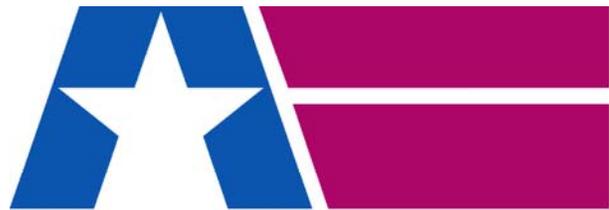
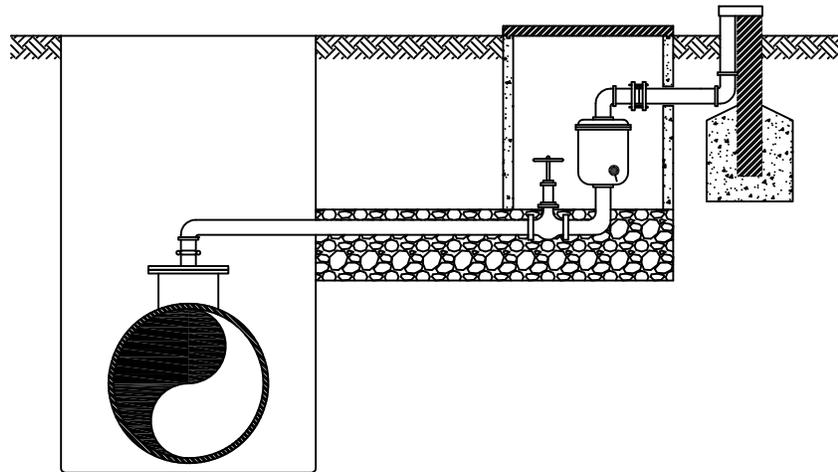


STANDARD CONSTRUCTION DETAILS

WATER

REVISED - OCTOBER 2015



CITY OF ALLEN

DEPARTMENT OF ENGINEERING

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GENERAL NOTES

POLYVINYL CHLORIDE (P.V.C.) WATER PIPE

1. UNPLASTICIZED POLYVINYL CHLORIDE (P.V.C.) WATER PIPE SHALL MEET OR EXCEED REQUIREMENTS OF AWWA C900. P.V.C. PIPE WITH CAST IRON OUTSIDE DIMENSIONS, PIPE SHALL BE LISTED BY UNDERWRITERS LABORATORIES AND SHALL BE APPROVED FOR USE IN CITIES AND TOWNS OF THE STATE OF TEXAS BY THE STATE BOARD INSURANCE.
2. P.V.C. WATER PIPE SHALL BE FURNISHED WITH A LOCKED-IN OR DUAL-DUROMETER RUBBER RING AT EACH JOINT AND AN INTEGRAL THICKENED BELL AS A PART OF EACH JOINT. THE PIPE CLASS SHALL BE A MINIMUM CLASS DR 14 FOR 6" PIPE AND CLASS 150 DR 18 FOR 8" AND LARGER PIPE. LAYING LENGTHS SHALL BE ±20 FEET. PIPE AND FITTINGS MUST BE ASSEMBLED WITH NON TOXIC LUBRICANT.
3. ALL FIRE MAINS SHALL BE CLASS DR14.
4. FITTINGS FOR P.V.C. WATER PIPE SHALL BE GRAY IRON OR DUCTILE IRON OF MECHANICAL JOINT TYPE AND SHALL BE CLASS 250 IN ACCORDANCE WITH AWWA C110-77 (ANSI A21 10).
5. UNLESS OTHERWISE SPECIFIED ON PLANS OR SHOWN IN PROFILES, P.V.C. WATER PIPE SHALL BE INSTALLED TO CLEAR ALL UTILITY LINES.
6. DOUBLE STRAPPED BRONZE SADDLES SHALL BE USED FOR MAKING 2" OR SMALLER TAPS.

SPECIFICATIONS FOR WATER PIPE

1. ALL WATER LINES SHALL BE AS SPECIFIED IN THE STANDARD SPECIFICATIONS AND SPECIAL PROVISIONS.
2. ALL CAST IRON FITTINGS SHALL BE MECHANICAL JOINT FOR D.I. PIPE .
OR MECHANICAL JOINT FOR P.V.C. WATER PIPE.
3. ALL WATER MAINS SHALL HAVE THE FOLLOWING MINIMUM COVER OR SUFFICIENT COVER TO CLEAR OTHER UTILITIES.
6" AND SMALLER = 42"
8" = 48"
10" AND 12" = 54" TO 60"
4. REMOVE ALL BLEEDER LINES UPON COMPLETION OT TESTING.
5. ALL WATER MAINS SHALL BE PURGED BY THE "POLY PIG" METHOD.
6. ALL DUCTILE IRON OR CAST IRON PIPE AND OR FITTINGS SHALL BE POLLY-WRAPPED.
7. WHERE CONFLICTS OCCUR WARP WATER LINE AROUND INLETS TO OBTAIN 1' MIN. CLEARANCE.
8. WATERLINES SHALL BE TESTED BOTH BACTERIOLOGICALLY AND HYDROSTATICALLY. WATER TO CHARGE AND BLEED THE LINES SHALL BE METERED BY THE CONTRACTOR AT HIS EXPENSE, SO AS TO ACCURATELY DOCUMENT WATER USED.



CITY OF ALLEN
DEPARTMENT OF ENGINEERING

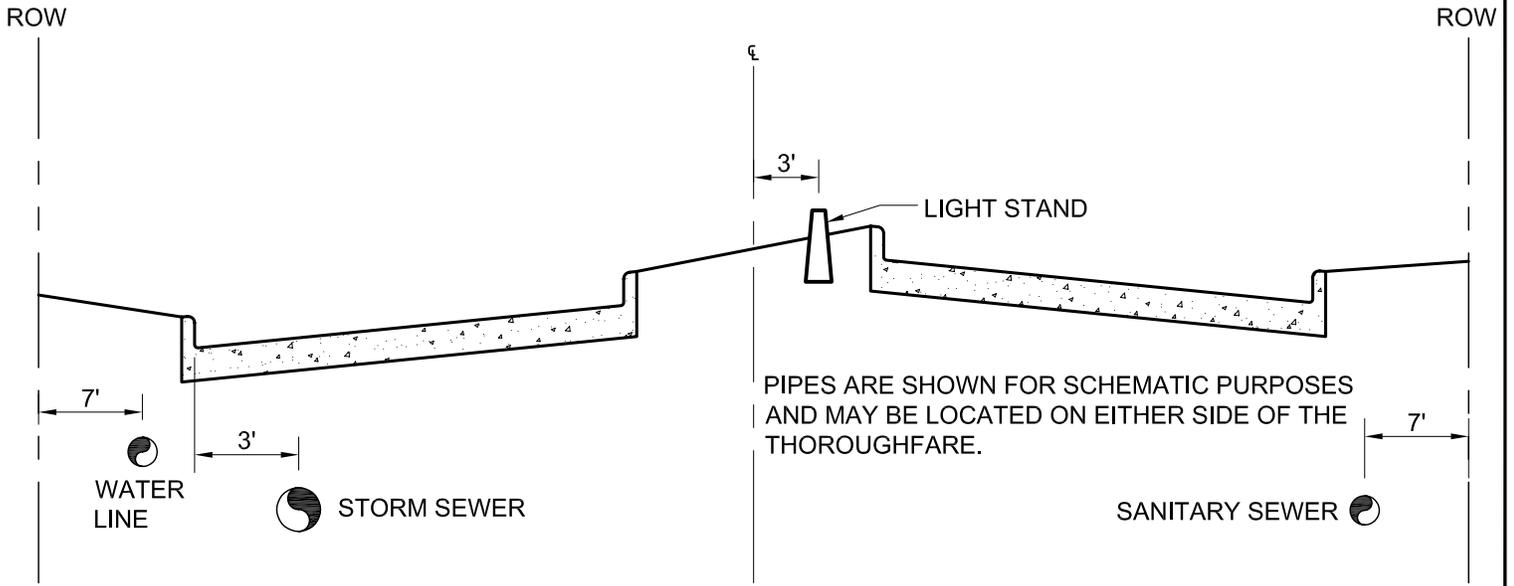
GENERAL NOTES

STANDARD CONSTRUCTION DETAILS
WATER

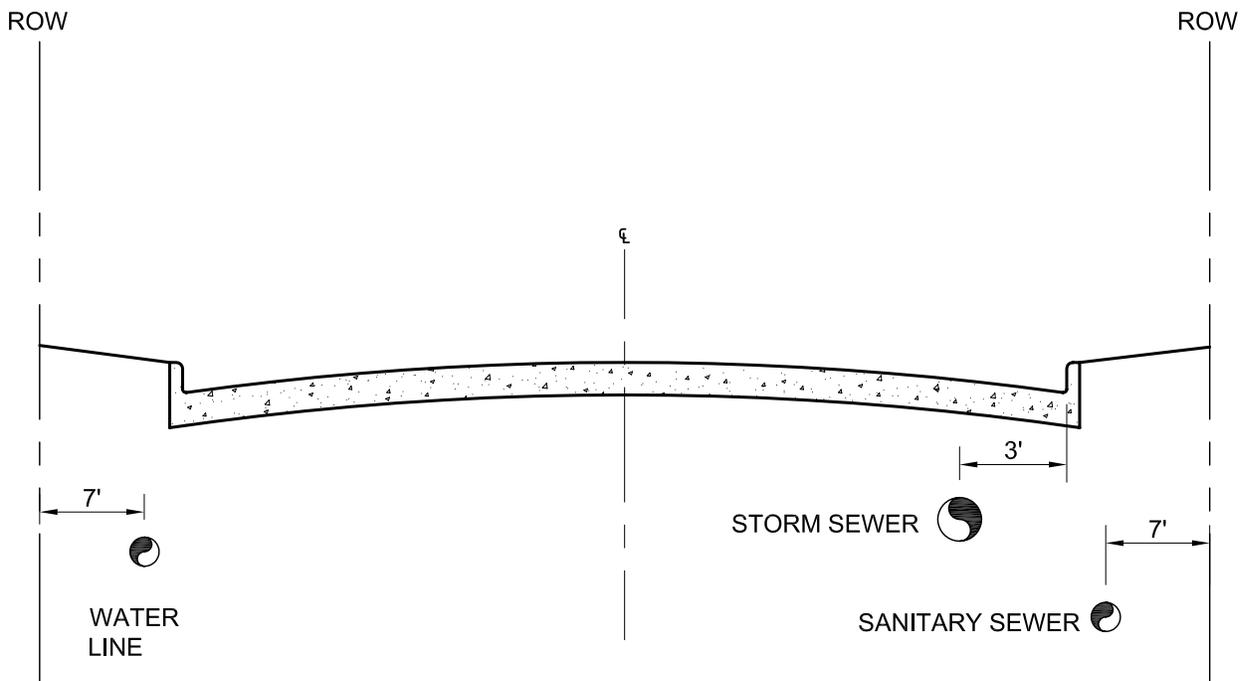
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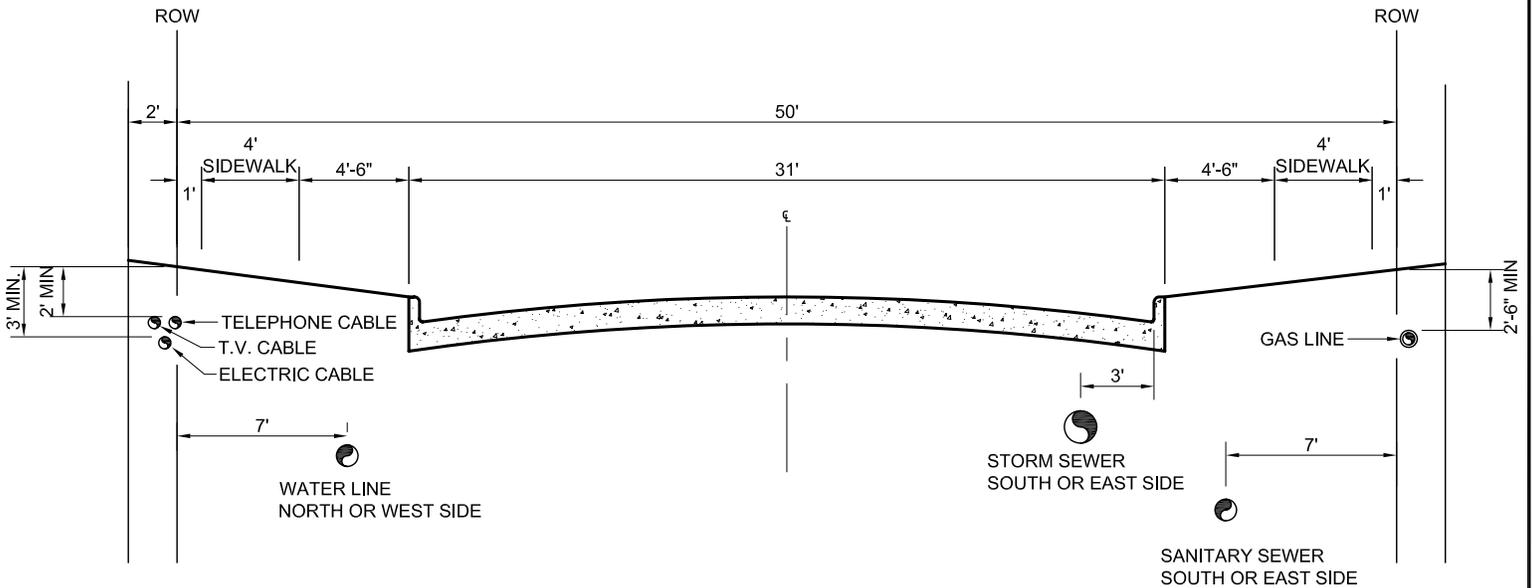
SHEET :
SD-W01



TYPICAL LOCATION UTILITIES STRAIGHT CROWN STREETS



TYPICAL LOCATION UTILITIES PARABOLIC CROWN STREETS



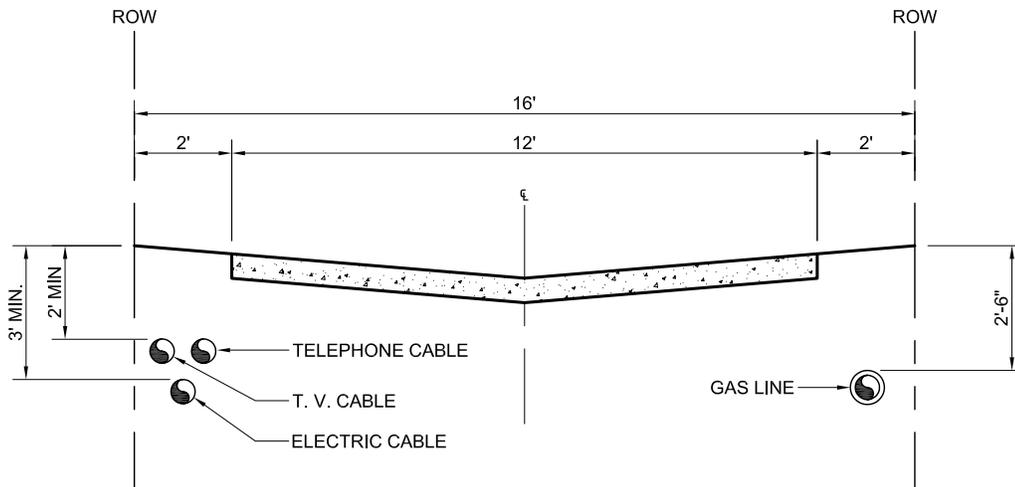
**PARABOLIC CROWN STREET
WITH NO ALLEYS**

NOTE :

T.V. CABLE
ELECTRIC CABLE
TELEPHONE CABLE
SOUTH OR WEST SIDE

NOTE :

GAS LINE
NORTH OR EAST SIDE



ALLEY (TYPICAL)



CITY OF ALLEN
DEPARTMENT OF ENGINEERING

TYPICAL LOCATION UTILITIES

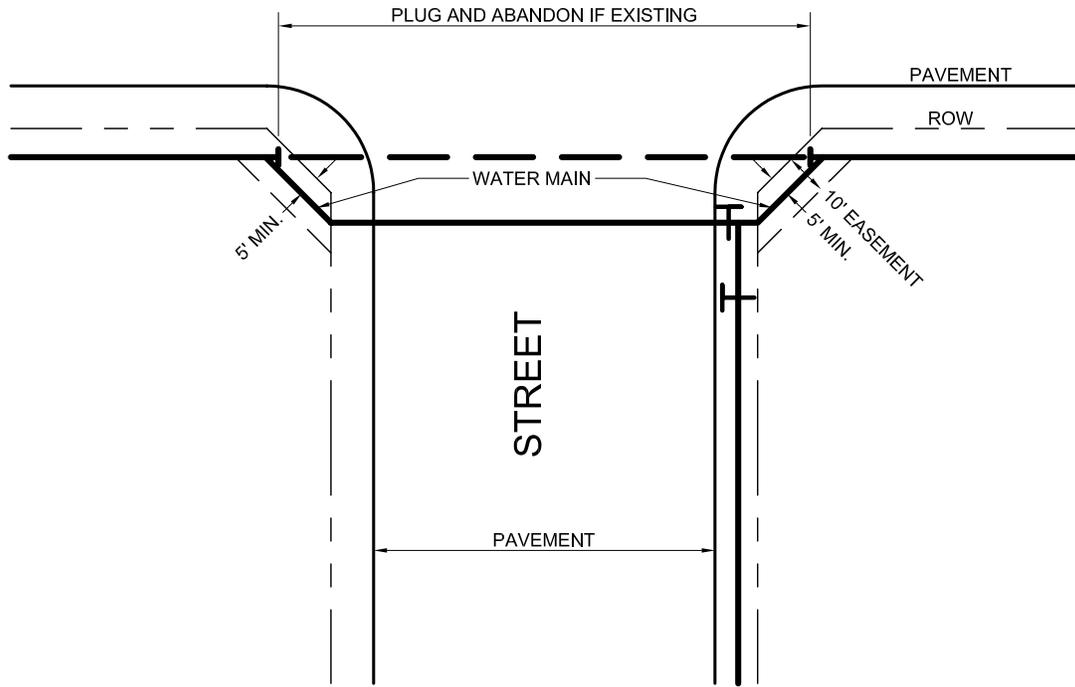
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WATER

