CITY OF GRAND ISLAND

UTILITIES DEPARTMENT

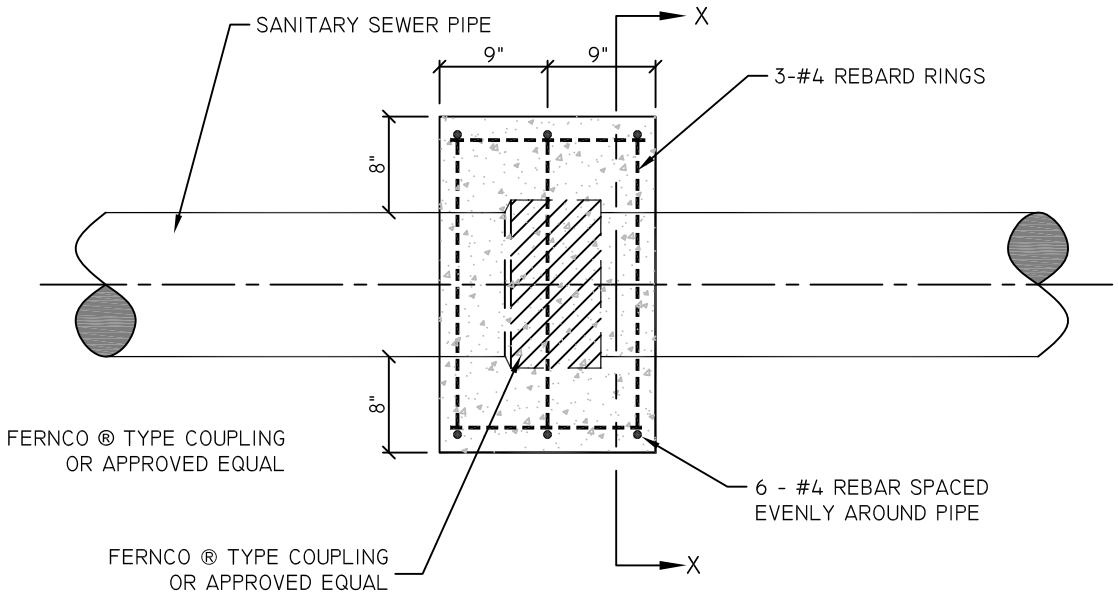
Water Main Standard Plans

CURRENT REVISION: FEBR. 4, 2013

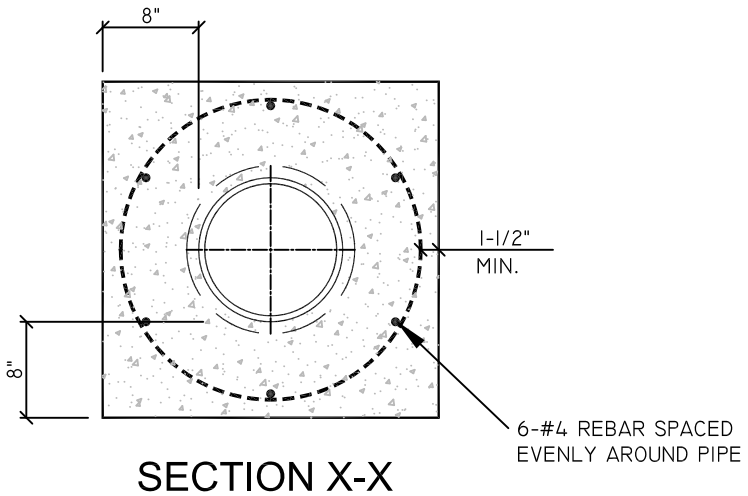
CITY OF GRAND ISLAND

UTILITIES DEPARTMENT

Water Main Standard Plans Index



PLAN VIEW



SECTION X-X

NOTES :

1. ALL JOINT ENCASEMENTS TO BE TYPE 47-B MODIFIED POURED CONCRETE AS PER DIVISION II; "CONCRETE PAVING SPECIFICATIONS"

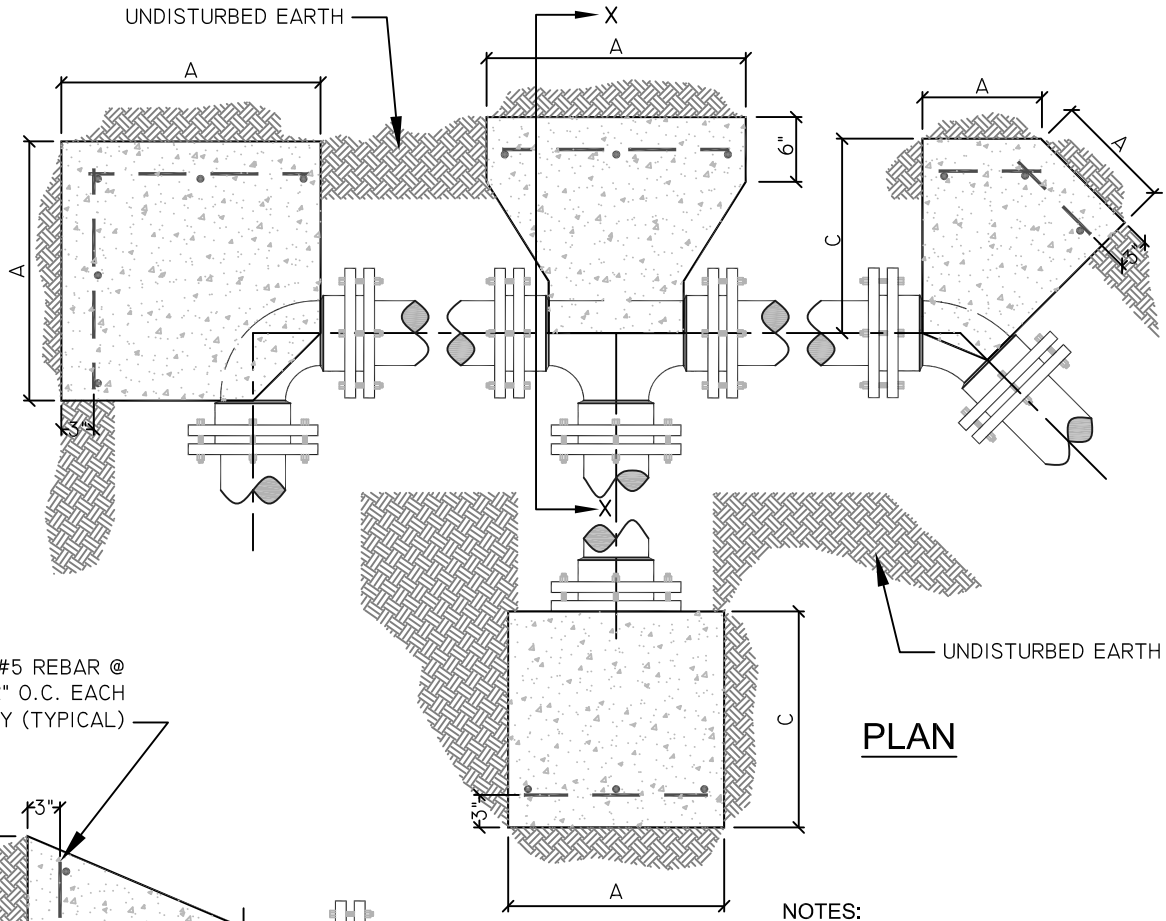
ENCASEMENT QUANTITIES		
PIPE (DIAMETER)	CONCRETE (CUBIC YARDS)	REBAR (POUNDS)
8"	0.2028	7.848
10"	0.2305	8.023
12"	0.2589	8.198
15"	0.3026	8.460
18"	0.3478	8.723

CITY OF GRAND ISLAND
UTILITIES DEPARTMENT

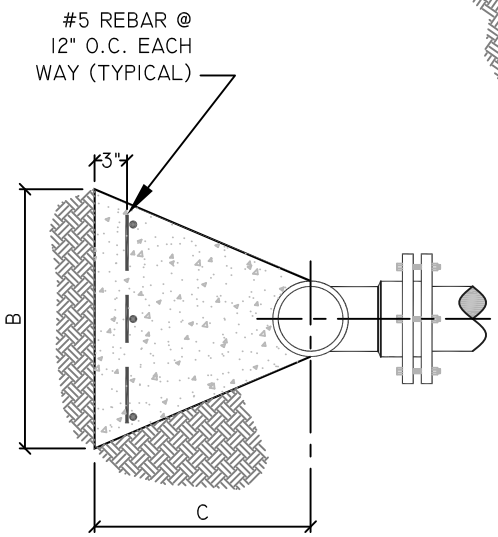
REVISED: 5/22/2002
DRAWN BY: ZEX
CHECKED BY: T.W.B.

JOINT ENCASEMENT

PLAN 133



PLAN



SECTION X-X

NOTES:

1. ALL THRUST BLOCKS TO BE TYPE 47-B MODIFIED POURED CONCRETE AS PER DIVISION II; "CONCRETE PAVING SPECIFICATIONS"; AND DIVISION VI "WATER MAINS".
2. ALL CONCRETE BLOCKING SHALL BE INSTALLED IN SUCH A MANNER THAT ALL PIPE AND FITTING JOINTS ARE ACCESSIBLE.
3. ALL FITTINGS ARE TO BE WRAPPED IN 8 MIL POLYETHYLENE.
4. ALL THRUST BLOCKS ARE TO BE POURED AGAINST UNDISTURBED SOIL.
5. IF SOIL OTHER THAN SANDY SOIL IS DISCOVERED DURING EXCAVATION, THE THRUST BLOCK SIZE SHALL BE VERIFIED BY THE ENGINEER.

THRUST BLOCK DIMENSIONS (INCHES)
DESIGN PRESSURE - 150 PSI SOIL TYPE - SANDY SILT (2000 LBS/SF)

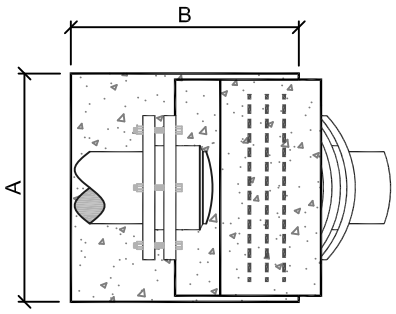
PIPE DIA.	TEES AND PLUGS			90° ELLS			45° ELLS			22 1/2° ELLS			11 1/4° ELLS		
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
4"	17	17	18	20	20	18	12	12	18	12	12	18	12	12	18
6"	24	24	20	29	29	20	21	21	20	12	12	20	12	12	20
8"	32	32	22	37	37	22	28	28	22	20	20	22	12	12	22
10"	39	39	24	46	46	24	34	34	24	24	24	24	17	17	24
12"	46	46	26	55	55	26	40	40	26	29	29	26	20	20	26
14"	53	53	29	63	63	29	47	47	29	33	33	29	24	24	29
16"	61	61	31	72	72	31	53	53	31	38	38	31	27	27	31
18"	68	68	33	81	81	33	59	59	33	42	42	33	30	30	33
20"	75	75	36	89	89	36	66	66	36	47	47	36	33	33	36
24"	90	90	39	108	108	39	80	80	39	56	56	39	40	40	39
30"	111	111	42	133	133	42	98	98	42	70	70	42	49	49	42

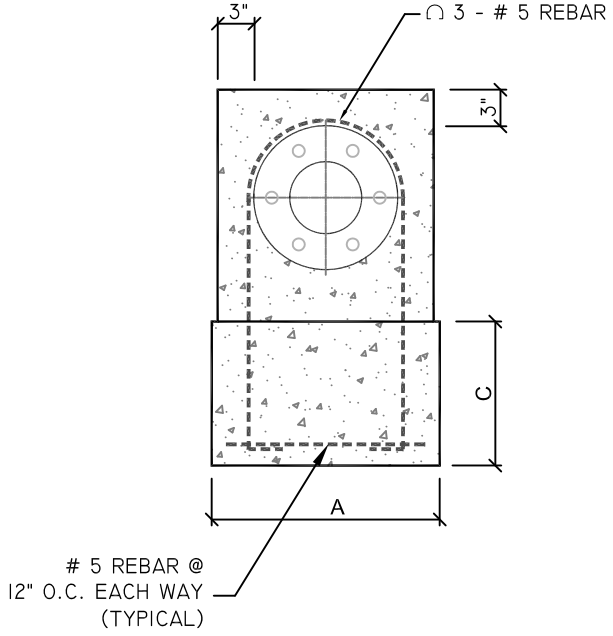
CITY OF GRAND ISLAND
UTILITIES DEPARTMENT

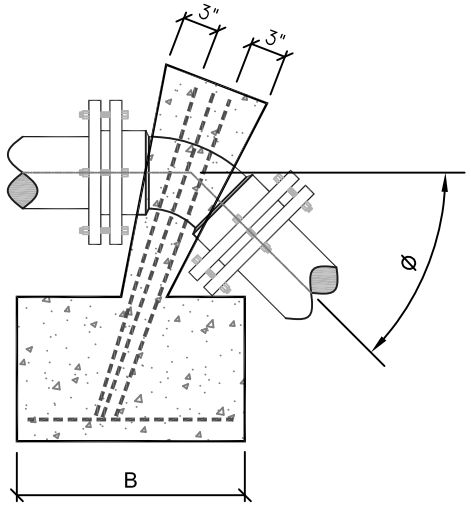
REVISED: 5/03/2010
DRAWN BY: P.F.G.
CHECKED BY: T.W.B.

