

WATER SECTION

GENERAL

All work shall be done in accordance with the latest editions of the American Water Works Association Standards (AWWA), and the American Society for Testing and Materials (ASTM), except as modified herein.

All component(s) going into city water system should be lead free.

WATER LINES

All water lines shall be Ductile Iron (Min. Thickness Class 50) with Ductile Iron fittings and shall conform to AWWA/ANSI C151/A21.51 standards. ALL valves, valve boxes, and covers shall be as indicated in the City of Morgan Hill Standard Details. Use of C900 Piping shall only be used with the City Engineers approval.

A standard gate valve, with a brass blow-off shall be installed at the end of all dead-end lines. A 1" air relief valve must be installed at all high points in the line. Water tight plugs shall be placed at all open ends of pipes when the job site is unattended.

All water services shall be Type "K" copper tubing as shown on Detail W-1.

The concrete Contractor shall stamp a letter "W" on the face of curb directly above the water service.

All fire hydrants shall have companion valves and be of the type indicated on Detail W-8.

All water lines shall be blocked with concrete kick blocks at all changes in direction, all bends, crosses, wyes, tees, reducers, plugs, dead-ends and changes in size. Thrust block or kick block dimensions shall be based on the greater of either 150 PSI min. or 1.5 times the working pressure, while assuming a 2000 PSF soil bearing.

Note: Add A/C Pipe, shall be removed by Dev./Contractor (Hazardous Waste with proper methods and State Standards).

CLEANING AND TESTING

After installation, all pipe lines shall be flushed at 1.0 fps (main line velocity) with clean water. Lines shall be filled slowly and provisions shall be made for venting of the air. Only Department of Public Works Personnel shall open valves to the City's water system. Water lines shall be tested for tightness at the lower end of the line under a hydrostatic pressure of 150 PSI, or 50% above normal operating pressure, whichever is greater. The Contractor shall furnish all necessary equipment, labor and materials needed for the test. The test shall conform to AWWA C600 Section 4 and be conducted for at least 2 hours. See Detail W-IV for allowable leakage of ductile iron pipe.

All water lines shall be tested after completion of the trench backfill and compaction of the final base material, but prior to placement of the final roadway surface.

STERILIZATION

After pressure testing, and before putting into service, all water lines shall be chlorinated by the Contractor in accordance with AWWA C651 or as directed by the City Engineer. Chlorine is furnished by the Contractor and chlorination shall be supervised by a City Inspector.

Chlorination by placement of chlorine tablets in each section of pipe is allowed and shall be in accordance with AWWA C651 and held for a duration of 24 hours.



City of Morgan Hill
Public Works Department


CITY ENGINEER

4/1/96
DATE

3/06/23
REVISED

GENERAL NOTES

DRAWING
NO.

W-I

MICROBIOLOGICAL TESTING

The Contractor shall provide the City with a laboratory report as to the purity of the water before acceptance by the City and placement of the new lines into service. The procedures for such tests shall be as follows:

1. The Contractor shall notify and receive approval for coliform bacteria testing from the Inspector a minimum of 48 hours prior to taking the test, and only after the water line has been hydrostatically tested, chlorinated, final flushed and passed by the Inspector.
2. All sampling and testing for the City of Morgan Hill Water System shall be performed by authorized staff from any laboratory chosen by the Contractor which is certified by the California State Department of Health Services to perform microbiological analysis of drinking water.
3. Authorized staff from the chosen certified laboratory shall take a chlorine residual test prior to taking the coliform test. Chlorine residual shall not exceed 0.3 parts per million, otherwise the coliform test shall not be taken. Flushing shall then continue until the maximum chlorine level is attained.
4. The Contractor shall submit to the Public Works Department the following items:
 - A. Proof of State Department of Health Services certification for the laboratory chosen;
 - B. A copy (Fax OK) of the chain-of-custody for the water sample;
 - C. A copy (Fax OK) of the results of the test with an original "hard copy" to follow.
5. Upon review and approval of the items submitted in item 4., only Department of Public Works personnel shall open the necessary valves to connect the new lines to City's water system. Failure to follow the above requirement shall be considered an "unlawful connection" to the City Water System and may result in the issuing of a citation and fines as specified in Section 13.04 of the Morgan Hill Municipal Code.
6. Connections requiring shut down of the system shall be done between the hours of 12:00 Midnight and 6:00 AM, and only upon coordination with the Department of Public Works.

DUCTILE IRON

- (a) Pipe. Ductile iron pipe shall conform to the requirements of AWWA C100 series. Class 50 pipe shall be the minimum allowable thickness class.
- (b) Joints. All ductile iron pipe laid underground shall have push-on, mechanical, or flange joints unless approved otherwise.
- (c) Lining and Coating. Water pipes shall be smooth cement lined in accordance with the requirements of AWWA C104. Polyethylene encasement wrap may be required in special soil conditions. Wrapping shall be in accordance with AWWA C105.
- (d) Fittings. Fittings shall be cast iron, cement lined and coal tar pitch varnish coated of the Bell and Spigot type and shall conform to ANSI A21.10. Where a specific type of fitting is called for on the Plans, this type shall be used. Fittings shall be all bell, unless indicated otherwise on the Plans. Fitting joints shall be made up with roll-on rubber gaskets. Junctions with other types shall be made with suitable adapters or fittings. Gaskets shall be rubber.



City of Morgan Hill
Public Works Department

Jim Cochcroft
CITY ENGINEER

4/1/96
DATE

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W-II

DUCTILE IRON (Continued)

(e) Taps. Taps into ductile iron pipe shall be by machine. Contractor shall perform all service taps as the City does not provide this service. Hot taps to main lines will be allowed only upon approval of the City Engineer. Tapping sleeves may only be used where a water main is at least two nominal sizes larger than the proposed branch. Less than two nominal size differential may be allowed upon City Engineer approval, but will not be allowed on water mains that are not ductile iron.

VALVES

All gate valves shall meet the standards of AWWA C509. Flanged ends shall meet the requirements of ANSI B16.1, class 125. Mechanical joint ends shall meet the requirements of AWWA C111. Interior corrosion prevention coatings shall meet the requirements of AWWA C550. All valves shall be resilient wedge, non-rising stem and double O-ring equipped.

Butterfly valves shall only be used upon the direction or approval of the City Engineer and shall meet the requirements of AWWA C504.

BOLTS AND NUTS

Underground bolts and nuts shall be of low carbon steel in accordance with AWWA C141. Stainless steel bolts and nuts may be required upon direction of the City Engineer.

DEPTH

All water lines shall have a minimum of 36 inches cover at any given time, unless directed otherwise by the City Engineer.

MARKER POSTS

Contractor shall place marker posts adjacent to all air relief valves and blow off assemblies along water mains located in unimproved areas or fields. The posts shall be pressure treated redwood 4"x4"x6', painted white, buried 2'-6", and inscribed with "W/A.V." (for air relief valves) or "B.O." (for blow off assemblies), in 3 inch high carved letters painted blue.



City of Morgan Hill
Public Works Department

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CITY ENGINEER

4/1/96
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W-III

ALLOWABLE LEAKAGE FOR DUCTILE IRON PIPE

ALLOWABLE LEAKAGE
(PER 1000 L.F.)

PIPE DIAMETER (inches)	AVG. TEST PRESSURE AT LOWEST POINT IN THE LINE- PSI						
	50	75	100	125	150	200	225
	LEAKAGE- GAL./HR.						
4	0.21	0.26	0.30	0.34	0.37	0.42	0.45
6	0.32	0.39	0.45	0.50	0.55	0.64	0.68
8	0.42	0.52	0.60	0.67	0.74	0.85	0.90
10	0.53	0.65	0.75	0.84	0.92	1.06	1.13
12	0.64	0.78	0.90	1.01	1.10	1.27	1.35
14	0.74	0.91	1.05	1.18	1.29	1.49	1.58
16	0.85	1.04	1.20	1.34	1.47	1.70	1.80
18	0.96	1.17	1.35	1.51	1.66	1.91	2.03
20	1.06	1.30	1.50	1.68	1.84	2.12	2.25
24	1.27	1.56	1.80	2.01	2.21	2.55	2.70

* DATA BASED ON THE FOLLOWING FORMULA:
PER AWWA C600 SEC. 4

$$\frac{(\text{DIA.})(\text{LENGTH})(\sqrt{\text{AVG. TEST PRESSURE}})}{133200} = \text{ALLOWABLE LEAKAGE (GALLONS / HOUR)}$$



City of Morgan Hill
Public Works Department

Jim Cahcraft
CITY ENGINEER

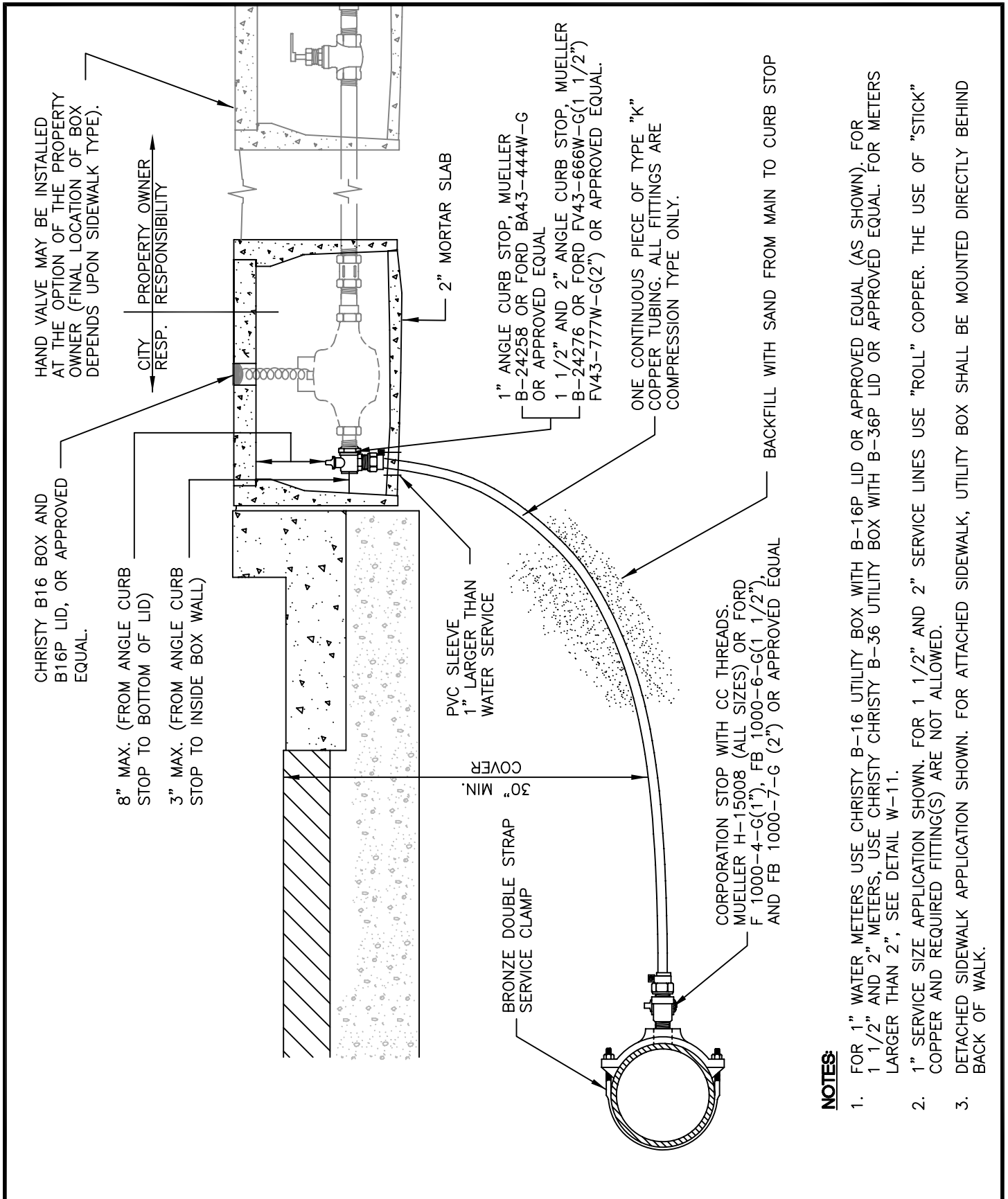
4/1/96
DATE

REVISED

GENERAL NOTES

DRAWING
NO.