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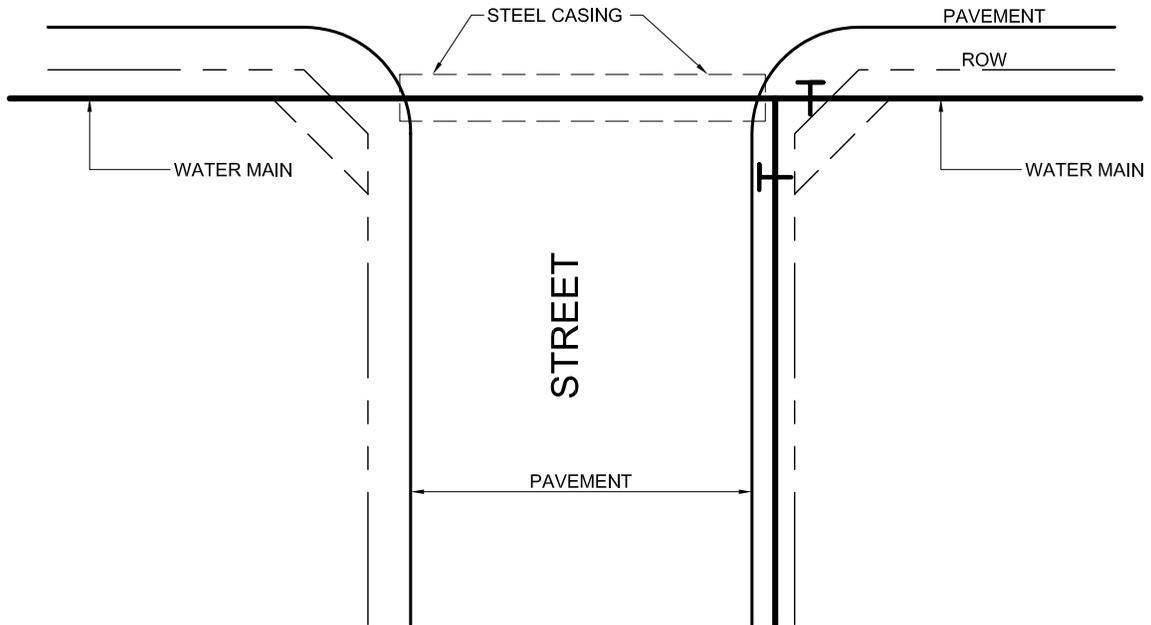
REV DATE:
AUG. 2006

SHEET :
SD-W03

HIGHWAY



ALTERNATIVE



TYPICAL LOCATION OF WATER MAIN AT HIGHWAY



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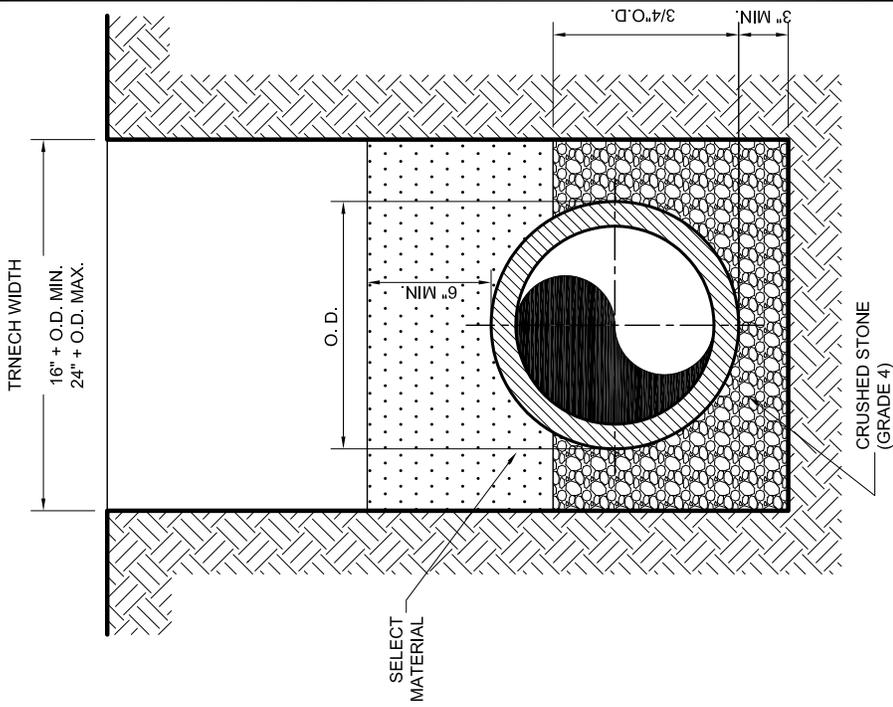
TYPICAL LOCATION OF WATER MAIN AT HIGHWAY

STANDARD CONSTRUCTION DETAILS
WATER

DATE:
MAY 1991

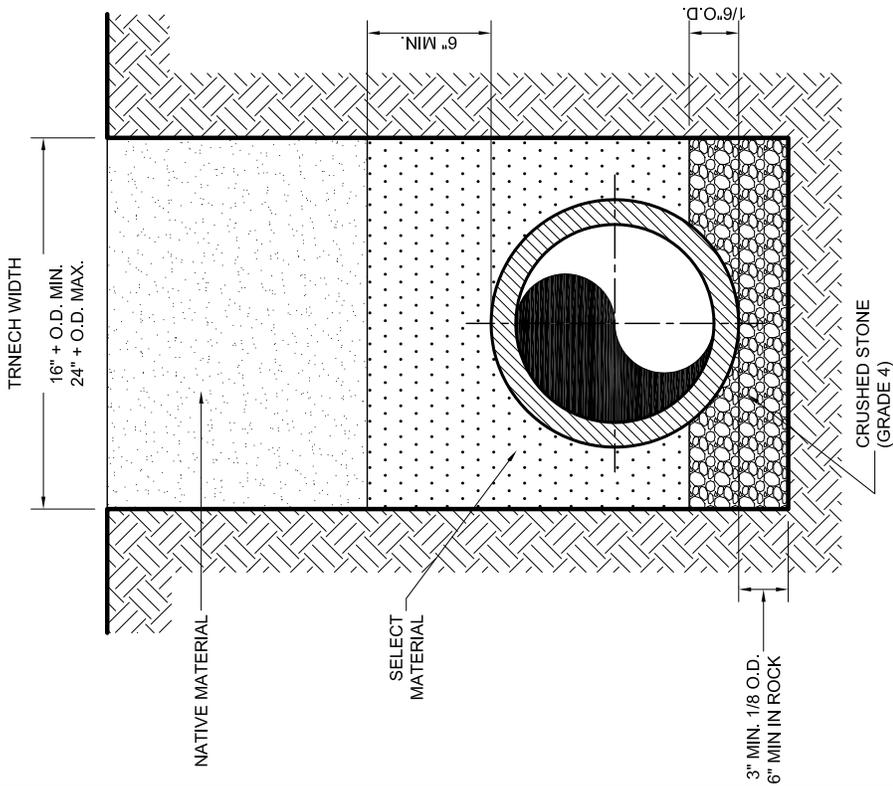
REV DATE:
AUG. 2006

SHEET :
SD-W04



CLASS "B-1" EMBEDMENT

TYPICAL BACKFILL WATER MAIN
P.V.C. WATER PIPE



CLASS "C" EMBEDMENT

TYPICAL BACKFILL WATER MAIN
DUCTILE IRON OR RCCP

CRUSHED STONE SHALL BE 3/4", PASSING # 4 SIEVE



CITY OF ALLEN
DEPARTMENT OF ENGINEERING

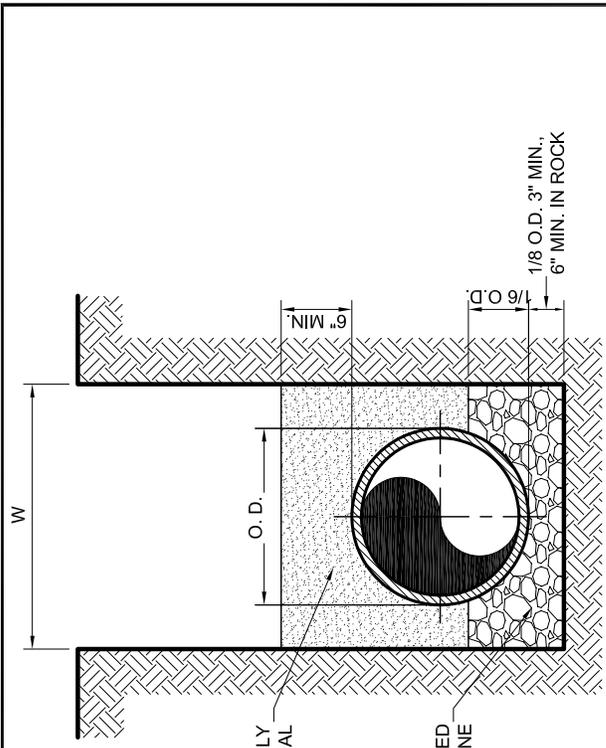
WATER MAIN BACKFILL

STANDARD CONSTRUCTION DETAILS
WATER

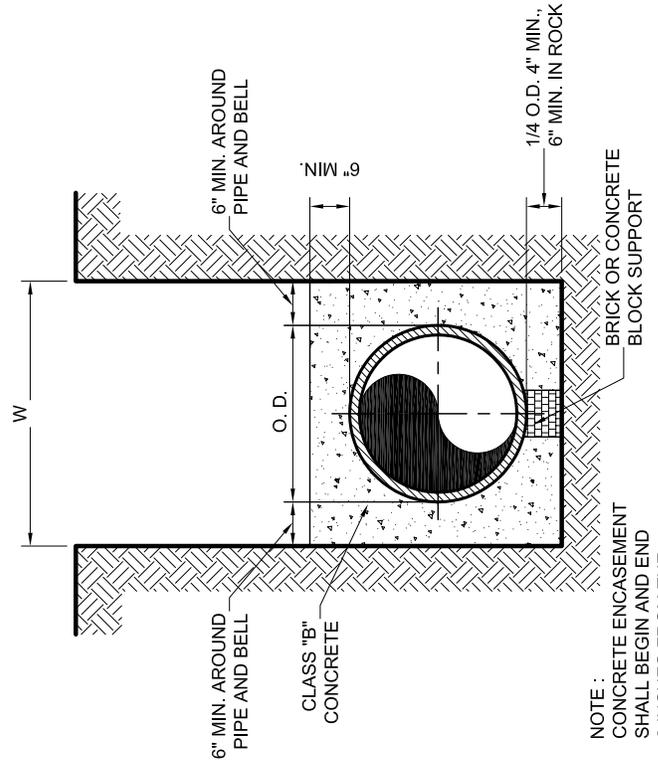
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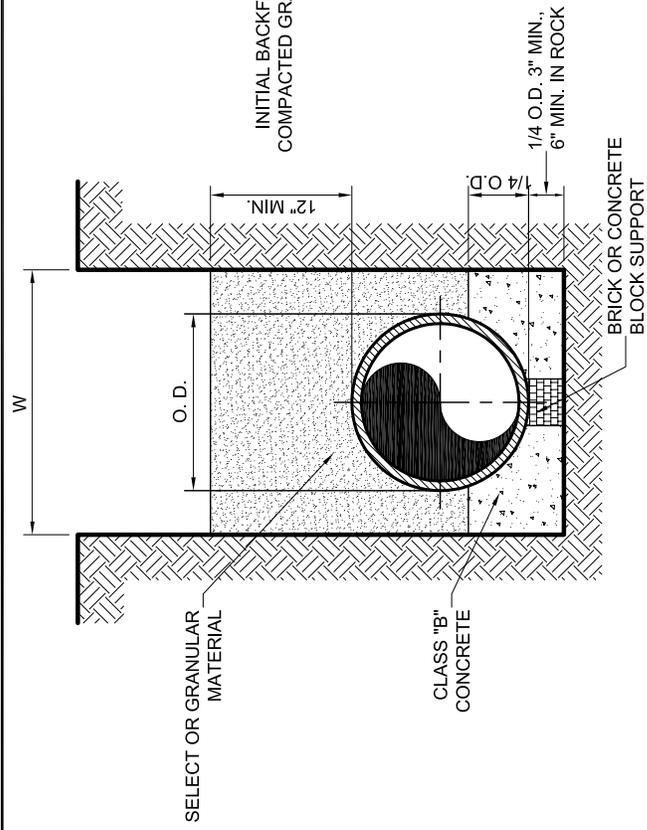
SHEET :
SD-W05



CLASS "C" EMBEDMENT



CLASS "G" EMBEDMENT



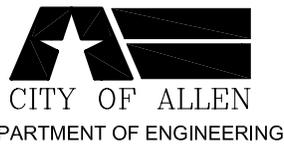
**CONCRETE CRADLE
CLASS "A" EMBEDMENT**

TABLE OF QUANTITIES OF MATERIAL IN CUBIC YARDS PER 100 LINEAR FEET

INSIDE DIAMETER OF PIPE	OUTSIDE DIAMETER OF PIPE	TRENCH WIDTH IN IN.	TRENCH WIDTH IN FEET	CONCRETE		CRUSHED STONE CLASS "G" EMBED.
				CLASS "A" EMBED.	CLASS "G" EMBED.	
REINFORCED CONCRETE CYLINDER PIPE						
14"	17.25"	34"	2.83	6.37	10.59	4.48
16"	19.38"	36"	3.00	7.49	12.26	4.94
18"	21.78"	38"	3.17	8.77	14.33	5.43
20"	23.78"	40"	3.33	10.00	16.14	5.91
24"	27.75"	44"	3.67	12.66	20.02	7.46

$W = 16" + O.D. MIN.$
 $24" + O.D. MAX.$

NOTE :
ALL COMPACTION SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS AND / OR SPECIAL PROVISIONS.



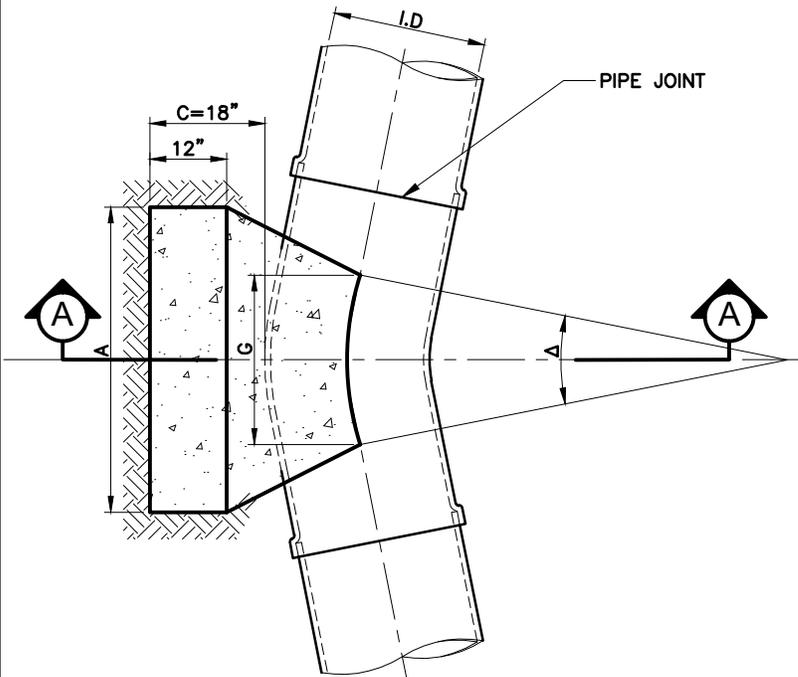
EMBEDMENT DETAILS

STANDARD CONSTRUCTION DETAILS
WATER

DATE:
MAY 1991

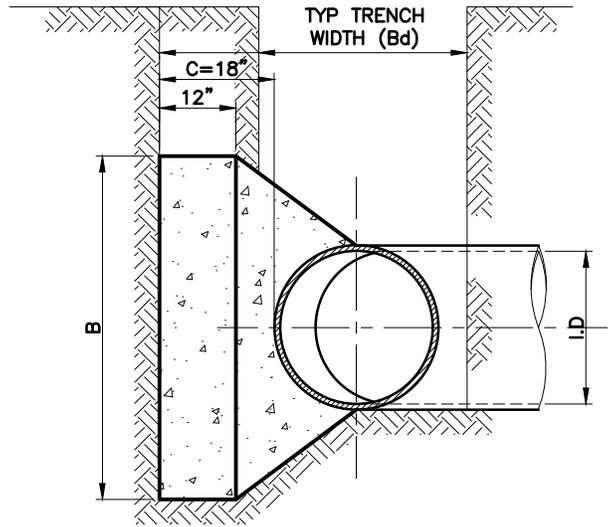
REV DATE:
AUG. 2006

SHEET :
SD-W06



PLAN VIEW

SCALE N.T.S.



