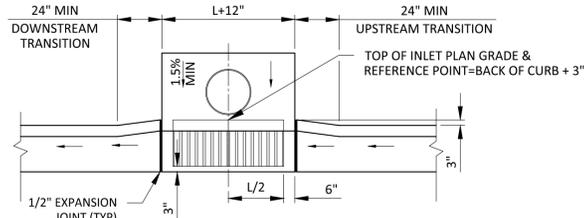
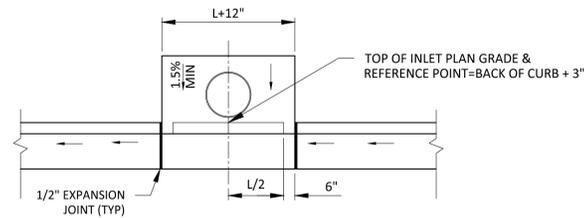


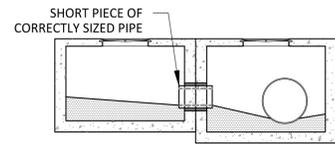
SETBACK INLET ON GRADE
TYPES A-5S, A-7.5S & A-10S



STANDARD INLET ON GRADE
TYPES A-5, A-7.5 & A-10



STANDARD INLET IN SUMP
TYPES A-5, A-7.5 & A-10



ADJACENT INLETS
NOT TO SCALE

1 A-SERIES CURB INLET PLACEMENT
SCALE: 1/4" = 1'-0"

NOTES:

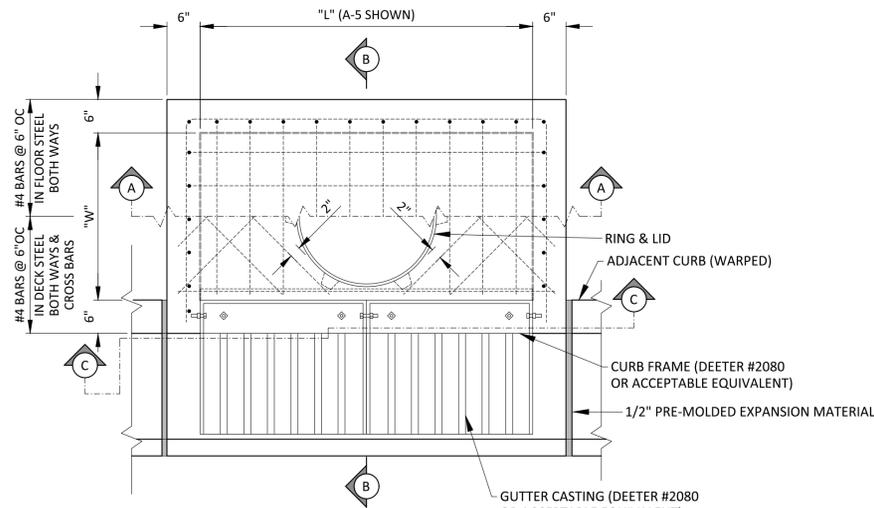
1. ALL INLET TOPS SHALL SLOPE LONGITUDINALLY AT SAME GRADE AS STREET. WHEN STREET GRADES ARE 2% OR LESS, BLOCKING IS ALLOWED WITH FLAT INLET TOPS.
2. ALL INLET TOPS SHALL SLOPE TOWARD STREET @ 1.5% PER FT. STANDARD. OTHER SLOPES MAY BE INDICATED TO ACCOMMODATE SITE CONDITIONS.
3. WHEN SETBACK INLETS ARE LOCATED IN SUMP, CURB TRANSITION LENGTH SHALL BE 5'-0" ON BOTH SIDES.
4. THE GUTTER CASTING IS NOT REQUIRED WHEN INSTALLED IN A SUMP CONDITION, UNLESS OTHERWISE INDICATED.
5. FOR STANDARD INLET ON GRADE, UPSTREAM AND DOWNSTREAM CURB TRANSITION MAY EXTEND TO THE NEAREST JOINT WITH ENGINEER APPROVAL PER FIELD CONDITIONS.

NOTES (A-SERIES INLETS)

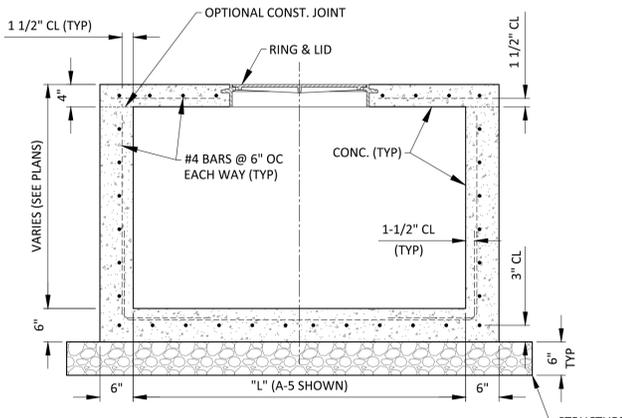
1. AT THE CONTRACTOR'S OPTION, INLET BOXES MAY BE CAST-IN-PLACE, PRECAST OR A COMBINATION THEREOF SUCH AS CAST-IN-PLACE BOX WITH PRECAST TOP SLAB.
2. AT THE CONTRACTOR'S OPTION, INLETS MAY HAVE A BASE THAT EXTENDS BEYOND THE LIMITS OF THE INLET.
3. WEEPHOLES SHALL ONLY BE INSTALLED IN SUMP INLETS. "WD" IS THE WEEPHOLE DISTANCE BELOW THE TOP OF CURB. "WD" SHALL BE 2'-0" EXCEPT WHEN OTHERWISE NOTED BY THE DESIGN ENGINEER.
4. ALL JOINTS BETWEEN PRECAST COMPONENTS SHALL HAVE 2 ROWS OF JOINT COMPOUND - IF JOINT IS TONGUE AND GROOVE, ONE ROW OF JOINT COMPOUND SHALL BE ON EACH HORIZONTAL MATING SURFACE.
5. REBAR CLEARANCES SHALL BE 3" WHEN CAST AGAINST AND PERMANENTLY IN CONTACT WITH THE GROUND AND 1-1/2" WHEN FORMS ARE UTILIZED AND PERMANENT CONCRETE IS EXPOSED TO WEATHER OR IN CONTACT WITH GROUND IN ACCORDANCE WITH ACI 318.
6. ADDITIONAL WEEPHOLES MAY BE SPECIFIED IN THE DRAWING FOR PARTICULAR LOCATIONS TO MEDIATE GROUNDWATER IN TRENCHES CHASING THE STORMWATER PIPE.
7. ROUGHED IN OPENINGS SHALL LEAVE EXPOSED REBAR IN PLACE AROUND THE PIPE TO REINFORCE THE GROUT. CONCRETE SHALL BE LEFT ROUGH TO PROVIDE BOND FOR GROUT.
8. REFERENCE THE CITY OF MANHATTAN STANDARD SPECIFICATIONS FOR ALL OTHER DETAILS OF CONSTRUCTION.

STANDARD SIZES			
TYPE	CASTING SECTIONS	"W" ≤ 24" Ø	"W" > 24" Ø OR SKEWED
A-5	2	2'-6" MIN.	3'-0" MIN. OR OD+6"
A-5S	2	2'-6" MIN.	3'-0" MIN. OR OD+6"
A-7.5	3	2'-6" MIN.	3'-0" MIN. OR OD+6"
A-7.5S	3	2'-6" MIN.	3'-0" MIN. OR OD+6"
A-10	4	2'-6" MIN.	3'-0" MIN. OR OD+6"
A-10S	4	2'-6" MIN.	3'-0" MIN. OR OD+6"

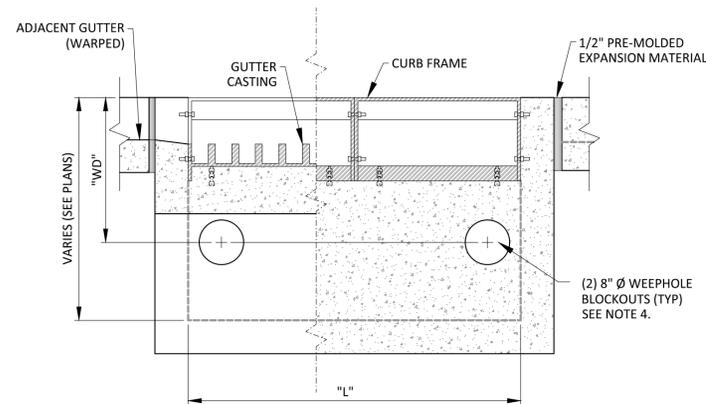
NOTE: SEE STORM SEWER PLANS OR SCHEDULE TO DETERMINE "H" AND OTHER REQUIREMENTS.



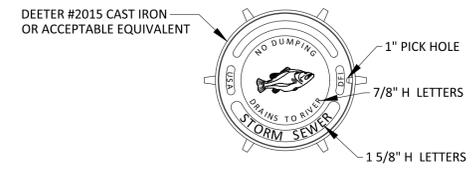
2 A-SERIES CURB INLET (PLAN)
SCALE: 3/4" = 1'-0"



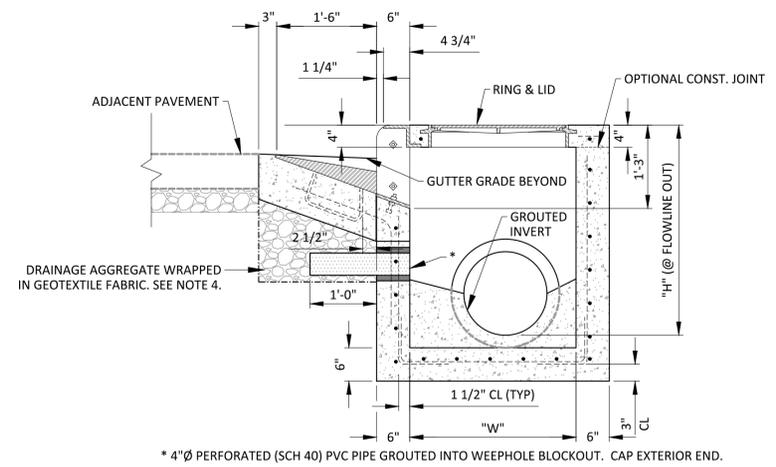
3 SECTION A
SCALE: 3/4" = 1'-0"



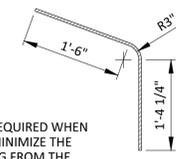
4 SECTION C
SCALE: 3/4" = 1'-0"