W-IV



NOTES:

- FOR 1" WATER METERS USE CHRISTY B-16 UTILITY BOX WITH B-16P LID OR APPROVED EQUAL (AS SHOWN). FOR 1 1/2" AND 2" METERS, USE CHRISTY CHRISTY B-36 UTILITY BOX WITH B-36P LID OR APPROVED EQUAL. FOR METERS LARGER THAN 2", SEE DETAIL W-11.
- 1" SERVICE SIZE APPLICATION SHOWN. FOR 1 1/2" AND 2" SERVICE LINES USE "ROLL" COPPER. THE USE OF "STICK" COPPER AND REQUIRED FITTING(S) ARE NOT ALLOWED.
- DETACHED SIDEWALK APPLICATION SHOWN. FOR ATTACHED SIDEWALK, UTILITY BOX SHALL BE MOUNTED DIRECTLY BEHIND BACK OF WALK.



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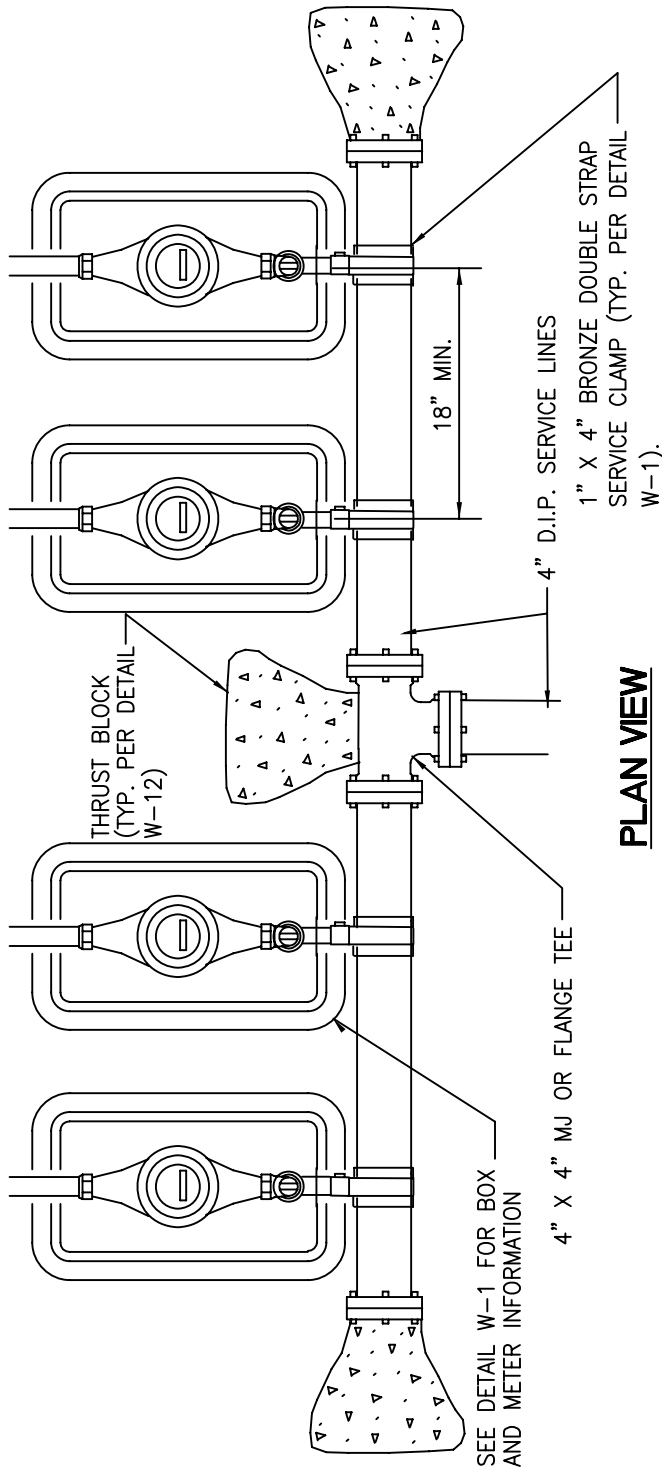
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3/15/07
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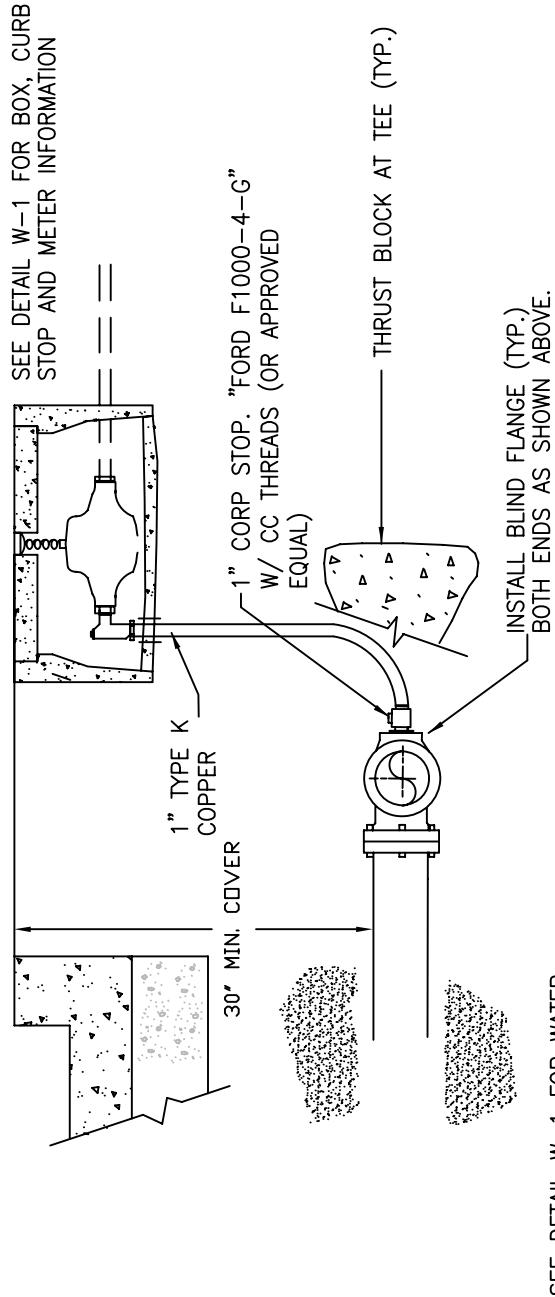
TYPICAL WATER SERVICE INSTALLATION

DRAWING
NO.

W-1



PLAN VIEW



PROFILE VIEW
(other meters hidden)

NOTES:

1. STANDARD DETAIL W-1, "RESIDENTIAL WATER SERVICE" IS A PART OF THIS DETAIL, EXCEPT AS MODIFIED HEREIN.
2. ADDITIONAL WATER SERVICES/METERS (MORE THAN 4) SHALL REQUIRE SERVICE LINE GREATER THAN 4".
3. A COMPANION VALVE (EQUAL TO PROPOSED SERVICE SIZE) SHALL BE USED AT CONNECTION OF SERVICE TO MAIN IN STREET (SEE DETAIL W-9 FOR REFERENCE).



City of Morgan Hill
Public Works Department

Jim Ashcraft
APPROVED

11/08/00
DATE

3/15/07
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**WATER SERVICE MANIFOLD
FOR 4" OR GREATER
SERVICE LINE**

DRAWING
NO.

W-3

SEE DETAIL W-1 FOR WATER
MAIN CONNECTION REQUIREMENTS

SEE DETAIL W-1 FOR BOX, CURB
STOP AND METER INFORMATION

SEE DETAIL W-1 FOR BOX
AND METER INFORMATION

THRUST BLOCK
(TYP. PER DETAIL
W-12)

1" CORP. STOP. "FORD F1000-4-G"
W/ CC THREADS (OR APPROVED
EQUAL)

THRUST BLOCK AT TEE (TYP.)

INSTALL BLIND FLANGE (TYP.)
BOTH ENDS AS SHOWN ABOVE.

