APPENDIX B

STANDARD DRAWINGS

CLERMONT COUNTY WATER RESOURCES DEPARTMENT

CLERMONT COUNTY, OHIO

STANDARD DRAWINGS

Drawing No.	Title
General Details	
G1.1	Keyblock Anchors for Water or Sewer Mains on Steep Slopes
G1.2	Stream Crossing Concrete Encasement Detail
G1.3	Concrete Blocking for Pipe Fittings on Water & Force Mains
Water Distribution System	
W1.0	General Water Notes
W1.1	Gate and Butterfly Valves
W1.2	Valve Restraint Blocking
W2.1	Fire Hydrant Layout & Assembly
W3.1	Detector Check Valve Assembly
W3.2	5/8"x3/4"& 1" Domestic Meters Assembly
W3.2.1	5/8"x3/4"& 1" Meter Box Detail
W3.3	1-1/2"& 2" Domestic Meters Assembly
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Wastewater Collection System	
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S1.3	Standard Manhole for Sewers 42"& Larger
S1.4	Inside Drop Manhole
S1.6	Manhole Frame with Vented Lid
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Drawing No.	Title
S5.1	Lift Station Layout
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S5.1.2	Lift Station Detail
S5.1.3	Valve Chamber Detail
S5.1.4	Wet Well Electric Detail
S5.1.5	Duplex Lift Station Control Panel General Layout
S5.1.6	Duplex Lift Station I/O List
S5.1.7	Lift Station Conduit Routing
S5.1.8	Duplex Control Panel Sample Drawings (1 of 7)
S5.1.9	Duplex Control Panel Sample Drawings (2 of 7)
S5.1.10	Duplex Control Panel Sample Drawings (3 of 7)
S5.1.11	Duplex Control Panel Sample Drawings (4 of 7)
S5.1.12	Duplex Control Panel Sample Drawings (5 of 7)
S5.1.13	Duplex Control Panel Sample Drawings (6 of 7)
S5.1.14	Duplex Control Panel Sample Drawings (7 of 7)
S5.2.1	Standard Force Main Access Manhole
S5.2.2	Standard Force Main Low Point Manhole
S5.2.3	Air Release Valve in Manhole
S6.1	Standard Septic Tank Effluent Pump (STEP)
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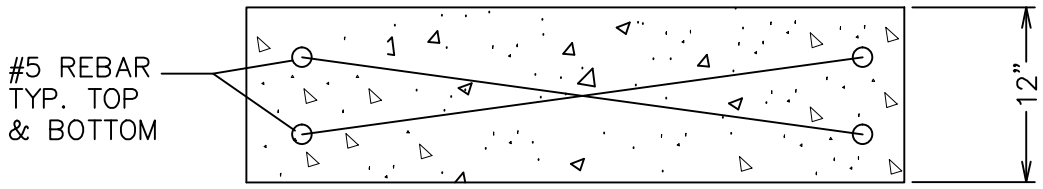
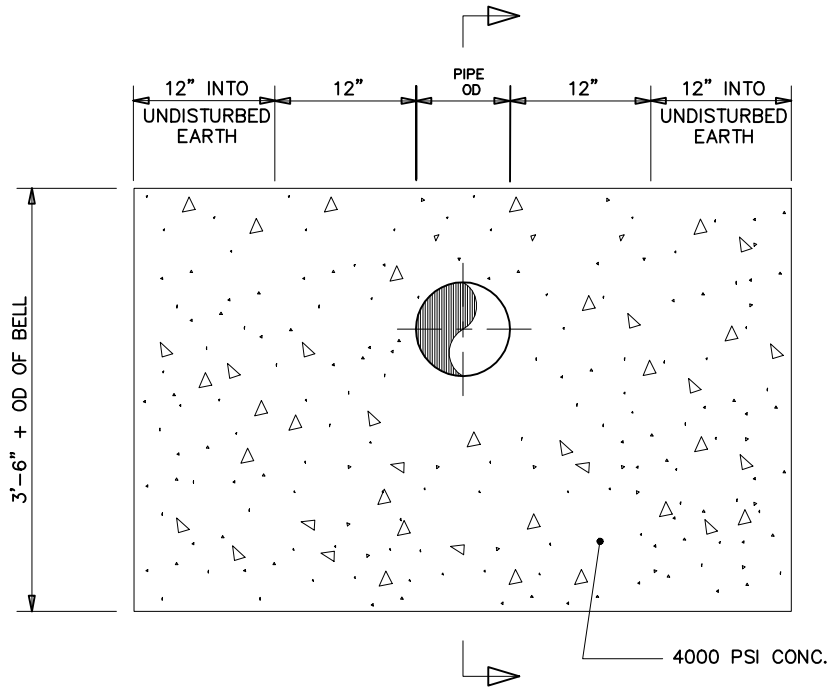
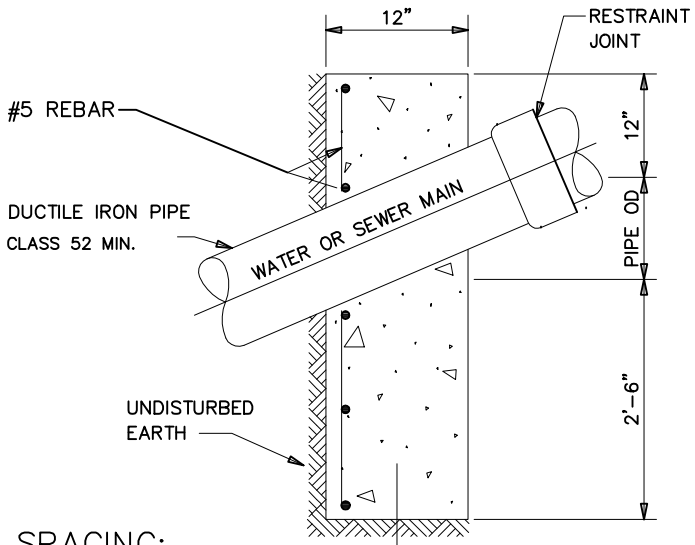
S6.1.2	Removed
S6.2	Typical Residential STEP Connection to a LPFM
S6.2.1	Low Pressure Force Main (LPFM) Lateral Installation
S6.3	Typical Residential STEP Connection to Small Diameter Gravity Sewer
S6.3.1	Small Diameter Gravity Sewer Lateral Installation
S6.4	Low Pressure Force Main Flushing Connection Manhole
S6.5	Low Pressure Force Main Flushing MH w/ Air Release Valve
S6.6	Low Pressure Force Main Terminal Manhole
S7.1	Gravity Grease Interceptor



TOP



ELEVATION



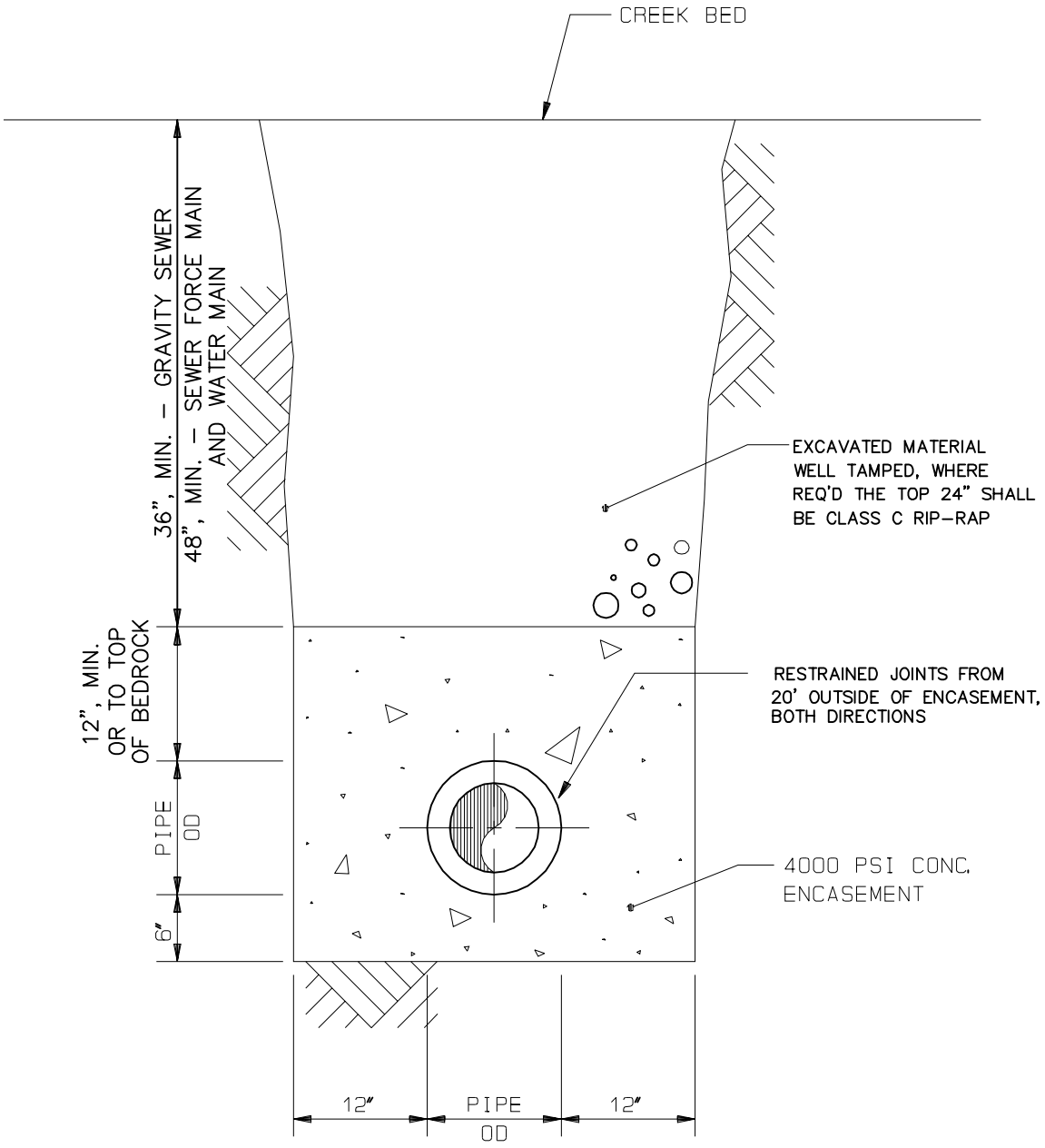
MINIMUM SPACING:

