

# STORM WATER SEWER NO. 577

to serve

## LIBERTY PARK 2ND ADDITION - PHASE I

CITY OF WICHITA, KANSAS

Neil D. Cable, P.E. City Engineer

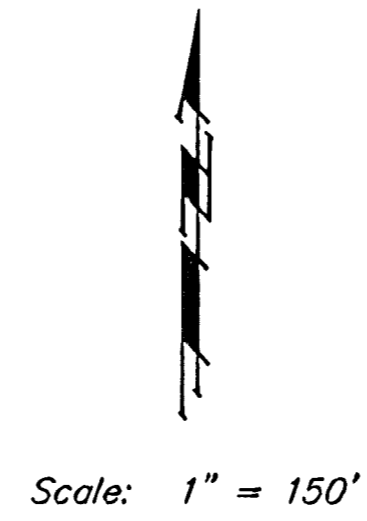
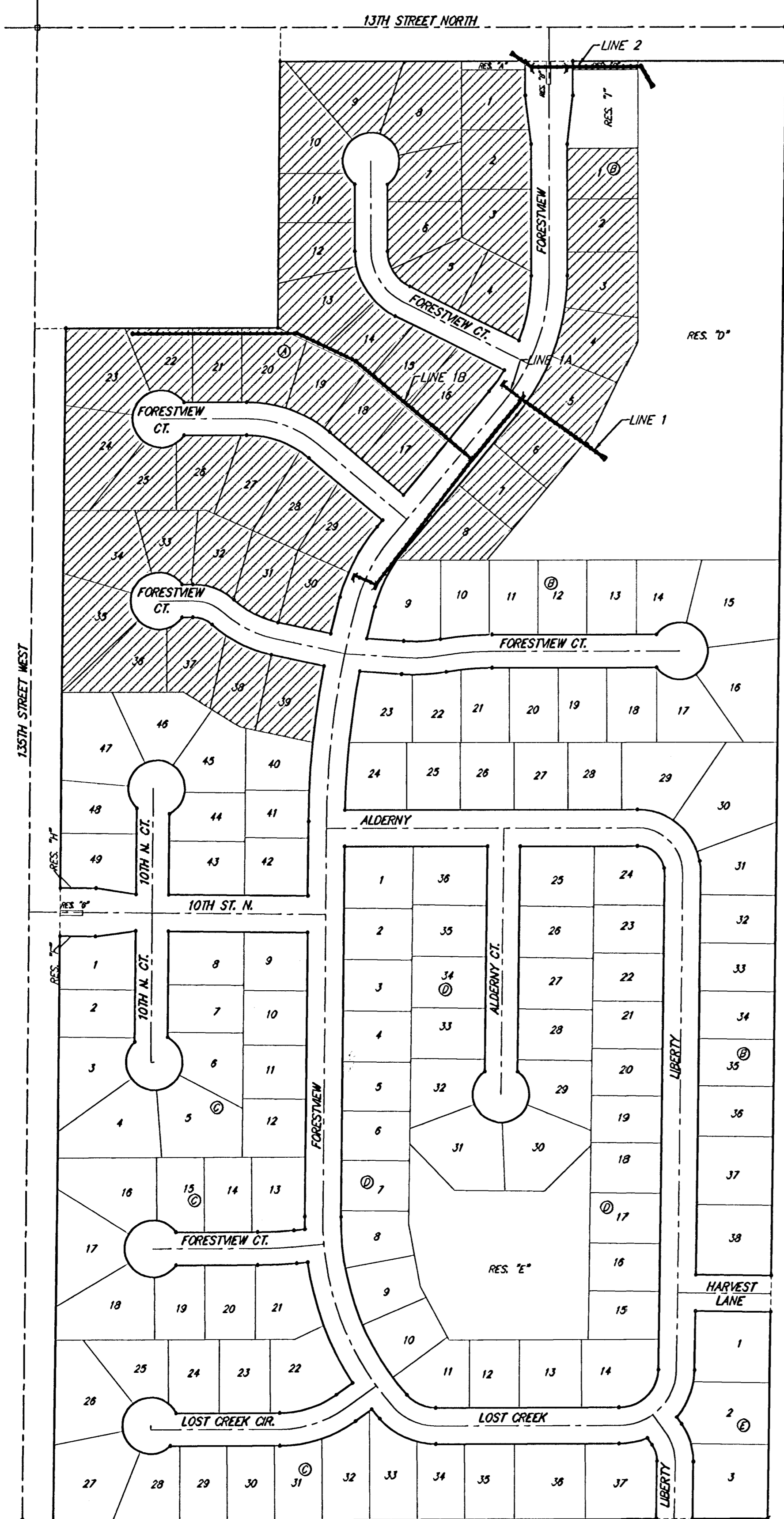
Project Number

**468-83544**

OCA Number

**751326**

BOOKED  
2-13-04  
MCS  
C-757



### GENERAL NOTES

- Contractor will be required to provide notice to utility companies a minimum of twenty-four (24) hours prior to any excavation, as follows:  
 Kansas One-Call 687-2470  
 The Contractor must notify the following in case of an emergency:  
 Cox Communications 262-4270  
 Kansas Gas Service 1-888-482-4950  
 Westar Energy 383-8650  
 Aquila Energy 1-888-482-4950  
 SBC Communication 268-2245  
 City of Wichita Water Dept. 268-4563  
 City of Wichita Sewer Maint. 268-4024  
 City of Wichita Storm Sewer Maint. 268-4090  
 City of Wichita Traffic Maint. 268-4034
- 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 or unless the plans specifically identify a utility to be adjusted by its owner during construction. Existing utilities and their location, as shown on the plans, represent the best information obtainable for design. The Contractor will be required to work around existing utilities within the right-of-way which do not conflict with proposed construction.
- Trees and shrubs in public right-of-way which are in direct conflict with proposed new construction shall be removed by the Contractor with the Engineer's approval. Trees and shrubs which are not in direct conflict with proposed new construction shall be saved and protected from damage.
- The Contractor shall give all property owners and/or tenants of developed property abutting the construction of this project a minimum of ten (10) days advance notice prior to start of construction.
- 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.

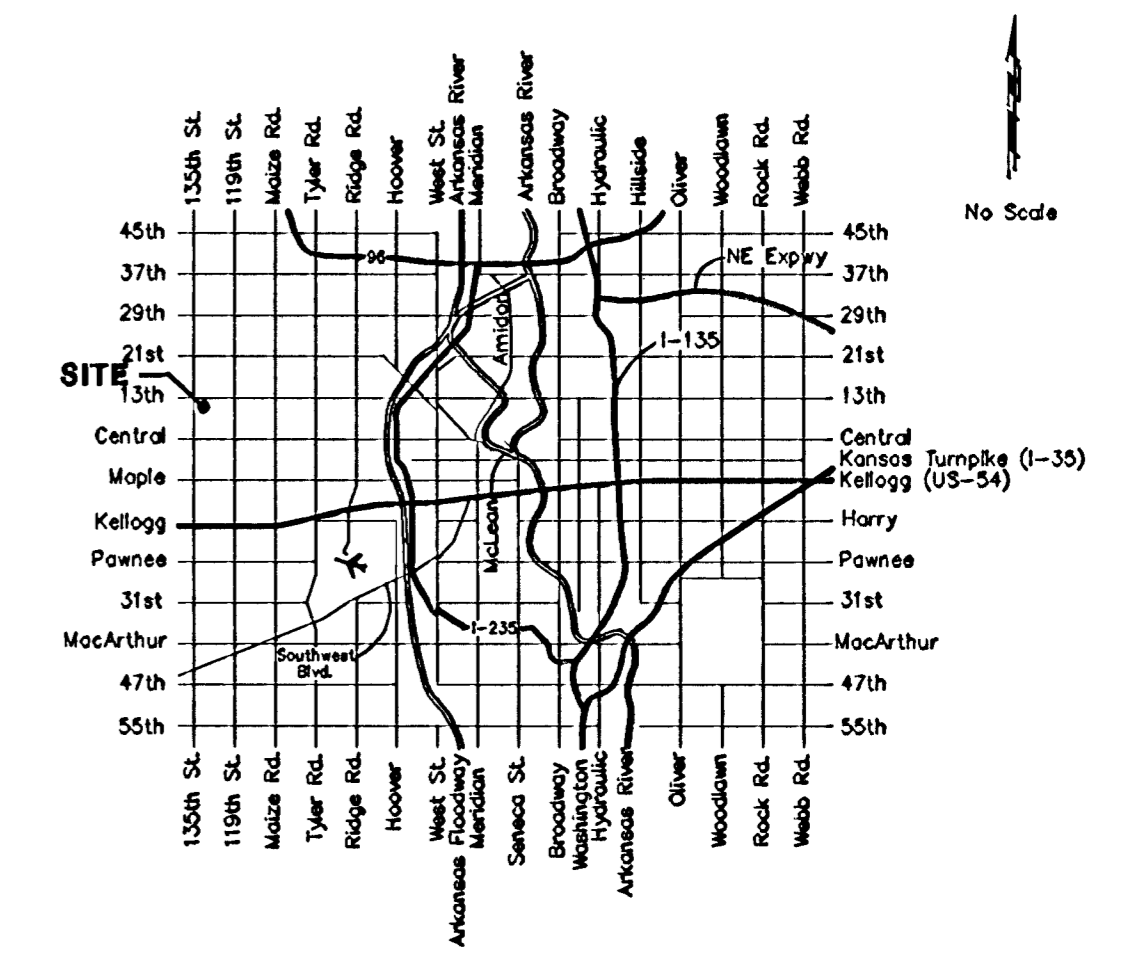


### BENCHMARKS

- BM #1: C.O.W. benchmark disk. 56' E and 55' N of CL 135th St. W & 13th St. N.  
 Elev. = 167.83 (City Datum)
- BM #2: 60D nail in HLP, 800' W & 31' N of the NE cor., NW1/4, Sec. 13, T-27-S, R-2-W.  
 Elev. = 162.68 (City Datum)

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Vicinity Map

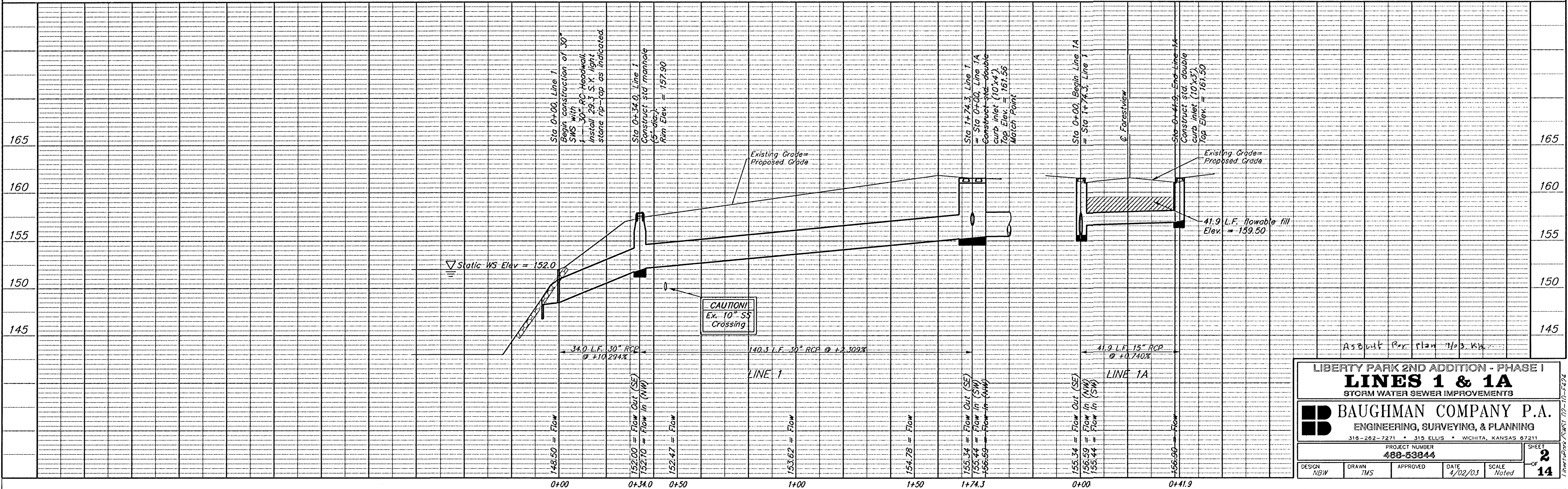
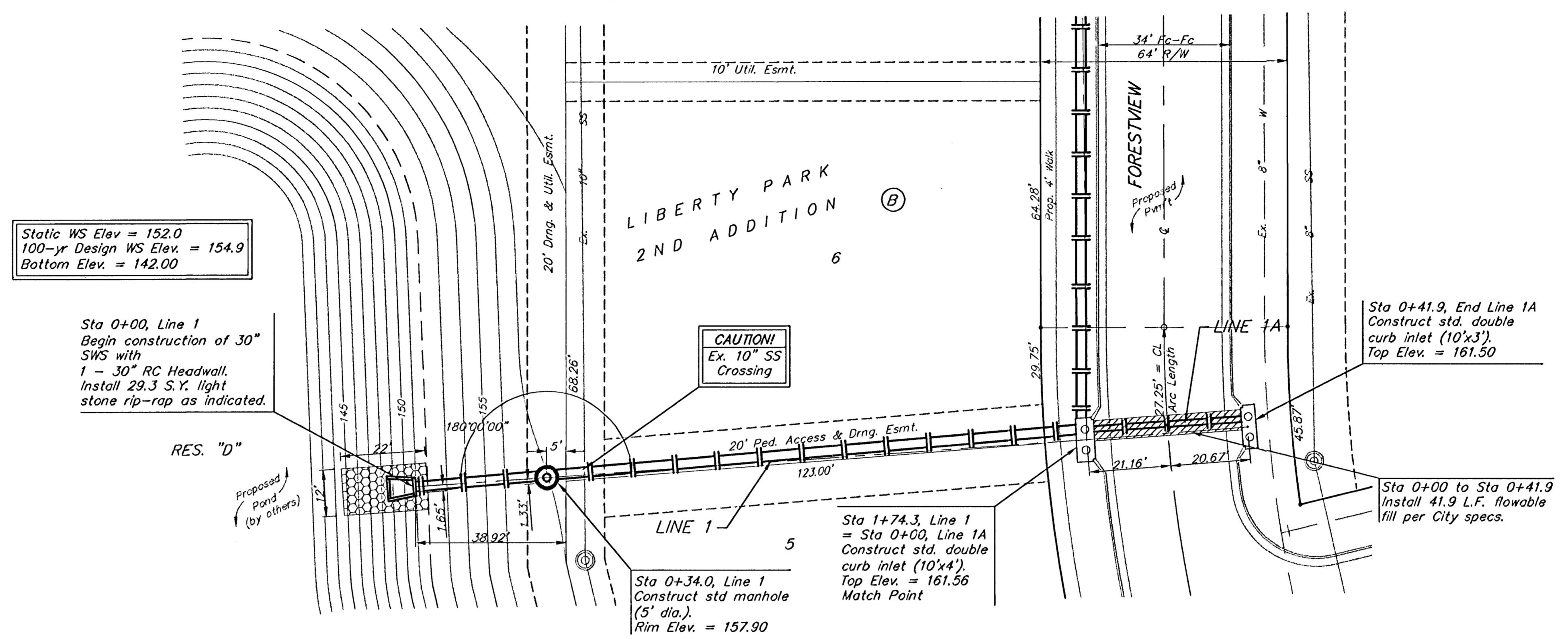


As Built Per Plan 9/03 KW

**BENCHMARKS:**  
 BM #1: C.O.W. benchmark disk  
 56' E and 55' N of CL 135th  
 St. W. & 13th St. N.  
 Elev. = 167.83 (City Datum)

BM #2: 600 nail in HLP, 800'  
 W & 31' N of the NE cor.,  
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 R-2-W.  
 Elev. = 162.68 (City Datum)

Scale: 1" = 20' Horizontal  
 1" = 5' Vertical  
 • = Iron



LIBERTY PARK 2ND ADDITION - PHASE I  
**LINES 1 & 1A**  
 STORM WATER SEWER IMPROVEMENTS

**BAUGHMAN COMPANY P.A.**  
 ENGINEERING, SURVEYING, & PLANNING  
 316-262-7271 • 319 ELLIS • WICHITA, KANSAS 67211

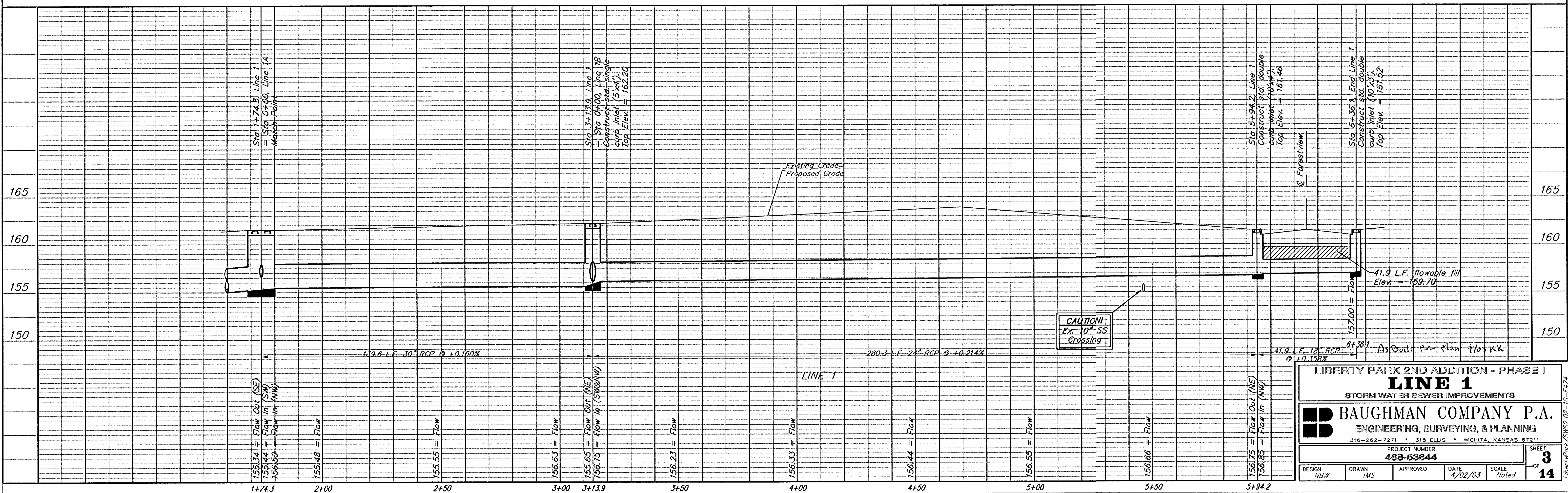
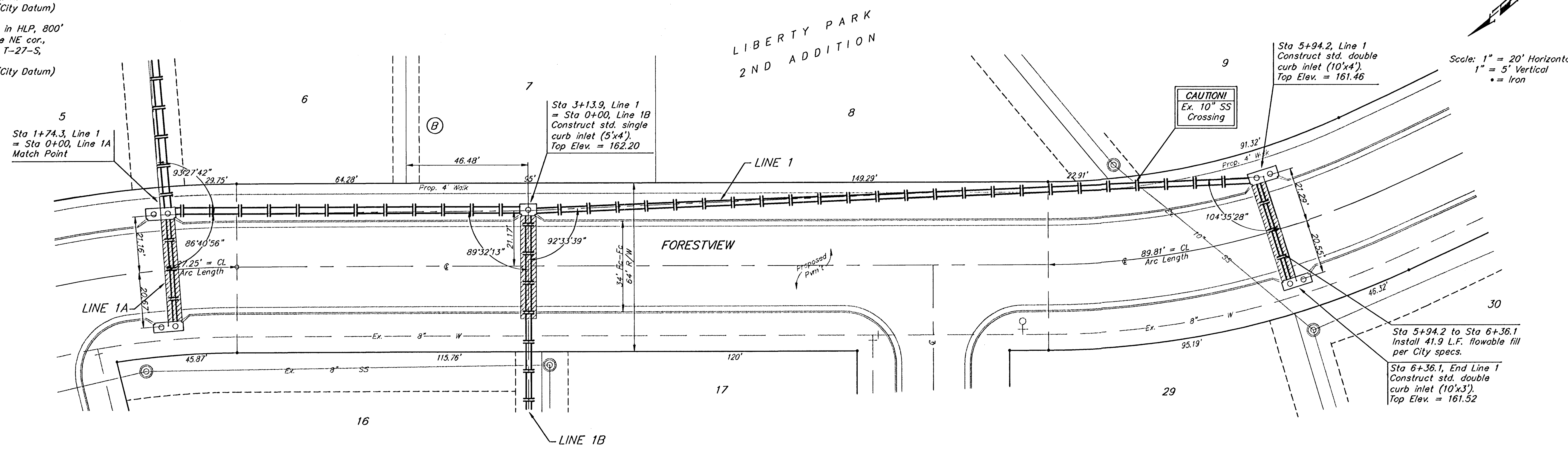
PROJECT NUMBER  
**488-53844**