CONCRETE BLOCKING FOR FITTINGS

PLAN 134







THRUST BLOCK DIMENSIONS
(INCHES)

DESIGN PRESSURE - 150 PSI
SOIL TYPE - SANDY SILT (2000 LBS/SF)

Ø = 22 1/2° AND 45°			
PIPE DIA.	A	B	C
4"	30"	30"	24"
6"	44"	44"	24"
8"	57"	57"	24"
10"	62"	62"	30"

NOTES :

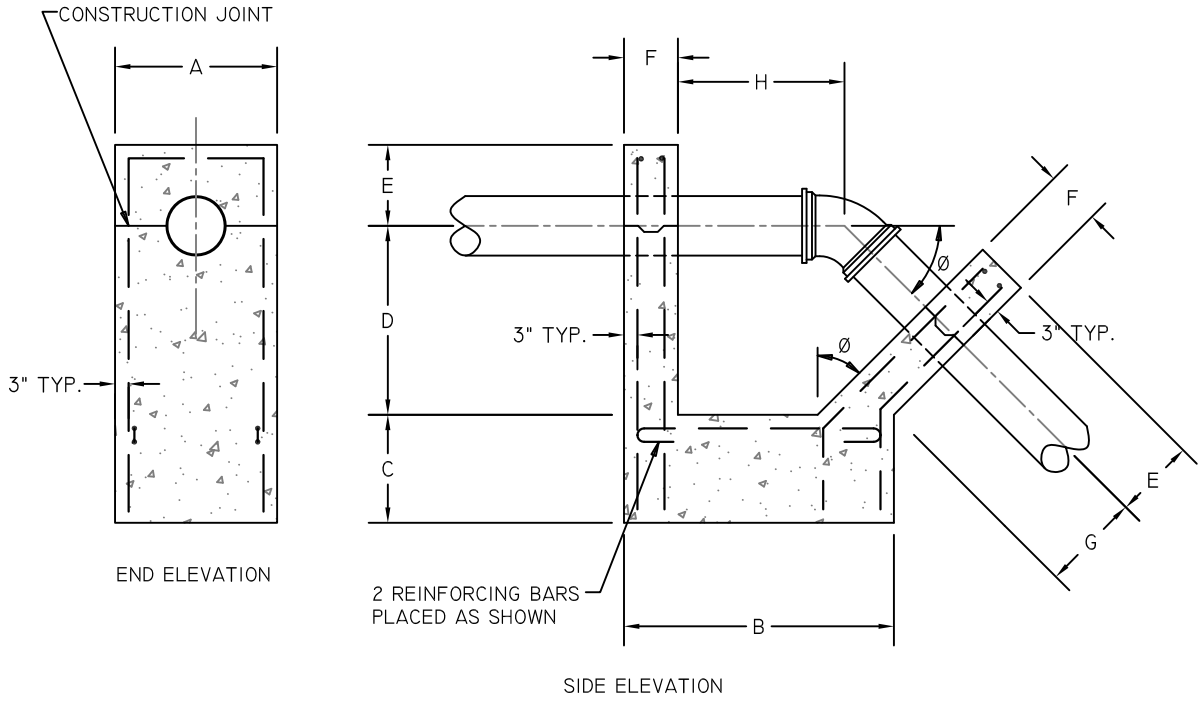
1. ALL THRUST BLOCKS TO BE TYPE 47-B MODIFIED POURED CONCRETE AS PER DIVISION II; "CONCRETE PAVING SPECIFICATIONS"; AND DIVISION VI "WATER MAINS".
2. ALL CONCRETE BLOCKING SHALL BE INSTALLED IN SUCH A MANNER THAT ALL PIPE AND FITTING JOINTS ARE ACCESSIBLE.
3. ALL FITTINGS ARE TO BE WRAPPED IN 8 MIL POLYETHYLENE.
4. ALL THRUST BLOCKS ARE TO BE POURED AGAINST UNDISTURBED SOIL.
5. ALL REINFORCING STEEL SHALL BE DEFORMED BARS CONFORMING TO A.S.T.M. A-305-507 AND SATISFY THE BENT TEST REQUIREMENTS FOR STRUCTURAL GRADE STEEL.
6. IF SOIL OTHER THAN SANDY SOIL IS DISCOVERED DURING EXCAVATION, THE THRUST BLOCK SIZE SHALL BE VERIFIED BY THE ENGINEER.

CITY OF GRAND ISLAND
UTILITIES DEPARTMENT

REVISED: 5/03/2010
DRAWN BY: P.F.G.
CHECKED BY: T.W.B.

INVERT BLOCKING 4" - 10" PIPE

PLAN 134A



Ø = 22 1/2°									
PIPE DIA.	BAR DIA.	SIZE IN INCHES							
		A	B	C	D	E	F	G	H
12"	#4	36	60	12	24	18	12	12	21
14"	#5	36	66	18	27	18	12	15	27
16"	#5	36	78	24	33	18	12	18	33
18"	#5	42	84	24	36	18	12	20	37
20"	#6	48	84	24	36	18	12	20	37
24"	#7	54	108	24	48	24	12	27	50

THRUST BLOCK DIMENSIONS
(INCHES)

DESIGN PRESSURE - 150 PSI
SOIL TYPE - SANDY SILT (2000 LBS/SF)

NOTES :

1. ALL THRUST BLOCKS TO BE TYPE 47-B MODIFIED POURED CONCRETE AS PER DIVISION II; "CONCRETE PAVING SPECIFICATIONS"; AND DIVISION VI "WATER MAINS".
2. ALL CONCRETE BLOCKING SHALL BE INSTALLED IN SUCH A MANNER THAT ALL PIPE AND FITTING JOINTS ARE ACCESSIBLE.
3. ALL FITTINGS ARE TO BE WRAPPED IN 8 MIL POLYETHYLENE.
4. ALL THRUST BLOCKS ARE TO BE POURED AGAINST UNDISTURBED SOIL.
5. ALL REINFORCING STEEL SHALL BE DEFORMED BARS CONFORMING TO A.S.T.M. A-305-507 AND SATISFY THE BENT TEST REQUIREMENTS FOR STRUCTURAL GRADE STEEL.
6. IF SOIL OTHER THAN SANDY SOIL IS DISCOVERED DURING EXCAVATION, THE THRUST BLOCK SIZE SHALL BE VERIFIED BY THE ENGINEER.

CITY OF GRAND ISLAND
UTILITIES DEPARTMENT

REVISED: 5/03/2010
DRAWN BY: P.F.G.
CHECKED BY: T.W.B.

INVERT BLOCKING 12" - 24" PIPE

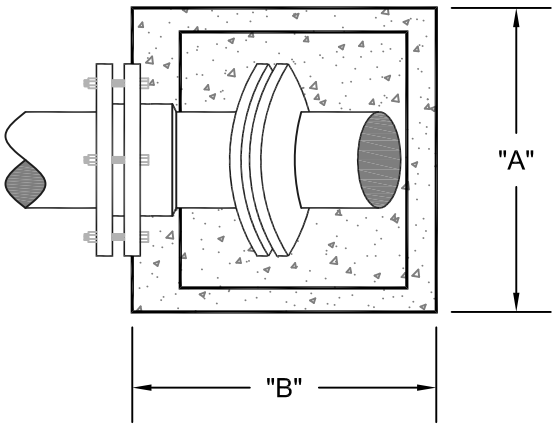
PLAN 134A
2 OF 2

THRUST BLOCK DIMENSIONS
(INCHES)

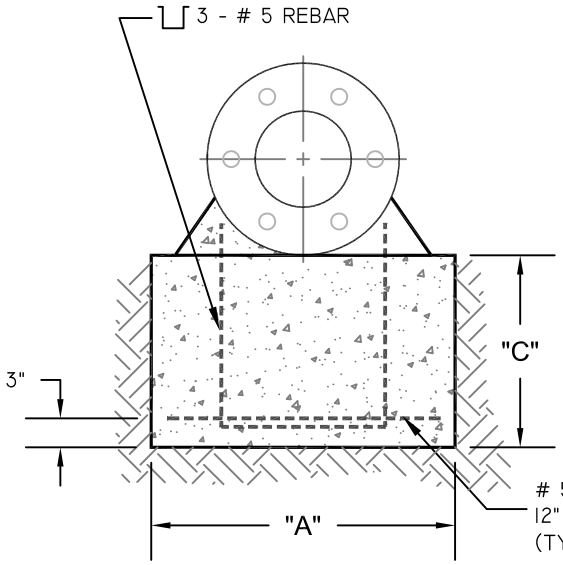
DESIGN PRESSURE - 150 PSI

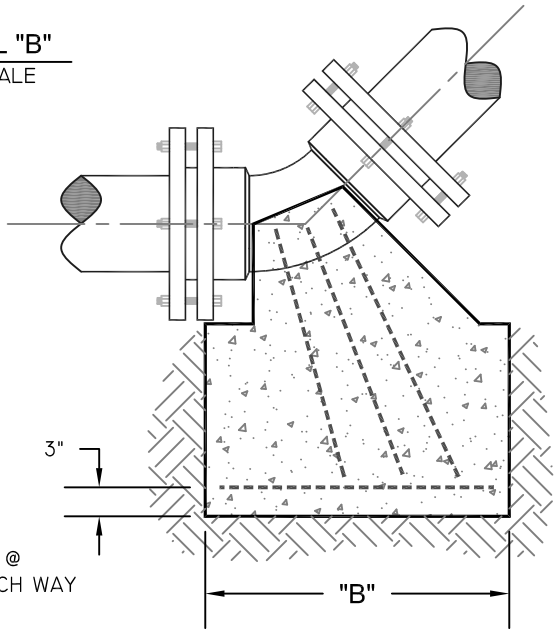
SOIL TYPE - SANDY SILT (2000 LBS/SF)

PIPE DIA.	A	B	C
4"	17"	17"	18"
6"	24"	24"	20"
8"	31"	31"	22"
10"	38"	38"	24"
12"	46"	46"	26"
14"	53"	53"	29"
16"	60"	60"	31"
18"	68"	68"	33"
20"	75"	75"	36"
24"	90"	90"	39"



DETAIL "B"
NO SCALE





NOTES :

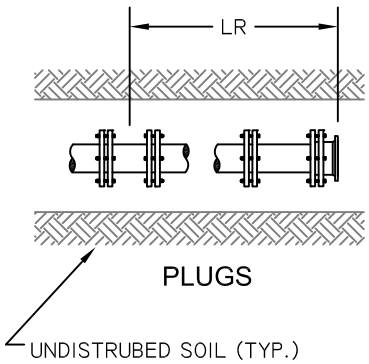
1. ALL THRUST BLOCKS TO BE TYPE 47-B MODIFIED POURED CONCRETE AS PER DIVISION II; "CONCRETE PAVING SPECIFICATIONS"; AND DIVISION VI "WATER MAINS".
2. ALL CONCRETE BLOCKING SHALL BE INSTALLED IN SUCH A MANNER THAT ALL PIPE AND FITTING JOINTS ARE ACCESSIBLE.
3. ALL FITTINGS ARE TO BE WRAPPED IN 8 MIL POLYETHYLENE.
4. ALL THRUST BLOCKS ARE TO BE POURED AGAINST UNDISTURBED SOIL.
5. IF SOIL OTHER THAN SANDY SOIL IS DISCOVERED DURING EXCAVATION, THE THRUST BLOCK SIZE SHALL BE VERIFIED BY THE ENGINEER.

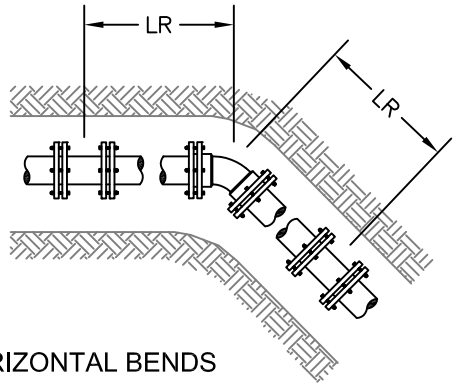
CITY OF GRAND ISLAND
UTILITIES DEPARTMENT

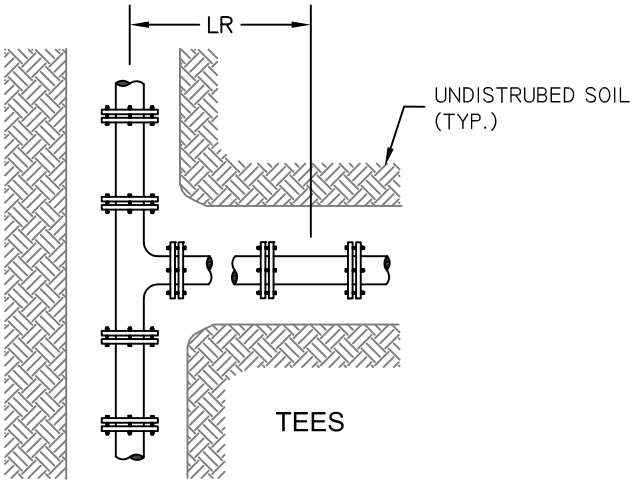
REVISED: 5/03/2010
DRAWN BY: P.F.G.
CHECKED BY: T.W.B.

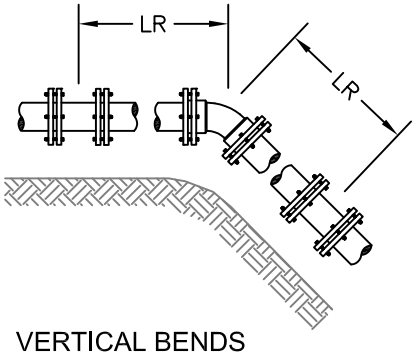
INVERT BLOCKING

PLAN 134B









ALL LENGTHS ARE GIVEN IN FEET

RESTRAINED LENGTHS "LR" FOR DUCTILE IRON PIPE WITH POLYETHYLENE WRAP						
NOMINAL PIPE SIZE INCHES	HORIZONTAL BENDS			TEE BRANCH AND PLUGS	VERTICAL BENDS	
	90 DEG.	45 DEG.	22½ DEG.		45 DEG.	22½ DEG
6	42	18	18	109	45	22
8	54	22	18	142	59	28
10	66	27	18	172	71	34
12	77	32	18	202	84	40
14	88	37	18	232	96	46
16	99	41	20	261	108	52
18	109	45	22	290	120	58
20	120	50	24	318	132	63
24	139	58	28	373	155	74

NOTES:

1. ALL JOINTS WITHIN THE SPECIFIED LENGTH "LR" MUST BE RESTRAINED.

2. SPECIFIED LENGTH BASED ON A DESIGN PRESSURE OF 200 PSI.

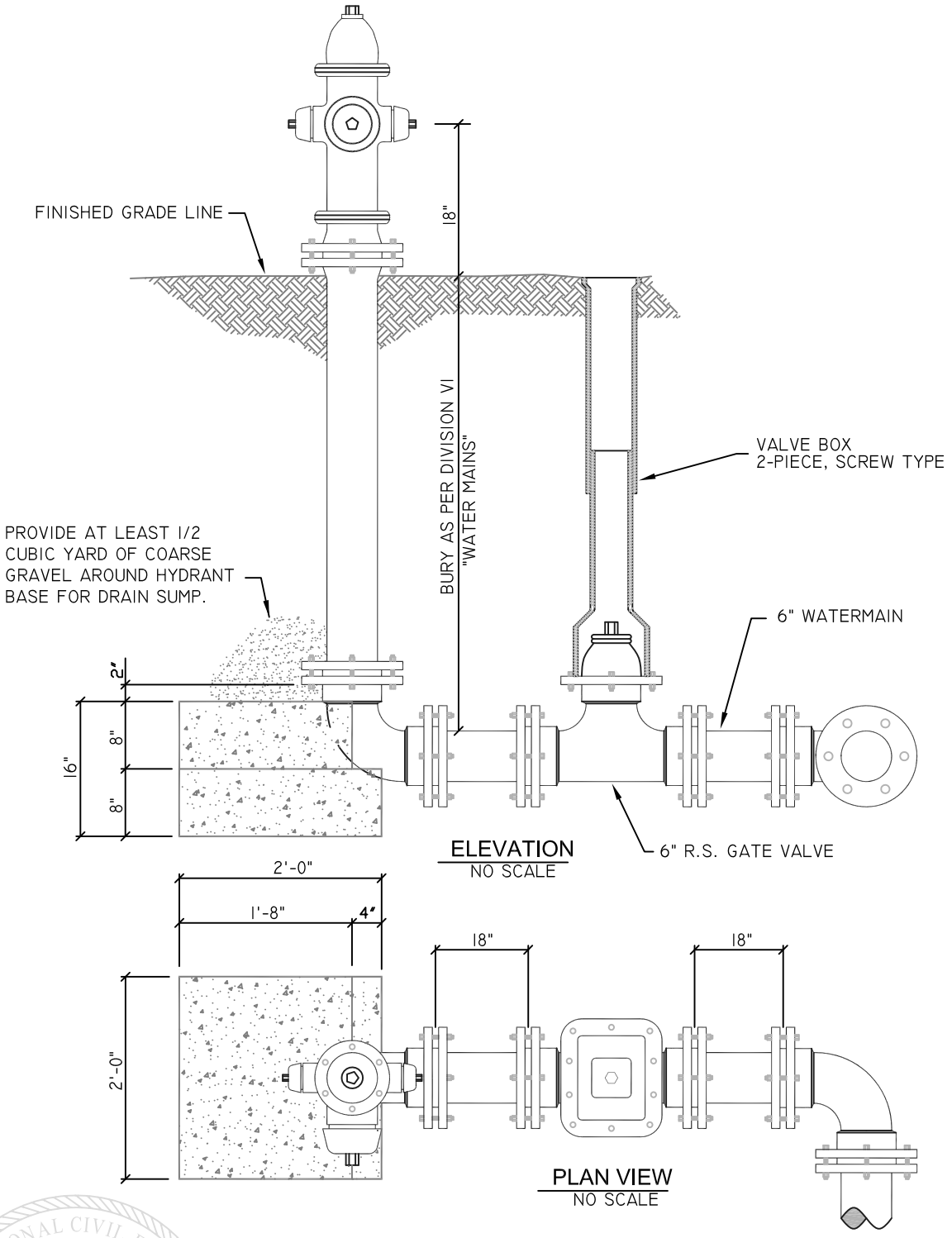
3. THE MINIMUM DEPTH OF BURY SHALL BE 5' TO TOP OF PIPE.