36' ON GRADES 15%–35%
24' ON GRADES 35%–50%
16' ON GRADES OVER 50%

SECTION

NO SCALE

CLERMONT COUNTY WATER RESOURCES DEPARTMENT APPROVED _____ DATE _____ REVISED JUNE, 2013	KEYBLOCK ANCHORS FOR WATER OR SEWER MAINS ON STEEP SLOPES	DRAWING NO. G1.1



NO SCALE

CLERMONT COUNTY WATER RESOURCES DEPARTMENT APPROVED _____ DATE	STREAM CROSSING CONCRETE ENCASEMENT DETAIL	DRAWING NO. G1.2

CLERMONT COUNTY
WATER RESOURCES DEPARTMENT

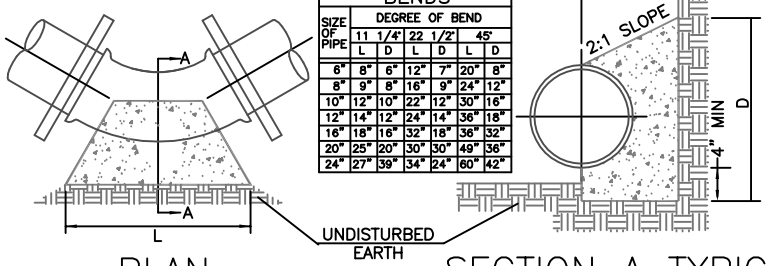
APPROVED _____

DATE _____

REVISED DEC. 2018

CONCRETE BLOCKING
FOR PIPE FITTINGS ON
WATER & FORCE MAINS

DRAWING NO.
G1.3

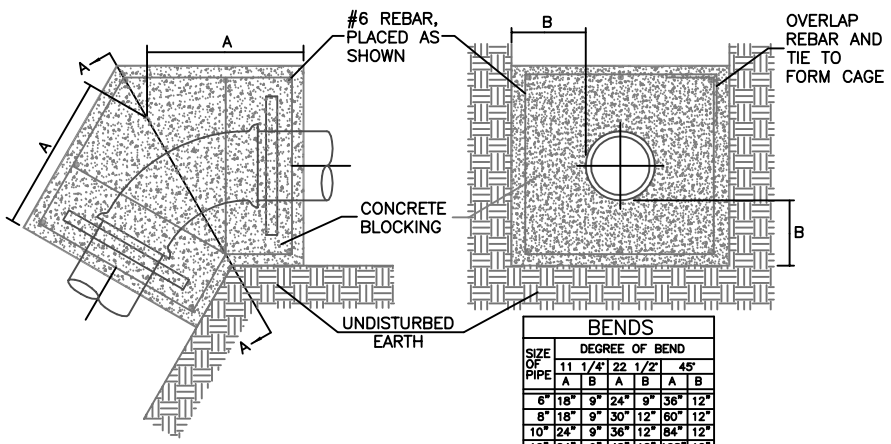


BENDS						
SIZE OF PIPE	DEGREE OF BEND					
	11 1/4°		22 1/2°		45°	
	L	D	L	D	L	D
6"	8"	6"	12"	7"	20"	8"
8"	9"	8"	16"	9"	24"	12"
10"	12"	10"	22"	12"	30"	16"
12"	14"	12"	24"	14"	36"	18"
16"	18"	16"	32"	18"	36"	32"
20"	25"	20"	30"	30"	48"	36"
24"	27"	39"	34"	24"	60"	42"

PLAN SECTION A TYPICAL

BENDS 45° AND UNDER

N.T.S.



BENDS						
SIZE OF PIPE	DEGREE OF BEND					
	11 1/4°		22 1/2°		45°	
	A	B	A	B	A	B
6"	18"	9"	24"	9"	36"	12"
8"	18"	9"	30"	12"	60"	12"
10"	24"	9"	36"	12"	84"	12"
12"	24"	9"	48"	12"	108"	12"

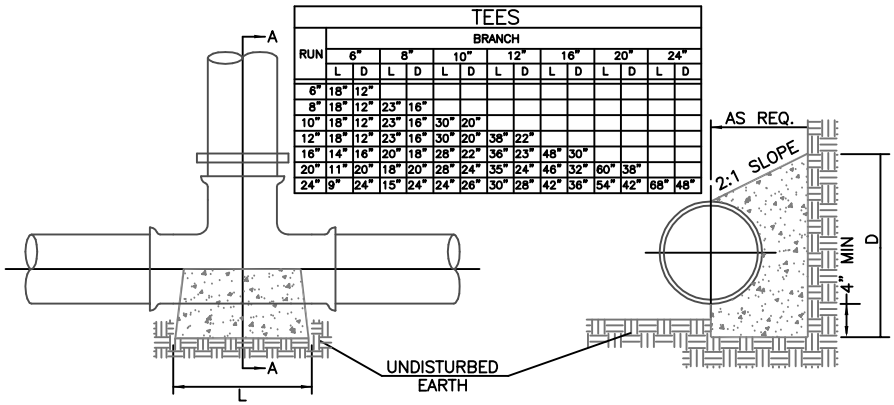
ELEVATION SECTION A TYPICAL

TOP VERTICAL BENDS

N.T.S.

BLOCKING NOTES:

1. BLOCKING SHALL BE CLASS "C" CONCRETE
2. BLOCKING REQUIRED AT ALL BENDS
3. FACE OF EACH BLOCK MUST BE PERPENDICULAR TO THE LINE OF THRUST
4. FITTINGS TO BE WRAPPED WITH 4 MIL PLASTIC TO PREVENT CONCRETE CONTACTING BOLTS, GLANDS, AND NUTS
5. CONCRETE TO BE POURED AGAINST UNDISTURBED EARTH ON THE THRUST SIDE
6. D.I. RETAINER GLANDS TO BE USED IN ADDITION TO CONCRETE THRUST BLOCKING
7. 3/4" REINFORCING BARS TO BE USED IN HIGH PRESSURE ZONES AS DIRECTED BY THE CCWRD
8. RUDIMENTARY FORMS USED TO CONTAIN CONCRETE IN THRUST AREA

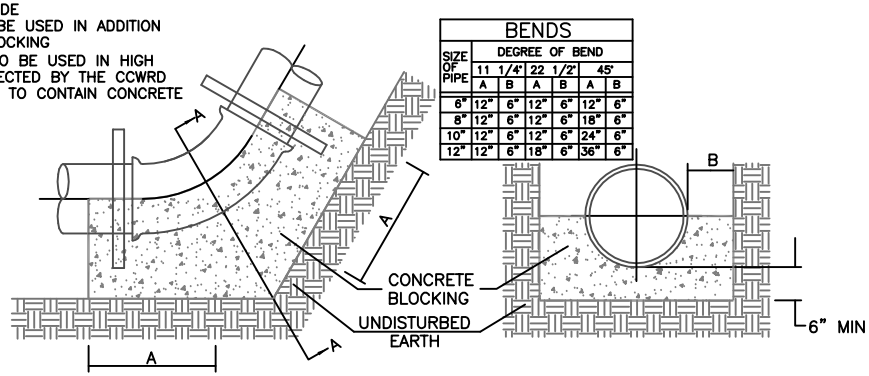


TEES														
RUN	BRANCH													
	6"		8"		10"		12"		16"		20"		24"	
	L	D	L	D	L	D	L	D	L	D	L	D	L	D
6"	18"	12"												
8"	18"	12"	23"	16"										
10"	18"	12"	23"	16"	30"	20"								
12"	18"	12"	23"	16"	30"	20"	38"	22"						
16"	14"	16"	20"	18"	28"	22"	36"	23"	48"	30"				
20"	11"	20"	18"	20"	28"	24"	35"	24"	46"	32"	60"	38"		
24"	9"	24"	15"	24"	24"	26"	30"	28"	42"	36"	54"	42"	68"	48"

PLAN SECTION A TYPICAL

TEES

N.T.S.



BENDS						
SIZE OF PIPE	DEGREE OF BEND					
	11 1/4°		22 1/2°		45°	
	A	B	A	B	A	B
6"	12"	6"	12"	6"	12"	6"
8"	12"	6"	12"	6"	18"	6"
10"	12"	6"	12"	6"	24"	6"
12"	12"	6"	18"	6"	36"	6"

ELEVATION SECTION A TYPICAL

BOTTOM VERTICAL BENDS

N.T.S.

GENERAL NOTES

GENERAL: ALL WORK AND MATERIALS SHALL CONFORM TO THE LATEST RULES AND REGULATIONS OF THE CLERMONT COUNTY WATER RESOURCES DEPARTMENT FOUND AT WRD.CLERMONTCOUNTYOHIO.GOV. IT IS THE INTENT OF THESE CONSTRUCTION DRAWINGS AND SPECIFICATIONS TO DESCRIBE A COMPLETE FUNCTIONING SYSTEM IN ALL RESPECTS, WHETHER OR NOT EVERY SUB–ELEMENT OF THE TOTAL SYSTEM IS ACTUALLY DEFINED IN WRITING AND/OR DETAIL. PAYMENT TO THE CONTRACTOR(S) SHALL BE INFERRED TO COVER WORK AND MATERIALS REQUIRED FOR A COMPLETE FUNCTIONING SYSTEM SUCH THAT WHEN FINAL PAYMENT IS MADE, THE SYSTEM IS COMPLETELY OPERABLE AND FUNCTIONS IN ALL RESPECTS AS REQUIRED BY THE CONTRACT DOCUMENTS.

