WITHIN THE BENEFIT IMPROVEMENT BOUNDARY LIMITS. THE CONTRACTOR SHALL CONTACT THE OWNER'S ENGINEER AT 262-2691 FOR INFORMATION PERTAINING TO THE ACCEPTABLE LOCATIONS FOR THE DISPOSITION OF EXCESS MATERIAL. WASTE MATERIAL SHALL BE GRADED SMOOTH AND SLOPED TO DRAIN. THIS WORK SHALL BE CONSIDERED SUBSIDIARY TO OTHER BID ITEMS.

CONTRACTOR SHALL PROVIDE A MINIMUM FORTY-EIGHT (48) HOUR 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, PEOPLES NATURAL GAS, WESTAR ENERGY, SOUTHWESTERN BELL TELEPHONE, COX COMMUNICATIONS, CITY OF WICHITA SEWER MAINTENANCE AND CITY OF WICHITA WATER DEPARTMENT.

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.

EROSION CONTROL (BMP'S)
THE CONTRACTOR SHALL INSTALL AND/OR MAINTAIN EROSION CONTROL METHODS AS SPECIFIED ON SHEET 23. THE FOLLOWING QUANTITIES ARE ESTIMATED, AND SHOULD BE CONSIDERED THE MINIMUM EFFORT REQUIRED. INSTALLATION OF THESE BMP'S DOES NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY OF ABATING SOIL EROSION.

INLET PROTECTION	5 EACH
SILT FENCE BARRIER	50 LF
CONSTRUCTION ENTRANCE	1 EACH
BACK OF CURB PROTECTION	4550 LF

BRENT E. REMSBERG
8168
3-14-02
KANSAS
PROFESSIONAL ENGINEER

RICHARD A. SCHLITT
LICENSED
8024
KANSAS
PROFESSIONAL ENGINEER
3-14-02

FEBRUARY 2002

PLANS PREPARED BY
PROFESSIONAL ENGINEERING CONSULTANTS, P.A.
ENGINEERS
WICHITA, KANSAS

DSNR: DEP OPER: SAD SCALE: 1=300.00
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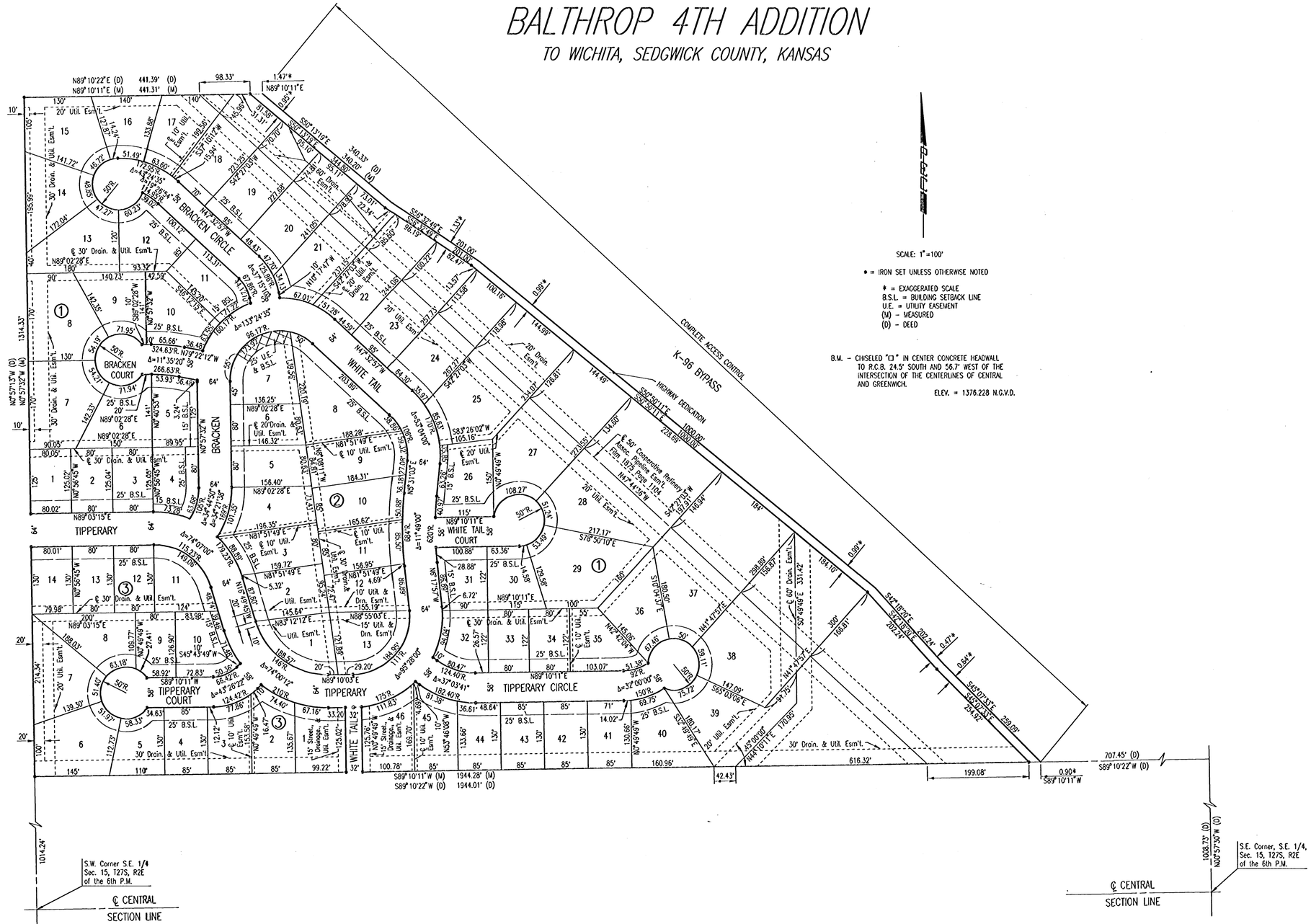
PROJECT NO.	SHEET NO.	TOTAL SHEETS
468-83392	2	23

BALTHROP 4TH ADDITION

TO WICHITA, SEDGWICK COUNTY, KANSAS



SCALE: 1"=100'

• = IRON SET UNLESS OTHERWISE NOTED

* = EXAGGERATED SCALE
B.S.L. = BUILDING SETBACK LINE
U.E. = UTILITY EASEMENT
(M) = MEASURED
(D) = DEED

B.M. – CHISELED "□" IN CENTER CONCRETE HEADWALL TO R.C.B. 24.5' SOUTH AND 56.7' WEST OF THE INTERSECTION OF THE CENTERLINES OF CENTRAL AND GREENWICH.

ELEV. = 1376.228 N.G.V.D.

DSNR: DEP OPER: SAD SCALE: 1=100.00
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BALTHROP 4TH ADDITION

PLAT

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

Designed by		Checked by	
Drawn by	DEP	Date FEB. 2002	Job No. 01545-001

SCALE: 1"=40'

Point	North	East
100	377,731.773	2,377,509.673
101	377,876.783	2,377,507.569
103	377,914.591	2,377,340.897
104	378,120.649	2,377,237.586
105	378,364.136	2,377,236.129
106	378,548.682	2,377,235.025
107	378,669.224	2,377,336.355
108	378,759.057	2,377,418.530
119	378,366.681	2,377,215.614
120	378,361.549	2,376,908.827
121	378,691.503	2,376,903.304
123	377,908.456	2,377,473.104
124	377,868.120	2,377,473.690
126	378,900.194	2,377,407.021
129	377,925.417	2,377,482.063
130	378,036.122	2,377,466.235
131	378,192.663	2,377,443.855
132	378,360.765	2,377,419.822
133	377,881.936	2,377,484.852
134	378,871.432	2,377,338.363
135	378,051.770	2,377,272.120
136	378,367.363	2,377,255.945
145	378,824.185	2,377,390.013
146	378,803.354	2,377,414.918
147	378,703.060	2,377,534.830
148	378,810.356	2,377,406.547
149	378,796.353	2,377,423.289

SEE REVISED SHEET 3R.

REINFORCED CONCRETE BOX
STA. 10+00.00 TO STA. 17+92.82

STORM WATER SEWER NO. 566

C.O.W. PROJ. NO. 466-83382

Professional Engineering Consultants, P.A.
303 S. TOPEKA, WICHITA, KANSAS 67202
316-262-2691 • FAX 316-262-0693

Designed by	BER	Job No.	01545
Drawn by	DEP	Date	FEB., 2002

DSNR: DEP OPER: SAD SCALE: 1=40.00
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SCALE: 1"=40'

(103) Sta. 13+15.93 ℄ RCB= ℄ Tipperary Sta. 16+30.00, 12' Rt.

Sta. 10+29.00, SWS Line No. 1= ℄ Tipperary Sta. 17+63.17, 20.17' Lt.= Std. Type 1A Curb Inlet (By Others) L=10'-0", W=3'-0" Top Elev.=1358.49 ℄ In=1354.10, ℄ Out=1354.00

(123) Sta. 40+22.10, SWS Line No. 1A= ℄ Tipperary Sta. 17+57.17, 20.17' Rt.= Std. Type 1A Curb Inlet (By Others) L=5'-0", W=3'-0" Top Elev.=1358.46 ℄ Out=1352.35

(124) Sta. 11+68.32 ℄ RCB= ℄ Tipperary Sta. 17+74.53, 6.52' Rt.= Sta. 40+00.00, SWS Line No. 1A Install 6 L.F. 18" RCP Stub(S) Plug with Temporary Redwood Pipe Plug and Mark with End of Pipe Marker

(133) Sta. 11+68.32 ℄ RCB= ℄ Tipperary Sta. 17+74.53, 6.52' Rt.= Sta. 10+00.00, SWS Line No. 1 Install 6 L.F. 30" RCP Stub(S) Plug with Temporary Redwood Pipe Plug and Mark with End of Pipe Marker

(133) Sta. 10+00.00 ℄ RCB=℄ (100)

Sta. 8+00.00 ℄ 20' Channel

Sta. 10+22.57 ℄ RCB= ℄ Tipperary Sta. 17+97.17, 137.03' Rt. Install 1375.31 L.F. 7'x4' RCB See Sh. Nos. 5-18

(104) Sta. 15+46.44 ℄ RCB= ℄ Tipperary Sta. 14+00.00, 12' Rt.

SS MH Top=1360.4 F=1347.51'

SS MH Top=1361.4 F=1351.05

Prop. 8" Water

(119) Sta. 20+20.67, SWS Line No. 2= ℄ Bracken Sta. 21+96.63, 20.17' Lt.= Std. Type 1A Curb Inlet L=5'-0", W=3'-0" Top Elev.=1360.35 ℄ Out=1356.32

(134) Sta. 20+18.40, SWS Line No. 2A= ℄ Tipperary Sta. 14+78.61, 20.17' Rt.= Std. Type 1A Curb Inlet (By Others) L=5'-0", W=3'-0" Top Elev.=1359.88 F=1356.00

(105) Sta. 17+89.93 ℄ RCB= ℄ Bracken Sta. 21+93.74, 0.30' Rt.= Sta. 20+00.00, SWS Line No. 2 Install 6 L.F. 24" RCP Stub(w) Plug with Temporary Redwood Pipe Plug and Mark with End of Pipe Marker

(135) Sta. 14+69.39 ℄ RCB= ℄ Tipperary Sta. 14+78.61, 1.77' Lt.= Sta. 20+00.00, SWS Line No. 2A Install 6 L.F. 18" RCP Stub(W) Plug with Temporary Redwood Pipe Plug and Mark with End of Pipe Marker

(105) Sta. 17+89.93 ℄ RCB= ℄ Bracken Sta. 21+93.74, 0.30' Rt.= Sta. 30+00.00, SWS Line No. 2B Install 6 L.F. 18" RCP Stub(E) Plug with Temporary Redwood Pipe Plug and Mark with End of Pipe Marker

(136) Sta. 20+20.08, SWS Line No. 2B= ℄ Bracken Sta. 21+96.63, 20.17' Rt.= Std. Type 1A Curb Inlet (By Others) L=5'-0", W=3'-0" Top Elev.=1360.35 ℄ Out=1356.32

(101) Sta. 11+45.03 ℄ RCB= ℄ Tipperary Sta. 17+97.17, 12' Rt.

Point	North	East
100	377,731.773	2,377,509.673
101	377,876.783	2,377,507.569
103	377,914.591	2,377,340.897
104	378,120.649	2,377,237.586
105	378,364.136	2,377,236.129
106	378,548.682	2,377,235.025
107	378,669.224	2,377,336.355
108	378,759.057	2,377,418.530
119	378,366.681	2,377,215.614
120	378,361.549	2,376,908.827
121	378,691.503	2,376,903.304
123	377,908.456	2,377,473.104
124	377,868.120	2,377,473.690
126	378,900.194	2,377,407.021
129	377,925.417	2,377,482.063
130	378,036.122	2,377,466.235
131	378,192.663	2,377,443.855
132	378,360.765	2,377,419.822
133	377,881.936	2,377,484.852
134	378,871.432	2,377,338.363
135	378,051.770	2,377,272.120
136	378,367.363	2,377,255.945
145	378,824.185	2,377,390.013
146	378,803.354	2,377,414.918
147	378,703.060	2,377,534.830
148	378,810.356	2,377,406.547
149	378,796.353	2,377,423.289

No.	Revision	By	Date
1	Added Channel Grading	BER	8/6/02

SECTION A-A

Varies 10' 10' Varies ℄ 4:1 4:1

+0.10% ℄ 20' Channel

Sta. 10+00 (100) — Begin RCB Construction Sta. 10+22.57 — Prop. 8" Water Top of Pipe=1349.50 Sta. 11+45.03 (101) — Sta. 11+68.32 (133) — Sta. 13+15.93 (103) — Prop. 8" Sanitary Sewer F=1347.65 Sta. 14+69.39 (135) — Sta. 15+46.44 (104) — Prop. 8" Sanitary Sewer F=1350.9 Sta. 17+89.93 (105)

Existing Ground — Proposed Ground

F=1352.28 SWS Line No. 1 & 1B

F=1353.38 SWS Line No. 2A

F=1354.67 SWS Line No. 2 & 2B

F=1350.80 F=1350.85 F=1350.90 F=1350.95 F=1351.00 F=1351.05 F=1351.08 F=1351.40 F=1351.58 F=1351.67 F=1351.80 F=1352.20 F=1352.26 F=1352.60 F=1352.87 F=1353.00 F=1353.19 F=1353.40 F=1353.80 F=1354.17

10+00 11 12 13 14 15+00 16 17 18

1365 1360 1355 1350

STORM WATER SEWER NO. 566

REINFORCED CONCRETE BOX
STA. 10+00.00 TO STA. 17+92.82

C.O.W. PROJ. NO. 468-83392

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

Designed by BER | Job No. 01545
Drawn by DEP | Date FEB., 2002

Sheet 3R of 23

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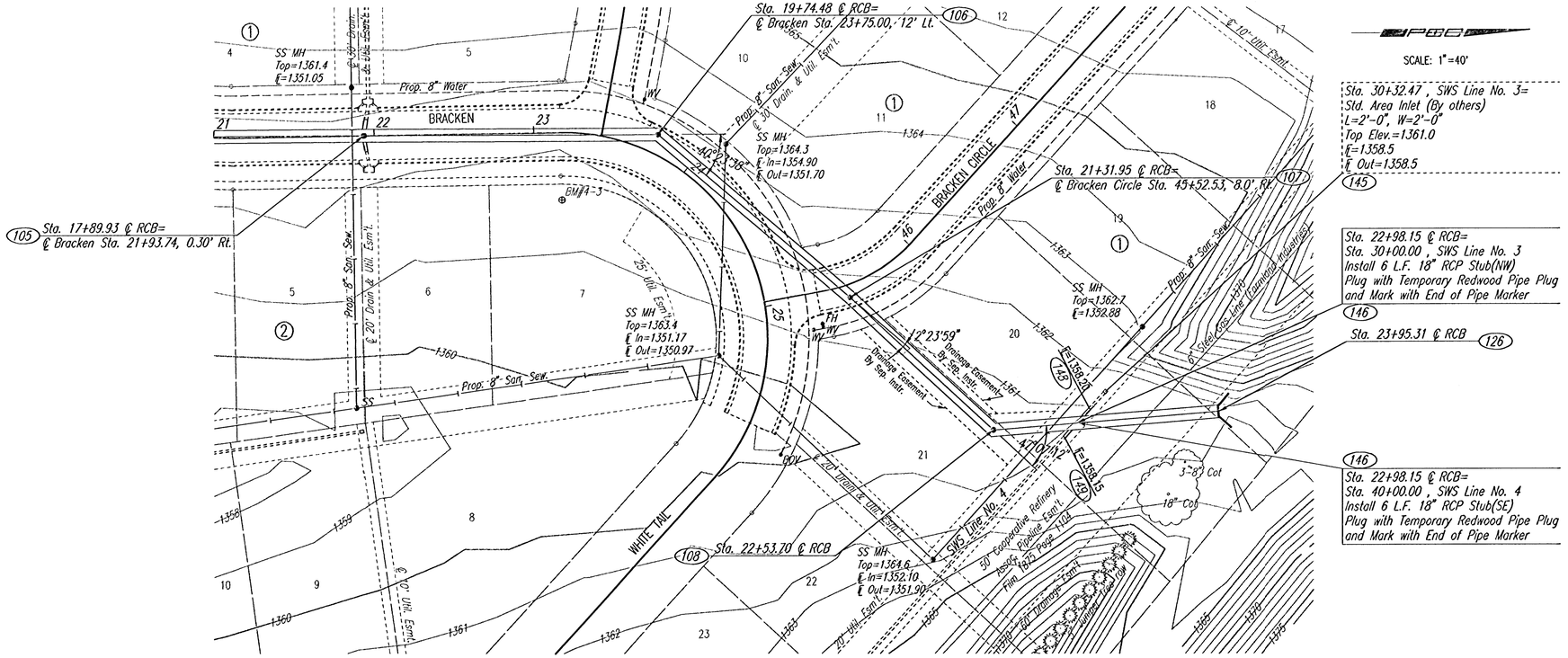
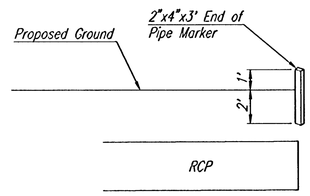
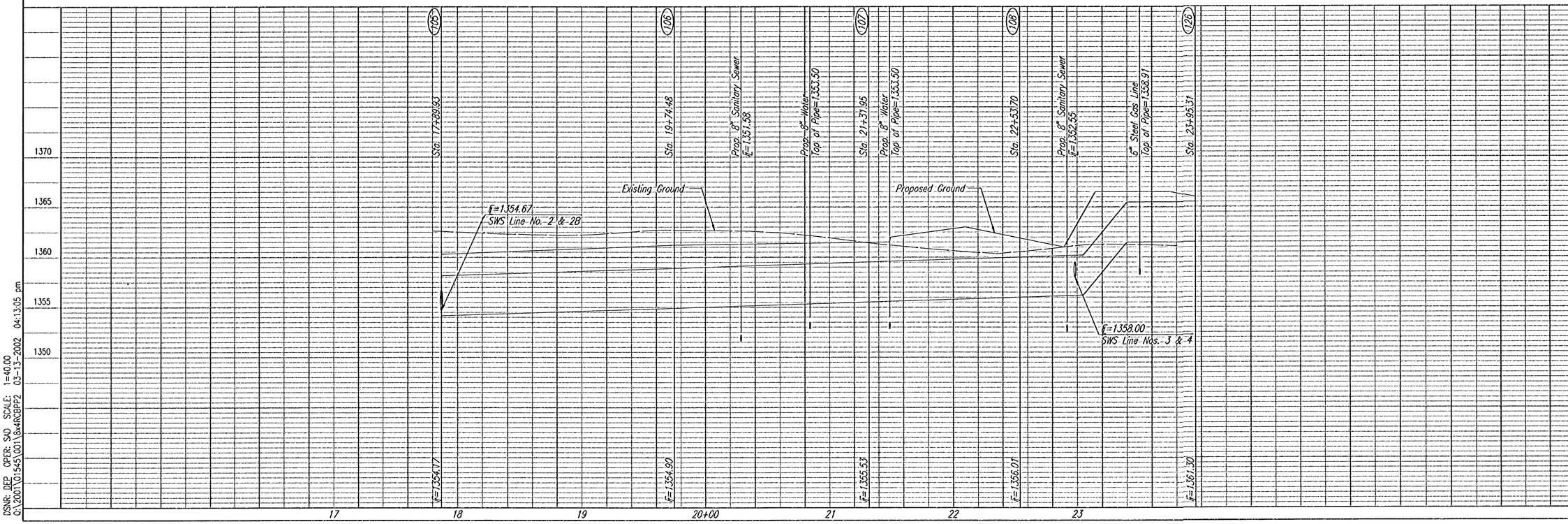




END OF PIPE MARKER DETAIL



STORM WATER SEWER NO. 566

REINFORCED CONCRETE BOX

STA. 17+89.93 TO STA. 23+95.31

C.O.W. PROJ. NO. 468-83392

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

Designed by	BER	Job No.	01545
Drawn by	DEP	Date	FEB., 2002

Sheet 4 of 23

DSN#: DEP OPER: SAD SCALE: 1=40.00
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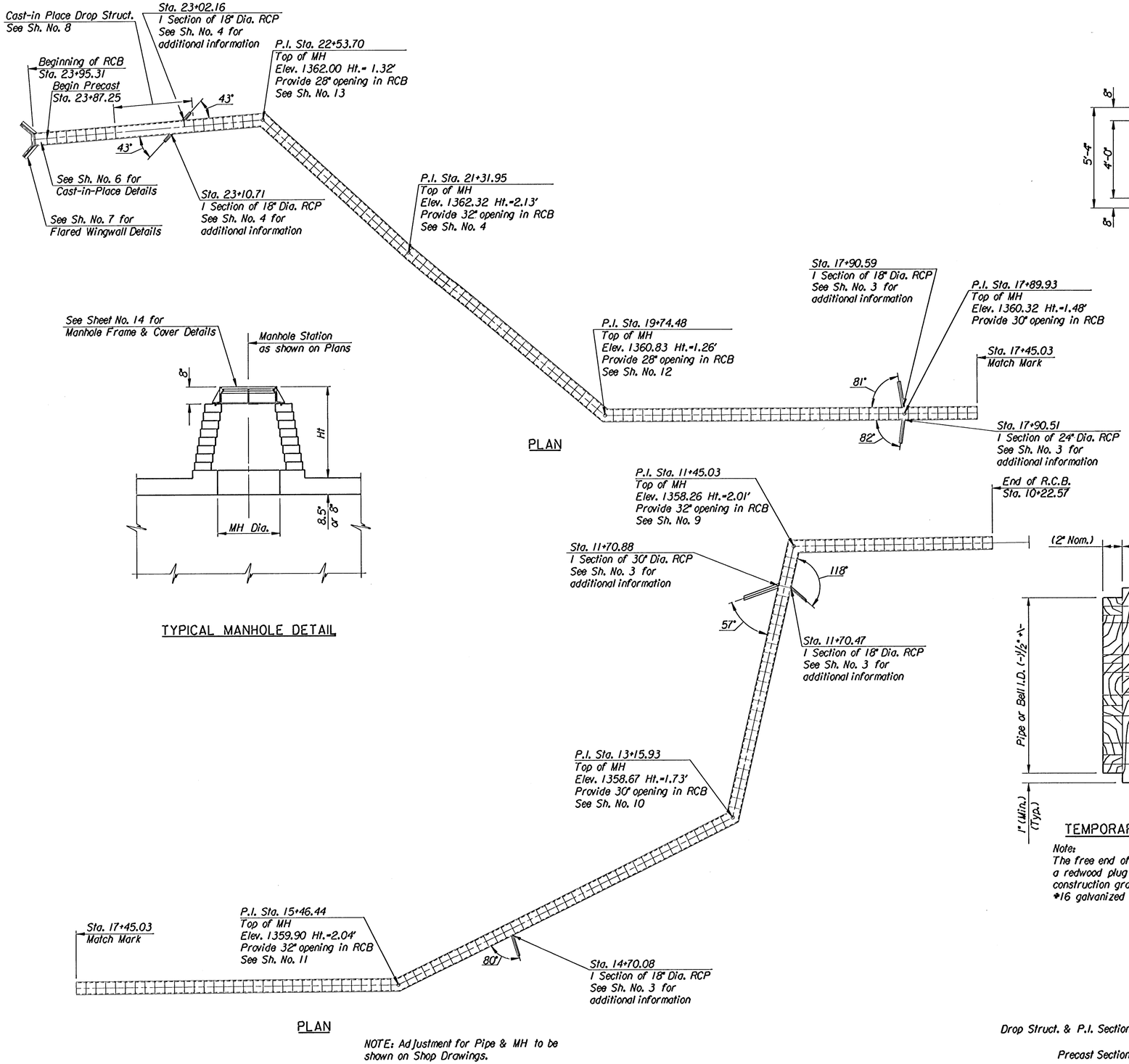
PROJECT NO.	SHEET NO.	TOTAL SHEETS
468-83392	5	23



Note:
The free end of all Pipe stubs installed shall be plugged with a redwood plug as shown. The plugs shall be constructed with construction grade redwood and securely nailed together with #16 galvanized nails.

NOTE: Precast Layout is based on a Section Lay Length of 6'-0¾" per Section.

BILL OF MATERIALS		
Drop Struct. & P.I. Sections	Class AAA Concrete (AE)	73.4 C.Y.
	Reinforcing Steel	9180 Lbs.
	Seal Course (Granular Base Assumed)	17.3 C.Y.
Precast Sections	7'x4' R.C.B. (Precast)	1255 L.F.
	Seal Course (Granular Base Assumed)	198 C.Y.

LOADING: HS20-44 A.A.S.H.T.O. Specification, 1983 Edition.

UNIT STRESSES:
Concrete F'c = 4000 p.s.i. Fy = 60,000 p.s.i.
Fc = 1600 p.s.i. Fs = 24,000 p.s.i.

CONSTRUCTION: The Contractor shall construct as shown. Additional Cast-in-Place Sections may be built if sections are jointed at 40'-4" increments and they must adhere to the Typical Section for dimensions and spacing as shown on Sheet No. 6.

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

EXCAVATION: All excavation and backfill shall extend two (2) feet beyond the sides of the box and wingwall. Excavation is expected to exceed 6" in depth.

CONFLICT: If R.C.B. plan notes conflict with the General Notes from this sheet, then these General Notes will govern.

PAYMENT: The 7'-0"x4'-0" R.C. Box shall be bid by Linear Feet measured along ℄ of R.C.B. ene to end. Which shall include all labor, material, excavation, backfill, concrete, reinforcing steel, seal course and all other incidentals necessary to complete the work. Quantities shown are for information only.

PRECAST CONCRETE: Precast Box Sections shall meet the appropriate design and inspection requirements of A.S.T.M. Designation C-850, 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 either 3" of Class A Concrete or a 6" Granular Base (Type UD-1) at the Contractors option. P.I. Sections will also require the same seal course as the precast sections, but the Cast-in-Place Section at Sta. 23+95.31 does not require a seal course, but the use is optional with the Contractor. 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 if the Cast-in-Place portion lengths are adjusted.