CITY OF GRAND ISLAND
UTILITIES DEPARTMENT

REVISED: 6/30/2009
DRAWN BY: L.J.S.
CHECKED BY: T.W.B.

JOINT RESTRAINT FOR D.I. PIPE W/ POLYETHYLENE WRAP

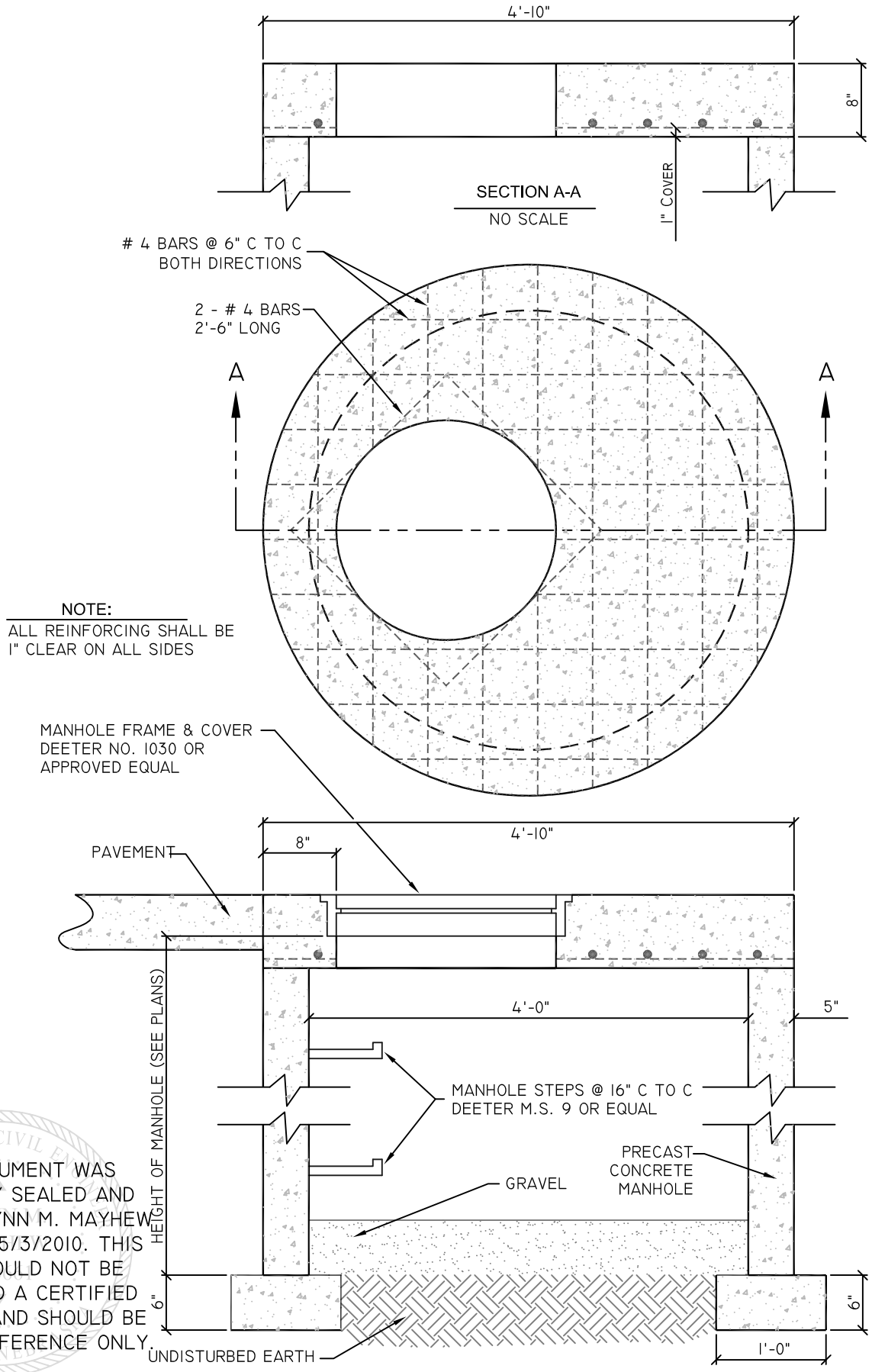
PLAN 134C



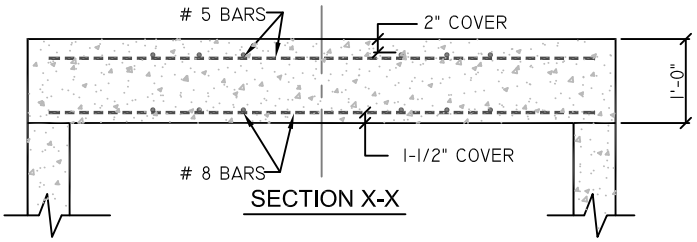
NOTES :

1. ALL THRUST BLOCKS TO BE TYPE 47-B MODIFIED POURED CONCRETE AS PER DIVISION II; "CONCRETE PAVING SPECIFICATIONS"; AND DIVISION VI "WATER MAINS".
2. ALL CONCRETE BLOCKING SHALL BE INSTALLED IN SUCH A MANNER THAT ALL PIPE AND FITTING JOINTS ARE ACCESSIBLE.
3. ALL FITTINGS ARE TO BE WRAPPED IN 8 MIL POLYETHYLENE.
4. ALL THRUST BLOCKS ARE TO BE POURED AGAINST UNDISTURBED SOIL.

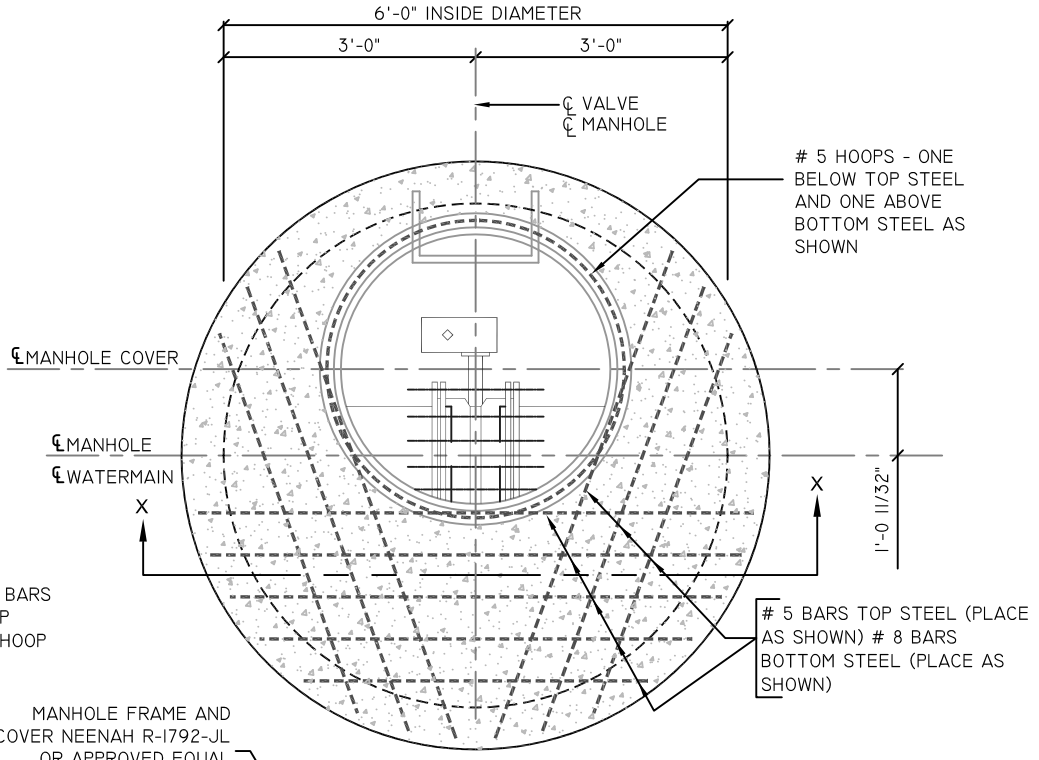
CITY OF GRAND ISLAND UTILITIES DEPARTMENT	REVISED: 12/13/2004 DRAWN BY: P.F.G. CHECKED BY: T.W.B.	FIRE HYDRANT BLOCKING	PLAN 135



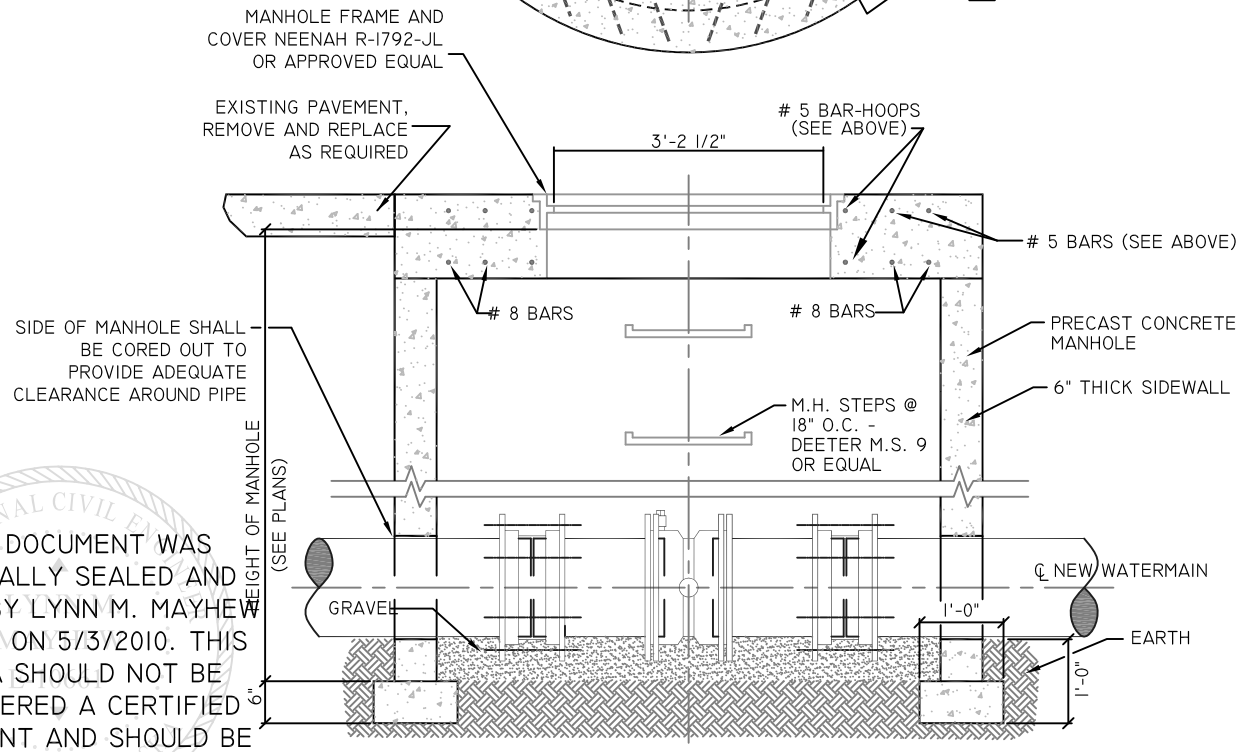
CITY OF GRAND ISLAND UTILITIES DEPARTMENT	REVISED: 5/22/2002 DRAWN BY: ZEX CHECKED BY: T.W.B.	STANDARD WATER VALVE MANHOLE FOR 8" OR SMALLER VALVES	PLAN 136A



SECTION X-X



THE NUMBER AND PATTERN OF BARS SHOWN ARE IDENTICAL FOR TOP AND BOTTOM STEEL (SEE BAR-HOOP NOTATION ABOVE)

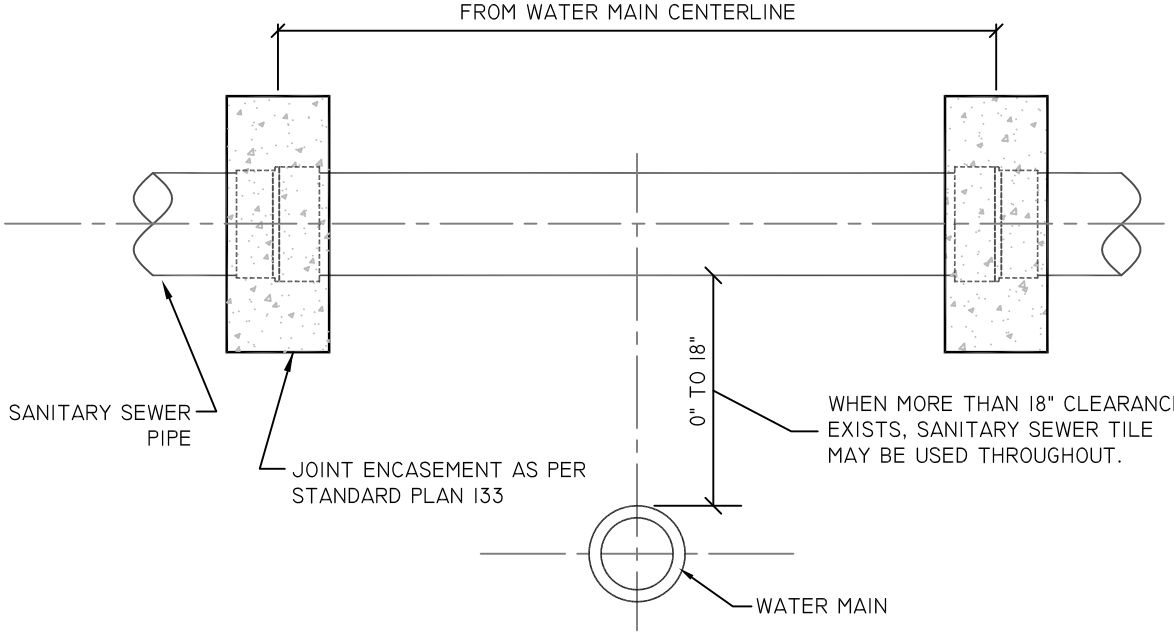


CITY OF GRAND ISLAND UTILITIES DEPARTMENT	REVISED: 5/22/2002 DRAWN BY: ZEX CHECKED BY: T.W.B.	STANDARD WATER VALVE MANHOLE FOR 10" OR LARGER VALVES	PLAN 136B