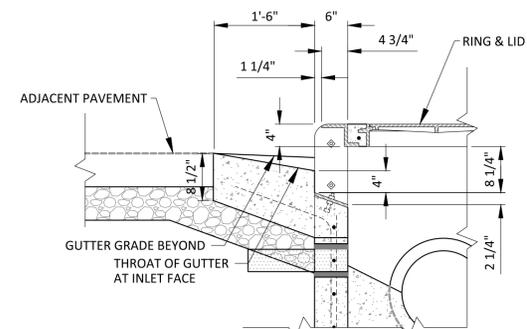
5 A-SERIES RING AND LID
SCALE: 3/4" = 1'-0"



6 SECTION B
SCALE: 3/4" = 1'-0"



7 TIE BAR BENDING DIAGRAM
SCALE: 3/4" = 1'-0"



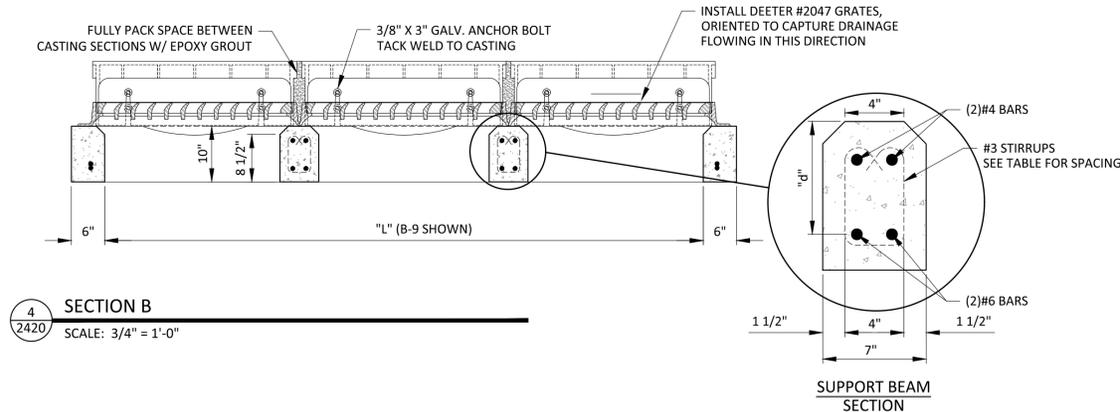
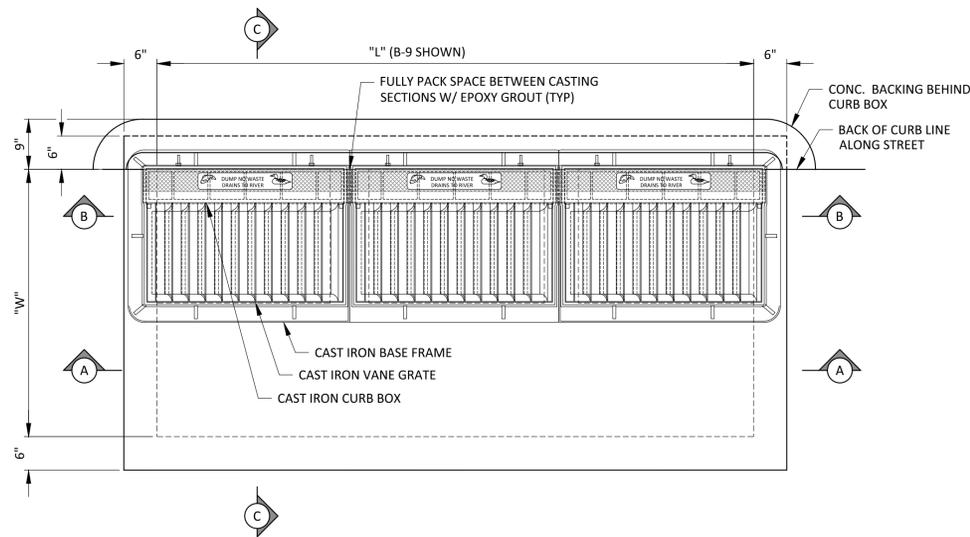
8 PARTIAL SECTION B (WITHOUT GUTTER CASTING)
SCALE: 3/4" = 1'-0"

NO.	DATE	DESCRIPTION	BY

X:\PUBLICWORKS\PROJECTS\2019\SW1907-STORMWATER MGMT DOC UPDATE\04-PLANS\03-DWG-SHEETS\MSD 2420 TYPE B INLET DETAILS.DWG

PLOT DATE: 8/1/2023 3:49 PM

LAST SAVED BY: BROOKE WEIR



NOTES (B-SERIES INLETS)

- AT THE CONTRACTOR'S OPTION, INLET BOXES MAY BE CAST-IN-PLACE, PRECAST OR A COMBINATION THEREOF SUCH AS CAST-IN-PLACE BOX WITH PRECAST TOP SLAB.
- AT THE CONTRACTOR'S OPTION, INLETS MAY HAVE A BASE THAT EXTENDS BEYOND THE LIMITS OF THE INLET.
- STRUCTURES WITH AN INSIDE WIDTH, "W", EXCEEDING 6'-6" SHALL BE CONSIDERED NON-STANDARD AND MUST BE DESIGNED BY A PROFESSIONAL ENGINEER LICENSED TO PRACTICE IN THE STATE OF KANSAS.
- STRUCTURES WITH A HEIGHT, "H" EXCEEDING 12'-0" SHALL BE CONSIDERED NON-STANDARD AND MUST BE DESIGNED BY A PROFESSIONAL ENGINEER LICENSED TO PRACTICE IN THE STATE OF KANSAS.
- WEEPHOLES SHALL ONLY BE INSTALLED IN SUMP INLETS. "WD" IS THE WEEPHOLE DISTANCE BELOW THE TOP OF CURB. "WD" SHALL BE 2'-6" EXCEPT WHERE OTHERWISE NOTED BY THE DESIGN ENGINEER.
- ADDITIONAL WEEPHOLES MAY BE SPECIFIED IN THE DRAWINGS FOR PARTICULAR LOCATIONS TO MEDIATE GROUNDWATER IN TRENCHES CHASING THE STORMWATER PIPE.
- ALL JOINTS BETWEEN PRECAST COMPONENTS SHALL HAVE 2 ROWS OF MASTIC - IF TONGUE AND GROOVE, ONE ROW OF MASTIC SHALL BE ON EACH HORIZONTAL MATING SURFACE. REBAR CLEARANCES SHALL BE 3" WHEN CAST AGAINST AND PERMANENTLY IN CONTACT WITH THE GROUND AND 1-1/2" WHEN FORMS ARE UTILIZED AND PERMANENT CONCRETE IS EXPOSED TO WEATHER OR IN CONTACT WITH GROUND IN ACCORDANCE WITH ACI 318.
- ROUGHED IN OPENINGS SHALL LEAVE EXPOSED REBAR IN PLACE AROUND THE PIPE TO REINFORCE THE GROUT. CONCRETE SHALL BE LEFT ROUGH TO PROVIDE BOND FOR GROUT.
- REFERENCE THE CITY OF MANHATTAN STANDARD SPECIFICATIONS FOR ALL OTHER DETAILS OF CONSTRUCTION.

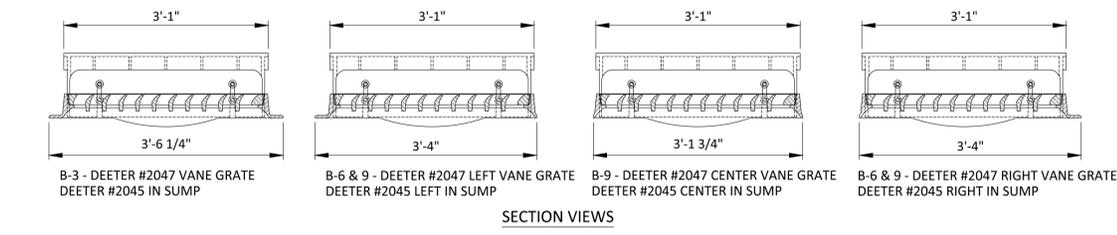
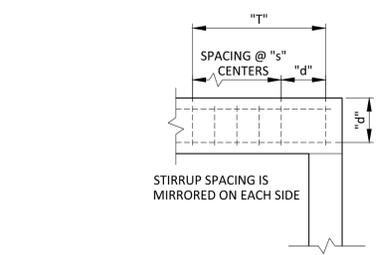
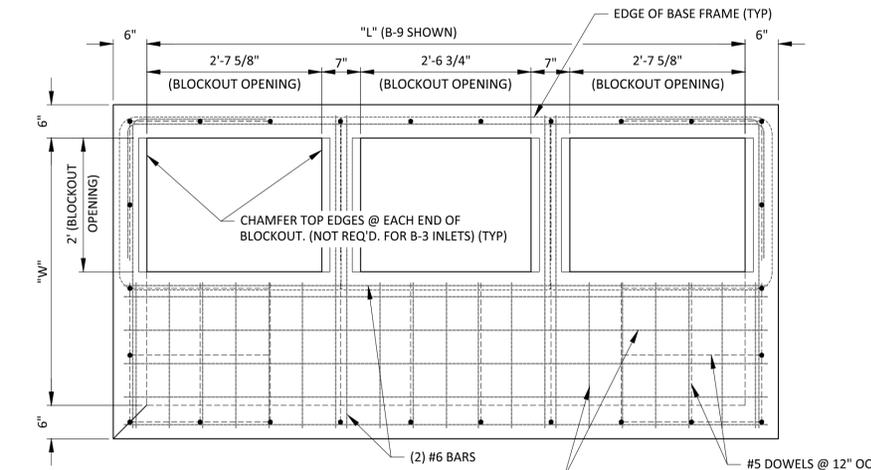
TYPE	STANDARD SIZES		
	"W" < 24"Ø	"W" >= 24"Ø OR SKEWED	"L"
B-3 B-3S	2'-6" MIN.	3'-0" MIN. OR OD+6"	3'-0"
B-6 B-6S	2'-6" MIN.	3'-0" MIN. OR OD+6"	6'-0"
B-9 B-9S	2'-6" MIN.	3'-0" MIN. OR OD+6"	9'-0"

1 B-SERIES CURB INLET (PLAN)

SCALE: 3/4" = 1'-0"

