



- b. On new work plan, show in bold the areas to be repaired after existing facilities removed. Add note stating repair work must be performed under Woodmoor Water & Sanitation District System Specifications.
- c. Please show more detail on the pumped water storage pipeline terminal at Lake Woodmoor. It appears that the flow will make an apx. 90-degree bend to enter the lake. Detail must include erosion control measures taken, which should account for head cut and effects of flow on the bend.

### **Sanitary Sewer**

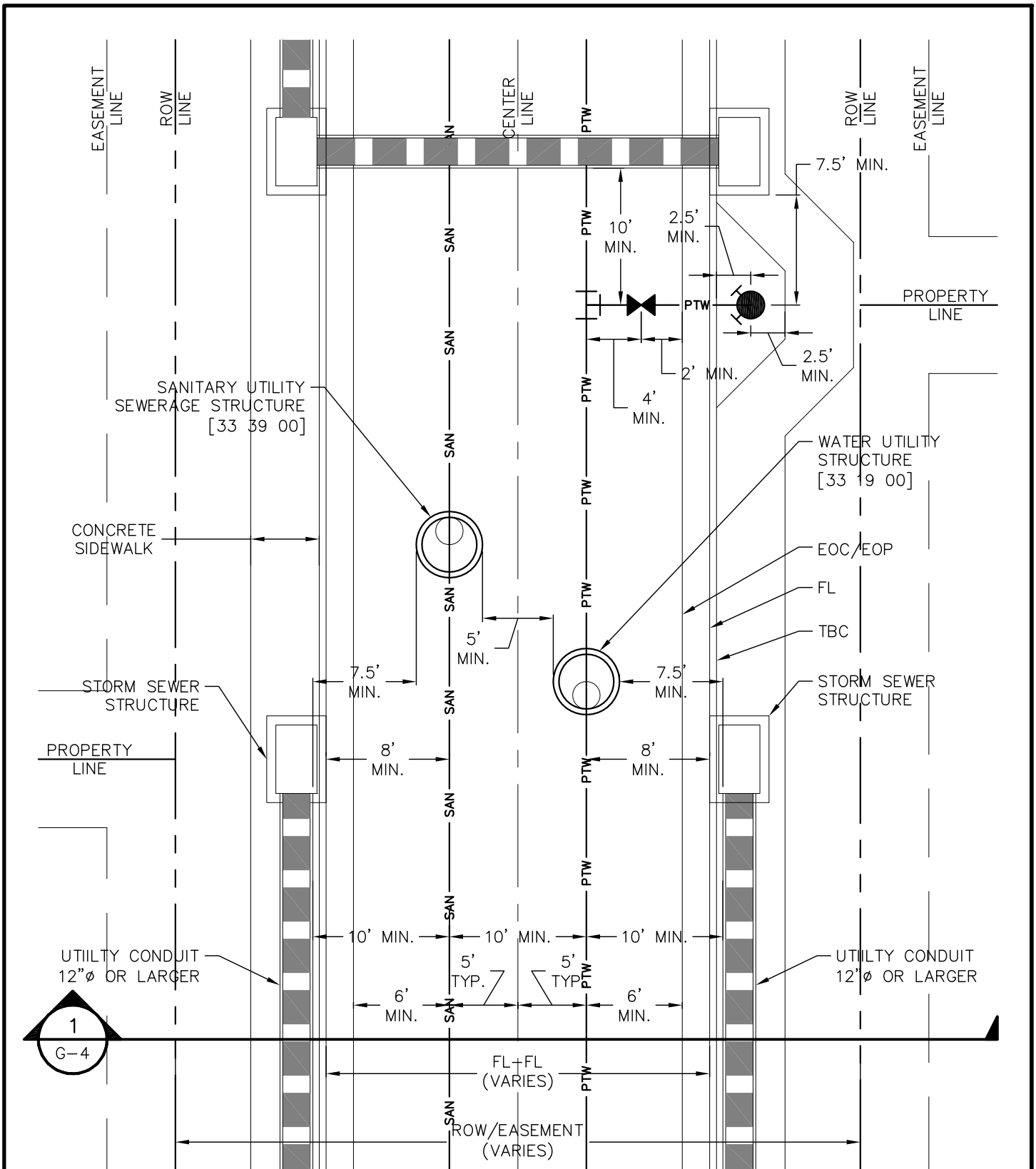
1. The existing 12” sanitary sewer line from Deer Creek Road through the North Bay subdivision boundaries is a high-flow line. Although the Cove Lift Station has the capacity to serve the additional multifamily units that North Bay will be developing, it does not have near the capacity to serve the hundreds of single family homes that the existing 12” pipeline currently services. Are there alternatives that have been considered?
  - a. For any pipelines to be demolished, re-routed, or removed, please include a demolition plan.
2. Labels in the profile need to be as specified in the WWSD System Specifications Section 4.8 and 4.9.

If you should have any questions, please contact me.

Sincerely,

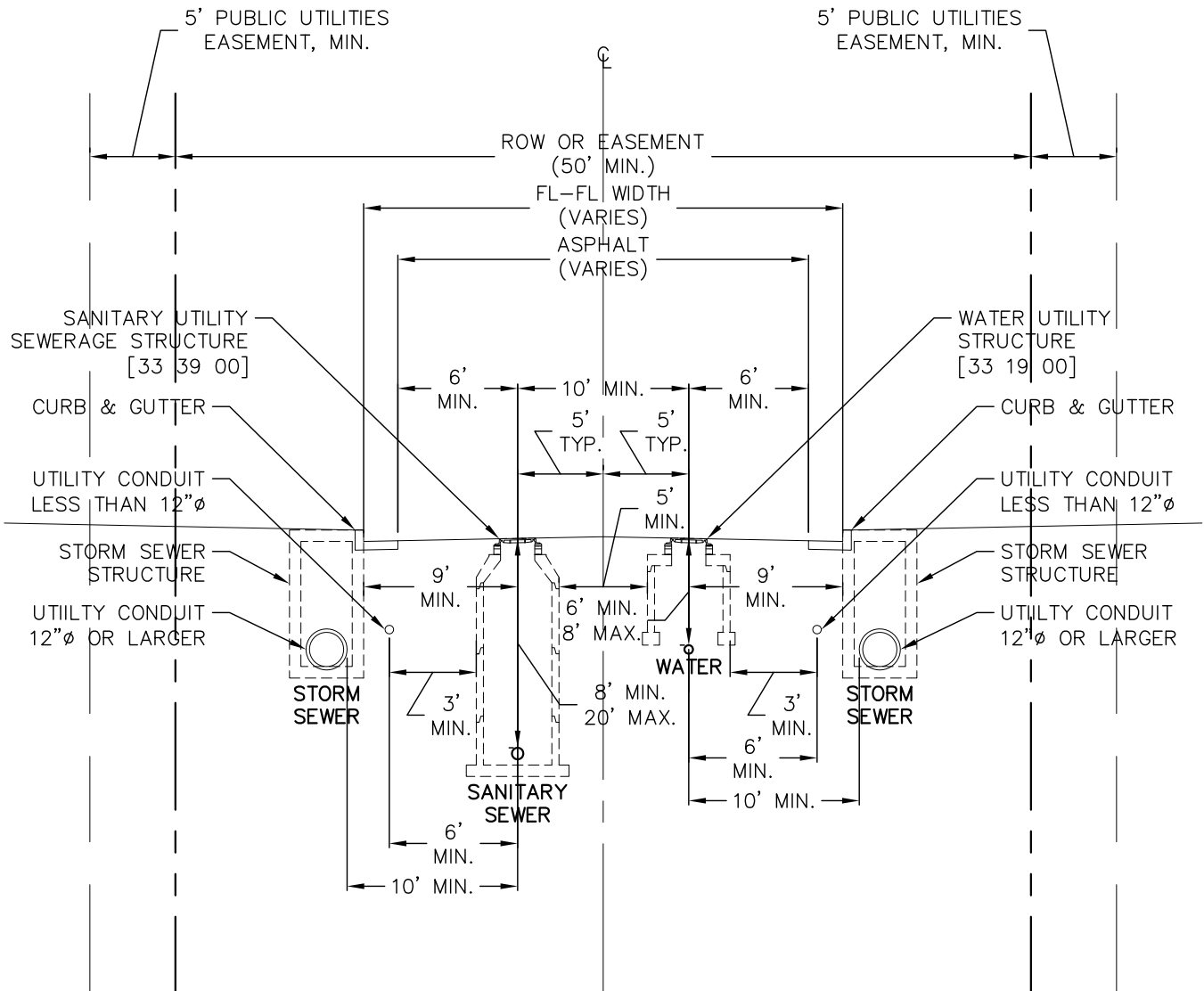
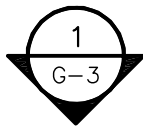
Ariel Hacker  
District Engineer

Cc: Jessie J. Shaffer  
Dan LaFontaine



1 TYPICAL UTILITIES LAYOUT (PLAN)  
1"=10'

	TYPICAL UTILITIES LAYOUT (PLAN)	G-3
	GENERAL	-
	THIS CONSTRUCTION DETAIL SHOWS GENERAL CONFORMANCE TO SYSTEM SPECIFICATIONS AND MAY NEED TO BE ADJUSTED FOR SPECIFIC APPLICATIONS.	MAY 13, 2014

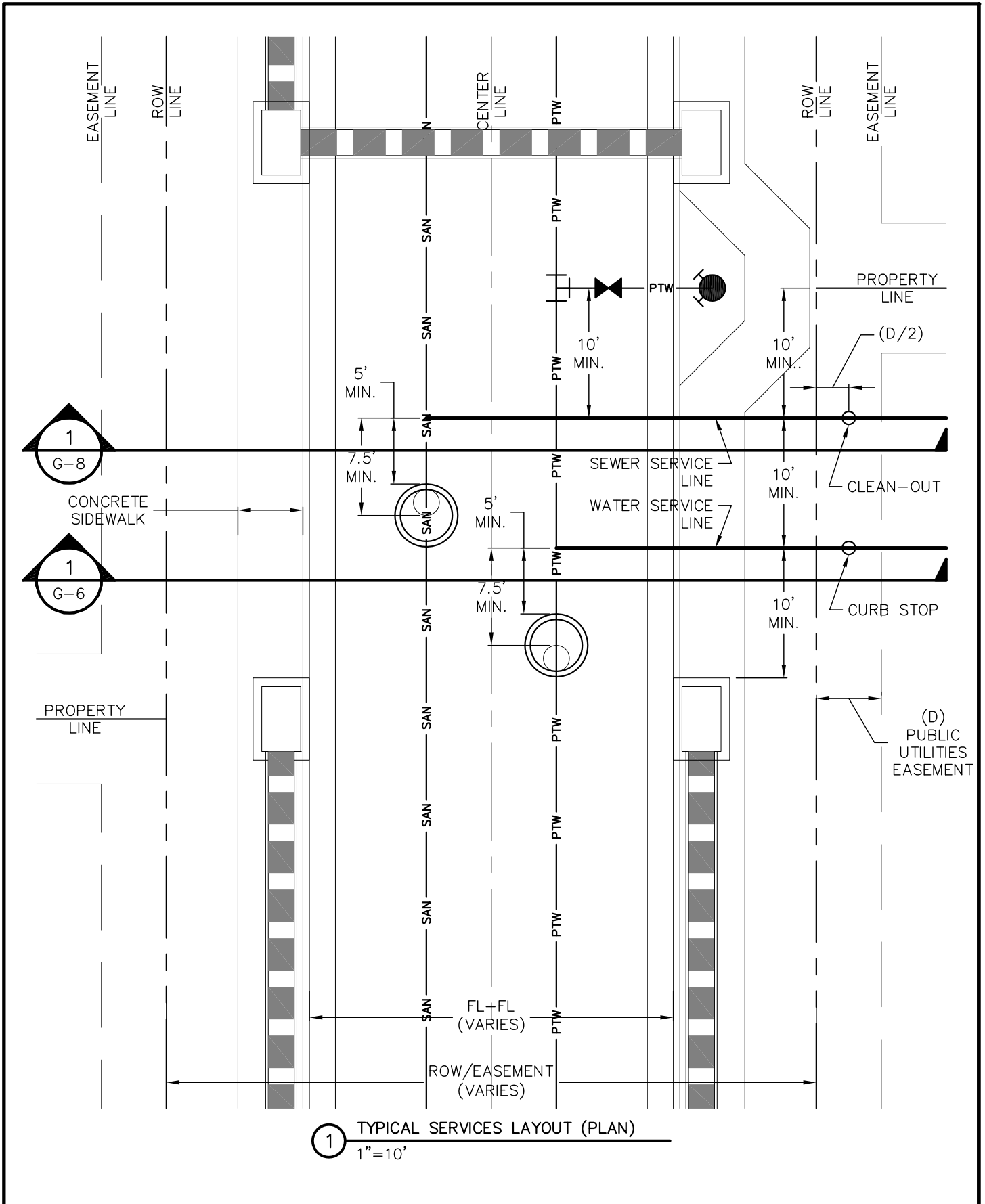


1 TYPICAL UTILITIES LAYOUT (SECTION)  
1"=10'



TYPICAL UTILITIES LAYOUT (SECTION)
GENERAL
THIS CONSTRUCTION DETAIL SHOWS GENERAL CONFORMANCE TO SYSTEM SPECIFICATIONS AND MAY NEED TO BE ADJUSTED FOR SPECIFIC APPLICATIONS.

