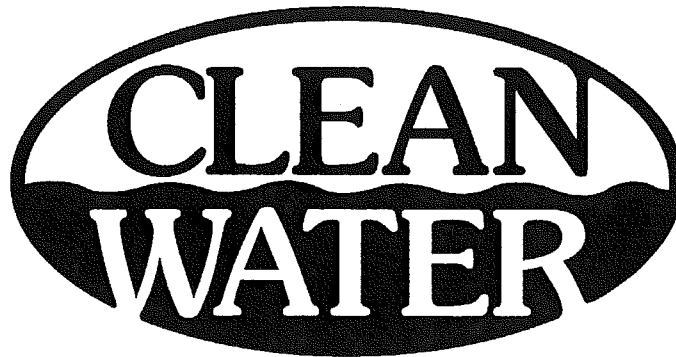
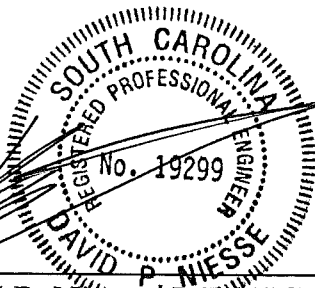


MOUNT PLEASANT WATERWORKS



WATER DISTRIBUTION SYSTEM CONSTRUCTION DETAILS

May 2009



David P. Niesse, P.E. (SC#19299)
Mount Pleasant Waterworks
Engineering Department Manager
843.971.7506
dniesse@mpwonline.com

BOARD:
Elizabeth M. Hagood
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Promoting and protecting the health of the public and the environment.

BOARD:
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Steven G. Kisner
Coleman F. Buckhouse, MD

May 14, 2009

MR. DAVID P. NIESSE, PE
MOUNT PLEASANT WATERWORKS
1619 RIFLE RANGE ROAD
P.O. BOX 330
MOUNT PLEASANT SC 29465-0330

RE: STANDARD SPECIFICATIONS FOR WATER SYSTEMS
MOUNT PLEASANT WATERWORKS

Dear Mr. Niesse:

This office has reviewed the water system specifications submitted to this office on 05/13/2009 for consideration of becoming approved Standard Specifications that we maintain on file. Based on our review, this letter may serve as your approval of these Standard Specifications. The water system standard specifications approval reference number is SS-002074 with an approval date of May 14, 2009.

Please be advised that these Standard Specifications are only approved for water supply distribution lines and related appurtenances as outlined in your submittal. Water storage tanks and water booster pump systems are not included.

For further submittals of projects, please indicate on the application for permit to construct that your specifications have been approved as Standard Specifications and that no additional copies will be necessary.

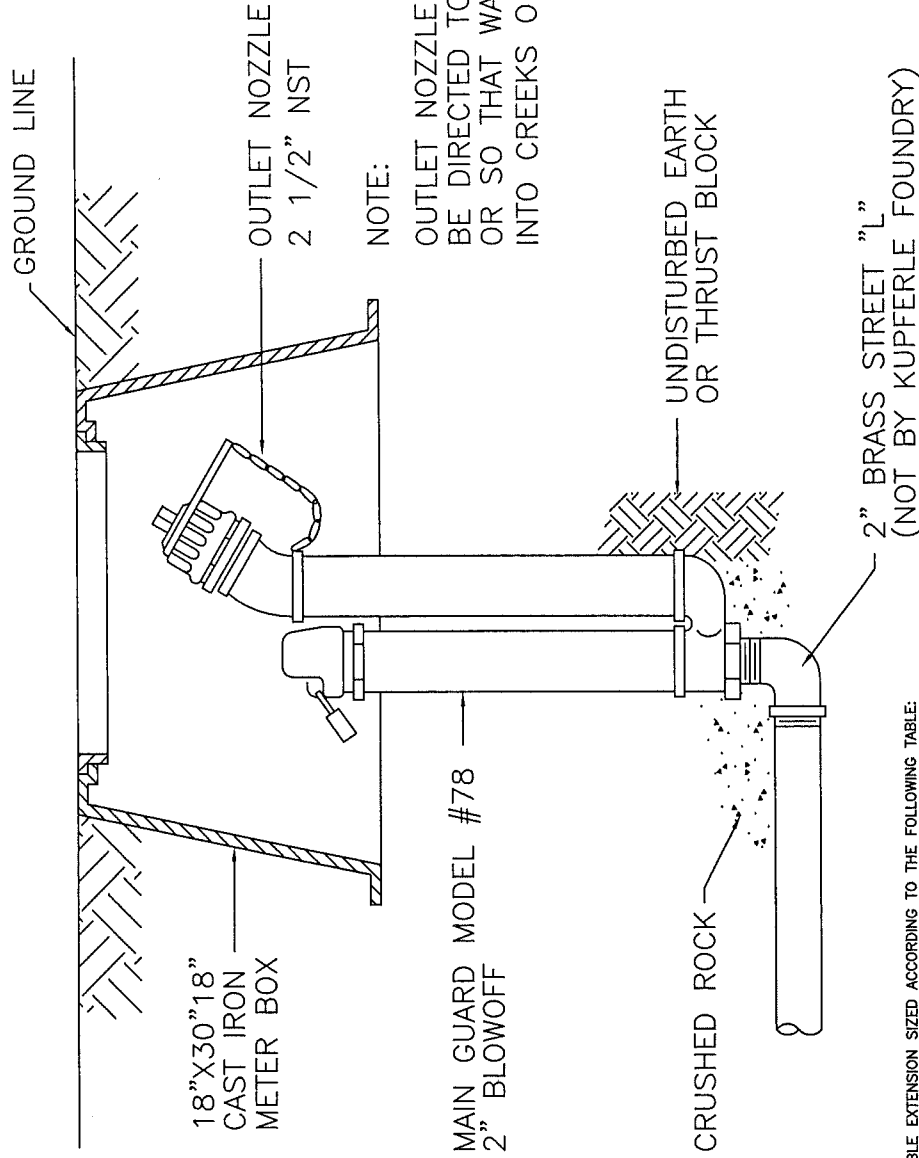
If you have any questions, please call me at 803-898-3396.

Sincerely,

Alan Coffey
Construction Permitting Section
Water Facilities Permitting Division
Bureau of Water

WATER SYSTEM CONSTRUCTION DETAILS

- W-01 BLOW-OFF HYDRANT FOR DEAD END LINES
- W-02 HORIZONTAL/VERTICAL OFFSET FOR PERPENDICULAR CROSSINGS
- W-03 METER AND BACKFLOW SCHEMATIC FOR FIRE, DOMESTIC, AND IRRIGATION SERVICES
- W-04 BACKFLOW PREVENTION AND AIR GAP LOCATIONS REQUIRED TO PROTECT MPW SYSTEM FROM CONTAMINATION DURING CONSTRUCTION ACTIVITIES
- W-05 BEDDING AND TRENCHING
- W-06 PIPING UNDER PAVEMENT
- W-07 PIPING UNDER DRIVEWAYS
- W-08 ¾" – 1" SINGLE WATER SERVICE
- W-09 1-1/2" – 2" WATER SERVICE
- W-10 MULTIPLE METER BOX (4 SERVICES)
- W-11 MULTIPLE METER BOX (3 SERVICES)
- W-12 MULTIPLE METER BOX
- W-13 METER VAULT FOR METER LARGER THAN 2"
- W-14 ROUTING OF LOCATOR WIRE INSIDE VALVE BOX TO PERMIT ACCESS TO WIRE AND TO PREVENT INTERFERENCE WITH VALVE WRENCH
- W-15 WATER EASEMENT
- W-16 THRUST BLOCK
- W-17 GRAVITY THRUST BLOCK
- W-18 EXCAVATION REQUIRED FOR INSTALLATION OF TAPPING SADDLE AND WET TAP BY MPW
- W-19 VALVE BOX
- W-20 HYDRANT
- W-21 PRECAST CONCRETE AIR RELEASE VALVE BOX



NOTE:
 OUTLET NOZZLE SHOULD NOT
 BE DIRECTED TOWARDS ROADS
 OR SO THAT WATER WILL FLOW
 INTO CREEKS OR STREAMS.

2" BRASS STREET "L"
 (NOT BY KUPFERLE FOUNDRY)


NOTE: BLOW-OFF INSTALLATIONS SHALL INCLUDE A REMOVABLE EXTENSION SIZED ACCORDING TO THE FOLLOWING TABLE:

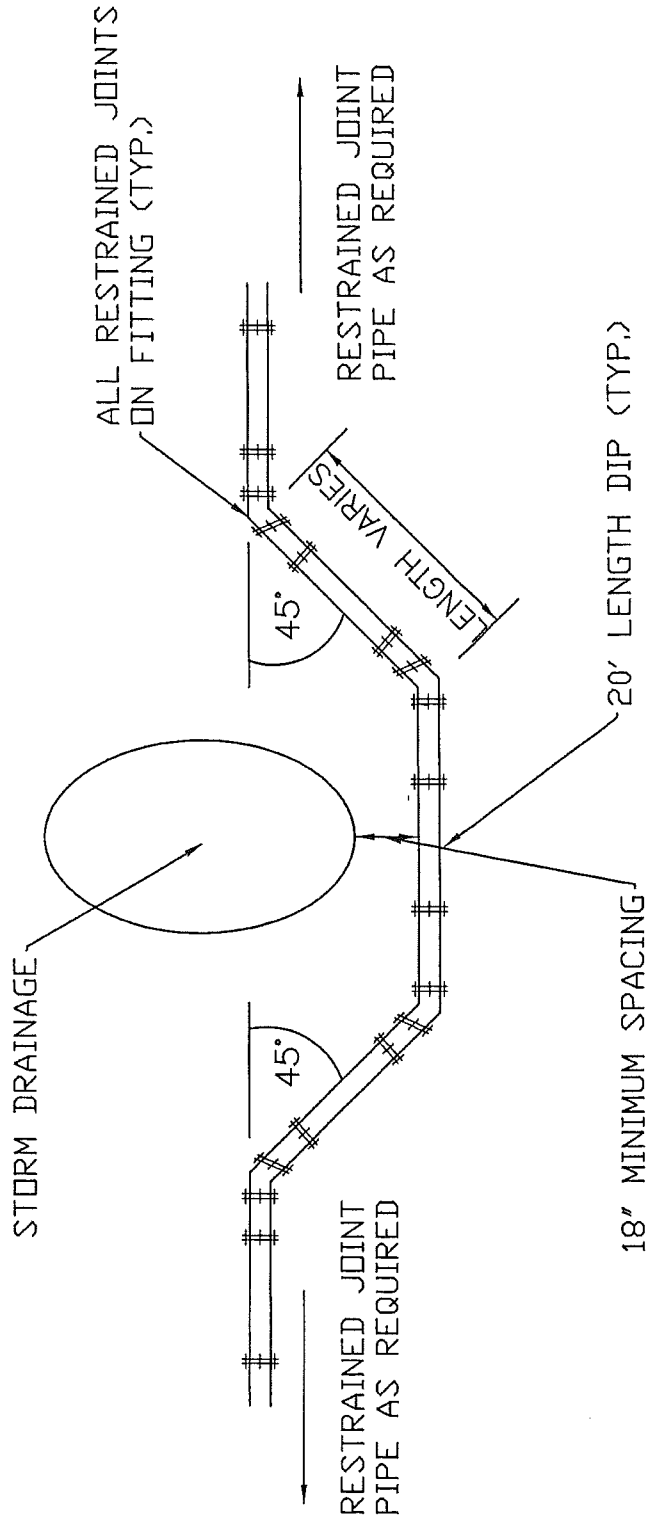
PIPE DIAMETER (INCH)	FLOW RATE REQUIRED* (GPM)	ORIFICE SIZE (INCH)
3	56	1.25
4	98	1.5
6	221	2
8	400	Fire Hydrant (see W-20)
10	612	Fire Hydrant (see W-20)
12	882	Fire Hydrant (see W-20)
14	1200	Fire Hydrant (see W-20)
16	1570	Fire Hydrant (see W-20)

