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Indiana Department of Transportation Standards

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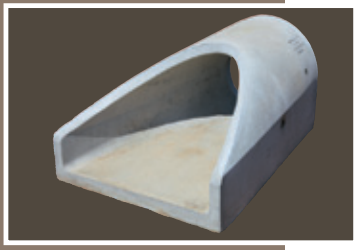
Reinforced Concrete Pipe – Round and Elliptical

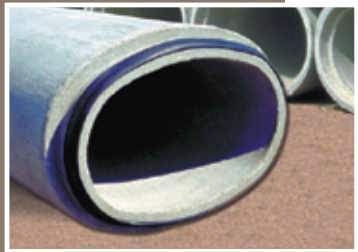
Round Concrete Pipe

Elliptical Concrete Pipe



Flared End Sections

Heavy Duty Flared End Grate



Gasketed Elliptical Concrete Pipe

Reinforced Concrete Pipe – Round and Elliptical

- Round Sizes 12" to 144"(All available with gaskets)
- Elliptical Sizes 18" to 120" Round Equiv.
- Elliptical Gasketed (18" to 60") and Non-Gasketed (18" - 120")
- Flared End Sections
- Special Fittings: Bends and Tees
- Strength, Durability, Permanence
- Greater Flow at Shallow Depths
- Environmentally Friendly
- Suitable for LEED projects
- Call for price and availability

All material meets AASHTO & ASTM specifications.
Material meets requirements for IDOT, INDOT, MODOT and St. Louis MSD

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Charleston: 20005 State Hwy. 16E • Charleston, IL 61920 • **(217) 348-0161**
Springfield: 2917 N. Dirksen Pkwy. • Springfield, IL 62702 • **(217) 544-4607**
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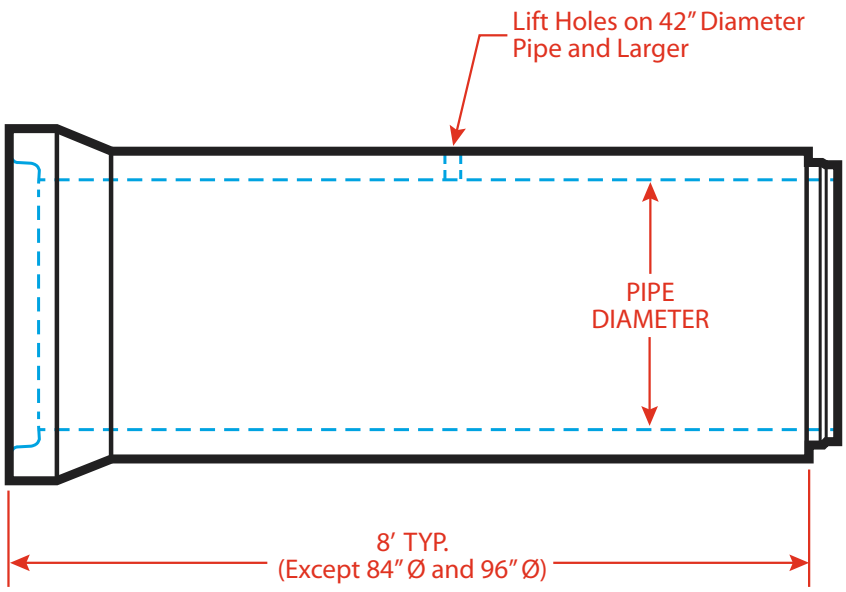
Charleston: (217) 348-0161
Springfield: (217) 544-4607

Shipping Details for Pipe



Pipe Ø	Wall	LB/PC	# PC/Load
12"	B-Wall	832	53
15"	B-Wall	1168	42
18"	B-Wall	1504	32
21"	B-Wall	1888	25
24"	B-Wall	2264	20
27"	B-Wall	2768	17
30"	B-Wall	3240	14
33"	B-Wall	3600	13
36"	B-Wall	4336	10
42"	C-Wall	6688	7
48"	B-Wall	7120	6
54"	C-Wall	10164	4
60"	C-Wall	12240	4
66"	C-Wall	14096	3
72"	C-Wall	16800	3
84" *	C-Wall	18053	2
96" **	B-Wall	21630	2

* 84" Ø Pipe are Constructed in 7 ½' Sections
** 96" Ø Pipe are Constructed in 7' Sections

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Precast Concrete Box Culvert

Precast Concrete Box Culvert

- Available in sizes 2' x 2' up to 20' x 4' spans
- Special design available
- Strength, Durability, Permanence
- Greater Flow Capacity
- Tunnels, Under Crossings, Walk Ways
- Suitable for LEED projects
- 0-2 ft. cover for HS20 Loading
- Call for price and availability

All material meets
AASHTO & ASTM specifications.
Material meets requirements for IDOT,
INDOT and MODOT

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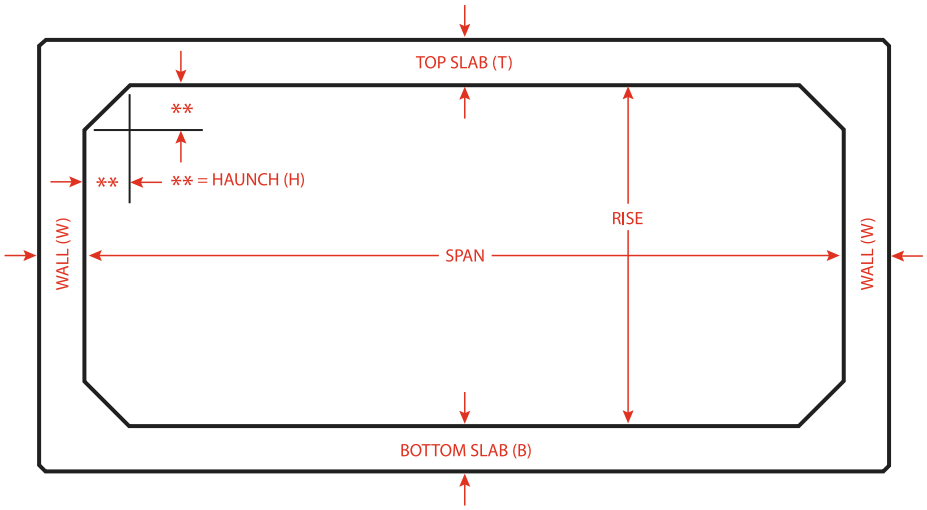
Precast Box Culvert Information – Illinois & Indiana Standard (ASTM) Designs



PLEASE NOTE:
The sizes indicated below are the "Standard Designs accepted by both the Illinois and Indiana Departments of Transportation. These sizes and depths of cover when utilized NORMALLY do not require an Illinois Bridge Office review or a S.E. review in Indiana.
In addition to the standard sizes and depths, we have built 2x2 up to 20x4 with depths past 40 feet.
Please call with questions concerning any size or depth not listed.

Span x Rise	Max. Depth	Approximate Weight per linear ft.	Cross Sect. Sq. Inches
3 x 2	20′	975	832
3 x 3	20′	1120	1264
4 x 2	30′	1235	1080
4 x 3	30′	1385	1656
4 x 4	30′	1530	2232
5 x 3	30′	1630	2088
5 x 4	30′	1780	2808
5 x 5	30′	1925	3528
6 x 3	30′	1945	2494
6 x 4	30′	2120	3358
6 x 5	30′	2290	4222
6 x 6	30′	2465	5086
7 x 4	30′	2565	3904
7 x 5	30′	2765	4912
7 x 6	30′	2960	5920
7 x 7	30′	3160	6928
8 x 4	20′	2765	4480
8 x 5	20′	2960	5632
8 x 6	20′	3160	6784
8 x 7	20′	3355	7936
8 x 8	20′	3555	9088

Span x Rise	Max. Depth	Approximate Weight per linear ft.	Cross Sect. Sq. Inches
9 x 5	25′	3610	6318
9 x 6	25′	3830	7614
9 x 7	20′	4055	8910
9 x 8	20′	4275	10206
9 x 9	20′	4500	11502
10 x 5	25′	4320	7000
10 x 6	25′	4565	8440
10 x 7	25′	4810	9880
10 x 8	20′	5060	11320
10 x 9	20′	5305	12760
10 x 10	20′	5550	14200
11 x 4	25′	4820	6094
11 x 6	25′	5360	9262
11 x 8	25′	5905	12430
11 x 10	20′	6445	15598
11 x 11	20′	6720	17182
12 x 4	25′	5625	6624
12 x 6	25′	6220	10080
12 x 8	25′	6810	13536
12 x 10	25′	7400	16992
12 x 12	20′	7995	20448

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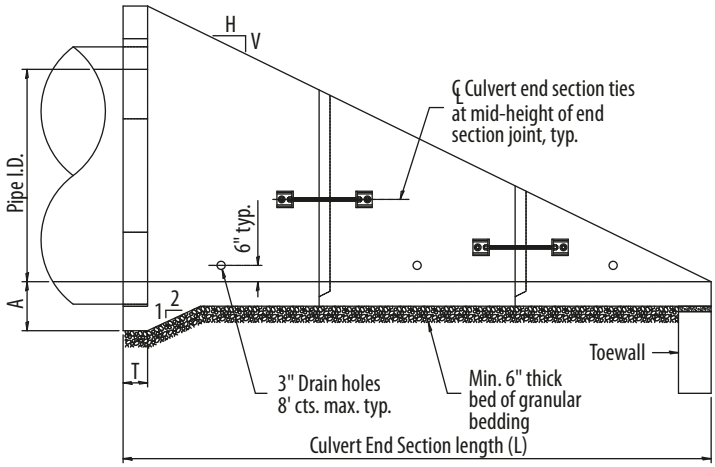
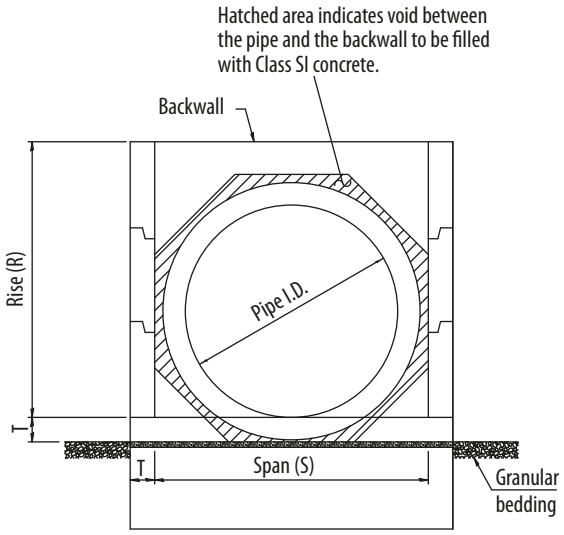
Drawing #: 542001-01
Date: 0414

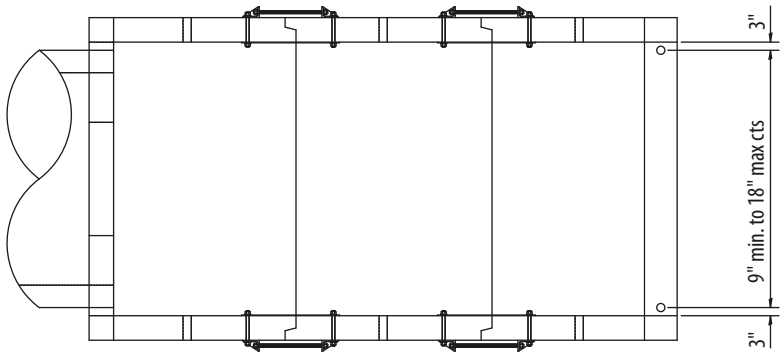
Concrete End Sections For Pipe Culverts 15" Thru 84" Dia.
Standard 542001-01
IDOT Standard



ELEVATION



END VIEW



PLAN

PIPE CULVERT END SECTION DIMENSIONS

Pipe I.D.	A	R	S	T	L Slope of End Section 1:2	1:3	1:4	1:6
15	14	29	28	8	5'-6"	7'-11"	10'-4"	15'-2"
18	15	33	32	8	6'-2"	8'-11"	11'-8"	17'-2"
21	15	36	34	8	6'-8"	9'-8"	12'-8"	18'-8"
24	15	39	38	8	7'-2"	10'-5"	13'-8"	20'-2"
27	15	3'-10"	3'-6"	8	8'-4"	12'-2"	16'-0"	23'-8"
30	16	4'-2"	3'-10"	8	9'-0"	13'-2"	17'-4"	25'-8"
33	16	4'-5"	4'-0"	8	9'-6"	13'-11"	18'-4"	27'-2"
36	16	4'-8"	4'-4"	8	10'-0"	14'-8"	19'-4"	28'-8"
42	17	5'-3"	5'-0"	8	11'-2"	16'-5"	21'-8"	32'-2"
48	17	5'-9"	5'-6"	8	12'-2"	17'-11"	23'-8"	35'-2"
54	18	6'-4"	6'-2"	8	13'-4"	19'-8"	26'-0"	38'-8"
60	18	6'-10"	6'-8"	8	14'-4"	21'-2"	28'-0"	41'-8"
66	19	7'-5"	7'-4"	8	15'-6"	22'-11"	30'-4"	45'-2"
72	19	7'-11"	7'-10"	8	16'-6"	24'-5"	32'-4"	48'-2"
78	21	8'-6"	8'-6"	9	17'-9"	26'-3"	34'-9"	51'-9"
84	21	9'-0"	9'-0"	9	18'-9"	27'-9"	36'-9"	54'-9"

QUANTITIES PER END SECTION

Pipe I.D.	Concrete yd 3 Slope of End Section 1:2	1:3	1:4	1:6
15	1.3	1.7	2.1	2.8
18	1.6	2.1	2.6	3.5
21	1.8	2.3	2.9	3.9
24	2.1	2.7	3.3	4.5
27	2.6	3.4	4.2	5.8
30	2.9	3.9	4.9	6.8
33	3.2	4.3	5.3	7.4
36	3.5	4.7	5.9	8.3
42	4.3	5.8	7.3	10.3
48	5.0	6.8	8.6	12.2
54	6.0	8.2	10.3	14.7
60	6.8	9.3	11.8	16.8
66	7.9	10.9	13.8	19.7
72	8.8	12.2	15.5	22.2
78	11.4	15.8	20.1	28.9
84	12.6	17.4	22.3	32.1

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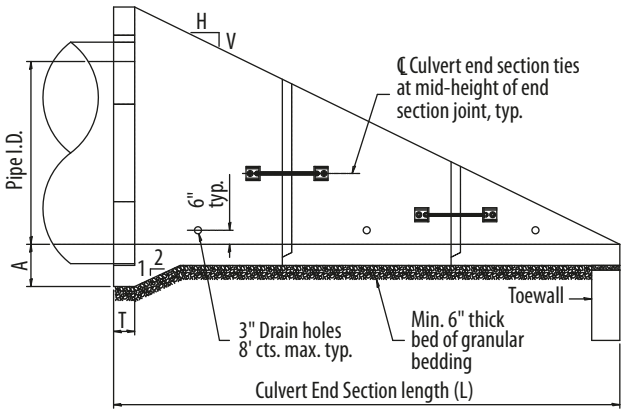
Drawing #: 542006-01
Date: 0414

Multiple Concrete End Sections For Pipe Culverts 15" Thru 84" Dia.
Standard 542006-01
IDOT Standard



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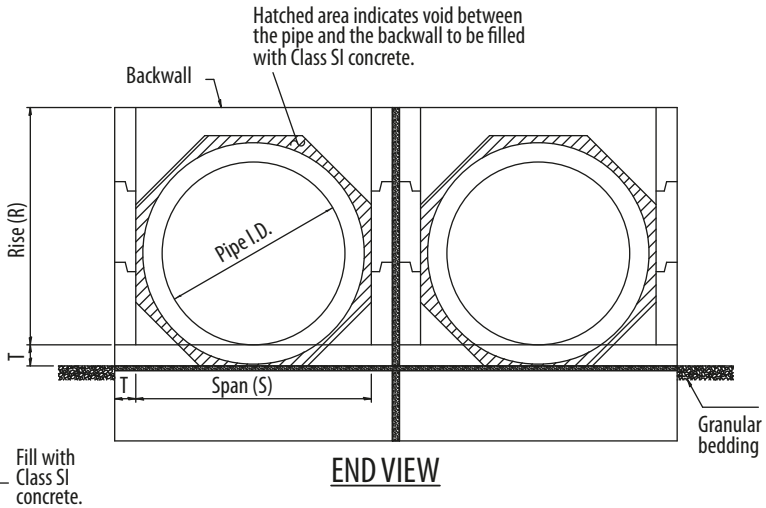
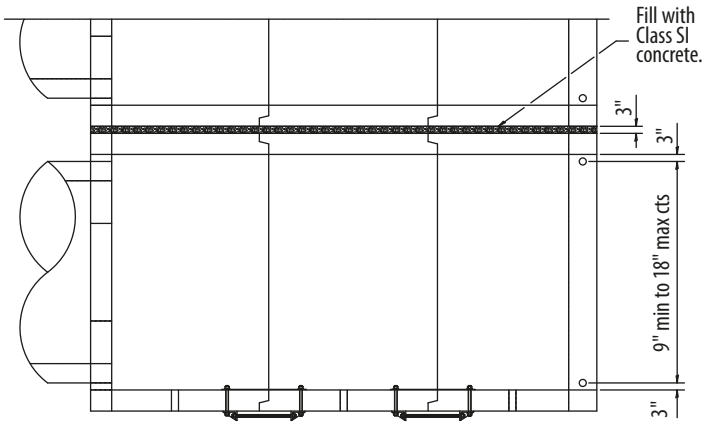


END VIEW



PLAN

PIPE CULVERT END SECTION DIMENSIONS

Pipe I.D.	A	R	S	T	L Slope of End Section 1:2	1:3	1:4	1:6
15	14	29	28	8	5'-6"	7'-11"	10'-4"	15'-2"
18	15	33	32	8	6'-2"	8'-11"	11'-8"	17'-2"
21	15	36	34	8	6'-8"	9'-8"	12'-8"	18'-8"
24	15	39	38	8	7'-2"	10'-5"	13'-8"	20'-2"
27	15	3'-10"	3'-6"	8	8'-4"	12'-2"	16'-0"	23'-8"
30	16	4'-2"	3'-10"	8	9'-0"	13'-2"	17'-4"	25'-8"
33	16	4'-5"	4'-0"	8	9'-6"	13'-11"	18'-4"	27'-2"
36	16	4'-8"	4'-4"	8	10'-0"	14'-8"	19'-4"	28'-8"
42	17	5'-3"	5'-0"	8	11'-2"	16'-5"	21'-8"	32'-2"
48	17	5'-9"	5'-6"	8	12'-2"	17'-11"	23'-8"	35'-2"
54	18	6'-4"	6'-2"	8	13'-4"	19'-8"	26'-0"	38'-8"
60	18	6'-10"	6'-8"	8	14'-4"	21'-2"	28'-0"	41'-8"
66	19	7'-5"	7'-4"	8	15'-6"	22'-11"	30'-4"	45'-2"
72	19	7'-11"	7'-10"	8	16'-6"	24'-5"	32'-4"	48'-2"
78	21	8'-6"	8'-6"	9	17'-9"	26'-3"	34'-9"	51'-9"
84	21	9'-0"	9'-0"	9	18'-9"	27'-9"	36'-9"	54'-9"

QUANTITIES PER END SECTION

Pipe I.D.	Concrete yd^3 Slope of End Section 1:2	1:3	1:4	1:6
15	1.3	1.7	2.1	2.8
18	1.6	2.1	2.6	3.5
21	1.8	2.3	2.9	3.9
24	2.1	2.7	3.3	4.5
27	2.6	3.4	4.2	5.8
30	2.9	3.9	4.9	6.8
33	3.2	4.3	5.3	7.4
36	3.5	4.7	5.9	8.3
42	4.3	5.8	7.3	10.3
48	5.0	6.8	8.6	12.2
54	6.0	8.2	10.3	14.7
60	6.8	9.3	11.8	16.8
66	7.9	10.9	13.8	19.7
72	8.8	12.2	15.5	22.2
78	11.4	15.8	20.1	28.9
84	12.6	17.4	22.3	32.1

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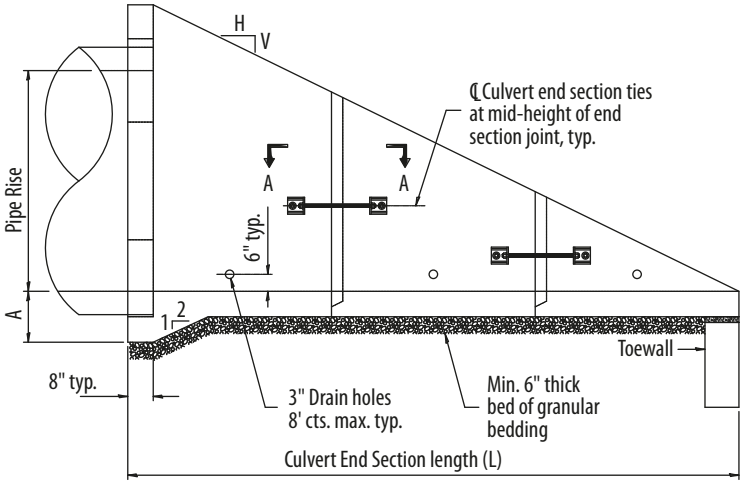
Drawing #: 542011
Date: 0414

Concrete End Sections For Elliptical Pipe Culverts 15" Thru 72" Equivalent Dia.
Standard 542011
IDOT Standard



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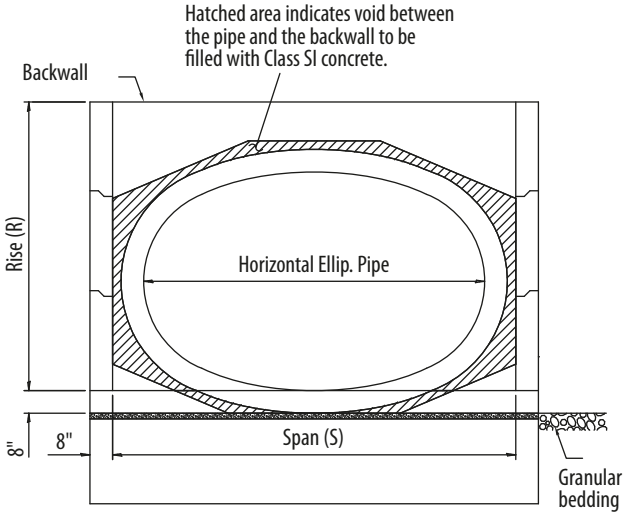

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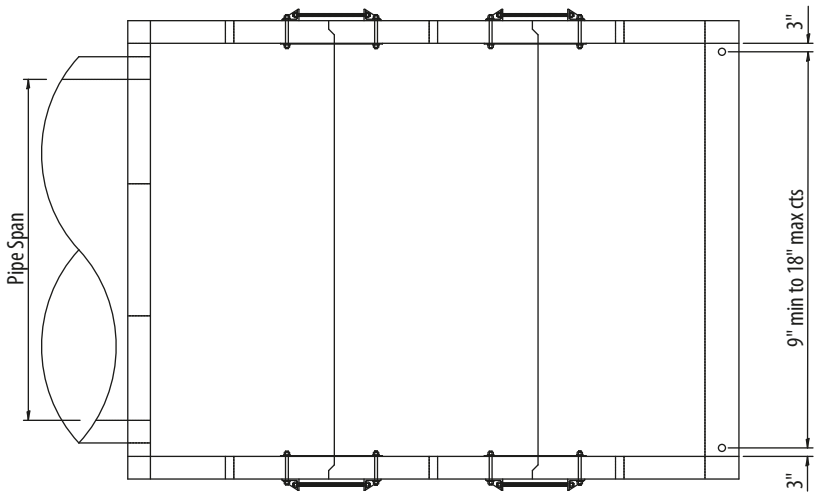

PLAN

PIPE CULVERT END SECTION DIMENSIONS

Equivalent Round Size Pipe I.D.	Pipe Span	Pipe Rise	A	R	S	L Slope of End Section 1:2	L Slope of End Section 1:3	L Slope of End Section 1:4	L Slope of End Section 1:6
15	23	14	15	28	36	5'-4"	7'-8"	10'-0"	14'-8"
18	23	14	15	28	36	5'-4"	7'-8"	10'-0"	14'-8"
21	30	19	15	38	3'-8"	7'-0"	10'-2"	13'-4"	19'-8"
24	30	19	15	38	3'-8"	7'-0"	10'-2"	13'-4"	19'-8"
27	34	22	15	3'-5"	4'-0"	7'-6"	10'-11"	14'-4"	21'-2"
30	38	24	15	3'-7"	4'-4"	7'-10"	11'-5"	15'-0"	22'-2"
36	45	29	16	4'-1"	5'-0"	8'-10"	12'-11"	17'-0"	25'-2"
42	53	34	16	4'-6"	5'-10"	9'-8"	14'-2"	18'-8"	27'-8"
48	60	38	17	4'-11"	6'-6"	10'-6"	15'-5"	20'-4"	30'-2"
54	68	43	17	5'-4"	7'-2"	11'-4"	16'-8"	22'-0"	32'-8"
60	76	48	18	5'-10"	8'-0"	12'-4"	18'-2"	24'-0"	35'-8"
66	83	53	18	6'-3"	8'-8"	13'-2"	19'-5"	25'-8"	38'-2"
72	91	58	19	6'-9"	9'-4"	14'-2"	20'-11"	27'-8"	41'-2"

QUANTITIES PER END SECTION

Equivalent Round Size Pipe I.D.	Concrete yd 3 Slope of End Section 1:2	1:3	1:4	1:6
15	1.5	1.9	2.3	3.0
18	1.5	1.9	2.3	3.0
21	2.2	2.8	3.5	4.8
24	2.2	2.8	3.5	4.8
27	2.5	3.2	3.9	5.4
30	2.7	3.5	4.3	5.9
36	3.3	4.4	5.4	7.5
42	4.0	5.3	6.6	9.2
48	4.7	6.2	7.8	10.9
54	5.3	7.2	9.0	12.6
60	6.3	8.5	10.7	15.1
66	7.1	9.6	12.2	17.2
72	8.2	11.1	14.0	19.8

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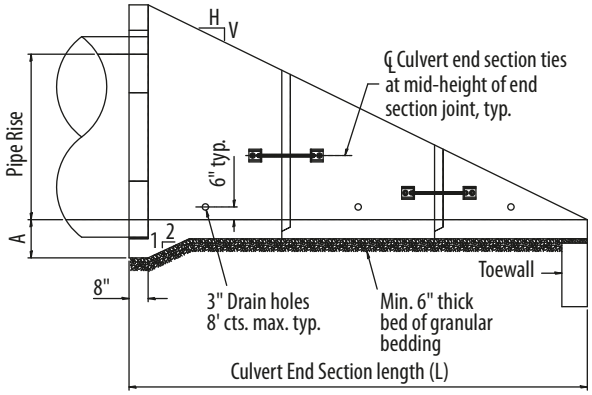
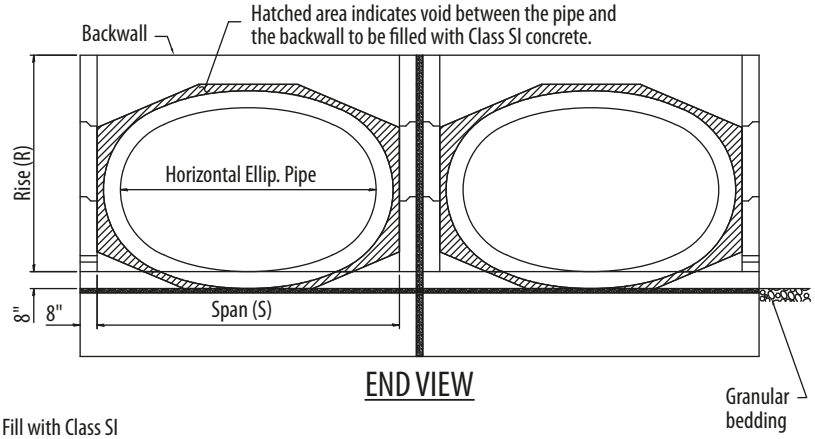
Drawing #: 542016
Date: 0414

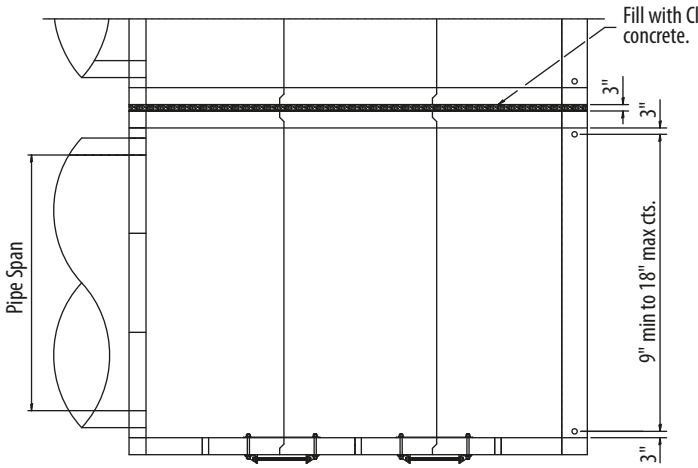
Multiple Concrete End Sections For Elliptical Pipe Culverts
15" Thru 72" Equivalent Diameter
Standard 542016
IDOT Standard



ELEVATION



END VIEW



PLAN

PIPE CULVERT END SECTION DIMENSIONS

Equivalent Round Size Pipe I.D.	Pipe Span	Pipe Rise	A	R	S	L Slope of End Section 1:2	1:3	1:4	1:6
15	23	14	15	28	36	5'-4"	7'-8"	10'-0"	14'-8"
18	23	14	15	28	36	5'-4"	7'-8"	10'-0"	14'-8"
21	30	19	15	38	3'-8"	7'-0"	10'-2"	13'-4"	19'-8"
24	30	19	15	38	3'-8"	7'-0"	10'-2"	13'-4"	19'-8"
27	34	22	15	3'-5"	4'-0"	7'-6"	10'-11"	14'-4"	21'-2"
30	38	24	15	3'-7"	4'-4"	7'-10"	11'-5"	15'-0"	22'-2"
36	45	29	16	4'-1"	5'-0"	8'-10"	12'-11"	17'-0"	25'-2"
42	53	34	16	4'-6"	5'-10"	9'-8"	14'-2"	18'-8"	27'-8"
48	60	38	17	4'-11"	6'-6"	10'-6"	15'-5"	20'-4"	30'-2"
54	68	43	17	5'-4"	7'-2"	11'-4"	16'-8"	22'-0"	32'-8"
60	76	48	18	5'-10"	8'-0"	12'-4"	18'-2"	24'-0"	35'-8"
66	83	53	18	6'-3"	8'-8"	13'-2"	19'-5"	25'-8"	38'-2"
72	91	58	19	6'-9"	9'-4"	14'-2"	20'-11"	27'-8"	41'-2"

QUANTITIES PER END SECTION

Equivalent Round Size Pipe I.D.	Concrete yd^3 Slope of End Section 1:2	1:3	1:4	1:6
15	1.5	1.9	2.3	3.0
18	1.5	1.9	2.3	3.0
21	2.2	2.8	3.5	4.8
24	2.2	2.8	3.5	4.8
27	2.5	3.2	3.9	5.4
30	2.7	3.5	4.3	5.9
36	3.3	4.4	5.4	7.5
42	4.0	5.3	6.6	9.2
48	4.7	6.2	7.8	10.9
54	5.3	7.2	9.0	12.6
60	6.3	8.5	10.7	15.1
66	7.1	9.6	12.2	17.2
72	8.2	11.1	14.0	19.8

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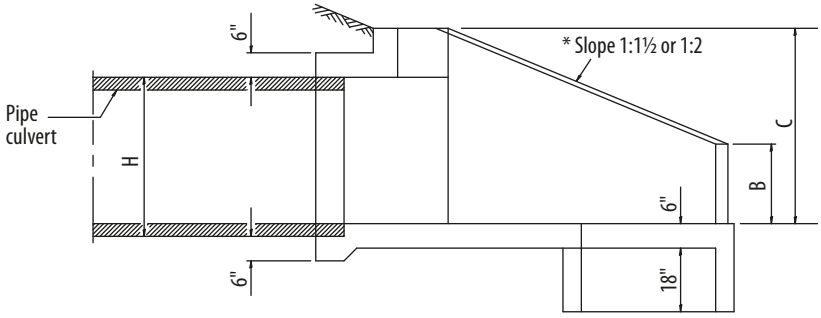
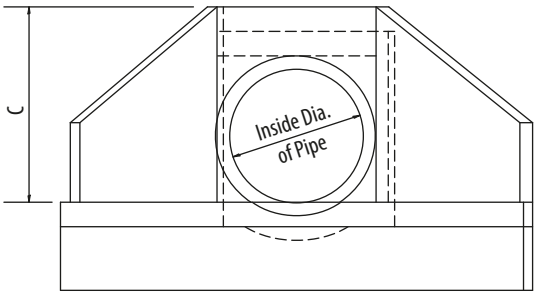
Drawing #: 542201-02
Date: 0414

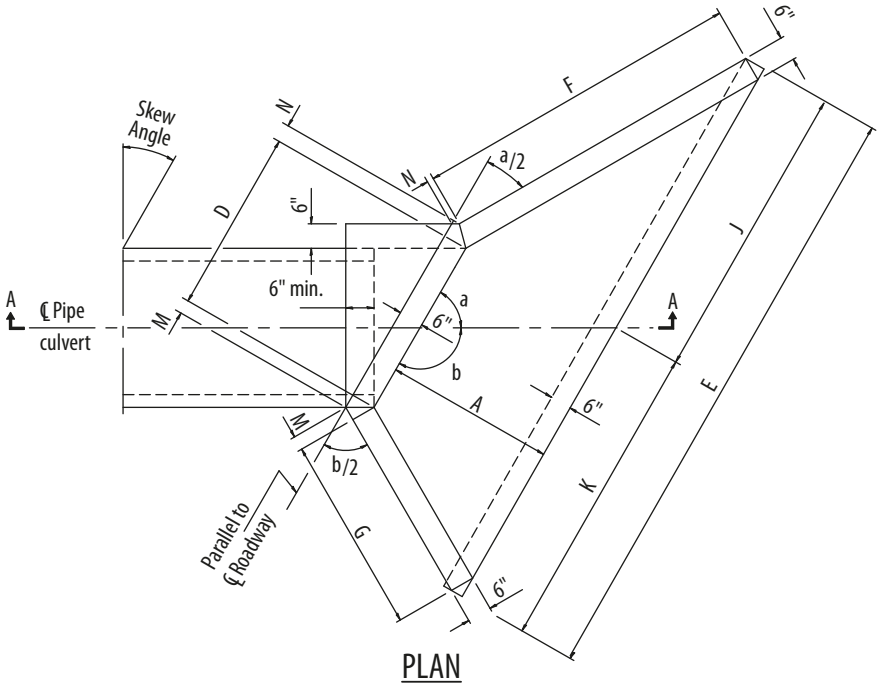
Reinforced Concrete End Sections For Pipe Culverts
15" Thru 36" Dia. Skewed With Roadway
Standard 542201-02
IDOT Standard



SECTION A-A



END VIEW



PLAN

Charts referring to this drawing are on the next (4) pages.