SECTION A

SCALE N.T.S.

- NOTE : 1. REFER TO NCTCOG TABLE FOR PIPE DIAMETER OVER 36"
 2. CONCRETE MINIMUM STRENGTH 3000 PSI.
 3. 1-80 LBS BAG OF QUIKRETE = 0.02 CY.

I.D. (IN.)	$\Delta = 11.25^\circ$							
	G (FT.)	THRUST (TONS)	EARTH			ROCK		
			A (FT.)	B (FT.)	VOL. (C.Y.)	A (FT.)	B (FT.)	VOL. (C.Y.)
4,6,8	0.4	1.0	1.0	1.5	0.1	1.0	1.0	0.1
10,12	0.6	2.2	1.5	1.5	0.1	1.0	1.5	0.1
16,18	0.8	5.0	2.0	2.5	0.3	1.5	2.0	0.2
20	0.9	6.2	2.0	3.5	0.4	1.5	3.0	0.3
24	1.1	8.9	3.0	3.5	0.5	1.5	3.0	0.3
30	1.4	10.4	3.0	3.5	0.6	2.0	3.5	0.4
36	1.7	15.0	3.5	4.5	0.9	2.0	4.0	0.5

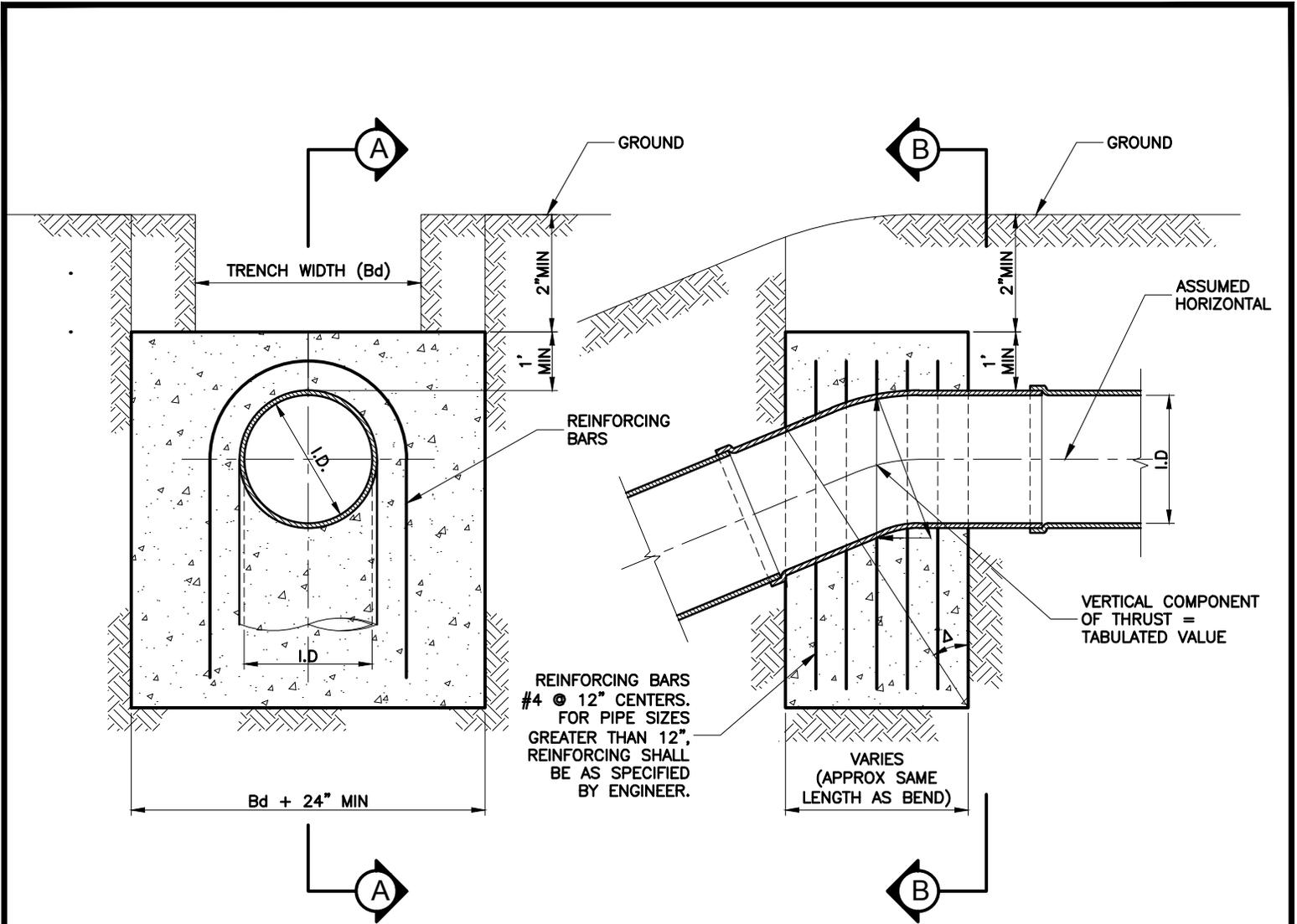
I.D. (IN.)	$\Delta = 22.50^\circ$							
	G (FT.)	THRUST (TONS)	EARTH			ROCK		
			A (FT.)	B (FT.)	VOL. (C.Y.)	A (FT.)	B (FT.)	VOL. (C.Y.)
4,6,8	0.8	2.0	1.5	1.5	0.1	1.0	1.0	0.1
10,12	1.1	4.4	2.0	2.5	0.3	1.5	1.5	0.1
16,18	1.6	9.9	3.0	3.5	0.6	2.0	2.5	0.3
20	1.8	12.3	3.5	3.5	0.7	2.0	3.0	0.4
24	2.2	17.7	4.0	4.5	1.0	3.0	3.5	0.5
30	2.7	20.7	5.0	4.5	1.5	3.0	4.0	0.8
36	3.3	29.8	5.5	5.5	2.3	4.0	4.0	1.3

I.D. (IN.)	$\Delta = 30^\circ$							
	G (FT.)	THRUST (TONS)	EARTH			ROCK		
			A (FT.)	B (FT.)	VOL. (C.Y.)	A (FT.)	B (FT.)	VOL. (C.Y.)
4,6,8	1.0	2.6	2.0	1.5	0.2	1.0	1.5	0.1
10,12	1.5	5.9	2.5	2.5	0.3	2.0	1.5	0.2
16,18	2.2	13.2	3.5	4.0	0.8	2.5	3.0	0.4
20	2.4	16.3	4.5	4.0	1.0	3.0	3.0	0.5
24	2.9	23.4	6.0	4.0	1.4	3.5	3.5	0.7
30	3.6	27.5	6.5	5.0	1.9	3.5	4.0	0.9
36	4.4	39.5	7.0	6.0	3.4	4.5	4.5	1.6

I.D. (IN.)	$\Delta = 45^\circ$							
	G (FT.)	THRUST (TONS)	EARTH			ROCK		
			A (FT.)	B (FT.)	VOL. (C.Y.)	A (FT.)	B (FT.)	VOL. (C.Y.)
4,6,8	1.5	3.9	2.0	2.0	0.2	1.5	1.5	0.1
10,12	2.2	8.7	3.5	2.5	0.5	2.0	2.5	0.3
16,18	3.2	19.5	4.5	4.5	1.2	3.0	3.5	0.6
20	3.6	24.1	5.5	4.5	1.5	3.5	3.5	0.7
24	4.3	34.6	8.0	4.5	2.3	4.5	4.0	1.1
30	5.4	40.6	8.5	5.0	3.2	5.5	4.0	1.6
36	6.5	58.5	10.0	6.0	5.3	6.5	4.5	2.6

I.D. (IN.)	$\Delta = 67.50^\circ$							
	G (FT.)	THRUST (TONS)	EARTH			ROCK		
			A (FT.)	B (FT.)	VOL. (C.Y.)	A (FT.)	B (FT.)	VOL. (C.Y.)
4,6,8	2.1	5.6	3.0	2.0	0.3	2.0	1.5	0.2
10,12	3.1	12.6	5.5	2.5	0.8	3.5	2.0	0.4
16,18	4.7	28.3	7.5	4.0	1.9	5.5	3.0	0.9
20	5.2	34.9	9.0	4.0	2.3	5.5	3.5	1.2
24	6.2	50.3	11.5	4.5	3.5	6.5	4.0	1.6
30	7.8	58.9	12.0	5.0	4.8	7.5	4.0	2.2
36	9.4	84.9	14.5	6.0	8.2	9.5	4.5	3.8

I.D. (IN.)	$\Delta = 90^\circ$							
	G (FT.)	THRUST (TONS)	EARTH			ROCK		
			A (FT.)	B (FT.)	VOL. (C.Y.)	A (FT.)	B (FT.)	VOL. (C.Y.)
4,6,8	2.7	7.1	5.0	1.5	0.4	2.0	2.0	0.2
10,12	4.0	16.0	6.5	2.5	1.0	3.5	2.5	0.5
16,18	6.0	36.0	9.0	4.0	2.4	4.5	4.0	1.0
20	6.6	44.4	10.0	4.5	3.1	6.0	4.0	1.5
24	7.9	64.0	14.5	4.5	5.0	8.0	4.0	2.1
30	9.9	75.0	15.0	5.0	6.7	10.0	4.0	3.3
36	11.9	108.0	18.0	6.0	11.4	12.0	4.5	5.3

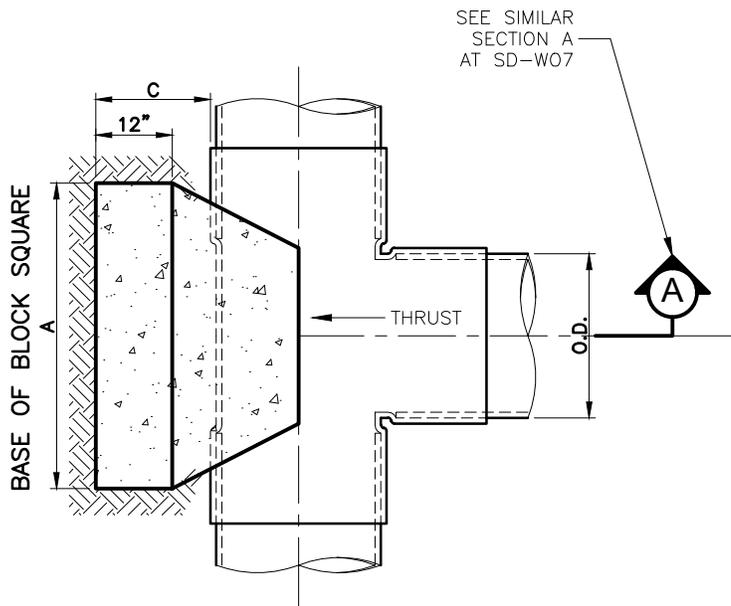


ELEVATION "B-B"
SCALE N.T.S.

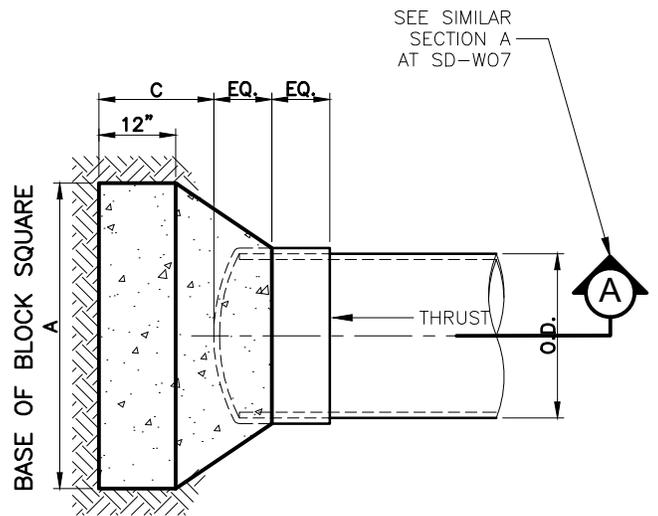
SECTION "A-A"
SCALE N.T.S.

Δ	11.25°		22.50°		30°		45°		67.50°		90°	
I.D. (IN.)	THRUST (TONS)	VOL. (C.Y.)										
4,6,8	1.0	0.5	2.0	1.0	2.5	1.3	3.6	1.8	4.6	2.3	5.0	2.5
10,12	2.2	1.1	4.3	2.2	5.7	2.8	8.0	4.0	10.5	5.2	11.3	5.7
16,18	5.0	2.5	9.7	4.9	12.7	6.4	18.0	9.0	23.5	11.8	25.5	12.7
20	6.1	3.1	12.0	6.0	15.7	7.9	22.2	11.1	29.2	14.5	31.4	15.7
24	8.2	4.4	17.3	8.7	22.6	11.3	32.0	16.0	41.8	20.9	45.2	22.6
30	10.5	5.2	20.3	10.1	26.5	13.3	37.5	18.8	49.0	24.5	53.1	26.5
36	14.9	7.5	29.2	14.6	38.2	19.1	54.0	27.0	70.5	35.3	76.4	38.2

- NOTE : 1. REFER TO NCTCOG TABLE FOR PIPE DIAMETER OVER 36".
 2. CONCRETE MINIMUM STRENGTH 3000 PSI.
 3. 1-80 LBS BAG OF QUIKRETE = 0.02 CY.



PLAN OF TEE THRUST BLOCK
SCALE N.T.S.

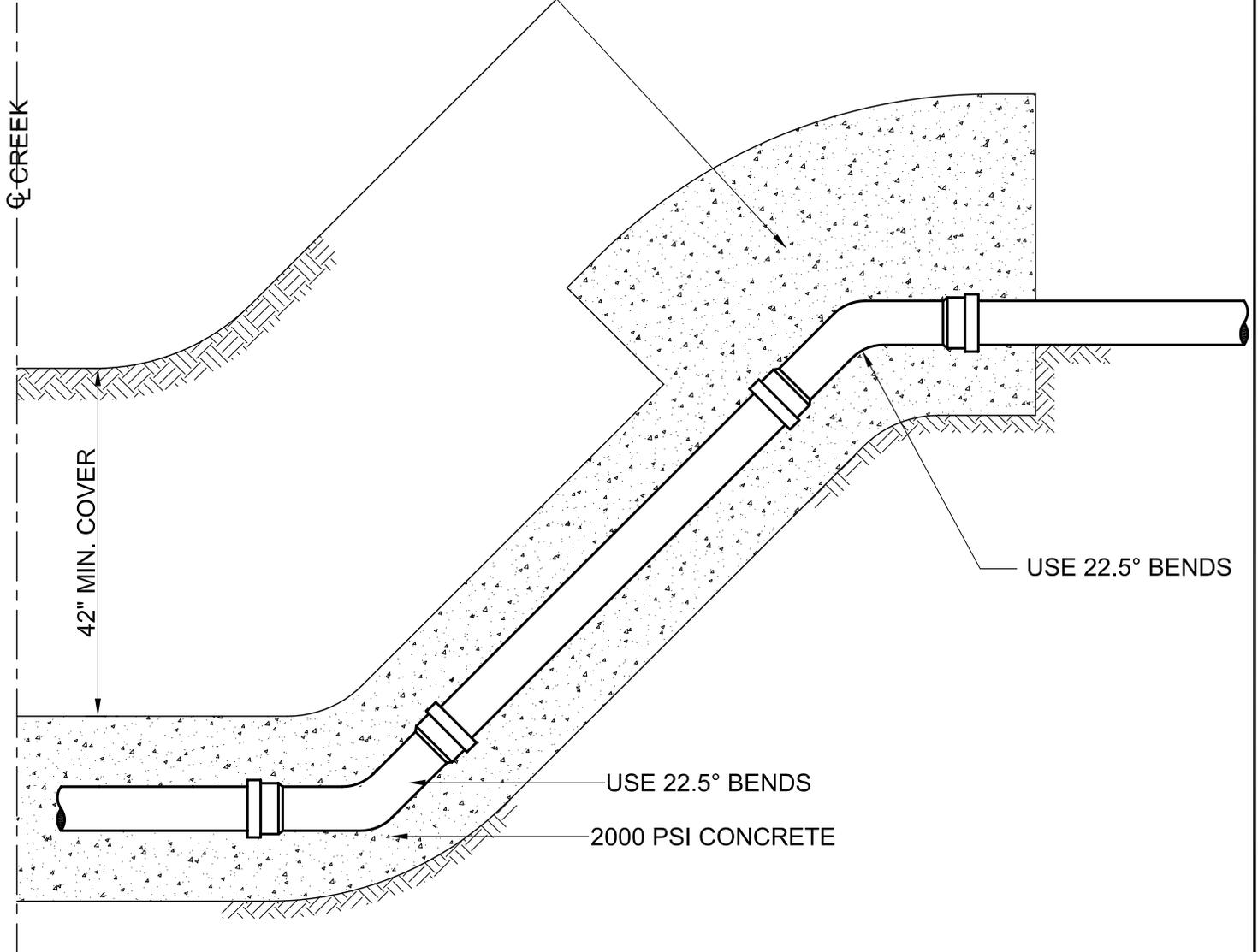


PLAN OF PLUG THRUST BLOCK
SCALE N.T.S.