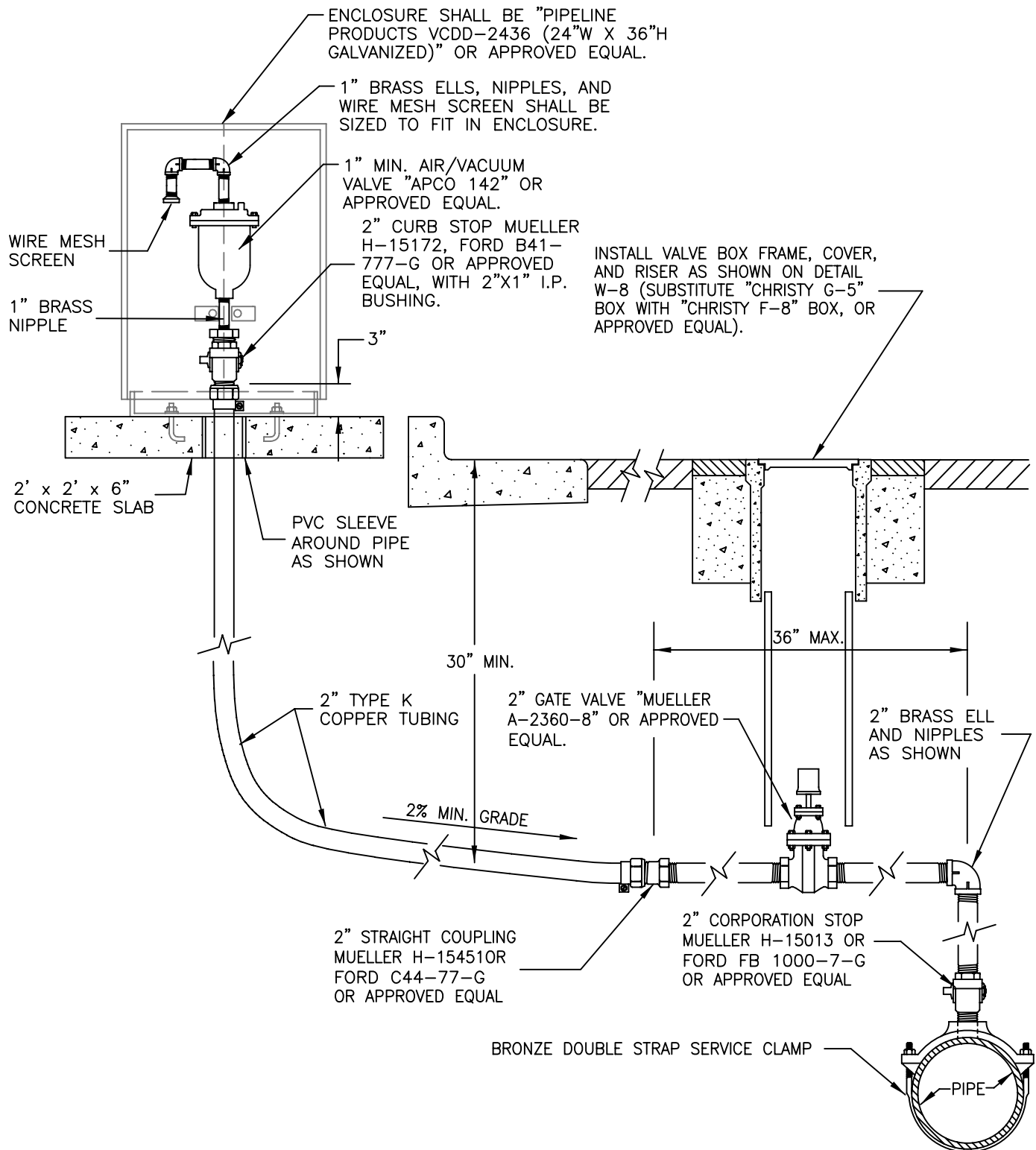
1" TYPE K
COPPER
30" MIN. COVER

4" X 4" MJ OR FLANGE TEE

18" MIN.

1" X 4" BRONZE DOUBLE STRAP
SERVICE CLAMP (TYP. PER DETAIL
W-1).

4" D.I.P. SERVICE LINES



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Public Works Department

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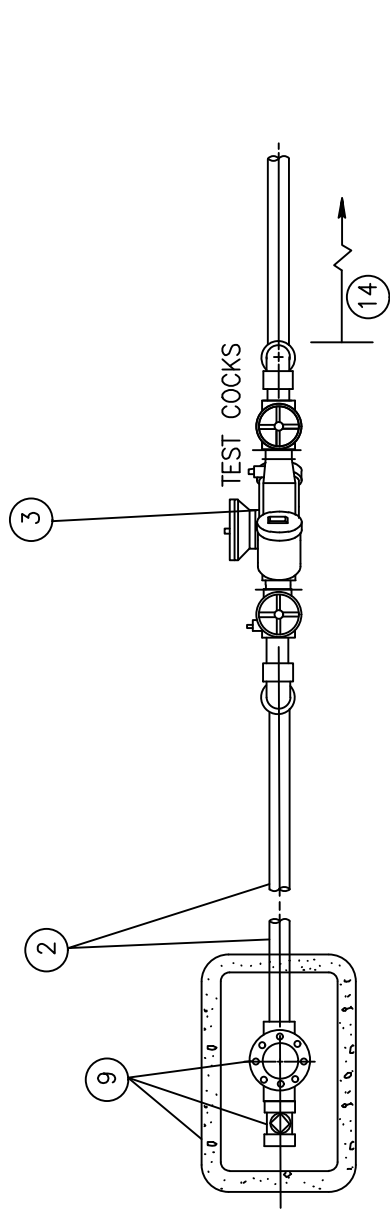
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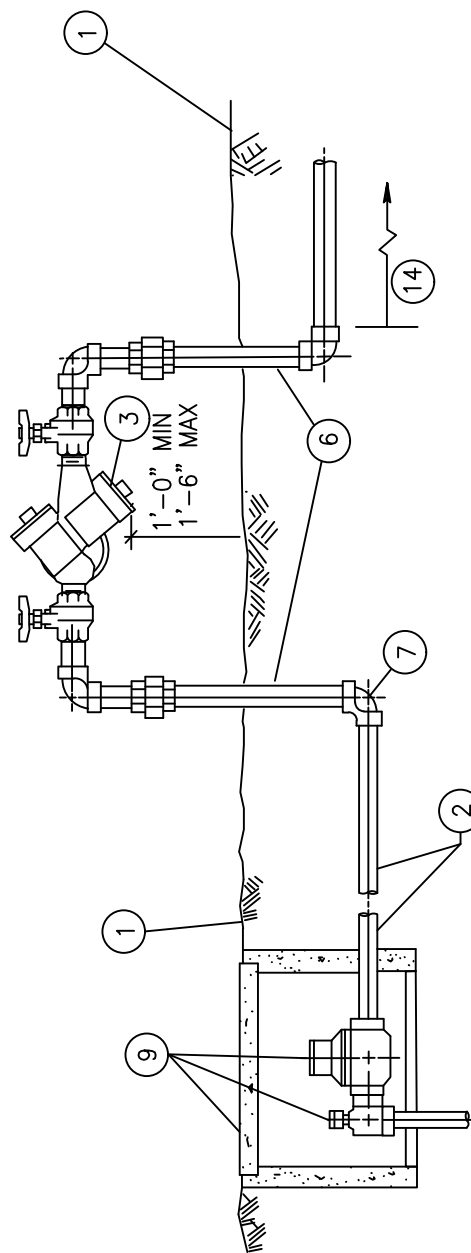
AIR RELIEF VALVE ASSEMBLY

DRAWING
NO.

W-5



PLAN



PROFILE

FOR NOTES AND LEGEND, SEE DETAIL W-10

NOTE: (FOR SIZES 1" TO 2" BACKFLOW UNITS SHALL BE LF FEBCO 825 Y LEAD FREE OR APPROVED EQUAL)

1. PIPING BETWEEN BACKFLOW DEVICE AND METER SHALL BE EXPOSED FOR INSPECTION BY THE UTILITY SYSTEMS
2. BACKFLOW ASSEMBLY MUST BE THE SAME SIZE AS THE METER AT A MINIMUM OF 1" or 1 to 1 RATIO.
3. BACKFLOW DEVICE SHALL BE PLACED DIRECTLY BEHIND SIDEWALK OR DIRECTLY BEHIND METER BOX FOR ATTACHED SIDEWALK CONFIGURATIONS.
4. BACKFLOW DEVICES OWNED AND MAINTAINED BY THE CITY OF MORGAN HILL SHALL BE EQUIPPED WITH LOCKABLE CAGES (SEE DETAIL L-10).



City of Morgan Hill
Public Works Department

S.E.
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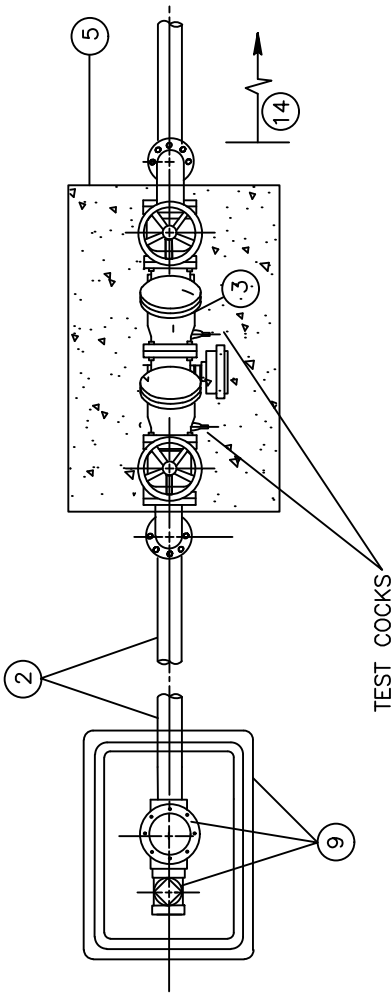
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DATE

3/06/23
REVISED

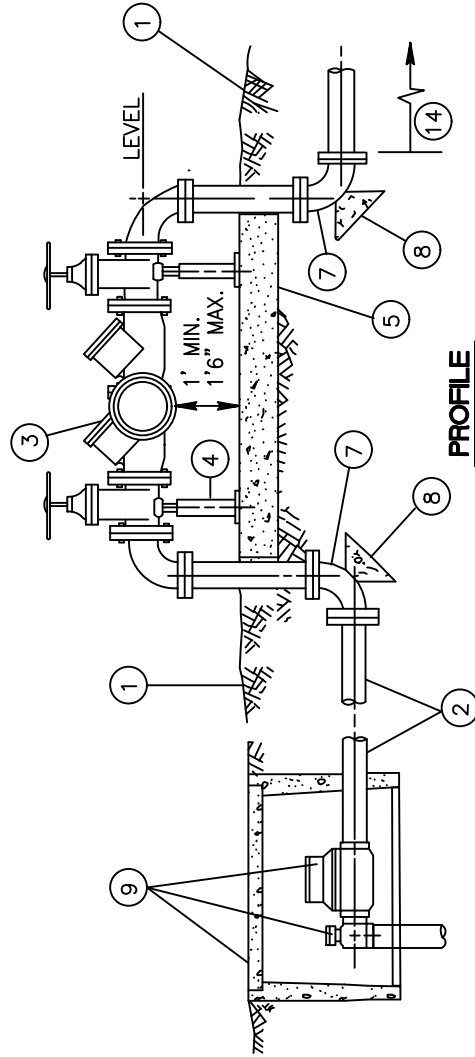
REDUCED PRESSURE BACKFLOW PREVENTER (SIZES 1" TO 2")

DRAWING
NO.

W-6



PLAN



PROFILE

FOR NOTES AND LEGEND, SEE DETAIL W-10

(FOR SIZES 2 1/2" TO 4" BACKFLOW UNITS SHALL BE LF FEBCO 825 YD OR APPROVED EQUAL)

NOTES:

1. PIPING BETWEEN BACKFLOW DEVICE AND METER SHALL BE EXPOSED FOR INSPECTION BY THE CITY.
2. FOR METER SIZES GREATER THAN 2 1/2", SEE DETAILS W-9 AND W-11.