THE WORK TO BE PERFORMED UNDER THESE SPECIFICATIONS INCLUDES FURNISHING ALL MATERIALS, EQUIPMENT, AND LABOR NECESSARY TO COMPLETE THE WORK CALLED FOR IN THE CONTRACT DOCUMENTS.

THE CONTRACTOR SHALL PROVIDE ALL NECESSARY ELECTRIC, WATER, SANITARY FACILITIES AND WASTE DISPOSAL TO COMPLETE THE WORK.

A SITE VISIT IS HIGHLY RECOMMENDED PRIOR TO SUBMISSION OF BID.

THE EXISTING WATER MAIN IS SHOWN BASED ON FIELD SURVEYS AND THE BEST AVAILABLE INFORMATION. THE CONTRACTOR IS RESPONSIBLE TO FIELD VERIFY THE LOCATION OF ALL UTILITIES PRIOR TO THE START OF WORK.

THE EXISTING WATER MAIN IS TO REMAIN IN SERVICE DURING CONSTRUCTION OF THE NEW WATER MAIN.

THE PROPOSED WATER MAIN SHALL BE INSTALLED AT A MINIMUM 4' BELOW THE PROPOSED GRADE OR AS DIRECTED BY THE ENGINEER.

CONTRACTOR IS RESPONSIBLE TO PROVIDE SUPPORT TO THE EXISTING UTILITY POLES, AS NECESSARY TO COMPLETE THE WORK CALLED FOR IN THE CONTRACT DRAWINGS AND SPECIFICATIONS.

PAVEMENT: ALL PAVEMENT AND/ROADWAY SURFACE DISTURBED BY THE CONTRACTOR, SHALL BE RESTORED BY THE CONTRACTOR AT HIS EXPENSE AND IN CONFORMANCE WITH THE REGULATIONS OF THE GOVERNING AUTHORITY OF SAID ROADWAYS. IN THE ABSENCE OF SUCH REGULATIONS, THE RESTORATION SHALL BE IN ACCORDANCE WITH INSTRUCTIONS BY THE OWNER'S REPRESENTATIVE WITH THE OBJECTION OF RESTORING THE PAVING OR ROADWAY SURFACE TO THE ORIGINAL CONDITION OF SAME.

RESTORATION: TEMPORARY RESTORATION AND RESTORATION OUTSIDE OF THE LIMITS OF THIS CONSTRUCTION PROJECT ARE THE RESPONSIBILITY OF THE CONTRACTOR. PRIOR TO CONSTRUCTION, THE CONTRACTOR IS RESPONSIBLE TO VIDEO TAPE AND PHOTOGRAPH ALL AREAS THAT WILL BE DISTURBED AS A RESULT OF HIS CONSTRUCTION ACTIVITIES AND WILL DELIVER TO THE OWNER'S REPRESENTATIVE A COPY OF THE VIDEO TAPE AND PHOTOGRAPHS. ALL PICTURES SHALL BE LABELED WITH THE LOCATION WHERE TAKEN. NONCOMPLIANCE MAY RESULT IN THE CONTRACTOR'S LIABILITY FOR ALL DISPUTED PROPERTY RESTORATIONS.

EROSION CONTROL: THE CONTRACTOR SHALL INSTALL AND MAINTAIN EROSION AND SEDIMENT CONTROL MEASURES AS NECESSARY TO COMPLETE THE WORK AS OUTLINED IN THESE DRAWINGS AND PROJECT SPECIFICATIONS AND TO THE SATISFACTION OF THE OWNER'S REPRESENTATIVE. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE CLERMONT COUNTY WATER MANAGEMENT AND SEDIMENT CONTROL REGULATIONS AND TO THE SATISFACTION OF THE OWNER'S REPRESENTATIVE

MAILBOXES: CONTRACTOR SHALL REMOVE AND REPLACE MAILBOXES, AS NEEDED DURING CONSTRUCTION. CONTRACTOR IS ADVISED THAT ALL MAILBOXES MAY NOT BE SHOWN.

UTILITIES: THE EXISTENCE, LOCATION, AND CONDITION OF UTILITIES AND STRUCTURES, BOTH ABOVE AND BELOW GROUND, SHALL BE INVESTIGATED AND VERIFIED IN THE FIELD BY THE CONTRACTOR BEFORE STARTING WORK. EXCAVATION IN THE VICINITY OF SUCH UTILITIES AND STRUCTURES, SHALL BE DONE CAREFULLY AND BY HAND IF NECESSARY. THE CONTRACTOR SHALL PROTECT ALL SUCH UTILITIES AND STRUCTURES, BOTH MARKED AND UNMARKED, AND BE HELD RESPONSIBLE FOR DAMAGE TO SAME. THIS INCLUDES ALL EXISTING AND PROPOSED SPRINKLER AND ELECTRIC LINES. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO ISOLATE, BRACE, SUPPORT, SHEET, ETC. AND PROTECT THE EXISTING UTILITIES FROM MOVING EITHER HORIZONTALLY OR VERTICALLY. IF SUCH MOVEMENT DOES OCCUR DUE TO THE CONTRACTOR'S OPERATIONS, HE SHALL REPAIR THE UTILITY TO THE SATISFACTION OF THE UTILITY OWNER AT THE CONTRACTOR'S EXPENSE. THE CONTRACTOR SHALL GIVE WRITTEN NOTICE TO ALL OWNERS OF ADJACENT UTILITIES, FIXTURES, AND/OR PROPERTY, OF HIS IMPENDING OPERATIONS, BUT IN NO WAY SHALL SUCH NOTICE RELIEVE THE CONTRACTOR OF HIS LIABILITY FOR DAMAGES TO SAID UTILITIES, FIXTURES, AND/OR PROPERTY. THE CONTRACTOR SHALL CONTACT THE APPROPRIATE UTILITY COMPANY AT LEAST 48 HOURS IN ADVANCE OF EXCAVATION IN THE VICINITY OF SAID UTILITY. FIELD LOCATION SHALL BE MADE BY THE UTILITY OR ITS AUTHORIZED AGENCY BEFORE ANY WORK IS PERFORMED BY THE CONTRACTOR. IF AT ANYTIME DURING WORK, AN EXISTING UTILITY IS DAMAGED IN ANY WAY, THE CONTRACTOR SHALL IMMEDIATELY CONTACT THE APPROPRIATE GOVERNING ENTITY AND THE OWNER'S REPRESENTATIVE.

SHUT DOWNS AND SCHEDULING.

- 1 WEEK TO PLAN
- 48 HOURS NOTICE TO AFFECTED CUSTOMERS REQUIRED PRIOR TO SHUTDOWNS
- CONTRACTOR REQUIRED TO DISTRIBUTE THE SHUT DOWN NOTICES PROVIDED BY THE OWNER
- SHUT DOWNS ARE TO BE PERFORMED AT NIGHT UNLESS PRIOR APPROVAL IS PROVIDED BY CCWRD

TESTING AND DISINFECTION OF WATER MAIN

THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL LABOR, MATERIAL AND EQUIPMENT NECESSARY TO DISINFECT THE COMPLETE WATER PIPE LINE IN ACCORDANCE WITH AWWA C–651 AND AS DIRECTED BY THE OWNER'S REPRESENTATIVE. ALL PIPING AND APPURTANCES MUST BE PROPERLY DISINFECT WITH A MINIMUM OF 50 MILLIGRAMS PER LITER TOTAL CHLORINE RESIDUAL FOR 48 HOURS. THE PIPING MUST BE FLUSHED TO REMOVE ANY EXCESS CHLORINE. CHLORINE SOLUTION SHALL BE EVENLY APPLIED AND DISTRIBUTED THROUGHOUT THE PIPING.

A HYDROSTATIC TEST AS REQUIRED IN SECTION 4 OF THE STANDARD AWWA SPECIFICATIONS C–600 SHALL BE APPLIED TO INDIVIDUAL VALVED–OFF SECTIONS OF THE MAINS AND FIRE HYDRANT LEADS EITHER BEFORE OR AFTER THE TRENCH IS BACKFILLED. THE WATER MAIN SHALL BE TESTED AT 200 PSI, OR AS DIRECTED BY THE OWNER'S REPRESENTATIVE, IN ANY SECTION BEING TESTED. THE DURATION OF EACH TEST SHALL BE AT LEAST TWO HOURS. SEE SPECIFICATION SECTION 2110, PART 5 – TESTING FOR ADDITIONAL DETAILS AND INFORMATION.

THE ONLY EXCLUSION OF TESTING IS TIE IN PIPING LESS THAN 18' IN LENGTH. IN THIS CASE, THE PIPE WILL BE SWABBED OR SPRAY DISINFECTED WITH CHLORINE SOLUTION, IN ACCORDANCE WITH AWWA C–657.

SPECS FOR PIPE, BENDS, VALVES AND APPURTANCES

DUCTILE IRON PIPE SHALL BE DUCTILE, CENTRIFUGALLY CAST TYPE IN ACCORDANCE WITH ANSI A21.51 (AWWA C–151) UNLESS OTHERWISE NOTED. FOR ALL IN–GROUND INSTALLATIONS THE PRESSURE CLASS SHALL BE CLASS 52, UNLESS A HIGHER CLASS IS REQUIRED BY LAYING CONDITIONS OR PRESSURE IN ACCORDANCE WITH ANSI A21.50 AND APPROVED BY THE OWNER'S REPRESENTATIVE. ALL DUCTILE PIPES SHALL HAVE BITUMINOUS COATED CEMENT LINING COMPLYING WITH AWWA C–104 AND SHALL HAVE AN OUTSIDE COATING OF BITUMASTIC ENAMEL OR APPROVED EQUAL. ALL DUCTILE IRON PIPES SHALL BE PROVIDED WITH EITHER MECHANICAL JOINT ENDS OR PUSH–ON JOINTS ENDS.