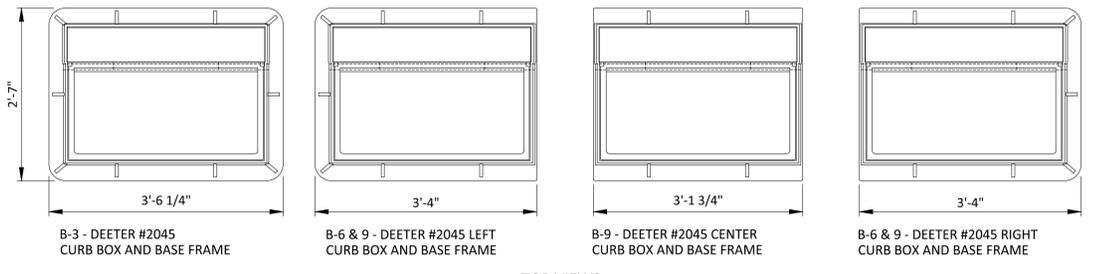
4 SECTION B

SCALE: 3/4" = 1'-0"



L(SPAN)	"d"	"s"	"T"	NUMBER OF STIRRUPS AND SPANNING
3.5'	7.75"	3.0"	12"	PLACE #3 SHEAR STIRRUPS AT A DISTANCE "d" FROM BEARING, THEN PLACE STIRRUPS AT "s" CENTERS UNTIL A TOTAL DISTANCE "T" IS MET
4.0'	7.75"	3.5"	17.5"	PLACE #3 SHEAR STIRRUPS AT A DISTANCE "d" FROM BEARING, THEN PLACE STIRRUPS AT "s" CENTERS UNTIL A TOTAL DISTANCE "T" IS MET
7.0'	7.75"	1.75"	33.25"	PLACE #3 SHEAR STIRRUPS AT A DISTANCE "d" FROM BEARING, THEN PLACE STIRRUPS AT "s" CENTERS UNTIL A TOTAL DISTANCE "T" IS MET

"d" = SEE DIMENSIONS ON DRAWING
 "s" = SPACING FOR STIRRUPS
 "T" = TOTAL DISTANCE FOR SPACING



2 B-SERIES CURB INLET TOP (PLAN)

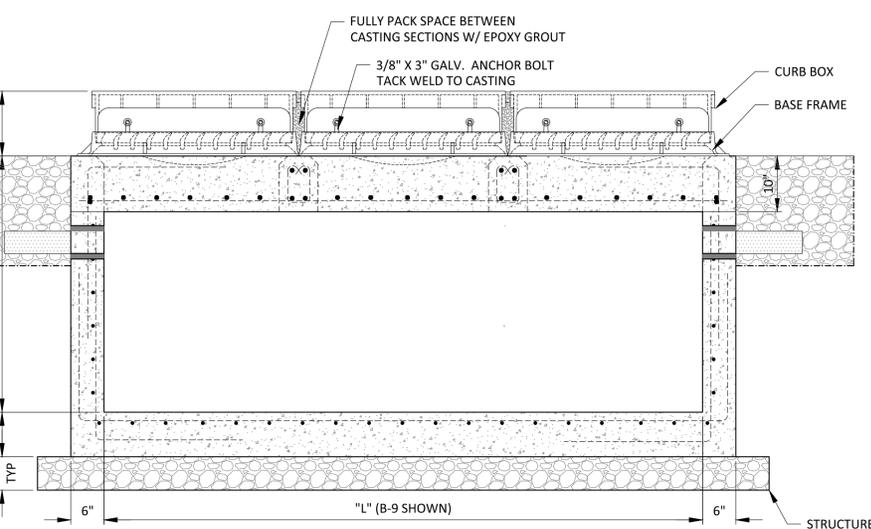
SCALE: 3/4" = 1'-0"

5 SUPPORT BEAM ELEVATION

SCALE: 3/4" = 1'-0"

7 CASTINGS CONFIGURATIONS

SCALE: 3/4" = 1'-0"



6 SECTION C

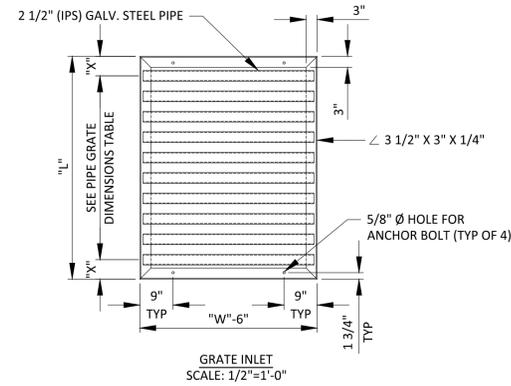
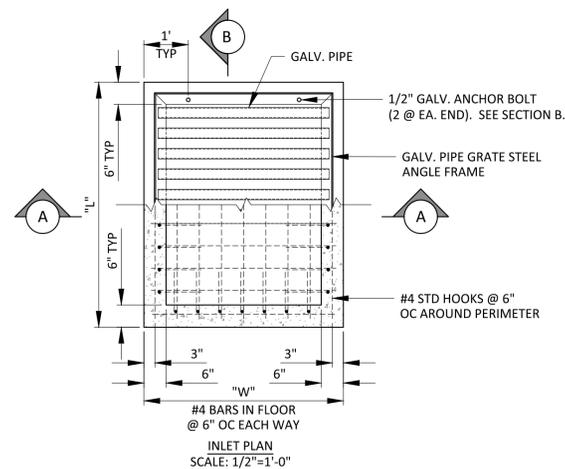
SCALE: 3/4" = 1'-0"

REV.	DATE	DESCRIPTION	BY

PUBLIC WORKS
 CITY OF MANHATTAN
 1101 POYNTZ AVENUE • MANHATTAN, KANSAS 66502 • PHONE (785) 387-2415

PROJECT NUMBER
 PROJECT NAME
MSD 2420 B-SERIES INLET DETAILS

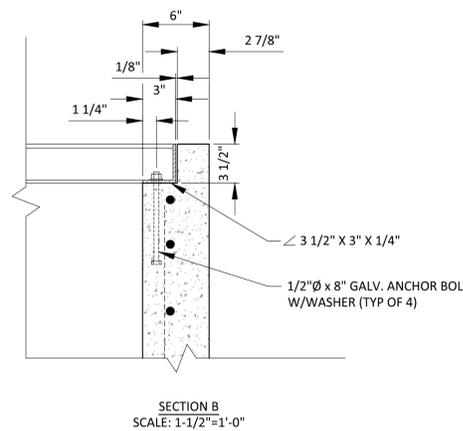
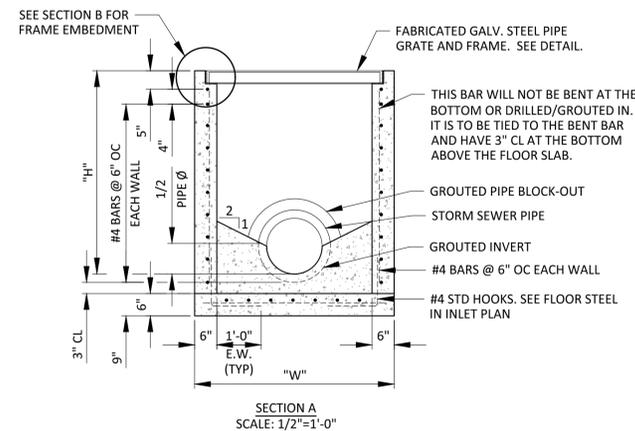
CITY ENGINEER: XXXXXX, P.E.
 DESIGN ENGINEER: XXXXXX, P.E.
 DRAWN BY: XXX
 DATE: XX/XX/20XX
 SHEET NUMBER: # OF #



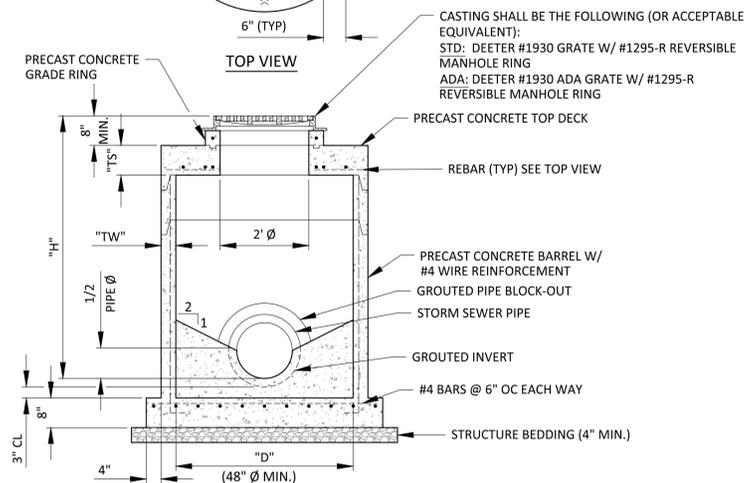
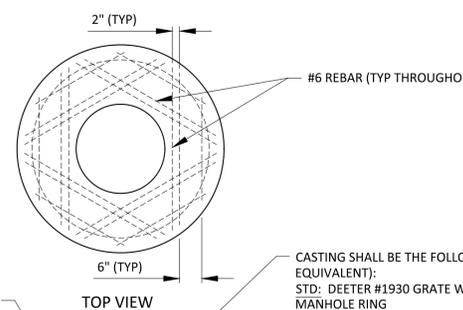
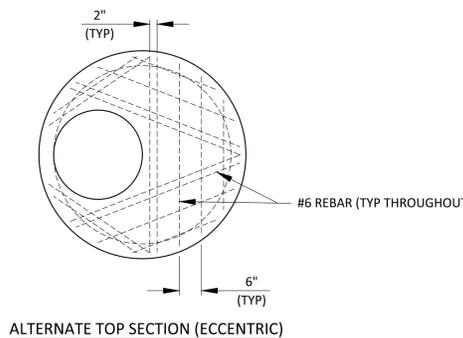
NOTES (AREA INLETS)

- PIPE USED IN GRATE FABRICATION SHALL MEET ASTM A53, GRADE B, SCH. 40 STEEL PIPE, 5.793 LBS./L.F.
- PIPE GRATE FABRICATION SHALL UTILIZE WELDS CONFORMING TO AWS D1.1.
- PIPE GRATE SHALL BE HOT-DIPPED GALVANIZED IN ACCORDANCE WITH ASTM A123; 2.0 OZ./S.F. MIN. (COATING GRADE OF 85), GRADE 85 IS 2.0 OZ./SF PER ASTM A123. GRADE 100 IS 2.3 OZ./SF.