I.D. (IN.)	C (FT.)	THRUST (TONS)	EARTH		ROCK	
			A (FT.)	VOL. (C.Y.)	A (FT.)	VOL. (C.Y.)
4,6,8	1.5	5.1	2.5	0.3	2.0	0.2
10,12	1.5	11.3	3.5	0.6	2.5	0.3
16,18	2.0	25.5	5.5	1.6	4.0	0.9
20	2.0	31.5	6.0	1.9	4.0	0.9
24	2.5	45.2	7.0	3.1	5.0	1.7
30	3.0	53.0	7.5	4.1	5.5	2.4
36	4.0	76.3	9.0	7.3	6.5	4.2

- NOTE : 1. REFER TO NCTCOG TABLE FOR
PIPE DIAMETER OVER 36".
2. CONCRETE MINIMUM STRENGTH 3000 PSI.
3. 1-80 LBS BAG OF QUIKRETE = 0.02 CY.

2000 PSI CONCRETE
QUANTITIES AT EACH LOCATION
AS DESIGNATED ON THE PLANS



**HALF -SECTION
TYPICAL CREEK CROSSING**



CITY OF ALLEN
DEPARTMENT OF ENGINEERING

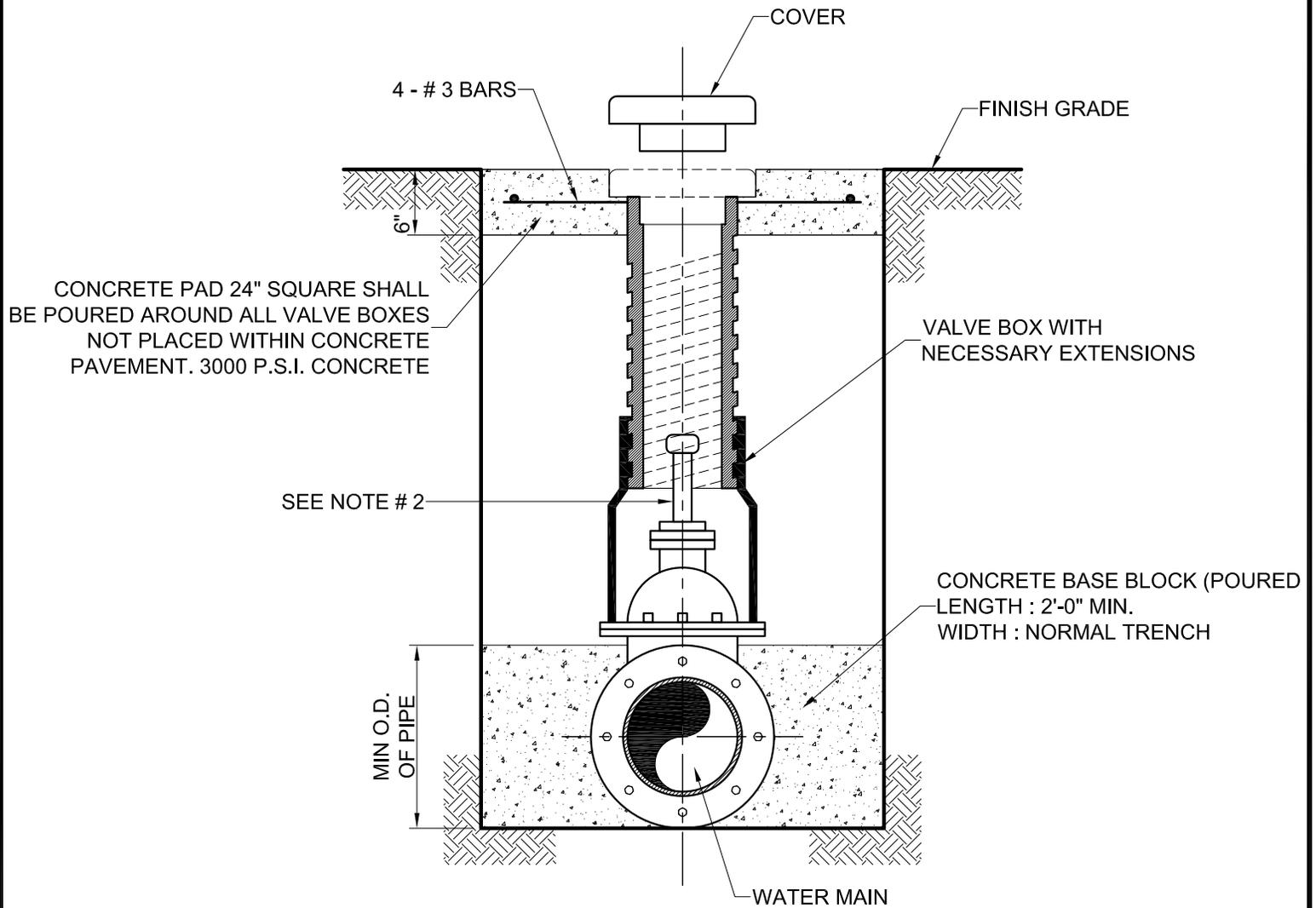
CREEK CROSSING

STANDARD CONSTRUCTION DETAILS
WATER

DATE:
MAY 1991

REV DATE:
AUG. 2006

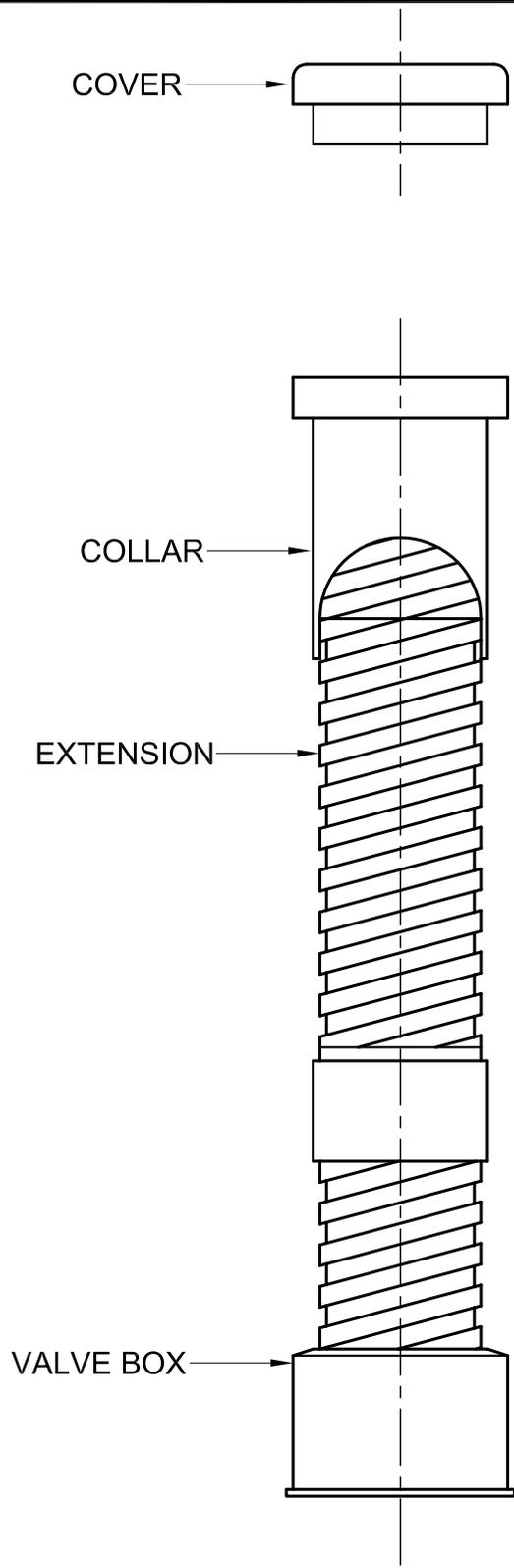
SHEET :
SD-W09



TYPICAL VALVE SETTING & BOX

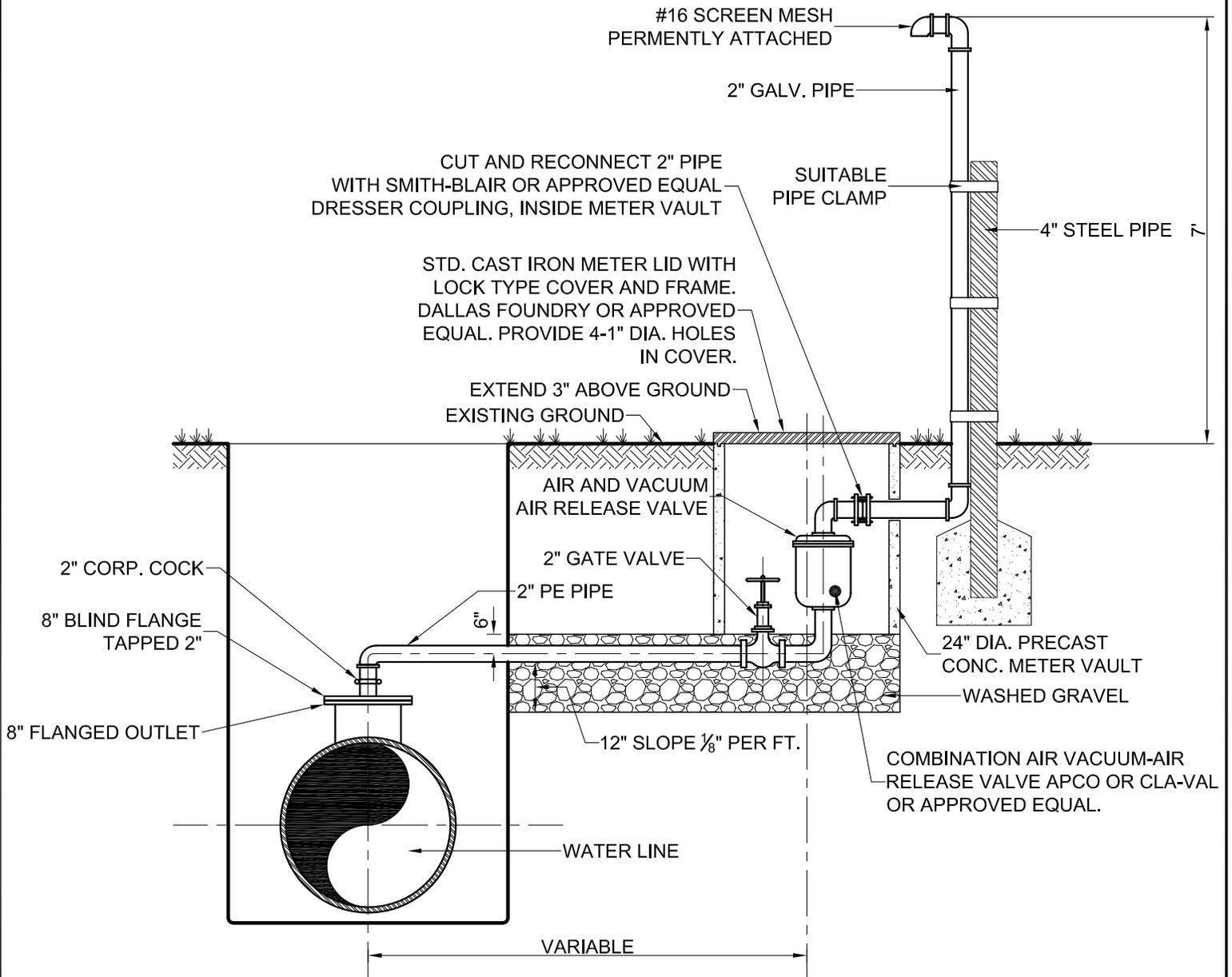
NOTE:

1. 4"-12" R.S. GATE VALVES SHALL BE IN ACCORDANCE WITH AWWA STANDARD C-509
2. A PERMANENTLY ATTACHED VALVE EXTENSION STEM SHALL BE REQUIRED FOR ANY VALVE THATS OPERATING NUT IS LOCATED IN EXCESS OF 4 FEET BELOW THE TOP OF VALVE BOX. THIS EXTENSION SHALL BE OF SUFFICIENT LENGTH TO INSURE THAT ITS TOP IS WITHIN 4 FEET OF VALVE BOX LID.
3. DUCTILE IRON OR C-900 PVC PIPE SHALL BE USED FOR VALVE STACKS WITH TWO PIECE ADJUSTABLE (SHORTY) VALVE BOXES.
4. A "V" SHALL BE PLACED ON NEAREST CURB WHERE VALVE IS IN FRONT OF CURB, AND AN "A" SHALL BE PLACED ON NEAREST CURB FOR INSTALLATIONS BEHIND THE CURB. SYMBOL SHALL BE SAWCUT INTO CURB AND PAINTED BLUE.
5. ALL CAST IRON MATERIALS SHALL BE DOMESTIC.

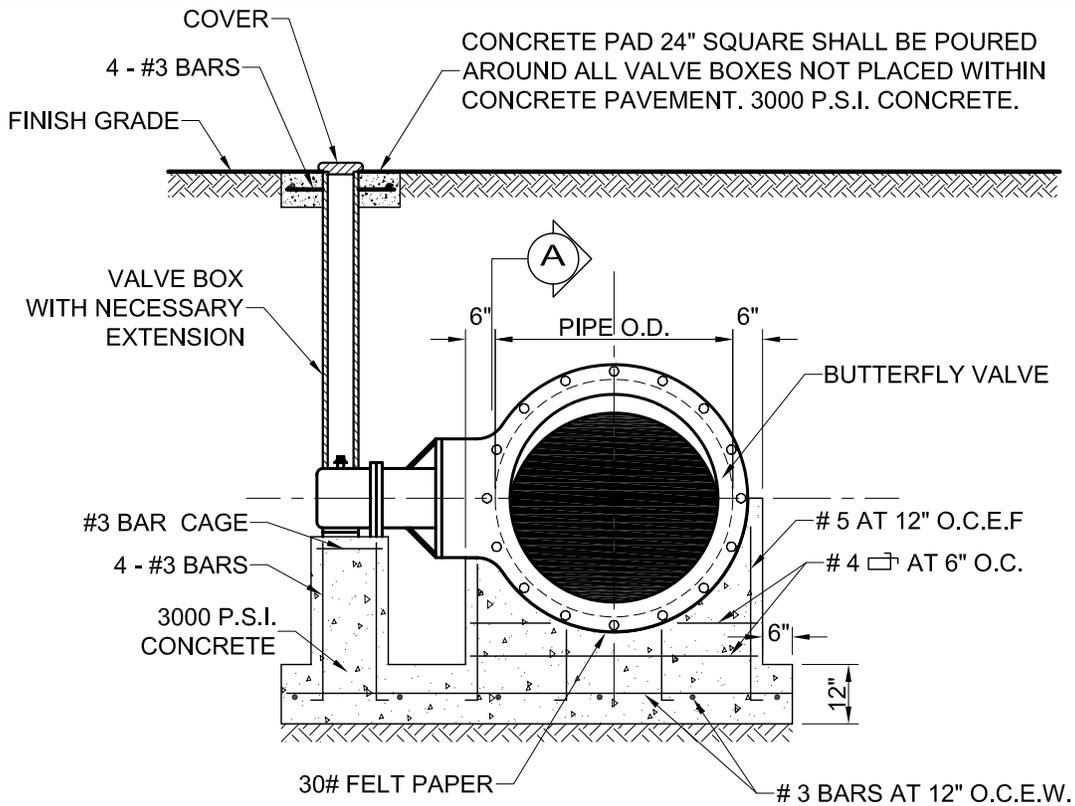


VALVE BOX WITH EXTENSION

ALL CAST IRON FITTINGS SHALL BE DOMESTIC.

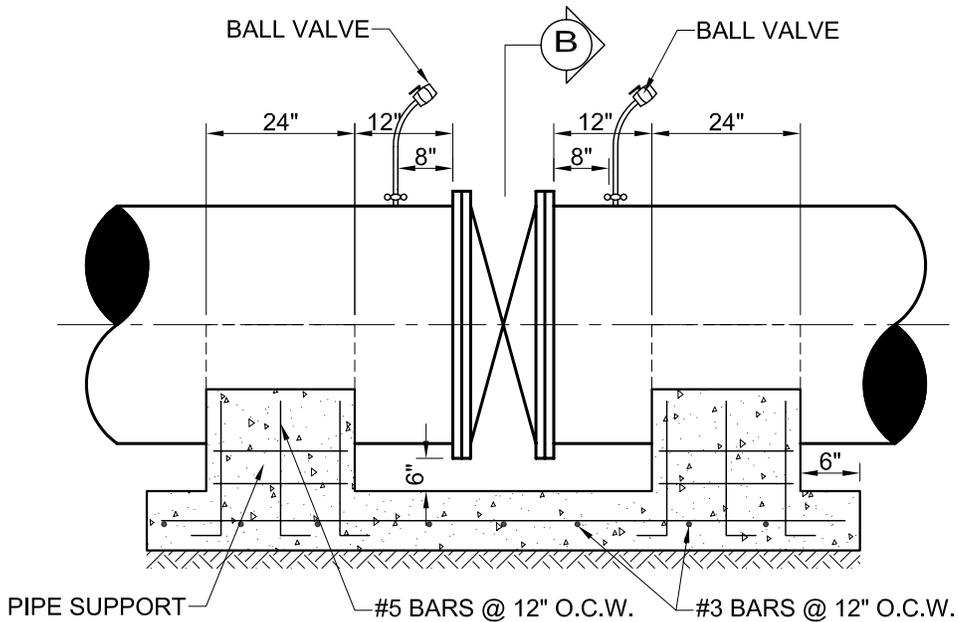


TYPICAL AIR AND VACUUM-AIR RELEASE VALVE INSTALLATION



SECTION B

SCALE N.T.S.



SECTION A

SCALE N.T.S.