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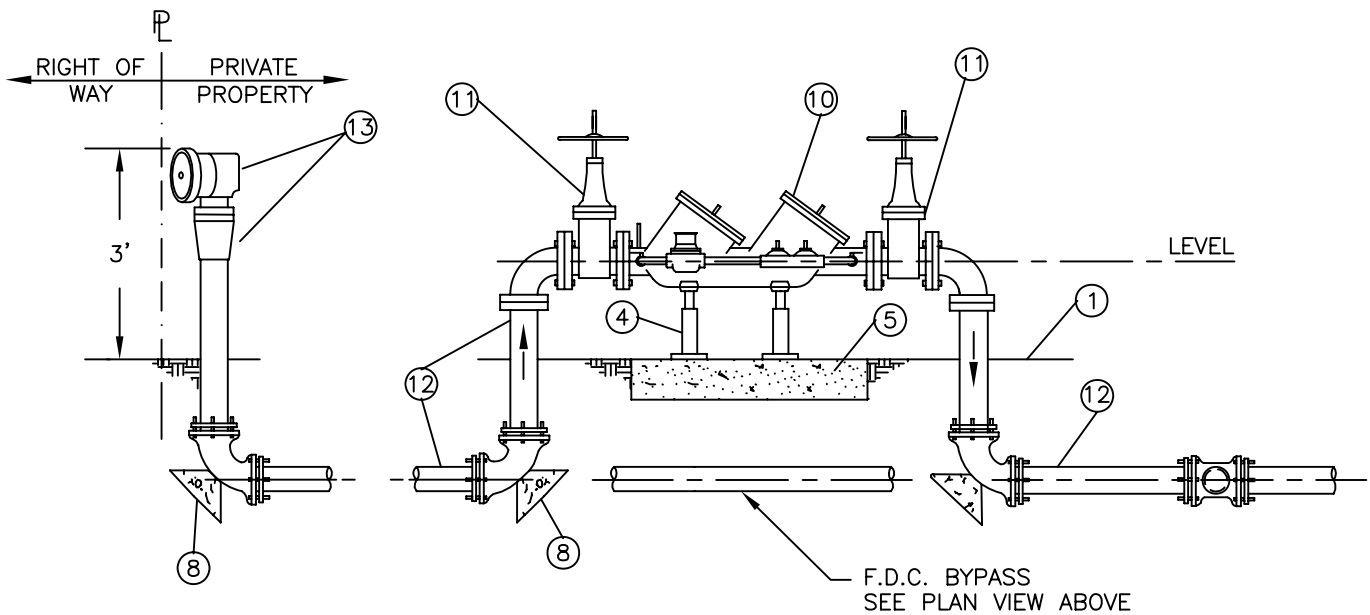
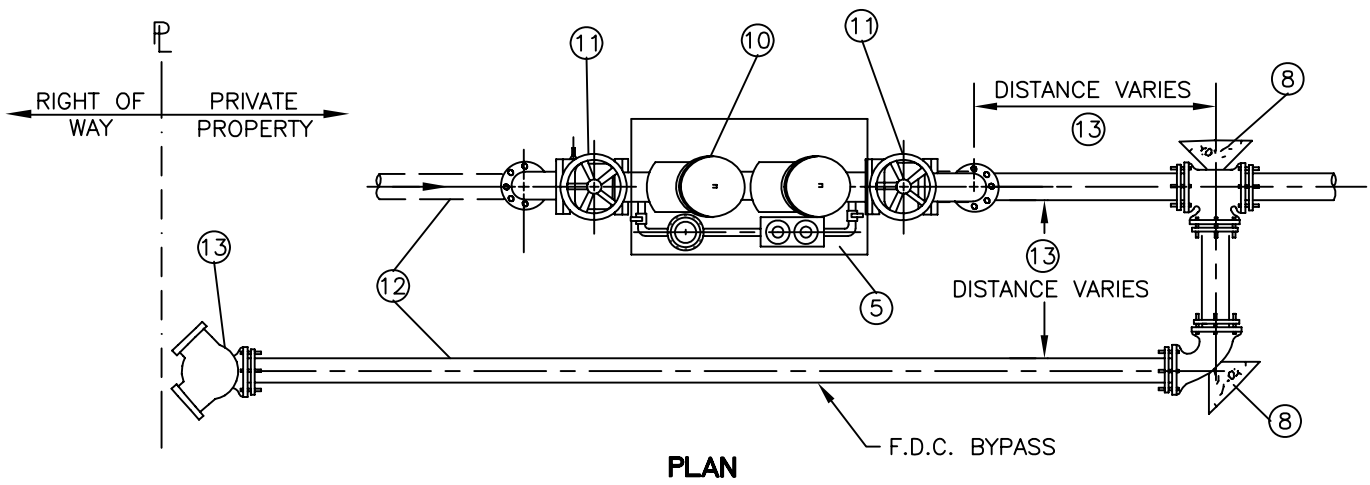
S.E.
CITY ENGINEER

4/1/96
DATE

3/06/23
REVISED

**REDUCED PRESSURE
BACKFLOW PREVENTER
(SIZES 2-1/2" TO 4")**

DRAWING
NO.
W-7



FOR NOTES AND LEGEND, SEE DETAIL W-10.

NOTES:

1. REQUESTED DEVIATIONS FROM THE F.D.C. BYPASS CONFIGURATION (IF BYPASS IS REQUIRED) ABOVE SHALL BE SUBMITTED IN THE FORM OF A PLAN AND PROFILE DRAWING AND MUST BE APPROVED BY THE CITY ENGINEER.
2. APPLICATION SHOWN IS FOR PRIVATELY MAINTAINED FIRE SERVICES, SEE DETAILS W-9 AND W-11 FOR METER (IF REQUIRED) AND CONNECTION INFORMATION.



City of Morgan Hill
Public Works Department

Jim Cochcroft
CITY ENGINEER

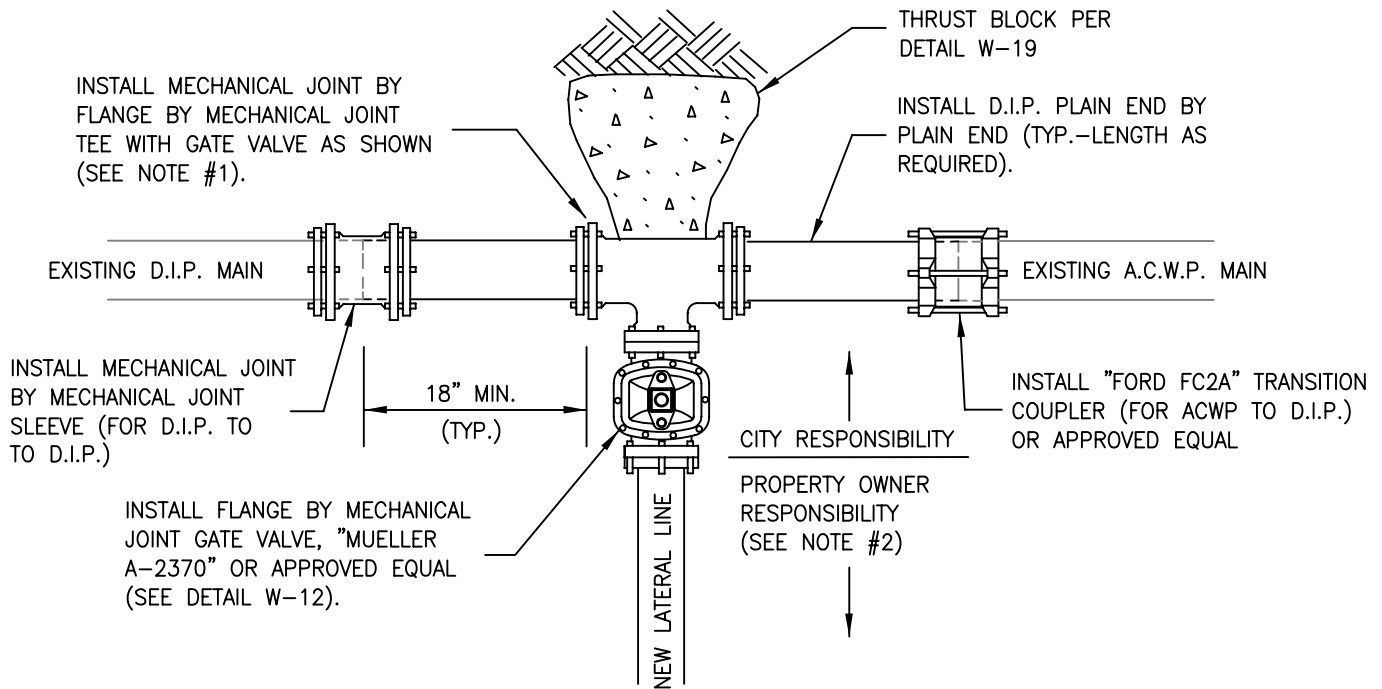
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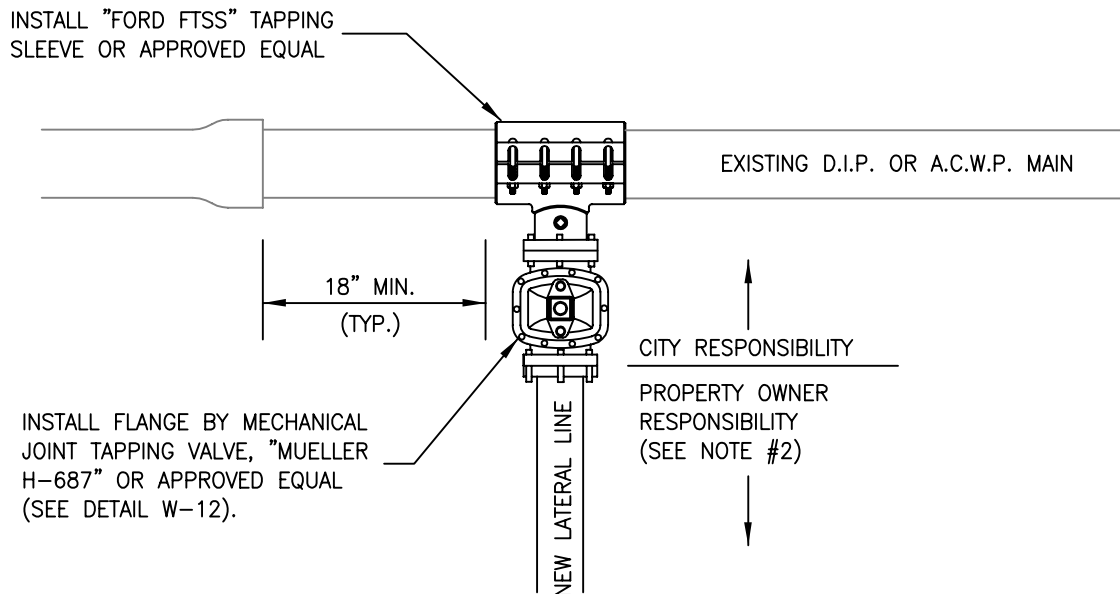
**DOUBLE DETECTOR CHECK
VALVE ASSEMBLY**

DRAWING
NO.

W-8



'CUT-IN' TEE FOR PRIVATE LATERAL



'HOT TAP' TIE-IN FOR PRIVATE LATERAL

NOTES:

1. THE APPLICATIONS SHOWN ARE INTENDED FOR USE IN CONNECTING PRIVATE LATERALS FOR PRIVATELY MAINTAINED FIRE SERVICE LINES. METHODS OF CONNECTIONS SHOWN MAY BE USED FOR PUBLICLY MAINTAINED CONNECTIONS. REFER TO APPROVED IMPROVEMENT PLANS FOR EXACT APPLICATIONS AND CONFIGURATIONS.
2. CUSTOMER TO PERFORM TEE INSTALLATION OR TAP. THE OWNER SHALL BE RESPONSIBLE FOR THE WATER LATERAL STARTING AT THE CUSTOMER SIDE OF THE COMPANION VALVE AND ENDING AT A POINT LOCATED ON THE PRIVATE PROPERTY.



City of Morgan Hill
Public Works Department

Jim Cahcraft
CITY ENGINEER

03/15/07

DATE

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PRIVATE WATER LATERAL CONNECTIONS 4" AND GREATER

DRAWING
NO.

