



WASTE-WATER STANDARDS

WATER ENGINEERING DIVISION

STANDARD DETAILS FOR SUBDIVISIONS AND COMMERCIAL DEVELOPMENTS

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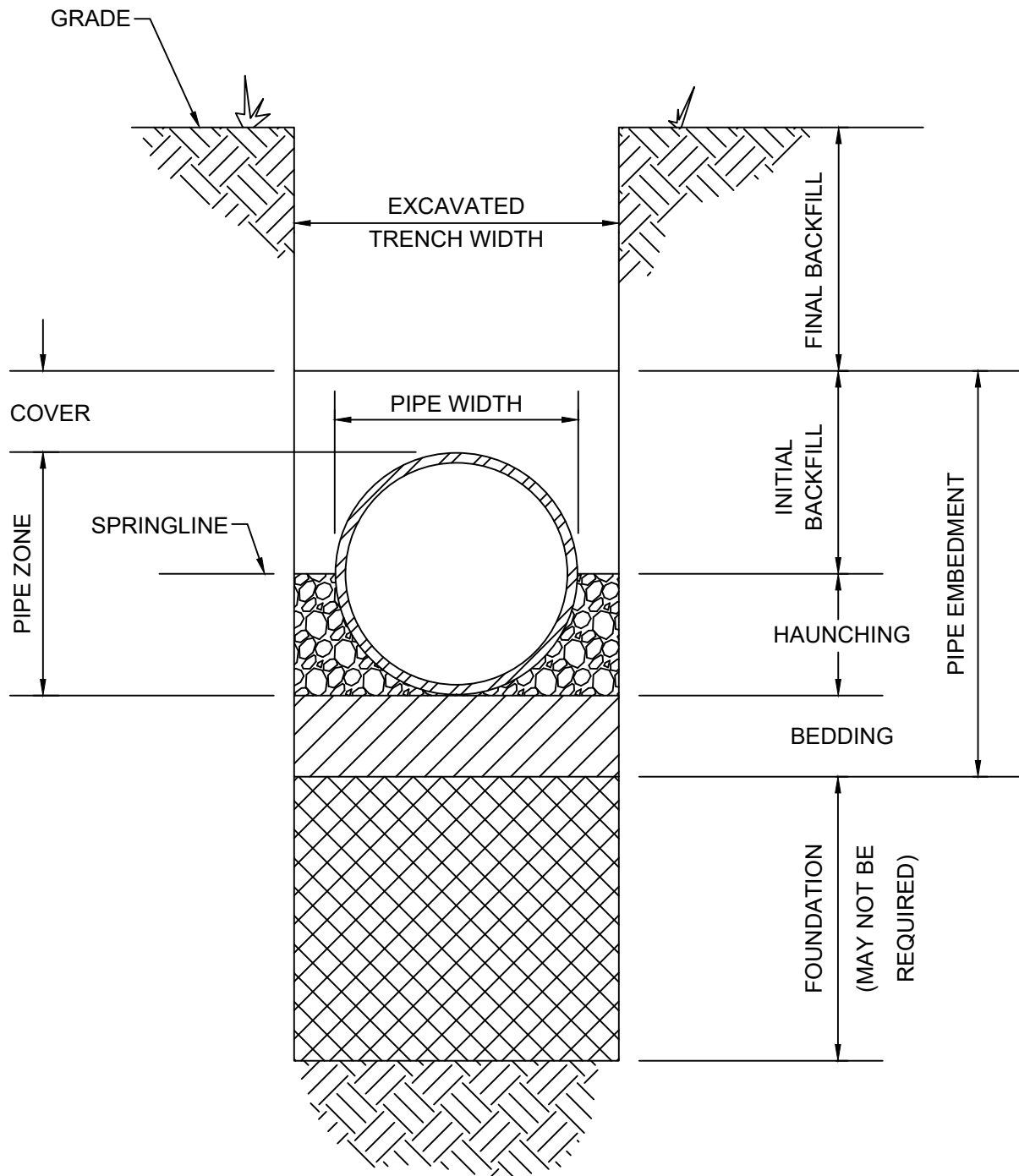
WASTE-WATER STANDARDS

WATER ENGINEERING DIVISION

TRENCH CROSS SECTION TERMINOLOGY

WWS-1

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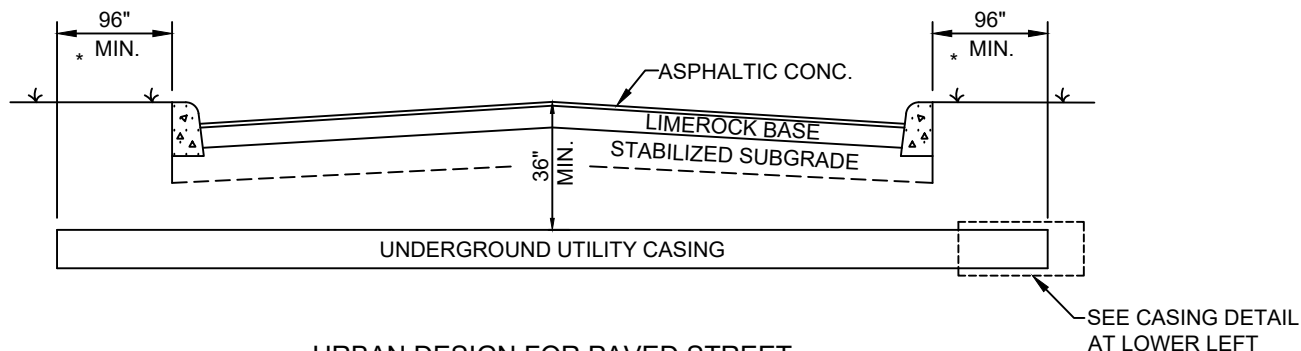
WASTE-WATER STANDARDS

WATER ENGINEERING DIVISION

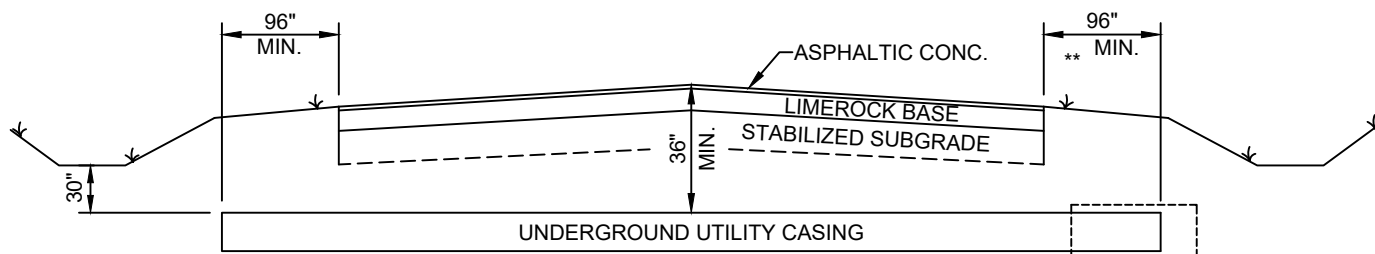
UNDERGROUND UTILITY CROSSING OF STREETS

WWS-3

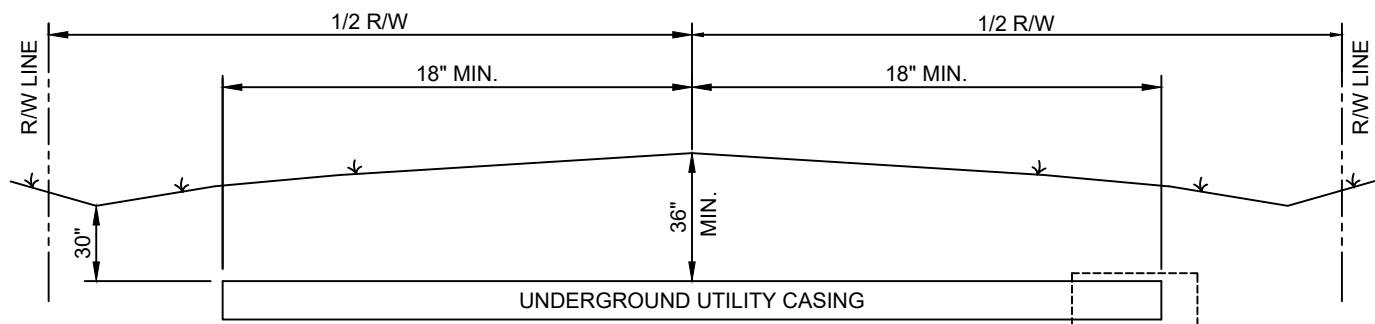
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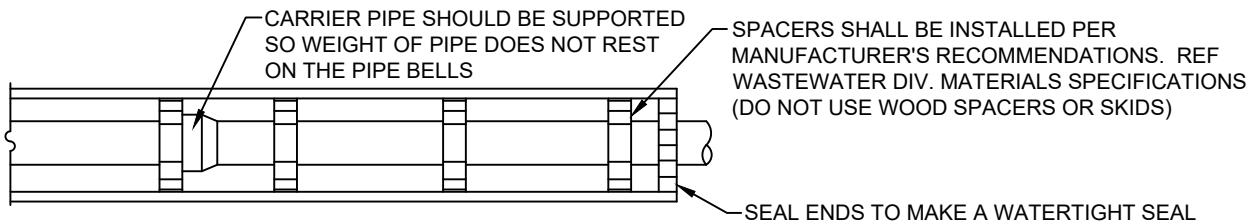
URBAN DESIGN FOR PAVED STREET



RURAL DESIGN FOR PAVED STREET



RURAL DESIGN FOR UNPAVED STREET
(OPEN CUT SECTION)



CASING DETAIL
N.T.S.

NOTE: ALL CARRIER PIPE THRU CASING SHALL HAVE RESTRAINED JOINTS

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WASTE-WATER STANDARDS

WATER ENGINEERING DIVISION

UNDERGROUND UTILITY CROSSING OF STREETS

WWS-3

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PAVED STREET INSTALLATION

1. The following methods shall be the only approved methods of installing a gravity main or a force main under an existing paved street:
Gravity Main - Jack and Bore (Push) method
Force Main - Jack and Bore or Directional Bore method
Neither "Air Jetting" nor "Water Jetting" methods will be allowed. Where extraordinary circumstances preclude the aforementioned methods of crossing, the Director of Public Works may authorize an "open-cut" trench across the paved street. The Contractor shall then be required to backfill the trench and patch the pavement as indicated on City of Lakeland Index No. 205 A. In certain instances a "feathering-in" of the asphalt patch, overlay, or milling & resurfacing may be required, as deemed appropriate by the Director of Public Works.
2. The casing of the underground utility crossing shall maintain a minimum of thirty six (36) inches of cover from the crown of the roadway pavement to the outside diameter of the casing.
3. The casing shall extend a minimum of eight (8) feet from the edge of the pavement on both sides of the road. When construction is to take place within a right of way other than the City of Lakeland, the requirements of the governing right of way authority shall be met.
4. Where the actual location of a potential conflict may exist between the proposed casing and an existing utility, a "window" in the asphalt pavement may be authorized by the City in order to verify the exact depth and location of the utility. This window must be patched as soon as it has served its purpose and shall not remain unpatched overnight under any circumstance. The window shall not exceed an area of one (1) square foot.
5. All methods of installation are subject to the review, approval, and inspection by the City of Lakeland. Such installations will require the issuance of a City of Lakeland Utility Permit. Operations deemed as potentially damaging or unsafe will not be permitted. Road crossings shall be completed on the same day whenever possible.
6. Traffic control at the project site shall conform to FDOT Standards. Traffic control, as approved by the City of Lakeland, shall be maintained during all stages of the underground utility installation.

UNPAVED STREET INSTALLATION

1. The crossing of an unpaved street may be accomplished by open-cutting of the street.
2. The depth of cover of the underground installation shall be a minimum of thirty six (36) inches.
3. The material removed is to be replaced in layers and compacted. The last six (6) inches of backfill material will be replaced with lime rock or shell material (as deemed appropriate) and compacted.
This will serve to provide a traffic bearing material and as an indication that there is a utility crossing at the location.
4. A City of Lakeland or Polk County Utility Permit shall be required and adequate traffic control shall be maintained at all stages of the operation.

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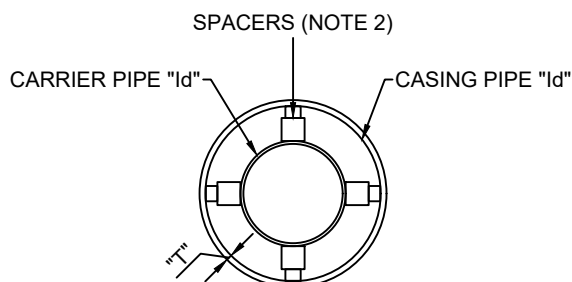
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WATER ENGINEERING DIVISION

UNDERGROUND UTILITY CROSSING OF STREETS

WWS-3

Sheet 3 of 3



MINIMUM CASING PIPE SIZE

MINIMUM CASING PIPE SIZE																
CARRIER PIPE	INSIDE DIAMETER 'Id'															
	DIP MECHANICAL JOINT	-	-	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"	30"		
	DIP PUSH- ON JOINT	-	-	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"	30"		
	PVC	-	4"	6"	8"	-	10"	12"	14"	16"	18"	20"	24"	-		
	CONCRETE	-	-	-	-	-	-	-	-	-	-	15"	18"	24"		
CASING	INSIDE DIAMETER 'Id'															
	STEEL CASING PIPE SIZE	8"	10"	14"	16"	16"	18"	24"	24"	30"	30"	36"	36"	42"	48"	54"
AGENCIES	INSIDE DIAMETER 'Id'															
	C.O.L. F.D.O.T. RAILROAD	.188"	.188"	.250"	.281"	.281"	.312"	.344"	.375"	.469"	.469"	.469"	.532"	.625"	.688"	.781"

NOTES:

1. MINIMUM STEEL CASING PIPE SIZES ARE BASED ON USING "UNI-FLANGE" SERIES 1390-C BELL-JOINT RESTRAINERS FOR 4" THRU 24" C-900/905 PVC PIPE. BELL-JOINT RESTRAINERS BY OTHER MANUFACTURERS WILL REQUIRE LARGER CASING PIPE SIZES.
2. REFERENCE WASTEWATER DIVISION MATERIAL SPECIFICATIONS. USE OF WOOD SKIDS ARE NOT PERMITTED.

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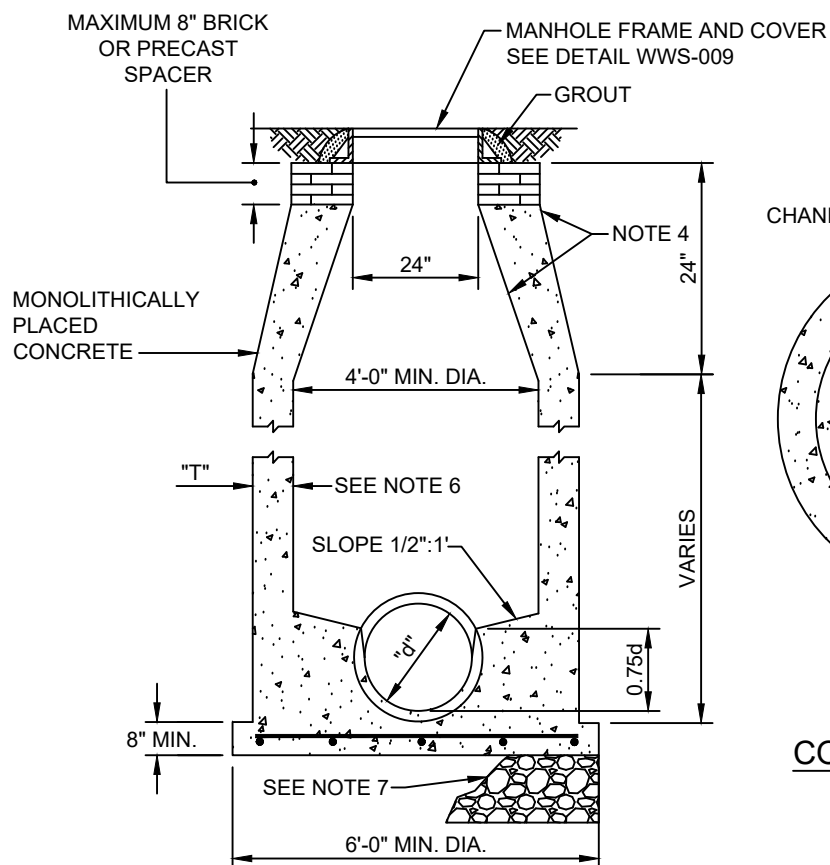
WASTE-WATER STANDARDS

WATER ENGINEERING DIVISION

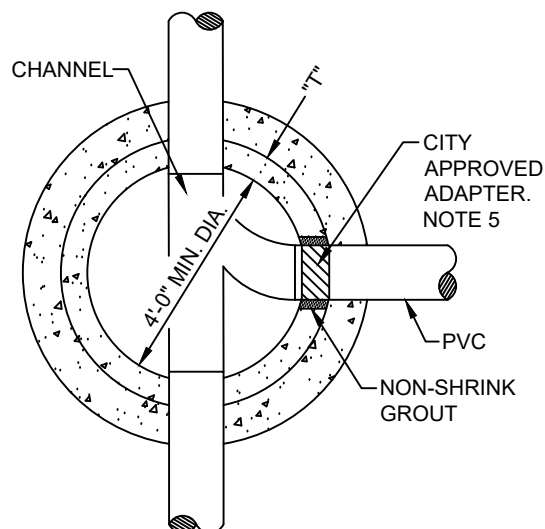
CAST IN PLACE MANHOLE

WWS-4

Sheet 1 of 1



CAST IN PLACE



CONNECTION DETAIL

NOTES:

1. CONCRETE SHALL BE 4000 PSI, USING ASTM C150 CEMENT, TYPE 2 OR 5.
2. CONE SECTION SHALL BE CONCENTRIC.
ECCENTRIC CONE SECTION REQUIRES APPROVAL FROM C.O.L. ENGINEERING.
3. FLOOR SHALL CONTAIN #4 REINFORCEMENT AT 6" CENTERS WITHIN THE CENTER 1/3, AS A MINIMUM.
4. THREE COATS OF 4 DRY MILS, FOR A MINIMUM OF 12 MILS TOTAL DRY THICKNESS, INSIDE AND OUTSIDE OF CON-SEAL CS-55 BLACK CONCRETE COATING, OR APPROVED EQUAL.
5. MANHOLE CONNECTIONS TO DUCTILE IRON AND CLAY PIPE MAY BE DIRECTLY CAST IN PLACE. CITY APPROVED ADAPTER RINGS MUST BE USED WITH PVC PIPE.
6. MINIMUM WALL THICKNESS "T" OF 6". FOR INSIDE DIAMETER (ID) GREATER THAN 4', INCREASE "T" 1" PER FOOT OF INCREASE IN ID.
7. 8" BEDDING (CLASS 2 OR 3) COMPACTED TO 98% AASHTO T180.
8. ALL PROVISIONS OF THE CITY'S "STANDARDS FOR WASTEWATER SYSTEM CONSTRUCTION" SHALL APPLY.
9. FOR MANHOLES OF DEPTH GREATER THAN 15' A CERTIFIED CONSTRUCTION DRAWING SHOWING DETAILED DESIGN FEATURES WILL BE REQUIRED.
10. MANHOLES CONSTRUCTED IN UNPAVED AREAS SHALL PROVIDE RIM ELEVATION AT FINAL GRADE AFTER SODDING. GRADE VIA SMOOTH TRANSITION.

