1. GATE VALVES AND BUTTERFLY VALVES SHALL NOT BE OVER 1000 FT APART FOR LINES 12" AND LARGER.

2. GATE VALVES SIXTEEN (16) INCHES AND LARGER SHALL BE PLACED IN A VAULT.

3. MINIMUM COVER FOR WATER LINES:
   4" thru 12" - 4 FT COVER (5 FT UNIMPROVED)
   14" THRU 18" - 5 FT COVER (6 FT UNIMPROVED)
   20" AND LARGER - 6 FT COVER (7 FT UNIMPROVED)

4. THE MINIMUM WATER MAIN SIZE SHALL BE 8" IN RESIDENTIAL (LARGER LINE SIZE MAY BE REQUIRED BY THE COMPREHENSIVE PLAN, WATER MASTER PLAN, OR TO MEET FIRE PROTECTION NEEDS AS DETERMINED BY THE CITY ENGINEER).

5. THERE SHALL BE A MINIMUM OF A FIFTEEN (15) FOOT EASEMENT FOR WATER LINES.

6. THE MINIMUM RESIDENTIAL WATER SERVICE LINE SHALL BE ONE INCH (1") POLY PIPE (SDR 9), AND SHALL BE INSTALLED BEHIND BACK OF CURB IN PARKWAY AWAY FROM DRIVEWAYS.

7. DEAD END MAINS SHALL NOT EXCEED SIX HUNDRED FEET (600'). PROVISIONS SHALL BE PROVIDED FOR FLUSHING DEAD END MAINS WITH A FIRE HYDRANT OR AUTO-FLUSH VALVE PLACED NEAR THE TERMINAL END OF THE LINE.

8. TRACER TAPE SHALL BE INSTALLED ALONG THE TOP CENTERLINE OF ALL NON-METALLIC WATER PIPES A MINIMUM OF TWO FEET ABOVE THE TOP OF PIPE AND SHALL BE DETECTABLE PER MANUFACTURER SPECIFICATIONS BY A METAL DETECTION DEVICE AT THE INSTALLED DEPTH. THE TAPE IS TO CONSIST OF A METAL STRIP COATED WITH A CORROSION RESISTANT SUBSTANCE AND SHALL BE AT LEAST 2" WIDE. TRACER TAPE SHALL ALSO BE PLACED ABOVE SERVICE LINES THAT CROSS THE STREET.

9. A MAXIMUM OF 6 FEET BURY IS ALLOWED FOR FIRE HYDRANTS.

10. REDUCED SIZE DETECTOR VALVES WILL NOT BE ALLOWED.

11. ONLY 5 1/4" WATEROUS PACER FIRE HYDRANT WITH SAFETY FLANGE WILL BE ALLOWED FOR STANDARD HYDRANTS. FIRE HYDRANTS WITH TWO PUMPER NOZZLES SHALL MEET REQUIREMENTS IN STANDARD DRAWING 4120CM AND 4120DM.

12. ALL FIRE HYDRANT LEADS SHALL CONTAIN A GATE VALVE THAT IS WITHIN 2'-5' OF THE HYDRANT.

13. FIRE HYDRANT MARKERS SHALL CONSIST OF A 4" BY 4" BLUE REFLECTOR PAVEMENT MARKER INSTALLED OPPOSITE EACH FIRE HYDRANT ON ALL STREETS' CENTER LINE.

14. MINIMUM 6" WATER LINES SHALL BE PROVIDED UP TO 25 FT OF FIRE HYDRANTS; OTHERWISE 8" OR LARGER MUST BE USED.

15. ALL WATER LINES SHALL MEET THE REQUIREMENTS OF AWWA AND NCTCOG UNDER THE FOLLOWING SPECIFICATIONS:
   - 8" THRU 12" : C900 DR 18 - PVC
   - 14" AND LARGER : AWWA C301 & C303 - REINFORCED CONCRETE CYLINDER PIPE
   : AWWA C900 - PVC - DR 18
   : AWWA C151 - DUCTILE IRON PIPE - THICKNESS CLASS 50

16. ALL FEEDER MAINS SHALL BE LOOPED AND ALL OTHER WATER LINES IN EXCESS OF 600' IN LENGTH SHALL BE LOOPED.

17. ALL WATER LINE FITTINGS SHALL BE DUCTILE IRON PER AWWA C110 OR AWWA C153 WITH CORROSION RESISTANT BOLTS/NUTS PER ASTM A325.

18. ALL GATE VALVES SHALL MEET THE REQUIREMENTS OF AWWA C509 AND NCTCOG 502.6.2. GATE VALVES SHALL INCLUDE VALVE BOXES PER STANDARD DRAWING 4050M AND DEBRIS CAPS/PLUGS PER STANDARD DRAWING 4051M. VALVES SHALL BE FURNISHED WITH EXTENSIONS TO 1' BELOW GRADE AT LOCATIONS WHERE THE VALVE OPERATING NUT IS MORE THAN 3' BELOW GRADE.

19. ALL VALVES, FIRE HYDRANTS, AND FITTINGS SHALL BE INSTALLED WITH ADEQUATE THRUST BLOCKING OR MECHANICAL JOINT RESTRAINT IN ACCORDANCE WITH THE CITY OF MELISSA STANDARD CONSTRUCTION DETAILS. POLYETHYLENE WRAPPING SHALL PRECEDE BLOCKING OR RESTRAINT. ALL JOINT RESTRAINTS SHALL BE MEGALUG OR APPROVED EQUIVALENT.

20. THE CITY ENGINEER SHALL BE NOTIFIED A MINIMUM OF 48 HOURS PRIOR TO THE INSTALLATION OF ANY AND ALL WATER IMPROVEMENTS.

21. DENSITY TESTING FOR UTILITY BACKFILL SHALL BE PERFORMED PER TXDOT STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MAINTENANCE OF STREETS, HIGHWAYS, AND BRIDGES ITEM 132.

22. HOME BUILDERS SHALL BE REQUIRED TO INSTALL PRESSURE REDUCING VALVES ON THE CUSTOMER SIDE OF THE METER ON LOTS WITH AN ELEVATION OF 657.65' AND LOWER.

M* - CITY OF MELISSA REVISION

GENERAL CONSTRUCTION WATER NOTES

CITY OF MELISSA, TEXAS

NCTCOG STANDARD SPECIFICATION REFERENCE		
500		
MODIFIED DATE	STANDARD DRAWING NO.	
1/6/20	4001M*	
NOTICE DATE	ADOPTED DATE	ENFORCEMENT DATE
1/6/20	2/6/20	2/6/20

WATER PIPELINE TESTING AND DISINFECTION

PART 1 - GENERAL

1.1 WORK OF THIS SECTION

A. THE WORK OF THIS SECTION INCLUDES PREPARATION, DISINFECTION, FLUSHING, SAMPLING, TESTING AND PAYMENT OF ALL PRESSURE PIPELINES AND APPURTENANT PIPING FOR POTABLE WATER AND DISINFECTION OF ALL PIPELINES AND APPURTENANT PIPING FOR POTABLE WATER, COMPLETE, INCLUDING PROVIDING TEST WATER AND ALL DISPOSAL THEREOF.

1.2 STANDARD SPECIFICATIONS

B. EXCEPT AS OTHERWISE INDICATED IN THIS SECTION OF THE SPECIFICATIONS, THE CONTRACTOR SHALL COMPLY WITH THE LATEST EDITIONS OF AWWA AND NCTCoG STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION TOGETHER WITH ALL LATEST STATE OF TEXAS AND TEXAS COMMISSION ON ENVIRONMENTAL QUALITY REQUIREMENTS.

1.3 SPECIFICATIONS AND STANDARDS

A. EXCEPT AS OTHERWISE INDICATED, THE CURRENT EDITIONS OF THE FOLLOWING APPLY TO THE WORK OF THIS SECTION:

1. ANSI/AWWA B300 - HYPOCHLORITES
2. ANSI/AWWA B301 - LIQUID CHLORINE
3. ANSI/AWWA C651 - DISINFECTING WATER MAINS
4. APHA, AWWA, AND WEF - STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER
5. TEXAS, NCTCoG, TCEQ - STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION

1.4 TESTING SCHEDULE

A. THE FOLLOWING SHALL BE SUBMITTED TO THE CITY ENGINEER:

1. A TESTING SCHEDULE, INCLUDING PROPOSED PLANS FOR WATER CONVEYANCE, CONTROL, AND DISINFECTION SHALL BE SUBMITTED IN WRITING FOR APPROVAL A MINIMUM OF 48 HOURS BEFORE TESTING IS TO START. THE SUBMITTAL SHALL ALSO INCLUDE THE CONTRACTOR'S PLAN FOR THE RELEASE OF WATER FROM PIPELINES AFTER TESTING AND DISINFECTION HAS BEEN COMPLETED.

1.5 PAYMENT

A. GENERAL CONTRACTOR (CIP) OR DEVELOPER (PRIVATE) WILL BE RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH BACTERIAL TESTING. TESTING WILL BE CONDUCTED UNTIL SATISFACTORY RESULTS, IN OPINION OF THE OWNER, HAVE BEEN ACHIEVED. THE CONTRACTOR/DEVELOPER WILL BE RESPONSIBLE FOR PAYING AN INVOICE FOR THE UNMETERED WATER USED AFTER EVERY FLUSHING EVENT DURING TESTING. FLUSHING/TESTING CAN RESUME ONLY AFTER THE INVOICE HAS BEEN PAID.

PART 2 - PRODUCTS

2.1 MATERIALS REQUIREMENTS

A. ALL TEST EQUIPMENT, CHEMICALS FOR CHLORINATION, PUMPS, HOSES, TEMPORARY VALVES, TEMPORARY BLOW-OFFS, BULKHEADS, BACKFLOW DEVICES, OR OTHER WATER CONTROL EQUIPMENT AND MATERIALS SHALL BE DETERMINED AND FURNISHED BY THE CONTRACTOR. NO MATERIALS SHALL BE USED WHICH WOULD BE, IN THE OPINION OF THE ENGINEER, INJURIOUS TO THE PIPELINE OR ITS FUTURE FUNCTION.

B. CHLORINE FOR DISINFECTION SHALL BE IN THE FORM OF LIQUID CHLORINE, SODIUM HYPOCHLORITE SOLUTION, OR CALCIUM HYPOCHLORITE GRANULES OR TABLETS.

C. IF USED, LIQUID CHLORINE SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF ANSI/AWWA B301. LIQUID CHLORINE SHALL BE USED ONLY:

1. IN COMBINATION WITH APPROPRIATE GAS FLOW CHLORINATORS AND EJECTORS;
2. UNDER THE DIRECT SUPERVISION OF AN EXPERIENCED TECHNICIAN;
3. WHEN APPROPRIATE SAFETY PRACTICES ARE OBSERVED.

D. IF USED, SODIUM HYPOCHLORITE AND CALCIUM HYPOCHLORITE SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF ANSI/AWWA B300.

M* - CITY OF MELISSA REVISION

	NCTCOG STANDARD SPECIFICATION REFERENCE: 506	
WATER PIPELINE TESTING AND DISINFECTION	MODIFIED DATE: 11/3/17	STANDARD DRAWING NO.: 4002AM*
CITY OF MELISSA, TEXAS	NOTICE DATE: 11/17/17	ADOPTED DATE: 11/17/17 / ENFORCEMENT DATE: 12/17/17

WATER PIPELINE TESTING AND DISINFECTION

PART 3 - EXECUTION

3.1 GENERAL

A. UNLESS OTHERWISE INDICATED, POTABLE WATER FOR TESTING AND DISINFECTING WATER PIPELINES WILL BE FURNISHED BY THE CONTRACTOR. THE CONTRACTOR SHALL FURNISH AND INSTALL ALL MATERIALS INCLUDING BUT NOT LIMITED TO APPROVED BACKFLOW DEVICES AND ALSO MAKE ALL NECESSARY ARRANGEMENTS FOR CONVEYING THE WATER TO THE POINTS OF USE.

B. ALL PRESSURE PIPELINES SHALL BE PASS HYDROSTATIC TESTING BEFORE CHLORINATING. DISINFECTION SHALL THEN BE ACCOMPLISHED BY CHLORINATION. ALL CHLORINATING AND TESTING OPERATIONS SHALL BE PERFORMED IN THE PRESENCE OF THE CITY'S AUTHORIZED REPRESENTATIVE.

C. DISINFECTION OPERATIONS SHALL BE SCHEDULED BY THE CONTRACTOR AS LATE AS POSSIBLE DURING CONTRACT TIME PERIOD SO AS TO ASSURE THE MAXIMUM DEGREE OF STERILITY OF THE FACILITIES AT THE TIME THE WORK IS ACCEPTED BY THE OWNER.

D. ALL POTABLE WATER FROM THE EXISTING WATER SYSTEM USED FOR TESTING WILL BE MEASURED USING A SONIC FLOW METER. THE CONTRACTOR WILL BE RESPONSIBLE FOR PROVIDING A LOCATION FOR THE INSPECTOR TO ATTACH THE FLOW METER TO THE OUTSIDE OF THE PIPE NEAR THE TIE-IN LOCATION TO THE EXISTING SYSTEM.

3.2 HYDROSTATIC TESTING OF PIPELINES

A. PRIOR TO HYDROSTATIC TESTING, ALL PIPELINES SHALL BE FLUSHED OR BLOWN OUT AS APPROPRIATE. THE CONTRACTOR SHALL TEST ALL PIPELINES AS A SINGLE UNIT. NO SECTION OF THE PIPELINE SHALL BE TESTED UNTIL ALL FIELD-PLACED CONCRETE OR MORTAR HAS ATTAINED AN AGE OF 14 DAYS. THE TEST SHALL BE MADE BY CLOSING VALVES WHEN AVAILABLE OR BY PLACING TEMPORARY BULKHEADS IN THE PIPE AND FILLING THE LINE SLOWLY WITH WATER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ASCERTAINING THAT ALL TEST BULKHEADS ARE SUITABLY RESTRAINED TO RESIST THE THRUST OF THE TEST PRESSURE WITHOUT DAMAGE TO, OR MOVEMENT OF, THE ADJACENT PIPE. ANY UNHARNESSED SLEEVE-TYPE COUPLINGS, EXPANSION JOINTS, OR OTHER SLIDING JOINTS SHALL BE RESTRAINED OR SUITABLY ANCHORED PRIOR TO TEST, TO AVOID MOVEMENT AND DAMAGE TO PIPING AND EQUIPMENT. THE CONTRACTOR SHALL PROVIDE SUFFICIENT TEMPORARY AIR TRAPPINGS IN THE PIPELINES TO ALLOW FOR EVACUATION OF ALL ENTRAPPED AIR IN EACH PIPE SEGMENT TO BE TESTED. AFTER COMPLETION OF THE TESTS, SUCH TAPS SHALL BE PERMANENTLY PLUGGED. CARE SHALL BE TAKEN TO SEE THAT ALL AIR VENTS ARE OPEN DURING FILLING.

B. THE PIPELINE SHALL BE FILLED FROM THE LOWEST POINT ON THE LINE AVAILABLE. THE LINE SHALL BE FILLED AT A RATE WHICH WILL NOT CAUSE ANY SURGES OR EXCEED THE RATE AT WHICH THE AIR CAN BE RELEASED THROUGH THE AIR VALVES AT A REASONABLE VELOCITY AND ALL THE AIR WITHIN THE PIPELINE SHALL BE PROPERLY PURGED. AFTER THE PIPELINE (OR SECTION THEREOF) HAS BEEN FILLED, IT SHALL BE ALLOWED TO STAND UNDER A SLIGHT PRESSURE FOR AT LEAST 24 HOURS TO ALLOW THE CONCRETE OR MORTAR LINING, AS APPLICABLE, TO ABSORB WATER AND TO ALLOW THE ESCAPE OF AIR FROM ANY AIR POCKETS. DURING THIS PERIOD, BULKHEADS, VALVES, AND CONNECTIONS SHALL BE EXAMINED FOR LEAKS. IF LEAKS ARE FOUND, CORRECTIVE MEASURES SATISFACTORY TO THE CITY SHALL BE TAKEN.

C. HYDROSTATIC TEST. BEFORE BEING ACCEPTED, ALL GRAY IRON, DUCTILE IRON AND PVC PIPE LINES CONSTRUCTED SHALL BE TESTED WITH A HYDRAULIC TEST PRESSURE OF NO LESS THAN 150 PSI (1,034.3 kPA), MAINTAINED OVER A PERIOD OF NOT LESS THAN 4 HOURS UNLESS OTHERWISE SPECIFIED BY THE OWNER. CONCRETE PRESSURE PIPE SHALL BE TESTED WITH A HYDRAULIC TEST PRESSURE OF 120 PERCENT OF THE DESIGN PRESSURE. STEEL PRESSURE PIPE SHALL BE TESTED WITH A HYDRAULIC TEST PRESSURE NOT TO EXCEED 150 PERCENT AND NOT LESS THAN 120 PERCENT OF THE DESIGN WORKING PRESSURE. CONTRACTOR WILL BE RESPONSIBLE FOR FILLING THE LINE AND PRESSURIZING THROUGH A FLOWMETER SUITABLE FOR TRACKING THE TOTAL USAGE. WATER LINES OF MATERIALS IN COMBINATION SHALL BE TESTED FOR THE TYPE OF PIPE (MATERIAL) WITH THE LEAST STRINGENT HYDRAULIC TEST PRESSURE MAINTAINED OVER A PERIOD OF NO LESS THAN 4 HOURS.

WATER PIPELINE TESTING AND DISINFECTION

D. THE RATE OF LEAKAGE OF ALL PIPE TESTED SHALL NOT EXCEED 11.65 GALLONS PER INCH OF NOMINAL DIAMETER OF PIPE PER MILE (0.01 CU. M. PER CM. OF NOMINAL DIAMETER PER KM.) OVER A 24 HOUR PERIOD. THE MAXIMUM ALLOWABLE LEAKAGE FOR DISTRIBUTION AND TRANSMISSION PIPELINES SHALL BE PER NCTCOG 506.5. THE ALLOWABLE LEAKAGE FOR 4 HOURS SHALL BE DETERMINED AS FOLLOWS:

ALLOWABLE LEAKAGE (GALS.) FOR 4 HOURS = $4*(S*D*\sqrt{P}) / 133,200$

WHERE:

S = LENGTH OF PIPE, FT.
D = DIAMETER OF PIPE, IN.
P = 150 PSI
HEIGHT CORRECTION = 0.43 PSI/FT. (APPLIED WHEN LINES CANNOT BE TESTED AT ITS LOWEST POINT)
VALVE LEAKAGE ALLOWABLE = 0.0078 GAL./HOUR/IN. OF NOMINAL VALVE SIZE
TEST - GRAY IRON, DUCTILE IRON, PLASTIC, AND AC AT 150 PSI
- CONCRETE 120% OF DESIGN PRESSURE
- STEEL 120% MIN. TO 150% MAX. DESIGN WORKING PRESSURE

NCTCOG TABLE 506.5.(a) ALLOWABLE LEAKAGE FOR 4-HOURS AT TEST PRESSURE 150-psi (GALLONS)

LENGTH	PIPE DIAMETER (INCHES)								
(FT.)	8	10	12	14	16	18	20	24	30
25	0.07	0.09	0.11	0.13	0.15	0.17	0.18	0.22	0.28
50	0.15	0.18	0.22	0.26	0.29	0.33	0.37	0.44	0.55
100	0.29	0.37	0.44	0.51	0.59	0.66	0.74	0.88	1.10
500	1.47	1.84	2.21	2.57	2.94	3.31	3.68	4.41	5.52
1000	2.94	3.68	4.41	5.15	5.88	6.62	7.36	8.83	11.03
1500	4.41	5.52	6.62	7.72	8.83	9.93	11.03	13.24	16.55
2000	5.88	7.36	8.83	10.30	11.77	13.24	14.71	17.65	22.07
2500	7.36	9.19	11.03	12.87	14.71	16.55	18.39	22.07	27.58
3000	8.83	11.03	13.24	15.45	17.65	19.86	22.07	26.48	33.10
3500	10.30	12.87	15.45	18.02	20.60	23.17	25.75	30.89	38.62
4000	11.77	14.71	17.65	20.60	23.54	26.48	29.42	35.31	44.13

STEEL PIPE WITH WELDED JOINTS SHALL HAVE NO LEAKAGE.

IN THE CASE OF PIPELINES THAT FAIL TO PASS THE PRESCRIBED LEAKAGE TEST, THE CONTRACTOR SHALL DETERMINE THE CAUSE OF THE LEAKAGE, SHALL TAKE CORRECTIVE MEASURES NECESSARY TO REPAIR THE LEAKS, AND SHALL TEST THE PIPELINES AGAIN AT THEIR OWN EXPENSE.

E. THE CONTRACTOR WILL BE RESPONSIBLE FOR CONDUCTING A SECOND HYDROSTATIC PRESSURE TEST AFTER ALL PAVING OPERATIONS HAVE BEEN COMPLETED AND PRIOR TO THE CITY ISSUING ANY FORM OF ACCEPTANCE. THE WATER USED TO PRESSURIZE THE LINE TO 150 PSI WILL BE CHLORINATED WATER HAVING A CHLORINE CONCENTRATION GREATER THAN 15 MG/L. BUT NOT GREATER THAN 100 MG/L. VALVES WILL NEED TO BE CLOSED TO TEMPORARILY ISOLATE THE SYSTEM FOR TESTING.

M* – CITY OF MELISSA REVISION

WATER PIPELINE TESTING AND DISINFECTION	MELISSA TX	NCTCOG STANDARD SPECIFICATION REFERENCE: 506	
		MODIFIED DATE: 8/16/18	STANDARD DRAWING NO.: 4002CM*
CITY OF MELISSA, TEXAS	NOTICE DATE: 8/16/18	ADOPTED DATE: 8/16/18	ENFORCEMENT DATE: 9/16/18

WATER PIPELINE TESTING AND DISINFECTION

3.3 DISINFECTING PIPELINES

A. GENERAL: ALL POTABLE PIPELINES EXCEPT THOSE APPURTENANT TO HYDRAULIC STRUCTURES SHALL BE DISINFECTED IN ACCORDANCE WITH THE REQUIREMENTS OF ANSI/AWWA C651 USING THE CONTINUOUS-FEED METHOD AS MODIFIED HEREIN. PRELIMINARY AND FINAL FLUSHING SHALL BE DONE AT THE ENDS OF MAINS, WHICH HAVE BEEN HYDROSTATICALLY TESTED.

B. CHLORINATION: A CHLORINE-WATER MIXTURE SHALL BE UNIFORMLY INTRODUCED INTO THE PIPELINE BY MEANS OF A SOLUTION-FEED CHLORINATING DEVICE. THE CHLORINE SOLUTION SHALL BE INTRODUCED AT ONE END OF THE PIPELINE THROUGH A TAP IN SUCH A MANNER THAT AS THE PIPELINE IS FILLED WITH WATER, THE DOSAGE APPLIED TO THE WATER ENTERING THE PIPE SHALL BE APPROXIMATELY 50 MG/L. CARE SHALL BE TAKEN TO PREVENT THE STRONG CHLORINE SOLUTION IN THE LINE BEING DISINFECTED FROM FLOWING BACK INTO THE LINE SUPPLYING THE WATER.

C. CHLORINE RESIDUAL TEST: CHLORINATED WATER SHALL BE RETAINED IN THE PIPELINE FOR AT LEAST 24 HOURS. AFTER THE CHLORINE-TREATED WATER HAS BEEN RETAINED FOR THE REQUIRED TIME, THE FREE CHLORINE RESIDUAL AT THE PIPELINE EXTREMITIES AND AT OTHER REPRESENTATIVE POINTS SHALL BE AT LEAST 25 MG/L. THE CONTRACTOR SHALL MAKE 24-HOUR CHLORINE RESIDUAL TESTS IN THE PRESENCE OF THE OWNER'S REPRESENTATIVE.

D. REPETITION OF TEST: THE DISINFECTION TESTING PROCEDURE SHALL BE REPEATED IF THE INITIAL TESTS FAIL TO PRODUCE SATISFACTORY RESULTS. TWO CONSECUTIVE SATISFACTORY TEST RESULTS SHALL BE REQUIRED AFTER ANY UNSATISFACTORY TEST. THE TABLET METHOD SHALL NOT BE USED FOR REPEATED DISINFECTION.

E. CHLORINATING VALVES: DURING THE PROCESS OF CHLORINATING THE PIPELINES, ALL VALVES, FLUSH POINTS AND OTHER APPURTENANCES SHALL BE OPERATED WHILE THE PIPELINE IS FILLED WITH THE SUPER-CHLORINATED WATER.

F. FINAL FLUSHING: FINAL FLUSHING SHALL BE DONE BY THE CONTRACTOR AFTER ACHIEVING A SATISFACTORY CHLORINE RESIDUAL TEST. AFTER THE APPLICABLE RETENTION PERIOD, THE HEAVILY CHLORINATED WATER SHALL BE FLUSHED FROM THE PIPELINE UNTIL CHLORINE MEASUREMENTS SHOW THE CONCENTRATION IN THE WATER LEAVING THE PIPELINE IS NO HIGHER THAN THAT GENERALLY PREVAILING IN THE SYSTEM OR IS ACCEPTABLE FOR THE INTENDED USE. IF THERE IS ANY QUESTION THAT THE CHLORINATED DISCHARGE WILL CAUSE DAMAGE TO THE ENVIRONMENT, A REDUCING AGENT SHALL BE APPLIED TO THE WATER TO NEUTRALIZE THOROUGHLY THE CHLORINE RESIDUAL REMAINING IN THE WATER WILL BE CONSIDERED SUBSIDIARY TO THE CONTRACT.

G. DISINFECTION OF CONNECTIONS: PIPE AND APPURTENANCES USED TO CONNECT THE NEWLY INSTALLED WATER MAIN SHALL ALSO BE DISINFECTED IN ACCORDANCE WITH AWWA C651.

H. NEUTRALIZATION OF CHLORINATED WATER: WHEN DEEMED NECESSARY BY THE OWNER, NEUTRALIZING AND DISPOSING OF CHLORINATED WATER SHALL BE IN ACCORDANCE WITH APPENDIX "B" OF AWWA STANDARD C651.

3.4 BACTERIOLOGICAL TESTING OF DISINFECTED PIPELINES

A. THE CONTRACTOR SHALL COLLECT A MINIMUM OF 2 SETS OF SAMPLES AFTER COMPLETION OF FINAL FLUSHING AS INDICATED ABOVE AND BY USING ONE OF THE TWO OPTIONS BELOW. SAMPLES WILL BE TAKEN AT LOCATIONS INDICATED IN ANSI/AWWA C651 AND WILL BE TESTED FOR COLIFORM ORGANISMS AND HETEROTROPHIC PLATE COUNT ACCORDING TO THE LATEST EDITION OF "THE STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER." LABORATORY COSTS OF TESTING WILL BE THE CONTRACTOR'S RESPONSIBILITY:

1. OPTION A: BEFORE APPROVING A MAIN FOR RELEASE, TAKE AN INITIAL SET OF SAMPLES AND THEN RESAMPLE AGAIN AFTER A MINIMUM OF 16 HOURS USING THE SAMPLING SITE PROCEDURES OUTLINES IN AWWA C651. BOTH SETS OF SAMPLES MUST PASS FOR THE MAIN TO BE APPROVED FOR RELEASE.