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

No.	Revisions	By	Date
1			

BALTHROP 4TH ADDITION
STORM WATER SEWER NO. 566

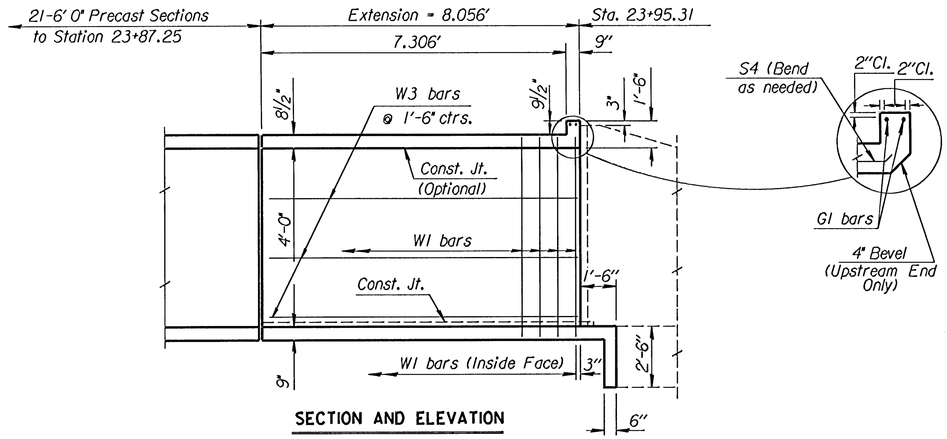
7'-0"x4'-0"x1372.7' R.C.B. GENERAL NOTES AND MISCELLANEOUS DETAILS

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

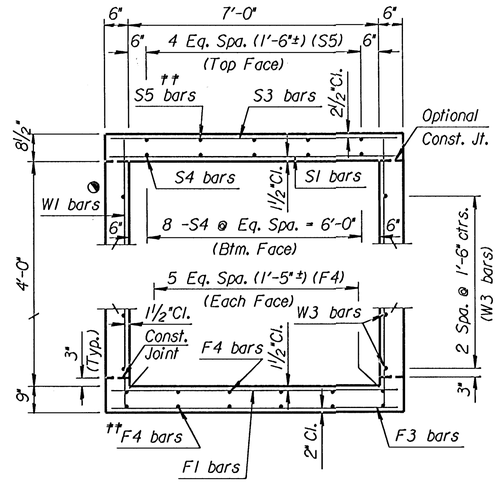
Designed by	RWA	Checked by	RAS
Drawn by	WLL	Date	Febr. 2002
		Job No.	01545-1

1:200//01545/rcb/gennotesdgn
drawn by: will
plotted by: drp 3-13-2002

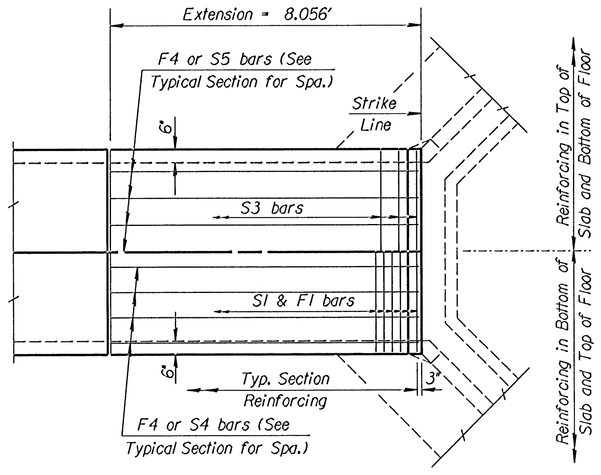
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	468-83392	2002	6	23



SECTION AND ELEVATION



TYPICAL SECTION



NORMAL BOX EXTENSION

PLAN

◔ See RCB Auxillary Details for Optional Splice.

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

Note:
F3 bars omitted unless floor thickness is greater than or equal to 12".

†† Omit S5 bars when S3 bars are omitted and omit the bottom layer of F4 bars when F3 bars are omitted.

GENERAL NOTES

LOADING: HS20-44 AASHTO Specifications, 1983 Edition.
UNIT STRESSES: Class AAA Concrete; f'c = 4,000 p.s.i.
Reinforcing Steel; fy = 60,000 p.s.i.
FILL HEIGHT: Unless otherwise noted, the Design Fill Height is measured from the riding surface at the culvert and shall include the surfacing.
CONCRETE: Class AAA Concrete shall be used throughout. Bevel all exposed edges with a ¾inch triangular moulding. Where Class AAA Concrete (AE) is specified, it shall be placed in the top slab above the Construction Joint.
REINFORCING: All reinforcing shall conform to ASTM A615, Grade 60. All dimensions relative to reinforcing steel shall be to centerline of bar unless otherwise noted.
EXCAVATION: Excavation for culverts less than bridge length shall not be paid for directly but shall be subsidiary to Class AAA Concrete. Excavation for RCB Bridges shall be paid for as Class III Excavation.
SEAL COURSE: A Seal Course may be required by the Engineer. The Seal Course shall be unreinforced Concrete (Commercial Grade) to 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: Foundation Stabilization may be required as directed by the Engineer. The depth of Foundation Stabilization shall be determined by the Engineer. Foundation Stabilization shall be paid for at the determined Unit Price set for Foundation Stabilization. See Auxiliary Details.
QUANTITIES: The quantities shown in the Culvert Summary include apron and/or soil saver quantities when their construction is required by the plans. Payment for additional quantities that result from including seal course and/or floating apron, as a change in original plans, shall be made at the Unit Price bid for the various items involved.
GRANULAR BACKFILL (WINGWALLS): Special backfill procedures may be required at the direction of the Engineer. See Auxiliary Details Sheet.
STRIKE LINE: Wingwalls and that portion of the RCB outside the Strike Line shall be constructed level. Footing for wingwalls shall be constructed with the culvert floor. See wingwall detail sheet.

CULVERT SUMMARY

Flow Line Elev. Lt.	Flow Line Elev. Rt.	Crown Gr. Elev.	Design Fill Ht.	Skew RT	Left Wings	Right Wings	Scour Apron	Soil Saver	Granular Backfill	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.)
			2		FLARED	FLARED	NO	NO	NO	4.85	4.70	9.55	564.2	369.4	933.6

✱See Bending Diagram

BAR SCHEDULE

F1 Size	Spa.	No.	Length	F3 Size	Spa.	No.	Length	F4 Size	Spa.	No.	Length	S1 Size	Spa.	No.	Length	S3 Size	Spa.	No.	Length	S4 Size	Spa.	No.	Length	S5 Size	No.	Length
6	6½"	15	7'-8"	-	-	-	-	-	-	-	-	4	6	7'-9"	6	6½"	15	7'-8"	-	-	-	-	-	-	-	-	5	8	7'-9"	-	-	-

W1 Size	Spa.	No.	Length	W3 Size	Spa.	No.	Length	G1 Size	No.	Length
4	9"	22	5'-2"	4	6	7'-9"	5	2	7'-8"

Minimum Splice Lengths	
#4	1'-4"
#5	1'-8"
#6	2'-0"

SUMMARY OF QUANTITIES		
Class AAA Concrete	9.6	C.Y.
Class AAA Concrete (AE)	0.0	C.Y.
Reinforcing Steel (Gr. 60)	934	Lbs.
Reinforcing Steel (Epoxy Coated)	0	Lbs.
Class III Excavation	—	C.Y.
Foundation Stabilization (Set)	1	C.Y.
Concrete for Seal Course (Set)	1	C.Y.
Granular Backfill (Wingwalls) (Set)	1	C.Y.

NO.	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION
Sta. 23+95.31
SINGLE 7' x 4' RCB
(8.056' EXTENSION)
BR 1.07.04 SEDGWICK CO.

FHWA APPROVAL		6-5-91	APP'D	KENNETH F. HURST
DESIGNED	DETAILED		QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.		QUAN.CK.	TRACE CK.

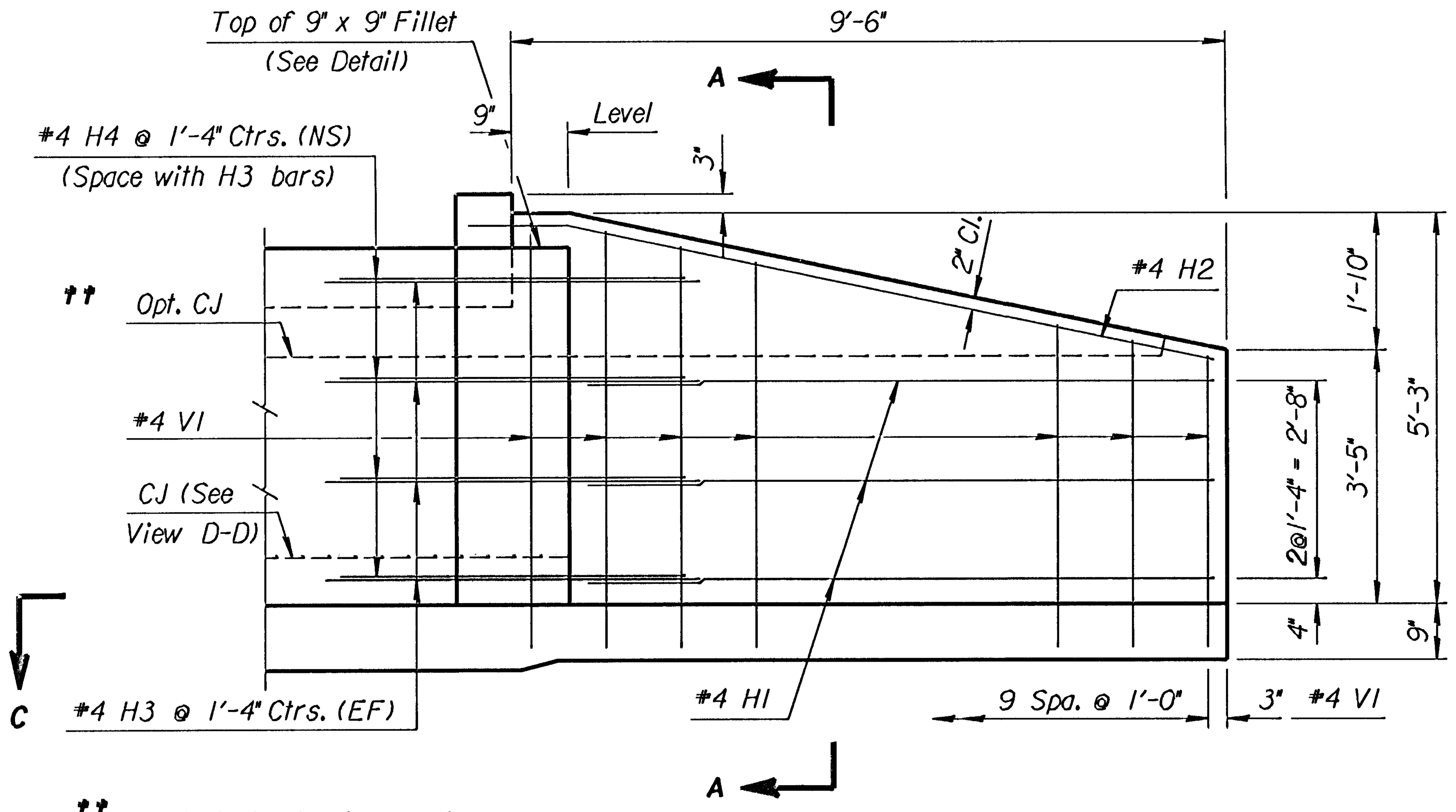
6

VERSION: 5.1.0 COMPILED: 02/09/99

ORIG. FROM BR.NO.	PROJ.	CO.
DESIGN	DATE	CHECK DATE
DETAIL	DATE	DATE
QUANTITIES	DATE	DATE
TRACING	DATE	DATE
DETRACED	DATE	DATE

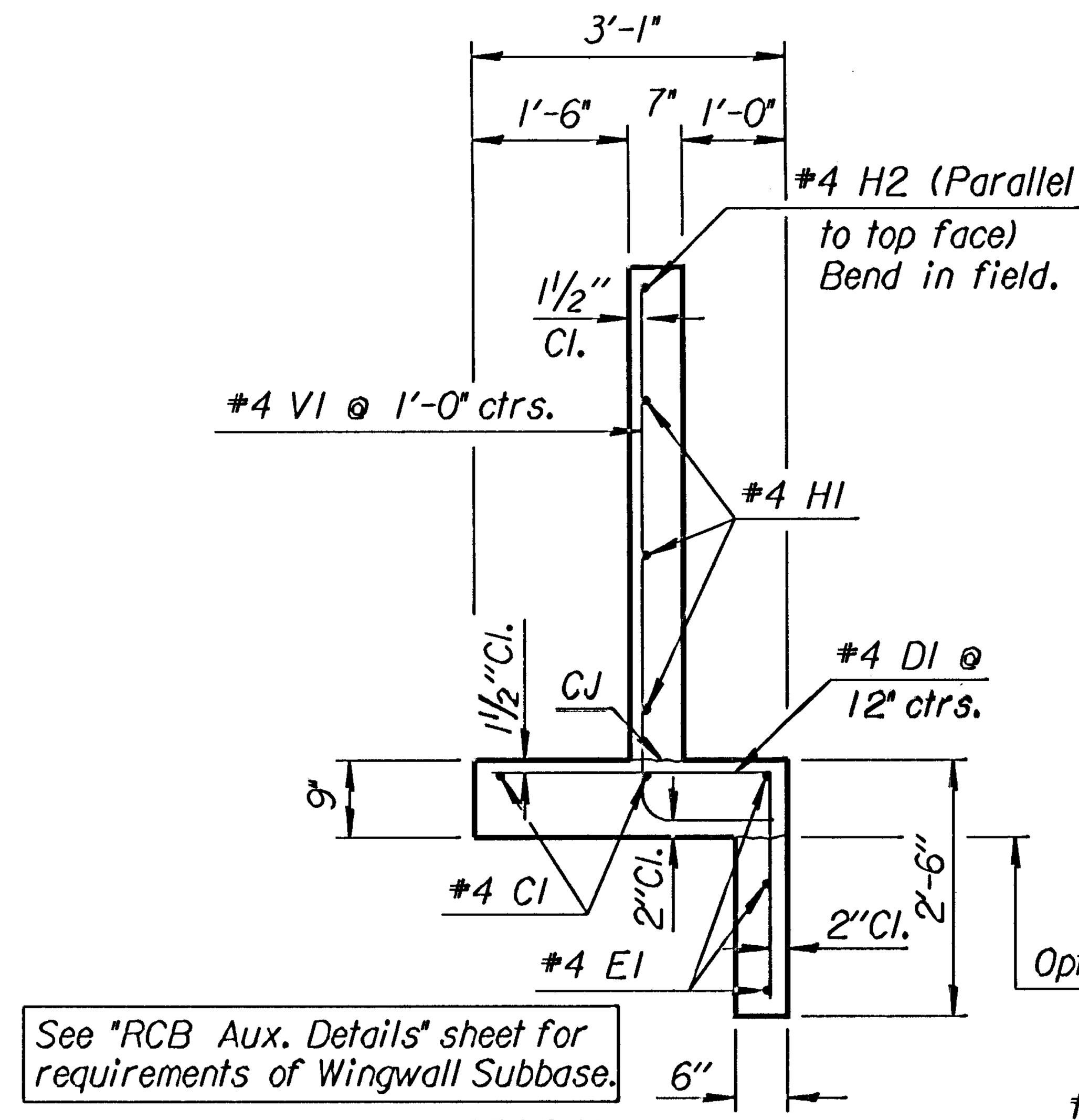
Drawn By : KDOT/msn
DGN File : 2001/01545/rcb/rs74b.dgn
Plotted : 3-13-2002 View=

VERSION: 5.1.0 COMPILED: 03/01/95

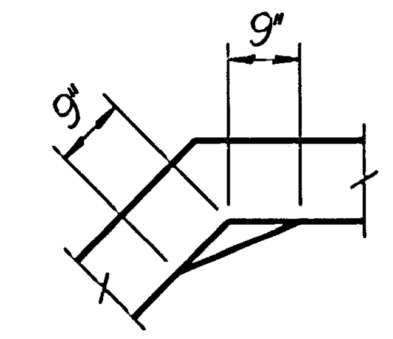


ELEVATION OF WINGWALL

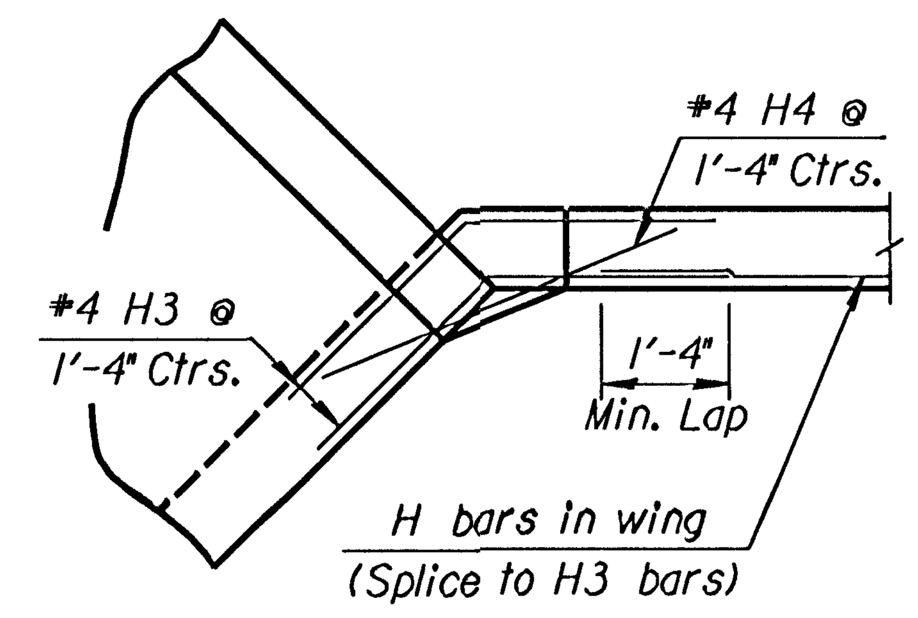
(Backface Shown)



SECTION A-A



Fillet Detail



DETAIL OF 9" x 9" FILLET

(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.

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

GENERAL NOTES

UNIT STRESSES: Class AAA Concrete; f'c = 4,000 p.s.i.
Reinforcing Steel; fy = 60,000 p.s.i.

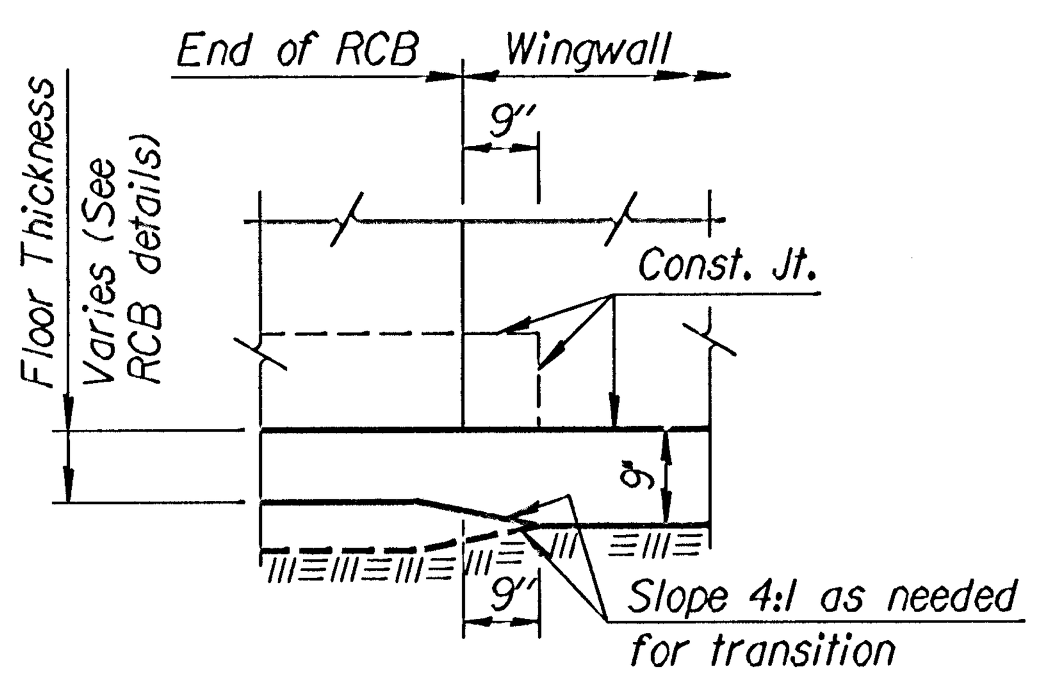
CONCRETE: Class AAA Concrete shall be used throughout. Bevel all exposed edges with a ¾ inch triangular moulding.

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 centerline of bar unless otherwise noted.

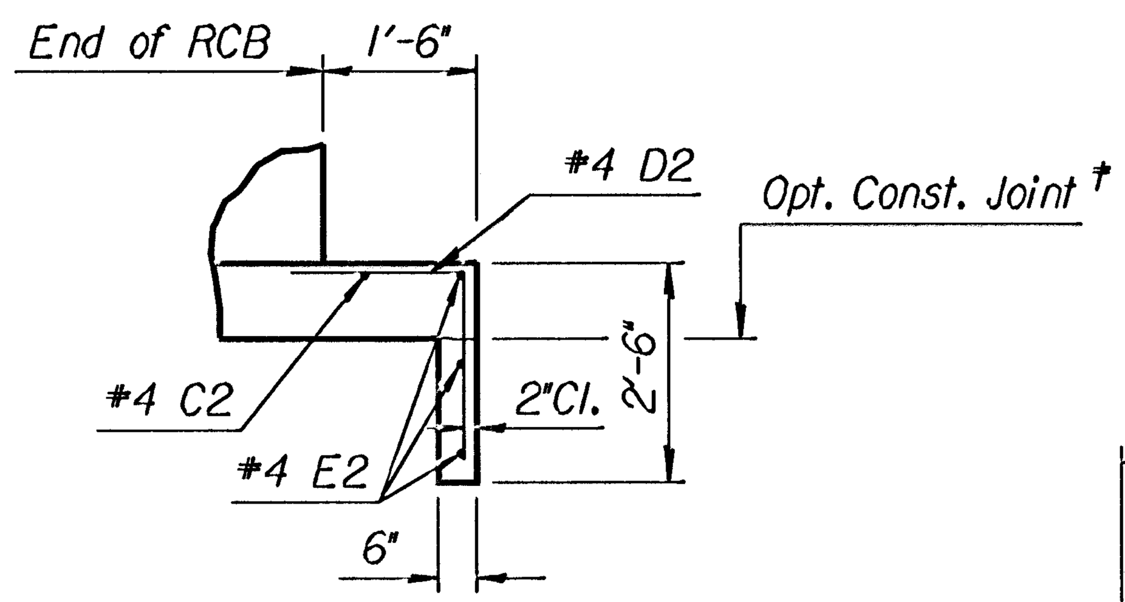
QUANTITIES: Wingwall Quantities include all quantities outside the neat lines of the box, excluding the hubguard.

APRON: A 5" concrete slab shall be constructed between the downstream wings in locations subject to scour only when specified on the plans or by the Engineer. Wire Reinforcing mesh shall be electrically welded and shall be composed of 6 x 6-W1.4 x W1.4 welded wire fabric and shall be classified as pounds of reinforcing.

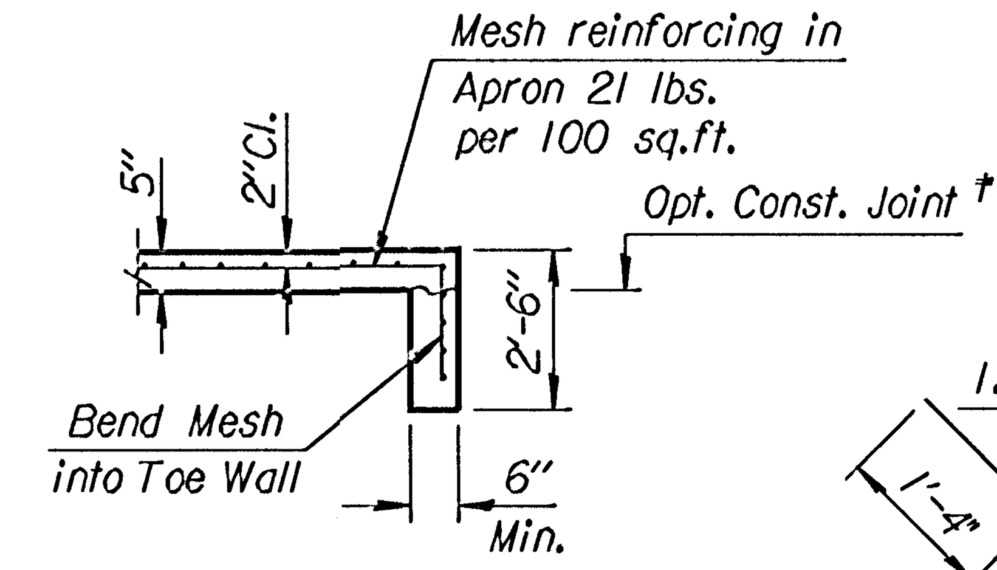
FOUNDATION AND BACKFILL MATERIAL: Soils judged as high plasticity clays, fat clays, expansive clays, or organic clays are unsuitable for foundation and/or backfill material for wingwalls and will not be used. Where these conditions exist, Foundation Stabilization and/or Granular Backfill (Wingwalls) shall be used as determined by the Engineer. See "RCB Auxiliary Details" sheet for additional details.