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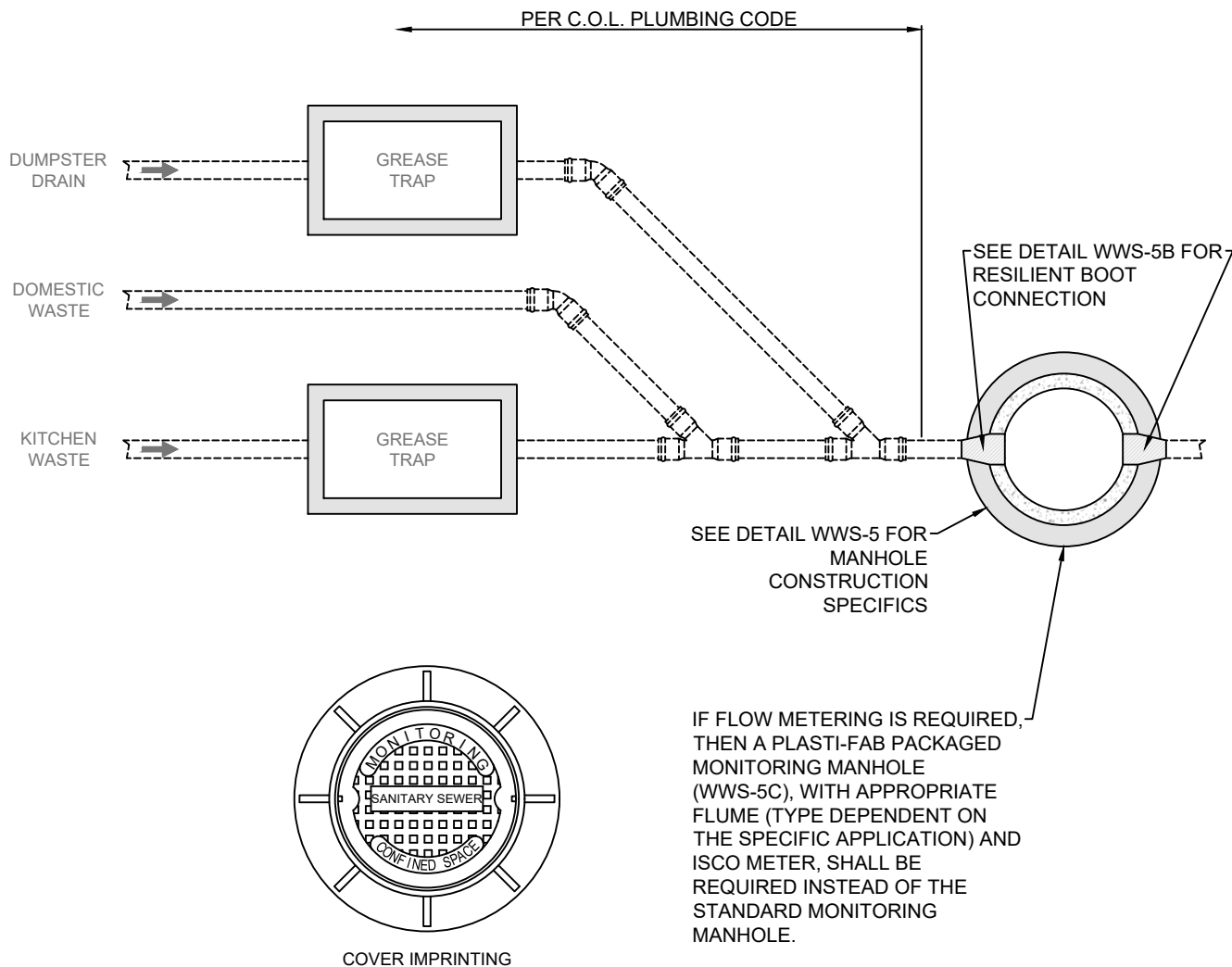
WASTE-WATER STANDARDS

WATER ENGINEERING DIVISION

MONITORING MANHOLE STRUCTURE

WWS-5A

Sheet 1 of 1



NOTES:

1. APPLICABLE FOR FOOD PROCESSORS, KITCHENS, AND INDUSTRIAL AND/OR CATEGORICAL SITES AND USERS.
2. STRUCTURE SHALL BE LOCATED OUTSIDE OF TRAFFIC AREAS WHERE DAYTIME ACCESS IS POSSIBLE. GREASE TRAPS AND MONITORING MANHOLES MAY NOT BE LOCATED IN DRIVE THROUGHS.
3. FLOW THROUGH STRUCTURE SHALL BE FROM A SINGLE USER.
4. CONE SECTION SHALL BE CONCENTRIC.
5. MANHOLE COVER SHALL BE IMPRINTED AS DEPICTED ABOVE. REFERENCE STANDARD DETAIL WWS-009 FOR FRAME AND COVER DETAILS.
6. WASTE FLOW SYSTEM SHALL BE DESIGNED TO ADEQUATELY ACCOMMODATE ALL COMBINED FLOWS, INCLUDING RAINWATER.

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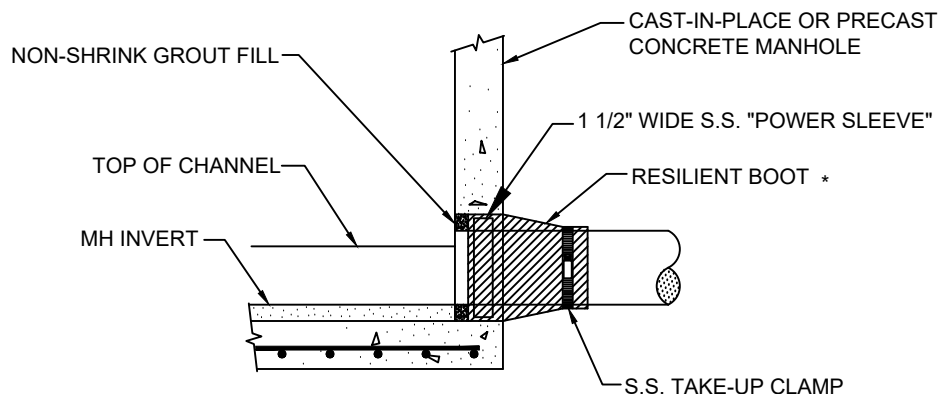
WASTE-WATER STANDARDS

WATER ENGINEERING DIVISION

RESILIENT BOOT OR PVC SLEEVE CONNECTION

WWS-5B

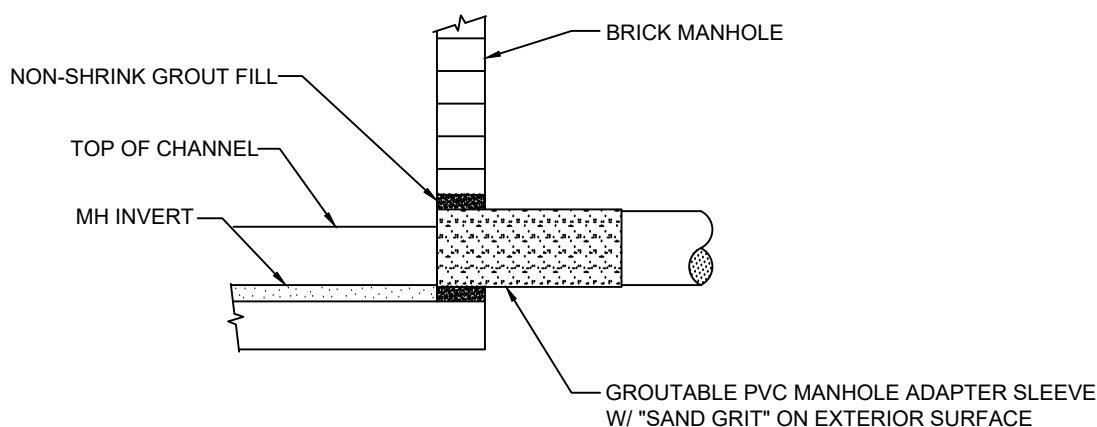
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* RESILIENT BOOT SHALL BE PSX MANUFACTURED BY PRESS SEAL GASKET CORP., 6935 LINCOLN PARKWAY, FT. WAYNE, IN., OR CITY APPROVED EQUAL, MEETING ASTM C923. REF. WASTEWATER OPERATIONS MAT'L SPECIFICATIONS SECTION 34

1. RESILIENT BOOT SHALL BE INSTALLED STRICTLY IN ACCORDANCE WITH MANUFACTURER'S DIRECTIONS.
2. FOR USE ON PRECAST MANHOLES. ALSO APPLICABLE ON CAST-IN-PLACE MANHOLES WHEN USED WITH A HOLE FORMER.
3. THE VOID BETWEEN BOOT AND PIPE SHALL BE FILLED WITH GROUT AND COATED AS SPECIFIED FOR THE MANHOLE.

RESILIENT BOOT CONNECTION



PVC SLEEVE CONNECTION

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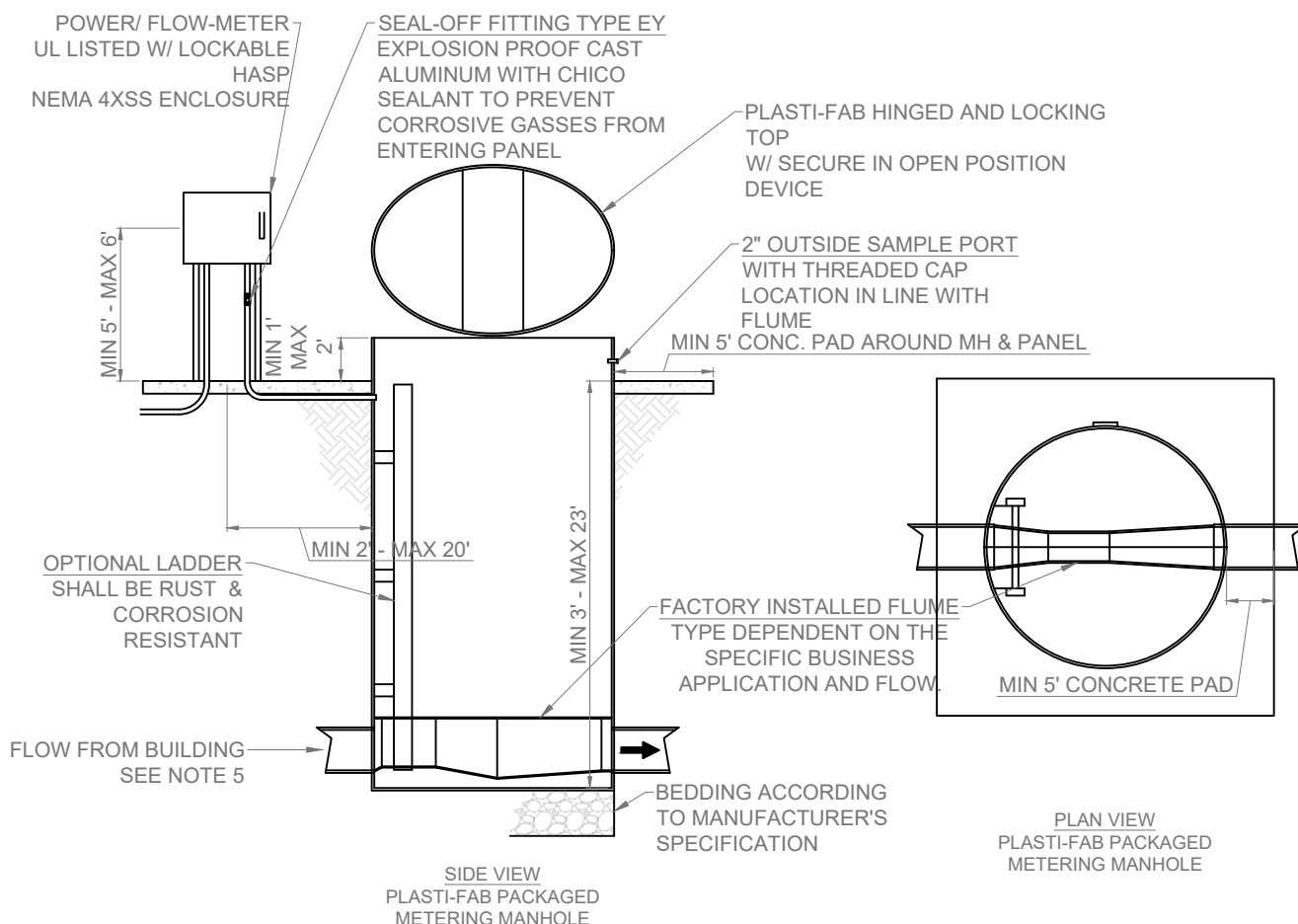
WASTE-WATER STANDARDS

WATER ENGINEERING DIVISION

GRAVITY SEWER FLOW METER STRUCTURE

WWS-5C

Sheet 1 of 1



NOTES:

1. SANITARY GRAVITY FLOW-METER STRUCTURE SHALL BE A PLASTI-FAB PACKAGED METERING MANHOLE OR APPROVED EQUIVALENT. WWW.PLASTI-FAB.COM
2. PLAN DRAWINGS MUST BE PROVIDED TO CITY OF LAKELAND WATER UTILITIES PRIOR TO INSTALLATION.
3. DIMENSIONS AND CONFIGURATIONS VARY. PRODUCT SPECIFICATIONS PROVIDED BY MANUFACTURER.
4. FLOW-METER INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURERS SPECIFICATIONS. ALL PROVISIONS OF THE CITY'S "STANDARDS FOR WASTEWATER SYSTEM CONSTRUCTION" AND CITY AND STATE ELECTRICAL CODES SHALL APPLY.
5. PER PLASTI-FAB, FLOW ENTERING THE FLUME MUST BE LAMINAR, NON-TURBULENT FLOW, WITH NO ELBOWS OR EXCESSIVE LINE SLOPE PRIOR TO THE FLUME.
6. POWER TO BE SUPPLIED BY CUSTOMER. FLOW-METER SHALL BE TELEDYNE ISCO SIGNATURE SERIES WITH DISPLAY AND 4-20mA ANALOG OUTPUT.
7. CUSTOMER TO DETERMINE IF EITHER BUBBLER OR ULTRASONIC FLOW-METER WILL WORK BEST FOR THEIR DISCHARGE.
8. A START UP WITH THE MANUFACTURER'S REPRESENTATIVE FROM TELEDYNE, AS WELL AS REPRESENTATIVES FROM CITY OF LAKELAND WATER UTILITIES IS REQUIRED PRIOR TO SERVICE BEING GRANTED. WARRANTY BEGIN DATE IS EFFECTIVE UPON COL ACCEPTANCE & PASSING OF CALIBRATION TESTING.
9. AN EASEMENT OF MIN 5' IS REQUIRED AROUND EVERY POINT OF EDGE OF CONCRETE AND PANEL/ MH STRUCTURE. THE EXACT SIZE TO BE DETERMINED CASE BY CASE, BY COL WATER UTILITIES ENGINEERING.
10. BOLLARDS MAY BE REQUIRED BASED ON LOCATION AND FIELD CONDITION. SIZE AND POSITION TO BE DETERMINED CASE BY CASE, BY COL WATER UTILITIES ENGINEERING.

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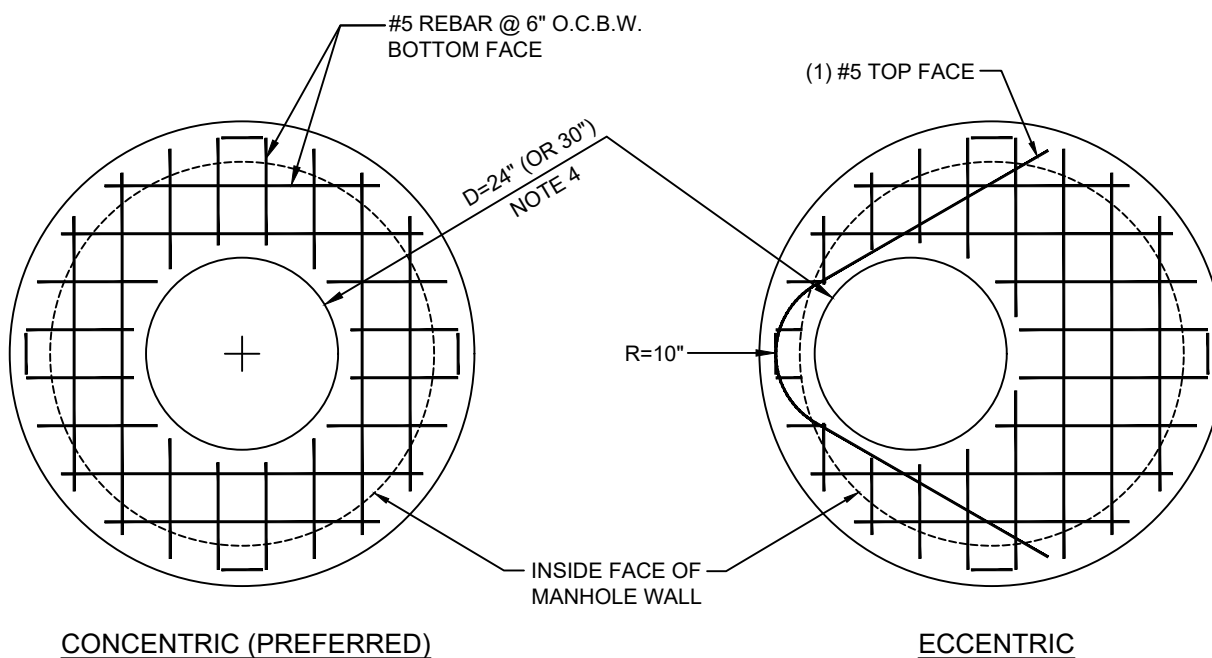
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WATER ENGINEERING DIVISION

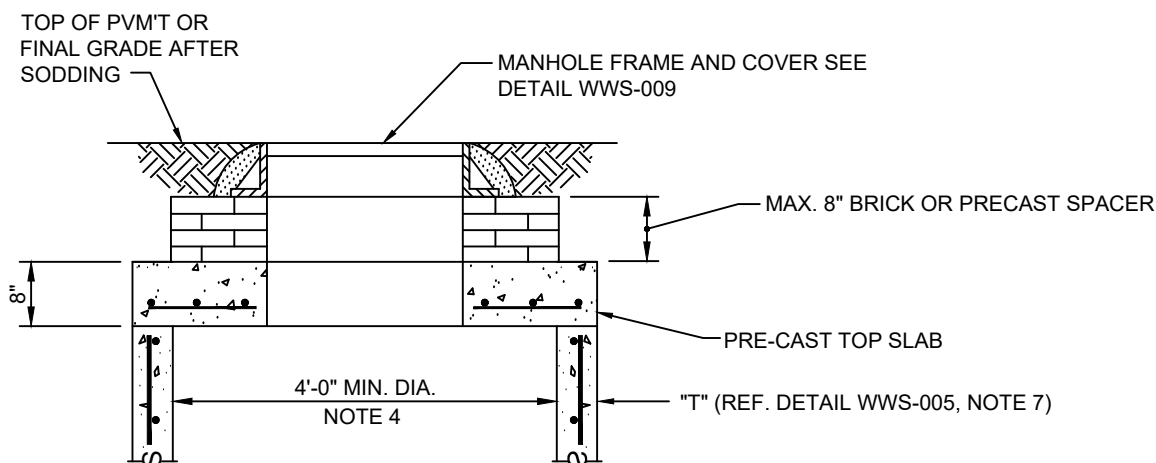
SHALLOW MANHOLE DESIGN

WWS-6

Sheet 1 of 1



SHALLOW MANHOLE TOP SLAB



TOP DETAIL

NOTE:

1. STANDARD MANHOLE SPECIFICATIONS APPLY EXCEPT WHERE OTHERWISE NOTED.
2. PRECAST TOP SLAB SHALL CONFORM TO DETAIL AND D.O.T. MINIMUM STANDARDS. REF. D.O.T. INDEX #200. OPENING MAY BE CONCENTRIC (PREFERRED) OR ECCENTRIC.
3. SHALLOW DESIGN MANHOLE SHALL BE LIMITED TO DEPTHS NOT GREATER THAN 6 FEET. SEE ALSO STANDARD DETAIL WWS-008.
4. IF DEPTH OF MANHOLE IS 42 INCHES OR LESS, DIAMETER SHALL EQUAL 5'-0" AND MANHOLE RING AND COVER SHALL BE 30 INCH MINIMUM DIAMETER, HINGED, USF FOUNDRY USF 324, OR APPROVED EQUAL. REFERENCE STANDARD DETAIL WWS-009A.