G-4
-
MAY 13, 2014

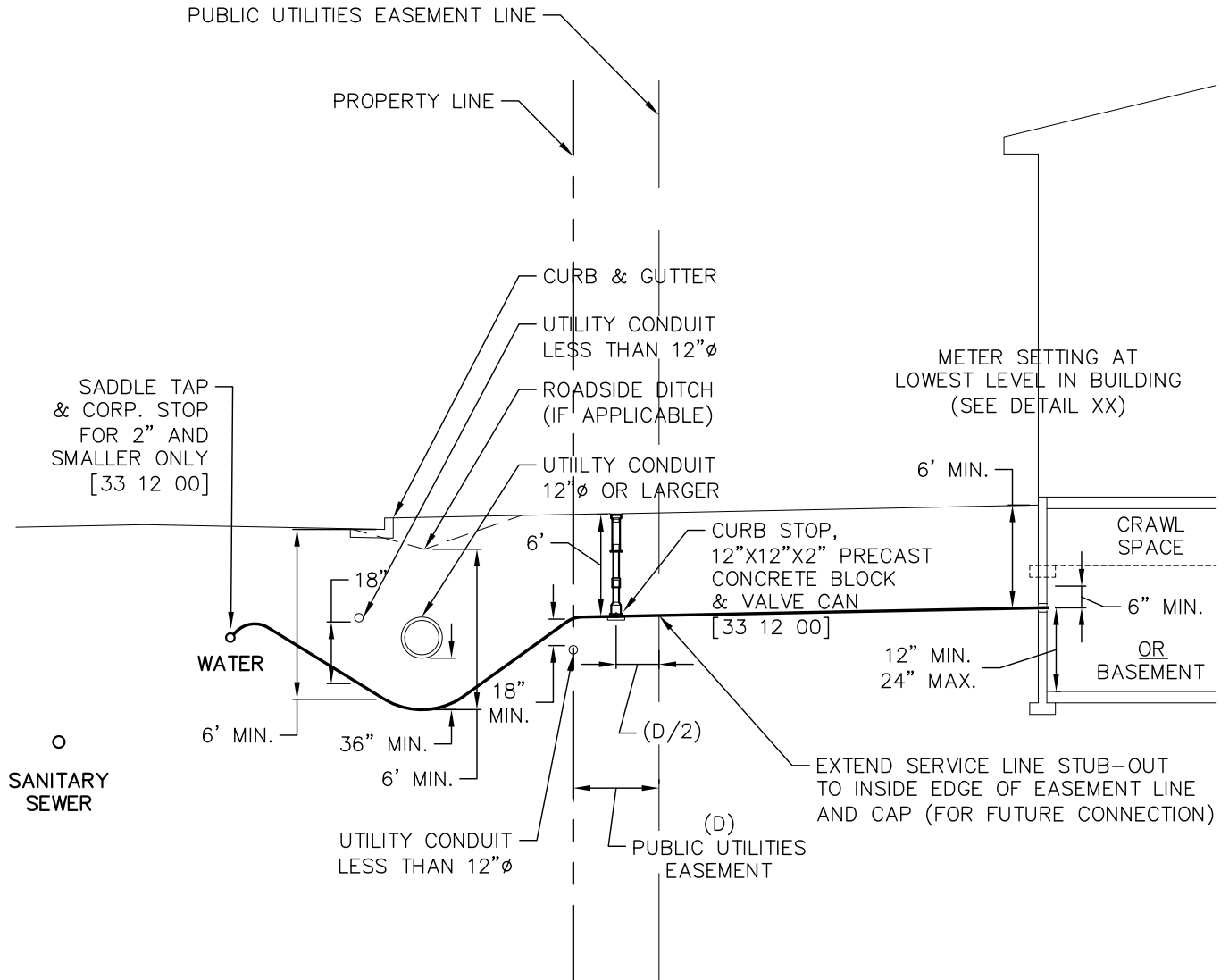


 <b>WOODMOOR</b> WATER & SANITATION DISTRICT NO. 1	TYPICAL SERVICES LAYOUT (PLAN)	G-5
	GENERAL	-
	THIS CONSTRUCTION DETAIL SHOWS GENERAL CONFORMANCE TO SYSTEM SPECIFICATIONS AND MAY NEED TO BE ADJUSTED FOR SPECIFIC APPLICATIONS.	MAY 13, 2014

REFER TO WATER & SEWER SERVICE LINE EQUIPMENT SPECIFICATIONS FOR SUPPLEMENTAL INFORMATION  
(APP C OF THE SYSTEM SPECIFICATIONS)

GENERAL NOTES:

- PROVIDE METAL T-POST AT CURB STOP WHEN CONSTRUCTION OF STUB-OUT TO LOT IS COMPLETE.  
T-POST MAY BE REMOVED AFTER CONNECTION TO SERVICE STUB.



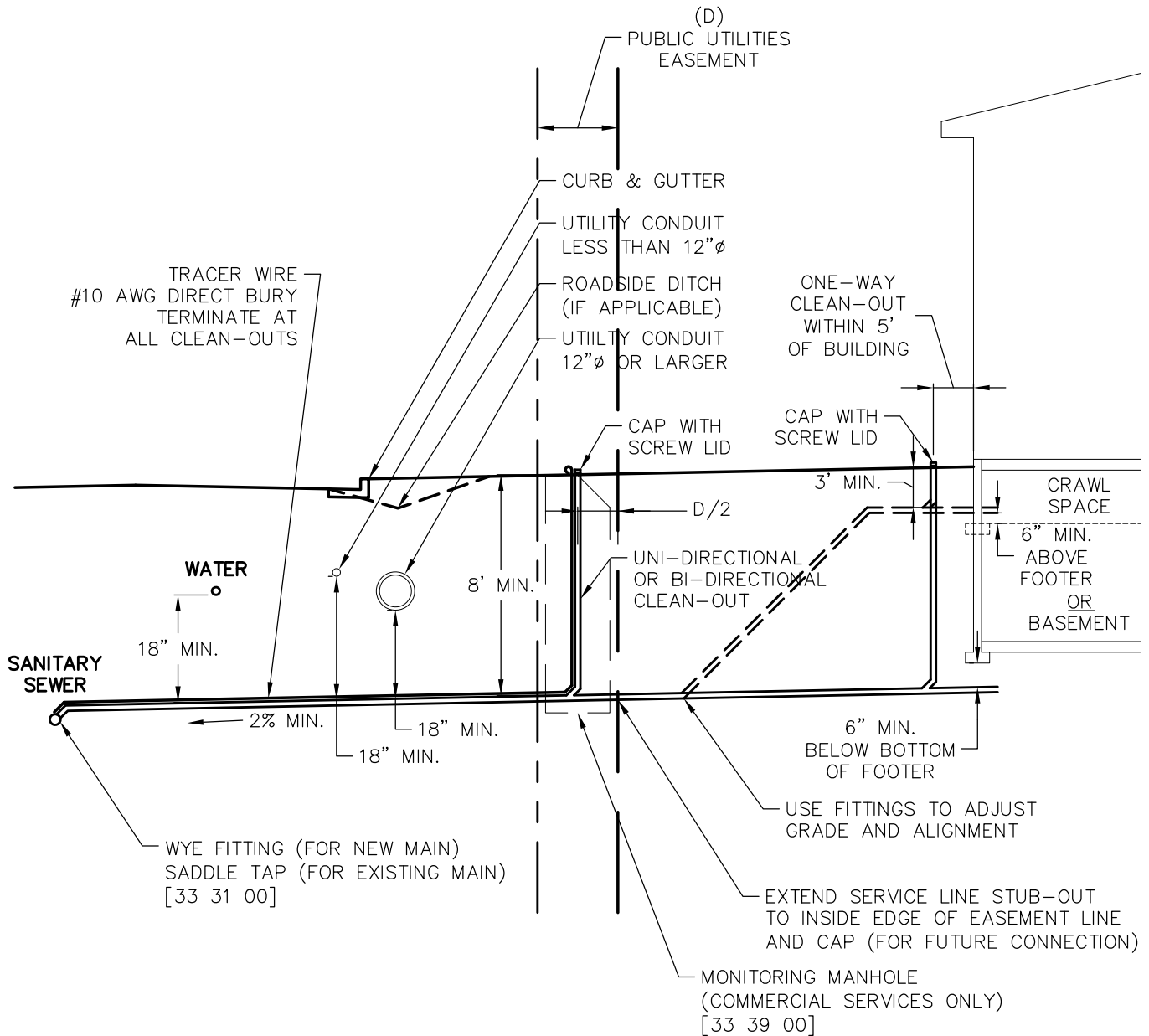
① WATER SERVICE (3/4" TO 2")  
1"=10'

	WATER SERVICE (3/4" TO 2")	G-6
	GENERAL	-
	<small>THIS CONSTRUCTION DETAIL SHOWS GENERAL CONFORMANCE TO SYSTEM SPECIFICATIONS AND MAY NEED TO BE ADJUSTED FOR SPECIFIC APPLICATIONS.</small>	
		MAY 13, 2014

REFER TO WATER & SEWER SERVICE LINE EQUIPMENT SPECIFICATIONS FOR SUPPLEMENTAL INFORMATION  
(APP C OF THE SYSTEM SPECIFICATIONS)

**GENERAL NOTES:**

- PROVIDE METAL T-POST AT CURB STOP WHEN CONSTRUCTION OF STUB-OUT TO LOT IS COMPLETE. T-POST MAY BE REMOVED AFTER CONNECTION TO SERVICE STUB.
- INTERMEDIATE CLEAN-OUT ASSEMBLIES REQUIRED AT 100' INTERVALS (FOR UNI-DIRECTIONAL) OR 200' INTERVALS (FOR BI-DIRECTIONAL) BETWEEN PROPERTY LINE CLEAN-OUT AND BUILDING CLEAN-OUT..

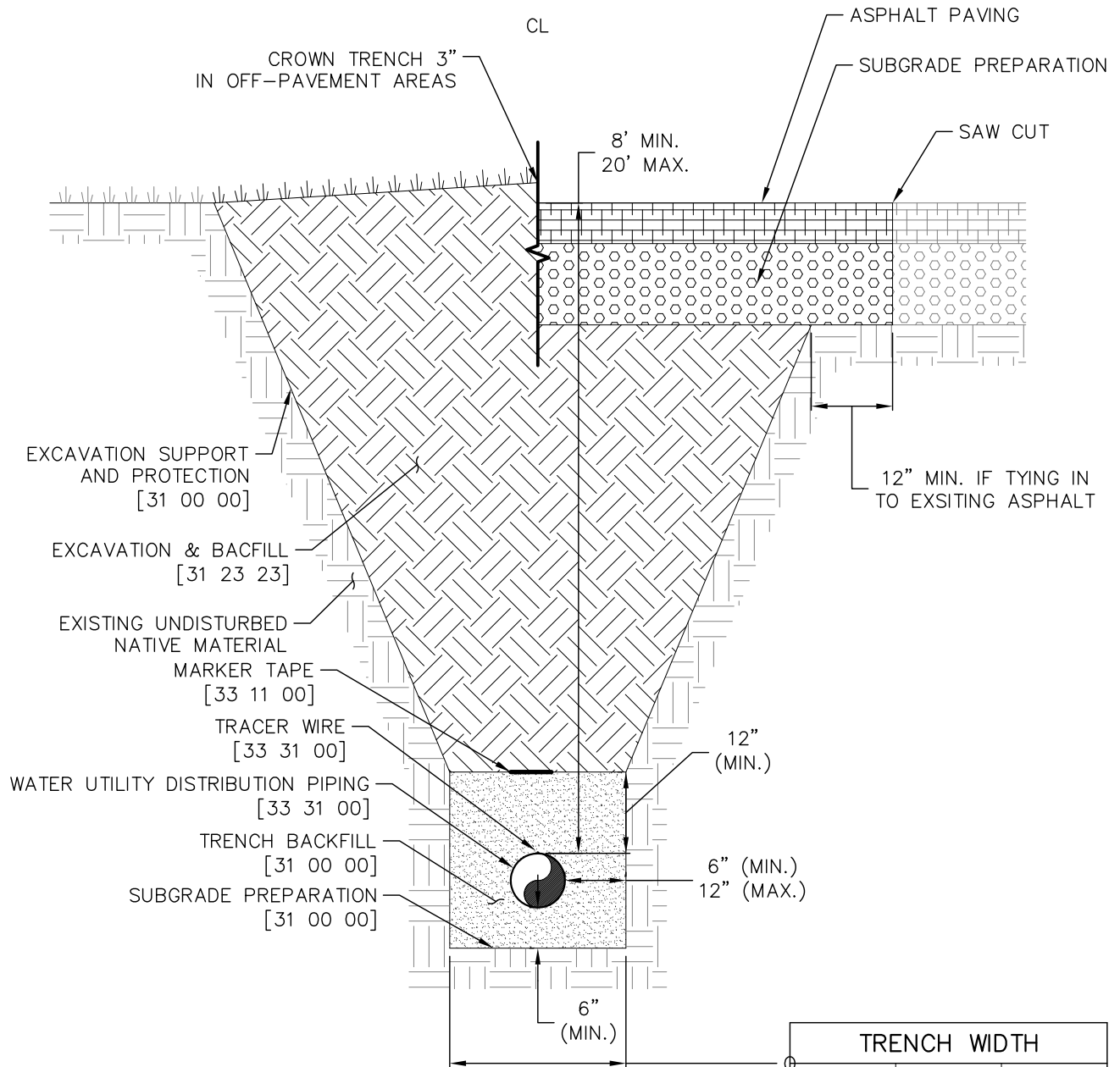


1 TYPICAL SEWER SERVICE (SECTION)  
1"=10'

	TYPICAL SEWER SERVICE (SECTION)	G-8
	GENERAL	-
	<small>THIS CONSTRUCTION DETAIL SHOWS GENERAL CONFORMANCE TO SYSTEM SPECIFICATIONS AND MAY NEED TO BE ADJUSTED FOR SPECIFIC APPLICATIONS.</small>	
		MAY 13, 2014

VEGETATED SURFACE

PAVED SURFACE



1 TYPICAL TRENCH SECTION  
1"=2'

TRENCH WIDTH		
PIPE DIAMETER	MINIMUM WIDTH	MAXIMUM WIDTH
4"	1'-4"	2'-4"
6"	1'-6"	2'-6"
8"	1'-8"	2'-8"
10"	1'-10"	2'-10"
12"	2'-0"	3'-0"
14"	2'-2"	3'-2"



**WOODMOOR**  
WATER & SANITATION DISTRICT NO. 1

TYPICAL SEWER TRENCH SECTION  
SANITARY UTILITY SEWERAGE PIPING

S-1

33 31 00

THIS CONSTRUCTION DETAIL SHOWS GENERAL CONFORMANCE TO SYSTEM SPECIFICATIONS AND MAY NEED TO BE ADJUSTED FOR SPECIFIC APPLICATIONS.