CITY OF ALLEN
DEPARTMENT OF ENGINEERING

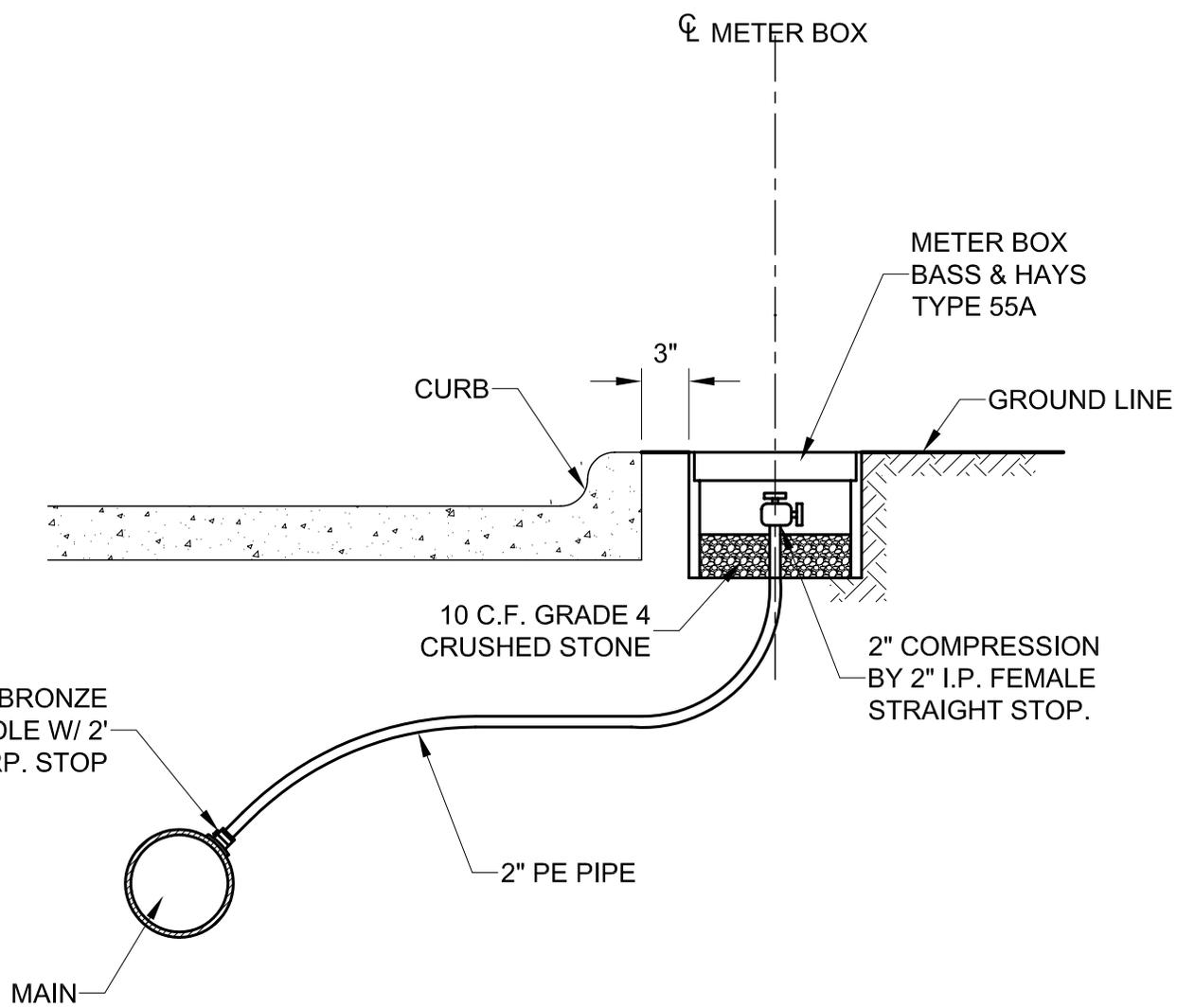
BUTTERFLY VALVE

STANDARD CONSTRUCTION DETAILS
WATER

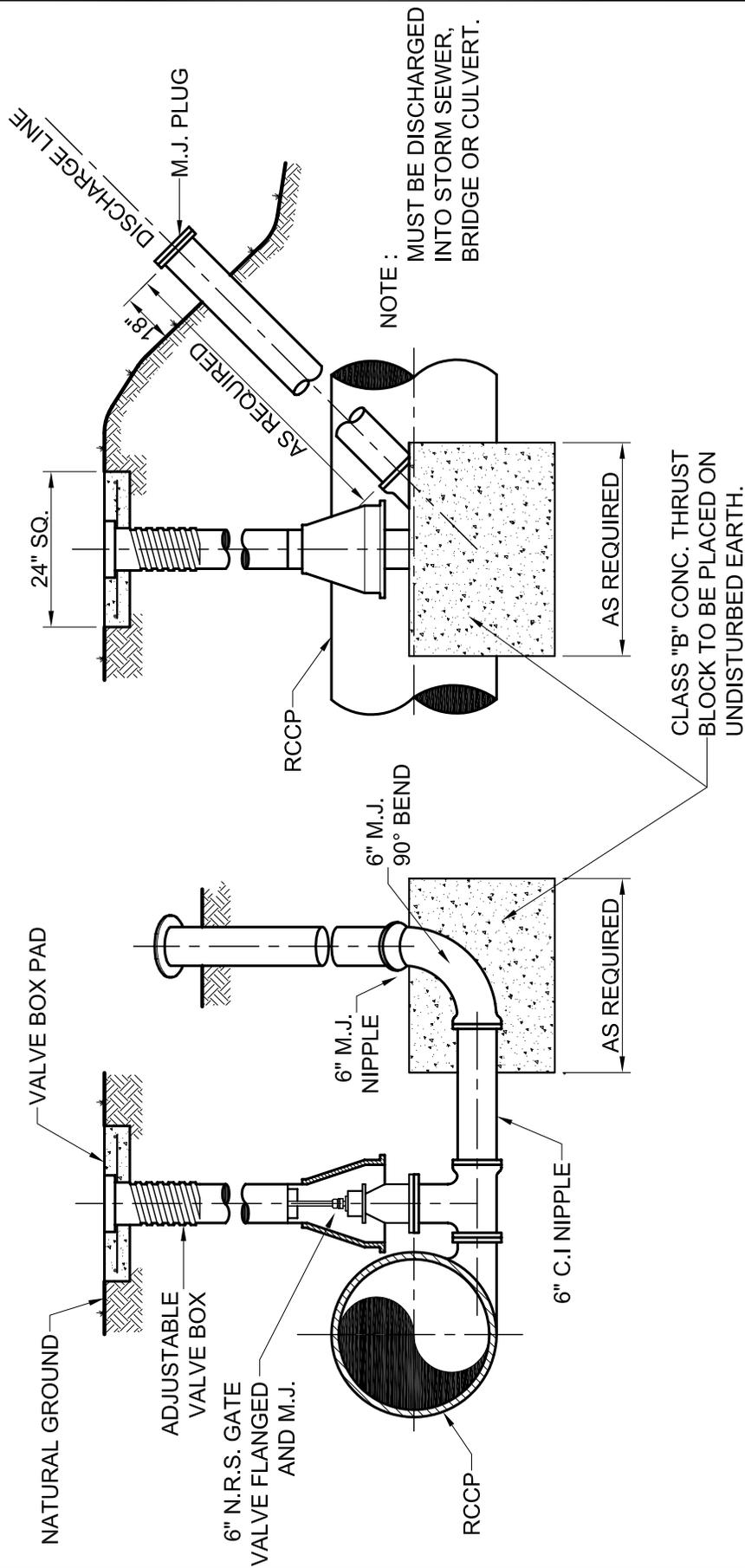
DATE:
MAY 1991

REV DATE:
AUG. 2006

SHEET :
SD-W14



2" BLOW OFF



BLOW OFF VALVE DETAIL



CITY OF ALLEN
DEPARTMENT OF ENGINEERING

BLOW OFF VALVE

STANDARD CONSTRUCTION DETAILS
WATER

DATE:
MAY 1991

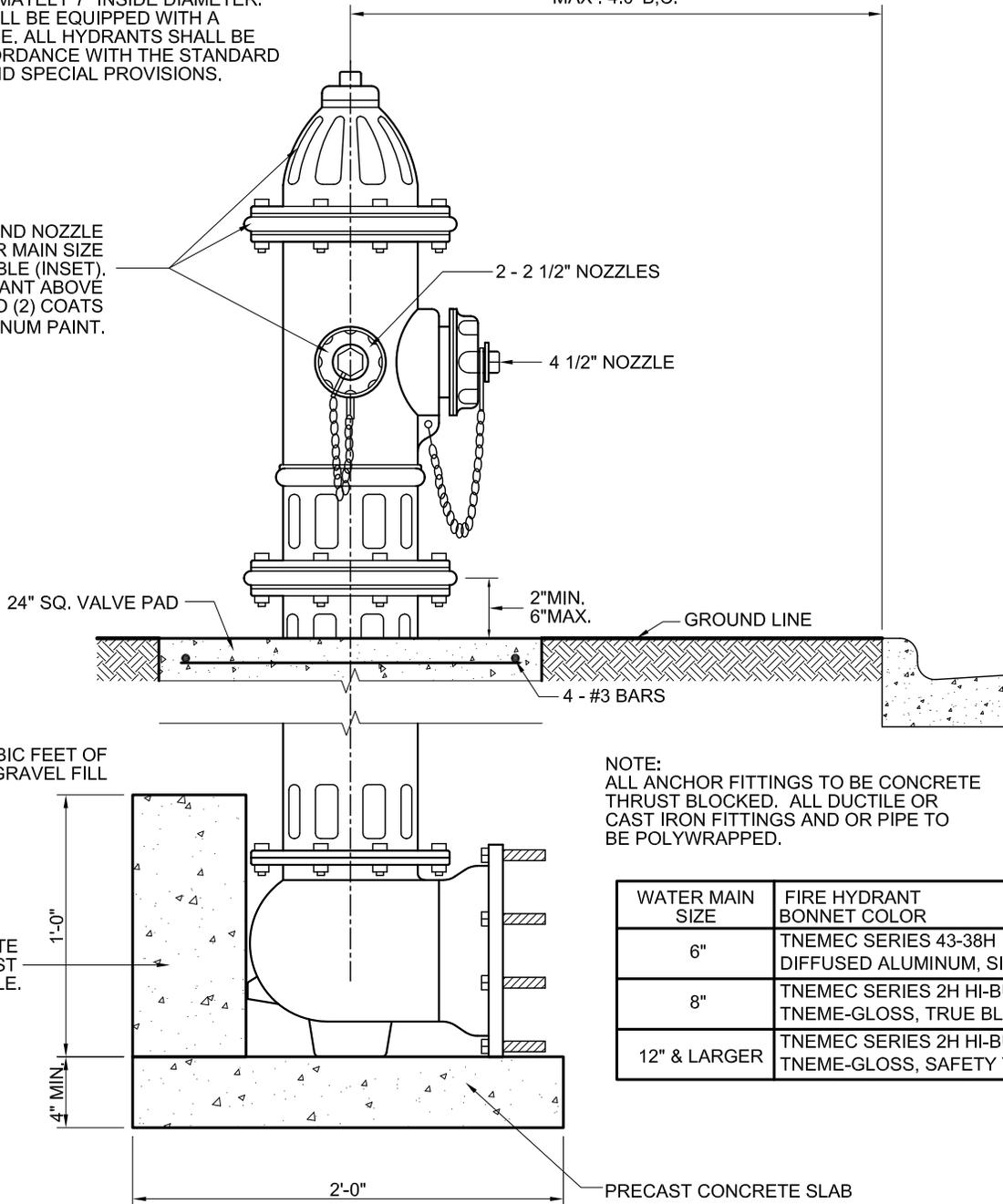
REV DATE:
AUG. 2006

SHEET :
SD-W16

NOTE:
 MUELLER "CENTURIAN" OR EQUAL.
 IN GENERAL, ALL FIRE HYDRANTS SHALL
 CONFORM TO AWWA STANDARD SPECIFICATIONS
 FOR FIRE HYDRANTS FOR ORDINARY WATER
 WORKS SERVICE FOR WATER AND SANITARY
 SEWER IMPROVEMENTS. FIRE HYDRANTS WITH
 A BARREL APPROXIMATELY 7" INSIDE DIAMETER.
 ALL HYDRANTS SHALL BE EQUIPPED WITH A
 BREAKAWAY FLANGE. ALL HYDRANTS SHALL BE
 APPROVED IN ACCORDANCE WITH THE STANDARD
 SPECIFICATIONS AND SPECIAL PROVISIONS.

MIN. 2.0' B.C.
 MAX. 4.0' B.C.

BONNET TO FLANGE AND NOZZLE
 CAPS COLOR CODE FOR MAIN SIZE
 ACCORDING TO TABLE (INSET).
 REMAINDER OF HYDRANT ABOVE
 GROUND PAINTED TWO (2) COATS
 OF ALUMINUM PAINT.



NOTE:
 ALL ANCHOR FITTINGS TO BE CONCRETE
 THRUST BLOCKED. ALL DUCTILE OR
 CAST IRON FITTINGS AND OR PIPE TO
 BE POLYWRAPPED.

WATER MAIN SIZE	FIRE HYDRANT BONNET COLOR
6"	TNEMEC SERIES 43-38H DIFFUSED ALUMINUM, SILVER
8"	TNEMEC SERIES 2H HI-BUILD TNEME-GLOSS, TRUE BLUE SAFETY
12" & LARGER	TNEMEC SERIES 2H HI-BUILD TNEME-GLOSS, SAFETY YELLOW

TYPICAL FIRE HYDRANT INSTALLATION



CITY OF ALLEN
 DEPARTMENT OF ENGINEERING

FIRE HYDRANT INSTALLATION

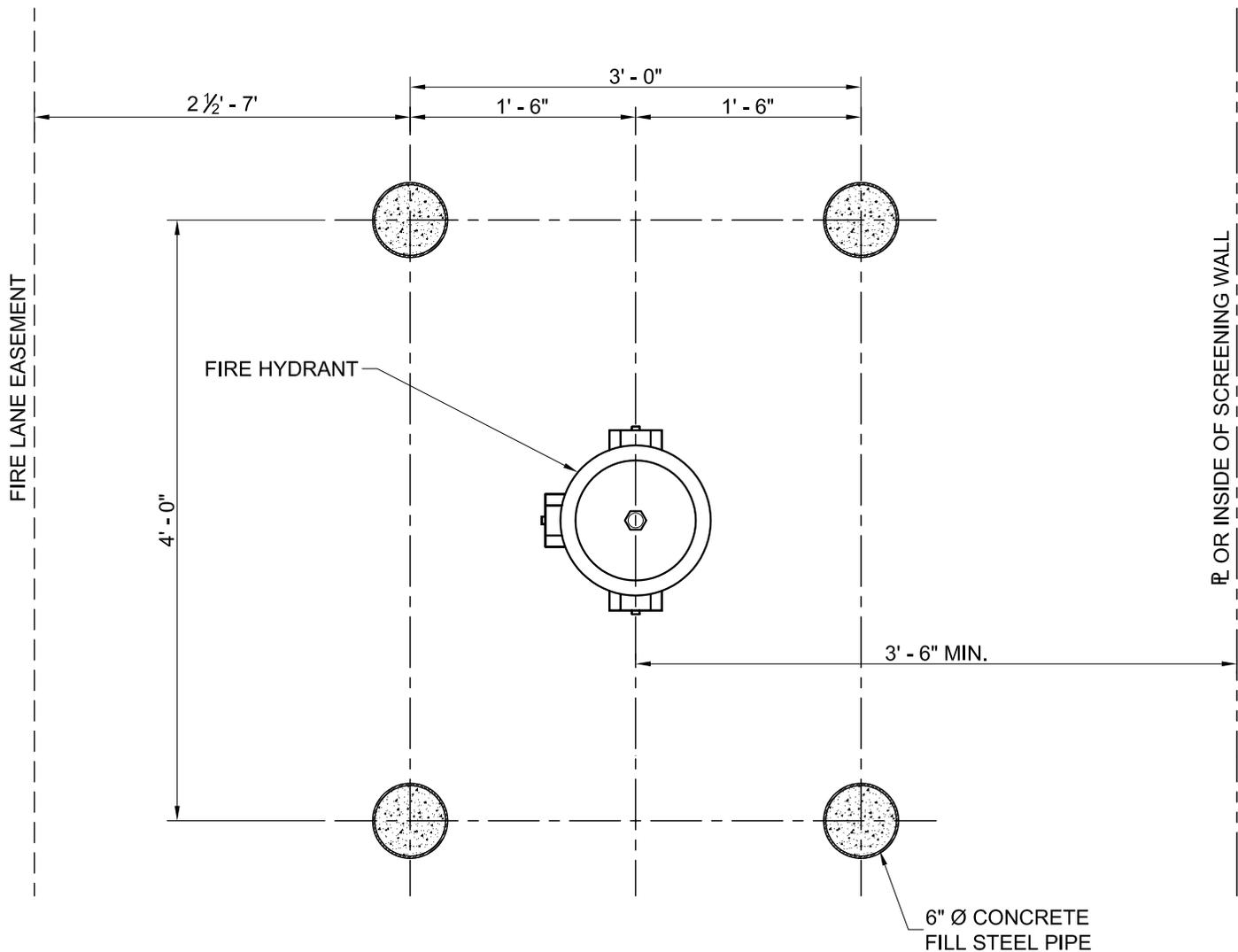
STANDARD CONSTRUCTION DETAILS
 WATER

DATE:
 MAY 1991

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 MAY 2007

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 SD-W17

6"Ø STEEL PIPE W/CONCRETE FILL
 6' LENGTH (3' ABOVE PAVING, 3' BELOW PAVING) TO BE CASED IN 16"Ø PIER TO DEPTH OF 1'-0". BELOW BOTTOM OF PIPE USE 2-#6x12" THRU PIPE INTO CONCRETE PIER. PIPES TO BE PAINTED SAME AS FIRE HYDRANT - ALUMINUM.