* TO ACHIEVE MINIMUM 2.5 FT/SEC FLUSHING VELOCITY IN LINE SIZE INDICATED

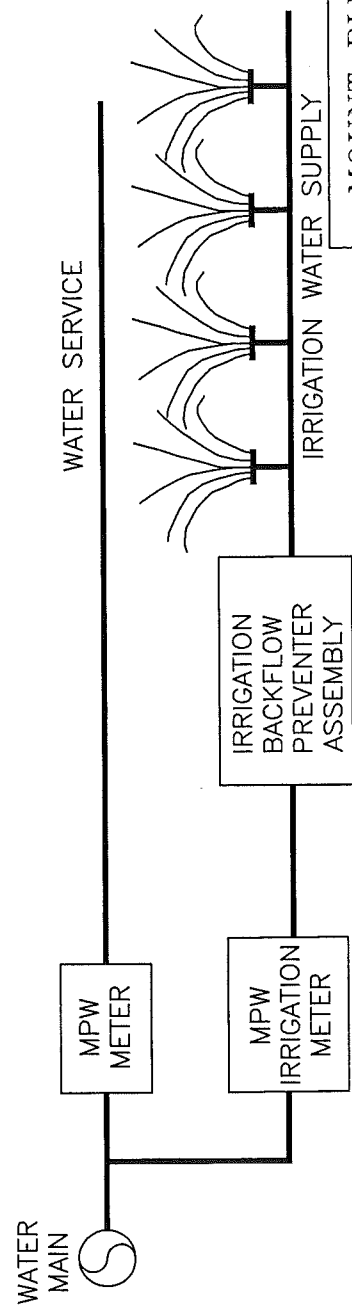
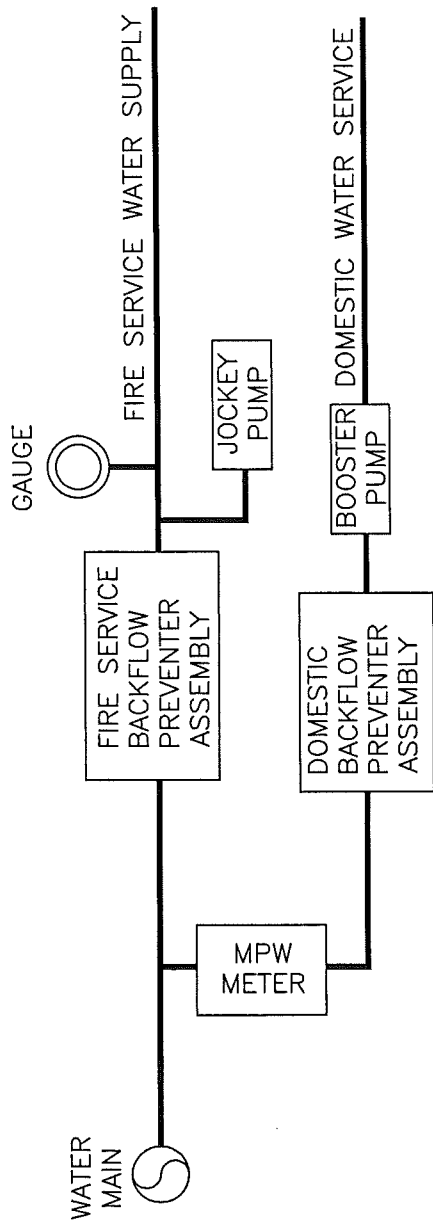
MOUNT PLEASANT WATERWORKS
 BLOW-OFF HYDRANT FOR DEAD END LINES

APPROVED BY: MPW	DATE: FEB 2009	DRAWING NO. W-01
SCALE: NTS	REVISED: FEB 2009	REVISED: FEB 2009





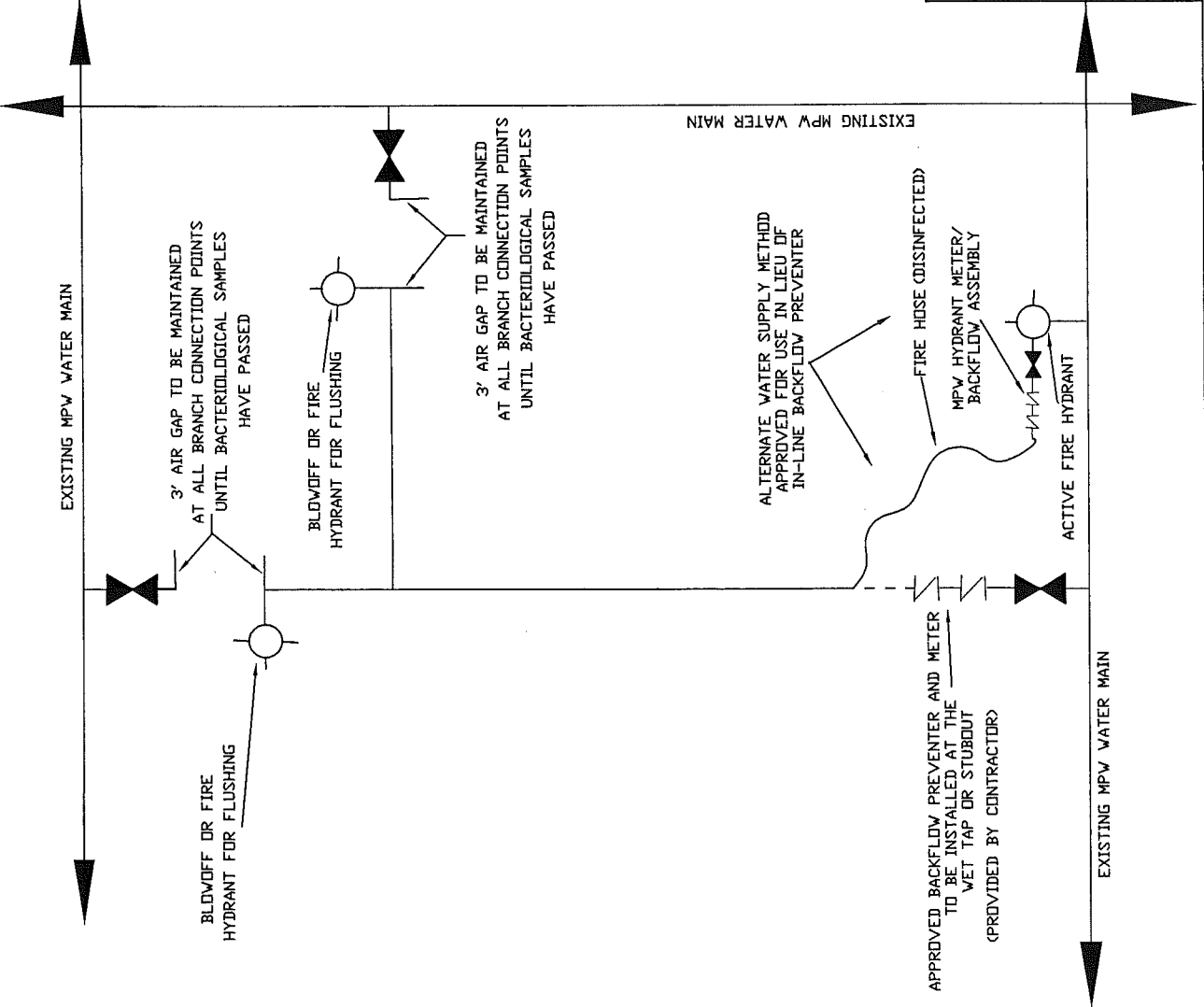
MOUNT PLEASANT WATERWORKS HORIZONTAL/VERTICAL OFFSET FOR PERPENDICULAR CROSSING		DRAWING NO. W-02
APPROVED BY: MPW	DATE: FEB 2009	REVISED: FEB 2009
SCALE: NTS		