SANITARY SEWER CROSSING OVER WATER MAIN

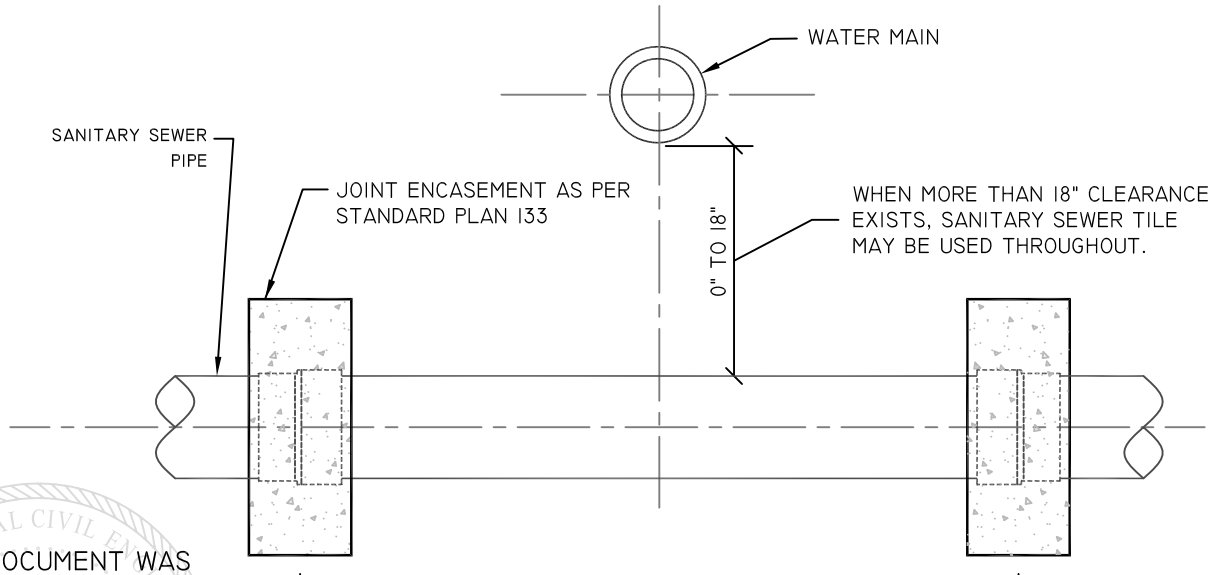
NO SCALE

ALL PIPE, 4" THROUGH 12" SHALL BE PVC AS PER ANSI / AWWA C900, AND ALL PIPE, 14" THROUGH 48" SHALL BE PVC AS PER ANSI / AWWA C905, AND SHALL BE INSTALLED SO THAT NO JOINT OCCURS LESS THAN 10' FROM WATER MAIN CENTERLINE



SANITARY SEWER CROSSING UNDER WATER MAIN

NO SCALE

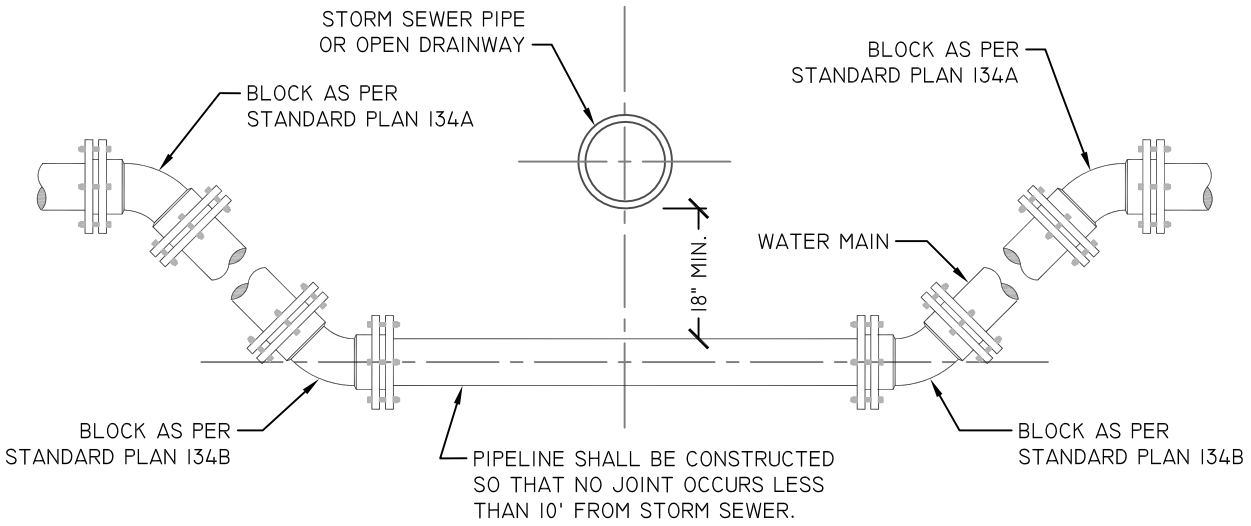


ALL PIPE, 4" THROUGH 12" SHALL BE PVC AS PER ANSI / AWWA C900, AND ALL PIPE, 14" THROUGH 48" SHALL BE PVC AS PER ANSI / AWWA C905, AND SHALL BE INSTALLED SO THAT NO JOINT OCCURS LESS THAN 10' FROM WATER MAIN CENTERLINE

CITY OF GRAND ISLAND UTILITIES DEPARTMENT	REVISED: 5/22/2002 DRAWN BY: ZEX CHECKED BY: T.W.B.	SANITARY SEWER WATER MAIN CROSSING	PLAN 138

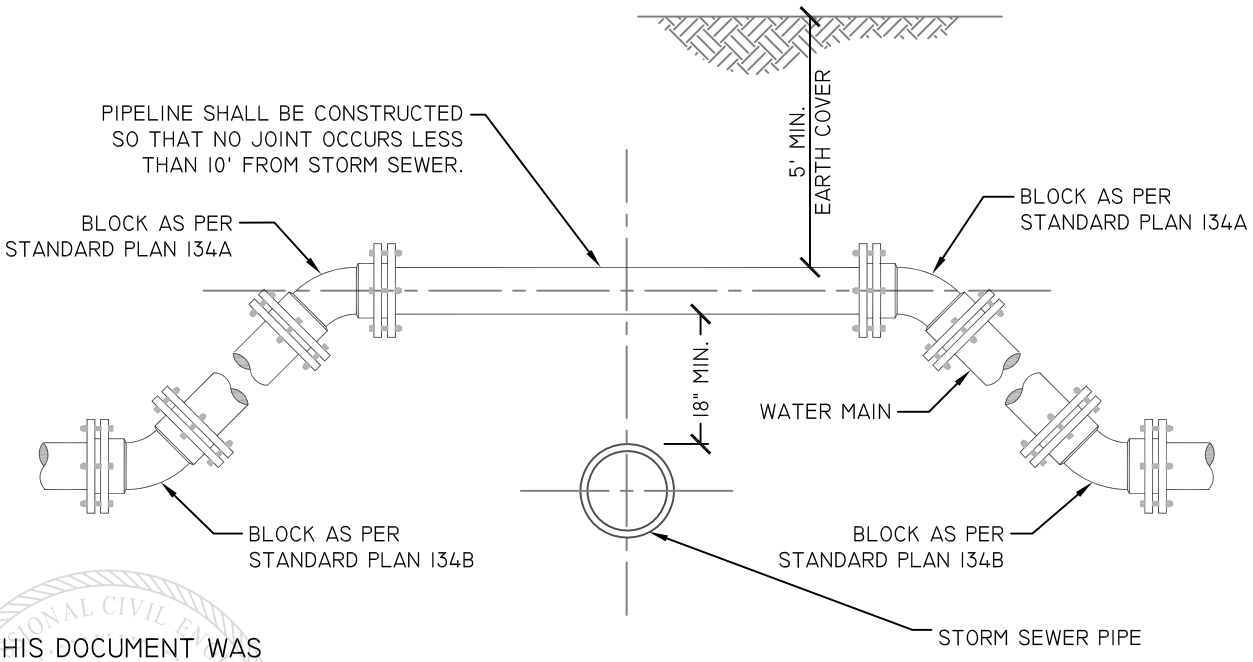
WATER MAIN CROSSING UNDER STORM SEWER / DRAINWAY

NO SCALE



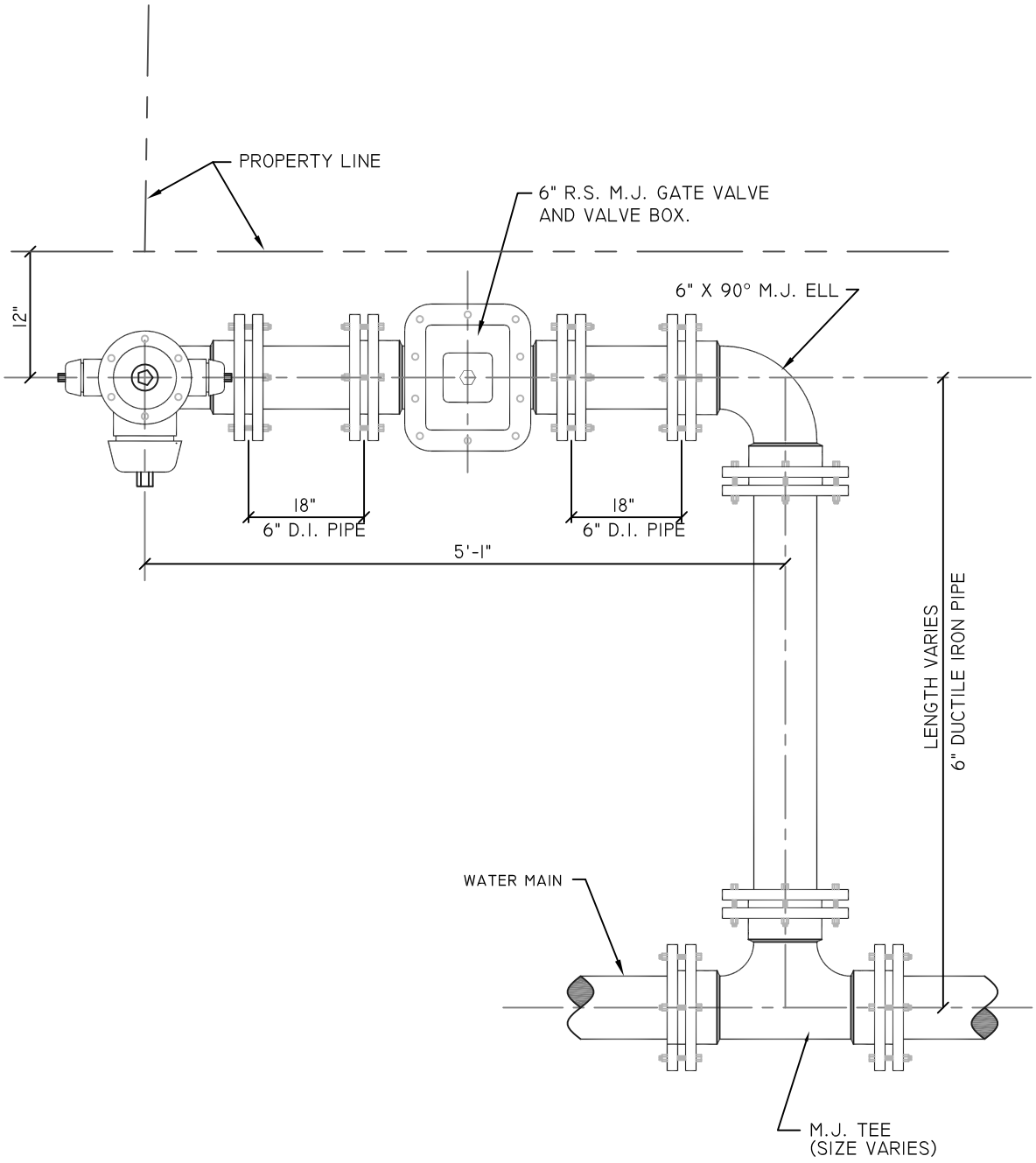
WATER MAIN CROSSING OVER STORM SEWER

NO SCALE



THIS DOCUMENT WAS ORIGINALLY SEALED AND ISSUED BY LYNN M. MAYHEW E-10661, ON 5/3/2010. THIS MEDIA SHOULD NOT BE CONSIDERED A CERTIFIED DOCUMENT AND SHOULD BE USED FOR REFERENCE ONLY.

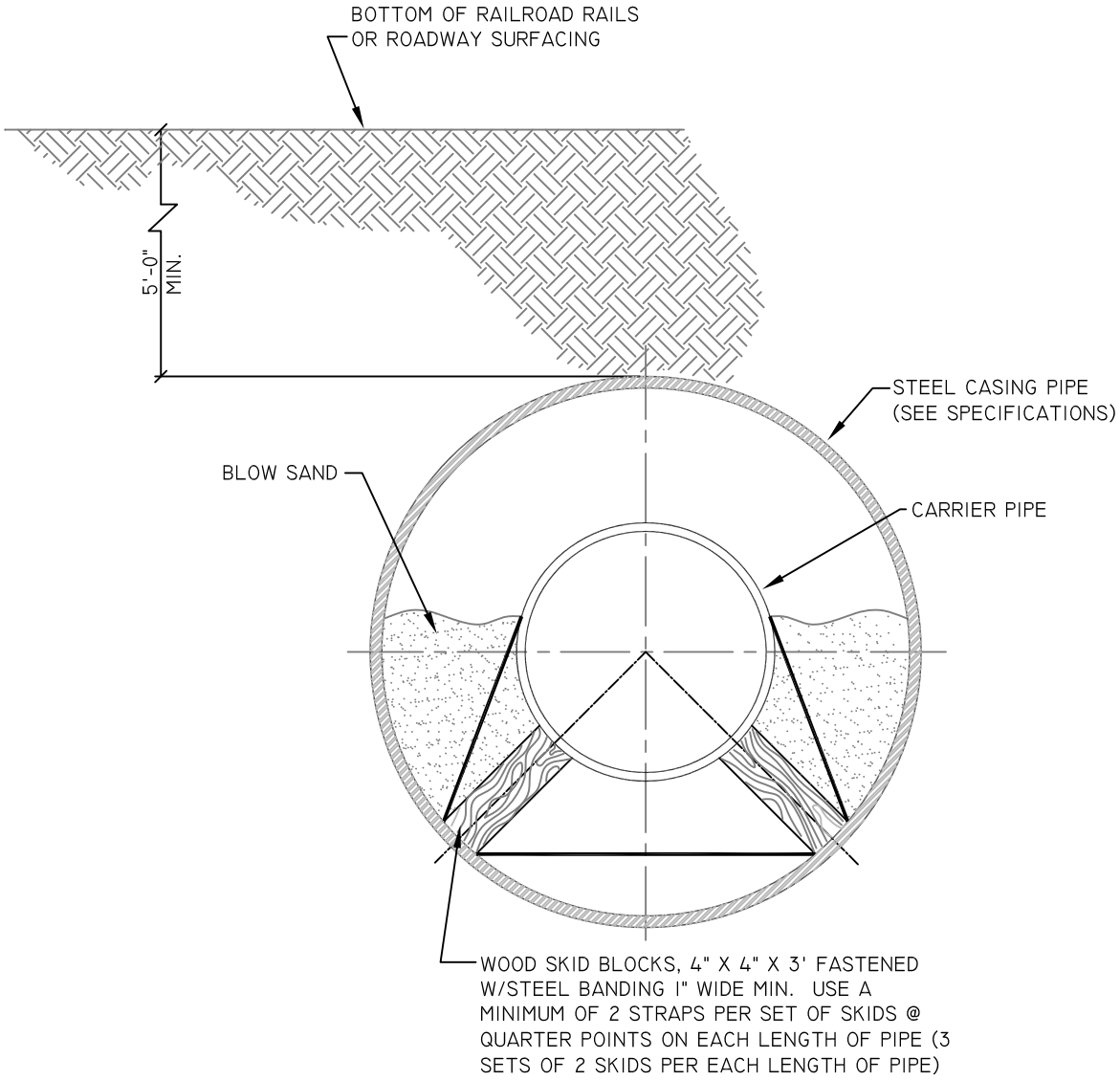
CITY OF GRAND ISLAND UTILITIES DEPARTMENT	REVISED: 8/17/2005 DRAWN BY: P.F.G. CHECKED BY: T.W.B.	STORM SEWER OR DRAINWAY - WATER MAIN CROSSING	PLAN 138A