NOTE:
 FOR USE ONLY WHERE CURBS
 ARE NOT POSSIBLE.

FIRE HYDRANT GUARD POST DETAIL



CITY OF ALLEN
 DEPARTMENT OF ENGINEERING

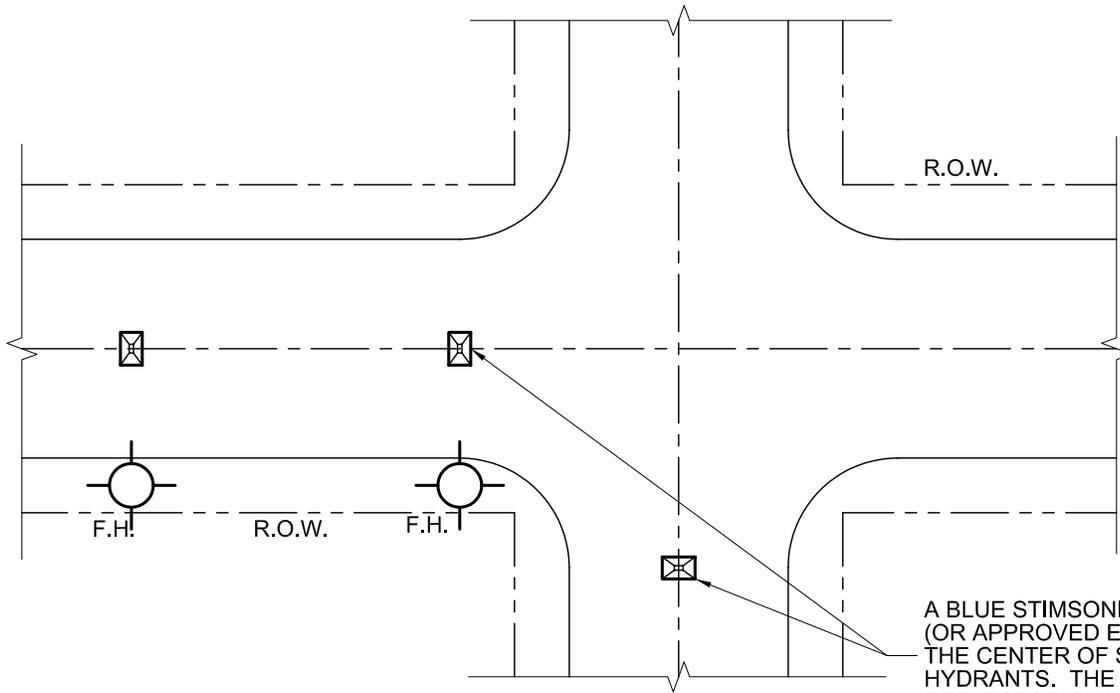
FIRE HYDRANT GUARD POST

STANDARD CONSTRUCTION DETAILS
 WATER

DATE:
 MAY 1991

REV DATE:
 AUG. 2006

SHEET :
 SD-W18



NOTE:
 FIRE HYDRANT SHALL BE LOCATED
 OUTSIDE OF RADIUS.

TYPICAL FIRE HYDRANT REFLECTOR INSTALLATION



CITY OF ALLEN
 DEPARTMENT OF ENGINEERING

FIRE HYDRANT
 REFLECTOR INSTALLATION

STANDARD CONSTRUCTION DETAILS
 WATER

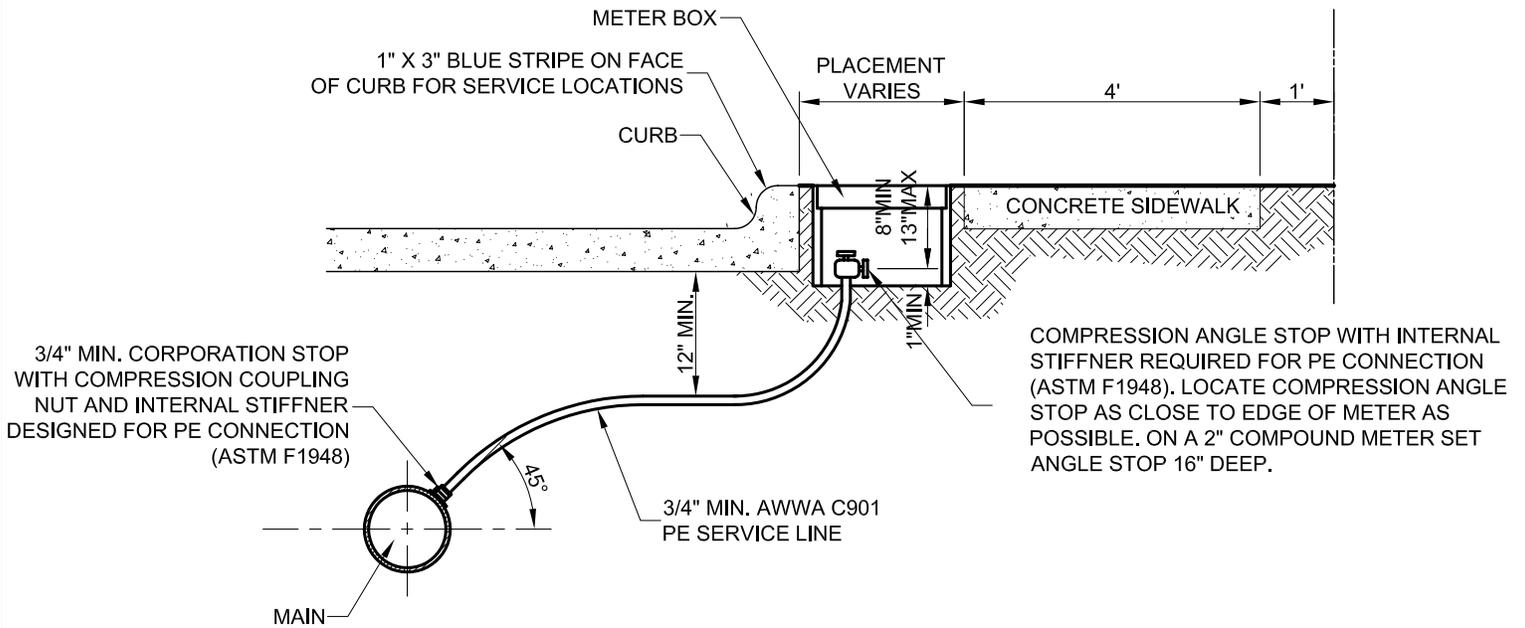
DATE:
 MAY 1991

REV DATE:
 AUG. 2006

SHEET :
 SD-W19

NOTE :

WATER SERVICES SHALL NOT BE CONNECTED TO FIRE HYDRANT LINES.
ALL MATERIALS SHALL CONFORM TO THE STANDARD SPECIFICATIONS
AND/OR SPECIAL PROVISIONS.

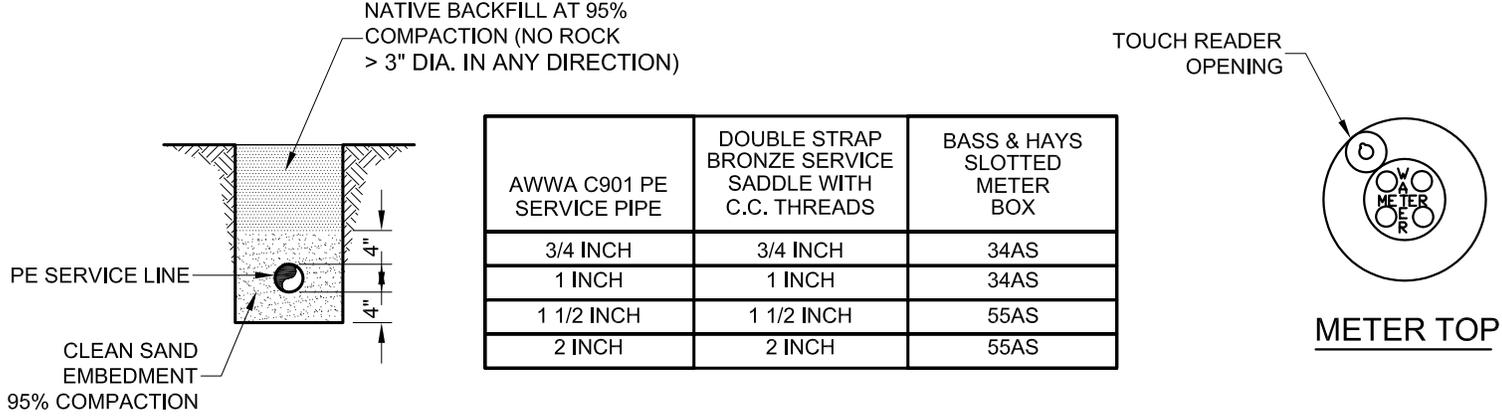


COMPRESSION ANGLE STOP WITH INTERNAL STIFFNER REQUIRED FOR PE CONNECTION (ASTM F1948). LOCATE COMPRESSION ANGLE STOP AS CLOSE TO EDGE OF METER AS POSSIBLE. ON A 2" COMPOUND METER SET ANGLE STOP 16" DEEP.

FOR 1" OR SMALLER METER

METER BOX SHALL BE CORRUGATED METAL, 18" DIAMETER, 14" DEEP, SLOTTED FOR SERVICE PIPE FITTED WITH CAST IRON TOP AND LID WITH TOUCH READER OPENING (SEE VIEW BELOW). LID SHALL BE C.I. BASS & HAYS DOMESTIC MFG. LID WITH #3P HAIRPIN LOCK OR TYLER RING #6200-R & WESTERN IRON WORKS #DWIW 92/20 OR EQUIVALENT. WATER METER SHALL BE PLACED IN CENTER OF LOT WITH SANITARY SEWER HOUSE CONNECTION LOCATED 10 FEET DOWN STREAM. ALL TAPS SHALL BE MADE AT 45° ANGLE TO L OF PIPE.

NOTE: ALL METERS WILL BE PURCHASED FROM CITY OF ALLEN

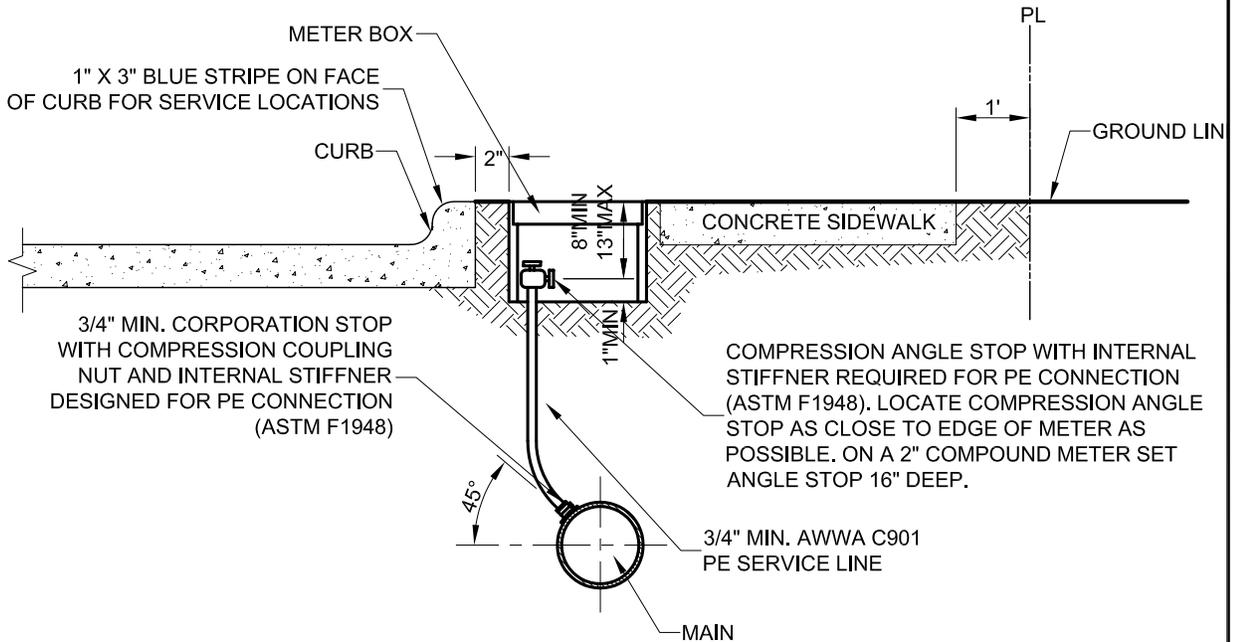


TYPICAL SERVICE CONNECTION WITH METER BOX

ALL CAST IRON MATERIALS SHALL BE DOMESTIC

NOTE :

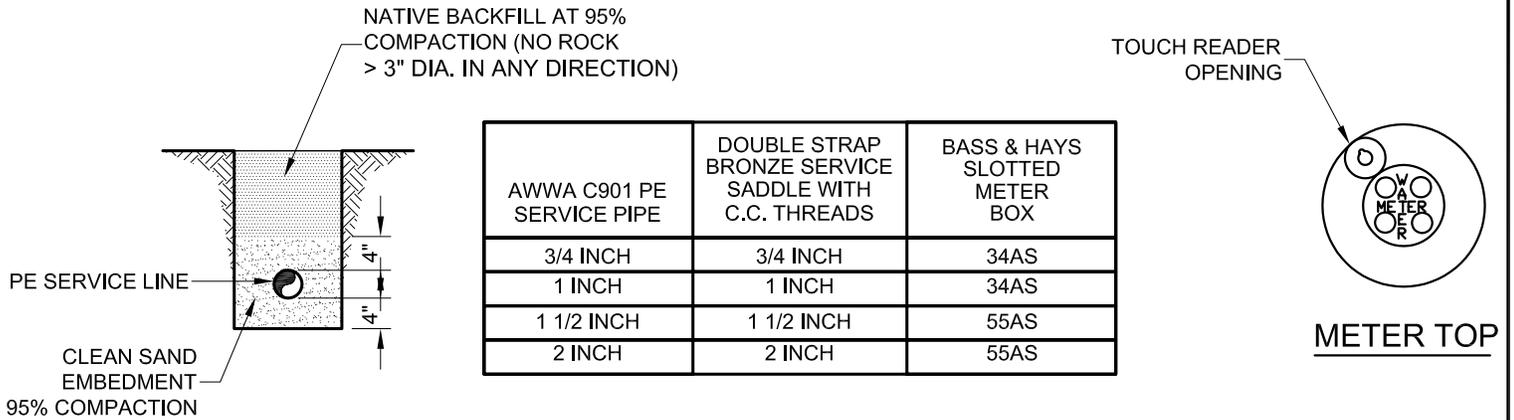
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ALL MATERIALS SHALL CONFORM TO THE STANDARD SPECIFICATIONS
AND/OR SPECIAL PROVISIONS.



FOR 1" OR SMALLER METER

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NOTE: ALL METERS WILL BE PURCHASED FROM CITY OF ALLEN



TYPICAL SERVICE CONNECTION WITH METER BOX

ALL CAST IRON MATERIALS SHALL BE DOMESTIC



CITY OF ALLEN
DEPARTMENT OF ENGINEERING

**SERVICE CONNECTION
WITH METER BOX**

STANDARD CONSTRUCTION DETAILS
WATER

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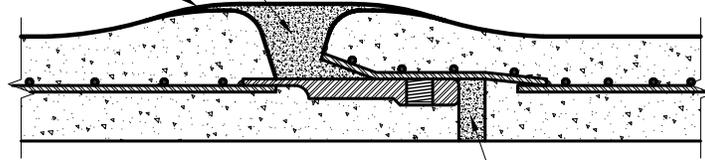
SHEET :
SD-W21

NOTE: PROVIDE 1" MINIMUM THICKNESS CONCRETE OR CEMENT MORTAR COATING IN THE FIELD FOR THE PROTECTION OF ALL EXPOSED STEEL SUCH AS FLANGES, CAULKED-JOINTS, THREADED OUTLETS, CLOSURES, ETC. THE CEMENT MORTAR USED SHALL CONSIST OF ONE PART PORTLAND CEMENT TO TWO AND ONE-HALF PARTS OF FINE, SHARP (PLASTER) SAND. WHERE SHOWN COATING IS TO BE REINFORCED WITH WIRE MESH.

CEMENT MORTAR, MIXED TO A CONSISTENCY OF THICK CREAM, TO BE POURED IN FIELD.

STEEL STRAP THREADED THROUGH HEM OF BURLAP WRAPPER, DRAWN TIGHT AND FASTENED.

BURLAP WRAPPED AS MANUFACTURED BY MAR-MAC CORP OR EQUAL, WIDTH OF WRAPPER TO BE 9" FOR 36" PIPE AND LARGER, 7" FOR 33" AND SMALLER.