2. OPTION B: BEFORE APPROVING A MAIN FOR RELEASE, LET IT SIT FOR A MINIMUM OF 16 HOURS WITHOUT ANY WATER USE. THEN COLLECT, USING THE SAMPLING PROCEDURES OUTLINES AND WITHOUT FLUSHING THE MAIN, TWO SETS OF SAMPLES A MINIMUM OF 15 MINUTES APART WHILE THE SAMPLING TAPS ARE LEFT RUNNING. BOTH SETS OF SAMPLES MUST PASS FOR THE MAIN TO BE APPROVED FOR RELEASE.

B. SATISFACTORY BACTERIOLOGICAL RESULTS WILL BE
a) ABSENCE OF TOTAL AND FECAL COLIFORM AND,
b) A HETEROTROPHIC PLATE COUNT LESS THAN 500 CFU/mL.

C. IF DISINFECTION FAILS TO PRODUCE SATISFACTORY BACTERIOLOGICAL COUNTS, THE PIPE SHALL BE REFLUSHED, RESAMPLED, AND RETESTED. IF COUNTS FROM ANALYSIS OF THE SECOND SAMPLES EXCEED THE CRITERIA IN STANDARD METHODS, THE PIPE SHALL BE RE-DISINFECTED AND WILL BE RESAMPLED AND RETESTED UNTIL SATISFACTORY RESULTS ARE OBTAINED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL BACTERIOLOGICAL TESTING COSTS.

M* – CITY OF MELISSA REVISION

WATER PIPELINE BACTERIAL TESTING FORM

DATE: _____

TO: PROGRAM MANAGER
PUBLIC WORKS/UTILITY BILLING

_____
(PROJECT)

FROM: _____
(CONTRACTOR)

Date	Task	Pipe (in)	Wall Thickness	Type of Pipe	Liner (Y/N)	Temp. (F°)	Gallons*
Total Gallons:							

NOTE- VALUES FOR CHLORINATING AND FLUSHING ARE MEASURED USING A SONIC FLOW METER, USING THE PARAMETERS ENTERED ABOVE. IN SOME CASES, VALUES PER FLUSH POINT ARE ESTIMATED AS FOLLOWS: HYDRANT - 1200 GPM; 2 $\frac{1}{2}$" HYDRANT OUTLET - 480 GPM; 2" - 365 GPM; 1 $\frac{1}{2}$" - 246 GPM; 1" - 120 GPM. BY THE DISCRETION OF THE CITY OF MELISSA & ITS ENGINEERING DEPARTMENT, HYDROSTATIC PRESSURE TESTING VOLUME CAN BE ASSUMED AS THE VOLUME OF SYSTEM BEING TESTED. CHLORINATION VOLUME CAN BE BASED UPON THE TOTAL VOLUME OF THE SYSTEM WITH A 10% WASTE FACTOR ADDED.

ESTIMATED TIME FOR INSPECTOR TO DELIVER SAMPLES TO NTMWD LAB
(HOURS INSPECTOR SPENT ONSITE, DRIVE TIME TO AND FROM LAB): _____

TIME SAMPLED: _____

MILEAGE (MELISSA TO NTMWD LAB, WYLIE): _____

INSPECTOR: _____

FIRST SERIES OF TESTING, COST OF TRAVEL EXPENSES FOR TESTING COVERED

SECOND TEST IN FIRST SERIES

FIRST TEST OF_____ SERIES OF TESTING, PAID BY CONTRACTOR

SECOND TEST OF _____ SERIES, PAID FOR BY CONTRACTOR

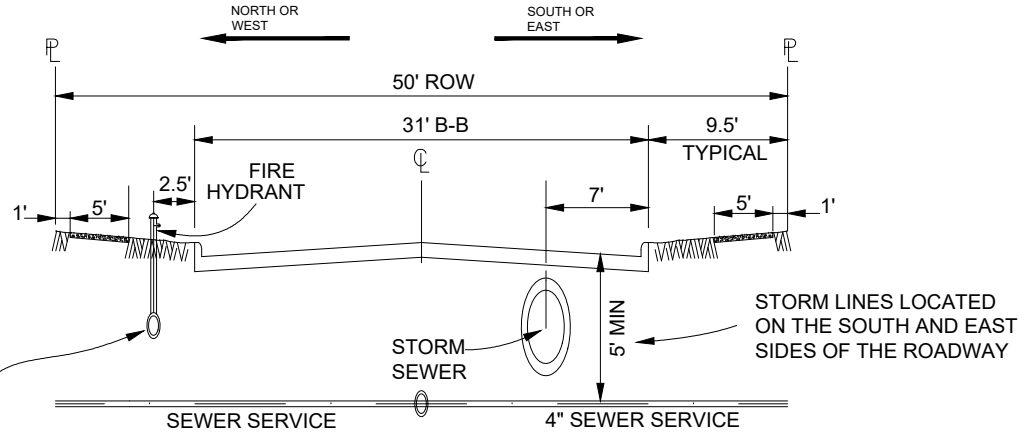
CONTRACTOR AGREES TO REIMBURSE OWNER AT THE STANDARD BILLING RATE ($69.00/HR + MILEAGE PER IRS RATES) FOR THE PAY OF THE INSPECTOR(S) ASSIGNED FOR THIS WORK. EXTRANEOUS BACTERIOLOGICAL TESTING WILL BE PAID FOR PRIOR TO SAMPLING WITH A CHECK MADE PAYABLE TO THE **CITY OF MELISSA.** IF PAYMENT FOR EXTRANEOUS SAMPLING IS NOT RECEIVED PRIOR TO SAMPLING, SAMPLES WILL NOT BE TAKEN ON THAT DAY. ADDITIONAL FLUSHING WILL NOT BE PERMITTED.

SIGNED:_____

TITLE:_____

M* – CITY OF MELISSA REVISION

WATER PIPELINE BACTERIAL TESTING FORM	MELISSA TX	NCTCOG STANDARD SPECIFICATION REFERENCE 506	
		MODIFIED DATE 6/14/24	STANDARD DRAWING NO. 4002EM*
CITY OF MELISSA, TEXAS		NOTICE DATE 6/14/24	ADOPTED DATE 6/14/24	ENFORCEMENT DATE 7/14/24



TYPICAL UTILITY LOCATION

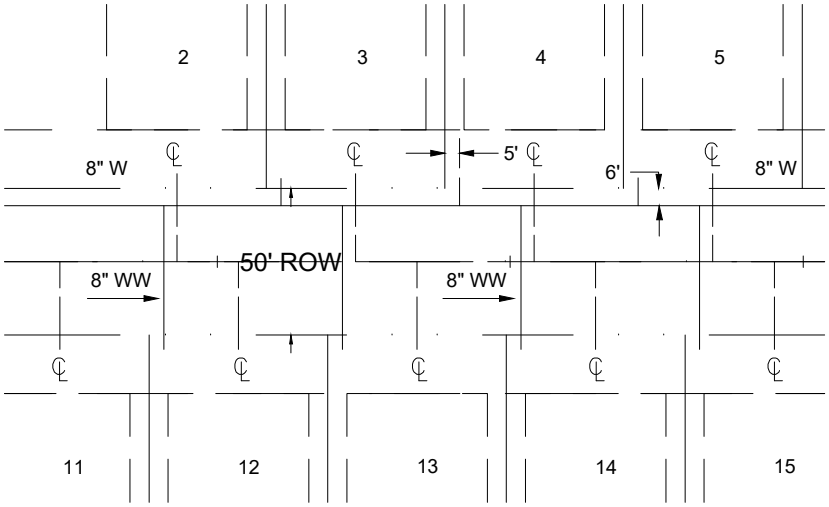
NTS

FIRE HYDRANTS TO BE LOCATED AT PCCR'S OR LOT LINES UNLESS NOTED OTHERWISE

WATER MAINS LOCATED ON THE NORTH & WEST SIDES OF THE ROADWAY WITH 4' MIN COVER OR AS NOTED IN THE GENERAL CONSTRUCTION WATER NOTES.

NOTE:
SANITARY SEWER SERVICE TO BE LOCATED AT CENTER OF LOT & WATER SERVICE TO BE LOCATED 5' OFF PROPERTY LINE UPSTREAM OF SANITARY SEWER SERVICE. NEITHER WATER OR WASTEWATER SERVICES SHALL BE PLACED IN DRIVEWAYS.

WHEN SANITARY SEWER SYSTEMS ENCROACH ON WATER LINES THE SANITARY SEWER MUST BE RATED 150 PSI OR GREATER, COLLECTION SYSTEMS WILL CROSS BELOW THE WATER LINE AND 6-INCHES IS REQUIRED BETWEEN THE OUTSIDE DIAMETERS OF THE PIPES.

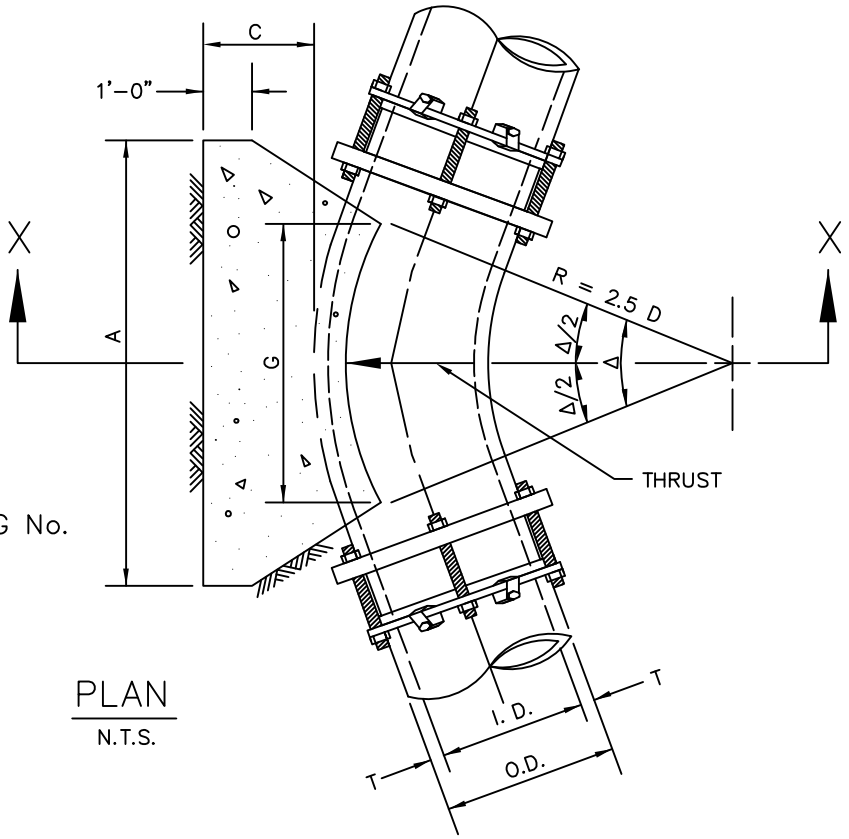


TYPICAL SERVICE LOCATION

NTS

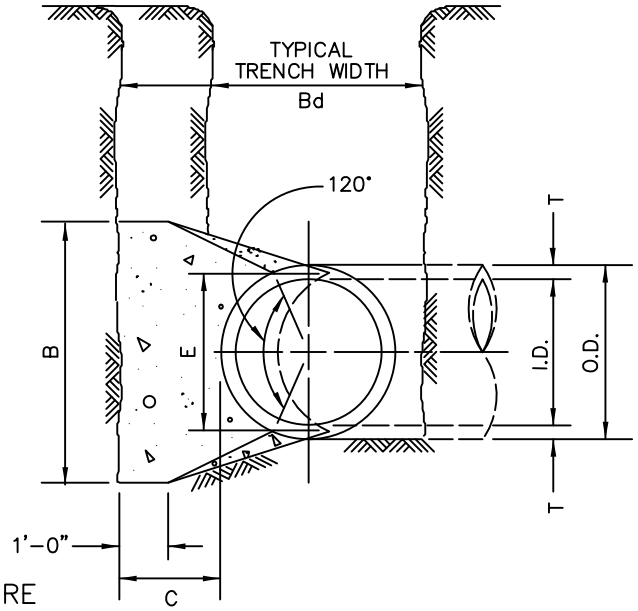
M* - CITY OF MELISSA REVISION

STANDARD WATER & WASTEWATER LOCATIONS	MELISSA TX	NCTCOG STANDARD SPECIFICATION REFERENCE: NA	
		MODIFIED DATE: 07/02/13	STANDARD DRAWING NO.: 4005M*
CITY OF MELISSA, TEXAS	NOTICE DATE: 06/17/13	ADOPTED DATE: 07/17/13	ENFORCEMENT DATE: 07/17/13



REFER TO STD. DWG No. 4040 FOR GENERAL NOTES

PLAN
N.T.S.



NOTE: ALL FITTINGS REQUIRE A MEGALUG JOINT RESTRAINT IN CONCERT WITH THRUST BLOCKING OR IN REFERENCE TO STANDARD DRAWING 4040 FOR GENERAL NOTES.

SECTION X–X
N.T.S.

HORIZONTAL THRUST BLOCK AT PIPE BEND

North Central Texas Council of Governments

STANDARD SPECIFICATION REFERENCE
502.4

DATE
AUG '23

STANDARD DRAWING NO.
4010A

I.D. (IN.)	T (IN.)	$\Delta = 11.25^\circ$ C (FT.)	$\Delta \geq 22.50^\circ$ C (FT.)	E (FT.)
4,6,8	0.4	1.5	1.5	0.9
10,12	0.5	1.5	1.5	1.2
16,18	0.6	1.5	1.5	1.6
20	0.7	1.5	1.5	1.8
24	0.9	1.5	1.5	2.1
30	2.9	1.5	1.9	2.6
36	4.5	1.5	2.3	3.3
42	5.0	1.8	2.6	3.8
48	5.5	2.0	3.0	4.3
54	6.0	2.3	3.4	4.8
60	6.5	2.5	3.8	5.3
66	6.8	2.8	4.1	5.7
72	7.5	3.0	4.5	6.3
78	7.5	3.3	4.9	6.7
84	8.0	3.5	5.3	7.2
90	8.5	3.8	5.6	7.7
96	9.0	4.0	6.0	8.2

	$\Delta = 11.25^\circ$									$\Delta = 22.50^\circ$							
			EARTH			ROCK						EARTH			ROCK		
I.D. (IN.)	G (FT.)	THRUST (TONS)	A (FT.)	B (FT.)	VOL. (C.Y.)	A (FT.)	B (FT.)	VOL. (C.Y.)	I.D. (IN.)	G (FT.)	THRUST (TONS)	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	4,6,8	0.8	2.0	1.5	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	10,12	1.1	4.4	2.0	2.5	0.3	1.5	1.5	0.1
16,18	0.8	5.0	2.0	2.5	0.3	1.5	2.0	0.2	16,18	1.6	9.9	3.0	3.5	0.6	2.0	2.5	0.3
20	0.9	6.2	2.0	3.5	0.4	1.5	3.0	0.3	20	1.8	12.3	3.5	3.5	0.7	2.0	3.0	0.4
24	1.1	8.9	3.0	3.5	0.5	1.5	3.0	0.3	24	2.2	17.7	4.0	4.5	1.0	3.0	3.5	0.5
30	1.4	10.4	3.0	3.5	0.6	2.0	3.5	0.4	30	2.7	20.7	5.0	4.5	1.5	3.0	4.0	0.8
36	1.7	15.0	3.5	4.5	0.9	2.0	4.0	0.5	36	3.3	29.8	5.5	5.5	2.3	4.0	4.0	1.3
42	1.9	20.4	4.5	5.0	1.5	2.5	5.0	0.8	42	3.8	40.5	7.0	6.0	3.9	4.5	5.0	2.1
48	2.2	26.6	4.5	6.0	2.0	2.5	6.0	1.1	48	4.4	52.9	8.0	7.0	5.7	4.5	6.0	2.8
54	2.5	33.7	6.0	6.0	3.0	3.0	6.0	1.4	54	4.9	67.0	9.0	8.0	8.0	6.0	6.0	4.1
60	2.7	41.6	6.0	7.0	3.8	3.0	7.0	1.8	60	5.5	82.7	9.5	9.0	10.6	6.0	7.0	5.3
66	3.0	50.3	6.5	8.0	5.1	3.5	8.0	2.7	66	6.0	100.1	10.5	10.0	14.1	6.5	8.0	7.2
72	3.3	59.9	7.5	8.0	6.3	4.0	8.0	3.3	72	6.6	119.1	11.0	11.0	17.6	7.5	8.0	9.1
78	3.6	70.2	8.0	9.0	8.1	4.0	9.0	3.9	78	7.1	139.8	12.0	12.0	22.5	8.0	9.0	11.7
84	3.8	81.5	8.5	10.0	10.3	4.5	10.0	5.3	84	7.6	162.1	13.0	12.5	27.2	8.5	10.0	14.8
90	4.1	93.5	9.5	10.0	12.2	5.0	10.0	6.3	90	8.2	186.1	14.0	13.5	33.7	9.5	10.0	17.7
96	4.4	106.4	10.0	11.0	15.0	5.0	11.0	7.4	96	8.7	211.7	15.0	14.5	41.2	10.0	11.0	21.8

TABLES OF DIMENSIONS AND QUANTITIES

HORIZONTAL THRUST BLOCK AT PIPE BEND

North Central Texas Council of Governments

STANDARD SPECIFICATION REFERENCE
502.4

DATE
AUG '23

STANDARD DRAWING NO.
4010B

I.D. (IN.)	Δ = 30° G (FT.)	THRUST (TONS)	EARTH A (FT.)	EARTH B (FT.)	EARTH VOL. (C.Y.)	ROCK A (FT.)	ROCK B (FT.)	ROCK VOL. (C.Y.)	I.D. (IN.)	Δ = 45° G (FT.)	THRUST (TONS)	EARTH A (FT.)	EARTH B (FT.)	EARTH VOL. (C.Y.)	ROCK A (FT.)	ROCK B (FT.)	ROCK VOL. (C.Y.)
4,6,8	1.0	2.6	2.0	1.5	0.2	1.0	1.5	0.1	4,6,8	1.5	3.9	2.0	2.0	0.2	1.5	1.5	0.1
10,12	1.5	5.9	2.5	2.5	0.3	2.0	1.5	0.2	10,12	2.2	8.7	3.5	2.5	0.5	2.0	2.5	0.3
16,18	2.2	13.2	3.5	4.0	0.8	2.5	3.0	0.4	16,18	3.2	19.5	4.5	4.5	1.2	3.0	3.5	0.6
20	2.4	16.3	4.5	4.0	1.0	3.0	3.0	0.5	20	3.6	24.1	5.5	4.5	1.5	3.5	3.5	0.7
24	2.9	23.4	6.0	4.0	1.4	3.5	3.5	0.7	24	4.3	34.6	8.0	4.5	2.3	4.5	4.0	1.1
30	3.6	27.5	6.5	5.0	1.9	3.5	4.0	0.9	30	5.4	40.6	8.5	5.0	3.2	5.5	4.0	1.6
36	4.4	39.5	7.0	6.0	3.4	4.5	4.5	1.6	36	6.5	58.5	10.0	6.0	5.3	6.5	4.5	2.6
42	5.1	53.8	8.0	7.0	5.1	5.5	5.0	2.5	42	7.5	79.6	11.5	7.0	8.1	8.0	5.0	4.2
48	5.8	70.3	9.0	8.0	7.4	6.0	6.0	3.7	48	8.6	104.0	13.0	8.0	11.9	9.0	6.0	6.3
54	6.5	89.0	10.0	9.0	10.3	7.0	6.5	5.3	54	9.7	131.5	15.0	9.0	17.1	10.5	6.5	8.9
60	7.3	110.0	11.0	10.0	13.9	7.5	7.5	7.3	60	10.7	162.4	16.5	10.0	23.1	11.0	7.5	12.0
66	8.0	132.9	12.5	11.0	18.9	8.5	8.0	9.6	66	11.8	196.5	18.0	11.0	30.1	12.0	8.5	16.2
72	8.7	158.2	13.5	12.0	24.0	9.0	9.0	12.3	72	12.9	233.9	19.5	12.0	38.6	14.0	8.5	20.7
78	9.4	185.6	14.5	13.0	30.0	10.0	9.5	15.6	78	13.9	274.5	21.5	13.0	49.8	14.5	9.5	25.9
84	10.1	215.3	15.5	14.0	37.1	10.5	10.5	19.5	84	15.0	318.4	23.0	14.0	61.2	15.5	10.5	32.6
90	10.9	247.1	16.5	15.0	45.0	11.5	11.0	23.9	90	16.1	365.5	24.5	15.0	74.5	17.5	10.5	39.6
96	11.6	281.2	18.0	16.0	55.5	12.5	11.5	28.9	96	17.1	415.6	26.0	16.0	89.5	18.5	11.5	48.5

I.D. (IN.)	Δ = 67.50° G (FT.)	THRUST (TONS)	EARTH A (FT.)	EARTH B (FT.)	EARTH VOL. (C.Y.)	ROCK A (FT.)	ROCK B (FT.)	ROCK VOL. (C.Y.)	I.D. (IN.)	Δ = 90° G (FT.)	THRUST (TONS)	EARTH A (FT.)	EARTH B (FT.)	EARTH VOL. (C.Y.)	ROCK A (FT.)	ROCK B (FT.)	ROCK VOL. (C.Y.)
4,6,8	2.1	5.6	3.0	2.0	0.3	2.0	1.5	0.2	4,6,8	2.7	7.1	5.0	1.5	0.4	2.0	2.0	0.2
10,12	3.1	12.6	5.5	2.5	0.8	3.5	2.0	0.4	10,12	4.0	16.0	6.5	2.5	1.0	3.5	2.5	0.5
16,18	4.7	28.3	7.5	4.0	1.9	5.5	3.0	0.9	16,18	6.0	36.0	9.0	4.0	2.4	4.5	4.0	1.0
20	5.2	34.9	9.0	4.0	2.3	5.5	3.5	1.2	20	6.6	44.4	10.0	4.5	3.1	6.0	4.0	1.5
24	6.2	50.3	11.5	4.5	3.5	6.5	4.0	1.6	24	7.9	64.0	14.5	4.5	5.0	8.0	4.0	2.1
30	7.8	58.9	12.0	5.0	4.8	7.5	4.0	2.2	30	9.9	75.0	15.0	5.0	6.7	10.0	4.0	3.3
36	9.4	84.9	14.5	6.0	8.2	9.5	4.5	3.8	36	11.9	108.0	18.0	6.0	11.4	12.0	4.5	5.3
42	10.9	115.5	17.0	7.0	12.8	11.0	5.5	6.3	42	13.9	147.0	21.0	7.0	17.8	14.0	5.5	8.7
48	12.5	150.9	19.0	8.0	18.4	13.0	6.0	9.2	48	15.9	192.0	24.0	8.0	26.2	16.0	6.0	12.4
54	14.0	191.0	21.5	9.0	26.0	15.0	6.5	12.9	54	17.9	243.0	27.0	9.0	36.9	18.0	7.0	18.1
60	15.6	235.8	24.0	10.0	35.6	16.0	7.5	17.6	60	19.9	299.8	30.0	10.0	50.3	20.0	7.5	24.0
66	17.1	285.3	26.0	11.0	46.0	18.0	8.0	23.0	66	21.8	362.8	33.0	11.0	66.2	22.0	8.5	32.5
72	18.7	339.5	28.5	12.0	57.8	19.0	9.0	28.4	72	23.8	431.8	36.0	12.0	85.6	24.0	9.0	41.0
78	20.2	398.5	31.0	13.0	75.7	21.0	9.5	37.4	78	25.7	506.7	39.0	13.0	108.2	26.0	10.0	53.2
84	21.8	462.1	33.5	14.0	94.7	22.0	10.5	46.5	84	27.7	587.7	42.0	14.0	134.4	28.0	10.5	64.8
90	23.3	530.5	35.5	15.0	114.4	24.5	11.0	58.2	90	29.0	674.6	45.0	15.0	164.9	30.0	11.5	81.2
96	24.9	603.6	38.0	16.0	138.9	25.5	12.0	70.0	96	31.6	767.5	48.0	16.0	199 0	32.0	12.0	95.1

TABLE OF DIMENSIONS AND QUANTITIES

HORIZONTAL THRUST BLOCK

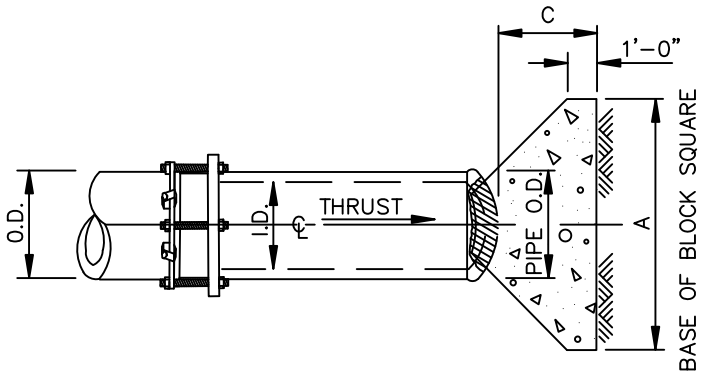
AT PIPE BEND

North Central Texas Council of Governments

STANDARD SPECIFICATION REFERENCE
502.4

DATE
AUG '23

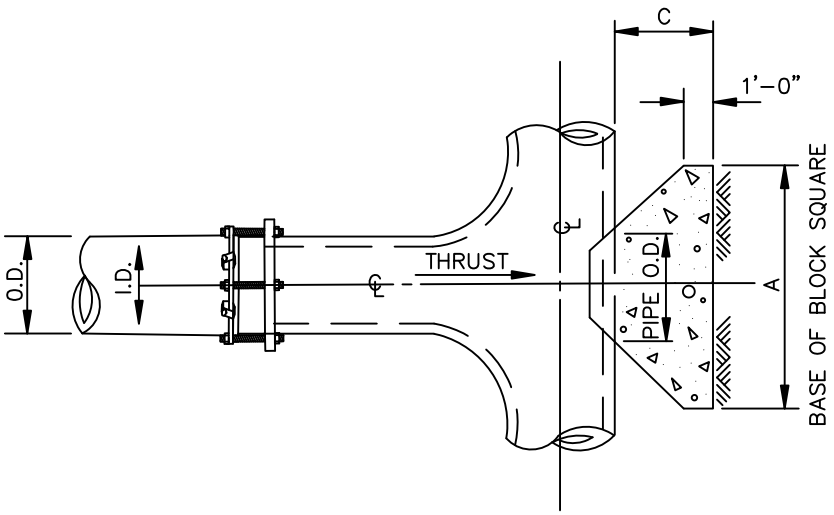
STANDARD DRAWING NO.
4010C



PLAN OF PLUG THRUST BLOCK

N.T.S.

REFER TO
STD. DWG. No. 4040
FOR GENERAL NOTES.



PLAN OF TEE THRUST BLOCK

N.T.S.