W-9

LEGEND

- ① FINISHED GRADE.
- ② SERVICE SIZE UP TO 2" SHALL BE COPPER PIPE. SERVICE SIZE GREATER THAN 2" SHALL BE DUCTILE IRON PIPE.
- ③ REDUCED PRESSURE BACKFLOW PREVENTER LF FEBCO 825Y (OR APPROVED EQUAL) FOR SIZES 1" TO 2" AND LF FEBCO 825 YD (OR APPROVED EQUAL) FOR SIZES 2 1/2" TO 4".
- ④ ADJUSTABLE PIPE SADDLE SUPPORT, GALVANIZED STEEL, SUITABLE FOR SUPPORTING GENERAL PIPING 4" AND LARGER, FROM FLOOR (12" MIN. AND 18" MAX. DISTANCE FROM BOTTOM OF DEVICE TO FLOOR).
- ⑤ 6" CONCRETE ENCLOSURE PAD, SIZE AS SHOWN ON THE PLAN.
- ⑥ SERVICE SIZE COPPER/DUCTILE IRON RISER WITH A MINIMUM OF TWO (2) UNIONS FOR THREADED CONNECTIONS. SEE NOTE 2.
- ⑦ 90° ELBOW, FLANGED OR THREADED.
- ⑧ CONCRETE THRUST BLOCK (SEE DETAIL W-17 FOR MINIMUM THRUST BLOCK DIMENSIONS.)
- ⑨ WATER SERVICE BY OTHERS PER DTL. W-1
- ⑩ DOUBLE DETECTOR CHECK VALVE ASSEMBLY TO BE LF FEBCO 806 YD OR APPROVED EQUAL
- ⑪ VALVES TO BE MUELLER O.S & Y.A-2473-6 OR APPROVED EQUAL, CHAINED AND LOCKED WITH "KNOX BOX" TYPE LOCK, AND TAMPER SWITCH.
- ⑫ ALL PIPE SHALL BE DUCTILE IRON PIPE (D.I.P), AND ALL FITTINGS SHALL BE FLANGED.
- ⑬ FIRE DEPARTMENT CONNECTION, F.D.C., SHALL BE 4" RISER X 2.5" X 2.5" SIAMESE CONNECTIONS AND STRAIGHT WAY CHECK VALVE, ("KWIK-CHECK" OR APPROVED EQUAL), WITH METAL CAPS. WHEN THE F.D.C. SERVES ON-SITE FIRE HYDRANTS, THE ASSEMBLY SHALL BE 6" MINIMUM (RISER) x 2.5" x 2.5" x 2.5" x 2.5" (CONNECTIONS). LOCATION OF F.D.C. RISER TO BE NO MORE THAN 40' FROM THE NEAREST FIRE HYDRANT. CONTRACTOR MAY BE REQUIRED TO INSTALL A NEW HYDRANT IF THE ABOVE REQUIREMENT CANNOT BE MET. LOCATION OF BYPASS CONNECTION SHALL BE MADE BEHIND THE THE DEVICE (DOWN-STREAM SIDE).
- ⑭ TYPE OF PIPE FROM THIS POINT INWARD, PER APPROVED PLAN.

NOTES:

1. GATE VALVES AND TEST COCKS ARE REQUIRED.
2. WATER SUPPLY- NO CONNECTIONS OR TEES WILL BE ALLOWED BETWEEN THE WATER METER AND BACKFLOW UNIT.
3. PROTECTION FROM FREEZE DAMAGE MAY BE REQUIRED IN EXPOSED AREAS.
4. DEVICE MUST BE ACCESSIBLE FOR TESTING AND MAINTENANCE.
5. WRAP BURIED GALVANIZED PIPE WITH 10 MIL PVC TAPE.
6. ASSEMBLY MUST BE TESTED BY A TESTER APPROVED BY THE CITY OF MORGAN HILL. THE CITY APPROVED TESTER LIST CAN BE OBTAINED BY CALLING 408-776-7333.
7. ASSEMBLY MUST BE LOCATED ABOVE GROUND AND DIRECTLY BEHIND WATER METER(NO GREATER THEN 5') AS SHOWN ON DTL W-6 ,W-7 AND W-8.
8. ADDITIONAL INFORMATION MAY BE OBTAINED FROM M.H. ORDINANCE 647 NEW SERIES, ADOPTED OCT, 1993
9. ALL DEVICES MUST BE APPROVED BY THE "FOUNDATION FOR CROSS CONNECTION AND HYDRAULIC RESEARCH".
10. REFER TO DETAIL L-10
11. CONTRACTOR SHOULD NOT REMOVE TAG FROM BACKFLOW DEVICE INSTALLATION UNTIL AFTER INSPECTION.



City of Morgan Hill
Public Works Department


CITY ENGINEER

4/1/96
DATE

3/06/23
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BACKFLOW PREVENTION LEGEND & NOTES

DRAWING
NO.

W-10

FLANGE FITTINGS
WITH FLANGE BY
MECHANICAL VALVES (TYP)

W W

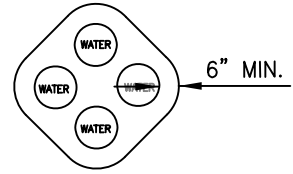
CROSS

W W

TEE

W W

COMPANION VALVE



PAVING AROUND
VALVE CLUSTER

VALVE CONFIGURATIONS

10 1/4" DIA. TRAFFIC
VALVE BOX. CHRISTY G5
OR APPROVED EQUAL.
LID STAMPED "WATER"

2" AC

CLASS B
CONCRETE COLLAR

10"

6"

BACKFILL MATERIAL
SHALL BE COMPACTED
TO 95% RELATIVE
COMPACTION

GATE VALVES SHALL BE
MUELLER A-2360-16 OR
APPROVED EQUAL WITH
NON-RISING STEM AND
DOUBLE "O" RING SEAL

CLASS "3" CONCRETE
SUPPORT PAD

1'-0" MIN

1" CLEARANCE FROM BOLTS

VALVES LARGER THAN 12" REQUIRE SPECIAL DETAILS AND SHALL BE APPROVED BY THE CITY ENGINEER.



City of Morgan Hill
Public Works Department

Jim Oshcraft
CITY ENGINEER

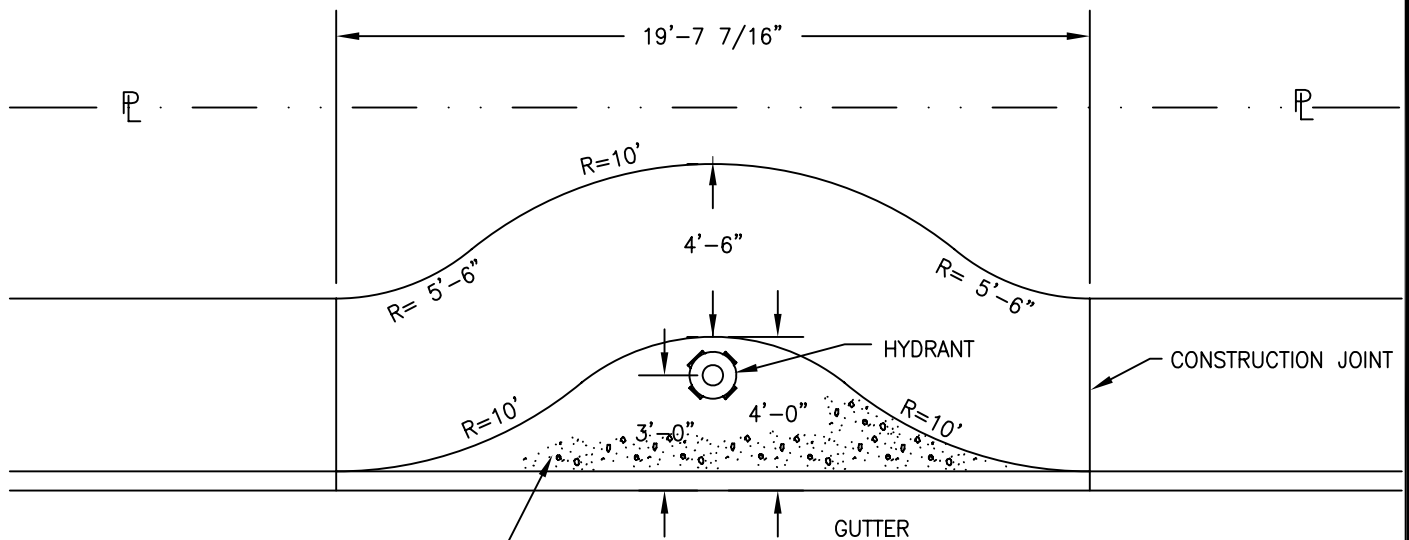
4/1/96
DATE

3/15/07
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TYPICAL VALVE INSTALLATION

DRAWING
NO.

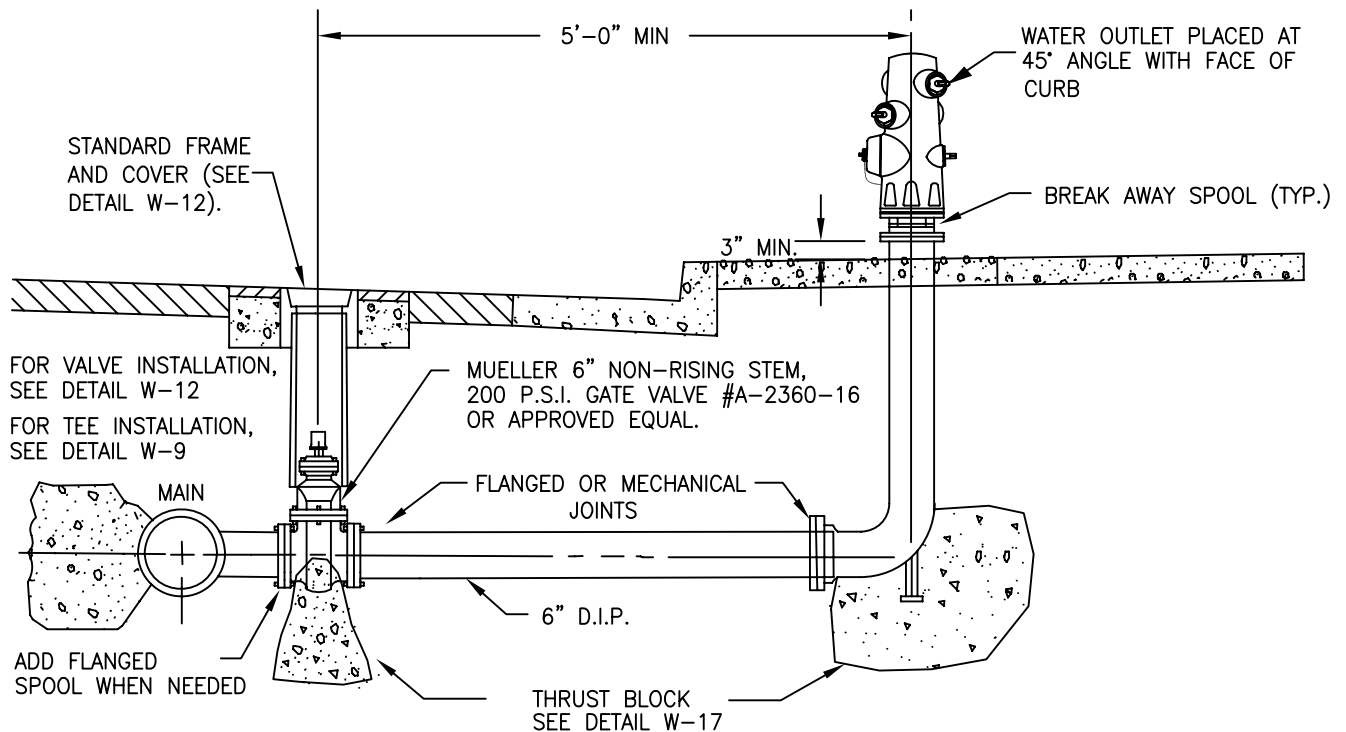
W-12



SIDEWALK SECTION WITH EXPOSED AGGREGATE.
(1/2" MARYSVILLE ROCK OR APPROVED EQUAL)