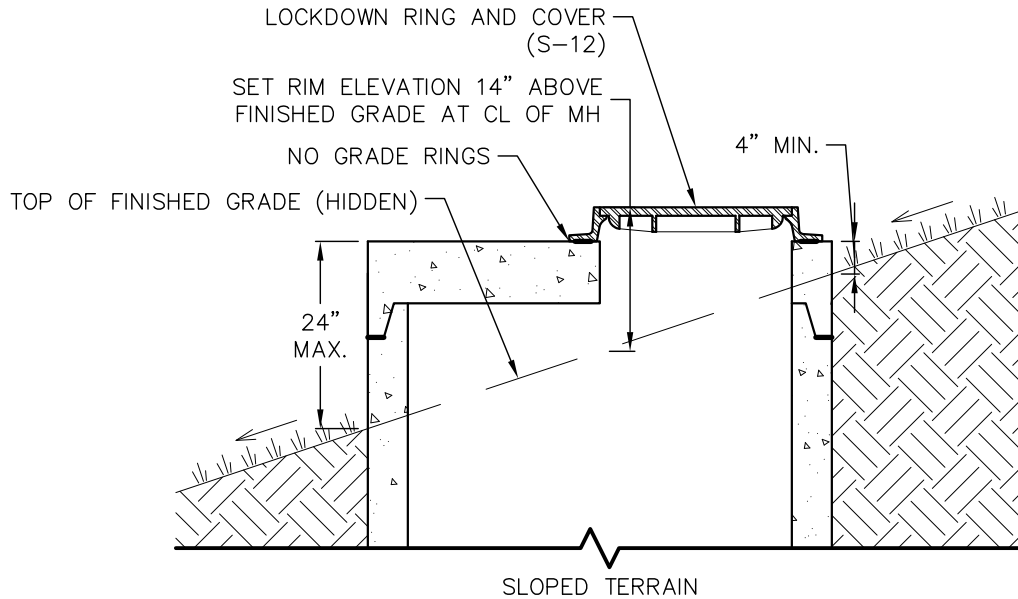
MAY 13, 2014



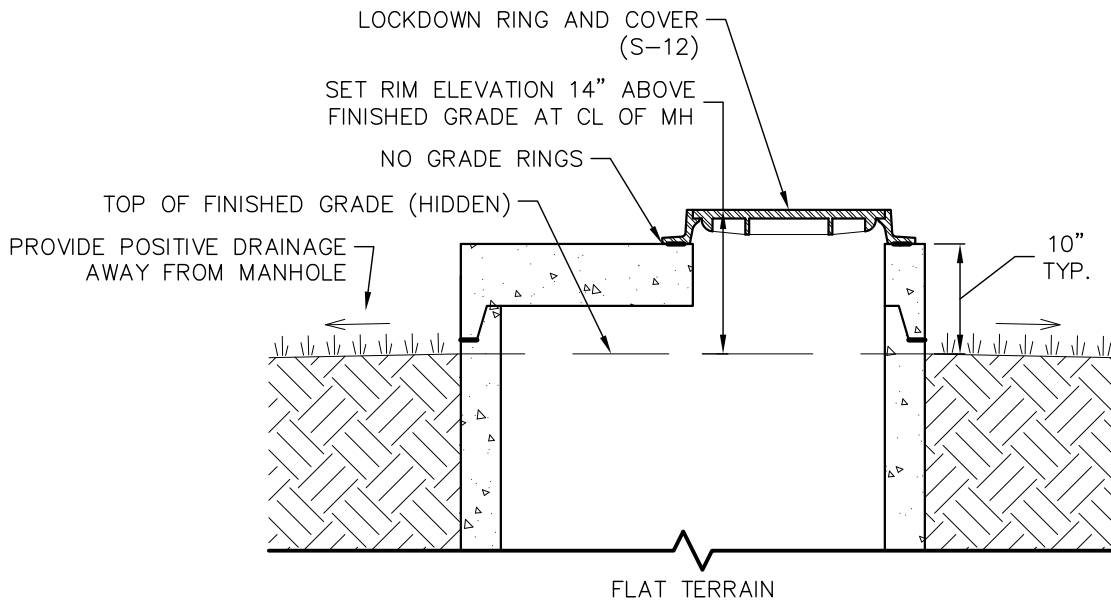
SEE DRAWING S-9 FOR FINISHING IN PAVED SURFACES

APPLICATION NOTES:

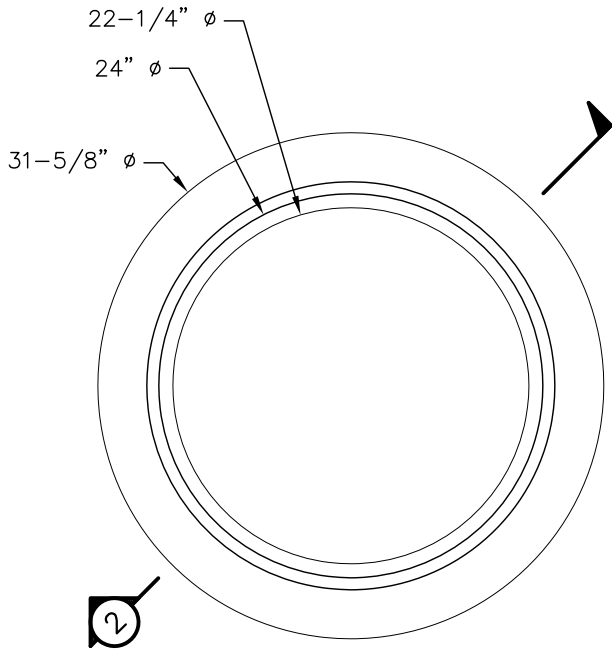
- USE FLAT TOP MANHOLES IN LOCATIONS OUTSIDE OF ASPHALT



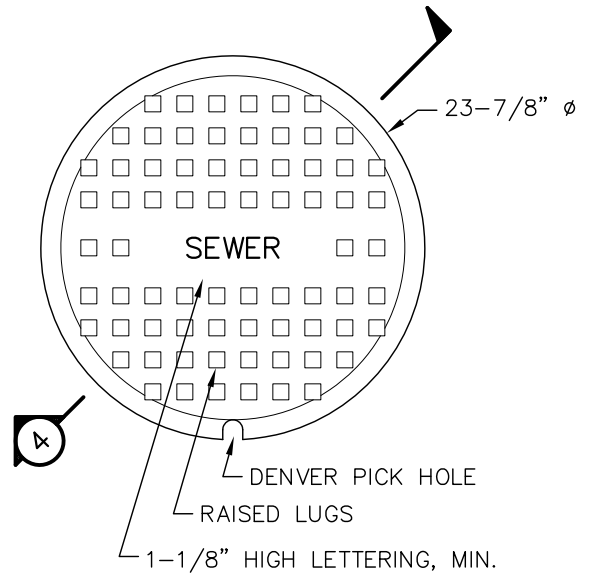
① MANHOLE OUTSIDE OF PAVEMENT  
1" = 2'



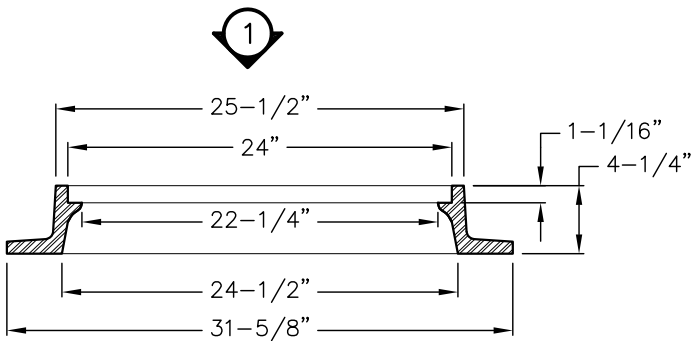
② MANHOLE OUTSIDE OF PAVEMENT  
1" = 2'



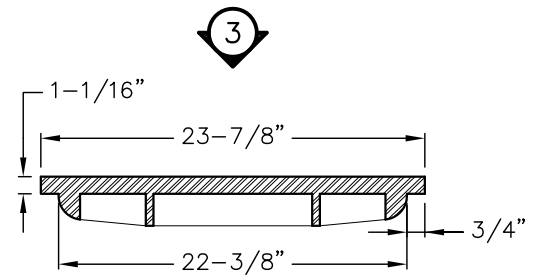
1 REGULAR RING PLAN  
1" = 1'



3 REGULAR COVER PLAN  
1" = 1'



2 REGULAR RING SECTION  
1" = 1'



4 REGULAR COVER SECTION  
1" = 1'



**WOODMOOR**  
WATER & SANITATION DISTRICT NO. 1

STANDARD SEWER RING & COVER  
SANITARY UTILITY SEWERAGE STRUCTURES

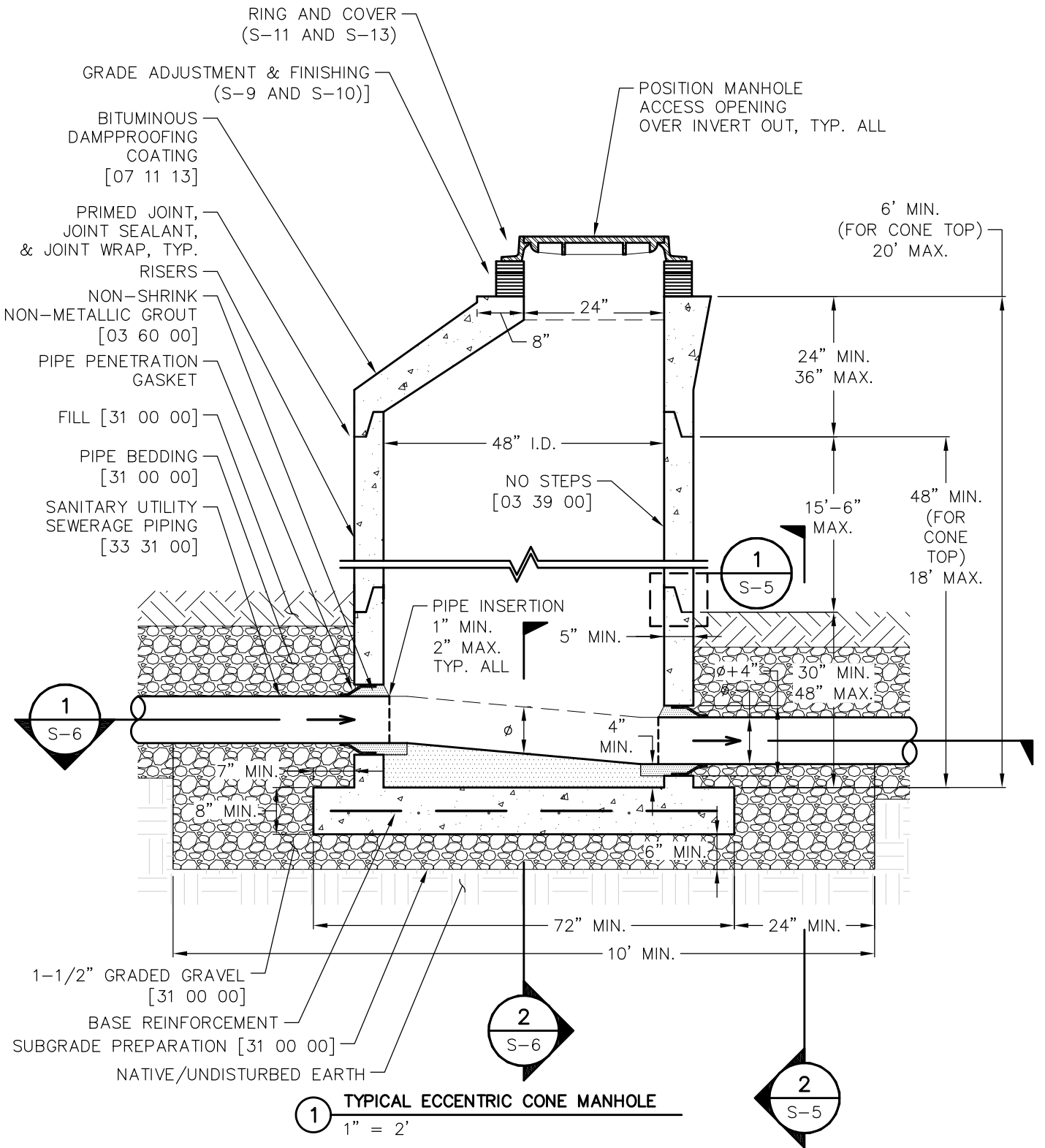
THIS CONSTRUCTION DETAIL SHOWS GENERAL CONFORMANCE TO SYSTEM SPECIFICATIONS AND MAY NEED TO BE ADJUSTED FOR SPECIFIC APPLICATIONS.

S-11

33 39 00

MAY 13, 2014

SEE DRAWING S-3 FOR TYPICAL FLAT TOP MANHOLE



**WOODMOOR**  
WATER & SANITATION DISTRICT NO. 1

TYPICAL ECCENTRIC CONE MANHOLE  
SANITARY UTILITY SEWERAGE STRUCTURES

S-2

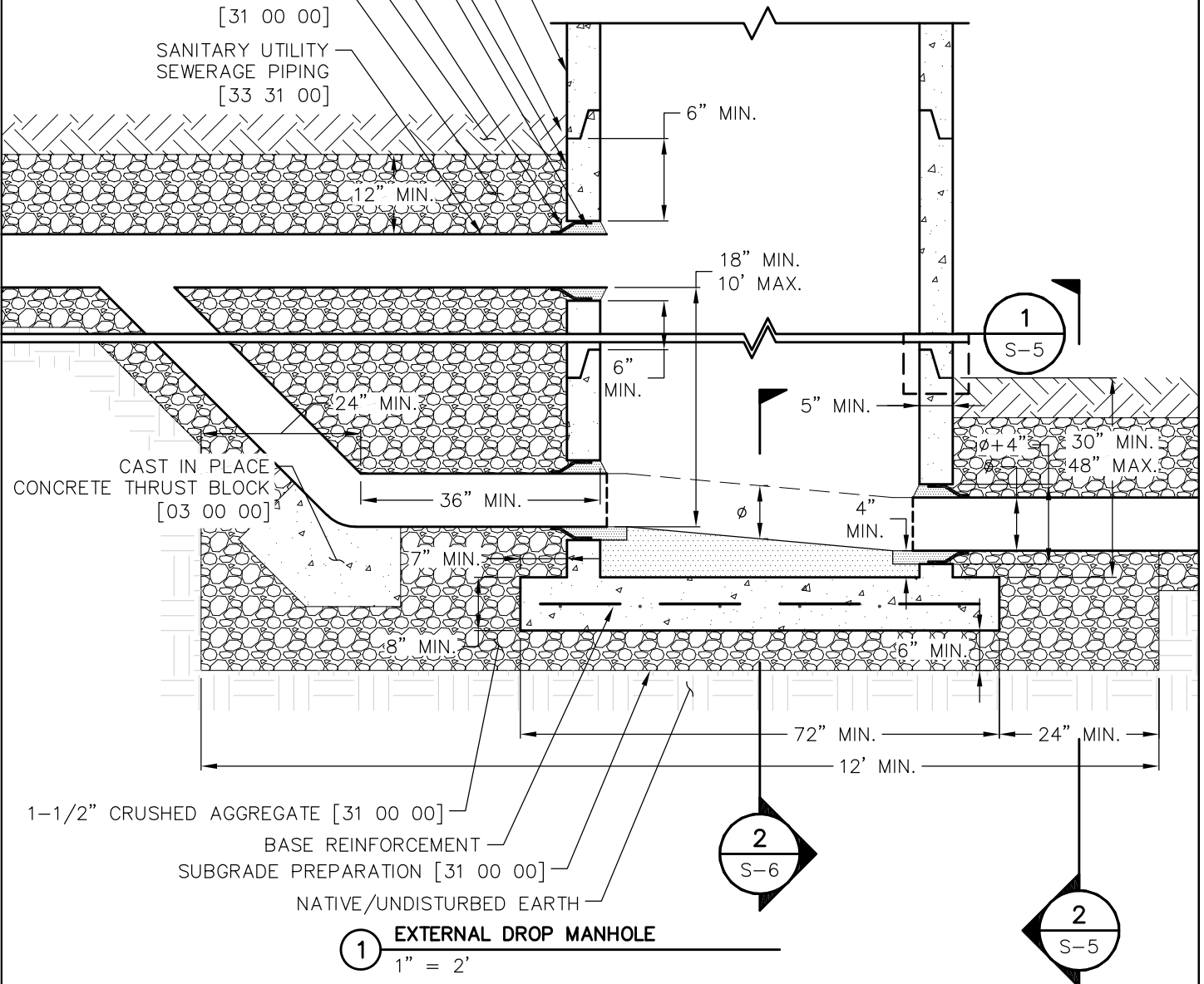
33 39 00

THIS CONSTRUCTION DETAIL SHOWS GENERAL CONFORMANCE TO SYSTEM SPECIFICATIONS AND MAY NEED TO BE ADJUSTED FOR SPECIFIC APPLICATIONS.