PIPE GRATE DIMENSIONS			
BOX (OUTSIDE) L x W	NO. OF PIPES	PIPE DIA. x LENGTH X SPACING	"X"
7'-6" x 4'-6"	13	2 1/2" x 3'-10 1/4" @ 6" OC	6"
5'-6" x 4'-6"	10	2 1/2" x 3'-10 1/4" @ 5 1/2" OC	5 1/4"
4'-6" x 4'-6"	8	2 1/2" x 3'-10 1/4" @ 5 1/2" OC	4 3/4"
4'-0" x 4'-0"	7	2 1/2" x 3'-4 1/4" @ 5 1/2" OC	4 1/2"



1 AREA INLET (TYPE 1)



2 AREA INLET (TYPE 2) 'FLAT TOP'

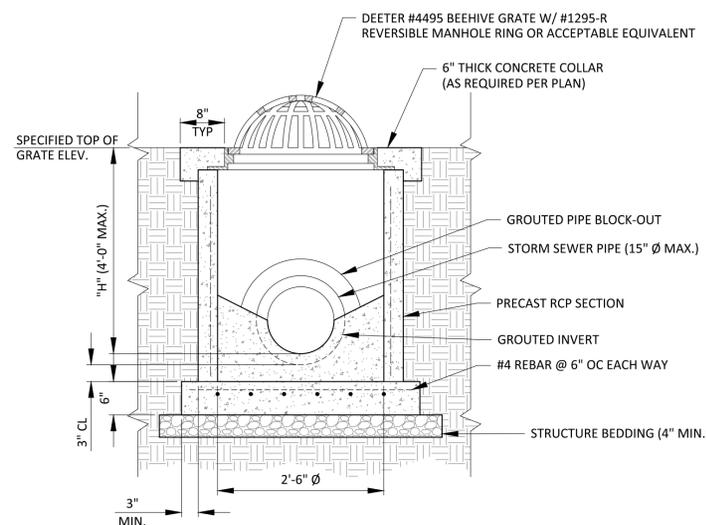
NOTE: 12" MIN. CLEARANCE FROM TOP DECK TO TOP OF RIM IS REQUIRED WHEN INSTALLED UNDER TURF.

MANHOLE DIMENSIONS & MAX. STORM SEWER SIZE				
"D"	"TW"	"TS"	MAX RCP	MAX RCPHE
48"	5"	8"	24"	PS
60"	6"	8"	30"	19"X30"
72"	7"	8"	48"	32"X49"
84"	8"	10"	54"	34"X53"
96"	9"	10"	60"	43"X68"

MAXIMUM PIPE CONNECTIONS

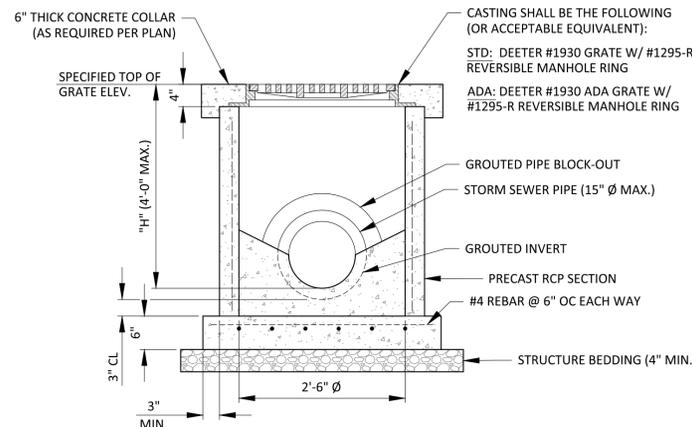
INLET USE SUMMARY TABLE				
BID ITEM	TRAVEL WAY	MEDIANS	BACK OF CURB	PEDESTRIAN-RATED
AREA INLET (TYPE 1)		X	X	
AREA INLET (TYPE 2)(STD)	X	X	X	
AREA INLET (TYPE 2)(ADA)	X	X	X	X
AREA INLET (TYPE 3)(STD)	X	X	X	
AREA INLET (TYPE 3)(ADA)	X	X	X	X
AREA INLET (TYPE 4)			X	

- NOTES:
- TYPE 4 INLETS SHALL NOT BE USED IN AREAS OF VEHICULAR OR PEDESTRIAN TRAFFIC.
 - CAPACITY TABLES FOR AREA INLET GRATES ARE INCLUDED IN THE CITY OF MANHATTAN STORMWATER MANAGEMENT CRITERIA.
 - REBAR CLEARANCES SHALL BE 3" WHEN CAST AGAINST AND PERMANENTLY IN CONTACT WITH THE GROUND AND 1-1/2" WHEN FORMS ARE UTILIZED AND PERMANENT CONCRETE IS EXPOSED TO WEATHER OR IN CONTACT WITH GROUND IN ACCORDANCE WITH ACI 318.
 - ROUGHED IN OPENINGS SHALL LEAVE EXPOSED REBAR IN PLACE AROUND THE PIPE TO REINFORCE THE GROUT. CONCRETE SHALL BE LEFT ROUGH TO PROVIDE BOND FOR GROUT.
 - REFERENCE THE CITY OF MANHATTAN STANDARD SPECIFICATIONS FOR ALL OTHER DETAILS OF CONSTRUCTION.



4 AREA INLET (TYPE 4) 'BEEHIVE'

- NOTES:
- IF "H" EXCEEDS 4-FT, USE TYPE 2 AREA INLET UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER.
 - GRATE/RING SHALL BE CENTERED TO MAINTAIN 1-7/8" BEARING OF AROUND PERIMETER.



3 AREA INLET (TYPE 3)

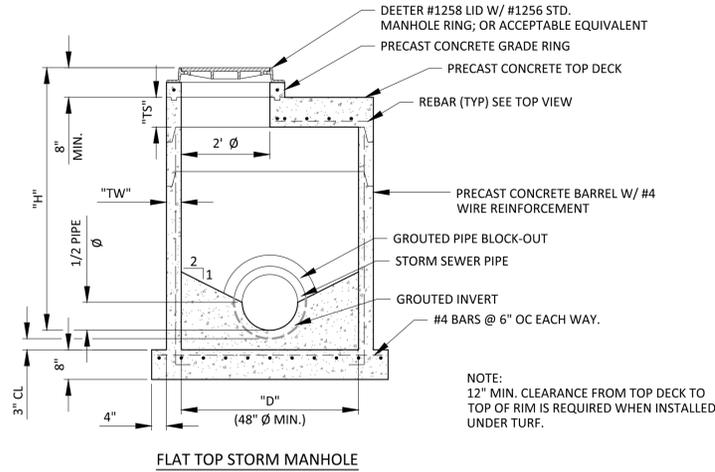
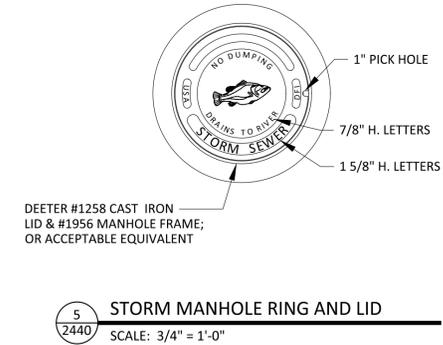
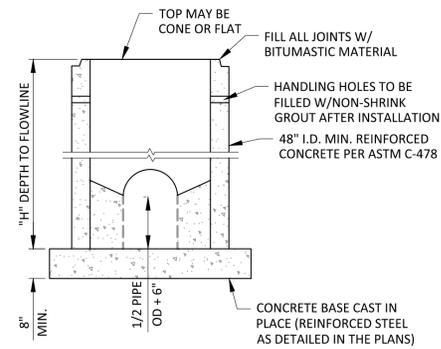
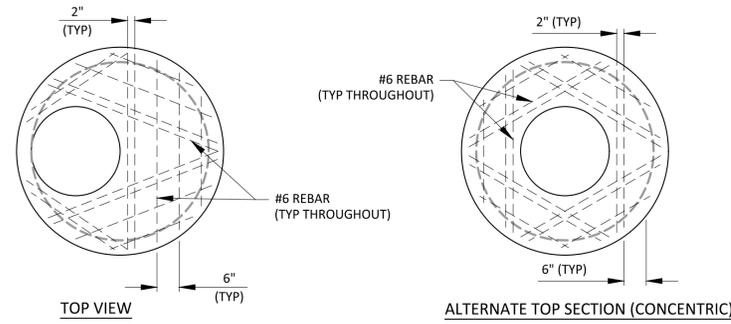
- NOTES:
- IF "H" EXCEEDS 4-FT, USE TYPE 2 AREA INLET UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER.
 - GRATE/RING SHALL BE CENTERED TO MAINTAIN 1-7/8" BEARING OF AROUND PERIMETER.

REV.	DATE	DESCRIPTION	BY

PUBLIC WORKS
CITY OF MANHATTAN
1101 POYNTZ AVENUE • MANHATTAN, KANSAS 66502 • PHONE (785) 587-2415

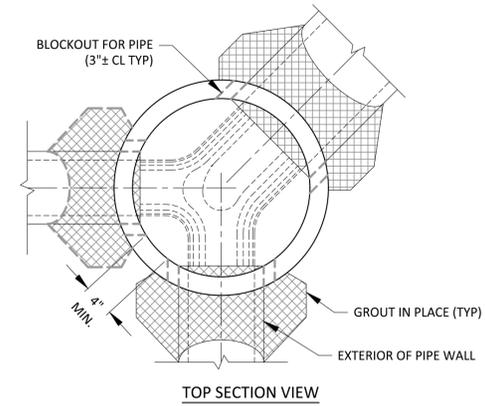
PROJECT NUMBER
PROJECT NAME
MSD 2430 AREA INLET DETAILS

CITY ENGINEER: XXXXXX, P.E.
DESIGN ENGINEER: XXXXXX, P.E.
DRAWN BY: XXX
DATE: XX/XX/20XX
SHEET NUMBER: # OF #



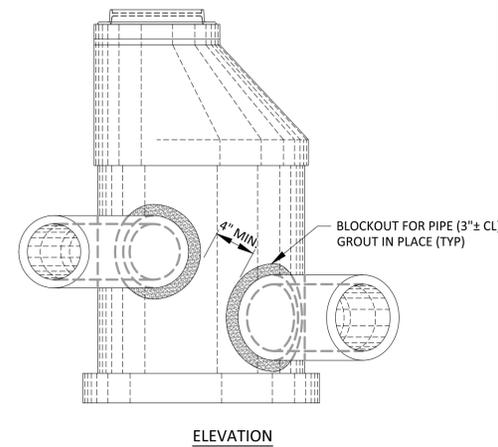
3
2440 **STORM MANHOLE (DOGHOUSE)**
SCALE: 1/2" = 1'-0"

1
2440 **STORM MANHOLE (SHALLOW)**
SCALE: 1/2" = 1'-0"