MOUNT PLEASANT WATERWORKS
 METER AND BACKFLOW SCHEMATIC FOR FIRE,
 DOMESTIC, AND IRRIGATION SERVICES

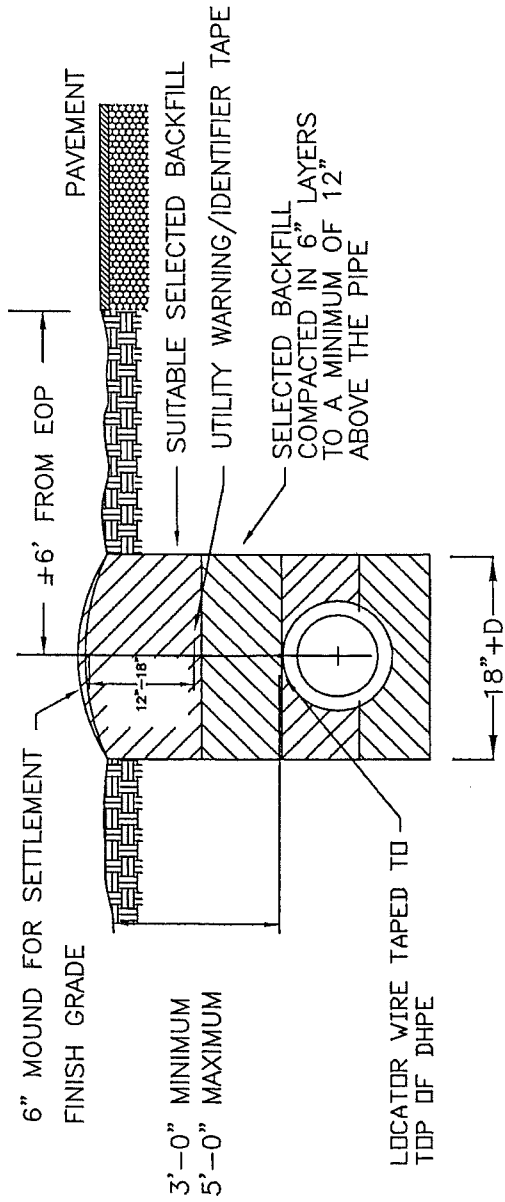
APPROVED BY: MPW	DATE: FEB 2009	DRAWING NO. W-03
SCALE: NTS	REVISED: FEB 2009	



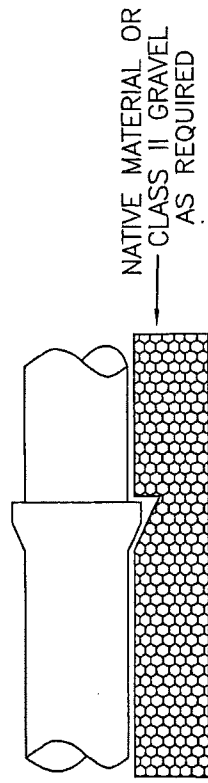


MOUNT PLEASANT WATERWORKS
 BACKFLOW PREVENTION AND AIR GAP LOCATIONS
 REQUIRED TO PROTECT MPW SYSTEM FROM
 CONTAMINATION DURING CONSTRUCTION ACTIVITIES

APPROVED BY: MPW	DATE: FEB 2009		DRAWING NO. W-04
SCALE: NTS	REVISED: FEB 2009		



TYPICAL PIPING DETAIL



BELL HOLES REQUIRED. PIPE TO BE
CONTINUOUSLY SUPPORTED ALONG
LENGTH OF BARREL EXCEPT AT BELL

TYPICAL TRENCHING DETAIL

MOUNT PLEASANT WATERWORKS
BEDDING AND TRENCHING

APPROVED BY:
MPW

SCALE:
NTS

DATE: FEB 2009
REVISED: FEB 2009

DRAWING NO.
1W-05



NOTE: IF ASPHALT IS LESS THAN 4" THICK,
THE SURFACE COURSE SHALL BE MILLED
AND REPLACED FOR 1/2 THE THICKNESS

FOR SCDOT ROADS NEW 4"
ASPHALT PAVEMENT PATCH
WITH PRIME COAT (2"
INTERMEDIATE COARSE AT 2"
SURFACE COARSE)

MILL AND REPLACE 2" SURFACE
A MINIMUM OF 2'-0" EITHER
SIDE OF PAVEMENT CUT

EXISTING ASPHALT PAVEMENT
2'-0"
TYP.

SAW CUT ASPHALT

BASE COARSE

LOCATOR TAPE APPROX. 18" BELOW GRADE

PLACE A MINIMUM OF 3 FEET
OF FLOWABLE FILL WITHIN
4" OF ASPHALT SURFACE.

6" OF WELL COMPACTED SUITABLE FILL

LOCATOR WIRE TAPED
TOP OF PIPE

SUITABLE BEDDING

MOUNT PLEASANT WATERWORKS
PIPING UNDER PAVEMENT

APPROVED BY: MPW
SCALE: NTS



DATE: FEB 2009
REVISED: FEB 2009

DRAWING NO. W-06

ASPHALT PAVEMENT REPAIR FOR
DRIVEWAYS AND OTHER NON-SCDOT
PAVED ROADWAYS. 2" ASPHALT
PATCH WITH PRIME COAT

12" TYP.

6", COMPACTED SABC MIN.

SAW CUT ASPHALT

6", COMPACTED SABC MIN.

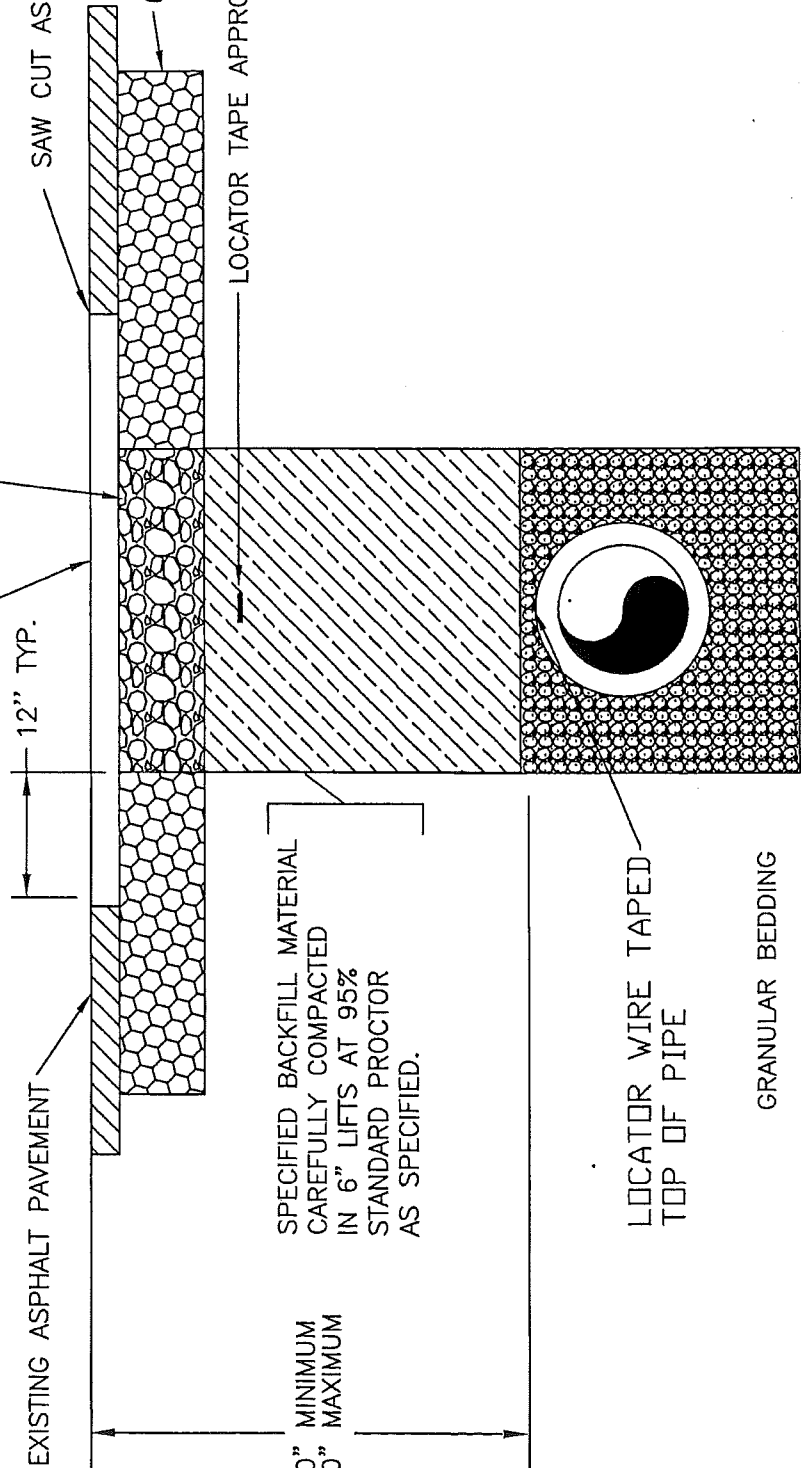
LOCATOR TAPE APPROX. 18" BELOW GRADE

SPECIFIED BACKFILL MATERIAL
CAREFULLY COMPACTED
IN 6" LIFTS AT 95%
STANDARD PROCTOR
AS SPECIFIED.

3'-0" MINIMUM
5'-0" MAXIMUM

LOCATOR WIRE TAPED
TOP OF PIPE

GRANULAR BEDDING



MOUNT PLEASANT WATERWORKS
PIPING UNDER DRIVEWAYS

APPROVED BY:
MPV
SCALE: NTS



DATE: FEB 2009
REVISED: FEB 2009

DRAWING NO.
W-07

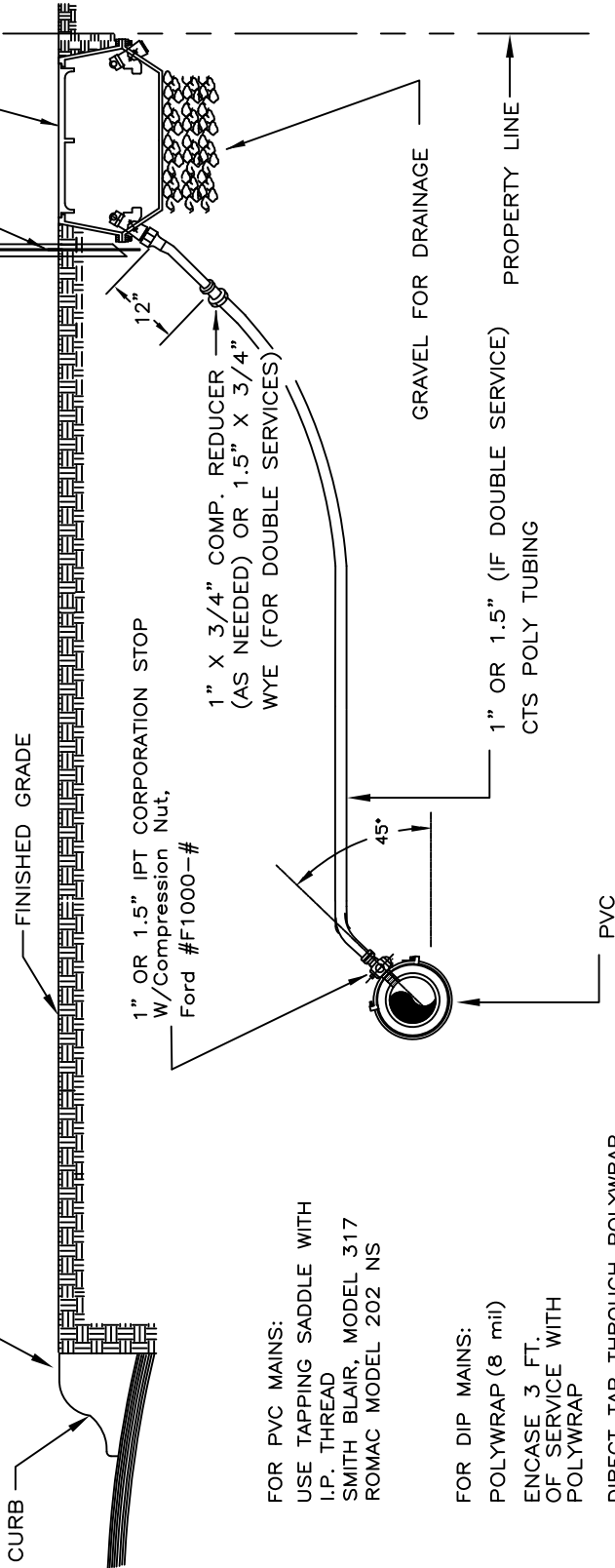
NOTES:

1. Contractor will provide all material including the meter box and will install services under MPW supervision.
2. All taps will be made in accordance with MPW standard specifications and AWWA guidelines for tapping through polyethylene encasement.
3. All meter boxes shall be installed perpendicularly to the property line, as shown herein.
4. CTS: Copper Tubing Size

FORD LONG YOKE BOX
#LYLVP141-95296-059 (5/8")
STRAIGHT KEY INLET
STRAIGHT KEY OUTLET
OR
FORD YOKE BOX
#LYLBB111-444-T (1")
1" FEMALE IPT ON INLET
1" FEMALE IPT ON OUTLET

NO. 4 REBAR
BLUE STAKE W/CAP

Three inch "W" to be stamped into curb at service location.



FOR PVC MAINS:
USE TAPPING SADDLE WITH
I.P. THREAD
SMITH BLAIR, MODEL 317
ROMAC MODEL 202 NS

FOR DIP MAINS:
POLYWRAP (8 mil)
ENCASE 3 FT.
OF SERVICE WITH
POLYWRAP

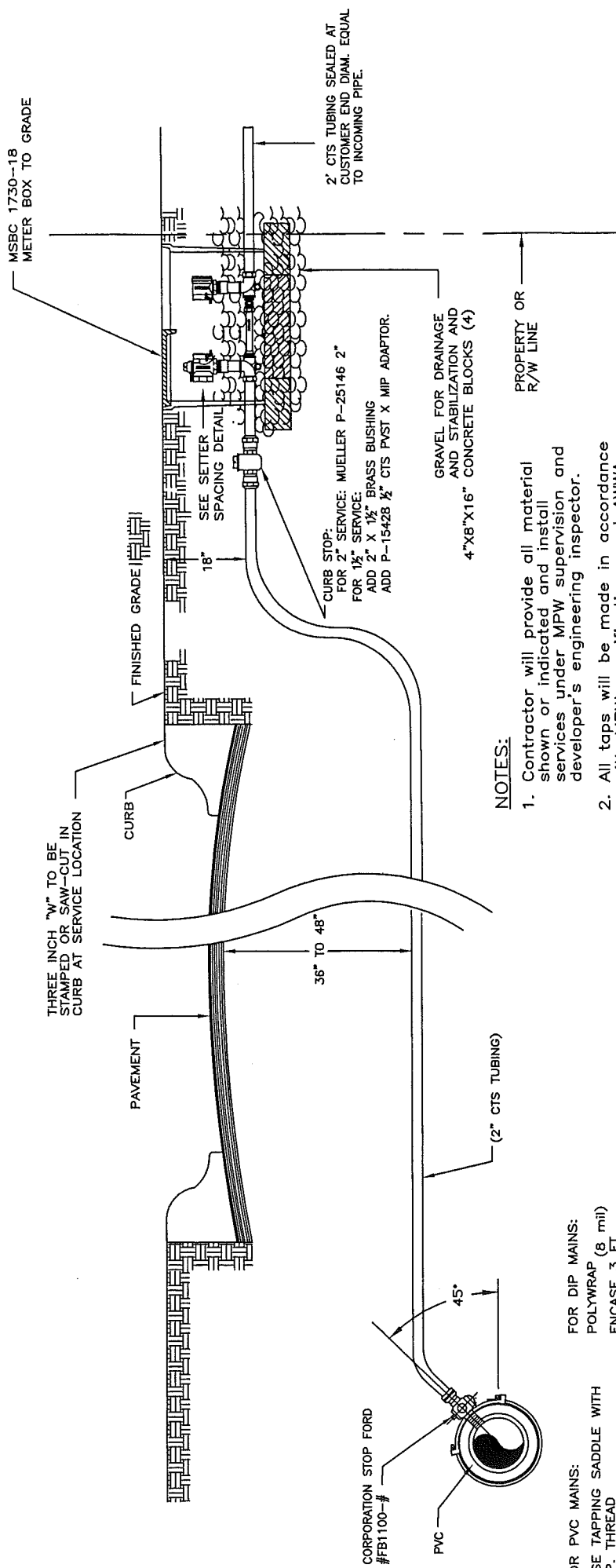
DIRECT TAP THROUGH POLYWRAP

MOUNT PLEASANT WATERWORKS
3/4" - 1" WATER SERVICES

APPROVED BY:
MPW
SCALE:
NTS



DATE: FEB 2009
REVISED: AUG 2010
DRAWING NO.
W-08



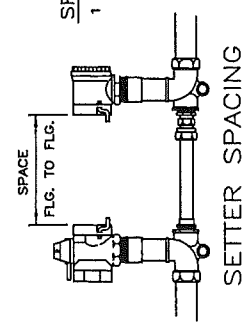
NOTES:

1. Contractor will provide all material shown or indicated and install services under MPW supervision and developer's engineering inspector.
2. All taps will be made in accordance with MPW specifications and AWWA guidelines for tapping through polyethylene encasement.
3. Setter for 1 1/2" meter to be Ford #VB76-12-41-66 and for 2" meter setter Ford #VB77-12-41-77. Setters shall be without bypasses.
4. 1 1/2" OR 2" METER TO BE SET BY MPW

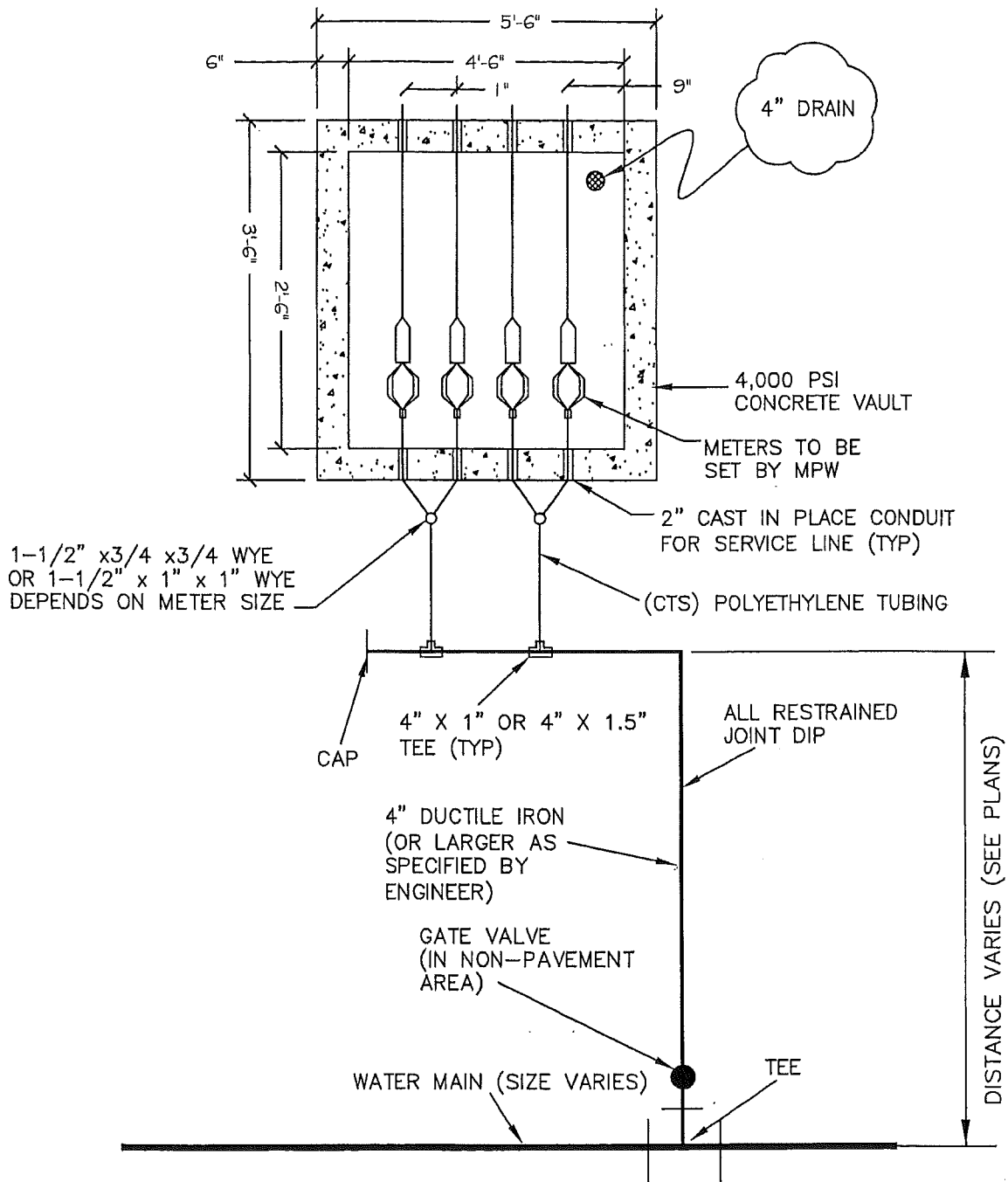
FOR DIP MAINS:
 POLYWRAP (8 mil)
 ENCASE 3 FT.
 OF SERVICE WITH
 POLYWRAP
 DIRECT TAP THROUGH POLYWRAP

FOR PVC MAINS:
 USE TAPPING SADDLE WITH
 I.P. THREAD
 SMITH BLAIR, MODEL 317
 ROMAC MODEL 202 NS

SPACE REQ'D. BETWEEN FLANGES.
 1 1/2" METER: 13 1/4"
 2" METER: 17 1/4"