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Reinforced Concrete End Sections For Pipe Culverts
15" Thru 36" Dia. Skewed With Roadway
Standard 542201-02
IDOT Standard

WINGS FOR 1:1½ SLOPE

Skew Angle	Design No.	Nominal Pipe Dia.	DIMENSIONS FOR CONCRETE													Concrete 2 End Sections yd³
			A	B	C	D	E	F	G	H	J	K	M	N	a	
5°	DS 15-1½	15	28	10	29	19	6'-11¾"	3'-5½"	38	19	3'-5¾"	3'-6"	2¾	2¼	85°	1.4
	DS 18-1½	18	28	13	32	22	7'-2¾"	3'-5½"	38	22	3'-7¼"	3'-7½"	2¾	2¼	85°	1.6
	DS 24-1½	24	34	16	39	30	8'-10¾"	4'-2¼"	3'-10"	30	4'-5¼"	4'-5½"	2¾	2¼	85°	2.2
	DS 30-1½	30	39	19	3'-9"	36	10'-3"	4'-9¾"	4'-5"	36	5'-1¼"	5'-1¾"	2¾	2¼	85°	2.7
	DS 36-1½	36	3'-9"	22	4'-4"	3'-8¼"	11'-11"	5'-6½"	5'-1"	3'-8"	5'-11¼"	5'-11¾"	2¾	2¼	85°	3.3
10°	DS 15-1½	15	28	10	29	19¼"	7'-0½"	3'-7½"	36½"	19	3'-6"	3'-6½"	2¾	2¼	80°	1.5
	DS 18-1½	18	28	13	32	22¼"	7'-3¾"	3'-7½"	36½"	22	3'-7½"	3'-8¼"	2¾	2¼	80°	1.6
	DS 24-1½	24	34	16	39	30½"	9'-0"	4'-5"	3'-8½"	30	4'-5¾"	4'-6¼"	2¾	2¼	80°	2.2
	DS 30-1½	30	39	19	3'-9"	36½"	10'-4½"	5'-0¾"	4'-3"	36	5'-1¾"	5'-2½"	2¾	2¼	80°	2.8
	DS 36-1½	36	3'-9"	22	4'-4"	3'-8¾"	12'-0½"	5'-10"	4'-10¾"	3'-8"	6'-0"	6'-0½"	2¾	2¼	80°	3.5
15°	DS 15-1½	15	28	10	29	19¾"	7'-2"	3'-10"	35¼"	19	3'-6½"	3'-7½"	3	2	75°	1.5
	DS 18-1½	18	28	13	32	22¾"	7'-5¼"	3'-10"	35¼"	22	3'-8"	3'-9¼"	3	2	75°	1.7
	DS 24-1½	24	34	16	39	31	9'-2"	4'-7¾"	3'-6¾"	30	4'-6½"	4'-7½"	3	2	75°	2.3
	DS 30-1½	30	39	19	3'-9"	37¼"	10'-6½"	5'-4"	4'-1¼"	36	5'-2¾"	5'-3¾"	3	2	75°	2.9
	DS 36-1½	36	3'-9"	22	4'-4"	3'-9½"	12'-3¼"	6'-2"	4'-8¾"	3'-8"	6'-1"	6'-2¼"	3	2	75°	3.8
20°	DS 15-1½	15	28	10	29	20¼"	7'-4"	4'-0¾"	34¼"	19	3'-7¼"	3'-8¾"	3	2	70°	1.6
	DS 18-1½	18	28	13	32	23½"	7'-7½"	4'-0¾"	34¼"	22	3'-9"	3'-10½"	3	2	70°	1.7
	DS 24-1½	24	34	16	39	32	9'-4½"	4'-11¼"	3'-5½"	30	4'-7½"	4'-9"	3	2	70°	2.4
	DS 30-1½	30	39	19	3'-9"	28¼"	10'-9¾"	5'-8"	3'-11½"	36	5'-4¼"	5'-5½"	3	2	70°	3.1
	DS 36-1½	36	3'-9"	22	4'-4"	3'-10¾"	12'-7"	6'-6½"	4'-7"	3'-8"	6'-2¾"	6'-4¼"	3	2	70°	4.0
25°	DS 15-1½	15	28	10	29	21	7'-7"	4'-4"	33¼"	19	3'-8½"	3'-10½"	3¼	1½	65°	1.6
	DS 18-1½	18	28	13	32	24¼"	7'-10¼"	4'-4"	33¼"	22	3'-10¼"	4'-0"	3¼	1½	65°	1.8
	DS 24-1½	24	34	16	39	33	9'-8½"	5'-3¼"	3'-4¼"	30	4'-9¼"	4'-11¼"	3¼	1½	65°	2.5
	DS 30-1½	30	39	19	3'-9"	3'-3¾"	11'-2"	6'-0½"	3'-10¼"	36	5'-6"	5'-8"	3¼	1½	65°	3.3
	DS 36-1½	36	3'-9"	22	4'-4"	4'-0½"	13'-0¼"	6'-11¾"	4'-5¼"	3'-8"	6'-5¼"	6'-7"	3¼	1½	65°	4.3
30°	DS 15-1½	15	28	10	29	22	7'-10¾"	4'-8"	32¼"	19	3'-10¼"	4'-0½"	3¼	1½	60°	1.7
	DS 18-1½	18	28	13	32	25½"	8'-2¼"	4'-8"	32¼"	22	4'-0"	4'-2¼"	3¼	1½	60°	1.9
	DS 24-1½	24	34	16	39	34¾"	10'-1¼"	5'-8"	3'-3¼"	30	4'-11½"	5'-1¾"	3¼	1½	60°	2.7
	DS 30-1½	30	39	19	3'-9"	3'-5½"	11'-7¾"	6'-6"	3'-9"	36	5'-8¾"	5'-11"	3¼	1½	60°	3.5
	DS 36-1½	36	3'-9"	22	4'-4"	4'-2¾"	13'-7"	7'-6"	4'-4"	3'-8"	6'-8½"	6'-10½"	3¼	1½	60°	4.6

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15" Thru 36" Dia. Skewed With Roadway
Standard 542201-02
IDOT Standard

WINGS FOR 1:1½ SLOPE

Skew Angle	Design No.	Nominal Pipe Dia.	DIMENSIONS FOR CONCRETE													Concrete 2 End Sections yd³
			A	B	C	D	E	F	G	H	J	K	M	N	a	
35°	DS 15-1 1/2	15	28	10	29	23 1/4	8'-3 3/4"	5'-0 3/4"	31 1/2"	19	4'-0 1/2"	4'-3"	3 3/4	1 1/2	55°	1.8
	DS 18-1 1/2	18	28	13	32	27	8'-7 1/4"	5'-0 3/4"	31 1/2"	22	4'-2 1/4"	4'-5"	3 3/4	1 1/2	55°	2.0
	DS 24-1 1/2	24	34	16	39	36 1/2	10'-7 3/4"	6'-1 3/4"	38 1/4"	30	5'-2 1/2"	5'-5 1/4"	3 3/4	1 1/2	55°	2.9
	DS 30-1 1/2	30	39	19	3'-9"	3'-8"	12'-3 1/4"	7'-0 1/2"	3'-8"	36	6'-0 1/4"	6'-3"	3 3/4	1 1/2	55°	3.7
	DS 36-1 1/2	36	3'-9"	22	4'-4"	4'-5 3/4"	14'-3 3/4"	8'-1 1/2"	4'-2 3/4"	3'-8"	7'-0 1/2"	7'-3 1/4"	3 3/4	1 1/2	55°	4.9
40°	DS 15-1 1/2	15	28	10	29	24	8'-10"	5'-6 1/4"	31	19	4'-3 1/2"	4'-6 1/2"	3 3/4	1 1/4	50°	1.9
	DS 18-1 1/2	18	28	13	32	28	9'-1 3/4"	5'-6 1/4"	31	22	4'-5 1/2"	4'-8 1/4"	3 3/4	1 1/4	50°	2.2
	DS 24-1 1/2	24	34	16	39	3'-3 1/4"	11'-4"	6'-8 1/2"	37 1/2"	30	5'-6 1/2"	5'-9 1/2"	3 3/4	1 1/4	50°	3.1
	DS 30-1 1/2	30	39	19	3'-9"	3'-11"	13'-0 3/4"	7'-8 1/4"	3'-7"	36	6'-5"	6'-7 3/4"	3 3/4	1 1/4	50°	4.0
	DS 36-1 1/2	36	3'-9"	22	4'-4"	4'-9 1/2"	15'-3"	8'-10 1/2"	4'-1 3/4"	3'-8"	7'-6"	7'-9"	3 3/4	1 1/4	50°	5.3
45°	DS 15-1 1/2	15	28	10	29	27	9'-6"	6'-1 1/4"	30 1/4"	19	4'-7 1/2"	4'-10 1/2"	4	1 1/4	45°	2.1
	DS 18-1 1/2	18	28	13	32	31	9'-10 1/4"	6'-1 1/4"	30 1/4"	22	4'-9 1/2"	5'-0 3/4"	4	1 1/4	45°	2.4
	DS 24-1 1/2	24	34	16	39	3'-6 1/2"	12'-3 1/2"	7'-4 3/4"	36 3/4"	30	5'-11 1/2"	6'-3"	4	1 1/4	45°	3.4
	DS 30-1 1/2	30	39	19	3'-9"	4'-3"	14'-1"	8'-6"	3'-6 1/4"	36	6'-11"	7'-2"	4	1 1/4	45°	4.4
	DS 36-1 1/2	36	3'-9"	22	4'-4"	5'-2 1/4"	16'-5 1/4"	9'-9 1/2"	4'-0 3/4"	3'-8"	8'-1"	8'-4 1/4"	4	1 1/4	45°	5.7
50°	DS 15-1 1/2	15	28	10	29	29	10'-4 1/2"	6'-10"	29 3/4"	19	5'-0 1/2"	5'-4"	4 1/4	1	40°	2.3
	DS 18-1 1/2	18	28	13	32	24	10'-9"	6'-10"	29 3/4"	22	5'-2 3/4"	5'-6 1/4"	4 1/4	1	40°	2.6
	DS 24-1 1/2	24	34	16	39	3'-10 3/4"	13'-4 1/4"	8'-3 1/2"	36 1/4"	30	6'-6 1/4"	6'-10"	4 1/4	1	40°	3.7
	DS 30-1 1/2	30	39	19	3'-9"	4'-8"	15'-5"	9'-6"	3'-5 1/2"	36	7'-6 3/4"	7'-10 1/4"	4 1/4	1	40°	4.8
	DS 36-1 1/2	36	3'-9"	22	4'-4"	5'-8 1/2"	18'-0 1/4"	10'-11 1/2"	4'-0"	3'-8"	8'-10 1/4"	9'-2"	4 1/4	1	40°	6.3
55°	DS 15-1 1/2	15	28	10	29	33	11'-6 1/4"	7'-9"	29 1/4"	19	5'-7 1/4"	5'-11"	4 1/2	1	35°	2.6
	DS 18-1 1/2	18	28	13	32	38 1/4	11'-11 1/2"	7'-9"	29 1/4"	22	5'-9 3/4"	6'-1 3/4"	4 1/2	1	35°	2.9
	DS 24-1 1/2	24	34	16	39	4'-4 1/4"	14'-10 1/2"	9'-5"	35 3/4"	30	7'-3 1/4"	7'-7 1/4"	4 1/2	1	35°	4.2
	DS 30-1 1/2	30	39	19	3'-9"	5'-2 3/4"	17'-2 1/4"	10'-9 3/4"	3'-5"	36	8'-5 1/4"	8'-9"	4 1/2	1	35°	5.4
	DS 36-1 1/2	36	3'-9"	22	4'-4"	6'-4 3/4"	20'-1 1/4"	12'-5 3/4"	3'-11 1/4"	3'-8"	9'-10 3/4"	10'-2 1/2"	4 1/2	1	35°	7.1
60°	DS 15-1 1/2	15	28	10	29	38	13'-1 1/4"	9'-0 1/4"	29	19	6'-4 1/2"	6'-8 3/4"	4 1/2	3/4	30°	2.9
	DS 18-1 1/2	18	28	13	32	3'-8"	13'-7 1/4"	9'-0 1/4"	29	22	6'-7 1/2"	6'-11 3/4"	4 1/2	3/4	30°	3.2
	DS 24-1 1/2	24	34	16	39	5'-0"	16'-11 1/4"	10'-11 1/4"	35 1/4"	30	8'-3 1/2"	8'-7 3/4"	4 1/2	3/4	30°	4.7
	DS 30-1 1/2	30	39	19	3'-9"	6'-0"	19'-7 1/4"	12'-6 3/4"	3'-4 1/2"	36	9'-7 1/2"	9'-11 3/4"	4 1/2	3/4	30°	6.1
	DS 36-1 1/2	36	3'-9"	22	4'-4"	7'-4"	22'-11 1/4"	14'-5 3/4"	3'-10 1/2"	3'-8"	11'-3 1/2"	11'-7 3/4"	4 1/2	3/4	30°	8.1

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Standard 542201-02
IDOT Standard

WINGS FOR 1:2 SLOPE

Skew Angle	Design No.	Nominal Pipe Dia.	DIMENSIONS FOR CONCRETE													Concrete 2 End Sections yd^3
			A	B	C	D	E	F	G	H	J	K	M	N	a	
5°	DS 15-2	15	38	10	29	19	8'-7 3/4"	4'-8 1/4"	4'-3 1/2"	19	4'-3 3/4"	4'-4"	2 3/4	2 1/4	85°	1.9
	DS 18-2	18	38	13	32	22	8'-10 3/4"	4'-8 1/4"	4'-3 1/2"	22	4'-5 1/4"	4'-5 1/2"	2 3/4	2 1/4	85°	2.0
	DS 24-2	24	3'-10"	16	39	30	10'-11"	5'-8"	5'-2 1/2"	30	5'-5 1/4"	5'-5 3/4"	2 3/4	2 1/4	85°	2.9
	DS 30-2	30	4'-4"	19	3'-9"	36	12'-5"	6'-5"	5'-10 1/2"	36	6'-2 1/4"	6'-2 3/4"	2 3/4	2 1/4	85°	3.7
	DS 36-2	36	5'-0"	22	4'-4"	3'-8 1/4"	14'-5"	7'-4 3/4"	6'-9 1/4"	3'-8"	7'-2 1/4"	7'-2 3/4"	2 3/4	2 1/4	85°	4.5
10°	DS 15-2	15	38	10	29	19 1/4	8'-9"	4'-11"	4'-1 1/2"	19	4'-4"	4'-5"	2 3/4	2 1/4	80°	2.0
	DS 18-2	18	38	13	32	22 1/4	9'-0"	4'-11"	4'-1 1/2"	22	4'-5 3/4"	4'-6 1/4"	2 3/4	2 1/4	80°	2.1
	DS 24-2	24	3'-10"	16	39	30 1/2	11'-0 3/4"	5'-11 1/2"	5'-0"	30	5'-5 3/4"	5'-6 1/2"	2 3/4	2 1/4	80°	3.0
	DS 30-2	30	4'-4"	19	3'-9"	36 1/2	12'-6 3/4"	6'-9"	5'-8"	36	6'-3"	6'-3 3/4"	2 3/4	2 1/4	80°	3.8
	DS 36-2	36	5'-0"	22	4'-4"	3'-8 3/4"	14'-7"	7'-9 1/4"	6'-6 1/4"	3'-8"	7'-3"	7'-4"	2 3/4	2 1/4	80°	4.7
15°	DS 15-2	15	38	10	29	19 3/4	8'-10 3/4"	5'-2 1/2"	4'-0"	19	4'-4 3/4"	4'-6"	3	2	75°	2.0
	DS 18-2	18	38	13	32	22 3/4	9'-2"	5'-2 1/2"	4'-0"	22	4'-6 1/2"	4'-7 1/2"	3	2	75°	2.2
	DS 24-2	24	3'-10"	16	39	31	11'-2 3/4"	6'-3 1/2"	4'-10"	30	5'-6 3/4"	5'-8"	3	2	75°	3.1
	DS 30-2	30	4'-4"	19	3'-9"	37 1/4	12'-9 1/4"	7'-1 1/2"	5'-5 1/2"	36	6'-4"	6'-5 1/4"	3	2	75°	3.9
	DS 36-2	36	5'-0"	22	4'-4"	3'-9 1/2"	14'-10 1/4"	8'-2 1/2"	6'-3 1/2"	3'-8"	7'-4 1/2"	7'-5 3/4"	3	2	75°	5.0
20°	DS 15-2	15	38	10	29	20 1/4	9'-1 1/2"	5'-6 1/4"	3'-10 1/2"	19	4'-6"	4'-7 1/2"	3	2	70°	2.1
	DS 18-2	18	38	13	32	23 1/2	9'-4 1/2"	5'-6 1/4"	3'-10 1/2"	22	4'-7 1/2"	4'-9"	3	2	70°	2.3
	DS 24-2	24	3'-10"	16	39	32	11'-6 1/4"	6'-8 1/4"	4'-8 1/4"	30	5'-8 1/2"	5'-9 3/4"	3	2	70°	3.2
	DS 30-2	30	4'-4"	19	3'-9"	38 1/4	13'-1 1/4"	7'-6 3/4"	5'-3 1/2"	36	6'-6"	6'-7 1/4"	3	2	70°	4.1
	DS 36-2	36	5'-0"	22	4'-4"	3'-10 3/4"	15'-3"	8'-8 1/2"	6'-1 1/4"	3'-8"	7'-6 3/4"	7'-8 1/4"	3	2	70°	5.3
25°	DS 15-2	15	38	10	29	21	9'-5"	5'-10 3/4"	3'-9"	19	4'-7 1/2"	4'-9 1/2"	3 1/4	1 3/4	65°	2.2
	DS 18-2	18	38	13	32	24 1/4	9'-8 1/2"	5'-10 3/4"	3'-9"	22	4'-9 1/4"	4'-11 1/4"	3 1/4	1 3/4	65°	2.4
	DS 24-2	24	3'-10"	16	39	33	11'-11"	7'-1 1/2"	4'-6 1/2"	30	5'-10 1/2"	6'-0 1/2"	3 1/4	1 3/4	65°	3.4
	DS 30-2	30	4'-4"	19	3'-9"	3'-3 1/4"	13'-6 3/4"	8'-0 3/4"	5'-1 3/4"	36	6'-8 1/2"	6'-10 1/4"	3 1/4	1 3/4	65°	4.3
	DS 36-2	36	5'-0"	22	4'-4"	4'-0 1/2"	15'-9 1/4"	9'-3 3/4"	5'-11 1/4"	3'-8"	7'-9 3/4"	7'-11 1/2"	3 1/4	1 3/4	65°	5.6
30°	DS 15-2	15	38	10	29	22	9'-9 3/4"	6'-4"	3'-8"	19	4'-9 3/4"	5'-0"	3 1/2	1 1/2	60°	2.3
	DS 18-2	18	38	13	32	25 1/2	10'-1 1/2"	6'-4"	3'-8"	22	4'-11 1/2"	5'-2"	3 1/2	1 1/2	60°	2.5
	DS 24-2	24	3'-10"	16	39	34 3/4	12'-5"	7'-8"	4'-5"	30	6'-1 1/2"	6'-3 1/2"	3 1/2	1 1/2	60°	3.6
	DS 30-2	30	4'-4"	19	3'-9"	3'-5 1/2"	14'-1 3/4"	8'-8"	5'-0"	36	6'-11 3/4"	7'-2"	3 1/2	1 1/2	60°	4.5
	DS 36-2	36	5'-0"	22	4'-4"	4'-2 3/4"	16'-5 1/2"	10'-0"	5'-9 1/4"	3'-8"	8'-1 3/4"	8'-3 3/4"	3 1/2	1 1/2	60°	5.9

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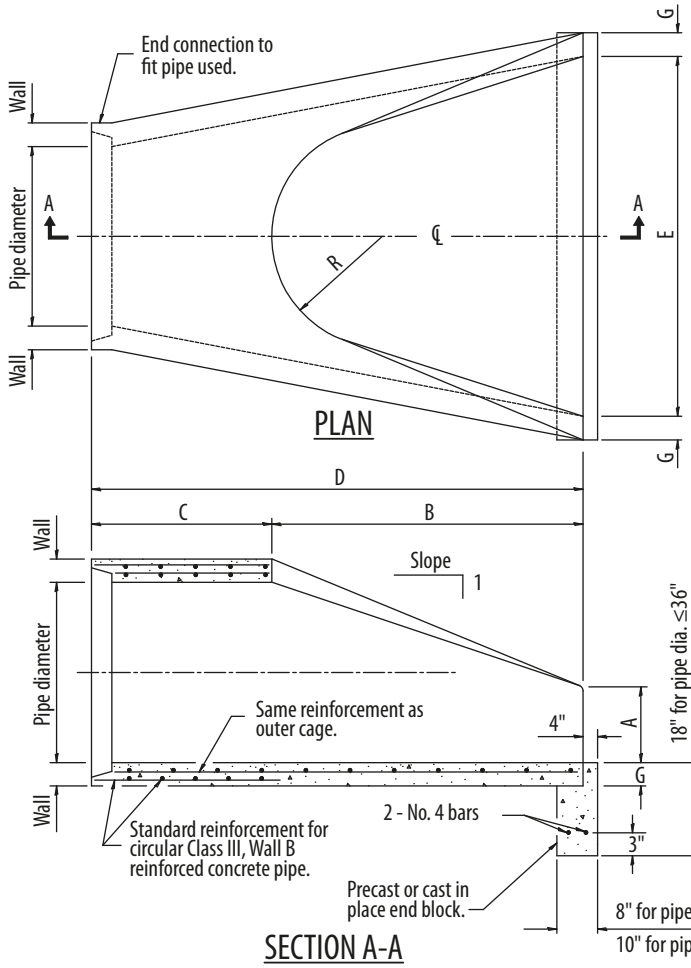
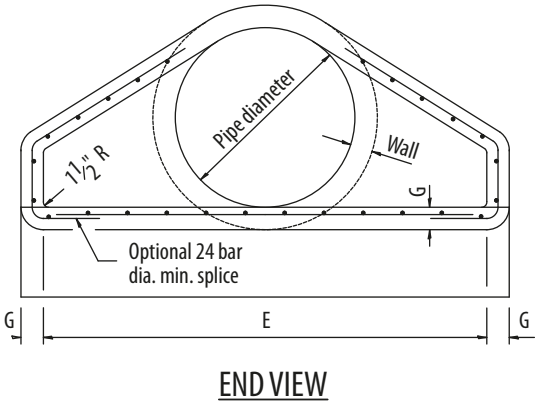
WINGS FOR 1:12 SLOPE

Skew Angle	Design No.	Nominal Pipe Dia.	DIMENSIONS FOR CONCRETE													Concrete 2 End Sections yd 3
			A	B	C	D	E	F	G	H	J	K	M	N	a	
35°	DS 15-2	15	38	10	29	23 1/4	10'-4"	6'-10 1/4"	3'-6 3/4"	19	5'-0 3/4"	5'-3 1/4"	3 3/4	1 1/2	55°	2.4
	DS 18-2	18	38	13	32	27	10'-7 3/4"	6'-10 1/4"	3'-6 3/4"	22	5'-2 1/2"	5'-5 1/4"	3 3/4	1 1/2	55°	2.6
	DS 24-2	24	3'-10"	16	39	36 1/2	13'-1"	8'-3 1/2"	4'-3 3/4"	30	6'-5 1/4"	6'-7 3/4"	3 3/4	1 1/2	55°	3.8
	DS 30-2	30	4'-4"	19	3'-9"	3'-8"	14'-11"	9'-4 1/2"	4'-10 1/2"	36	7'-4 1/4"	7'-6 3/4"	3 3/4	1 1/2	55°	4.8
	DS 36-2	36	5'-0"	22	4'-4"	4'-5 3/4"	17'-4 1/4"	10'-10"	5'-7 3/4"	3'-8"	8'-6 3/4"	8'-9 1/2"	3 3/4	1 1/2	55°	6.3
40°	DS 15-2	15	38	10	29	34 3/4	11'-0"	7'-6"	3'-6"	19	5'-4 1/2"	5'-7 1/2"	3 3/4	1 1/4	50°	2.6
	DS 18-2	18	38	13	32	28 3/4	11'-4"	7'-6"	3'-6"	22	5'-6 1/2"	5'-9 1/2"	3 3/4	1 1/4	50°	2.8
	DS 24-2	24	3'-10"	16	39	3'-3 1/4"	13'-11 1/4"	9'-0 3/4"	4'-2 3/4"	30	6'-10 1/4"	7'-1"	3 3/4	1 1/4	50°	4.1
	DS 30-2	30	4'-4"	19	3'-9"	3'-11"	15'-10 3/4"	10'-3"	4'-9 1/2"	36	7'-10"	8'-0 3/4"	3 3/4	1 1/4	50°	5.2
	DS 36-2	36	5'-0"	22	4'-4"	4'-9 1/2"	18'-6"	11'-10"	5'-6 1/4"	3'-8"	9'-1 1/2"	9'-4 1/2"	3 3/4	1 1/4	50°	6.8
45°	DS 15-2	15	38	10	29	27	11'-10 1/4"	8'-3 1/4"	3'-5 1/4"	19	5'-9 1/2"	6'-0 3/4"	4	1 1/4	45°	2.8
	DS 18-2	18	38	13	32	31	12'-2 1/2"	8'-3 1/4"	3'-5 1/4"	22	5'-11 1/2"	6'-3"	4	1 1/4	45°	3.1
	DS 24-2	24	3'-10"	16	39	3'-6 1/2"	15'-0 1/4"	10'-0 1/4"	4'-1 3/4"	30	7'-4 1/2"	7'-7 3/4"	4	1 1/4	45°	4.4
	DS 30-2	30	4'-4"	19	3'-9"	4'-3"	17'-1 3/4"	11'-4"	4'-8 1/4"	36	8'-5 1/4"	8'-8 1/2"	4	1 1/4	45°	5.6
	DS 36-2	36	5'-0"	22	4'-4"	5'-2 1/4"	19'-11 3/4"	13'-0 3/4"	5'-5"	3'-8"	9'-10 1/4"	10'-1 1/2"	4	1 1/4	45°	7.4
50°	DS 15-2	15	38	10	29	29 1/2	12'-11 1/2"	9'-3"	3'-4 1/2"	19	6'-4"	6'-7 1/2"	4 1/4	1	40°	3.1
	DS 18-2	18	38	13	32	34 1/4	13'-4 1/4"	9'-3"	3'-4 1/2"	22	6'-6 1/4"	6'-10"	4 1/4	1	40°	3.4
	DS 24-2	24	3'-10"	16	39	3'-10 3/4"	16'-5 1/2"	11'-2 1/2"	4'-1"	30	8'-1"	8'-4 1/2"	4 1/4	1	40°	4.8
	DS 30-2	30	4'-4"	19	3'-9"	4'-8"	18'-9 1/2"	12'-8"	4'-7 1/4"	36	9'-3"	9'-6 1/2"	4 1/4	1	40°	6.2
	DS 36-2	36	5'-0"	22	4'-4"	5'-8 1/2"	21'-10 3/4"	14'-7 1/2"	5'-3 3/4"	3'-8"	10'-9 1/2"	11'-1 1/4"	4 1/4	1	40°	8.1
55°	DS 15-2	15	38	10	29	33	14'-5"	10'-6 1/4"	3'-4"	19	7'-0 1/2"	7'-4 1/2"	4 1/2	1	35°	3.4
	DS 18-2	18	38	13	32	38 1/4	14'-10 1/4"	10'-6 1/4"	3'-4"	22	7'-3 1/4"	7'-7"	4 1/2	1	35°	3.7
	DS 24-2	24	3'-10"	16	39	4'-4 1/4"	14'-10 1/4"	12'-9"	4'-0 1/4"	30	9'-0 1/4"	9'-4"	4 1/2	1	35°	5.4
	DS 30-2	30	4'-4"	19	3'-9"	5'-2 3/4"	20'-11 1/2"	14'-5"	4'-6 1/2"	36	10'-3 3/4"	10'-7 3/4"	4 1/2	1	35°	6.9
	DS 36-2	36	5'-0"	22	4'-4"	6'-4 3/4"	24'-5 1/4"	16'-7 1/2"	5'-3"	3'-8"	12'-0 3/4"	12'-4 3/4"	4 1/2	1	35°	9.1
60°	DS 15-2	15	38	10	29	38	16'-5 1/4"	12'-2 3/4"	3'-3 1/4"	19	8'-0 1/2"	8'-4 3/4"	4 1/2	0 3/4	30°	3.9
	DS 18-2	18	38	13	32	3'-8"	16'-11 1/4"	12'-2 3/4"	3'-3 1/4"	22	8'-3 1/2"	8'-7 3/4"	4 1/2	0 3/4	30°	4.2
	DS 24-2	24	3'-10"	16	39	5'-0"	20'-11 1/4"	14'-9 3/4"	3'-11 3/4"	30	10'-3 1/2"	10'-7 3/4"	4 1/2	0 3/4	30°	6.1
	DS 30-2	30	4'-4"	19	3'-9"	6'-0"	23'-11 1/4"	16'-9"	4'-5 3/4"	36	11'-9 1/2"	12'-1 3/4"	4 1/2	0 3/4	30°	7.9
	DS 36-2	36	5'-0"	22	4'-4"	7'-4"	27'-11 1/4"	19'-3 3/4"	5'-2"	3'-8"	13'-9 1/2"	14'-1 3/4"	4 1/2	0 3/4	30°	10.4