MAXIMUM DIMENSIONS & MAX. STORM SEWER SIZE				
"D"	"TW"	"TS"	MAX RCP	MAX RCPHE
48"	5"	8"	24"	14"x23"
60"	6"	8"	30"	19"x30"
72"	7"	8"	48"	32"x49"
84"	8"	10"	54"	34"x53"
96"	9"	10"	60"	43"x68"

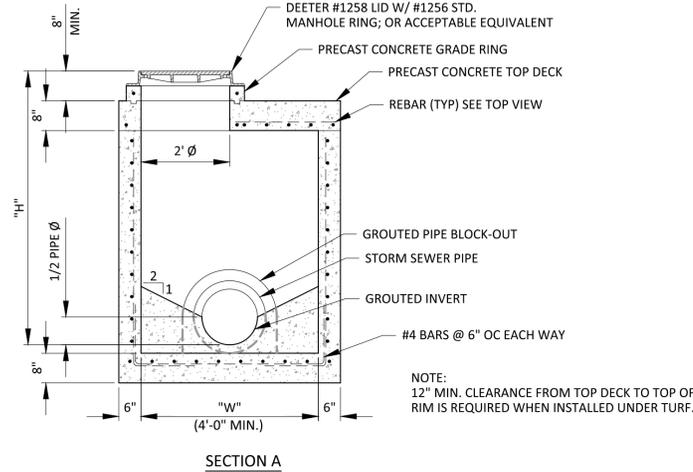
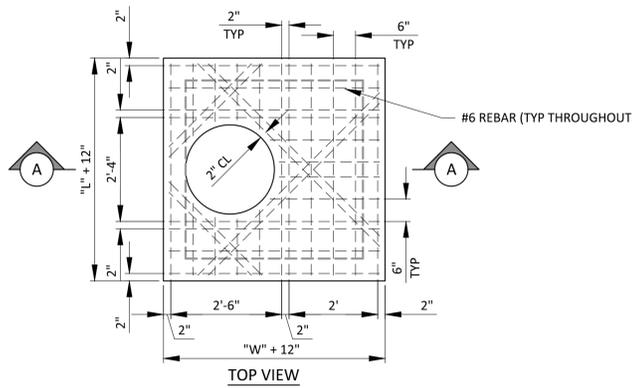
MAXIMUM PIPE CONNECTIONS



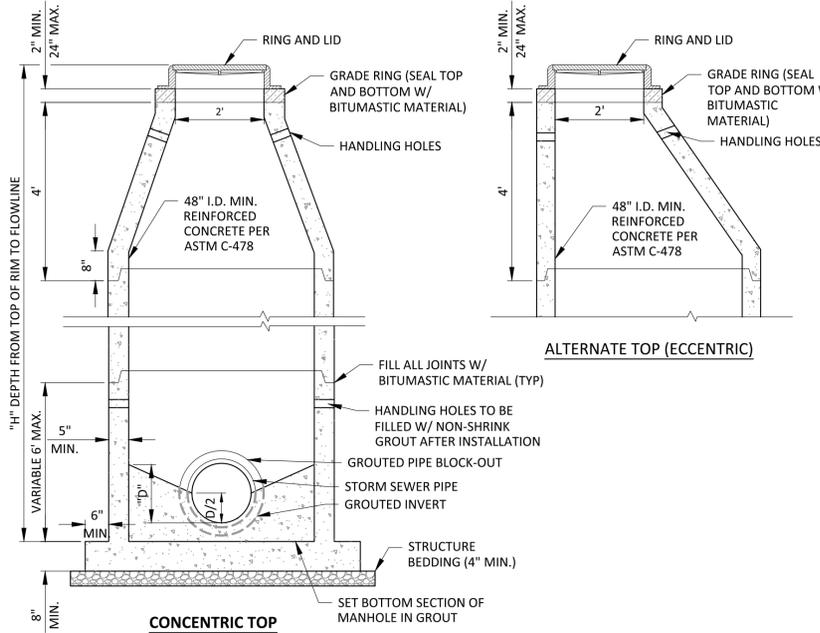
6
2440 **STORM MANHOLE - PIPE CONNECTIONS**
NO SCALE

NOTES (STORM MANHOLES AND JUNCTION BOXES)

1. PRECAST MANHOLE AND JUNCTION BOXES SHALL BE USED UNLESS OTHERWISE SPECIFIED IN THE PLANS OR FIELD CHANGES HAVE BEEN APPROVED BY THE ENGINEER.
2. REBAR CLEARANCES SHALL BE 3" WHEN CAST AGAINST AND PERMANENTLY IN CONTACT WITH THE GROUND AND 1-1/2" WHEN FORMS ARE UTILIZED AND PERMANENT CONCRETE IS EXPOSED TO WEATHER OR IN CONTACT WITH GROUND IN ACCORDANCE WITH ACI 318.
3. ROUGHED IN OPENINGS SHALL LEAVE EXPOSED REBAR IN PLACE AROUND TO REINFORCE THE GROUT. CONCRETE SHALL BE LEFT ROUGH TO PROVIDE BOND FOR GROUT.
4. ALL JOINTS BETWEEN PRECAST COMPONENTS SHALL HAVE 2 ROWS OF JOINT COMPOUND. IF JOINT IS TONGUE AND GROOVE, ONE ROW OF JOINT COMPOUND SHALL BE ON EACH HORIZONTAL MATING SURFACE.
5. REFERENCE THE CITY OF MANHATTAN STANDARD SPECIFICATIONS FOR ALL OTHER DETAILS OF CONSTRUCTION.

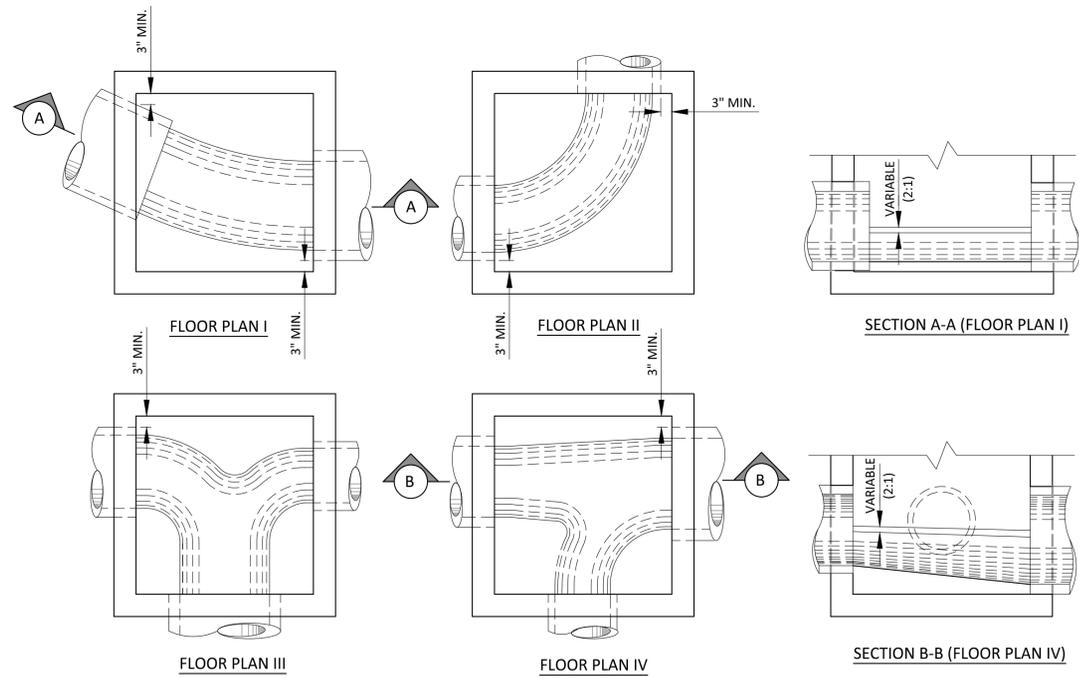


4
2440 **JUNCTION BOX**
SCALE: 1/2" = 1'-0"



2
2440 **MANHOLE (STD) W/CONCENTRIC TOP**
SCALE: 1/2" = 1'-0"

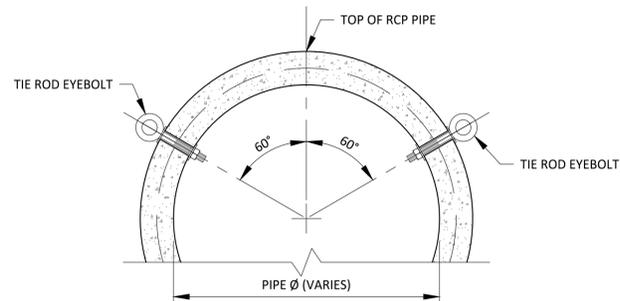
REV.	DATE	DESCRIPTION	BY



1
2450
INVERT SHAPING DETAILS
NOT TO SCALE

INVERT NOTES

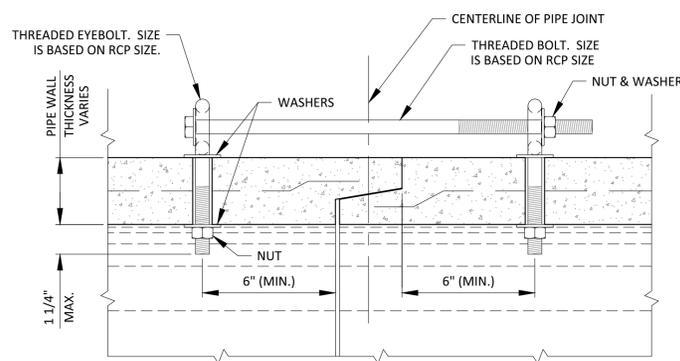
1. SHALL BE 1/2 PIPE DIAMETER IN DEPTH
2. CROSS SECTIONAL RADIUS SHALL MATCH PIPE RADIUS
3. SHALL BE MECHANICALLY CONSOLIDATED CONCRETE PER THE SPECIFICATIONS
4. ENTIRE INVERT SHALL BE PLACED IN ONE PLACEMENT
5. SHALL HAVE A SMOOTH TROWELED FINISH
6. DEFLECTIONS WILL HAVE THE LARGEST RADIUS THAT IS PRACTICAL
7. TEE AND WYE CONFIGURATIONS WILL HAVE SMOOTH TRANSITIONS THAT DIRECT FLOW TO THE OUTLET PIPE
8. BENCH OUTSIDE OF MAIN FLOW CHANNEL SHALL HAVE A MINIMUM SLOPE FROM THE WALL TO THE CHANNEL OF 2.1%



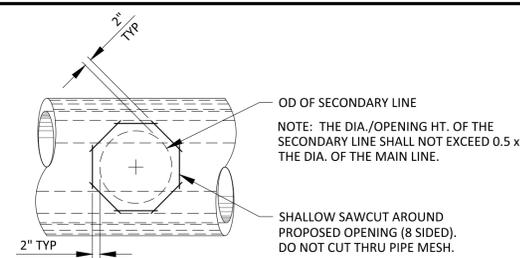
NOTES

1. RCP JOINT TIE ROD CONNECTIONS ARE REQUIRED IN THE FIRST THREE PIPE JOINTS AT THE DISCHARGE END WHEN A FLARED END SECTION IS USED ON A STORM SEWER WITH A SLOPE IN EXCESS OF 7%. SAID CONNECTIONS SHALL BE REQUIRED ON ALL JOINTS IN THE PIPE RUN WHEN THE PIPE SLOPE EXCEEDS 10%.
2. CONNECTORS, INCLUDING BOLTS, NUTS AND WASHERS, SHALL HAVE A GALVANIZED FINISH COMPLYING WITH ASTM A-153 OR ASTM F-2329. BOLTS SHALL COMPLY TO ASTM A-307, GRADE A. NUTS SHALL CONFORM TO ASTM A-563. WASHERS SHALL CONFORM TO ASTM F-844.
3. DO NOT USE PIPE TIES TO PULL THE PIPE SECTIONS TOGETHER OR TO TIGHTEN THE PIPE JOINTS.
4. TIE RODS FOR HERCP SHALL BE SIZED FOR THE RCP EQUIVALENT.