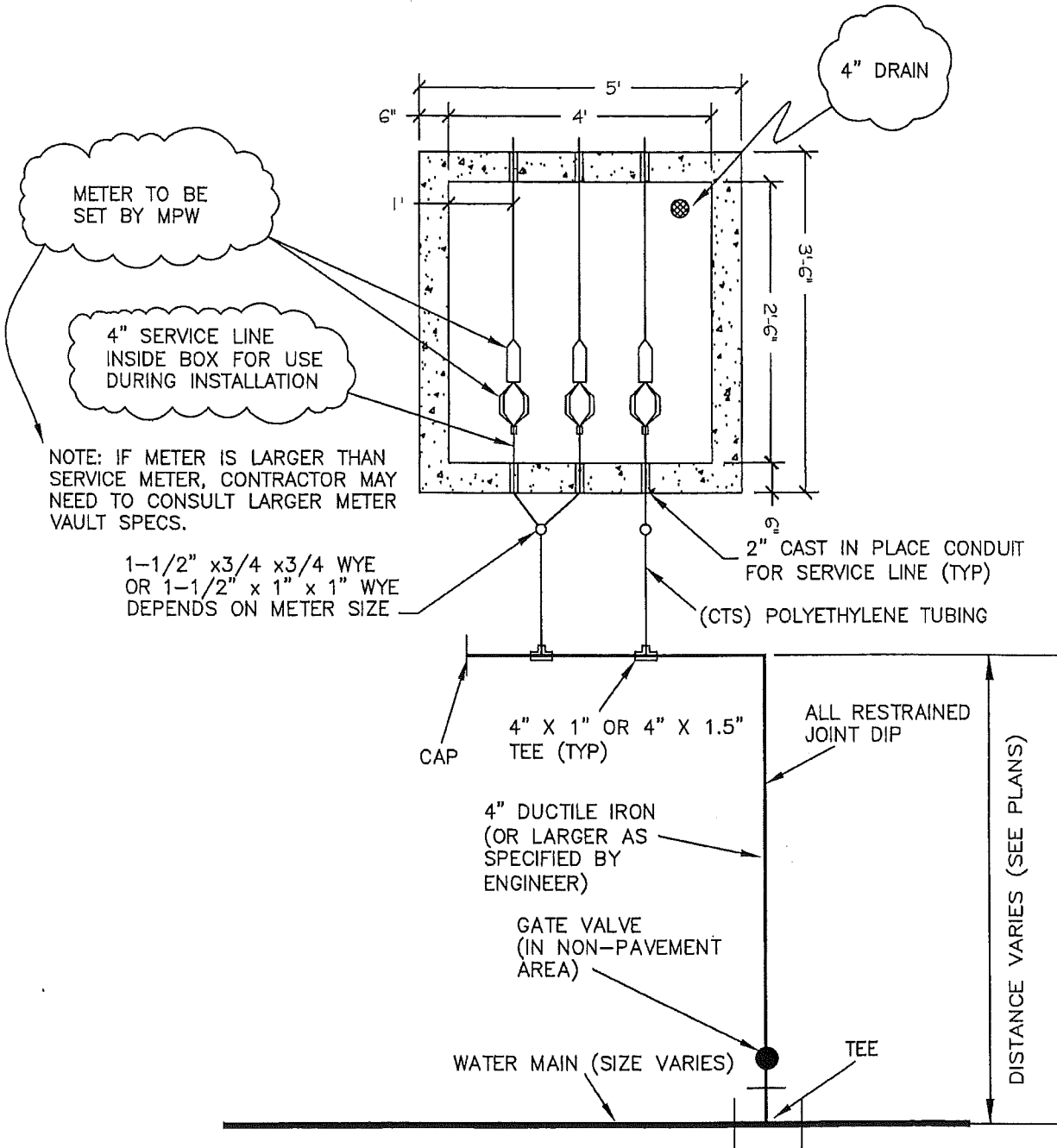


MOUNT PLEASANT WATERWORKS 1 1/2" - 2" WATER SERVICE		DATE: FEB 2009 REVISED: FEB 2009	DRAWING NO. W-09
APPROVED BY: MPW	SCALE: NTS		




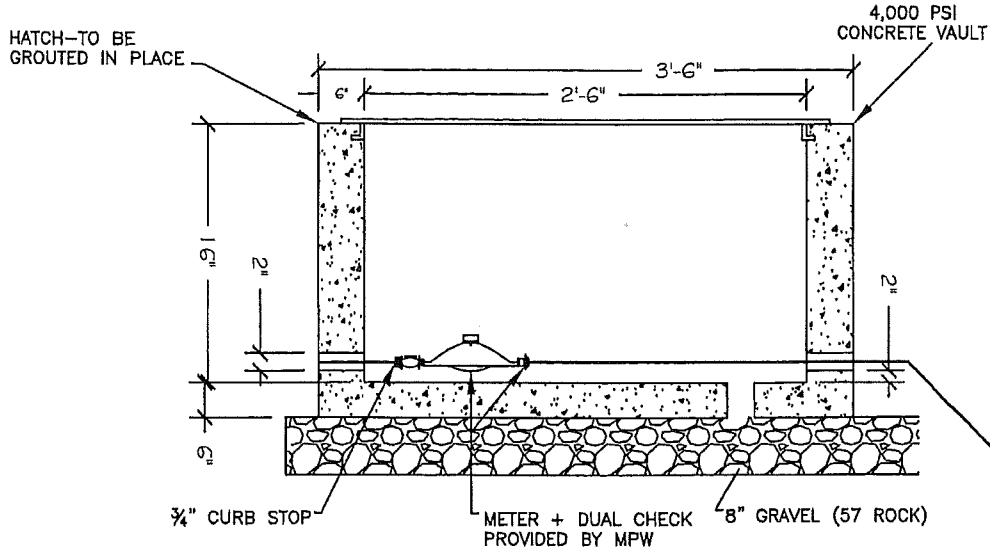
NOTE: ALL PIPING FROM METER VAULT BACK TO MAIN LINE MUST BE PLACED WITHIN AN EASEMENT TO BE DEDICATED TO MPWW AND DIP SHALL BE POLY-WRAPPED IN ACCORDANCE WITH AWWA C105

MOUNT PLEASANT WATERWORKS MULTIPLE METER BOX (4 SERVICES)			
APPROVED BY:		DATE:	FEB 2009 REVISED: FEB 2009
SCALE:		DRAWING NO.	
NTS		W-10	



NOTE: ALL PIPING FROM METER VAULT BACK TO MAIN LINE MUST BE PLACED WITHIN AN EASEMENT TO BE DEDICATED TO MPWW AND DIIP SHALL BE POLY-WRAPPED IN ACCORDANCE WITH AWWA C105

MOUNT PLEASANT WATERWORKS MULTIPLE METER BOX (3 SERVICES)			
APPROVED BY:		DATE:	DRAWING NO.
MPW		FEB 2009	
SCALE:	NTS	REVISED:	FEB 2009

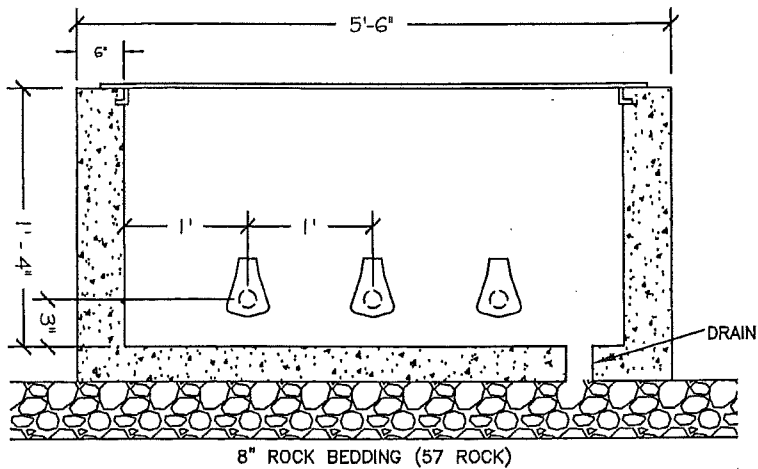


- SERVICE LINE STUB OUT WILL NOT EXCEED 13" IN DEPTH FROM THE TOP AT THE VAULT. IT WILL NOT BE SHALLOW FROM 12" FROM THE TOP OF VAULT.

HATCH TYPE: U.S. FABRICATION OR APPROVED EQUAL

NUMBER OF METERS	INSIDE WIDTH
3	4'
4	5'

- APS 300 30 X 48 STANDARD RECESS STAPLE FOR PADLOCK.
- MT. PLEASANT WATERWORKS MILLED IN 2" LETTERS ON THE DOOR.
- APD 300 30 X 54 SAME AS ABOVE WITH RECESS STAPLE FOR PADLOCK & LETTERING OR APPROVED EQUAL.