MAY 13, 2014

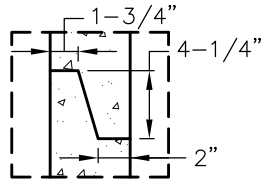
- BITUMINOUS DAMPROOFING [07 11 13]
- PRIMED JOINT, JOINT SEALANT, & JOINT WRAP, TYP.
- RISERS
- NON-SHRINK NON-METALLIC GROUT [03 60 00]
- PIPE PENETRATION GASKET FILL [31 00 00]
- PIPE BEDDING [31 00 00]
- SANITARY UTILITY SEWERAGE PIPING [33 31 00]

**APPLICATION NOTES:**  
 - DROP MANHOLES CAN BE FINISHED WITH ECCENTRIC CONE OR FLAT TOP, DEPENDING ON APPLICATION (SEE DRAWING S-2 AND S-3)

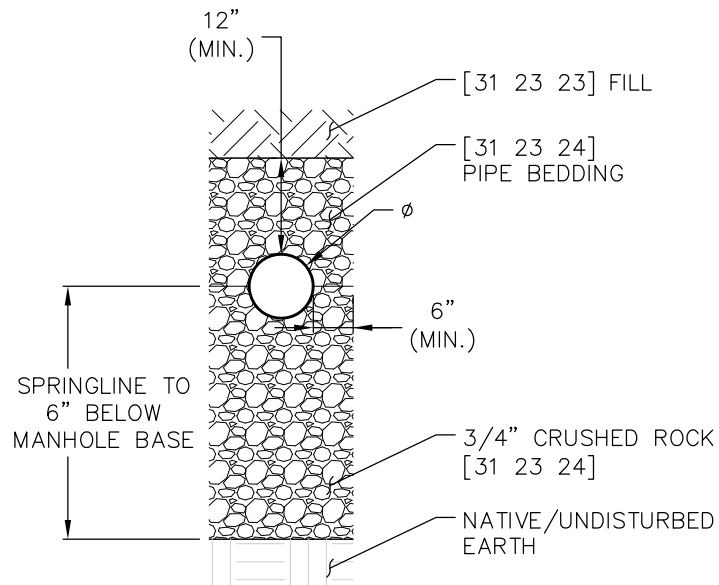


- 1-1/2" CRUSHED AGGREGATE [31 00 00]
- BASE REINFORCEMENT
- SUBGRADE PREPARATION [31 00 00]
- NATIVE/UNDISTURBED EARTH

	TYPICAL DROP MANHOLE	S-4
	SANITARY UTILITY SEWERAGE STRUCTURES	33 39 00
	THIS CONSTRUCTION DETAIL SHOWS GENERAL CONFORMANCE TO SYSTEM SPECIFICATIONS AND MAY NEED TO BE ADJUSTED FOR SPECIFIC APPLICATIONS.	MAY 13, 2014

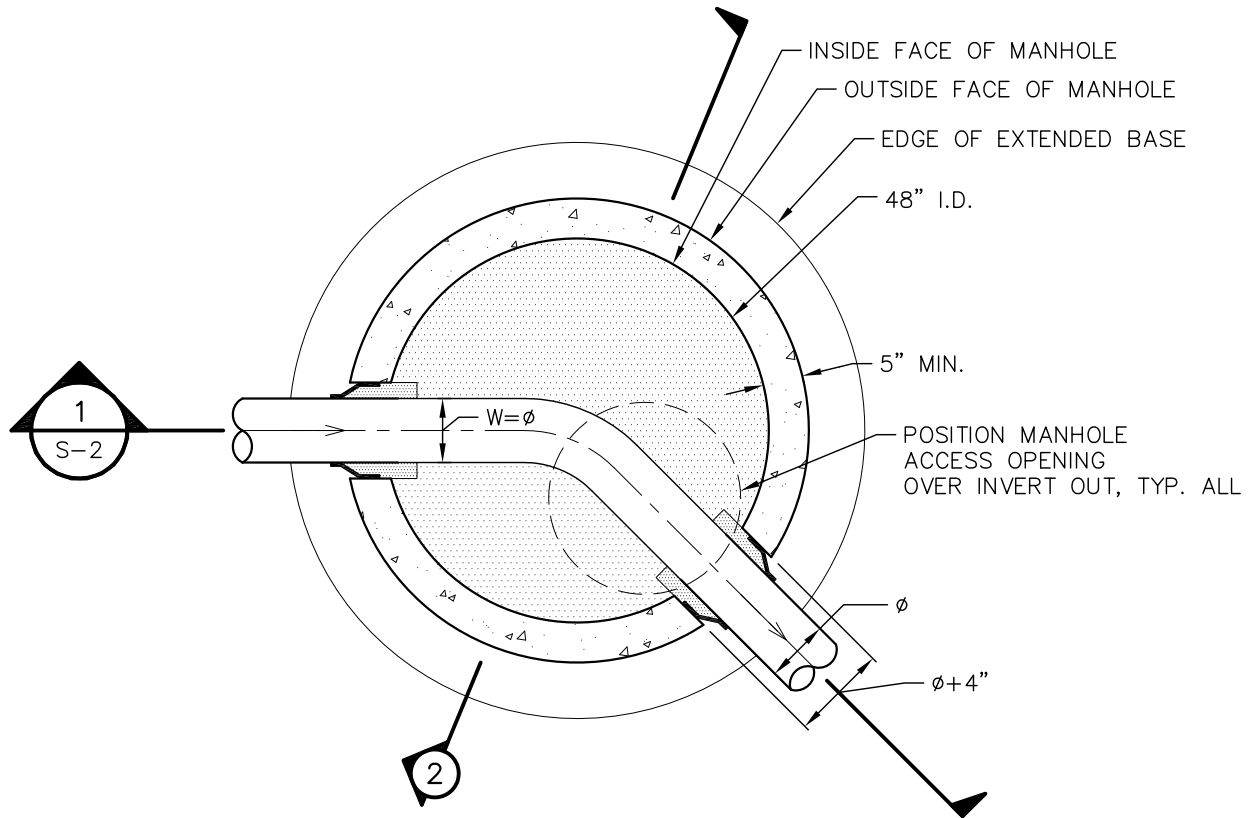


① TONGUE AND GROOVE JOINT  
1" = 1'



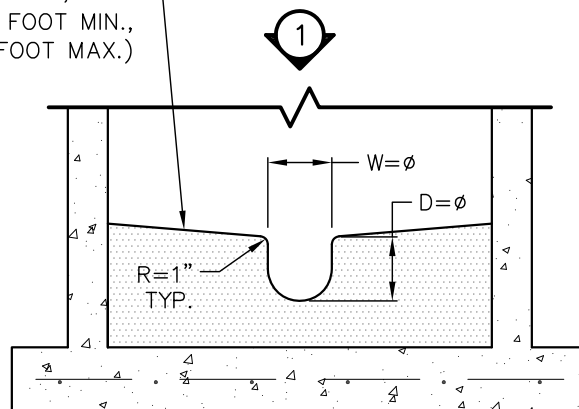
② PIPE BEDDING AT CONNECTION TO MANHOLE  
1" = 2'

SEE DRAWING S-7 FOR HIGH-VELOCITY CHANNEL AND BENCH



① STANDARD CHANNEL AND BENCH (PLAN)  
1" = 2'

SLOPE BENCH TOWARDS CHANNEL  
AT 1" PER FOOT, TYP.  
(½" PER FOOT MIN.,  
1-½" PER FOOT MAX.)



② STANDARD CHANNEL AND BENCH (SECTION)  
1" = 2'



**WOODMOOR**  
WATER & SANITATION DISTRICT NO. 1

SEWER MANHOLE STANDARD BASE  
SANITARY UTILITY SEWERAGE STRUCTURES

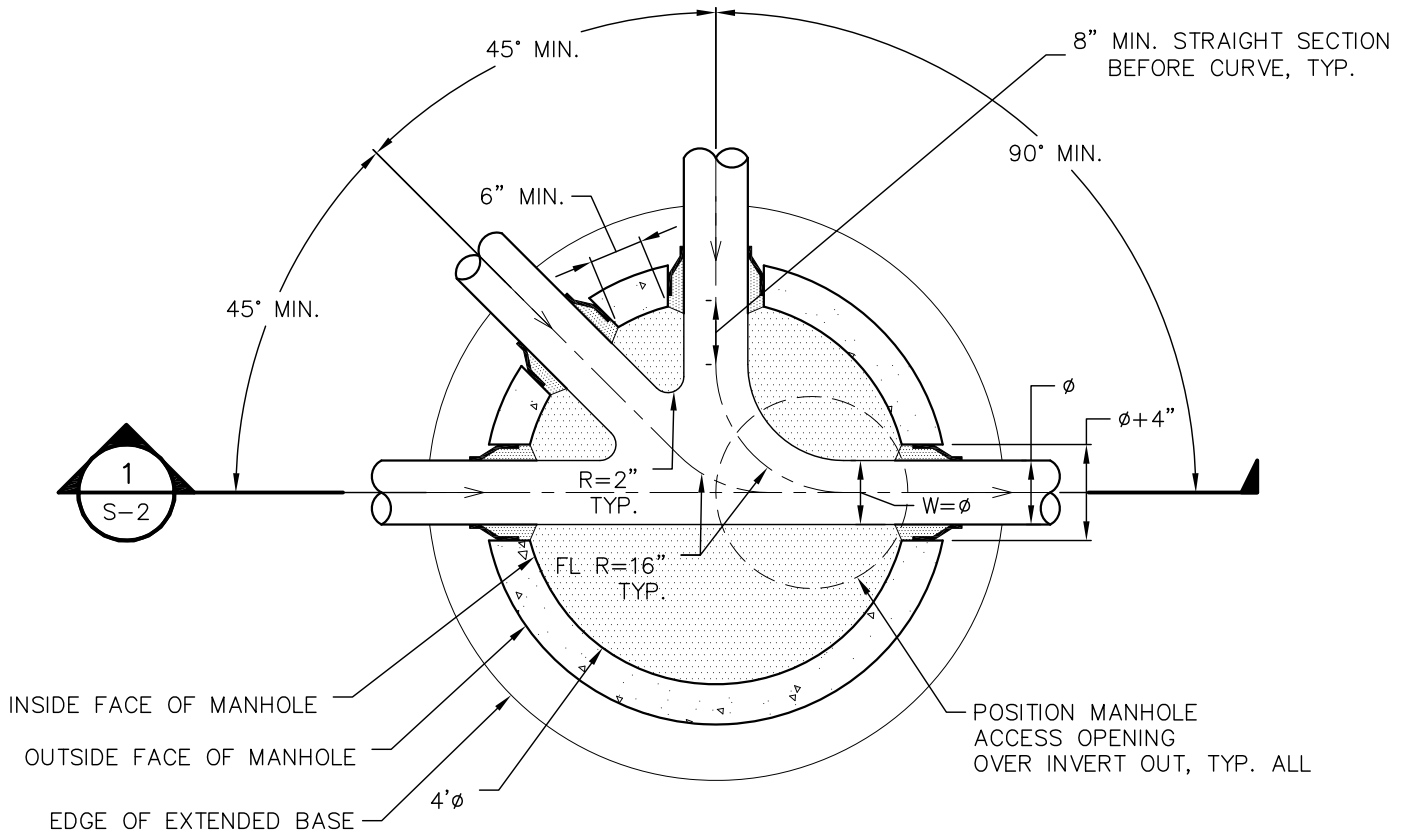
THIS CONSTRUCTION DETAIL SHOWS GENERAL CONFORMANCE TO SYSTEM SPECIFICATIONS AND MAY NEED TO BE ADJUSTED FOR SPECIFIC APPLICATIONS.

S-6


33 39 00

MAY 13, 2014

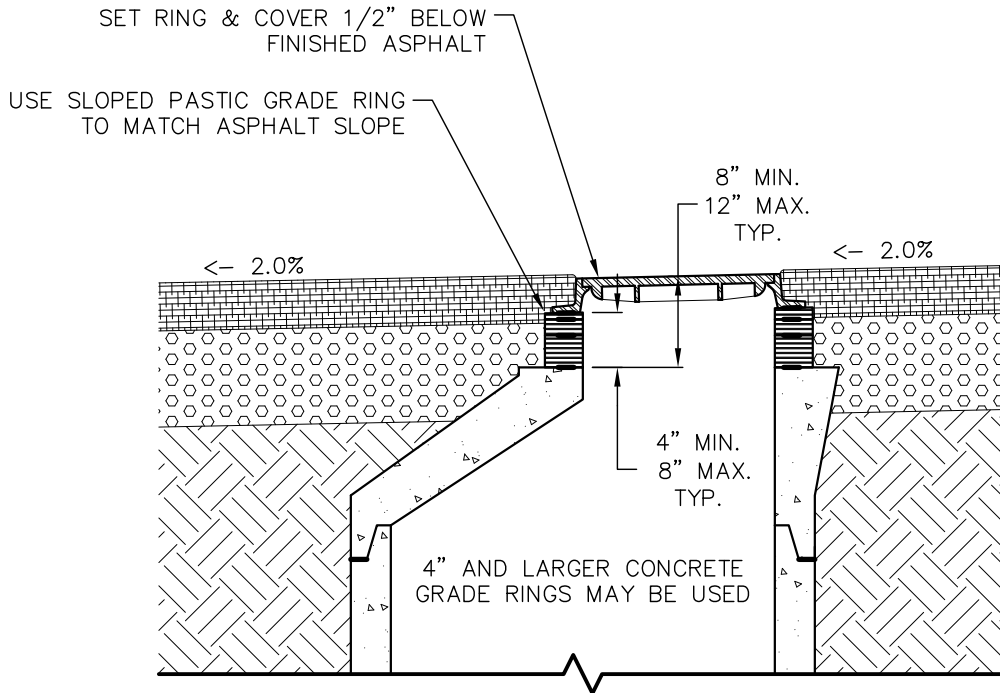
CHANNEL DROP FROM INVERT IN TO INVERT OUT SHALL BE 0.3 FEET.