VIEW D-D



SECTION E-E



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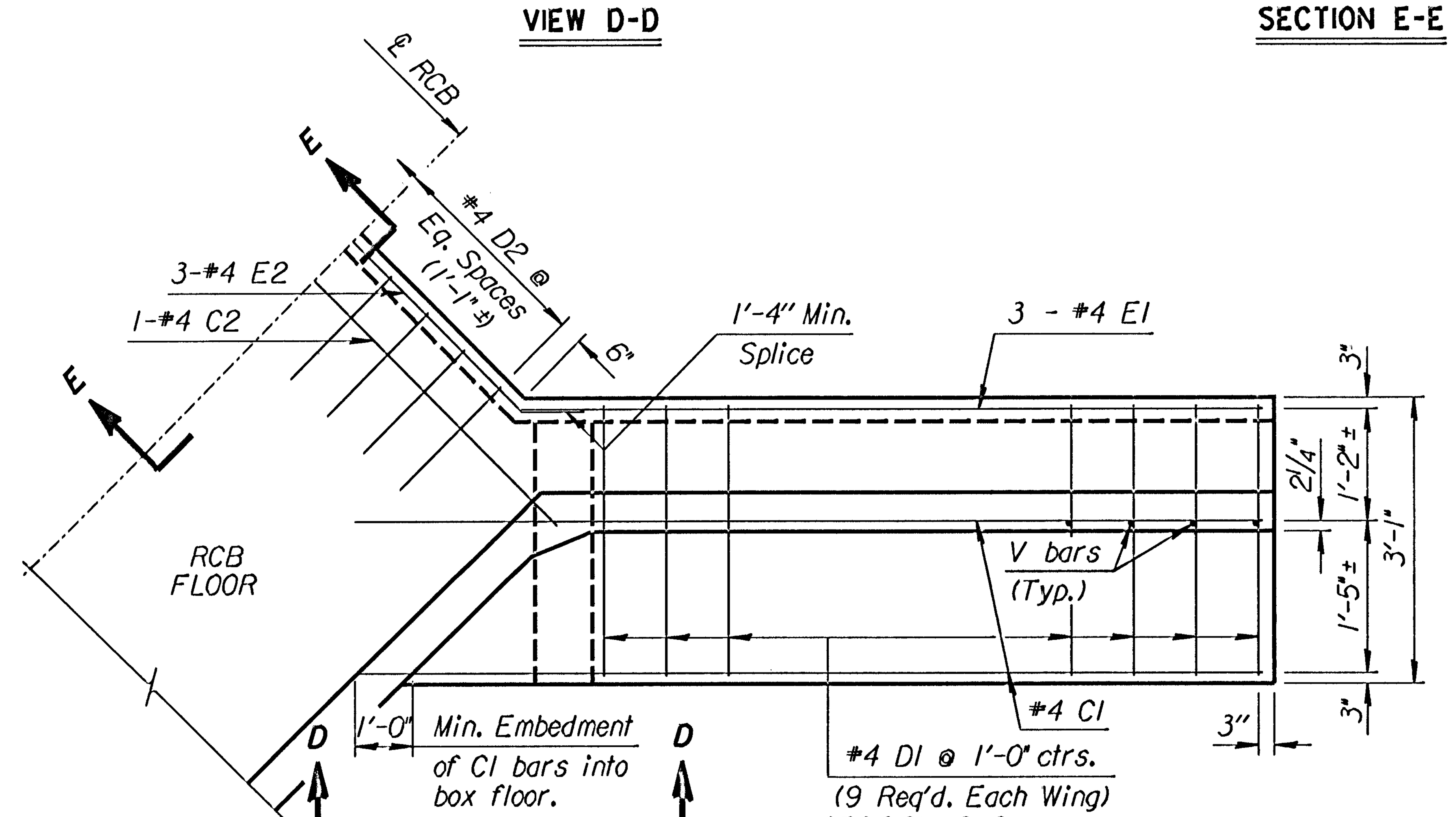

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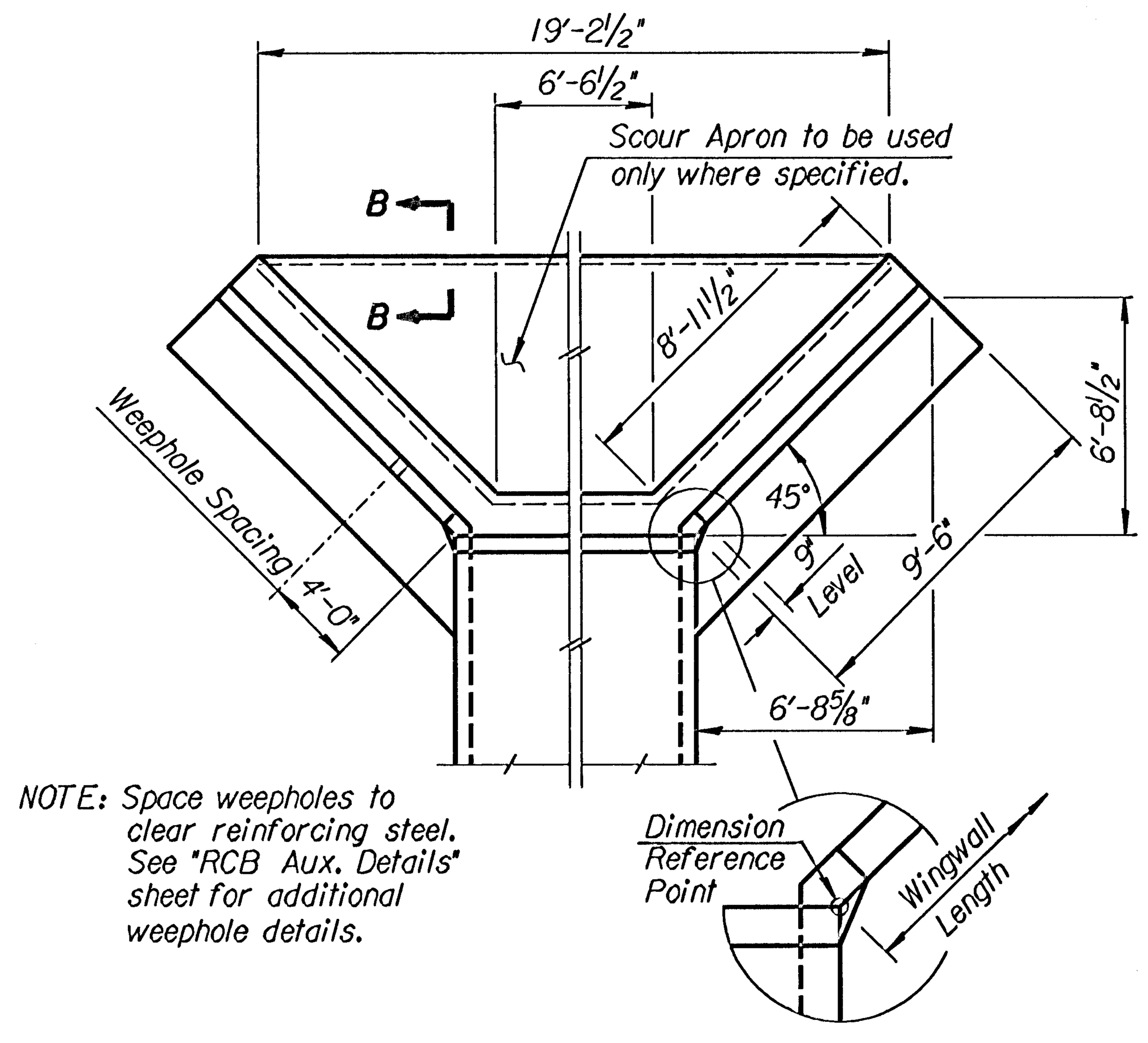
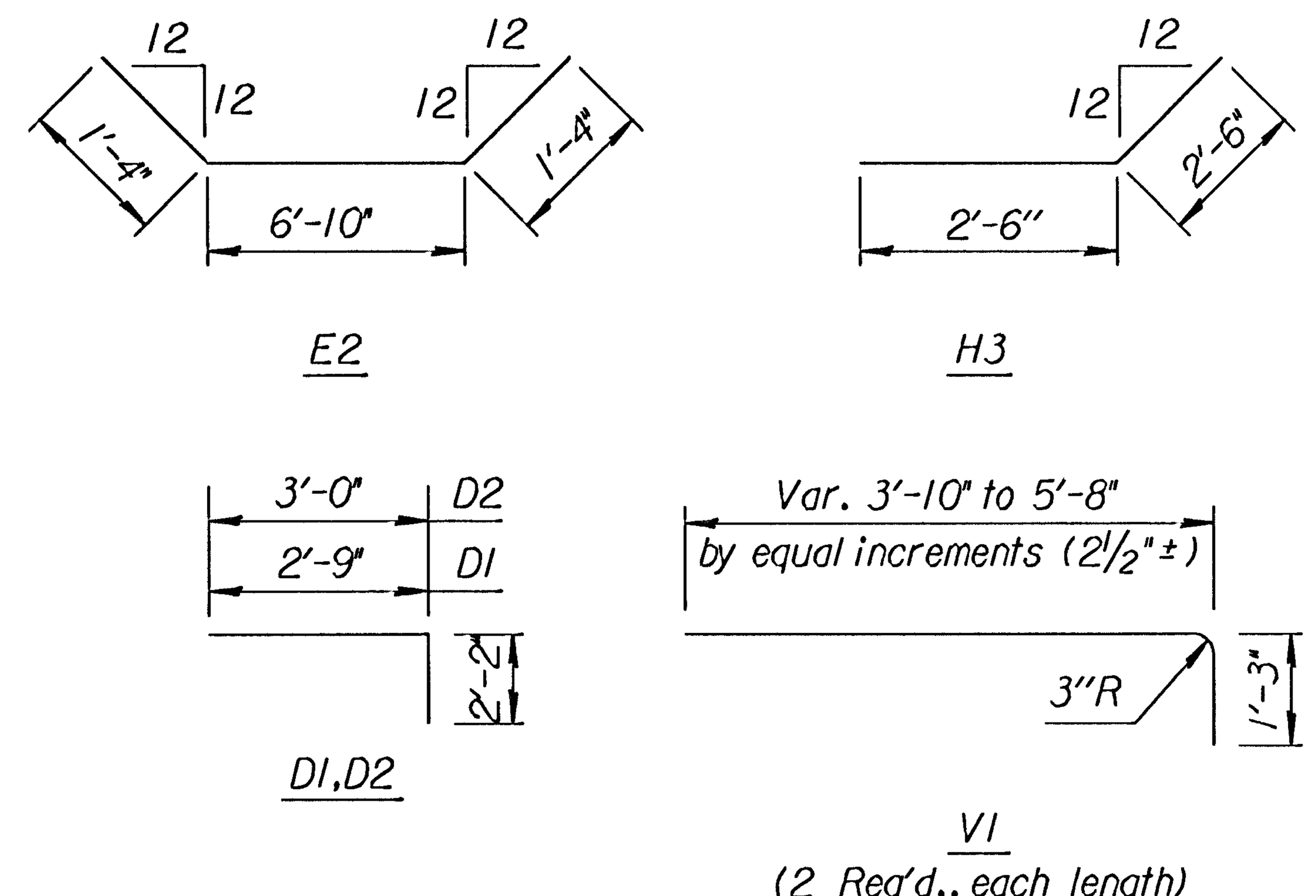


NOTE: Space weepholes to clear reinforcing steel. See "RCB Aux. Details" sheet for additional weephole details.

WING DIMENSIONS FOR NORMAL BOX

(3½:1 Embankment Slope)



BENDING DIAGRAM

(All dimensions are out to out of bars.)

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

WINGWALL QUANTITIES (One End Only)		
Class AAA Concrete:		
Wingwalls	4.70	CY.
Apron	0.00	CY.
Soil Saver	0.00	CY.
Reinforcing Steel	369.4	Lbs.
Welded Wire Fabric	0.00	Lbs.

✱ See Bending Diagram

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

		#4CI	#4DI	#4EI	#4C2	#4D2	#4E2	#4VI	#4HI	#4H2	#4H3	#4H4
0° Skew	No.	4	18✱	6	1	6✱	3✱	20	6	2	16✱	8
	Length	11'-7"	4'-11"	8'-9"	7'-8"	5'-2"	9'-6"	✱	8'-4"	10'-3"	5'-0"	3'-6"

NO.	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION

Sta. 23+95.31

FLARED WINGWALLS 4 FT. RISE (0° SKEW)

STD. NO. 10.00.04 SEDGWICK CO.

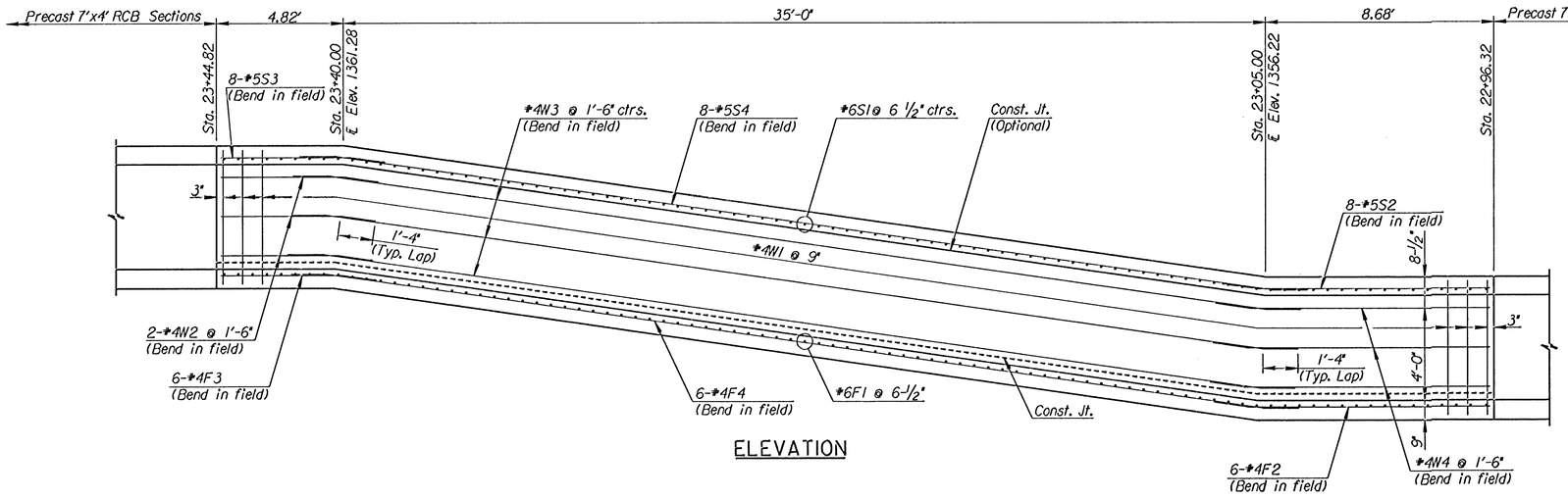
FHWA APPROVAL 6-5-91		APP'D	KENNETH F. HURST
DESIGNED	DETAILED	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN. CK.	TRACE CK.

ORIG. FROM BRNG.	DESIGN	PROJ.	CO. CHECK
DESIGN	DATE		DATE
DETAIL	DATE		DATE
QUANTITIES	DATE		DATE
TRACING	DATE		DATE
RETRACED	DATE		DATE

Drawn By: KDOT/msn
DGN File: 2001/01545/rcb/rs14b.dgn
Plotted: DRP 03/13/02 View=

PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
468-83392	2002	8	23

DATE	BY	REFERENCES NOTED / REFERENCES CHECKED



ELEVATION

REINFORCING STEEL

Straight Bars				Bent Bars			
Mark	No.	Size	Length	Mark	No.	Size	Length
F1	90	#6	7'-8"				
F2	6	#4	10'-3"				
F3	6	#4	6'-3"				
F4	6	#4	38'-8"				
S1	90	#6	7'-8"				
S2	8	#5	10'-3"				
S3	8	#5	6'-3"				
S4	8	#5	38'-8"				
W1	130	#4	5'-2"				
W2	6	#4	6'-3"				
W3	6	#4	38'-8"				
W4	6	#4	10'-3"				

SUMMARY OF QUANTITIES

Class AAA Concrete (AE)	28.4	C.Y.
Reinforcing Steel	3425	Lbs.

See Sheet No. 6 for additional details for reinforcing steel clearances and slab and wall dimensions.

No.	Revisions	By	Date
1			

BALTHROP 4TH ADDITION
STORM WATER SEWER NO. 566

CAST-IN-PLACE DROP SECTION
STA. 22+96.32 TO STA. 23+44.82

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

Designed by	RWA	Checked by	RAS	
Drawn by	DRP	Date	Feb., 2002	Job No. 01545-1

DSNR: RWA OPER: DRP SCALE: 3/8"=1'
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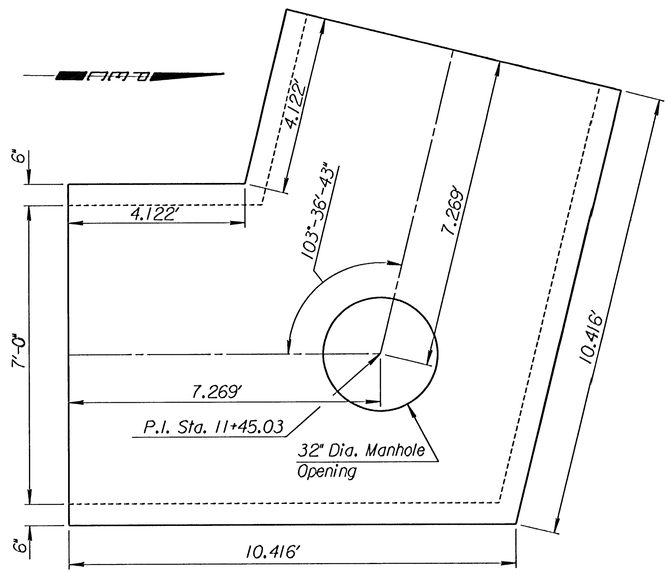
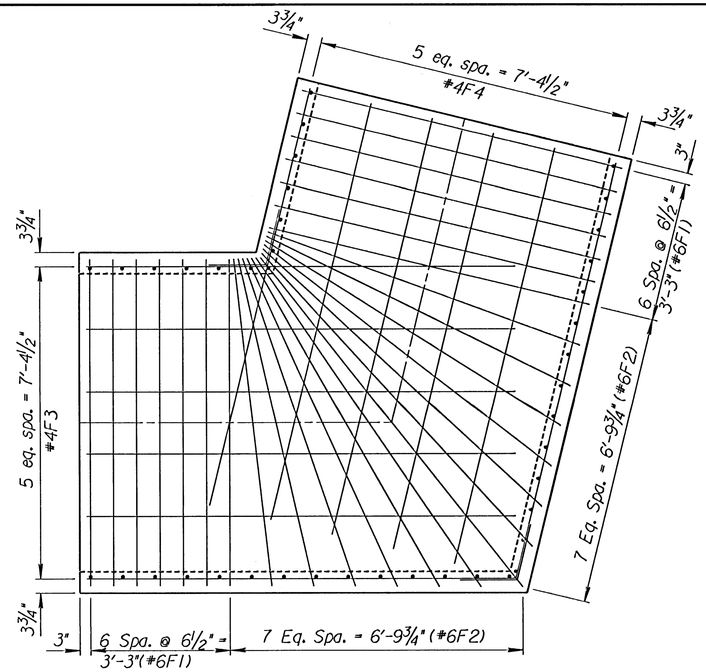
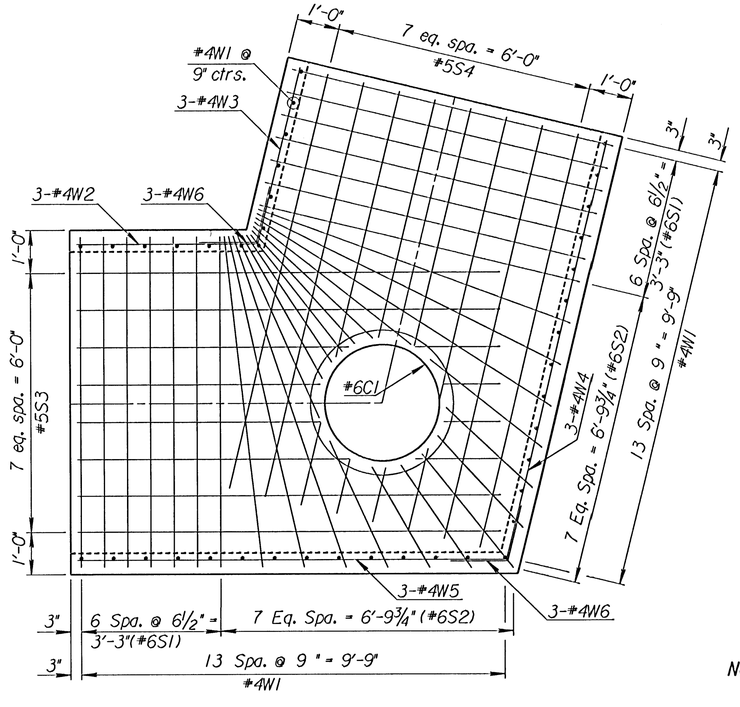
PROJECT NO.	SHEET NO.	TOTAL SHEETS
468-83392	9	23



PLAN
Dimensional Control



FLOOR PLAN

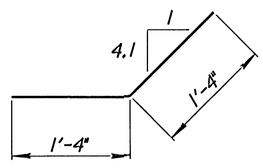


SLAB PLAN

Note: Provide 1-#6S5 Extra bars each side of Manhole opening. Field cut #6S2 bars at opening.

REINFORCING STEEL

Straight Bars				Bent Bars			
Mark	No.	Size	Length	Mark	No.	Size	Length
F1	14	#6	7'-8"	F2	13	#6	Varies
F3	6	#4	10'-0"				
F4	6	#4	10'-0"	S2	13	#6	Varies
S1	14	#6	7'-8"	C1	1	#6	12'-6"
S3	8	#5	9'-10"				
S4	8	#5	9'-10"	W6	6	#4	2'-8"
S5	2	#6	8'-9"				
W1	40	#4	5'-2"				
W2	3	#4	4'-3"				
W3	3	#4	4'-3"				
W4	3	#4	10'-0"				
W5	3	#4	10'-0"				



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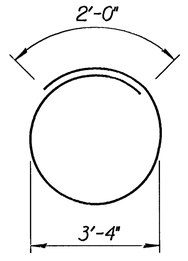


C1

S2 — Varies from 7'-9" to 9'-9" by 4" incr. Cut 2 Each Length

F2 — Varies from 7'-9" to 9'-9" by 4" incr. Cut 2 Each Length

F2, S2

BENDING DIAGRAMS
Dimensions are out to out of bars

See Sheet No. 6 for additional details for reinforcing steel clearances and slab and wall dimensions.

No.	Revisions	By	Date
1			

BALTHROP 4TH ADDITION
STORM WATER SEWER NO. 566

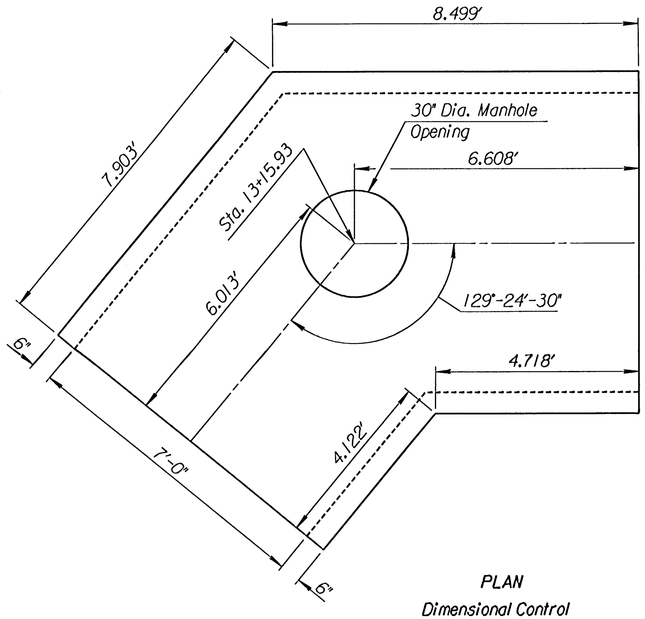
P.I. DETAIL STA. 11+45.03

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

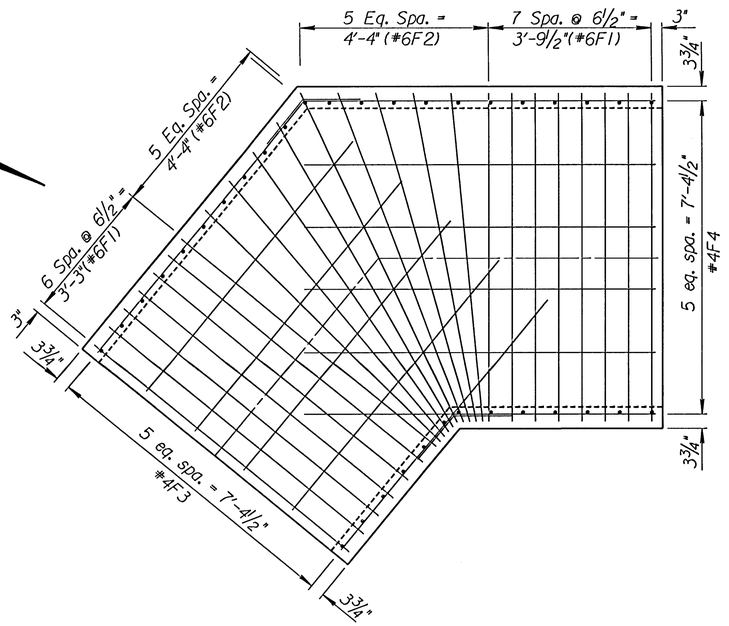
Designed by	RWA	Checked by	RAS	
Drawn by	WLL	Date	Febr. 2002	Job No. 01545-1

I:\2001\01545\pisections\
drawn by : WLL
plotted by : drp 3-13-2002

PROJECT NO.	SHEET NO.	TOTAL SHEETS
468-83392	10	23



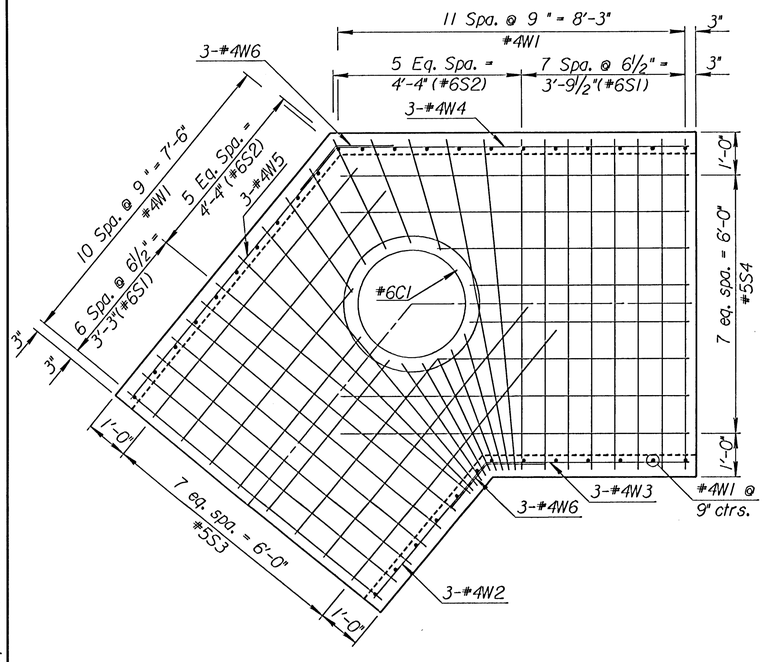
PLAN
Dimensional Control



FLOOR PLAN

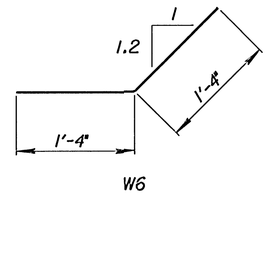
REINFORCING STEEL

Straight Bars				Bent Bars			
Mark	No.	Size	Length	Mark	No.	Size	Length
F1	15	#6	7'-8"	F2	9	#6	Varies
F3	6	#4	10'-0"				
F4	6	#4	10'-0"	S2	9	#6	Varies
S1	15	#6	7'-8"	C1	1	#6	12'-0"
S3	8	#5	9'-10"				
S4	8	#5	9'-10"	W6	6	#4	2'-8"
S5	2	#6	7'-11"				
W1	35	#4	5'-2"				
W2	3	#4	4'-1"				
W3	3	#4	4'-8"				
W4	3	#4	8'-2"				
W5	3	#4	7'-7"				



SLAB PLAN

Note: Provide 1-#6S5 Extra bars each side of Manhole opening. Field cut #6S2 bars at opening.