MOUNT PLEASANT WATERWORKS MULTIPLE METER BOX

APPROVED BY:

MPW

SCALE:

NTS



DATE:

FEB 2009

REVISED:

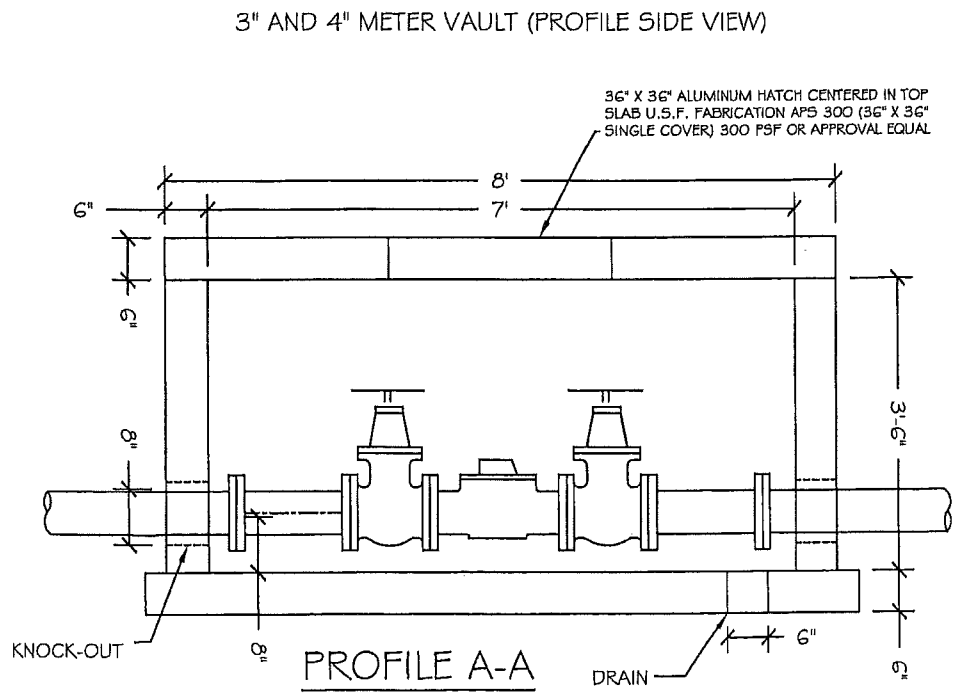
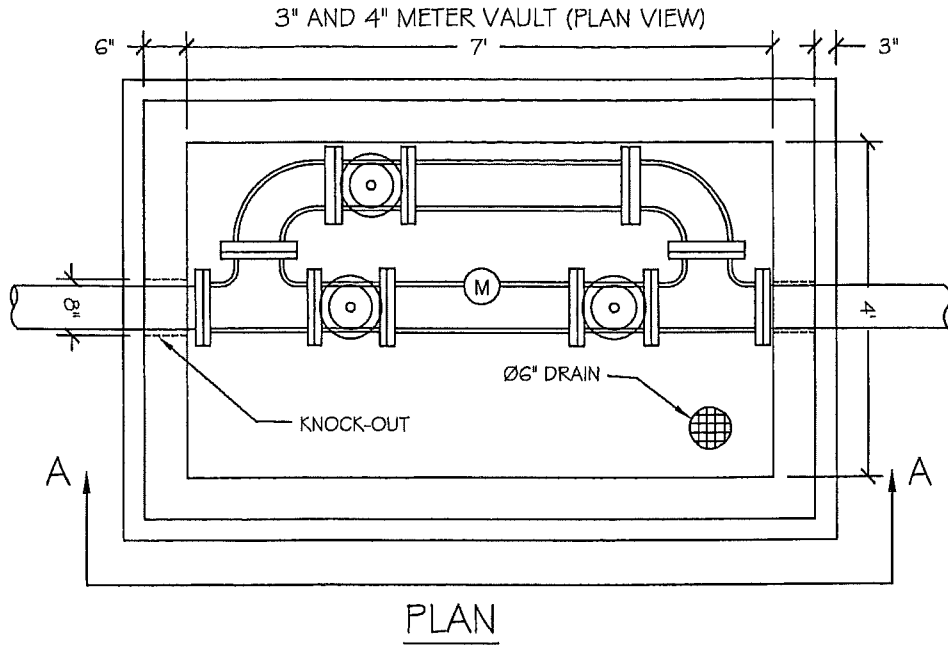
FEB 2009

DRAWING NO.

W-12

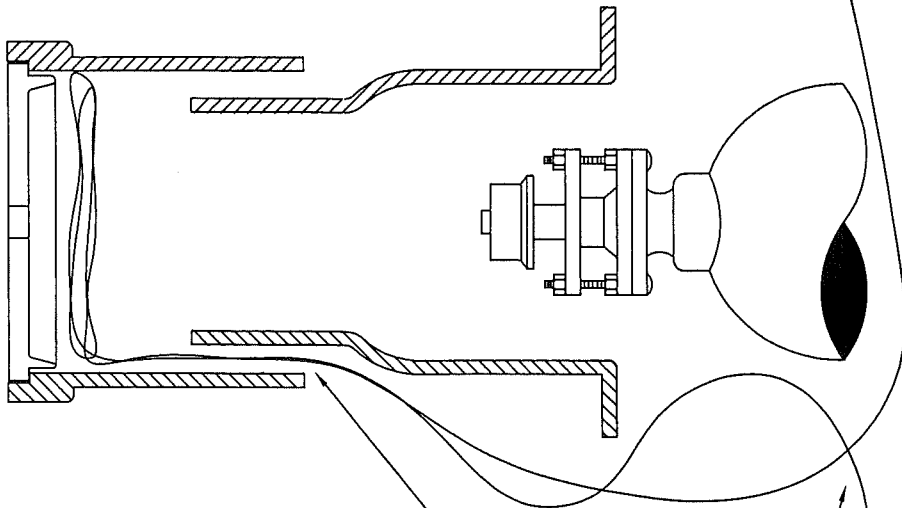
NOTE:

1. THE VAULT SHALL BE CONSTRUCTED WITH 4000 PSI CONCRETE (REINFORCED)
2. TOP AND BOTTOM SLAB SHALL BE 6" THICK. IF THE VAULT IS TO BE PLACED IN TRAFFIC AREAS, SUBMIT PLANS SHOWING DEVIATION AND DESIGN TO COMPENSATE. ALL DEVIATIONS MUST BE APPROVED BY MPW PRIOR TO INSTALLATION.



36" X 36" ALUMINUM HATCH CENTERED IN TOP SLAB U.S.F. FABRICATION AFS 300 (36" X 36" SINGLE COVER) 300 PSF OR APPROVAL EQUAL

MOUNT PLEASANT WATERWORKS METER VAULT FOR METER LARGER THAN 2"			
APPROVED BY:	MPW	DATE:	FEB 2009
SCALE:	NTS	REVISED:	FEB 2009
			DRAWING NO. W-13



LOCATOR WIRE SHOULD BE
 ROUTED OUTSIDE OF LOWER
 VALVE BOX AND INSIDE UPPER
 VALVE BOX THROUGH THE
 UN-THREADED SECTION OF
 THE LOWER BOX

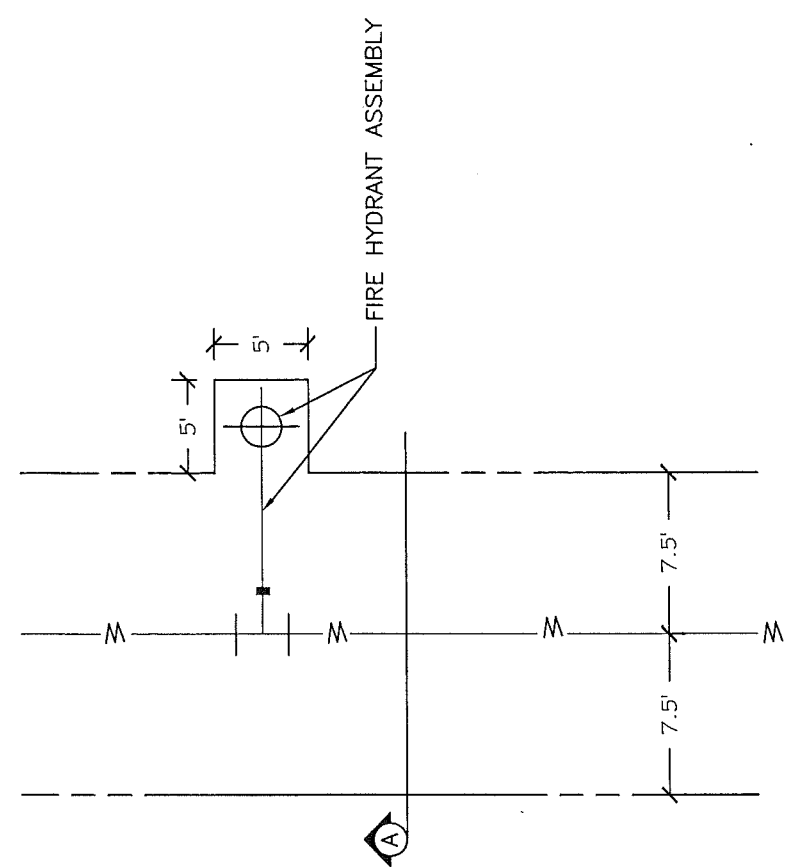
LOCATOR WIRE

MOUNT PLEASANT WATERWORKS
 ROUTING OF LOCATOR WIRE INSIDE VALVE BOX TO
 PERMIT ACCESS TO WIRE AND TO PREVENT
 INTERFERENCE WITH VALVE WRENCH