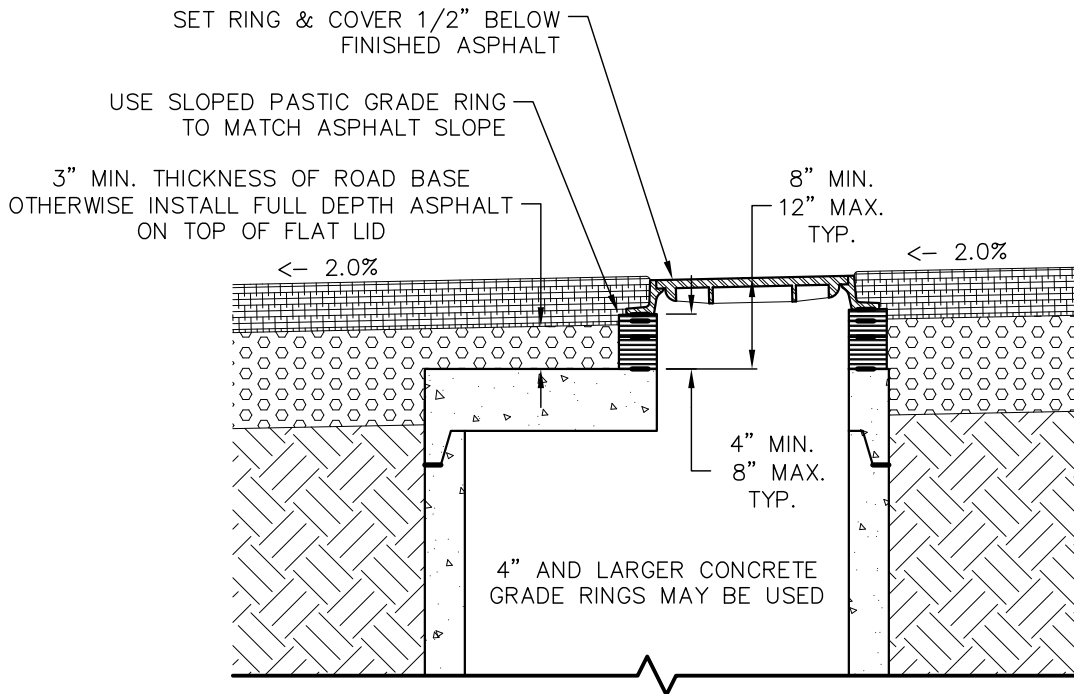
1 CHANNEL GEOMETRY  
1" = 2'

 <b>WOODMOOR</b> WATER & SANITATION DISTRICT NO. 1	<b>BASE GEOMETRY</b>	<b>S-8</b>
	<b>SANITARY UTILITY SEWERAGE STRUCTURES</b>	
	<small>THIS CONSTRUCTION DETAIL SHOWS GENERAL CONFORMANCE TO SYSTEM SPECIFICATIONS AND MAY NEED TO BE ADJUSTED FOR SPECIFIC APPLICATIONS.</small>	
		<small>MAY 13, 2014</small>

SEE DRAWING S-10 FOR FINISHING IN NON-PAVED SURFACES



1 CONE TOP MANHOLE IN PAVEMENT  
1" = 2'



2 FLAT TOP MANHOLE IN PAVEMENT  
1" = 2'



**WOODMOOR**  
WATER & SANITATION DISTRICT NO. 1

MANHOLES IN PAVED AREAS  
SANITARY UTILITY SEWERAGE STRUCTURES

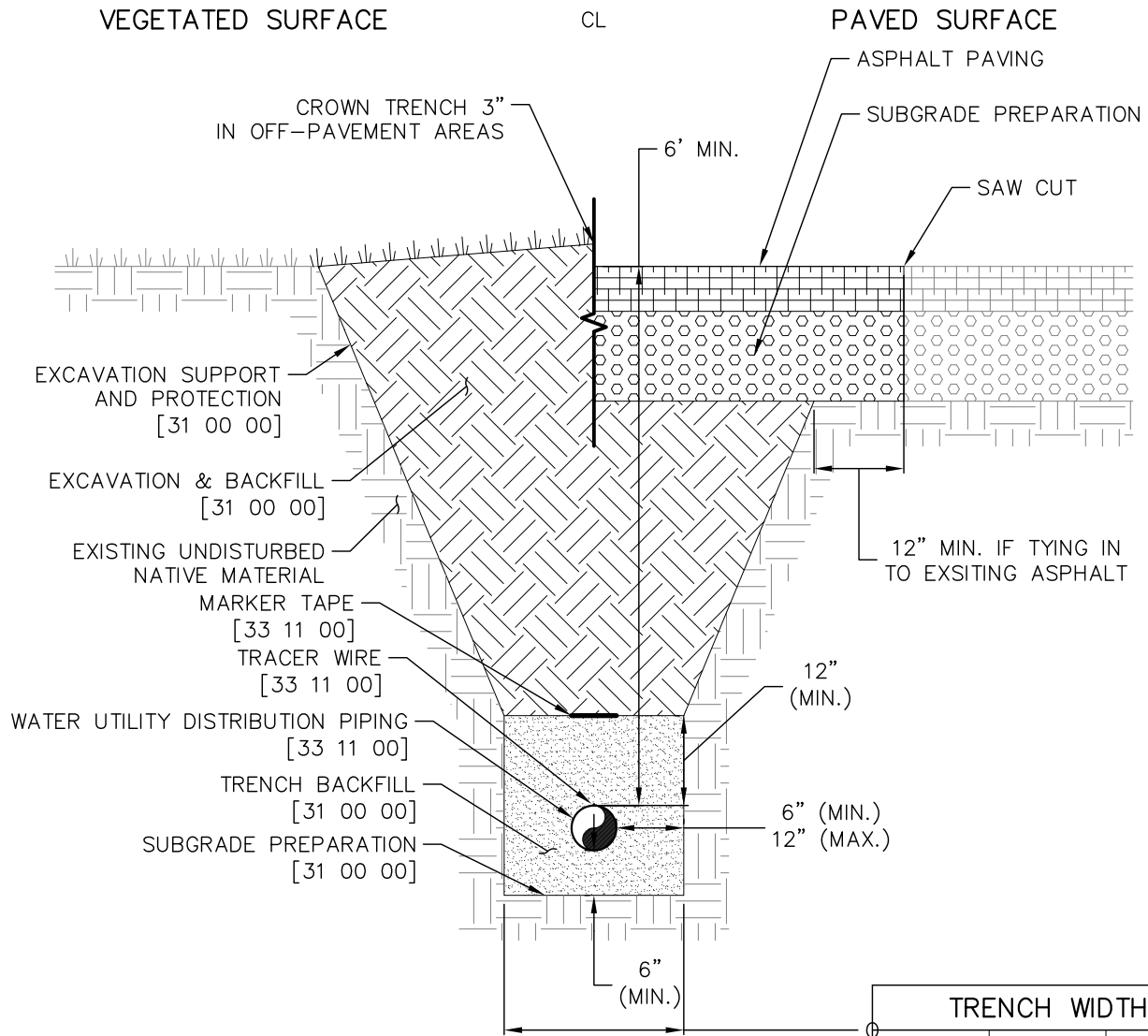
S-9

33 39 00

THIS CONSTRUCTION DETAIL SHOWS GENERAL CONFORMANCE TO SYSTEM SPECIFICATIONS AND MAY NEED TO BE ADJUSTED FOR SPECIFIC APPLICATIONS.

MAY 13, 2014



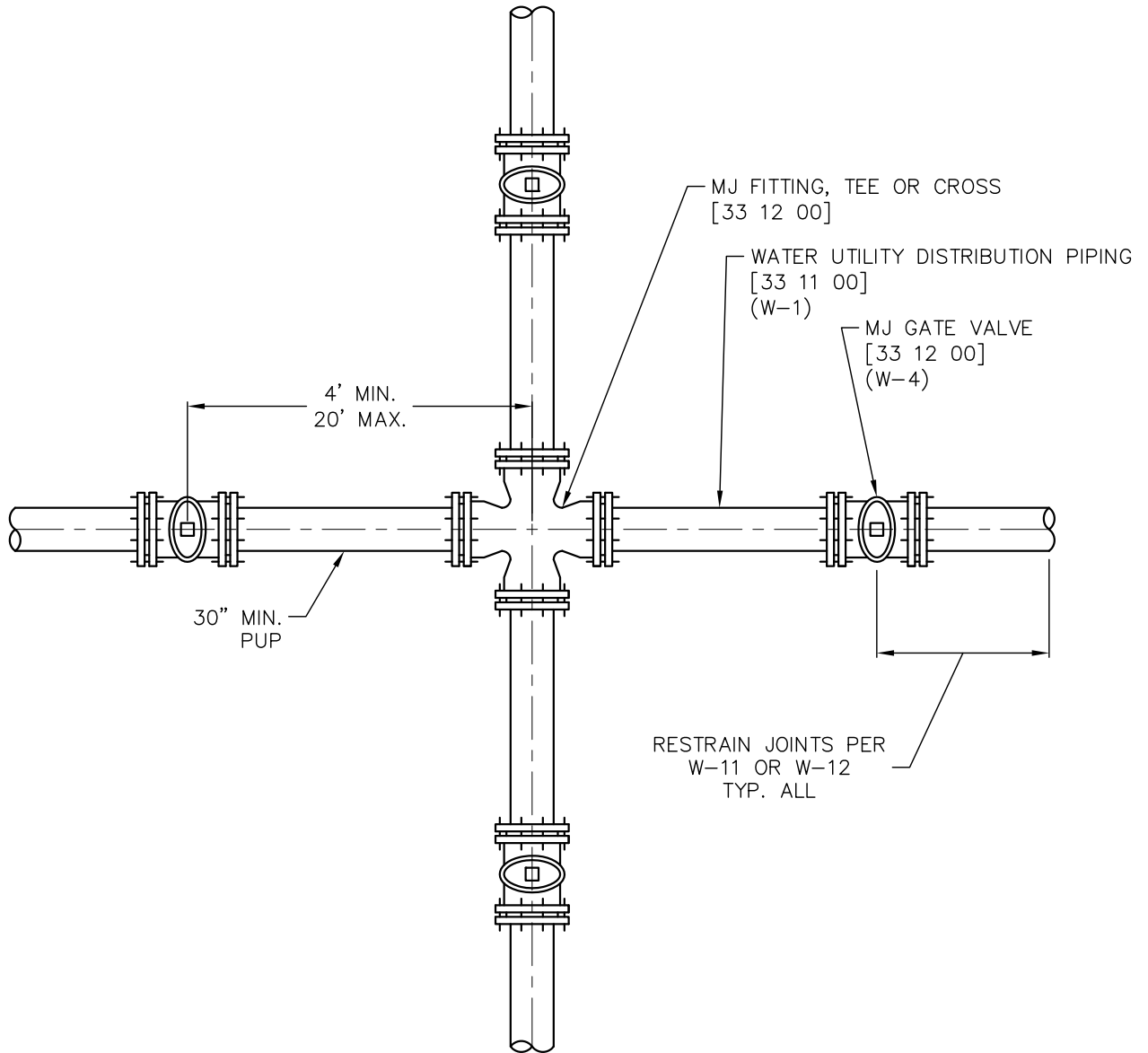


1 TYPICAL WATER TRENCH (SECTION)  
1"=2'


PIPE DIAMETER	TRENCH WIDTH	
	MINIMUM WIDTH	MAXIMUM WIDTH
4"	1'-4"	2'-4"
6"	1'-6"	2'-6"
8"	1'-8"	2'-8"
10"	1'-10"	2'-10"
12"	2'-0"	3'-0"
14"	2'-2"	3'-2"

GENERAL NOTES:

- EARTHWORK, TRACER WIRE, AND PIPE WRAP OMITTED FOR CLARITY.



① TYPICAL JUNCTION ASSEMBLY (PLAN)  
1"=2'

 <b>WOODMOOR</b> WATER & SANITATION DISTRICT NO. 1	WATER MAIN JUNCTION	W-10
	WATER UTILITY DISTRIBUTION EQUIPMENT	33 12 00
	<small>THIS CONSTRUCTION DETAIL SHOWS GENERAL CONFORMANCE TO SYSTEM SPECIFICATIONS AND MAY NEED TO BE ADJUSTED FOR SPECIFIC APPLICATIONS.</small>	<small>MAY 13, 2014</small>

TEE'S			
NOMINAL RUN DIAMETER	NOMINAL BRANCH DIAMETER	RUN	BRANCH
[IN]	[IN]	[FT]	[FT]
4"	4"	10	F.O.
4"	6"	10	8
4"	8"	10	42
6"	4"	10	F.O.
6"	6"	10	F.O.
6"	8"	10	21
8"	4"	10	F.O.
8"	6"	10	F.O.
8"	8"	10	2

**CALCULATION METHOD & ASSUMPTIONS**  
**EBAA IRON RESTRAINED LENGTH CALCULATOR (VERSION 5.4)**

PIPE MATERIAL: PVC  
 SOIL TYPE: CH, GRAN. FILL  
 SAFETY FACTOR: 1.5:1  
 TRENCH TYPE: 5  
 DEPTH OF BURY: 6 FEET  
 TEST PRESSURE: 200 PSI

REDUCERS		
NOMINAL LARGE DIAMETER	NOMINAL SMALL DIAMETER	LENGTH
[IN]	[IN]	[FT]
6"	4"	32
8"	4"	59
8"	6"	35

DEAD-ENDS AND VALVES	
NOMINAL PIPE DIAMETER	LENGTH
[IN]	[FT]
4"	44
6"	62
8"	82

HORIZONTAL AND VERTICAL BENDS										
NOMINAL PIPE DIAMETER	HORIZONTAL BENDS				VERTICAL BENDS (OFFSETS)					
					45°		22.5°		12.5°	
	90°	45°	22.5°	11.25°	UPPER	LOWER	UPPER	LOWER	UPPER	LOWER
[IN]	[FT]	[FT]	[FT]	[FT]	[FT]	[FT]	[FT]	[FT]	[FT]	[FT]
4"	90°	5	3	2	19	5	9	3	5	2
6"	BENDS NOT ALLOWED	7	4	2	26	7	13	3	7	2
8"		10	5	3	34	8	17	4	9	2

**NOTES:**

1. RESTRAINED PIPE LENGTH SHALL BE ACHIEVED WITH MECHANICAL JOINT RESTRAINTS OR BELL RESTRAINTS. DO NOT USE THREADED TIE RODS OR CONCRETE KICKER BLOCKS.
2. FOR VALVES, BENDS, AND TEE RUNS THE LENGTHS OF TIED PIPES ARE MEASURED EACH WAY.
3. FOR DEAD-ENDS, TEE BRANCHES, AND REDUCERS THE LENGTHS OF TIED PIPE ARE MEASURED ONE WAY IN THE OPPOSITE DIRECTION OF THE APPLIED THRUST.
4. F.O. = MECHANICAL JOINT RESTRAINT AT FITTING ONLY.