Precast Reinforced Concrete Flared End Section
Standard 542301-03
IDOT Standard





PIPE DIA.	APPROX. QTY. lbs.	WALL	A	B	C	D	E	G	R	APPROX. SLOPE
12	530	2	4	24	4'-0 7/8"	6'-0 7/8"	24	2	9	1:2.4
15	740	2 1/4	6	27	3'-10"	6'-1"	30	2 1/4	11	1:2.4
18	990	2 1/2	9	27	3'-10"	6'-1"	36	2 1/2	12	1:2.4
21	1280	2 3/4	9	35	38	6'-1"	3'-6"	2 3/4	13	1:2.4
24	1520	3	9 1/2	3'-7 1/2	30	6'-1 1/2"	4'-0"	3	14	1:2.5
27	1930	3 1/4	10 1/2	4'-0"	25 1/2	6'-1 1/2"	4'-6"	3 1/4	14 1/2	1:2.4
30	2190	3 1/2	12	4'-6"	19 3/4	6'-1 3/4"	5'-0"	3 1/2	15	1:2.5
33	3200	3 3/4	13 1/2	4'-10 1/2"	39 1/4	8'-1 3/4"	5'-6"	3 3/4	17 1/2	1:2.5
36	4100	4	15	5'-3"	34 3/4	8'-1 3/4"	6'-0"	4	20	1:2.5
42	5380	4 1/2	21	5'-3"	35	8'-2"	6'-6"	4 1/2	22	1:2.5
48	6550	5	24	6'-0"	26	8'-2"	7'-0"	5	22	1:2.5
54	8240	5 1/2	27	5'-5"	35	8'-4"	7'-6"	5 1/2	24	1:2.0
60	8730	6	35	5'-0"	39	8'-3"	8'-0"	5	*	1:1.9
66	10710	6 1/2	30	6'-0"	27	8'-3"	8'-6"	5 1/2	*	1:1.7
72	12520	7	36	6'-6"	21	8'-3"	9'-0"	6	*	1:1.8
78	14770	7 1/2	36	7'-6"	21	9'-3"	9'-6"	6 1/2	*	1:1.8
84	18160	8	36	7'-6 1/2"	21	9'-3 1/2"	10'-0"	6 1/2	*	1:1.6

* Radius as furnished by manufacturer

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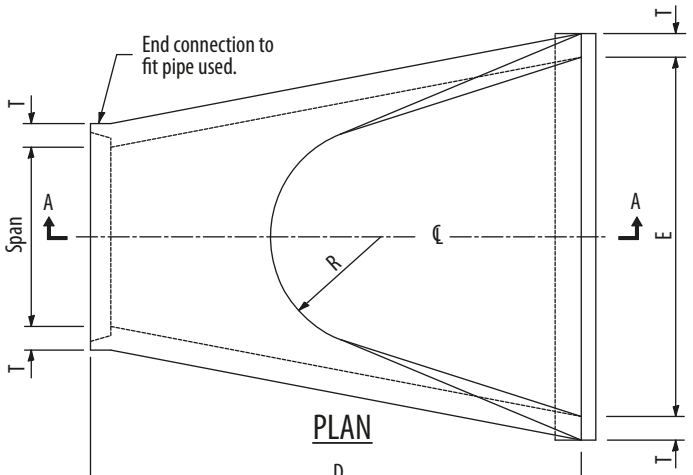
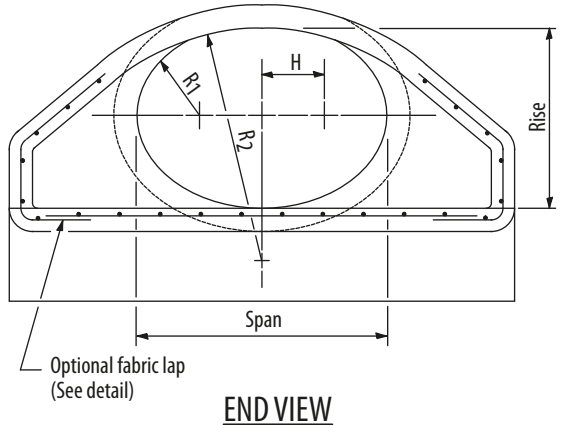
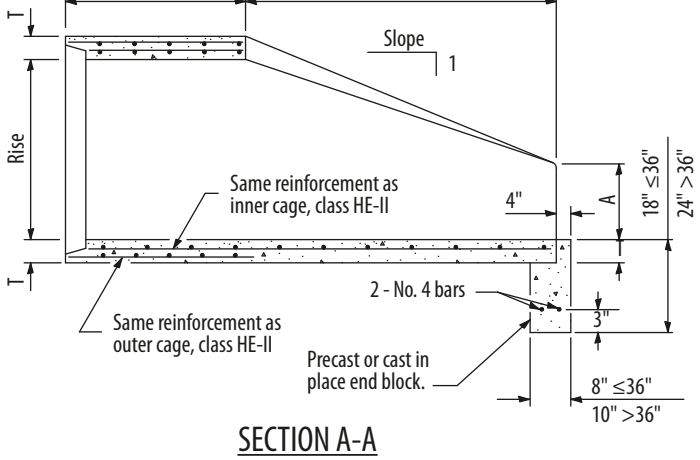
Drawing #: 542306-02
Date: 0414

Precast Reinforced Concrete Elliptical Flared End Section
Standard 542306-02
IDOT Standard

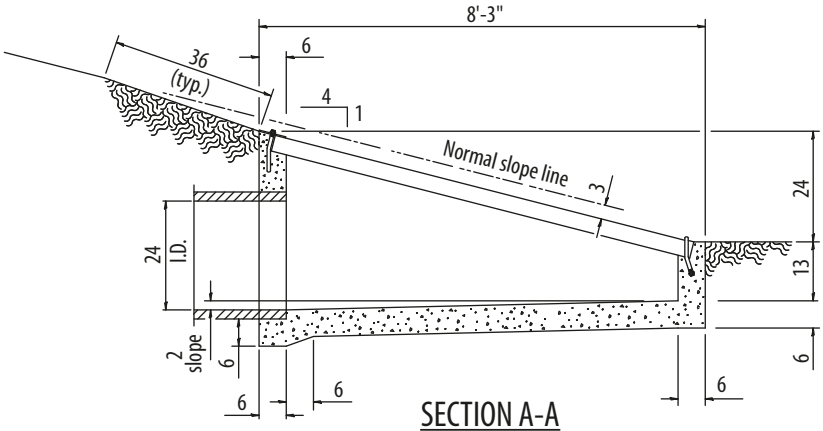




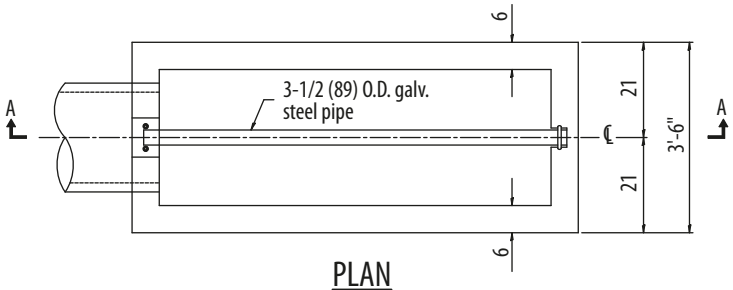


SPAN	RISE	EQUIV. DIA.	WALL T	A	B	C	D	E	H	R	R_1	R_2	APPROX. SLOPE
23	14	18	2 3/4	8	27	3'-9"	6'-0"	36	5 3/8	6	6	20	1:3.1
30	19	24	3 1/4	8 1/2	39	33	6'-0"	4'-0"	6 7/8	7	8 1/4	26 1/4	1:2.8
34	22	27	3 1/2	9	4'-0"	24	6'-0"	4'-6"	7 3/4	8	9 1/4	29 1/4	1:2.9
38	24	30	3 1/2	9 1/2	4'-6"	18	6'-0"	5'-0"	8 5/8	9	10 1/4	32 3/4	1:2.9
45	29	36	4 1/2	11 1/4	5'-0"	36	8'-0"	6'-0"	10 1/2	12	12 1/4	39 1/4	1:2.7
53	34	42	5	15 3/4	5'-0"	36	8'-0"	6'-6"	12 1/8	13	14 1/2	3'-10"	1:2.6
60	38	48	5 1/2	21	5'-0"	36	8'-0"	7'-0"	13 1/2	14	16 1/2	4'-3 1/2"	1:2.7
68	43	54	6	26	5'-0"	36	8'-0"	7'-6"	15 1/4	16	18 3/4	4'-10 1/2"	1:2.6
76	48	60	6 1/2	31	5'-0"	36	8'-0"	8'-0"	17	18	20 3/4	5'-5"	1:2.6

Inlet Box Type 24 A
Standard 542501-02
IDOT Standard



SECTION A-A



PLAN

Materials required for one inlet box

Material	Size	Length
Galv. Steel Pipe	3 1/2 O.D.	8'-0"
Concrete	cu. yds.	1.2
Reinf. Bars	lbs.	115

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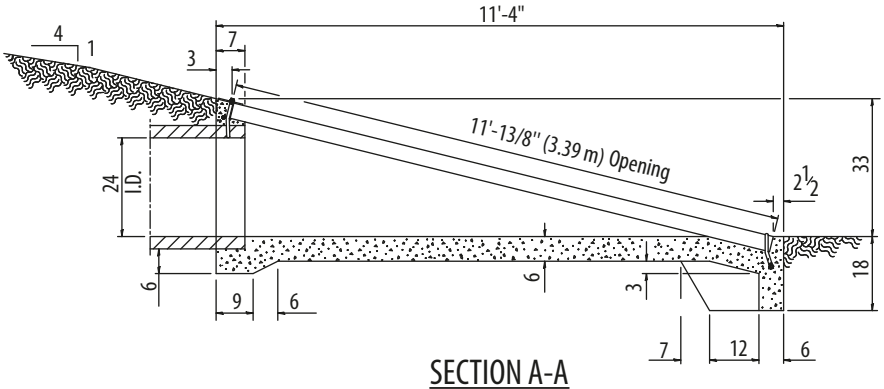
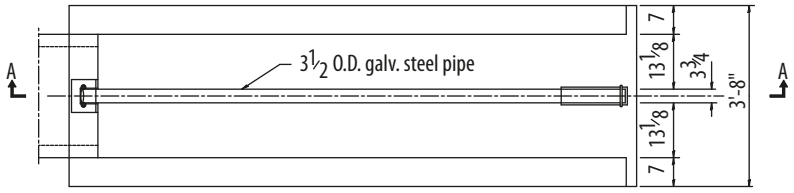
Date: 0414

Inlet Box Type 24 B
Standard 542506-02
IDOT Standard



SECTION A-A



PLAN

Materials required for one inlet box

Material	Size	Length
Galv. Steel Pipe	3 ½ O.D.	11'-1 ⅛ "
Concrete	cu. yds.	1.6
Reinf. Bars	lbs.	127

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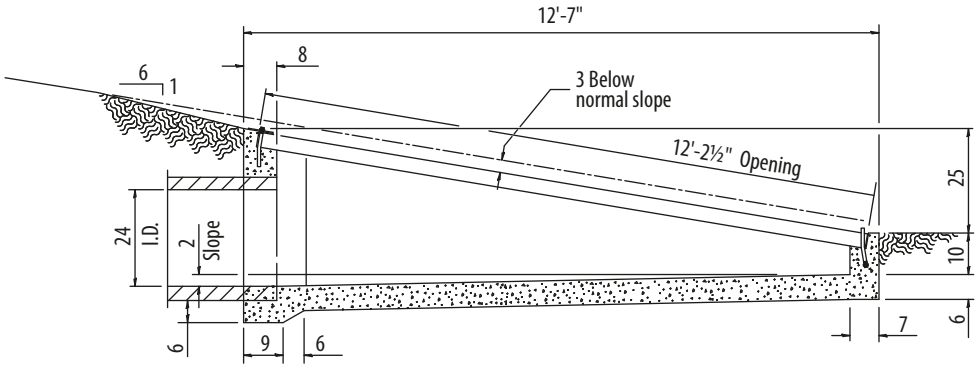
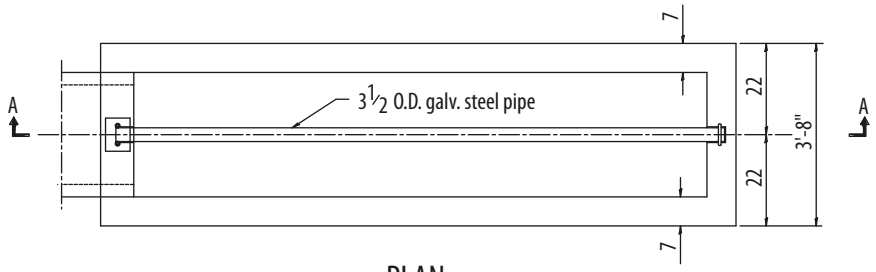
Inlet Box Type 24 C
Standard 542511
IDOT Standard



SECTION A-A



PLAN

Materials required for one inlet box

Material	Size	Length
Galv. Steel Pipe	3½ O.D.	12'-2¼ "
Concrete	cu. yds.	1.9
Reinf. Bars	lbs.	83

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Drawing #: 542516
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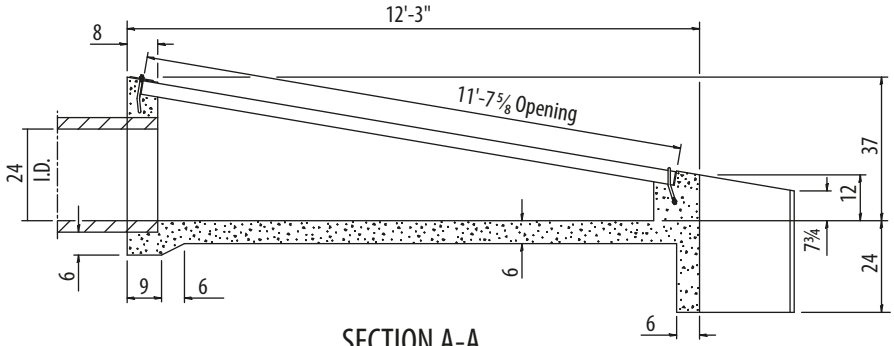
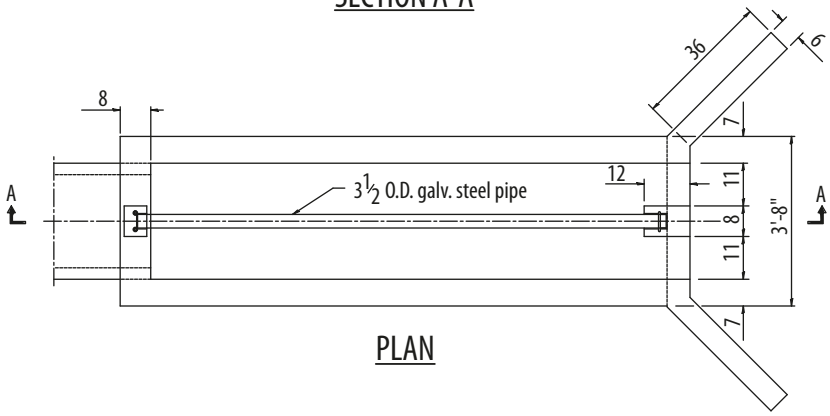
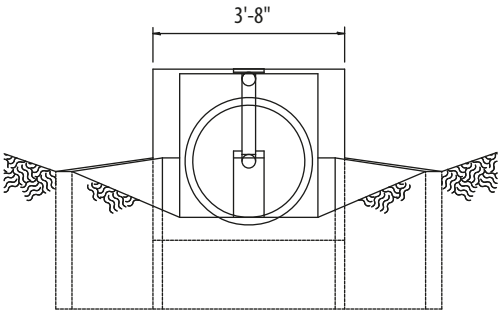
Inlet Box Type 24 D
Standard 542516
IDOT Standard



SECTION A-A



PLAN

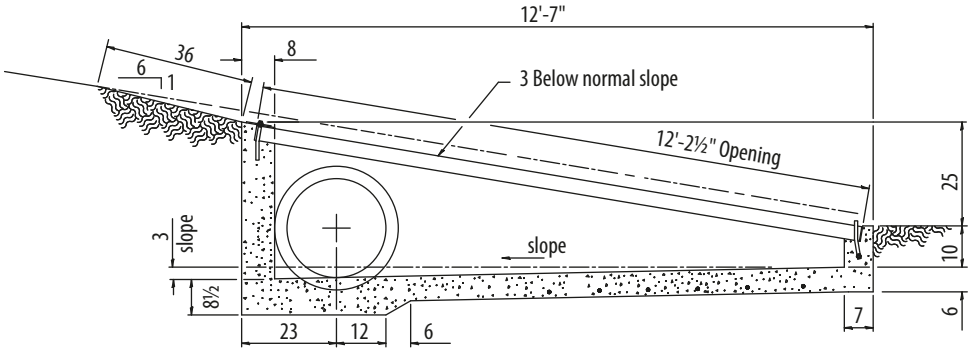


END VIEW

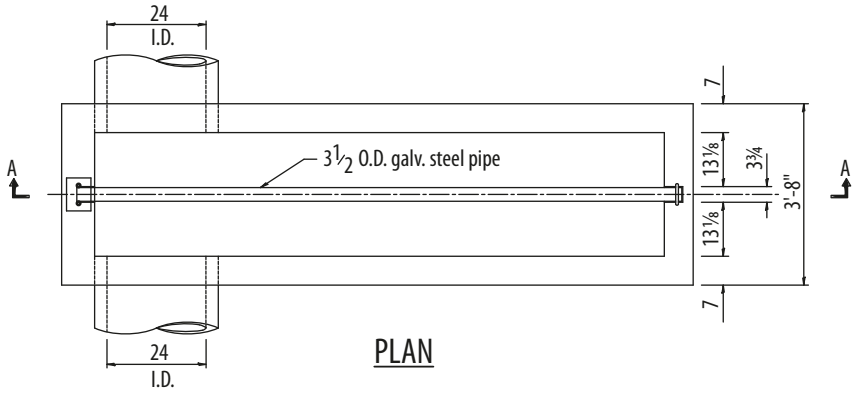
Materials required for one inlet box

Material	Size	Length
Galv. Steel Pipe	3½ O.D.	11'-7⅜"
Concrete	cu. yds.	2.2
Reinf. Bars	lbs.	220

Inlet Box Type 24 E
Standard 542521
IDOT Standard



SECTION A-A



PLAN

Materials required for one inlet box

Material	Size	Length
Galv. Steel Pipe	3½ O.D.	12'-2¼ "
Concrete	cu. yds.	2.0
Reinf. Bars	lbs.	175

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Drawing #: 542526
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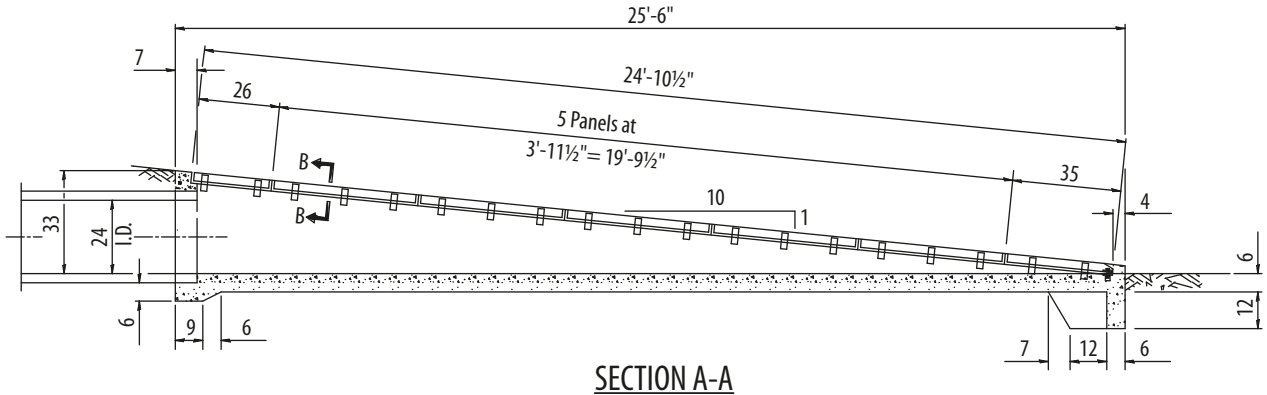
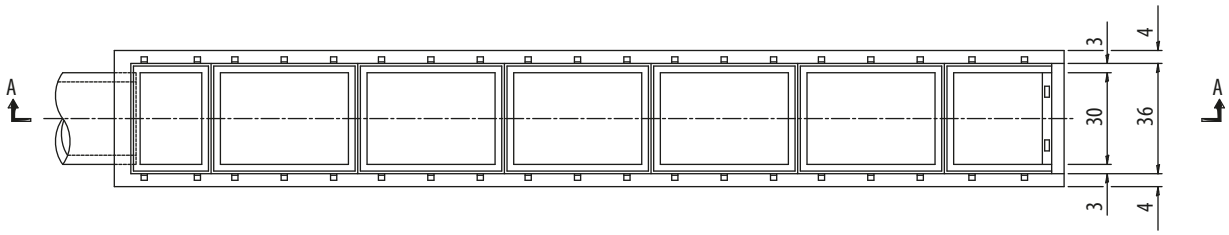
Inlet Box Type 24 F
Standard 542526
IDOT Standard



SECTION A-A

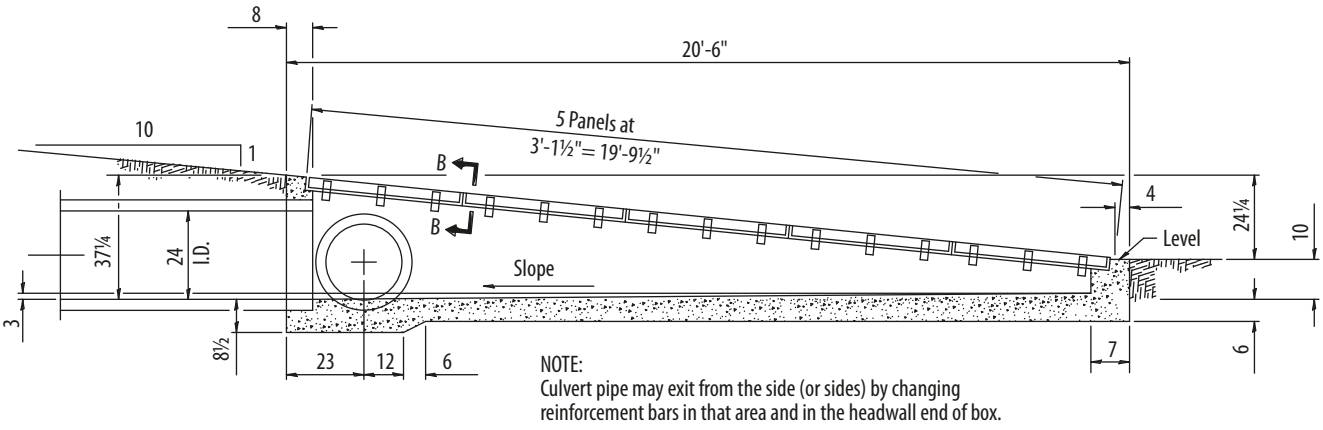


PLAN

Materials Required for One Inlet Box

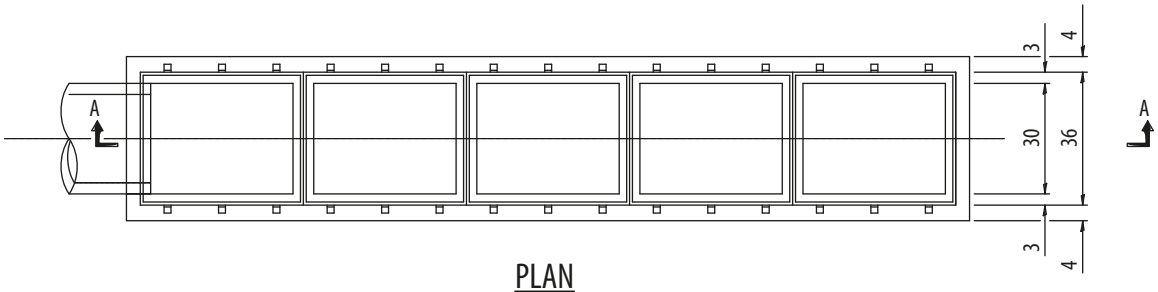
Material	Unit	Quantity
Concrete	cu. yds.	3.4
Reinf. Bars	lbs.	250
Grating	sq. ft	70.4

Inlet Box Type 24 G
Standard 542531
IDOT Standard



NOTE:
Culvert pipe may exit from the side (or sides) by changing reinforcement bars in that area and in the headwall end of box.

SECTION A-A



PLAN

Materials Required for One Inlet Box

Material	Unit	Quantity
Concrete	cu. yds.	3.2
Reinf. Bars	lbs.	270
Grating	sq. ft	56.0

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Drawing #: 542536
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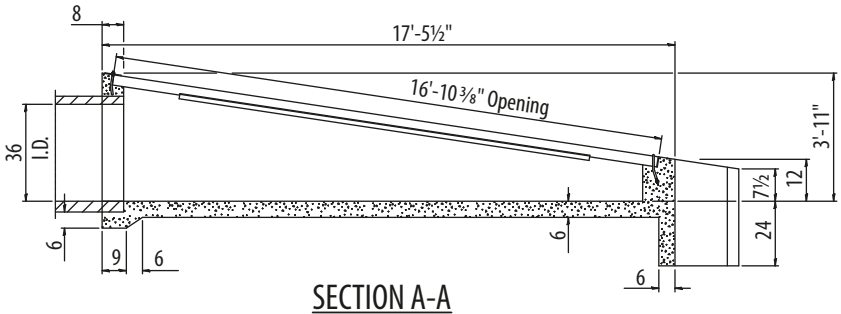
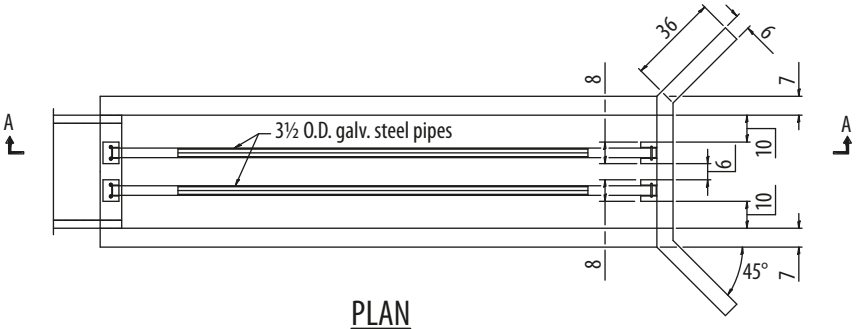
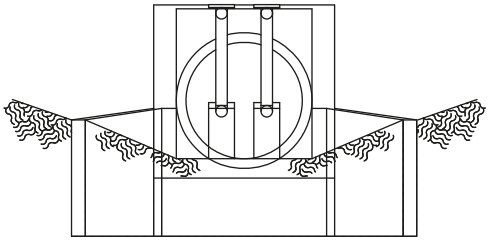
Inlet Box Type 36 A
Standard 542536
IDOT Standard



SECTION A-A



PLAN



END VIEW

Materials required for one inlet box

Material	Unit	Quantity
Concrete	cu. yds.	3.9
Reinf. Bars	lbs.	319
Galv. Steel Pipe	3 ½ O.D.	2 at 16'-10 ⅛ "
Galv. Steel Angle	2x2x ⅜	2 at 12'-10"

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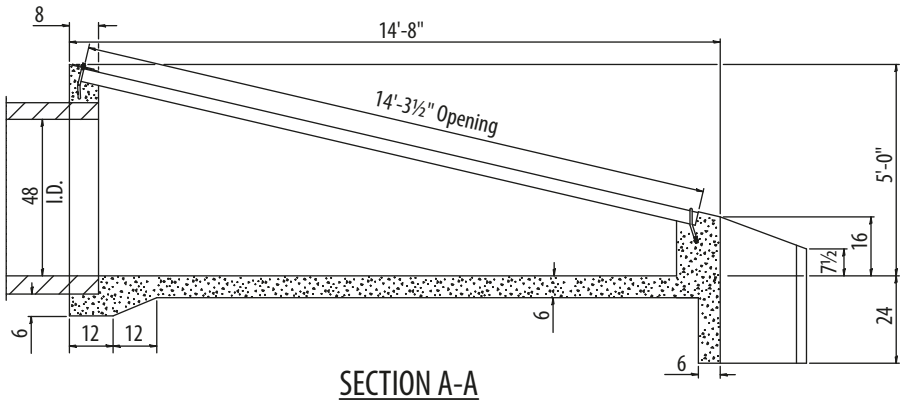
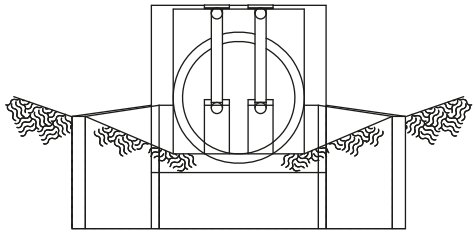
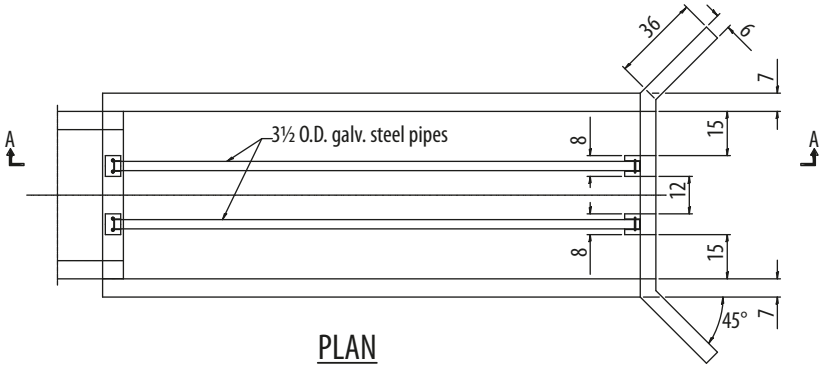
Inlet Box Type 48 A
Standard 542541
IDOT Standard



SECTION A-A



END VIEW

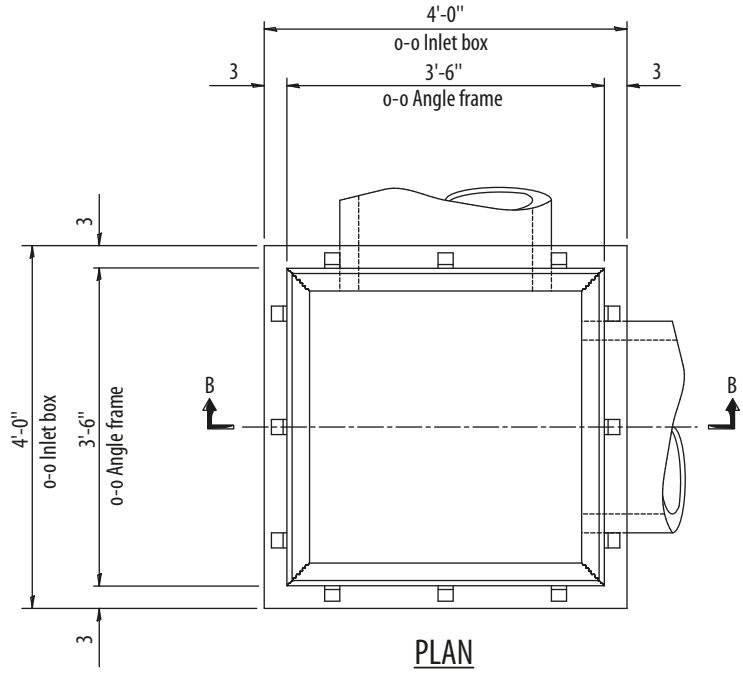


PLAN

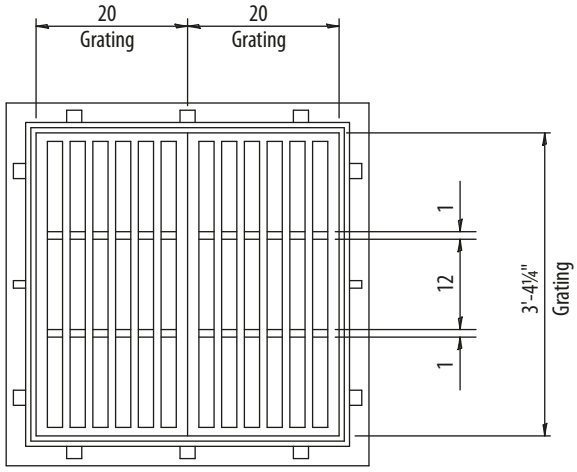
Materials required for one inlet box

Material	Unit	Quantity
Concrete	cu. yds.	5.0
Reinf. Bars	lbs.	324
Galv. Steel Pipe	3½ O.D.	2 at 14'-3¼ "

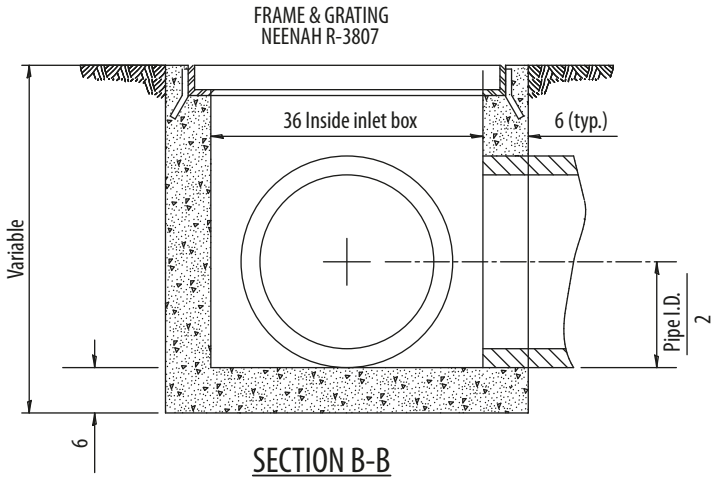
Flush Inlet Box For Median
Standard 542546
IDOT Standard