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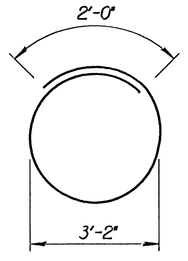

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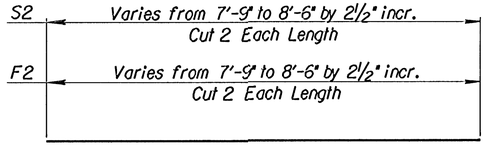


F2, S2

BENDING DIAGRAMS
Dimensions are out to out of bars

See Sheet No. 6 for additional details for reinforcing steel clearances and slab and wall dimensions.

No.	Revisions	By	Date
1			

BALTHROP 4TH ADDITION
STORM WATER SEWER NO. 566

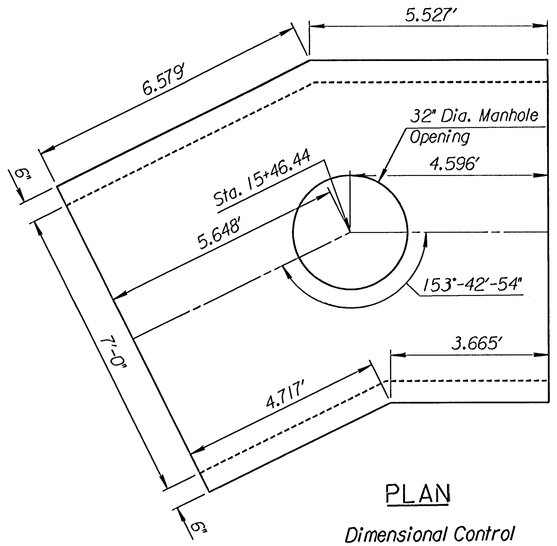
P.I. DETAIL STA. 13+15.93

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

Designed by	RWA	Checked by	RAS	
Drawn by	WLL	Date	Febr. 2002	Job No. 01545-1

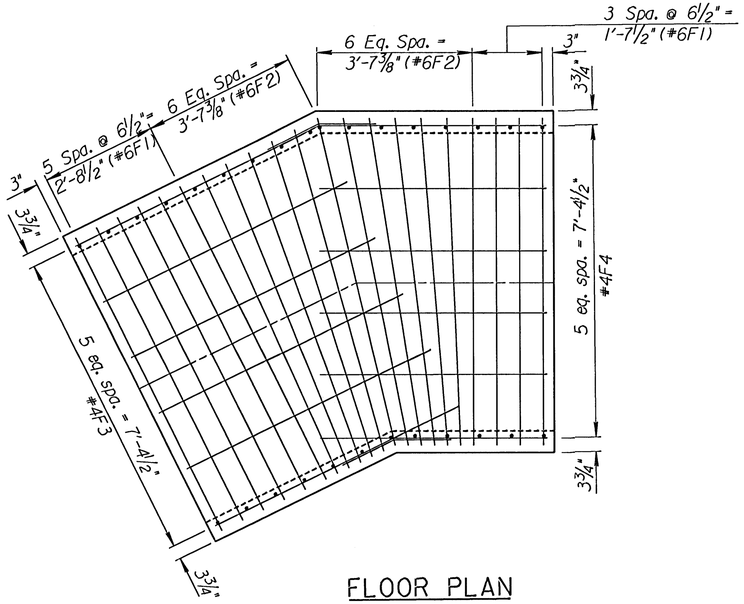
i:2001/01545/pisections2
drawn by: wll
plotted by: drp 3-13-2002

PROJECT NO.	SHEET NO.	TOTAL SHEETS
468-83392	11	23

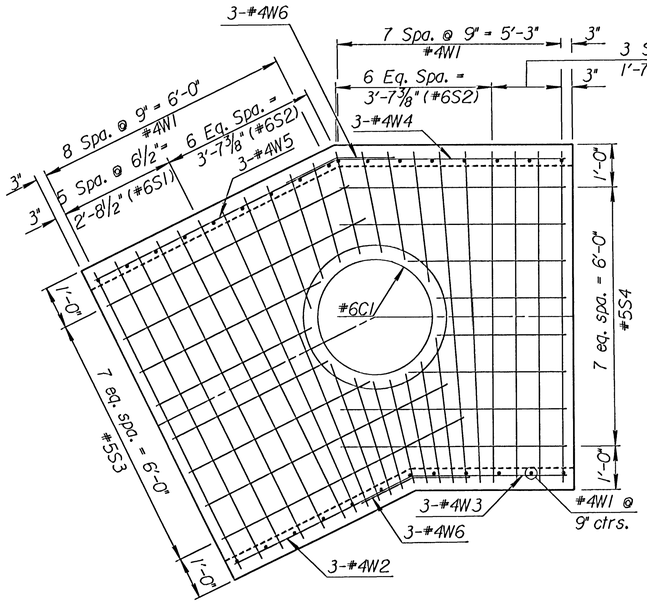


PLAN

Dimensional Control



FLOOR PLAN

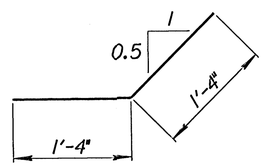


SLAB PLAN

Note: Provide 1-#6S5 Extra bars each side of Manhole opening. Field cut #6S2 bars at opening.

REINFORCING STEEL

Straight Bars				Bent Bars			
Mark	No.	Size	Length	Mark	No.	Size	Length
F1	10	#6	7'-8"	F2	11	#6	Varies
F3	6	#4	6'-4"				
F4	6	#4	5'-4"	S2	11	#6	Varies
S1	10	#6	7'-8"	C1	1	#6	12'-6"
S3	8	#5	6'-4"				
S4	8	#5	5'-3"	W6	6	#4	2'-8"
S5	2	#6	7'-9"				
W1	29	#4	5'-2"				
W2	3	#4	4'-7"				
W3	3	#4	3'-6"				
W4	3	#4	5'-3"				
W5	3	#4	6'-4"				



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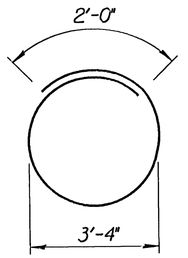


C1

S2 — Varies from 7'-8" to 7'-11" by ½" incr. Cut 2 Each Length

F2 — Varies from 7'-8" to 7'-11" by ½" incr. Cut 2 Each Length

F2, S2

BENDING DIAGRAMS

Dimensions are out to out of bars

See Sheet No. 6 for additional details for reinforcing steel clearances and slab and wall dimensions.

No.	Revisions	By	Date
1			

BALTHROP 4TH ADDITION
STORM WATER SEWER NO. 566

P.I. DETAIL STA. 15+46.44

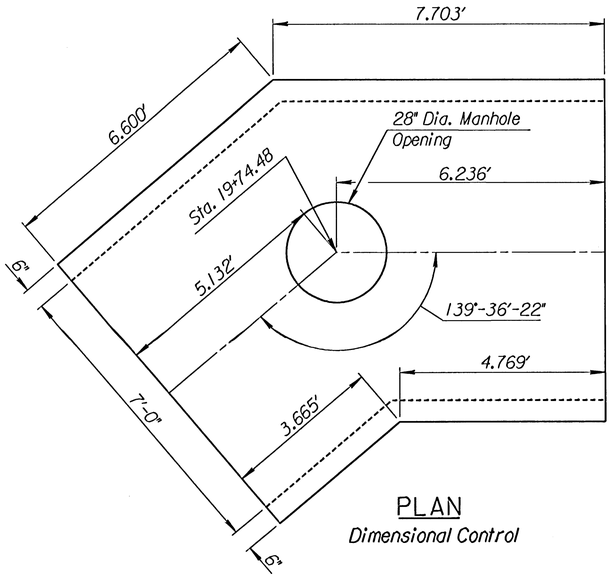
Professional Engineering Consultants, P.A.
303 S. TOPEKA • WICHITA, KANSAS 67202
316-262-2691 • FAX 316-262-3003

Designed by	RWA	Checked by	RAS
Drawn by	MSN	Date	Febr. 2002

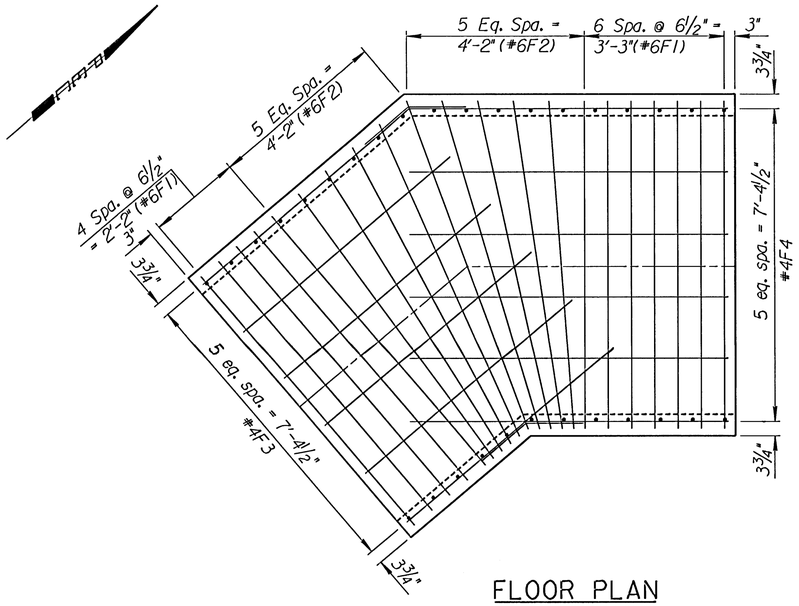
Job No. 01545-1

i:2001/01545/plsections3
drawn by : msn
plotted by : drp 3-13-2002

PROJECT NO.	SHEET NO.	TOTAL SHEETS
468-83392	12	23



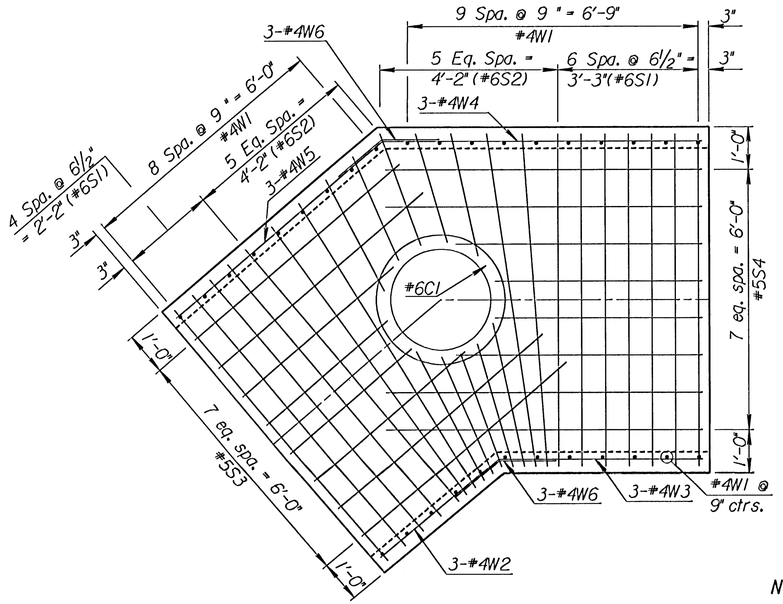
PLAN
Dimensional Control



FLOOR PLAN

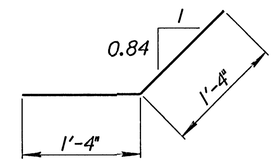
REINFORCING STEEL

Straight Bars				Bent Bars			
Mark	No.	Size	Length	Mark	No.	Size	Length
F1	12	#6	7'-8"	F2	9	#6	Varies
F3	6	#4	6'-4"				
F4	6	#4	7'-5"	S2	9	#6	Varies
S1	12	#6	7'-8"	C1	1	#6	11'-5"
S3	8	#5	6'-3"				
S4	8	#5	7'-4"	W6	6	#4	2'-8"
S5	2	#6	7'-10"				
W1	31	#4	5'-2"				
W2	3	#4	3'-8"				
W3	3	#4	4'-9"				
W4	3	#4	7'-5"				
W5	3	#4	6'-4"				

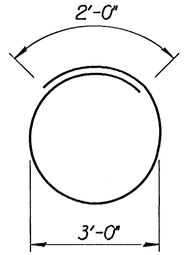


SLAB PLAN

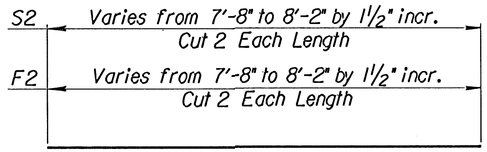
Note: Provide 1-#6S5 Extra bars each side of Manhole opening. Field cut #6S2 bars at opening.



W6



C1



F2, S2

BENDING DIAGRAMS
Dimensions are out to out of bars

See Sheet No. 6 for additional details for reinforcing steel clearances and slab and wall dimensions.

No.	Revisions	By	Date
1			

BALTHROP 4TH ADDITION
STORM WATER SEWER NO. 566

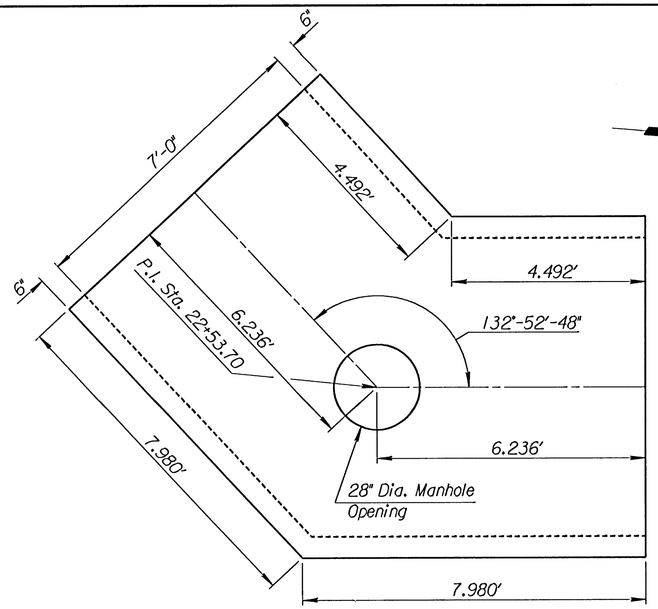
P.I. DETAIL STA. 19+74.48

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

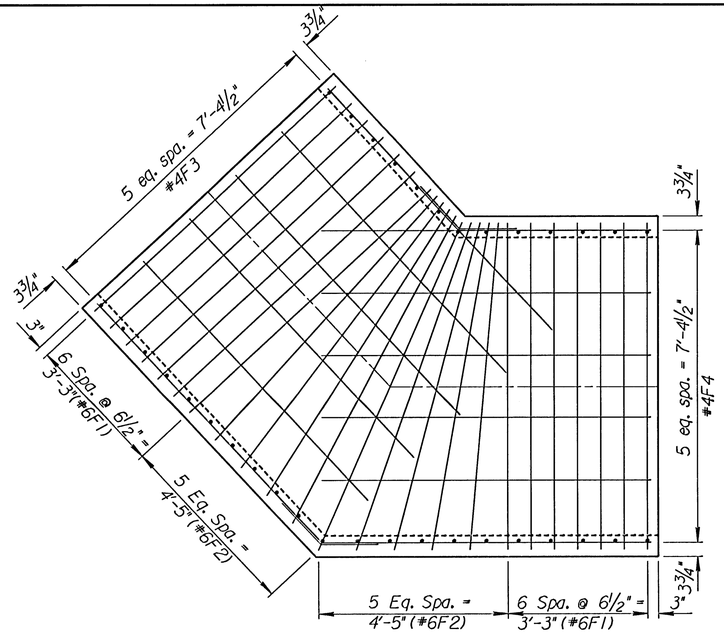
Designed by	RWA	Checked by	RAS	
Drawn by	WLL	Date	Febr. 2002	Job No. 01545-1

i:2001/01545/rcb/plsections4
drawn by : wll
plotted by : drp 3-13-2002

PROJECT NO.	SHEET NO.	TOTAL SHEETS
468-83392	13	23



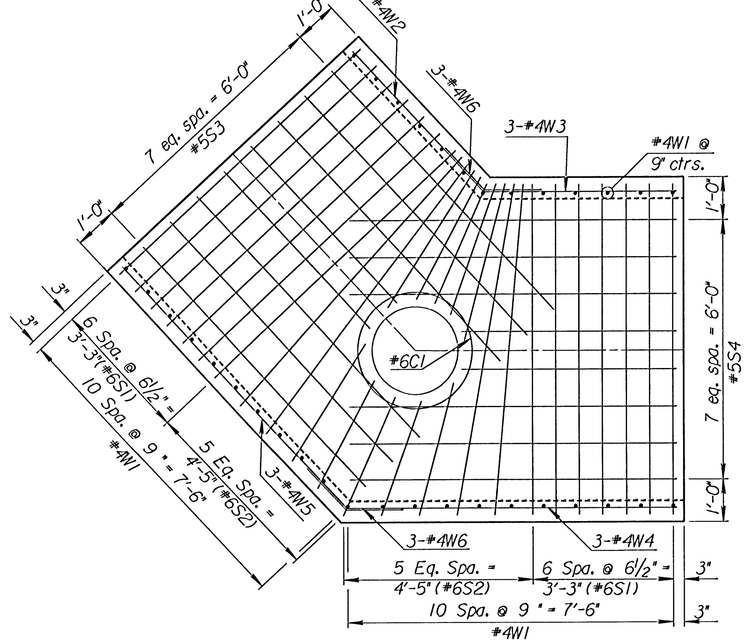
PLAN
Dimensional Control



FLOOR PLAN

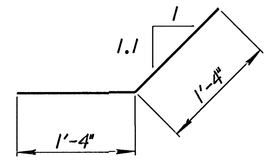
REINFORCING STEEL

Straight Bars				Bent Bars			
Mark	No.	Size	Length	Mark	No.	Size	Length
F1	14	#6	7'-8"	F2	9	#6	Varies
F3	6	#4	7'-8"				
F4	6	#4	7'-8"	S2	9	#6	Varies
S1	14	#6	7'-8"	C1	1	#6	11'-5"
S3	8	#5	7'-7"				
S4	8	#5	7'-7"	W6	6	#4	2'-8"
S5	2	#6	7'-10"				
W1	34	#4	5'-2"				
W2	3	#4	4'-5"				
W3	3	#4	4'-5"				
W4	3	#4	7'-8"				
W5	3	#4	7'-8"				



SLAB PLAN

Note: Provide 1-#6S5 Extra bars each side of Manhole opening. Field cut #6S2 bars at opening.



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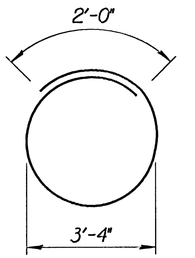


C1

S2 — Varies from 7'-8" to 8'-4" by 2" incr.
Cut 2 Each Length

F2 — Varies from 7'-8" to 8'-4" by 2" incr.
Cut 2 Each Length

F2, S2

BENDING DIAGRAMS
Dimensions are out to out of bars

See Sheet No. 6 for additional details for reinforcing steel clearances and slab and wall dimensions.

No.	Revisions	By	Date
1			

BALTHROP 4TH ADDITION
STORM WATER SEWER NO. 566

P.I. DETAIL STA. 22+53.70

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

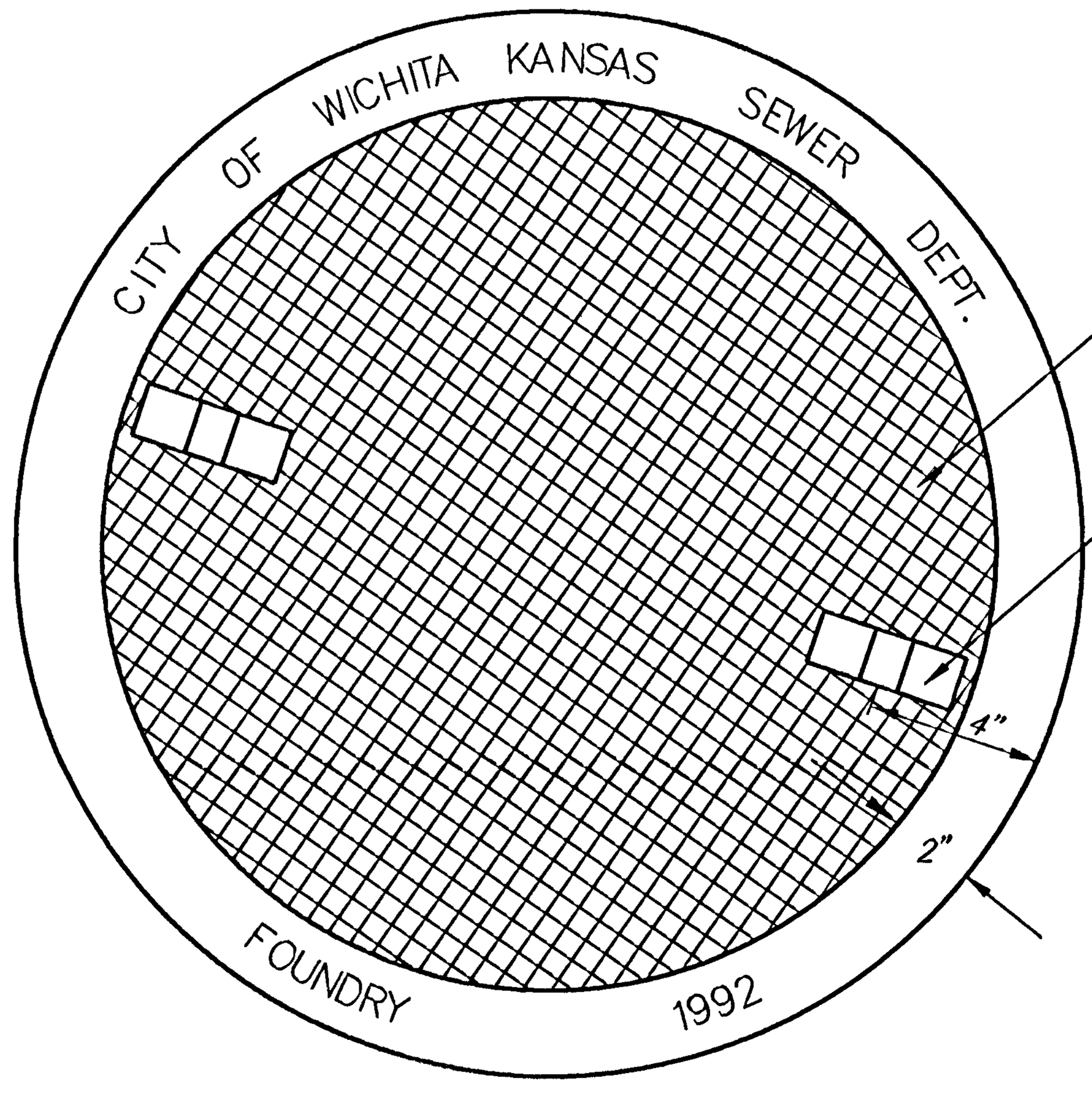
Designed by	RWA	Checked by	RAS	
Drawn by	WLL	Date	Febr. 2002	Job No. 01545-1

I:\2001\01545\plsections5
drawn by: wll
plotted by: drp 3-13-2002

MANHOLE FRAME AND COVER DETAIL

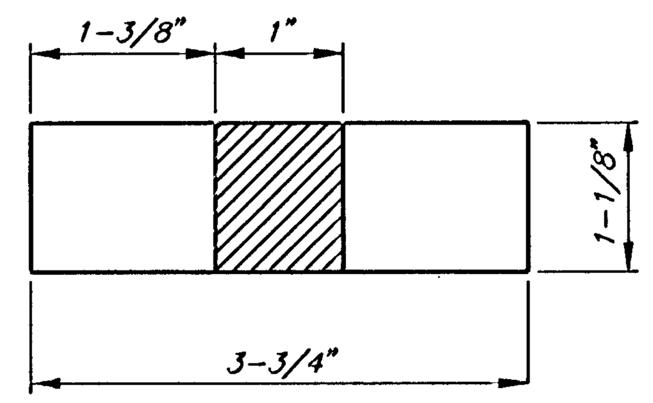
ADOPTED AS STANDARD DESIGN BY
CITY OF WICHITA, KANSAS

MANHOLE COVER
Weight = 180 Lbs.