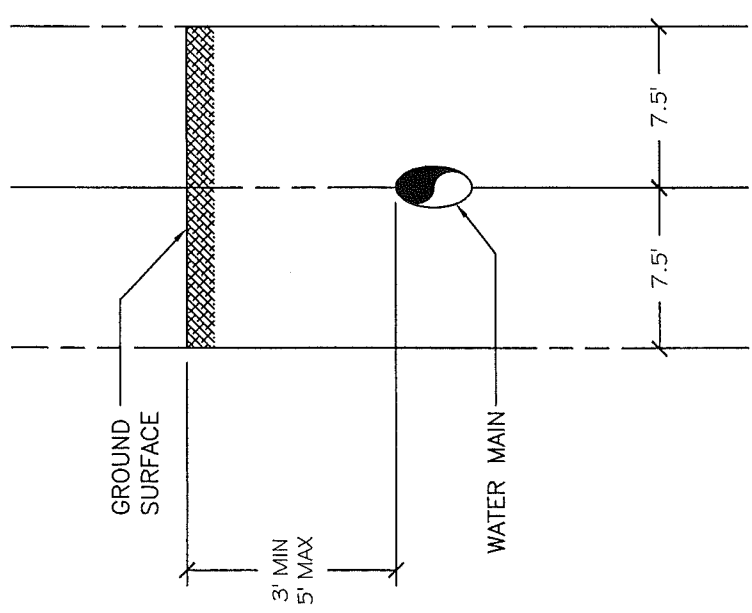
APPROVED BY:
 MPW
 SCALE:
 NTS



DATE: FEB 2009
 REVISED: FEB 2009
 DRAWING NO.
 W-14



PLAN VIEW

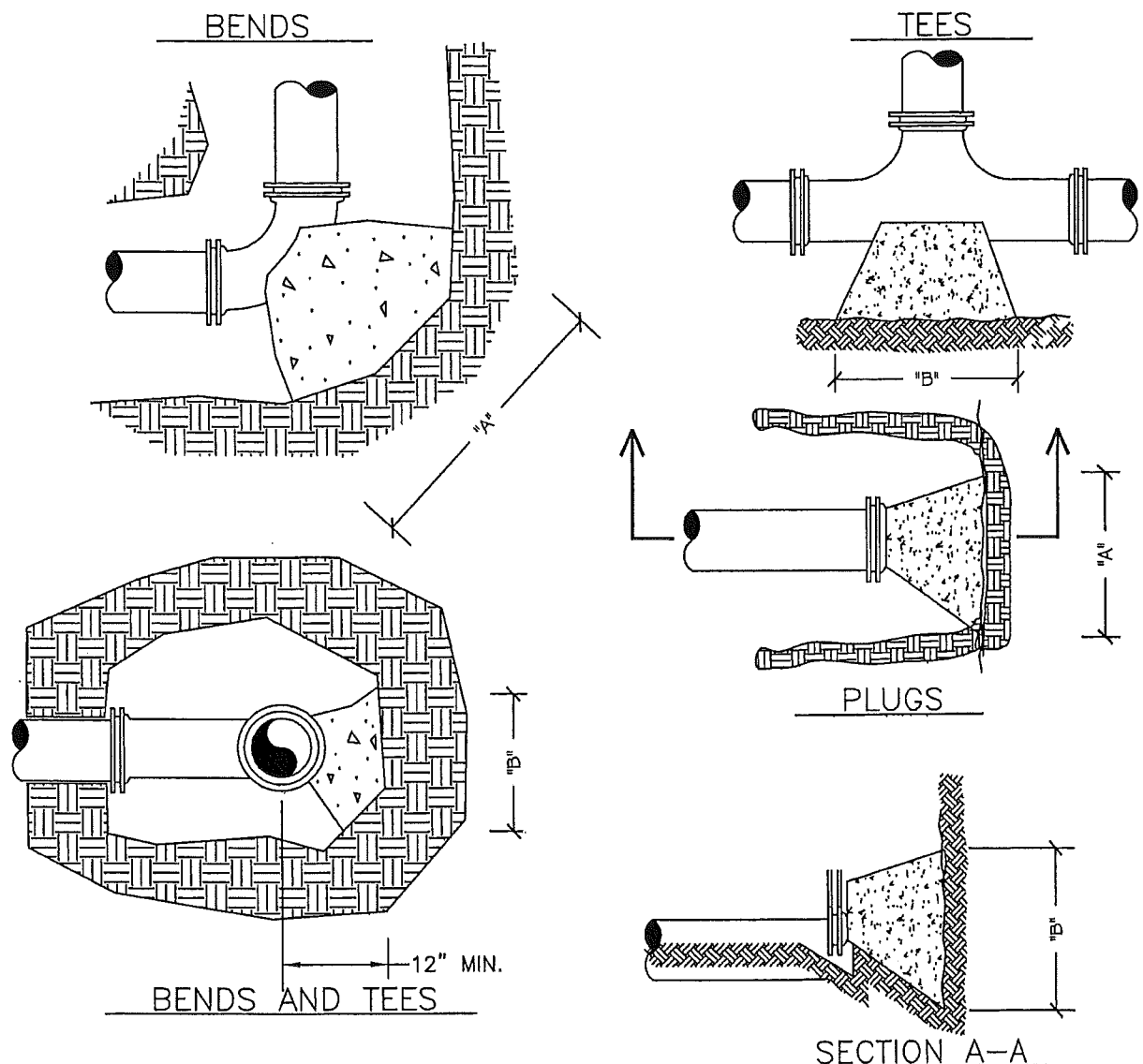


SECTION "A"

MOUNT PLEASANT WATERWORKS
WATER EASEMENT

APPROVED BY: MPIW	DATE: FEB 2009	DRAWING NO. W-15
SCALE: NTS	REVISED: FEB 2009	



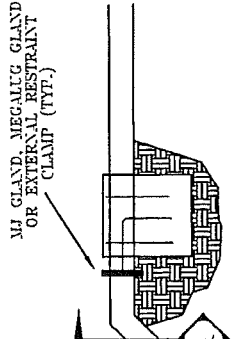


PIPE SIZE	TEES		90° BENDS		45° BENDS		22.5° BENDS		11.25° BENDS	
	A	B	A	B	A	B	A	B	A	B
6"	24"	18"	30"	18"	24"	16"	24"	16"	24"	16"
8"	36"	18"	39"	18"	30"	18"	24"	18"	24"	16"
12"	54"	24"	54"	36"	42"	24"	24"	24"	24"	21"
14"	63"	28"	63"	42"	49"	28"	28"	28"	28"	25"
16"	72"	32"	72"	48"	56"	32"	32"	32"	32"	28"
18"	81"	36"	81"	54"	63"	36"	36"	36"	36"	32"
20"	90"	40"	90"	60"	70"	40"	40"	40"	40"	35"
24"	106"	48"	108"	72"	84"	48"	48"	48"	48"	42"
30"	135"	60"	135"	90"	105"	60"	60"	60"	60"	53"

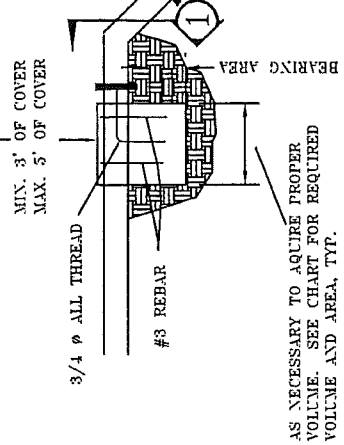
- NOTE:
1. DEPTH FROM GROUND SURFACE TO TOP OF BLOCKING SHALL BE GREATER THAN HEIGHT OF BLOCKING.
THRUST BLOCK DIMENSIONS TO BE VERIFIED BY THE ENGINEER BASED ON SOIL BEARING CAPACITY.
 - 2.

MOUNT PLEASANT WATERWORKS			
THRUST BLOCK			
APPROVED BY:		DATE:	DRAWING NO.
MPW		FEB 2009	W-16
SCALE:	NTS	REVISED:	FEB 2009

FINISH GRADE



PIPE SIZE	CONCRETE VOL. (CU. YD.)	BEARING AREA (SQ. FT.)
8"	2.0	1.5
10"	3.1	2.3
12"	4.4	3.3
16"	7.9	5.9
20"	8.2	6.1



MIN. 3' OF COVER
MAX. 5' OF COVER

3/4" ϕ ALL THREAD

#3 REBAR

BEARING AREA

AS NECESSARY TO AQUIRE PROPER VOLUME. SEE CHART FOR REQUIRED VOLUME AND AREA, TYP.

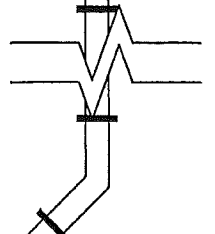
VOLUME AND DESIGN OF GRAVITY THRUST BLOCK SHALL BE APPROVED BY THE DESIGN ENGINEER. VALUES IN TABLE ARE APPROXIMATE ONLY AND MAY NOT PROVIDE ADEQUATE RESTRAINT DEPENDING ON SOIL CONDITIONS AND TRANSIENT PRESSURES IN WATER MAIN.

ALL RESTRAINED JOINTS ON FITTINGS (TYP.)

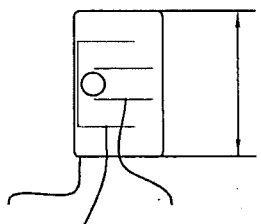
HIGH / EARLY STRENGTH CONC. GRAVITY BLOCK

#3 BAR

3/4" ϕ ALL THREAD



PROFILE VIEW
NOT TO SCALE



SECTION VIEW
NOT TO SCALE

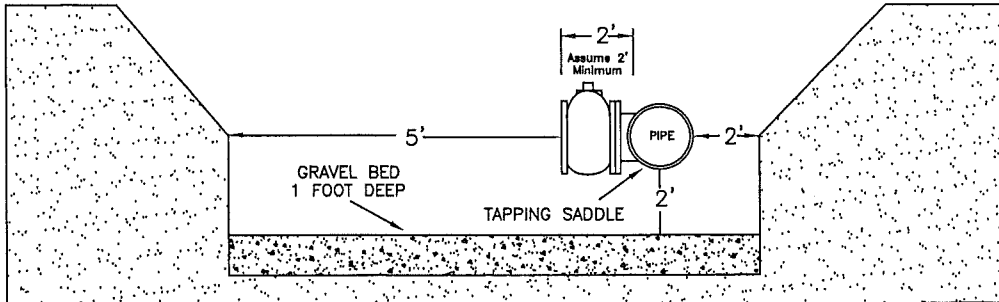
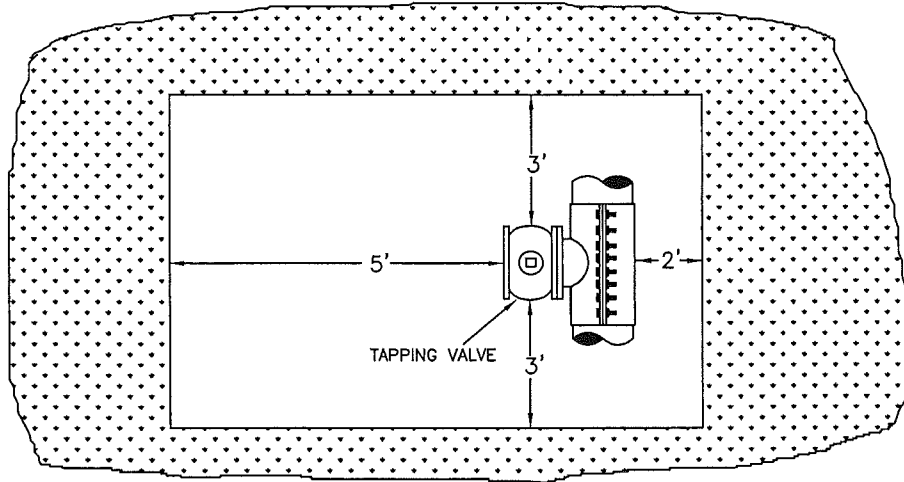
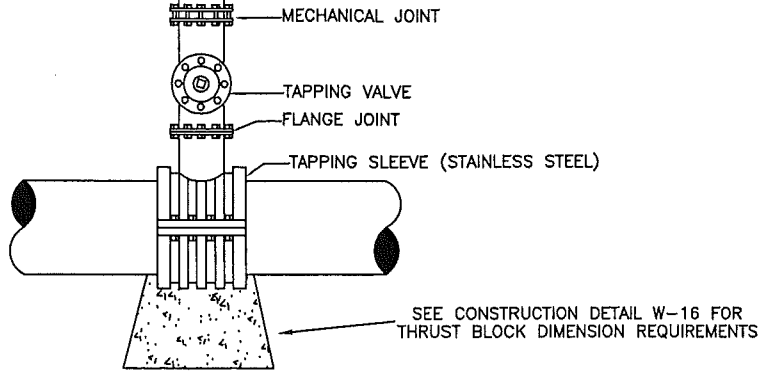


AS NECESSARY TO AQUIRE PROPER VOLUME AND BEARING AREA. SEE CHART FOR APPROXIMATE VOLUME AND AREA, TYP.