			EARTH		ROCK	
I.D. (IN.)	THRUST (TONS)	C (FT.)	A (FT.)	VOL. (C.Y.)	A (FT.)	VOL. (C.Y.)
4,6,8	5.1	1.5	2.5	0.3	2.0	0.2
10,12	11.3	1.5	3.5	0.6	2.5	0.3
16,18	25.5	2.0	5.5	1.6	4.0	0.9
20	31.5	2.0	6.0	1.9	4.0	0.9
24	45.2	2.5	7.0	3.1	5.0	1.7
30	53.0	3.0	7.5	4.1	5.5	2.4
36	76.3	4.0	9.0	7.3	6.5	4.2
42	104.0	4.5	10.5	11.0	7.5	6.2
48	136.0	5.0	12.0	15.6	8.5	8.7
54	172.0	5.5	13.5	21.4	9.5	11.9
60	212.0	6.0	15.0	28.4	10.5	15.7
66	257.0	6.5	16.5	36.8	11.5	20.5
72	305.0	7.5	17.5	47.2	12.5	27.2
78	358.0	8.0	19.0	58.9	13.5	33.7
84	416.0	8.5	20.5	72.3	14.5	41.2
90	477.0	9.0	22.0	87.7	15.5	49.7
96	543.0	9.5	23.5	104.8	16.5	61.0

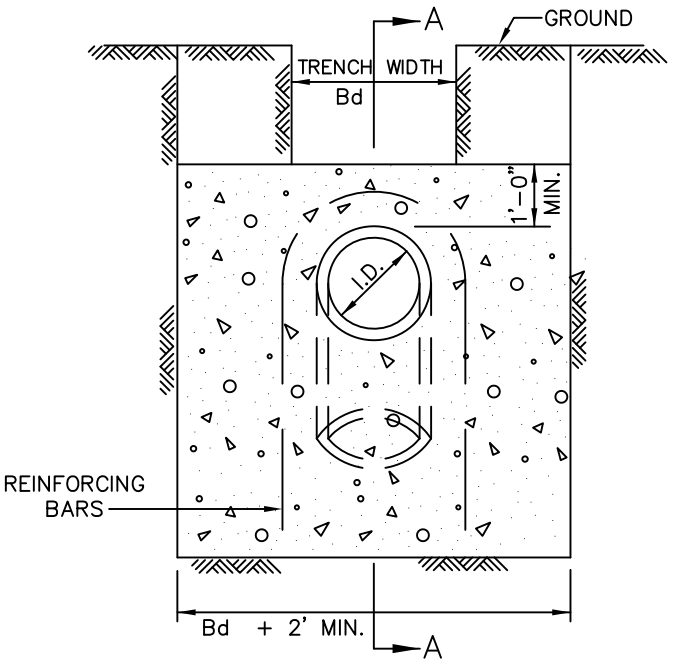
HORIZONTAL THRUST BLOCK AT TEES AND PLUGS

North Central Texas Council of Governments

STANDARD SPECIFICATION REFERENCE
502.4

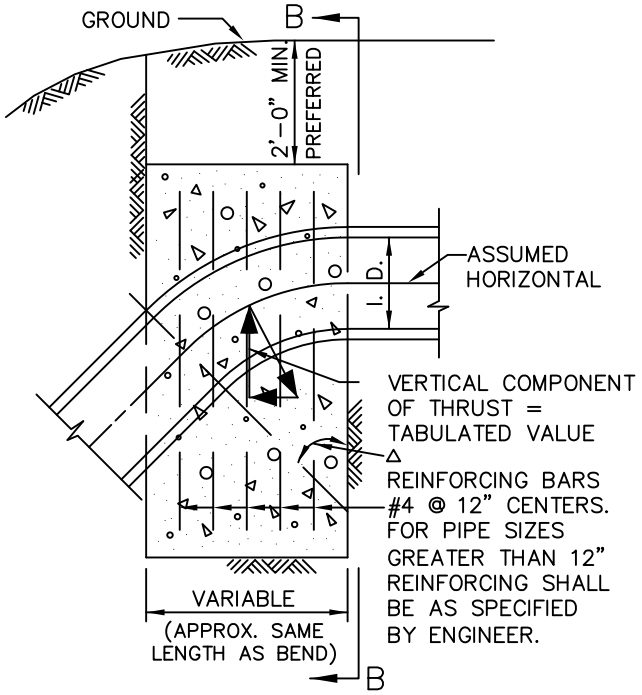
DATE
AUG '23

STANDARD DRAWING NO.
4020



ELEVATION "B–B"

N.T.S.



SECTION "A–A"

N.T.S.

REFER TO
STD. DWG. No. 4040
FOR GENERAL NOTES.

Δ →	11.25°		22.50°		30°		45°		67.50°		90°		← Δ
I.D. (IN.)	THRUST (TONS)	VOL. (C.Y.)	THRUST (TONS)	VOL. (C.Y.)	THRUST (TONS)	VOL. (C.Y.)	THRUST (TONS)	VOL. (C.Y.)	THRUST (TONS)	VOL. (C.Y.)	THRUST (TONS)	VOL. (C.Y.)	I.D. (IN.)
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	4,6,8
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	10,12
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	16,18
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	20
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	24
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	30
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	36
42	20.3	10.1	39.8	19.9	52.0	26.0	73.5	36.7	96.0	48.0	104.0	52.0	42
48	26.5	13.2	51.9	26.0	67.9	33.9	96.0	48.0	126.0	62.7	136.0	67.9	48
54	33.5	16.8	65.7	32.9	85.9	42.9	122.0	60.7	159.0	79.4	172.0	85.9	54
60	41.4	20.7	81.2	40.6	106.0	53.0	150.0	75.0	196.0	98.0	212.0	106.0	60
66	50.1	25.0	98.2	49.1	128.0	64.2	182.0	90.7	237.0	119.0	257.0	128.0	66
72	59.6	29.8	117.0	58.4	153.0	76.3	216.0	108.0	282.0	141.0	305.0	153.0	72
78	69.9	35.0	137.0	68.6	179.0	90.0	254.0	127.0	331.0	166.0	358.0	179.0	78
84	81.1	40.5	159.0	79.5	208.0	104.0	294.0	147.0	384.0	192.0	416.0	208.0	84
90	93.1	46.5	183.0	91.3	239.0	119.0	337.0	169.0	441.0	221.0	477.0	239.0	90
96	106.0	53.0	208.0	104.0	272.0	136.0	384.0	192.0	502.0	251.0	543.0	272.0	96

VERTICAL THRUST BLOCK

AT PIPE BEND

North Central Texas Council of Governments

STANDARD SPECIFICATION REFERENCE
502.4

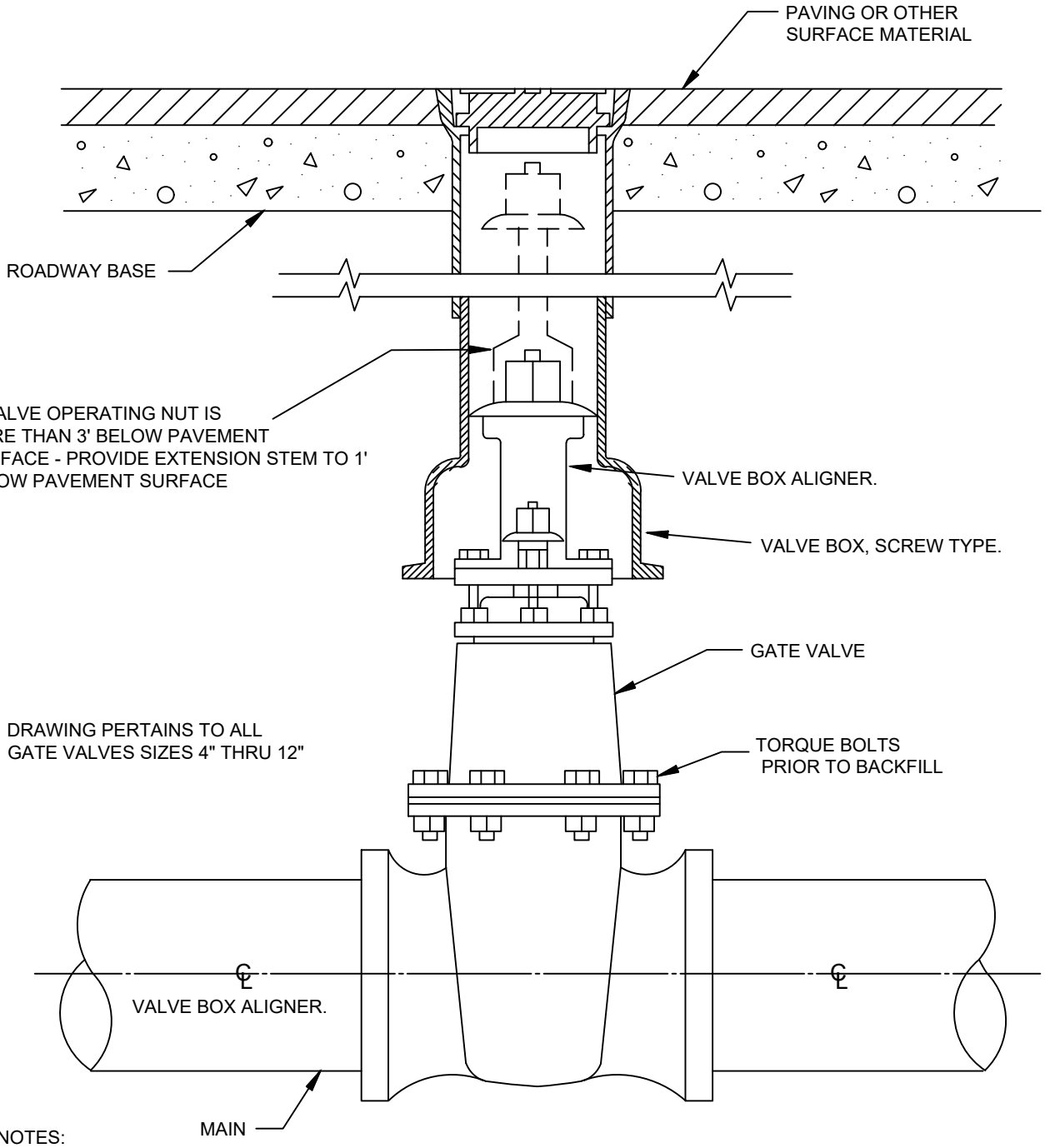
DATE
AUG '23

STANDARD DRAWING NO.
4030

GENERAL NOTES FOR ALL THRUST BLOCKS:

1. CONCRETE FOR BLOCKING SHALL BE CLASS "B".
2. ALL CALCULATIONS ARE BASED ON INTERNAL PRESSURE OF 200 PSI FOR DUCTILE IRON, P.V.V, AND 150 PSI FOR CONCRETE PIPE.
3. VOLUMES OF THRUST BLOCKS ARE NET VOLUMES OF CONCRETE TO BE FURNISHED. THE CORRESPONDING WEIGHT OF THE CONCRETE (CLASS "B") IS EQUAL TO OR GREATER THAN THE VERTICAL COMPONENT OF THE THRUST ON THE VERTICAL BEND.
4. WALL THICKNESS (T) ASSUMED HERE FOR ESTIMATING PURPOSES ONLY.
5. POUR CONCRETE FOR BLOCKS AGAINST UNDISTURBED EARTH.
6. DIMENSIONS MAY BE VARIED AS REQUIRED BY FIELD CONDITIONS WHRE AND AS DIRECTED BY THE ENGINEER. THE VOLUME OF CONCRETE BLOCKING SHALL NOT BE LESS THAN SHOWN HERE.
7. THE SOIL BEARING PRESSURES ARE BASED ON 1000 LBS./S.F. IN SOIL AND 2000 LBS./S.F. IN ROCK.
8. USE POLYETHYLENE WRAP OR EQUAL BETWEEN CONCRETE AND BEND, TEE, OR PLUG TO PREVENT THE CONCRETE FROM STICKING TO IT.
9. CONCRETE SHALL NOT EXPAND BEYOND JOINTS.
10. RESTRAINED JOINTS AND/OR THRUST BLOCKING SHALL BE USED TO RESIST THRUST FORCES AT ALL FITTINGS. IF USED IN LIEU OF THRUST BLOCKING, RESTRAINING LENGTH SHALL BE CALCULATED IN ACCORDANCE WITH AWWA M41 FOR DUCTILE IRON PIPES AND AWWA M23 FOR PVC PIPES.
11. IF ADDING ADDITIONAL SACRIFICIAL ANODE DETAIL: SACRIFICIAL ANODES CAN BE ADDED TO FITTINGS AS DIRECTED BY OWNER AND/OR ENGINEER.

THRUST BLOCK	North Central Texas Council of Governments	STANDARD SPECIFICATION REFERENCE 502.4	
GENERAL NOTES		DATE AUG '23	STANDARD DRAWING NO. 4040



NOTES:

1. IN UNPAVED AREAS, INSTALL 2'x2'x4" CONCRETE VALVE PAD FLUSH WITH THE TOP OF VALVE BOX. REINFORCE WITH #3 BARS ON 6" CENTERS BOTH WAYS.

2. ALL VALVES SHALL BE MARKED ON THE CURB WITH A SAWED "V" AND A BLUE VALVE MARKER CENTERED ON THE "V".

3. ALL VALVE BOX COVERS SHALL BE PAINTED BLUE.

4. ALL VALVES WILL BE CONSTRUCTED WITH GATE BOX ALIGNER USA BLUE BOOK MODEL NUMBER 75181

GATE VALVE BOX AND EXTENSION STEM

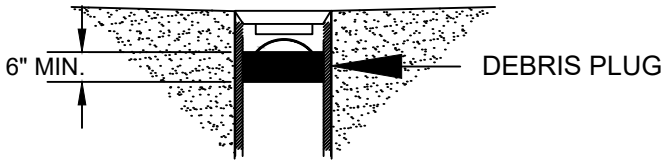
N.T.S.

M * - CITY OF MELISSA REVISION

GATE VALVE 4" TO 12"

BOX & EXTENSION STEM

NCTCOG STANDARD SPECIFICATION REFERENCE		
502.6		
MODIFIED DATE	STANDARD DRAWING NO.	
07/31/23	4050M*	
NOTICE DATE	APPLIED DATE	ENFORCED DATE
10/15/18	10/15/18	11/15/18



DEBRIS PLUG

1. PUSH-IN/PULL OUT PLUG SHALL BE MANUFACTURED OF 1.2 OR 1.7 POUND DENSITY CLOSED-CELL POLYETHYLENE MATERIAL. ALL MATERIALS SHALL BE FLEXIBLE, NON-CRACKING, AND WILL NOT ABSORB WATER.
2. THE POLYETHYLENE PAD SHALL CONFORM TO THE SIDES OF THE ENCLOSURE WITHOUT THE NEED FOR ANY TIGHTENING MECHANISM.
3. THE DEVICE SHALL COME COMPLETE WITH A 350 POUND TEST POLYPROPYLENE HANDLE FOR EASY AND SECURE PLUG REMOVAL AND BE FLEXIBLE SO AS NOT TO INTERFERE WITH THE INSTALLATION OF ANY ENCLOSURE TOP.
4. THE PLUG SHALL BE MANUFACTURED BY INFACT CORPORATION OR APPROVED EQUAL.

M* - CITY OF MELISSA REVISION

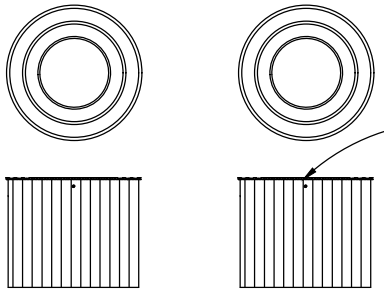
STANDARD DRAWING NO.
4051M*

DEBRIS PLUG

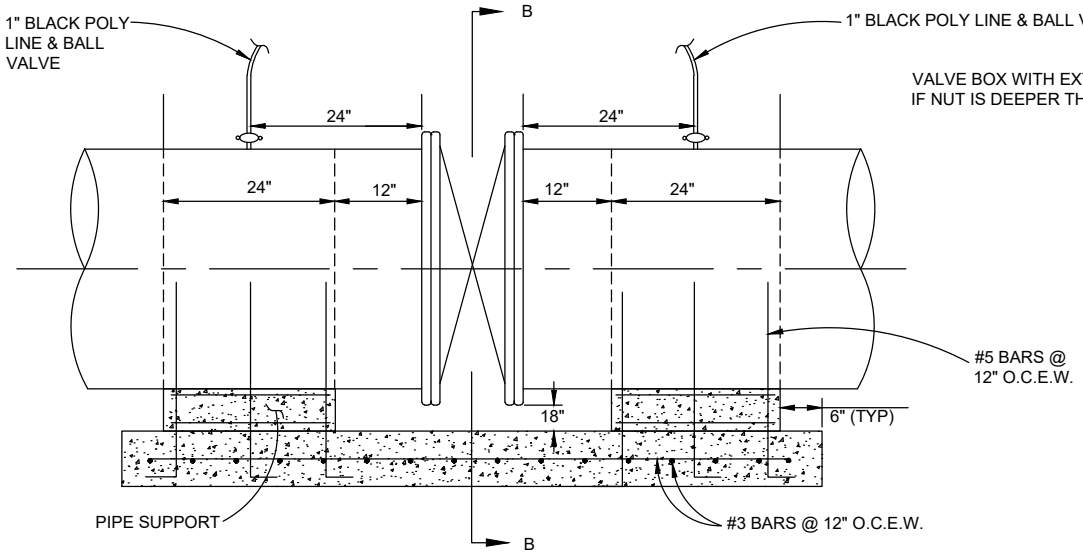
CITY OF MELISSA, TEXAS

MELISSA TX

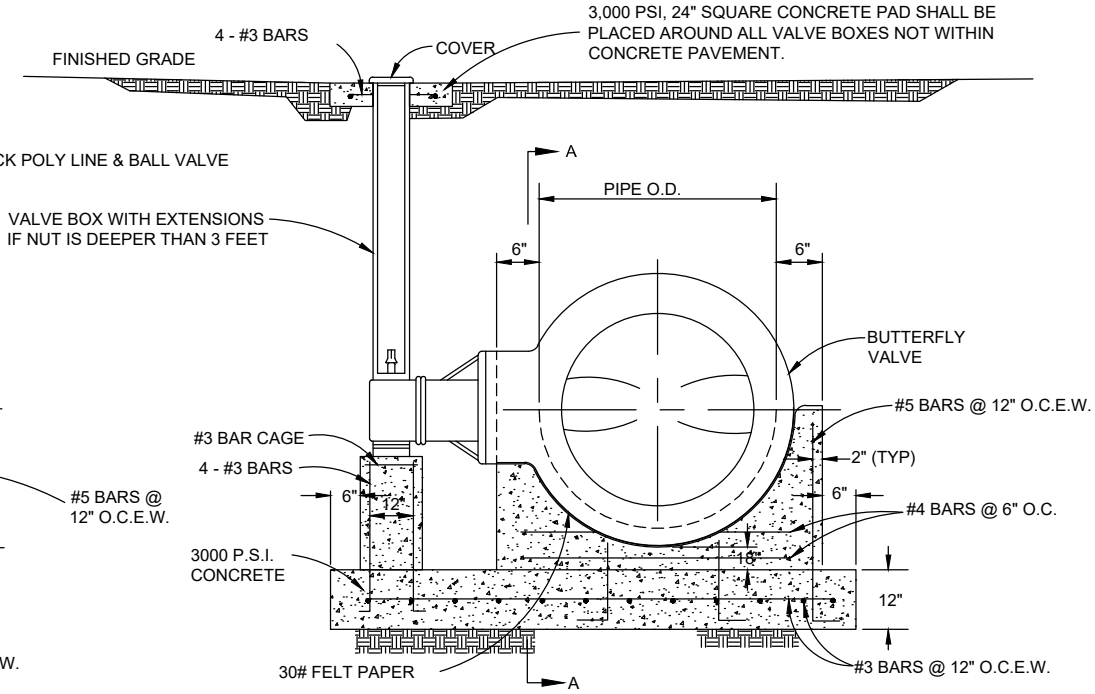
NCTCOG STANDARD SPECIFICATION REFERENCE	
502	
MODIFIED DATE	STANDARD DRAWING NO.
06/14/24	4051M*
NOTICE DATE	APPLIED DATE	ENFORCED DATE
06/14/24	06/14/24	07/14/24



PROVIDE & CENTER METER CANS ABOVE EACH 1" LINE. SEE DETAILS 4141M* & 4142M* FOR ADDITIONAL INFORMATION.



SECTION A-A



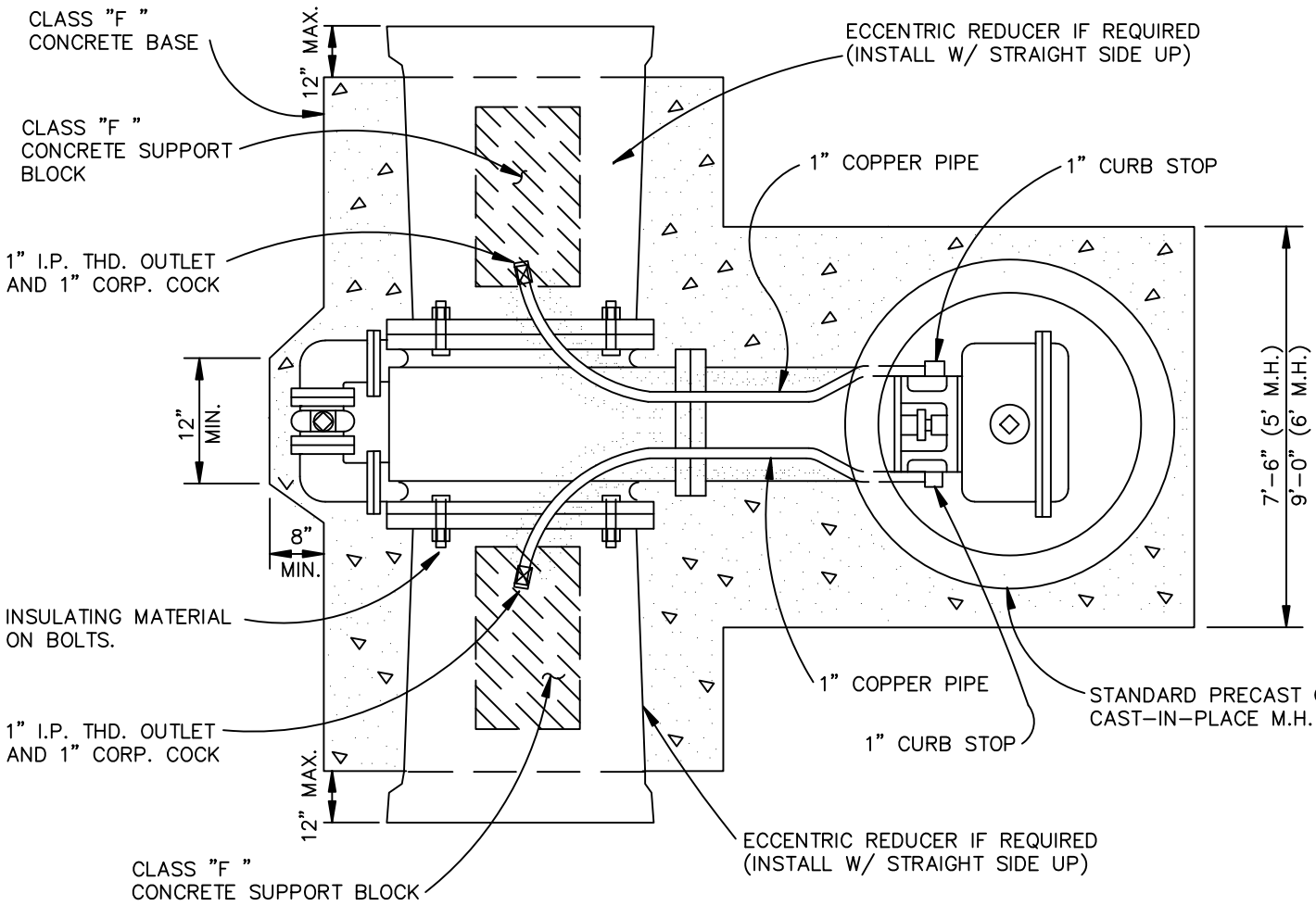
SECTION B-B

BUTTERFLY VALVE
DETAIL
NOT TO SCALE

M* - CITY OF MELISSA REVISION

BUTTERFLY VALVE ≥ 16"	MELISSA TX	NCTCOG STANDARD SPECIFICATION REFERENCE: 502	
BOX & EXTENSION STEM		MODIFIED DATE: 07/28/23	STANDARD DRAWING NO.: 4055M*
	NOTICE DATE: 07/28/23	APPLIED DATE: 07/28/23	ENFORCED DATE: 08/28/23

STANDARD DRAWING NO. 4055M *



PLAN
N.T.S.

STANDARD DRAWING NO. 4060A

VAULT CONSTRUCTION

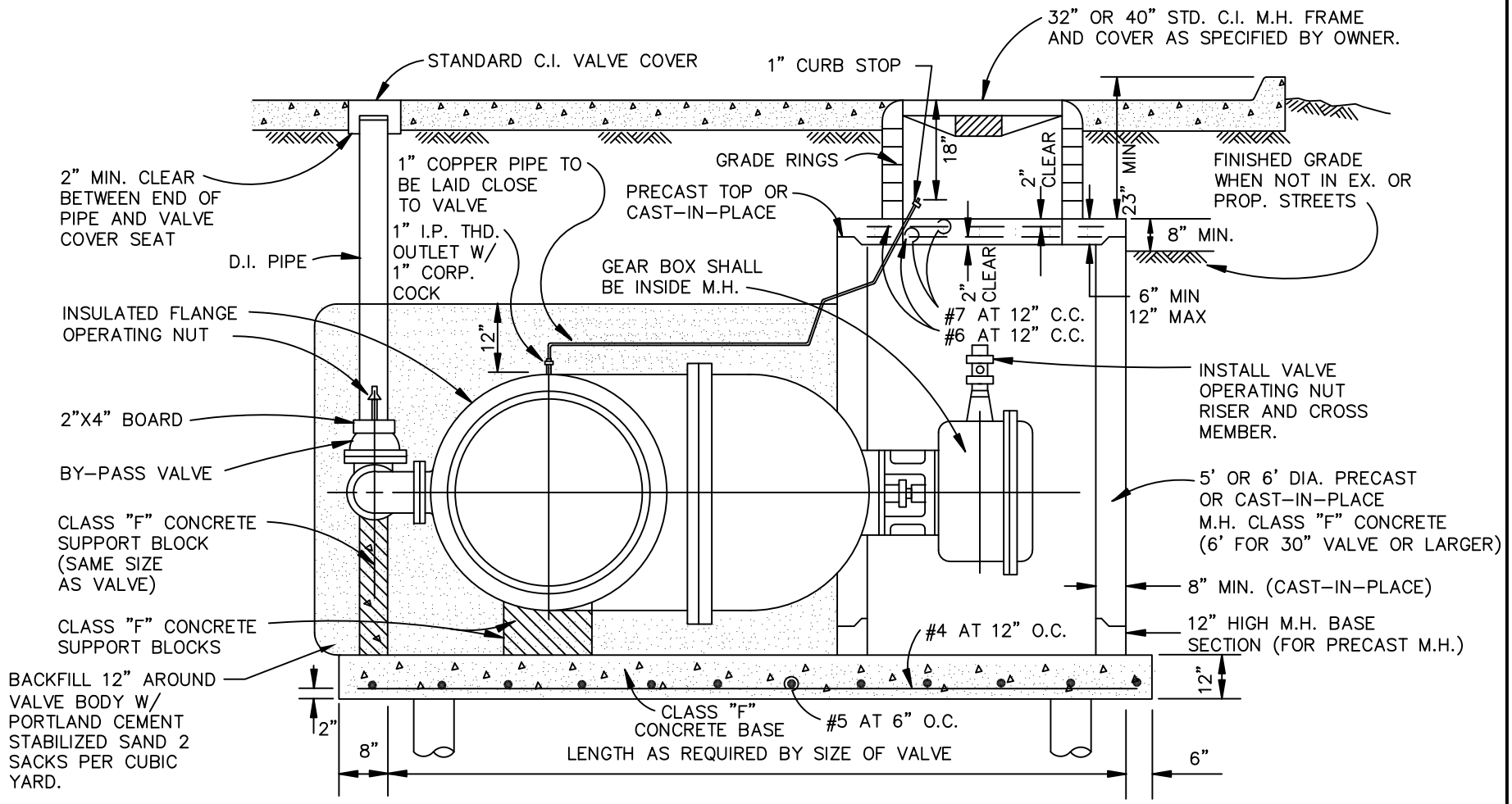
HORIZONTAL GATE VALVE ≧ 16"

North Central Texas Council of Governments

STANDARD SPECIFICATION REFERENCE 702.5

DATE AUG '23

STANDARD DRAWING NO. 4060A



PROFILE

N.T.S.