DESIGN: NBW | DRAWN: TMS | APPROVED: [Signature] | DATE: 4/02/03 | SCALE: Noted

SHEET **2** OF **14**

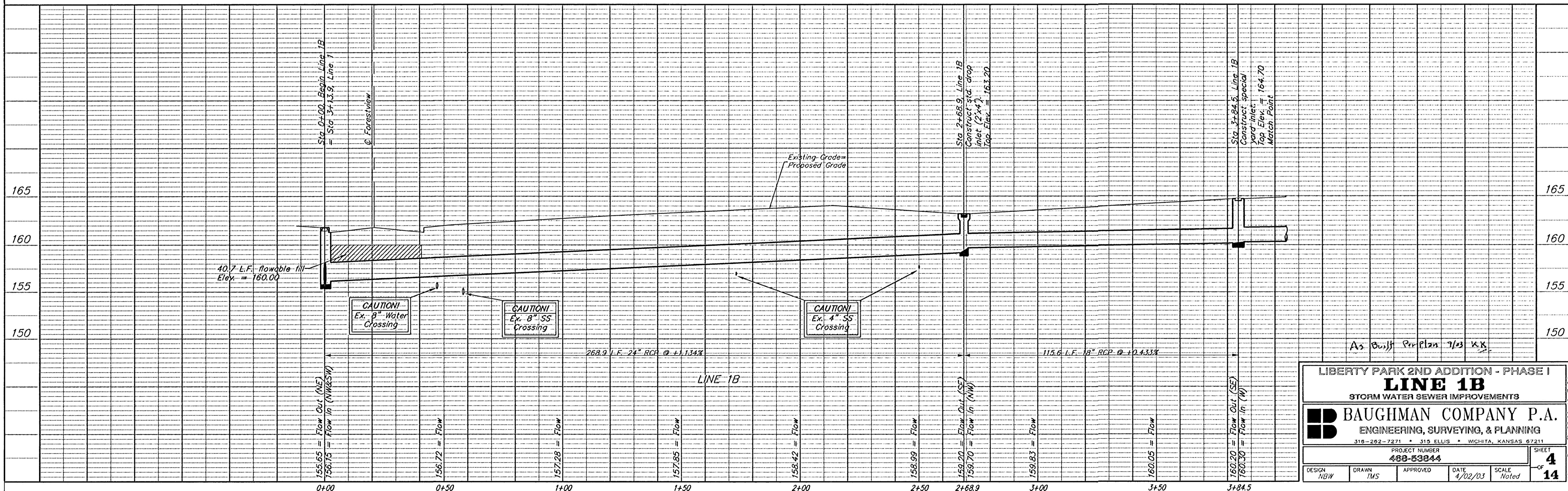
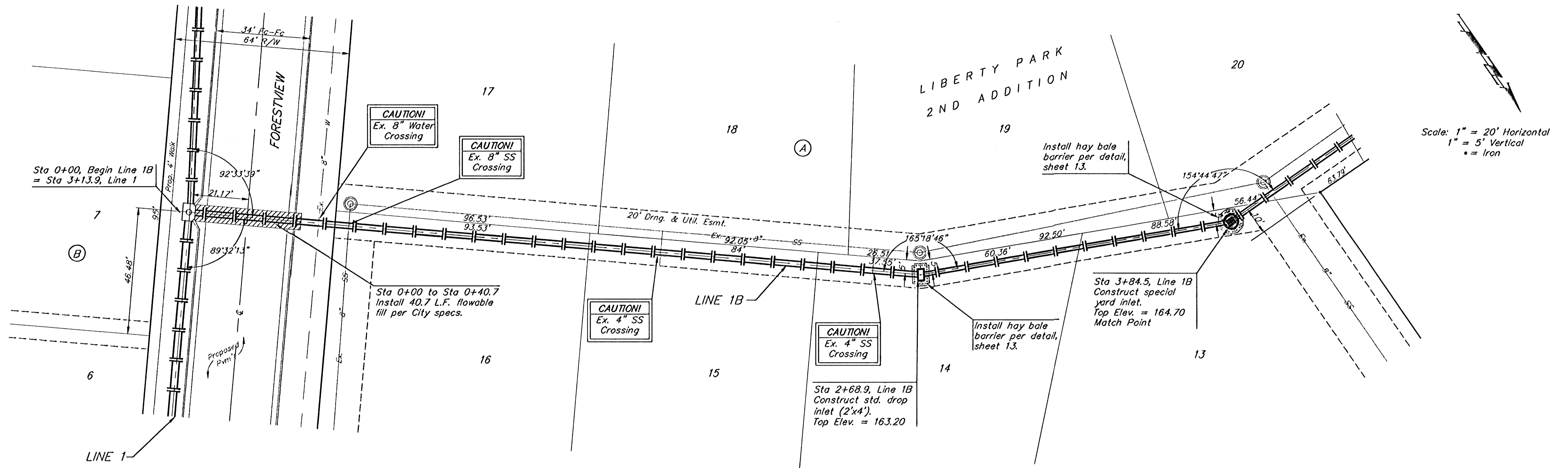
**BENCHMARKS:**  
 BM #1: C.O.W. benchmark disk  
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 St. W. & 13th St. N.  
 Elev. = 167.83 (City Datum)

BM #2: 60D nail in HLP, 800'  
 W & 31' N of the NE cor.,  
 NW1/4, Sec. 13, T-27-S,  
 R-2-W.  
 Elev. = 162.68 (City Datum)



**BENCHMARKS:**  
 BM #1: C.O.W. benchmark disk  
 56' E and 55' N of CL 135th  
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BM #2: 60D nail in HLP, 800'  
 W & 31' N of the NE cor.,  
 NW1/4, Sec. 13, T-27-S,  
 R-2-W.  
 Elev. = 162.68 (City Datum)



As Built Per Plan 7/23 K.S.

LIBERTY PARK 2ND ADDITION - PHASE I  
**LINE 1B**  
 STORM WATER SEWER IMPROVEMENTS

**BAUGHMAN COMPANY P.A.**  
 ENGINEERING, SURVEYING, & PLANNING  
 316-262-7271 • 315 ELLIS • WICHITA, KANSAS 67211

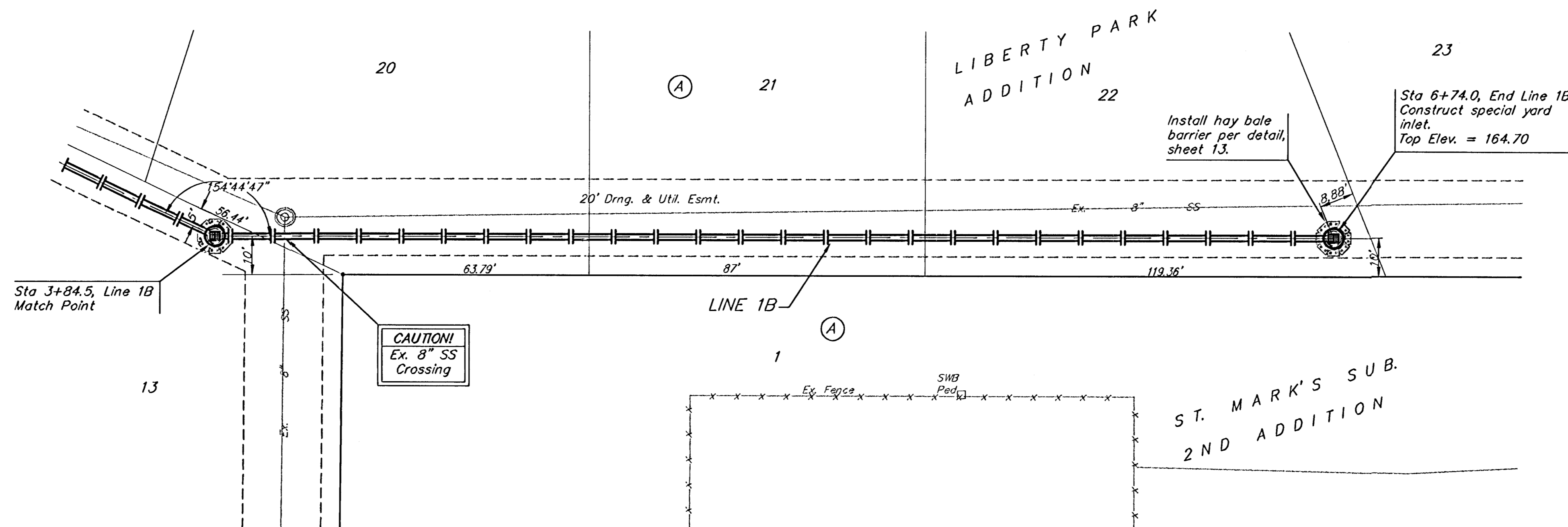
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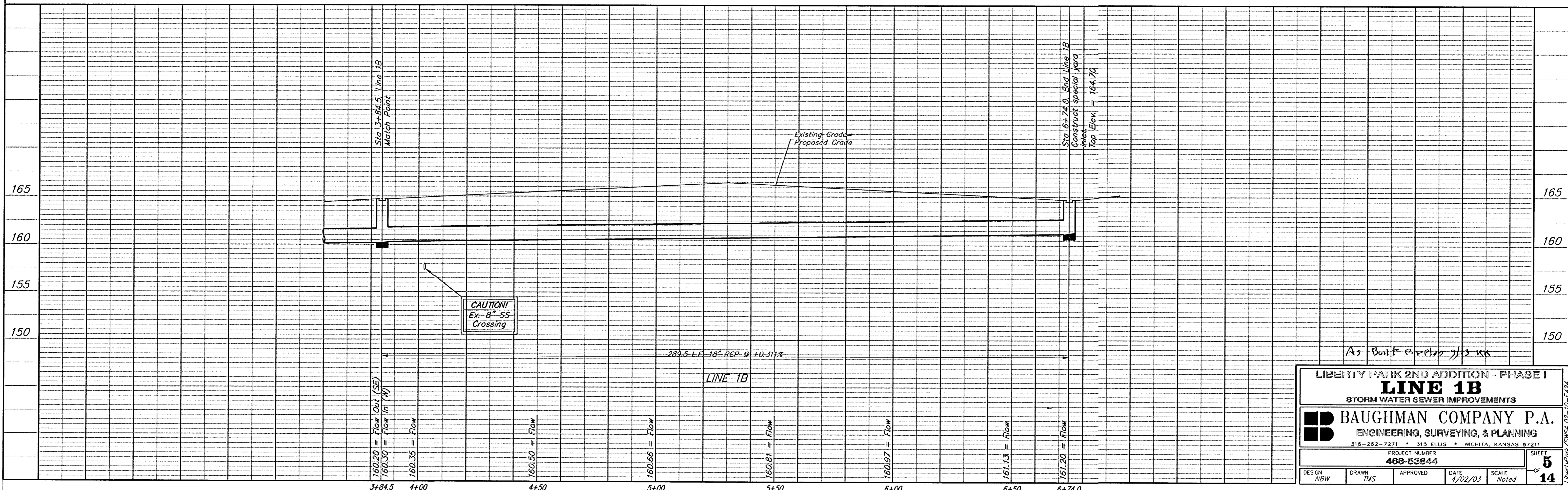
SHEET  
**4**  
 OF  
**14**

**BENCHMARKS:**  
 BM #1: C.O.W. benchmark disk.  
 56' E and 55' N of CL 135th  
 St. W. & 13th St. N.  
 Elev. = 167.83 (City Datum)

BM #2: 60D nail in HLP, 800'  
 W & 31' N of the NE cor.,  
 NW1/4, Sec. 13, T-27-S,  
 R-2-W.  
 Elev. = 162.68 (City Datum)



Scale: 1" = 20' Horizontal  
 1" = 5' Vertical  
 • = Iron



LIBERTY PARK 2ND ADDITION - PHASE I  
**LINE 1B**  
 STORM WATER SEWER IMPROVEMENTS

**BAUGHMAN COMPANY P.A.**  
 ENGINEERING, SURVEYING, & PLANNING  
 318-282-7271 • 315 ELLIS • WICHITA, KANSAS 67211

PROJECT NUMBER  
**488-53844**

DESIGN NBW	DRAWN TMS	APPROVED	DATE 4/02/03	SCALE Noted
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SHEET **5** OF **14**

BENCHMARKS:  
 BM #1: C.O.W. benchmark disk  
 56' E and 55' N of CL 135th  
 St. W. & 13th St. N.  
 Elev. = 167.83 (City Datum)

BM #2: 600 nail in HLP, 800'  
 W & 31' N of the NE cor.,  
 NW1/4, Sec. 13, T-27-S,  
 R-2-W.  
 Elev. = 162.68 (City Datum)

Ditch 500' south to  
 ensure positive  
 drainage.

Sta 0+00, Line 2  
 Begin construction of 36"  
 RCP w/end section.  
 Install 40 S.Y. light stone  
 rip-rap as indicated.

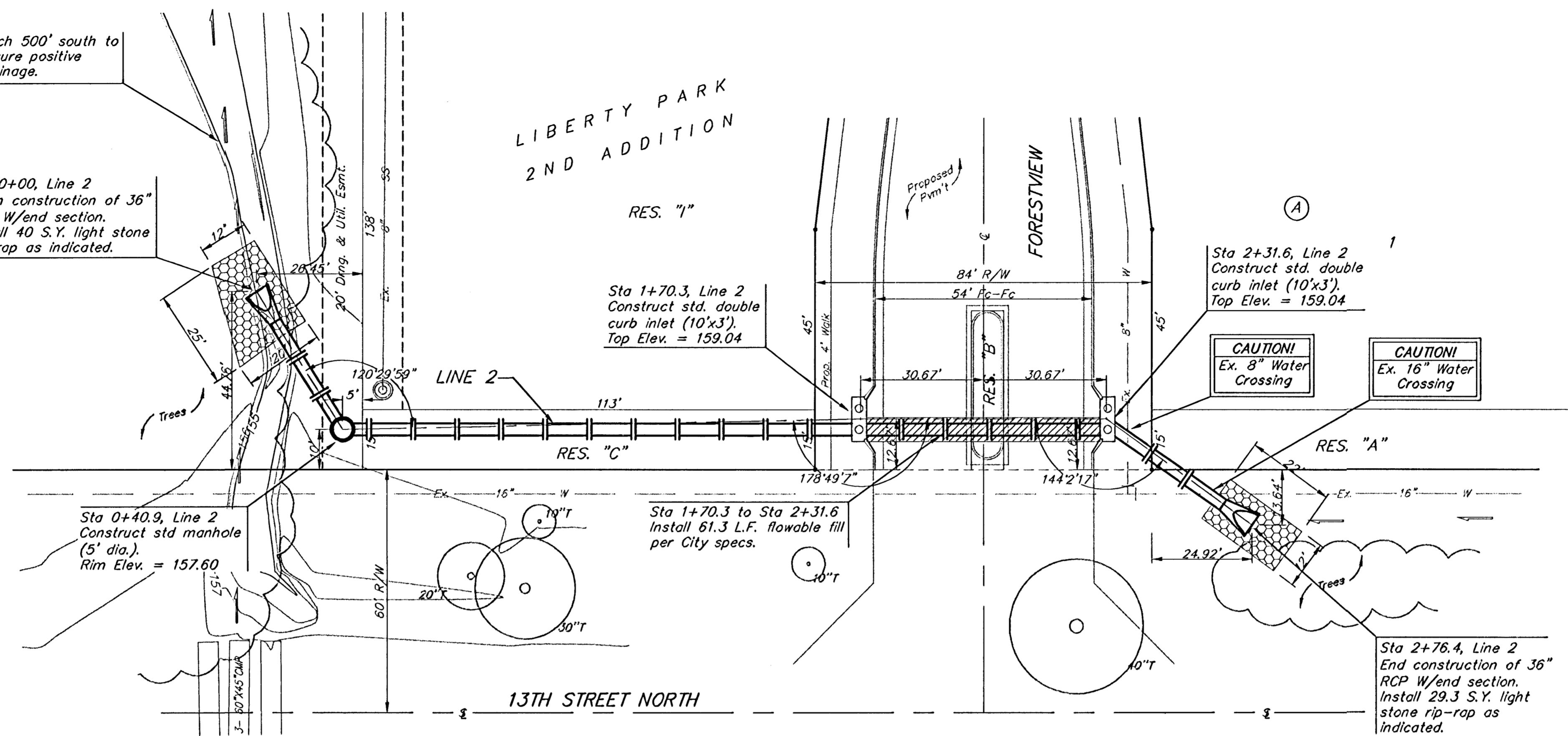
Sta 0+40.9, Line 2  
 Construct std manhole  
 (5' dia.)  
 Rim Elev. = 157.60

Sta 1+70.3, Line 2  
 Construct std. double  
 curb inlet (10'x3')  
 Top Elev. = 159.04

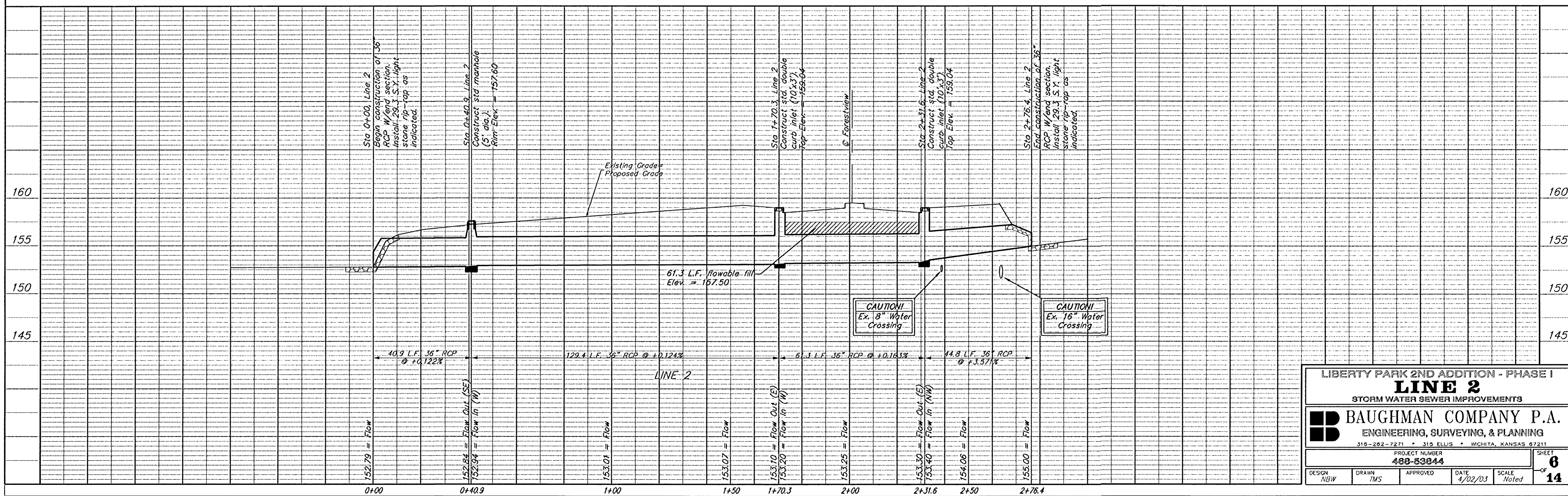
Sta 1+70.3 to Sta 2+31.6  
 Install 61.3 L.F. flowable fill  
 per City specs.

Sta 2+31.6, Line 2  
 Construct std. double  
 curb inlet (10'x3')  
 Top Elev. = 159.04

Sta 2+76.4, Line 2  
 End construction of 36"  
 RCP w/end section.  
 Install 29.3 S.Y. light  
 stone rip-rap as  
 indicated.



Scale: 1" = 20' Horizontal  
 1" = 5' Vertical  
 • = Iron



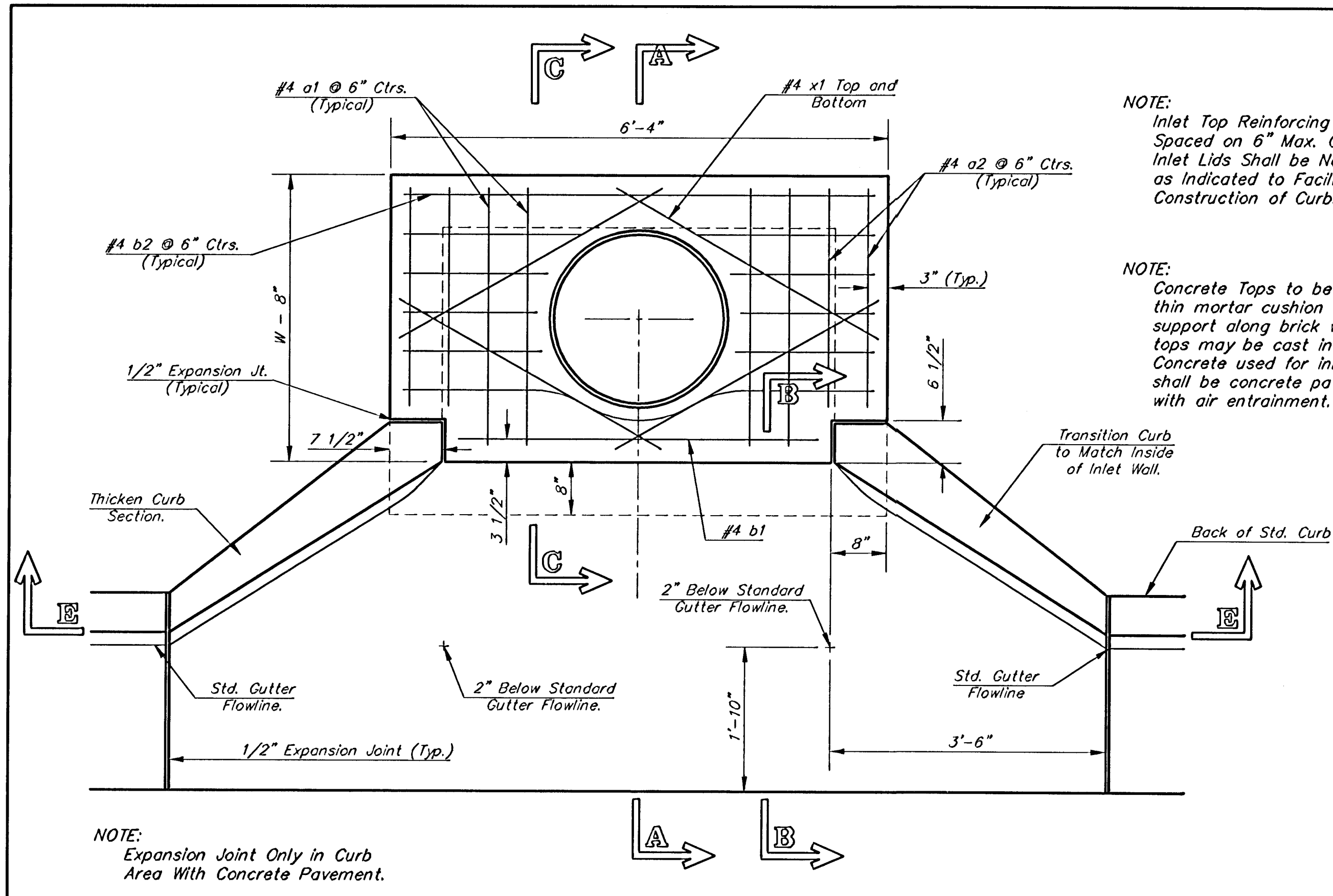
LIBERTY PARK 2ND ADDITION - PHASE I  
**LINE 2**  
 STORM WATER SEWER IMPROVEMENTS