**WOODMOOR**  
 WATER & SANITATION DISTRICT NO. 1

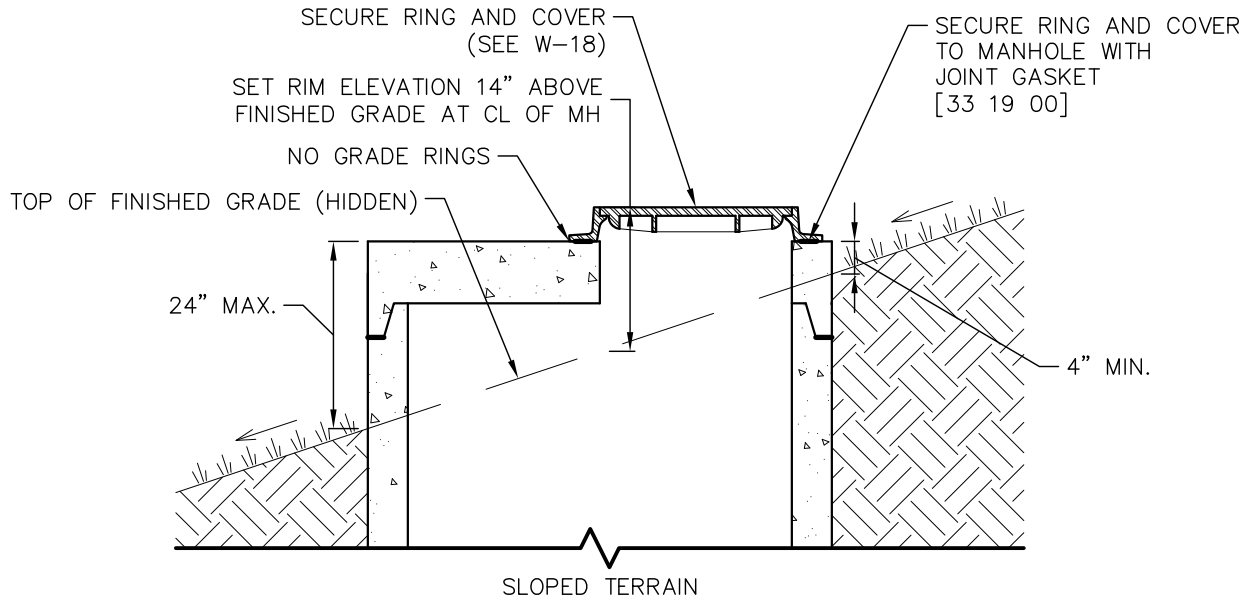
LENGTH OF RESTRAINED PIPE (PVC)  
 WATER UTILITY DISTRIBUTION EQUIPMENT

W-11  
 33 12 00

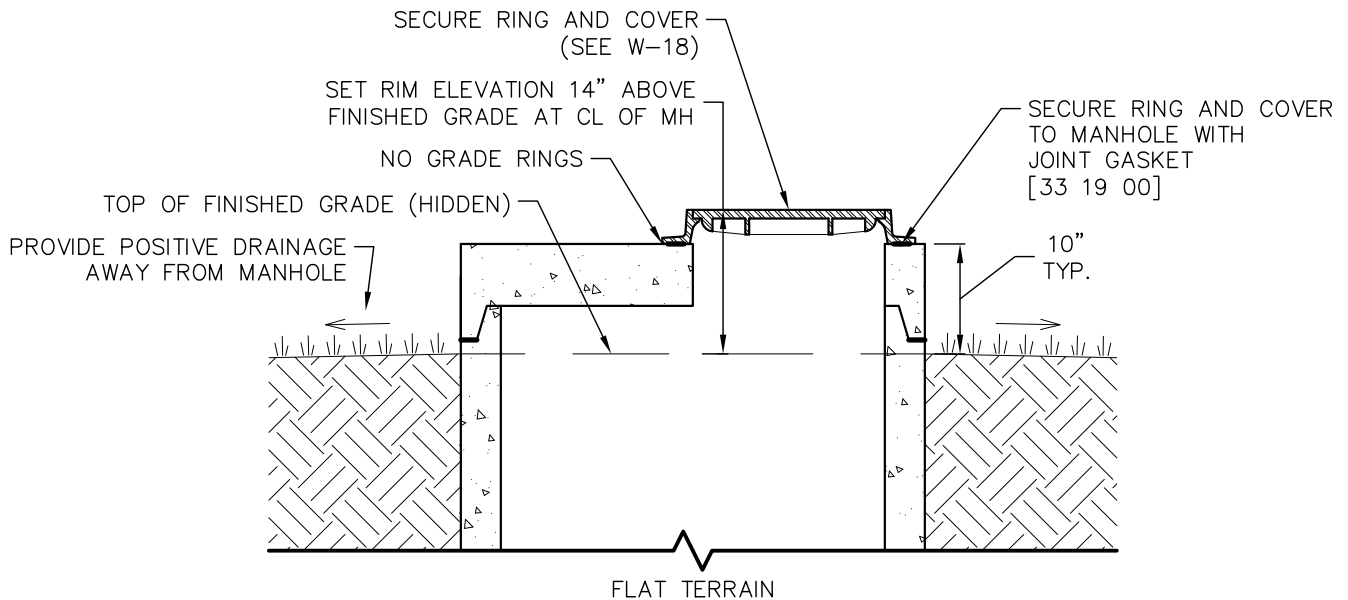
THIS CONSTRUCTION DETAIL SHOWS GENERAL CONFORMANCE TO SYSTEM SPECIFICATIONS AND MAY NEED TO BE ADJUSTED FOR SPECIFIC APPLICATIONS.

MAY 13, 2014

SEE DRAWING W-15 FOR FINISHING IN PAVED SURFACES



1 MANHOLE OUTSIDE OF PAVEMENT  
1" = 2'



2 MANHOLE OUTSIDE OF PAVEMENT  
1" = 2'



**WOODMOOR**  
WATER & SANITATION DISTRICT NO. 1

MANHOLES IN UNPAVED AREAS

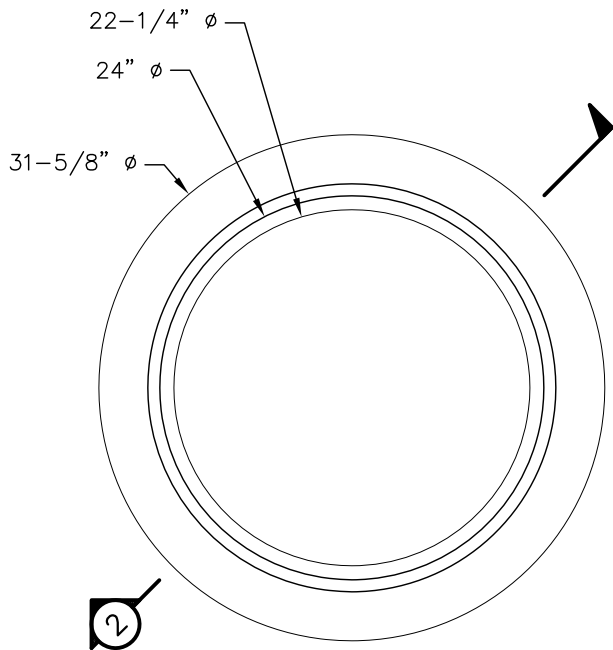
W-16

WATER UTILITY STRUCTURES

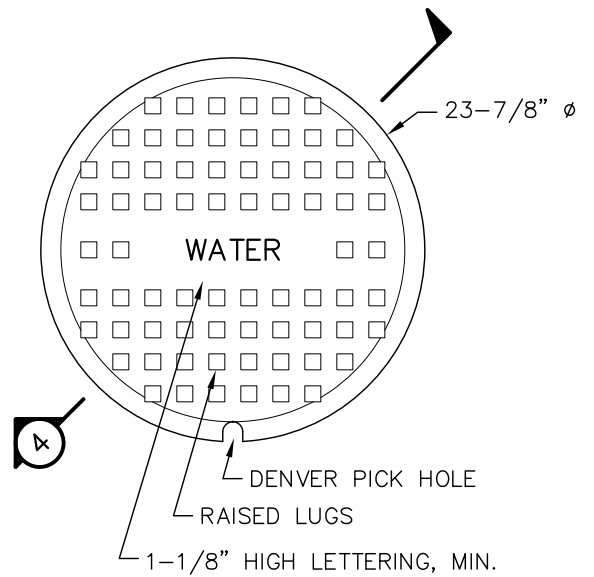
33 19 00

THIS CONSTRUCTION DETAIL SHOWS GENERAL CONFORMANCE TO SYSTEM SPECIFICATIONS AND MAY NEED TO BE ADJUSTED FOR SPECIFIC APPLICATIONS.

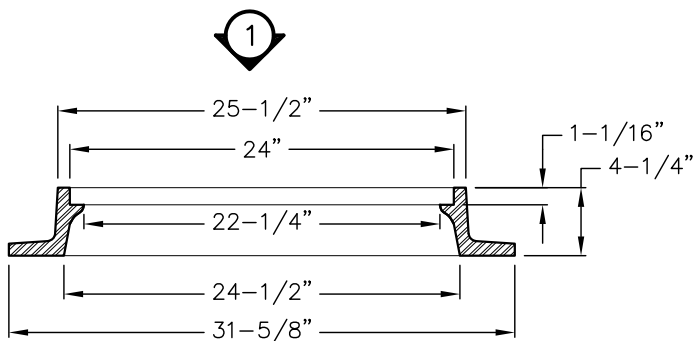
MAY 13, 2014



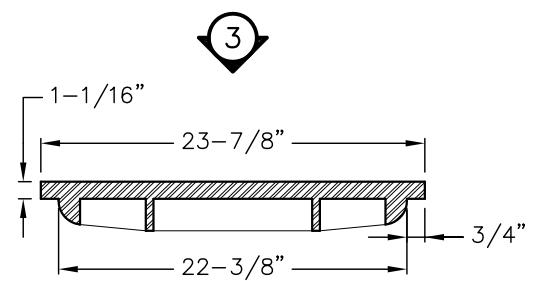
1 REGULAR RING PLAN  
1" = 1'



3 REGULAR COVER PLAN  
1" = 1'



2 REGULAR RING SECTION  
1" = 1'



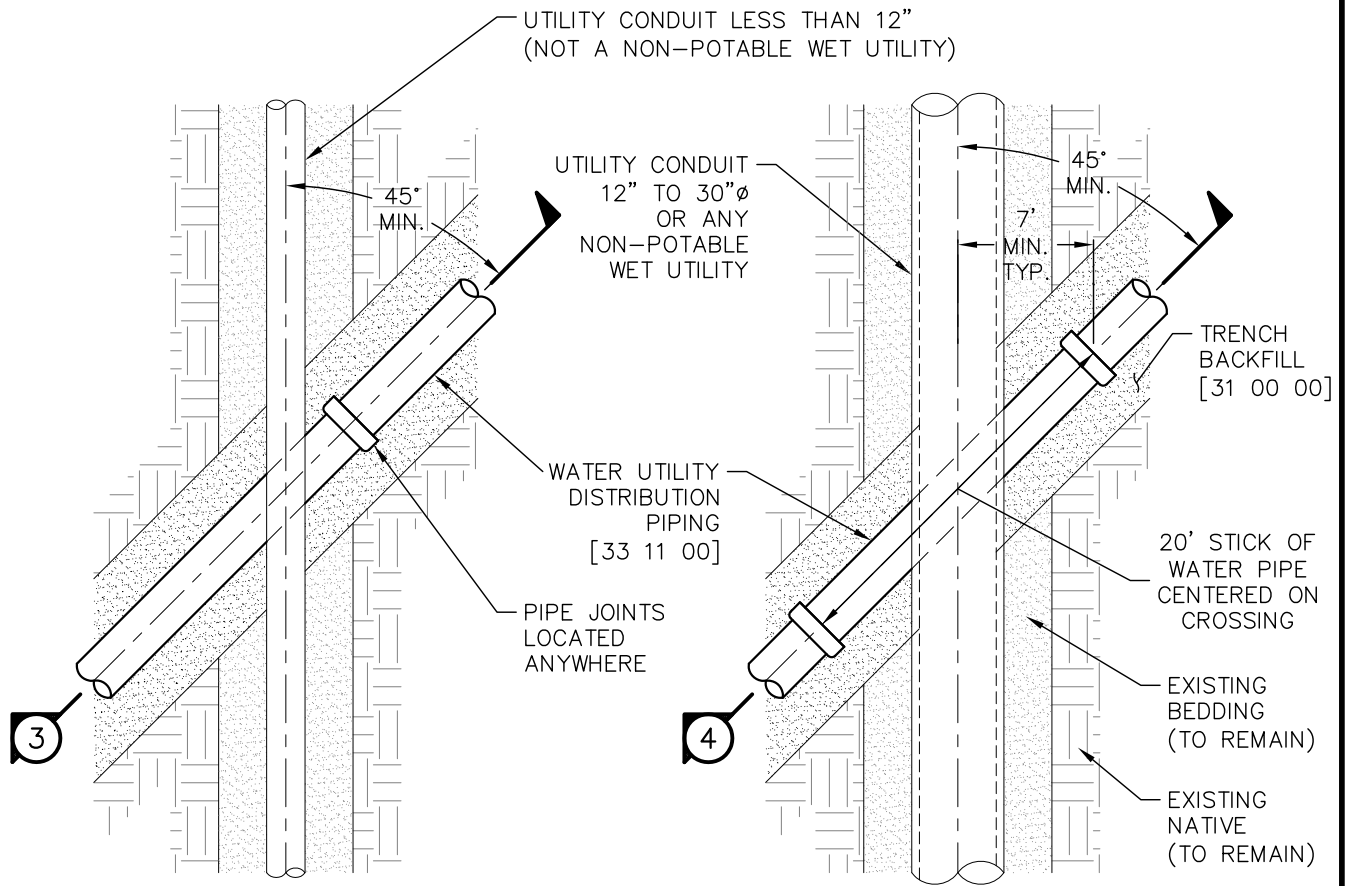
4 REGULAR COVER SECTION  
1" = 1'



**WOODMOOR**  
WATER & SANITATION DISTRICT NO. 1

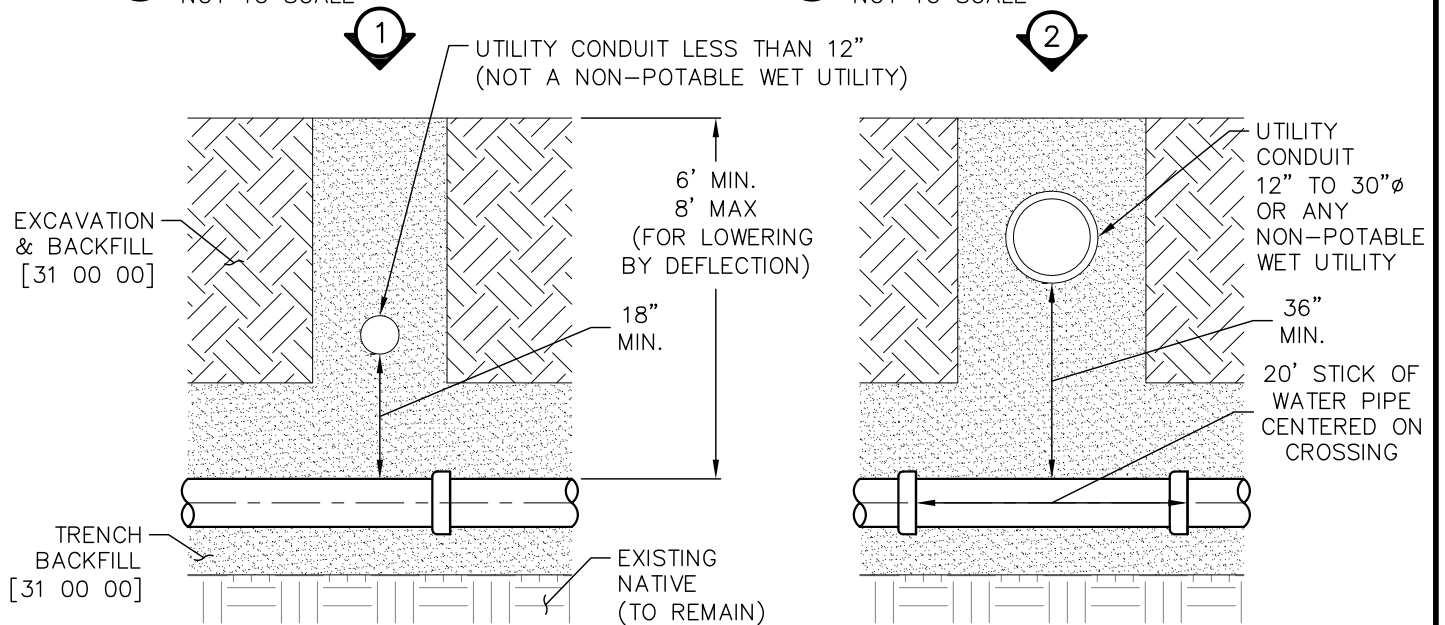
STANDARD WATER RING & COVER  
WATER UTILITY STRUCTURES  
THIS CONSTRUCTION DETAIL SHOWS GENERAL CONFORMANCE TO SYSTEM SPECIFICATIONS AND MAY NEED TO BE ADJUSTED FOR SPECIFIC APPLICATIONS.