NOTES:

1. FOR COMMERCIAL / INDUSTRIAL APPLICATIONS ONLY, PAINT CURB RED 15' ON BOTH SIDES OF HYDRANT.
2. PLACE BLUE PAVEMENT MARKER IN STREET DIRECTLY ACROSS FROM HYDRANT, SEE DETAIL W-16.
3. HYDRANTS: RESIDENTIAL CLOW VALVE CO. #950 WITH 1-2 1/2" AND 1-4 1/2" OUTLET OR APPROVED EQUAL. PAINTED WITH FINISH YELLOW.
INDUSTRIAL CLOW VALVE CO. #960 WITH 2-2 1/2" AND 1-4 1/2" OUTLET OR APPROVED EQUAL. PAINTED WITH FINISH YELLOW.
4. CENTER OF HYDRANT TO FACE OF CURB SHALL BE 3' FOR ATTACHED SIDEWALKS WITH MEANDER AND DETACHED SIDEWALK CONFIGURATIONS (ATTACHED SIDEWALK WITH MEANDER SHOWN). FOR ATTACHED SIDEWALK WITHOUT SIDEWALK MEANDER SEE DETAIL W-14.
5. JOINT TRENCHES LOCATED BEHIND SIDEWALK SHALL FOLLOW MEANDER AROUND FIRE HYDRANT.



City of Morgan Hill
Public Works Department

Jim Ashcraft
CITY ENGINEER

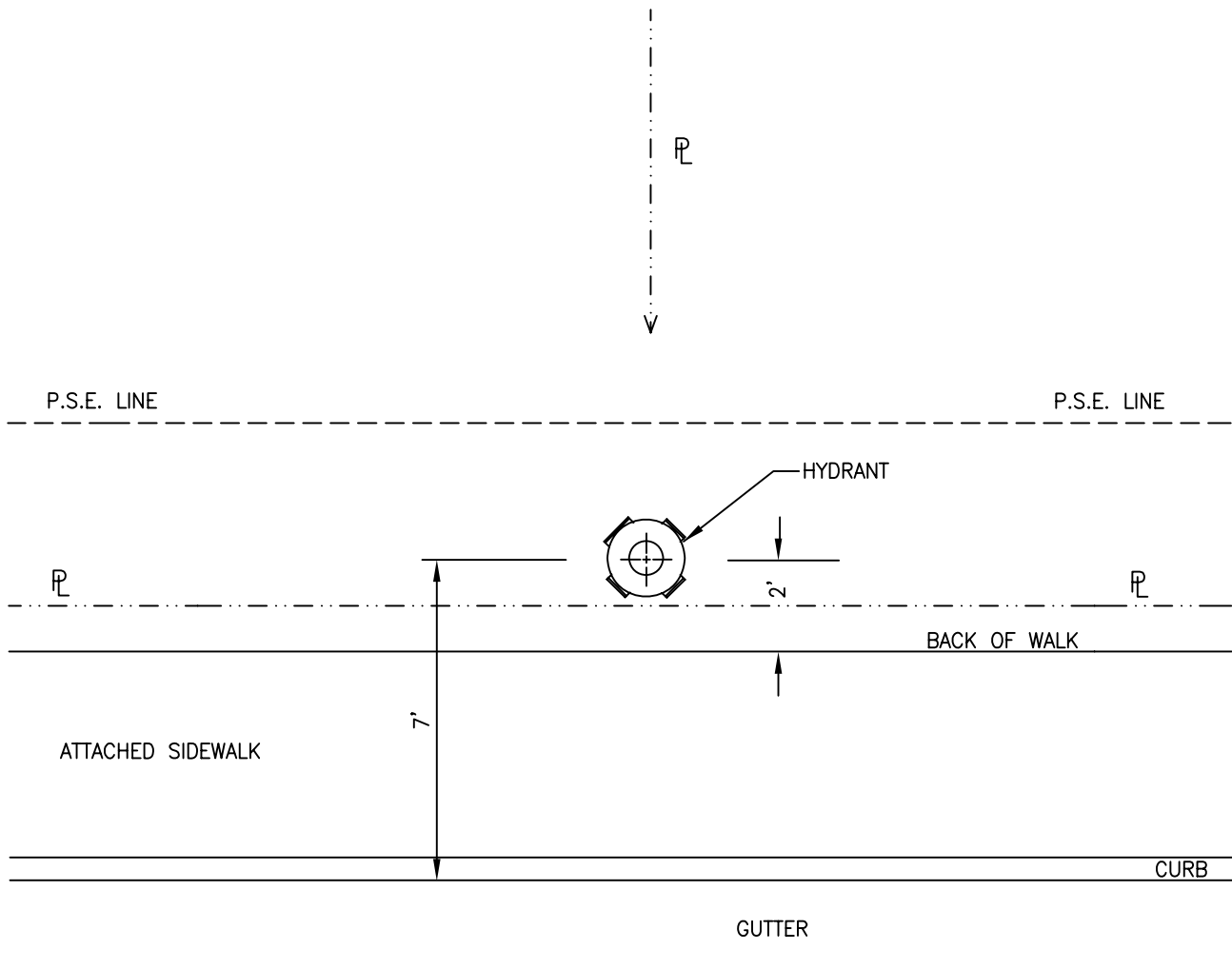
4/1/96
DATE

3/15/07
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HYDRANT INSTALLATION AND LOCATION (with SIDEWALK MEANDER)

DRAWING
NO.

W-13



ATTACHED SIDEWALK
(WITHOUT SIDEWALK MEANDER)

- NOTES:**
1. SEE DETAIL W-13 "HYDRANT INSTALLATION AND LOCATION", DETAIL W-12 "TYPICAL VALVE INSTALLATION", AND W-17 " ELBOW THRUST BLOCK".
 2. CENTER OF HYDRANT TO FACE OF CURB SHALL BE 7' FOR THIS SIDEWALK APPLICATION.
 3. CURB SHALL NOT BE PAINTED FOR THIS APPLICATION. PAINTED CURBS ARE NOT REQUIRED FOR RESIDENTIAL APPLICATIONS.
 4. PLACE BLUE PAVEMENT MARKER IN STREET DIRECTLY ACROSS FROM HYDRANT, SEE DETAIL W-16.
 5. FOR ADDITIONAL NOTES SEE DETAIL W-13.



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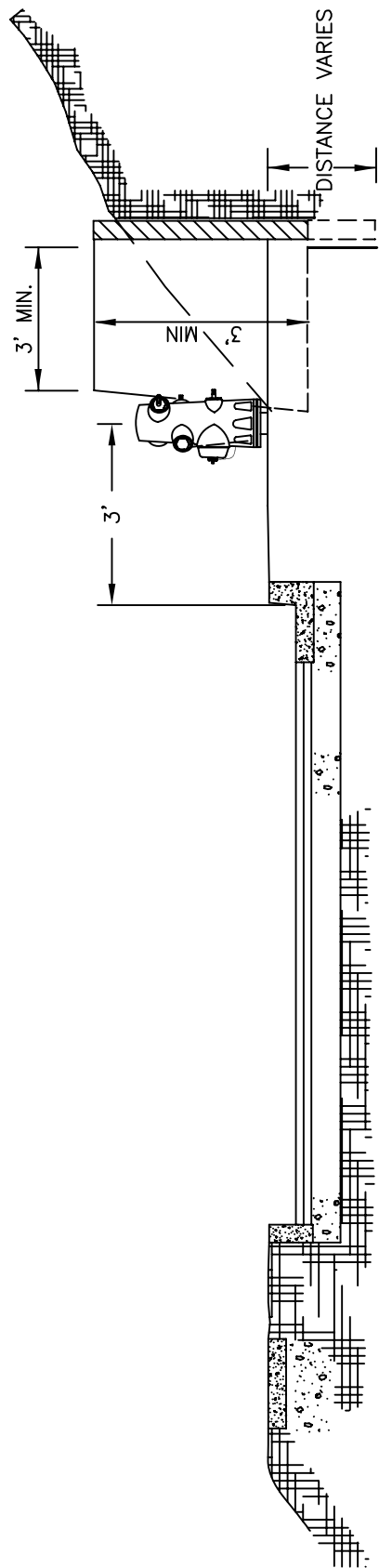
6/8/00
DATE

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REVISED

**HYDRANT LOCATION
ATTACHED SIDEWALK
(without) SIDEWALK MEANDER**

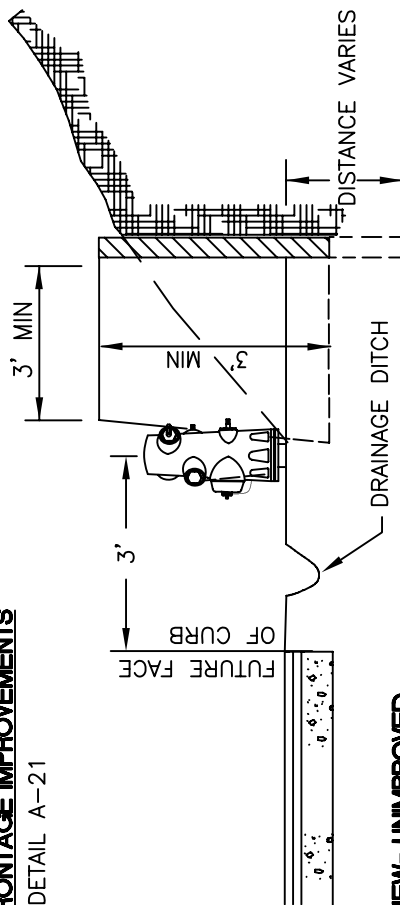
DRAWING
NO.