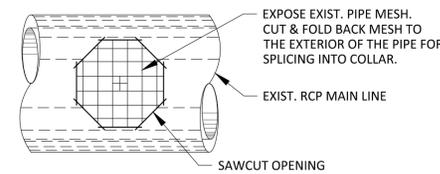
RCP JOINT TIE RODS		
RCP SIZE	CONNECTOR SIZE	DRILL HOLE SIZE
30" OR SMALLER	5/8" DIA.	7/8" DIA.
30"-60"	3/4" DIA.	1" DIA.
60" OR LARGER	1" DIA.	1-1/4" DIA.



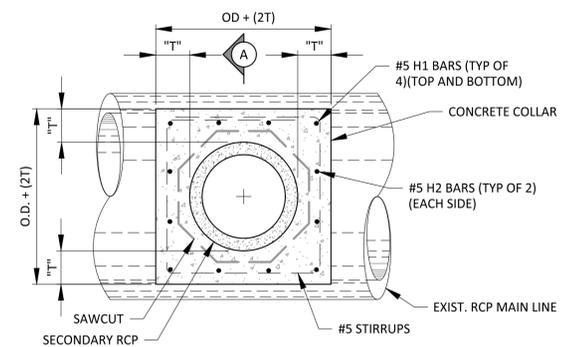
2
2450
RCP JOINT - TIE ROD CONNECTOR DETAIL



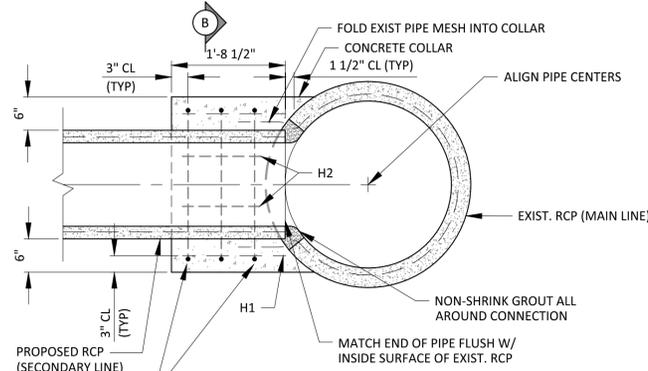
SAWCUT
SCALE: 1/2" = 1'-0"



OPENING
SCALE: 1/2" = 1'-0"



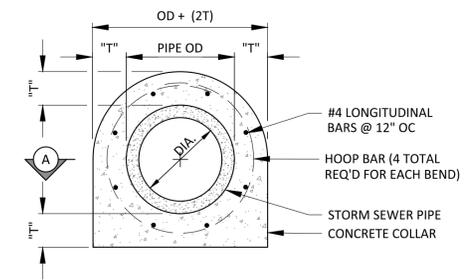
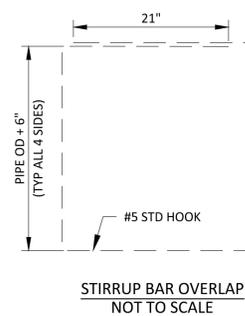
SECTION B
SCALE: 3/4" = 1'-0"



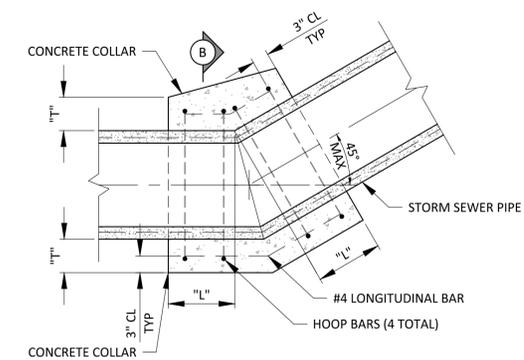
SECTION A
SCALE: 3/4" = 1'-0"

PIPE TEE COLLAR INFORMATION			
SECONDARY PIPE DIA.	"T" (MIN)	H1 BAR QUANT.	H2 BAR QUANT.
15"	6"	8	4
18"	6"	10	6
24"	6"	12	8
30"	7"	14	10
36"	9"	16	12

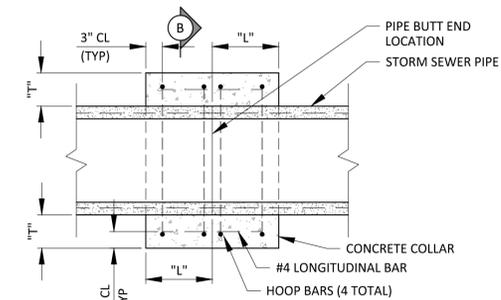
3
2450
PIPE TEE COLLAR DETAILS



PIPE BEND - SECTION B
SCALE: 3/4" = 1'-0"

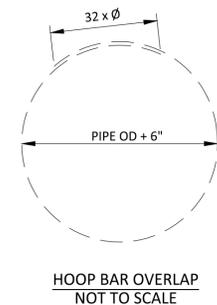


PIPE BEND - SECTION A
SCALE: 3/4" = 1'-0"



PIPE BEND - SECTION A
SCALE: 3/4" = 1'-0"

PIPE BUTT END & BEND CONNECTION COLLAR INFORMATION			
PIPE DIA.	"L" (MIN)	"T" (MIN)	HOOP BAR SIZE
15"	12"	6"	#4
18"	12"	6"	#4
24"	12"	6"	#4
30"	18"	7"	#4
36"	18"	9"	#5
42"	18"	9"	#5
48"	18"	10"	#5
54"	24"	10"	#5
60"	24"	12"	#5



4
2450
CONCRETE COLLAR DETAILS

REV.	DATE	DESCRIPTION	BY

PUBLIC WORKS
CITY OF MANHATTAN
1101 POINTZ AVENUE • MANHATTAN, KANSAS 66502 • PHONE (785) 387-2415

PROJECT NUMBER
PROJECT NAME
MSD 2450 MISC. STORM SEWER DETAILS

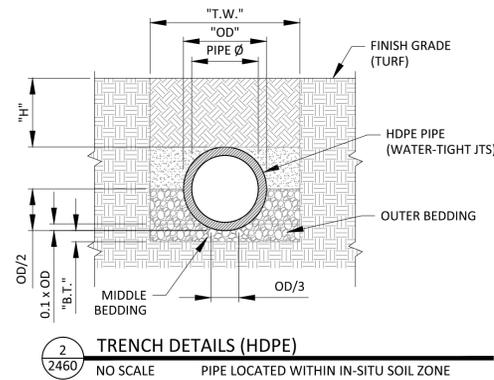
CITY ENGINEER: XXXXXX, P.E.
DESIGN ENGINEER: XXXXXX, P.E.
DRAWN BY: XXX
DATE: XX/XX/20XX
SHEET NUMBER: # OF #

TRENCH GENERAL NOTES:

- DETAILS REFLECT TRENCH CONSTRUCTION USING A TRENCH BOX OR SUITABLE TRENCH SHIELDING SYSTEM AND TRENCHES LESS THAN 5-FT DEEP WITH STABLE SIDES. THE CONTRACTOR SHALL FOLLOW ALL APPLICABLE GUIDELINES ESTABLISHED BY OSHA #29 CFR 1926 - "CONSTRUCTION INDUSTRY REGULATIONS AND STANDARDS," PARTICULARLY APPENDICES "A" THRU "F".
- HDPE PIPE IS ONLY PERMITTED WHEN APPROVED BY THE CITY ENGINEER AND WILL ONLY BE CONSIDERED FOR SMALL SIDE OR BACKYARD DRAINAGE WITHIN PUBLIC DRAINAGE EASEMENTS.
- PIPE/BOX CULVERT BEDDING SHALL BE PLACED ON STABLE SUBGRADE. IMMEDIATELY NOTIFY THE CITY ENGINEER FOR INSTRUCTIONS IF SUBGRADE IS IN AN UNSTABLE CONDITION.
- CONCRETE PIPE/BOX CULVERT GRANULAR BEDDING MATERIAL SHALL MEET THE REQUIREMENTS OF KDOT 58-2 AGGREGATE. INITIAL BACKFILL MATERIAL FOR CONCRETE PIPE/BOX CULVERT SHALL MEET THE REQUIREMENTS OF USCS (ASTM D2487) SOIL CLASSIFICATION CATEGORY I OR CATEGORY II. SEE CITY SPECIFICATION SECTION 2105 FOR ADDITIONAL INFO REGARDING ACCEPTABLE GRADATIONS. PLACE BACKFILL IN CONTROLLED, COMPACTED LIFTS IN ACCORDANCE WITH CITY SPECIFICATIONS.
- HDPE PIPE GRANULAR BEDDING MATERIAL SHALL MEET THE REQUIREMENTS OF KDOT PB-2 AGGREGATE. HAUNCH BACKFILL AND INITIAL BACKFILL SHALL MEET THE REQUIREMENTS OF USCS (ASTM D2487) SOIL CLASSIFICATION CATEGORY I OR CATEGORY II, BUT SHALL HAVE 100% PASSING THE 1 1/2" SIEVE. SEE CITY SPECIFICATION SECTION 2105 FOR ADDITIONAL INFO REGARDING ACCEPTABLE MATERIALS. PLACE IN CONTROLLED, COMPACTED LIFTS IN ACCORDANCE WITH CITY SPECIFICATIONS AND PIPE/BOX CULVERT MANUFACTURER'S WRITTEN RECOMMENDATIONS.