W-17  
33 19 00  
MAY 13, 2014



1 WATER UNDER SMALL CONDUIT (PLAN)  
NOT TO SCALE

2 WATER UNDER LARGE CONDUIT (PLAN)  
NOT TO SCALE



3 WATER UNDER SMALL CONDUIT (SECTION)  
NOT TO SCALE

4 WATER UNDER LARGE CONDUIT (SECTION)  
NOT TO SCALE



**WOODMOOR**  
WATER & SANITATION DISTRICT NO. 1

WATER CROSSING UNDER UTILITIES

W-3

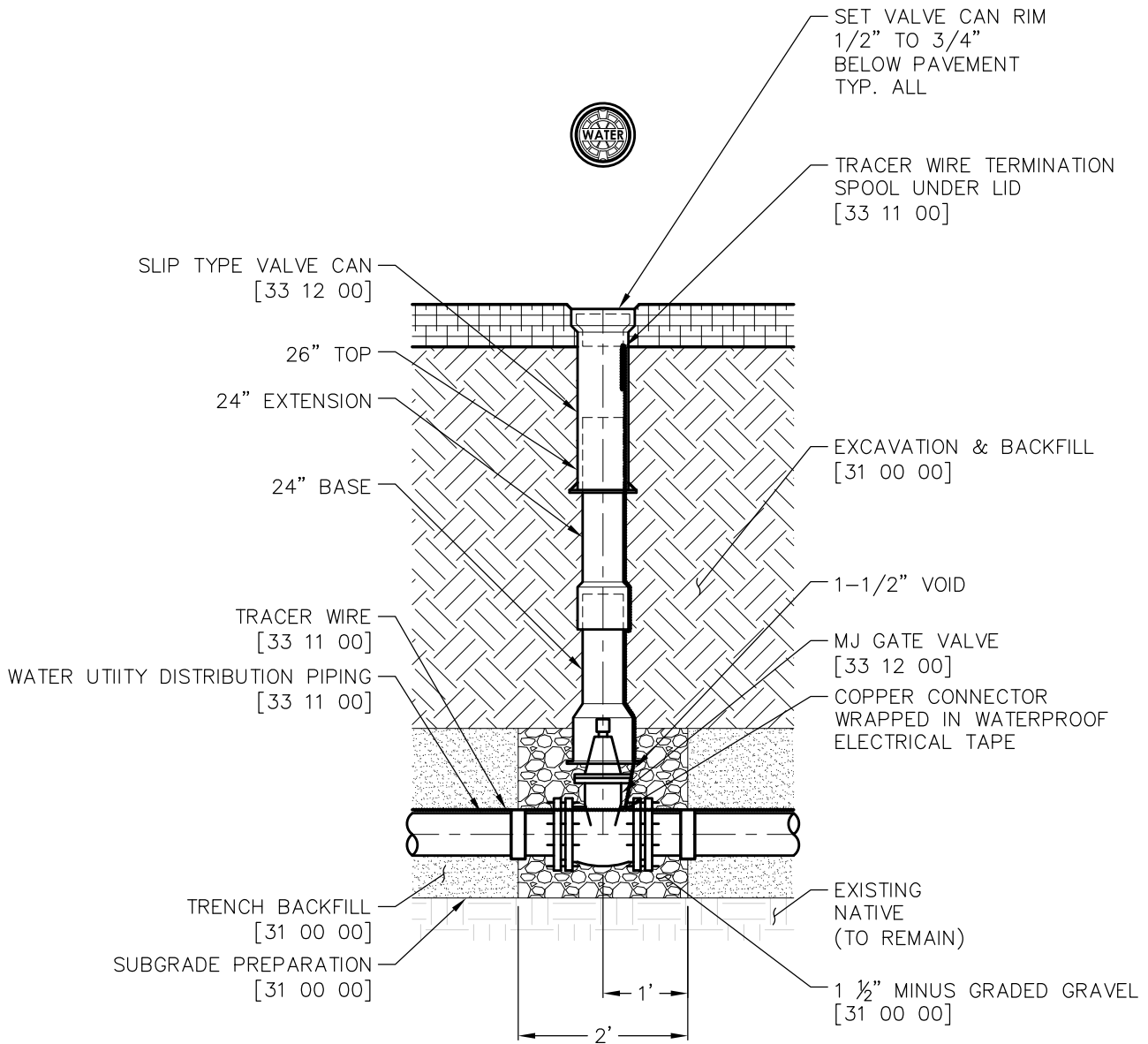
WATER UTILITY DISTRIBUTION PIPING

33 11 00

THIS CONSTRUCTION DETAIL SHOWS GENERAL CONFORMANCE TO SYSTEM SPECIFICATIONS AND MAY NEED TO BE ADJUSTED FOR SPECIFIC APPLICATIONS.

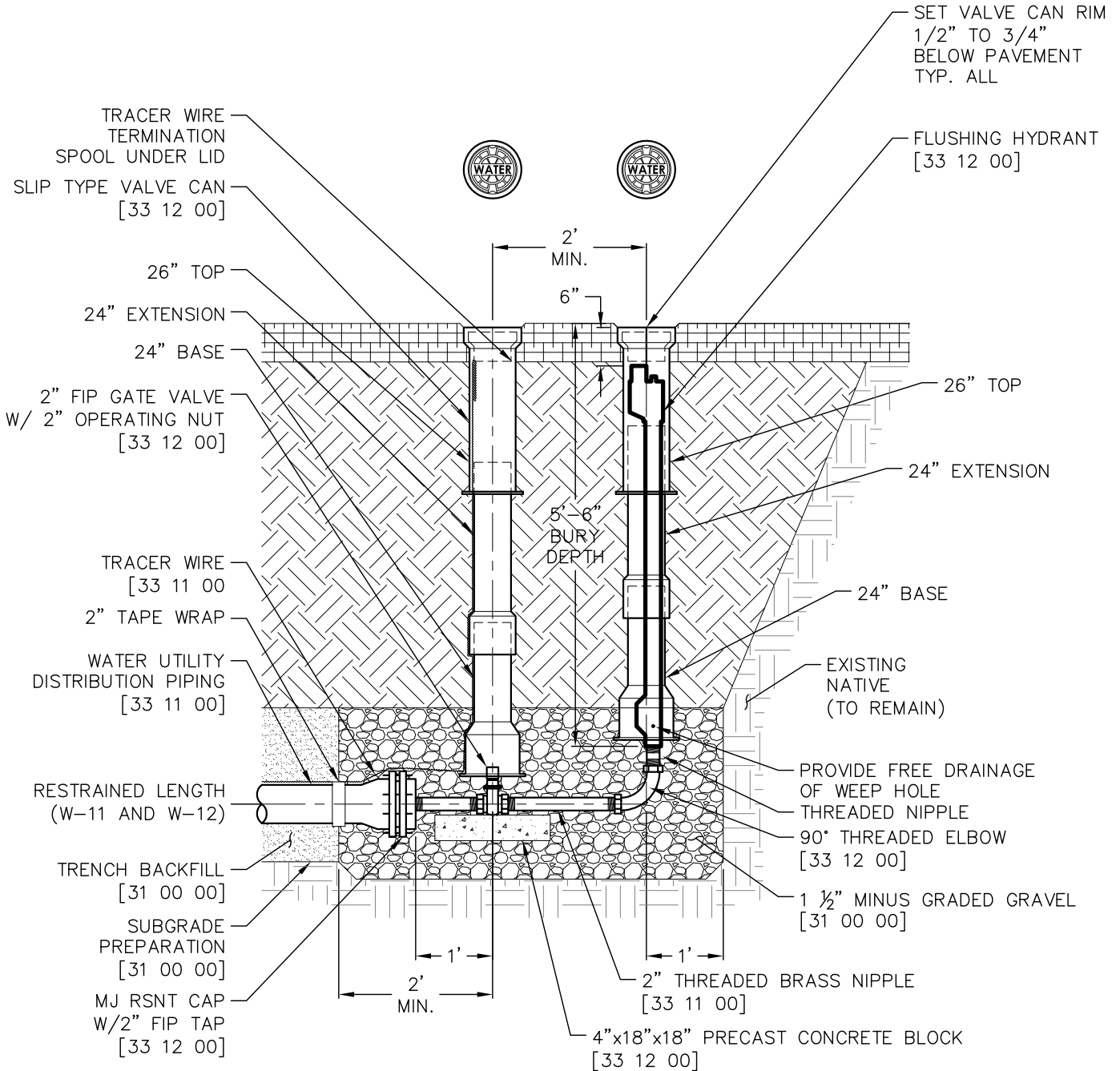
MAY 13, 2014

FOR INSTALLATIONS IN UNPAVED AREAS  
SEE DRAWING W-6




① GATE VALVE DETAIL  
1"=2'

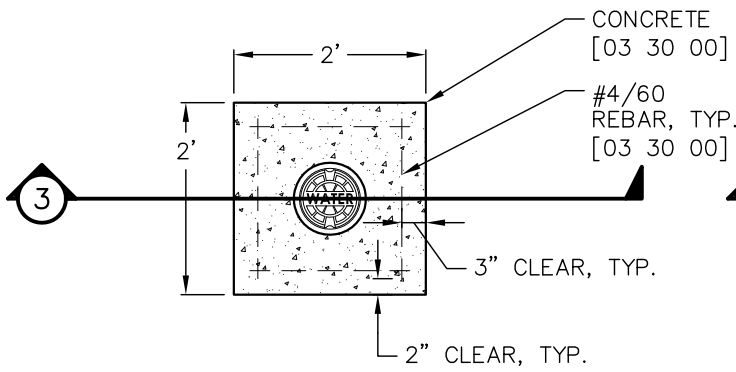
FOR INSTALLATIONS IN UNPAVED AREAS  
SEE DRAWING W-6



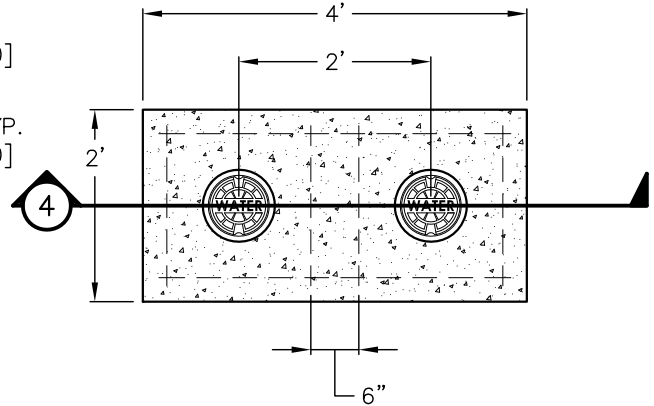
① DEAD-END BLOW-OFF (SECTION)  
NOT TO SCALE

 <b>WOODMOOR</b> WATER & SANITATION DISTRICT NO. 1	DEAD-END BLOW-OFF ASSEMBLY	W-5
	WATER UTILITY DISTRIBUTION EQUIPMENT	33 12 00
	<small>THIS CONSTRUCTION DETAIL SHOWS GENERAL CONFORMANCE TO SYSTEM SPECIFICATIONS AND MAY NEED TO BE ADJUSTED FOR SPECIFIC APPLICATIONS.</small>	

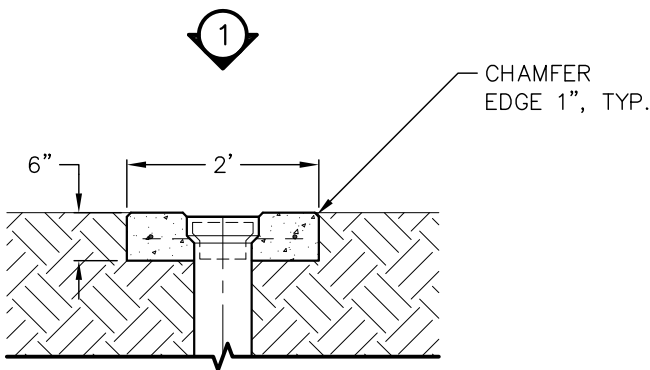




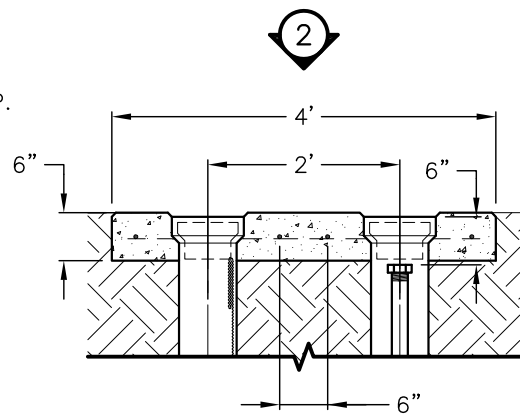
1 CONCRETE COLLAR SINGLE (PLAN)  
 1"=2'