**BAUGHMAN COMPANY P.A.**  
 ENGINEERING, SURVEYING, & PLANNING  
 316-282-7271 • 315 ELLIS • WICHITA, KANSAS 67211

PROJECT NUMBER  
**488-53844**

DESIGN: NBW DRAWN: TMS APPROVED: DATE: 4/02/03 SCALE: Noted

SHEET **6** OF **14**

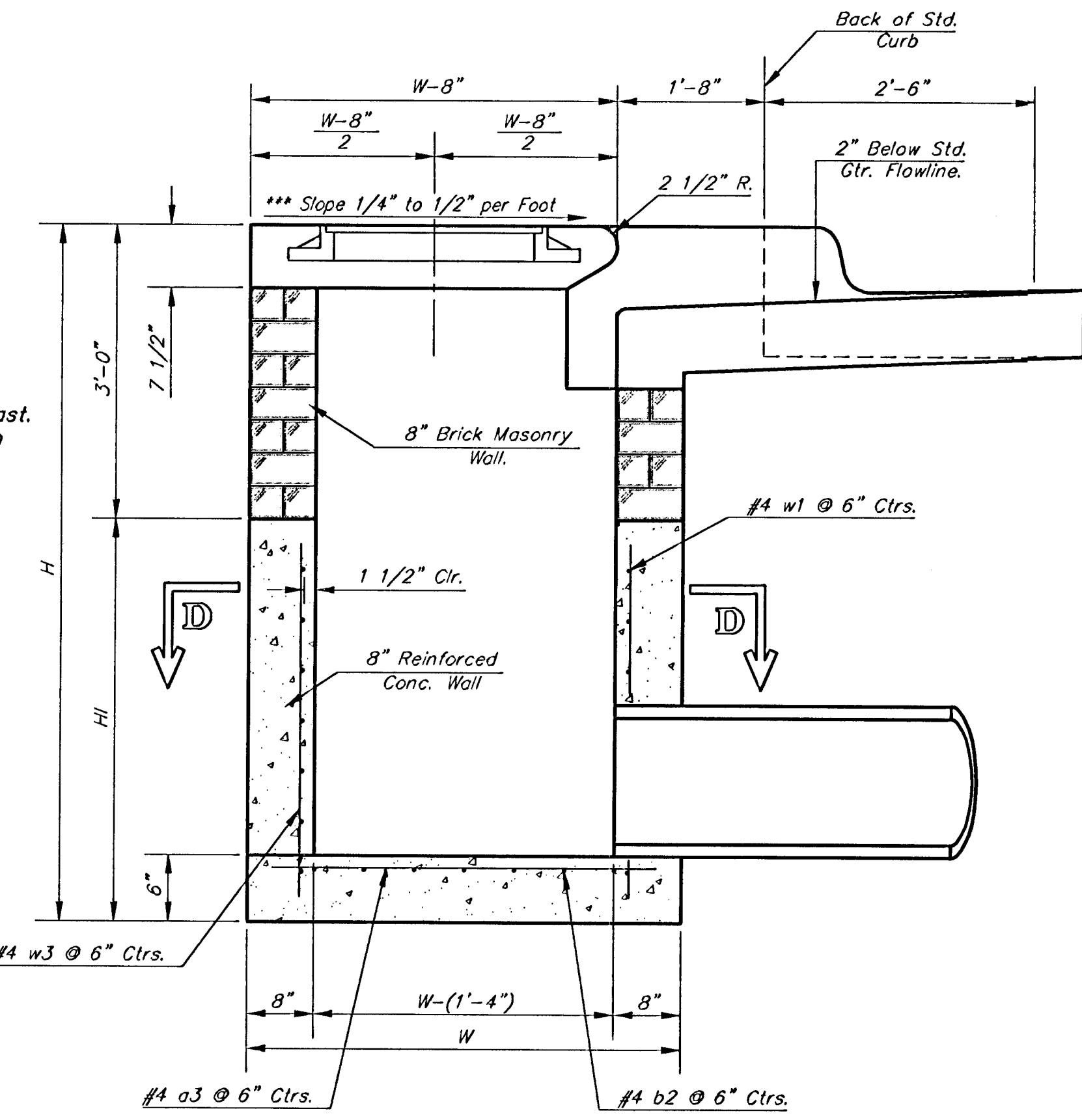


NOTE: Inlet Top Reinforcing shall be Spaced on 6" Max. Centers. Inlet Lids Shall be Notched Out as Indicated to Facilitate Construction of Curb.

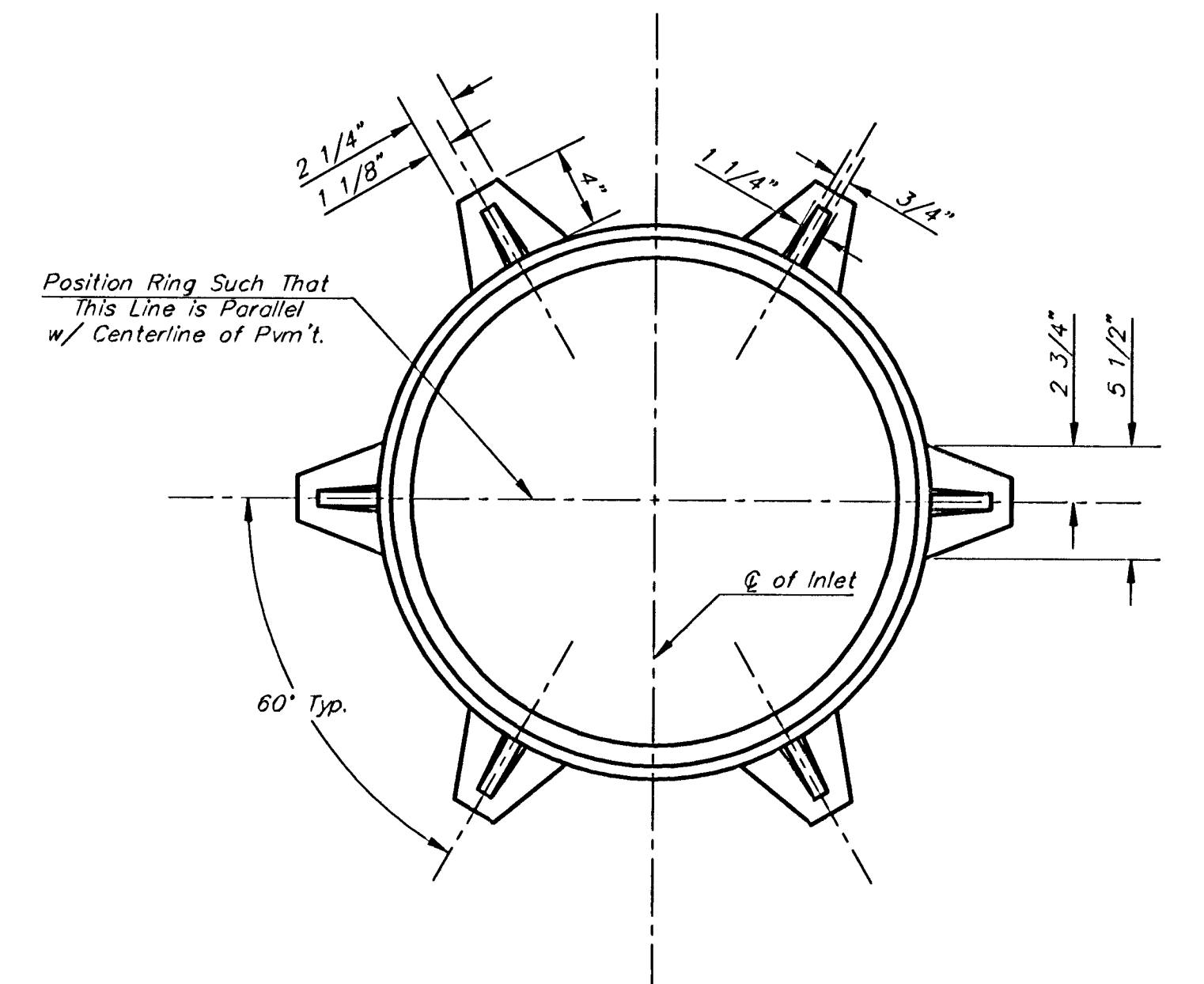
NOTE: Concrete Tops to be installed on thin mortar cushion to insure full support along brick walls. Concrete tops may be cast in place or precast. Concrete used for inlet construction shall be concrete pavement mix with air entrainment.

NOTE: Expansion Joint Only in Curb Area With Concrete Pavement.

PLAN

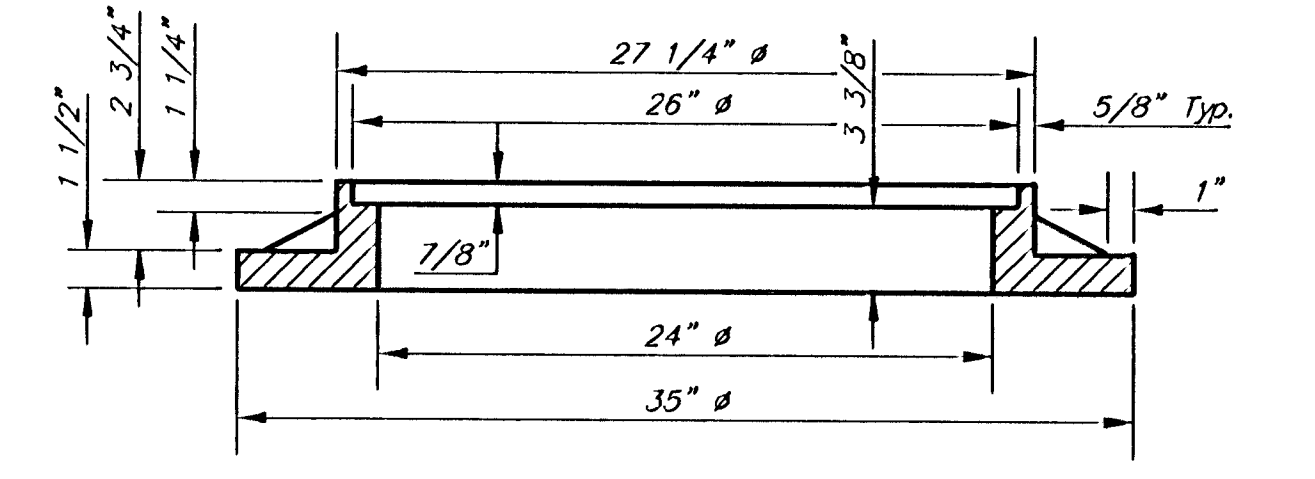


SECTION A-A  
 \*\*\*NOTE: Slope of Inlet tops to Match Sidewalk or Parking Slopes within Limits Indicated.

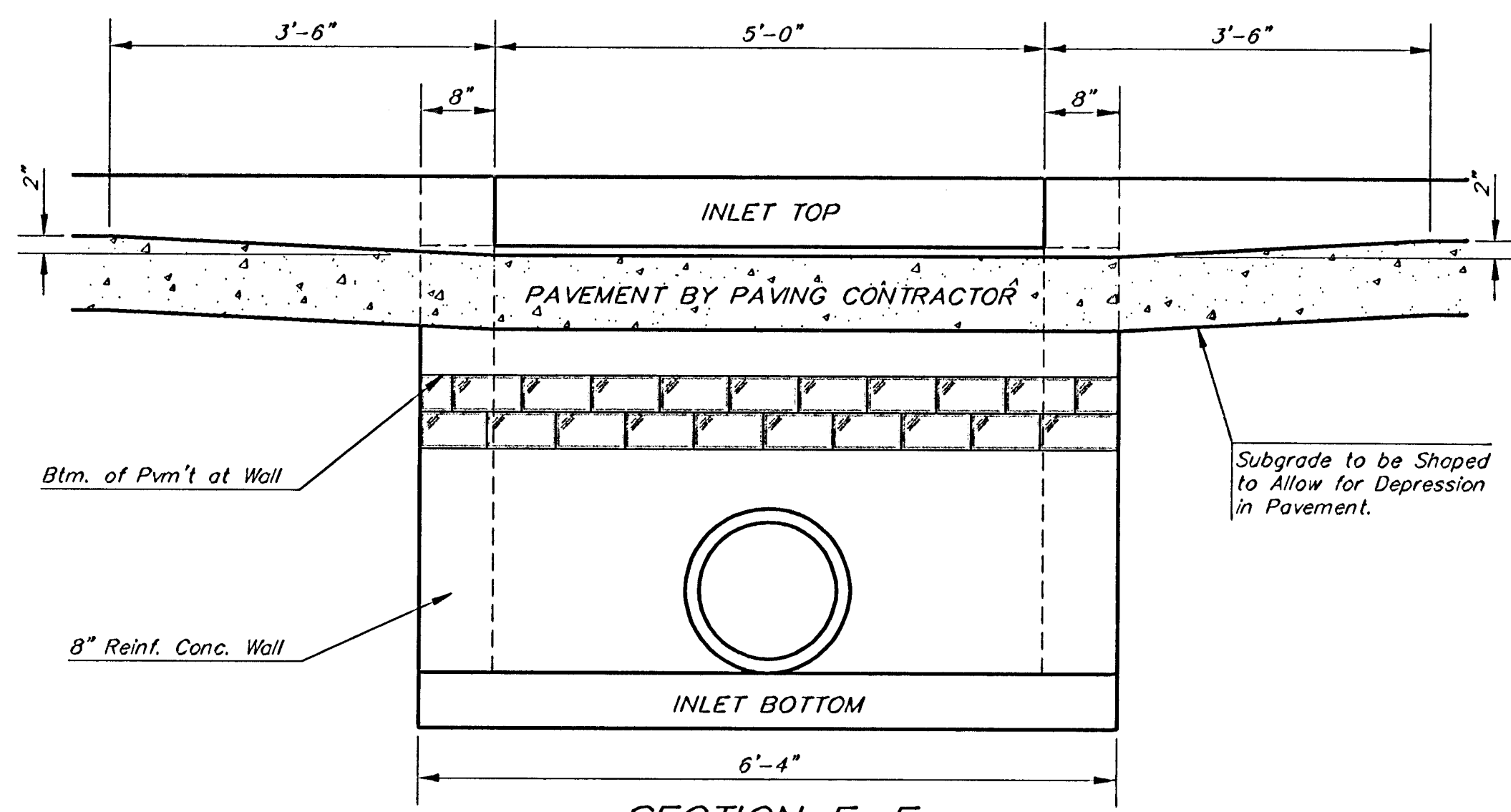


MANHOLE RING AND COVER  
 Weight = 180 Lbs.

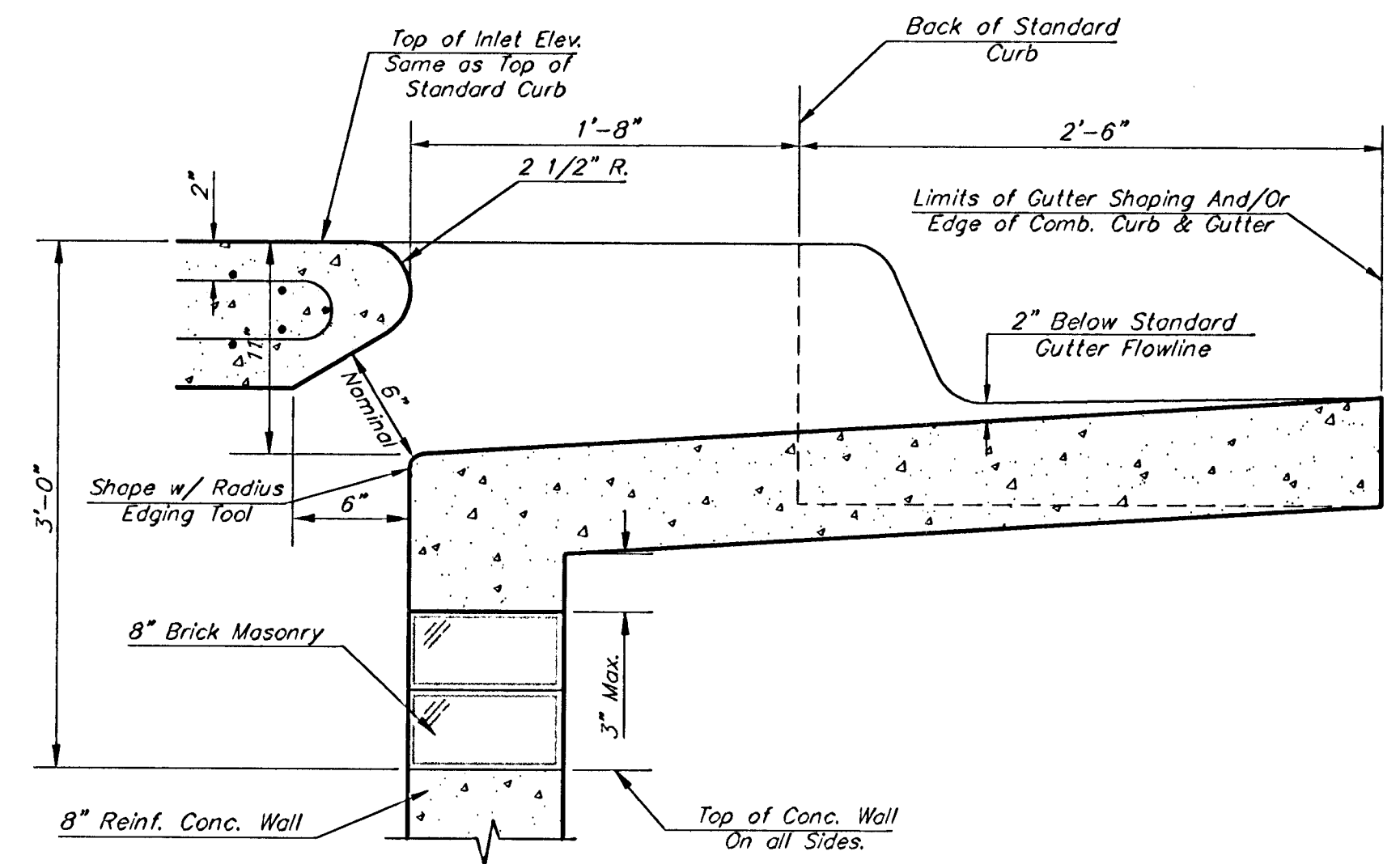
\*See City of Wichita Standard Manhole Ring and Cover Detail Sheet for Cover Details to Be Used With Inlet Frame.



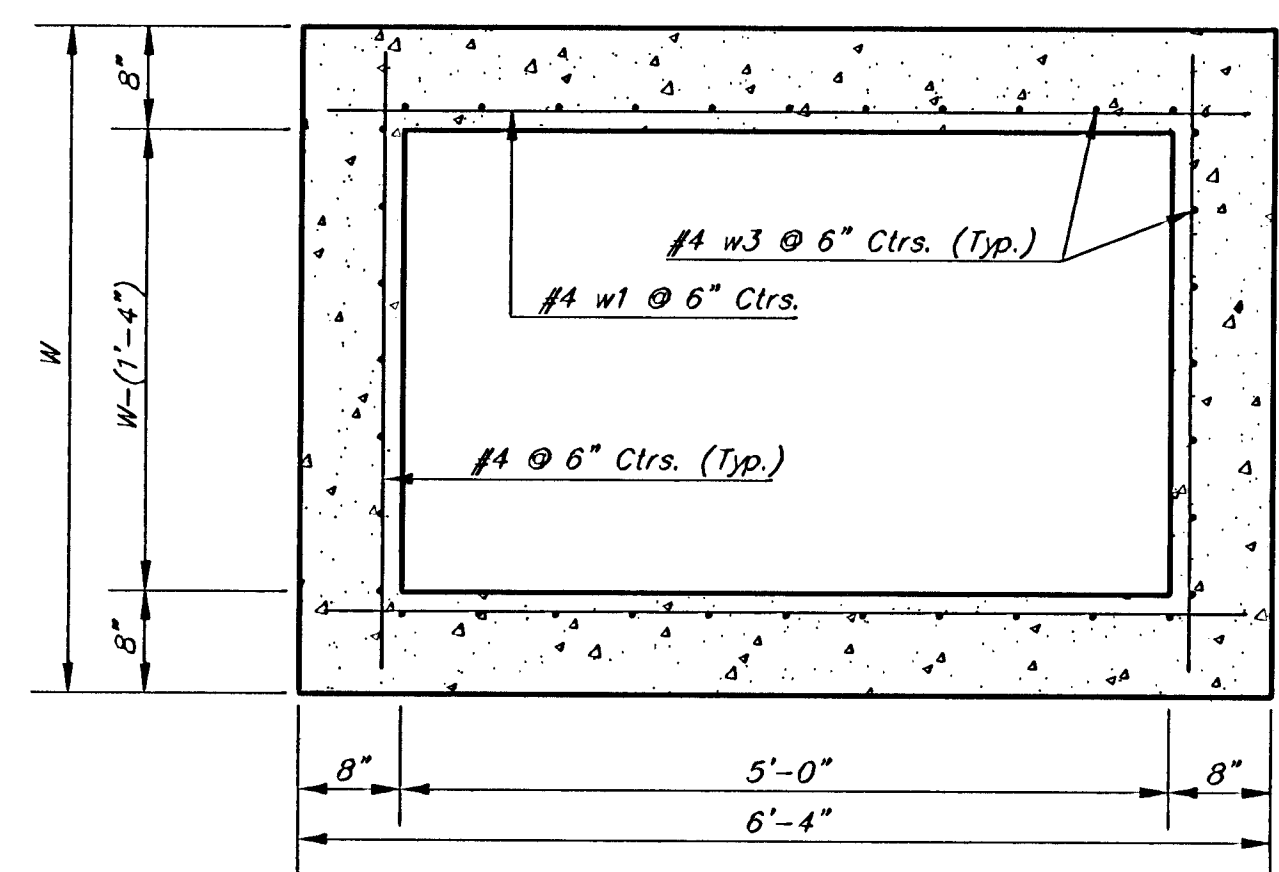
SECTION C-C



SECTION E-E



SECTION B-B



SECTION D-D

NOTE: Contractor shall have the option of constructing 8" brick masonry walls between the concrete inlet base and top on this inlet when W=6'-4" and H=7'-0" or less.

Additional curb and gutter construction necessary to connect set-back inlet to pavement will be paid for at the unit price bid for each inlet hookup.

Inlet invert shall be shaped with 8 sack sand mix concrete to create flow channels and to increase hydraulic efficiency such that the inlet will be self-cleaning between all inlet and/or outlet pipes.