HATCH LEGEND

- FINAL BACKFILL
- EMBANKMENT
- UNDISTURBED EARTH
- HAUNCH BACKFILL
- INITIAL BACKFILL
- CONCRETE

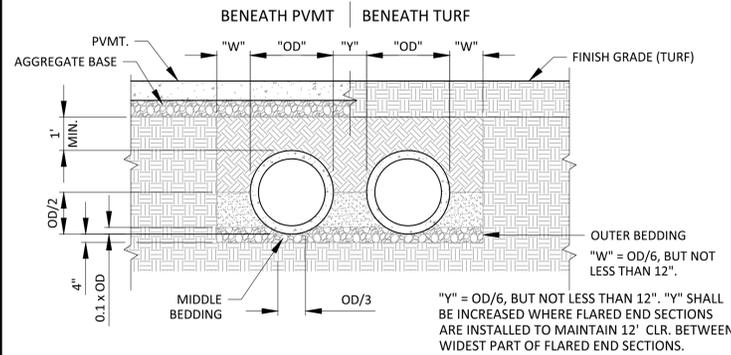


2
2460
TRENCH DETAILS (HDPE)
NO SCALE PIPE LOCATED WITHIN IN-SITU SOIL ZONE

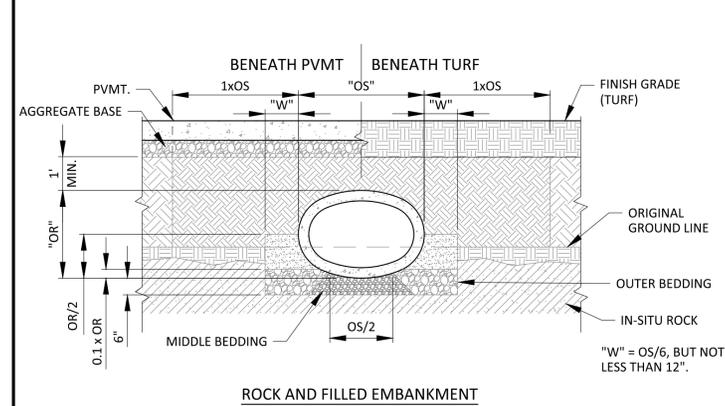
HDPE TRENCH REQUIREMENTS:

- "H" = 12" MIN. BUT SHALL BE SUFFICIENT TO RESIST PIPE FLOTATION. FLOTATION ANALYSIS IS REQD. TO CONFIRM.
- "B.T." IS MIN. BEDDING THICKNESS BENEATH PIPE. "B.T." = 4" FOR PIPE DIAMETERS UP TO 24" AND 6" FOR PIPES WITH DIAMETERS OF 30" THRU 60" INCLUSIVELY.
- "T.W." IS MIN. TRENCH WIDTH WITH PIPE POSITIONED IN THE CENTER. SEE "T.W." IN TABLE.

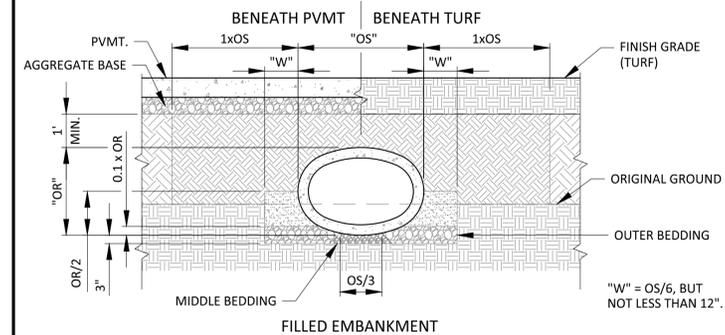
PIPE DIA.	"T.W."
15"	34"
18"	39"
24"	48"
30"	56"
36"	64"
42"	72"
48"	80"
60"	96"



3
2460
TRENCH DETAILS (PARALLEL RCP)
NO SCALE PIPE LOCATED WITHIN IN-SITU SOIL ZONE

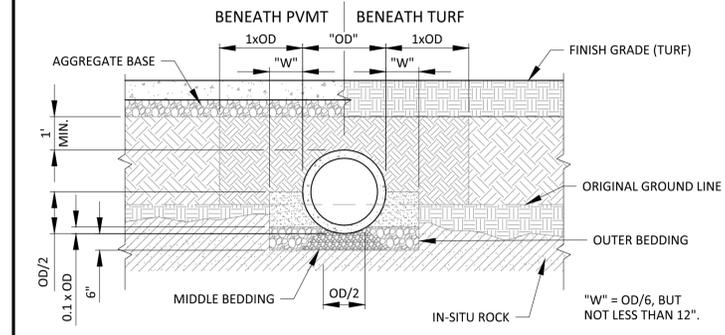


ROCK AND FILLED EMBANKMENT

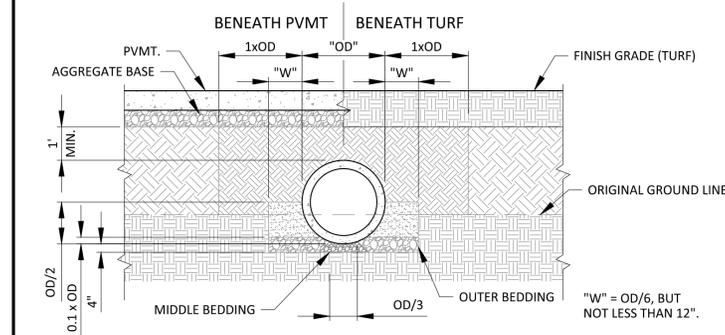


FILLED EMBANKMENT

4
2460
TRENCH DETAILS (RCP)
NO SCALE

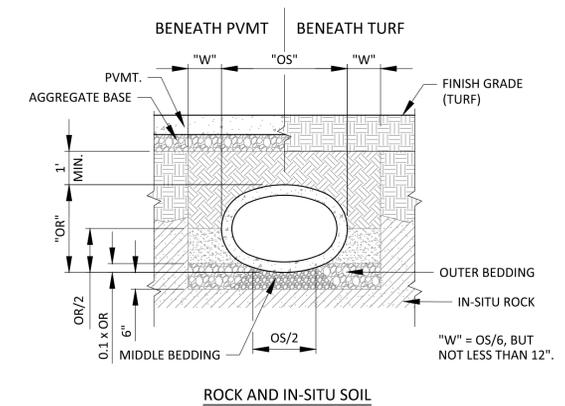


ROCK AND FILLED EMBANKMENT

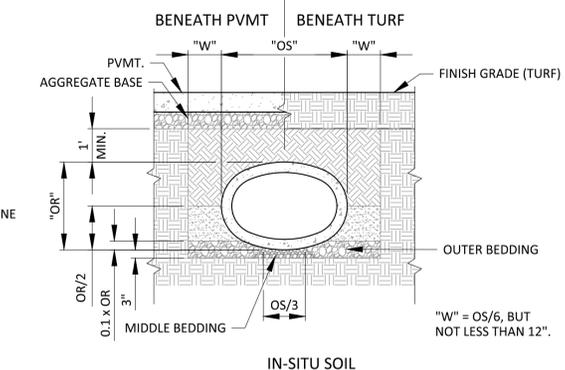


FILLED EMBANKMENT

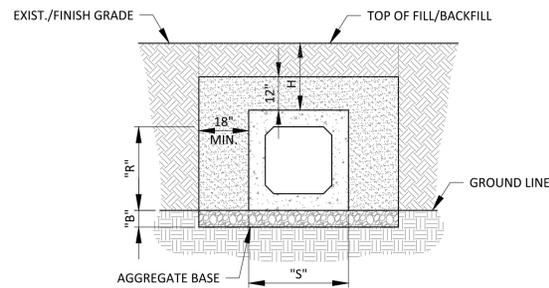
5
2460
TRENCH DETAILS (RCP)
NO SCALE



ROCK AND IN-SITU SOIL



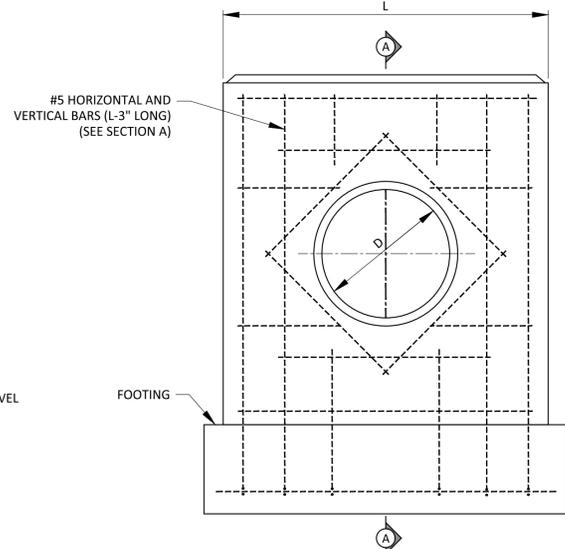
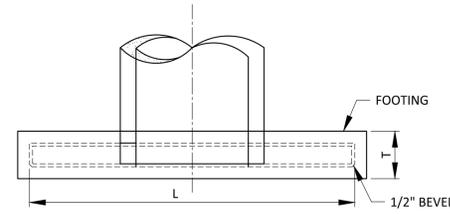
IN-SITU SOIL



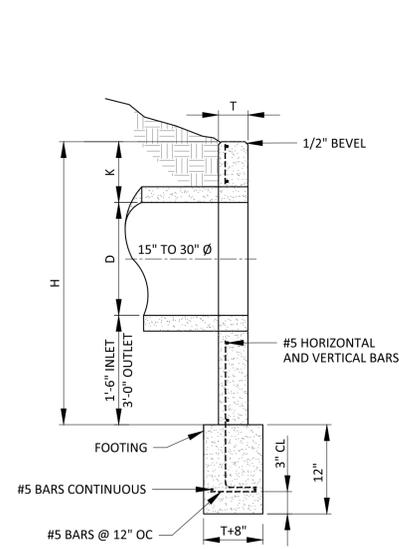
H = HEIGHT OF COVER MEASURED FROM TOP OF CULVERT TO FINISHED GRADE.
 FOR NORMAL EARTH FOUNDATION:
 B = 6"
 FOR ROCK FOUNDATION:
 B = 1/4" PER 12" OF H (8" MINIMUM TO 24" MAXIMUM)
 FOR SOFT, YIELDING OR OTHERWISE UNSUITABLE FOUNDATION:
 B = DEPTH AS SHOWN ON PLANS OR TO FIRM BEARING SOIL