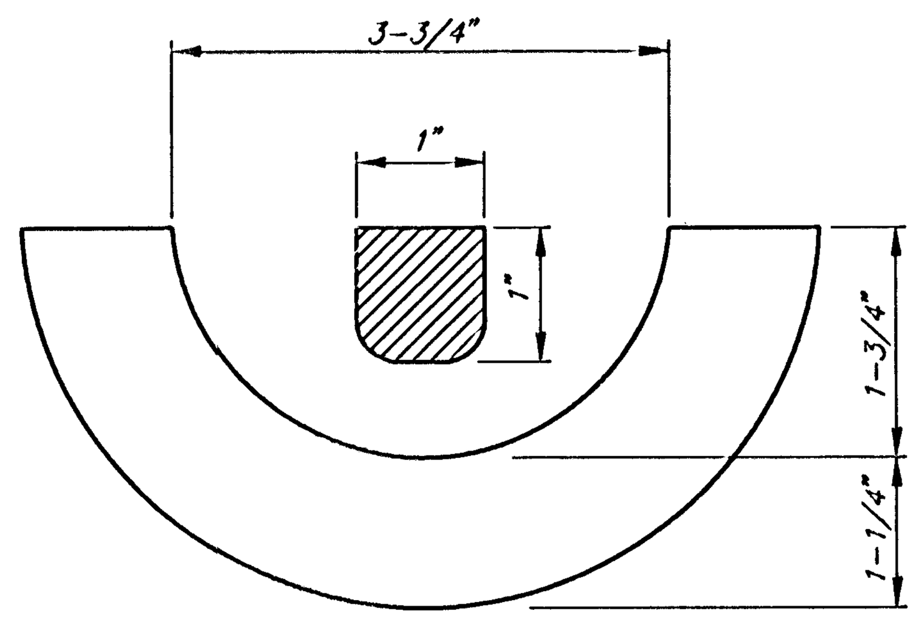


TOP VIEW

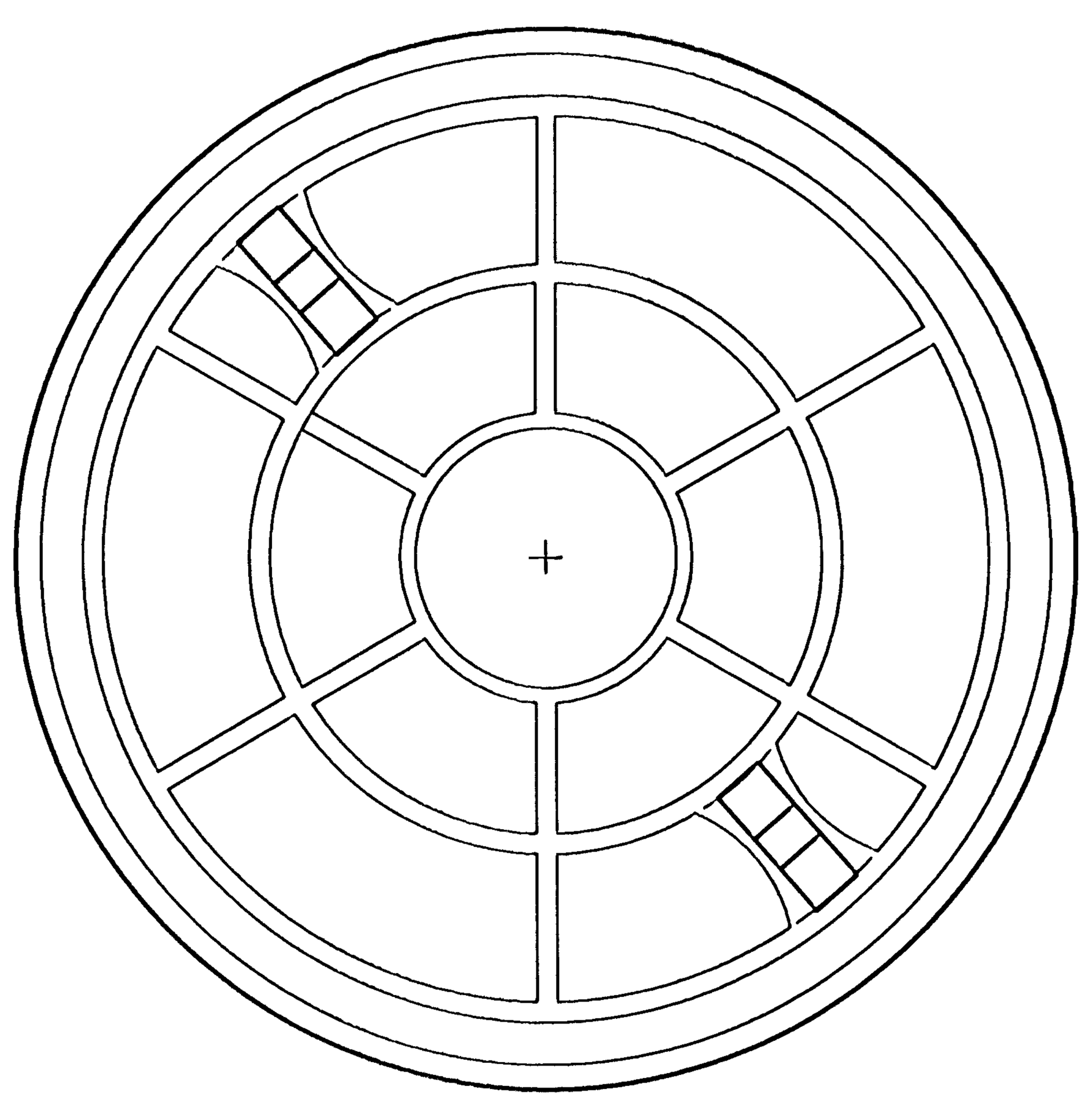
PICKHOLE DETAIL



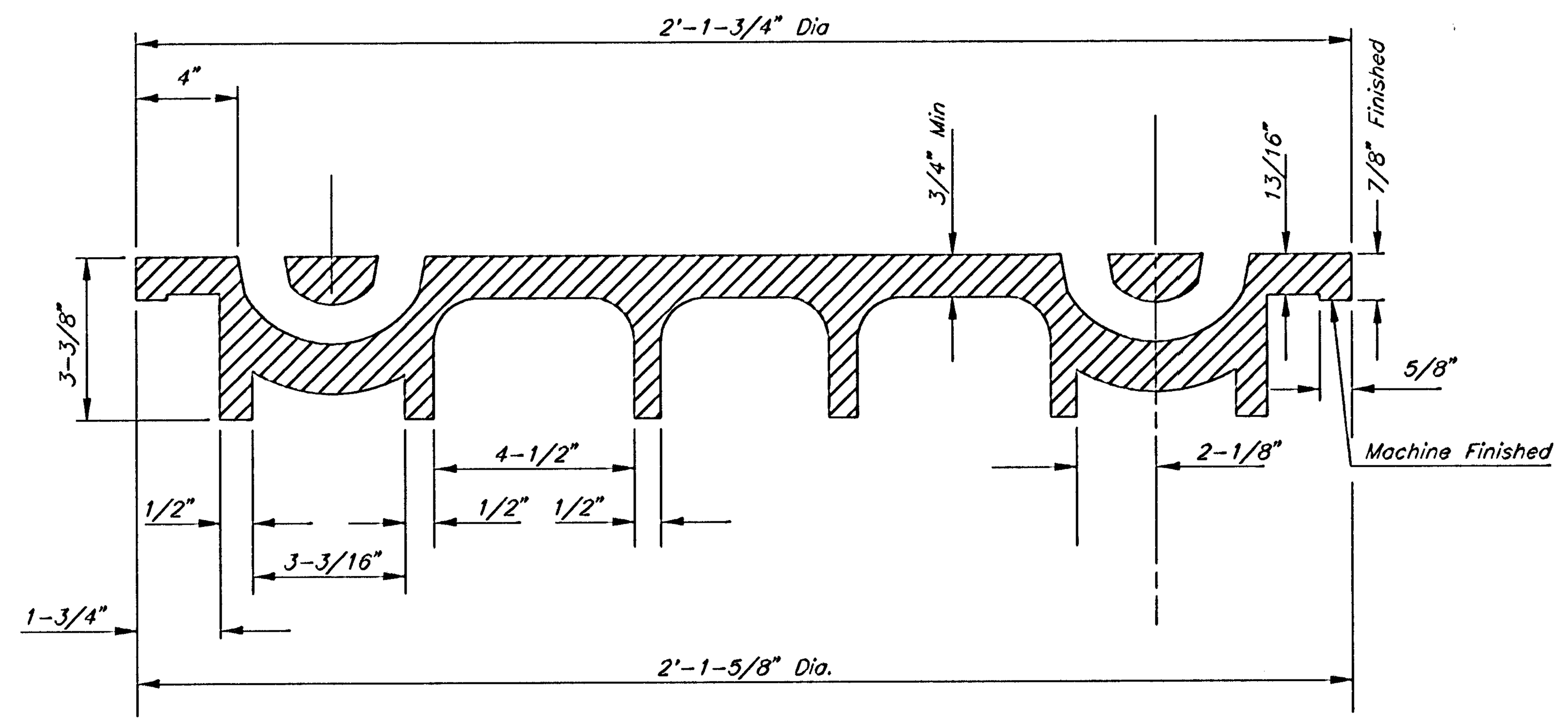
TOP VIEW



SECTION VIEW

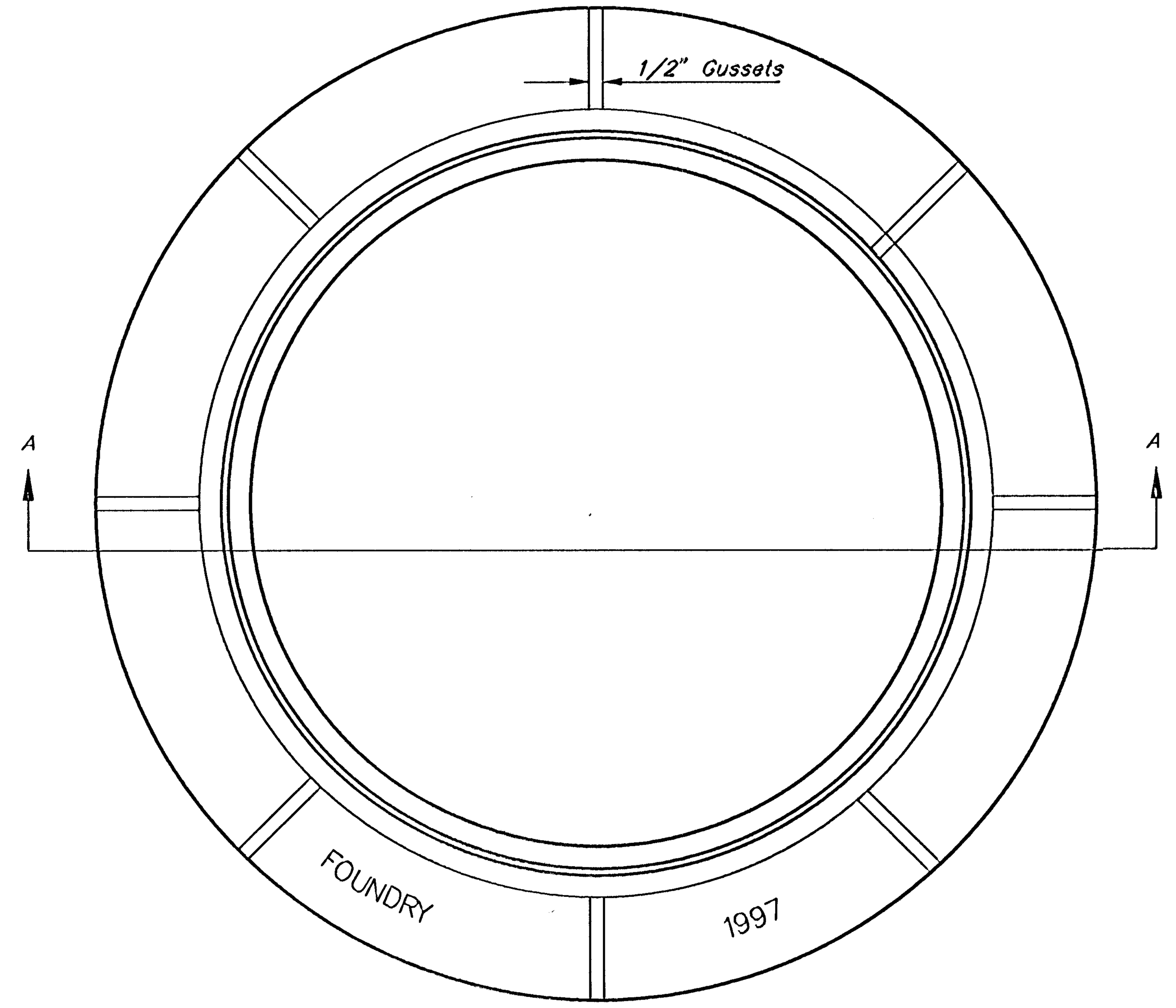


BOTTOM VIEW

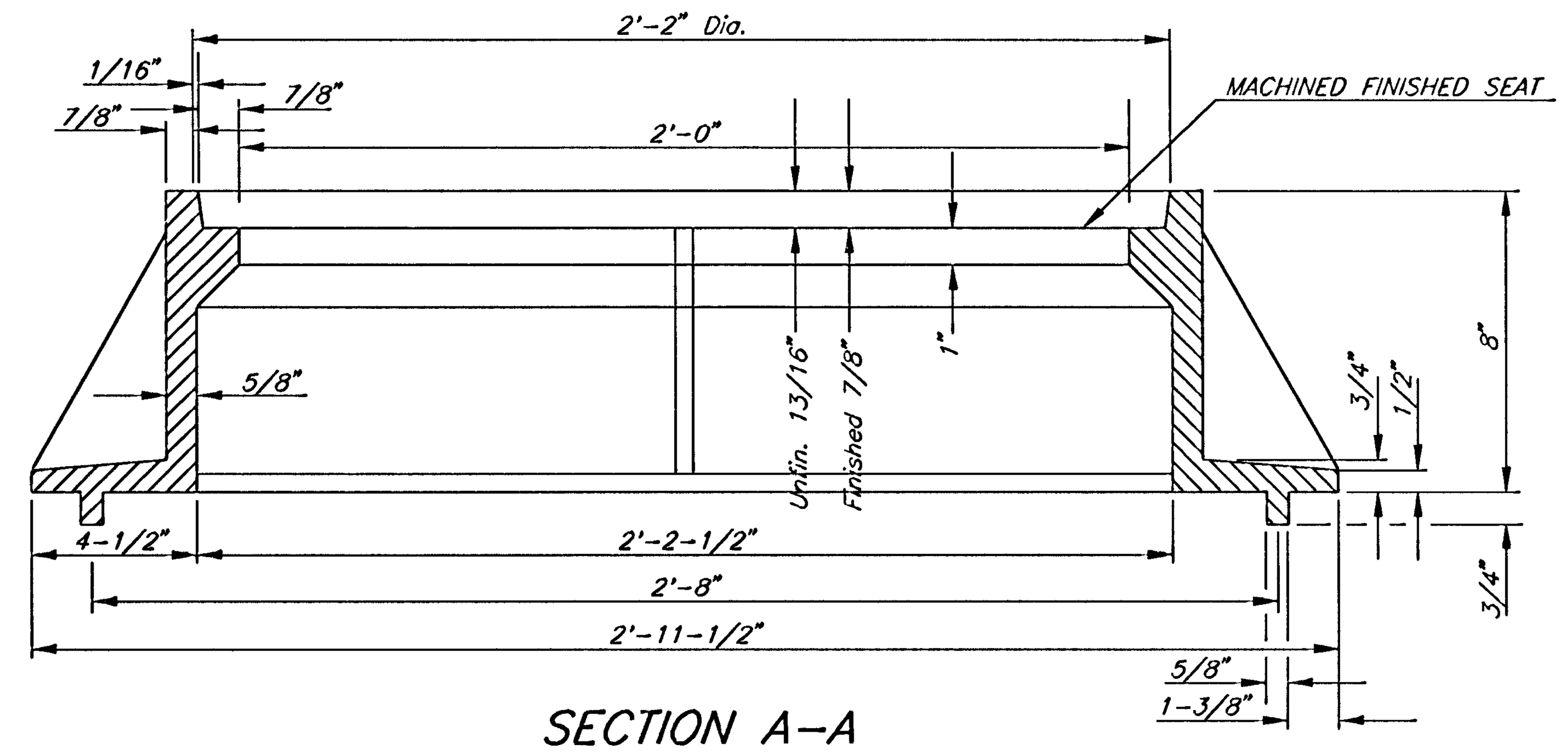


SECTION VIEW

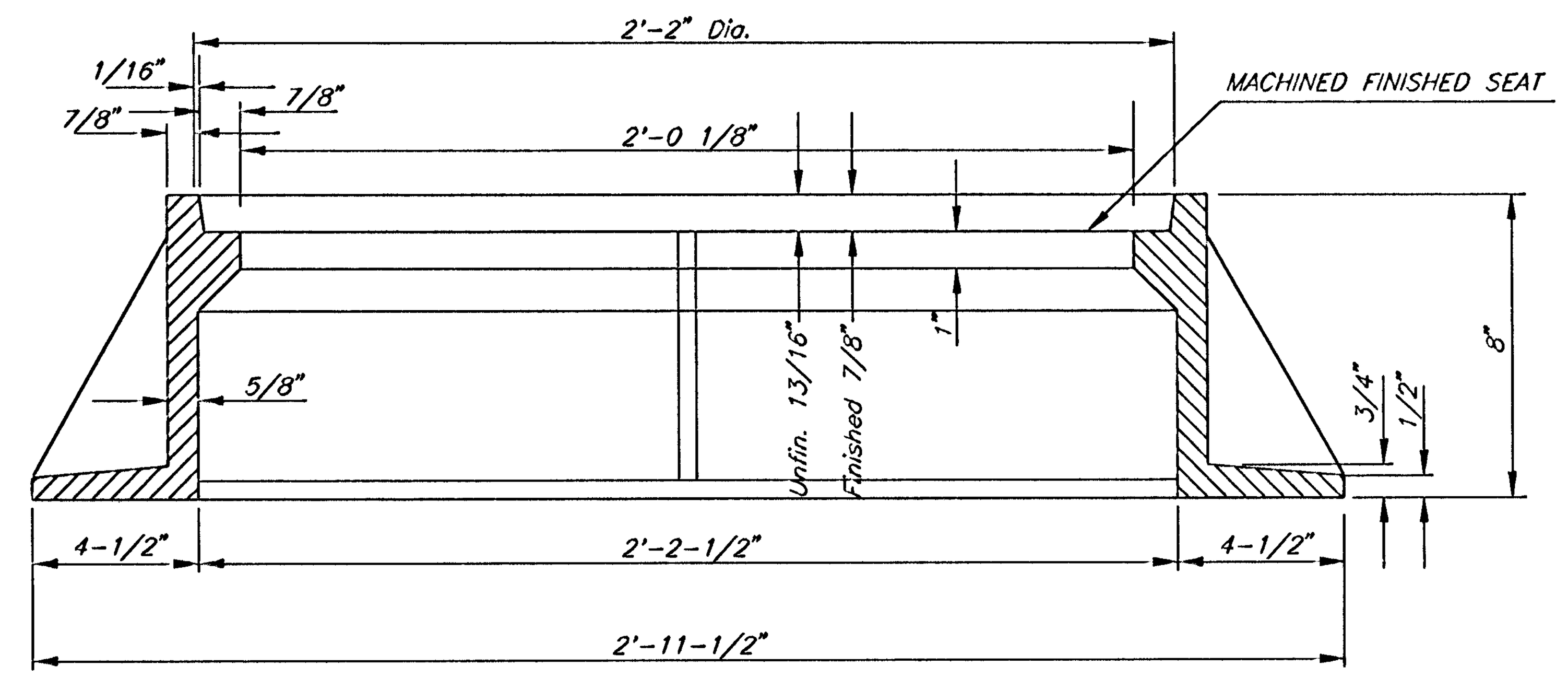
MANHOLE FRAME
Weight = 240 Lbs.



TOP VIEW



SECTION A-A
MUD RING



SECTION A-A

GENERAL NOTES

1. MANHOLE CASTINGS SHALL BE MANUFACTURED USING GOOD QUALITY GRAY IRON CONFORMING TO CLASS 30 OF A.S.T.M. DESIGNATION A-48. DIMENSIONS AND WEIGHTS SHOWN ON THE DETAILED DRAWINGS SHALL BE CONSIDERED AS MINIMUM REQUIREMENTS AND ANY DEVIATIONS FROM THE DIMENSIONS SHOWN MUST BE SPECIFICALLY APPROVED. THE FINISHED CASTINGS SHALL BE OF UNIFORM QUALITY, FREE FROM BLOWHOLES, POROSITY, HARD SPOTS, SHRINKAGE DISTORTIONS OR OTHER DEFECTS.

2. MANHOLE CASTINGS SHALL WEIGH A MINIMUM OF 180 POUNDS ON THE SOLID COVER AND 240 POUNDS ON THE MANHOLE RING. THIS IS A TOTAL OF 420 POUNDS ON A RING AND COVER SET. CASTINGS WEIGHING LESS THAN THE MINIMUM SPECIFICATIONS WILL NOT BE ACCEPTED.

3. MANHOLE CASTINGS SHALL BE MANUFACTURED SUCH THAT A COVER MANUFACTURED BY ANY ONE FOUNDARY WILL FIT INTERCHANGEABLY INTO A FRAME MANUFACTURED BY ANOTHER FOUNDRY AND STILL MEET ALLOWABLE CLEARANCES AND NON-ROCKING REQUIREMENTS. THIS WILL REQUIRE MANUFACTURING OF THE MATCHING FACES ON THE COVER AND THE FRAME TO CLOSE TOLERANCES.

4. THE OUTSIDE CIRCUMFERENCE OF THE VERTICAL FACE OF THE COVER AND THE INSIDE CIRCUMFERENCE OF THE VERTICAL FACE IN THE FRAME RECESS SHALL BE MANUFACTURED TO TOLERANCES SUCH THAT THE CLEARANCE BETWEEN THE COVER AND FRAME WILL NOT EXCEED 1/8" AT ANY POINT AROUND THE CIRCUMFERENCE OF THE COVER. THE SEATING SURFACES BETWEEN THE COVER AND FRAME SHALL BE MACHINED SUCH THAT THESE SEATING SURFACES SHALL MAKE FULL CONTACT FOR THEIR FULL CIRCUMFERENCE TO PRECLUDE THE COVER FROM ROCKING IN THE FRAME.

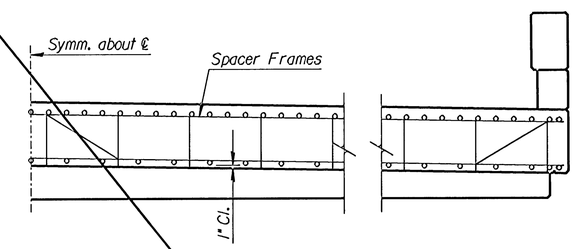
5. THE MANHOLE FRAME AND COVER SHALL BE MARKED WITH LETTERING INDICATING THE NAME OF THE MANUFACTURER AND THE YEAR WHEN THE COVER OR FRAME WAS CAST. THE COVER SHALL BE FURTHER IDENTIFIED WITH REGARDS TO OWNERSHIP USING LETTERS AT LEAST 1 INCH IN HEIGHT. THIS IDENTIFICATION SHALL BE "CITY OF WICHITA SEWER DEPARTMENT". THE WORD DEPARTMENT MAY BE ABBREVIATED. THE TEXTURE OF THE TOP SURFACE OF THE COVER SHALL BE MANUFACTURED IN A CHECKERED PATTERN DESIGN AS INDICATED ON THE DRAWINGS. SMOOTH BLOCKOUTS SHALL BE UTILIZED TO HIGHLIGHT THE LETTERING ON THE COVER SURFACE. THE TOTAL AREA OF SMOOTH SURFACE BLOCKOUT SHALL NOT EXCEED THE AREA AS INDICATED ON THE DRAWING. POSITIONING OF SMOOTH BLOCKOUTS AND LETTERING MAY VARY FROM THAT SHOWN ON THE DETAILED DRAWING.

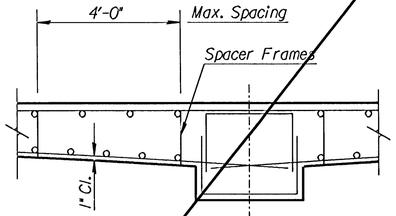
THE CITY OF WICHITA
CITY ENGINEER'S OFFICE
CITY HALL - SEVENTH FLOOR
455 NORTH MAIN STREET
WICHITA, KANSAS 67202
(316) 268-4501
(316) 268-4114 FAX

MANHOLE FRAME AND COVER	
M. E. LINDEBAK P.E. - CITY ENGINEER	
PROJECT NUMBER 468-83392	INDEX CODE XXXXXX
DATE MAR 96	SHEET 14 OF 23

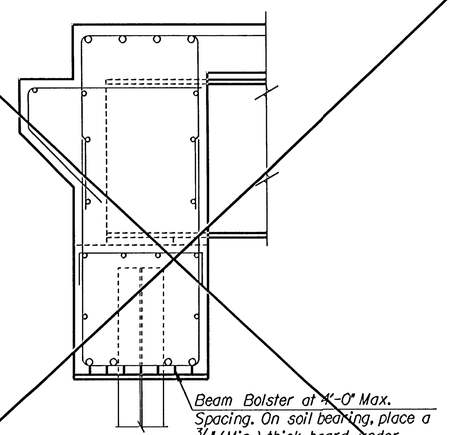
I-I-45\cd\mhfrcmov.dgn
date plotted: 3-13-2002
deliver to: drp

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	468-83392	2002	15	23





CONTINUOUS HAUNCHED SLAB



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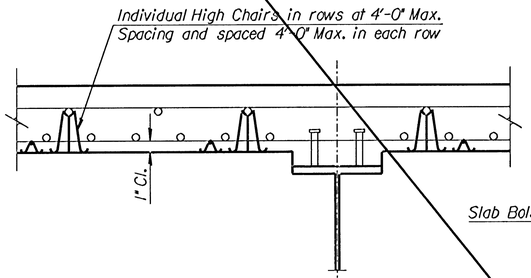
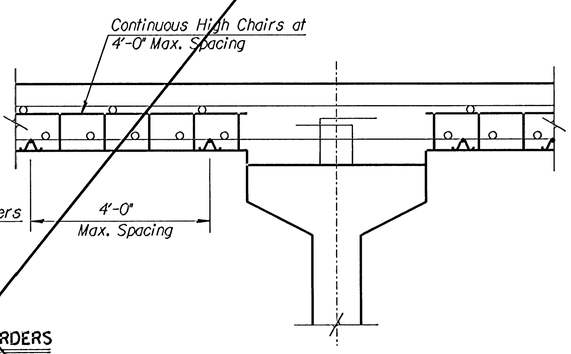
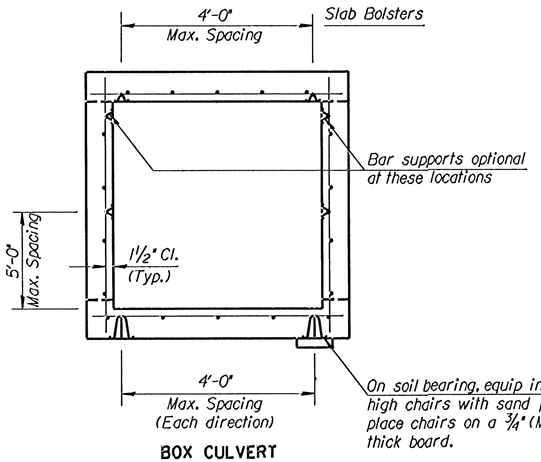
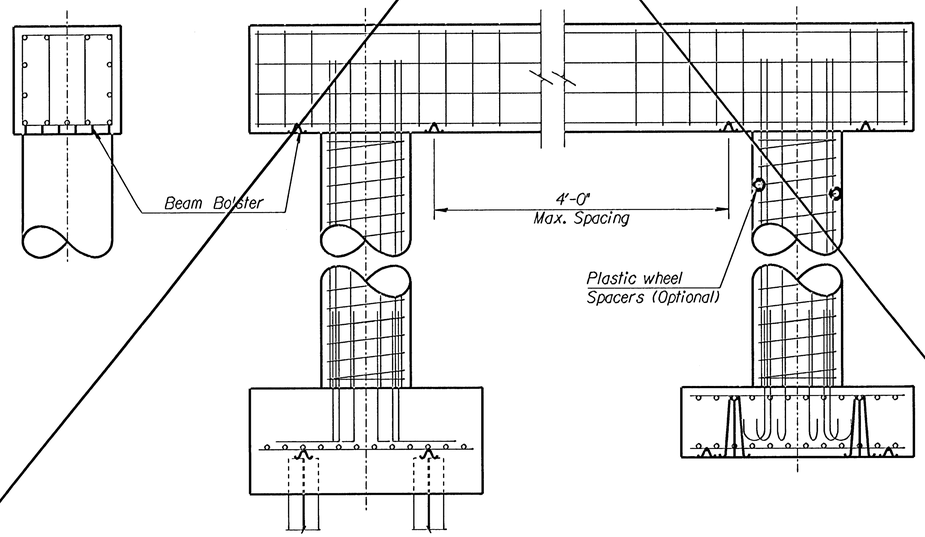