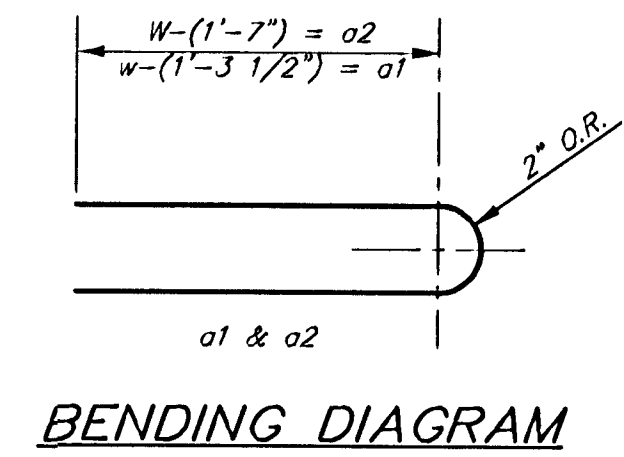
The ends of all pipes installed in inlets shall be cut off flush with the inside face of the inlet wall

PRECAST SLAB AND FLOOR REINFORCING											
MARK	SIZE	W = 4'-4"		W = 5'-4"		W = 6'-4"		W = 7'-4"		W = 8'-4"	
		NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH
* a1	#4	6	6'-7"	6	8'-7"	6	10'-7"	6	12'-7"	6	14'-7"
a2	#4	4	6'-0"	4	8'-0"	4	10'-0"	4	12'-0"	4	14'-0"
a3	#4	13	4'-1"	13	5'-1"	13	6'-1"	13	7'-1"	13	8'-1"
b1	#4	1	4'-9"	1	4'-9"	1	4'-9"	1	4'-9"	1	4'-9"
* b2	#4	23	6'-1"	29	6'-1"	35	6'-1"	41	6'-1"	47	6'-1"
x1	#4	8	3'-10"	8	4'-2"	8	4'-5"	8	4'-10"	8	5'-2"

WALL REINFORCING											
MARK	SIZE	W = 4'-4"		W = 5'-4"		W = 6'-4"		W = 7'-4"		W = 8'-4"	
		NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH
w1	#4	①	6'-1"	①	6'-1"	①	6'-1"	①	6'-1"	①	6'-1"
w2	#4	①	4'-1"	①	5'-1"	①	6'-1"	①	7'-1"	①	8'-1"
w3	#4	32	②	36	②	40	②	44	②	48	②

\* Field Bend or Cut Reinforcing as Required for Clearance.  
 ① 4 (H1 - 12") (H1 - 21") Rounded down to nearest 0.5'  
 ② H1 - 3"



BENDING DIAGRAM

STANDARD CURB INLET PRECAST TOPS			
W	PRE-CAST TOP SIZE	PIPE SIZE	CU. YD. CONC.
4'-4"	3'-8" x 6'-4" x 7 1/2"	21" & SMALLER	0.38±
5'-4"	4'-8" x 6'-4" x 7 1/2"	24" & 30"	0.51±
6'-4"	5'-8" x 6'-4" x 7 1/2"	36" & 42"	0.64±
7'-4"	6'-8" x 6'-4" x 7 1/2"	48" & 54"	0.77±
8'-4"	7'-8" x 6'-4" x 7 1/2"	60" & 66"	0.90±

Revised - Feb. 16, 1989

CITY OF WICHITA STANDARD TYPE 1A  
**Curb Inlet Details**  
 INLET OPENING = 8" X 5'-0"

**BAUGHMAN COMPANY P.A.**  
 ENGINEERING, SURVEYING, & PLANNING  
 316-262-7271 • 315 ELLIS • WICHITA, KANSAS 67221

PROJECT NUMBER  
**488-83544**

DESIGN: G.O.W. DRAWN: Staff APPROVED: DATE: 4/02/03 SCALE: None SHEET: 7 OF 14

PRECAST SLAB AND FLOOR REINFORCING											
MARK	SIZE	W = 4'-4"		W = 5'-4"		W = 6'-4"		W = 7'-4"		W = 8'-4"	
		NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH
a1	#4	13	6'-7"	13	8'-7"	13	10'-7"	13	12'-7"	13	14'-7"
a2	#4	4	6'-0"	4	8'-0"	4	10'-0"	4	12'-0"	4	14'-0"
a3	#4	23	4'-1"	23	5'-1"	23	6'-1"	23	7'-1"	23	8'-1"
b1	#4	1	9'-9"	1	9'-9"	1	9'-9"	1	9'-9"	1	9'-9"
b2	#4	23	11'-1"	29	11'-1"	35	11'-1"	41	11'-1"	47	11'-1"
x1	#4	16	3'-10"	16	4'-2"	16	4'-6"	16	4'-10"	16	5'-2"

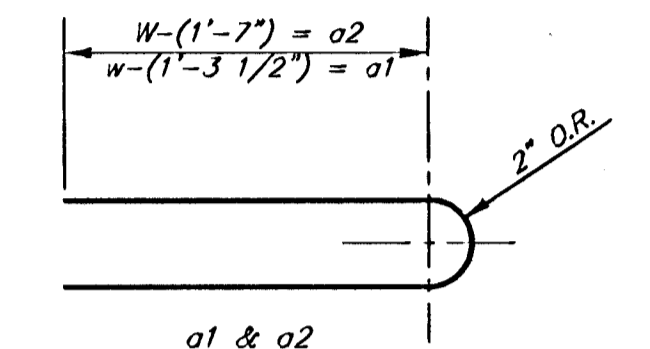
  

WALL REINFORCING											
MARK	SIZE	W = 4'-4"		W = 5'-4"		W = 6'-4"		W = 7'-4"		W = 8'-4"	
		NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH
w1	#4	1	11'-1"	1	11'-1"	1	11'-1"	1	11'-1"	1	11'-1"
w2	#4	1	4'-1"	1	5'-1"	1	6'-1"	1	7'-1"	1	8'-1"
w3	#4	52	2	56	2	60	2	64	2	68	2

\* Field Bend or Cut Reinforcing as Required for Clearance.  
 ① 4 (H - 12") (H - 21") Rounded down to nearest 0.5"  
 ② H - 3"

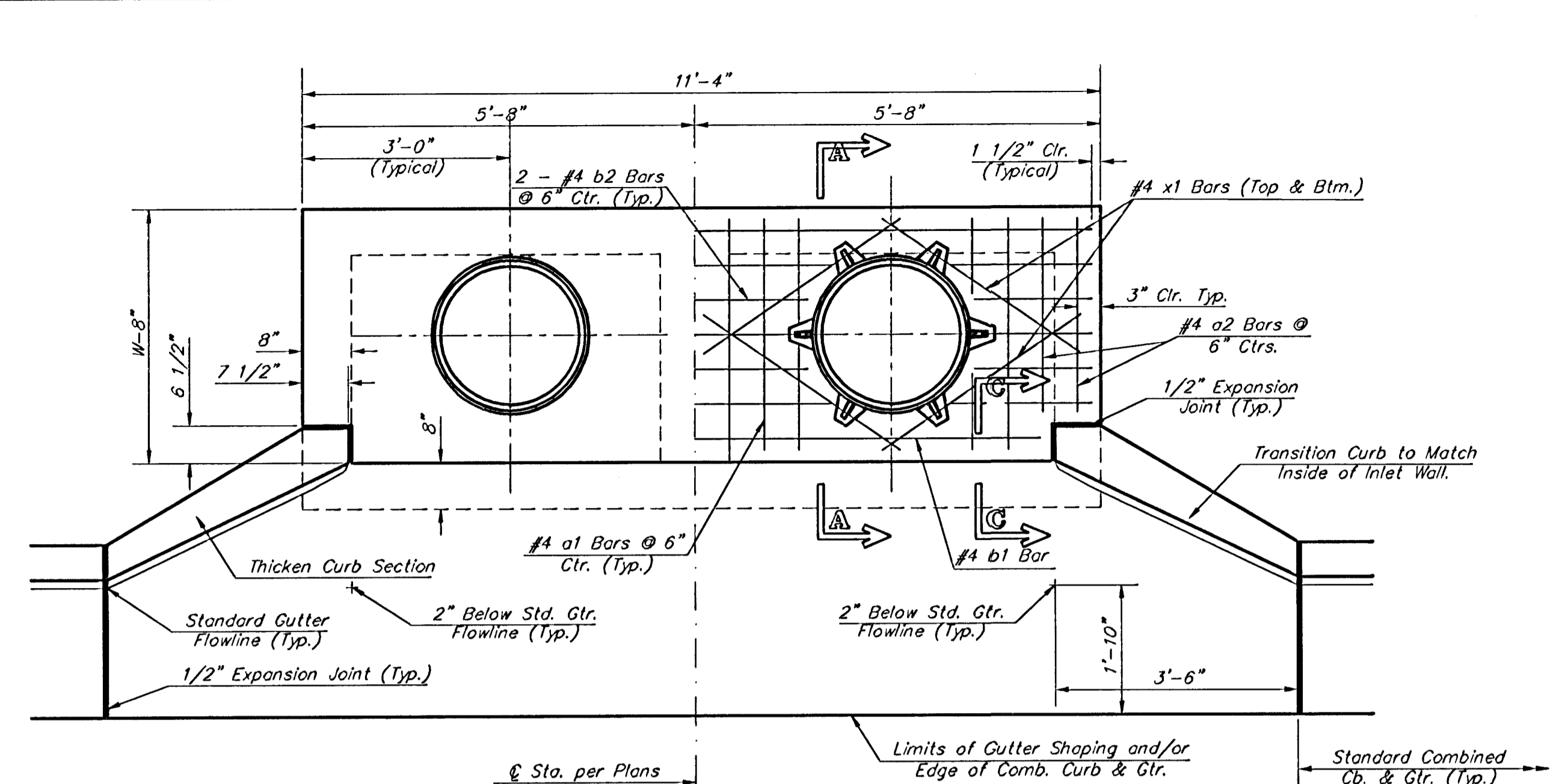
**GENERAL NOTES:**

- The contractor shall be required to construct 8" brick masonry walls between the concrete inlet base and top on this inlet when W=6'-4" or less and H=7'-0" or less. When W is greater than 6'-4" and H is less than 7'-0" the outside inlet walls below the brick stock shall be reinforced concrete construction and the center wall shall be of masonry construction as shown for the masonry wall option.
- Inlet invert shall be shaped with 8 sack sand mix concrete to create flow channels and to increase hydraulic efficiency such that the inlet will be self cleaning between all inlet and/or outlet pipes.
- Concrete tops to be installed on thin mortar cushion to insure full support along brick walls. Concrete tops may be cast in place or precast. Concrete used for inlet construction shall be concrete pavement mix.
- Inlet top reinforcing shall be spaced on 6" max. centers. Inlet lids shall be notched out as indicated to facilitate construction of curb. Bars in inlet top to be field bent or cut to clear manhole ring.
- The ends of all pipes installed in inlets shall be cut off flush with the inside face of the inlet wall.



**BENDING DIAGRAM**

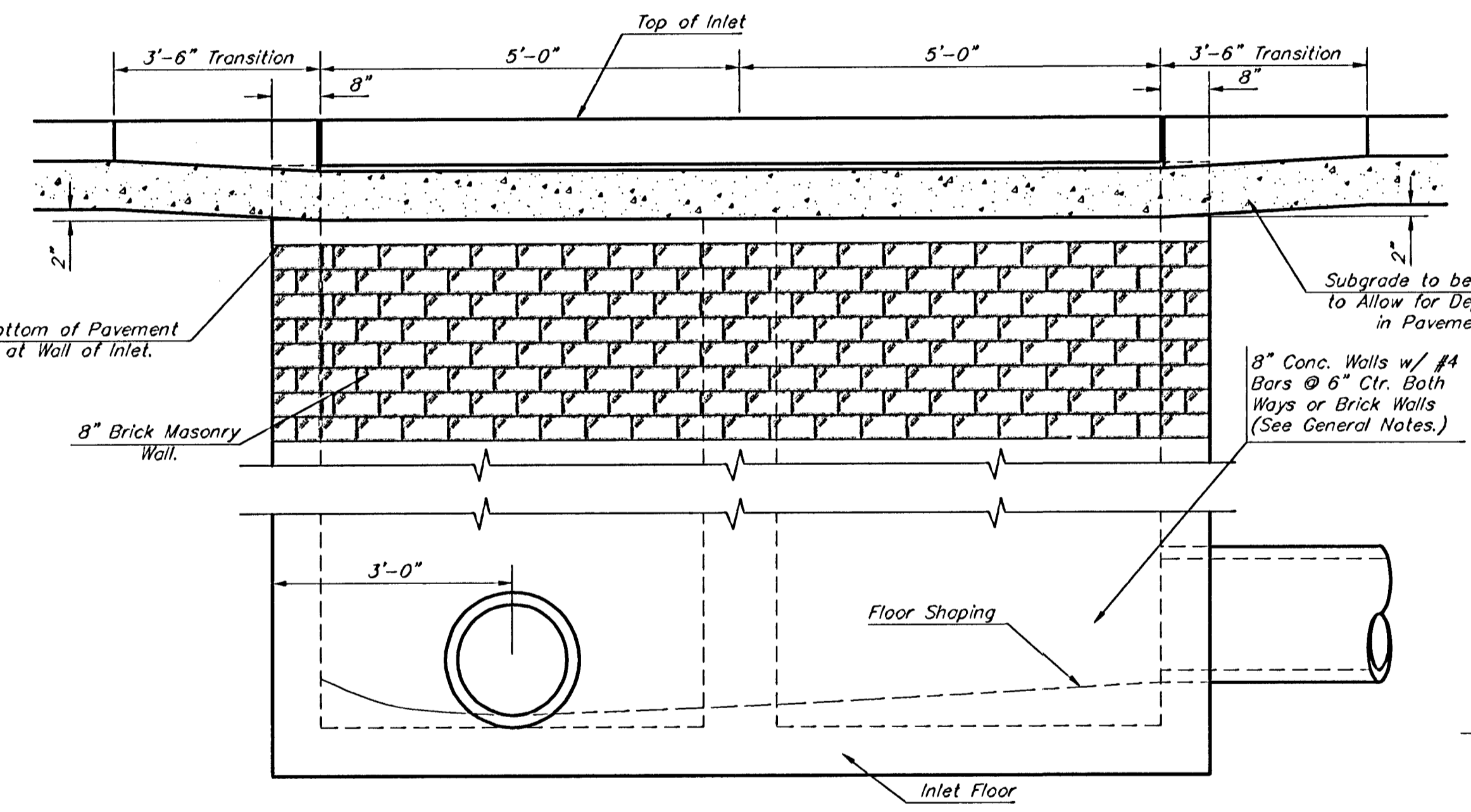
STANDARD CURB INLET PRECAST TOPS			
W	PRE-CAST TOP SIZE	PIPE SIZE	CU. YD. CONC.
4'-4"	3'-8" 11'-4" 7 1/2"	21" & SMALLER	0.83±
5'-4"	4'-8" 11'-4" 7 1/2"	24" & 30"	1.09±
6'-4"	5'-8" 11'-4" 7 1/2"	36" & 42"	1.35±
7'-4"	6'-8" 11'-4" 7 1/2"	48" & 54"	1.61±
8'-4"	7'-8" 11'-4" 7 1/2"	60" & 66"	1.87±



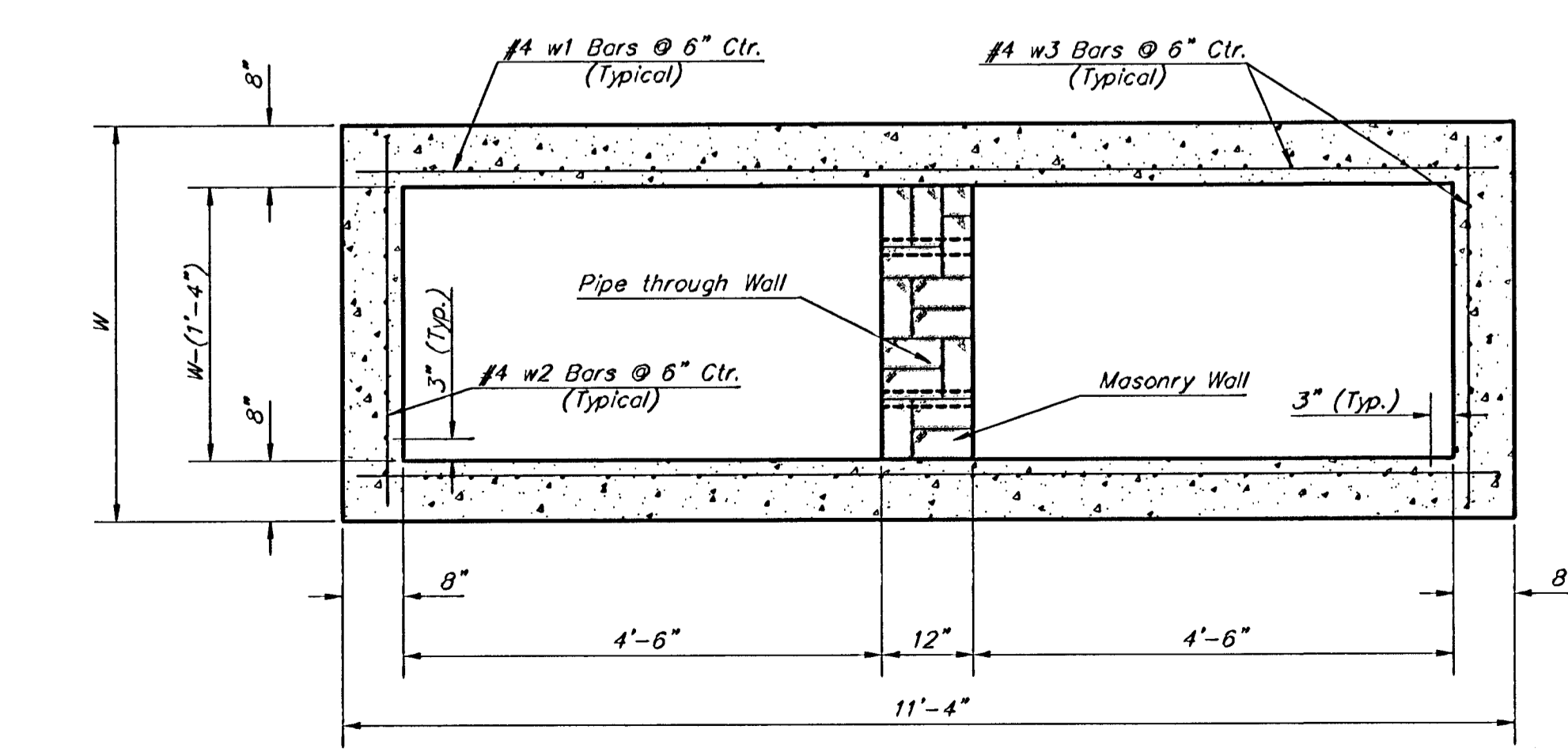
NOTE:  
Expansion Joint Only in Curb Area with Concrete Pavement.

**PLAN**

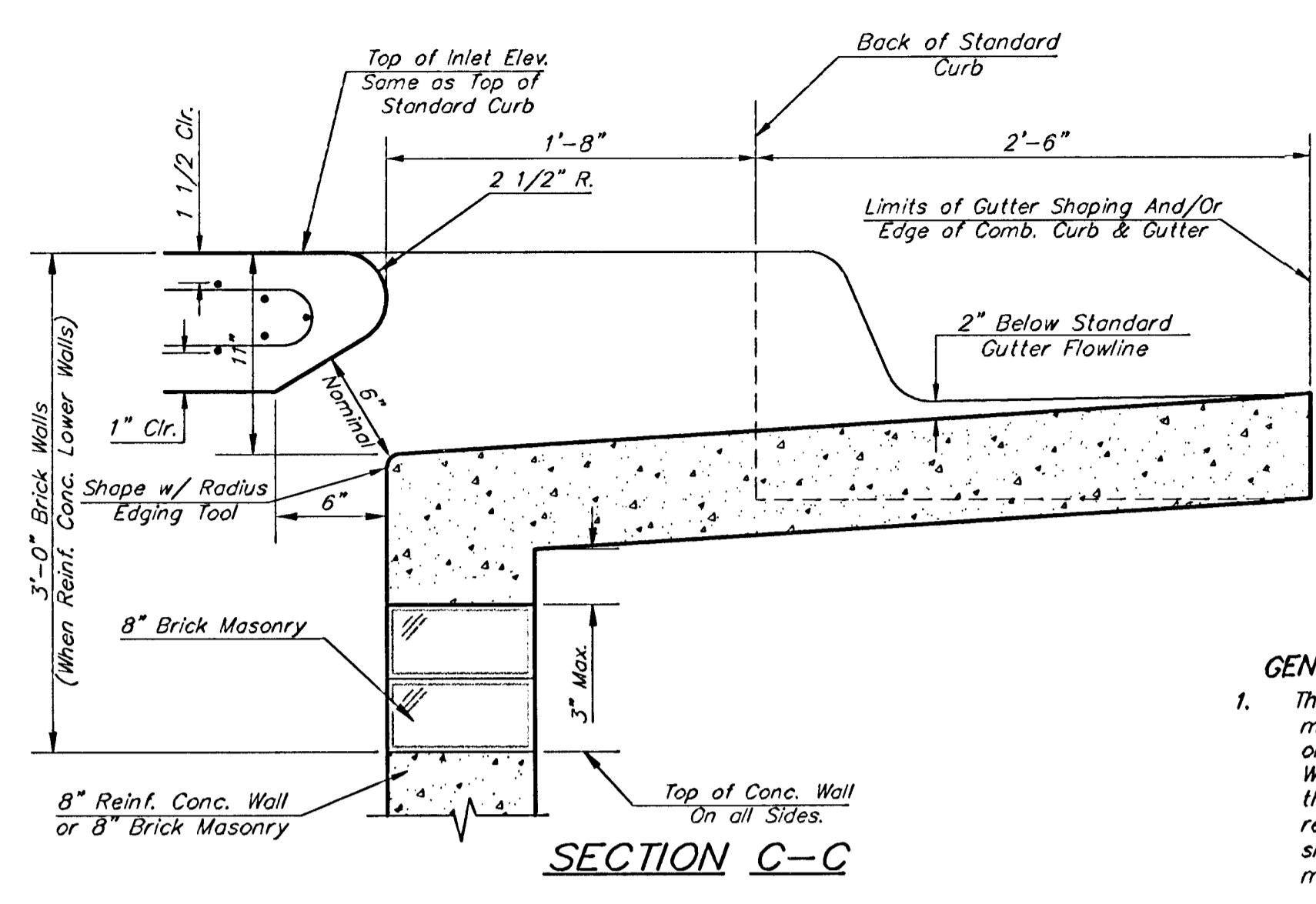
\*Left Side Shown Without Slab Reinforcing, Right Side Shown With Slab Reinforcing