2 CONCRETE COLLAR DOUBLE (PLAN)  
 1"=2'



3 CONCRETE COLLAR SINGLE (SECTION)  
 1"=2'



4 CONCRETE COLLAR DOUBLE (SECTION)  
 1"=2'



**WOODMOOR**  
 WATER & SANITATION DISTRICT NO. 1

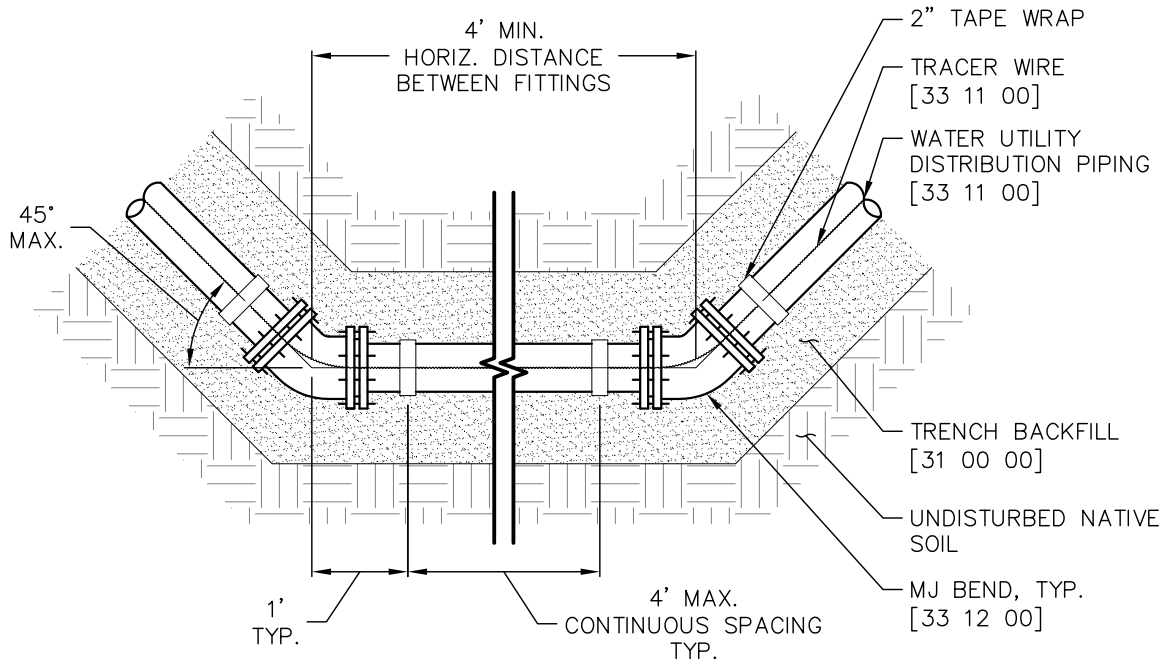
VALVE CANS IN UNPAVED AREAS  
 WATER UTILITY DISTRIBUTION EQUIPMENT

THIS CONSTRUCTION DETAIL SHOWS GENERAL CONFORMANCE TO SYSTEM SPECIFICATIONS AND MAY NEED TO BE ADJUSTED FOR SPECIFIC APPLICATIONS.

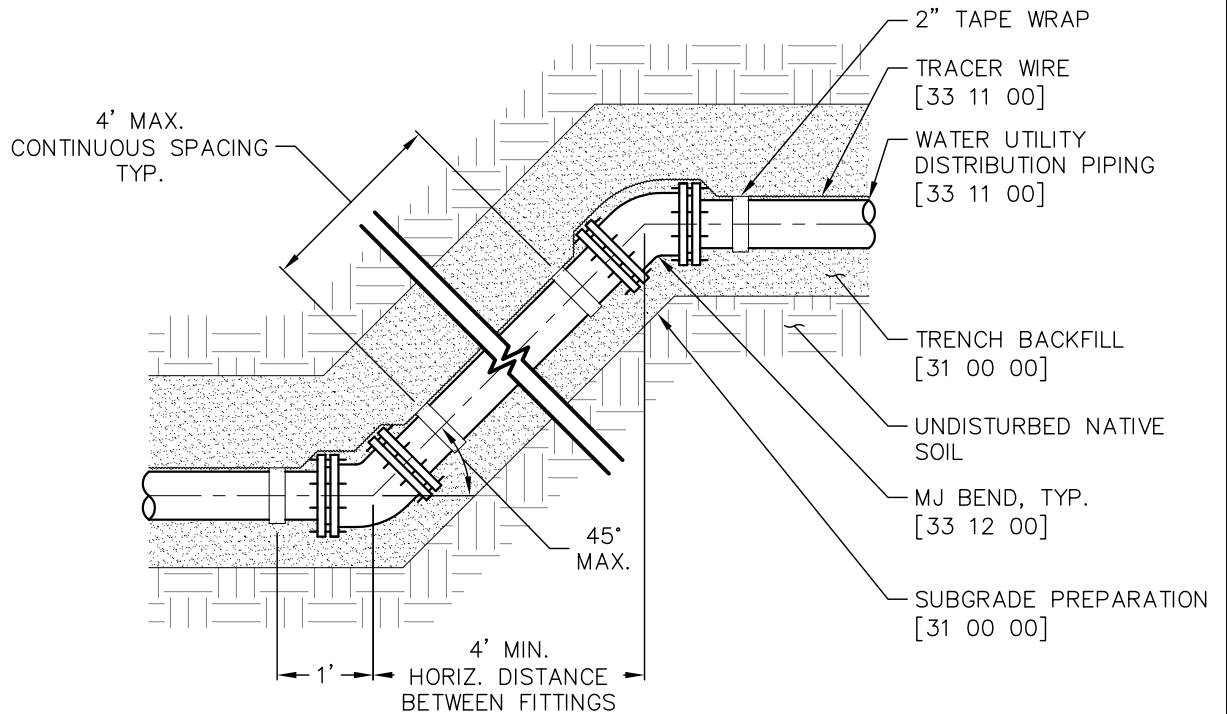
W-6

33 12 00

MAY 13, 2014



① HORIZONTAL BENDS (PLAN)  
NOT TO SCALE



② VERTICAL BENDS (SECTION)  
NOT TO SCALE



**WOODMOOR**  
WATER & SANITATION DISTRICT NO. 1

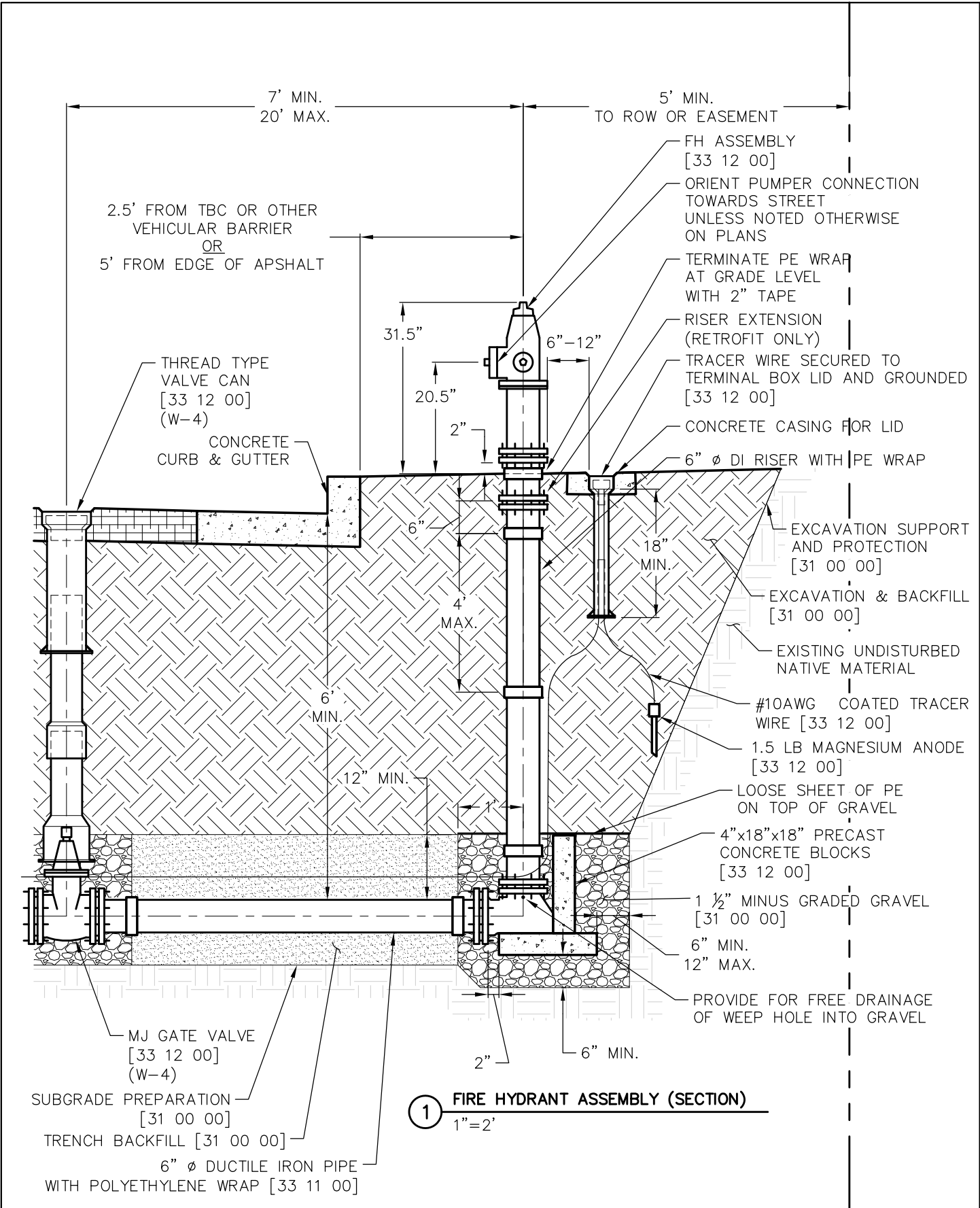
HORIZONTAL AND VERTICAL BENDS  
WATER UTILITY DISTRIBUTION EQUIPMENT

W-7

33 12 00

THIS CONSTRUCTION DETAIL SHOWS GENERAL CONFORMANCE TO SYSTEM SPECIFICATIONS AND MAY NEED TO BE ADJUSTED FOR SPECIFIC APPLICATIONS.

MAY 13, 2014



**WOODMOOR**  
WATER & SANITATION DISTRICT NO. 1

**FIRE HYDRANT ASSEMBLY**  
**WATER UTILITY DISTRIBUTION EQUIPMENT**

**W-8**

33 12 00

THIS CONSTRUCTION DETAIL SHOWS GENERAL CONFORMANCE TO SYSTEM SPECIFICATIONS AND MAY NEED TO BE ADJUSTED FOR SPECIFIC APPLICATIONS.

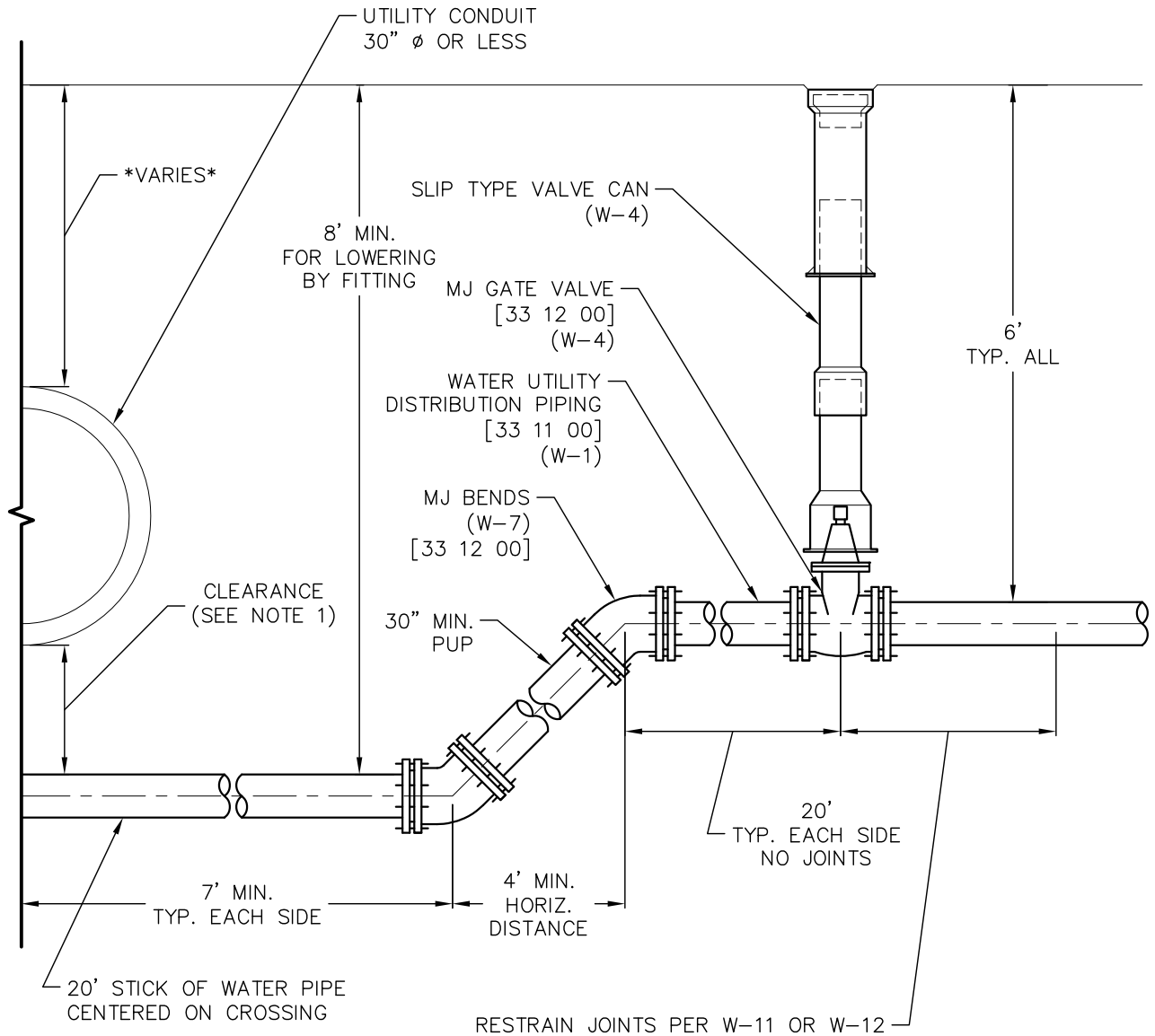
APRIL 10, 2020

GENERAL NOTES:


- EARTHWORK, TRACER WIRE, AND PIPE WRAP OMITTED FOR CLARITY.

DETAIL NOTES:

1. 18" MIN. IF CROSSING UNDER CONDUIT LESS THAN 12"Ø. 36" MIN. IF CROSSING UNDER CONDUIT 12" TO 30" DIAMETER.



① WATER LOWERING BY FITTING (SECTION)  
1"=2'

 <p><b>WOODMOOR</b> WATER &amp; SANITATION DISTRICT NO. 1</p>	WATER LOWERING BY FITTING	W-9
	WATER UTILITY DISTRIBUTION EQUIPMENT	33 12 00
	<p>THIS CONSTRUCTION DETAIL SHOWS GENERAL CONFORMANCE TO SYSTEM SPECIFICATIONS AND MAY NEED TO BE ADJUSTED FOR SPECIFIC APPLICATIONS.</p> <p>MAY 13, 2014</p>	