1
2460
SMALL PRECAST BOX CULVERT
NO SCALE

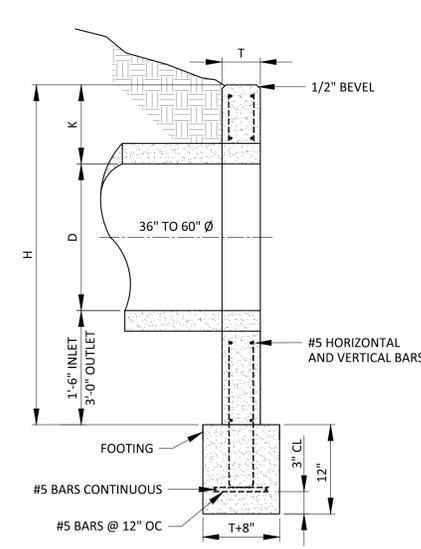
REV.	DATE	DESCRIPTION	BY



1
2510 TYPE A HEADWALL
NOT TO SCALE



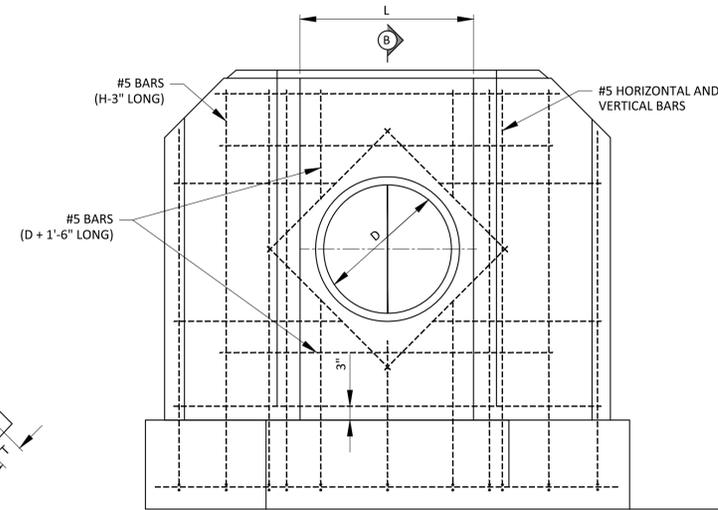
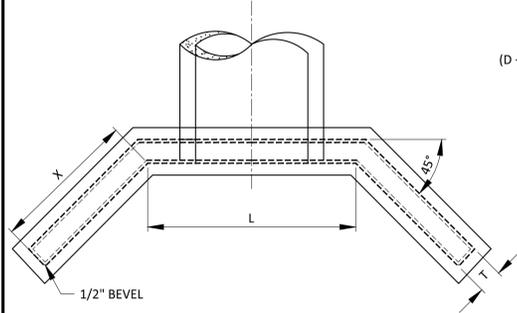
SECTION A
15" TO 30" PIPE DIA.



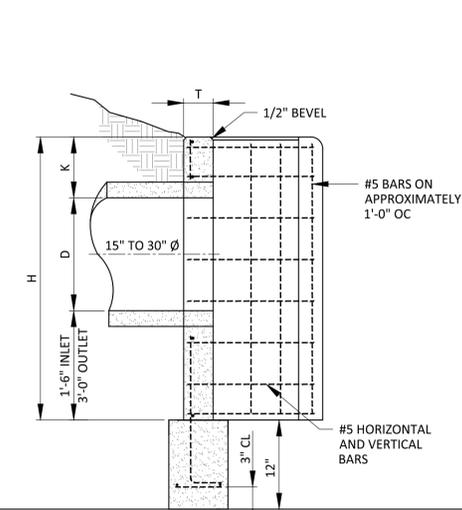
SECTION A
36" TO 60" PIPE DIA.

TYPE "A" HEADWALL					
D	H		L	K	T
	INLET	OUTLET			
15"	3'-9"	5'-3"	3'-3"	1'-0"	6"
18"	4'-0"	5'-6"	3'-6"	1'-0"	6"
21"	4'-3"	5'-9"	4'-6"	1'-0"	6"
24"	4'-6"	6'-0"	4'-10"	1'-0"	6"
30"	5'-1"	6'-7"	5'-10"	1'-1"	6"
36"	5'-7"	7'-1"	6'-8"	1'-1"	8"
42"	6'-2"	-CH	7'-10"	1'-2"	8"
48"	6'-8"	P	9'-10"	1'-2"	8"
54"	7'-3"	C	10'-2"	1'-3"	8"
60"	7'-9"	2	11'-2"	1'-3"	8"

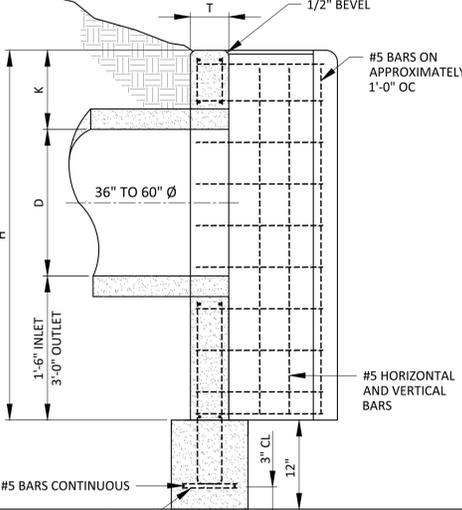
NOTE: ALL REINFORCING STEEL SHALL BE #5 BARS, PLACED AS SHOWN.



2
2510 TYPE B HEADWALL
NOT TO SCALE



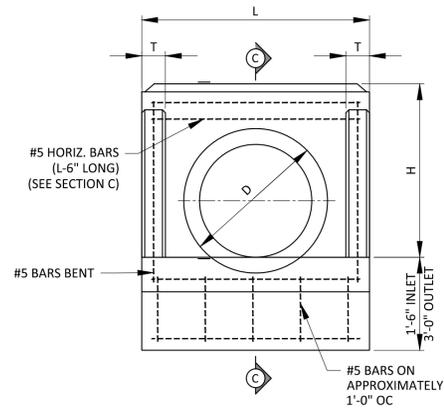
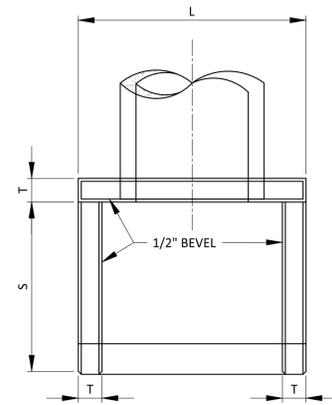
SECTION B
15" TO 30" PIPE DIA.



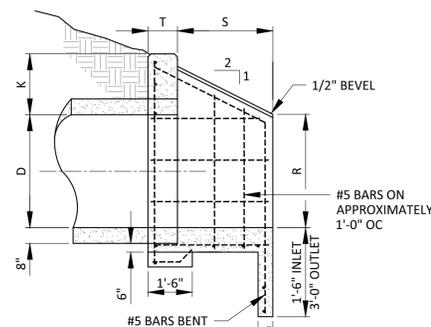
SECTION B
36" TO 60" PIPE DIA.

TYPE "B" HEADWALL						
D	H		L	K	X	T
	INLET	OUTLET				
15"	3'-9"	5'-3"	2'-2"	1'-0"	1'-0"	6"
18"	4'-0"	5'-6"	2'-5"	1'-0"	1'-0"	6"
21"	4'-3"	5'-9"	2'-9"	1'-0"	1'-3"	6"
24"	4'-6"	6'-0"	3'-0"	1'-0"	1'-6"	6"
30"	5'-1"	6'-7"	3'-7"	1'-1"	2'-0"	6"
36"	5'-7"	7'-1"	4'-2"	1'-1"	2'-0"	8"
42"	6'-2"	7'-8"	4'-9"	1'-2"	2'-6"	8"
48"	6'-8"	8'-2"	6'-0"	1'-2"	3'-0"	8"
54"	7'-3"	8'-9"	6'-6"	1'-3"	3'-6"	8"
60"	7'-9"	9'-3"	7'-0"	1'-3"	3'-6"	8"

NOTE: ALL REINFORCING STEEL SHALL BE #5 BARS, PLACED AS SHOWN.



3
2510 TYPE C HEADWALL
NOT TO SCALE



SECTION C

TYPE "C" HEADWALL						
D	H	L	K	S	R	T
15"	2'-3"	3'-2"	1'-0"	1'-10"	1'-0"	6"
18"	2'-6"	3'-5"	1'-0"	2'-1"	1'-2"	6"
21"	2'-9"	3'-9"	1'-0"	2'-4"	1'-3"	6"
24"	3'-0"	4'-0"	1'-0"	2'-6"	1'-5"	6"
30"	3'-7"	4'-7"	1'-1"	3'-1"	1'-8"	6"
36"	4'-1"	5'-6"	1'-1"	4'-0"	1'-9"	8"
42"	4'-8"	6'-1"	1'-2"	4'-10"	1'-11"	8"
48"	5'-2"	7'-2"	1'-2"	5'-9"	2'-0"	8"
54"	5'-9"	7'-9"	1'-3"	6'-7"	2'-3"	8"
60"	6'-3"	8'-4"	1'-3"	7'-4"	2'-3"	8"

NOTE: ALL REINFORCING STEEL SHALL BE #5 BARS, PLACED AS SHOWN.

NOTES (HEADWALL)

- ALL REINFORCING STEEL SHALL BE DEFORMED BARS CONFORMING TO A.S.T.M. SERIAL DESIGNATION A-305-507 AND SHALL SATISFY
- ALL CONCRETE SHALL BE L3500.
- MINIMUM DEPTH OF EMBEDMENT FOR REINFORCING STEEL SHALL BE 2" UNLESS OTHERWISE INDICATED.
- GROOVE END OF CONCRETE PIPE TO FACE UPSTREAM.
- ALL REINFORCING STEEL SHALL BE EPOXY COATED.
- INSTALL END GUARD ON INLET ENDS OF STORM SEWER SYSTEM ONLY.
- ALL EXPOSED EDGES OF CONCRETE SHALL BE FINISHED WITH A 1/2" CHAMFER.
- PRECAST CONCRETE SHALL NOT BE USED UNLESS APPROVED BY CITY ENGINEER.

REV.	DATE	DESCRIPTION	BY