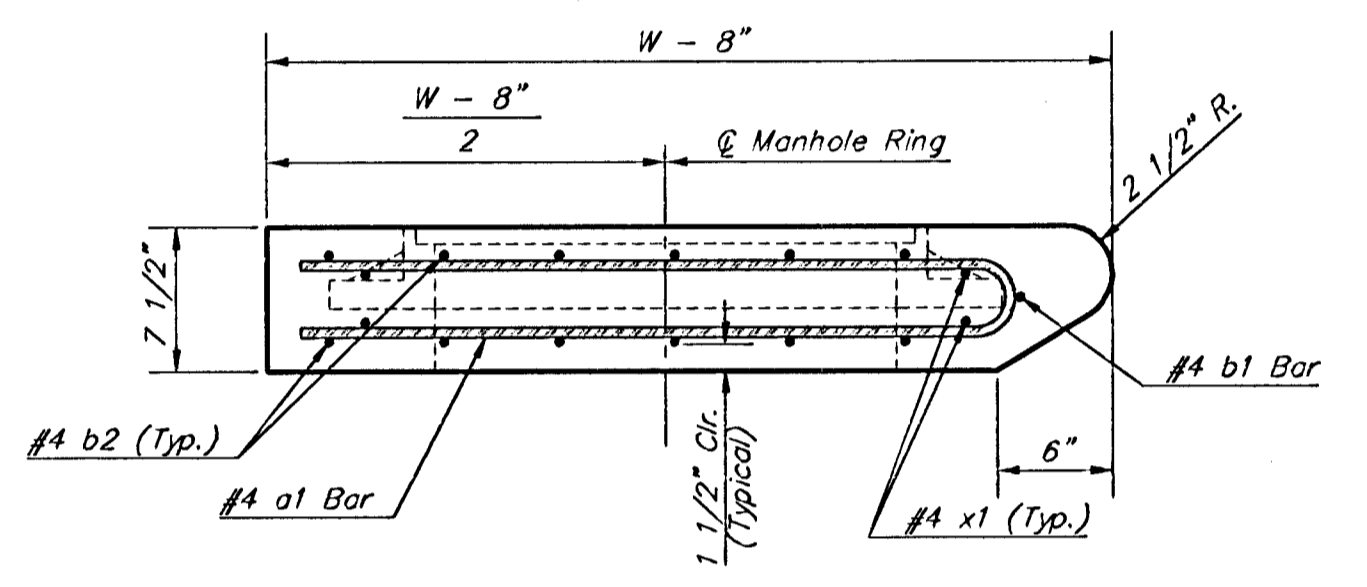
**ELEVATION**



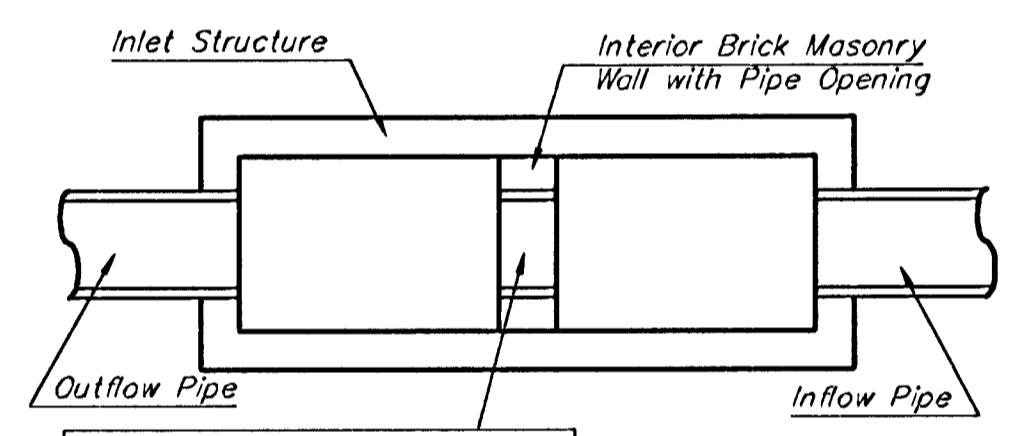
**SECTION B-B**



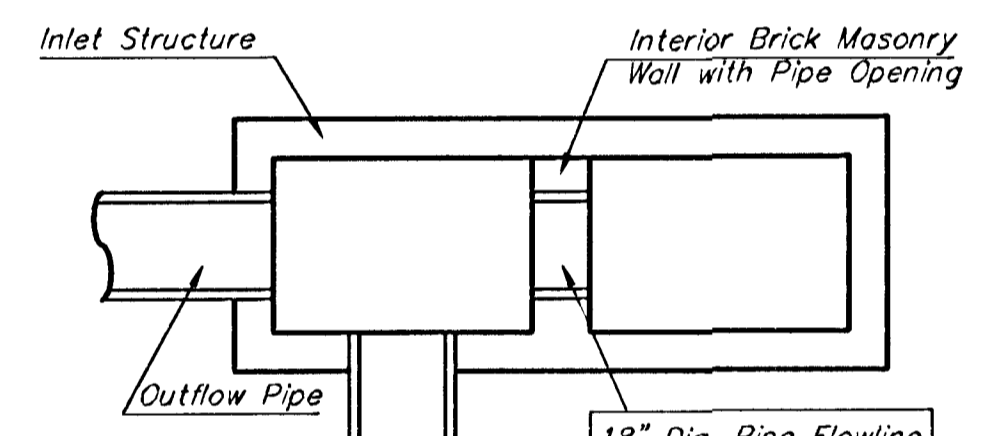
**SECTION C-C**



**SECTION A-A**

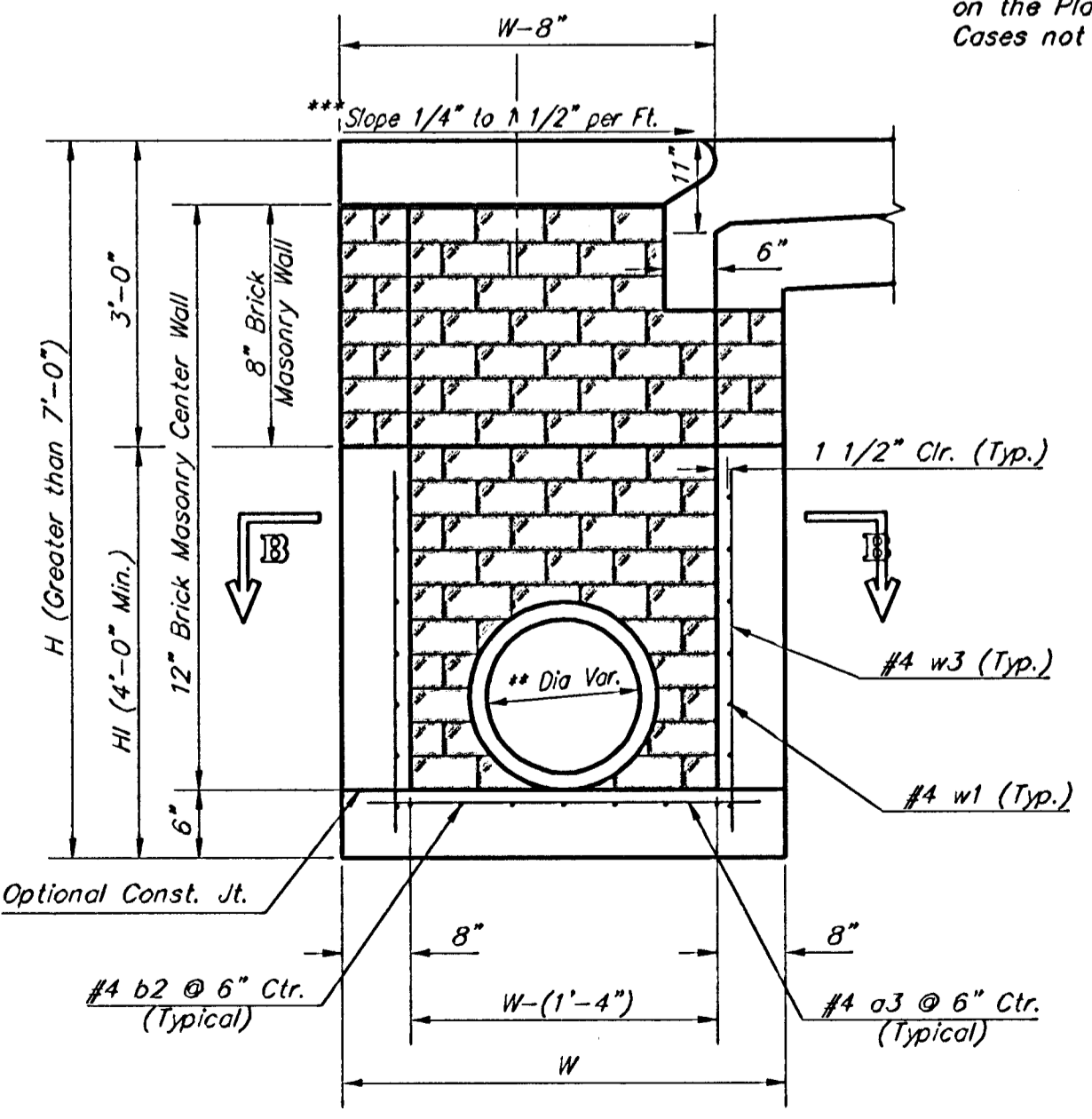


**CASE I**

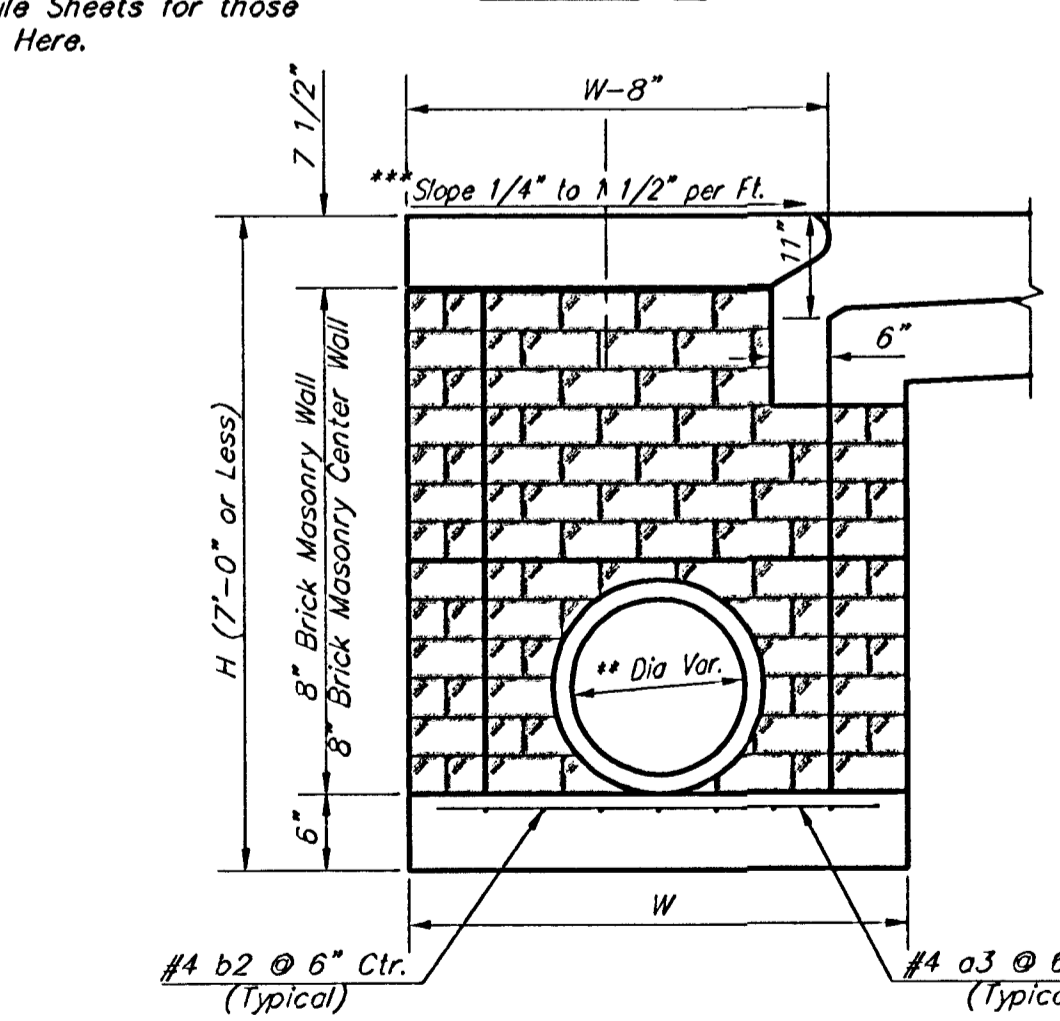


**CASE II**

NOTE:  
Center Wall Pipe Size shall be as Specified in Inlet Construction Notes on the Plan/Profile Sheets for those Cases not Shown Here.

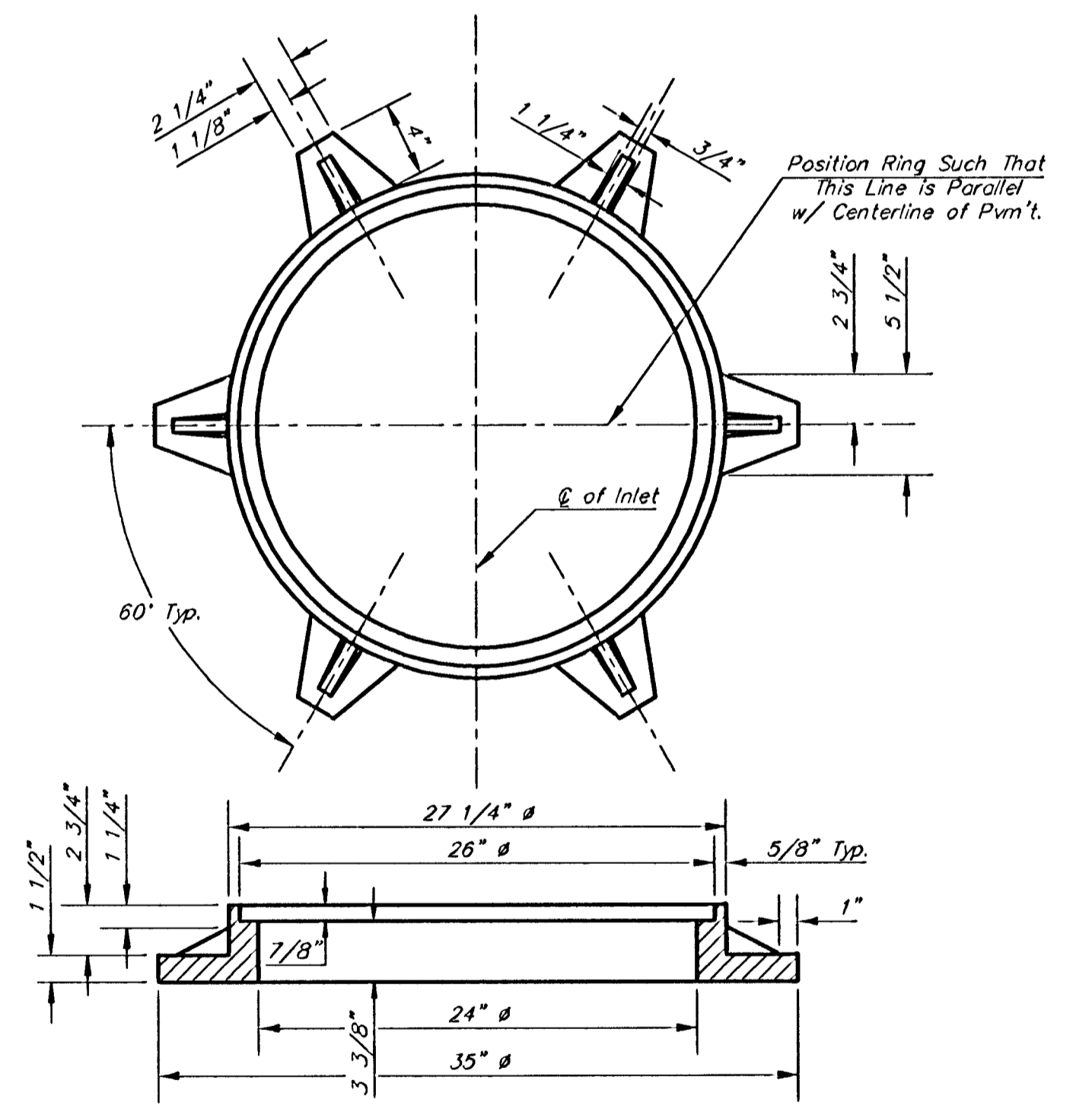


**TYPICAL INLET SECTION AT CENTER WALL (Reinforced Concrete Walls)**



**TYPICAL INLET SECTION AT CENTER WALL (Masonry Walls)**

NOTES:  
 \*\* A center wall opening shall be provided by means of a section of reinforced concrete pipe. See Case I and Case II above.  
 \*\*\* Slope of inlet tops to match sidewalk of parking slopes within limits indicated



**MANHOLE RING AND COVER**  
Weight = 180 lbs.

\*See City of Wichita Standard Manhole Ring and Cover Detail Sheet for Cover Details to Be Used With Inlet Frame.