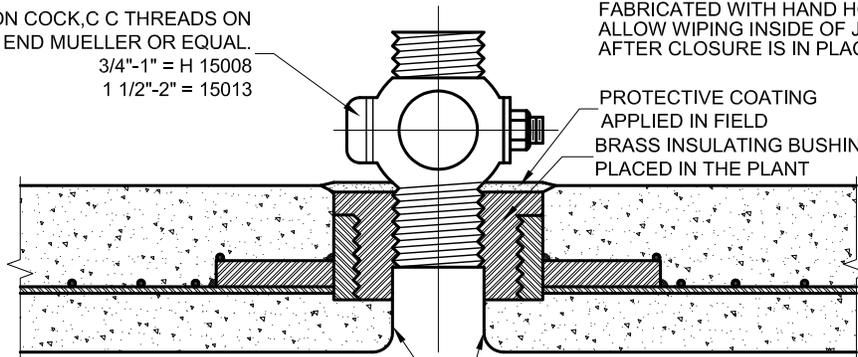


CEMENT MORTAR OF STIFF CONSISTENCY PLACED IN THE FIELD.

STANDARD RUBBER GASKET JOINT

CORPORATION COCK, C C THREADS ON INLET END MUELLER OR EQUAL.
3/4"-1" = H 15008
1 1/2"-2" = 15013

NOTE: ALL CLOSURE SECTIONS SHALL BE FABRICATED WITH HAND HOLES TO ALLOW WIPING INSIDE OF JOINTS AFTER CLOSURE IS IN PLACE.

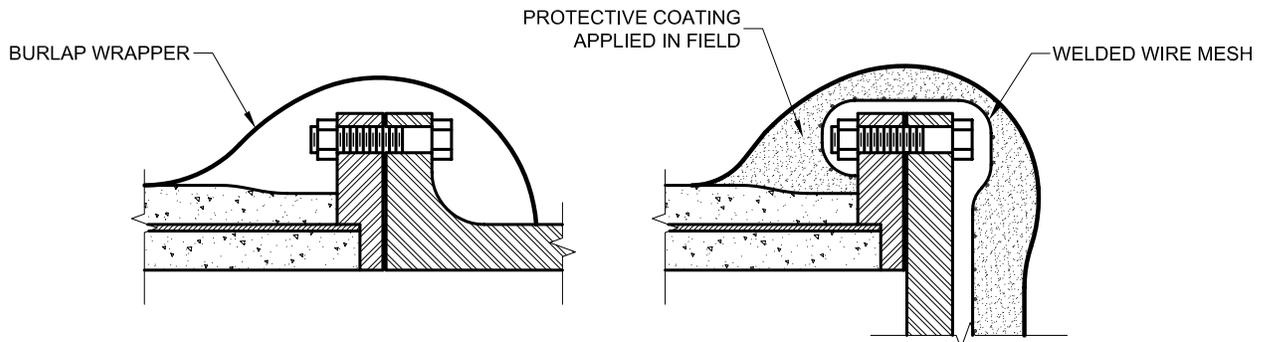


PROTECTIVE COATING APPLIED IN FIELD
BRASS INSULATING BUSHING PLACED IN THE PLANT

NOTE: IF CORPORATION COCK IS NOT PROVIDED IN FIELD, THEN STEEL PLUG SHALL BE COVERED WITH CEMENT MORTAR.

LINE IN PLANT TO COVER ALL EXPOSED STEEL

THREADED CONNECTION



FLANGED CONNECTIONS



CITY OF ALLEN
DEPARTMENT OF ENGINEERING

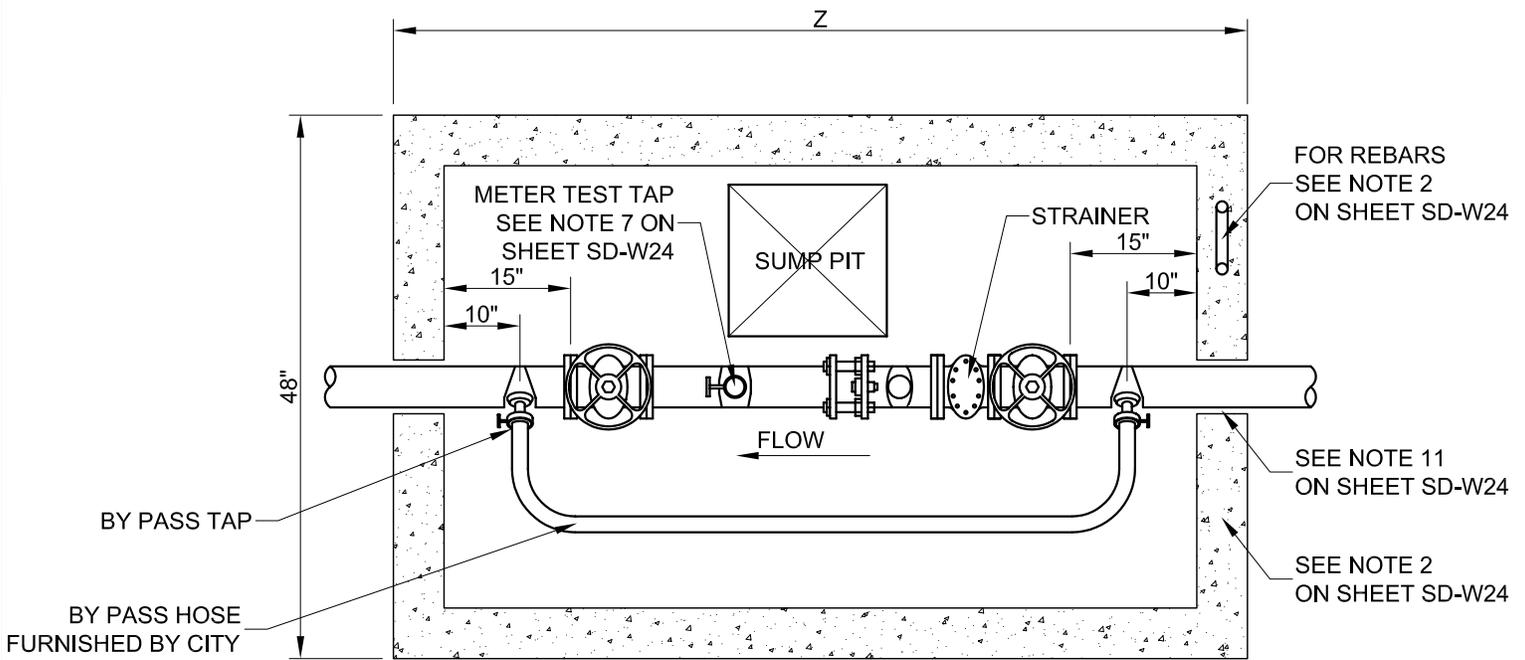
REINFORCED CONCRETE CYLINDER
PIPE DETAIL

STANDARD CONSTRUCTION DETAILS
WATER

DATE:
MAY 1991

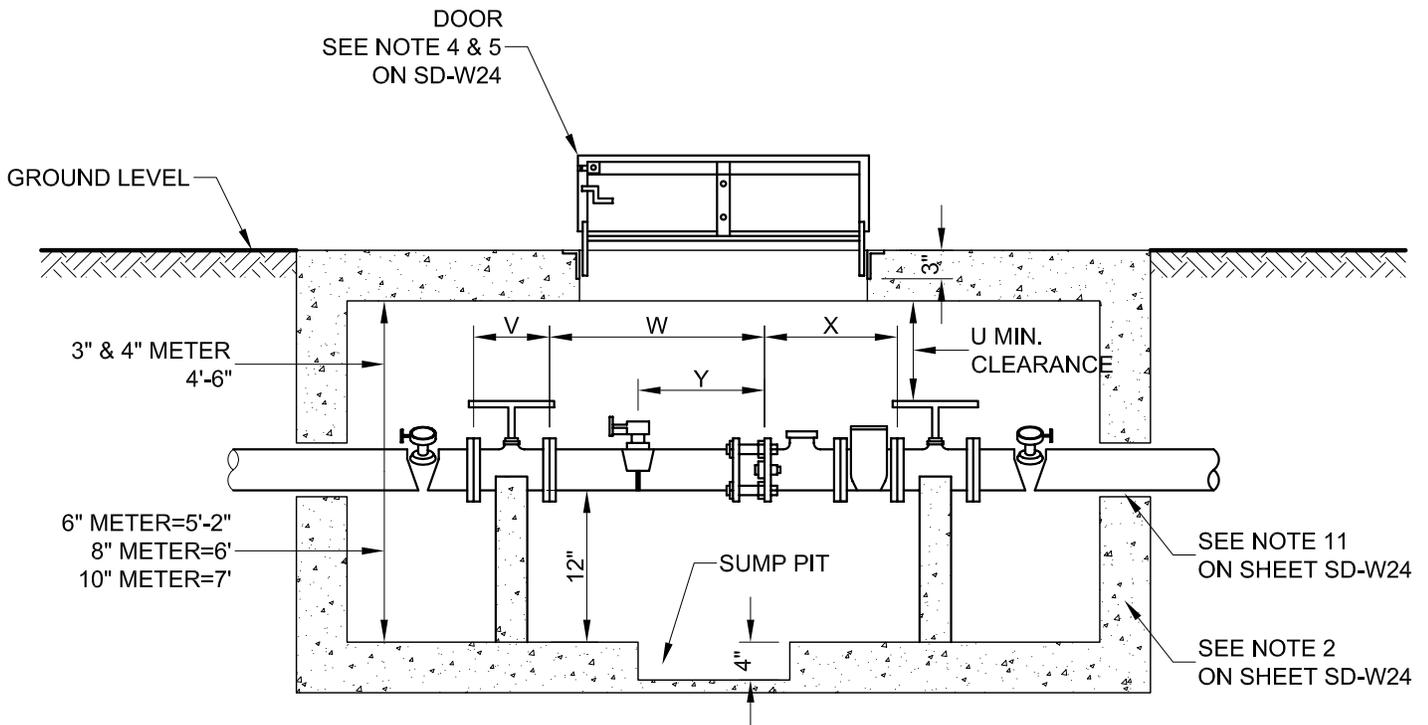
REV DATE:
AUG. 2006

SHEET :
SD-W22



PLAN

SCALE N.T.S.



SECTION

SCALE N.T.S.



CITY OF ALLEN
DEPARTMENT OF ENGINEERING

METER VAULT

STANDARD CONSTRUCTION DETAILS
WATER

DATE:
MAY 1991

REV DATE:
AUG.2006

SHEET :
SD-W23

METER VAULT & BY-PASS SPECIFICATIONS

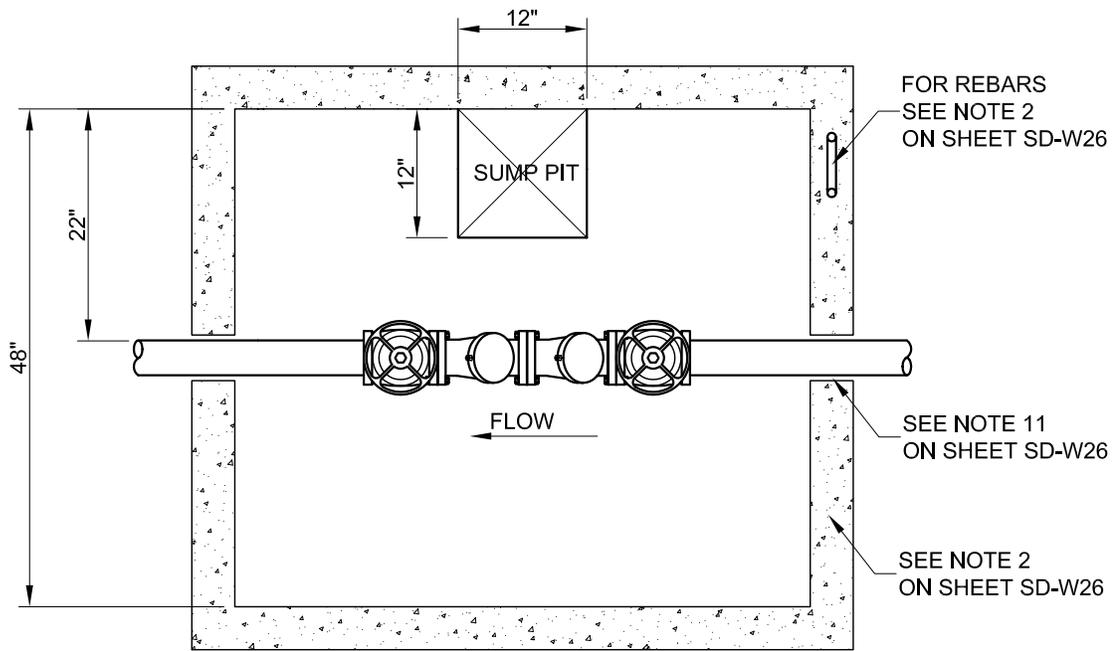
1. NOTIFY THE ENGINEERING DEPARTMENT PRIOR TO CONSTRUCTION OF VAULT OR BY-PASS ASSEMBLY.
2. THE METER VAULT CAN BE EITHER POURED IN PLACE OR PREFABRICATED. CONCRETE SHALL BE 6" THICK AND BE 3000 P.S.I. WITH #4 REINFORCEMENT STEEL ON 12" CENTERS EACH WAY IF VAULT IS POURED IN PLACE. PREFABRICATED VAULTS SHALL BE 4" THICK AND BE 4,500 P.S.I. CONCRETE WITH #4 REINFORCEMENT STEEL ON 8" CENTERS EACH WAY. THESE ARE MINIMAL SPECIFICATIONS.
3. THE VAULT WILL NOT BE PUT IN ANY DRIVE OR PARKING AREAS AND MUST BE LOCATED IN A UTILITY EASEMENT.
4. THE VAULT LID SHALL BE A BILCO LID, TYPE Q-4 SINGLE LEAF DESIGN. ANGLE FRAME IS 1/4" STEEL WITH STRAP ANCHORS BOLTED TO THE EXTERIOR. THE LEAF IS 1/4" STEEL DIAMOND PATTERN PLAT, PIVOTING ON TORSION BARS FOR EASY OPERATION. THE MINIMUM LIVE LOAD CAPACITY IS 150 LBS. PER SQUARE FOOT. THE SIZE OF THE LID IS 3' BY 3'.
5. THE LID SHALL BE PAINTED WITH 43-38 TNE MEC DIFFUSED ALUMINUM PAINT OR APPROVED EQUAL.
6. THE CONTRACTOR SHALL MAKE THE BY-PASS AND METER TEST TAP INSIDE THE VAULT. IF THE SERVICE IS USED AS A STRICTLY DOMESTIC/IRRIGATION COMBINATION, TAP A ON THIS DRAWING IS NOT NECESSARY. IF THE SERVICE IS USED STRICTLY FOR IRRIGATION, TAP A IS REQUIRED. TAP A MUST BE AT LEAST TWO PIPE DIAMETERS DOWNSTREAM OF THE METER. TAPS B & C MUST BE MADE AT AN APPROXIMATE 45° ANGLE ON EACH END OF THE PIPE AND CENTERED 10 INCHES AWAY FROM THE WALL. ALL TAPS SHALL BE 2" AWAY FROM THE WALL. ALL TAPS SHALL BE 2" AND THE CONTRACTOR SHALL INSTALL A ROCKWELL NO. 317-045514-000 FOR 3" x 2"; ROCKWELL NO. 317-056314-000 FOR 4" x 2"; ROCKWELL NO. 317-076014-000 FOR 6" x 2" AND ROCKWELL NO. 317-121214-000 SERVICE SADDLES WITH BRASS NIPPLES AND NO. 7500 OHIO BRASS OR APPROVED EQUAL GATE VALVES.
7. THE STRAINER, METER AND FLEXIBLE COUPLING WILL BE PROVIDED AND INSTALLED BY THE CITY OF ALLEN AT THE CONTRACTOR'S EXPENSE.
8. THE STRAINER, METER AND FLEXIBLE COUPLING WILL NOT BE SET UNTIL THE METER VAULT AND TAPS ARE ACCEPTED BY THE CITY OF ALLEN, ENGINEERING DEPARTMENT. ALL UTILITIES MUST ALSO HAVE BEEN ACCEPTED AND RELEASED BY THE ENGINEERING DEPARTMENT PRIOR TO METER INSTALLATION.
9. THE VALVES SHALL BE ANY RESILIENT WEDGE DESIGN VALVE WHICH HAS RECEIVED FORMAL APPROVAL FROM THE CITY OF ALLEN. ALL VALVES SHALL BE FLANGED BOTH ENDS AND HAVE HAND WHEELS.
10. THE BOTTOM OF THE METER VAULT MUST BE 6" THICK CONCRETE WITH #4 REBAR ON 12" CENTERS AND HAVE A 4" FILL SAND CUSHION UNDERNEATH. A SUMP 4" DEEP AND 12" IN DIAMETER SHALL BE INSTALLED TO ONE SIDE IN THE CENTER OF THE BOTTOM SLAB. IF PRECAST VAULT IS USED, WHERE SIDES JOIN THE BOTTOM, A LAYER OF RAM-NEK SHALL BE USED TO SEAL THE JOINT.
11. CONTRACTOR SHALL HAVE A CHOICE OF EITHER HAVING A LINK SEAL WALL SLEEVE MODEL WS-6-28-S-6 FOR 3" PIPE, MODEL WS-8-32-S-6 FOR 4" PIPE, MODEL WS-10-36-S-6 FOR 6" PIPE AND MODEL WS-14-37-S-6 FOR 10" PIPE, CAST IN THE WALL OF THE VAULT. THE ABOVE MENTIONED WALL SLEEVE SHALL USE THE FOLLOWING LINK SEALS: FOR 3" PIPE AND 5 NO. LS-325-C; FOR 4" PIPE, 5 NO. LS-400-C; FOR 6" PIPE, 7 NO. LS-400-C AND FOR A 10" PIPE, 12 NO. LS-325-C. THE CONTRACTOR MAY HAVE THE VAULT WALL CORED BEFORE INSTALLATION OF VAULT AND PIPING. IF THE WALL IS CORED THE FOLLOWING SPECIFICATION SHALL BE USED: FOR 3" PIPE CORE SIZE SHALL BE 6" AND USE 5 NO. LS-325-C LINK SEALS, FOR 4" PIPE CORE SIZE SHALL BE 8" AND USE 5 NO. LS-400-C LINK SEALS, FOR 6" PIPE CORE SIZE SHALL BE 10" AND USE 7 NO. LS-400-C LINK SEALS AND FOR 10" PIPE CORE SIZE SHALL BE 14" AND USE 11 NO. LS-425-C LINK SEALS. BREAKING OF THE WALL WITH A JACKHAMMER OR USING PRE-CAST KNOCKOUT PANELS IS NOT PERMITTED.
12. UNDER EACH VAULT WILL BE A CONCRETE SUPPORT.
13. DEPTH OF VAULT SHALL BE A MINIMUM OF 4 1/2 FEET.
14. ALL PIPING INSIDE THE VAULT SHALL BE DUCTILE IRON WITH FLANGED FITTINGS. THE OUTSIDE DIMENSION OF THE PIPING SHALL BE WITHIN THE FOLLOWING RANGES: 3" DUCTILE IRON PIPE - 3.74 - 3.86; 4" DUCTILE IRON PIPE - 4.74 - 4.90; 6" DUCTILE IRON PIPE - 6.871 - 6.96; 8" DUCTILE IRON PIPE - 8.98 - 9.20; 10" DUCTILE IRON PIPE - 11.04 - 11.16; VARIATION FROM THESE DIMENSIONS WILL RESULT IN THE VAULT BEING REJECTED.