ALL FITTINGS, WALL PIPES AND SPECIALS SHALL BE OF DUCTILE IRON OR IN ACCRODANCE WITH ANSI A21.10 (AWWA C–153). ALL FITTINGS SHALL HAVE A BITUMINOUS COATED CEMENT LINING COMPLYING WITH AWWA C–104 AND SHALL HAVE AN OUTSIDE COATING COMPLYING WITH AWWA C–153 OR AN EPOXY COATING COMPLYING WITH AWWA C–116. ALL DUCTILE IRON FITTINGS SHALL BE PROVIDED WITH AND ASSEMBLED USING MECHANICAL JOINT ENDS AND RETAINER GLANDS.

CONCRETE THRUST BLOCKING, SUPPORTS AND/OR BUTTRESSES SHALL BE PROVIDED AT ALL TEES AND BENDS AND AT ANY OTHER LOCATIONS REQUIRED BY THE DISTRICT. THESE CONCRETE STRUCTURES SHALL BE BUILT TO THE LINES, GRADES AND DIMENSIONS SHOWN ON THE STANDARD DRAWINGS. CONCRETE USED FOR BLOCKING SHALL CONFORM TO CLASS C CONCRETE, HAVING A COMPRESSIVE STRENGTH OF 4,000 POUNDS PER SQUARE INCH. ALL CONCRETE SHALL BE MIXED BY MECHANICAL MEANS PRIOR TO INSTALLATION. THE INSTALLATION OF DRY CONCRETE WILL NOT BE PERMITTED.

PIPE JOINTS RESTRAINTS SHALL BE FIELD LOK GASKET, AMERICAN FAST GRIP, OR APPROVED EQUAL AS DETERMINED BY OWNER'S REPRESENTATIVE, EXCEPT AS MODIFIED HEREIN. ALL FIRE HYDRANT LEADS AND FIRE HYDRANT ASSEMBLIES SHALL BE RESTRAINED USING MEGALUG SERIES 1100 MECHANICAL JOINT RESTRAINT OR SIGMA CORPORATION ONE–LOCK SERIES SLDE MECHANICAL JOINT RESTRAINT FOR DUCTILE IRON PIPE OR APPROVED EQUAL AS DETERMINED BY OWNER'S REPRESENTATIVE.

POLYETHYLENE ENCASEMENT SHALL BE INSTALLED IN ACCORDANCE WITH ANSI/AWWA C105/A21.5 METHODS A OR B AND THE COUNTY'S SPECIFICATIONS. THE POLYETHYLENE ENCASEMENT SHALL BE A LOW–DENSITY POLYETHYLENE FILM MADE FROM VIRGIN LOW–DENSITY POLYETHYLENE RAW MATERIAL CONFORMING TO ASTM D4976 AND SHALL BE A MINIMUM OF EIGHT MILS IN THICKNESS.

GATE VALVES: ALL GATE VALVES SHALL CONFORM TO AWWA C–509 OR C–515 EXCEPT AS MODIFIED HEREIN. NEW GATE VALVES SHALL BE FULLY ENCAPSULATED RESILIENT WEDGE, PARALLEL SEATS, NON–RISING STEM, LEFT HAND OPEN (COUNTER CLOCKWISE), AND SHALL HAVE RUBBER "O"–RING, PACKING SEALS AND MECHANICAL JOINT ENDS WITH A 250 PSI PRESSURE RATING, UNLESS OTHERWISE APPROVED BY THE OWNER'S REPRESENTATIVE. THE INTERNAL VALVE COATING SHALL BE IN ACCORDANCE WITH AWWA–C550. APPROVED MODELS ARE: AMERICAN FLOW CONTROL SERIES 2500, MUELLER 2360, US PIPE METROSEAL 250, AND M&H 4067.

VALVE BOXES SHALL BE EQUAL TO F–2450 SERIES AS MANUFACTURED BY CLOW CORP OR SIGMA CORPORATION VB261–8. VALVE BOX ASSEMBLY SHALL BE OF CAST IRON WITH STAY PUT COVER AND PROPERLY SIZED BASE FOR THE VALVE BEING FITTED. COVER SHALL BE MARKED "WATER". ALL BOXES SHALL BE FURNISHED WITH THE NECESSARY EXTENSIONS TO BRING THE TOP OF THE BOX TO THE FINISHED GRADE.

BUTTERFLY VALVES: ALL BUTTERFLY VALVES SHALL CONFORM TO THE AWWA STANDARD SPECIFICATION FOR RUBBER SEATED BUTTERFLY VALVES; DESIGNATION AWA C–504 OF THE LATEST REVISION EXCEPT MODIFIED HEREIN. VALVES SHALL BE SUITABLE FOR FLOW IN EITHER DIRECTION AND SHALL BE BUBBLE TIGHT IN EITHER DIRECTION. WAFER VALVES SHALL NOT BE ACCEPTABLE. INTERNAL VALVE COATING SHOULD BE IN ACCORDANCE WITH AWWA–C550. VALVES SHALL BE AWWA CLASS 250B DESIGNED FOR 250 PSI NON–SHOCK SHUT–OFF PRESSURE AND A VELOCITY OF 16 FEET PER SECOND. VALVES AND APPURTANCES, INCLUDING OPERATORS, SHALL BE CAST IRON SUITABLE FOR BURIED AND SUBMERGED SERVICE. VALVES FOR USE WITH DUCTILE IRON PIPE SHALL HAVE MECHANICAL JOINT ENDS FURNISHED WITH HIGH STRENGTH CAST IRON TEE HEAD BOLTS AND HEX NUTS, AND RUBBER GASKETS. BODIES SHALL BE EITHER CAST IRON CONFORMING TO ASTM A126, CLASS B OR ASTM A48, CLASS 40 DUCTILE IRON CONFORMING TO ASTM A536 GRADE 65–45–12. UNLESS OTHERWISE APPROVED, SHAFTS SHALL BE STAINLESS STEEL CONFORMING WITH ASTM A276, TYPE 304, OR MONEL, TURNED, GROUND AND POLISHED AND SECURED TO THE VALVE DISC BY ONE OR MORE TANGENTIALLY FITTED MONEL OR STAINLESS STEEL TAPER PINS DRIVEN INTO REAMED TAPERED HOLES AND HELD SNUG BY MEANS OF A LOCKING NUT OR HEX–MATED TO VALVE DISC AND DESIGNED TO EXCLUDE EXPOSURE TO WATER. VALVES SHALL BE DESIGNED TO SEAT AT 90 DEGREES TO THE PIE AXIS AND SHALL BE CONSTRUCTED OF CORROSION–RESISTANT MATERIALS. SEATS SHALL BE OF A RUBBER COMPOUND COMPLYING WITH THE REQUIREMENTS OF SECTION B OF AWWA C–504–75. RUBBER SEATS SHALL BE ON THE BODY. OPERATORS SUITABLE FOR BURIED AND SUBMERGED SERVICE SHALL BE FURNISHED WITH EACH VALVE. OPERATORS SHALL BE DESIGNED TO DELIVER AN OUTPUT TORQUE TO THE VALVE SHAFT EQUAL TO THAT SHOWN ON THE FOLLOWING TABLE:

MAXIMUM OPERATING TORQUES:	VALVE DIAMETER(IN)	TORQUE(FT–LBS)
	3	19
	4	36
	6	93
	8	175
	10	320
	12	510
	14	720
	16	1030

OPERATORS SHALL BE DESIGNED TO PRODUCE THE SPECIFIED OUTPUT TOQUE WITH A MAXIMUM INPUT TORQUE OF 150 FOOT–POUNDS APPLIED TO THE OPERATING NUT. TRAVELING NUT TYPE OPERATORS SHALL BE TYPE MDT AS MANUFACTURED BY PRATT, OR APPROVED EQUAL. THE TOTAL NUMBER OF TURNS APPLIED TO THE WRENCH NUT REQUIRED TO COMPLETELY OPEN (CLOSE) THE VALVE FROM COMPLETELY CLOSED (OPEN) POSITION SHALL BE NOT LESS THAN TWICE THE NOMINAL VALVE DIAMETER IN INCHES FOR VALVES LESS THAT 16 INCHES IN DIAMETER AND SHALL BE NOT LESS THAN 30 TURNS FOR 16 INCH AND LARGER VALVES. ALL OPERATORS SHALL BE LEFT–HAND (COUNTER CLOCKWISE) OPENING.

APPROVED BUTTERFLY VALVES ARE: DEZURIK–250B, MUELLER LINESEAL XP–250B OR HENERY PRATT COMPANY–MODEL HP–250.

VALVE BOXES SHALL BE EQUAL TO F–2450 SERIES AS MANUFACTURED BY CLOW CORP OR SIGMA CORPORATION VB261–8. VALVE BOX ASSEMBLY SHALL BE OF CAST IRON WITH STAY PUT COVER AND PROPERLY SIZED BASE FOR THE VALVE BEING FITTED. COVER SHALL BE MARKED "WATER". ALL BOXES SHALL BE FURNISHED WITH THE NECESSARY EXTENSIONS TO BRING THE TOP OF THE BOX TO THE FINISHED GRADE.