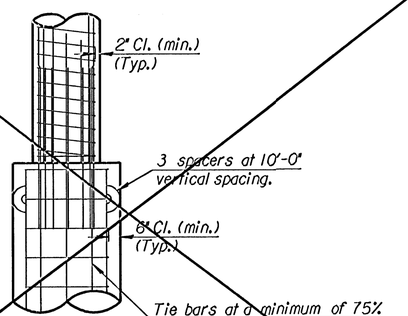
DECK GIRDERS



BOX CULVERT



PIER



DRILLED SHAFT

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
3				
2				
1				

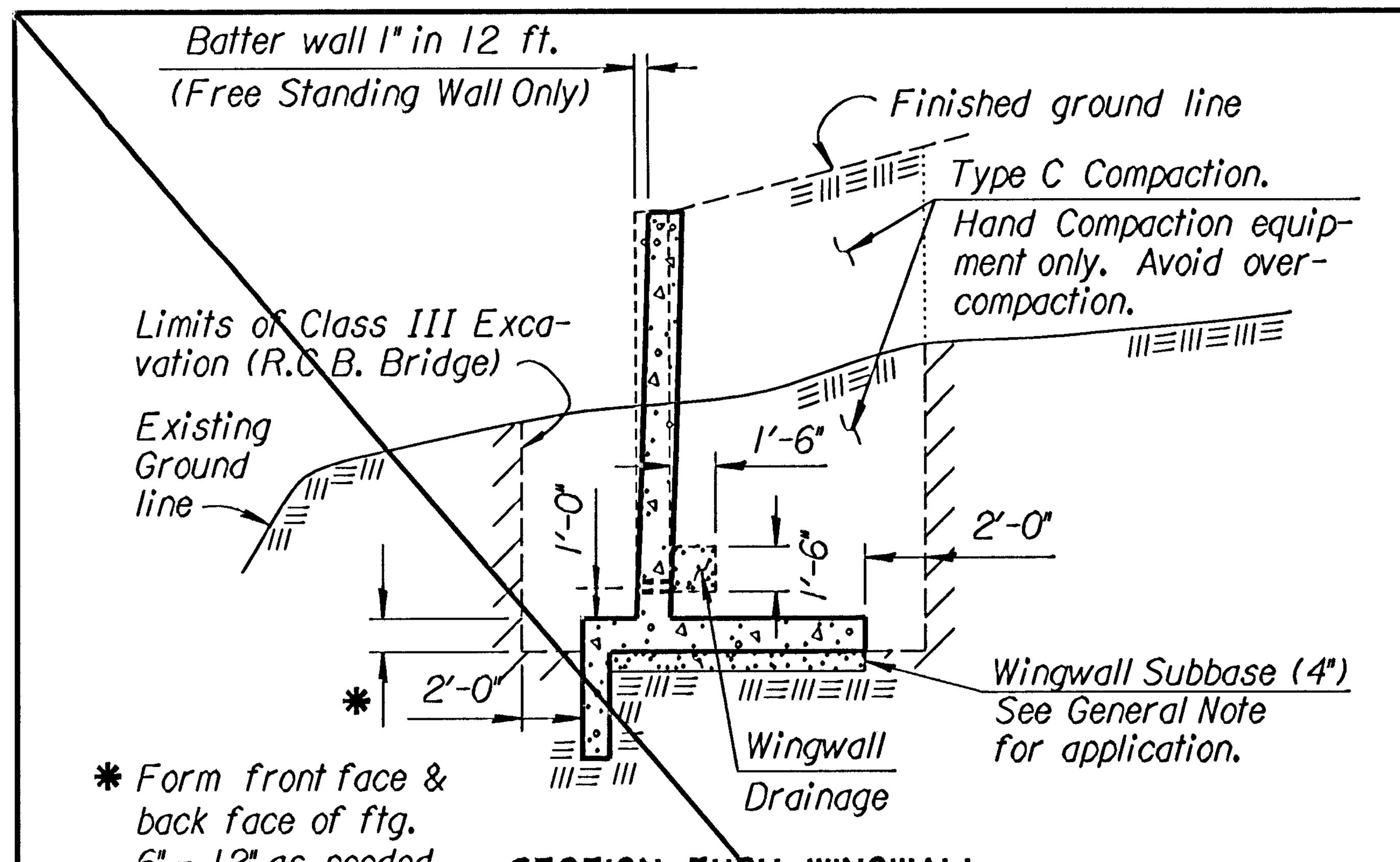
KANSAS DEPARTMENT OF TRANSPORTATION

SUPPORTS AND SPACERS FOR REINFORCING STEEL

~~BR120~~

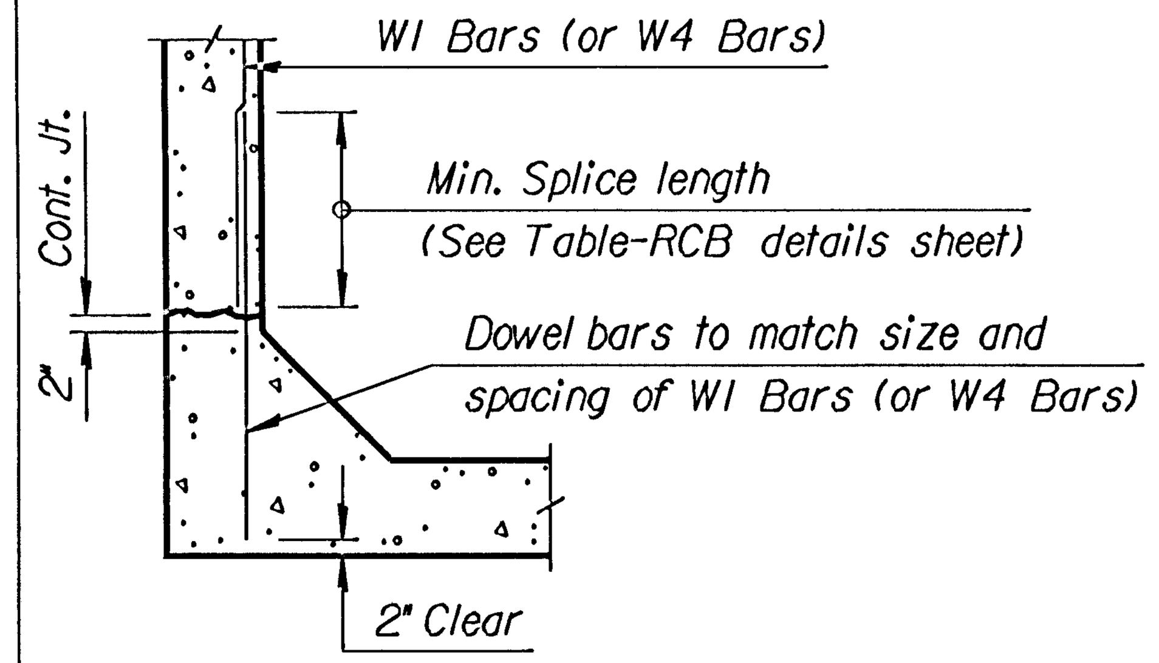
FHWA APPROVAL		6-15-95	APP'D	KENNETH F. HURST	
DESIGNED	RAM	DETAILED	GFK	QUANTITIES	GFK
DESIGN CK.	LRR	DETAIL CK.	RAM	QUAN. CK.	RAM
CADD	GFK	CADD CK.	RAM		

Plotted By :	drp
Plot File :	i:2001/01409/002/rcb/br120
Plot Date :	3-13-2002
Std. Base File :	/usr2/stand/us/br120.dgn
Working File :	/usr2/
Back Up File :	witch
View = PLOT	



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

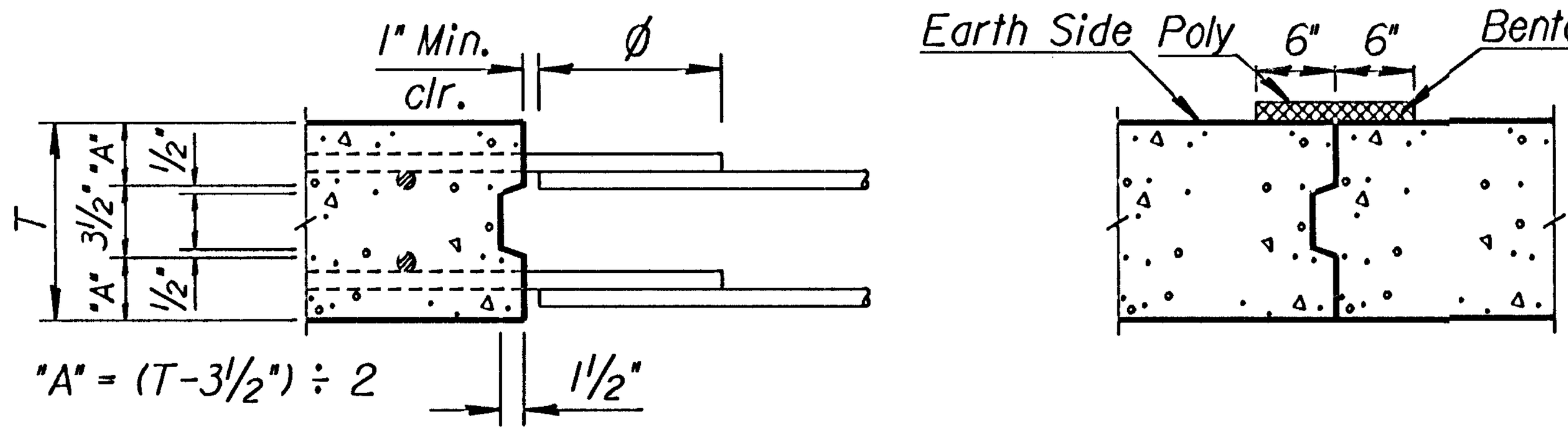
SECTION THRU WINGWALL



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.

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

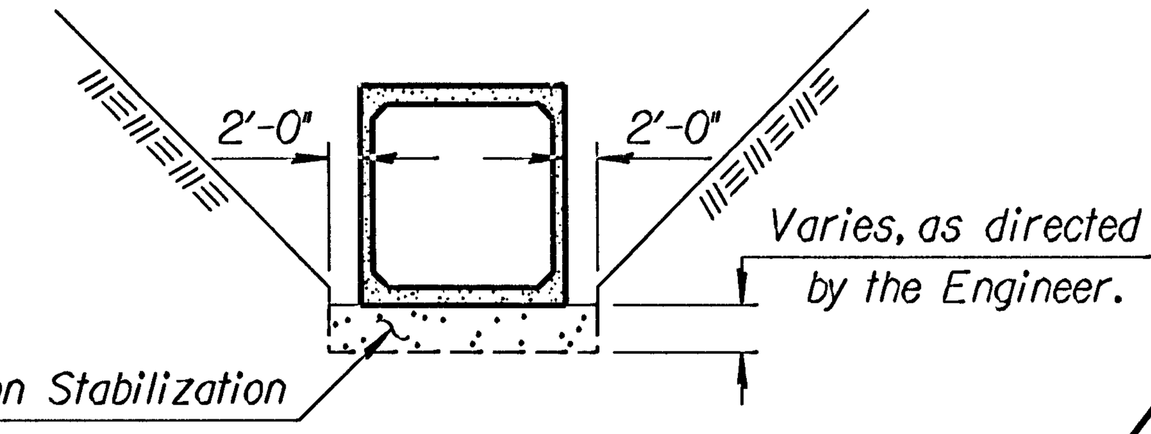


VERTICAL CONSTRUCTION JOINTS

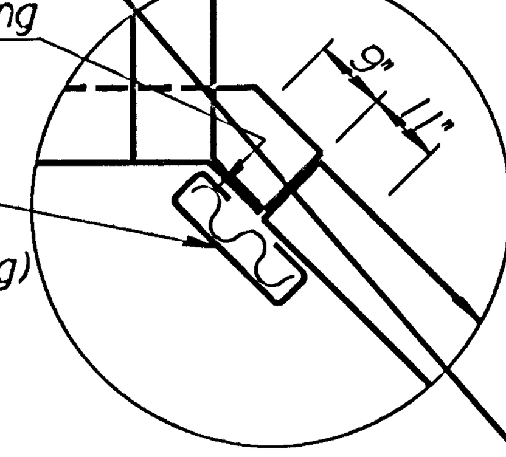
NOTE: Vertical construction joints shall be perpendicular to the longitudinal axis of the RCB and shall be placed at any location as needed for construction and as approved by the Engineer.

NOTE: Horizontal construction joints shall be a roughened finish.

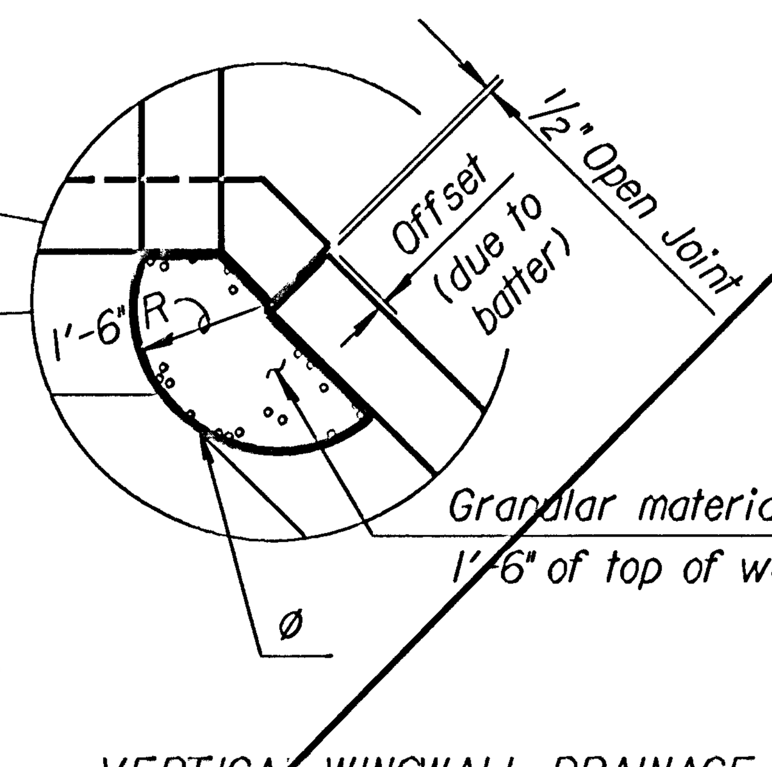
NOTE: Barrel Construction Joints located in a median with less than 5 ft. of fill or at locations specified by the Engineer, shall be protected by a bentonite based system as shown. Place the bentonite on the exterior walls and top slab. See requirements for bentonite in the KDOT Specifications for "Bridge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

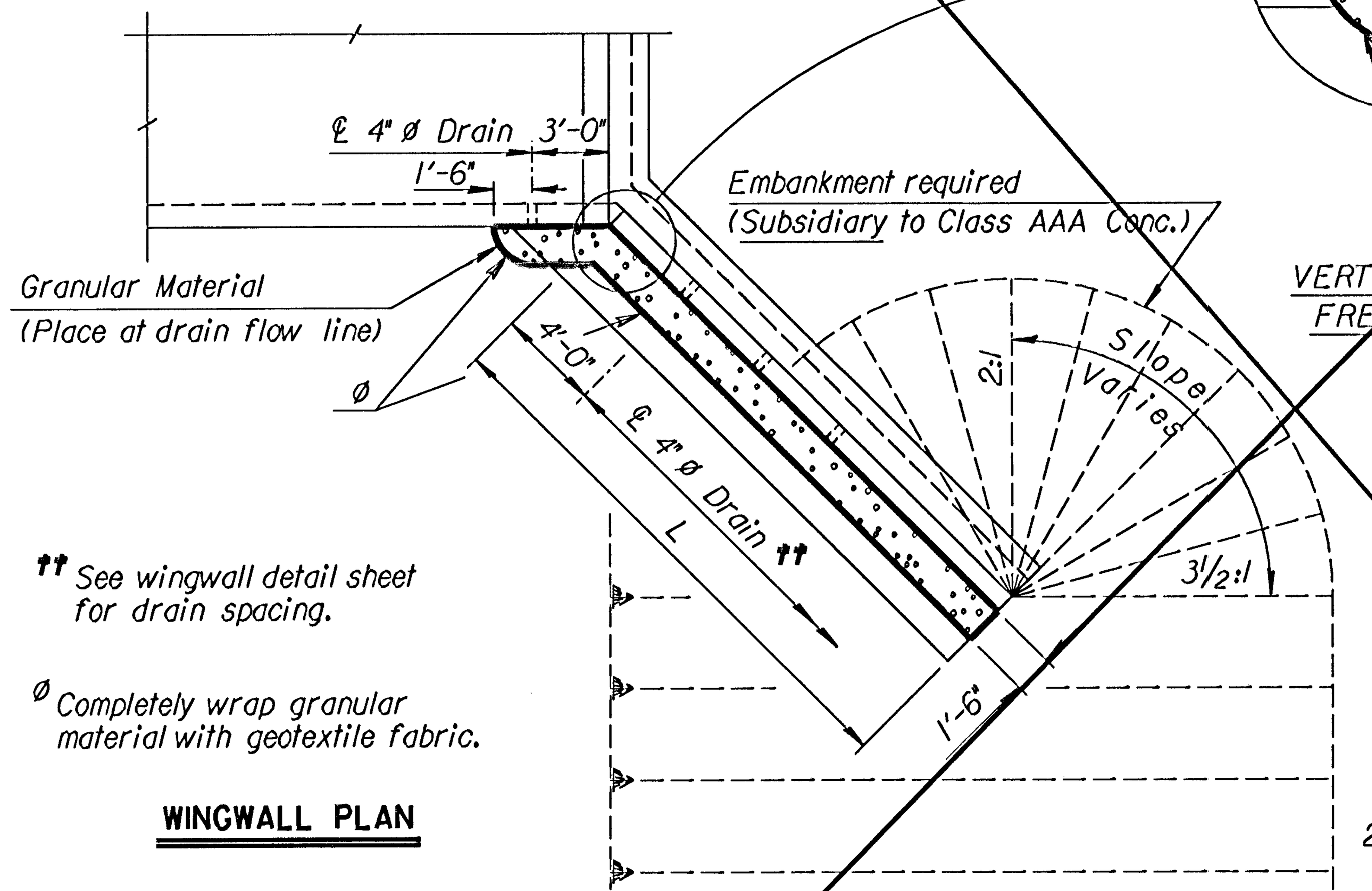


SECTION



OPTIONAL STRIP DRAIN
Detail 'A'



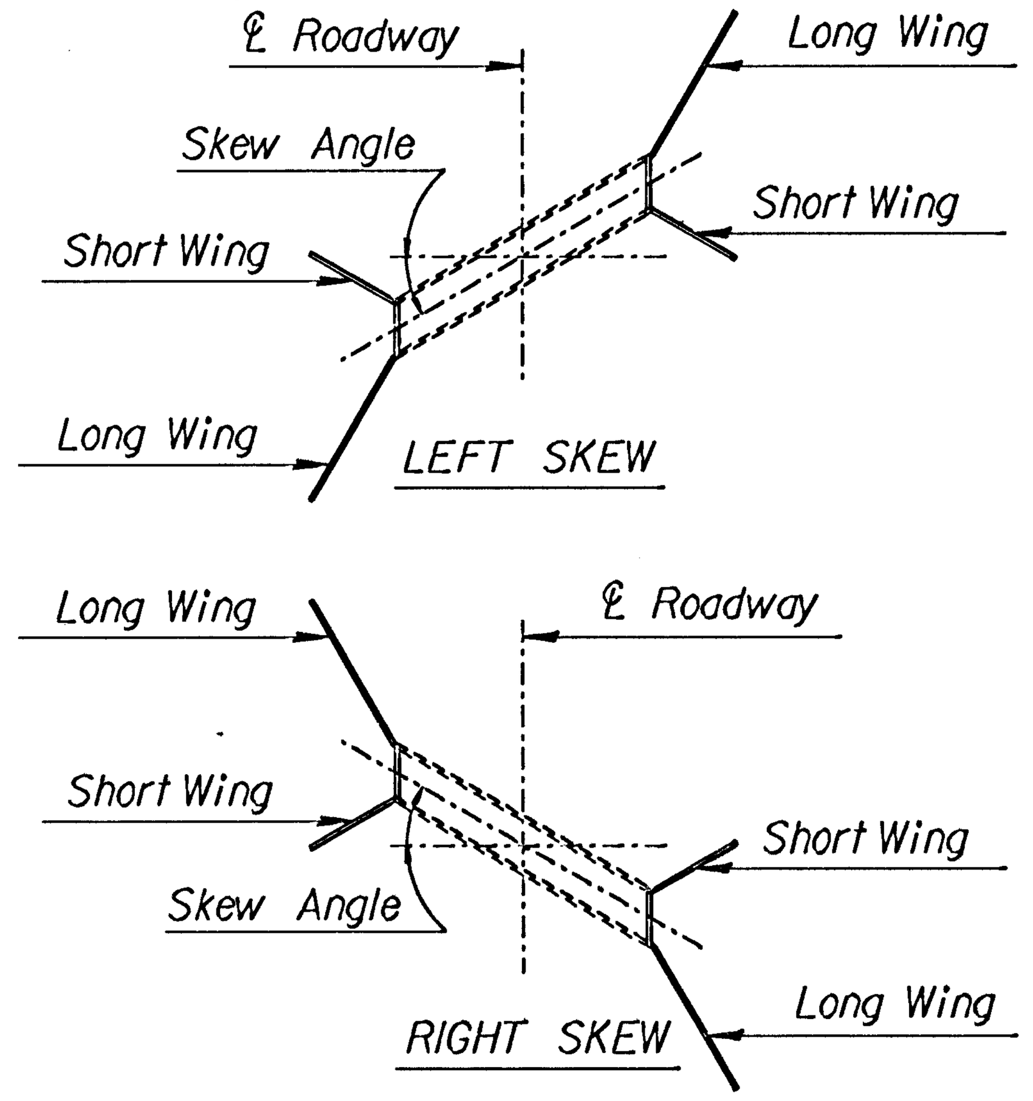


VERTICAL WINGWALL DRAINAGE FOR FREE-STANDING WINGWALLS ONLY
(RCB Rise 12 ft. & over)

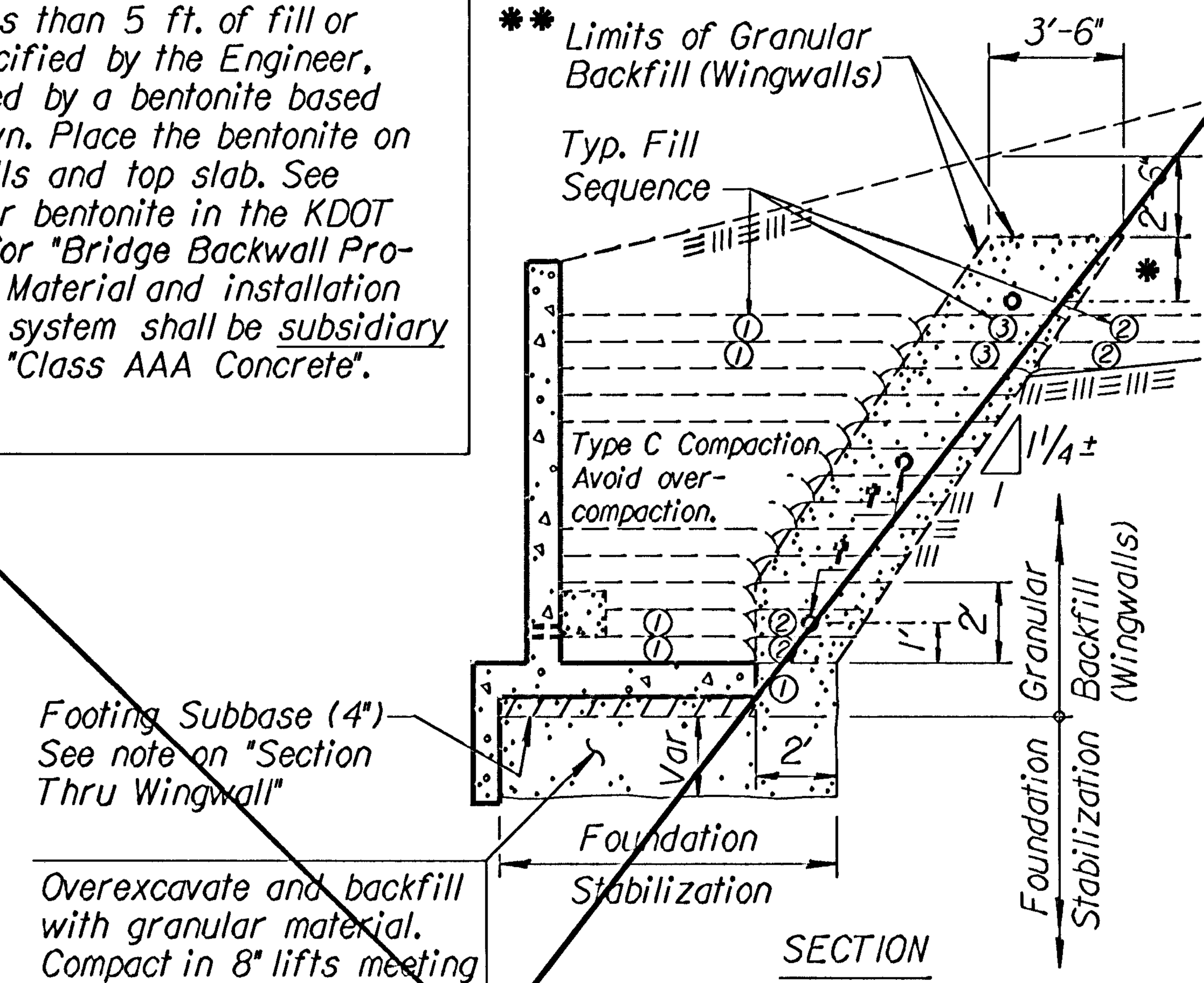
†† See wingwall detail sheet for drain spacing.

Ø Completely wrap granular material with geotextile fabric.

WINGWALL PLAN



PLAN VIEW SKEWED R.C.B.