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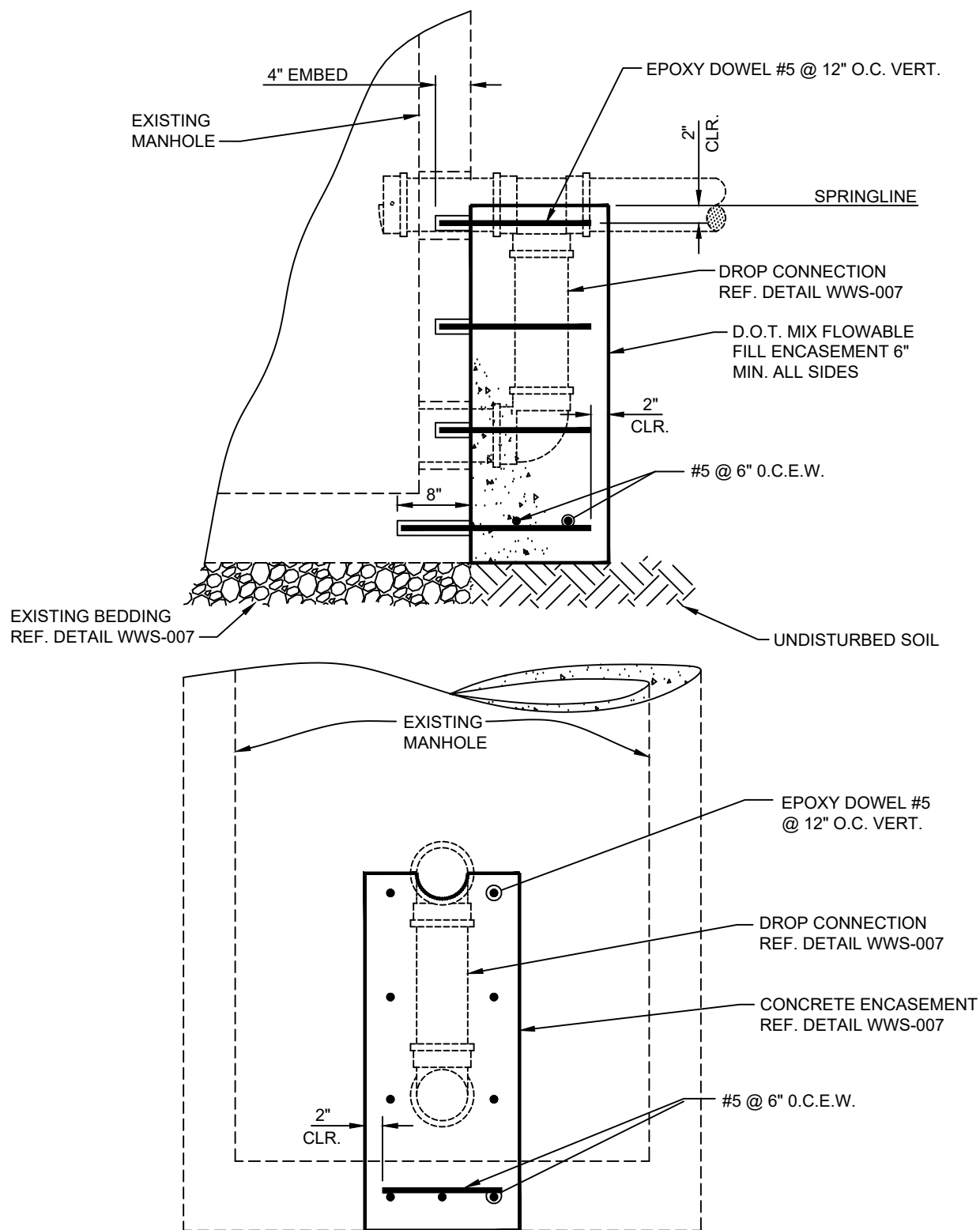
WASTE-WATER STANDARDS

WATER ENGINEERING DIVISION

MANHOLE OUTSIDE DROP CONNECTION (EXISTING CONST.)

WWS-7A

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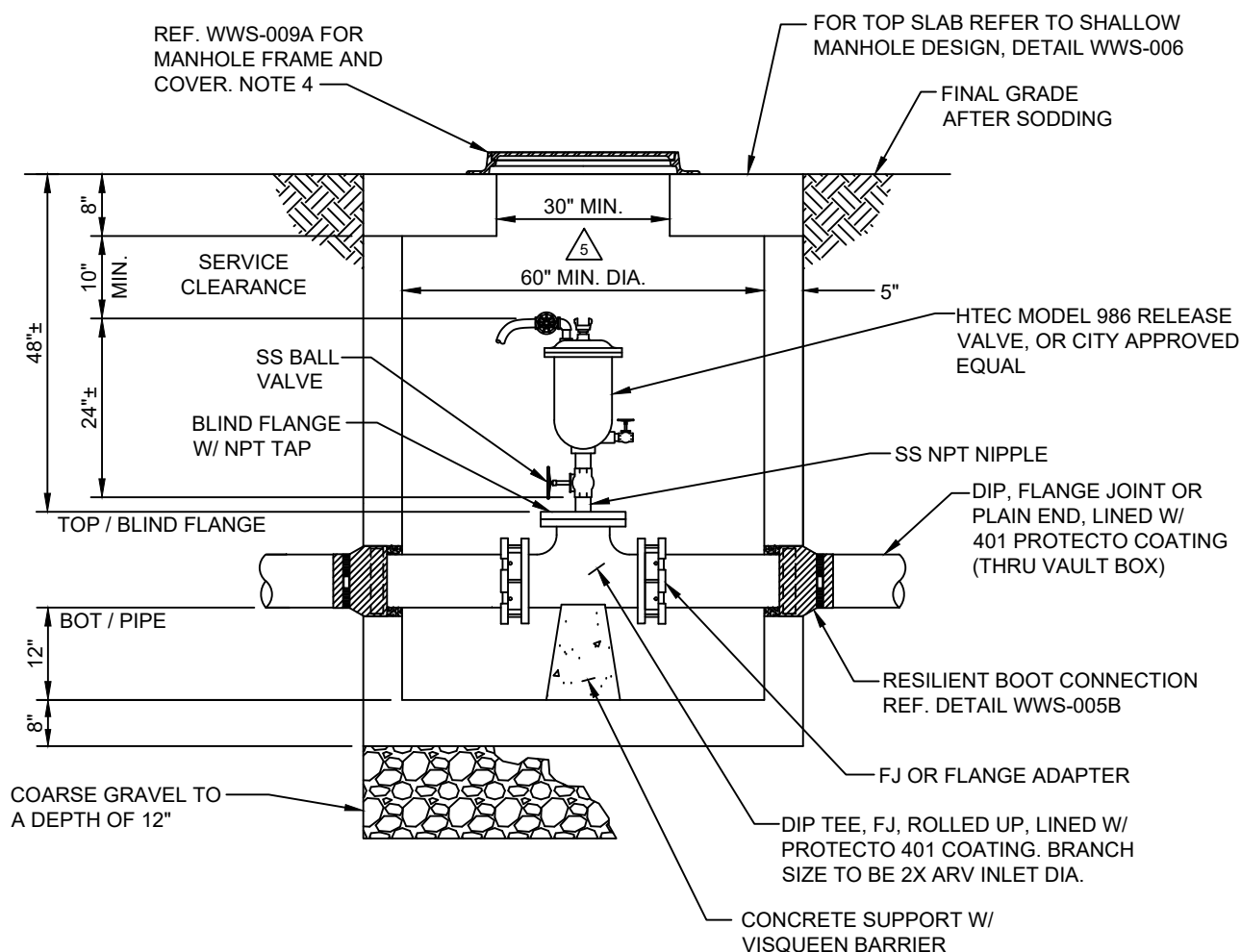
WASTE-WATER STANDARDS

WATER ENGINEERING DIVISION

AIR RELEASE VALVE ON **NEW** FORCE MAINS

WWS-8

Sheet 1 of 1



ABOVE GROUND ARV WWS-8B IS PREFERRED INSTALLATION METHOD.
BELOW GROUND IS ONLY ACCEPTABLE WITH PRIOR COL-WATER UTILITIES ENGINEERING APPROVAL.

NOTES:

1. STANDARD MANHOLE SPECIFICATIONS APPLY EXCEPT WHERE OTHERWISE NOTED.
2. INSTALL AIR RELEASE VALVE TO MANUFACTURER'S SPECIFICATIONS.
3. COARSE GRAVEL BEDDING REQUIRED REGARDLESS OF SOIL TYPE.
4. NOT INTENDED FOR USE IN ROADWAYS. BRICK OR PRECAST SPACER RING IS REQUIRED IF STRUCTURE IS LOCATED UNDER PAVEMENT. REFERENCE DETAIL WWS-009A.
5. ADJUST DEPTH OF FORCE MAIN VIA SMOOTH TRANSITION TO ACCOMMODATE DEPTH TO TOP OF BLIND FLANGE LOCATED IN ARV VAULT.
6. ALL NUTS AND BOLTS TO BE STAINLESS STEEL. DO NOT PAINT.
7. DO NOT PAINT STAINLESS STEEL NIPPLES OR STAINLESS ISOLATION VALVE.
8. PAINT THE FOLLOWING EXTERNAL SURFACES WITH PROTECTO 401: DUCTILE IRON PIPE, DUCTILE IRON FITTINGS, DUCTILE IRON BLIND FLANGE, AND ARV BODY.

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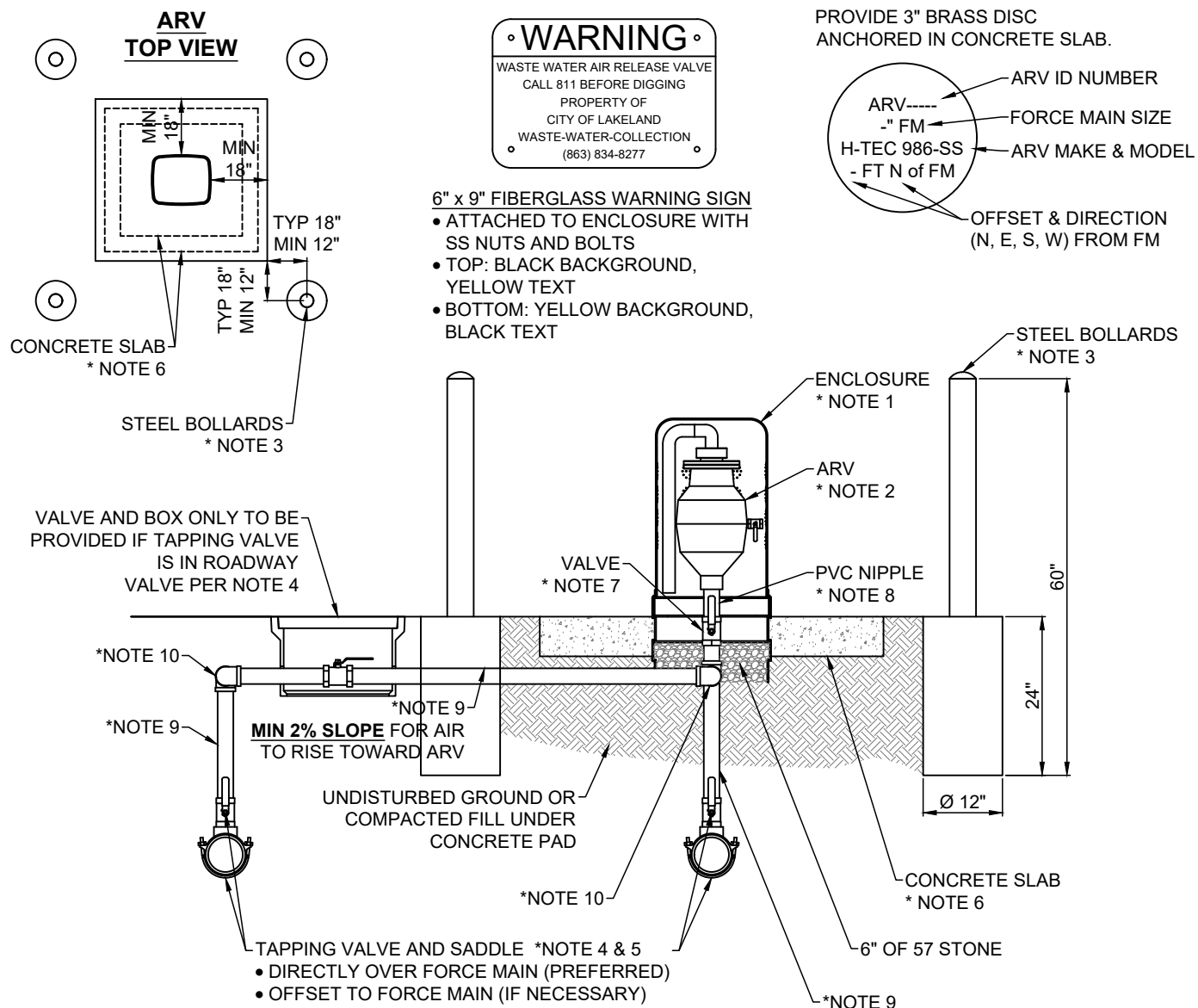
WASTE-WATER STANDARDS

WATER ENGINEERING DIVISION

ABOVE GROUND AIR RELEASE VALVE ON FORCE MAINS

WWS-8B

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NOTES:

1. ARV ENCLOSURE (WATER PLUS 107 GREEN VENTED)
2. AIR RELEASE VALVE (H-TEC 986 SS)
VENT PIPE (2" SCH 80 PVC) TO EXTEND BELOW GRADE WITHIN ENCLOSURE
3. 4" STEEL BOLLARD, PAINTED SAFETY YELLOW, IN ALL 4 CORNERS AT A DISTANCE OF TYPICALLY 18" (MIN 12") OF ARV
CONCRETE PAD, 3000 PSI CONCRETE FILLED AND CAPPED
BOLLARD TO BE 5' LONG WITH THE BOTTOM 24" SET IN MIN 12" DIAMETER 3000 PSI CONCRETE FOOTER.
4. 2" JAMESBURY FULL PORT 316 SS BALL VALVE WITH 316 SS HANDLE
4" OR LARGER PLUG VALVE PER CITY SPECIFICATIONS
5. 2" ARV: 316 SS DOUBLE STRAP TAPPING SADDLE WITH NPT OUTLET
4" OR LARGER ARV: SS FLANGED SLEEVE OR DI FLANGED TEE
6. 6" SLAB TO BE 3000 PSI REINFORCED CONCRETE, #4 BARS CONTINUOUS AROUND AT 2" AND 8" FROM ALL SIDES OF THE SLAB
7. VALVE PER NOTE 4, TOP OF VALVE ELEVATION TO MATCH FINISHED GRADE ELEVATION
8. SCH80 PVC NIPPLE, LENGTH AS REQUIRED
9. 316 SS PIPE OR POLYTUBING, LENGTH AS REQUIRED
10. 2x 90° 316 SS ELBOW & 316 SHORT SS NIPPLE

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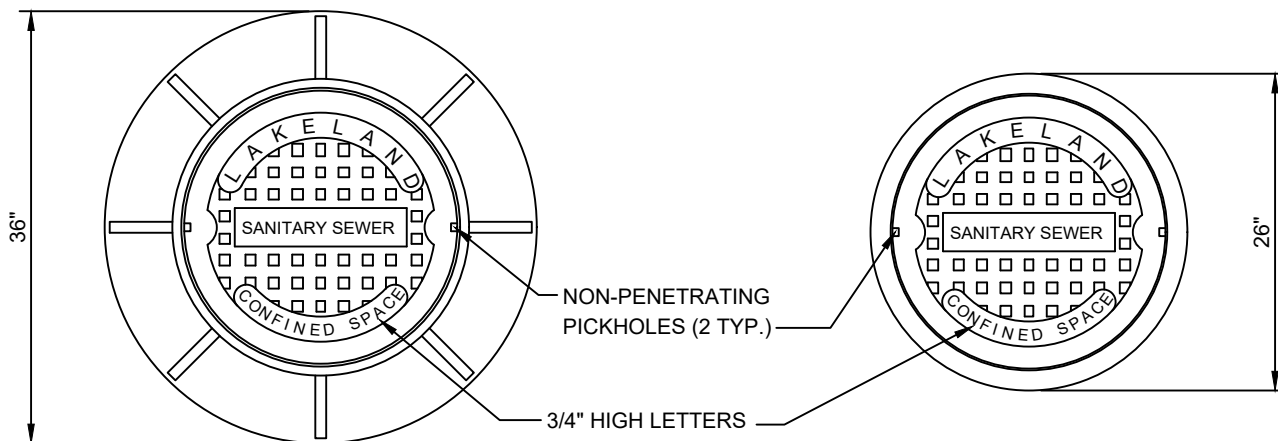
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WATER ENGINEERING DIVISION

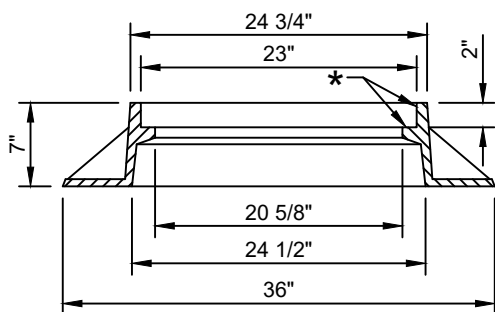
MANHOLE COVER AND FRAME

WWS-9

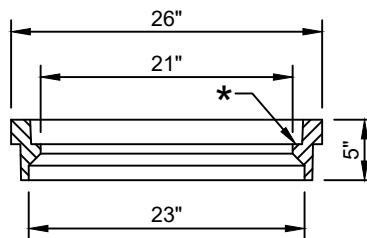
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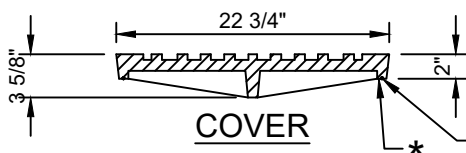
FRAME & COVER - PLAN



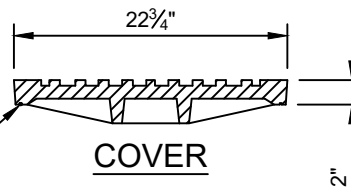
FRAME



FRAME



COVER



COVER

'O' RING

* MACHINED SURFACES

U.S. FOUNDARY & MFG. CORP.
REF. CAT. NO. 420-G-ORS
FRAME WT. 240 LBS. ±
COVER WT. 130 LBS. ±
MAT'L - CAST IRON, ONE COAT OF
ASPHALTIC PAINT
(OR CITY APPROVED EQUAL)

ALTERNATE FRAMES

U.S.F. CAT. NO.	HEIGHT
525	9"
465	4"
440	3"

(AS REQ'D. FOR HEIGHT ADJUSTMENTS)

U.S. FOUNDARY & MFG. CORP.
REF. CAT. NO. 1125-G-ORS
FRAME WT. 155 LBS. ±
COVER WT. 130 LBS. ±
MAT'L - CAST IRON, ONE COAT OF
ASPHALTIC PAINT
(OR CITY APPROVED EQUAL)

MANHOLE ASSEMBLY

WITH MUD RING

MANHOLE ASSEMBLY

SLAB TYPE

NOTES:

1. MANHOLE COVER SHALL BE IMPRINTED WITH "LAKELAND" AND "SANITARY SEWER" AND WITH NOTE "CONFINED SPACE".
2. PAVED AREAS - SET FRAMES AT FINAL GRADE. UNPAVED AREAS - SET FRAMES AT FINAL GRADE AFTER SODDING.