PLAN
(Grating omitted for clarity)

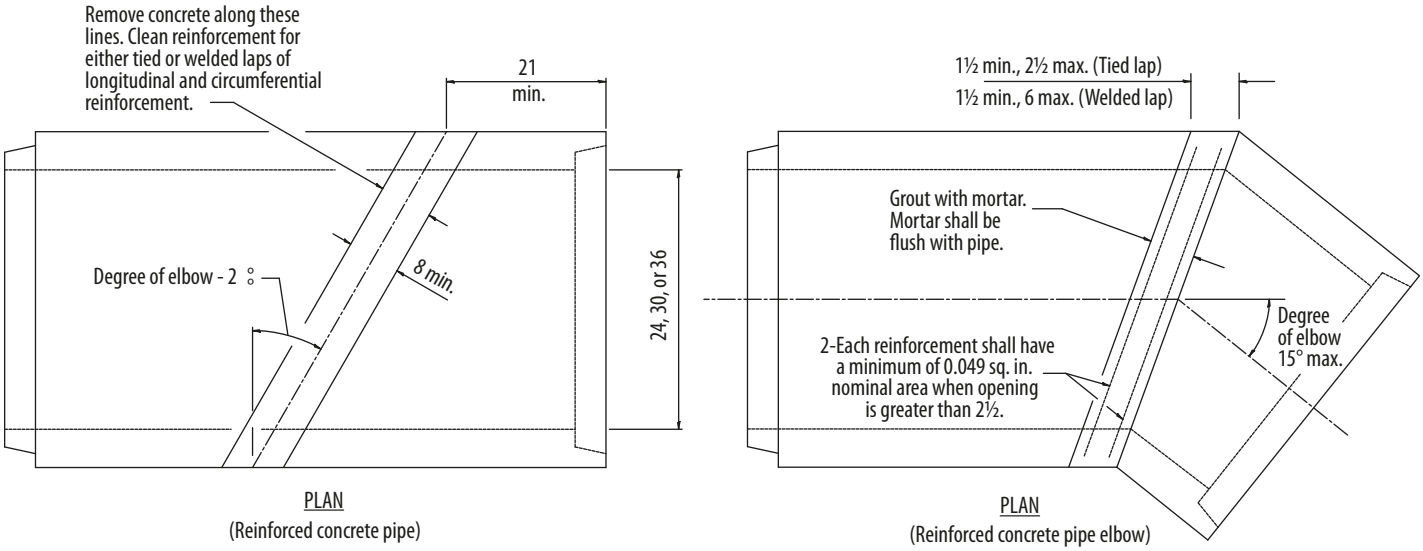


NEENAH R-3807



SECTION B-B

Reinforced Concrete Pipe Elbow 24", 30" or 36"
Standard 542601
IDOT Standard



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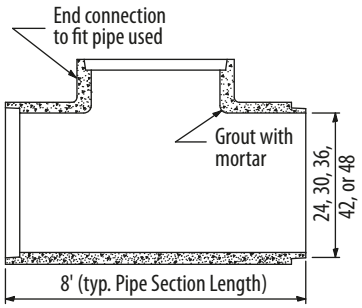
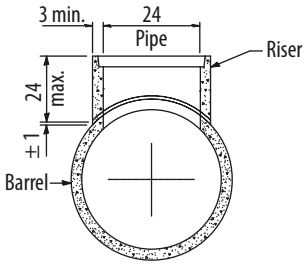
Drawing #: 542606
Date: 0414

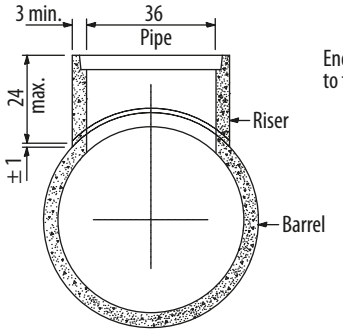
Reinforced Concrete Pipe Tee
Standard 542606
IDOT Standard



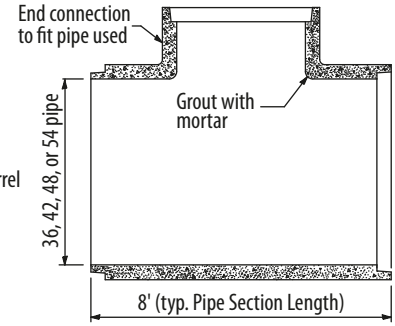
LONGITUDINAL SECTION



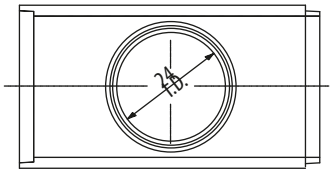
TRANSVERSE SECTION



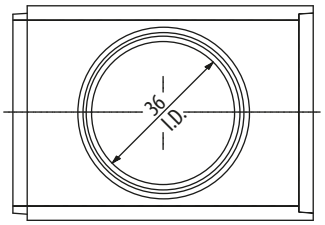
TRANSVERSE SECTION



LONGITUDINAL SECTION



PLAN
TEE WITH 24 RISER



PLAN
TEE WITH 36 RISER

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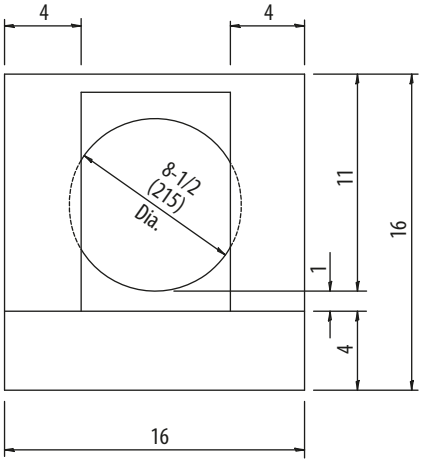
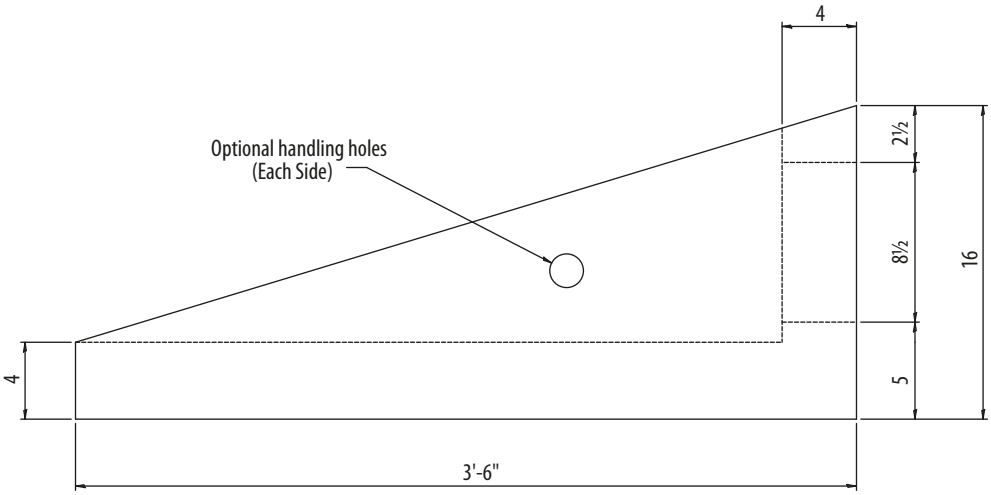
Drawing #: 601101
Date: 0414

Concrete Headwall For Pipe Drain
Standard 601101
IDOT Standard



FRONT VIEW



SIDE VIEW

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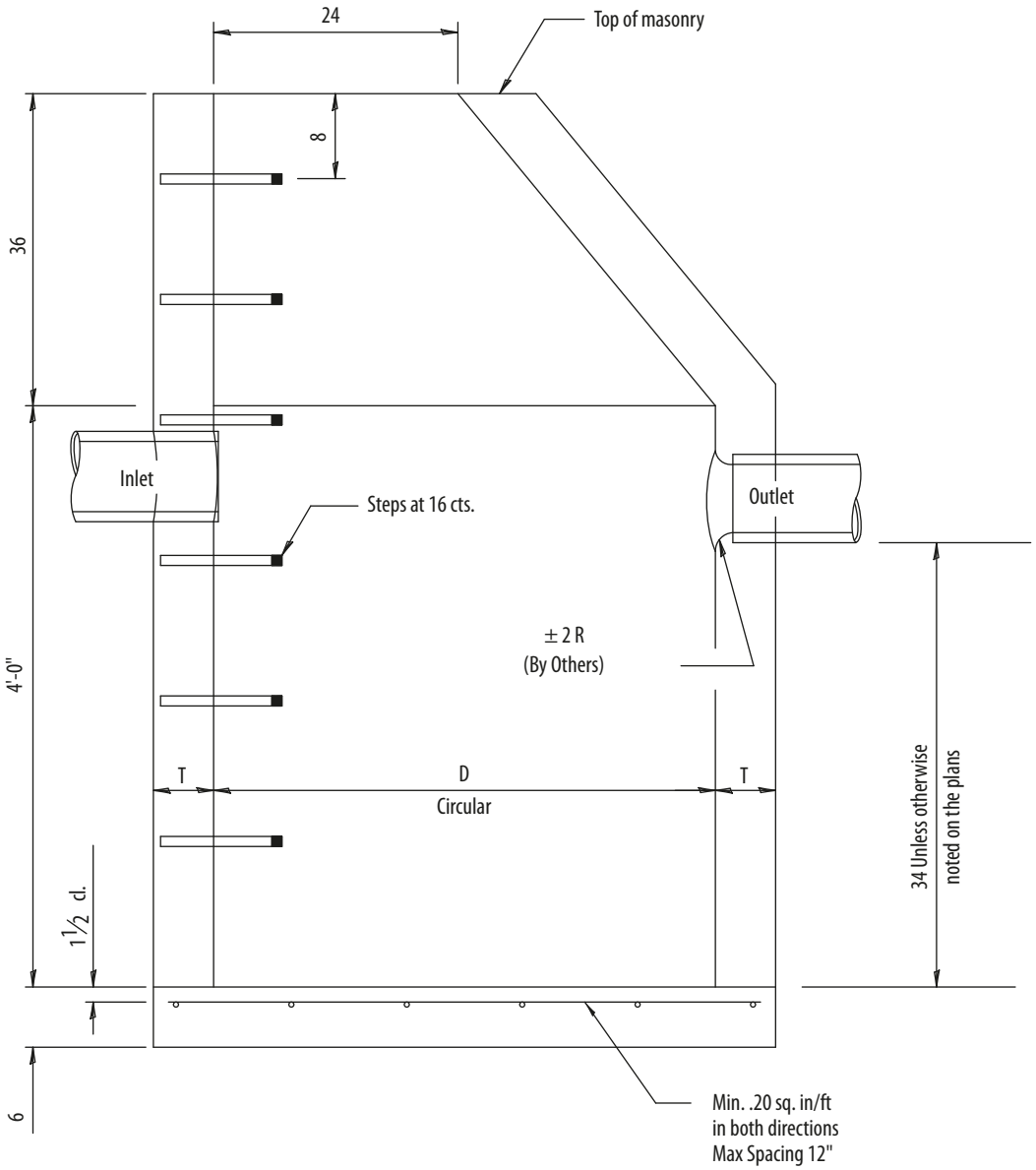
Drawing #: 602001
Date: 0414

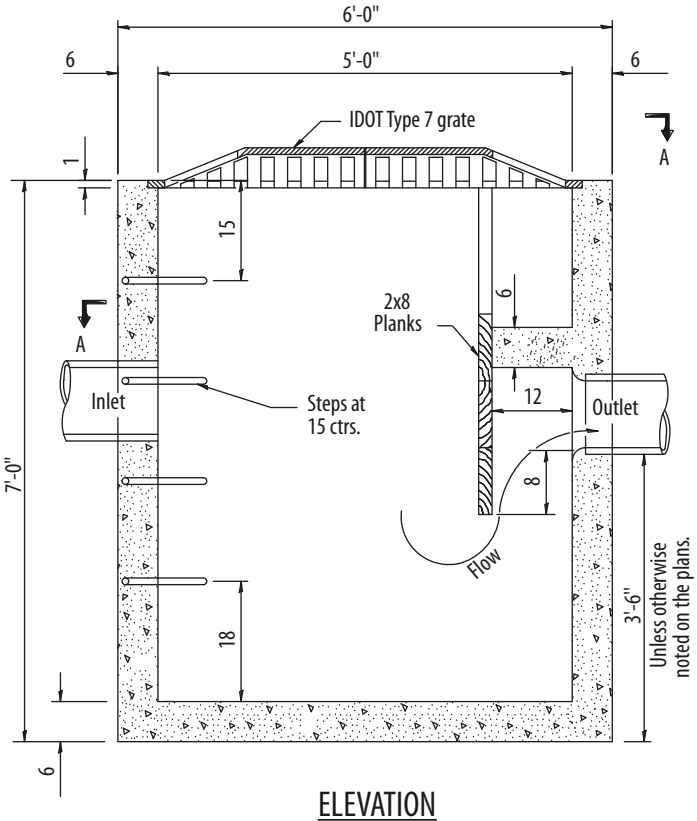
Catch Basin Type A
Standard 602001
IDOT Standard



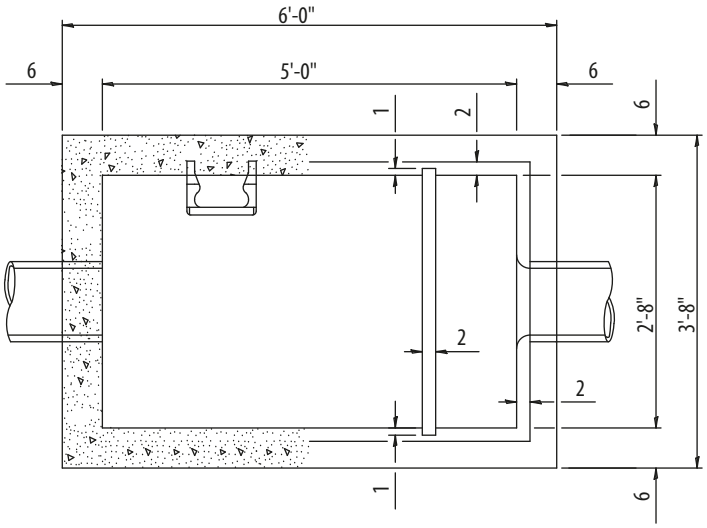
ELEVATION

MATERIALS FOR WALLS	D	C	T
Precast Reinforced Concrete Sections	4'-0"	36"	5
	5'-0"	48"	6 or 6.75

Catch Basin Type B
Standard 602006
IDOT Standard



ELEVATION



SECTION A-A
(Grating removed to show plan of baffles.)

MATERIALS REQUIRED

Concrete	cu. yd.	2.5
Reinforcement bars	lbs.	210

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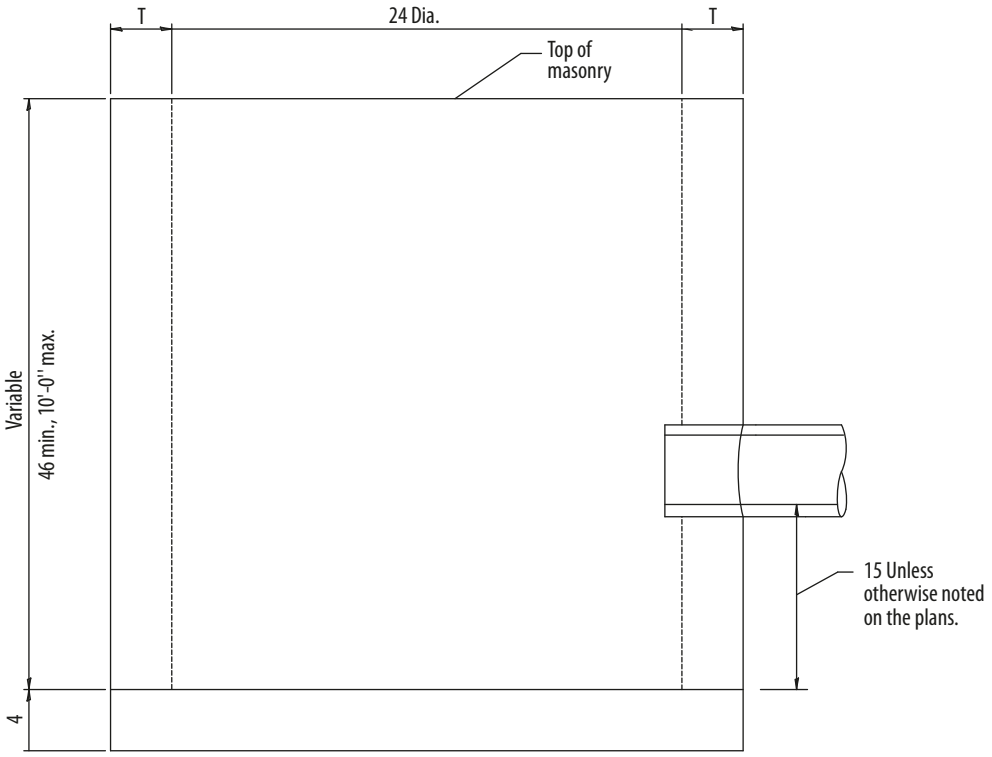
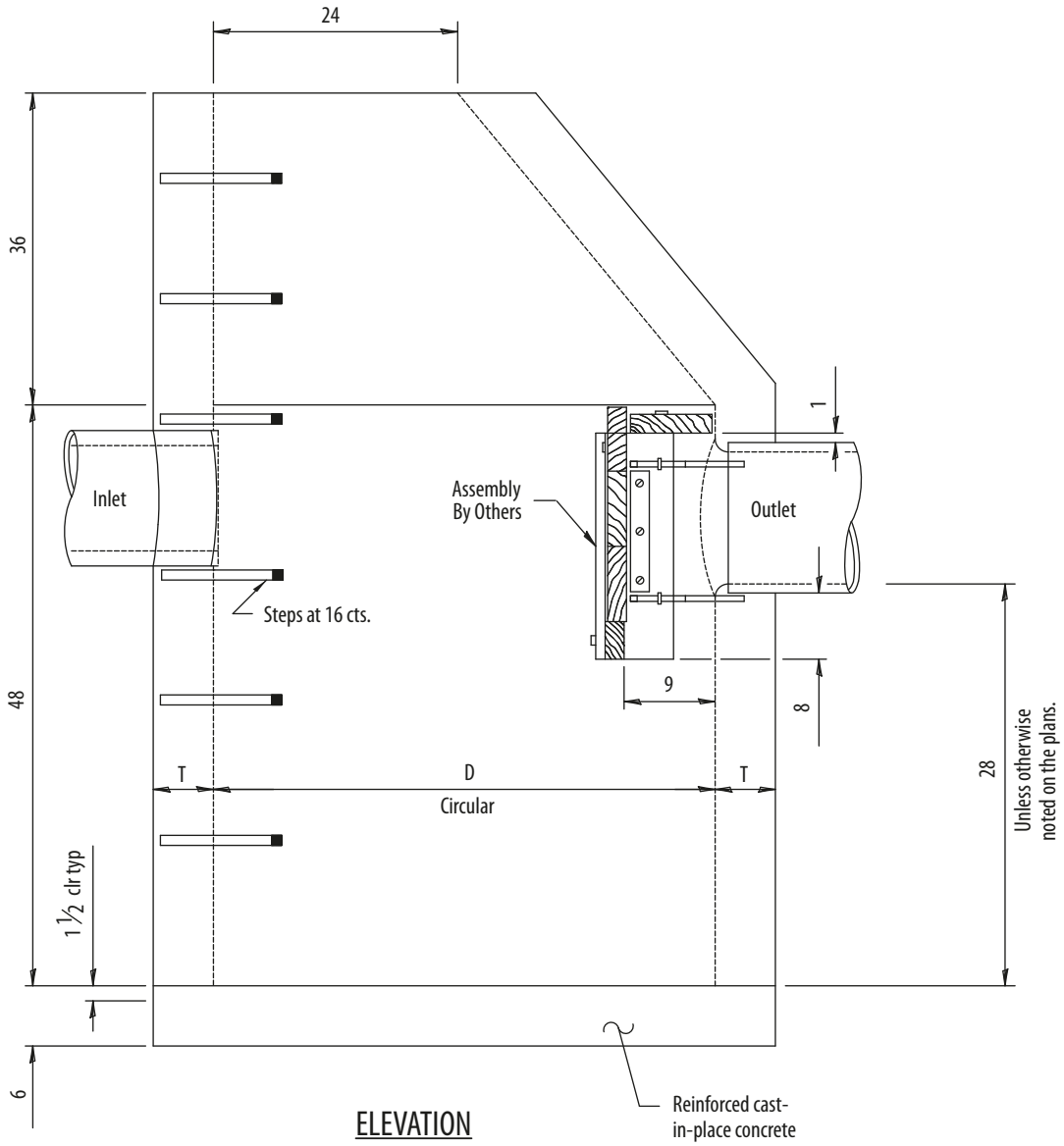
Catch Basin Type C
Standard 602011
IDOT Standard



ELEVATION

MATERIALS FOR WALLS	T
Precast Reinforced Concrete Section	3

Catch Basin Type D
Standard 602016
IDOT Standard

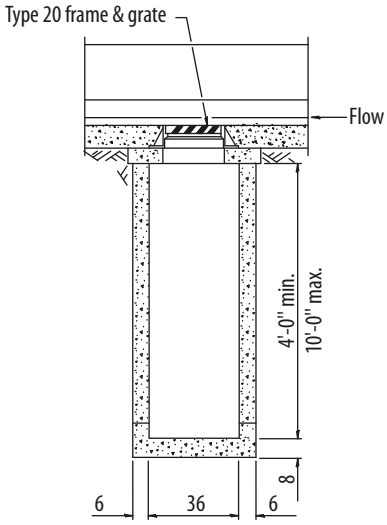


ELEVATION

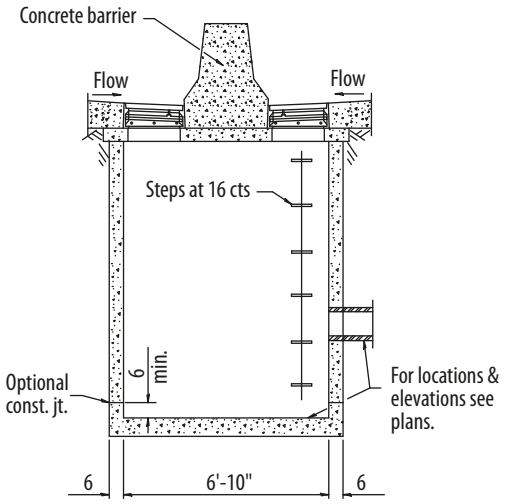
ALTERNATE MATERIALS FOR WALLS	D	C*	T (min.)
Precast Reinforced Concrete Section	36	15	3
	4'-0"	36	4

* For precast reinforced concrete sections, dimension "C" may vary from the dimension given to plus 6.

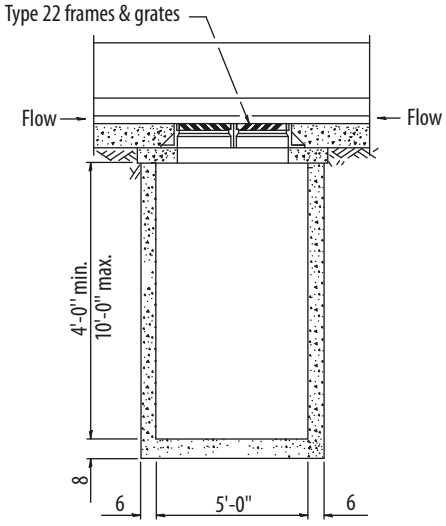
Drainage Structures Types 1, 2 & 3
Standard 602101
IDOT Standard



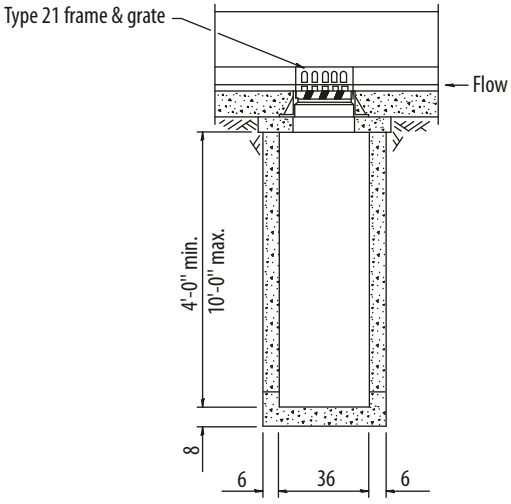
FRONT ELEVATION - TYPE 1



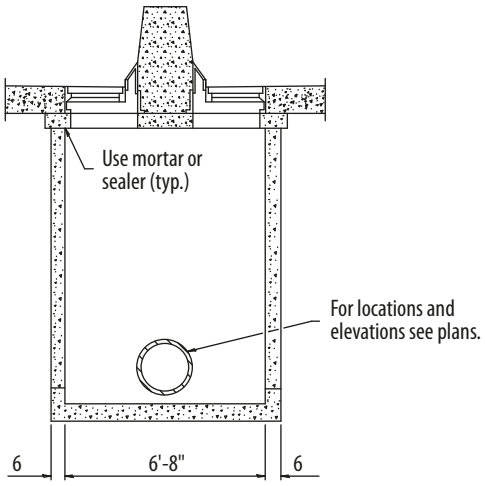
SIDE ELEVATION - TYPE 1 & 2



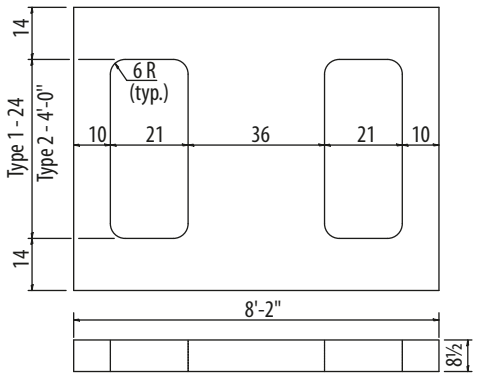
FRONT ELEVATION - TYPE 2



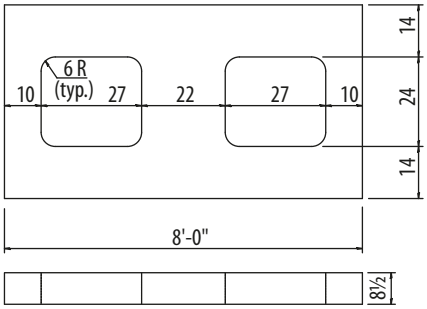
FRONT ELEVATION - TYPE 3



SIDE ELEVATION - TYPE 3

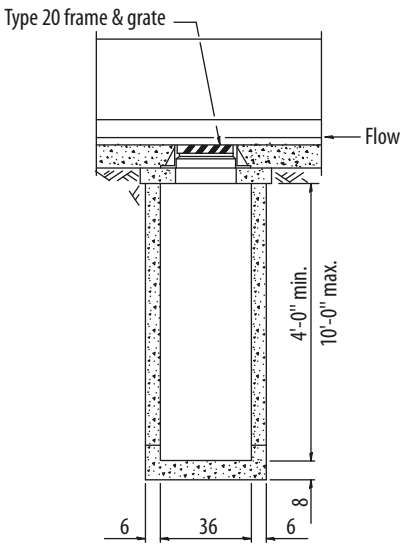


REINFORCED LID - TYPE 1 & 2

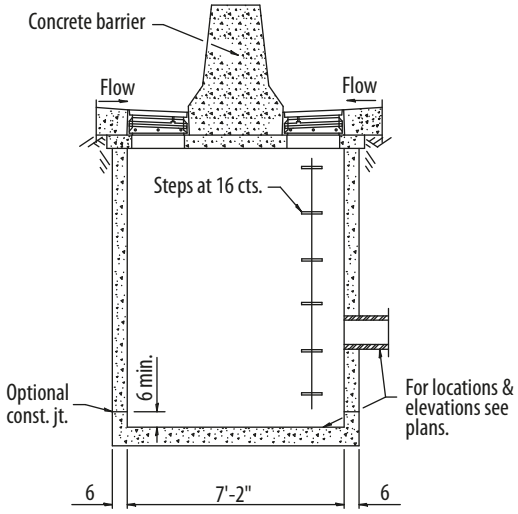


REINFORCED LID - TYPE 3

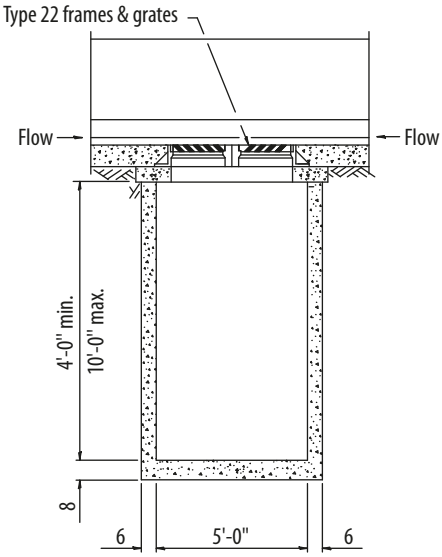
Drainage Structures Types 4, 5 & 6
Standard 602106
IDOT Standard