STANDARD DRAWING NO. 4060B

VAULT CONSTRUCTION

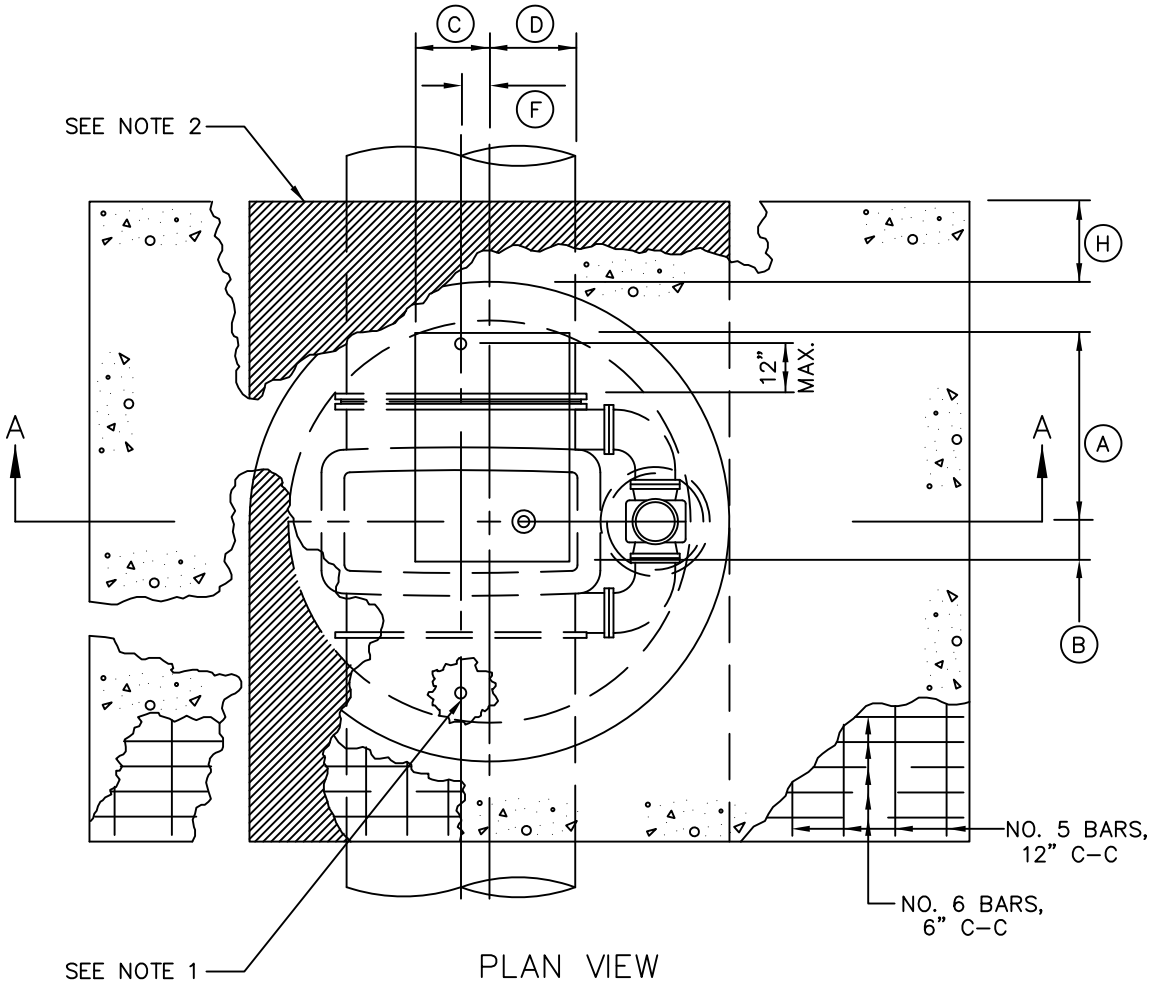
HORIZONTAL GATE VALVE ≥ 16"

North Central Texas Council of Governments

STANDARD SPECIFICATION REFERENCE 702.5

DATE AUG '23

STANDARD DRAWING NO. 4060B



PLAN VIEW

(LESS MANHOLE FRAME & COVER INSTALLATION)
N.T.S.

GATE VALVE SIZE	DIMENSION TABLE											
	A	B	C	D	E	F	G	H	J	K	L	M
16"	20"	20"	12"	12"	44 1/2"	1"	48"	12"	10"	24"	12"	16"
18"	20"	20"	12"	12"	51 3/8"	2"	48"	12"	12"	24"	12"	18"
20"	22"	18"	12"	12"	56 5/8"	1"	48"	12"	12"	24"	16"	20"
24"	26"	14"	12"	12"	64 3/8"	1"	60"	18"	14"	30"	18"	24"
30"	28"	12"	12"	12"	80 5/8"	3"	60"	18"	18"	30"	20"	30"
36"	32"	8"	12"	12"	90 1/16"	4"	72"	18"	18"	36"	24"	36"
42"	34"	6"	15"	9"	107 3/4"	5"	84"	24"	20"	36"	30"	42"
48"	36"	4"	14"	10"	121 5/8"	4"	96"	24"	26"	42"	36"	48"
54"	36"	4"	9"	15"	142 1/2"	3"	120"	24"	32"	46"	40"	54"

NOTES:

1. PROVIDE CORPORATION AND CURB STOPS A MAXIMUM OF 12" FROM EACH END OF GATE VALVE, AS SHOWN. CORPORATION AND CURB STOP SIZES SHALL BE 1" FOR 16", 20", AND 24" NOMINAL PIPE DIAMETERS; 2" FOR 30" AND LARGER DIAMETERS. 2" TAPS SHALL BE MADE AS A 2" FLANGED OUTLET WITH INSULATED ADAPTOR KIT. COPPER RISERS SHALL BE PROVIDED BETWEEN THE CORPORATION AND CURB STOPS. CURB STOPS SHALL BE INSTALLED AT AN ELEVATION 12" ABOVE THE TOP SURFACE OF VAULT BOTTOM SLAB.
2. POLYURETHANE CUSHION PAD.
3. STANDARD PRECAST DIMENSIONS MAY BE USED WITH APPROVAL OF THE OWNER AND MAY REQUIRE AN INCREASE IN SIZE TO THE NEXT READILY AVAILABLE PRECAST DIMENSION.

VAULT CONSTRUCTION

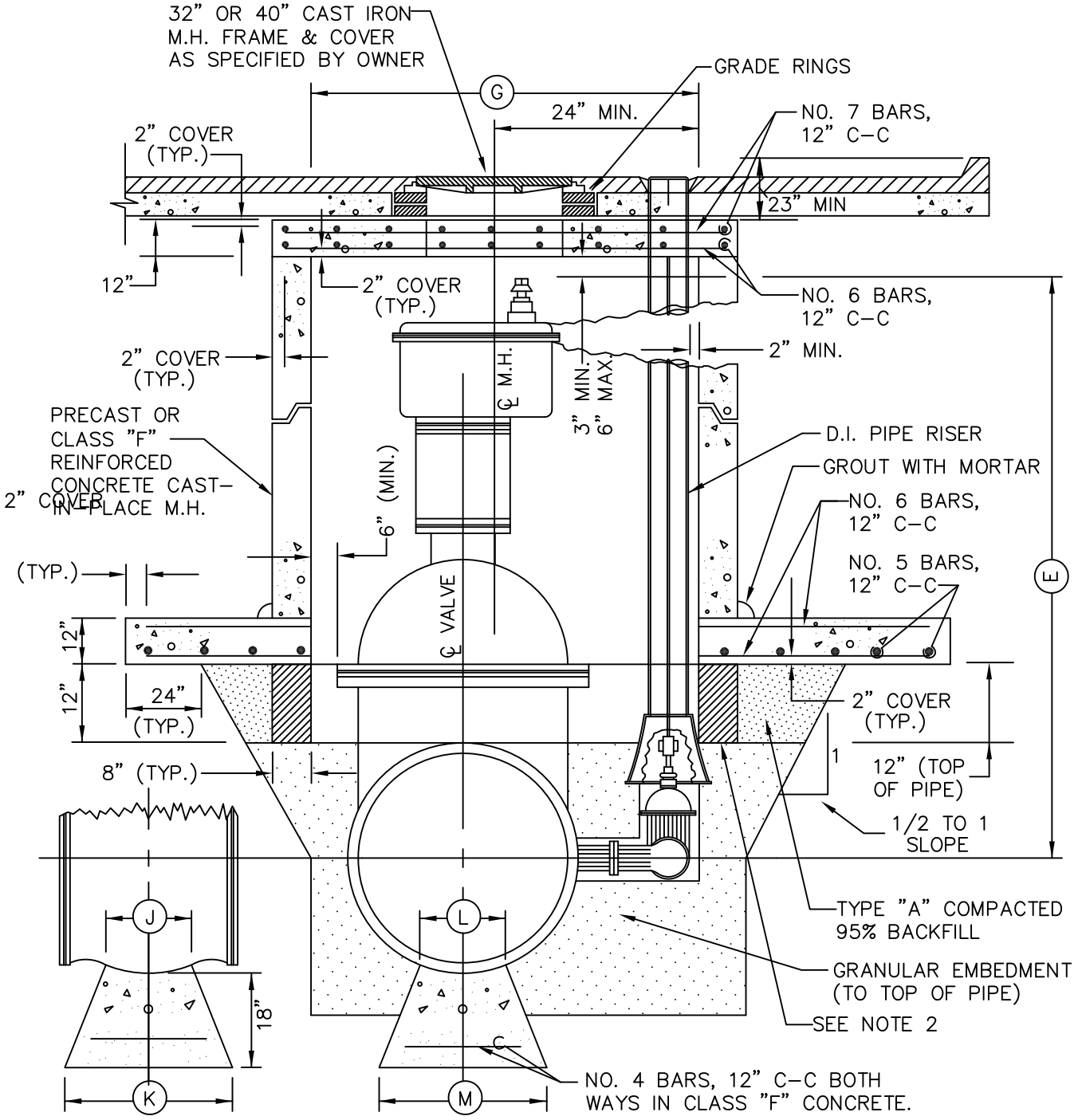
VERTICAL GATE VALVE ≥ 16"

North Central Texas Council of Governments

STANDARD SPECIFICATION REFERENCE
702.5

DATE
AUG '23

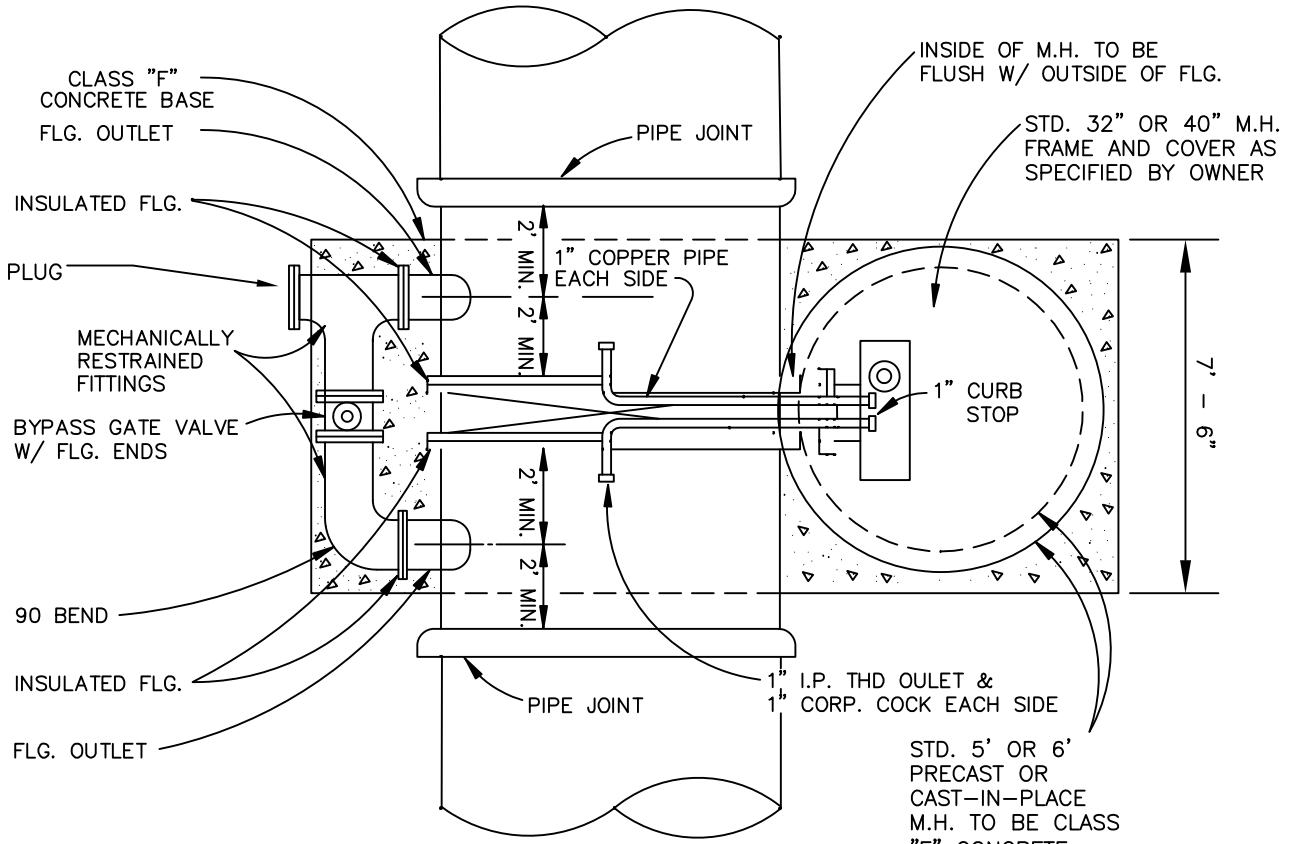
STANDARD DRAWING NO.
4070A



SECTION "A–A"

REFER TO STD. DWG. 4070A FOR DIMENSION TABLE AND GENERAL NOTES.

VAULT CONSTRUCTION	North Central Texas Council of Governments	STANDARD SPECIFICATION REFERENCE 702.5	
VERTICAL GATE VALVE ≥ 16"		DATE AUG '23	STANDARD DRAWING NO. 4070B



PLAN

N.T.S.

STANDARD DRAWING NO. 4080A

VAULT CONSTRUCTION

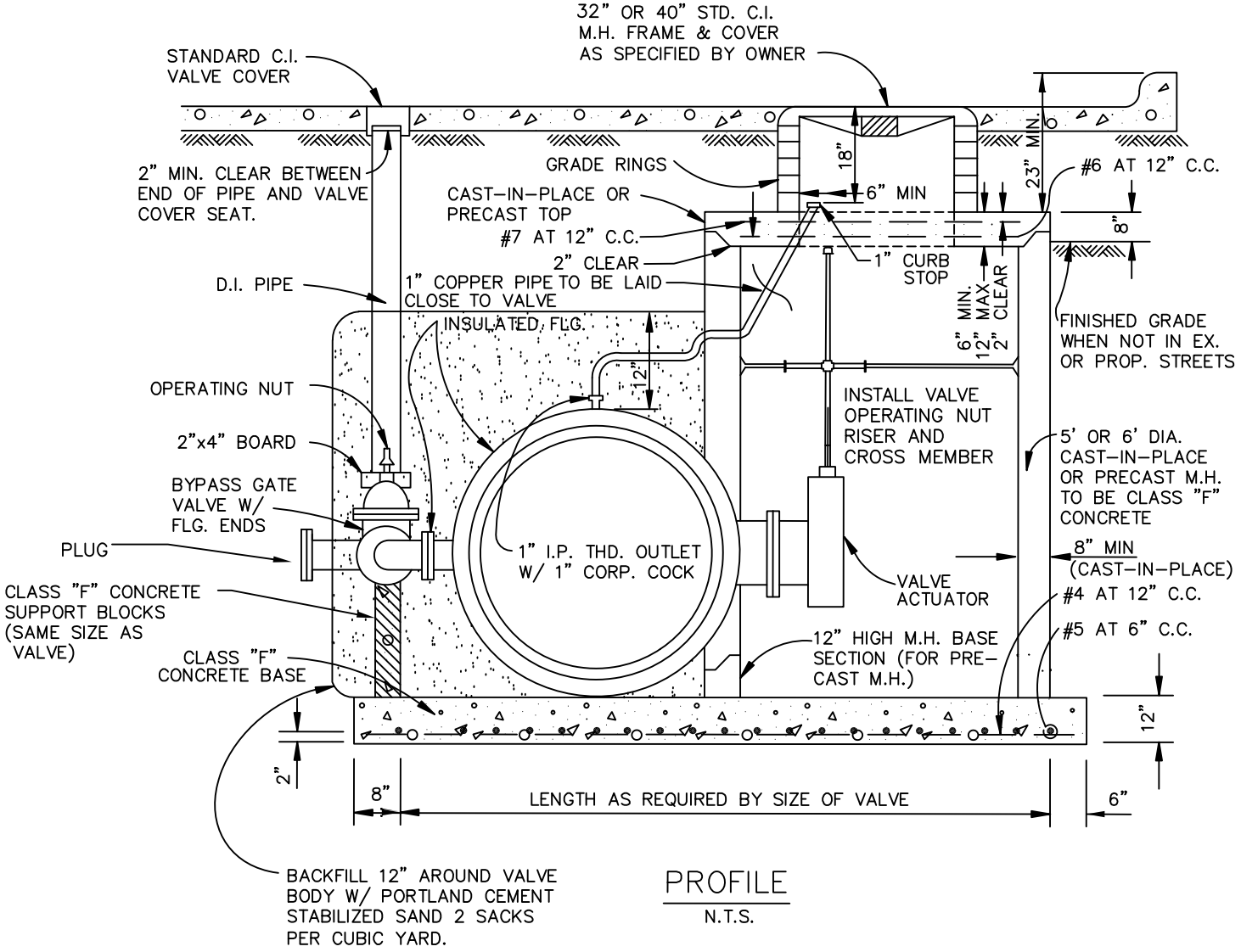
BUTTERFLY VALVE ≥ 48"

North Central Texas Council of Governments

STANDARD SPECIFICATION REFERENCE 702.5

DATE AUG '23

STANDARD DRAWING NO. 4080A



PROFILE

N.T.S.

STANDARD DRAWING NO. 4080B

VAULT CONSTRUCTION

BUTTERFLY VALVE ≧ 48"

North Central Texas Council of Governments

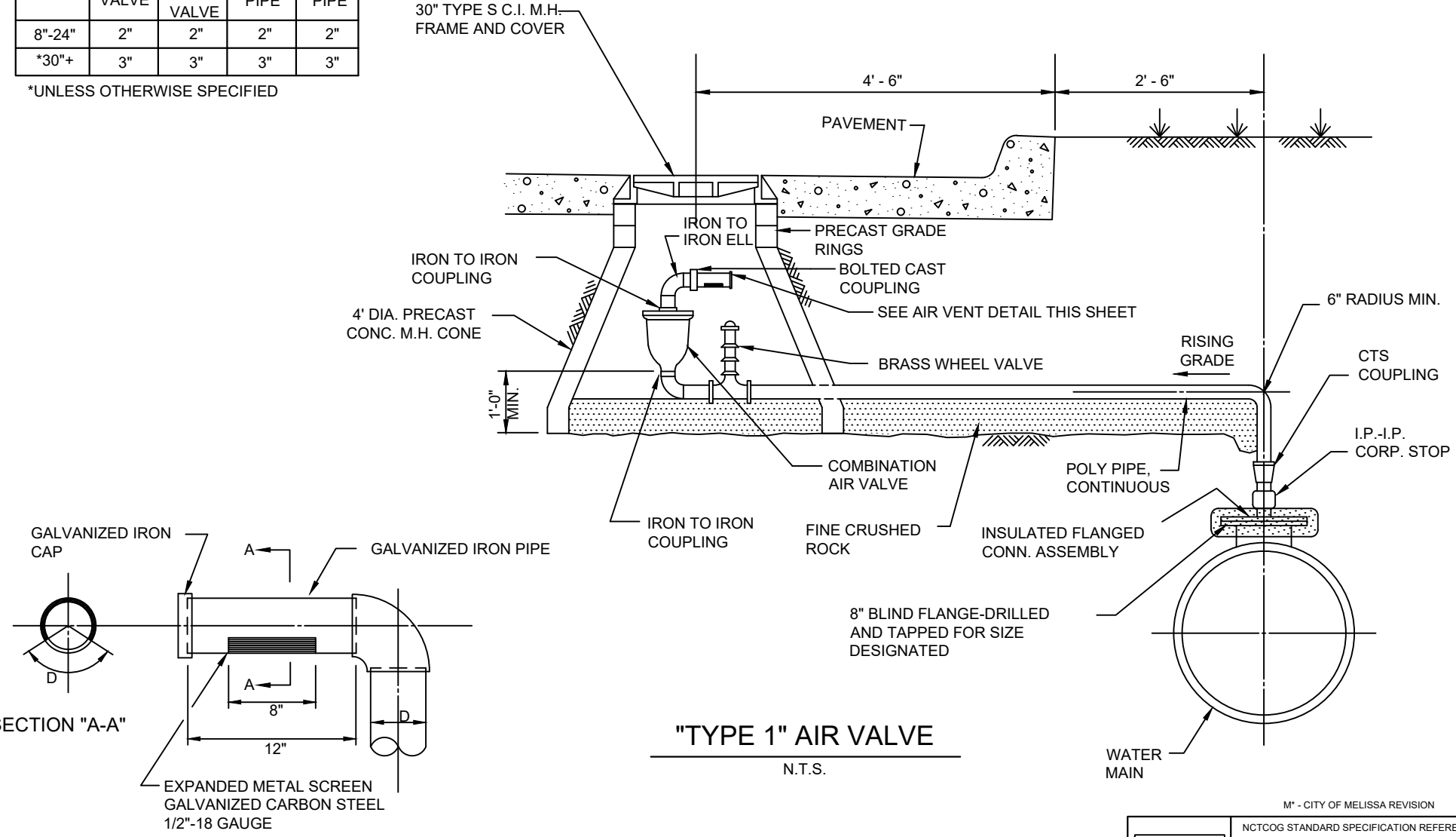
STANDARD SPECIFICATION REFERENCE 702.5

DATE AUG '23

STANDARD DRAWING NO. 4080B

MAIN	AIR VALVE	BRASS WHEEL VALVE	VENT PIPE	POLY PIPE
8"-24"	2"	2"	2"	2"
*30"+	3"	3"	3"	3"

*UNLESS OTHERWISE SPECIFIED



"TYPE 1" AIR VALVE

N.T.S.

AIR VENT

N.T.S.

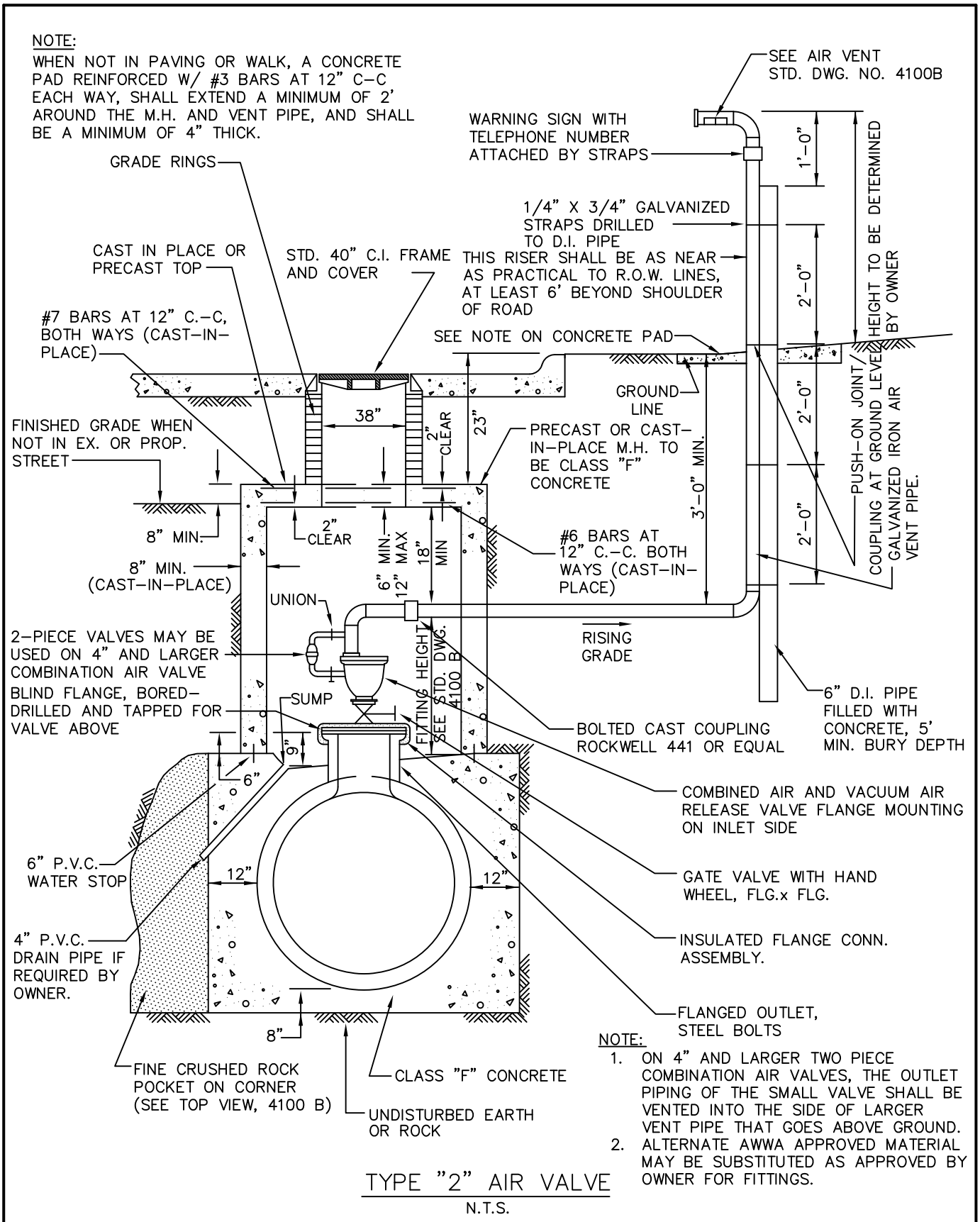
COMBINATION AIR VACUUM VALVE

"TYPE 1"

M* - CITY OF MELISSA REVISION

NCTCOG STANDARD SPECIFICATION REFERENCE	
502.6	
MODIFIED DATE	STANDARD DRAWING NO.
09/06/13	4090M*
NOTICE DATE	ADOPTED DATE	ENFORCEMENT DATE
09/06/13	09/06/13	10/06/13

STANDARD DRAWING NO. 4090M*



TYPE "2" AIR VALVE

N.T.S.