Revised - Feb. 16, 1989

**CITY OF WICHITA STANDARD TYPE 1A Curb Inlet Details**  
INLET OPENING = 6" X 10'-0"

**BAUGHMAN COMPANY P.A.**  
ENGINEERING, SURVEYING, & PLANNING  
316-282-7271 • 315 ELLIS • WICHITA, KANSAS 67211

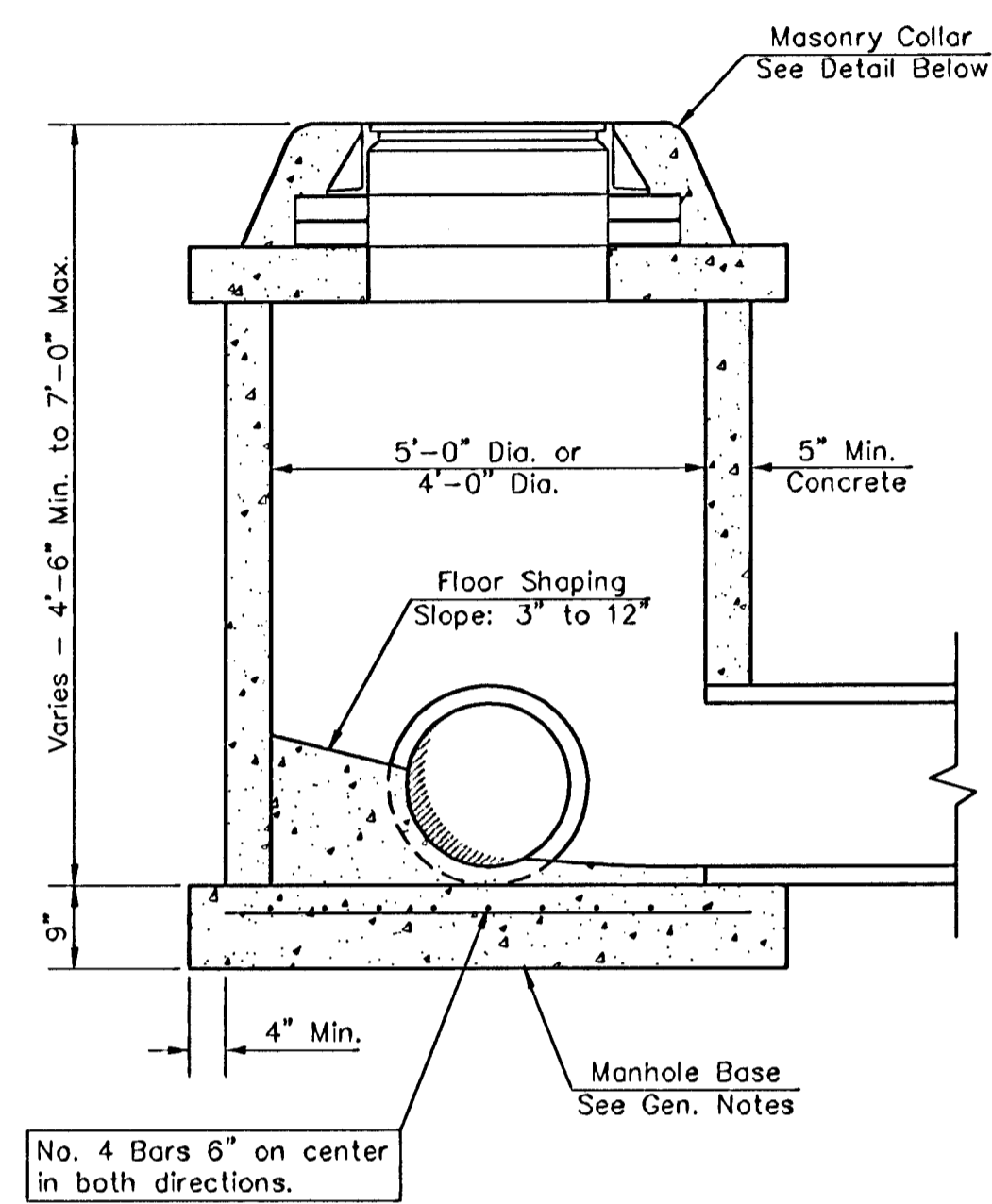
PROJECT NUMBER: **488-83844**

DESIGN: C.O.W.    DRAWN: Staff    APPROVED:    DATE: 4/02/03    SCALE: NONE

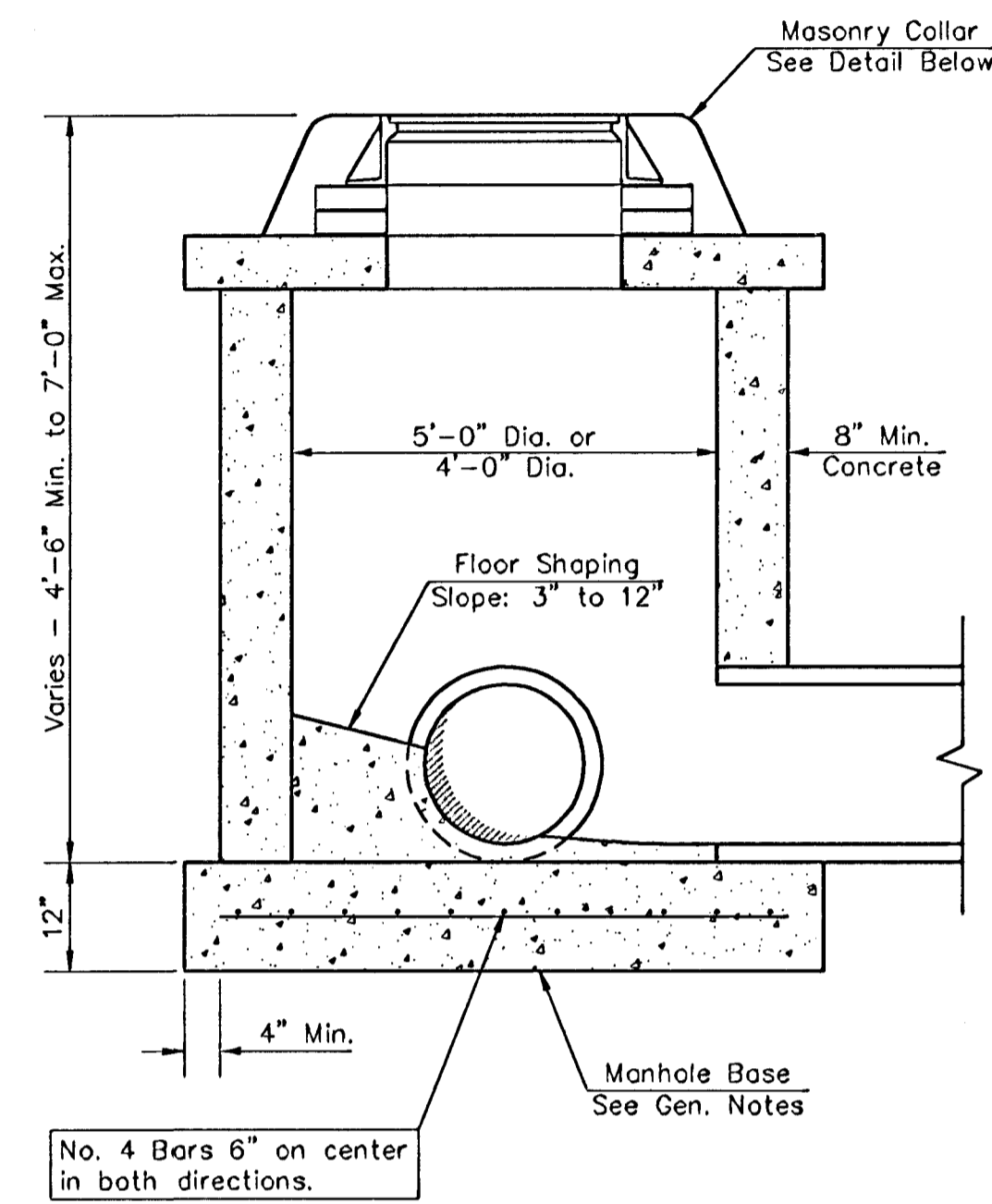
SHEET **8** OF **14**

**GENERAL NOTES**

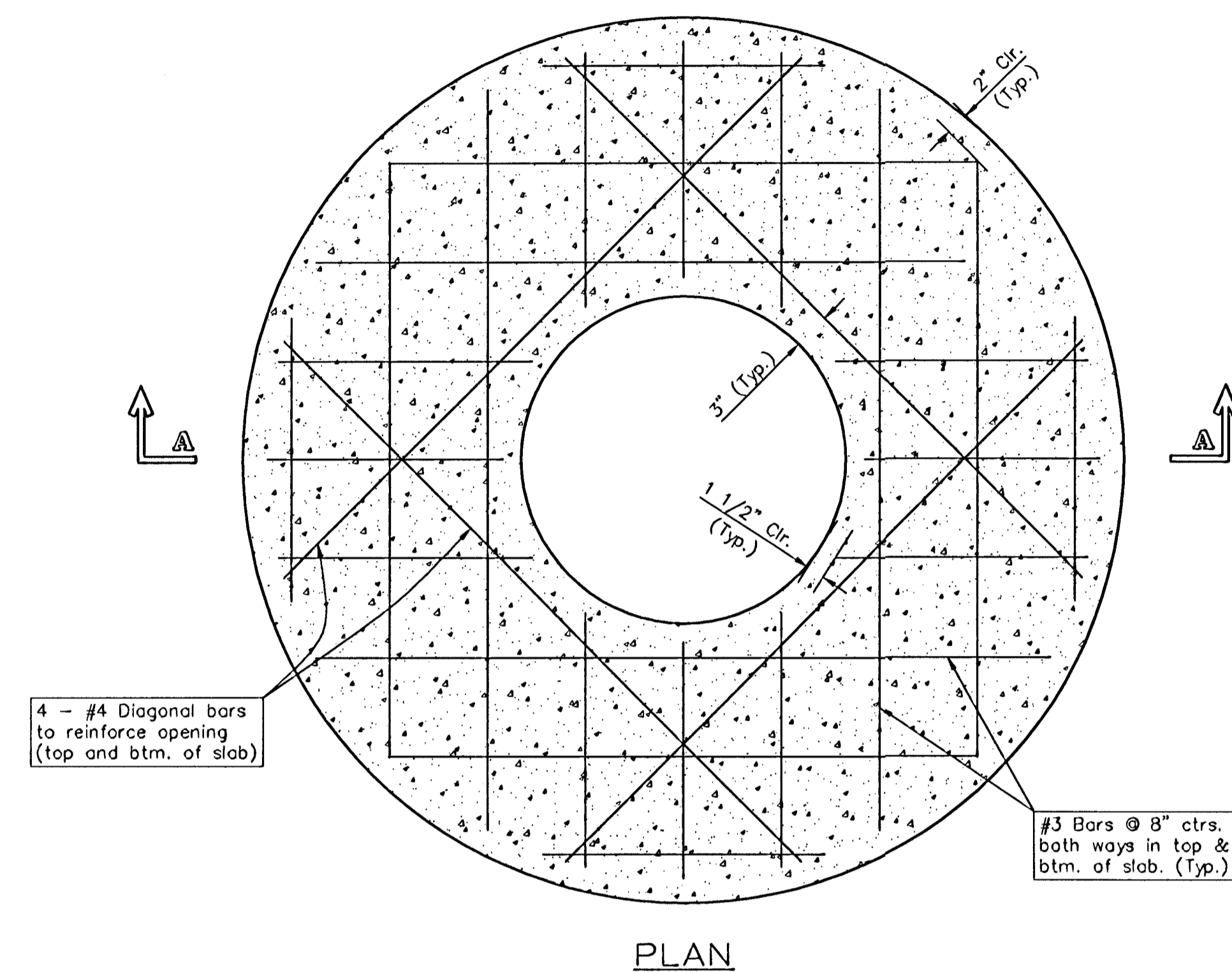
1. Mortar used in masonry construction shall contain 8 sacks of cement per cubic yard. Concrete used in manhole bases shall conform to the requirements of concrete for concrete pavement construction as specified in the city standard paving specifications using city concrete cement mix without air entraining admixture. Mortar shall be placed around the manhole ring as shown on the drawings when manholes are constructed in unpaved areas. Manholes constructed where pipe sizes are smaller than 24" shall have an inside diameter of 4'. Manholes constructed where pipe sizes are 24" or larger shall have an inside diameter of 5'. Completed manhole shall be without leaks and water tight.
2. Reinforcing steel shall be installed in the manhole bases and shall consist of no. 4 bars placed on 6" centers in both directions. The manhole base reinforcement shall be placed 6" above the bottom of the manhole base. All costs for furnishing and installing reinforcing steel shall be included in the unit price bid for the manhole.
3. The floors of all manholes shall be shaped with flow channels such that the manholes will be self cleaning and free of areas where solids could be deposited as sewage flows through the manhole from all inlet pipes to the outlet pipe. Flow channels shall be formed to match the bottom halves of the inflowing pipes and the outflowing pipe as shown by the drawings. Manhole floors shall have slopes of 3 inches per foot in the areas outside of the flow channels sloped toward the flow channels. Pipes laid through manholes shall have the top half removed to neat lines for the full inside diameter of the manhole. Manhole floors shall then be shaped around the bottom half of the pipe which forms the flow channel.
4. Pipes installed within the excavation made for the manhole shall be cradled with concrete to the limits of the manhole excavation. When clay pipe is used, the cradle shall extend to the first joint outside the manhole. The cradle shall be terminated at the clay pipe joint in a manner which will maintain the flexibility of the joint. Cost of cradle within manhole excavation or to clay pipe joints adjacent to manhole shall be included in the unit price bid for the manhole.
5. Manhole cover castings and manhole frame castings shall conform to the requirements as indicated in the standard specifications and as shown in the standard detail drawings.
6. The crowns of inflowing pipes shall never be set lower than the crown of the outflowing pipe.
7. Standard shallow manholes type "P" and "C" shall be paid for at the unit price bid per each for the type and diameter indicated. All standard shallow manhole diameters will be 4' unless indicated otherwise.
8. All brick used in manhole construction shall meet Grade SW of ASTM C652 or C62-87.



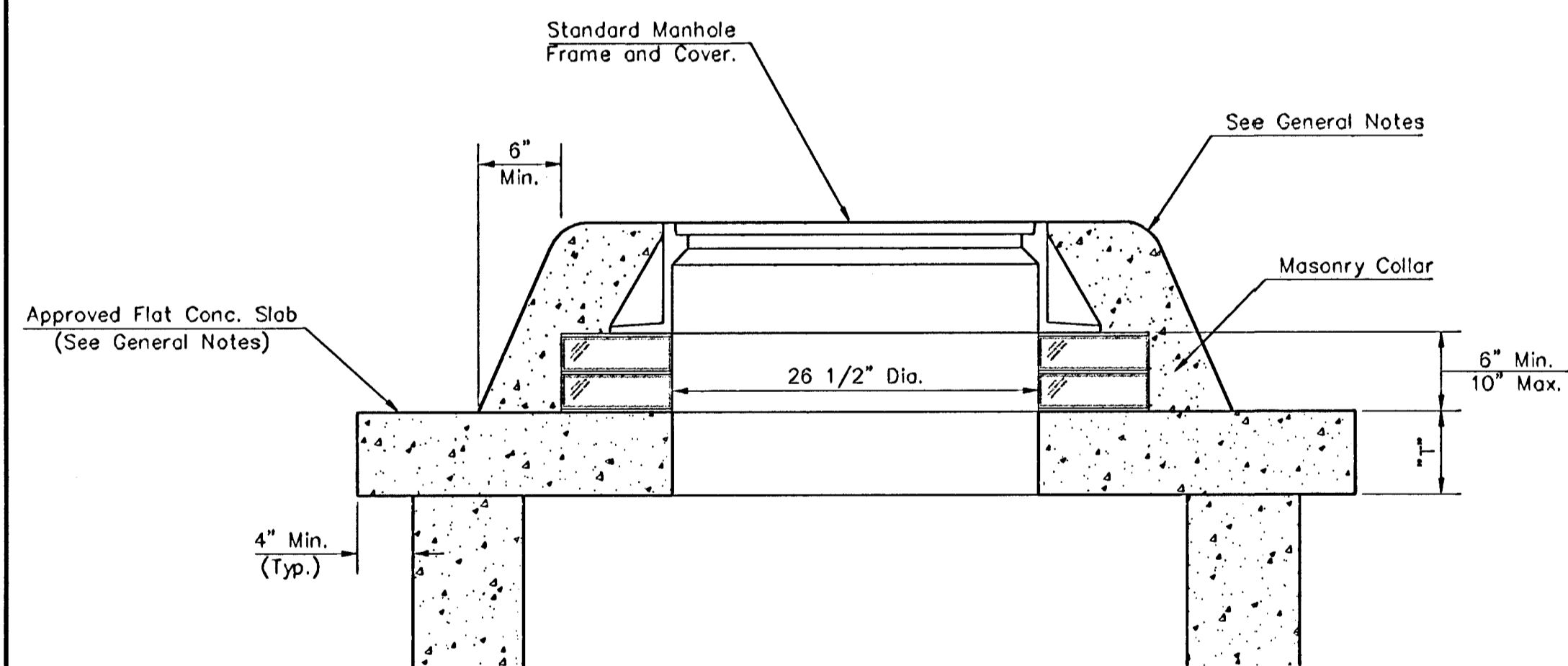
**SHALLOW TYPE "P" MANHOLE**



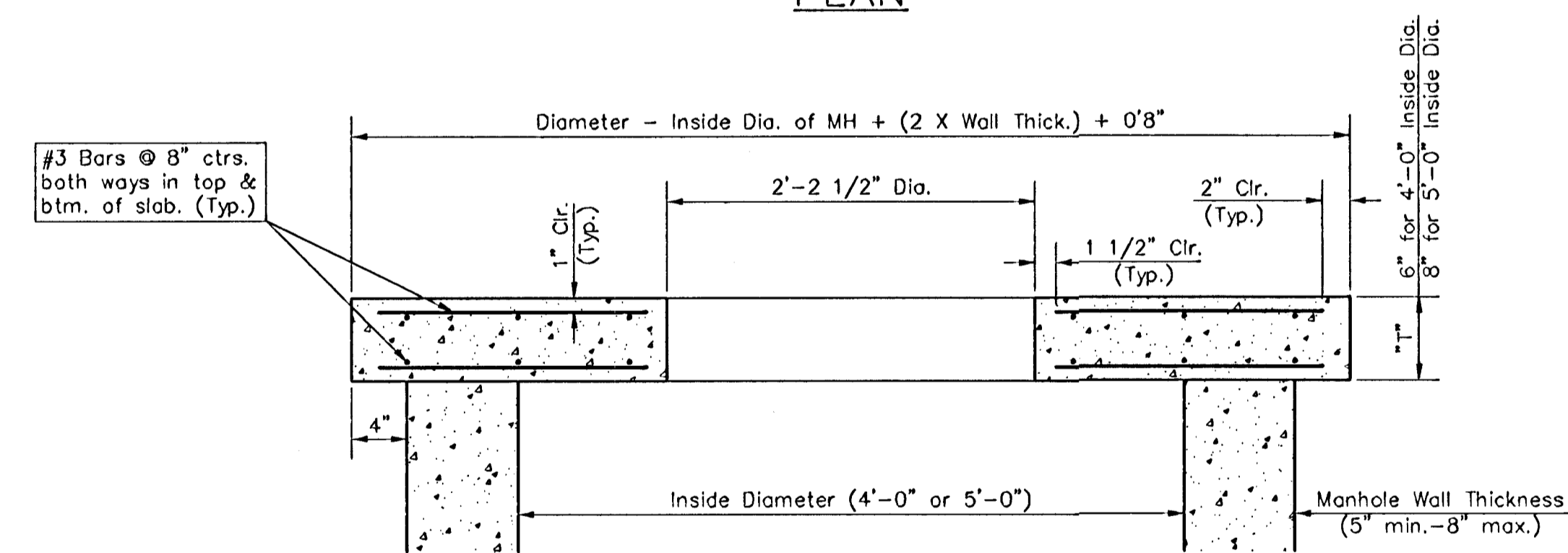
**SHALLOW TYPE "C" MANHOLE**



**PLAN**



**MASONRY COLLAR DETAIL**



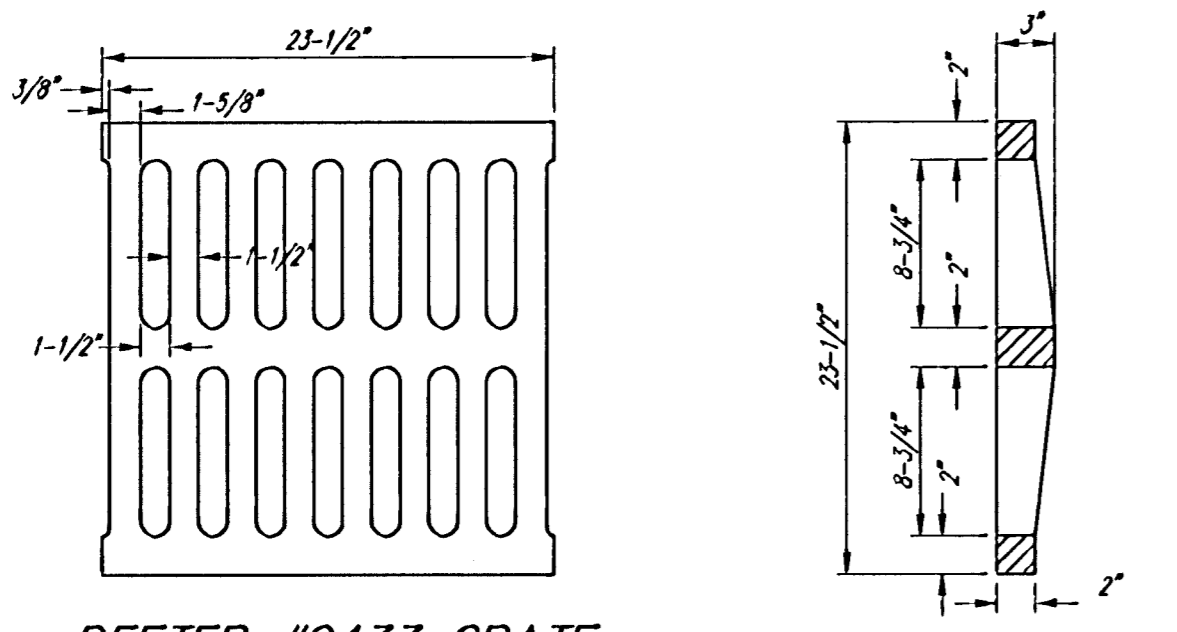
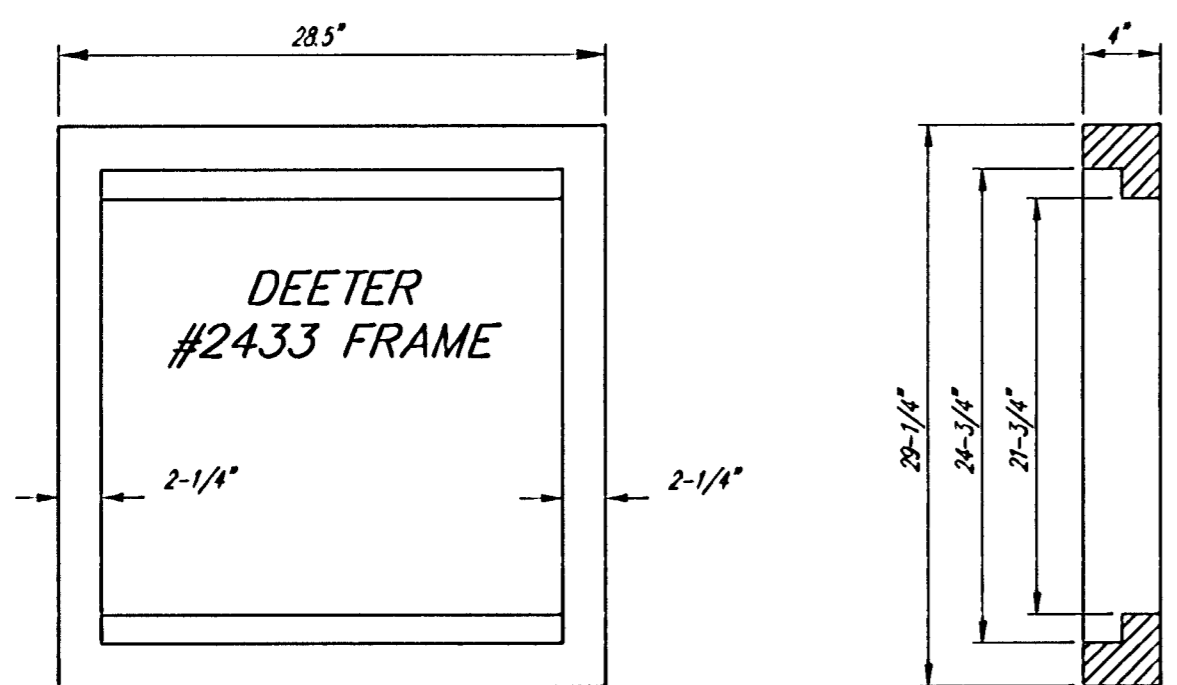
**SECTION A-A**

**FLAT CONCRETE SLAB DETAILS**

CITY OF WICHITA, KANSAS				
<b>STD. SHALLOW MANHOLES</b>				
TYPE 'P' AND TYPE 'C'				
<b>BAUGHMAN COMPANY P.A.</b> ENGINEERING, SURVEYING, & PLANNING 316-262-7271 • 315 ELLIS • WICHITA, KANSAS 67211				
PROJECT NUMBER				
<b>488-83844</b>				
DESIGN	DRAWN	APPROVED	DATE	SCALE
STAFF	STAFF	STAFF	4/02/03	NONE
				SHEET
				<b>9</b>
				OF
				<b>14</b>