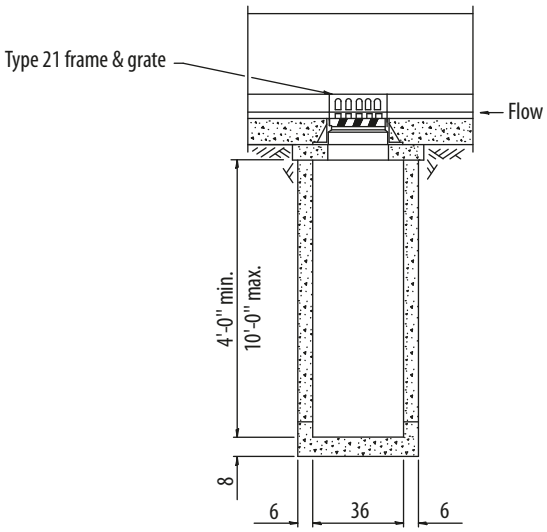
FRONT ELEVATION - TYPE 4



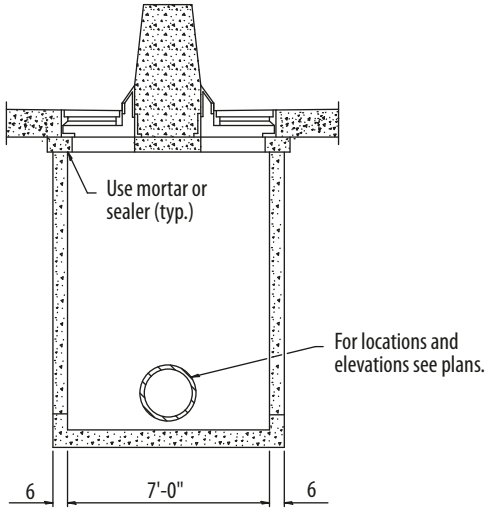
SIDE ELEVATION - TYPE 4 & 5



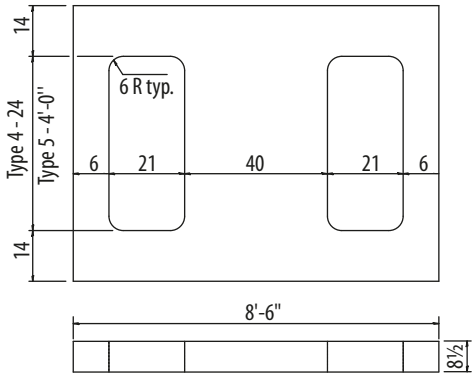
FRONT ELEVATION - TYPE 5



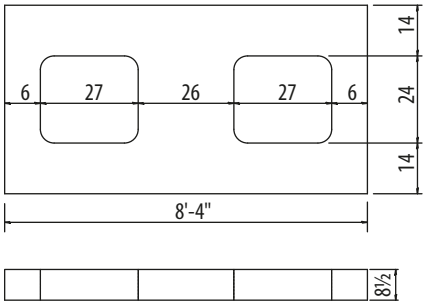
FRONT ELEVATION - TYPE 6



SIDE ELEVATION - TYPE 6

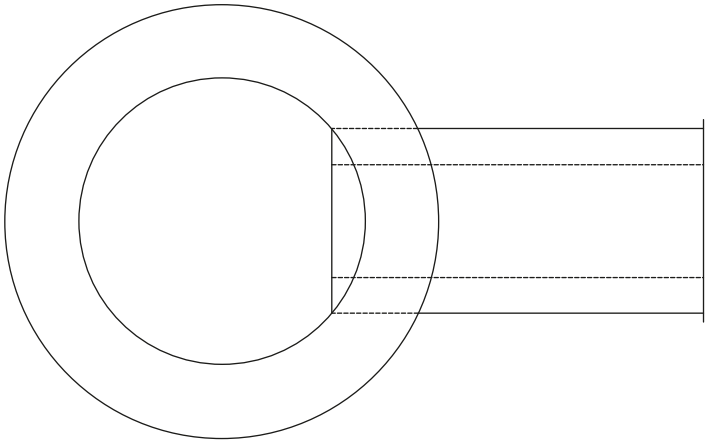


REINFORCED LID - TYPE 4 & 5

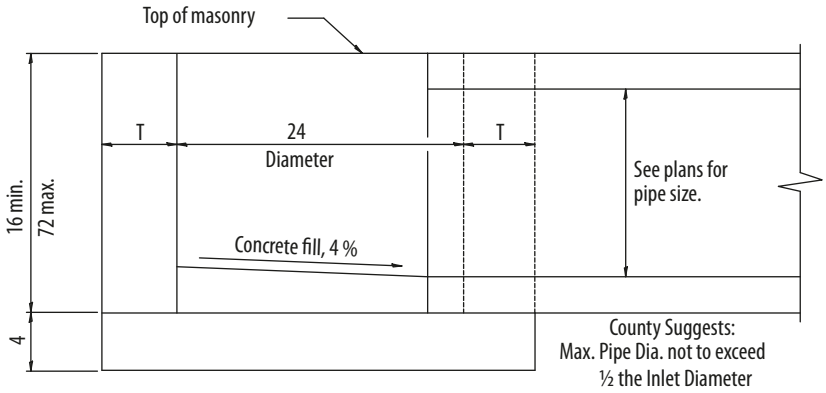


REINFORCED LID - TYPE 6

Inlet - Type A
Standard 602301
IDOT Standard



PLAN



ELEVATION

ALTERNATE MATERIALS FOR WALLS	T
PRECAST REINFORCED CONCRETE SECTION	3

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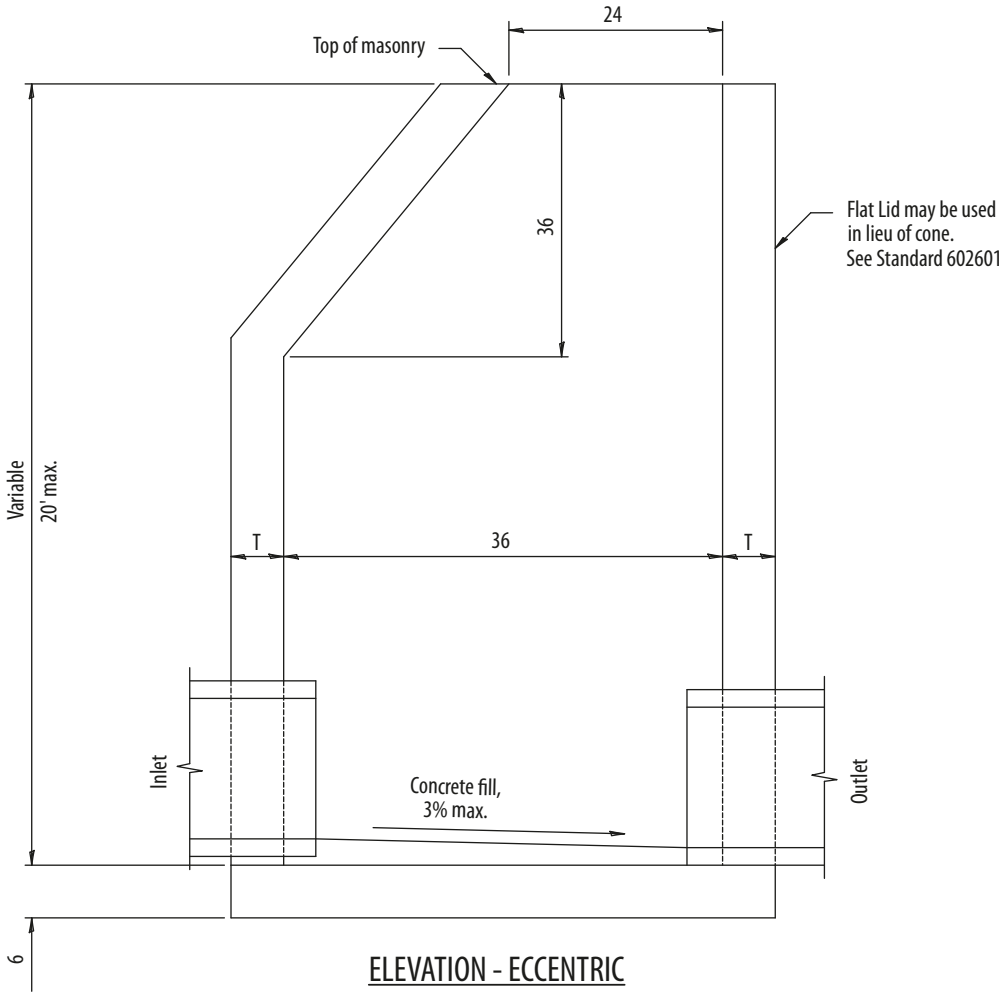
Date: 0414

Inlet - Type B
Standard 602306
IDOT Standard

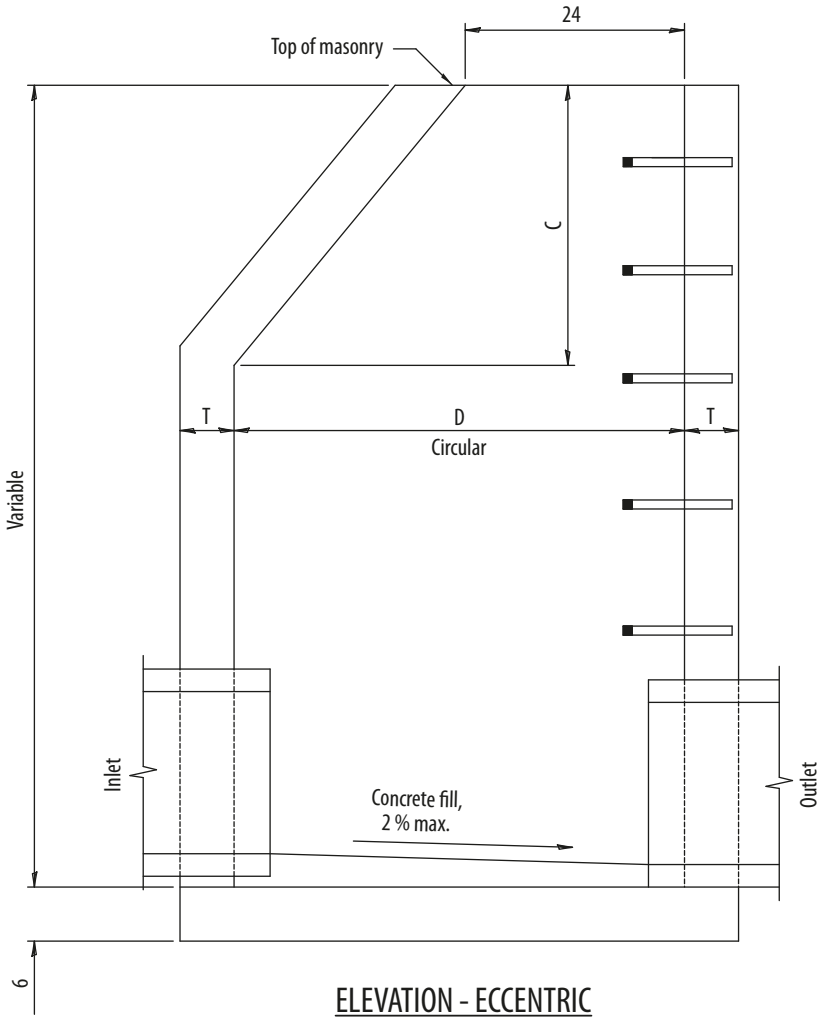


ELEVATION - ECCENTRIC

ALTERNATE MATERIALS FOR WALLS	T (min.)
Precast Reinforced Concrete Section	3

County Suggests:
Max. Pipe Dia. not to exceed
½ the Inlet Diameter

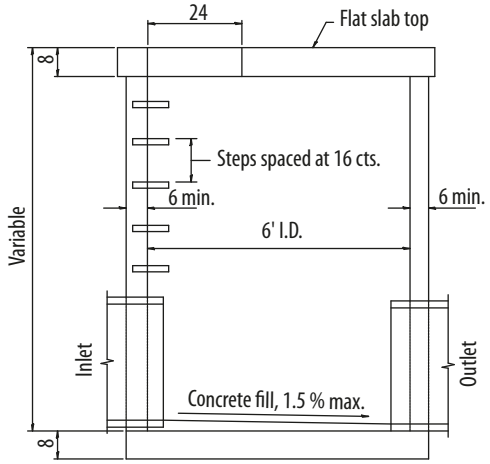
Manhole Type A
Standard 602401
IDOT Standard



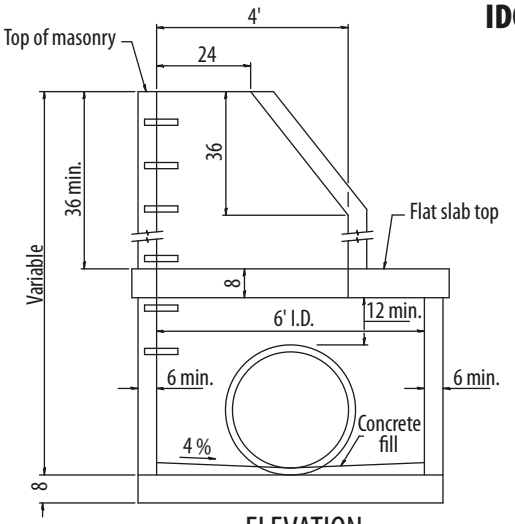
ELEVATION - ECCENTRIC

ALTERNATE MATERIALS FOR WALLS	D	C	T
Precast Reinforced Concrete Section	4'-0"	3'-0"	5"
	5'-0"	4'-0"	6" min

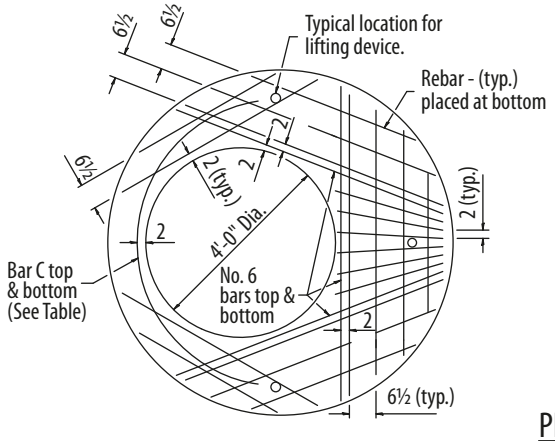
Manhole Type A 6' Diameter
Standard 602406
IDOT Standard

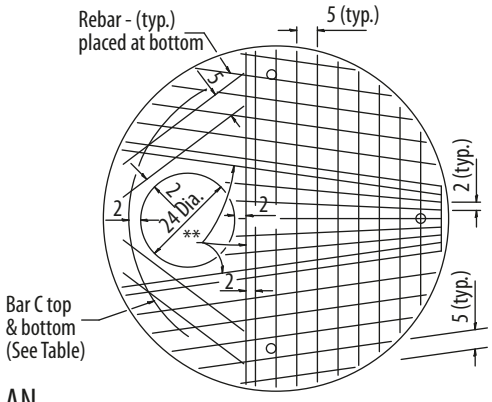


ELEVATION
(with flat slab top only)



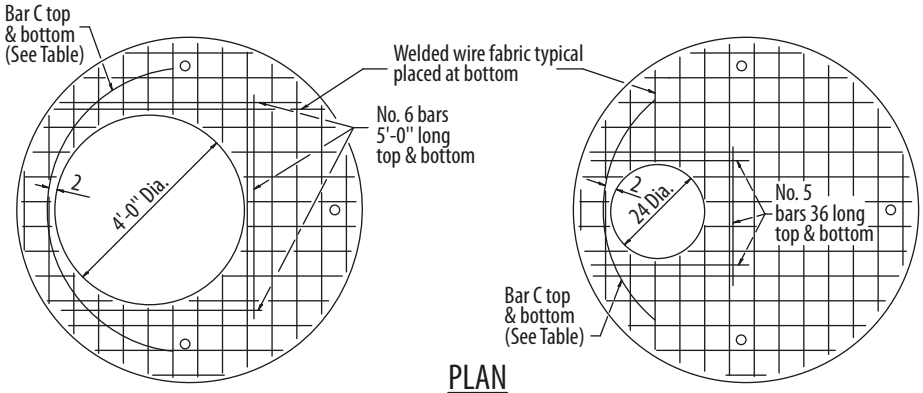
ELEVATION
(with flat slab top and riser)





** No. 6 bars top & bottom

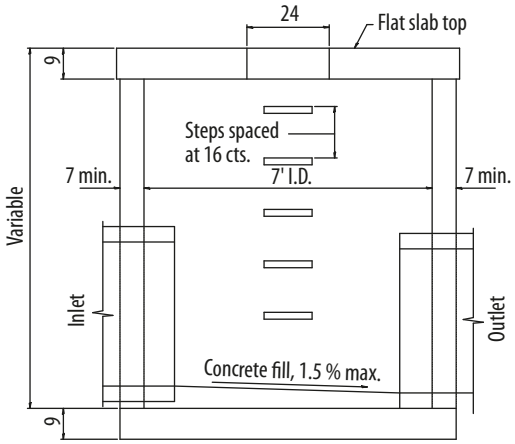
PLAN
Showing Rebar Reinforcement



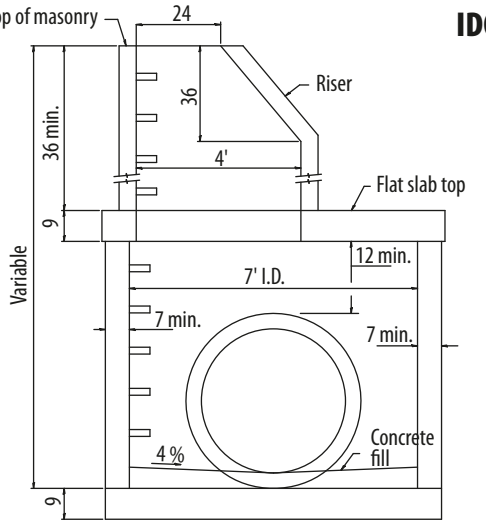
PLAN
Showing Welded Wire Fabric Reinforcement

Diameter of opening	Thickness	Reinforcement "As" WWF Each direction	Bar Size	No. 4 Bar C	
				Length	Radius
24	8	1.06 sq. in./ft.	No. 6	6'-0"	38
4'-0"	8	0.82 sq. in./ft/	No. 6	9'-0"	38

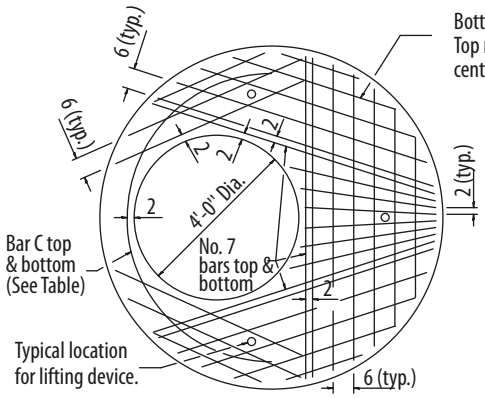
Manhole Type A 7' Diameter
Standard 602411
IDOT Standard

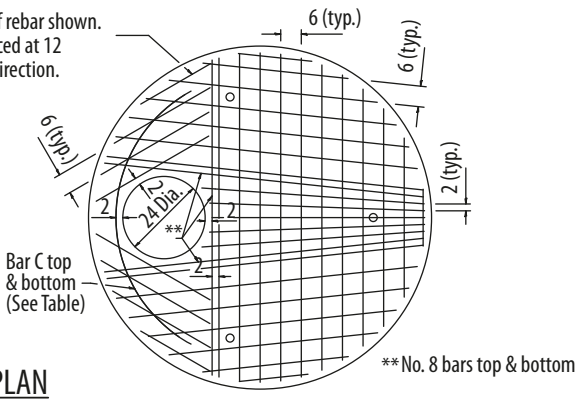


ELEVATION
(with flat slab top only)

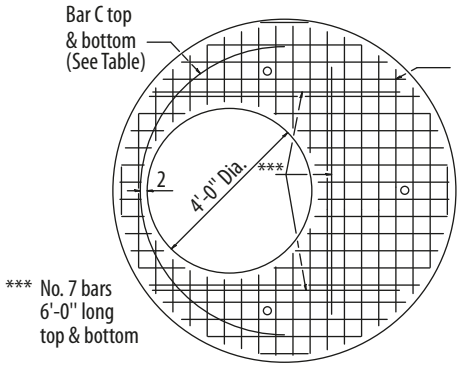


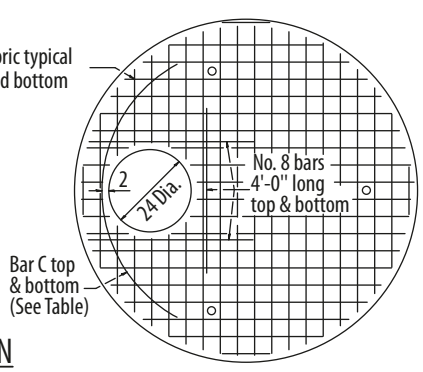
ELEVATION
(with flat slab top and riser)





PLAN
Showing Rebar Reinforcement



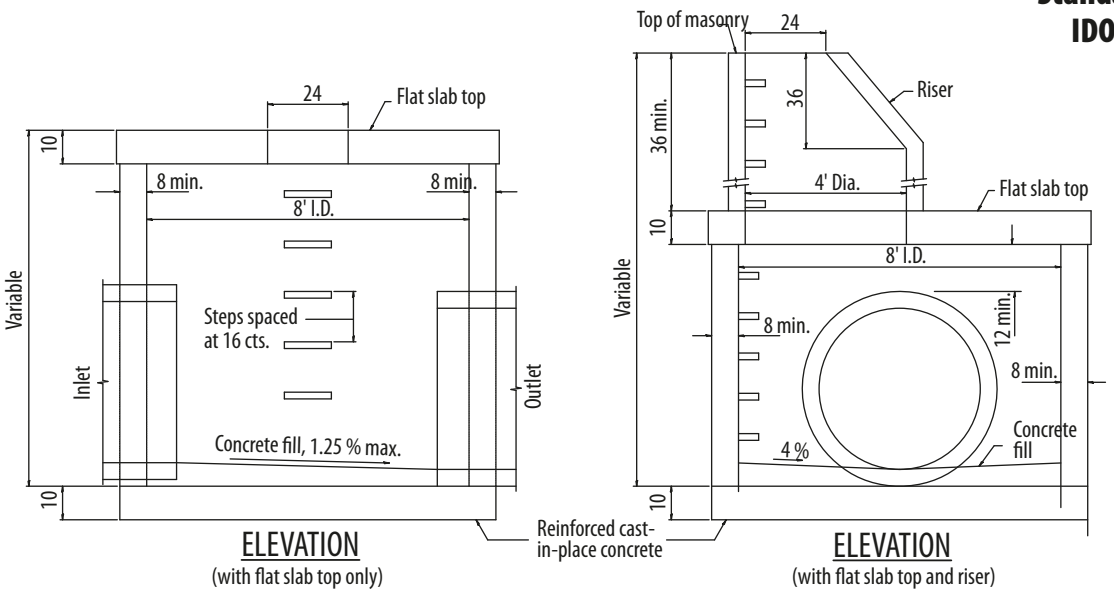


PLAN
Showing Welded Wire Fabric Reinforcement

Diameter of opening	Reinforcement Bar Size	Reinforcement "As" WWF each direction	No. 4 Bar C Length	No. 4 Bar C Radius
24	Bottom mat No. 8	Bottom mat **** 1.57 sq. in./ft.	7'-6"	3'-6"
	Top mat No. 4	Top mat **** 0.20 sq. in./ft.		
4'-0"	Bottom mat No. 7	Bottom mat **** 1.20 sq. in./ft.	11'-0"	3'-6"
	Top mat No. 4	Top mat **** 0.20 sq. in./ft.		

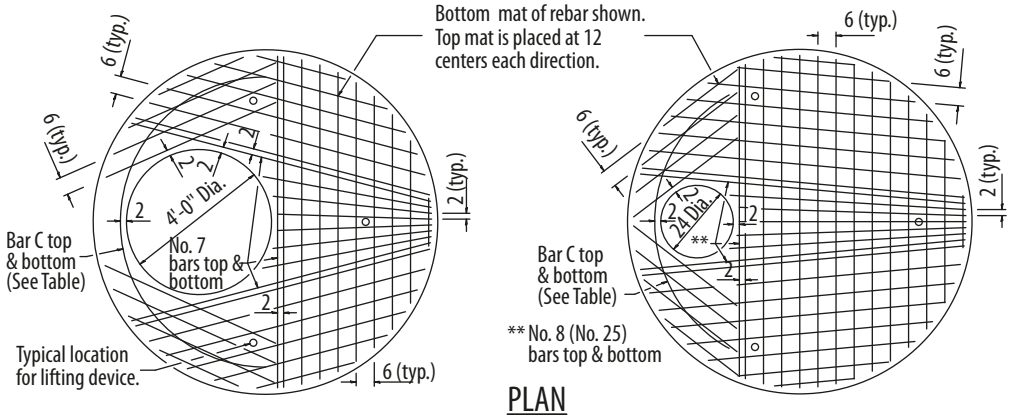
**** A maximum of two layers of welded wire fabric may be used to satisfy the required "As" for each mat.

Manhole Type A 8' Diameter
Standard 602416
IDOT Standard

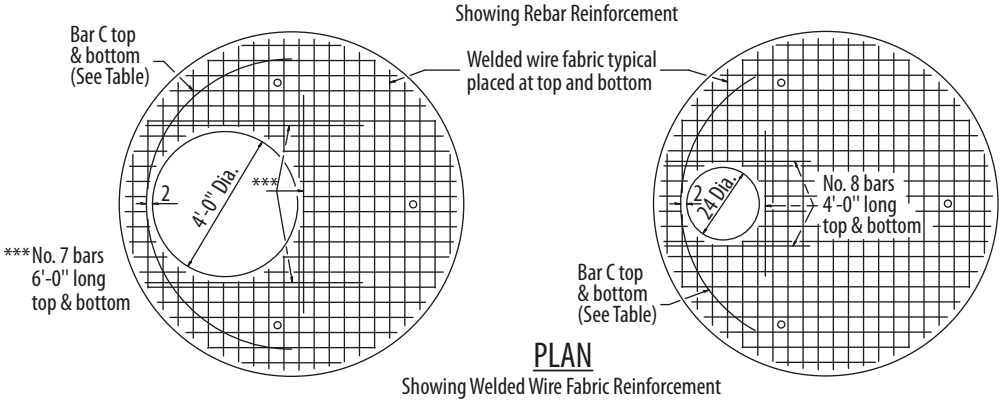


ELEVATION
(with flat slab top only)

ELEVATION
(with flat slab top and riser)



PLAN
Showing Rebar Reinforcement



PLAN
Showing Welded Wire Fabric Reinforcement

Diameter of opening	Reinforcement Bar Size	Reinforcement "As" WWF each direction	No. 4 Bar C Length	No. 4 Bar C Radius
24	Bottom mat No. 8	Bottom mat **** 1.57 sq. in./ft.	8'-6"	4'-0"
	Top mat No. 4	Top mat **** 0.22 sq. in./ft.		
4'-0"	Bottom mat No. 7	Bottom mat **** 1.20 sq. in./ft.	12'-6"	4'-0"
	Top mat No. 4	Top mat **** 0.22 sq. in./ft.		

**** A maximum of two layers of welded wire fabric may be used to satisfy the required "As" for each mat.

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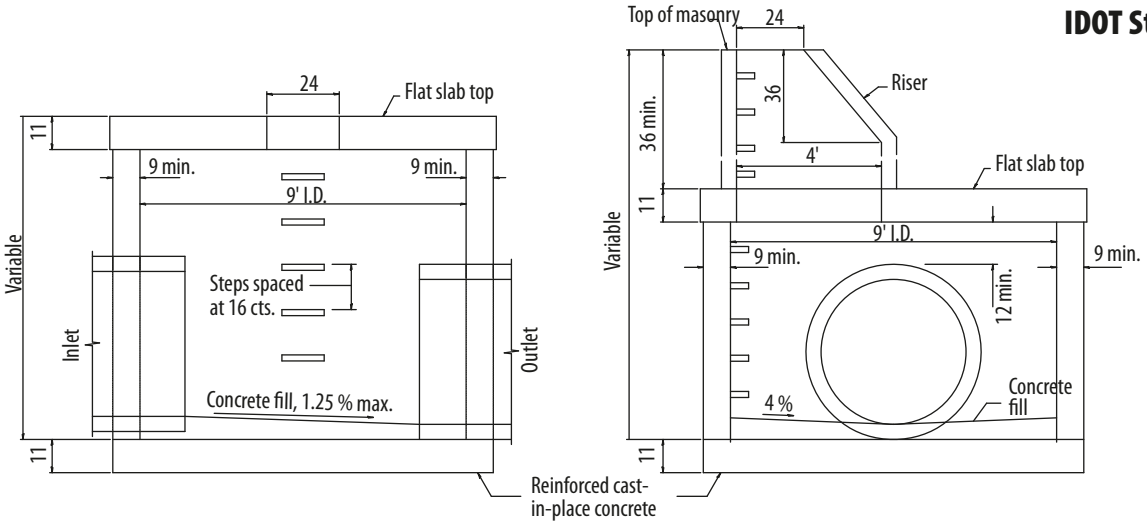
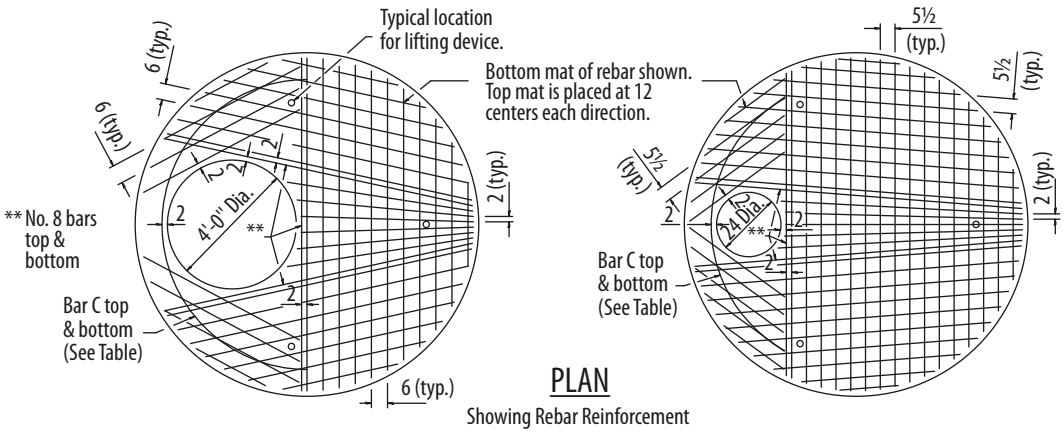
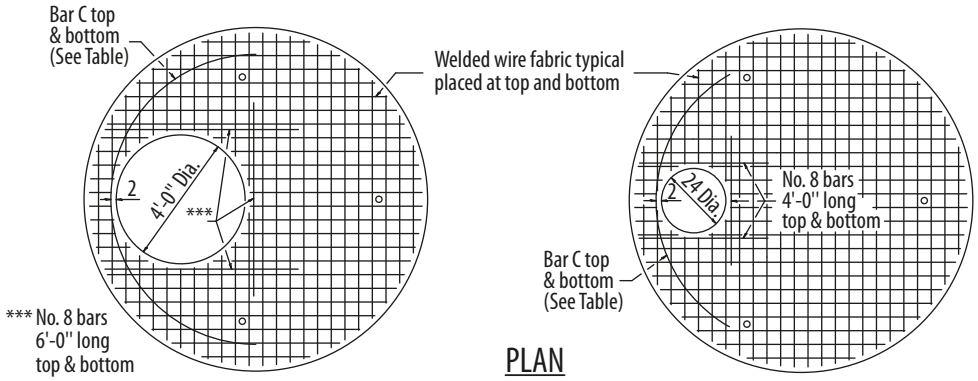
Drawing #: 602421
Date: 0414

Manhole Type A 9' Diameter
Standard 602421
IDOT Standard





PLAN
Showing Rebar Reinforcement

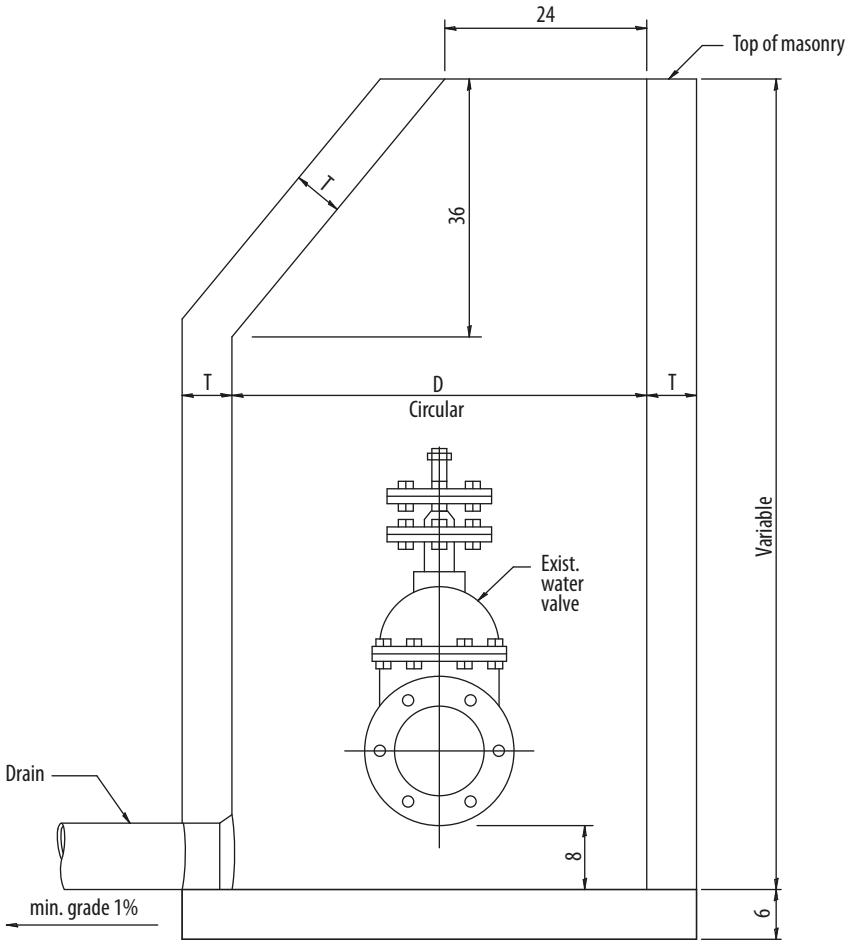


PLAN
Showing Welded Wire Fabric Reinforcement

Diameter of opening	Reinforcement Bar Size	Reinforcement "As" WWF each direction	No. 4 Bar C Length	No. 4 Bar C Radius
24	Bottom mat No. 8	Bottom mat **** 1.71 sq. in./ft.	9'-6"	4'-6"
	Top mat No. 4	Top mat **** 0.24 sq. in./ft.		
48	Bottom mat No. 8	Bottom mat **** 1.57 sq. in./ft.	14'-2"	4'-6"
	Top mat No. 4	Top mat **** 0.24 sq. in./ft.		