W-14

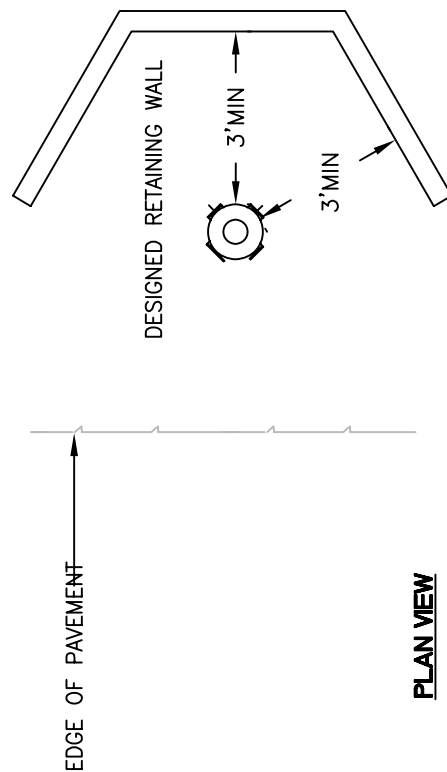


SECTION VIEW- FRONTAGE IMPROVEMENTS

SEE DETAIL A-21



SECTION VIEW- UNIMPROVED



PLAN VIEW



City of Morgan Hill
Public Works Department

Jim Oakcraft
CITY ENGINEER

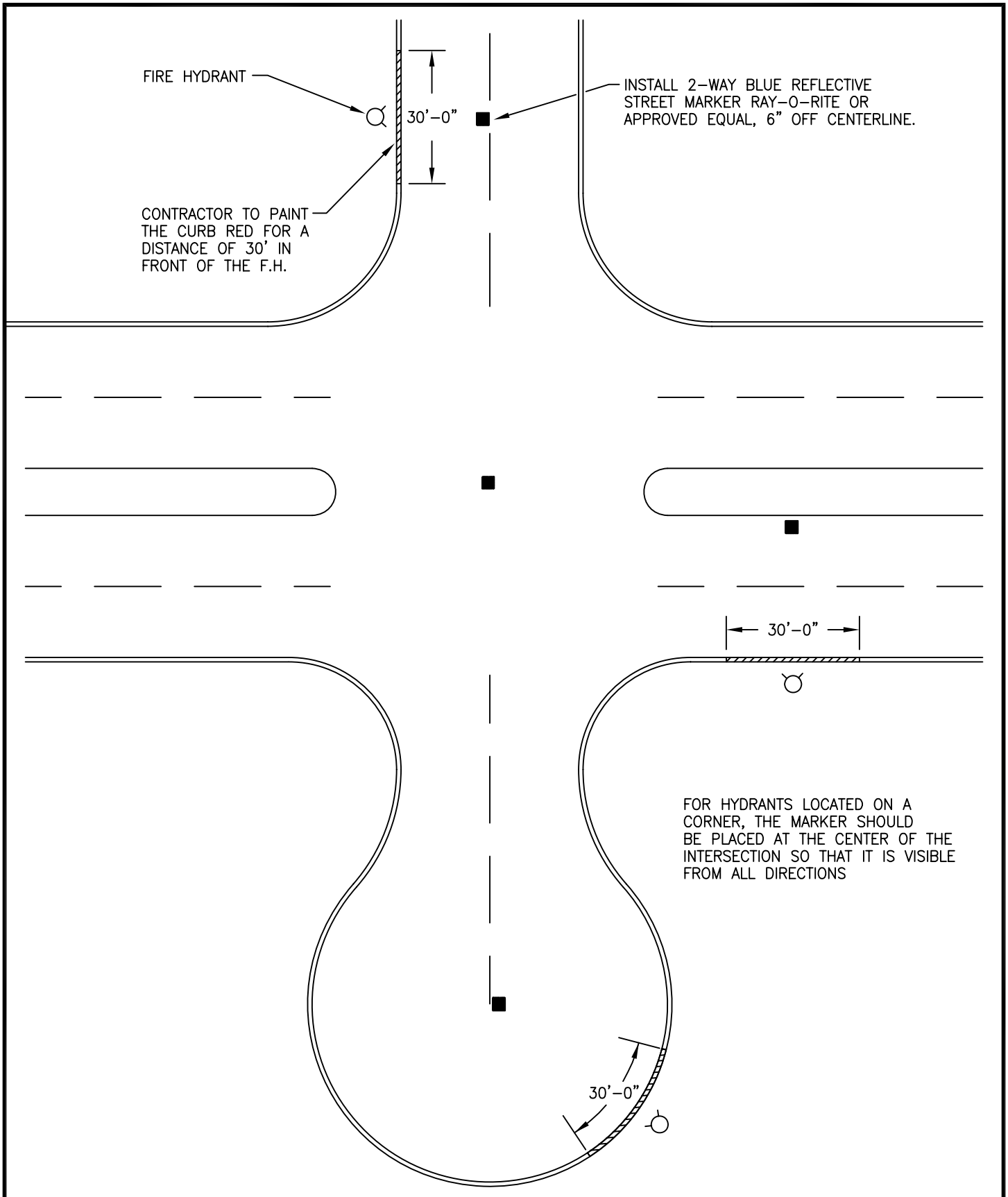
4/1/96
DATE

REVISED

HILLSIDE FIRE HYDRANT LOCATION

DRAWING
NO.

W-15



City of Morgan Hill
Public Works Department

Jim Oshecraft
CITY ENGINEER

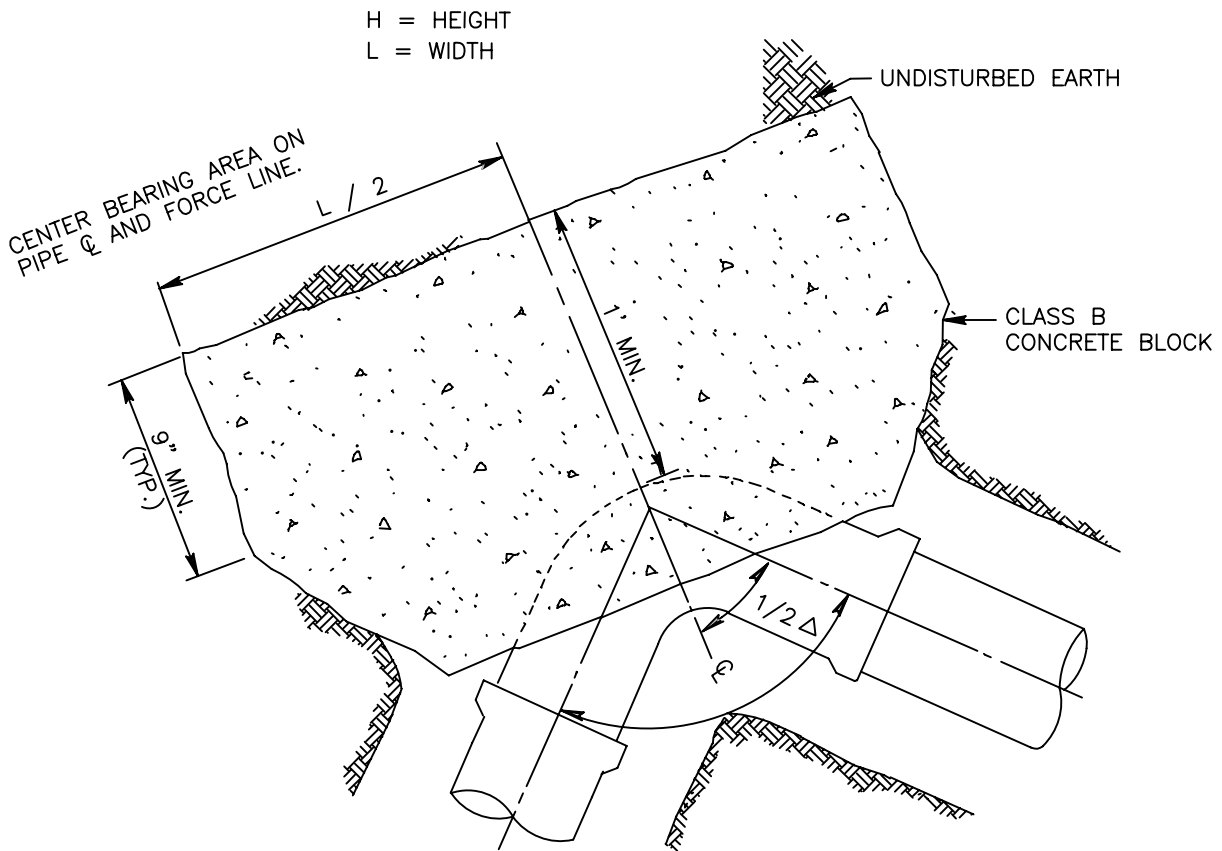
4/1/96
DATE

REVISED

FIRE HYDRANT LOCATION MARKER

DRAWING
NO.

W-16



- NOTES:**
1. CONCRETE SHALL BE KEPT CLEAR OF FLANGES, NUTS, AND BOLTS.
 2. CENTER OF H COINCIDES WITH CENTERLINE OF PIPE.
 3. "MEGA-LUG" (OR APPROVED EQUAL) TYPE GLANDS AND FASTENERS MAY BE USED BUT SHALL NOT BE USED AS A REPLACEMENT FOR THE USE OF THRUST BLOCKS.

PIPE SIZE	DIMENSIONS — L x H (200 PSI TEST)			
	11 1/4"	22 1/2"	45"	90"
4"-6"	1'0" x 1'0"	1'5" x 1'5"	1'9" x 1'9"	2'3" x 2'3"
8"	1'0" x 1'0"	1'5" x 1'5"	2'0" x 2'0"	2'10" x 2'10"
10"	1'5" x 1'5"	2'0" x 2'0"	2'8" x 2'8"	3'5" x 3'5"
12"	1'9" x 1'9"	2'3" x 2'3"	3'0" x 3'0"	4'2" x 4'2"
14"	1'9" x 1'9"	2'8" x 2'8"	3'6" x 3'6"	4'10" x 4'10"
16"	2'0" x 2'0"	2'10" x 2'10"	4'0" x 4'0"	5'5" x 5'5"
18"	3'0" x 3'0"	4'0" x 4'0"	5'0" x 5'0"	6'6" x 6'6"



City of Morgan Hill
Public Works Department

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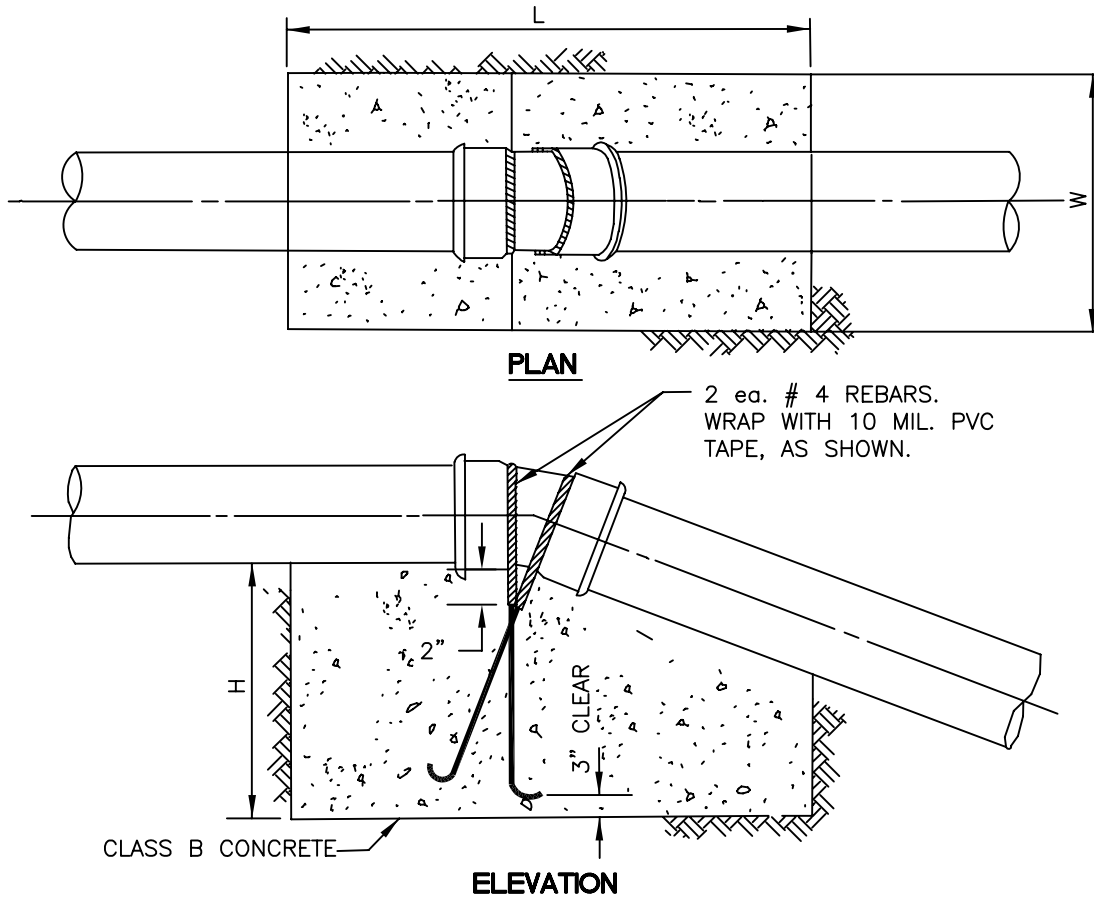
4/1/96
DATE

REVISED

ELBOW THRUST BLOCK HORIZONTAL AND DOWNWARD THRUSTS

DRAWING
NO.