WATER SERVICE, FITTINGS, AND METER SETTING

DIRECT TAPS ARE TO BE USED FOR ¾" to 1" CONNECTIONS,TAPPING SADDLES ARE TO BE USED FOR CONNECTIONS LARGER THAN 1". TAPPING SADDLES SHALL BE MANUFACTURED FOR THE FORD METER BOX COMPANY STYLE S90, STYLE A OR B IN AREAS WITH STATIC PRESSURE AT OR BELOW 150 PSI.

CORPORATION STOPS– APPROVED CORPORATION STOPS SHALL BE:
¾" AND 1"– FORD METER BOX COMPANY F1000–3–G–NL.
1 ½"– FORD METER BOX COMPANY FB1000–6–G–NL
2" – FORD METER BOX COMPANY FB1000–7–G–NL

WATER SERVICE LINES, WHICH EXTEND FROM THE WATER MAIN TO 3' BEYOND THE METER, SHALL BE TYPE "K" COPPER CONFORMING TO ASTM B–88 SPECIFICATIONS.

METER BOXES SHALL BE:
¾" METER – OLD CASTLE HEAVY WALL METER PIT 0020–30 B BODY B–W 2 MSHI
1" METER – OLD CASTLE HEAVY WALL METER PIT 0020–30 BODY B–W 2 MSHI
1 ½" AND 2" – OLD CASTLE HEAVY WALL METER PIT 0030–30 B BODY B–W 2 MSHI
OR APPROVED EQUAL.

ALL METERS USED IN THE CLERMONT COUNTY WATER RESOURCES DEPARTMENT DISTRIBUTION SYSTEM MUST BE PURCHASED FROM THE WATER RESOURCES DEPARTMENT AND INSTALLED ACCORDING TO THE WATER RESOURCES DEPARTMENT STANDARD DRAWINGS. WHERE EXISTING WATER SERVICES ARE BEING RELOCATED OR RECONNECTED, THE EXISTING WATER METER CAN BE RE–USED.

ANGLE VALVES FOR RELOCATED ⅝" X ¾" AND 1" WATER METERS SHALL BE IN ACCORDANCE WITH THE FOLLOWING SCHEDULE AND INSTALLED ACCORDING TO THE CLERMONT COUNTY WATER RESOURCES DEPARTMENT STANDARD DRAWINGS:

METER SIZE	ANGLED YOKE VALVE, W/ PADLOCK WING	ANGLED CHECK VALVE
⅝" X ¾"	FORD AV94–323–WG–NL OR APPROVED EQUAL	FORD HA94–323–G–NL OR APPROVED EQUAL
1"	FORD AV94–444–WG–NL OR APPROVED EQUAL	FORD HA91–444–NL–W OR APPROVED EQUAL

THE EXISTING WATER METER, YOKE AND EXPANSION WHEEL ASSEMBLY SHALL BE RE–USED AND RE–INSTALLED BY THE CONTRACTOR.

METER ASSEMBLIES FOR 1 ½" AND 2" DOMESTIC METERS SHALL BE IN ACCORDANCE WITH THE FOLLOWING SCHEDULE AND INSTALLED ACCORDING TO CLERMONT COUNTY WATER RESOURCES 1 DEPARTMENT STANDARD DRAWINGS: 1 ½" METERS– FORDVH76–18–11–66–G–NL, 2" METERS– FORD 2 VH77–18–11–77–G–NL.

COMPRESSION FITTINGS USED FOR RELOCATED AND RECONNECTED WATER METERS SHALL BE FORD GRIP JOINT COUPLING (C44–XX–G–NL STYLE), FORD PACK JOINT COUPLING (C44–XX–NL STYLE), OR APPROVED EQUAL.

CONTRACTOR MUST SUBMIT LITERATURE AND/OR CATALOG CUT SHEETS FOR REVIEW AND APPROVAL PRIOR TO ORDERING OF ALL MATERIAL AND FITTINGS TO BE USED ASSOCIATED WITH THE INSTALLATION OF 2" AND SMALLER SIGNLE, DOMESTIC WATER SERVICES.

SUBMIT LITERATURE DETAILING THE CONSTRUCTION METHOD TO BE USED TO PROVIDE TRENCHLESS INSTALLATION OF WATER SERVICES FOR REVIEW AND APPROVAL. TRENCHLESS SERVICE LINE INSTALLATION IS REQUIRED FOR ALL SERVICES CROSSING PUBLIC ROADWAYS.

REVISION NO.	DATE
REVISION #1 – GATE VALVES & BUTTERFLY VALVES	3/14/17
REVISION #2 – TESTING OF WATER MAIN	4/19/17
REVISION #3 – UPDATES	8/13/24

GENERAL WATER NOTES

SCALE: N/A

DATE: AUGUST 2024

W 1.0

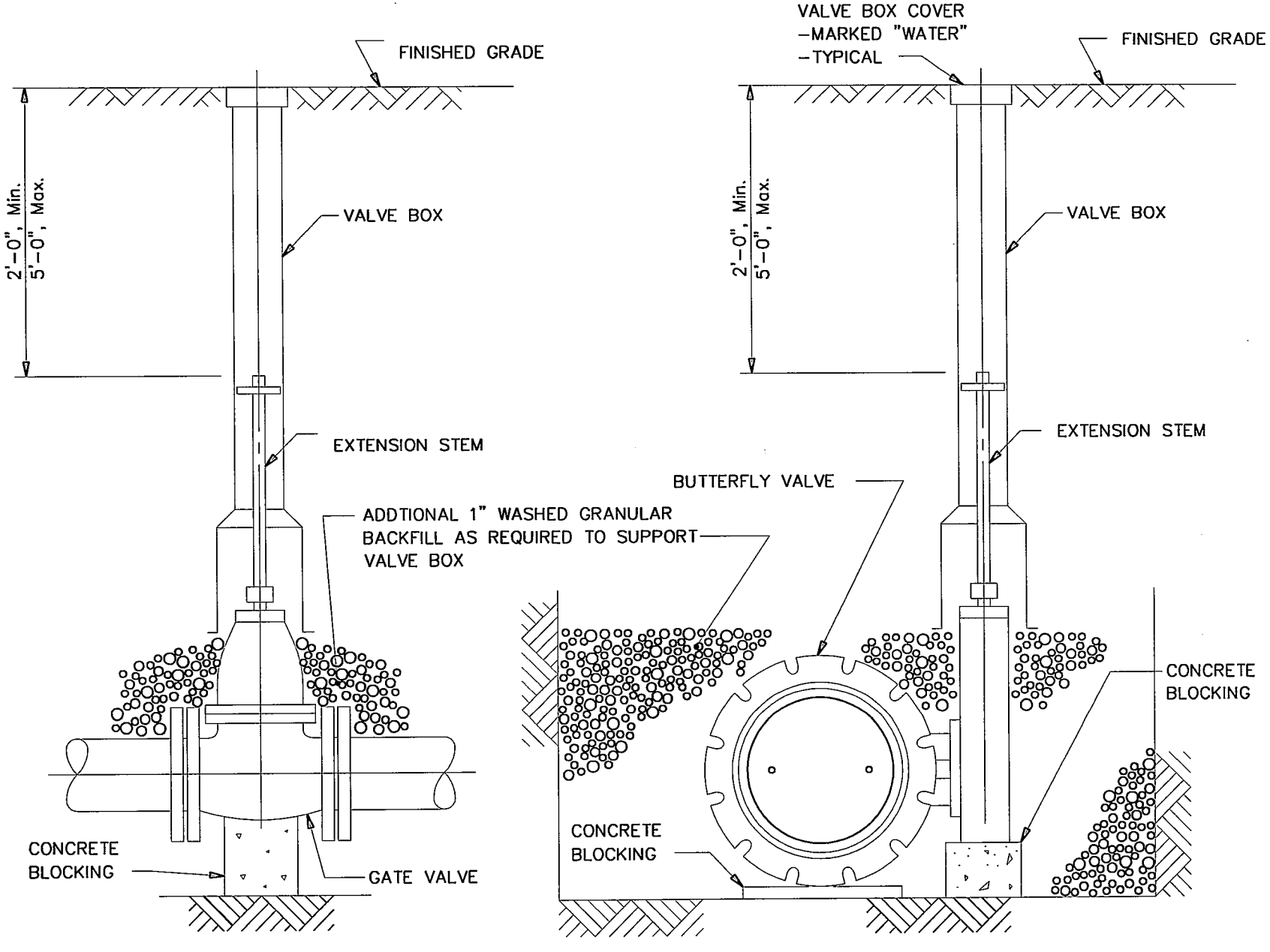
CLERMONT COUNTY
WATER RESOURCES DEPARTMENT