COMBINATION AIR VACUUM VALVE

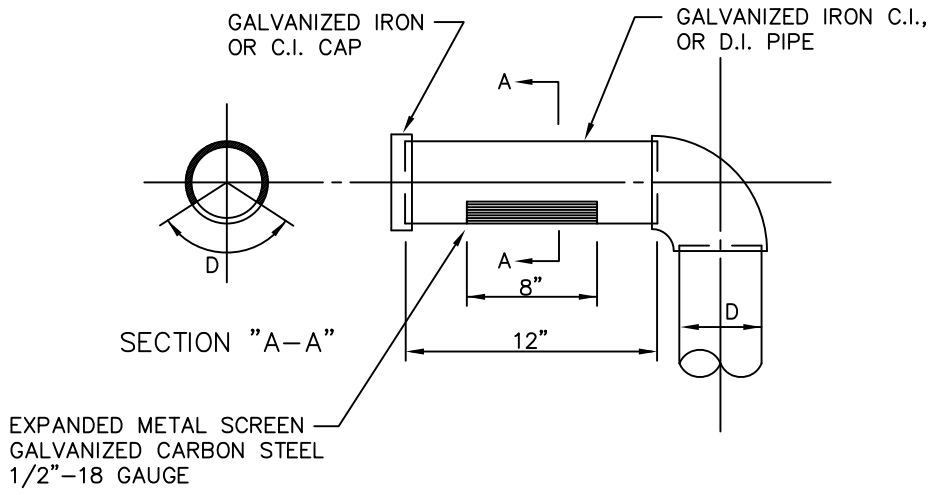
TYPE "2"

North Central Texas Council of Governments

STANDARD SPECIFICATION REFERENCE: 502.6

DATE: AUG '23

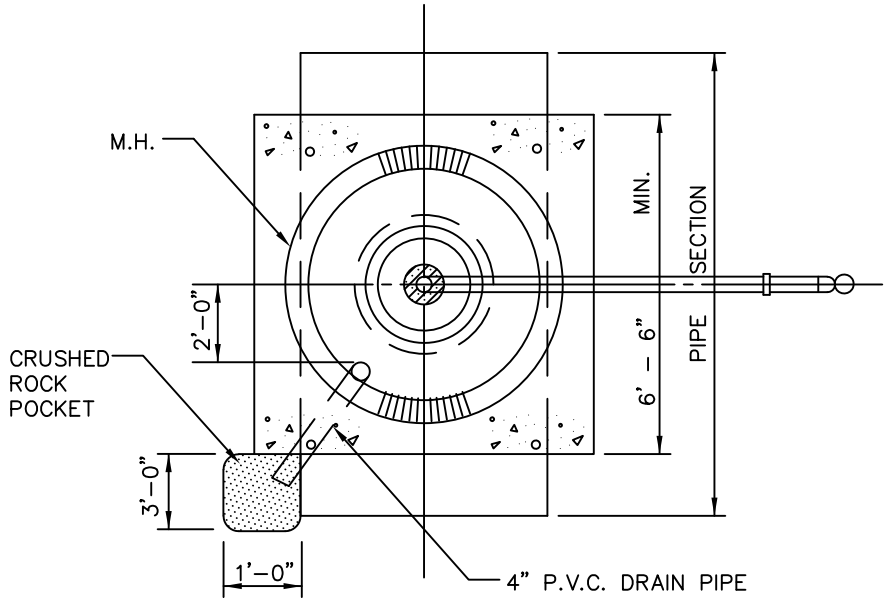
STANDARD DRAWING NO.: 4100A



AIR VENT

N.T.S.

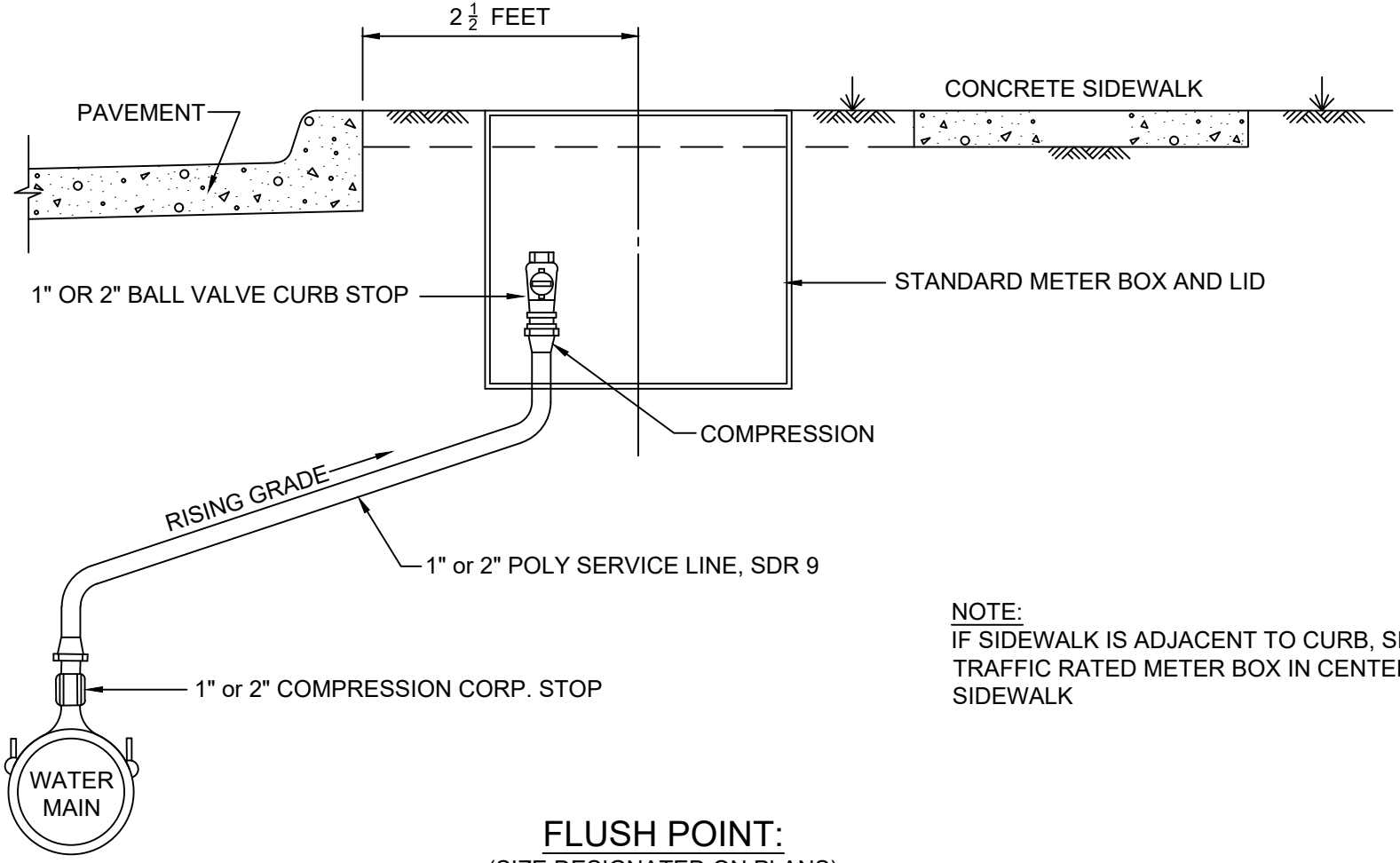
AIR VALVE	GATE VALVE	FLG. OUTLET	MIN. FITTING HEIGHT	VENT PIPE D	M.H. DIA.
2"	2"	8"	26"	2"	5'
3"	3"	18"	31"	3"	5'
4"	4"	18"	38"	4"	5'
6"	6"	18"	46"	6"	5'
8"	8"	18"	53"	8"	6'
10"	10"	20"	62"	10"	6'
12"	12"	24"	72"	12"	6'



PLAN VIEW

N.T.S.

AIR VENT STANDARD DIMENSION AND DETAIL	North Central Texas Council of Governments	STANDARD SPECIFICATION REFERENCE 502.6	
		DATE AUG '23	STANDARD DRAWING NO. 4100B



NOTE:
IF SIDEWALK IS ADJACENT TO CURB, SET TRAFFIC RATED METER BOX IN CENTER OF SIDEWALK

FLUSH POINT:

(SIZE DESIGNATED ON PLANS)
N.T.S.

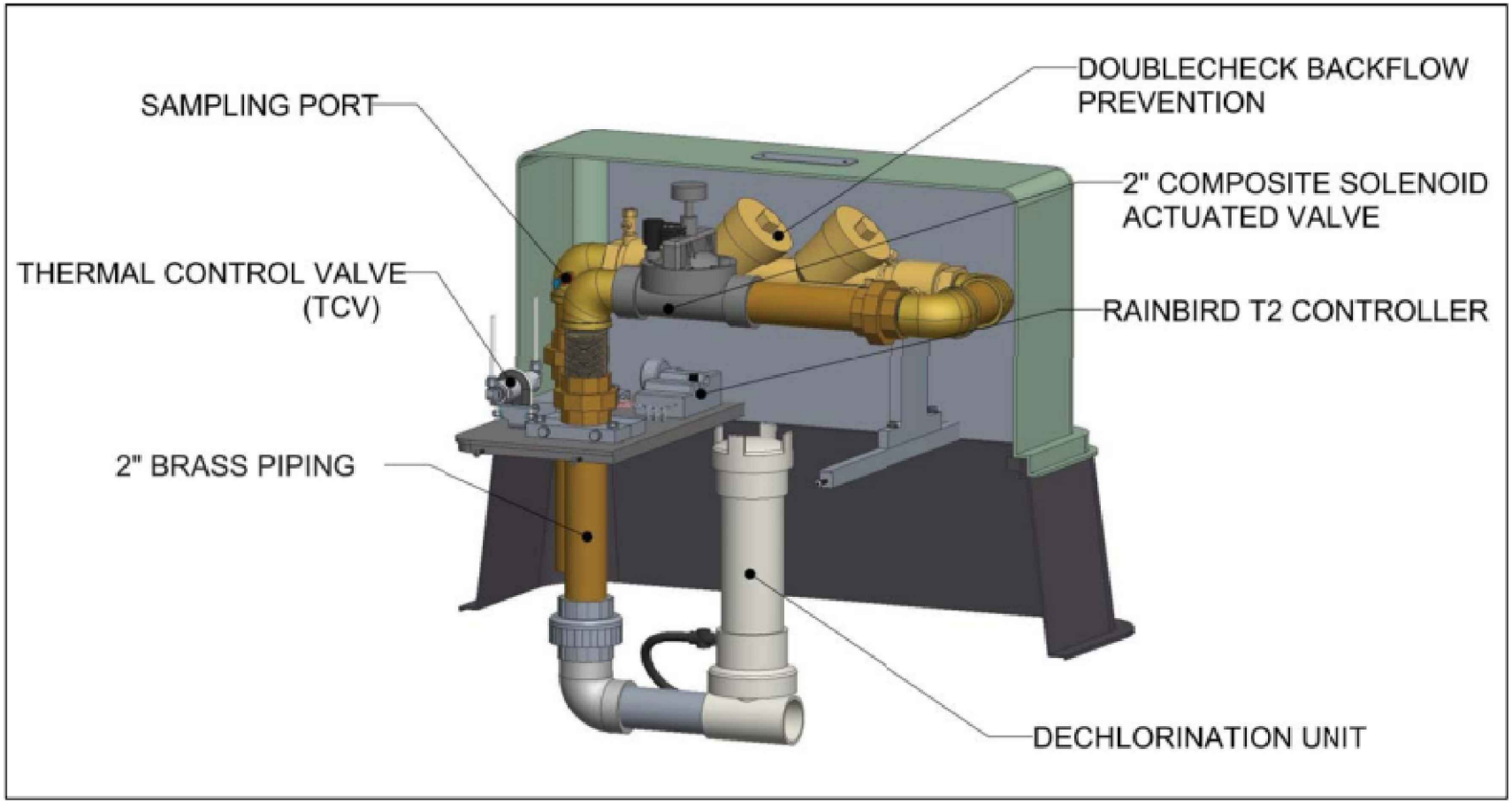
M* - CITY OF MELISSA REVISION

FLUSH POINT INSTALLATION

TYPE "1"

NCTCOG STANDARD SPECIFICATION REFERENCE	
502.10	
MODIFIED DATE	STANDARD DRAWING NO.
09/24/15	4110M*
NOTICE DATE	APPLIED DATE	ENFORCED DATE
09/24/15	09/24/15	10/24/15

STANDARD DRAWING NO.
4110M*



NOTES:

1. MODEL NUMBER IS HG2DRM2BRN018LPLG-TCV
2. THE CONTRACTOR WILL ORDER AND FURNISH TO THE CITY HYDROGUARD'S PORTABLE SAMPLE VALVE TO THE CITY (PART #HG-S1167).
3. METER SHOULD BE SET UPSTREAM FROM AUTO-FLUSH VALVE WITHIN 5 FEET OF UNIT.
4. DISCHARGE PIPE SHALL BE CONNECTED TO NEARBY STORM SEWER SYSTEM.
5. IF UNABLE TO CONNECT TO STORM SEWER, DISCHARGE PIPE CAN BE INSTALLED WHERE WATER WILL DRAIN INTO CREEK OR DRAINAGE SWALE. THE USE OF THIS OPTION WILL BE APPROVED BY CITY ENGINEER PRIOR TO INSTALLATION IN THE FIELD. EROSION CONTROL AS APPROVED BY THE CITY OF MELISSA WILL BE INSTALLED AT THE DISCHARGE LOCATION.

M* - CITY OF MELISSA REVISION

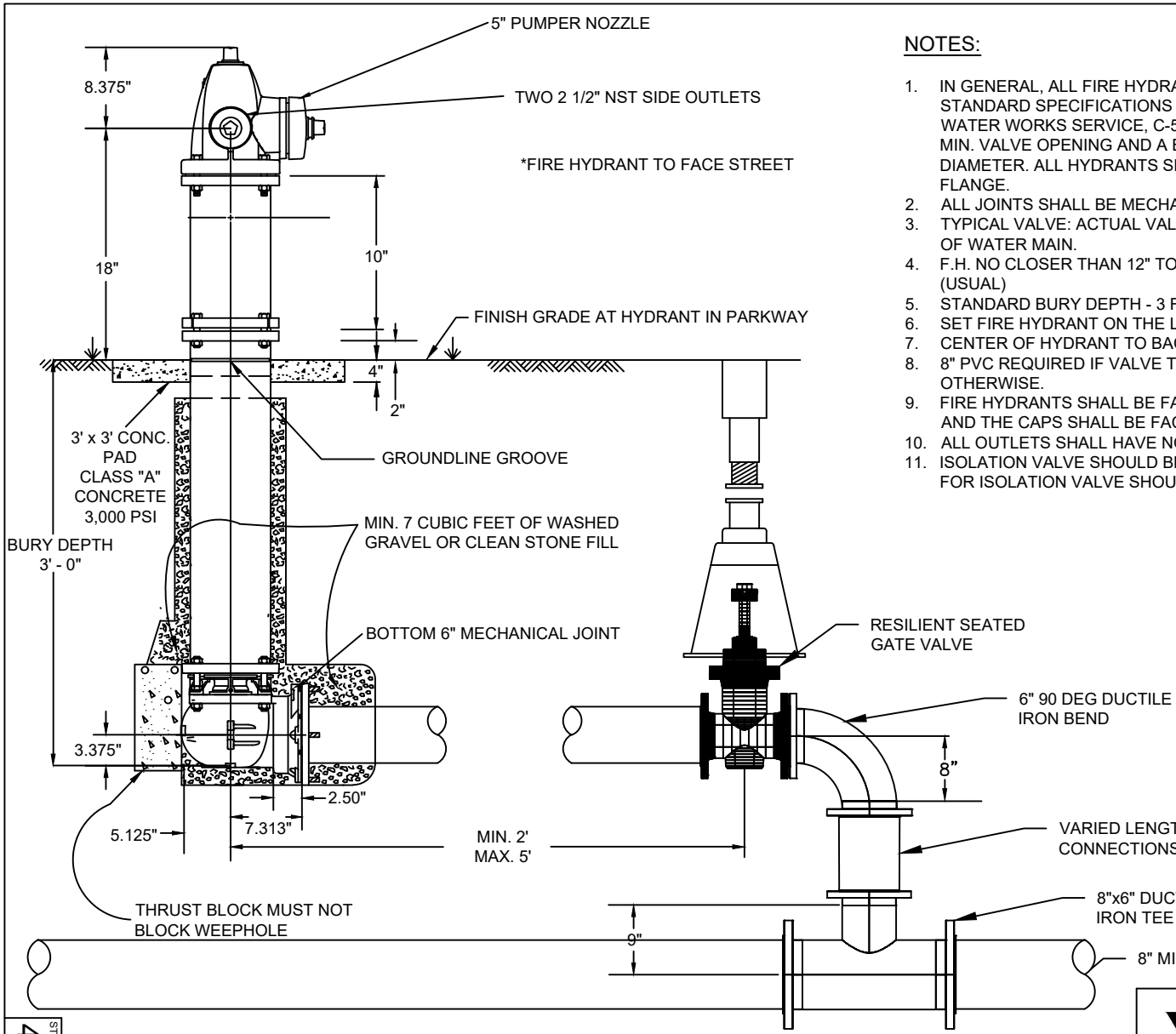
STANDARD DRAWING NO. 4111M *

AUTO-FLUSH VALVE

HG2 UNDERGROUND

MELISSA TX

NCTCOG STANDARD SPECIFICATION REFERENCE	
502	
MODIFIED DATE	STANDARD DRAWING NO.
2/8/18	4111M*
NOTICE DATE	APPLIED DATE	ENFORCED DATE
3/1/18	3/1/18	4/1/18



NOTES:

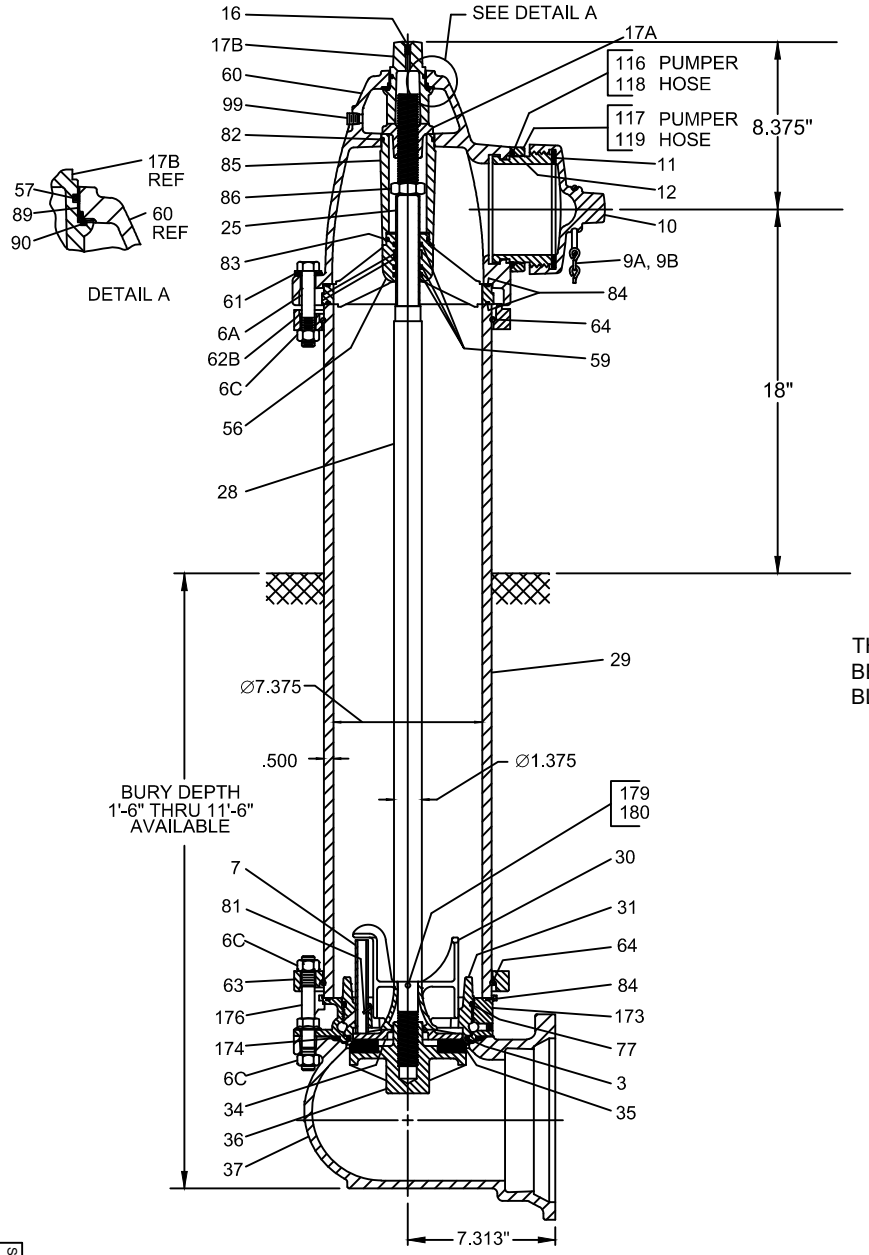
1. IN GENERAL, ALL FIRE HYDRANTS SHALL CONFORM TO AWWA STANDARD SPECIFICATIONS FOR FIRE HYDRANTS FOR ORDINARY WATER WORKS SERVICE, C-502. FIRE HYDRANTS SHALL HAVE A 5 1/4" MIN. VALVE OPENING AND A BARREL APPROXIMATELY 7" INSIDE DIAMETER. ALL HYDRANTS SHALL BE EQUIPPED WITH A BREAKAWAY FLANGE.
2. ALL JOINTS SHALL BE MECHANICAL JOINTS.
3. TYPICAL VALVE: ACTUAL VALVE LOCATION WILL DEPEND ON LOCATION OF WATER MAIN.
4. F.H. NO CLOSER THAN 12" TO EXISTING OR PROPOSED SIDEWALKS. (USUAL)
5. STANDARD BURY DEPTH - 3 FEET WITH 6 FEET MAXIMUM.
6. SET FIRE HYDRANT ON THE LOT LINE EXTENDED WHEN POSSIBLE.
7. CENTER OF HYDRANT TO BACK OF CURB - 2'-6" MIN, 8'-0" MAX.
8. 8" PVC REQUIRED IF VALVE TO HYDRANT DISTANCE IS >25', 6" OTHERWISE.
9. FIRE HYDRANTS SHALL BE FACTORY ENAMEL COATED RED(M-4104), AND THE CAPS SHALL BE FACTORY ENAMEL COATED SILVER(M-4111).
10. ALL OUTLETS SHALL HAVE NON-LOCKING CAPS AND FACE THE STREET.
11. ISOLATION VALVE SHOULD BE 2'-5' AWAY FROM HYDRANT. VALVE LID FOR ISOLATION VALVE SHOULD BE EPOXY-COATED SAFETY RED.

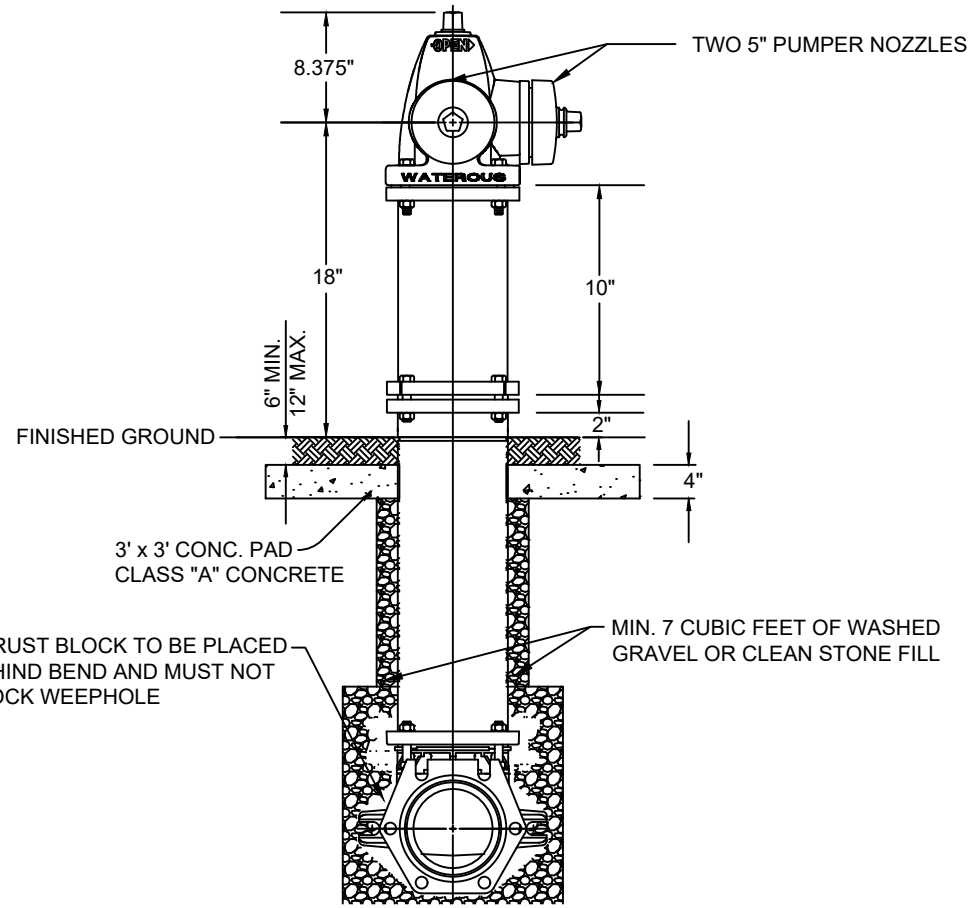
M* - CITY OF MELISSA REVISION

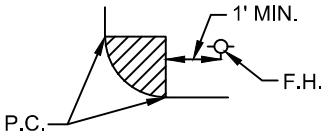
FIRE HYDRANT INSTALLATION

ONE PUMPER NOZZLE

STANDARD DRAWING NO.	NCTCOG STANDARD SPECIFICATION REFERENCE	
4120AM*	502.3	
	MODIFIED DATE: 07/28/23	STANDARD DRAWING NO.: 4120AM*
	NOTICE DATE: 07/28/23	APPLIED DATE: 07/28/23
		ENFORCED DATE: 08/28/23







PLAN VIEW
N.T.S.