W-17



- NOTES:**
1. CONCRETE SHALL BE KEPT CLEAR OF FLANGES, NUTS & BOLTS.
 2. "MEGA-LUG" (OR APPROVED EQUAL) TYPE GLANDS AND FASTENERS MAY BE USED BUT SHALL NOT BE USED AS A REPLACEMENT FOR THE USE OF THRUST BLOCKS.

DIMENSIONS (150 PSI TEST)

PIPE SIZE	11 1/4" BEND			22 1/2" BEND			45° BEND		
	L	W	H	L	W	H	L	W	H
6"	2'0"	2'0"	1'0"	2'0"	2'0"	2'0"	2'0"	2'0"	2'0"
8"	2'0"	2'0"	1'0"	2'0"	3'0"	2'0"	2'0"	4'0"	2'0"
10"	2'0"	3'0"	2'0"	2'0"	4'0"	2'0"	2'0"	4'0"	3'0"
12"	2'0"	3'0"	2'0"	2'0"	6'0"	2'0"	2'0"	6'6"	3'0"
18"	3'0"	3'0"	3'0"	3'0"	6'0"	3'0"	3'0"	5'0"	5'0"



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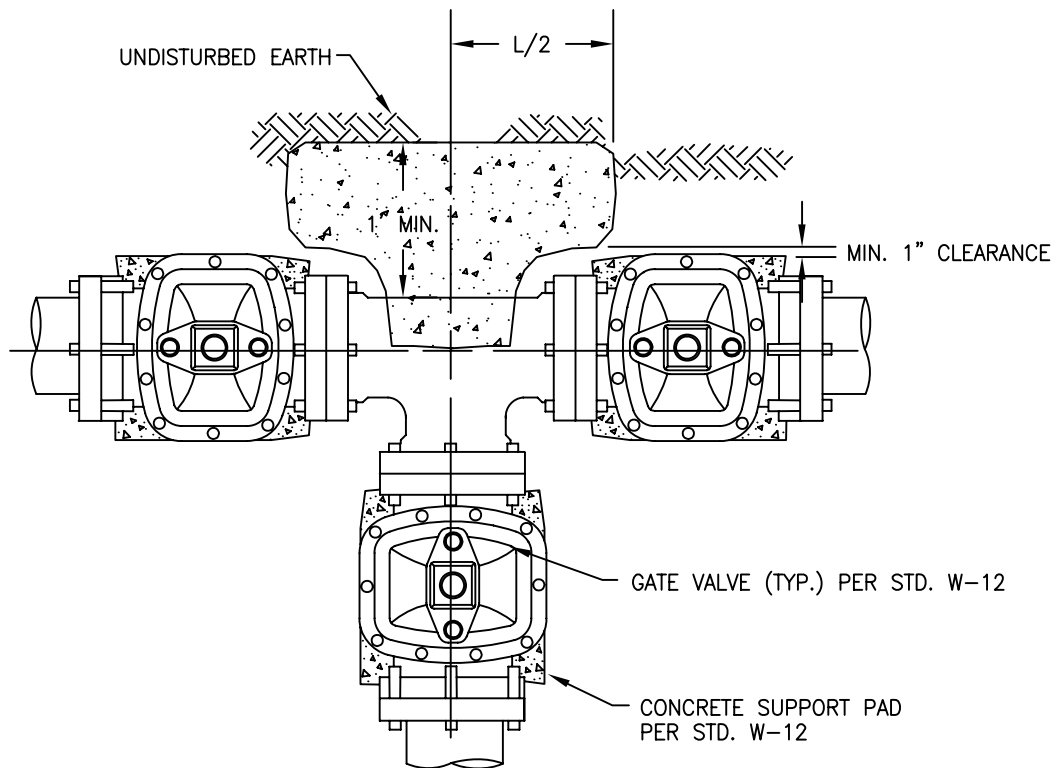
4/1/96
DATE

REVISED

ELBOW THRUST BLOCK UPWARD THRUST

DRAWING
NO.

W-18



- NOTES:**
1. CONCRETE SHALL BE KEPT CLEAR OF FLANGES, NUTS, AND BOLTS.
 2. "MEGA-LUG" (OR APPROVED EQUAL) TYPE GLANDS AND FASTENERS MAY BE USED BUT SHALL NOT BE USED AS A REPLACEMENT FOR THE USE OF THRUST BLOCKS.

BLOCKING FOR PIPE TEES		
PIPE SIZE	BEARING (SQ. FT.)	L X H
6"	3	1'-9"X1'-9"
8"	5	2'-3"X2'-3"
10"	9	3'-0"X3'-0"
12"	12	3'-5"X3'-5"
10"	16	4'-0"X4'-0"
12"	21	4'-7"X4'-7"



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Public Works Department

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CITY ENGINEER

4/1/96
DATE

REVISED

TEE THRUST BLOCK

DRAWING
NO.

W-19

INSTALL VALVE BOX, FRAME, COVER, AND RISER AS SHOWN ON DETAIL W-8 (SUBSTITUTE "CHRISTY G-5" BOX WITH "CHRISTY F-8" BOX, OR APPROVED EQUAL).

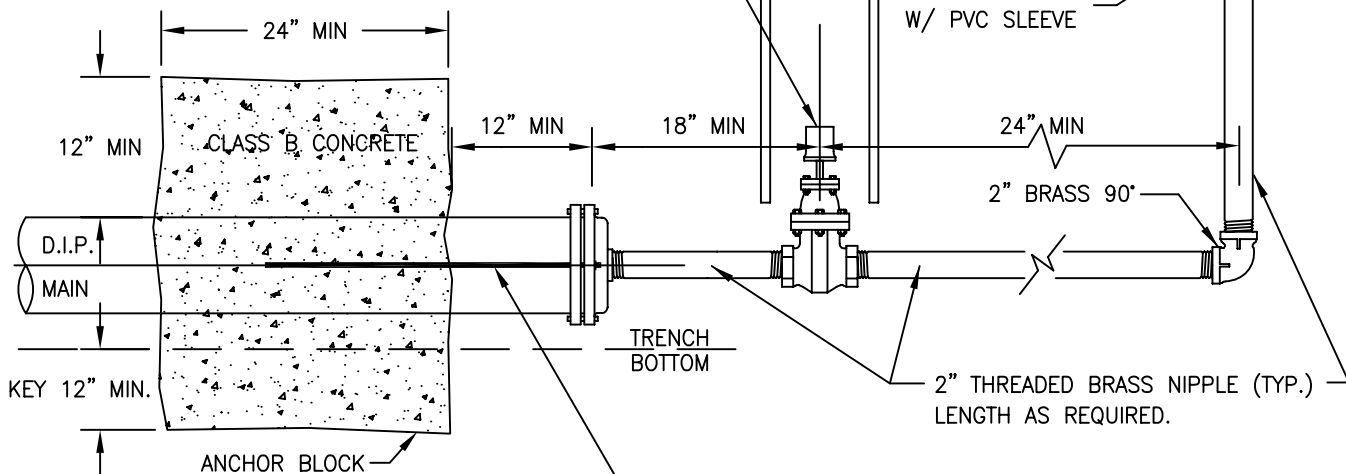
INSTALL VALVE BOX, FRAME, COVER, AND RISER AS SHOWN ON DETAIL W-8 ("CHRISTY G-5" BOX OR APPROVED EQUAL).

2" BRASS I.P. COUPLING WITH BRASS I.P. CAP
4" MAX.

NOTE: TRENCH WALL AND TRENCH BOTTOM SHALL BE KEYED TO ACCEPT CONCRETE ANCHOR BLOCK.

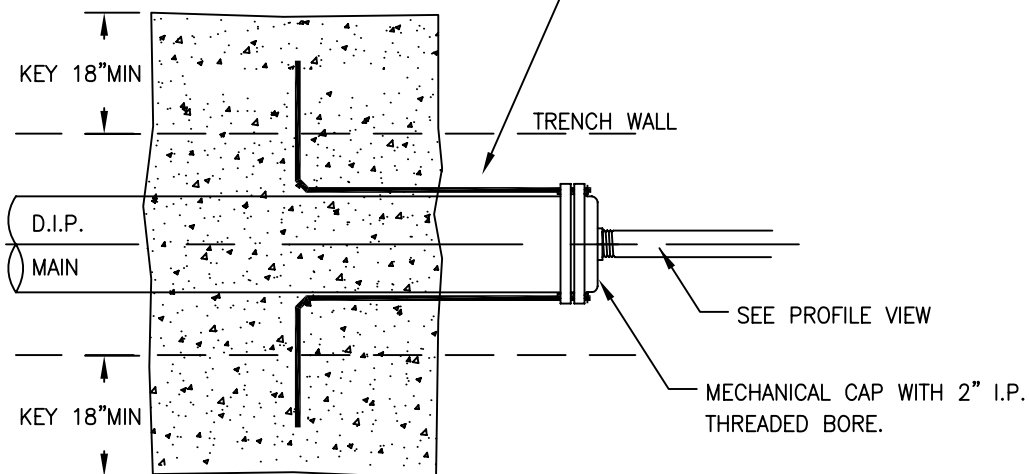
2" GATE VALVE "MUELLER A-2360-8" OR APPROVED EQUAL.

2" MORTAR BASE W/ PVC SLEEVE



PROFILE VIEW

2 EA. - 3/4" X 36" MIN. ANCHOR RODS (24" MIN. W/ 12" MIN. TAIL BEND).



PLAN VIEW



City of Morgan Hill
Public Works Department

Jim Oshcraft
CITY ENGINEER

4/1/96
DATE

3/15/07
REVISED

BLOW OFF

DRAWING NO.

W-20