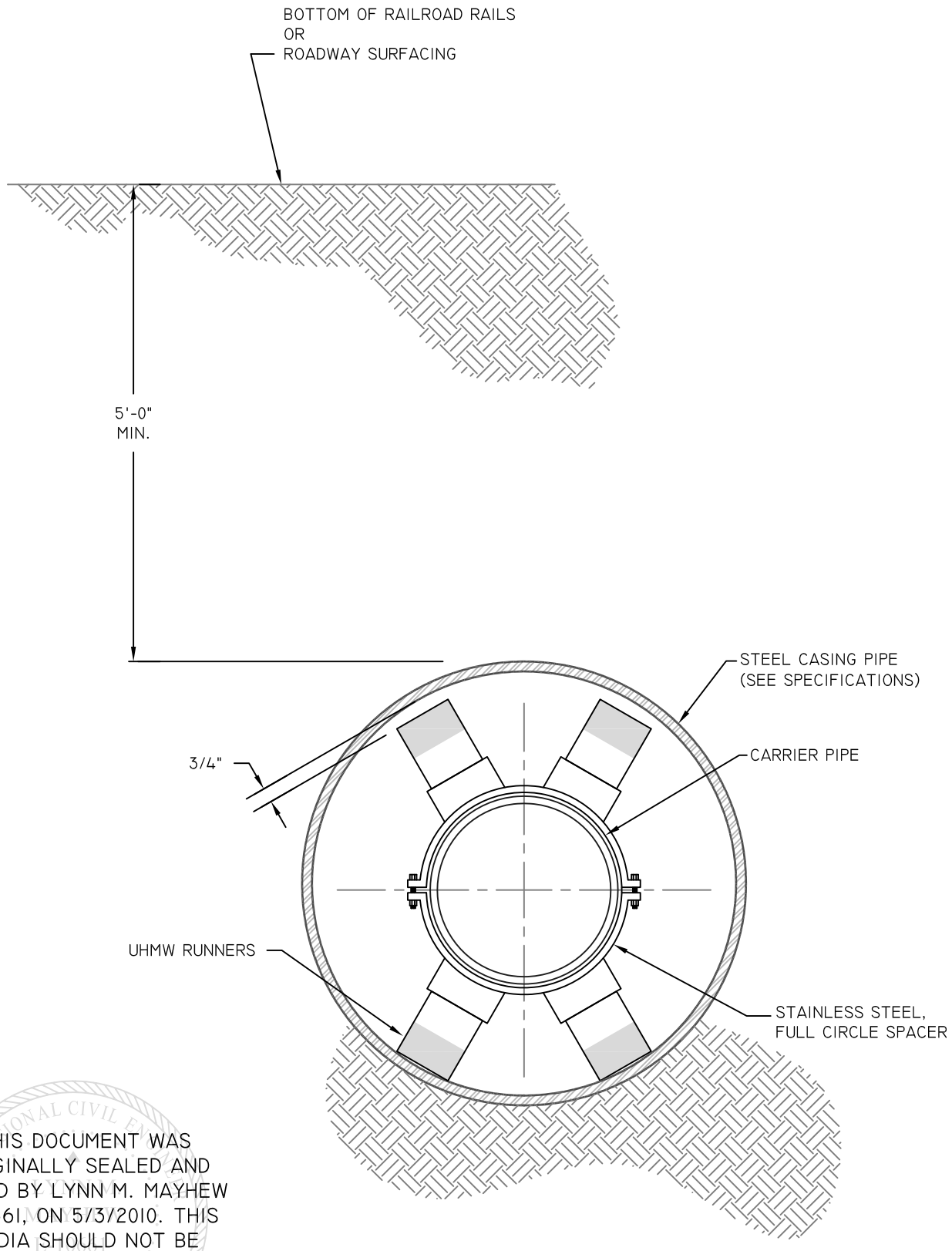
NOTES :

1. EACH FIRE HYDRANT ASSEMBLY SHALL INCLUDE: FIRE HYDRANT, 6" DUCTILE IRON PIPE AS REQUIRED TO COMPLETE THE ASSEMBLY, 6" M.J. R.S. GATE VALVE, VALVE BOX, 6" X 90° M.J. ELL, AND THRUST BLOCKS AS PER STANDARD PLANS 134 AND 135.
2. THE CONTRACTOR SHALL SET OR TURN ALL FIRE HYDRANTS SO THE PUMPER NOZZLE FACES THE DRIVEN ROADWAY OR AS OTHERWISE DIRECTED BY THE UTILITIES DEPARTMENT.
3. WHERE FIRE HYDRANTS ARE LOCATED IN A HARD SURFACED ISLAND, OR PARKING AREA, THE CONTRACTOR SHALL PROVIDE AN 18" BLOCK-OUT AROUND THE HYDRANT BARREL FILLED WITH COMPACTED SOIL.

CITY OF GRAND ISLAND UTILITIES DEPARTMENT	REVISED: 12/06/2004 DRAWN BY: ZEX CHECKED BY: T.W.B.	FIRE HYDRANT LOCATION	PLAN 140

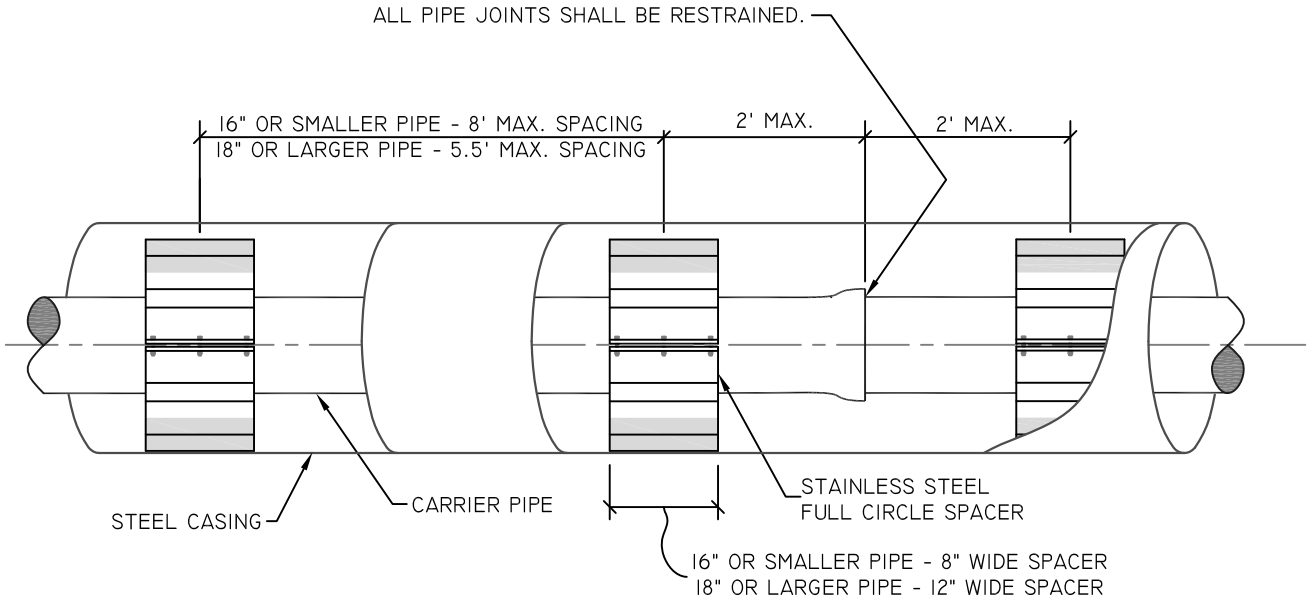


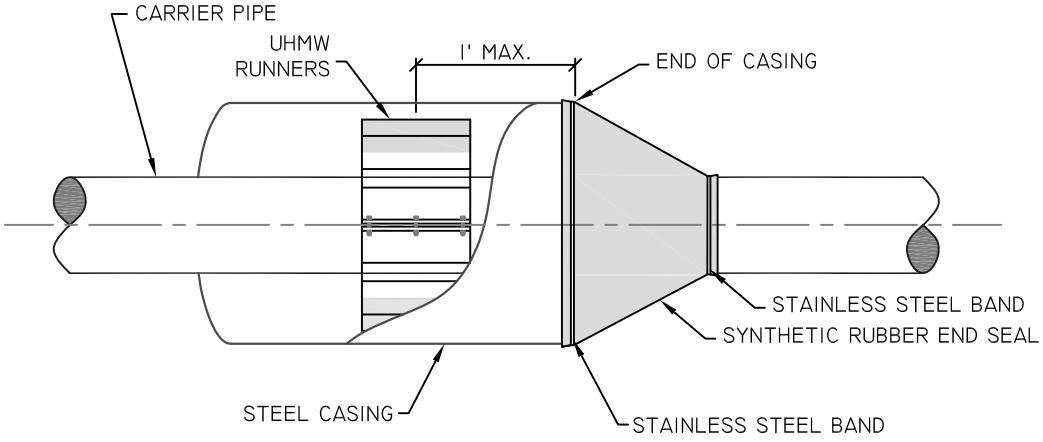
CITY OF GRAND ISLAND UTILITIES DEPARTMENT	REVISED: 8/07/2003 DRAWN BY: ZEX CHECKED BY: T.W.B.	CARRIER PIPE AND ENCASEMENT TYPE 1	PLAN 141 1 OF 3



THIS DOCUMENT WAS ORIGINALLY SEALED AND ISSUED BY LYNN M. MAYHEW E-10661, ON 5/3/2010. THIS MEDIA SHOULD NOT BE CONSIDERED A CERTIFIED DOCUMENT AND SHOULD BE USED FOR REFERENCE ONLY.

CITY OF GRAND ISLAND UTILITIES DEPARTMENT	REVISED: 12/13/2006 DRAWN BY: P.F.G. CHECKED BY: T.W.B.	CARRIER PIPE AND ENCASEMENT TYPE 2	PLAN 141 2 OF 3





THIS DOCUMENT WAS ORIGINALLY SEALED AND ISSUED BY LYNN M. MAYHEW E-10661, ON 5/3/2010. THIS MEDIA SHOULD NOT BE CONSIDERED A CERTIFIED DOCUMENT AND SHOULD BE USED FOR REFERENCE ONLY.

CITY OF GRAND ISLAND UTILITIES DEPARTMENT	REVISED: 1/06/2010 DRAWN BY: P.F.G. CHECKED BY: T.W.B.	CARRIER PIPE AND ENCASEMENT TYPE 2	PLAN 141 3 OF 3

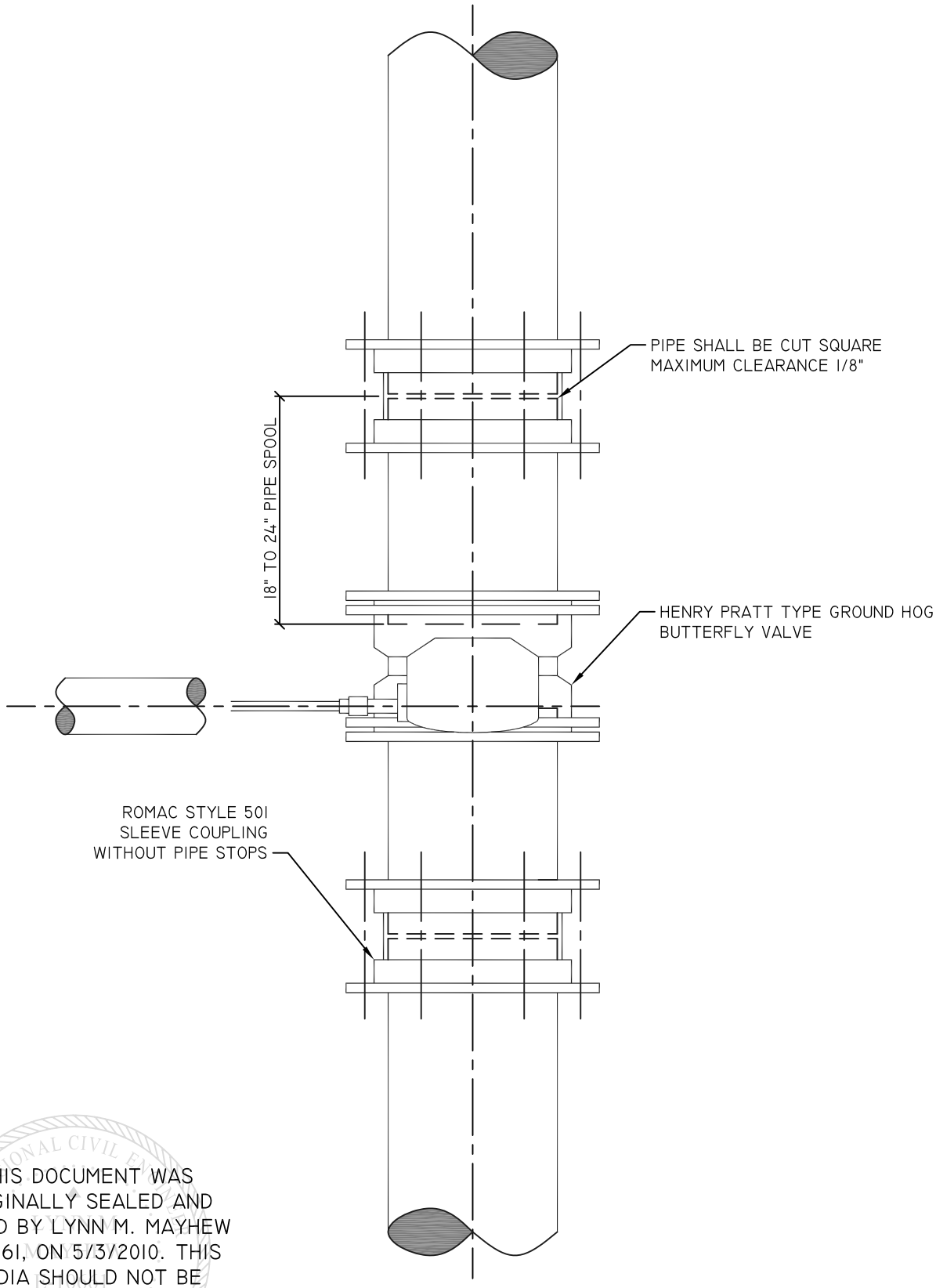
STANDARD FOR SIZING CASINGS:

CARRIER PIPE DIAMETER	GLAND O.D.	CASING DIAMETER	MINIMUM WALL THICKNESS
4"	9.120	12	0.250
6"	11.120	16	0.313
8"	13.370	18	0.313
10"	15.620	20	0.375
12"	17.880	24	0.438
14"	20.250	24	0.438
16"	22.500	28	0.438
18"	24.750	30	0.500
20"	27.000	32	0.500
24"	31.500	36	0.563
30"	37.180	42	0.563
* ALL DIMENSIONS ARE IN INCHES			

THE INSIDE DIAMETER OF THE CASING PIPE SHALL EXCEED THE OUTSIDE DIAMETER OF THE CARRIER PIPE, JOINTS, OR COUPLINGS, BY 4 (FOUR) INCHES.