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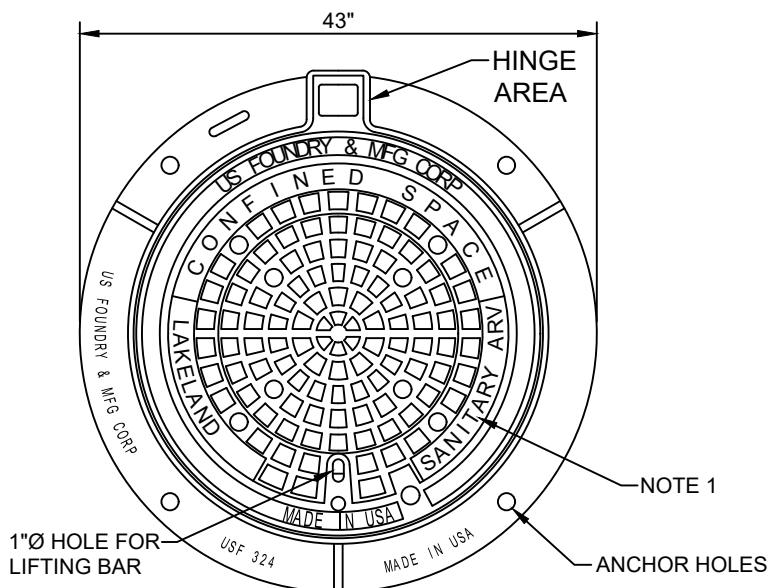
WASTE-WATER STANDARDS

WATER ENGINEERING DIVISION

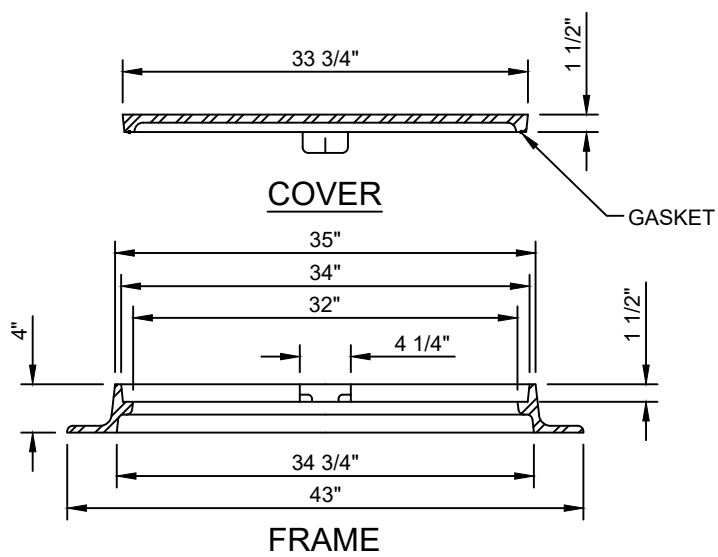
ARV & SHALLOW MANHOLE COVER AND FRAME

WWS-9A

Sheet 1 of 1



FRAME & COVER - PLAN



U.S. FOUNDRY & MFG. CORP.
 REF. CAT. NO. 324
 FRAME WT. 165 LBS. ±
 COVER WT. 180 LBS. ±
 MAT'L - CAST IRON, ONE COAT OF
 ASPHALTIC PAINT
 (OR CITY APPROVED EQUAL)

NOTE:

- MANHOLE COVER SHALL BE IMPRINTED WITH "LAKELAND" AND "SANITARY SEWER" OR "SANITARY ARV", AND WITH NOTE "CONFINED SPACE"

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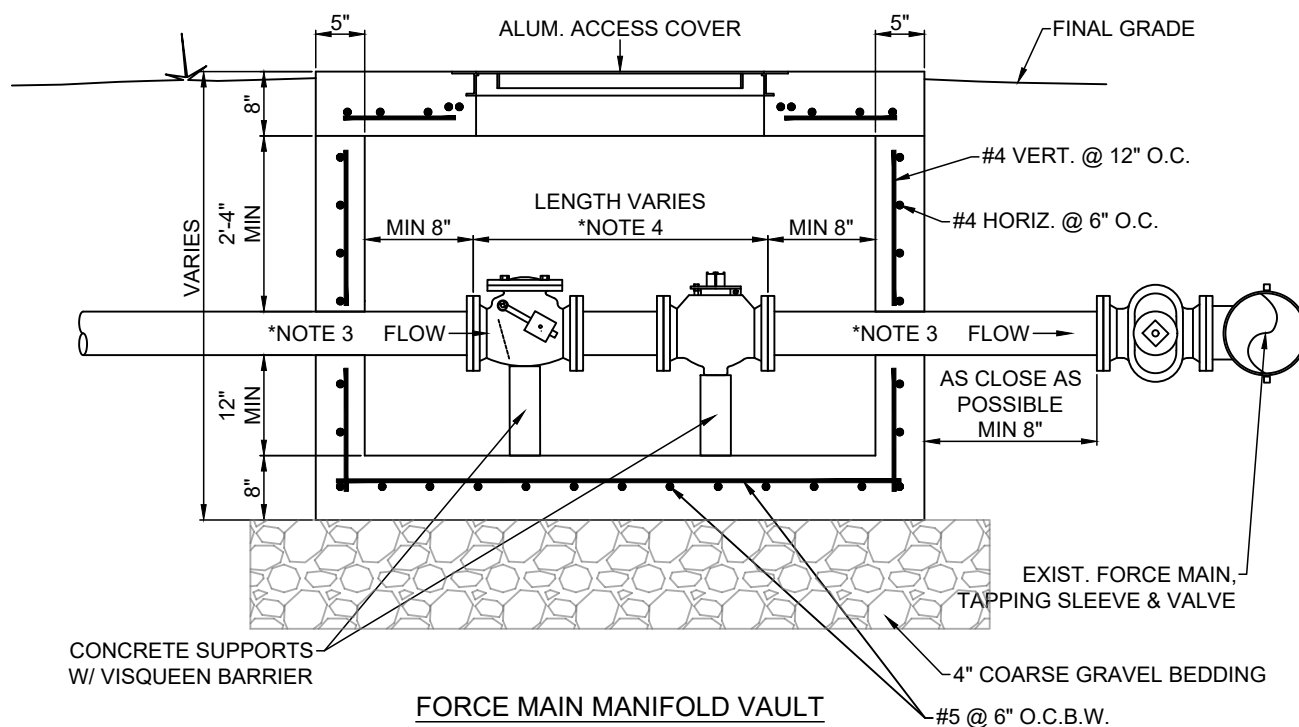
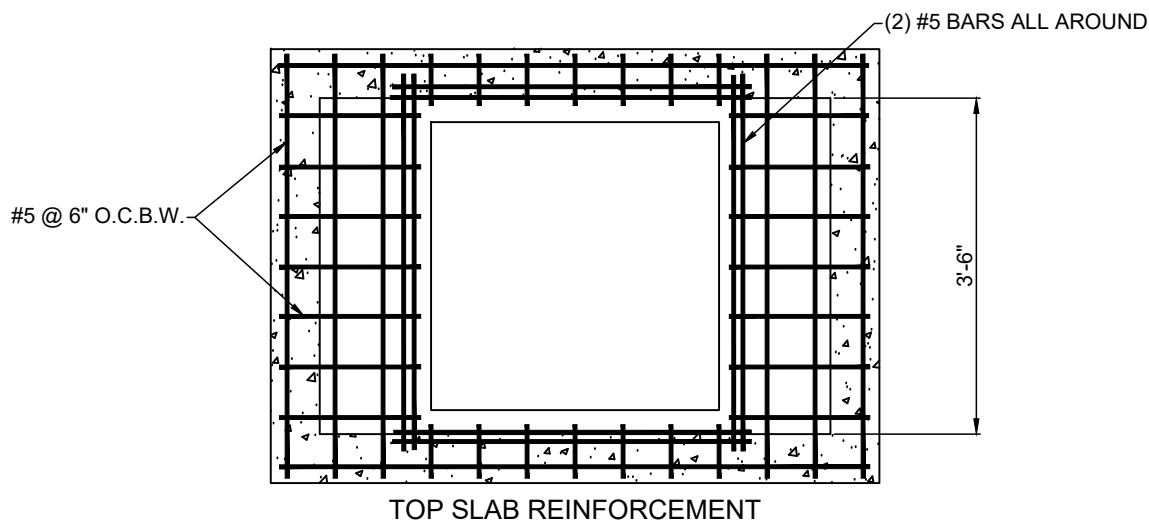
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REVISION DATE

02/10/2015



NOTES:

1. ALUMINUM FRAME AND COVER, 36" x 36" CLEAR OPENING.
2. LOAD RATINGS:
WITHIN ROADWAY: NOT PERMITTED
ALL OTHER AREAS: H-20.
3. DIP THRU VAULT BOX, FLANGE JOINT OR PLAIN END, LINED W/ 401 PROTECTO COATING
4. FLANGED CHECK VALVE, SPOOL PIECE, & PLUG VALVE. SPOOL PIECE LENGTH MUST ALLOW FOR REMOVAL OF ALL BOLTS WITHOUT REMOVING PLUG AND CHECK VALVE.

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4

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M.RIESNER

REVISION DATE

02/23/2026

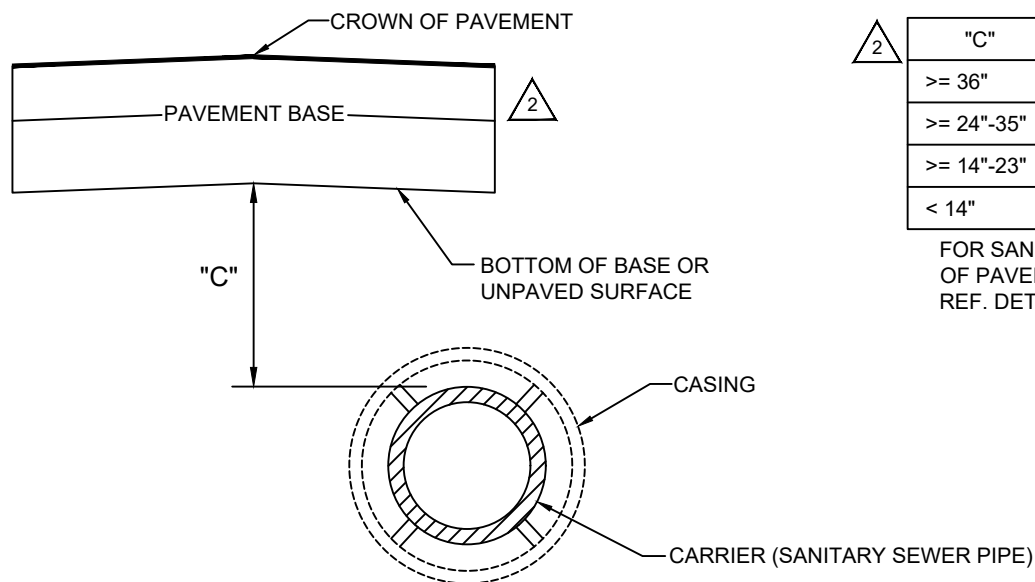
WASTE-WATER STANDARDS

WATER ENGINEERING DIVISION

SANITARY SEWER CLEARANCES

WWS-11

Sheet 1 of 1

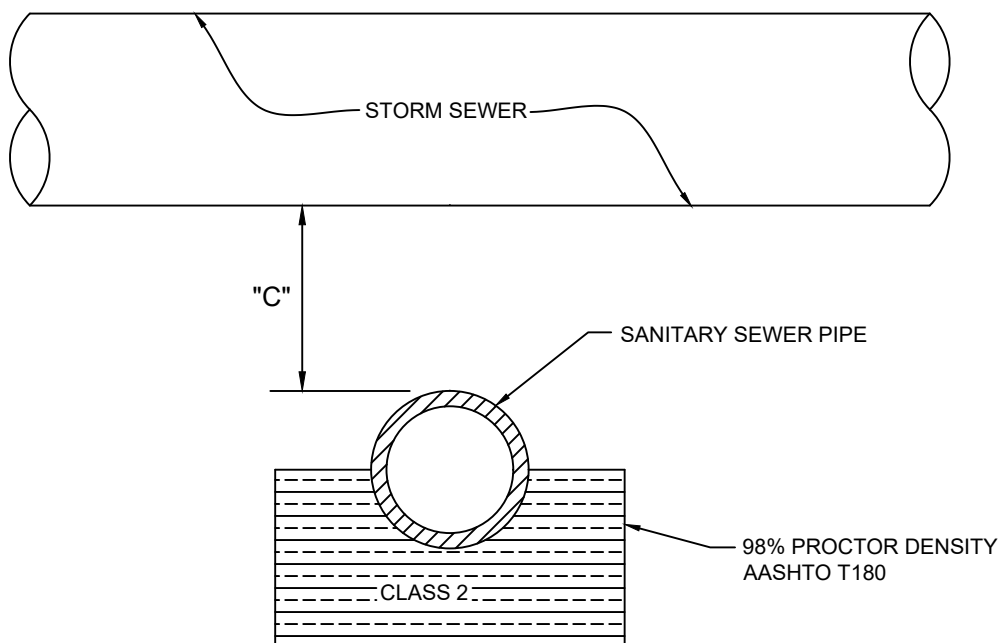


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"C"	SANITARY SEWER PIPE
>= 36"	PVC, DIP, HDPE SDR11
>= 24"-35"	PVC DR18 (FM), DIP
>= 14"-23"	DIP, STEEL CASING
< 14"	NOT PERMITTED

FOR SANITARY SEWER CROSSINGS
OF PAVED OR UNPAVED STREETS
REF. DETAIL WWS-003

CLEARANCES-STRUCTURAL REQUIREMENTS



"C"	SANITARY SEWER PIPE
>= 12"	PVC, DIP
>= 3"-11"	DIP, PVC DR18 & CLASS 2 BEDDING
< 3"	CONFLICT STRUCTURE, STEEL CASING

CLEARANCES-VERTICAL SEPARATION

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REVISION DATE

04/05/2004

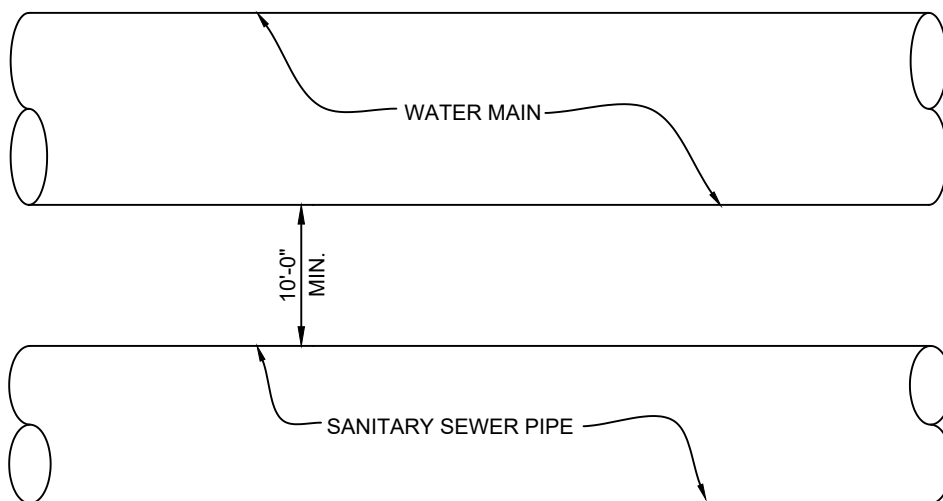
WASTE-WATER STANDARDS

WATER ENGINEERING DIVISION

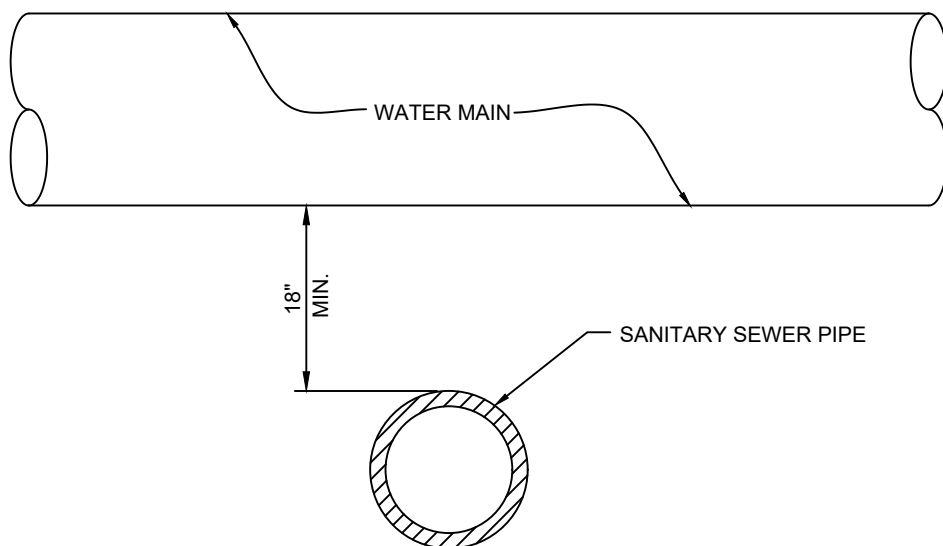
SANITARY SEWER CLEARANCES FOR WATER MAINS

WWS-11A

Sheet 1 of 1



CLEARANCES-HORIZONTAL SEPARATION



CLEARANCES-VERTICAL SEPARATION

GENERAL NOTES:

1. WHERE ENCROACHMENT UPON THE MINIMUM 10 FOOT HORIZONTAL SEPARATION IS PERMITTED BY THE WATER UTILITY, C900 OR DUCTILE IRON PIPE SHALL BE USED.
2. WHERE ENCROACHMENT UPON THE MINIMUM 18" VERTICAL SEPARATION IS PERMITTED BY THE WATER UTILITY, THE SEWER PIPE SHALL EITHER BE PLACED IN A STEEL SLEEVE OR ARRANGED SO SEWER PIPE AND WATER PIPE JOINTS ARE SEPARATED BY A MINIMUM OF 10 FEET. REFERENCE LAKE LAND WATER UTILITIES WASTEWATER OPERATIONS POLICIES, STANDARDS, AND SPECIFICATIONS FOR SUBDIVISIONS AND COMMERCIAL DEVELOPMENTS, SECTION 8.4 "PROTECTION OF WATER SUPPLY".