METER VAULT													
DOMESTIC							IRRIGATION						
METER SIZE	U	V	W	X	Y	Z	METER SIZE	U	V	W	X	Y	Z
3"	25"	8"	11 1/2"	24"	—	6'-10"	3"	25"	8"	16 1/2"	19"	9"	6'-10"
4"	22"	9"	13 1/2"	29"	—	7'-7"	4"	22"	9"	19 1/2"	23"	10"	7'-7"
6"	26"	10 1/2"	13 1/2"	33"	—	8'-2"	6"	26"	10 1/2"	19 1/2"	27"	13"	8'-2"
							8"	31"	11 1/2"	25 1/2"	30"	17"	9'-1"
							10"	37"	13"	29 1/2"	41"	21"	10'-7"



METER VAULT NOTES

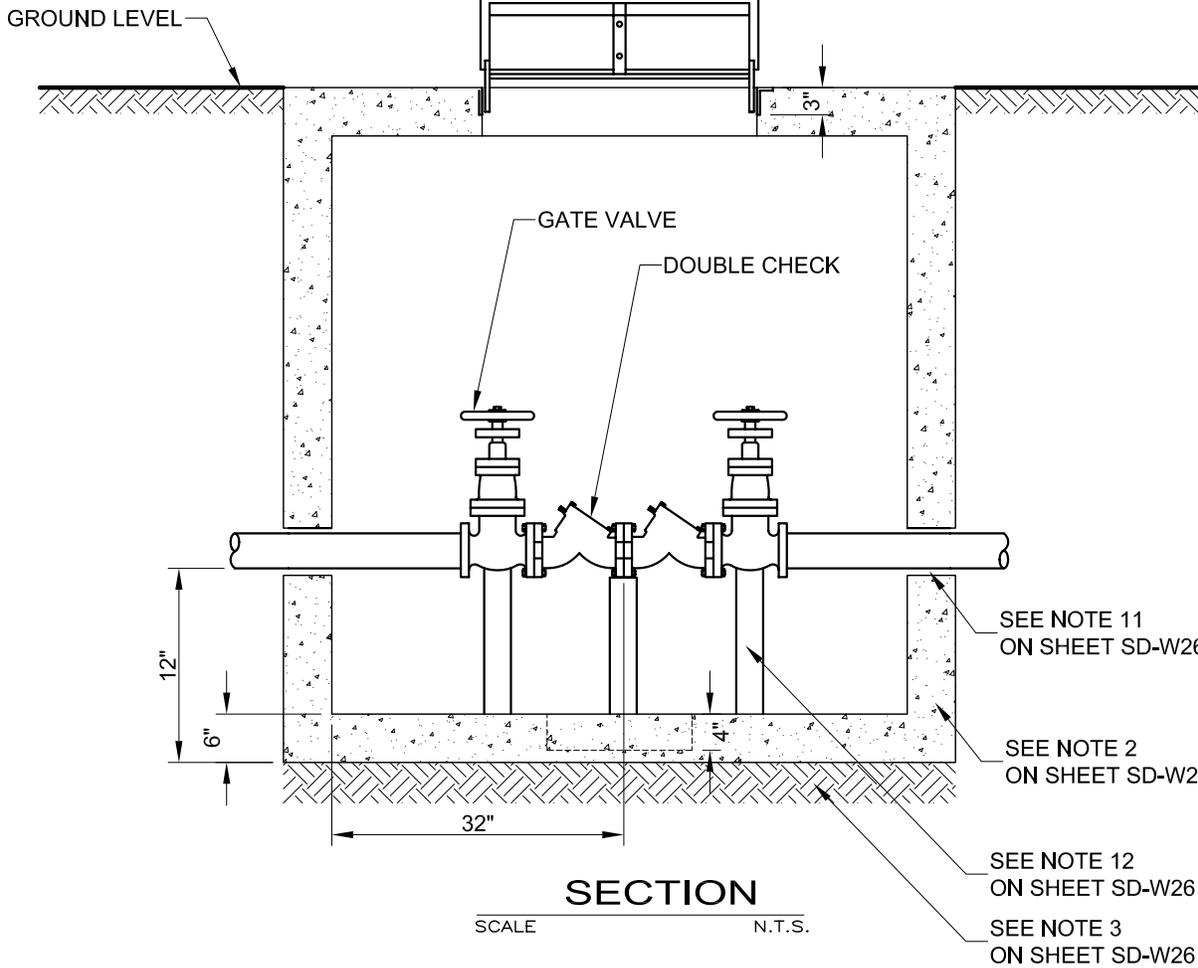
STANDARD CONSTRUCTION DETAILS WATER		
DATE: DEC. 1992	REV DATE: AUG. 2006	SHEET : SD-W24



PLAN

DOOR
SEE NOTE 5 & 6
ON SD-W26

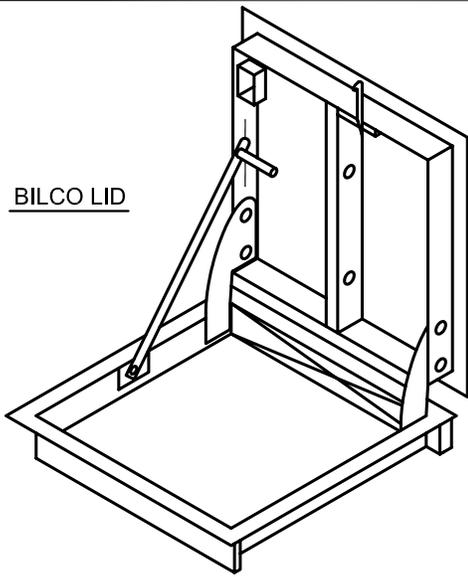
SCALE N.T.S.



SECTION

SCALE N.T.S.

BILCO LID



DOUBLE CHECK VAULT		
DOUBLE CHECK SIZE	"X"	"Y"
4"	4'-7"	9"
6"	5'-4"	10 1/2"
8"	5'-8"	11 1/2"

DOUBLE CHECK VAULT SPECIFICATIONS

1. NOTIFY THE ENGINEERING DEPARTMENT PRIOR TO CONSTRUCTION OF VAULT OR BY-PASS ASSEMBLY.
2. THE VAULT CAN EITHER BE POURED IN PLACE OR PREFABRICATED. CONCRETE SHALL BE 6" THICK AND BE 3000 P.S.I. REINFORCED WITH #4 STEEL BARS ON 12" CENTERS EACH WAY IF THE VAULT IS POURED IN PLACE. PREFABRICATED VAULTS SHALL BE 4" THICK AND BE 4,500 P.S.I. CONCRETE WITH #4 STEEL BARS ON 8" CENTER. THESE ARE MINIMUM SPECIFICATIONS.
3. THE BOTTOM OF THE VAULT SHALL BE 6" THICK CONCRETE WITH #4 STEEL BARS ON 12" CENTERS BOTH WAYS. A SUMP 4" DEEP AND 12" IN DIAMETER SHALL BE INSTALLED TO ONE SIDE IN THE CENTER OF THE BOTTOM SLAB. A 4" FILL SAND CUSHION SHALL BE INSTALLED UNDER THE SLAB. IF A PRECAST VAULT IS TO BE USED, A LAYER OF REM-NEK SHALL BE INSTALLED BETWEEN THE WALLS AND BOTTOM.
4. THE VAULT WILL NOT BE PUT IN ANY DRIVE OR PARKING AREAS AND MUST BE LOCATED IN A UTILITY EASEMENT.
5. THE VAULT LID SHALL BE A BILCO LID. TYPE Q-4 LEAF DESIGN. ANGLE FRAME IS 1/4" STEEL WITH STRAP ANCHORS BOLTED TO THE EXTERIOR. THE LEAF IS 1/4" STEEL DIAMOND PATTERN PLATE, PIVOTING ON TORSION BARS FOR EASY OPERATION. THE MINIMUM LIVE LOAD CAPACITY IS 150 LBS. PER SQUARE FOOT. THE SIZE OF THE LID IS 3' BY 3'.
6. THE LID SHALL BE PAINTED WITH 43-38 TNEMEC ALUMINUM PAINT OR APPROVED REPLACEMENT.
7. ALL PIPING INSIDE VAULT SHALL BE DUCTILE IRON WITH FLANGED FITTINGS. THE OUTSIDE DEMENSION OF THE PIPING SHALL BE WITHIN THE FOLLOWING RANGES: 3" DUCTILE IRON PIPE - 3.74-3.86; 4" DUCTILE IRON PIPE - 4.74-4.90; 6" DUCTILE IRON PIPE - 6.81-6.96; 8" DUCTILE IRON PIPE - 8.98-9.20; 10" DUCTILE IRON PIPE - 11.04-11.16. VARIATIONS FROM THESE DIMENSIONS WILL RESULT IN THE VAULT BEING REJECTED.
8. THE DOUBLE CHECK SHALL BE A MUELLER A-2130-6 AND EQUIPPED WITH AN ALL BRASS METER TRIM PACKAGE IN THE FOLLOWING SIZES: FOR A 4" THROUGH 8" DOUBLE CHECK, 1" TRIM PACKAGE; FOR A 10" DOUBLE CHECK, 2" TRIM PACKAGE. THE METER FOR THE TRIM PACKAGE WILL BE FURNISHED BY THE CITY AT THE CONTRACTORS EXPENSE. A FLANGED ADAPTER COUPLING WILL ALSO BE FURNISHEDDD BY THE CITY AT THE CONTRACTORS EXPENSE.
9. THE GATE VALVES SHALL BE MUELLER #A-2078-6 OUTSIDE STEM AND YOKE AND SHALL HAVE AN UNDERWRITERS LABORATORY LISTING.
10. ALL PIPING INSIDE THE VAULT AND THE VAULT ITSELF SHALL HAVE TO BE APPROVED BY THE CITY OF ALLEN ENGINEERING DEPARTMENT.
11. CONTRACTORS SHALL HAVE THE CHOICE OF EITHER HAVING LINK SEAL WALL SLEEVE MODEL WS-8-32-S-6 FOR 4" PIPE, MODEL MODEL WS-10-36-S-6 FOR 6" PIPE AND MODEL WS-12-37-S-6 FOR 8" PIPECAST IN THE WALL OF THE VAULT. THE ABOVE MENTIONED WALL SLEEVE SHALL USE THE FOLLOWING LNK SEALS: FOR 4" PIPE, 5NO.LS-400-C; FOR 6" PIPE, 7 NO. LS-400-C; FOR 8" PIPE, 9 NO. LS-400-C. THE CONTRACTOR MAY HAVE THE WALL CORED BEFORE INSTALLATIONOF VAULTAND PIPING. THE FOLLOWING SPECIFICATION SHALL BE YSED:FOR 4" PIPE CORESIZE SHALL BE 8" AND USE 5 NO. LS-400-C LINK SEALS; FOR 6" PIPE CORE SIZE SHALL BE 10" AND USE 7 NO. LS-400-C LINK SEALS AND FOR 8" PIPE CORE SIZE SHALL BE 12" AND USE 9 NO. LS-400-C LINK SEALS. BREAKING OF THE WALL WITH A JACKHAMMER OR USING PRE-CAST KNOCKOUT PANELS IS NOT PERMITTED.
12. THERE WILL BE CONCRETE SUPPORT UNDER EACH VALVE AND UNDER THE DOUBLE CHECK VALVE.
13. DEPTH OF VAULT SHALL BE A MINIMUM OF 4'-6".



CITY OF ALLEN
DEPARTMENT OF ENGINEERING

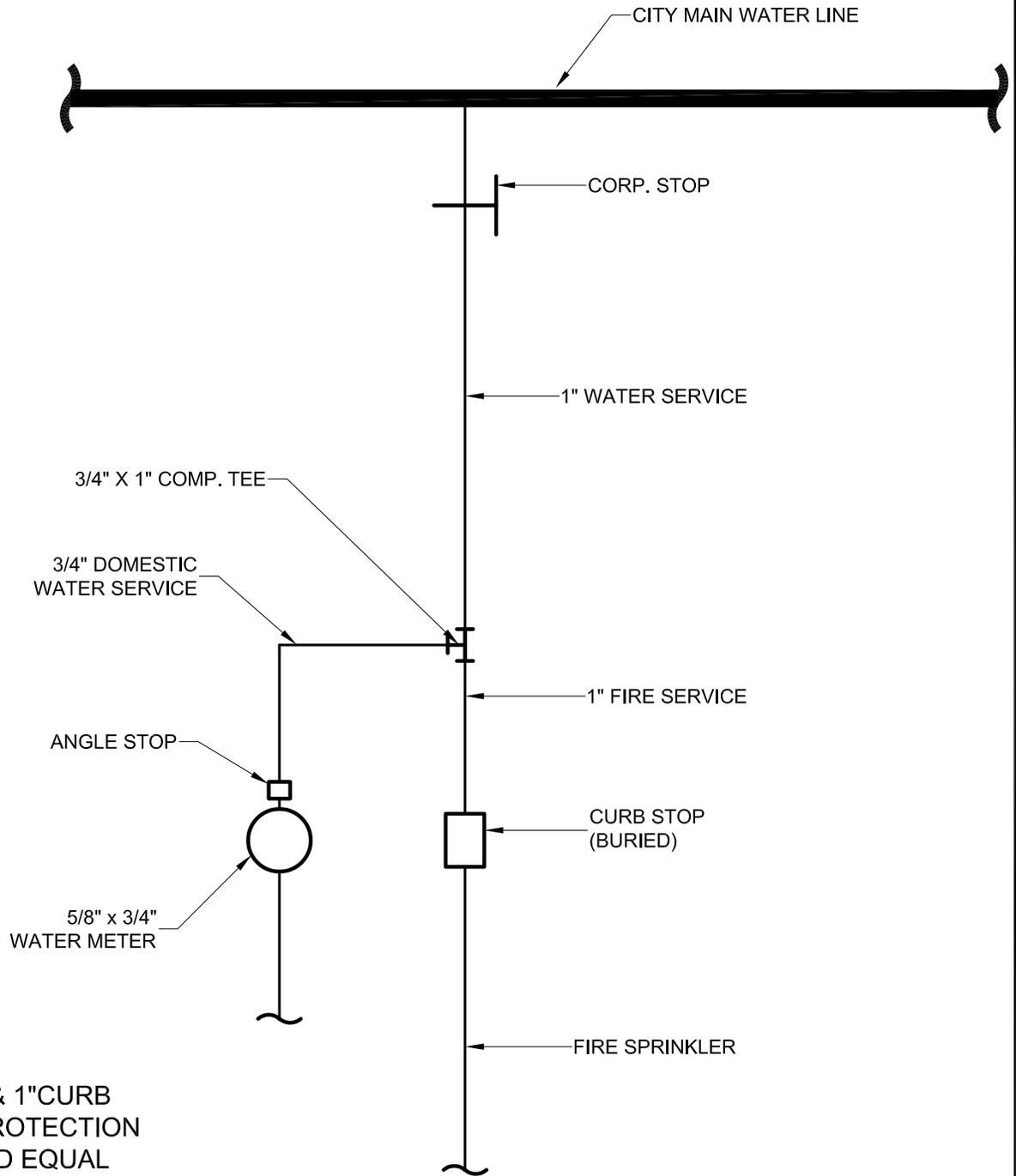
DOUBLE CHECK VAULT

STANDARD CONSTRUCTION DETAILS
WATER

DATE:
DEC. 1992

REV DATE:
AUG. 2006

SHEET :
SD-W26



* 3/4" ANGLE STOP & 1" CURB STOP FOR FIRE PROTECTION ARE TO BE PLACED EQUAL DISTANCES OFF CURB.

STIFFNERS TO BE PLACED ON ALL COMPRESSION FITTINGS.



CITY OF ALLEN
DEPARTMENT OF ENGINEERING

TOWNHOME FIRE SERVICE

STANDARD CONSTRUCTION DETAILS
WATER

DATE:
AUG. 2005

REV DATE:
AUG. 2006

SHEET :
SD-W27