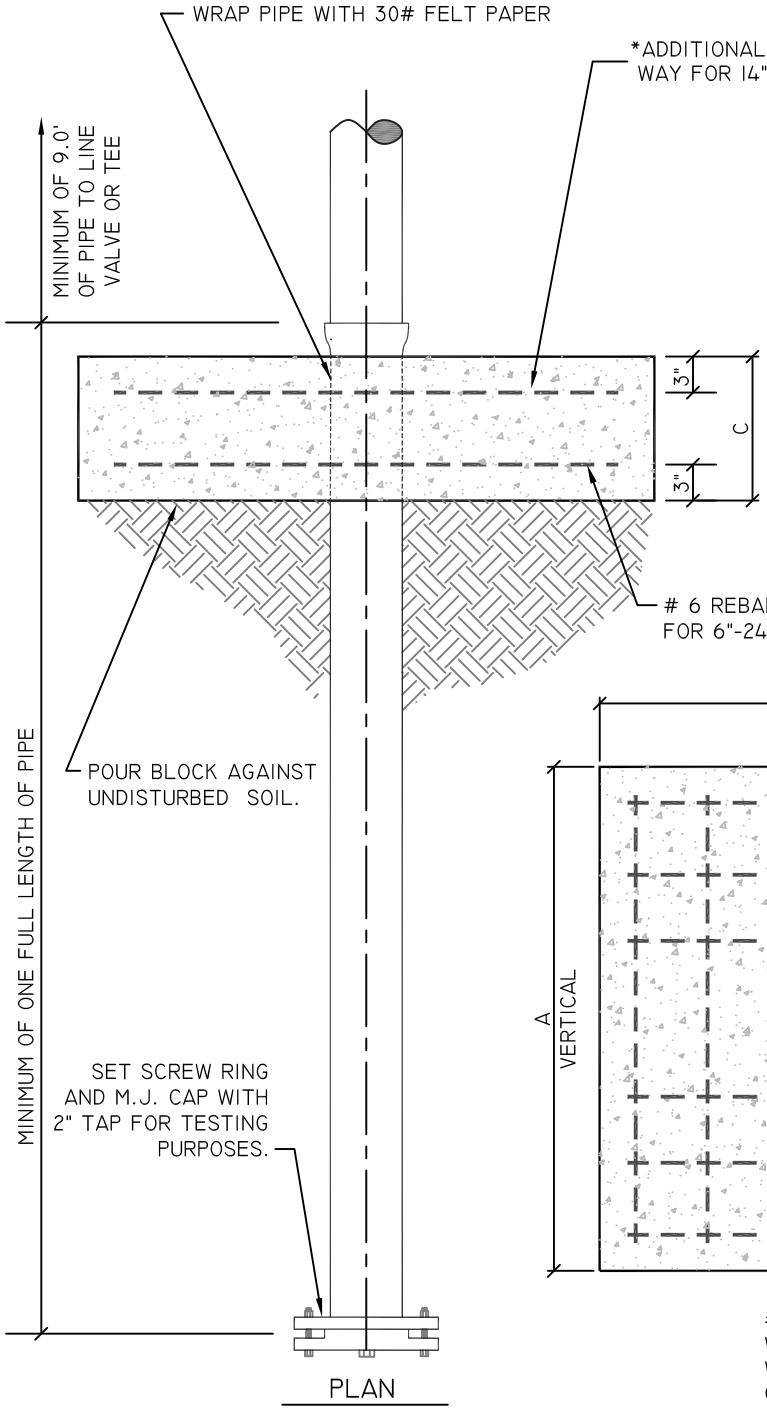
THE STEEL CASING PIPE SHALL HAVE A MINIMUM WALL THICKNESS AS BASED ON THE CHART SHOWN. THE CASING SHALL BE ENTIRELY OF 1 (ONE) MATERIAL AND COATED INSIDE AND OUT WITH AN ASPHALT COATING, DOUBLED FULL DIPPED. THE DESIGN OF THE CASING PIPE IS BASED ON SUPER-IMPOSED LOADS AND NOT UPON LOADS WHICH MAY BE ON CASING AS A RESULT OF THE JACKING OPERATIONS. INCREASES IN CASING STRENGTH TO WITHSTAND JACKING LOADS SHALL BE THE RESPONSIBILITY OF THE CONTRATOR.

CITY OF GRAND ISLAND UTILITIES DEPARTMENT	REVISED: 5/22/2002 DRAWN BY: ZEX CHECKED BY: T.W.B.	ENCASEMENT DETAILS	PLAN 141A

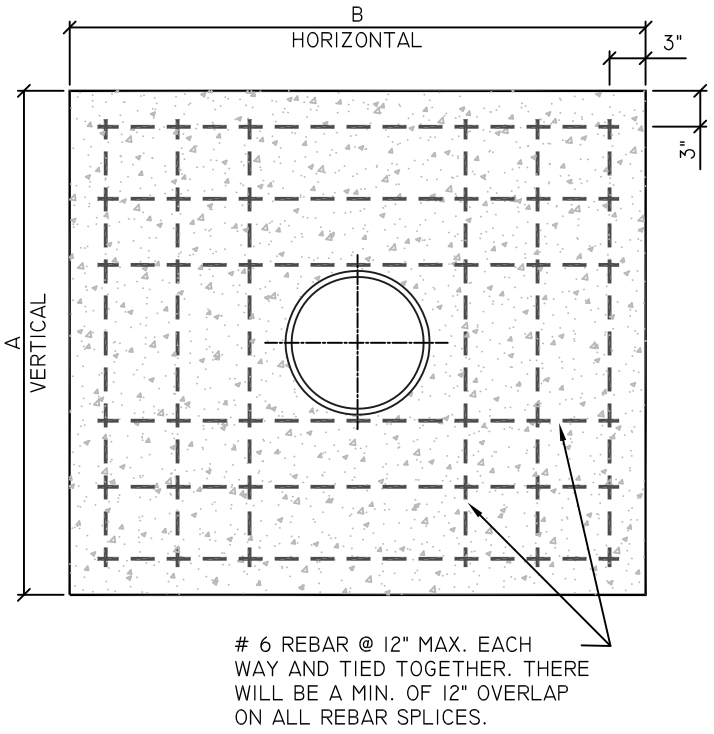


ELEVATION

CITY OF GRAND ISLAND UTILITIES DEPARTMENT	REVISED: 5/22/2002 DRAWN BY: ZEX CHECKED BY: T.W.B.	BUTTERFLY VALVE INSTALLATION	PLAN 142



MIN. BELL BLOCK DIMENSIONS			
PIPE DIA.	VERT. "A"	HORZ. "B"	WIDTH "C"
6"	42'	48"	12"
8"	42'	48"	12"
10"	48"	48"	12"
12"	48"	48"	12"
*14"	54"	54"	18"
*16"	54"	60"	18"
*18"	54"	66"	18"
*20"	60"	84"	18"
*24"	60"	102"	18"
* 2 ROWS OF # 6 REBAR REQUIRED			



ELEVATION

NOTES:

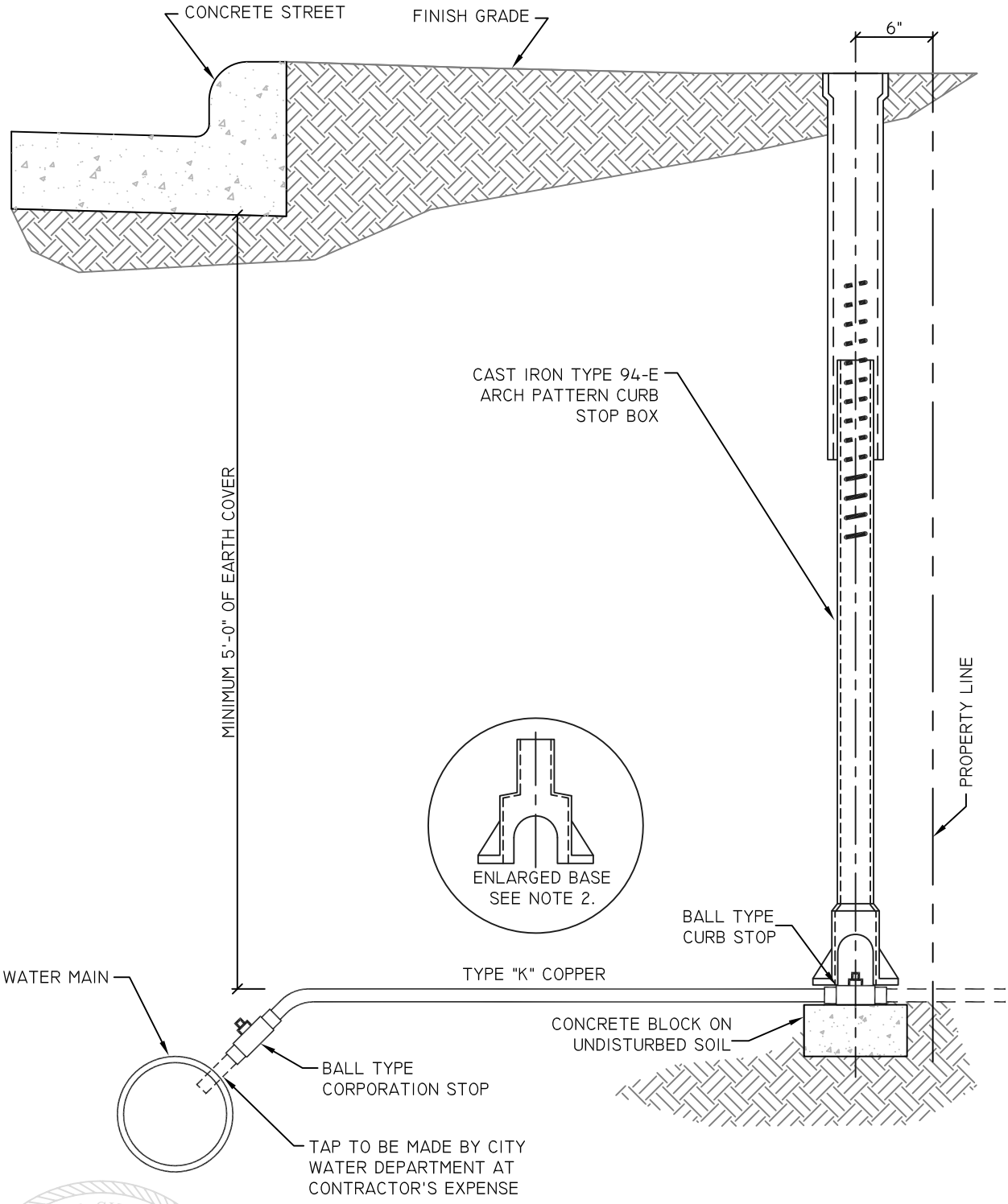
1. GRANULAR BACKFILL SHALL BE PLACED IN 3" TO 6" VERTICAL LIFTS AND COMPACTED BY APRROVED MECHANICAL TAMPING DEVICE. MINIMUM EARTH COVER SHALL BE 5'-0".
2. ALL THRUST BLOCKS TO BE TYPE 47-B MODIFIED POURED CONCRETE AS PER DIVISION II; "CONCRETE PAVING SPECIFICATIONS"; AND DIVISION VI "WATER MAINS".
3. ALL CONCRETE BLOCKING SHALL BE INSTALLED IN SUCH A MANNER THAT ALL PIPE AND FITTING JOINTS ARE ACCESSIBLE.

CITY OF GRAND ISLAND
UTILITIES DEPARTMENT

REVISED: 12/13/2004
DRAWN BY: ZEX
CHECKED BY: T.W.B.

BELL JOINT BLOCK

PLAN 143



NOTES:

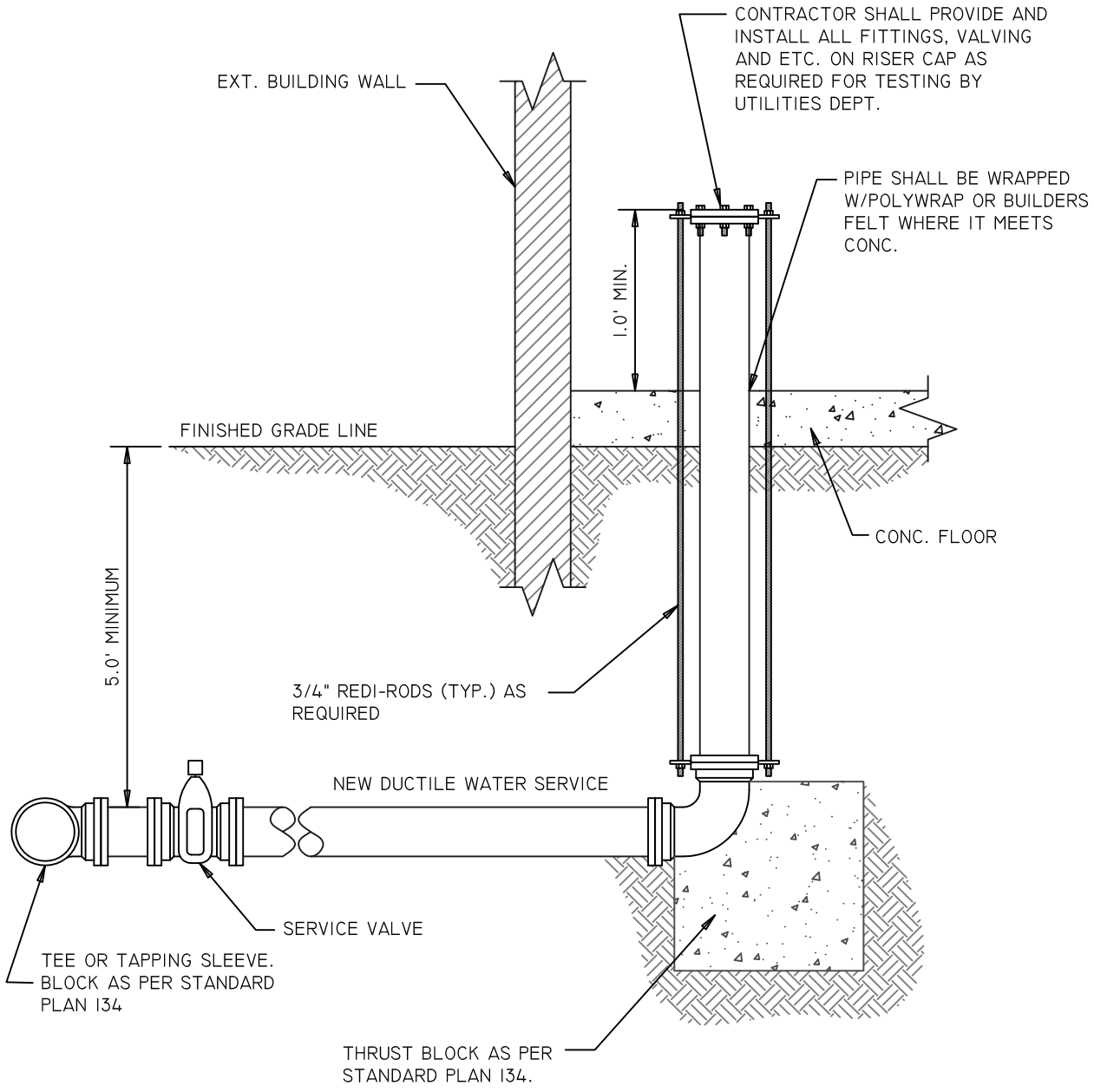
1. A SERVICE SADDLE SHALL BE REQUIRED FOR ALL 1-$\frac{1}{2}$" AND LARGER TAPS ON ALL MAINS REGARDLESS OF PIPE THICKNESS CLASS.
2. USE ADDITIONAL ENLARGED BASE WITH STANDARD 94-E BOX ON ALL 1-$\frac{1}{2}$" AND 2" CURB STOPS.