**** A maximum of two layers of welded wire fabric may be used to satisfy the required "As" for each mat.

Valve Vault Type A
Standard 602501
IDOT Standard

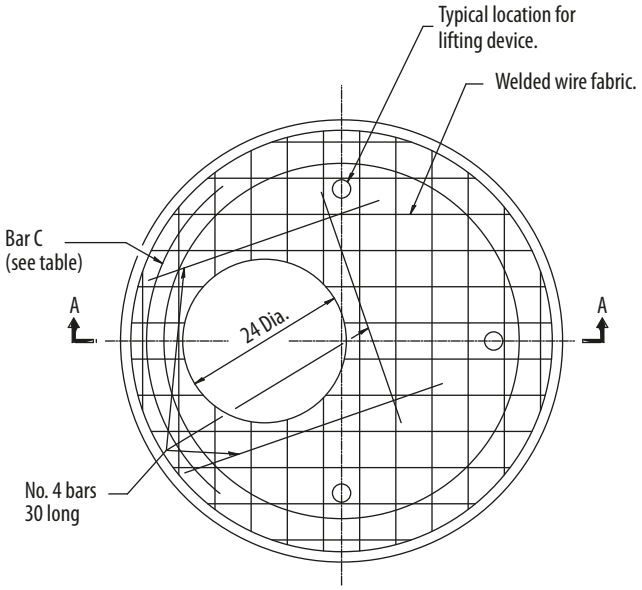


ELEVATION

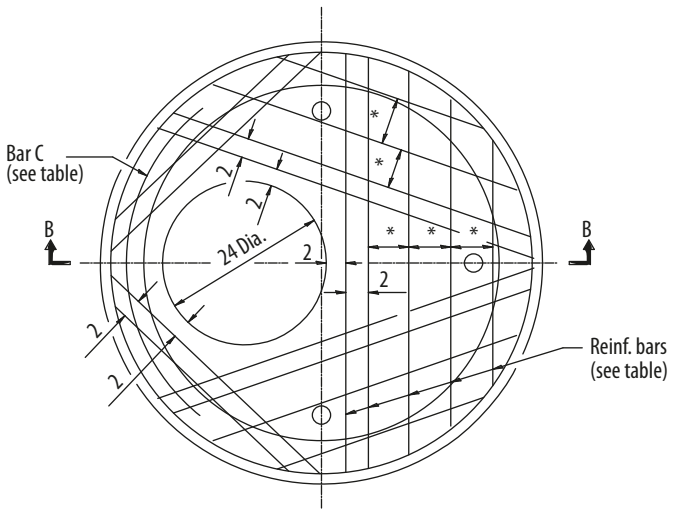
ALTERNATE MATERIALS FOR WALLS	D	C	T (min.)
Precast Reinforced Concrete Section	4'-0"	36	4
	5'-0"	48	5

DIAMETER OF WATER MAIN	D
8 and under	4'-0"
10 and over	5'-0"

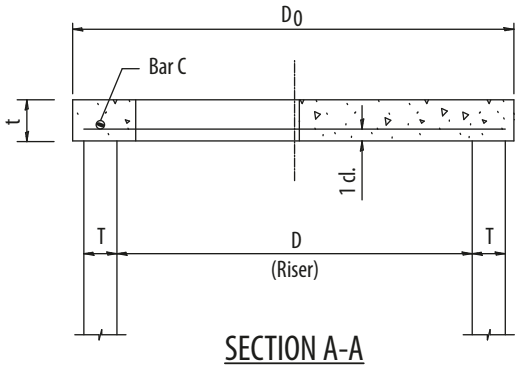
Precast Reinforced Concrete Flat Slab Top
Standard 602601
IDOT Standard



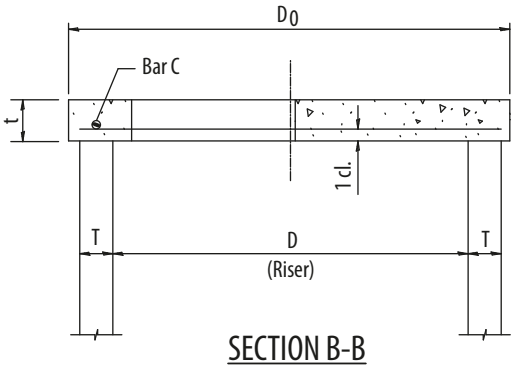
PLAN
(WELDED WIRE FABRIC)



PLAN
(REINFORCEMENT BARS)



SECTION A-A

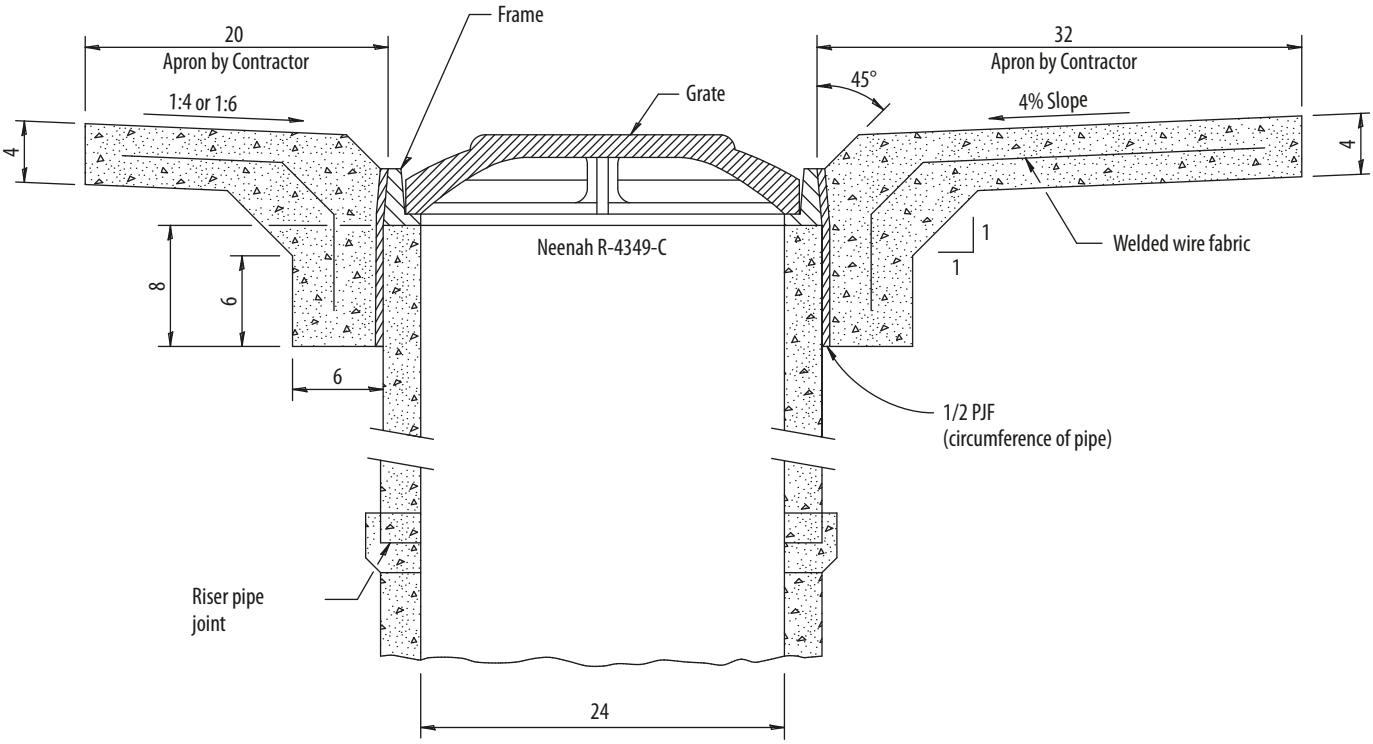


SECTION B-B

TABLE

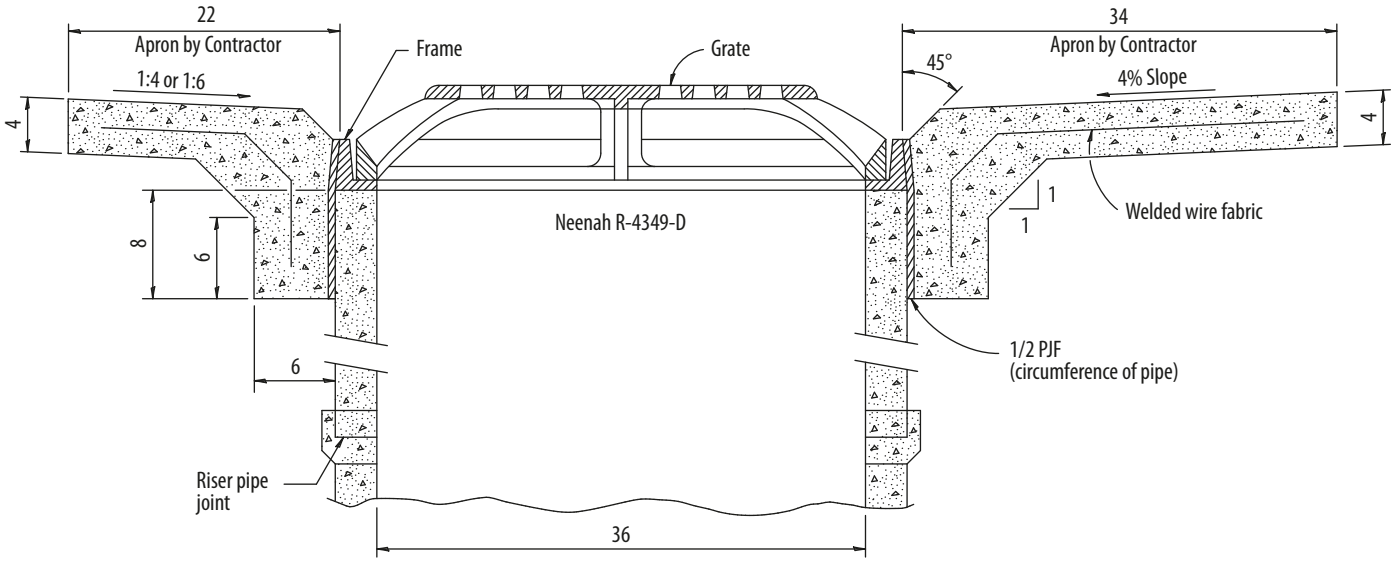
D	T	D_0 (min.)	t	Reinforcement "A" W.W.F. each direction	OR Bar size	No. 4 Bar C Length	Radius
36	See applicable Standards	D + 2T	6	0.20 sq. in./ft.	No. 4	4'-0"	19
4'-0"			6	0.35 sq. in./ft.	No. 5	4'-6"	26
5'-0"			8	0.35 sq. in./ft.	No. 5	5'-0"	32

Median Inlet For 24" Reinforced Concrete Pipe
Standard 604101
IDOT Standard



SECTION

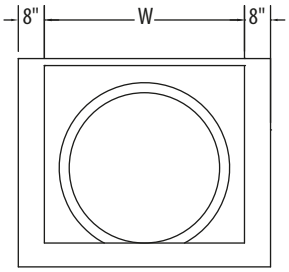
Median Inlet For 36" Reinforced Concrete Pipe
Standard 604106
IDOT Standard

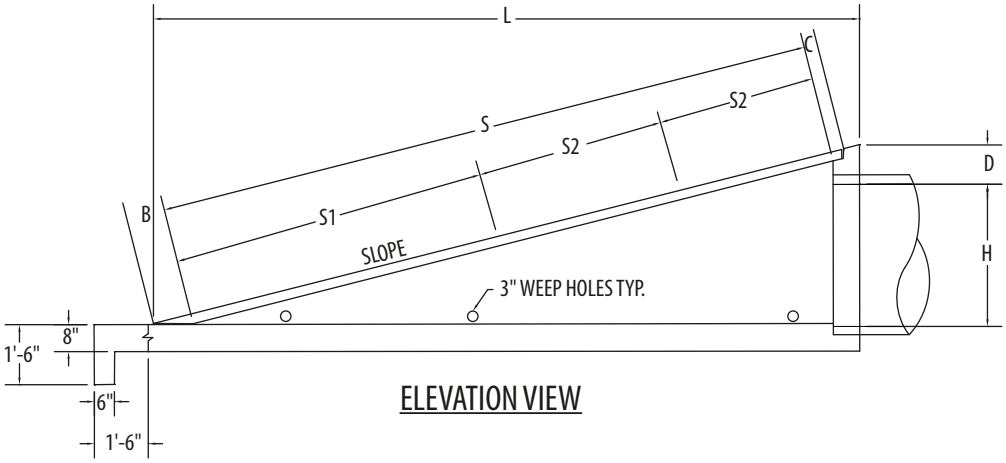


SECTION

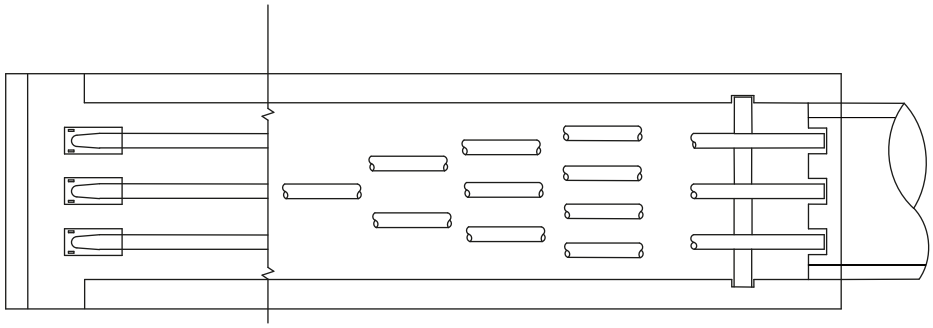
Grated Box End Section Type I
Standard E 715-GBTO-01
INDOT Standard

See Tables Listed For
Grated Box End Section Type I
For Dimensions





ELEVATION VIEW



PLAN VIEW

Grated Box End Section Type I
Standard E 715-GBTO-05
INDOT Standard

APPROXIMATE QUANTITIES																				
PIPE DIAMETER	2 : 1 SLOPE				3 : 1 SLOPE				4 : 1 SLOPE				5 : 1 SLOPE				6 : 1 SLOPE			
	Concrete Cu Yds		Reinf Steel, lb.	Str. Steel, lb.	Concrete Cu Yds		Reinf Steel, lb.	Str. Steel, lb.	Concrete Cu Yds		Reinf Steel, lb.	Str. Steel, lb.	Concrete Cu Yds		Reinf Steel, lb.	Str. Steel, lb.	Concrete Cu Yds		Reinf Steel, lb.	Str. Steel, lb.
	Conc. Pipe	C.M. Pipe			Conc. Pipe	C.M. Pipe			Conc. Pipe	C.M. Pipe			Conc Pipe	C.M. Pipe			Conc. Pipe	C.M. Pipe		
12	1.1	1.1	290	80	1.4	1.4	375	160	1.7	1.7	465	195	2.1	2.1	555	275	2.4	2.4	645	305
15 & 18	1.3	1.3	345	145	1.8	1.8	460	180	2.2	2.2	575	270	2.8	2.8	690	305	3	3	805	345
21 & 24	1.9	1.9	460	215	2.5	2.5	620	370	3.1	3.1	775	460	3.8	3.8	935	545	4.3	4.4	1090	705
27 &30	2.1	2.2	525	245	2.9	3	715	410	3.6	3.7	905	510	4.4	4.5	1095	680	5.2	5.3	1285	780
33 & 36	2.8	2.9	670	410	3.8	3.9	910	660	4.8	4.9	1150	825	5.9	6	1395	995	6.9	7	1640	1255
42	3.2	3.3	745	450	4.4	4.5	1025	720	5.6	5.7	1305	905	6.8	8.9	1585	1090	8	8.1	1870	1370
48	4	4.1	1.1	910	5.5	5.6	1250	80	8.5	8.7	1940	1310	10.1	10.2	1940	1310	10.1	10.2	2285	1515
54	4.9	5.1	1090	845	6.8	6.9	1500	1125	8.6	8.8	1915	1415	10.5	10.7	2330	1845	12.4	12.6	2745	2145
60	5.4	5.8	1180	900	7.8	7.7	1640	1205	9.8	9.8	2105	1850	11.7	11.9	2570	1970	13.8	14	3035	2425

2 : 1 SLOPE									
CULVERT SIZE	H	L	W	LONGITUDINAL PIPE			CROSS TUBE			
				S	No.	Length	No.	Length	S1	S2
12	2′-0″	4′-0″	2′-0″	4′-5 5/8″	1	5′-7 5/8″	-	-	5′-1 5/8″	-
15 & 18	2′-6″	5′-0″	2′-0″	5′-7″	1	6′-9″	1	2′-7 1/2″	4′-9 1/8″	1′-6″
21 & 24	3′-0″	6′-0″	3′-0″	6′-8 1/2″	2	7′-10 1/2″	-	-	7′-4 1/2″	-
27 & 30	3′-6″	7′-0″	3′-0″	7′-9 7/8″	2	10′-1 1/4″	-	-	8′-5 7/8″	-
33 & 36	4′-0″	8′-0″	4′-0″	8′-11 3/8″	3	10′-11 3/8″	-	-	9′-7 3/8″	-
42	4′-6″	9′-0″	4′-0″	10′-0 3/4″	3	11′-1 1/4″	-	-	10′-8 3/4″	-
48	5′-0″	10′-0″	5′-0″	11′-2 1/8″	3	12′-4 1/8″	-	-	11′-10 1/8″	-
54	5′-6″	11′-0″	6′-0″	12′-3 5/8″	4	13′-5 1/2″	1	6′-7 1/2″	9′-11 5/8″	3′-0″
60	6′-0″	12′-0″	6′-0″	13′-5″	4	14′-7″	1	6′-7 1/2″	11′-1″	3′-0″

3 : 1 SLOPE									
CULVERT SIZE	H	L	W	LONGITUDINAL PIPE			CROSS TUBE			
				S	No.	Length	No.	Length	S1	S2
12	2′-0″	6′-0″	2′-0″	6′-3 1/8″	1	7′-9″	1	2′-7 1/2″	5′-3 7/8″	2′-0″
15 & 18	2′-6″	7′-6″	2′-0″	7′-10 7/8″	1	9′-3 7/8″	1	2′-7 1/2″	5′-4 7/8″	3′-6″
21 & 24	3′-0″	9-0″	3′-0″	9′-5 7/8″	2	10′10 7/8″	1	3′-7 1/2″	6′-11 7/8″	3′-6″
27 & 30	3′-6″	10′-6″	3′-0″	11′-0 3/4″	2	12′-5 7/8″	1	3′-7 1/2″	8′-6 3/4″	3′-6″
33 & 36	4′-0″	12′-01″	4′-0″	12-′7 3/4″	3	14′-0 7/8″	1	4′-7 1/2″	10′-1 3/4″	3′-6″
42	4′-6″	13′-6″	4′-0″	14′-2 3/4″	3	15′-7 3/4″	1	4′-7 1/2″	10′-8 3/4″	4′-6″
48	5′-0″	15′-0″	5′-0″	15′-9 3/4″	3	17′-2 3/4″	1	5′-7 1/2″	12′-3 3/4″	4′-6″
54	5′-6″	16′-6″	6′-0″	17′-4 3/4″	4	18′-9 3/4″	1	6′-7 1/2″	10′-4 3/4″	8′-0″
60	6′-0″	18′-0″	6′-0″	18′-11 3/4″	4	20′-4 3/4″	1	6′-7 1/2″	11′-11 3/4″	8′-0″

Grated Box End Section Type I
Standard E 715-GBTO-05
INDOT Standard

4 : 1 SLOPE										
CULVERT SIZE	H	L	W	LONGITUDINAL PIPE			CROSS TUBE			
				S	No.	Length	No.	Length	S1	S2
12	2′-0″	8′-0″	2′-0″	8′-3″	1	9′-11 1/2″	1	2′-7 1/2″	5′-7″	4′-0″
15 & 18	2′-6″	10′-0″	2′-0″	10′-3 3/4″	1	12′-0 1/4″	2	2′-7 1/2″	5′-7 3/4″	3′-0″
21 & 24	3′-0″	12′-0″	3′-0″	12′-4 3/8″	2	14′-1″	1	3′-7 1/2″	9′-2 1/2″	4′-6″
27 & 30	3′-6″	14′-0″	3′-0″	14′-5 1/8″	2	16′-1 3/4″	1	3′-7 1/2″	9′-3 1/8″	6′-6″
33 & 36	4′-0″	16′-0″	4′-0″	16′-5 7/8″	3	18′-2 1/2″	1	4′-7 1/2″	11′-3 7/8″	6′-6″
42	4′-6″	18′-0″	4′-0″	18′-6 5/8″	3	20′-3 1/4″	1	4′-7 1/2″	12′-4 5/8″	7′-6″
48	5′-0″	20′-0″	5′-0″	20′-7 3/8″	3	22′-4″	1	5′-7 1/2″	11′-5 3/8″	10′-6″
54	5′-6″	22′-0″	6′-0″	22′-8 1/8″	4	24′-4 3/4″	-	6′-7 1/2″	12′-6 1/8″	11′-6″
60	6′-0″	24′-0″	6′-0″	24′-8 7/8″	4	26′-5 1/2″	2	6′-7 1/2″	12′-6 7/8″	6′-9″

5 : 1 SLOPE										
CULVERT SIZE	H	L	W	LONGITUDINAL PIPE			CROSS TUBE			
				S	No.	Length	No.	Length	S1	S2
12	2′-0″	10′-0″	2′-0″	10′2 3/8″	1	12′-2 3/4″	2	2′-7 1/2″	6′-2 3/8″	2′-10
15 & 18	2′-6″	12′-6″	2′-0″	12′-9″	1	14′-9 3/8″	2	2′-7 1/2″	5′-11″	4′-3″
21 & 24	3′-0″	15′-0″	3′-0″	15′-3 1/2″	2	17′-4″	1	3′-7 1/2″	9′-2 1/2″	7′-9″
27 & 30	3′-6″	17′-6″	3′-0″	17′-10 1/8″	2	19′-10 1/2″	2	3′-7 1/2″	9′-6 1/8″	5′-0″
33 & 36	4′-0″	20′-0″	4′-0″	20′-4 3/4″	3	22′-5 1/8″	1	4′-7 1/2″	13′-0 3/4″	9′-0″
42	4′-6″	22′-6″	4′-0″	22′-11 3/8″	3	24′-11 3/4″	1	4′-7 1/2″	13′-1 3/8″	11′-6″
48	5′-0″	25′-0″	5′-0″	25′-6″	3	27′-6 1/4″	2	5′-7 1/2″	13′-2″	7′-0″
54	5′-6″	27′-6″	6′-0″	28′0 1/2″	4	30′-0 7/8″	2	6′-7 1/2″	13′-2 1/2″	8′-3″
60	6′-0″	30′-0″	6′-0″	30′-7 1/8″	4	32′-7 1/2″	2	6′-7 1/2″	11′-9 1/8″	10′-3″

6:1 SLOPE										
CULVERT SIZE	H	L	W	LONGITUDINAL PIPE			CROSS TUBE			
				S	No.	Length	No.	Length	S1	S2
12	2′-0″	12′-0″	2′-0″	12′-2″	1	14′-6 1/4″	2	2′-7 1/2″	6′-2″	4′-0″
15 & 18	2′-6″	15′-0″	2′-0″	15′-2 1/2″	1	17′-6 3/4″	2	2′-7 1/2″	6′-8 1/2″	5′-3″
21 & 24	3′-0″	18′-0″	3′-0″	18′-3″	2	20′-7 1/4″	2	3′-7 1/2″	9′-9″	5′-3″
27 & 30	3′-6″	21′-0″	3′-0″	21′-3 1/2″	2	23′-7 3/4″	2	3′-7 1/2″	9′-9 1/2″	6′-9″
33 & 36	4′-0″	24′-0″	4′-0″	24′-4″	3	26′8 1/4″	2	4′-7 1/2″	13′-4″	6′-6″
42	4′-6″	27′-0″	4′-0″	27′-4 1/2″	3	29′-8 3/4″	2	4′-7 1/2″	13′-4 1/2″	8′-0″
48	5′-0″	30′-0″	5′-0″	30′-5″	3	32′-9 1/4″	2	5′-7 1/2″	13′-5″	9′-6″
54	5′-6″	33′-0″	6′-0″	33′-5 1/2″	4	35′-9 3/4″	2	6′-7 1/2″	12′-11 1/2″	11′-3″
60	6′-0″	36′-0″	6′-0″	36′-6″	4	38′-10 1/8″	3	6′-7 1/2″	13′-0″	8′-6″

COUNTY MATERIALS CORPORATION
Charleston
20005 State Hwy 16 East • Charleston, IL 61920-0078
toll free (800) 747-3669
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Drawing #: E 715-GBTO-08
Date: 0414

Grated Box End Section Type I
Standard E 715-GBTO-08
INDOT Standard

APPROXIMATE QUANTITIES																				
PIPE DIAMETER	2 : 1 SLOPE				3 : 1 SLOPE				4 : 1 SLOPE				5 : 1 SLOPE				6 : 1 SLOPE			
	Concrete Cu Yds		Reinf Steel, lb.	Str. Steel, lb.	Concrete Cu Yds		Reinf Steel, lb.	Str. Steel, lb.	Concrete Cu Yds		Reinf Steel, lb.	Str. Steel, lb.	Concrete Cu Yds		Reinf Steel, lb.	Str. Steel, lb.	Concrete Cu Yds		Reinf Steel, lb.	Str. Steel, lb.
	Conc. Pipe	C.M. Pipe			Conc. Pipe	C.M. Pipe			Conc. Pipe	C.M. Pipe			Conc Pipe	C.M. Pipe			Conc. Pipe	C.M. Pipe		
17 X 13		1.0	260	75		1.2	335	150		1.5	415	180		1.8	490	210		2.1	565	290
21 X 15		1.1	280	80		1.3	360	160		1.6	445	190		1.9	530	220		2.3	615	300
24 X 18		1.4	360	170		1.8	465	235		2.2	570	370		2.6	680	440		3.1	790	505
28 X 20		1.5	375	180		1.9	495	245		2.4	610	390		2.8	730	460		3.3	845	530
35 X 24		2.0	475	300		2.6	625	410		3.2	775	525		3.8	925	740		4.4	1075	860
42 X 29		2.2	535	335		2.9	710	460		3.6	885	685		4.4	1060	820		5.1	1240	955
49 X 33		2.8	645	360		3.7	860	500		4.6	1075	750		5.5	1290	900		6.4	1505	1045
57 X 38		3.0	710	395		4.1	955	655		5.2	1205	815		6.2	1450	980		7.3	1700	1140
64 X 43		3.8	855	575		5.1	1155	925		6.4	1450	1160		7.8	1755	1400		9.1	2055	1760
71 X 47		4.0	910	610		5.5	1235	980		7.0	1565	1225		8.4	1895	1480		9.9	2225	1865

2 : 1 SLOPE										
CULVERT SIZE	H	L	W	LONGITUDINAL PIPE			CROSS TUBE			
				S	No.	Length	No.	Length	S1	S2
12	2′-0″	4′-0″	2′-0″	4′-5 5/8″	1	5′-7 5/8″	-	-	5′-1 5/8″	-
15 & 18	2′-6″	5′-0″	2′-0″	5′-7″	1	6′-9″	1	2′-7 1/2″	4′-9 1/8″	1′-6″
21 & 24	3′-0″	6′-0″	3′-0″	6′-8 1/2″	2	7′-10 1/2″	-	-	7′-4 1/2″	-
27 & 30	3′-6″	7′-0″	3′-0″	7′-9 7/8″	2	10′-1 1/4″	-	-	8′-5 7/8″	-
33 & 36	4′-0″	8′-0″	4′-0″	8′-11 3/8″	3	10′-11 3/8″	-	-	9′-7 3/8″	-
42	4′-6″	9′-0″	4′-0″	10′-0 3/4″	3	11′-1 1/4″	-	-	10′-8 3/4″	-
48	5′-0″	10′-0″	5′-0″	11′-2 1/8″	3	12′-4 1/8″	-	-	11′-10 1/8″	-
54	5′-6″	11′-0″	6′-0″	12′-3 5/8″	4	13′-5 1/2″	1	6′-7 1/2″	9′-11 5/8″	3′-0″
60	6′-0″	12′-0″	6′-0″	13′-5″	4	14′-7″	1	6′-7 1/2″	11′-1″	3′-0″

3 : 1 SLOPE										
CULVERT SIZE	H	L	W	LONGITUDINAL PIPE			CROSS TUBE			
				S	No.	Length	No.	Length	S1	S2
12	2′-0″	6′-0″	2′-0″	6′-3 1/8″	1	7′-9″	1	2′-7 1/2″	5′-3 7/8″	2′-0″
15 & 18	2′-6″	7′-6″	2′-0″	7′-10 7/8″	1	9′-3 7/8″	1	2′-7 1/2″	5′-4 7/8″	3′-6″
21 & 24	3′-0″	9-0″	3′-0″	9′-5 7/8″	2	10′10 7/8″	1	3′-7 1/2″	6′-11 7/8″	3′-6″
27 & 30	3′-6″	10′-6″	3′-0″	11′-0 3/4″	2	12′-5 7/8″	1	3′-7 1/2″	8′-6 3/4″	3′-6″
33 & 36	4′-0″	12′-01″	4′-0″	12-′7 3/4″	3	14′-0 7/8″	1	4′-7 1/2″	10′-1 3/4″	3′-6″
42	4′-6″	13′-6″	4′-0″	14′-2 3/4″	3	15′-7 3/4″	1	4′-7 1/2″	10′-8 3/4″	4′-6″
48	5′-0″	15′-0″	5′-0″	15′-9 3/4″	3	17′-2 3/4″	1	5′-7 1/2″	12′-3 3/4″	4′-6″
54	5′-6″	16′-6″	6′-0″	17′-4 3/4″	4	18′-9 3/4″	1	6′-7 1/2″	10′-4 3/4″	8′-0″
60	6′-0″	18′-0″	6′-0″	18′-11 3/4″	4	20′-4 3/4″	1	6′-7 1/2″	11′-11 3/4″	8′-0″

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Drawing #: E 715-GBTO-08
Date: 0414

Grated Box End Section Type I
Standard E 715-GBTO-08
INDOT Standard

4 : 1 SLOPE										
CULVERT SIZE	H	L	W	LONGITUDINAL PIPE			CROSS TUBE			
				S	No.	Length	No.	Length	S1	S2
12	2′-0″	8′-0″	2′-0″	8′-3″	1	9′-11 1/2″	1	2′-7 1/2″	5′-7″	4′-0″
15 & 18	2′-6″	10′-0″	2′-0″	10′-3 3/4″	1	12′-0 1/4″	2	2′-7 1/2″	5′-7 3/4″	3′-0″
21 & 24	3′-0″	12′-0″	3′-0″	12′-4 3/8″	2	14′-1″	1	3′-7 1/2″	9′-2 1/2″	4′-6″
27 & 30	3′-6″	14′-0″	3′-0″	14′-5 1/8″	2	16′-1 3/4″	1	3′-7 1/2″	9′-3 1/8″	6′-6″
33 & 36	4′-0″	16′-0″	4′-0″	16′-5 7/8″	3	18′-2 1/2″	1	4′-7 1/2″	11′-3 7/8″	6′-6″
42	4′-6″	18′-0″	4′-0″	18′-6 5/8″	3	20′-3 1/4″	1	4′-7 1/2″	12′-4 5/8″	7′-6″
48	5′-0″	20′-0″	5′-0″	20′-7 3/8″	3	22′-4″	1	5′-7 1/2″	11′-5 3/8″	10′-6″
54	5′-6″	22′-0″	6′-0″	22′-8 1/8″	4	24′-4 3/4″	-	6′-7 1/2″	12′-6 1/8″	11′-6″
60	6′-0″	24′-0″	6′-0″	24′-8 7/8″	4	26′-5 1/2″	2	6′-7 1/2″	12′-6 7/8″	6′-9″

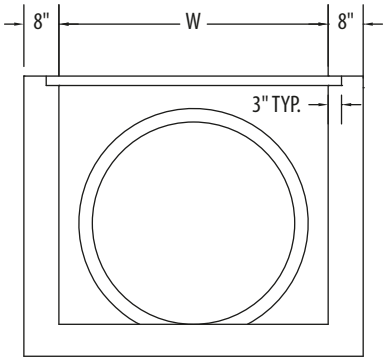
5 : 1 SLOPE										
CULVERT SIZE	H	L	W	LONGITUDINAL PIPE			CROSS TUBE			
				S	No.	Length	No.	Length	S1	S2
12	2′-0″	10′-0″	2′-0″	10′2 3/8″	1	12′-2 3/4″	2	2′-7 1/2″	6′-2 3/8″	2′-10
15 & 18	2′-6″	12′-6″	2′-0″	12′-9″	1	14′-9 3/8″	2	2′-7 1/2″	5′-11″	4′-3″
21 & 24	3′-0″	15′-0″	3′-0″	15′-3 1/2″	2	17′-4″	1	3′-7 1/2″	9′-2 1/2″	7′-9″
27 & 30	3′-6″	17′-6″	3′-0″	17′-10 1/8″	2	19′-10 1/2″	2	3′-7 1/2″	9′-6 1/8″	5′-0″
33 & 36	4′-0″	20′-0″	4′-0″	20′-4 3/4″	3	22′-5 1/8″	1	4′-7 1/2″	13′-0 3/4″	9′-0″
42	4′-6″	22′-6″	4′-0″	22′-11 3/8″	3	24′-11 3/4″	1	4′-7 1/2″	13′-1 3/8″	11′-6″
48	5′-0″	25′-0″	5′-0″	25′-6″	3	27′-6 1/4″	2	5′-7 1/2″	13′-2″	7′-0″
54	5′-6″	27′-6″	6′-0″	28′0 1/2″	4	30′-0 7/8″	2	6′-7 1/2″	13′-2 1/2″	8′-3″
60	6′-0″	30′-0″	6′-0″	30′-7 1/8″	4	32′-7 1/2″	2	6′-7 1/2″	11′-9 1/8″	10′-3″