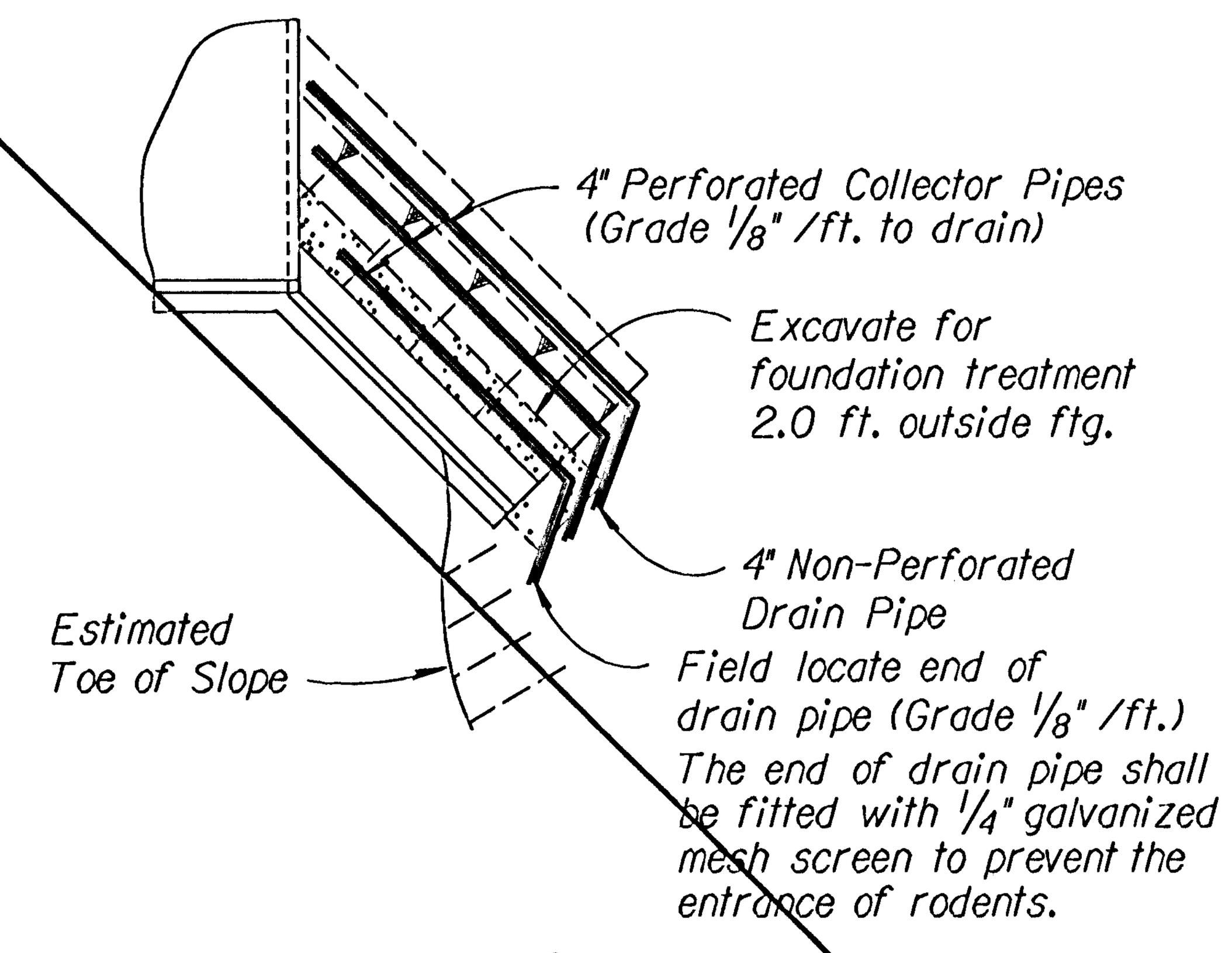


SECTION

✱ Omit Drain Pipe when distance is less than 2'-0".

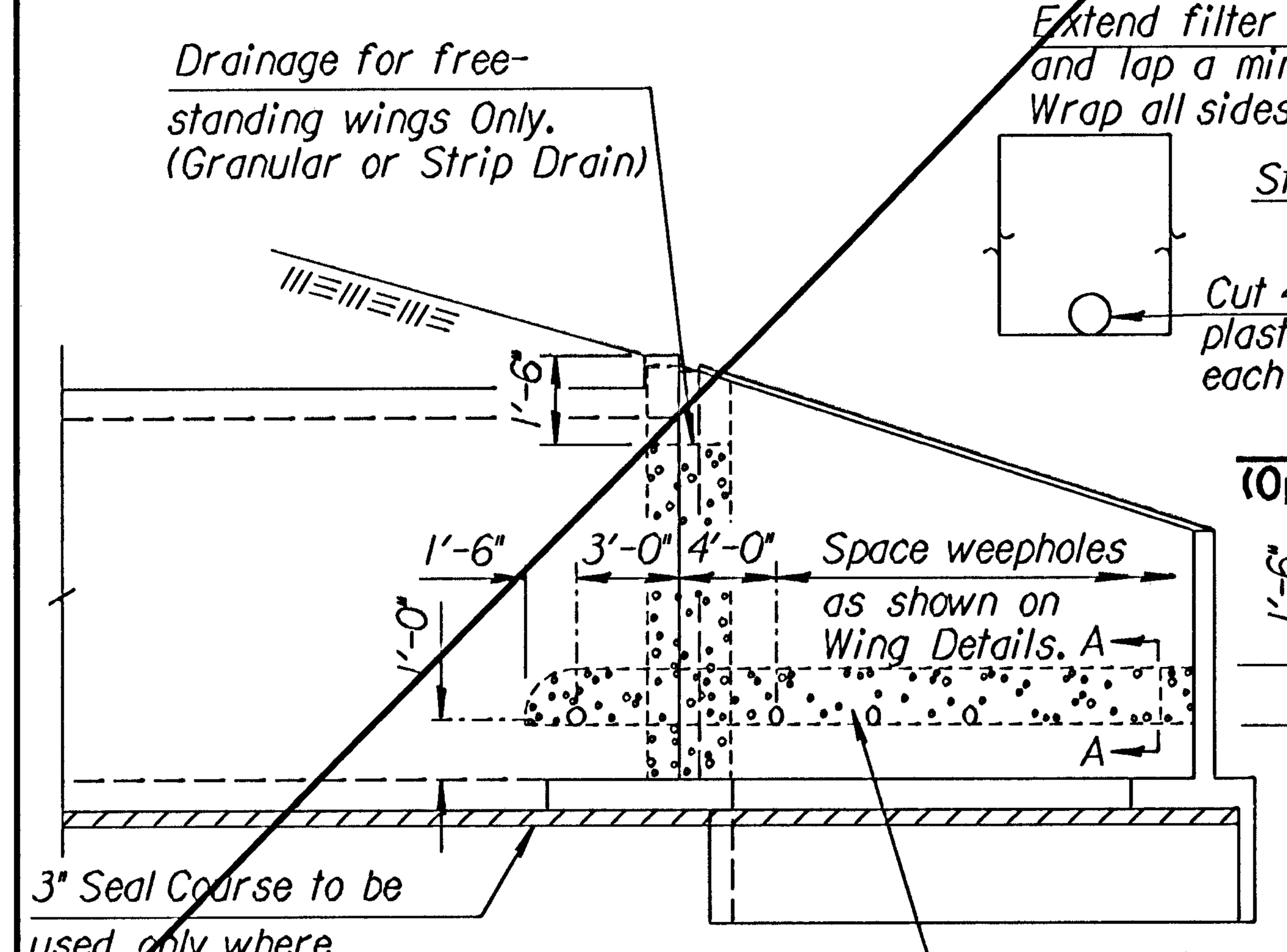
† 4" Perforated Pipe (Install ea. 4' in Elev.)

✱✱ NOTE: As an alternative, all backfill for the wall (within 2'-6" of finish grade) may be granular backfill material. Measurement for quantity shall be to the same limits as listed in the General Notes.

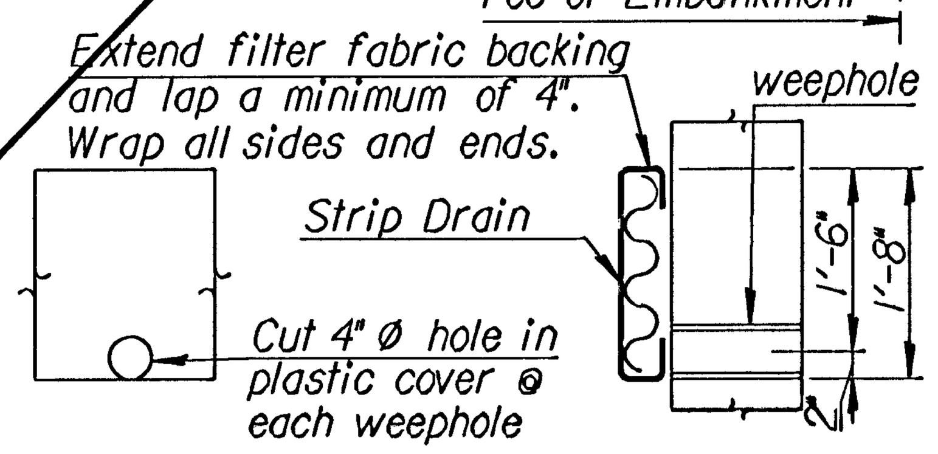


PLAN

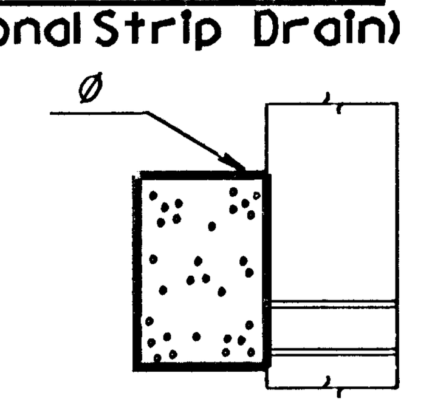
GRANULAR BACKFILL AND FOUNDATION STABILIZATION



ELEVATION



SECTION A-A
(Optional Strip Drain)



SECTION A-A
(Granular Drain)

GENERAL NOTES

Wingwall Drainage:

1. All wingwalls with weepholes shall have horizontal wingwall drainage as shown. Free-standing wingwalls shall also have the vertical wingwall drainage. Strip drains may be used in lieu of aggregate. See KDOT Specifications for "Abutment Strip Drains" for strip drain requirements.
2. Construction and materials for wingwall drainage, including weepholes, geotextile fabric, granular material, and strip drain shall be subsidiary to the bid item, "Class AAA Concrete". Granular material for wingwall drainage shall conform to the requirements of UD-1. Weepholes may be a formed opening or corrugated polyethylene tubing.

Wingwall Subbase:

1. Wingwall subbase shall be constructed at all wingwall footings to assure the assumed coefficient of friction between the concrete footing and the foundation, with the following exceptions;
   a) Wingwall subbase will not be required for footings on RCB's 6 feet or less in height unless otherwise determined by the Engineer.
   b) The subbase will also not be required for footings founded on rock or clean, granular material as determined by the Engineer.
2. Subbase shall consist of 4" compacted granular material consisting of commercial grade clean sand or UD-1 material. All excavation, material and labor necessary to construct the wingwall subbase shall be subsidiary to "Class AAA Concrete".

Seal Course:

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

GENERAL NOTES

Foundation Stabilization:

1. At sites where the wingwall footing or culvert floor is located within the limits of an existing streambed or is founded on unsuitable material, the Engineer will determine the depth of Foundation Stabilization.
2. Foundation Stabilization may be required under the box and/ or wingwalls as directed by the Engineer. The granular material placed for foundation stabilization shall be measured and paid for at the contract price per cubic yard for "Foundation Stabilization". Material for Foundation Stabilization shall be suitable backfill material as approved by the Engineer. The excavation for the placement of granular material shall be subsidiary to the bid item, "Foundation Stabilization".

Granular Backfill (Wingwalls):

1. In locations where the material behind the wingwall consist of soils judged as high plasticity clays, fat clays, expansive clays or organic clays, Granular Backfill (Wingwalls) shall be used. 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. Drainage pipe, rodent screens, and excavation shall be subsidiary to the bid item, "Granular Backfill (Wingwalls)".
3. Material for Granular Backfill (Wingwalls) shall conform to the requirements of UD-1 or BD-1. Drainage Pipe shall be corrugated polyethylene tubing conforming to KDOT Specifications.

NO.	DATE	REVISIONS	BY	APP'D
3	3-28-97	Wrap granular drains	RAM	KFH
2	9-20-96	Strip drain & bentonite at joint	RAM	KFH
1	10-2-91	Change drainage details	RAM	KFH

KANSAS DEPARTMENT OF TRANSPORTATION

RCB AUXILIARY DETAILS

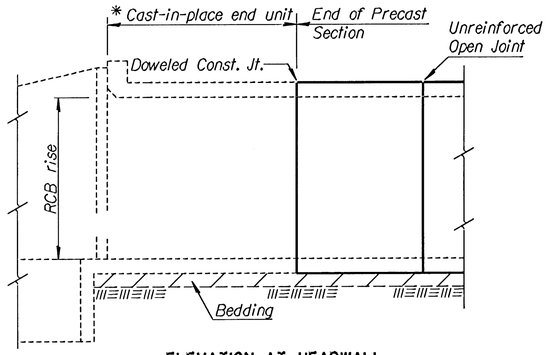
BR020

FHWA APPROVAL		3-31-97 APP'D		KENNETH F. HURST
DESIGNED	RAM	DETAILED	RDR	QUANTITIES	TRACED
DESIGN CK.	RRR	DETAIL CK.	RRR	QUAN.CK.	TRACE CK.

ORIG. FROM BR.NO.	DESIGN	PROJ.	CO.
DESIGN	DATE		CHECK
DETAIL	DATE		DATE
QUANTITIES	DATE		DATE
TRACING	DATE		DATE
RETRACED	DATE		DATE

Drawn By : kdot/jps
DGN File : i:01409/002/rcb/br020 View= PLOT1
Plotted : drp 3-13-2002

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	468-83392	2002	17	23



ELEVATION AT HEADWALL

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". 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.

GENERAL NOTES

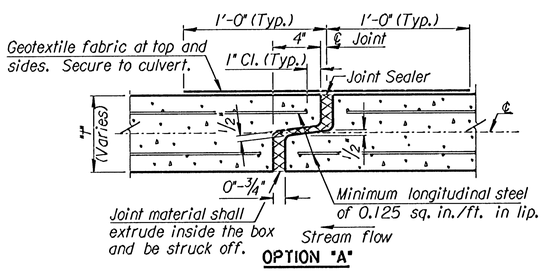
PRECAST BOX CULVERTS: If precast boxes are specified, construct them at the locations shown in the plans and according to the requirement shown on this sheet. When approved by the Engineer, precast box culverts may be used in lieu of cast-in-place box culverts. If the Contractor chooses the precast option, 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.

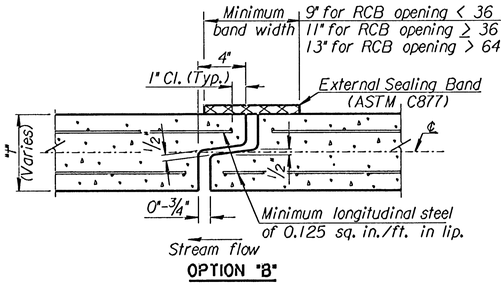
Cast-in-place concrete work shall conform to the requirements of the KDOT Specifications and KDOT's 'Guidelines for Structural Design and Detail of Reinforced Concrete Box Culverts'. Use Class AAA concrete and Grade 60 reinforcing steel conforming to ASTM A615M for cast-in-place construction.

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 Appendices of. ASTM Specification C789M and C850M and the latest AASHTO Specifications.)

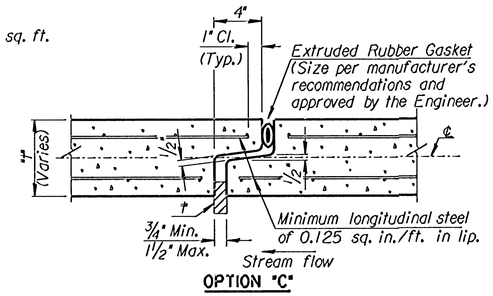
Condition	Min. Fill	AASHTO	Equiv. ASTM
≥ 2'-0" fill	2'-0"	M259, Table 2	C789, Table 2
< 2'-0" fill	0	M273, Table 2	C850, Table 2



OPTION "A"



OPTION "B"



OPTION "C"

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

OPEN JOINT DETAIL

NO.	DATE	REVISIONS	BY	APP'D
4	12-20-96	Revised CIP end unit details.	RAM	KFH
3	1-17-95	Revised generalnotes	LRR	KFH
2	6-22-94	Added option 'C' & revised notes	RAM	KFH
1	3-1-93	Revised generalnotes	RAM	KFH

KANSAS DEPARTMENT OF TRANSPORTATION

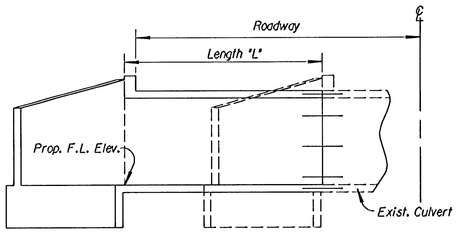
PRECAST CONCRETE BOX CULVERT DETAILS

BR03t

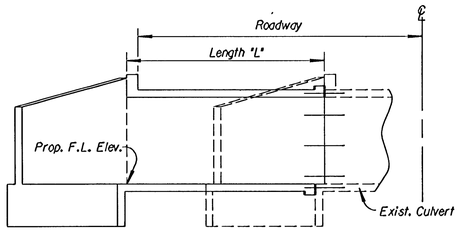
FHWA APPROVAL	12-23-96	APP'D	KENNETH F. HURST
DESIGNED	PF	QUANTITIES	CADD
DESIGN CK.	DETAIL CK. RAM	QUAN. CK.	CADD CK.

Plotted By :	drp
Plot File :	i301409/002/rcb/br031
Plot Date :	3/13/2002
Std. Base File :	/usr2/stand/us/br031.dgn
Server File :	/usr
Server :	witch
View= PLOT1	

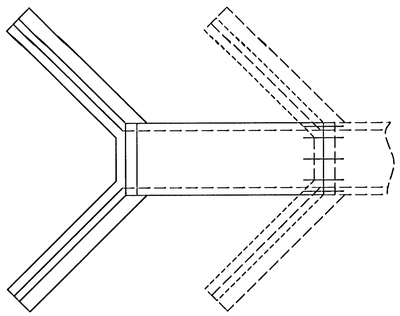
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	468-83392	2002	18	23



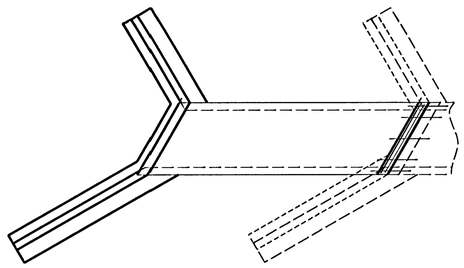
TYPICAL SECTION
(Flared Wings)



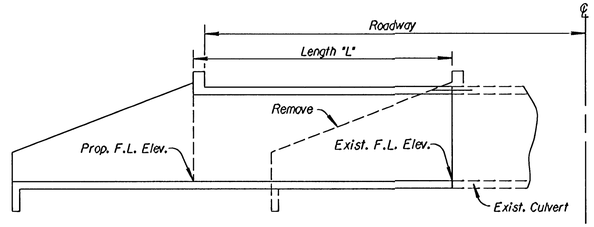
TYPICAL SECTION
(Skewed Structure)



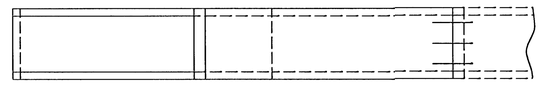
TYPICAL PLAN
(Flared Wings)



TYPICAL PLAN
(Skewed Structure)



TYPICAL SECTION
(Straight Wings)



TYPICAL PLAN
(Straight Wings)

GENERAL NOTE

Dimensions of existing structures shall be checked in the field prior to starting the new construction. Interior walls of multiple box extensions need not be the same thickness as the existing walls.

All existing concrete surfaces adjacent to new concrete shall be thoroughly cleaned by brushing, and soaked with water immediately prior to placing the new concrete.

All work and material necessary for installing the dowel bars shall be subsidiary to the bid item "Reinforcing Steel".

Grouting of bars shall meet the Standard Specifications of the Kansas Department of Transportation.

"s_1" and "f_1" bars shall be placed at 1/2 normal spacing for the first 18".

Straight Wing Extensions

Remove existing wings and wing aprons. Remove top of hubguard if necessary to clear new construction. A minimum of 24" length of the existing wing and floor steel shall be left intact and shall be cleaned and straightened to bond into the new concrete. Dowels (#5 deformed bars) shall be inserted across the top of box as shown in sketch. Butt extensions against existing culvert. The work shall be subsidiary to the bid item "Class AAA Concrete (AE)".

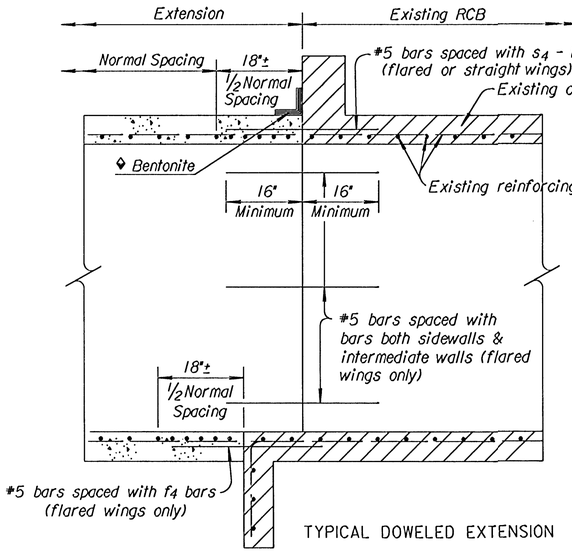
Flared Wing Extensions

Remove top of hubguard, if necessary, to clear new construction. Dowels (#5 deformed bars) shall be inserted in top, bottom, sides and intermediate walls, as shown in sketch. Butt extensions against existing culvert. If the existing wingwall has an open vertical joint that interferes with installation of the dowels, remove part of the wingwall to clear construction. This work shall be subsidiary to the bid item "Class AAA Concrete (AE)".

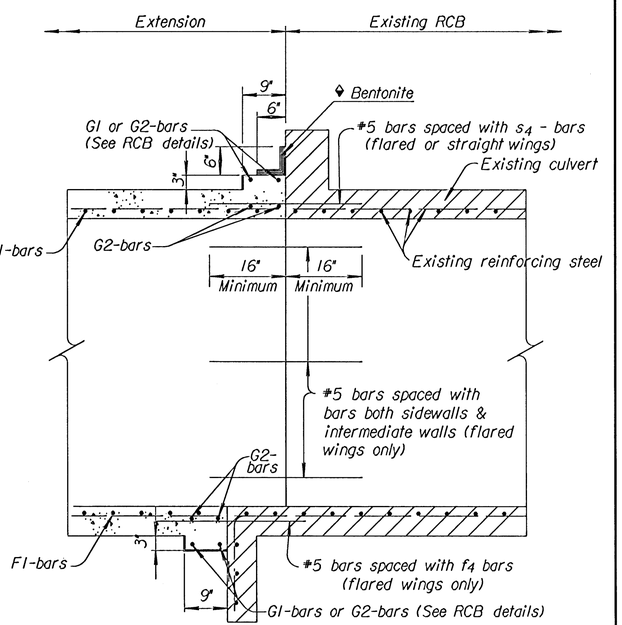
♦ *Note: The joint between the RCB extension and the existing structure shall be protected by a Bentonite base system as shown when the following conditions exist:*

1. Fill depth over the joint is 24" or less.
2. lateral location of the joint is 20' or less from edge of pavement.
3. RCB span is equal to or greater than 8'.

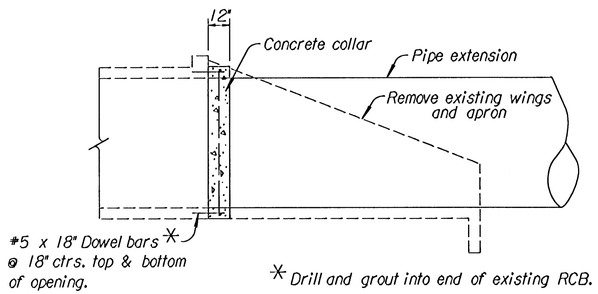
The Bentonite shall be placed on the exterior walls and top slab and shall conform with the requirements of the Special Provision for "Bridge Backwall Protection System". All materials and labor required for this work shall be subsidiary to the bid item "Class AAA Concrete (AE)".



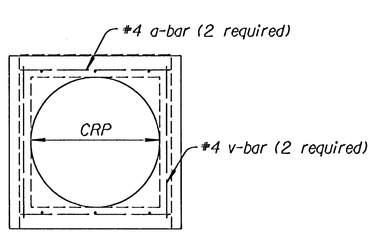
TYPICAL DOWELED EXTENSION



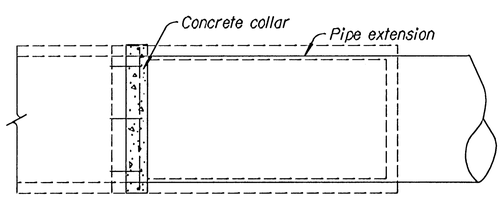
TYPICAL DOWELED EXTENSION
(Skewed Structure)



SIDE VIEW



END VIEW



TOP VIEW

CONSTRUCTION OF COLLAR

NOTE: All Labor, Equipment, Materials, and Incidentials necessary to complete the concrete collar shall not be paid for directly but shall be considered Subsidiary to the individual pipe bid item.

Station	Size Exist. R.C.B.	Size C.R.P. Extension	Ext. Length		End Section	
			Lt.	Rt.	Lt.	Rt.

Quantities on this sheet are included in Summary of Quantities, Sh. No.

Station	Size Exist. R.C.B.	Roadway		Length "L"		Class AAA Conc. Cu. Yds.	Reinf. Steel Lbs.	Remarks
		Lt.	Rt.	Lt.	Rt.			