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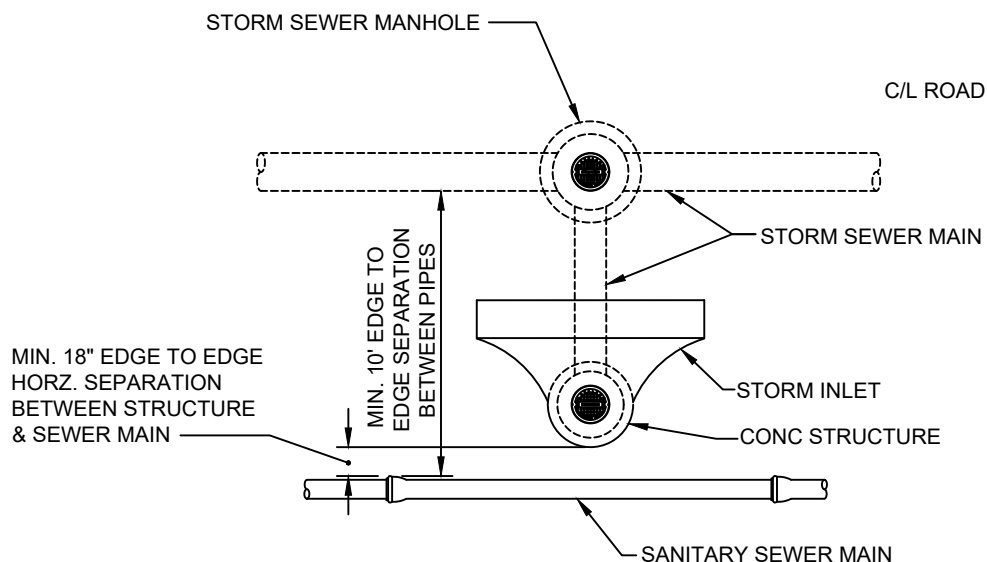
WASTE-WATER STANDARDS

WATER ENGINEERING DIVISION

SANITARY SEWER HORIZONTAL CLEARANCES

WWS-11B

Sheet 1 of 1



CLEARANCES-HORIZONTAL SEPARATION

GENERAL NOTES:

1. SANITARY SEWER MAINS SHALL BE DESIGNED WITH MINIMUM 18" EDGE TO EDGE HORIZONTAL SEPARATION FROM STORM STRUCTURES.
2. INCREASE HORIZONTAL SEPARATION AS DEPTH OF COVER INCREASES OVER SANITARY SEWER MAINS DESIGNED ADJACENT TO STORM STRUCTURES. FOR EXCAVATION BELOW THE BASE OF THE STRUCTURE, SOIL CLASSIFICATION AND STABILITY OF THE STRUCTURE DURING EXCAVATION IS TO BE CONSIDERED.

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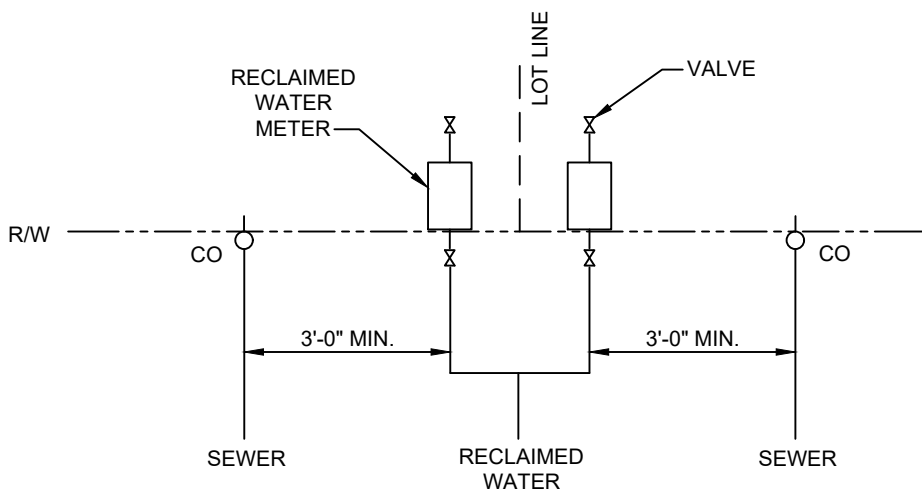
WASTE-WATER STANDARDS

WATER ENGINEERING DIVISION

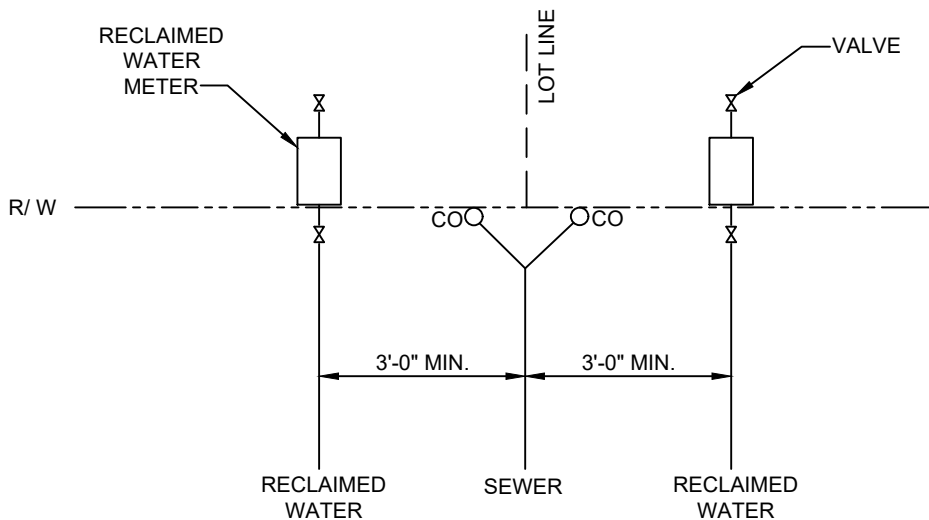
RECLAIMED WATER SEWER SERVICE SEPARATION

WWS-11C

Sheet 1 of 1



OPTION #1
RECLAIMED WATER ADJACENT TO LOT LINE



OPTION #2
SEWER ADJACENT TO LOT LINE

GENERAL NOTES:

1. ALL RECLAIMED WATER METER ASSEMBLIES SHALL BE INSTALLED BY CITY OF LAKELAND WATER OPERATIONS.
2. RECLAIMED WATERMAIN TAPS BY CITY OF LAKELAND CREWS ONLY. REFERENCE WATER OPERATIONS MANUAL FOR FURTHER INFORMATION.
3. REFERENCE CITY OF LAKELAND WATER UTILITIES ALTERNATIVE IRRIGATION SYSTEM EXCEPTION TABLE.

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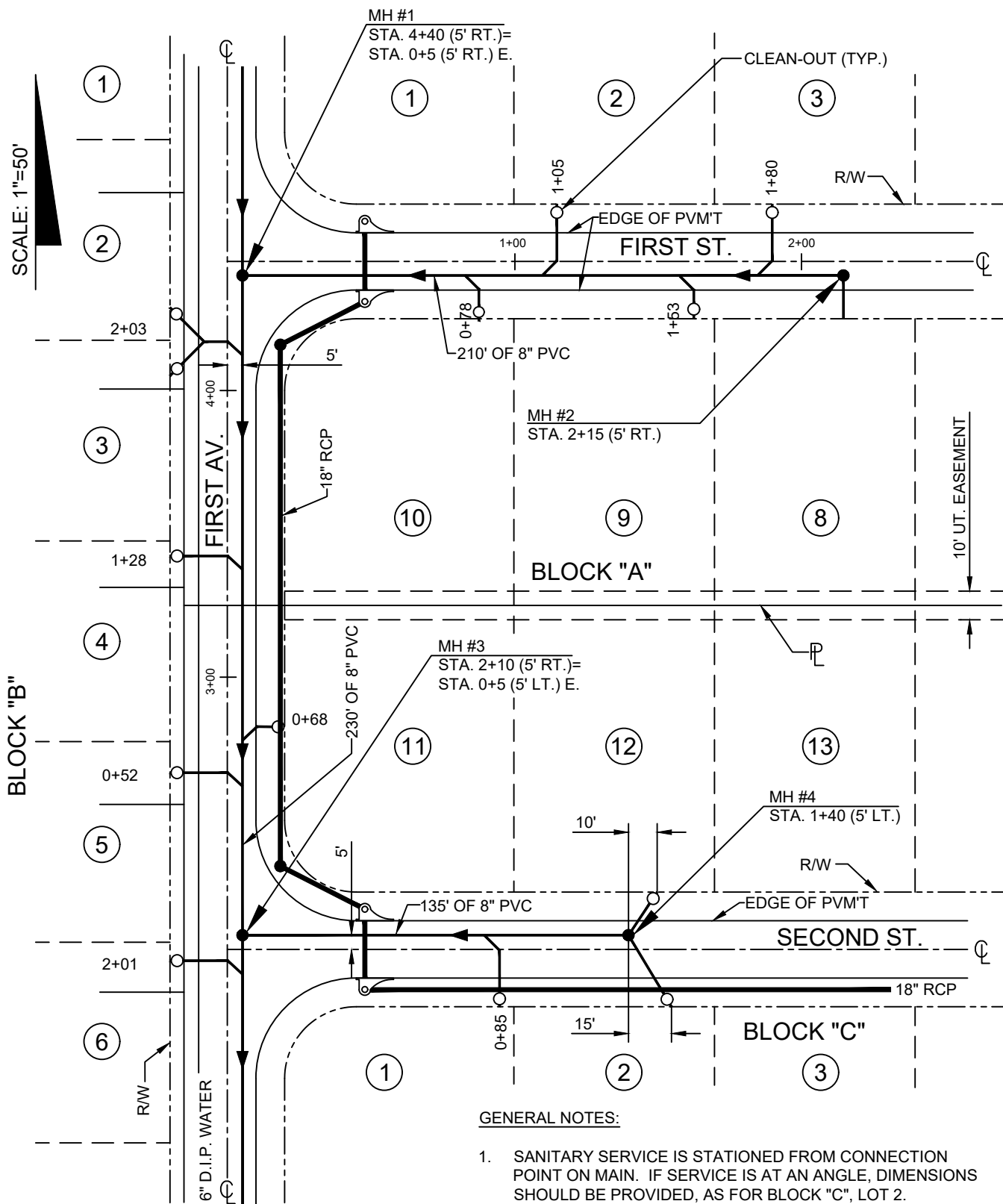
WASTE-WATER STANDARDS

WATER ENGINEERING DIVISION

SANITARY SEWER MASTER PLAN (SAMPLE)

WWS-12

Sheet 1 of 1



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10/15/2007

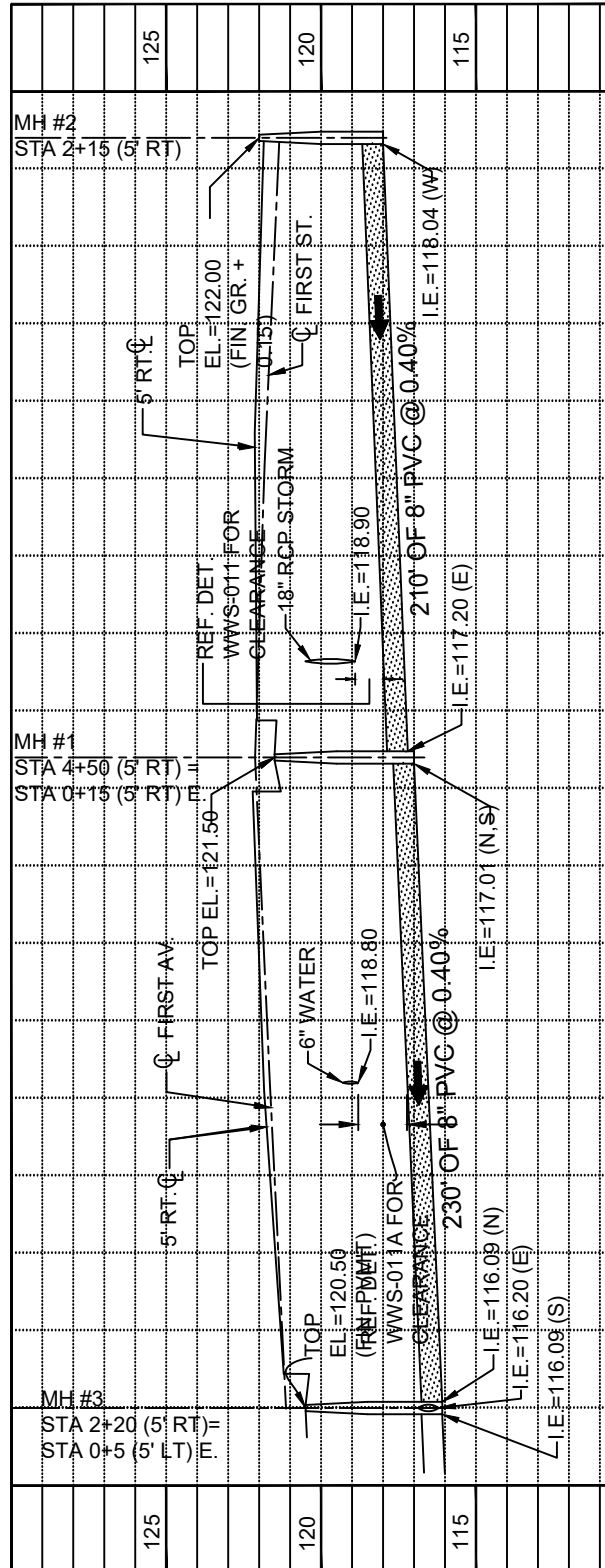
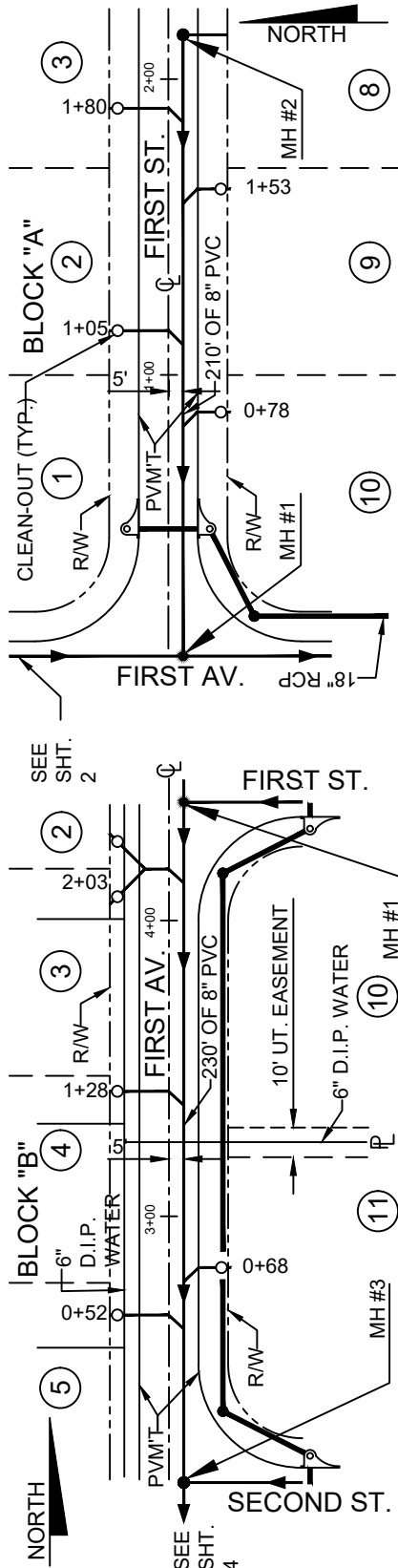
WASTE-WATER STANDARDS

WATER ENGINEERING DIVISION

SANITARY SEWER PLAN & PROFILE (SAMPLE)