CITY OF GRAND ISLAND
UTILITIES DEPARTMENT

REVISED: 12/3/2012
DRAWN BY: P.F.G.
CHECKED BY: T.W.B.

1", 1-$\frac{1}{2}$", OR 2" WATER SERVICE LINE

PLAN 152



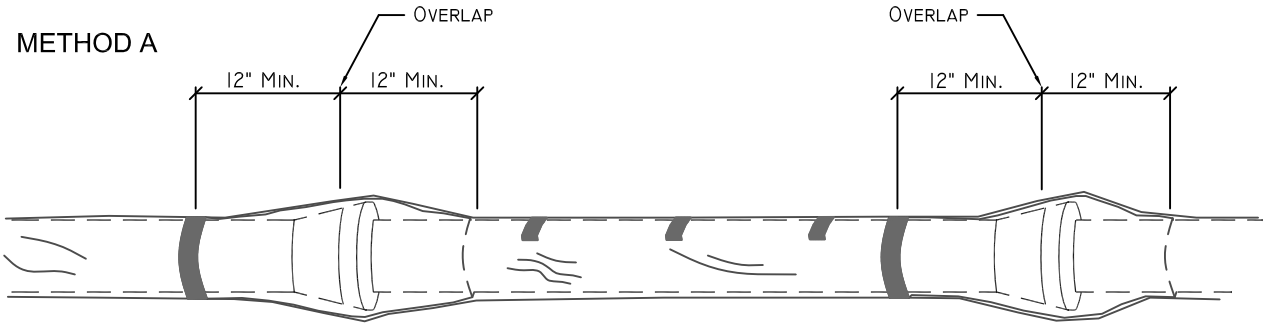
GENERAL NOTES:

1. ALL COMMERCIAL WATER SERVICES LARGER THAN 2" IN DIA. SHALL BE DUCTILE IRON FROM SERVICE VALVE TO METER.

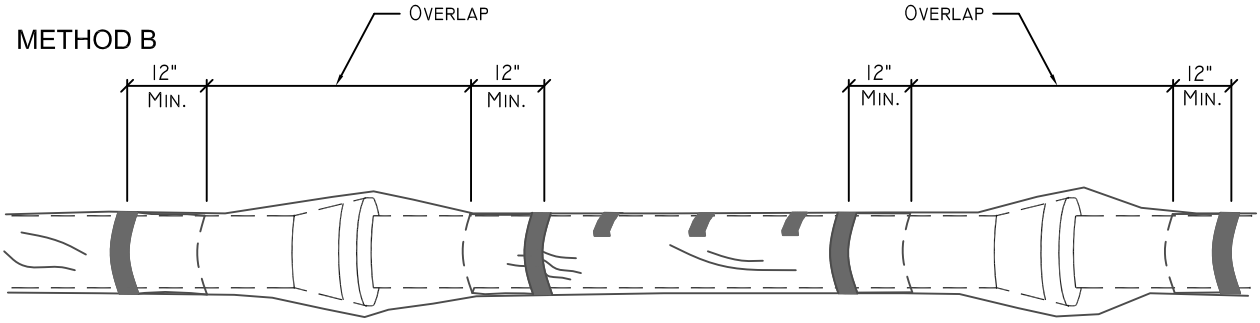
2. DETAILED PLANS FOR NEW AND REPLACEMENT SERVICE LINES SHALL BE PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE "SITE PLAN GUIDELINES FOR PRIVATE DOMESTIC AND PRIVATE FIRE SERVICE MAINS, LARGER THAN 2" DIA." THE WORKING PLANS SHALL BE SUBMITTED FOR REVIEW TO THE AUTHORITY HAVING JURISDICTION BEFORE ANY EQUIPMENT IS INSTALLED OR REMODELED. THE CITY OF GRAND ISLAND UTILITIES DEPARTMENT AND THE CITY OF GRAND ISLAND FIRE DEPARTMENT SHALL BE REFERENCED AS THE AUTHORITY HAVING JURISDICTION (AHJ).

CITY OF GRAND ISLAND UTILITIES DEPARTMENT	REVISED: 5/20/2006 DRAWN BY: P.F.G. CHECKED BY: T.W.B.	SERVICE LINES LARGER THAN 2" DIA.	PLAN 152 2 OF 2

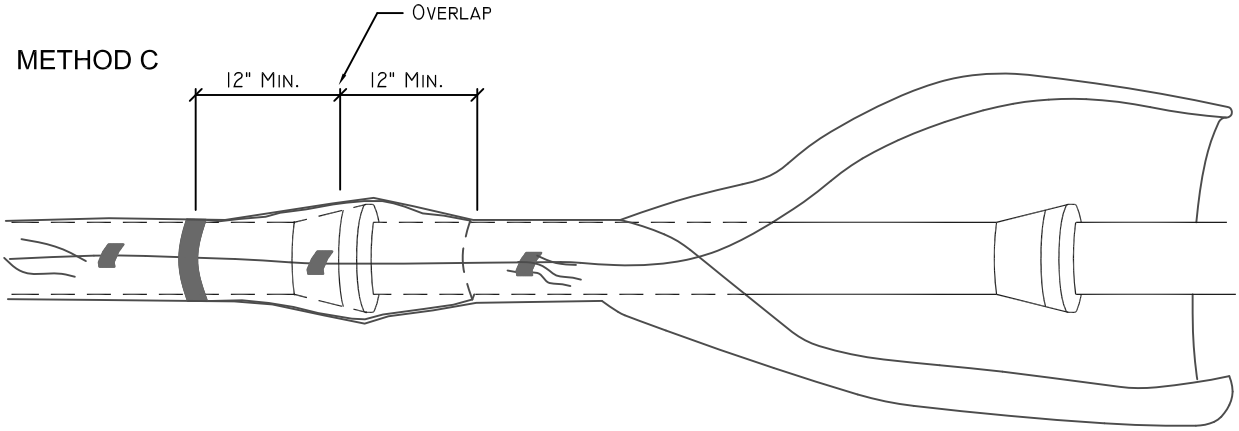
METHOD A



METHOD B



METHOD C



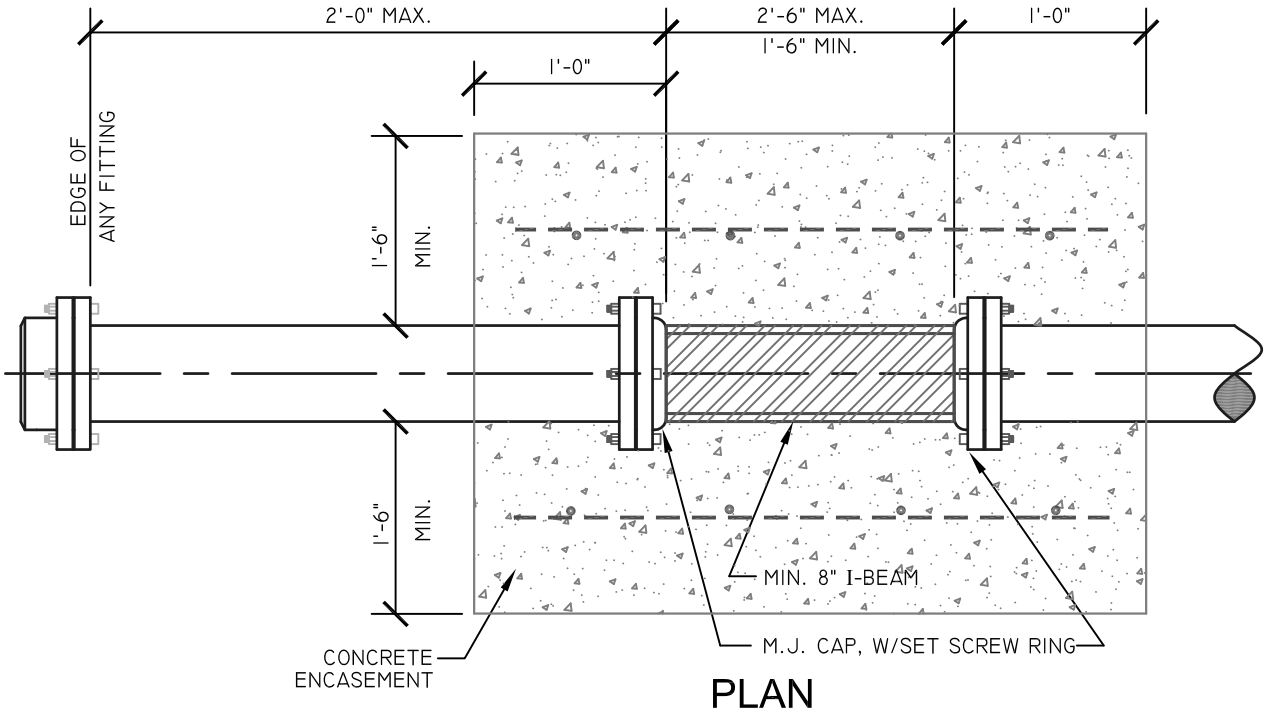
POLYETHYLENE TUBE AND SHEET SIZES NOMINAL THICKNESS OF 0.008 IN. (8 MIL.)		
NOMINAL PIPE DIA. (INCHES)	MIN. POLYETHYLENE WIDTH (INCHES)	
	FLAT TUBE	SHEET
4	16	32
6	20	40
8	24	48
10	27	54
12	30	60
14	34	68
16	37	74
18	41	82
20	45	90
24	54	108
30	67	134
36	81	162

CITY OF GRAND ISLAND
UTILITIES DEPARTMENT

REVISED: 5/22/2002
DRAWN BY: ZEX
CHECKED BY: T.W.B.

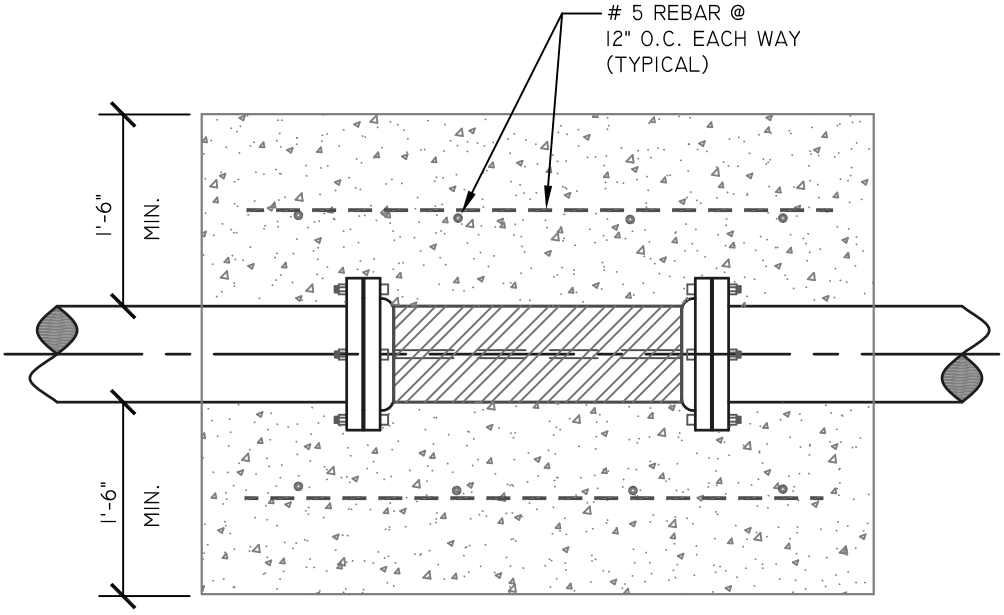
POLYETHLENE ENCASEMENT

PLAN 155



PLAN

NO SCALE



ELEVATION

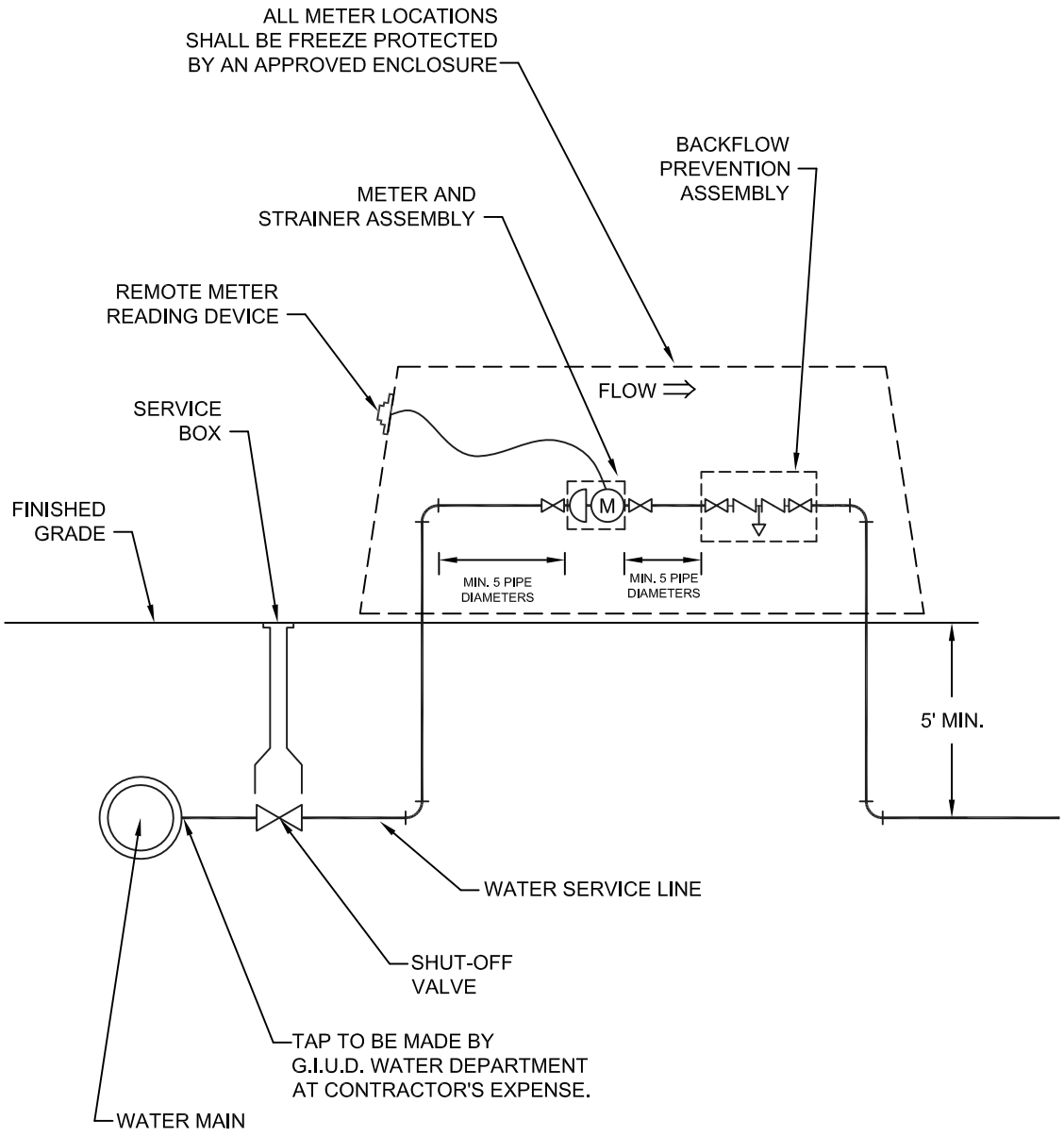
NO SCALE

THIS DOCUMENT WAS ORIGINALLY SEALED AND ISSUED BY LYNN M. MAYHEW E-10661, ON 5/3/2010. THIS MEDIA SHOULD NOT BE CONSIDERED A CERTIFIED DOCUMENT AND SHOULD BE USED FOR REFERENCE ONLY.