NO.	DATE	REVISIONS	BY	APP'D
4	12-28-93	Add collar construction note	R.J.S.	J.O.B.
3	12-21-92	Rev. Bar Spacing on Skewed Box	R.J.S.	J.O.B.
2	6-9-92	Added Skewed Box Details	R.J.S.	J.O.B.
1	5-13-91	Revised General Note	R.J.S.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

TYPICAL CULVERT EXTENSIONS

RD080

FHWA APPROVAL	2-10-94	APP'D James O. Brewer	
DESIGNED	DETAILED	QUANTITIES	TRACED Bowser
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK. Seltz

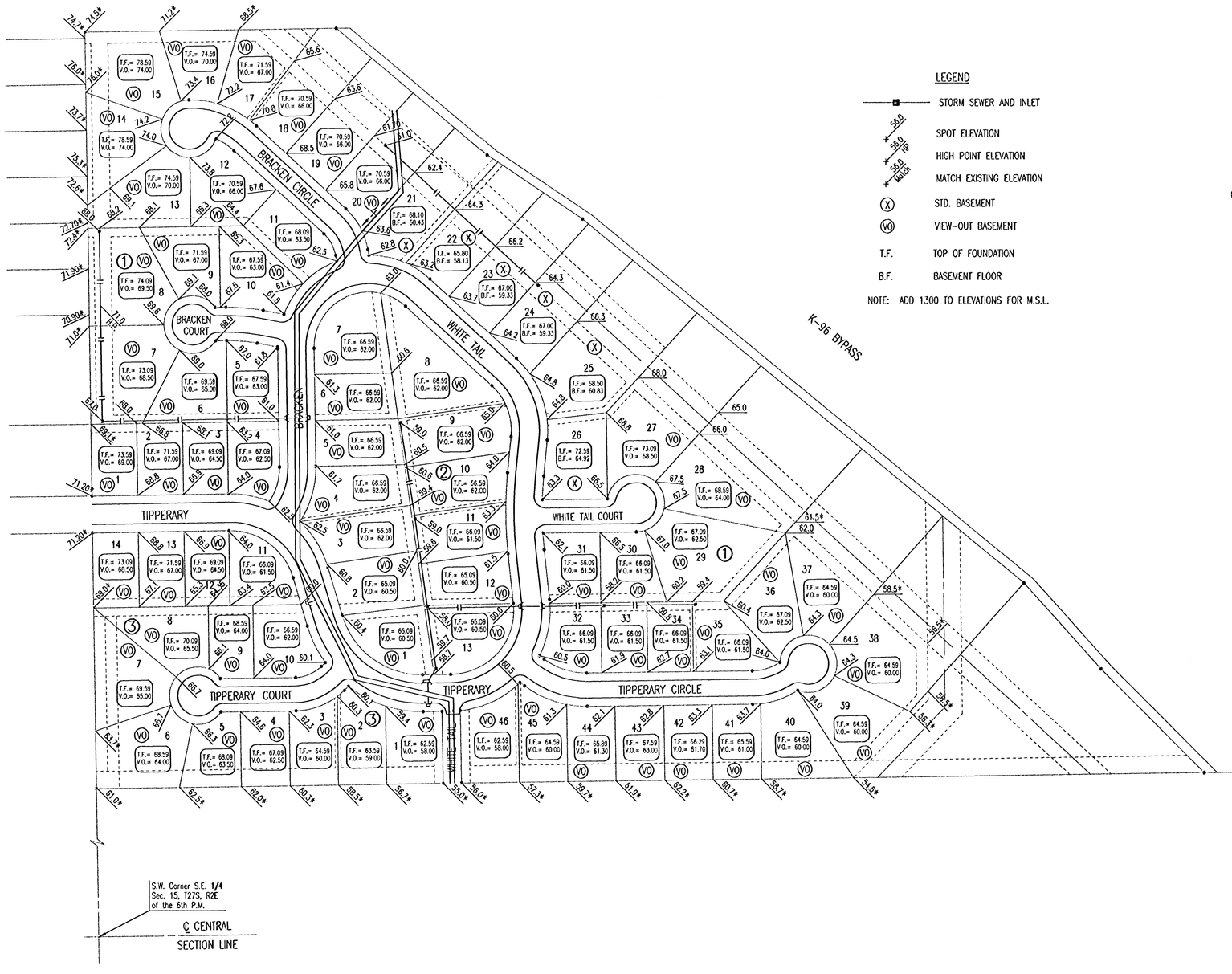
DSNR: STD OPER: DRP SCALE:
I:/2001/01545/RCB/RD080.DGN 2-22-2002 13:31:00 LAST REV: BY:

PROJECT NO.	SHEET NO.	TOTAL SHEETS
468-83392	19	23

FOUR-CORNER PLAN/MASTER DRAINAGE PLAN

BALTHROP 4TH ADDITION

TO WICHITA, SEDGWICK COUNTY, KANSAS



LEGEND

- STORM SEWER AND INLET
- SPOT ELEVATION
- HIGH POINT ELEVATION
- MATCH EXISTING ELEVATION
- (X) STD. BASEMENT
- (VO) VIEW-OUT BASEMENT
- T.F. TOP OF FOUNDATION
- B.F. BASEMENT FLOOR

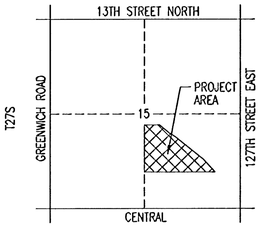
NOTE: ADD 1300 TO ELEVATIONS FOR M.S.L.

SCALE: 1"=100'

● = IRON SET UNLESS OTHERWISE NOTED

B.M. – CHISELED "□" IN CENTER CONCRETE HEADWALL TO R.C.B. 24.5' SOUTH AND 56.7' WEST OF THE INTERSECTION OF THE CENTERLINES OF CENTRAL AND GREENWICH.

ELEV. = 1376.228 N.G.V.D.



VICINITY MAP

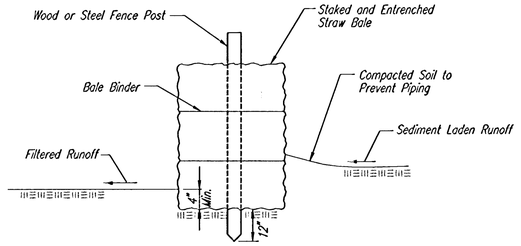
STORM WATER SEWER NO. 566

FOUR CORNER LOT GRADING

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

Designed by	BER	Checked by	
Drawn by	DEP	Date FEB., 2002	Job No. 01545

DSNR: DEP OPER: SAD SCALE: 1=100.00
Q:\2001\01545\00\4CORNER 03-13-2002 04:12:44 pm



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.

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:

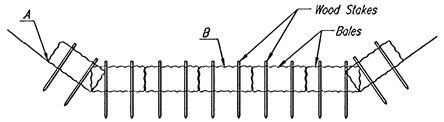
When practical, do not place bale slope barriers across contours. Slope barriers should be placed along contours to avoid a concentration of flow. Concentrated flow over a slope barrier creates a scour hole on the downslope side of the barrier. The scour hole eventually undermines the bales and the barrier 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?

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.
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".

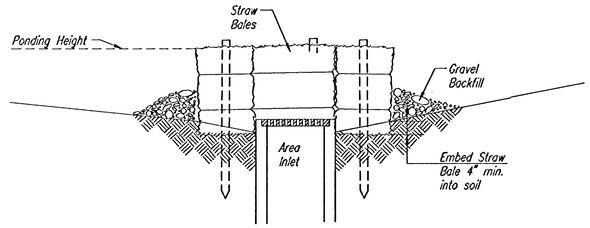
List of common placement/installation mistakes to avoid:

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.

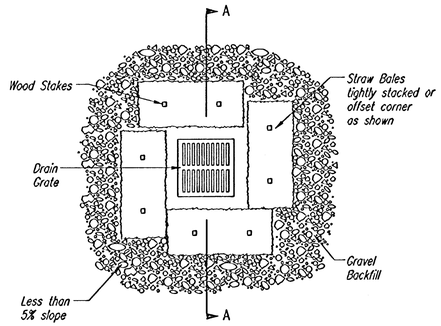
Inspection and Maintenance:

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.

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.

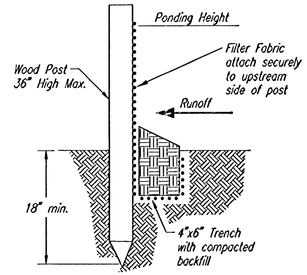
List of common placement installation mistakes to avoid:

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 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?



SILT FENCE BARRIERS

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 becouse 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

SOIL EROSION BMP DETAILS

CHRISTOPHER M. CARRIER, P.E.
STORM WATER ENGINEER

PROJECT NUMBER	OCA NO.
468-83392	751313
DATE: MAY 2001	SHEET 20 OF 23

DSNR: DEP OPER: SAD SCALE: 1=1.00
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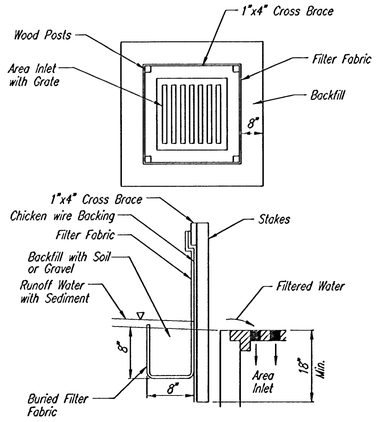


SILT FENCE BARRIERS FOR AREA INLETS
(INLET PROTECTION)

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:

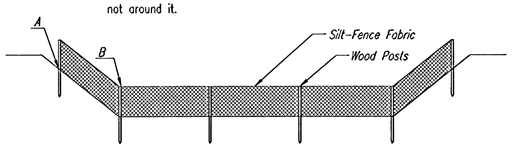
Water should flow through a silt fence barrier for area inlet-not over it. Place a silt fence barrier for area inlet in a location where it is unlikely to be overtopped. Silt fence barrier for area inlets often fail when repeatedly overtopped.
Do not place posts on the outside of the silt fence barrier 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:

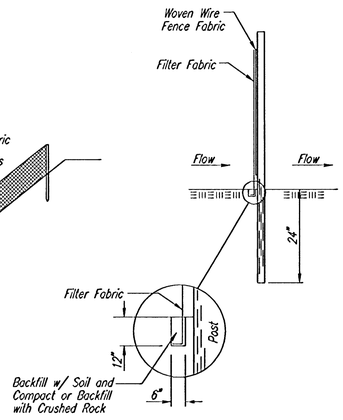
Does water flow under the silt fence?
Does the silt fence sag excessively?
Has the silt fence torn or become detached from the posts?
Does sediment need to be removed from behind the area inlet barrier?

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.
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 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 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.

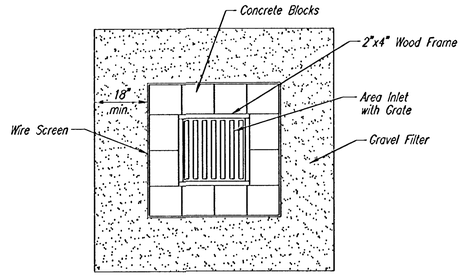
List of common placement/installation mistakes to avoid:

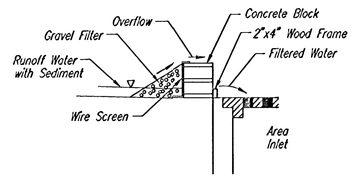
Water should flow through a silt fence ditch check-not over it. Place silt fence in ditches where it is unlikely that it will be overtopped. Silt fence installations quickly deteriorate when water overtops them.
Do not place silt fence posts on the upstream side of the silt fence fabric. In this configuration, 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?





CONCRETE BLOCK FILTER FOR AREA DRAIN
(INLET PROTECTION)

Gravel barriers provide little filtering of large inflow waters. However, when installed correctly and maintained, they can effectively treat low runoff flows.

Placement of gravel filters around area drains must be completed in a manner that will not cause local flooding.

Gravel filters can be used if the immediate and adjacent area to the area drain consists of soil or pavement.

Only gravel filters are to be installed on top of the pavement.

Instructions for Installing:

STEP 1: Place concrete blocks around the grate. The blocks can be stacked one or two high and should be supported by a 2"x4" board.
STEP 2: Wrap 1/2" mesh wire screen around the concrete blocks.
STEP 3: Place 1" to 1-1/2" diameter rock around the blocks and wire screen. Be sure the rock extends down from the top of the concrete block.
STEP 4: To prevent damage to vehicles, signs warning drivers about the structures may be necessary.

An alternative method is use of gravel bags that are supported to prevent collapsing.

Use of rock having diameters smaller than 1" may result in clogging of pores and reduce the amount of water flowing into an inlet.

Maintenance:

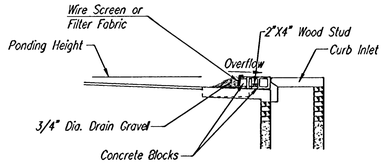
All gravel filters installed around area drains should be inspected and repaired after each runoff event. Sediment should be removed when material is within 3" of the top of any block. Periodically, the gravel should be raked to increase infiltration and filtering of runoff waters. Accumulated sediment is to be removed immediately from roads and streets after every runoff event.

CITY OF WICHITA

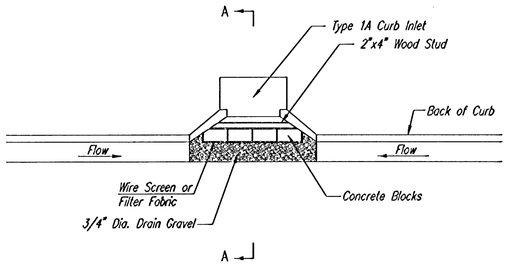
SOIL EROSION BMP DETAILS

CHRISTOPHER M. CARRIER, P.E.
STORM WATER ENGINEER

PROJECT NUMBER 468-83392
OCA NO. 751313
DATE MAY 2001



SECTION A-A



CURB INLET GRAVEL FILTERS
(INLET PROTECTION-RESIDENTIAL STREETS ONLY)

NOTE: Other types of curb inlet protection may be approved by the city so long as equal protection is provided.

A gravel inlet filter shall be installed at sump locations on residential streets. This type of protection is not to be used on arterial or collector streets at any time that it would pose an undue traffic hazard.

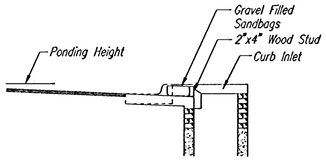
Instructions for Installing:

STEP 1: Place concrete blocks around the inlet as shown on drawing. Insert 2x4 board as shown.
STEP 2: Wrap 1/2" mesh wire screen around the concrete blocks.
STEP 3: Place 1" to 1-1/2" diameter rock around the blocks and wire screen. Be sure the rock extends down from the top of the concrete block.
STEP 4: To prevent damage to vehicles, signs warning drivers about the structures may be necessary. An alternative installation is the use of gravel bags supported by a 2"x4" board to prevent collapsing.

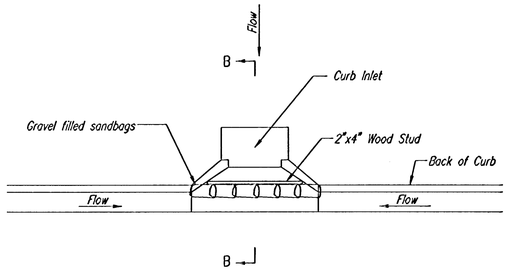
Use of rock with diameters smaller than 1" in the bag may result in clogging of pores and reduce the amount of water flowing into an inlet.

Maintenance:

All curb inlet gravel filters shall be inspected and repaired after each runoff event. Sediment deposits are to be removed once material is within 8 cm (3 inches) of the top of any block. Periodically, the gravel shall be raked to increase infiltration and filtering of runoff waters. Accumulated sediment is to be removed immediately from roads and streets.

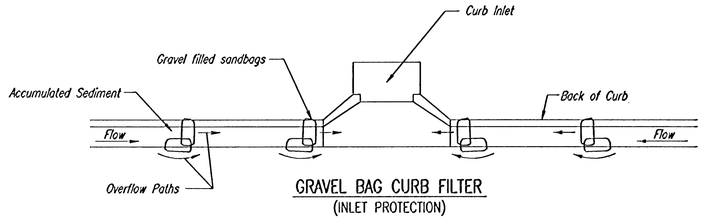


SECTION B-B



CURB INLET SANDBAG FILTERS
(INLET PROTECTION)

NOTE: Other types of curb inlet protection may be approved by the City so long as equal protection is provided.



GRAVEL BAG CURB FILTER
(INLET PROTECTION)

NOTE: Place two or more sets of bags in a manner that results in maximum support. The flow line bag must be lower than top of curb.

CURB SEDIMENT TRAPS

When inlets are located on streets having a grade (i.e., sump conditions do not exist), installing gravel (or sand) bags in the gutter flow line to create small sediment traps can be considered. Gravel bags are recommended over sand bags to allow for drainage.

If the spacing between bags becomes too large, little sediment may be trapped. Spacing of bags should be completed using the table or graph that illustrates placement distances based upon street slope. When installed in the gutter, bag tops must be lower than the sidewalk.

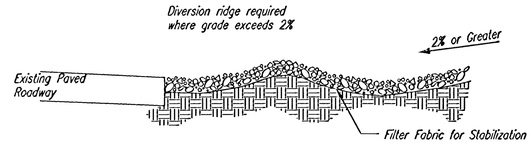
Spacing:

Gravel bags are to be placed according to street grades using the following table or graph that appears below.

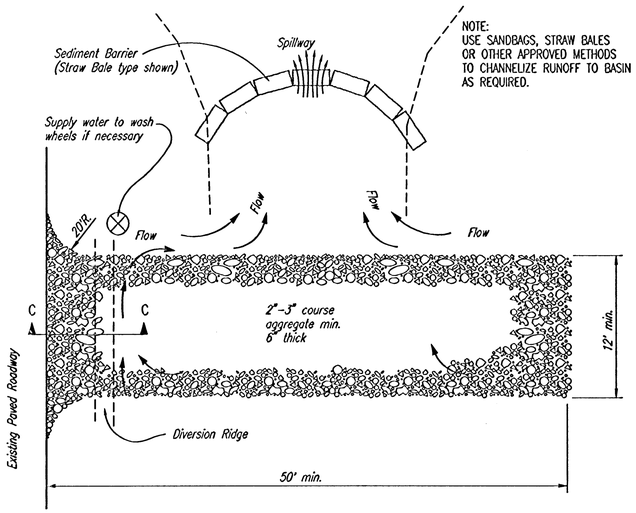
GRADE (%)	SPACING (FEET)
0.5	75
1.0	45
2.0	18
3.0	12
4.0	9
5.0	6

Maintenance:

Collected sediment shall be removed after every runoff event. Bags that are destroyed by vehicular traffic or through natural deterioration are to be immediately replaced.



SECTION C-C



STABILIZED CONSTRUCTION ENTRANCE

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

SOIL EROSION BMP DETAILS

CHRISTOPHER M. CARRIER, P.E.
STORM WATER ENGINEER

PROJECT NUMBER	OCA NO.
468-83392	751313
DATE: MAY 2001	SHEET 22 OF 23

DSNR: DEP OPER: SAD SCALE: 1=1.00
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GENERAL NOTES:

1. THIS SHEET IS INTENDED TO PROVIDE GUIDELINES AS TO WHAT TYPES OF BMP'S WILL BE INSTALLED DURING THE CONSTRUCTION PROCESS. CONTRACTORS ARE EXPECTED TO BID PROJECTS ACCORDINGLY.

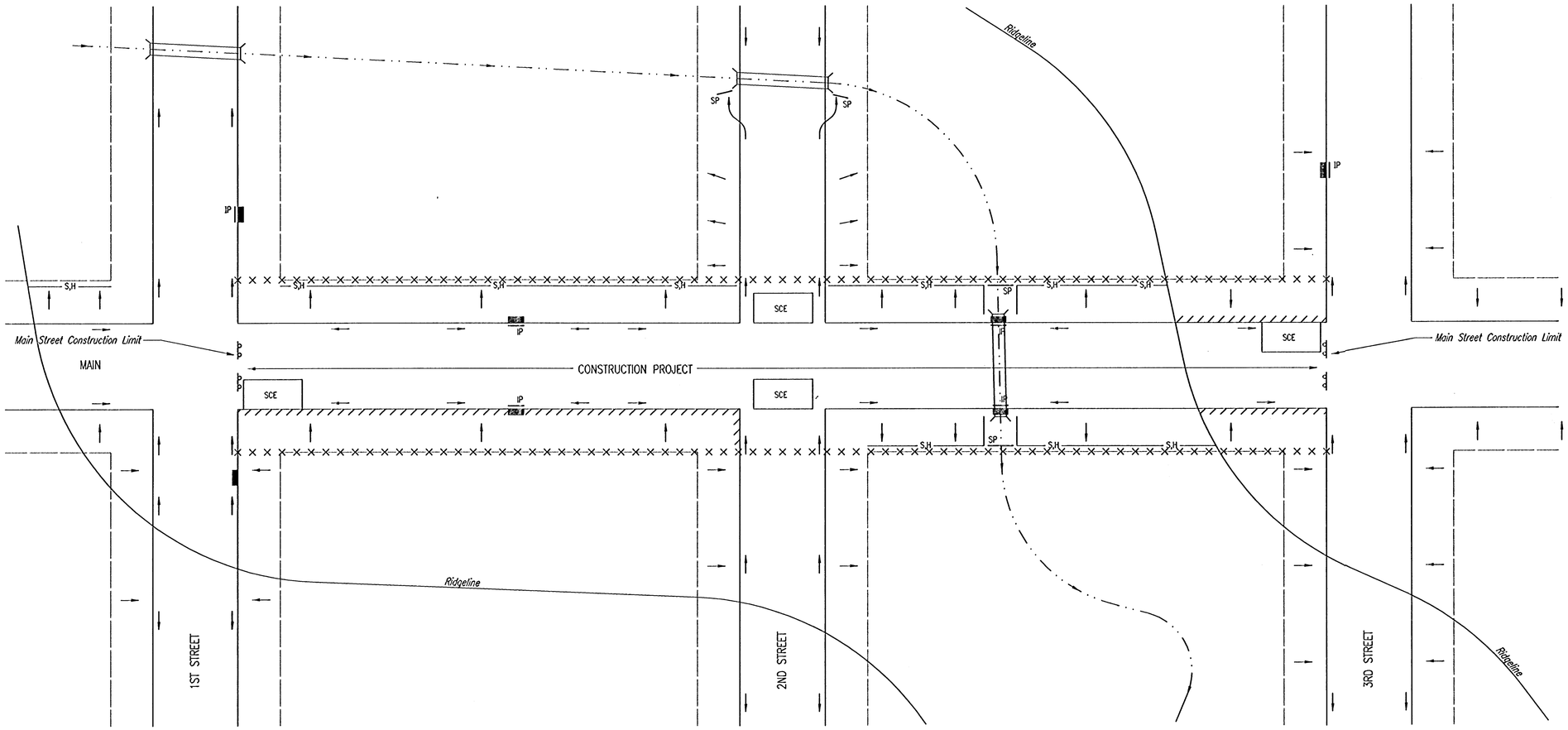
2. BMP'S MUST BE MAINTAINED BY THE CONTRACTOR THROUGHOUT THE CONSTRUCTION PROCESS.

3. IF THE PROJECT WILL DISTURB 5 ACRES OR MORE, A FEDERAL/STATE NPDES STORMWATER PERMIT IS REQUIRED. A DETAILED STORMWATER POLLUTION PREVENTION PLAN, IS REQUIRED. THE BMP'S SHOWN ON THIS SHEET ARE CONSIDERED TO BE THE MINIMUM TO BE SHOWN IN THE POLLUTION PREVENTION PLAN.

4. FOR PROJECTS DISTURBING LESS THAN 5 ACRES, CONTRACTORS ARE ENCOURAGED TO PREPARE STORMWATER POLLUTION PREVENTION PLANS PRIOR TO CONSTRUCTION.

5. FAILURE TO USE AND MAINTAIN BMP'S 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 BMP'S SHOWN ON THIS SHEET IS FOR SITUATIONS NORMALLY ENCOUNTERED. FROM TIME TO TIME, SITUATIONS WILL ARISE THAT MAY REQUIRE A DIFFERENT BMP OTHER THAN THOSE SHOWN. BMP'S, OTHER THAN THOSE SHOWN, MAY BE UTILIZED AS LONG AS THEY ARE EFFECTIVE AND MAINTAINED.

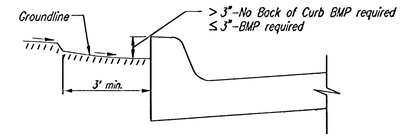


LEGEND

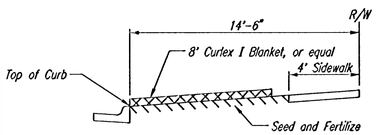
- R-O-W LIMITS
- DRAINAGE FLOW PATH
- R/W LIMIT WITHIN CONSTRUCTION LIMIT
- STORM WATER INLETS
- IP — INLET PROTECTION
- S,H — SILT FENCE OR HAYBALE BMP
- SP — STREAM PROTECTION
- SCE — STABILIZED CONSTRUCTION ENTRANCE
- BACK OF CURB PROTECTION

NOTES:

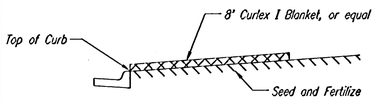
1. GENERAL BMP GOAL IS TO KEEP ALL SEDIMENT CONFINED TO THE CONSTRUCTION SITE, AND OUT OF ALL UNDERGROUND PIPES, DITCHES, AND OTHER DRAINAGE FACILITIES.
2. THE POINT OF COMPLIANCE IS GENERALLY THE RIGHT-OF-WAY LINES WITHIN THE LIMITS OF CONSTRUCTION.
3. BMP'S WILL BE REQUIRED AT ALL POINTS ALONG THE 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. BMP'S 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 BMP'S BACK OF CURB, WHENEVER WATER CAN DRAIN OVER CURB, TO KEEP ERODED SOIL OUT OF THE GUTTERLINES, IN ACCORDANCE WITH THE FOLLOWING:
   A. THE BMP REQUIRED WILL BE CURLEX I EXCELSIOR BLANKET, OR EQUAL. SAID BLANKET SHALL BE PLACED OVER THE APPROPRIATE SEED AND FERTILIZER, AS SPECIFIED IN THE PROJECT SPECIFICATIONS. (SEE BACK OF CURB PROTECTION DETAIL)
   B. THIS BMP 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 BMP'S (HAYBALES, 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 DETAIL)



CURB BACKFILL DETAIL

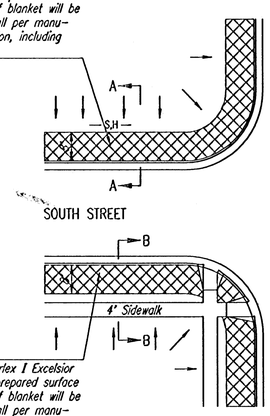


SECTION B-B



SECTION A-A

BMP-Install 8' wide Curlex I Excelsior Blanket, or equal, on prepared surface back of curb. Edge of blanket will be at back of curb. Install per manufacturers recommendation, including staples.



BMP-Install 8' wide Curlex I Excelsior Blanket, or equal, on prepared surface back of curb. Edge of blanket will be at back of curb. Install per manufacturers recommendation, including staples.

BACK OF CURB PROTECTION DETAIL

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 BMP'S WILL BE INSTALLED BY THE CONTRACTOR AS NEEDED, TO FIX THE PROBLEM.

CITY OF WICHITA

SOIL EROSION BMPS STREET IMPROVEMENT PROJECTS

CHRISTOPHER M. CARRIER, P.E.
STORM WATER ENGINEER

PROJECT NUMBER	OCA NO.
468-83392	751313
DATE: MAY 2001	SHEET 23 OF 23

DSNR: DEP OPER: SAD SCALE: 1=20.00
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