WWS-13

Sheet 1 of 1



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WASTE-WATER STANDARDS

WATER ENGINEERING DIVISION

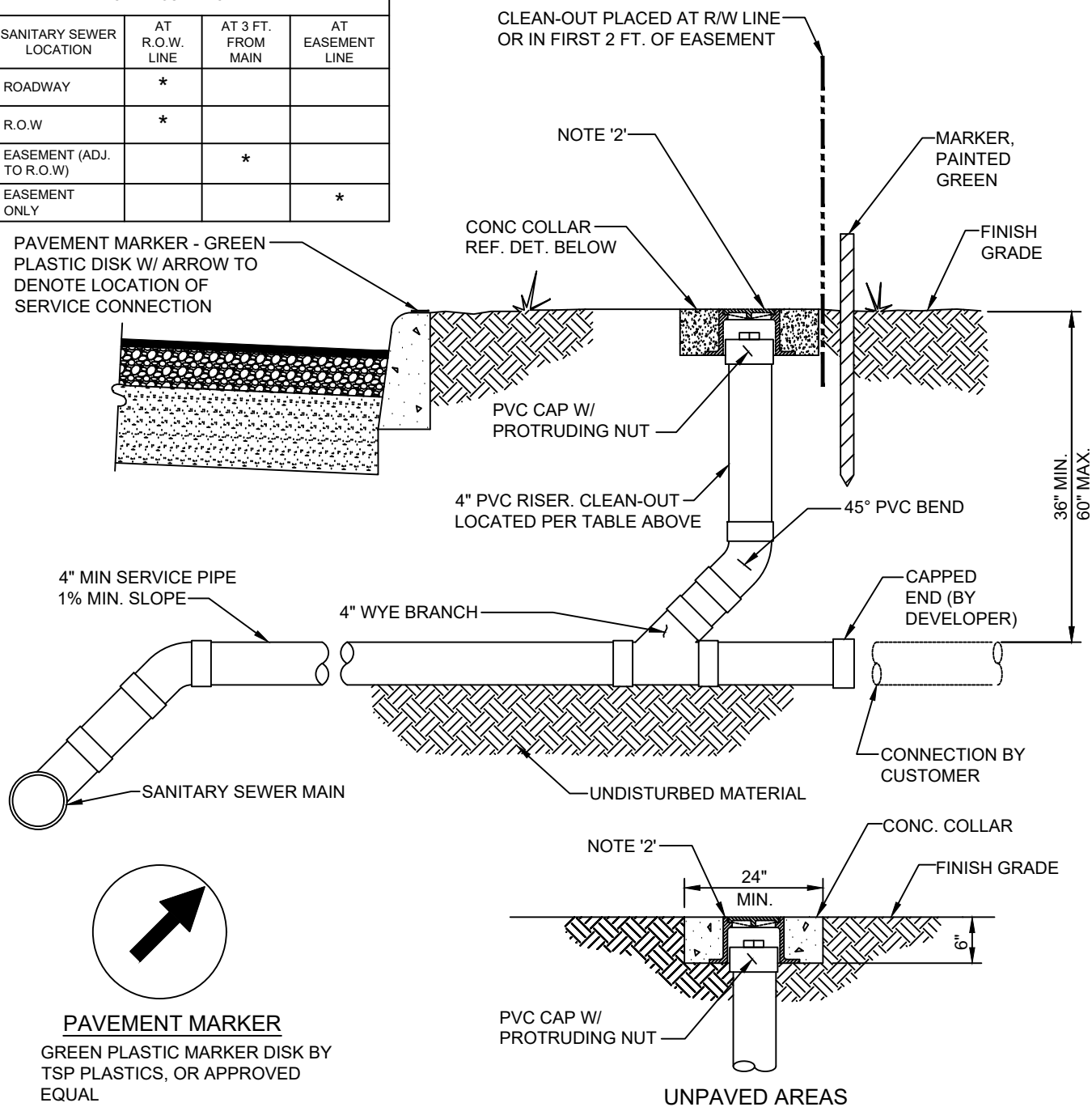
SINGLE SERVICE WYE CONNECTION & CLEAN OUT

WWS-14

Sheet 1 of 1

CLEAN-OUT PLACEMENT			
SANITARY SEWER LOCATION	AT R.O.W. LINE	AT 3 FT. FROM MAIN	AT EASEMENT LINE
ROADWAY	*		
R.O.W	*		
EASEMENT (ADJ. TO R.O.W)		*	
EASEMENT ONLY			*

PAVEMENT MARKER - GREEN
PLASTIC DISK W/ ARROW TO
DENOTE LOCATION OF
SERVICE CONNECTION



PAVEMENT MARKER

GREEN PLASTIC MARKER DISK BY
TSP PLASTICS, OR APPROVED
EQUAL

GENERAL NOTES:

- CLEAN-OUTS IN UNPAVED AREAS SHALL HAVE A MIN. 24" SQUARE OR 24" DIAMETER POURED IN PLACE CONCRETE COLLAR 6" THICK CENTERED ON THE C.I. COVER.
- US FOUNDRY #7621 FOR 4" AND 6" CO'S OR, FOR 4" CO'S ONLY, AN ADJUSTABLE 6" C.I. VALVE BOX, TOP SECTION ONLY. COVERS TO BE MARKED W/ 'S' OR 'SEWER'. NON-DOMESTIC EQUAL IS ACCEPTABLE.
- EOR TO CONFIRM PIPE DEPTHS & SEPARATIONS ARE CORRECT FOR WATER & WASTE WATER SERVICES. ANY VARIANCES REQUIRE APPROVAL FROM WUE.

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GEG

DATE

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9

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M.RIESNER

REVISION DATE

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WASTE-WATER STANDARDS

WATER ENGINEERING DIVISION

DOUBLE SERVICE WYE CONNECTION & CLEAN OUT

WWS-14A

Sheet 1 of 1

CLEAN-OUT PLACEMENT			
SANITARY SEWER LOCATION	AT R.O.W. LINE	AT 3 FT. FROM MAIN	AT EASEMENT LINE
ROADWAY	*		
R.O.W.	*		
EASEMENT (ADJ. TO R.O.W.)		*	
EASEMENT ONLY			*

← TO SANITARY SEWER MAIN

6" MIN. SERVICE PIPE

6x4 DOUBLE WYE BRANCH

CONC COLLAR
REF. DET. WWS-014

PLAN

CLEAN-OUT PLACED AT R/W LINE
OR IN FIRST 2 FT. OF EASEMENT

PAVEMENT MARKER - GREEN
PLASTIC DISK W/ ARROW TO
DENOTE LOCATION OF
SERVICE CONNECTION.
REF. DET. WWS-014

REF. DET. WWS-014
CONC COLLAR
REF. DET. WWS-014

MARKER,
PAINTED GREEN

4" PVC RISER. CLEAN-OUT
LOCATED PER TABLE ABOVE

36" MIN.
60" MAX.

6x4 DOUBLE WYE BRANCH

45° PVC ELL

UNDISTURBED MATERIAL

SANITARY SEWER MAIN

WYE BRANCH

CAPPED
END (BY
DEVELOPER)

CONNECTION BY
CUSTOMER

ELEVATION

GENERAL NOTES:

1. REFERENCE WASTEWATER DETAIL WWS-014 FOR CLEAN-OUTS LOCATED IN UNPAVED AREAS.
2. EOR TO CONFIRM PIPE DEPTHS & SEPARATIONS ARE CORRECT FOR WATER & WASTE WATER SERVICES. ANY VARIANCES REQUIRE APPROVAL FROM WUE.

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8

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WASTE-WATER STANDARDS

WATER ENGINEERING DIVISION

SEWER PUMP STATION PLAN, SECTION, & DETAILS

WWS-15

Sheet 1 of 1

**PLEASE SEE SEWER PUMP STATION
DETAILS & SPECIFICATIONS ON CITY
OF LAKE LAND WEBSITE**

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M.M.RIESNER

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12/30/2022

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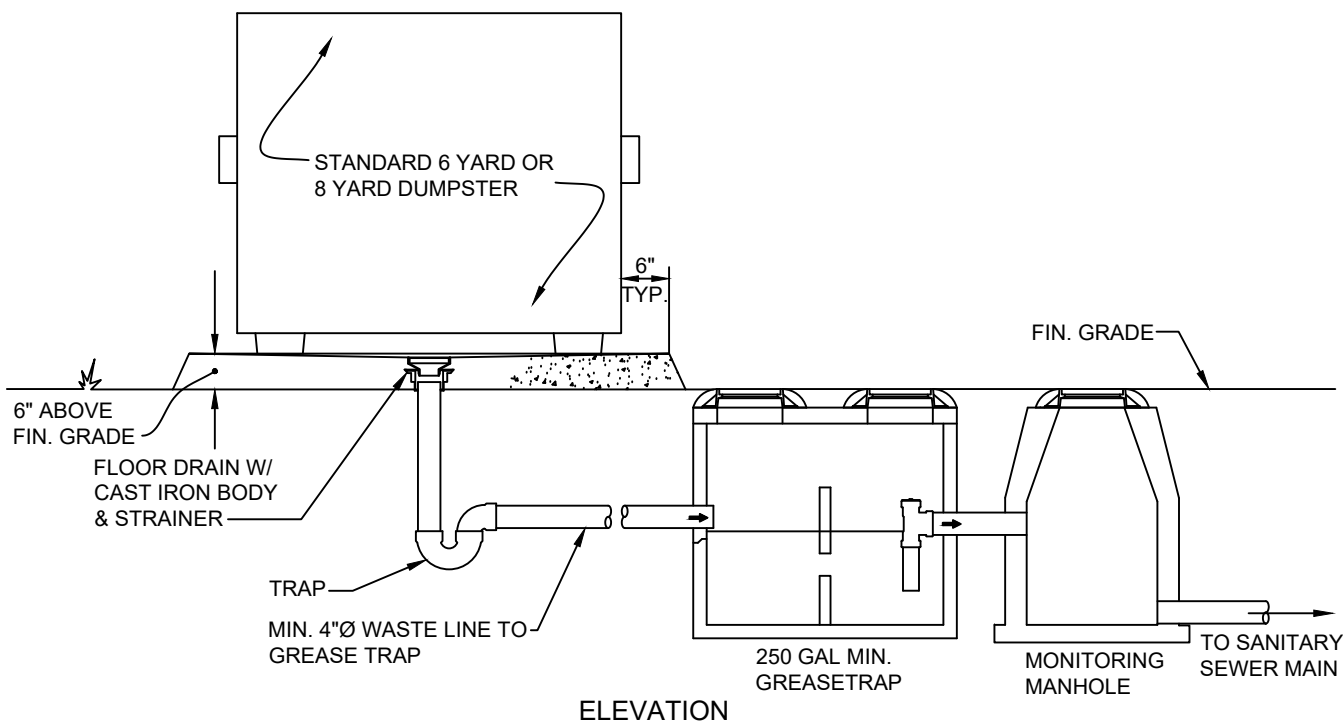
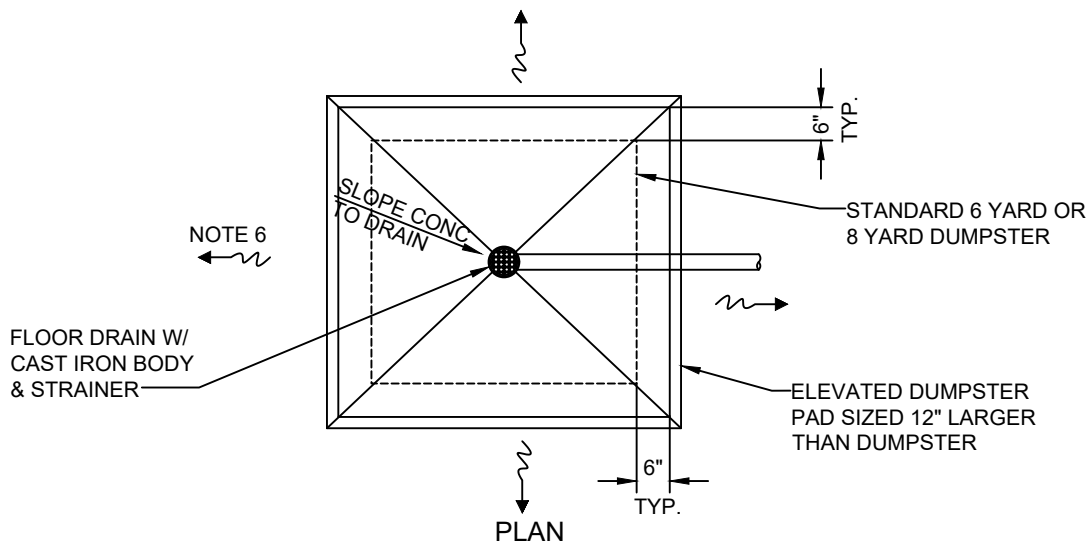
WASTE-WATER STANDARDS

WATER ENGINEERING DIVISION

DUMPSTER & COMPACTOR PADS DRAINED TO SANITARY SEWER

WWS-16

Sheet 1 of 1



GENERAL NOTES:

1. THIS DETAIL TO BE EMPLOYED WHEN OTHER JURISDICTIONAL AGENCIES REQUIRE DUMPSTERS/COMPACTORS TO BE DRAINED TO SEWER. **THIS IS NOT A REQUIREMENT OF THE WATER UTILITIES DEPARTMENT.**
2. DUMPSTERS AND TRASH COMPACTORS SHALL INCLUDE A MIN. 250 GAL. CAPACITY GREASE TRAP AND  5
3. DUMPSTER - REFERENCE CITY OF LAKE LAND SOLID WASTE DIV., 6 YARD OR 8 YARD CAPACITY, 72"W x 66"D x 60"/80"H.
4. IMPACT FEES AND MONTHLY WASTEWATER FEES SHALL APPLY.
5. REFERENCE DETAIL WWS-005A FOR COMBINED WASTE FLOWS TO MONITORING MANHOLE.
6. SURROUNDING AREA SHALL BE GRADED TO DRAIN AWAY FROM ELEVATED DUMPSTER PAD ON ALL SIDES.

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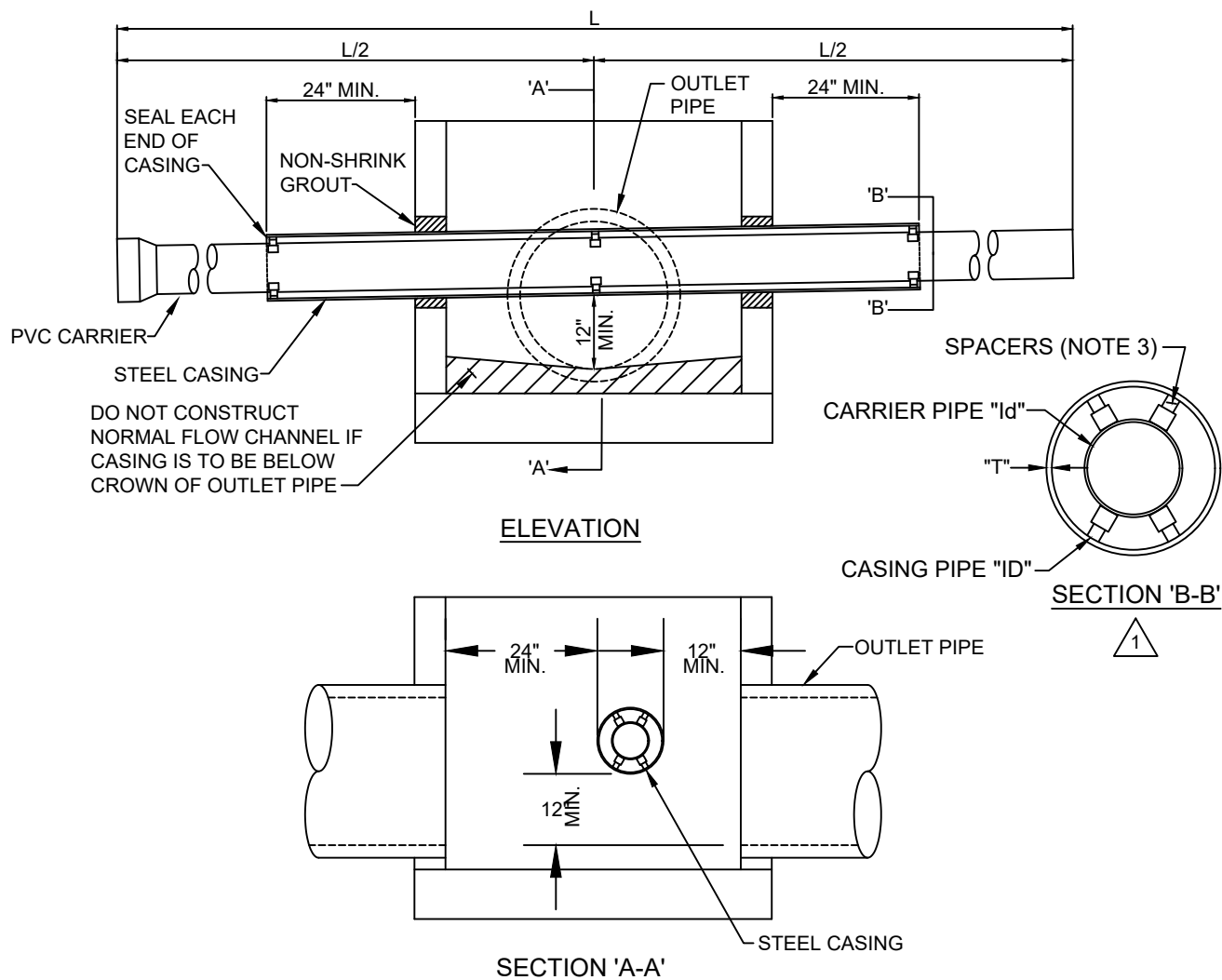
WASTE-WATER STANDARDS

WATER ENGINEERING DIVISION

CONFLICT STRUCTURE

WWS-17

Sheet 1 of 1



CASING SCHEDULE										
PVC CARRIER PIPE SIZE (Id)	4"	6"	8"	10"	12"	14"	16"	18"	21"	24"
STEEL CASING PIPE SIZE (ID)	10"	12"	16"	18"	20"	24"	30"	30"	30"	36"
STEEL CASING PIPE SIZE (T)	.188"	.250"	.281"	.312"	.344"	.375"	.469"	.469"	.469"	.532"

GENERAL NOTES:

1. PIPE BELLS / JOINTS ARE NOT PERMITTED WITHIN CASING. ONE STICK OF PVC TO BE CENTERED ON STRUCTURE.
 2. "SUMPED" CONFLICT STRUCTURES SHALL NOT BE USED UNLESS THE SYSTEM IS DESIGNED TO ACCOUNT FOR COMPLETE BLOCKAGE OF THE SUMP.
 3. SPACERS ARE REQUIRED AT EACH END AND MIDDLE OF THE CASING. USE OF WOOD SKIDS ARE NOT PERMITTED.
1. REFERENCE WASTEWATER DIVISION MATERIAL SPECIFICATIONS.