M* - CITY OF MELISSA REVISION

FIRE HYDRANT INSTALLATION

TWO PUMPER NOZZLES

MELISSA TX

NCTCOG STANDARD SPECIFICATION REFERENCE	
502.3	
MODIFIED DATE	STANDARD DRAWING NO.
07/28/23	4120BM*
NOTICE DATE	APPLIED DATE	ENFORCED DATE
07/28/23	07/28/23	08/28/23

STANDARD DRAWING NO.
4120BM*

PARTS LIST			
ITEM	DESCRIPTION	MATERIAL	A.S.T.M.
3	O-RING, 5-5/8 X 3-3/4 IN.	BUNA N, 90 DUROMETER	D20007GB915B14E14E34E51E61L14
6A	HEX HD BOLT, 5/8-11 X 3-3/4 IN.	ZINC PLATED STEEL	A-307
6B	HEX HD BOLT, 5/8-11 X 3 IN.	ZINC PLATED STEEL	A-307
6C	HEX HD NUT, 5/8-11 (ABOVE GRADE)	ZINC PLATED STEEL	A-307
6C	HEX NUT, 5/8-11 (BELOW GRADE)	STAINLESS STEEL, TYPE 304	F-594
7	DRAIN PLUNGER	RED BREASS	B-135 ALLOY C23000
9A,B	NOZZLE CAP CHAIN, SINGLE OR DOUBLE	ZINC PLATED STEEL	A-307
10	NOZZLE CAP, HOSE PUMPER	DUCTILE IRON	A-536 GRADE 65-45-12
11	CAP GASKET, HOSE PUMPER	NEOPRENE	D735 SC715
12	NOZZLE, HOSE PUMPER	BRASS	B505 ALLOY C83600
16	FLAT HD SCREW, 1/4-20 X 1/2 IN.	STAINLESS STEEL, TYPE 304	F-594
17	OPERATING NUT (ONE-PIECE)	BRONZE	B763 ALLOY C86500 OR C86700
17A	LOWER OPERATING NUT	BRONZE	CDA 67600 OR CDA 67500
17B	UPPER OPERATING NUT	DUCTILE IRON	A536 GRADE 65-45-12
25	ROD BUSHING	RED BRASS	B135 ALLOY C23000
28	ROD (NON-TRAFFIC MODEL)	STEEL ROD	A575 GRADE M 1044M
29	LOWER STANDPIPE (TRAFFIC MODEL)	CENTRIFUGALLY CAST DUCTILE IRON PIPE	ANSI A21.51 (AWWA C151)
30	CROSSARM	BRONZE	B763 ALLOY C99500
31	VALVE SEAT	BRASS	B-584 ALLOY C83600
34	UPPER VALVE WASHER	DUCTILE IRON	A536 GRADE 65-45-12
35	MAIN VALVE RUBBER	URETHANE	D2000M1AA914A13Z1
36	LOWER VAVLE WASHER	DUCTILE IRON/EPOXY COATED	A536 GRADE 65-45-12/AWWA C550
37	HYDRANT BOTTOM	DUCTILE IRON/EPOXY COATED	A536 GRADE 65-45-12/AWWA C550
40	UPPER STANDPIPE (TRAFFIC MODEL)	CENTRIFUGALLY CAST DUCTILE IRON PIPE	ANSI A21.51 (AWWA C151)
56	SUPPORT WHEEL	DUCTILE IRON PIPE	A536 GRADE 65-45-12
57	O-RING(OPERATING NUT), 1-1/2X1-3/4	BUNA N, 70 DUROMETER	D20002BG720B34E14E34E51E61L14
59	O-RING(SUPPORT WHEEL), 1-1/8X1-3/8	BUNA N, 70 DUROMETER	D20002BG720B34E14E34E51E61L14
60	NOZZLE SECTION	DUCTILE IRON	A536 GRADE 65-45-12
61	BURY DEPTH PLATE AND WASHER	ALUMINUM, ZINC PLATED STEEL	
62B	UPPER STANDPIPE FLANGE	DUCTILE IRON	A536 GRADE 65-45-12
63	STANDPIPE FLANGE	DUCTILE IRON	A536 GRADE 65-45-12
64	FLANGE LOCKING RING	STAINLESS STEEL, TYPE 430	
67	COUPLING SLEEVE (TWO HALVES)	GRAY IRON	A48 CLASS 30B
71	UPPER ROD (TRAFFIC MODEL)	STEEL ROD	A575 GRADE M 1044M
72	LOWER ROD (TRAFFIC MODEL)	STEEL ROD	A575 GRADE M 1044M
77	O-RING(UPPER VALVE SEAT) 5-7/8X6-1/4	BUNA N, 70 DUROMETER	D20002BG720B34E14E34E51E61L14
81	GROOVE PIN, 3/32 X 7/16 IN	BERYLLIUM COPPER	
82	O-RING(UPPER TUBE SEAL), 2-3/8X2-5/8	BUNA N, 70 DUROMETER	D20002BG720B34E14E34E51E61L14
83	O-RING(LOWER TUBE SEAL), 1-7/8X2-1/8	BUNA N, 70 DUROMETER	D20002BG720B34E14E34E51E61L14
84	SUPPORT WHEEL/LOWER STANDPIPE GASKET	BUNA N, 70 DUROMETER	D735 SB720-BE3
85	SUPPORT TUBE	DUCTILE IRON	A536 GRADE 65-45-12
86	STOP NUT, 1"-8	ZINC PLATED STEEL	
87	COUPLING NUT, 1/2-20	BRASS	
88	COUPLING STUD, 1/2-20X2-9/16 IN.	STAINLESS STEEL, TYPE 430	
89	NOZZLE SECTION BUSHING	BRASS	CDA 26000
90	THRUST RING	POLYMER BEARING	
92	UPPER STANDPIPE GASKET	NEOPRENE	D2000M4BC814A14B14EO14EO34F17
99	PIPE PLUG, 1/4 NPT	BRASS	
101	WEATHERSHIELD NUT	DUCTILE IRON	A536 GRADE 65-45-12
102	SPIROL PIN, HVY, 1/4X2-1/4 IN.	STAINLESS STEEL, TYPE 302	
113	BREAKABLE FLANGE	DUCTILE IRON	A536 GRADE 65-45-12
116	O-RING (PUMPER NOZZLE), 5-1/4X5-3/4	BUNA N, 70 DUROMETER	
117	PUMPER NOZZLE RETAINER	DUCTILE IRON	A536 GRADE 65-45-12
118	O-RING (HOSE NOZZLE), 3-1/4X3-5/8	BUNA N, 70 DUROMETER	
119	HOSE NOZZLE RETAINER	DUCTILE IRON	A536 GRADE 65-45-12
162	WEATHERSHIELD NUT GASKET	NITRILE, 70 DUROMETER	
173	VALVE SEAT INSERT	BRASS	B584 ALLOY C83600
174	VALVE SEAT INSERT GASKET	NITRILE, 70 DUROMETER	D2000M3CH714A25B14EO16EO36F16Z
176	STUD, 5/8-11X5.65 IN.	STAINLESS STEEL, TYPE 304	F593
179	CLEVIS PIN, 1/4X1-11/16 IN.	STAINLESS STEEL, TYPE 18-8	
180	KICKOUT PIN	STAINLESS STEEL, TYPE 18-8	

NOTES:

1. IN GENERAL, ALL FIRE HYDRANTS SHALL CONFORM TO AWWA STANDARD SPECIFICATIONS FOR FIRE HYDRANTS FOR ORDINARY WATER WORKS SERVICE, C-502. FIRE HYDRANTS SHALL HAVE A 5 1/4" MIN. VALVE OPENING AND A BARREL APPROXIMATELY 7" INSIDE DIAMETER. ALL HYDRANTS SHALL BE EQUIPPED WITH A BREAKAWAY FLANGE.
2. ALL JOINTS SHALL BE MECHANICAL JOINTS.
3. TYPICAL VALVE: ACTUAL VALVE LOCATION WILL DEPEND ON LOCATION OF WATER MAIN.
4. F.H. NO CLOSER THAN 12" TO EXISTING OR PROPOSED SIDEWALKS. (USUAL)
5. STANDARD BURY DEPTH - 5 FEET WITH 6 FEET MAXIMUM.
6. SET FIRE HYDRANT ON THE LOT LINE EXTENDED WHEN POSSIBLE.
7. F.H. SHALL BE LOCATED MINIMUM 1 FOOT OUTSIDE OF THE AREA BETWEEN THE P.C.'S OF THE CORNER TURNING RADII AT INTERSECTIONS. (SEE PLAN VIEW 4120BM)
8. CENTER OF HYDRANT TO BACK OF CURB - 2'-6" MIN, 8'-0" MAX.
9. 8" PVC REQUIRED IF VALVE TO HYDRANT DISTANCE IS >25', 6" OTHERWISE.
10. FIRE HYDRANTS SHALL BE FACTORY ENAMEL COATED RED(M-4104), AND THE CAPS SHALL BE FACTORY ENAMEL COATED SILVER(M-4111).
11. ALL OUTLETS SHALL HAVE NON-LOCKING CAPS AND FACE THE STREET.
12. ISOLATION VALVE SHOULD BE 2'-5' AWAY FROM HYDRANT. VALVE LID FOR ISOLATION VALVE SHOULD BE EPOXY-COATED SAFETY RED.

M* - CITY OF MELISSA REVISION

STANDARD DRAWING NO. 4120CM*

FIRE HYDRANT INSTALLATION

TWO PUMPER NOZZLES

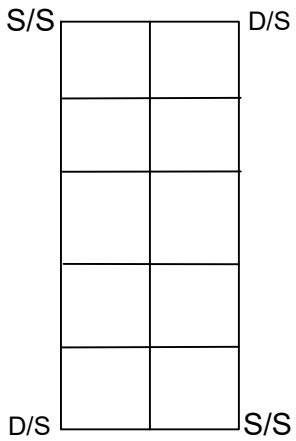
MELISSA TX

NCTCOG STANDARD SPECIFICATION REFERENCE: 502.3

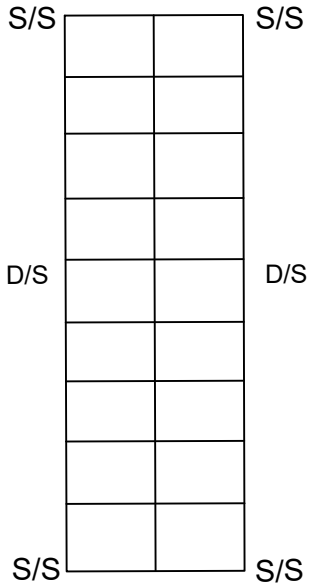
MODIFIED DATE	STANDARD DRAWING NO.
07/28/23	4120CM*

NOTICE DATE	APPLIED DATE	ENFORCED DATE
07/28/23	07/28/23	08/28/23

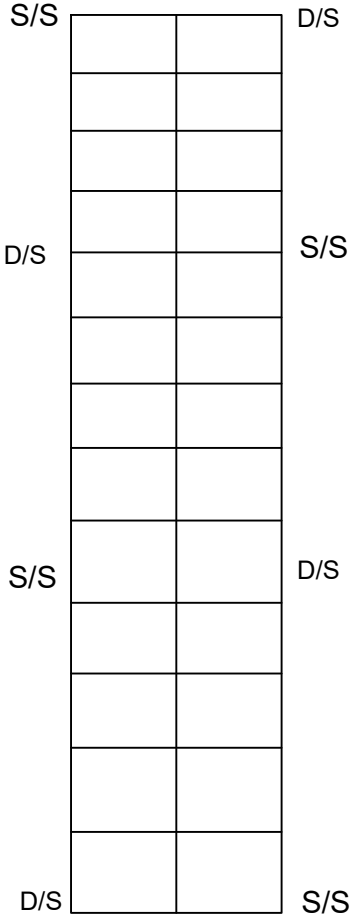
CASE 1



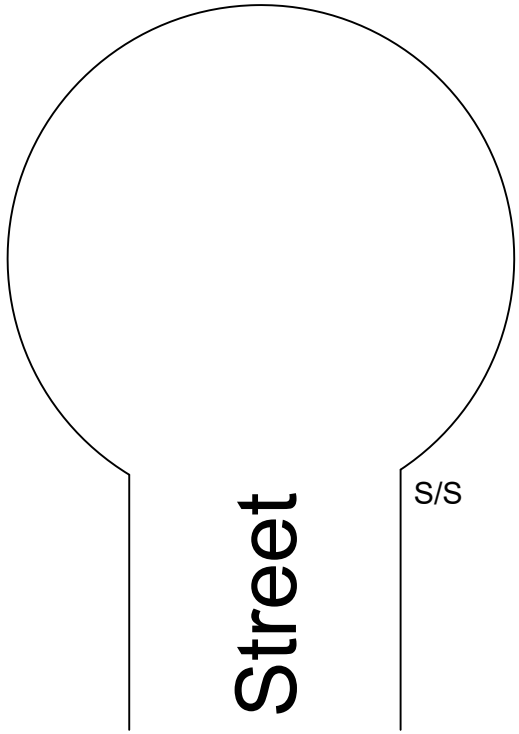
CASE 2



CASE 3



CASE 4



CASE 1: FOR BLOCK LENGTHS OF 300 FEET OR LESS
CASE 2: FOR BLOCK LENGTHS IN BETWEEN 300 AND 1200 FEET
CASE 3: FOR BLOCK LENGTHS ≈1200 FEET
CASE 4: FOR CUL-DE-SACS

S/S- SINGLE STEAMER FIRE HYDRANT
D/S- DOUBLE STEAMER FIRE HYDRANT

FINAL LOCATION IS BASED ON PREFERENCE OF CITY OF MELISSA FIRE DEPARTMENT

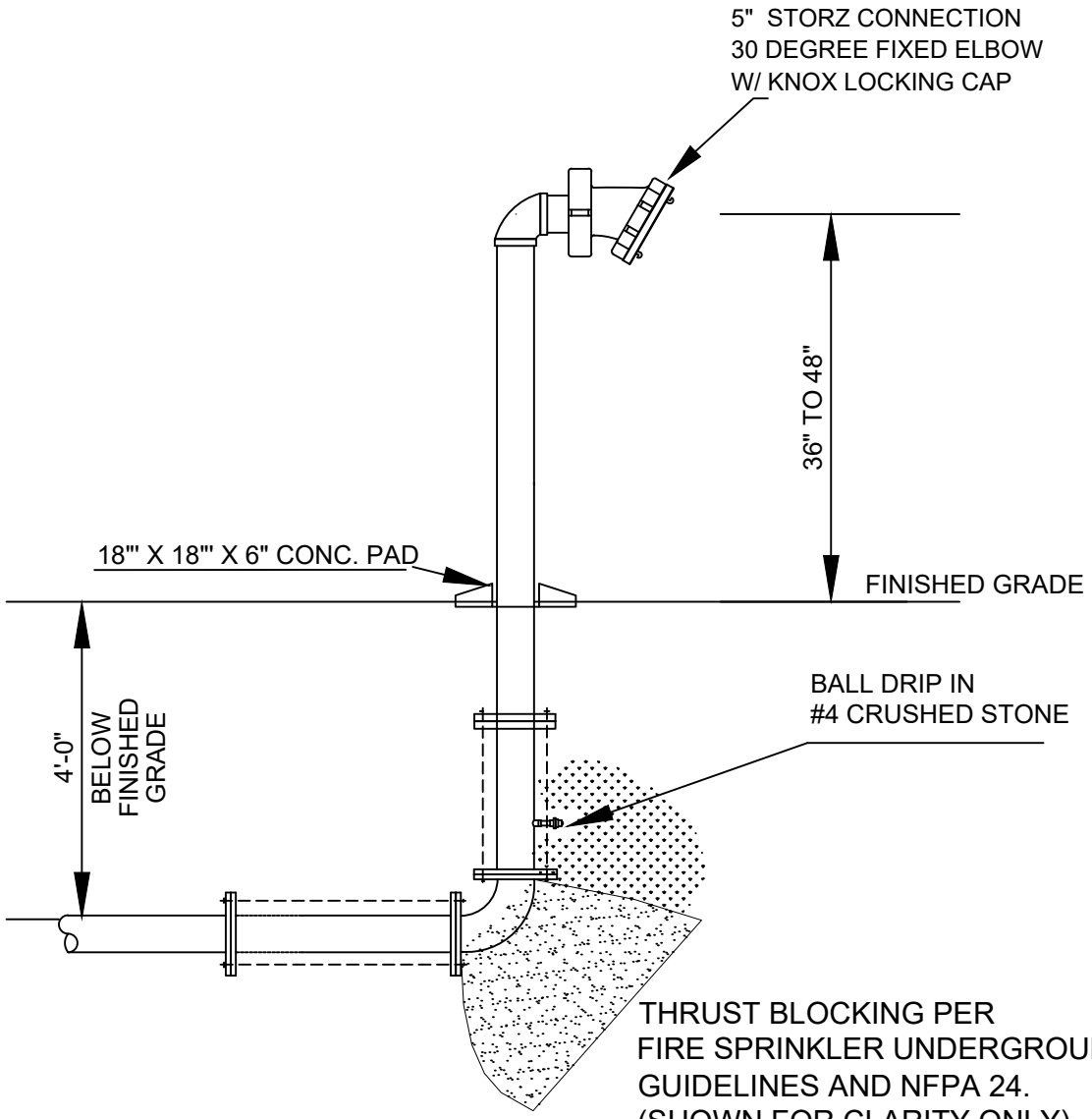
STANDARD DRAWING NO. 4120DM*

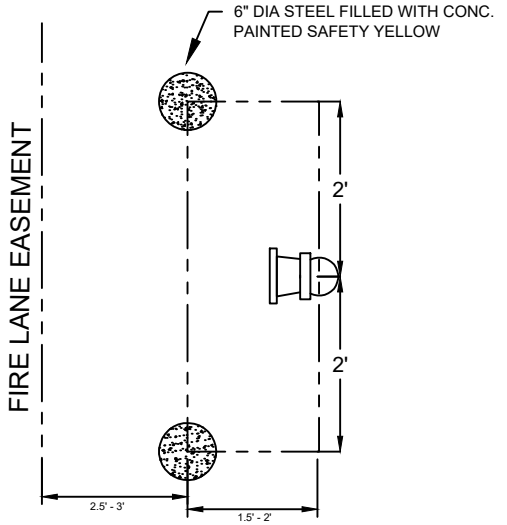
TYPICAL FIRE HYDRANT LOCATION FOR SUBDIVISION BLOCKS

MELISSA TX

502.3

NOTICE DATE	MODIFIED DATE	STANDARD DRAWING NO.
	09/23/15	4120DM*
APPLIED DATE	ENFORCED DATE	





PLAN VIEW

NOTES

1. MINIMUM PIPE SIZE LEADING TO THE STORZ FDC SHALL BE DETERMINED BY HYDRAULIC CALCULATIONS, BUT SHALL BE A MIN. OF 4". A 6" MIN. IS REQUIRED FOR ALL SYSTEMS WITH A TOTAL DEMAND EXCEEDING 750 GPM.
2. FDC MUST BE IN BETWEEN 15 FEET AND 40 FEET AWAY FROM THE NEAREST HYDRANT
3. KNOX STORZ GUARD LOCKING CAPS ARE REQUIRED ON ALL CONNECTIONS
4. ALL EXPOSED PIPE SHALL BE POLISHED FINISH WITH THE EXCEPTION OF THE STORZ CONNECTION.
5. INSPECTION AND FINAL APPROVAL BY CITY OF MELISSA FIRE DEPARTMENT

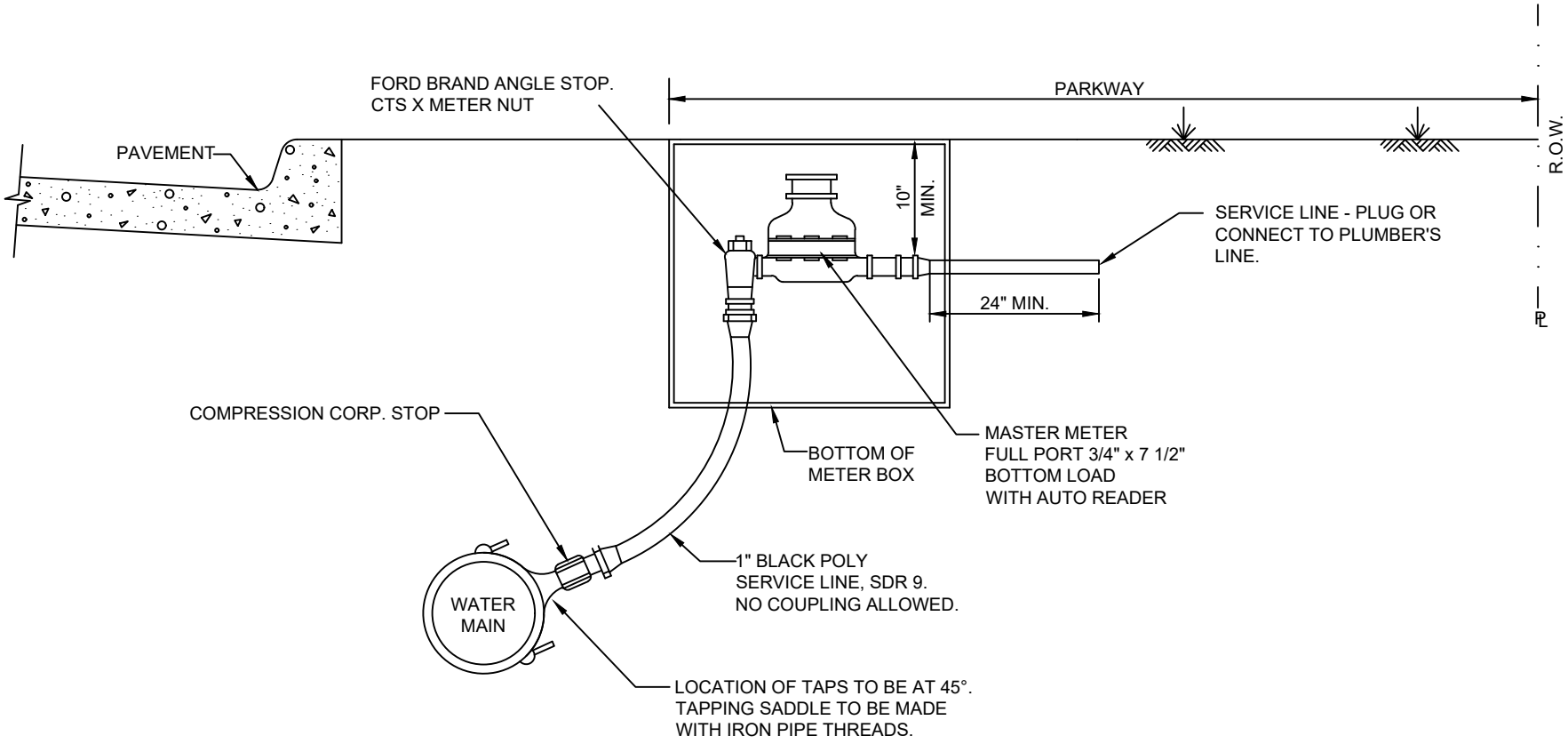
M* - CITY OF MELISSA REVISION

REMOTE FDC

WITH BOLLARDS

NCTCOG STANDARD SPECIFICATION REFERENCE		
	MODIFIED DATE	STANDARD DRAWING NO.
MELISSA TX	05/14/18	4125M*
NOTICE DATE	APPLIED DATE	ENFORCED DATE
05/14/18	05/14/18	06/14/18

STANDARD DRAWING NO.
4125M*



NOTES:

1. METER SHALL NOT BE LOCATED WITHIN SIDEWALKS OR DRIVEWAYS.

2. THE METER AND AUTOMATIC METER READER SHALL BE PROVIDED AND INSTALLED BY THE CITY OF MELISSA AT DEVELOPER'S EXPENSE.

3. METER BOXES SHALL BE CORRUGATED METAL FOR AREAS OF TRAFFIC AND PLASTIC FOR NON TRAFFIC AREAS.

4. SERVICE LINE SHALL BE EMBEDDED IN ⅜" ROCK EMBEDMENT PER DETAIL 3061M.

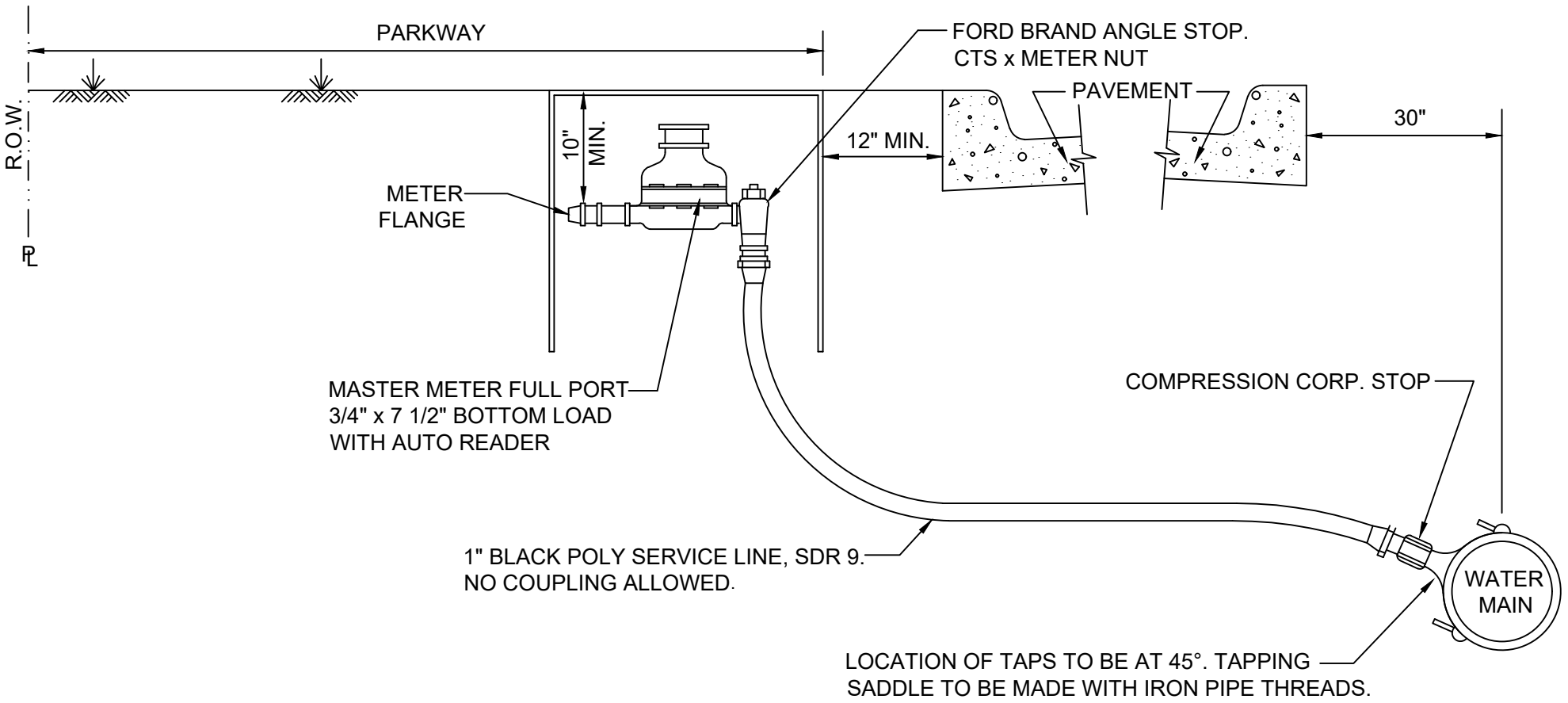
M* - CITY OF MELISSA REVISION

STANDARD DRAWING NO.
4130AM*

WATER SERVICE INSTALLATION
1" LINE FOR 3/4" OR 1" METER

MELISSA TX

NCTCOG STANDARD SPECIFICATION REFERENCE		
500		
MODIFIED DATE	STANDARD DRAWING NO.	
07/28/23	4130AM*	
NOTICE DATE	APPLIED DATE	ENFORCED DATE
07/28/23	07/28/23	08/28/23



NOTES:

1. METER SHALL NOT BE LOCATED WITHIN SIDEWALKS OR DRIVEWAYS.
2. THE METER AND AUTOMATIC METER READER SHALL BE PROVIDED AND INSTALLED BY THE CITY OF MELISSA AT DEVELOPER'S EXPENSE.
3. METER BOXES SHALL BE CORRUGATED METAL FOR AREAS OF TRAFFIC AND PLASTIC FOR NON TRAFFIC AREAS.
4. SERVICE LINE SHALL BE EMBEDDED IN ⅜" ROCK EMBEDMENT PER DETAIL 3061M.