DETAIL: SCH-MANHFZ.DWG

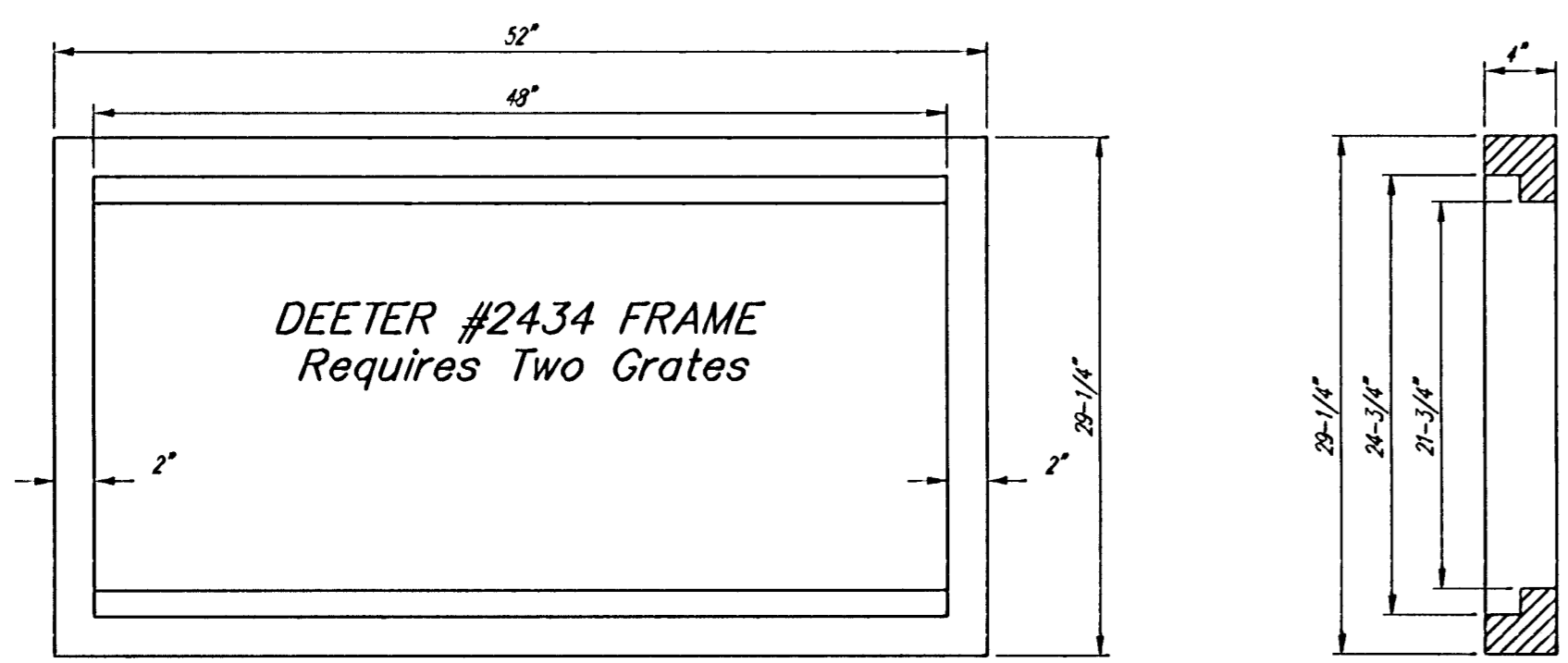




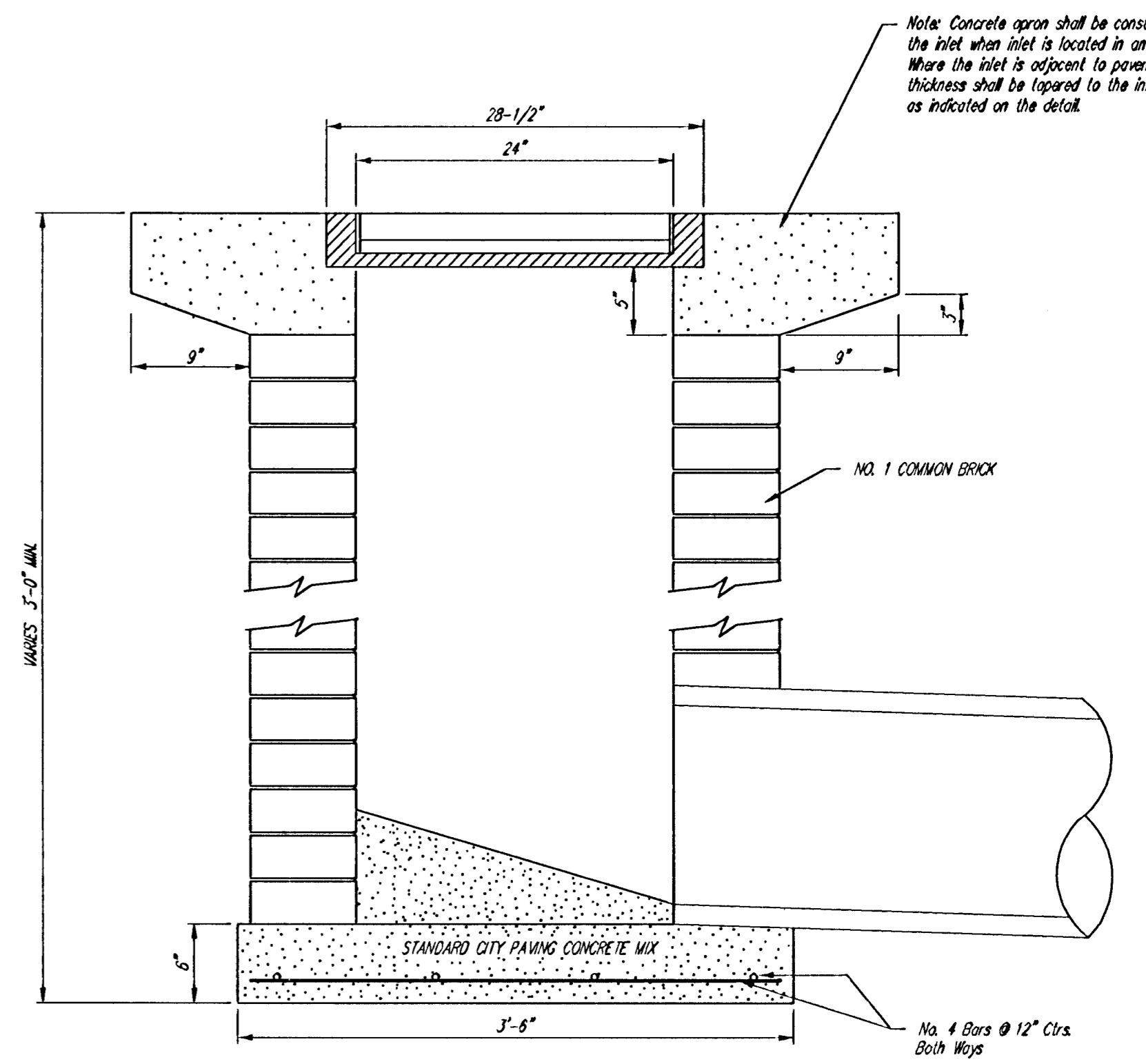
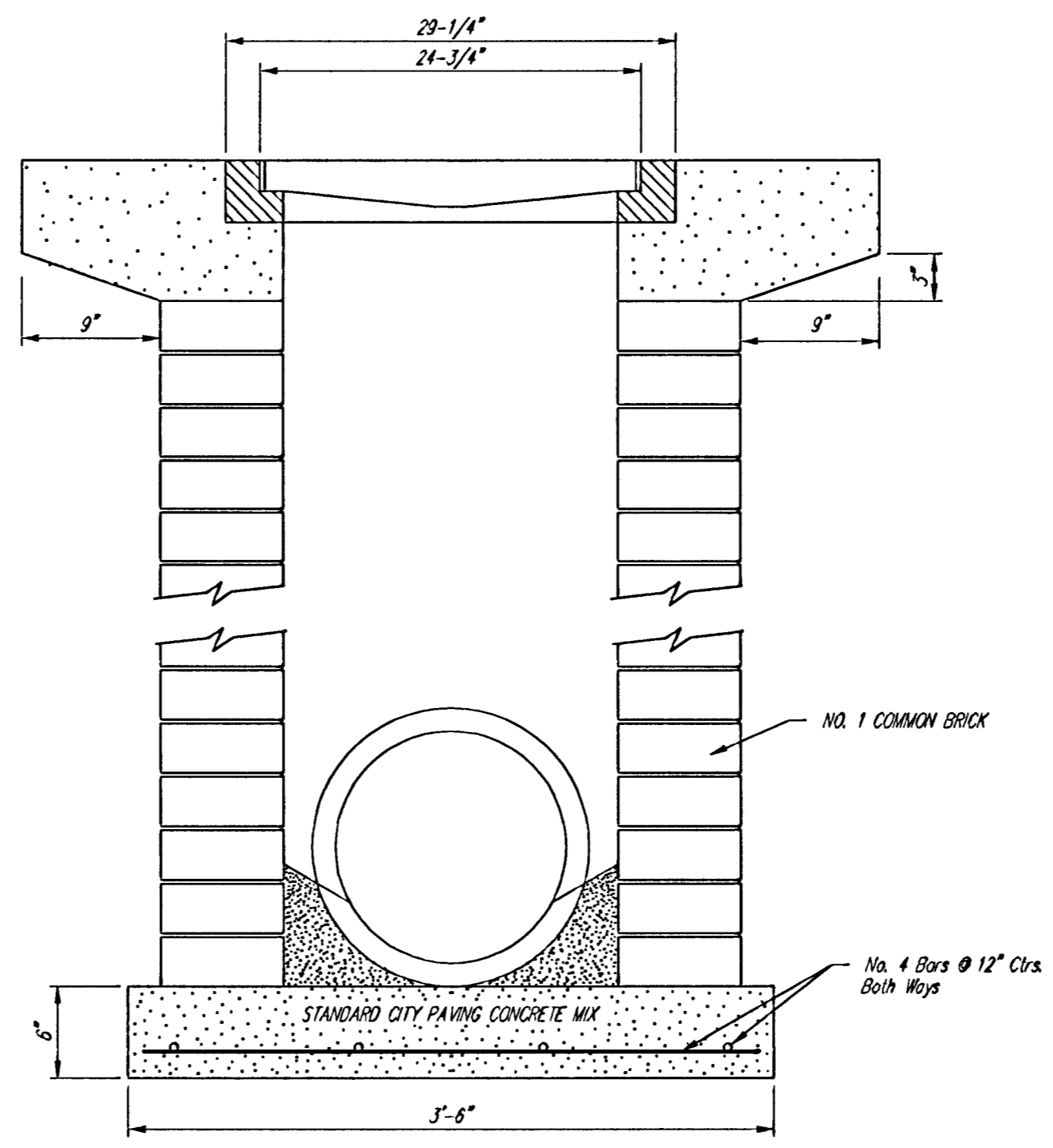
DEETER #2433 GRATE

24" x 24" Frame and Grate Detail

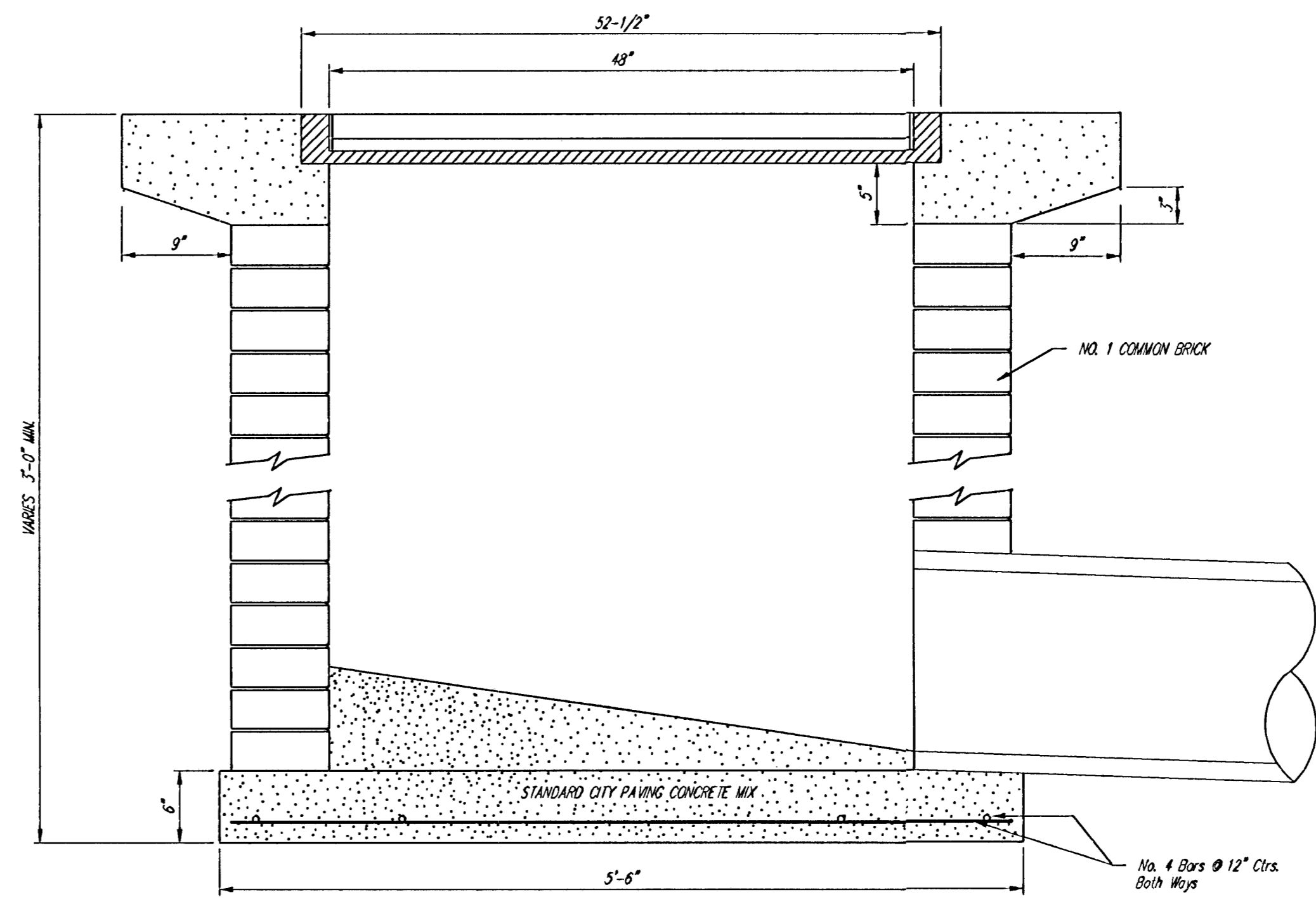
NOTE: Grates shall be imprinted on the top surface with "CITY OF WICHITA" using letters at least 1" in height. Other marking methods may be approved by the engineer.



Double 24" x 24" Frame Detail

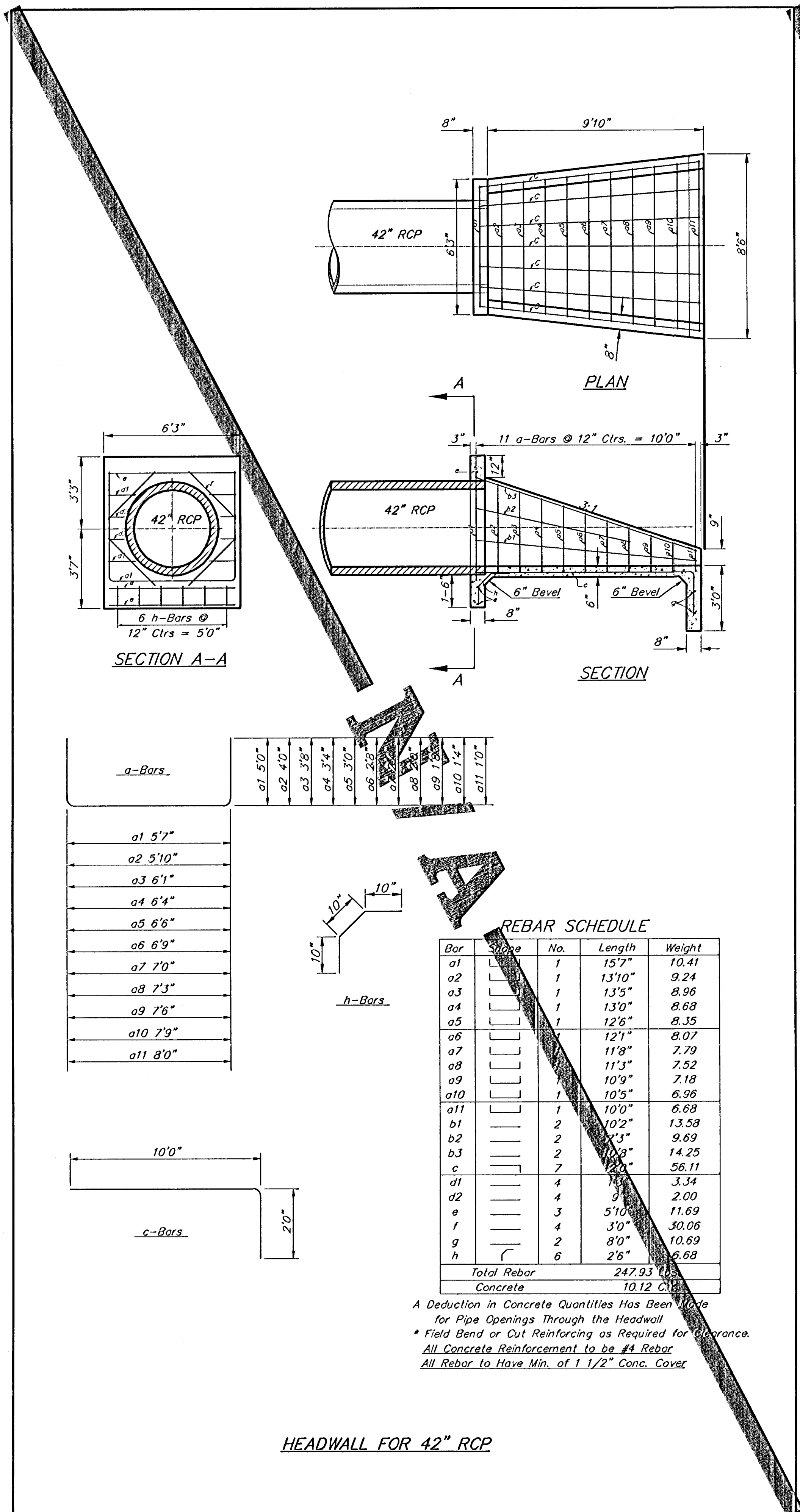


Note: Concrete apron shall be constructed around the inlet when inlet is located in an unwarped area. Where the inlet is adjacent to pavement, the pavement thickness shall be figured to the inlet in 3 inches as indicated on the detail.

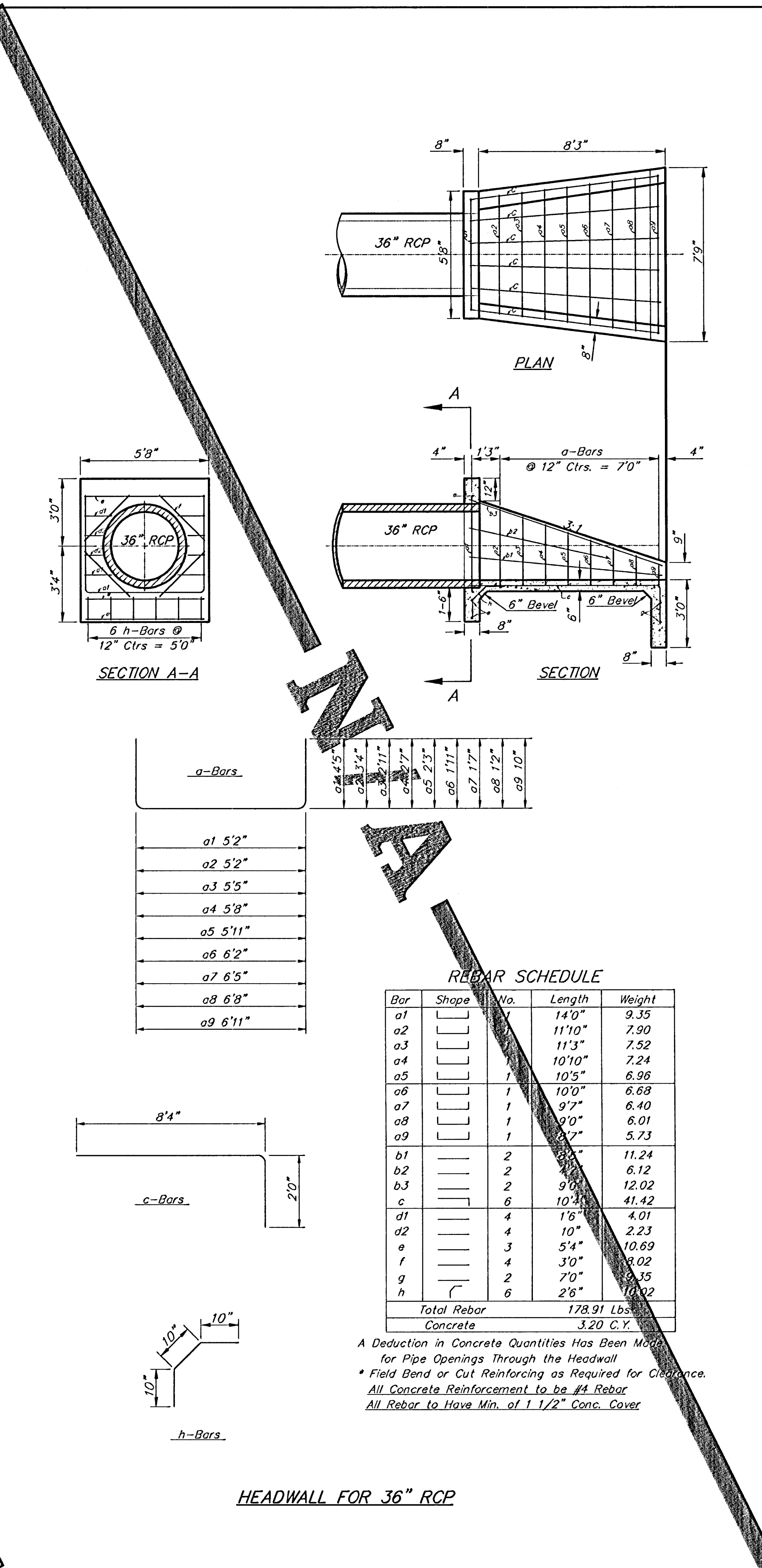


City of Wichita Standard <b>Drop Inlet</b>				
<b>BAUGHMAN COMPANY P.A.</b> ENGINEERING, SURVEYING, & PLANNING 316-262-7271 • 319 ELLIS • WICHITA, KANSAS 67211				
PROJECT NUMBER <b>468-83644</b>				SHEET <b>11</b>
DESIGN C.O.W.	DRAWN Staff	APPROVED	DATE 4/02/03	SCALE NONE
				OF <b>14</b>