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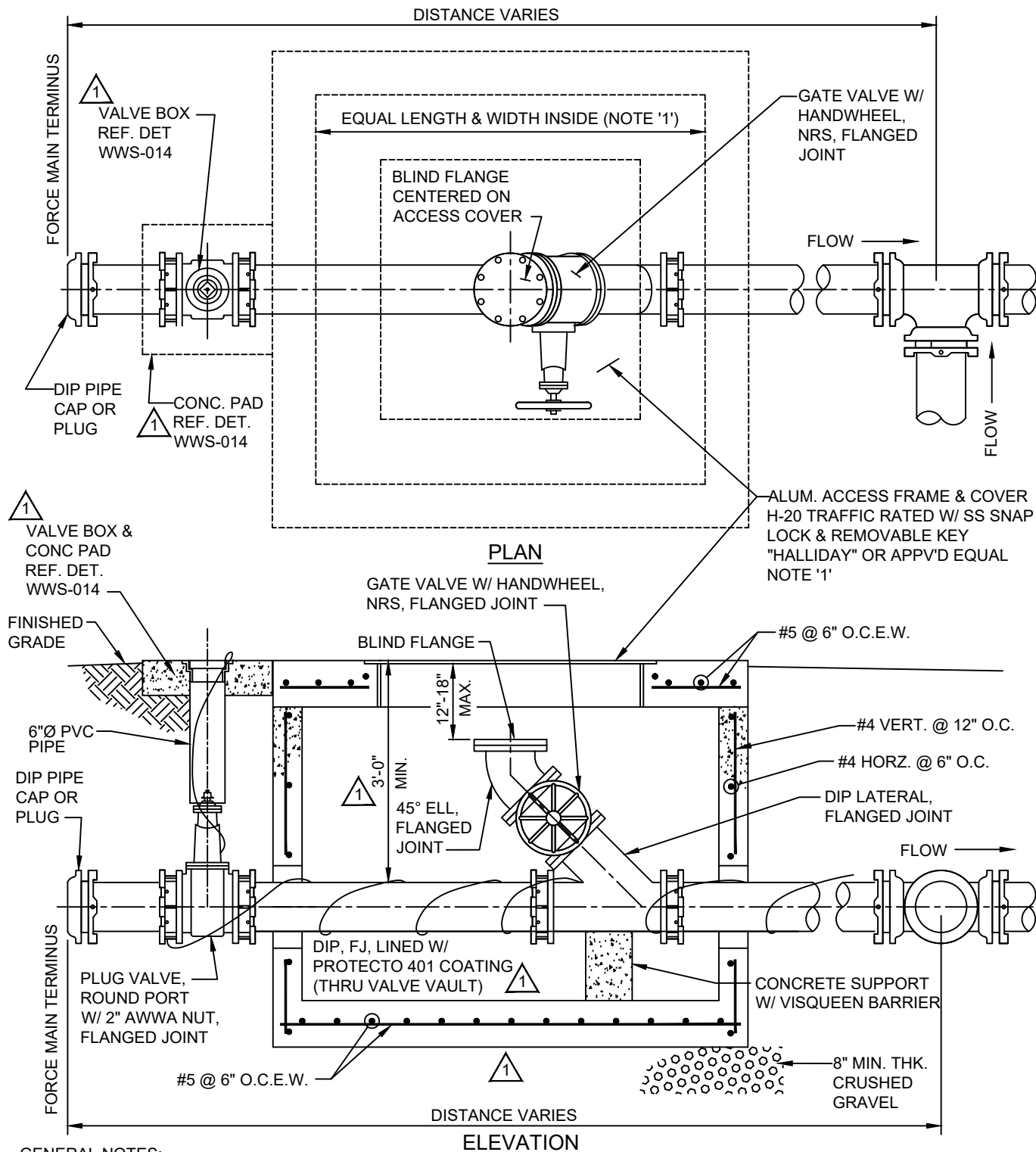
WASTE-WATER STANDARDS

WATER ENGINEERING DIVISION

PIG LAUNCHING PORT REMOTE APPLICATION

WWS-18

Sheet 1 of 1



GENERAL NOTES:

1. DIMENSION VARIES ACCORDING TO PIPE SIZE.
2. THE USE OF 'DOGHOUSE' STYLE VAULTS FOR PIG LAUNCHING PORTS ON EXISTING FORCE MAINS MAY BE EVALUATED BY CONTACTING WATER UTILITIES ENGINEERING.

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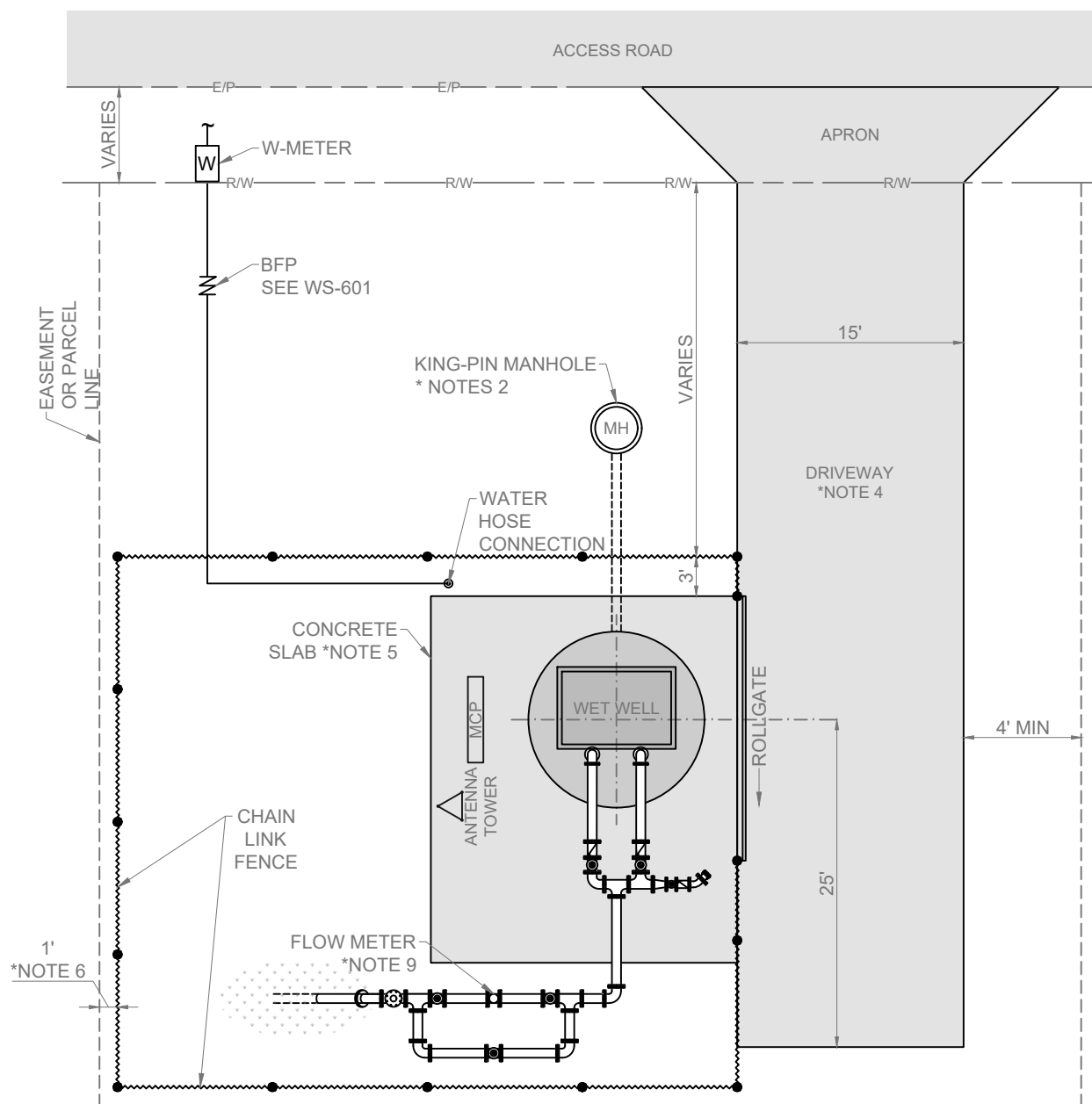
WASTE-WATER STANDARDS

WATER ENGINEERING DIVISION

SEWER PUMP STATION (TYPICAL LAYOUT)

WWS-19

Sheet 1 of 1



GENERAL NOTES:

1. ALSO REFER TO SANITARY SEWER PUMP STATION DETAILS AND SPECIFICATION
2. 6' Ø KINGPIN MANHOLE AND WET WELL SHALL BE POLYMER CONCRETE. REFER TO DETAIL WWS-005.
3. REFER TO CITY OF LAKELAND OR POLK COUNTY STANDARDS FOR DRIVE WAY AND APRON SPECIFICATIONS.
4. DRIVE WAY IS REQUIRED AS DIMENSIONED WHEN ACCESS ROAD IS CONSIDERED TO HAVE, OR IS INTENDED FOR, SIGNIFICANT TRAFFIC.
5. DRIVE WAY AND CONCRETE SLAB TO BE FLUSH AND WITHOUT GRASS STRIP IN BETWEEN.
6. WITH THE EXCEPTION OF THE FRONT, FENCING SHALL BE PLACED 1 FOOT INSIDE THE EASEMENT OR PARCEL LINE.
7. FOR FINAL LAYOUT OF STATION, DRIVEWAY AND FENCING, A FIELD MEETING IS REQUIRED WITH WATER UTILITIES DEPARTMENT, LIFT STATION SUPERVISOR, AND ENGINEERING INSPECTOR; OR OTHER DEPARTMENT DESIGNEES.
8. FOR PIPING AND WET WELL DETAILS REFER TO "SANITARY SEWER PUMP STATION DETAILS AND SPECIFICATIONS".
9. PROVIDE FOR UPSTREAM & DOWNSTREAM PIPE DIAMETERS PER MANUFACTURERS REQUIREMENTS.

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M.RIESNER

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02/28/2025

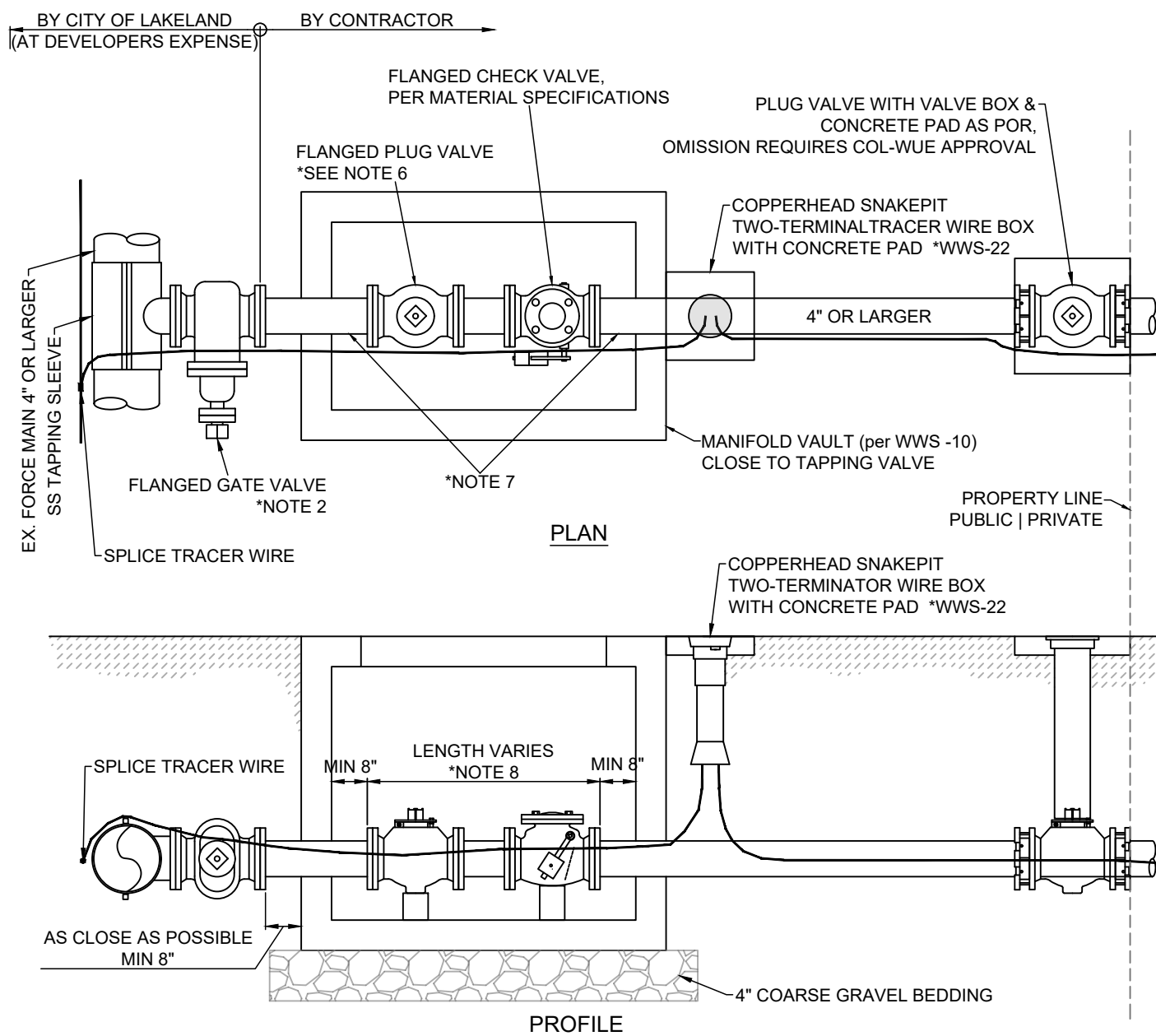
WASTE-WATER STANDARDS

WATER ENGINEERING DIVISION

4" AND LARGER FORCE MAIN CONNECTION

WWS-20A

Sheet 1 of 1



GENERAL NOTES:

1. WET TAPS ON WW FORCE MAINS ARE TO BE PERFORMED BY CITY OF LAKELAND AT THE EXPENSE OF THE DEVELOPER.
2. FLANGED TAPPING VALVE TO BE ROLLED 90° FROM VERTICAL.
3. THE CONTRACTOR IS TO INSTALL A MANIFOLD VAULT AS CLOSE AS POSSIBLE (MIN 8") TO TAPPING LOCATION. EQUIPPED WITH FLANGED ROUND PORT PLUG VALVE AND FLANGED CHECK VALVE. SEE WWS-10 FOR MANIFOLD VAULT SPECS.
4. MINIMUM DISTANCE FOR EXCAVATION OF TAPPING PIT SHALL BE SIX FEET FROM EXISTING FORCE MAIN TO BACK OF PIT.
5. TAPPING SLEEVES SHALL NOT BE INSTALLED WITHIN TWO FEET OF ANY PIPE JOINT.
6. PLUG VALVES LARGER THEN 6 INCHES SHALL BE EQUIPPED WITH A GEAR OPERATOR.
7. DUCTILE IRON PIPE THRU VAULT, FLANGED JOINT OR PLAIN END, LINED W/ 401 PROTECTO COATING
4. FLANGED CHECK VALVE, SPOOL PIECE, & PLUG VALVE. SPOOL PIECE LENGTH MUST ALLOW FOR REMOVAL OF ALL BOLTS WITHOUT REMOVING PLUG AND CHECK VALVE.

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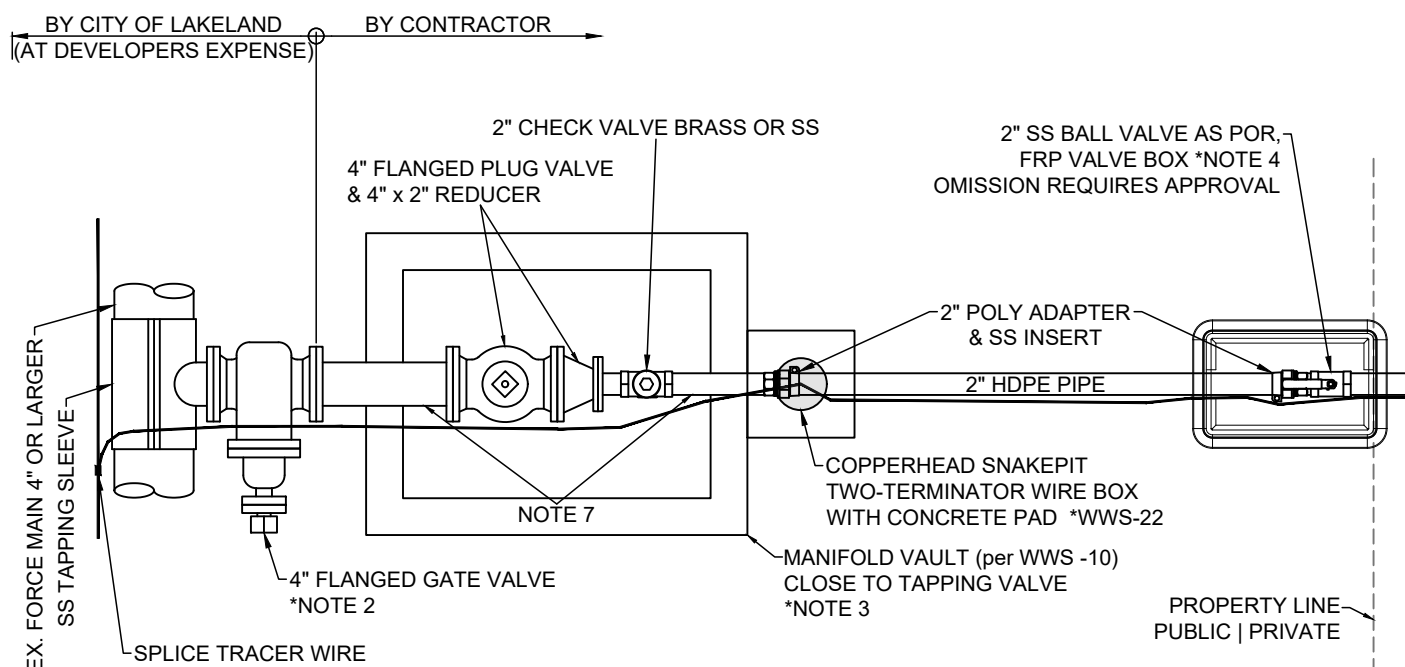
WASTE-WATER STANDARDS

WATER ENGINEERING DIVISION

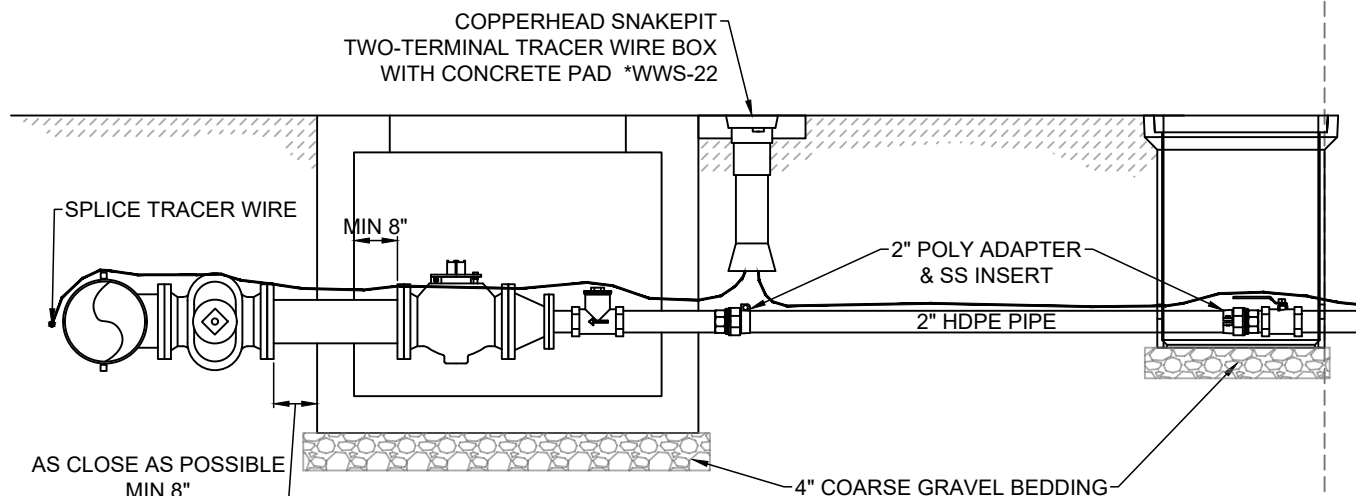
2" CONNECTION TO 4" AND LARGER FORCE MAIN