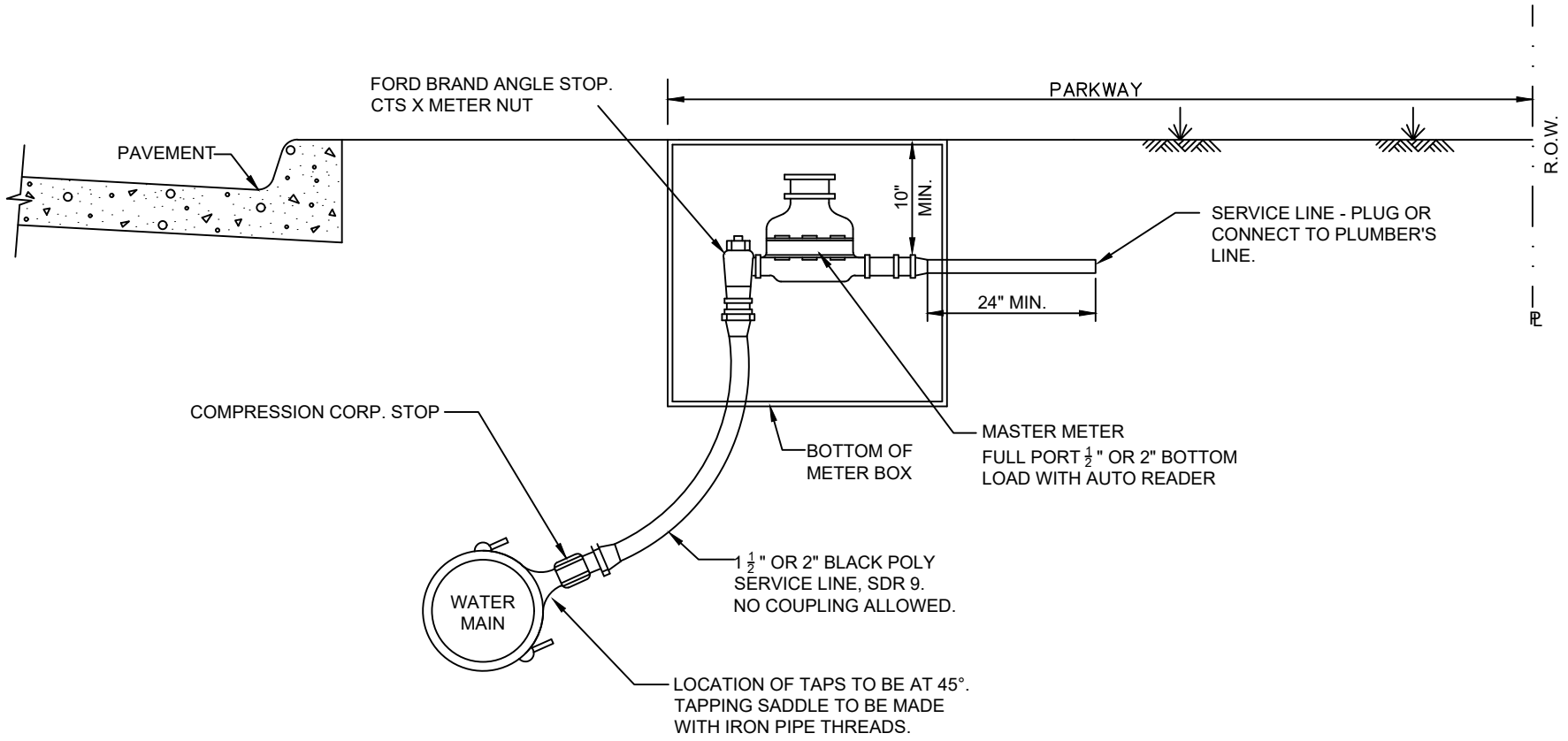
M* - CITY OF MELISSA REVISION

WATER SERVICE INSTALLATION

1" LINE FOR 3/4" OR 1" METER

NCTCOG STANDARD SPECIFICATION REFERENCE	
500	
MODIFIED DATE	STANDARD DRAWING NO.
07/28/23	4130BM*
NOTICE DATE	APPLIED DATE	ENFORCED DATE
07/28/23	07/28/23	08/28/23

STANDARD DRAWING NO.
4130BM*



NOTES:

1. METER SHALL NOT BE LOCATED WITHIN SIDEWALKS OR DRIVEWAYS.

2. THE METER AND AUTOMATIC METER READER SHALL BE PROVIDED AND INSTALLED BY THE CITY OF MELISSA AT DEVELOPER'S EXPENSE.

3. METER BOXES SHALL BE CORRUGATED METAL FOR AREAS OF TRAFFIC AND PLASTIC FOR NON TRAFFIC AREAS.

4. SERVICE LINE SHALL BE EMBEDDED IN 3/8" ROCK EMBEDMENT PER DETAIL 3061M.

M* - CITY OF MELISSA REVISION

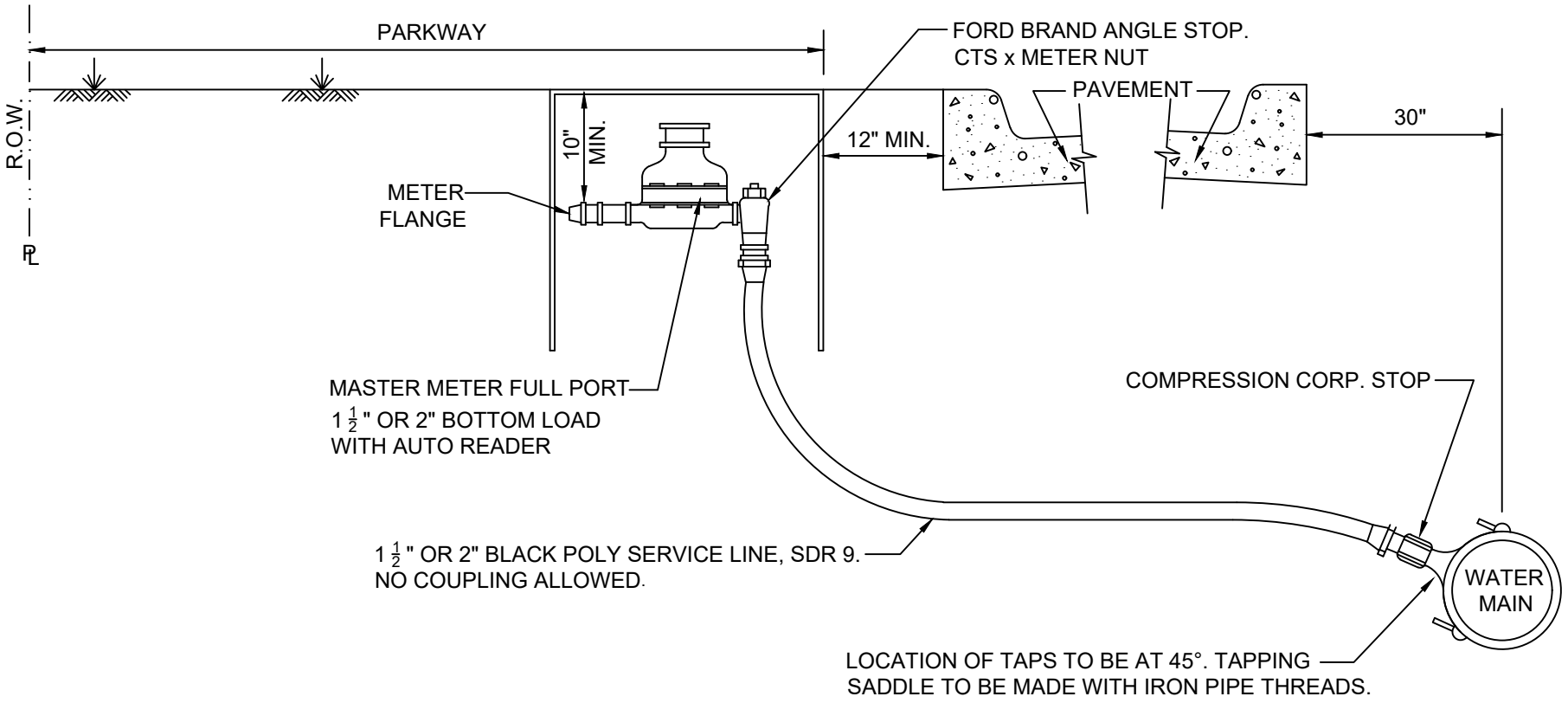
STANDARD DRAWING NO. 4140AM*

WATER SERVICE INSTALLATION

1 1/2" or 2" LINE

MELISSA TX

NCTCOG STANDARD SPECIFICATION REFERENCE		
500		
MODIFIED DATE	STANDARD DRAWING NO.	
07/28/23	4140AM*	
NOTICE DATE	APPLIED DATE	ENFORCED DATE
07/28/23	07/28/23	08/28/23



NOTES:

1. METER SHALL NOT BE LOCATED WITHIN SIDEWALKS OR DRIVEWAYS.
2. THE METER AND AUTOMATIC METER READER SHALL BE PROVIDED AND INSTALLED BY THE CITY OF MELISSA AT DEVELOPER'S EXPENSE.
3. METER BOXES SHALL BE CORRUGATED METAL FOR AREAS OF TRAFFIC AND PLASTIC FOR NON TRAFFIC AREAS.
4. SERVICE LINE SHALL BE EMBEDDED IN ⅜" ROCK EMBEDMENT PER DETAIL 3061M.

M* - CITY OF MELISSA REVISION

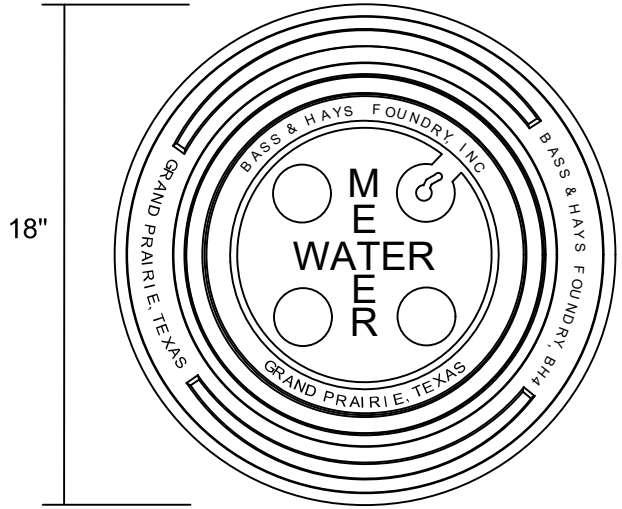
STANDARD DRAWING NO.
4140BM*

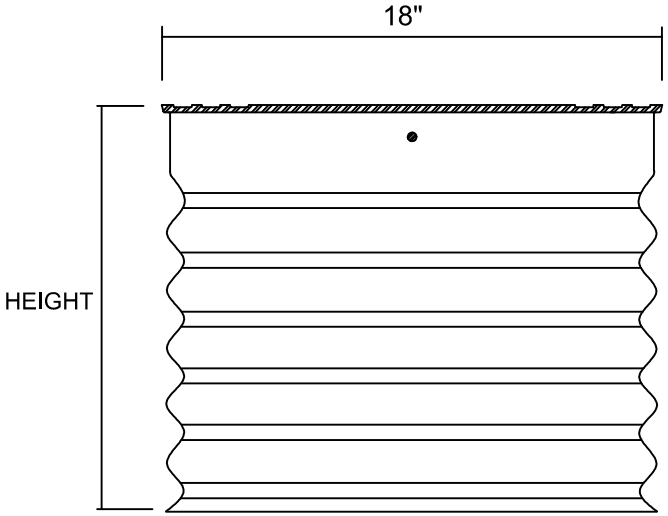
WATER SERVICE INSTALLATION

1 1/2" or 2" LINE

MELISSA TX

NCTCOG STANDARD SPECIFICATION REFERENCE	
500	
MODIFIED DATE	STANDARD DRAWING NO.
07/28/23	4140BM*
NOTICE DATE	APPLIED DATE	ENFORCED DATE
07/28/23	07/28/23	08/28/23





62 SERIES GALVANIZED METER BOXES WITH 18" DIA. CORRUGATED CANS		
PART NO.	HEIGHT	WEIGHT
62A	14"	55 LBS
62A1S	14"	55 LBS
62B	18"	70 LBS
62C	24"	80 LBS

METER BOXES SHALL BE PLACED WITHIN THE RIGHT-OF-WAY OR IN A DEDICATED WATER EASEMENT.

FOR METERS LARGER THAN 2", A VAULT IS TO BE USED.

METER BOXES WILL BE INSTALLED AT THE TIME PUBLIC IMPROVEMENTS ARE MADE TO A SUBDIVISION.

M* - CITY OF MELISSA REVISION

STANDARD DRAWING NO. 4141M*

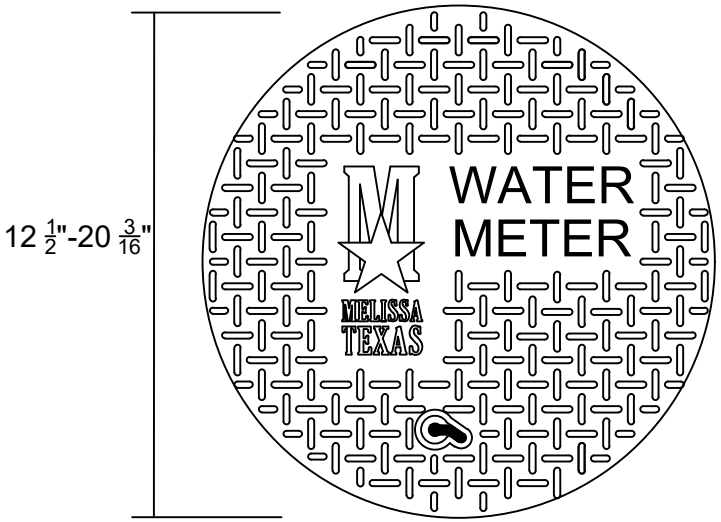
WATER METER BOX DETAIL

TRAFFIC AREAS

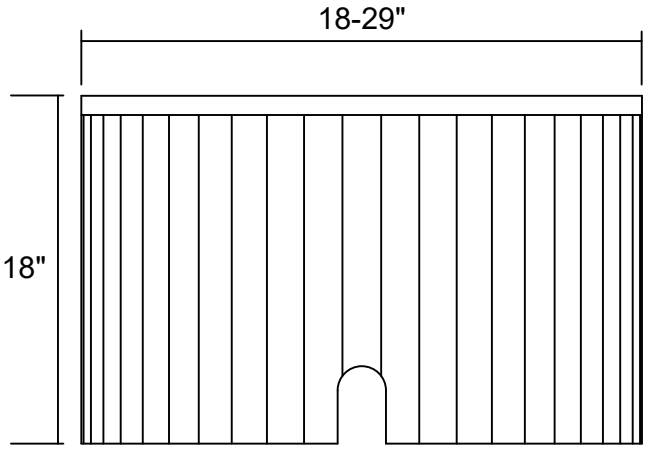
MELISSA TX

NCTCOG STANDARD SPECIFICATION REFERENCE: 502

NOTICE DATE	MODIFIED DATE	STANDARD DRAWING NO.
	09/16/15	4141M*
	APPLIED DATE	ENFORCED DATE



LIST OF ACCEPTABLE WATER METER BOXES
18" DIAMETER CANS: DFW PLASTICS DFW-1818F-B1A STAR MEL BASS & HAYS BHP34P14D1S 3LID P BASS & HAYS BHP34P18D1S 3LID P
24" DIAMETER CANS: DFW PLASTICS DFW-2418F-1BA STAR MEL BASS & HAYS BHP359P18D 3LID P
29" DIAMETER CANS: DFW PLASTICS DFW-2818F-1BA STAR MEL BASS & HAYS BH P55P18 5LIDP



FOR 3/4"-1" METERS, A CIRCULAR POLYMER METER BOX MEASURING 18"x18" IS TO BE USED IN NON TRAFFIC AREAS.

FOR METERS 1 1/2"-2", A CIRCULAR POLYMER METER BOX MEASURING 24"x18" IS TO BE USED IN NON TRAFFIC AREAS OR AS APPROVED BY THE ENGINEER.

FOR METERS LARGER THAN 2", A VAULT IS TO BE USED.

METER BOXES WILL BE INSTALLED AT THE TIME PUBLIC IMPROVEMENTS ARE MADE TO A SUBDIVISION.

ONLY 24" OR 29" METER BOXES SHALL BE USED FOR LOTS WITH FP ELEVATION BELOW 657.65'.

ALL LIDS TO HAVE CITY OF MELISSA LOGO.

M* - CITY OF MELISSA REVISION

WATER METER BOX DETAIL

NON-TRAFFIC AREAS

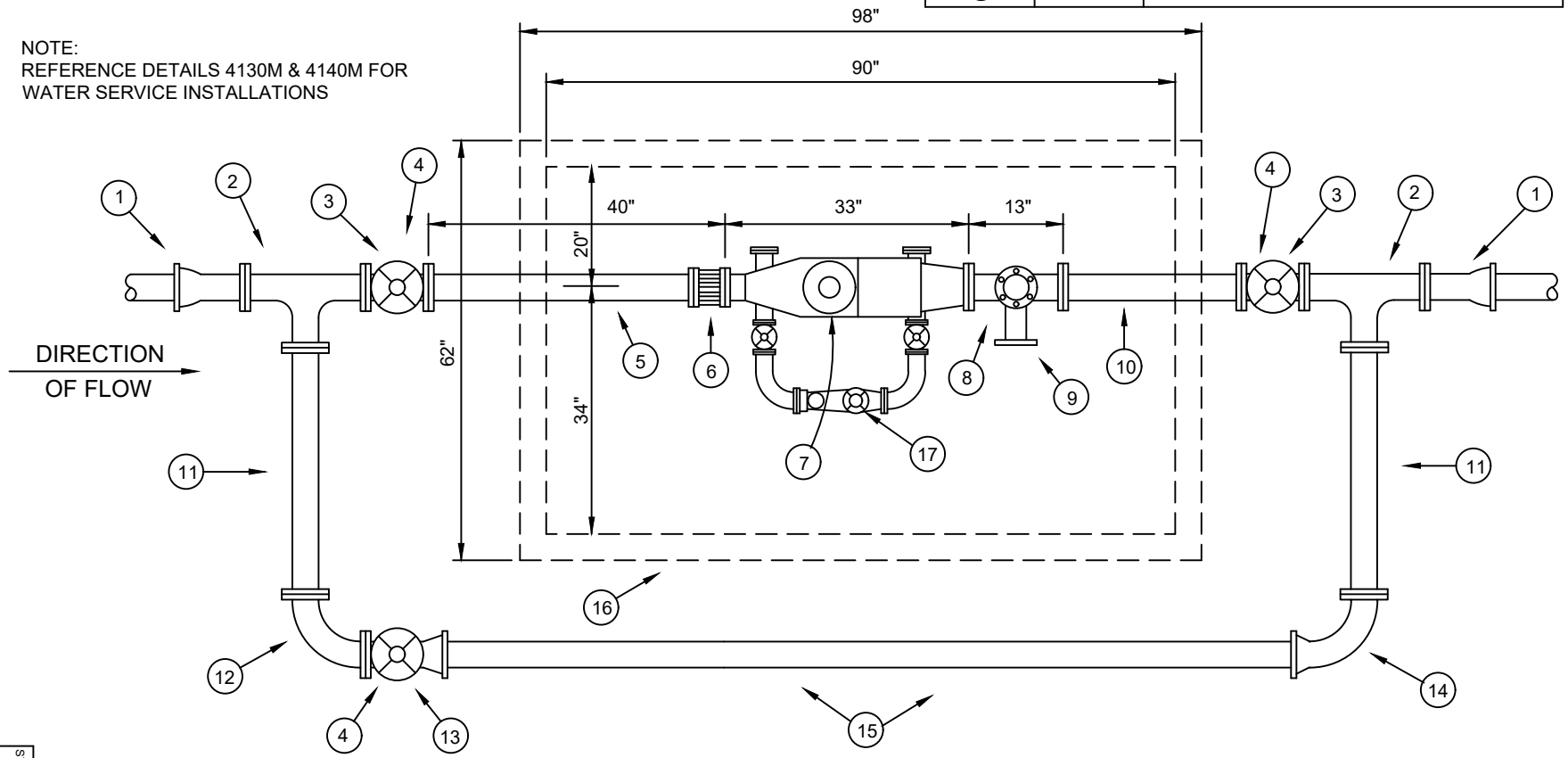
NCTCOG STANDARD SPECIFICATION REFERENCE	
502	
MODIFIED DATE	STANDARD DRAWING NO.
12/09/19	4142M*
NOTICE DATE	APPLIED DATE	ENFORCED DATE
12/10/19	12/10/19	01/10/20

STANDARD DRAWING NO.
4142M*

MATERIALS LIST		
PART NO.	QUANTITY	DESCRIPTION
①	2 EA.	4" X 12" D.I. NIPPLE M.J. X F.
②	2 EA.	4" X 4" D.I. TEE F. X F.
③	2 EA.	4" GATE VALVE F. X F.
④	3 EA.	VALVE STACK RISER COVER & LID
⑤	1 EA.	4" X 40" D.I. NIPPLE F. X SLEEVE
⑥	1 EA.	4" FLANGED COUPLING ADAPTER
⑦	1 EA.	4" MASTER METER WITH RAISED GLASS
⑧	1 EA.	4" X 4" D.I. TEE F. X F. (TEST POINT)
⑨	1 EA.	4" BLIND FLG.

MATERIALS LIST		
PART NO.	QUANTITY	DESCRIPTION
⑩	1 EA.	4" X 24" D.I. NIPPLE F. X F.
⑪	2 EA.	4" X 36" D.I. NIPPLE F. X F.
⑫	1 EA.	4" D.I. 90° BEND F. X F.
⑬	1 EA.	4" GATE VALVE F. X M.J.
⑭	1 EA.	4" D.I. 90° BEND M.J. X F.
⑮	1 EA.	4" D.I. PIPE, CLASS 52, APPROX. 10'
⑯	1 EA.	PRECAST METER VAULT
	1 EA.	VAULT FLOOR (NOT SHOWN)
	1 EA.	ACCESS HATCH (NOT SHOWN)
⑰	1 EA.	BY-PASS METER

NOTE:
REFERENCE DETAILS 4130M & 4140M FOR
WATER SERVICE INSTALLATIONS



M* - CITY OF MELISSA REVISION

STANDARD DRAWING NO.
4150M*

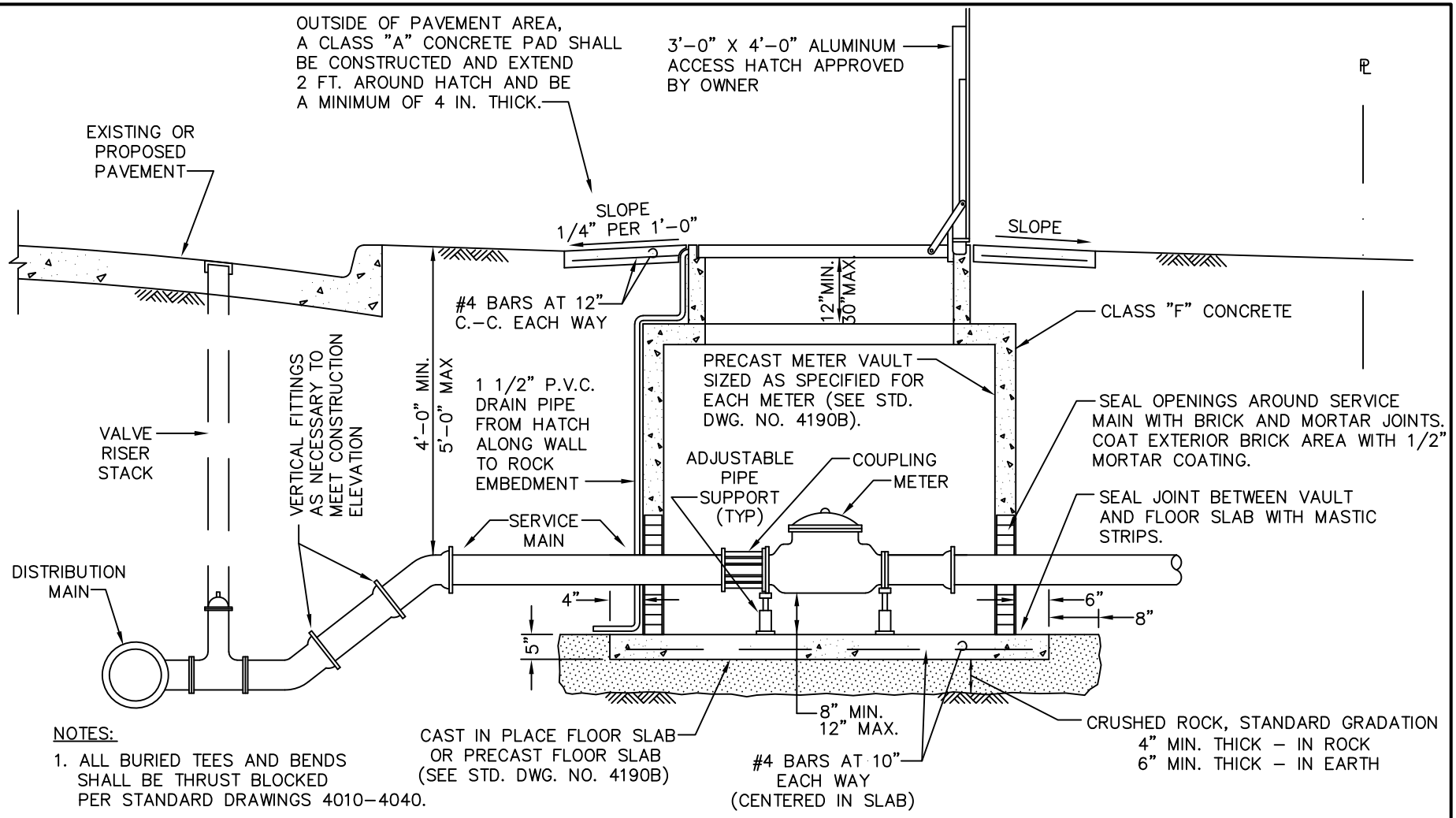
4" COMBINED SERVICE WITH 4" METER

MELISSA TX

NCTCOG STANDARD SPECIFICATION REFERENCE
500

DATE
11/13/08

STANDARD DRAWING NO.
4150M*



NOTES:

1. ALL BURIED TEES AND BENDS SHALL BE THRUST BLOCKED PER STANDARD DRAWINGS 4010-4040.
2. ALL BURIED D.I. PIPE AND C.I. FITTINGS SHALL BE POLY-WRAPPED AS SPECIFIED FOR THE ADJECENT DISTRIBUTION MAIN.