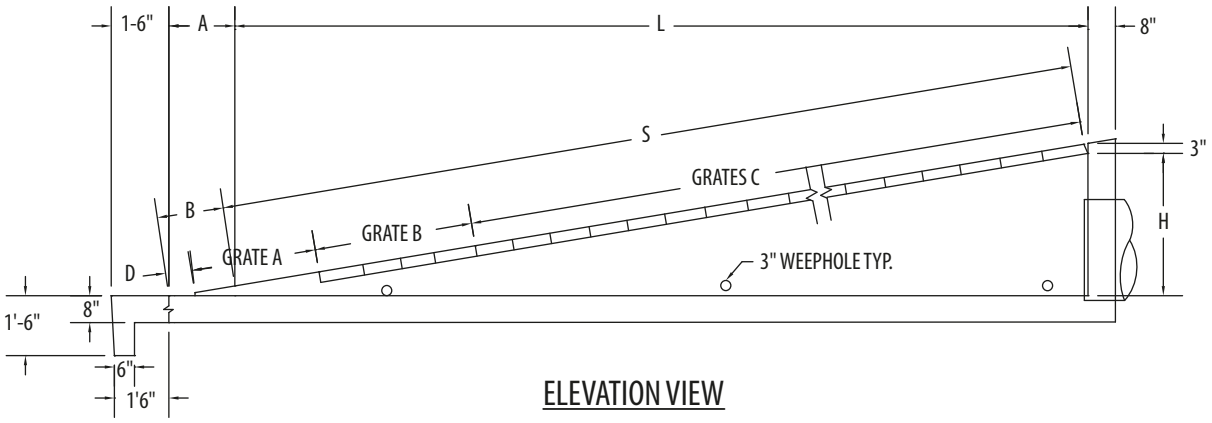
6:1 SLOPE										
CULVERT SIZE	H	L	W	LONGITUDINAL PIPE			CROSS TUBE			
				S	No.	Length	No.	Length	S1	S2
12	2′-0″	12′-0″	2′-0″	12′-2″	1	14′-6 1/4″	2	2′-7 1/2″	6′-2″	4′-0″
15 & 18	2′-6″	15′-0″	2′-0″	15′-2 1/2″	1	17′-6 3/4″	2	2′-7 1/2″	6′-8 1/2″	5′-3″
21 & 24	3′-0″	18′-0″	3′-0″	18′-3″	2	20′-7 1/4″	2	3′-7 1/2″	9′-9″	5′-3″
27 & 30	3′-6″	21′-0″	3′-0″	21′-3 1/2″	2	23′-7 3/4″	2	3′-7 1/2″	9′-9 1/2″	6′-9″
33 & 36	4′-0″	24′-0″	4′-0″	24′-4″	3	26′8 1/4″	2	4′-7 1/2″	13′-4″	6′-6″
42	4′-6″	27′-0″	4′-0″	27′-4 1/2″	3	29′-8 3/4″	2	4′-7 1/2″	13′-4 1/2″	8′-0″
48	5′-0″	30′-0″	5′-0″	30′-5″	3	32′-9 1/4″	2	5′-7 1/2″	13′-5″	9′-6″
54	5′-6″	33′-0″	6′-0″	33′-5 1/2″	4	35′-9 3/4″	2	6′-7 1/2″	12′-11 1/2″	11′-3″
60	6′-0″	36′-0″	6′-0″	36′-6″	4	38′-10 1/8″	3	6′-7 1/2″	13′-0″	8′-6″

DIMENSIONS						
Slope	A	B	C	D	E	F
2:1	0′-9″	0′-8″	0′ – 6 1/2″	0′ – 8 1/2″	0′ – 0 3/4″	0′ – 0 7/8″
3:1	1′- 0 5/8″	1′-0″	0′ – 5 1/2″	0′ – 6 7/8″	0′ – 1 1/8″	0′ – 1 1/8″
4:1	1′- 4 1/2″	1′-4″	0′ – 5 1/8″	0′ – 6 1/8″	0′ – 1 1/2″	0′ – 1 1/2″
5:1	1′- 8 3/8″	1′-8″	0′ – 4 7/8″	0′ – 5 5/8″	0′ – 1 7/8″	0′ – 1 7/8″
6:1	2′ – 0 3/8″	2′-0″	0′ – 4 3/4″	0′ – 5 3/8″	0′ – 2 1/4″	0′ – 2 1/4″

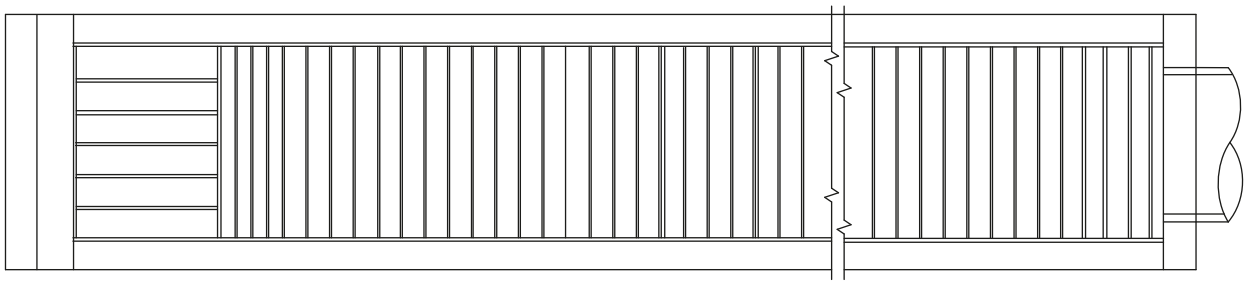
Grated Box End Section Type II
Standard E 715-GBTT-01
INDOT Standard

See Tables Listed For
Grated Box End Section Type II
For Dimensions





ELEVATION VIEW



PLAN VIEW

COUNTY MATERIALS CORPORATION
Charleston
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toll free (800) 747-3669
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Drawing #: E 715-GBTT-05
Date: 0414

Grated Box End Section Type II
Standard E 715-GBTT-05
INDOT Standard

APPROXIMATE QUANTITIES												
PIPE SIZE	4:1 SLOPE				6:1 SLOPE				10:1 SLOPE			
	Conc., cys		Str. Steel, lb.	Reinf. Steel, lb.	Conc., cys		Reinf. Steel, lb.	Str. Steel, lb.	Conc., cys		Reinf. Steel, lb.	Str. Steel, lb.
	Conc. Pipe	C.M. Pipe			Conc. Pipe	C.M. Pipe			Conc. Pipe	C.M. Pipe		
12	1.1	1.1	335.0	295	1.5	1.5	400	480	2.3	2.4	605	790
15 & 18	1.6	1.6	445.0	395	2.2	2.2	550	645	3.4	3.4	865	1080
21 & 24	2.4	2.4	750.0	565	3.3	3.3	790	1130	5.2	5.2	1245	1830
27 & 30	2.9	3.0	910.0	695	4.2	4.3	980	1345	6.6	6.7	1580	2195
33 & 36	4	4.1	1415.0	910	5.7	5.8	1290	2115	9.1	9.2	2075	3455
42	4.8	4.9	1655.0	1085	6.9	7	1545	2415	11	11.2	2490	4015
48	6.2	6.3	2230.0	1350	8.8	9	1925	3265	14.2	14.4	3100	5425
54	7.8	8.0	2955.0	1665	11.3	11.4	2400	4375	18.1	18.3	3855	7440
60	8.7	8.9	3215.0	1850	12.6	12.8	2675	1725	20.4	20.4	4310	8175

4 : 1 SLOPE							
PIPE SIZE	H	L	W	S	GRATE C		GRATE B
					No.	Length	LENGTH
12	1′-5″	5′-8″	2′-0″	5′-9″	1	3′-4″	1′-0″
15 & 18	2′-0″	8′-0″	2′-0″	8′-1″	1	4′-0″	2′-8″
21 & 24	2′-6″	10′-0″	3′-0″	10′-1″	2	3′-0″	2′-8″
27 & 30	3′-1″	12′-4″	3′-0″	12′-5″	3	3′-0″	2′-0″
33 & 36	3′-7″	14′-4″	4′-0″	14′-5″	5	2′-4″	1′-4″
42	4′-2″	16′-5″	4′-0″	17′-1″	6	2′-4″	1′-8″
48	4′-8″	18′-8″	5′-0″	19′-1″	8	2′-0″	1′-8″
54	5′-3″	21′-0″	6′-0″	21′-5″	12	1′-8″	-
60	5′-9″	23′-0″	6′-0″	23′-5″	12	1′-8″	2′-0″

6 : 1 SLOPE							
PIPE SIZE	H	L	W	S	GRATE C		GRATE B
					No.	LENGTH	LENGTH
12	1′-5″	8′-6″	2′-0″	8′-5″	1	4′-0″	2′-4″
15 & 18	2′-0″	12′-0″	2′-0″	11′-9″	2	4′-0″	1′-8″
21 &24	2′-6″	15′-0″	3′-0″	15′-1″	4	3′-0″	1′-0″
27 & 30	3′-1″	18′-6″	3′-0″	18′-5″	5	3′-0″	1′-4″
33 & 36	3′-7″	21′-6″	4′-0″	21′-5″	9	2′-0″	1′-4″
42	4′-2″	25′-0″	4′-0″	25′-1″	9	2′-4″	2′-0″
48	4′-8″	28′-0″	5′-0″	28′-1″	13	2′-0″	-
54	5′-3″	31′-6″	6′-0″	31′-9″	17	1′-8″	1′-4″
60	5′-9″	34′-6″	6′-0″	34′-9″	19	1′-8″	1′-0″

10 : 1 SLOPE							
PIPE SIZE	H	L	W	S	GRATE C		GRATE B
					No.	LENGTH	LENGTH
12	1′-5″	14′-2″	2′-0″	14′-1″	2	4′-0″	2′-8″
15 & 18	2′-0″	20′-0″	2′-0″	19′-9″	4	3′-8″	1′-8″
21 & 24	2′-6″	25′-0″	3′-0″	24′-9″	8	2′-8″	-
27 & 30	3′-1″	30′-10″	3′-0″	30′-5″	9	3′-0″	-
33 & 36	3′-7″	35′-10″	4′-0″	35′-9″	13	2′-4″	2′-0″
42	4′-2″	41′-8″	4′-0″	41′-9″	16	2′-4″	1′-0″
48	4′-8″	46′-8″	5′-0″	46′-9″	21	2′-0	1′-4″
54	5′-3″	52′-6″	6′-0″	52′-5″	36	1′-4″	1′-0″
60	4′-0″	57′-6″	6′-0″	57′-9″	40	1′-4″	1′-0″

COUNTY MATERIALS CORPORATION
Charleston
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Drawing #: E 715-GBTT-06
Date: 0414

Grated Box End Section Type II
Standard E 715-GBTT-06
INDOT Standard

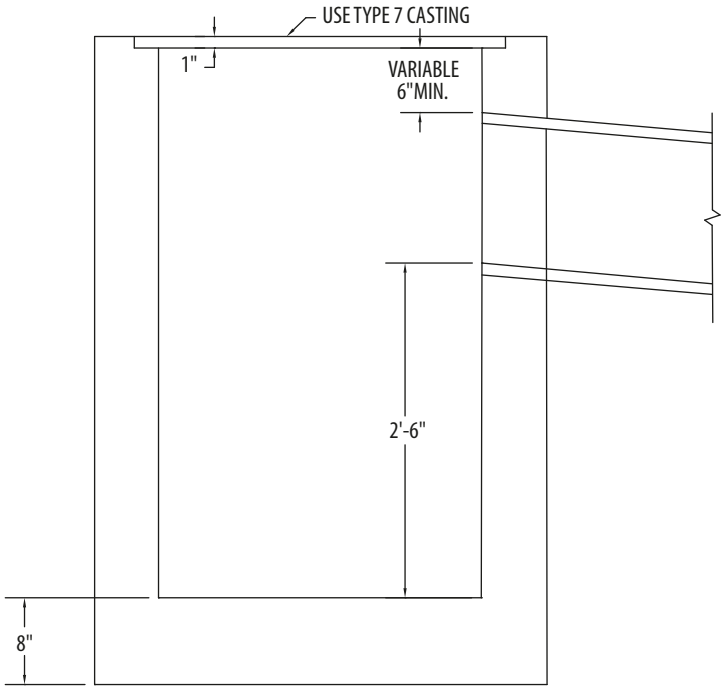
APPROXIMATE QUANTITIES									
PIPE SIZE	4:1 SLOPE			6:1 SLOPE			10:1 SLOPE		
	Str. Steel, lb.	Conc., cys	Reinf. Steel, lb.	Str. Steel, lb.	Conc., cys	Reinf. Steel, lb.	Str. Steel, lb.	Conc., cys	Reinf. Steel, lb.
17 X 13	355	1.2	305	495	1.5	415	820	2.5	640
21 X 15	385	1.3	335	540	1.8	460	910	2.8	715
24 X 18	605	1.8	440	875	2.5	610	1445	3.9	935
28 X 20	645	2.0	465	940	2.7	645	1545	4.2	1020
35 X 24	975	2.7	615	1435	3.7	855	2375	5.8	1325
42 X 29	1145	3.1	700	1710	4.4	995	2750	6.9	1570
49 X 33	1520	4.0	880	2270	5.6	1230	3825	8.9	1960
57 X 38	1715	4.5	985	2525	6.4	1400	4400	10.2	2245
64 X 43	2295	5.7	1210	3335	8.1	1725	5560	12.9	2755
71 X 47	24703	6.2	1310	3735	8.9	1880	6005	14.2	3015

4 : 1 SLOPE							
PIPE SIZE	H	L	W	S	GRATE C		GRATE B
					No.	LENGTH	LENGTH
17 X 13	1′-6″	6′-0″	2′-0″	6′-1″	1	3′-8″	1′-0″
21 X 15	1′-8″	6′-8″	2′-0″	6′-9″	1	4′-0″	1′-4″
24 X 18	1′-11″	7′-8″	3′-0″	7′-9″	2	2′-8″	1′-0″
28 X 20	2′-1″	8′-4″	3′-0″	8′-5″	2	3′-0″	1′-0″
35 X 24	2′-5″	9′-8″	4′-0″	9′-9″	3	2′-4″	1′-4″
42 X 29	2′-10″	11′-4″	4′-0″	11′-5″	5	2′-0″	-
49 X 33	3′-2″	12′-8″	5′-0″	12′-9″	5	2′-0″	1′-4″
57 X 38	3′-7″	14′-4″	5′-0″	14′-5″	6	2′-0″	1′-0″
64 X 43	4′-0″	16′-0″	6′-0″	16′-5″	9	1′-8″	-
71 X 47	4′-4″	17′-4″	6′-0″	17′-9″	9	1′-8″	1′-4″

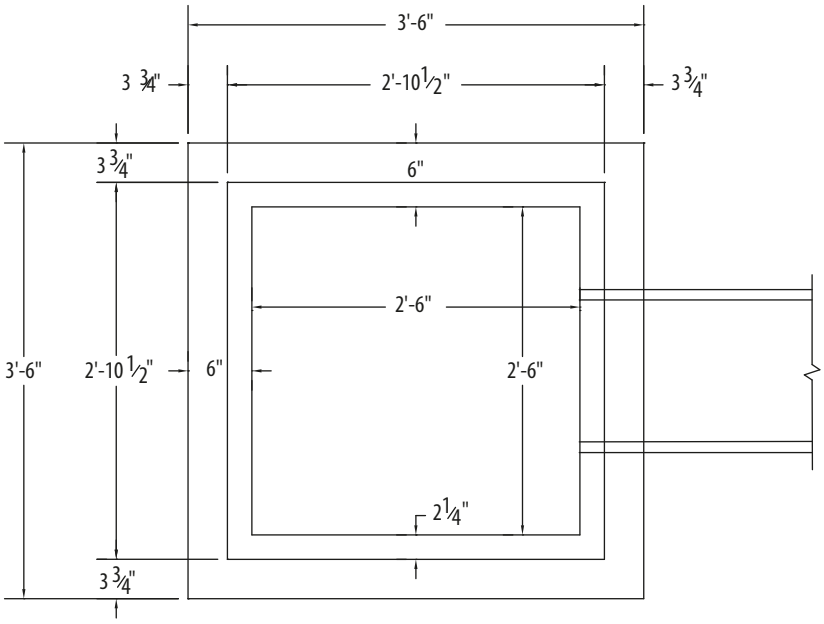
6 : 1 SLOPE							
PIPE SIZE	H	L	W	S	GRATE C		GRATE B
					No.	LENGTH	LENGTH
17 X 13	1′-6″	9′-0″	2′-0″	8′-9″	1	4′-0″	2′-8″
21 X 15	1′-8″	10′-0″	2′-0″	9′-9″	1	4′-0″	3′-8″
24 X 18	1′-11″	11′-6″	3′-0″	11′-5″	3	2′-8″	1′-4″
28 X 20	2′-1″	12′-6″	3′-0″	12′-5″	3	3′-0″	1′-4″
35 X 24	2′-5″	14′-6″	4′-0″	14′-5″	5	2′-0″	2′-4″
42 X 29	2′-10″	17′-0″	4′-0″	17′-1″	7	2′-0″	1′-0″
49 X 33	3′-2″	19′-0″	5′-0″	19′-1″	8	2′-0″	1′-0″
57 X 38	3′-7″	21′-6″	5′-0″	21′-5″	9	2′-0″	1′-4″
64 X 43	4′-0″	24′-0″	6′-0″	24′-1″	12	1′-8″	2′-0″
71 X 47	4′-4″	26′-0″	6′-0″	26′-1″	18	1′-4″	-

10 : 1 SLOPE							
PIPE SIZE	H	L	W	S	GRATE C		GRATE B
					No.	LENGTH	LENGTH
17 X 13	1′-6″	15′-0″	2′-0″	14′-9″	2	4′-0″	3′-4″
21 X 15	1′-8″	16′-8″	2′-0″	16′-5″	3	4′-0″	1′-0″
24 X 18	1′-11″	19′-2″	3′-0″	19′-1″	5	2′-6″	2′-4″
28 X 20	2′-1″	20′-10″	3′-0″	20′-9″	5	3′-0″	2′-4″
35 X 24	2′-5″	24′-2″	4′-0″	24′-1″	8	2′-4″	2′-0″
42 X 29	2′-10″	28′-4″	4′-0″	28′-1″	10	2′-4″	1′-4″
49 X 33	3′-2″	31′-8″	5′-0″	31′-9″	17	1′-8″	-
57 X 38	3′-7″	35′-10″	5′-0″	35′-9″	23	1′-4″	1′-8″
64 X 43	4′-0″	40′-0″	6′-0″	40′-1″	22	1′-8″	-
71 X 47	4′-4″	43′-4″	6′-0″	43′-5″	24	1′-8″	-

Catch Basin Type E
Standard E 720-CBST-03
INDOT Standard



ELEVATION VIEW



PLAN VIEW

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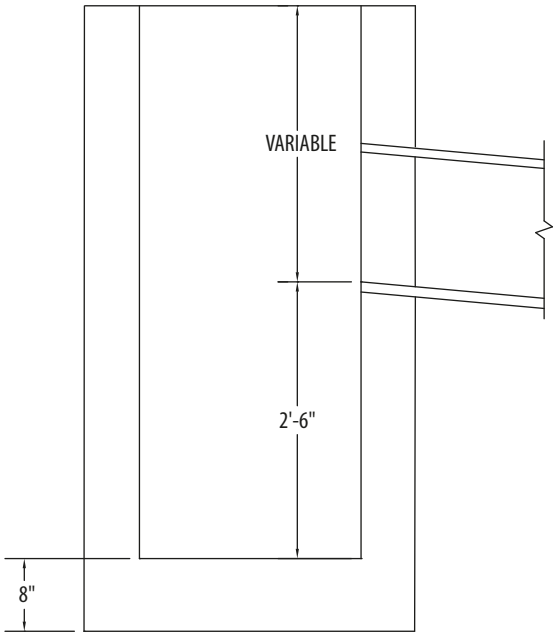
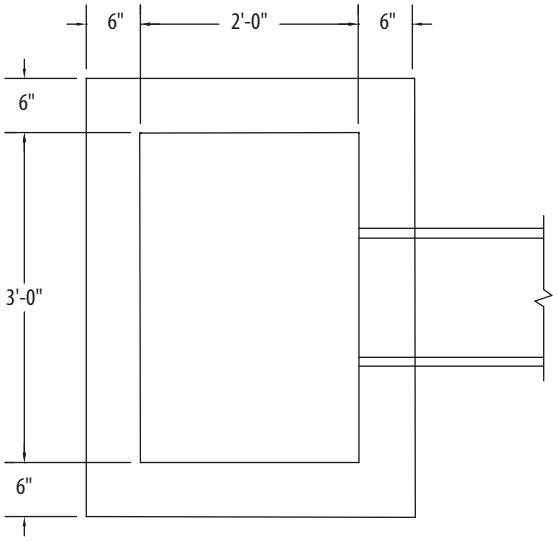
Drawing #: E 720-CBST-05
Date: 0414

Catch Basin Type K
Standard E 720-CBST-05
INDOT Standard

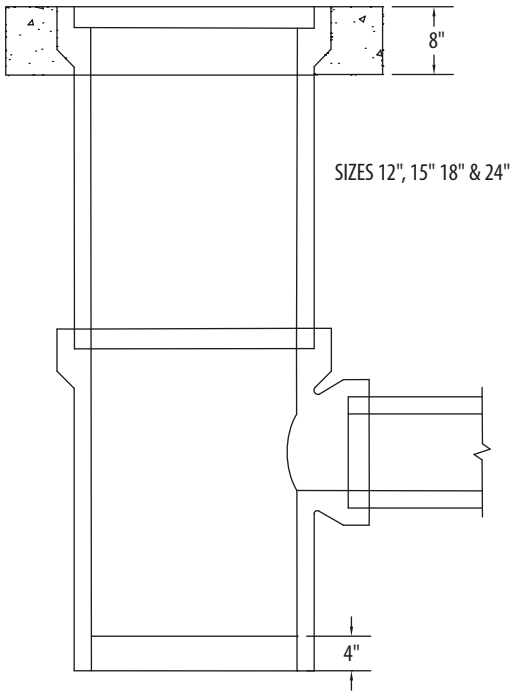


ELEVATION VIEW

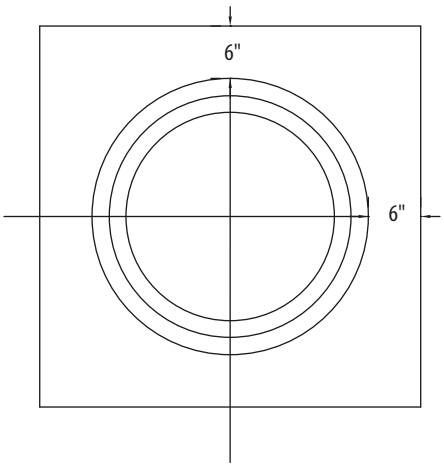


PLAN VIEW

Catch Basin Pipe
Standard E 720-CBST-06
INDOT Standard

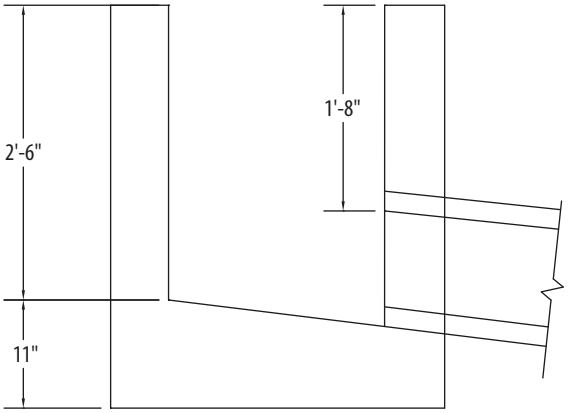


ELEVATION VIEW

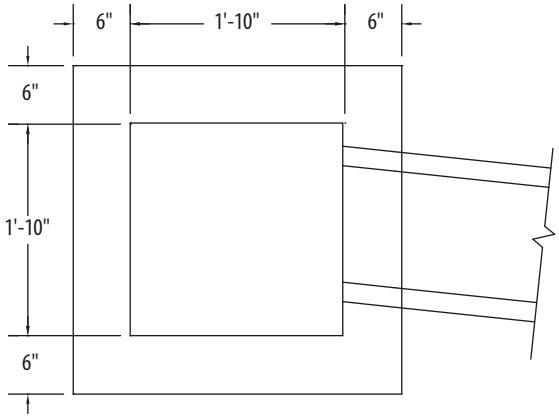


PLAN VIEW

Inlet Type A
Standard E 720-INST-01
INDOT Standard

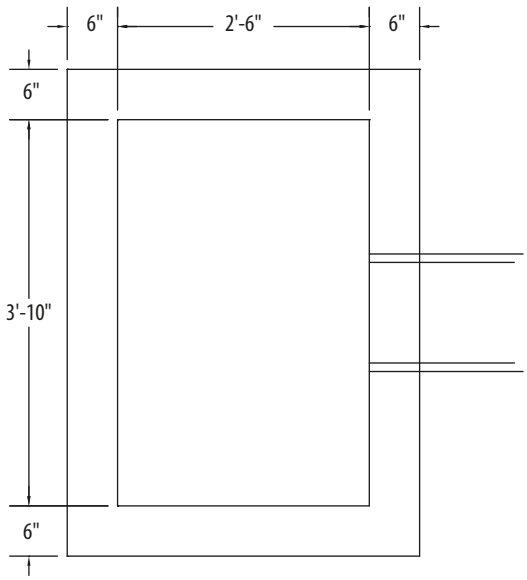


ELEVATION VIEW

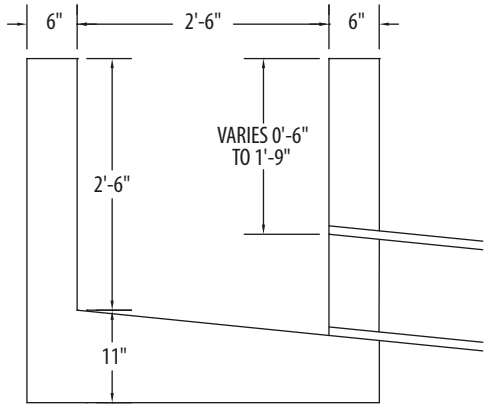


PLAN VIEW

Inlets Type B And C
Standard E 720-INST-02
INDOT Standard

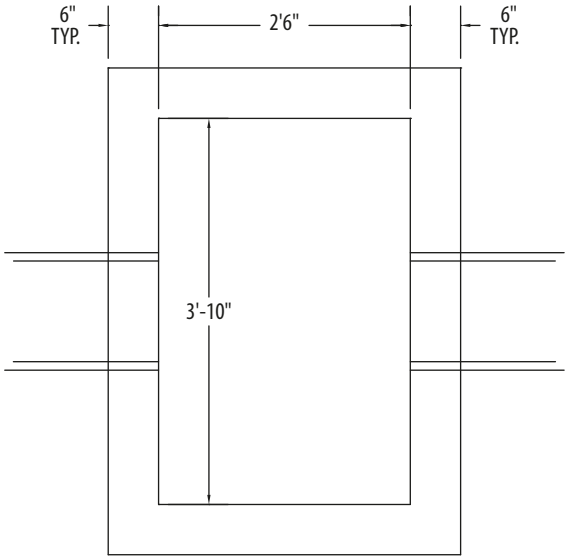


PLAN VIEW

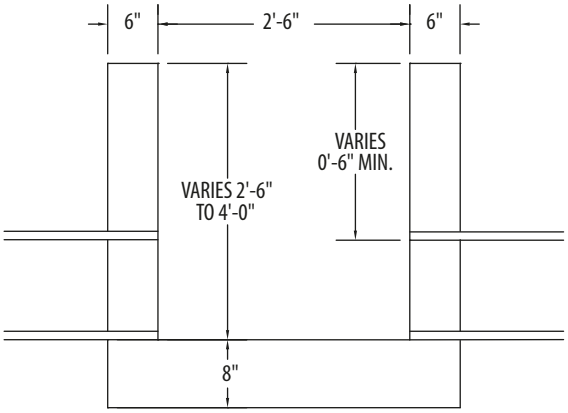


ELEVATION VIEW

INLET-TYPE B



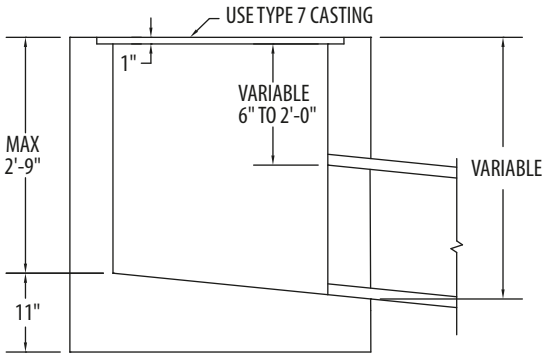
PLAN VIEW



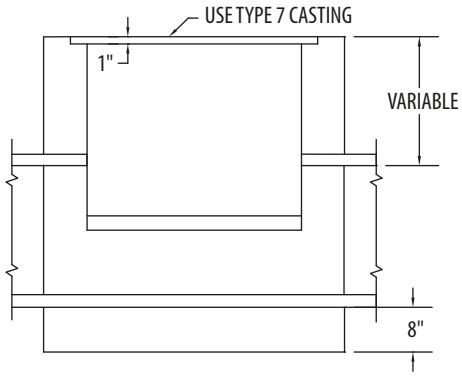
ELEVATION VIEW

INLET-TYPE C

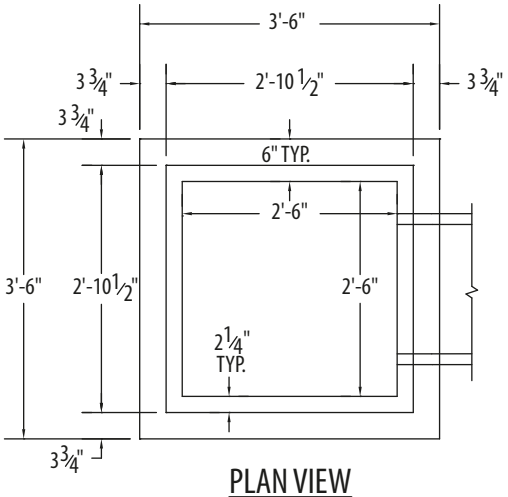
Inlets Type E And F
Standard E 720-INST-04
INDOT Standard