WWS-20B

Sheet 1 of 1



PLAN



PROFILE

GENERAL NOTES:

1. WET TAPS ON WASTEWATER FORCE MAINS ARE TO BE PERFORMED BY CITY OF LAKELAND AT THE EXPENSE OF THE DEVELOPER.
2. 4" FLANGED TAPPING VALVE TO BE ROLLED 90° FROM VERTICAL.
3. THE CONTRACTOR IS TO INSTALL A MANIFOLD VAULT AS CLOSE AS POSSIBLE (MIN 8") TO TAPPING LOCATION. EQUIPPED WITH 4" FLANGED ROUND PORT PLUG VALVE, 4"x2" REDUCER, AND 2" BRASS OR SS CHECK VALVE. SEE WWS-10 FOR MANIFOLD VAULT SPECS.
4. FRP VAULT BOX NOT FOR USE IN ROADWAYS. H-20 LOAD RATING FOR ALL OTHER AREAS. ONE-PIECE POLYMER CONCRETE COVER WITH "SANITARY SEWER" AND "CONFINED SPACE" IMPRINT.
5. MINIMUM DISTANCE FOR EXCAVATION OF TAPPING PIT SHALL BE SIX FEET FROM EXISTING FORCE MAIN TO BACK OF PIT.
6. TAPPING SLEEVES SHALL NOT BE INSTALLED WITHIN TWO FEET OF ANY PIPE JOINT.
7. DUCTILE IRON PIPE THRU VAULT, FLANGED JOINT OR PLAIN END, LINED W/ 401 PROTECTO COATING

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M.RIESNER

DATE

2/24/2026

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REVISION DATE

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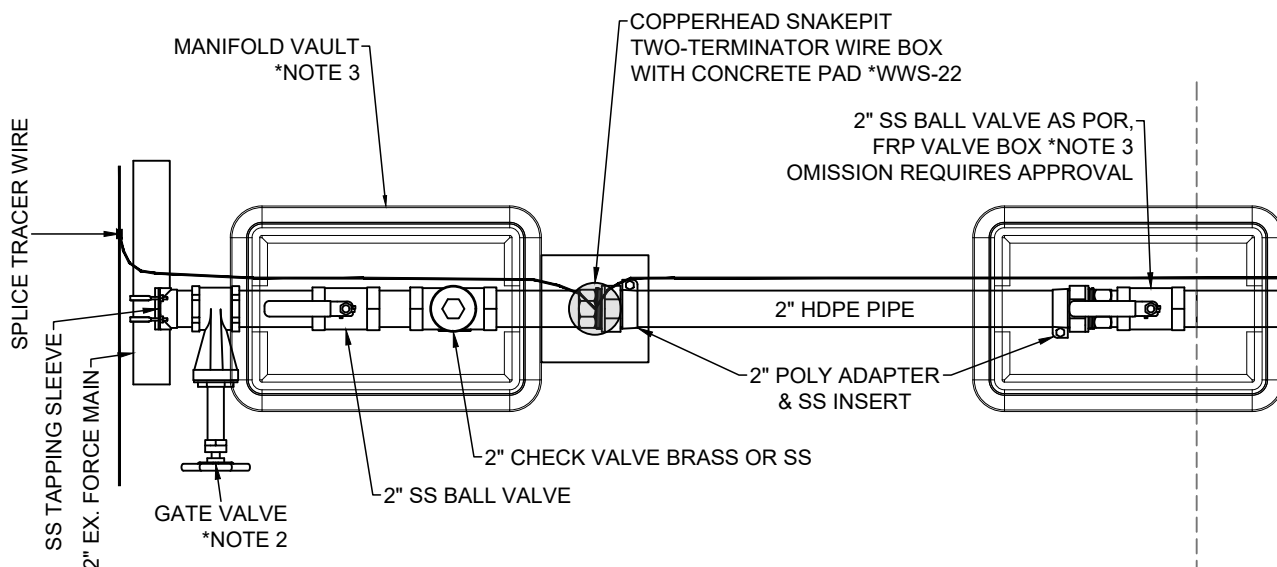
WASTE-WATER STANDARDS

WATER ENGINEERING DIVISION

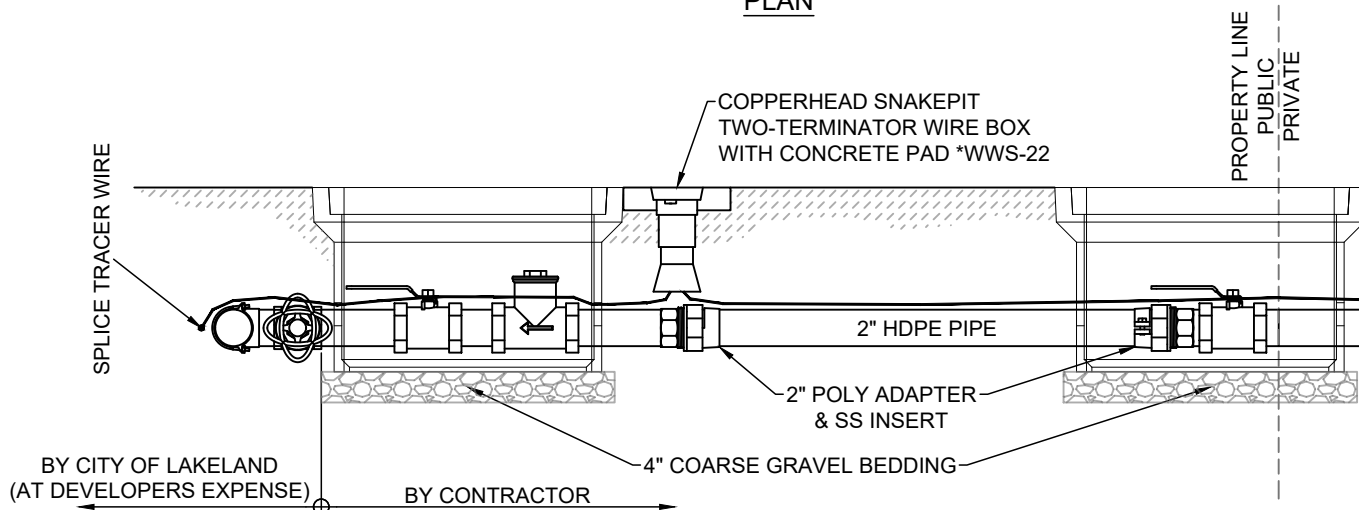
2" FORCE MAIN CONNECTION

WWS-20C

Sheet 1 of 1



PLAN



PROFILE

GENERAL NOTES:

1. WET TAPS ON WASTEWATER FORCE MAINS ARE TO BE PERFORMED BY CITY OF LAKE LAND AT THE EXPENSE OF THE DEVELOPER. TAPS SHALL NOT BE INSTALLED WITHIN TWO FEET OF ANY PIPE JOINT.
2. TAPPING VALVE TO BE ROLLED 90° FROM VERTICAL.
3. FRP VAULT BOX A12-24-36 TO BE INSTALLED AS CLOSE AS POSSIBLE TO TAPPING LOCATION. NOT FOR USE IN ROADWAYS. H-20 LOAD RATING FOR ALL OTHER AREAS. ONE-PIECE POLYMER CONCRETE COVER WITH "SANITARY SEWER" AND "CONFINED SPACE" IMPRINT.

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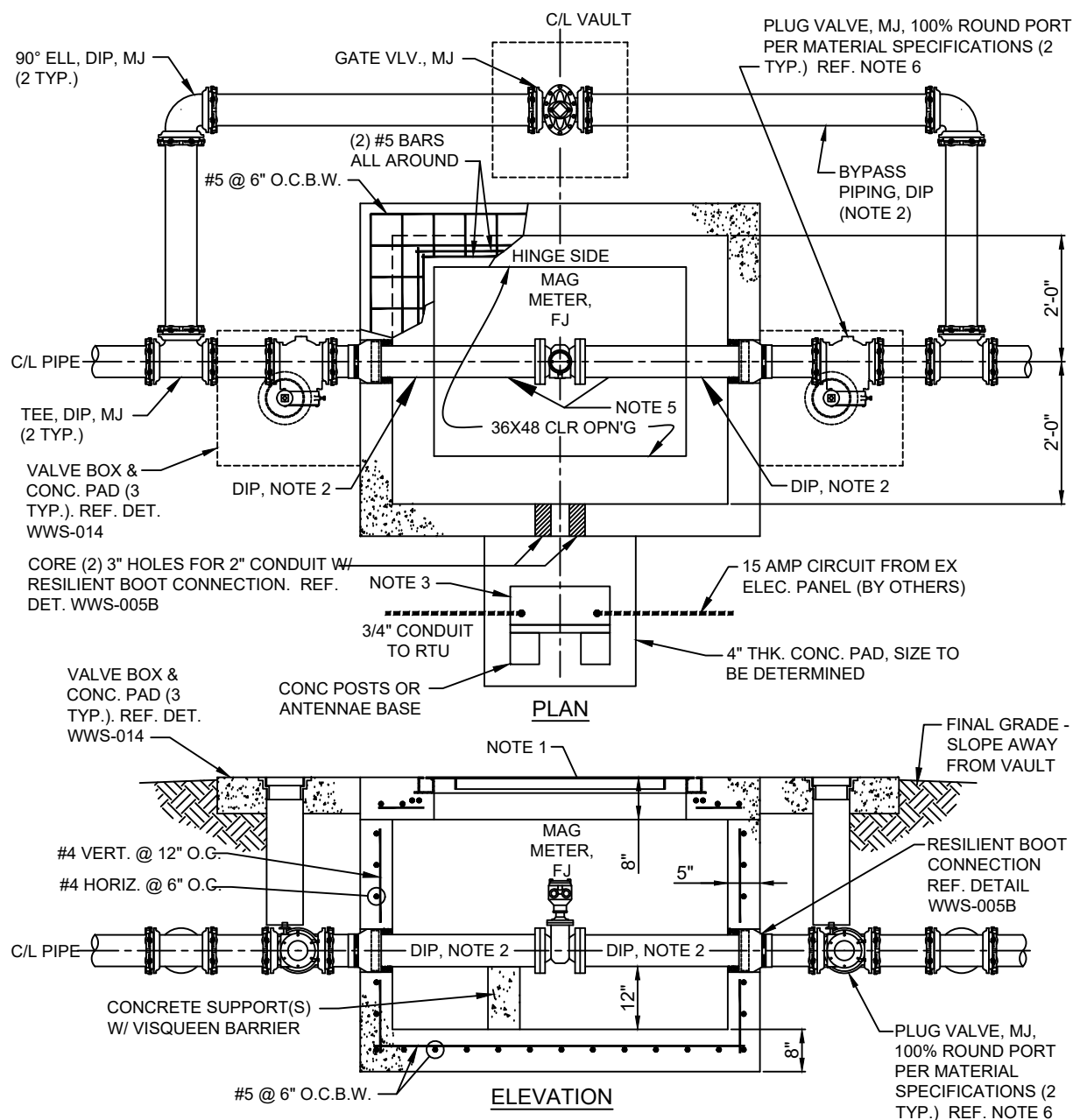
WASTE-WATER STANDARDS

WATER ENGINEERING DIVISION

SEWER FORCE MAIN MAG METER VAULT

WWS-21

Sheet 1 of 1



GENERAL NOTES:

- HALLIDAY ALUMINUM ACCESS DOOR SERIES W1R3648, OR EQUAL. LOAD RATINGS - WITHIN ROADWAY NOT PERMITTED. ALL OTHER AREAS H-20.
- ALL DUCTILE IRON PIPE AND FITTINGS TO BE EPOXY LINED WITH PROTECTO 401.
- STAINLESS STEEL ENCLOSURE OR SUN SHIELD FOR REMOTE READOUT AND 110V OUTLET. SIZE TO BE DETERMINED.
- SIZES FOR METER, PIPE, AND VAULT TO BE DETERMINED BY THE ENGINEER.
- DUCTILE IRON PIPE LENGTHS TO MEET MANUFACTURER'S RECOMMENDATION; MINIMUM OF 30" LONG ON ONE SIDE FOR CALIBRATION (EITHER SIDE).
- PLUG VALVES SIX INCHES IN SIZE AND GREATER SHALL BE EQUIPPED WITH A GEAR OPERATOR.
- BASED ON FIELD CONDITIONS AND THE LOCATION OF THE VALVE VAULT, WATER UTILITIES ENGINEERING MAY REQUIRE THE USE OF BOLLARDS FOR THE PROTECTION OF THE VAULT.

DRAWN BY

CHART/GE

DATE

10/10/2013

REVISION NO.

1

REVISION BY

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REVISION DATE

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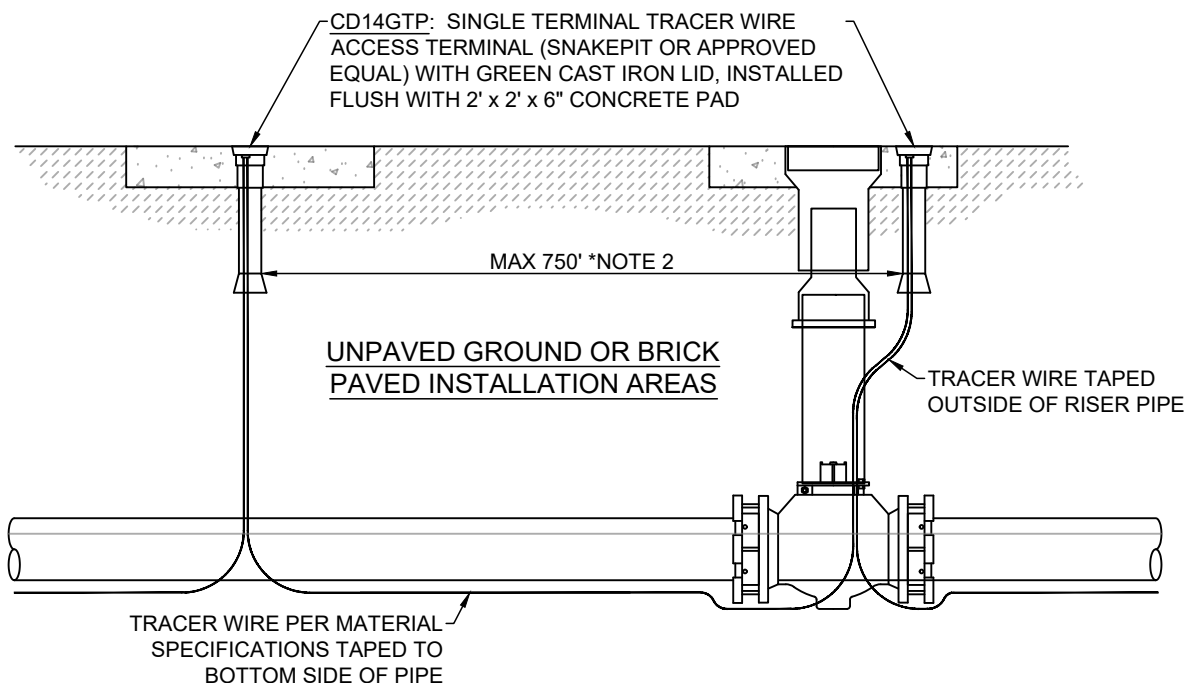
WASTE-WATER STANDARDS

WATER ENGINEERING DIVISION

TRACER WIRE ACCESS POINT TERMINAL

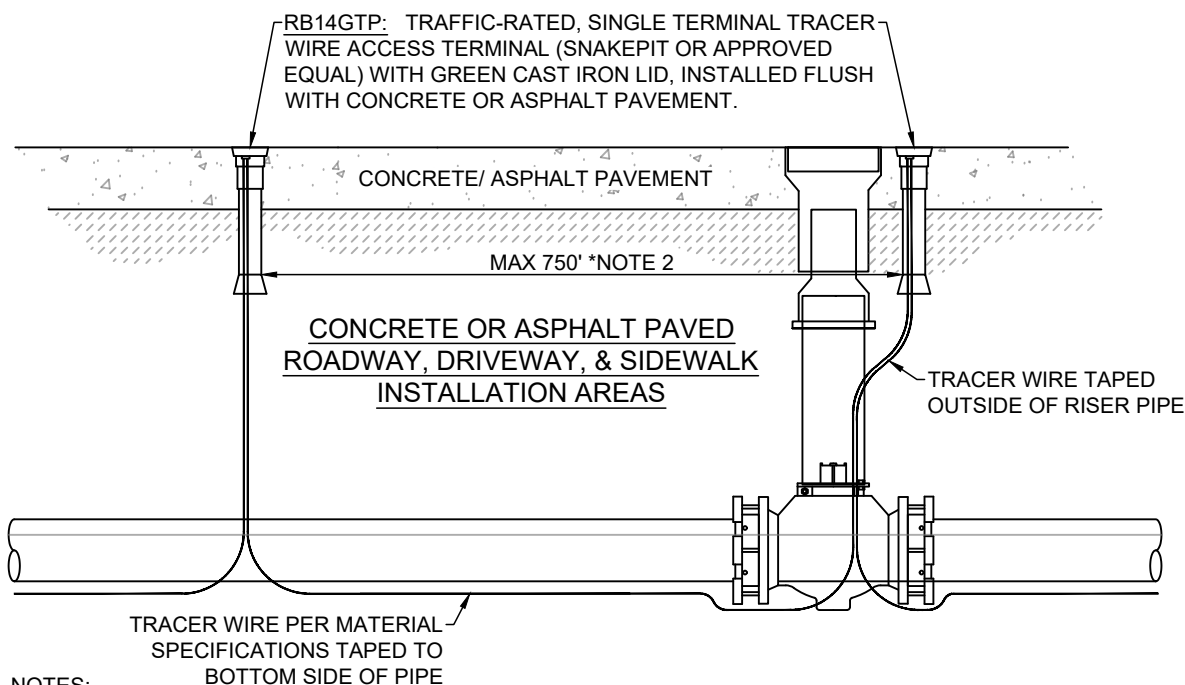
WWS-22

Sheet 1 of 1



TRACER WIRE TERMINAL INSTALLATIONS
NOT AT PLUG VALVES

TRACER WIRE TERMINAL INSTALLATIONS
AT PLUG VALVES



GENERAL NOTES:

1. TRACER WIRES ARE TO BE CONNECTED TO ACCESS TERMINAL PER MANUFACTURERS SPECIFICATIONS.
2. TRACER WIRE ACCESS TERMINALS SHALL BE INSTALLED AT EACH PLUG VALVE. IF PLUG VALVE SPACING EXCEEDS 750FT, INSTALL ADDITIONAL ACCESS TERMINALS AT INTERVALS NOT EXCEEDING 750 FT.

DRAWN BY

M.RIESNER

DATE

3/9/2026

REVISION NO.

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REVISION BY

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