ELEVATION VIEW

(D.C. METER SHOWN) N.T.S.

STANDARD DRAWING NO. 4190A

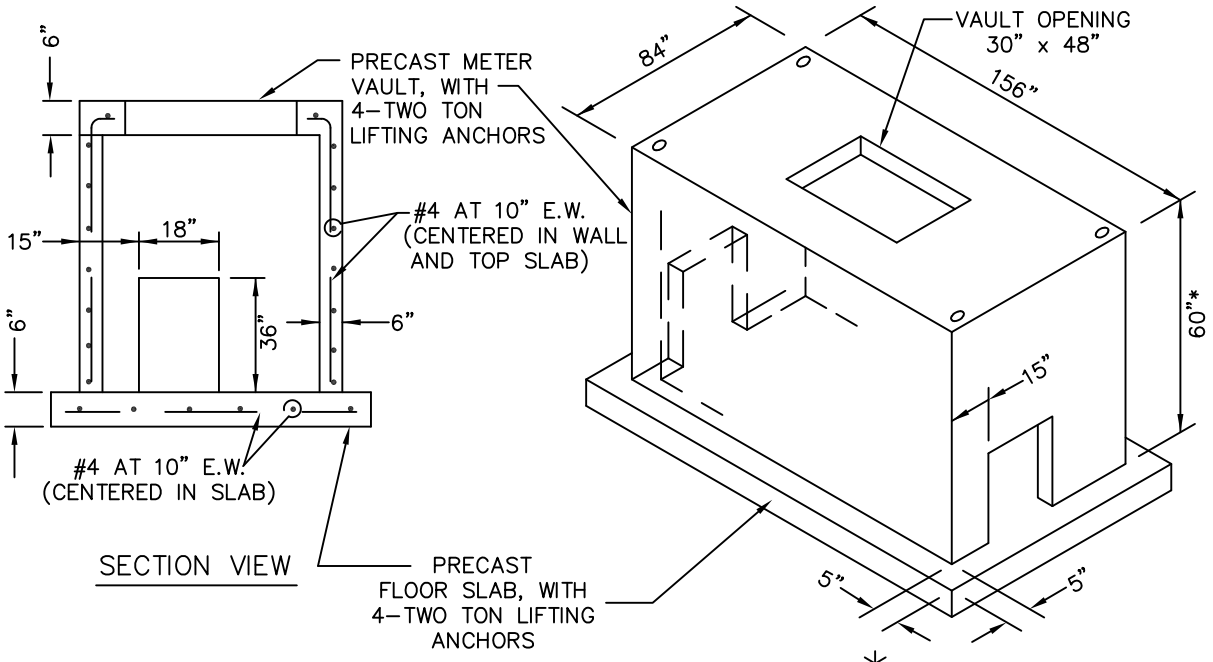
LARGE SERVICE METER VAULT INSTALLATION

North Central Texas Council of Governments

STANDARD SPECIFICATION REFERENCE 702.5

DATE AUG '23

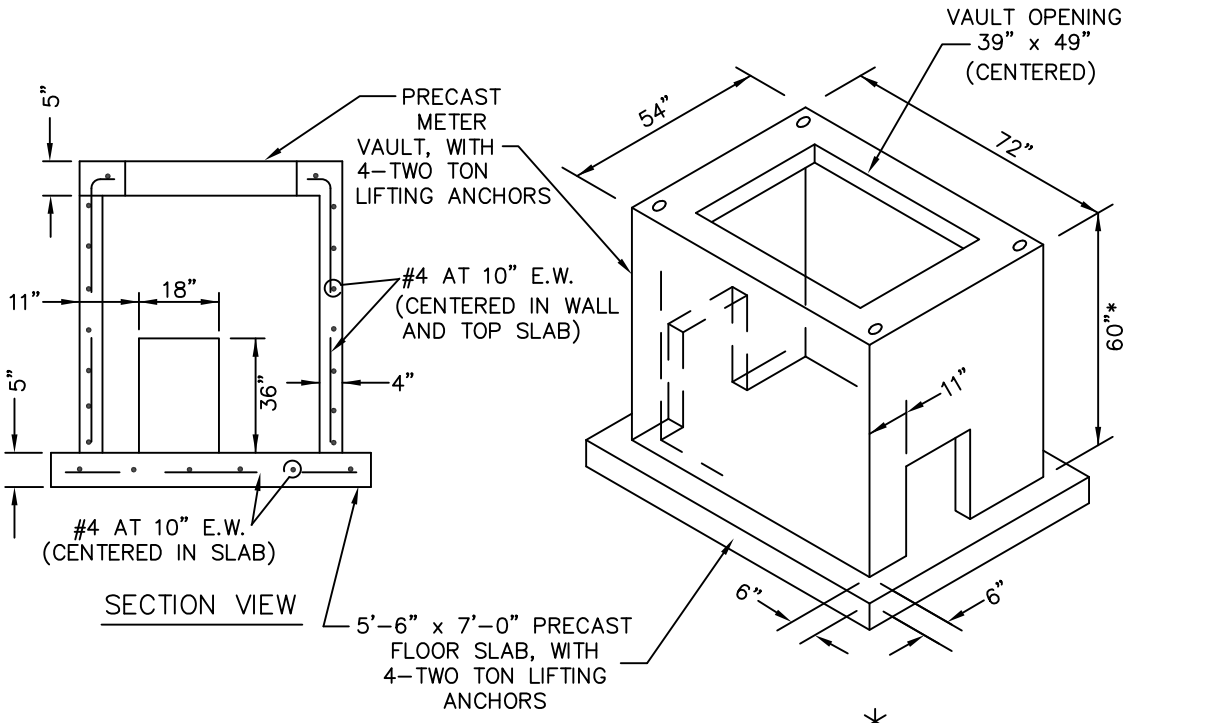
STANDARD DRAWING NO. 4190A



* AVAILABLE HEIGHTS: 36", 48", 60", 90", 96" USE OF WHICH IS SPECIFIED BY OWNER

F.M. METER VAULT

N.T.S.



* AVAILABLE HEIGHTS: 36", 48", 60" USE OF WHICH IS SPECIFIED BY OWNER

D.C. METER VAULT

N.T.S.

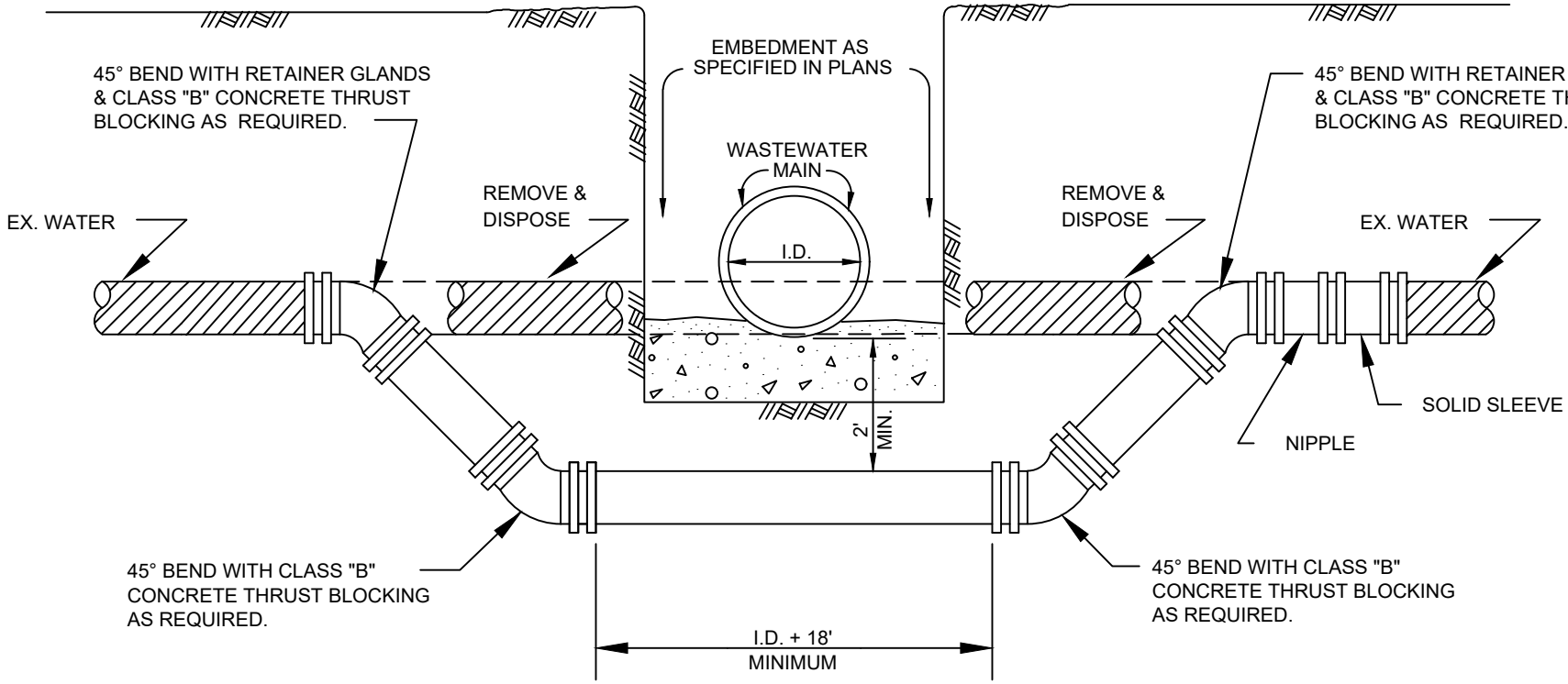
LARGE SERVICE METER PRECAST VAULT

North Central Texas Council of Governments

STANDARD SPECIFICATION REFERENCE: 702.5

DATE: AUG '23

STANDARD DRAWING NO.: 4190B

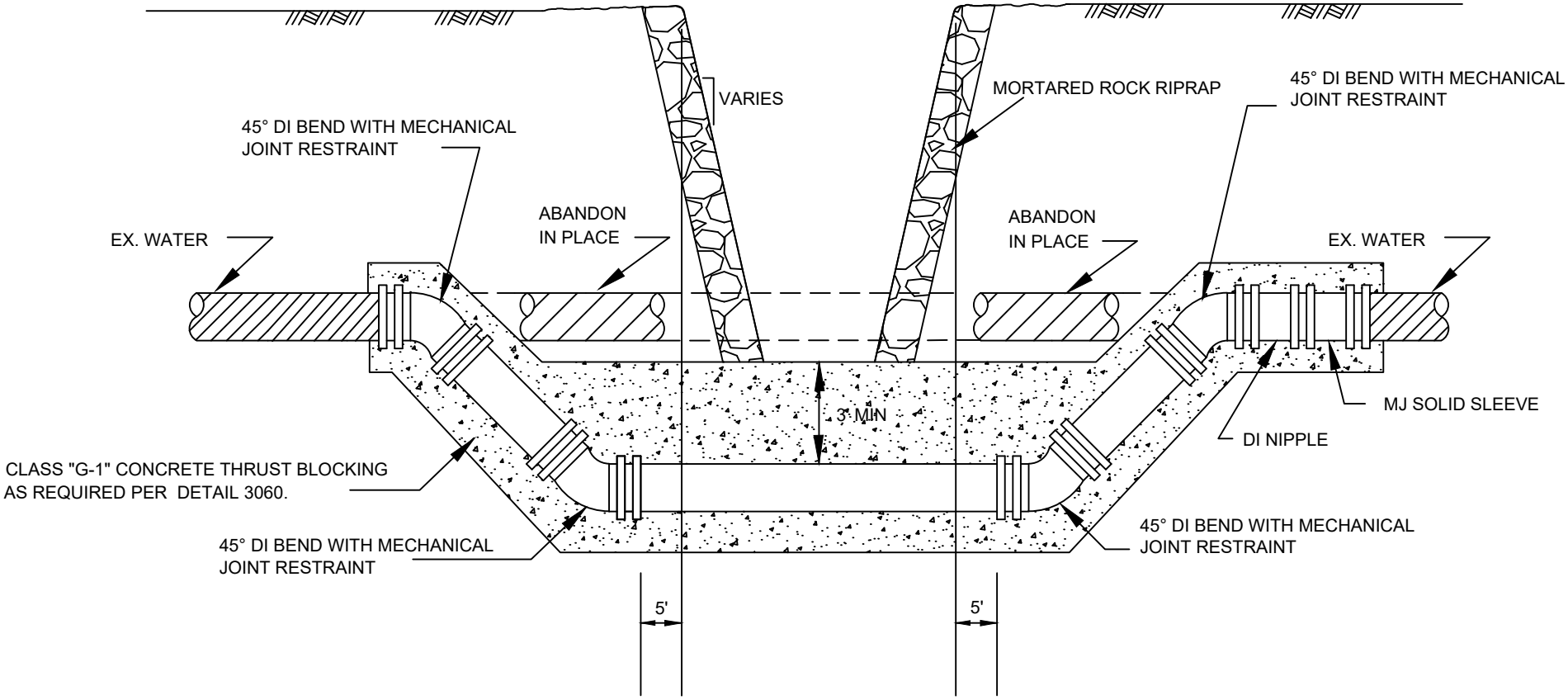


STANDARD DRAWING NO. 4200M

STANDARD WATER MAIN LOWERING

CITY OF MELISSA

	STANDARD SPECIFICATION REFERENCE	
	506.6	
NOTICE DATE	MODIFIED DATE 3/7/2014	STANDARD DRAWING NO. 4200M
	ADOPTED DATE	ENFORCEMENT DATE



M* - CITY OF MELISSA REVISION

STANDARD DRAWING NO. 4201M*

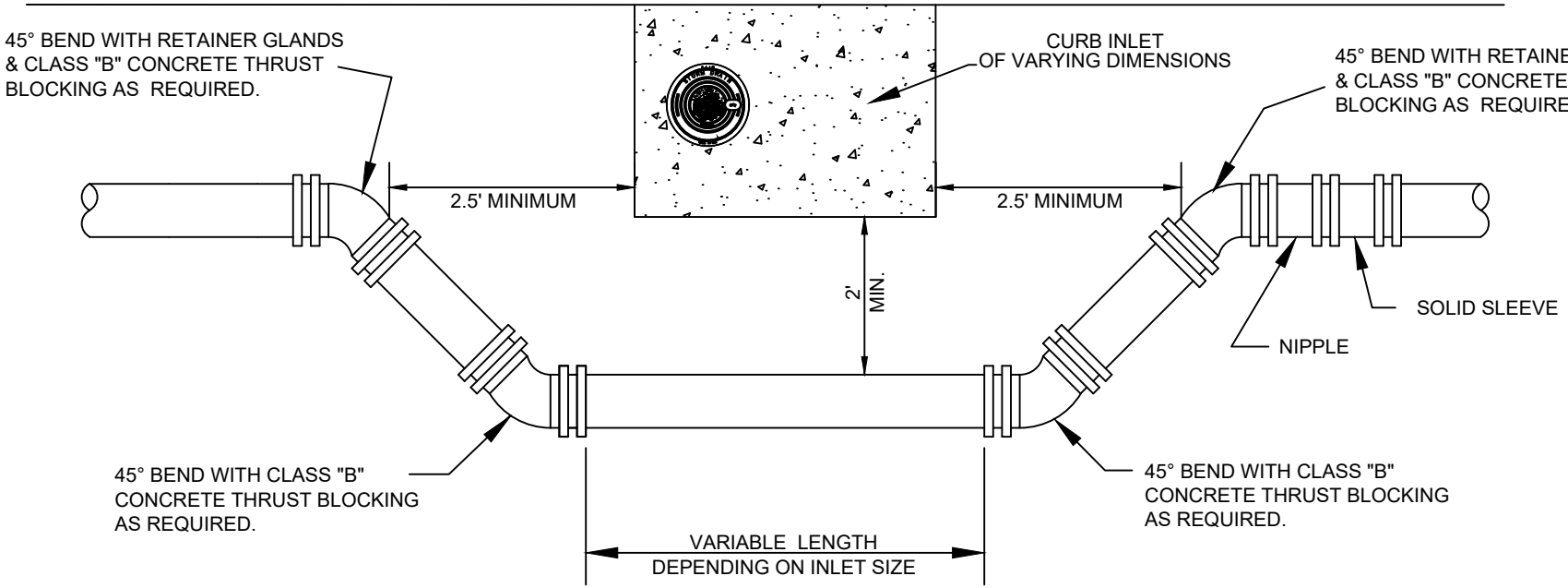
WATER MAIN LOWERING AT CREEK CROSSING

CITY OF MELISSA

MELISSA TX

NCTCOG STANDARD SPECIFICATION REFERENCE	
506.6	
DATE	STANDARD DRAWING NO.
08/26/09	4201M*

ROADWAY



STANDARD DRAWING NO. 4202M

STANDARD WATER MAIN ALIGNMENT

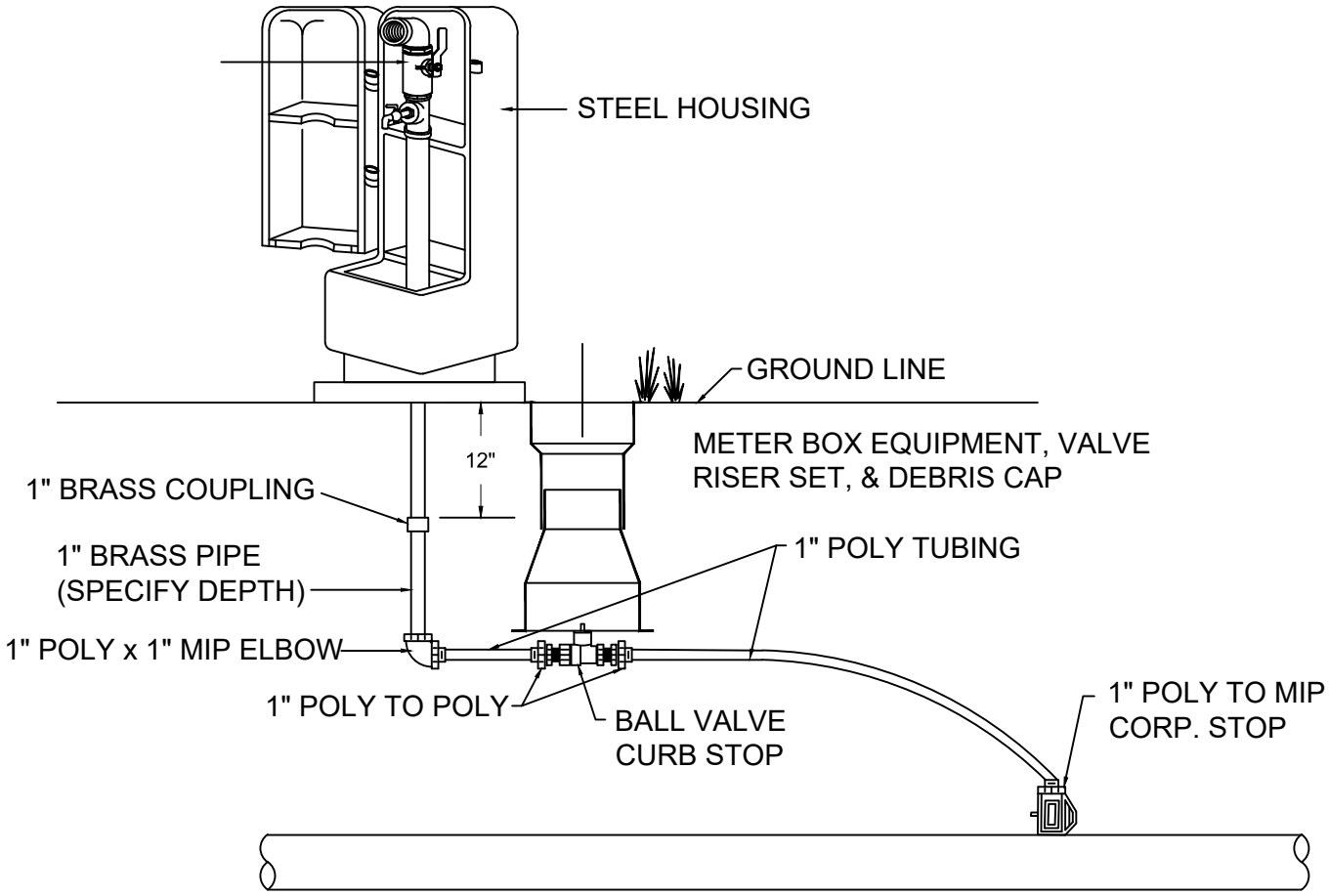
AROUND CURB INLET

MELISSA TX

STANDARD SPECIFICATION REFERENCE		
	MODIFIED DATE	STANDARD DRAWING NO. 4202M
NOTICE DATE 6/14/17	ADOPTED DATE 6/14/17	ENFORCEMENT DATE 7/14/17

APPROVED SAMPLING STATIONS

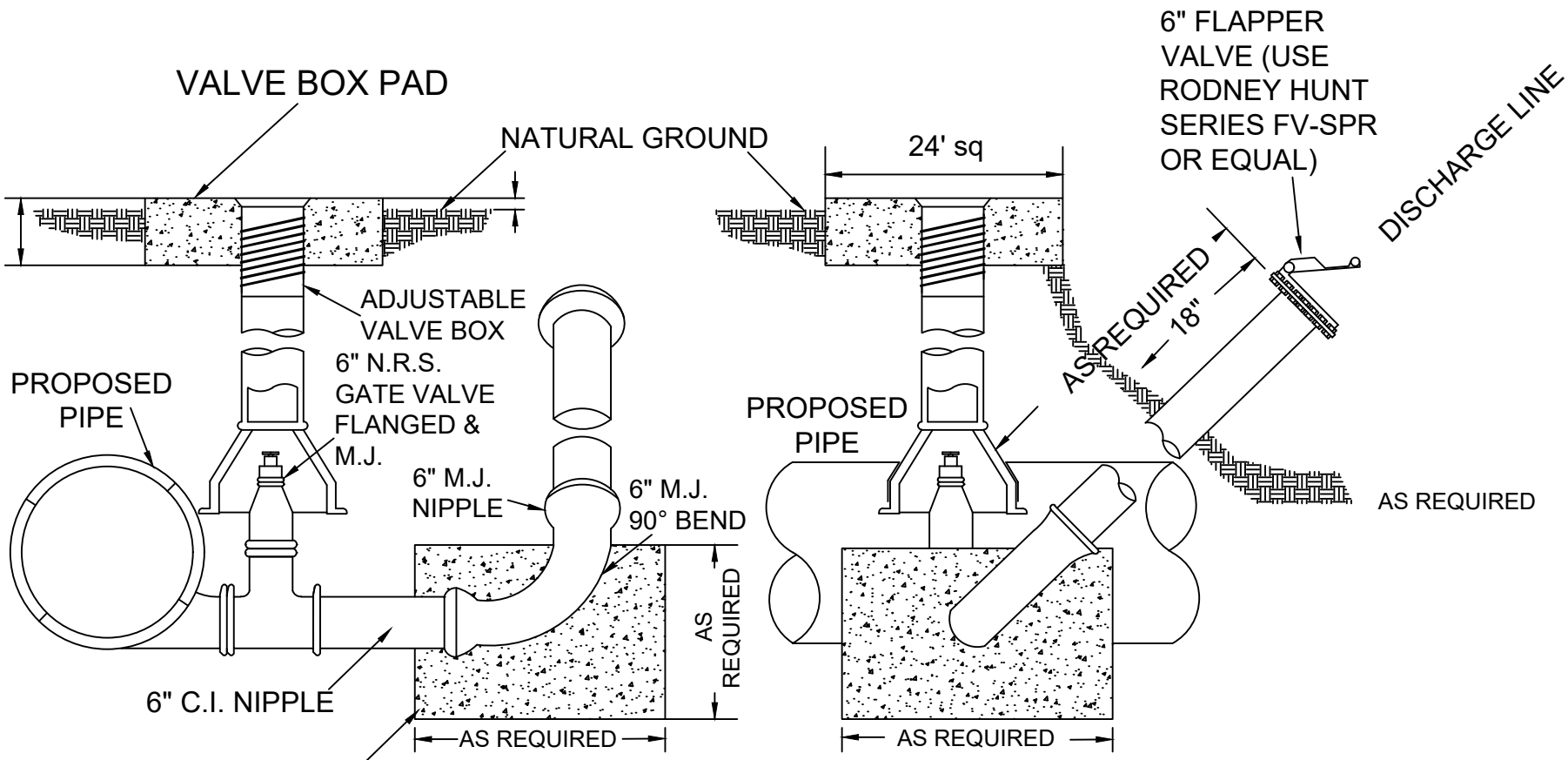
- ECLIPSE NO. 88
- SAFETY GUARD B.O.S.S.



SAMPLING STATIONS SHALL BE 3' BURY, WITH A 1" MIP INLET, AND A 1" FIP DISCHARGE. A 1/4" BENT-NOSE SAMPLING BIBB SHALL BE LOCATED BEFORE THE DISCHARGE. ALL STATIONS SHALL BE ENCLOSED IN A LOCKABLE, NONREMOVABLE, ALUMINUM-CAST HOUSING WITH THE CITY OF MELISSA LOGO. HOUSING SHALL BE ON A 3'-0" x 3'-0" CONCRETE PAD. WHEN OPENED, THE STATION SHALL REQUIRE NO KEY FOR OPERATION, AND THE WATER WILL FLOW IN AN ALL BRASS WATERWAY. ALL WORKING PARTS WILL BE OF BRASS AND SERVICEABLE FROM ABOVE GROUND WITH NO DIGGING. A 1" BALL VALVE WILL CONTROL THE WATER FLOW, AND BE LOCATED BEFORE (OR AFTER) THE SAMPLING BIBB.

M* - CITY OF MELISSA REVISION

	NCTCOG STANDARD SPECIFICATION REFERENCE	
	MODIFIED DATE	STANDARD DRAWING NO.
# SAMPLING STATION	09/25/15	4210M*
# CITY OF MELISSA	NOTICE DATE / APPLIED DATE	ENFORCED DATE



CLASS "B" CONCRETE THRUST BLOCK TO BE PLACED ON UNDISTURBED EARTH.

NOTE:
MUST BE DISCHARGED INTO STORM SEWER, BRIDGE OR CULVERT.

M* - CITY OF MELISSA REVISION

STANDARD DRAWING NO.
4220M *

WATER LINE BLOW OFF VALVE

CITY OF MELISSA

NCTCOG STANDARD SPECIFICATION REFERENCE		
502		
MODIFIED DATE	STANDARD DRAWING NO.	
06/14/24	4220M*	
NOTICE DATE	APPLIED DATE	ENFORCED DATE
06/14/24	06/14/24	07/14/24