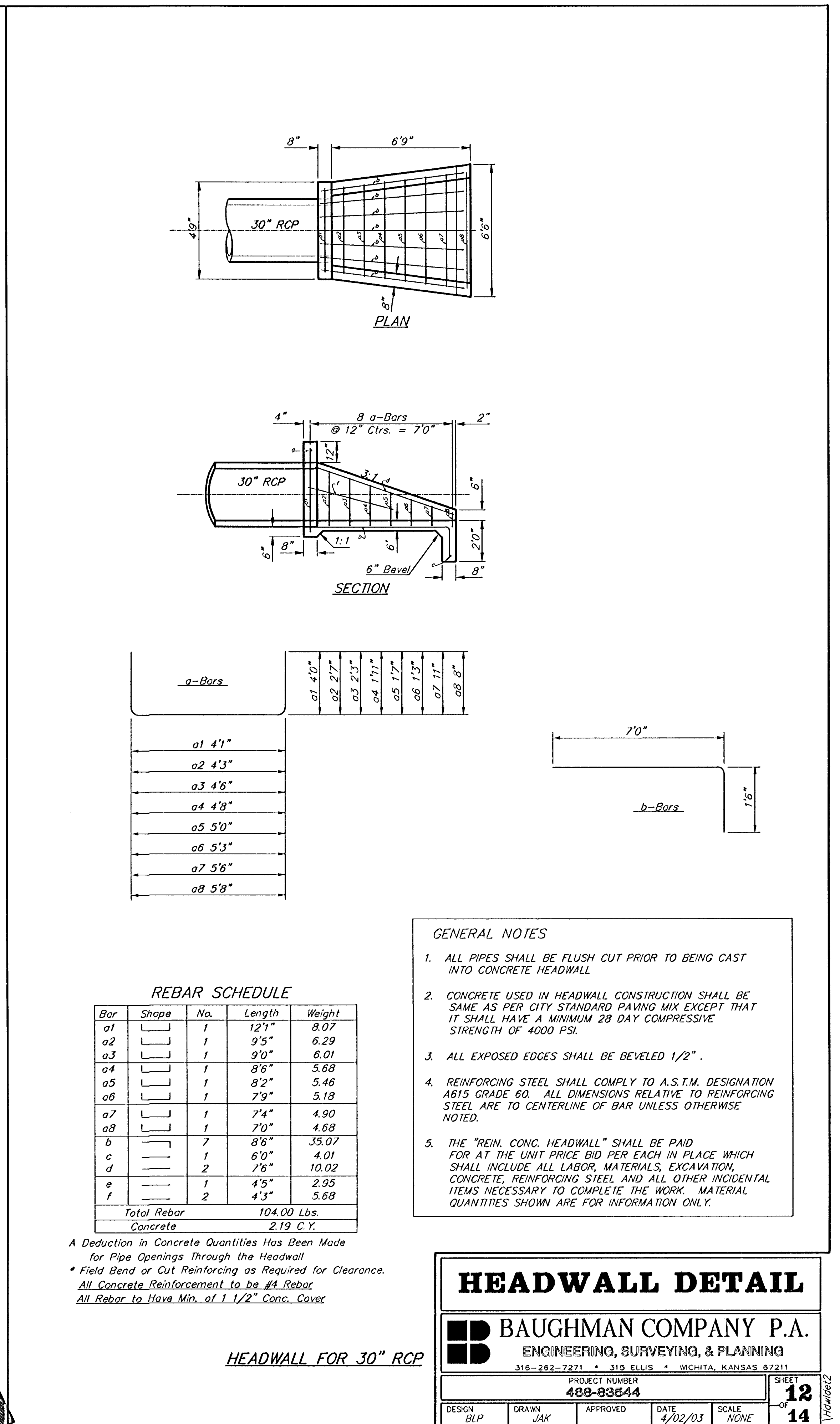
Dropin12



HEADWALL FOR 42" RCP



HEADWALL FOR 36" RCP



HEADWALL FOR 30" RCP

a-Bars

a1	5'7"
a2	5'10"
a3	6'1"
a4	6'4"
a5	6'6"
a6	6'9"
a7	7'0"
a8	7'3"
a9	7'6"
a10	7'9"
a11	8'0"

h-Bars

h1	10"
h2	10"
h3	10"
h4	10"
h5	10"
h6	10"
h7	10"
h8	10"
h9	10"
h10	10"
h11	10"

REBAR SCHEDULE

Bar	Shape	No.	Length	Weight
a1		1	15'7"	10.41
a2		1	13'10"	9.24
a3		1	13'5"	8.96
a4		1	13'0"	8.68
a5		1	12'6"	8.35
a6		1	12'1"	8.07
a7		1	11'8"	7.79
a8		1	11'3"	7.52
a9		1	10'9"	7.18
a10		1	10'5"	6.96
a11		1	10'0"	6.68
b1		2	10'2"	13.58
b2		2	9'3"	9.69
b3		2	10'3"	14.25
c		7	12'0"	56.11
d1		4	3'4"	3.34
d2		4	3'	2.00
e		3	5'10"	11.69
f		4	3'0"	30.06
g		2	8'0"	10.69
h		6	2'6"	6.68
Total Rebar			247.93	10.12 C.Y.
Concrete				10.12 C.Y.

A Deduction in Concrete Quantities Has Been Made for Pipe Openings Through the Headwall  
 • Field Bend or Cut Reinforcing as Required for Clearance.  
 All Concrete Reinforcement to be #4 Rebar  
 All Rebar to Have Min. of 1 1/2" Conc. Cover

a-Bars

a1	5'2"
a2	5'2"
a3	5'5"
a4	5'8"
a5	5'11"
a6	6'2"
a7	6'5"
a8	6'8"
a9	6'11"

c-Bars

c1	8'4"
c2	20"

h-Bars

h1	10"
h2	10"
h3	10"
h4	10"
h5	10"
h6	10"
h7	10"
h8	10"
h9	10"
h10	10"
h11	10"

REBAR SCHEDULE

Bar	Shape	No.	Length	Weight
a1		1	14'0"	9.35
a2		1	11'10"	7.90
a3		1	11'3"	7.52
a4		1	10'10"	7.24
a5		1	10'5"	6.96
a6		1	10'0"	6.68
a7		1	9'7"	6.40
a8		1	9'0"	6.01
a9		1	8'7"	5.73
b1		2	9'7"	11.24
b2		2	9'0"	6.12
b3		2	9'0"	12.02
c		6	10'3"	41.42
d1		4	1'6"	4.01
d2		4	1'0"	2.23
e		3	5'4"	10.69
f		4	3'0"	8.02
g		2	7'0"	9.35
h		6	2'6"	10.02
Total Rebar			178.91	10.12 C.Y.
Concrete				3.20 C.Y.

A Deduction in Concrete Quantities Has Been Made for Pipe Openings Through the Headwall  
 • Field Bend or Cut Reinforcing as Required for Clearance.  
 All Concrete Reinforcement to be #4 Rebar  
 All Rebar to Have Min. of 1 1/2" Conc. Cover

a-Bars

a1	4'1"
a2	4'3"
a3	4'6"
a4	4'8"
a5	5'0"
a6	5'3"
a7	5'6"
a8	5'8"

b-Bars

b1	7'0"
b2	7'6"

REBAR SCHEDULE

Bar	Shape	No.	Length	Weight
a1		1	12'1"	8.07
a2		1	9'5"	6.29
a3		1	9'0"	6.01
a4		1	8'6"	5.68
a5		1	8'2"	5.46
a6		1	7'9"	5.18
a7		1	7'4"	4.90
a8		1	7'0"	4.68
b		7	8'6"	35.07
c		1	6'0"	4.01
d		2	7'6"	10.02
e		1	4'5"	2.95
f		2	4'3"	5.68
Total Rebar			104.00	10.12 C.Y.
Concrete				2.19 C.Y.

A Deduction in Concrete Quantities Has Been Made for Pipe Openings Through the Headwall  
 • Field Bend or Cut Reinforcing as Required for Clearance.  
 All Concrete Reinforcement to be #4 Rebar  
 All Rebar to Have Min. of 1 1/2" Conc. Cover

- GENERAL NOTES
- ALL PIPES SHALL BE FLUSH CUT PRIOR TO BEING CAST INTO CONCRETE HEADWALL
  - CONCRETE USED IN HEADWALL CONSTRUCTION SHALL BE SAME AS PER CITY STANDARD PAVING MIX EXCEPT THAT IT SHALL HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 4000 PSI.
  - ALL EXPOSED EDGES SHALL BE BEVELED 1/2".
  - REINFORCING STEEL SHALL COMPLY TO A.S.T.M. DESIGNATION A615 GRADE 60. ALL DIMENSIONS RELATIVE TO REINFORCING STEEL ARE TO CENTERLINE OF BAR UNLESS OTHERWISE NOTED.
  - THE "REIN. CONC. HEADWALL" SHALL BE PAID FOR AT THE UNIT PRICE BID PER EACH IN PLACE WHICH SHALL INCLUDE ALL LABOR, MATERIALS, EXCAVATION, CONCRETE, REINFORCING STEEL AND ALL OTHER INCIDENTAL ITEMS NECESSARY TO COMPLETE THE WORK. MATERIAL QUANTITIES SHOWN ARE FOR INFORMATION ONLY.

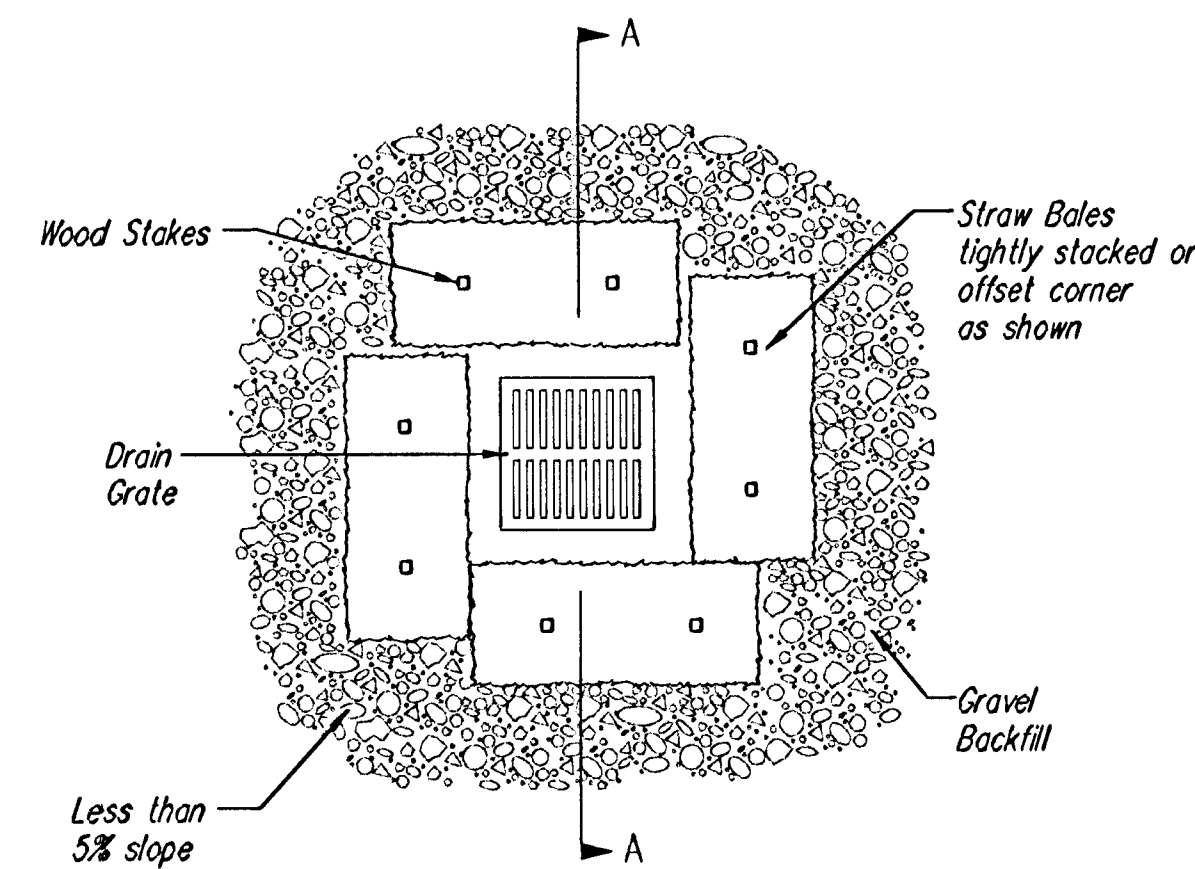
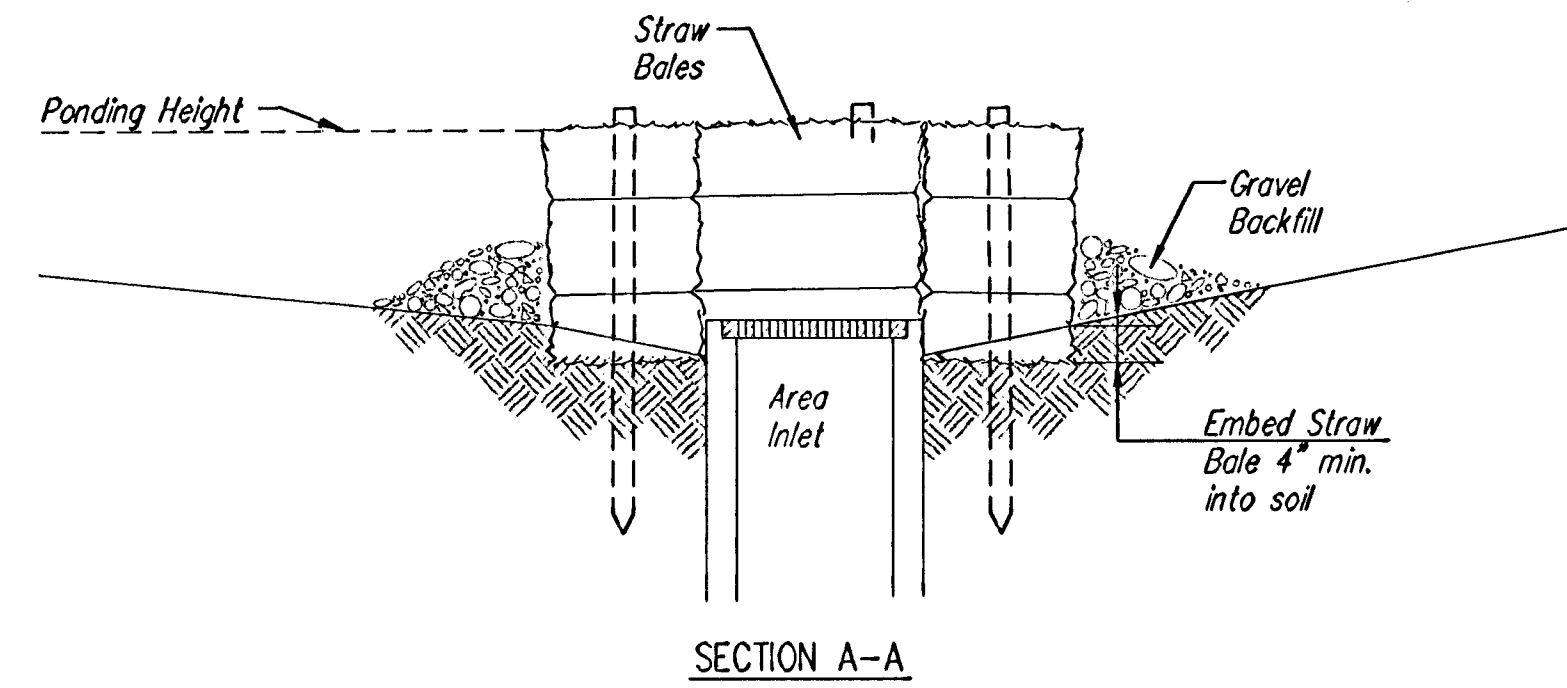
**HEADWALL DETAIL**

**BAUGHMAN COMPANY P.A.**  
 ENGINEERING, SURVEYING, & PLANNING  
 316-262-7271 • 315 ELLIS • WICHITA, KANSAS 67211

PROJECT NUMBER  
**488-83544**

SHEET  
**12**  
 OF  
**14**

DESIGN: BLP    DRAWN: JAK    APPROVED:    DATE: 4/02/03    SCALE: NONE



**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.

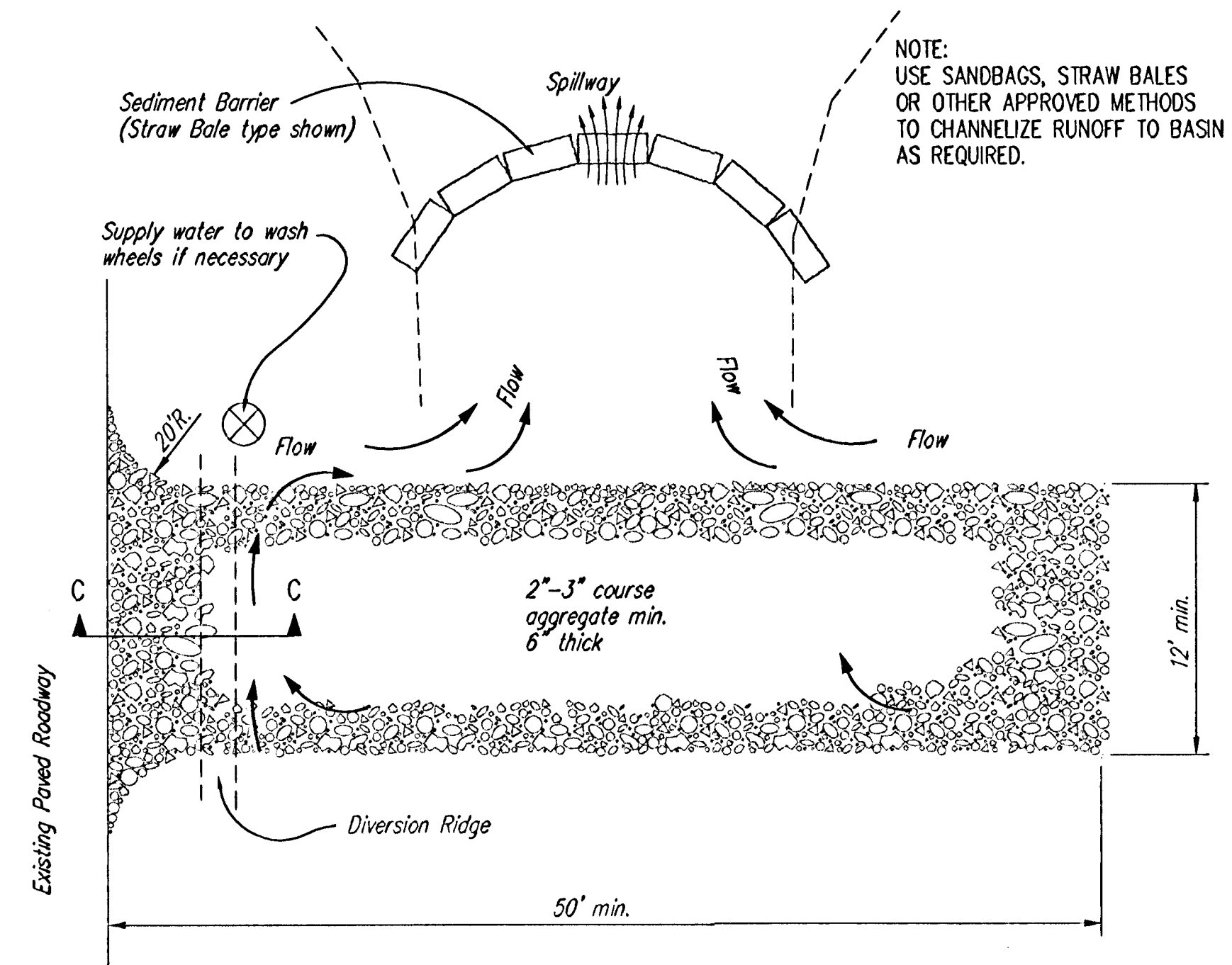
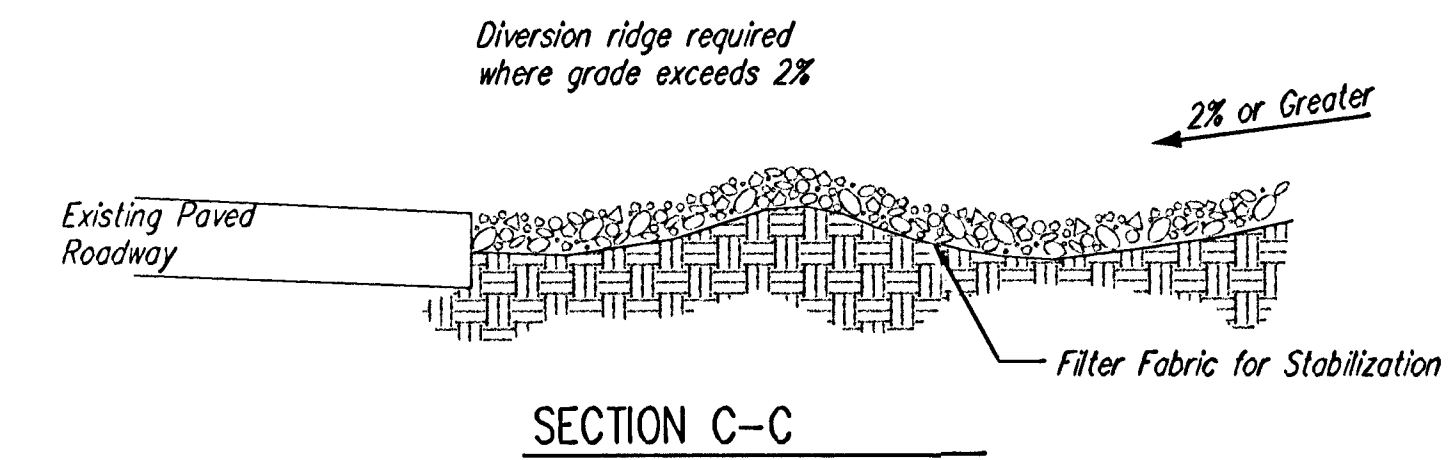
**List of common placement installation mistakes to avoid:**

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?



**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.



**SOIL EROSION  
BMP DETAILS**

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

PROJECT NUMBER 468-83544 OCA NO. 751326

DATE APR 2003 SHEET 13 OF 14