GENERAL NOTES

1. ALL THRUST BLOCKS TO BE TYPE 47-B MODIFIED POURED CONCRETE AS PER DIVISION II; "CONCRETE PAVING SPECIFICATIONS"; AND DIVISION VI "WATER MAINS".
2. ALL THRUST BLOCKS ARE TO BE POURED AGAINST UNDISTURBED SOIL.

CITY OF GRAND ISLAND UTILITIES DEPARTMENT	REVISED: 5/22/2002 DRAWN BY: ZEX CHECKED BY: T.W.B.	IN-LINE "I" BEAM BLOCK	PLAN 156



NOTE:
NO ELBOWS, BENDS, NON-CONCENTRIC REDUCERS, CHECK VALVES, BACK FLOW PREVENTERS AND/OR PRESSURE REDUCING DEVICES SHALL BE INSTALLED WITHIN TEN (10) PIPE DIAMETERS UPSTREAM OR FIVE (5) PIPE DIAMETERS DOWNSTREAM OF THE METER SET.

BUTTERFLY VALVES SHALL NOT BE INSTALLED WITHIN FIVE (5) PIPE DIAMETERS UPSTREAM OR THREE (3) PIPE DIAMETERS DOWNSTREAM OF THE METER SET.

FULL PORT BALL VALVES OR GATE VALVES MAY BE INSTALLED IMMEDIATELY UPSTREAM OF THE METER SET, PROVIDED THEY ARE FULLY OPENED AND NOT USED TO THROTTLE FLOW RATES THROUGH THE METER.

CITY OF GRAND ISLAND UTILITIES DEPARTMENT	REVISED: 9/06/2002 DRAWN BY: K.J.M. CHECKED BY: T.W.B.	OUTSIDE INSTALLATION FOR WATER METER AND BACKFLOW PREVENTER	PLAN 157

CITY OF GRAND ISLAND
UTILITIES DEPARTMENT

REVISED:
DRAWN BY: P.F.G. 1/23/2007
CHECKED BY: T.W.B.

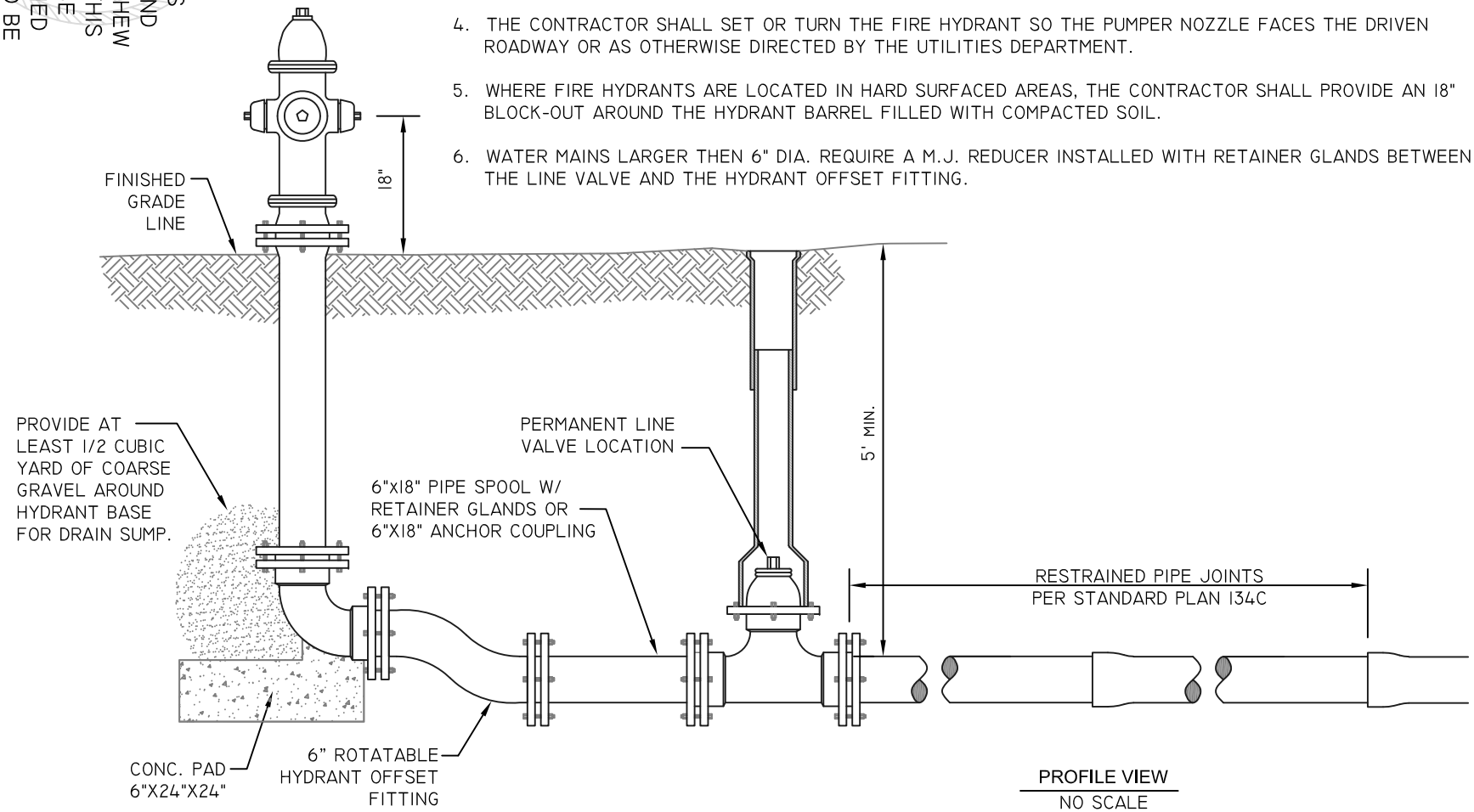
FIRE HYDRANT ON DEAD END W/ RESTRAINED JOINTS

PLAN 158

THIS DOCUMENT WAS ORIGINALLY SEALED AND ISSUED BY LYNN M. MAYHEW E-10661, ON 5/3/2010. THIS MEDIA SHOULD NOT BE CONSIDERED A CERTIFIED DOCUMENT AND SHOULD BE USED FOR REFERENCE ONLY.

NOTES:

1. PUSH-ON PIPE BELLS SHALL BE RESTRAINED USING STAINLESS STEEL WEDGE FASTENERS VULCANIZED INTO THE PIPE GASKETS: I.E., FAST-GRIP®; FIELD LOK 350®; OR APPROVED EQUAL GASKETS.
2. RETRAINER GLANDS SHALL BE GRADE 65-45-12, DUCTILE IRON, PER A.S.T.M. A536 WITH A WEDGE STYLE DESIGN AND TORQUE LIMITING BOLT HEADS. GLANDS SHALL BE ROMAGRIP®, MEGALUG SERIES 1100®, OR APPROVED EQUAL.
3. HYDRANT OFFSET FITTINGS SHALL BE DUCTILE IRON, MECHANICAL JOINT, WITH SWIVEL ENDS, AND WITH A PRESSURE RATING OF 350 PSI.
4. THE CONTRACTOR SHALL SET OR TURN THE FIRE HYDRANT SO THE PUMPER NOZZLE FACES THE DRIVEN ROADWAY OR AS OTHERWISE DIRECTED BY THE UTILITIES DEPARTMENT.
5. WHERE FIRE HYDRANTS ARE LOCATED IN HARD SURFACED AREAS, THE CONTRACTOR SHALL PROVIDE AN 18" BLOCK-OUT AROUND THE HYDRANT BARREL FILLED WITH COMPACTED SOIL.
6. WATER MAINS LARGER THEN 6" DIA. REQUIRE A M.J. REDUCER INSTALLED WITH RETAINER GLANDS BETWEEN THE LINE VALVE AND THE HYDRANT OFFSET FITTING.



PROFILE VIEW
NO SCALE

NOTES :

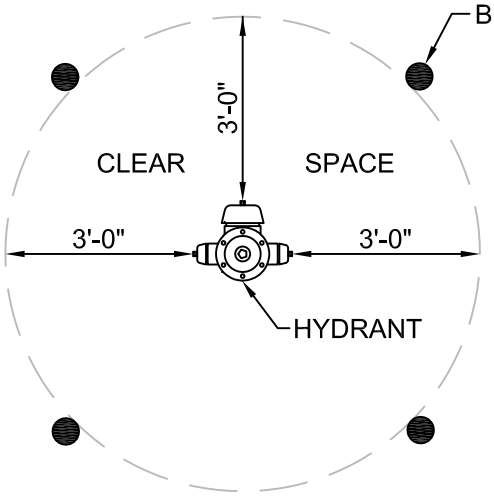
1. ALL THRUST BLOCKS TO BE TYPE 47-B MODIFIED POURED CONCRETE AS PER DIVISION II; "CONCRETE PAVING SPECIFICATIONS"; AND DIVISION VI "WATER MAINS".
2. ALL CONCRETE BLOCKING SHALL BE INSTALLED IN SUCH A MANNER THAT ALL PIPE AND FITTING JOINTS ARE ACCESSIBLE.
3. ALL FITTINGS ARE TO BE WRAPPED IN 8 MIL POLYETHYLENE.
4. ALL THRUST BLOCKS ARE TO BE POURED AGAINST UNDISTURBED SOIL.
5. THE CONTRACTOR SHALL SET OR TURN ALL FIRE HYDRANTS SO THE PUMPER NOZZLE FACES THE DRIVEN ROADWAY OR AS OTHERWISE DIRECTED BY THE UTILITIES DEPARTMENT.
6. WHERE FIRE HYDRANTS ARE LOCATED IN HARD SURFACED AREAS, THE CONTRACTOR SHALL PROVIDE AN 18" BLOCK-OUT AROUND THE HYDRANT BARREL FILLED WITH COMPACTED SOIL.
7. WATER MAINS LARGER THAN 6" DIA. REQUIRE A M.J. REDUCER INSTALLED AFTER THE FULL LENGTH OF PIPE.
8. IF HYDRANT EXTENSIONS ARE REQUIRED, THEY SHALL BE SUPPLIED BY THE CONTRACTOR AND INSTALLED BY THE CITY WATER DEPT. AT THE CONTRACTOR'S EXPENSE. THE METHOD OF ADJ. SHALL HAVE PRIOR APPROVAL OF THE UTILITIES DEPT. AS PER DIVISION VI "WATER MAINS" - SECTION 32.19.

CITY OF GRAND ISLAND
UTILITIES DEPARTMENT

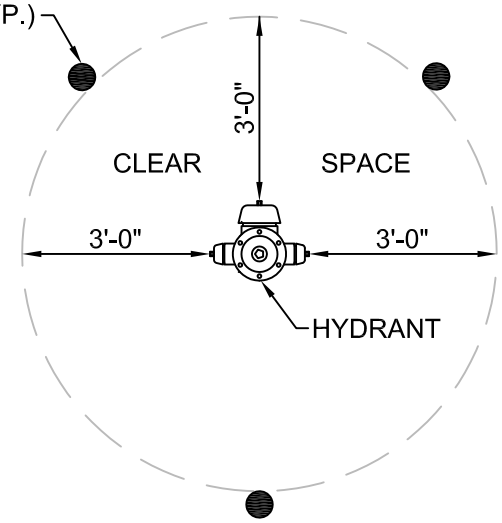
REVISED: 1/23/2007
DRAWN BY: P.F.G.
CHECKED BY: T.W.B.

FIRE HYDRANT ON DEAD END W/ CONC. BLOCKING

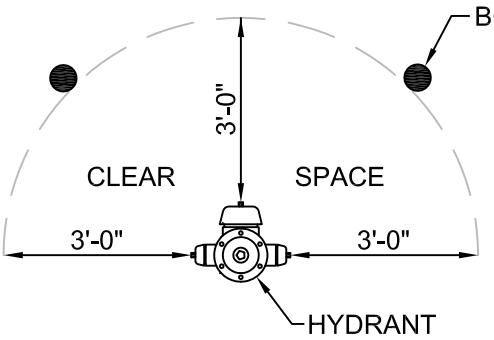
PLAN 159



FIRE HYDRANT BOLLARD PROTECTION- TYPE C



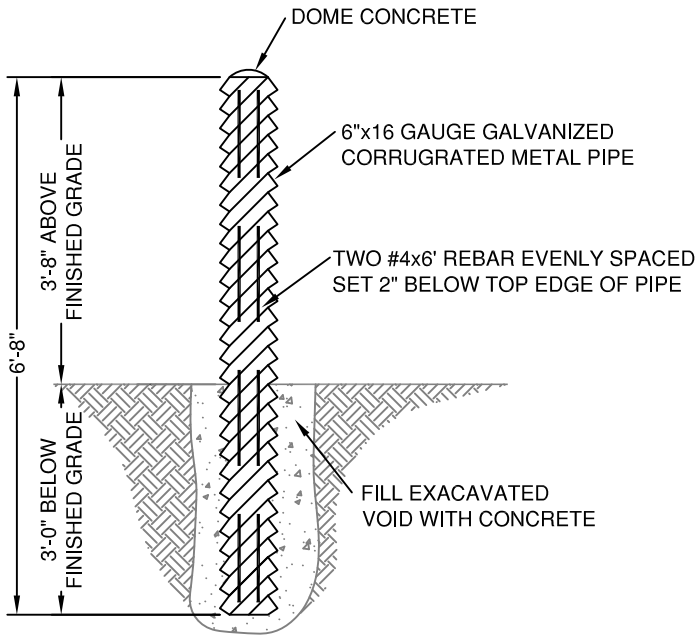
FIRE HYDRANT BOLLARD PROTECTION- TYPE B



FIRE HYDRANT BOLLARD PROTECTION- TYPE A

NOTE:
PROTECTIVE BOLLARDS SHALL BE PLACED SO THERE IS NO INTERFERENCE WITH THE OPERATION OF THE FIRE HYDRANT OR IT'S AUXILARY VALVE.

TYPE 47-B CONCRETE REQUIRED
VOLUME-1.4 CU. FT.
FILLED WT.-APPROX. 235 LBS. EA.



FIRE HYDRANT BOLLARD DETAIL

THIS DOCUMENT WAS ORIGINALLY SEALED AND ISSUED BY LYNN M. MAYHEW E-10661, ON 2/04/2013. THIS MEDIA SHOULD NOT BE CONSIDERED A CERTIFIED DOCUMENT AND SHOULD BE USED FOR REFERENCE ONLY.

CITY OF GRAND ISLAND UTILITIES DEPARTMENT	DATE: 4/9/2012 DRAWN BY: K.J.M. CHECKED BY: T.W.B.	FIRE HYDRANT BOLLARD PROTECTION	PLAN 160