MOUNT PLEASANT WATERWORKS
GRAVITY THRUST BLOCK

APPROVED BY: MPW	DATE: FEB 2009	DRAWING NO. W-17
	REVISED: FEB 2009	
SCALE: NTS		

AIR GAP OR
BACK-FLOW PREVENTER
MUST BE PROVIDED UNTIL
PERMIT TO OPERATE
IS ISSUED FOR NEW MAIN.



NOTES:

- 1) MINIMUM CLEARANCE ABOVE, BELOW AND AROUND PIPE AND FITTINGS SHALL BE AS INDICATED.
- 2) IF EXCAVATION IS "MAKING WATER" SUITABLE GRAVEL BED SHALL BE INSTALLED AND A PUMP PROVIDED.
- 3) FOR TAPPING VALVES 8" DIAMETER AND LARGER, CONTRACTOR SHALL PROVIDE A BACKHOE OR OTHER SUITABLE MACHINE (WITH OPERATOR AND RIGGING) TO LOWER VALVE INTO PLACE.
- 4) EXCAVATION MUST COMPLY WITH ALL OSHA STANDARDS
- 5) IF ALL REQUIREMENTS ARE NOT MET, WET TAP WILL NOT BE PERFORMED AND MUST BE RESCHEDULED.

MOUNT PLEASANT WATERWORKS
EXCAVATION REQUIRED FOR THE INSTALLATION OF
TAPPING SADDLE AND WET TAP BY MPW

APPROVED BY:

MPW

SCALE:

NTS



DATE:

FEB 2009

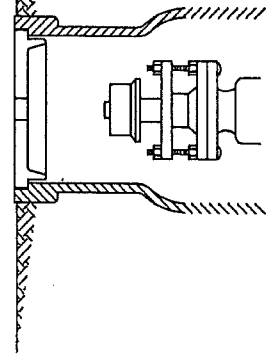
REVISED:

FEB 2009

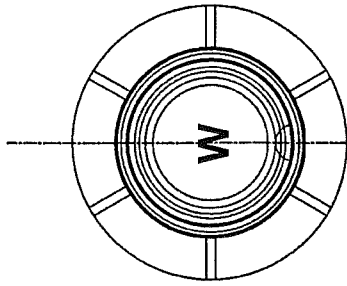
DRAWING NO.

W-18

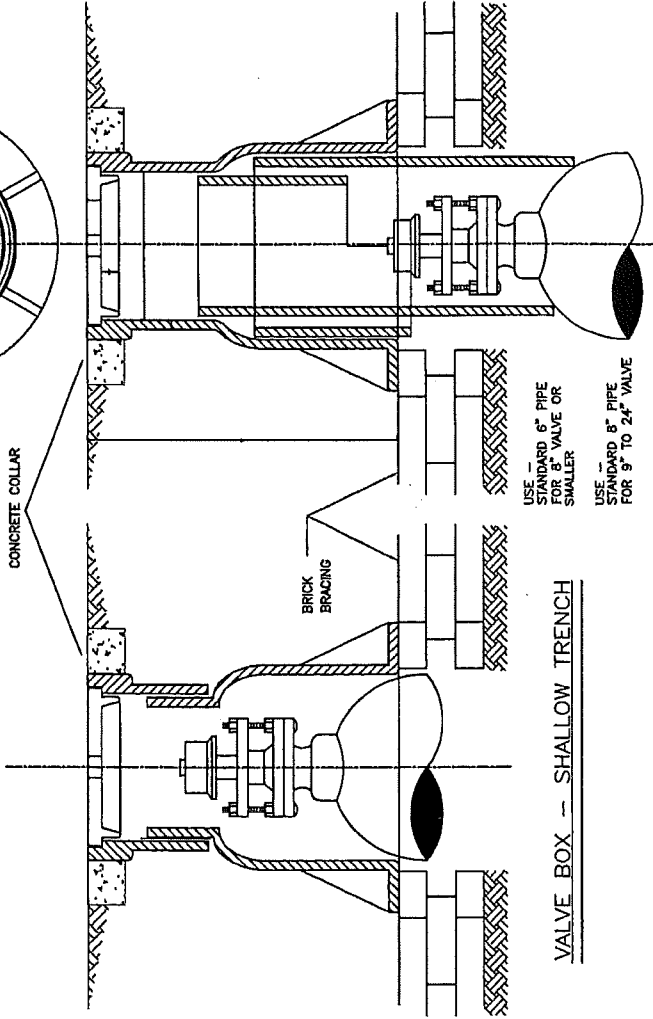
SURFACE OF PAVEMENT



VALVE BOX - IN PAVEMENT



CONCRETE COLLAR



USE
STANDARD 6" PIPE
FOR 8" VALVE OR
SMALLER

USE
STANDARD 8" PIPE
FOR 9" TO 24" VALVE

VALVE BOX - SHALLOW TRENCH

VALVE BOX - DEEP TRENCH

MOUNT PLEASANT WATERWORKS
VALVE BOX

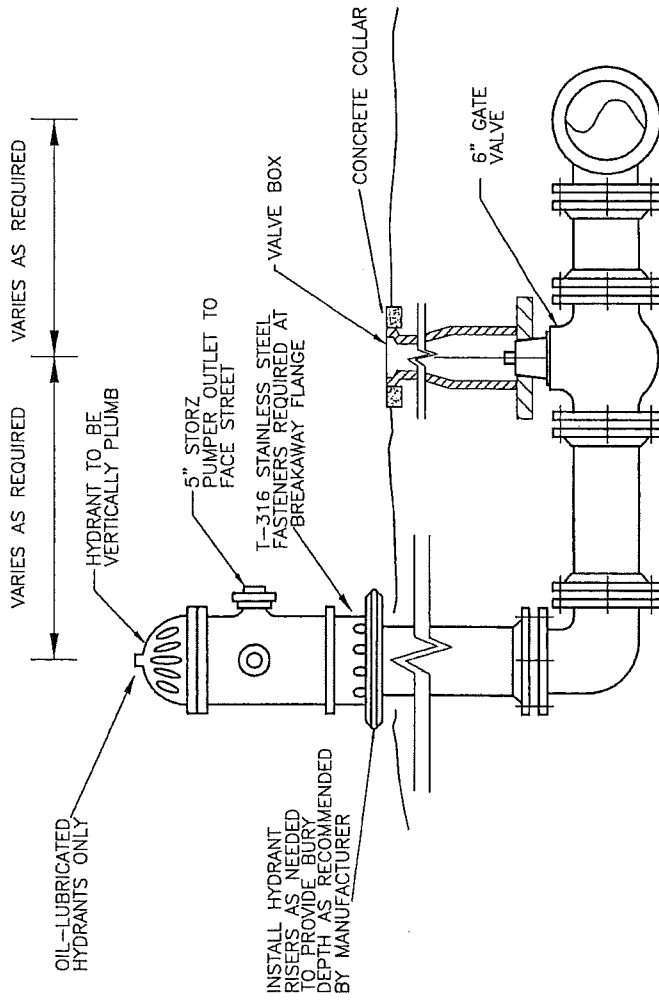
APPROVED BY: MP'W
SCALE: NTS

DATE: FEB 2009
REVISED: FEB 2009

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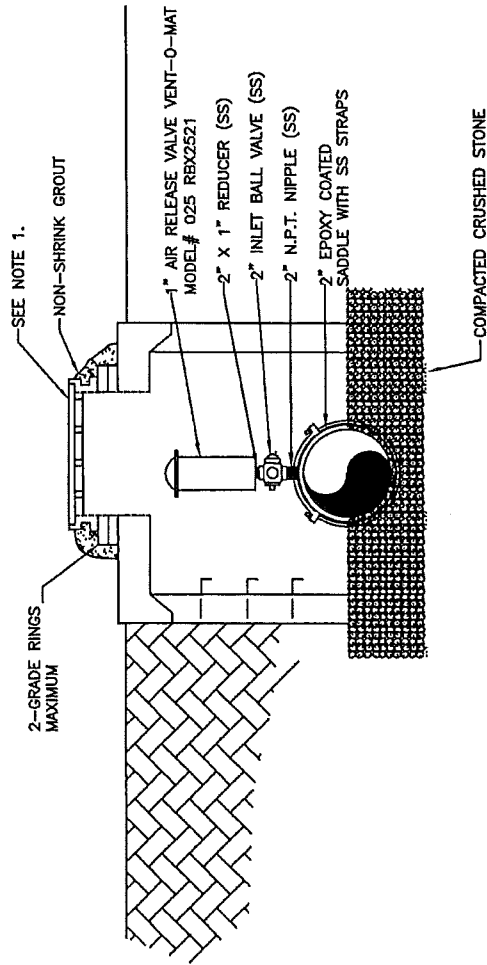




- NOTE: 1) A GRAVEL POCKET OR DRY WELL MUST BE PROVIDED
- 2) FIRE HYDRANT MAY NOT DRAIN WITHIN 10 FEET OF A SANITARY SEWER
- 3) ALL METALLIC PIPING, VALVES, FITTINGS, RESTRAINER GLANDS, AND MISC. APPURTENANCES INSTALLED AS PART OF THE HYDRANT ASSEMBLY SHALL BE POLY-WRAPPED IN ACCORDANCE WITH AWWA C105. POLY-WRAP SHALL NOT RESTRICT DRAINAGE FROM WEEP HOLES.
- 4) MEGALUGS SHALL BE USED ON ALL MECHANICAL JOINTS.

MOUNT PLEASANT WATERWORKS
HYDRANT

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NOTE:

1. MANHOLES NOT LOCATED IN CONCRETE OR ASPHALT AREAS SHALL HAVE A RING AND COVER BY PAHREX MODEL COPAGEH, OR EQUAL.
2. MANHOLES LOCATED IN CONCRETE OR ASPHALT AREA SHALL HAVE A USE 480 RING AND RA-SSG COVER MANUFACTURED BY EAST JORDAN IRON WORKS 2029AVH, WITH WIPER GASKET ASSEMBLY OR EQUAL.

**MOUNT PLEASANT WATERWORKS
PRECAST CONCRETE AIR RELEASE VALVE BOX**

APPROVED BY:
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