ELEVATION VIEW

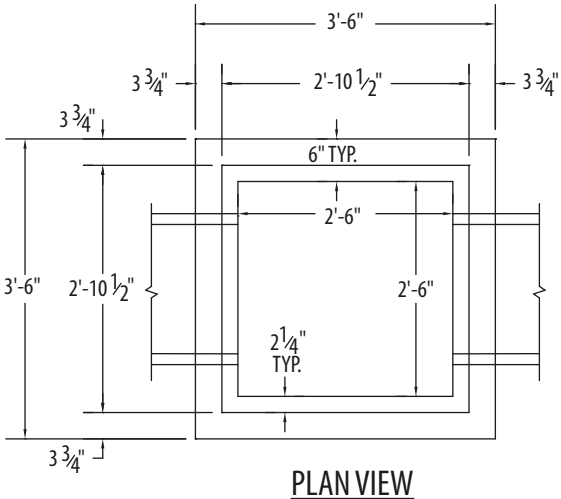


ELEVATION VIEW



PLAN VIEW

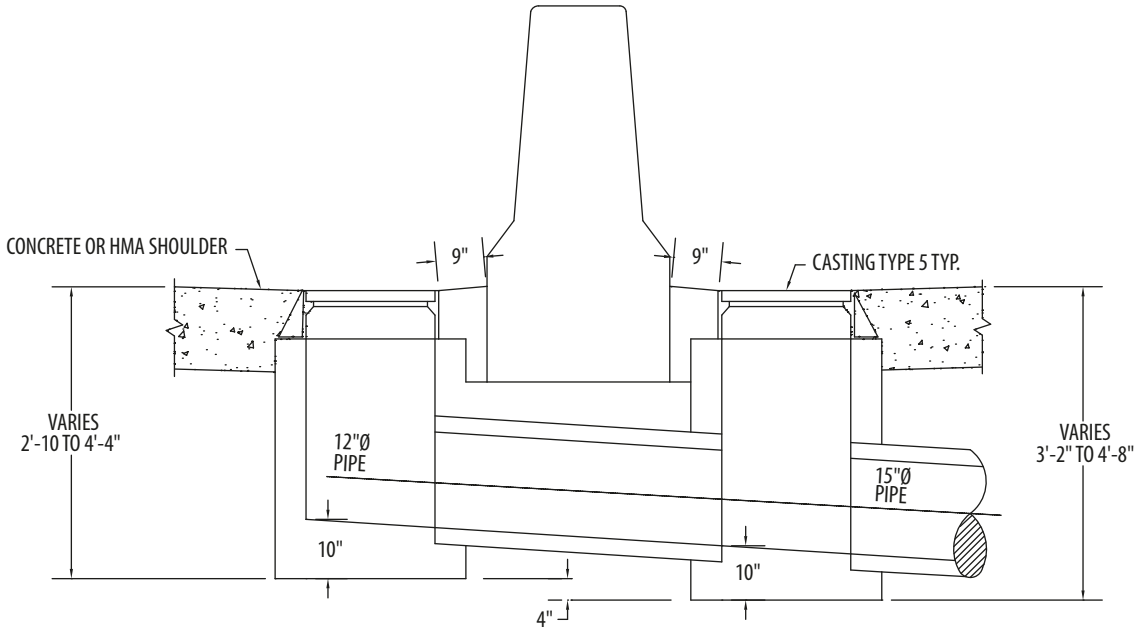
INLET-TYPE E



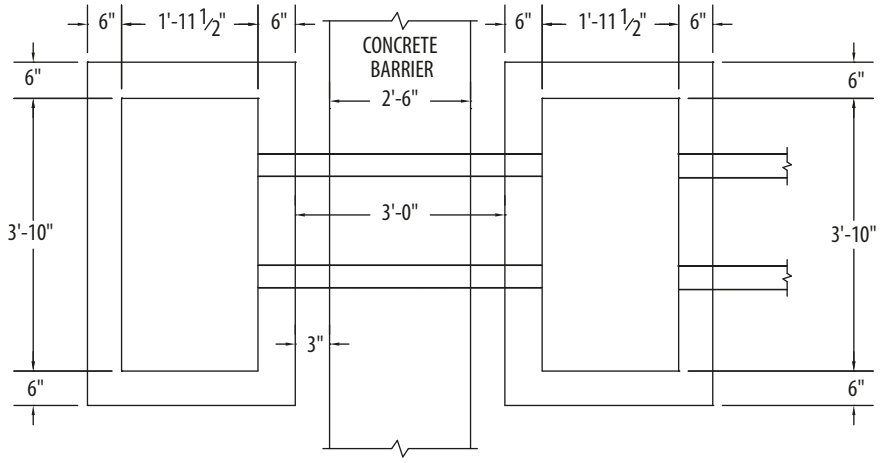
PLAN VIEW

INLET-TYPE F

Inlet Type H
Standard E 720-INST-05A
INDOT Standard

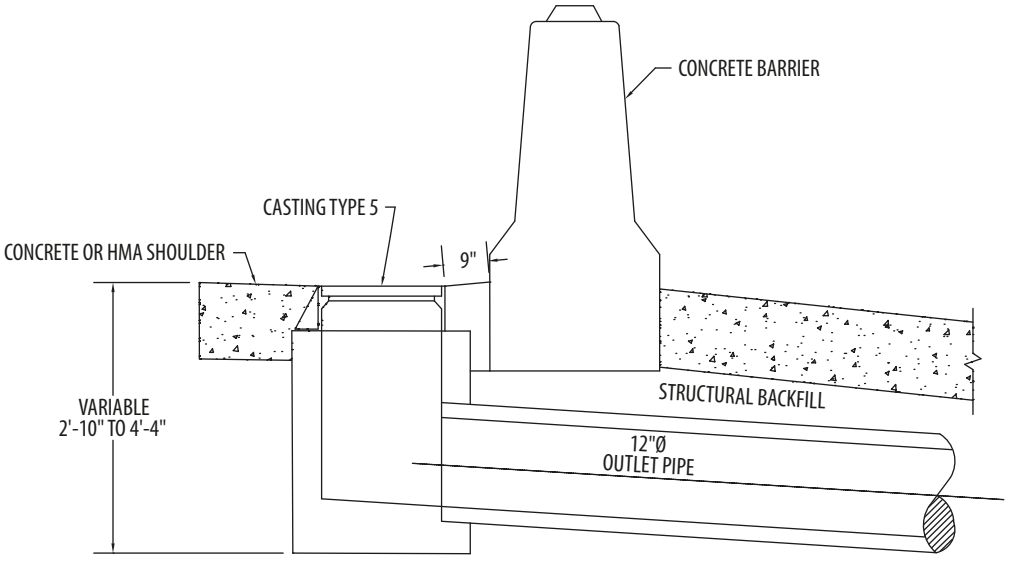


ELEVATION VIEW

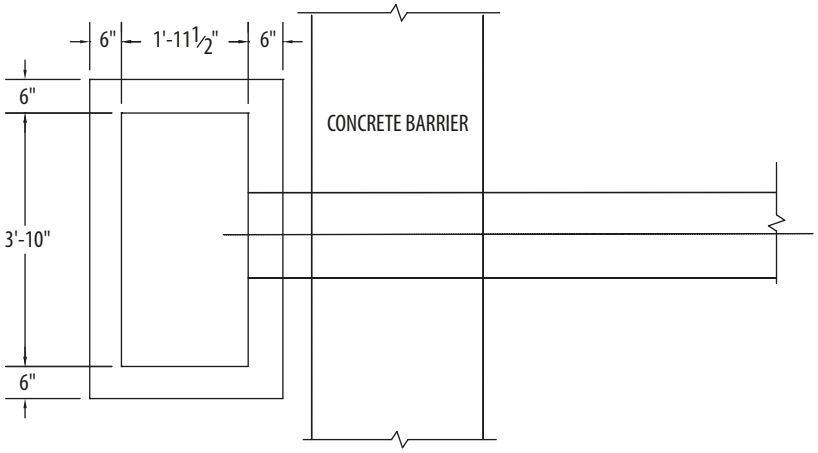


PLAN VIEW

Inlet Type HA
Standard E 720-INST-05C
INDOT Standard

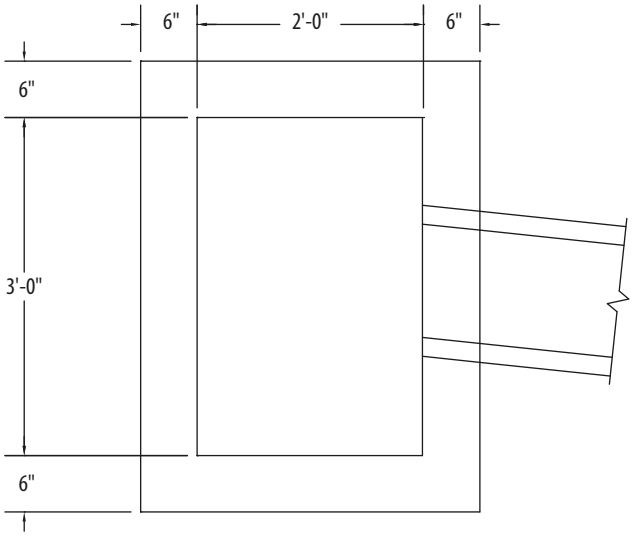


ELEVATION VIEW

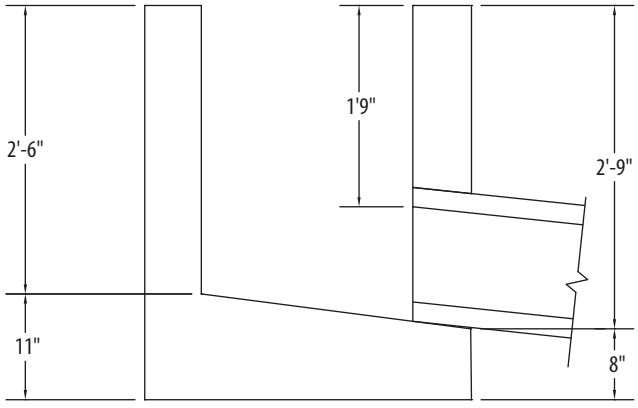


PLAN VIEW

Inlet Type J
Standard E 720-INST-06
INDOT Standard

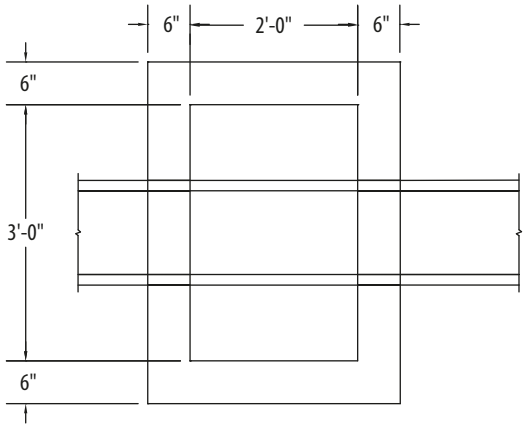


ELEVATION VIEW

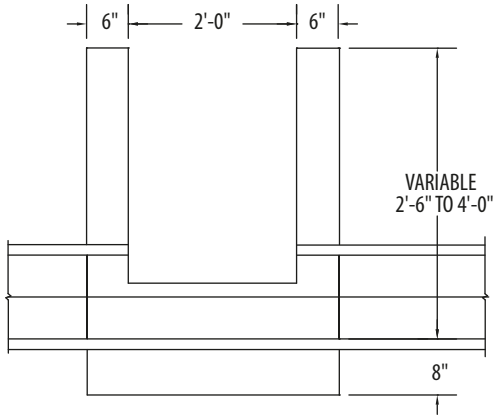


PLAN VIEW

Inlets Type M & R
Standard E 720-INST-07
INDOT Standard

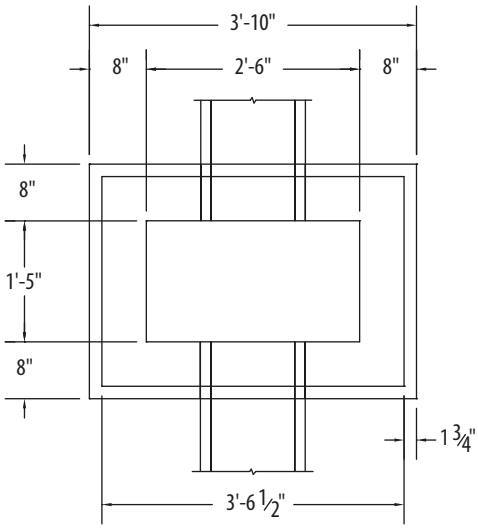


PLAN VIEW

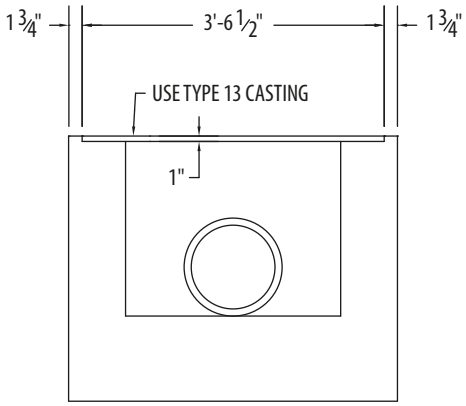


ELEVATION VIEW

INLET-TYPE M



PLAN VIEW



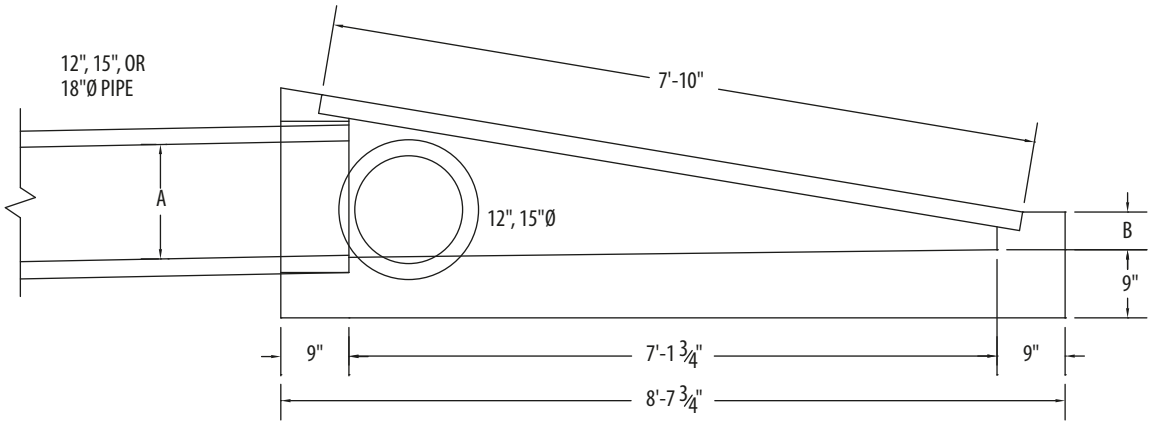
ELEVATION VIEW

INLET-TYPE R

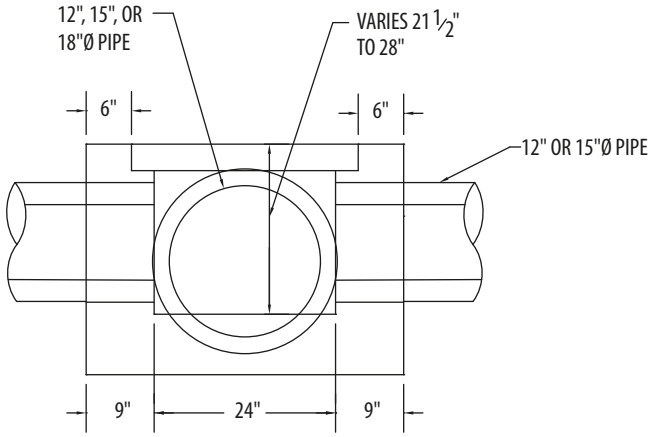
COUNTY MATERIALS CORPORATION
Charleston
20005 State Hwy 16 East • Charleston, IL 61920-0078
toll free (800) 747-3669
www.countymaterials.com

Drawing #: E 720-INST-08
Date: 0414

Inlet Type N
Standard E 720-INST-08
INDOT Standard



ELEVATION VIEW



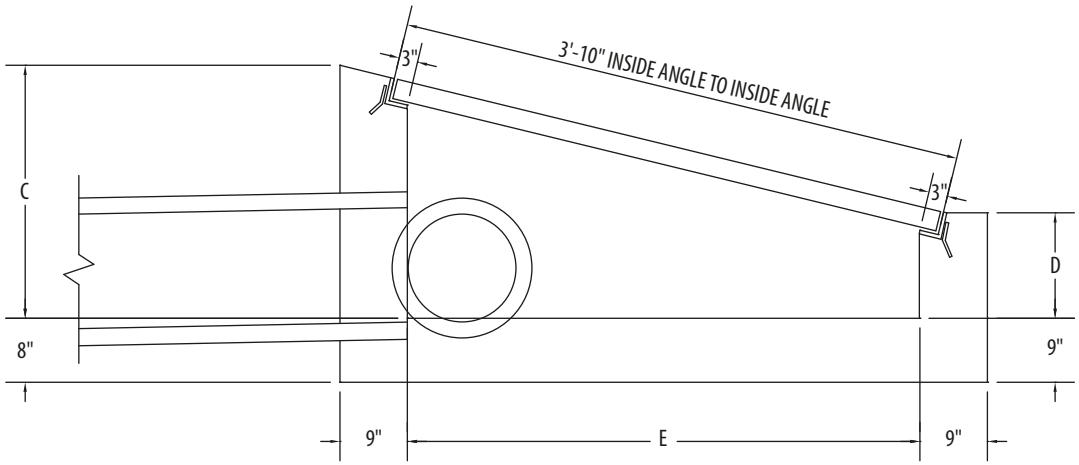
PLAN VIEW

TYPE N INLET						
PIPE SIZE	6:1		8:1		10:1	
	A	B	A	B	A	B
12"	21 1/2"	5"	21 1/2"	8 7/8"	21 1/2"	11 1/8"
15"	24 3/4"	8 1/4"	24 3/4"	12 1/8"	24 3/4"	14 3/8"
18"	28"	11 1/2"	28"	15-3/8"	28"	17 5/8"

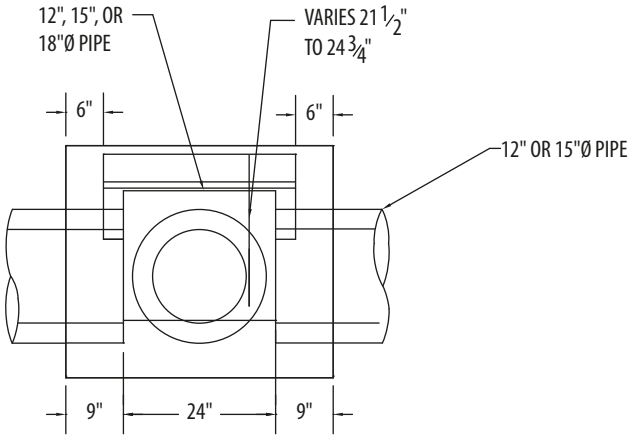
COUNTY MATERIALS CORPORATION
Charleston
20005 State Hwy 16 East • Charleston, IL 61920-0078
toll free (800) 747-3669
www.countymaterials.com

Drawing #: E 720-INST-09
Date: 0414

Inlet Type P
Standard E 720-INST-09
INDOT Standard



ELEVATION VIEW



PLAN VIEW

TYPE P INLET									
PIPE SIZE	6:1			8:1			10:1		
	C	D	E	C	D	E	C	D	E
12"	21 1/2"	13"	3'-3 1/4"	21 1/2"	14 1/2"	3'-3 3/4"	21 1/2"	15 7/8"	3'-3 3/4"
15"	24 3/4"	16-1/4"	3'-3 1/4"	24 3/4"	18"	3'-3 3/4"	24 3/4"	19 1/8"	3'-3 3/4"

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20005 State Hwy 16 East • Charleston, IL 61920-0078
toll free (800) 747-3669
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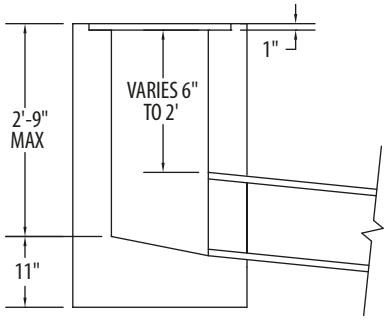
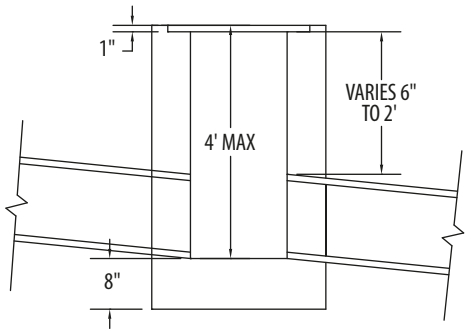
Drawing #: E 720-INST-10
Date: 0414

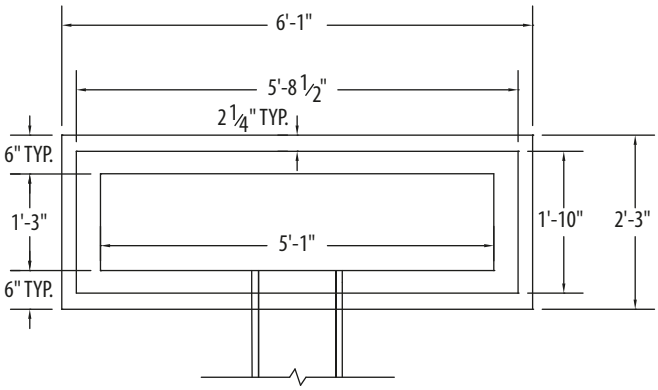
Inlets Type S & T
Standard E 720-INST-10
INDOT Standard



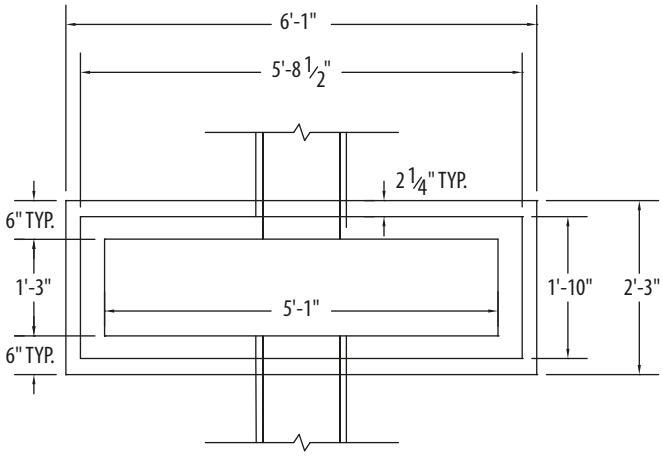
ELEVATION VIEW



ELEVATION VIEW



PLAN VIEW

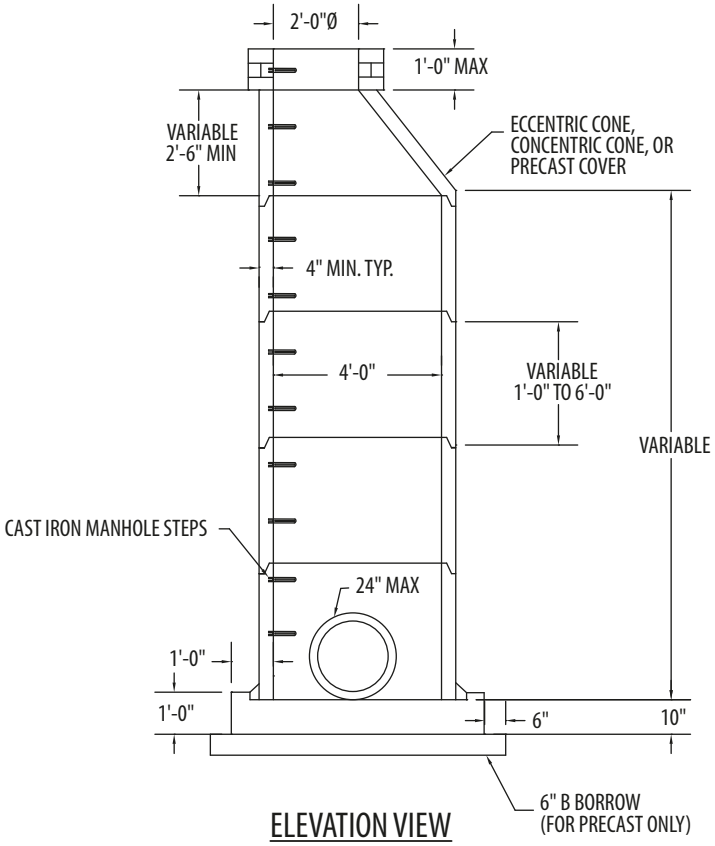


PLAN VIEW

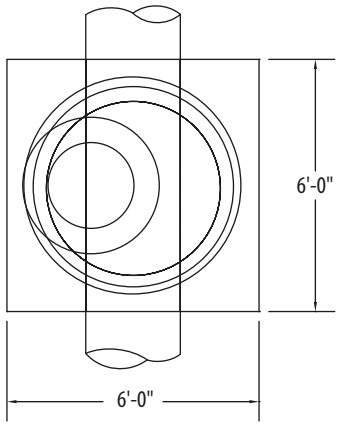
TYPE S

TYPE T

Manhole Type C
Standard E 720-MHST-02
INDOT Standard

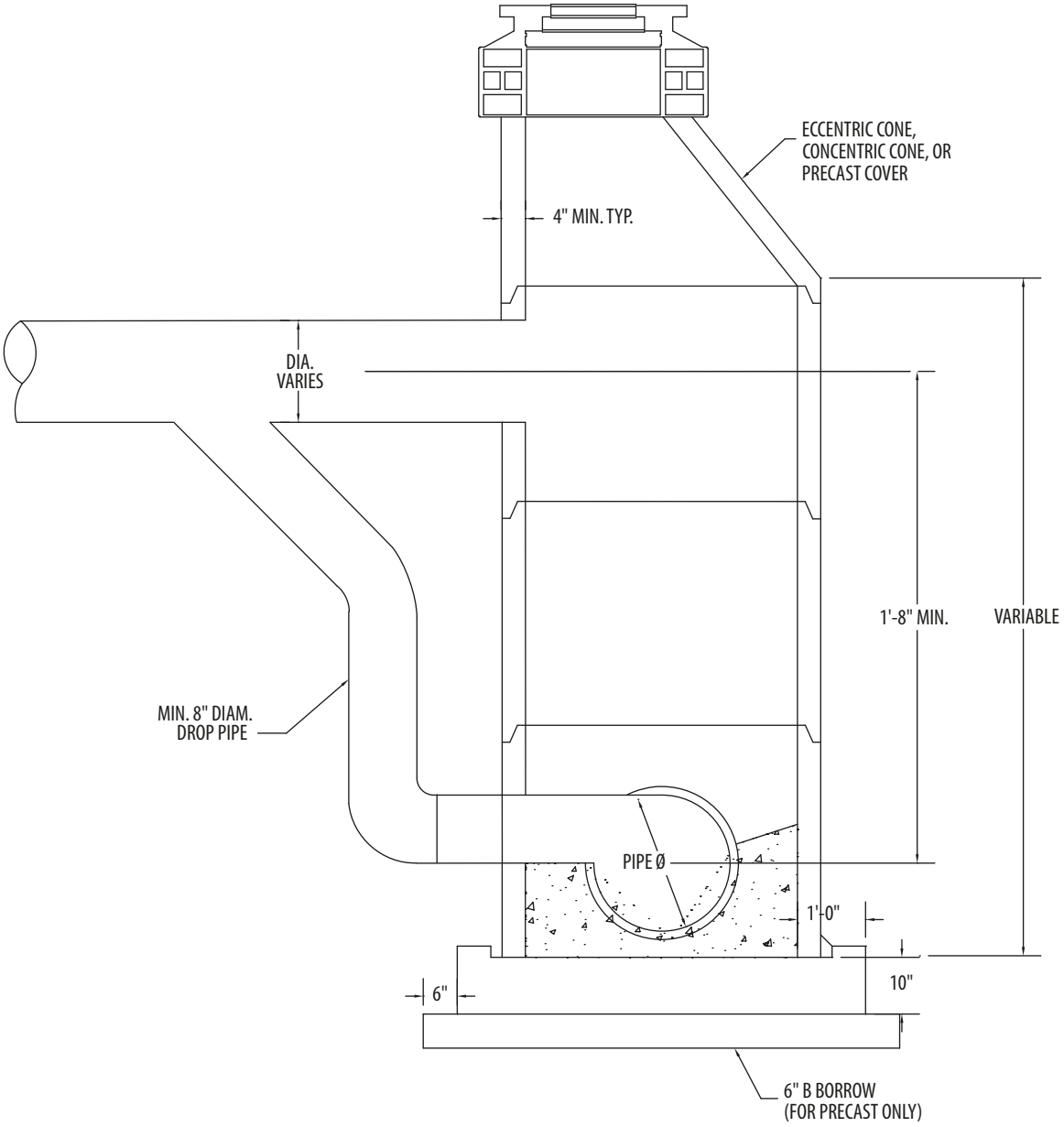


ELEVATION VIEW



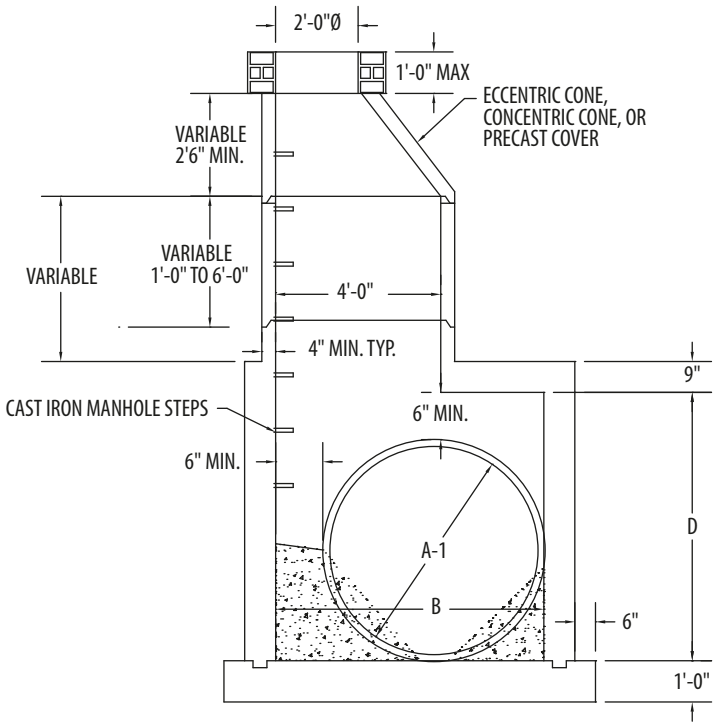
PLAN VIEW

Manhole Type C
Standard E 720-MHST-03
INDOT Standard

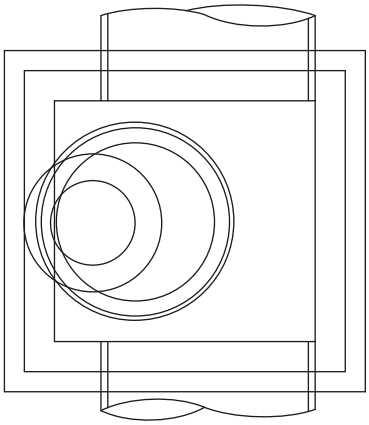


ELEVATION VIEW

Manholes Type D,E,F, And G
Standard E 720-MHST-04
INDOT Standard



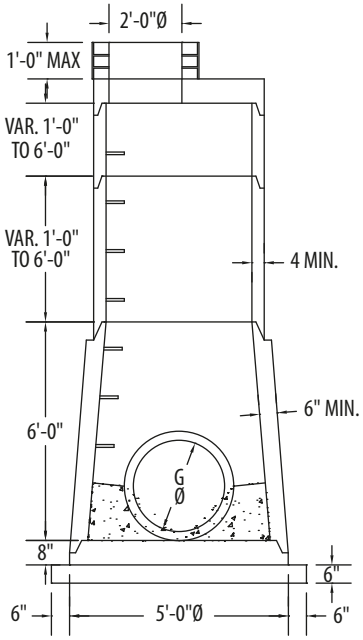
ELEVATION VIEW



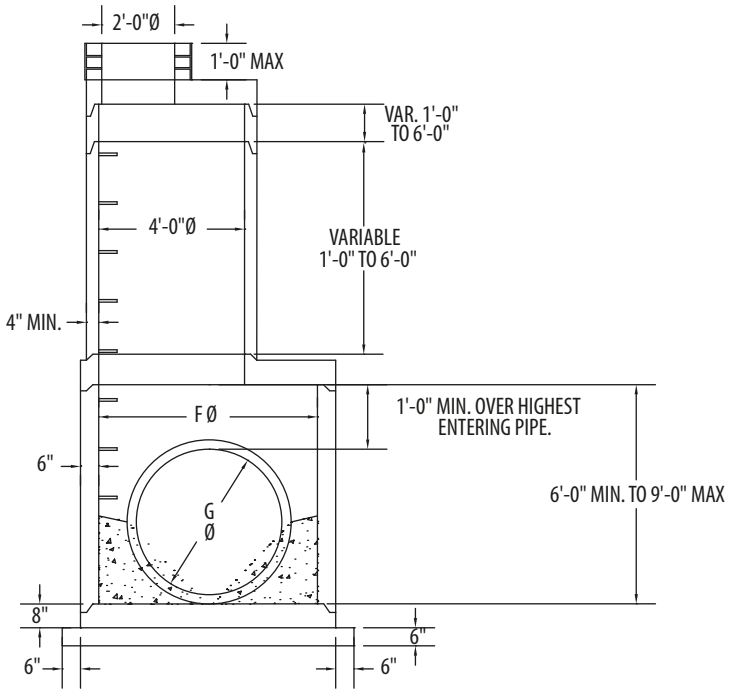
PLAN VIEW

MANHOLE DIMENSIONS		
TYPE	A-1 PIPE SIZE DIA. (IN.)	B&D
D	27 TO 42	4'-9"
E	48 TO 60	6'-6"
F	66 TO 84	8'-10"
G	90 TO 108	11'-2"

Manholes Type H,J,K,L, And N
Standard E 720-MHST-05
INDOT Standard



MANHOLE TYPE H



MANHOLE TYPE J,K,L, AND N

MANHOLE PIPE SIZES				
TYPE	G (in.)	F (ft.-in.)	Maximum Pipe Size Rt. Angle to Mainline (in.)	Maximum Pipe Size for Mainline (in.)
H	24 to 36	---	30	36
J	24 to 36	5′-0″	30	36
K	36 to 48	6′-0″	36	48
L	48 to 54	8′-0″	48	54
N	72 to 84	9′-0″	72	84