APPROVED
DATE

GATE & BUTTERFLY VALVES

DRAWING NO.
W1.1

NO SCALE



GATE VALVE BOX

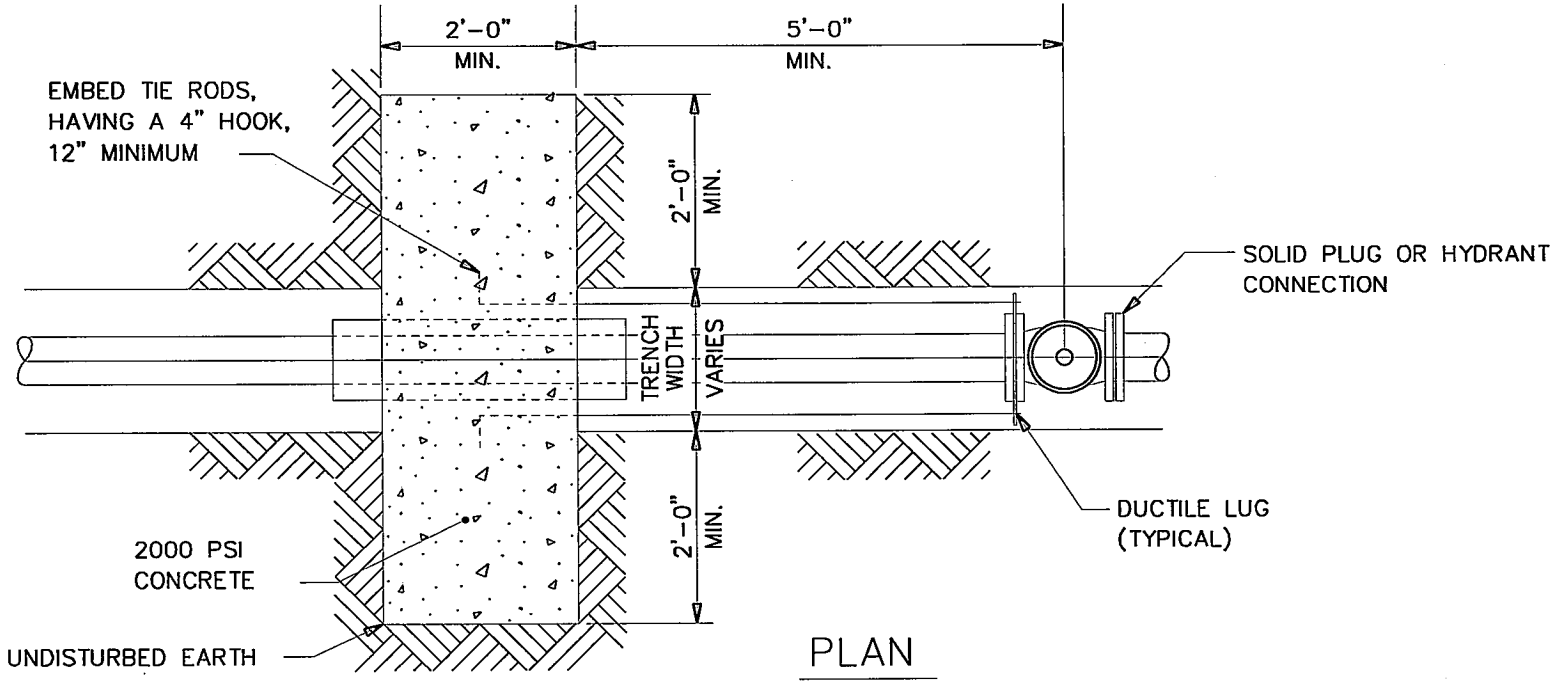
BUTTERFLY VALVE BOX

CLERMONT COUNTY
WATER RESOURCES DEPARTMENT

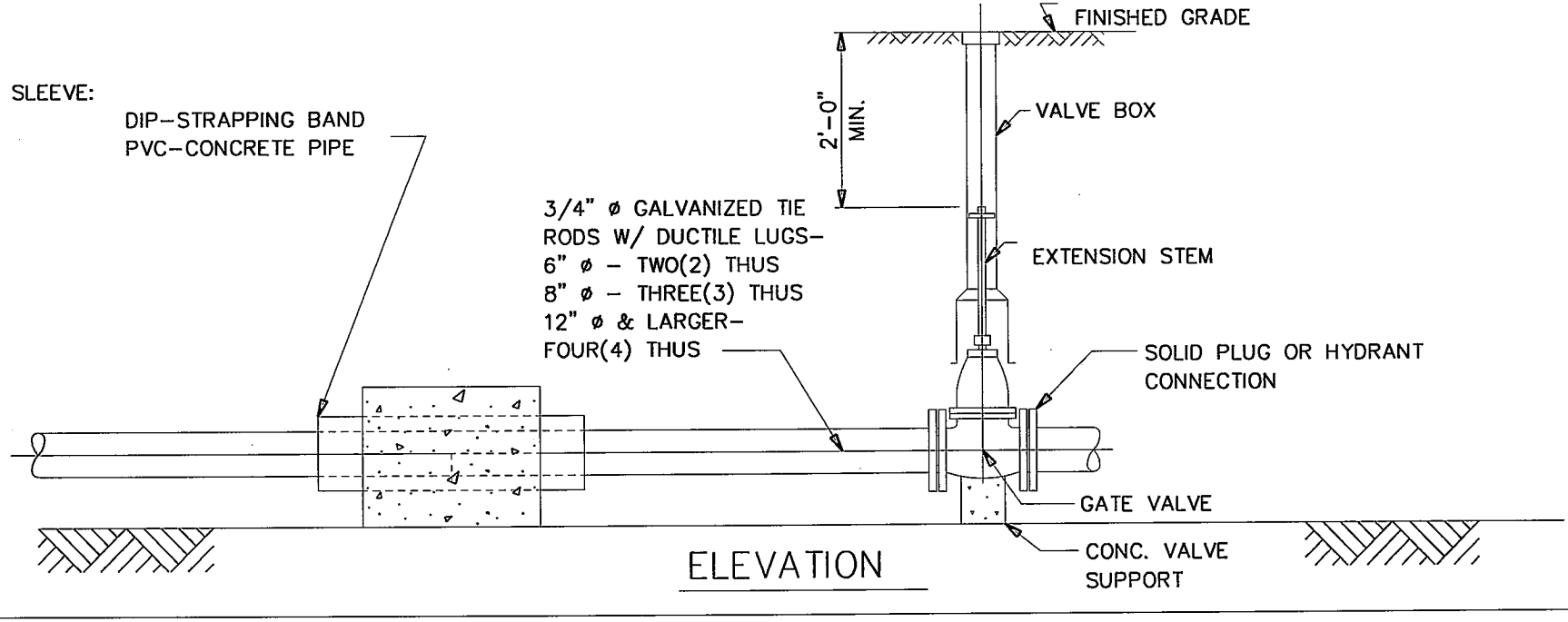
APPROVED _____
DATE _____

VALVE RESTRAINT BLOCKING

DRAWING NO. W1.2

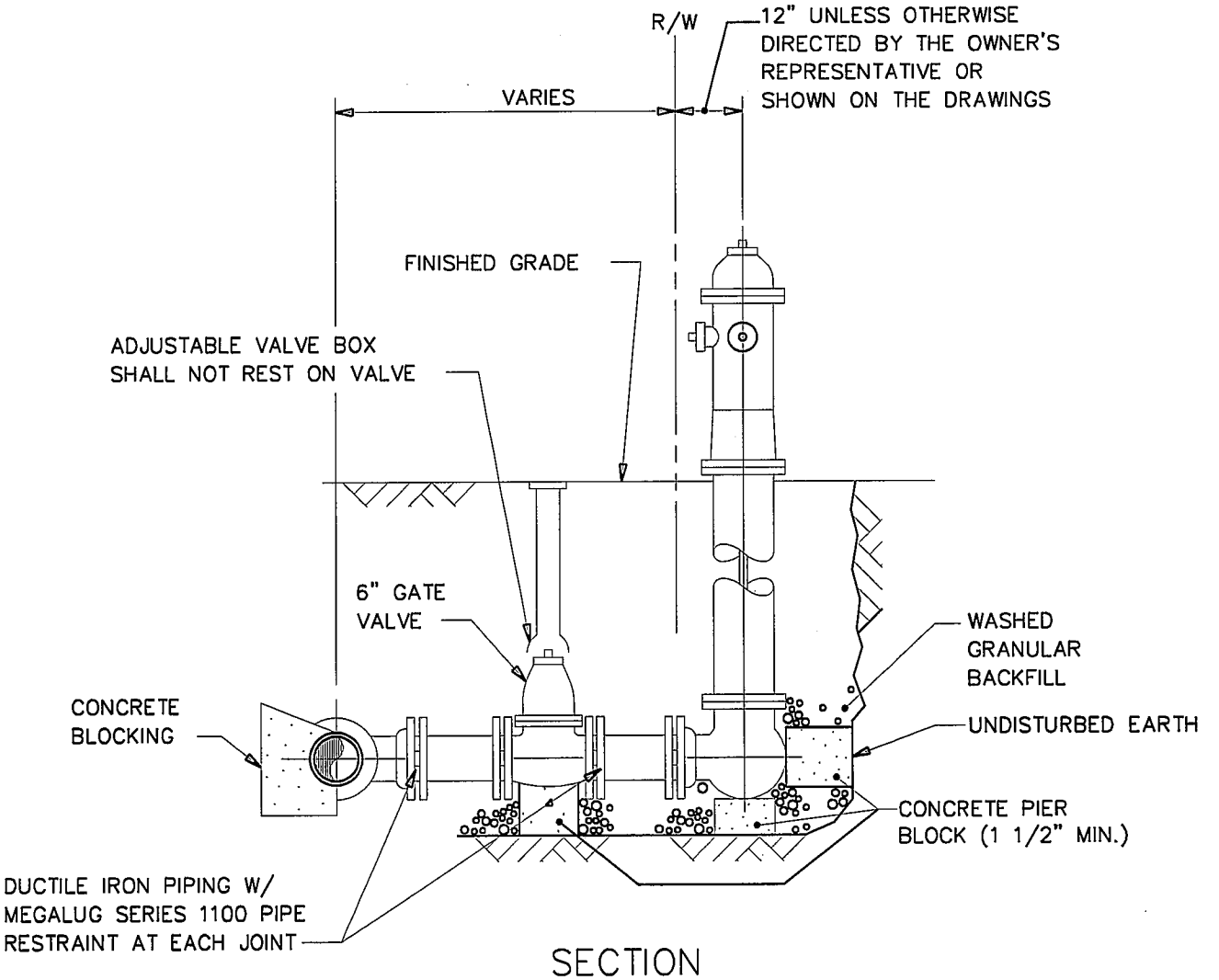


PLAN

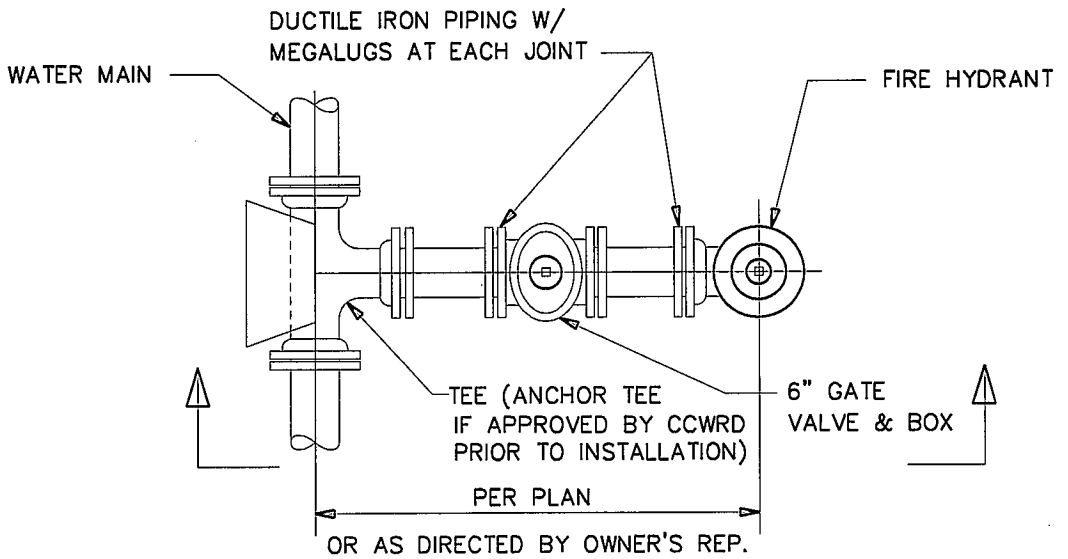


ELEVATION

NO SCALE



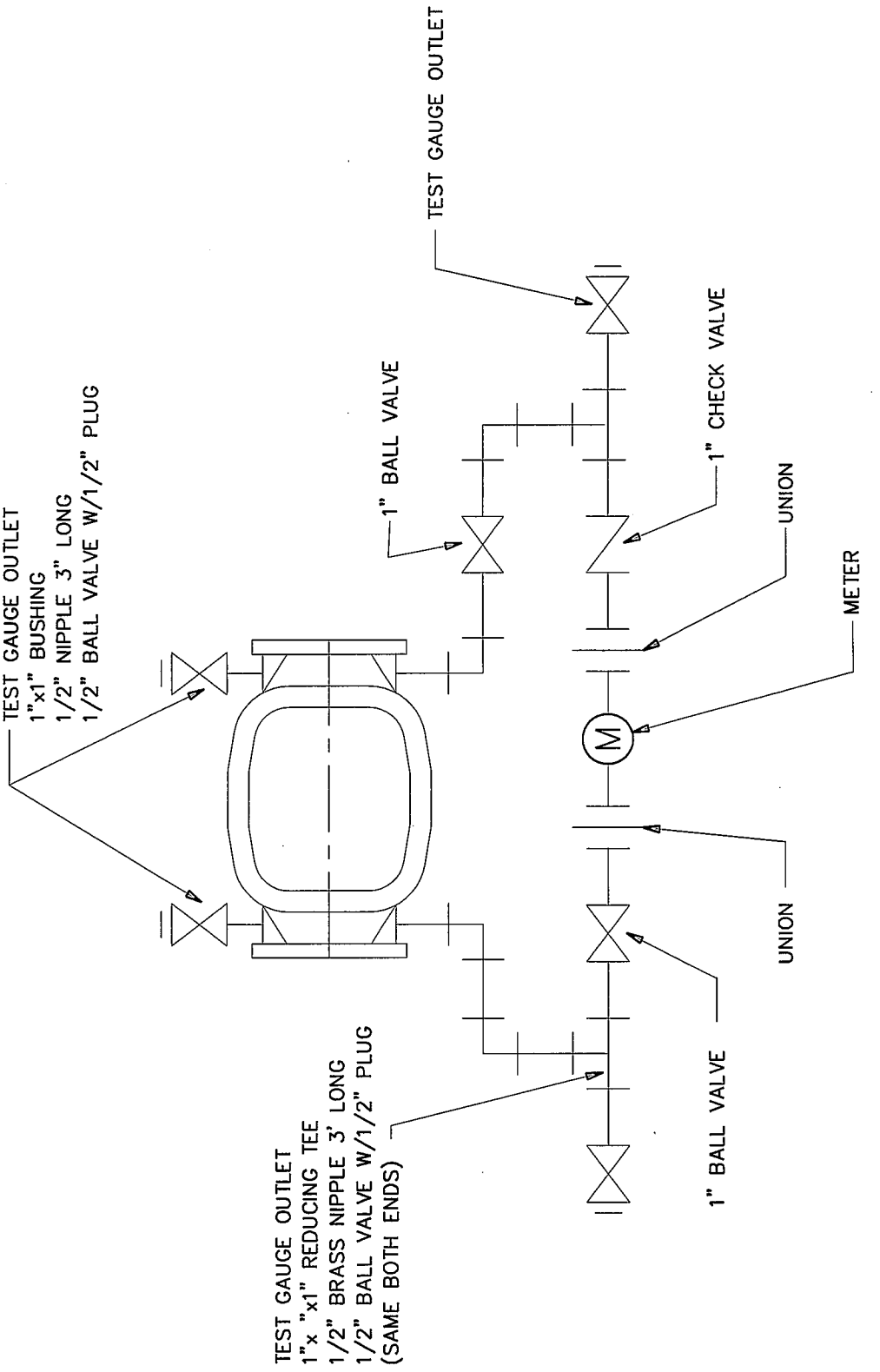
SECTION



PLAN

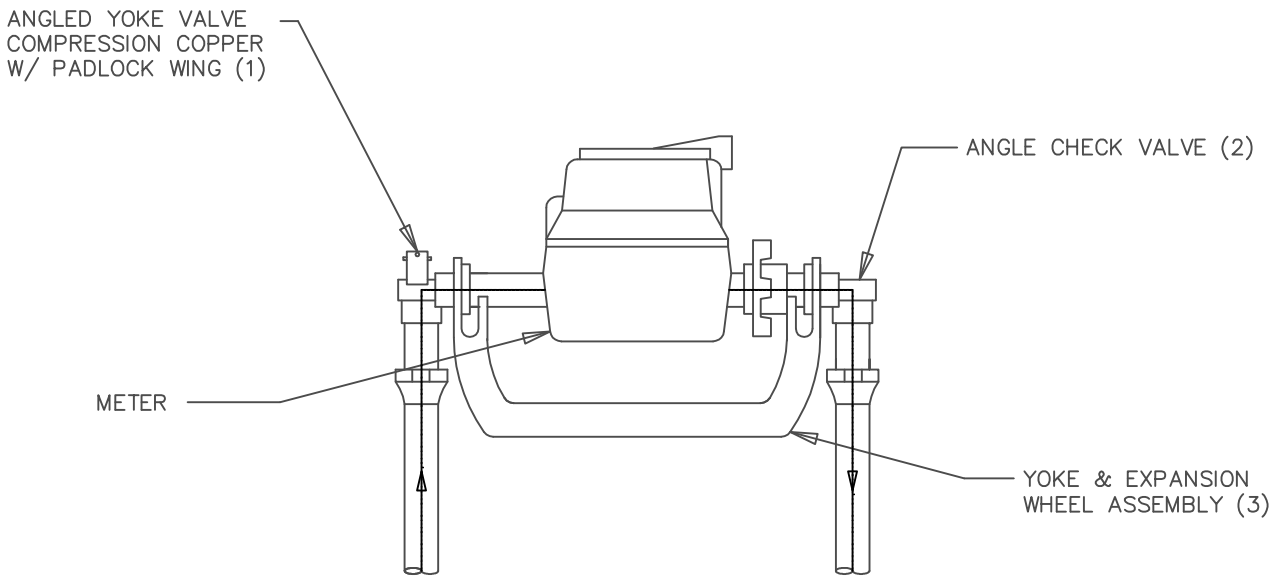
NO SCALE

CLERMONT COUNTY WATER RESOURCES DEPARTMENT	FIRE HYDRANT LAYOUT & ASSEMBLY	DRAWING NO. W2.1
APPROVED _____ DATE _____		



NO SCALE

CLERMONT COUNTY WATER RESOURCES DEPARTMENT	DETECTOR CHECK VALVE ASSEMBLY	DRAWING NO. W3.1
APPROVED _____ DATE		



$\frac{5}{8}$" X $\frac{3}{4}$" & 1" METERS

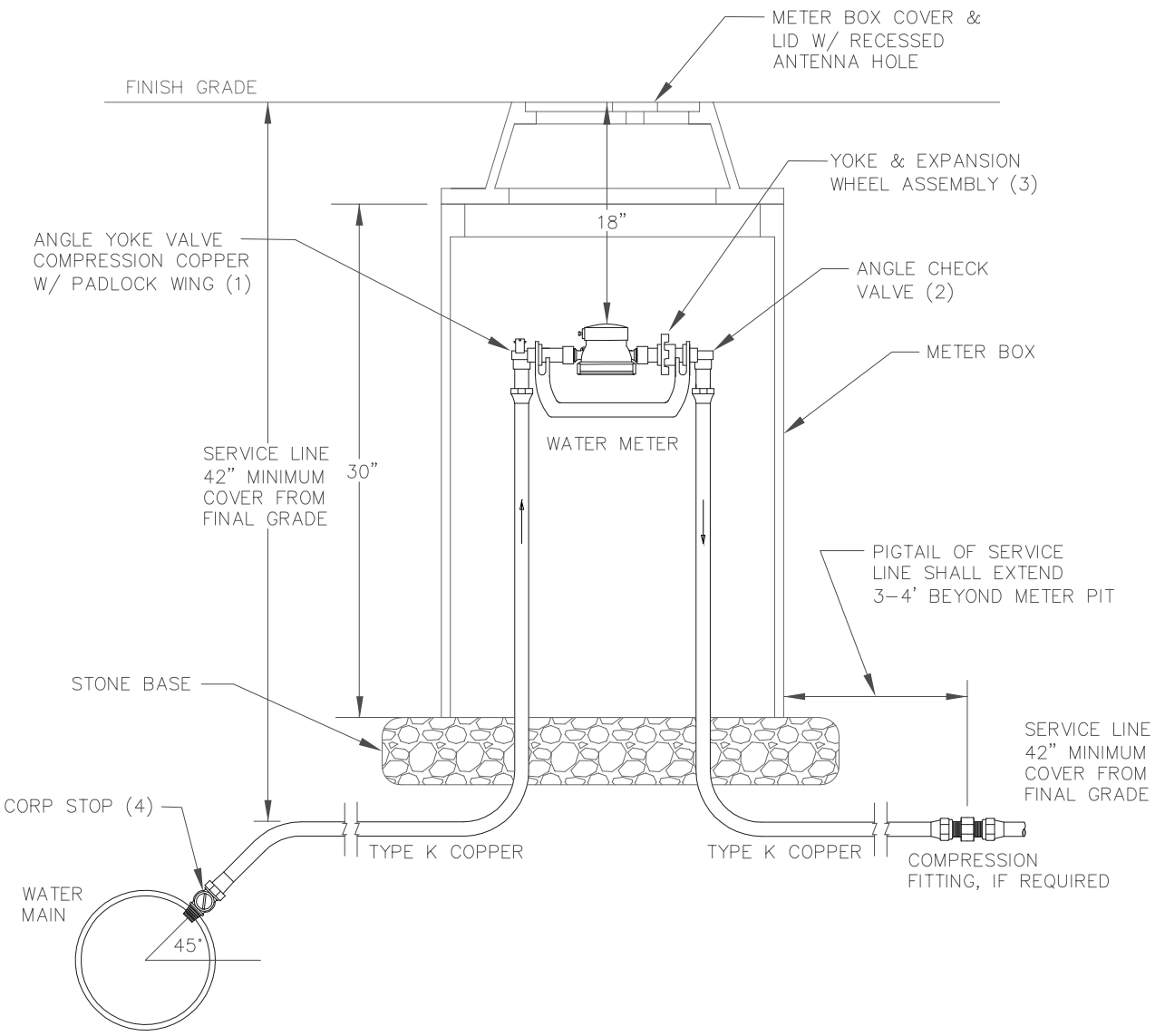
NOTE:

METERS SHALL BE PURCHASED FROM CCWRD

METER SIZE	1	2	3
5/8" X 3/4"	FORD AV94-323-WG-NL OR EQUAL	FORD HA94 -323-G-NL OR EQUAL	YOKE-FORD Y502, WHEEL-EC-23-NL OR EQUAL
1"	FORD AV94-444-WG-NL OR EQUAL	FORD HA91-444-NL-W OR EQUAL	YOKE-FORD Y504, WHEEL-EC4-NL OR EQUAL

NO SCALE

CLERMONT COUNTY WATER RESOURCES DEPARTMENT APPROVED _____ DATE _____ REVISED MAY 2016	5/8" X 3/4" & 1" DOMESTIC METERS ASSEMBLY	DRAWING NO. W3.2



METER SIZE	ANGLE YOKE VALVE W/ PADLOCK WING (1)	ANGLE CHECK VALVE (2)	YOKE & EXPANSION WHEEL ASSEMBLY (3)	CORP STOP (4)
5/8" x 3/4"	FORD AV94-323-WG-NL OR APPROVED EQUAL	FORD HA94-323-G-NL OR APPROVED EQUAL	YOKE - FORD Y502, WHEEL-EC-23-NL OR APPROVED EQUAL	3/4" ONLY FORD F1000-3-G-NL
1"	FORD AV94-444-WG-NL OR APPROVED EQUAL	FORD HA94-444-NL-W OR APPROVED EQUAL	YOKE - FORD Y504, WHEEL-EC-4-NL OR APPROVED EQUAL	FORD F1000-3-G-NL

NOTES:

1. WATER METER IS PROVIDED, INSTALLED AND PROGRAMMED BY COUNTY. CONTRACTOR IS RESPONSIBLE FOR THE COST OF THE METER AND ANTENNA. ANTENNA IS NOT SHOWN FOR CLARITY.
2. METER BOX SHALL BE OLD CASTLE HEAVY WALL 0020-30 H Body B-W 2 MsHI FOR 5/8" x 3/4" & 1" METERS WITH 24" BASE.
3. COMPRESSION FITTINGS SHALL BE FORD GRIP JOINT COUPLING (C44-XX-G-NL) STYLE, FORD PACK JOINT COUPLING (C44-XX-NL) STYLE, OR APPROVED EQUAL.
4. FORD S90 STYLE A OR B TAPPING SADDLES IN AREAS WITH STATIC PRESSURE AT OR BELOW 150 PSI FOR CONNECTIONS TO C-900 PVC WATER MAIN.
5. METER BOX FRAME & LID SHALL BE VESTAL RMR-20 RECESSED FRAME AND NICOR, INC. 12.25" TYPE A NON-METALLIC LID WITH SENSUS RECESS AND THRU HOLE, OR APPROVED EQUAL.

NOT TO SCALE

CLERMONT COUNTY

WATER RESOURCES DEPARTMENT

APPROVED _____

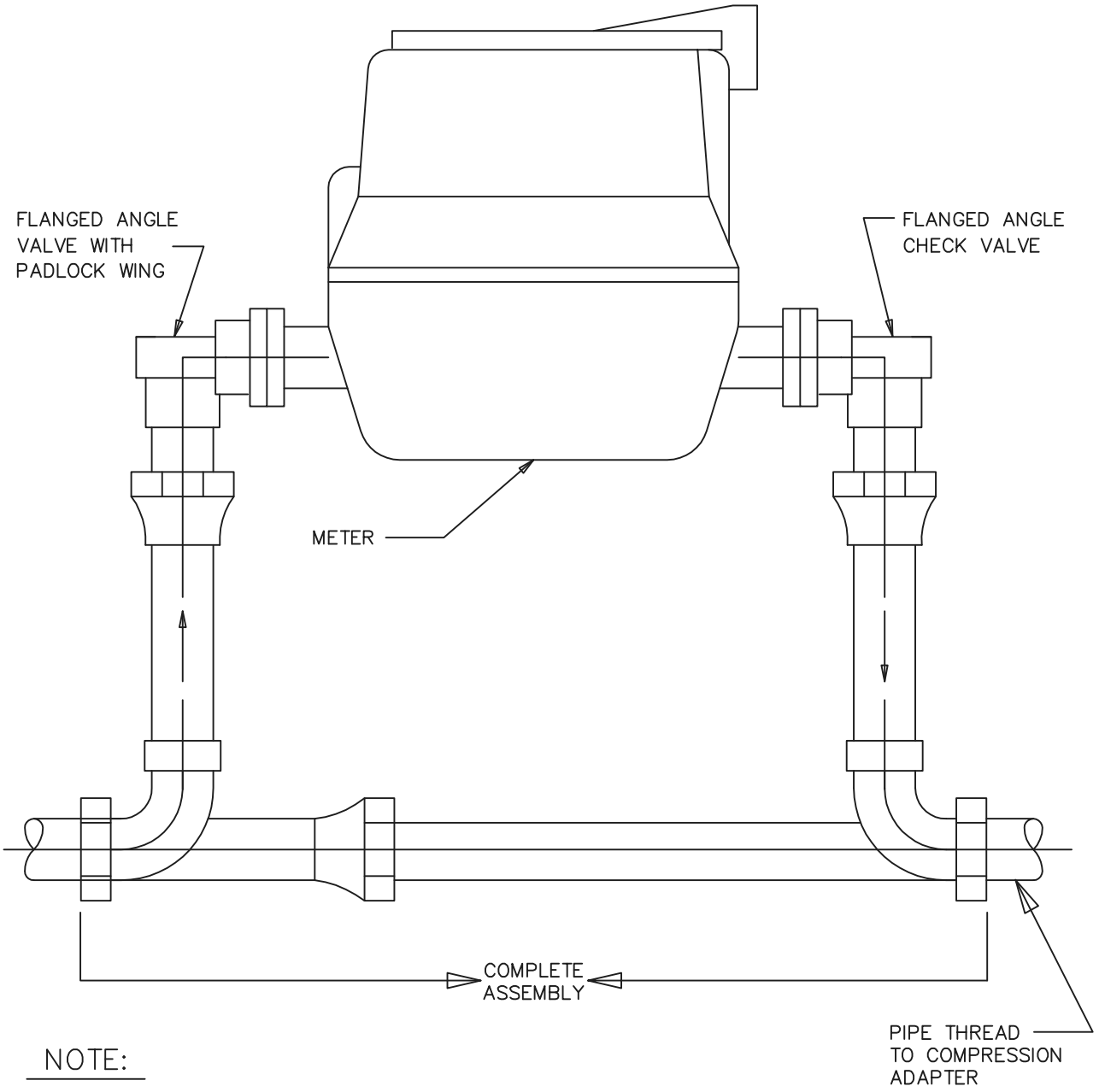
DATE _____

DECEMBER 2020

5/8"X3/4" & 1" METER BOX DETAIL

DRAWING NO.

W3.2.1



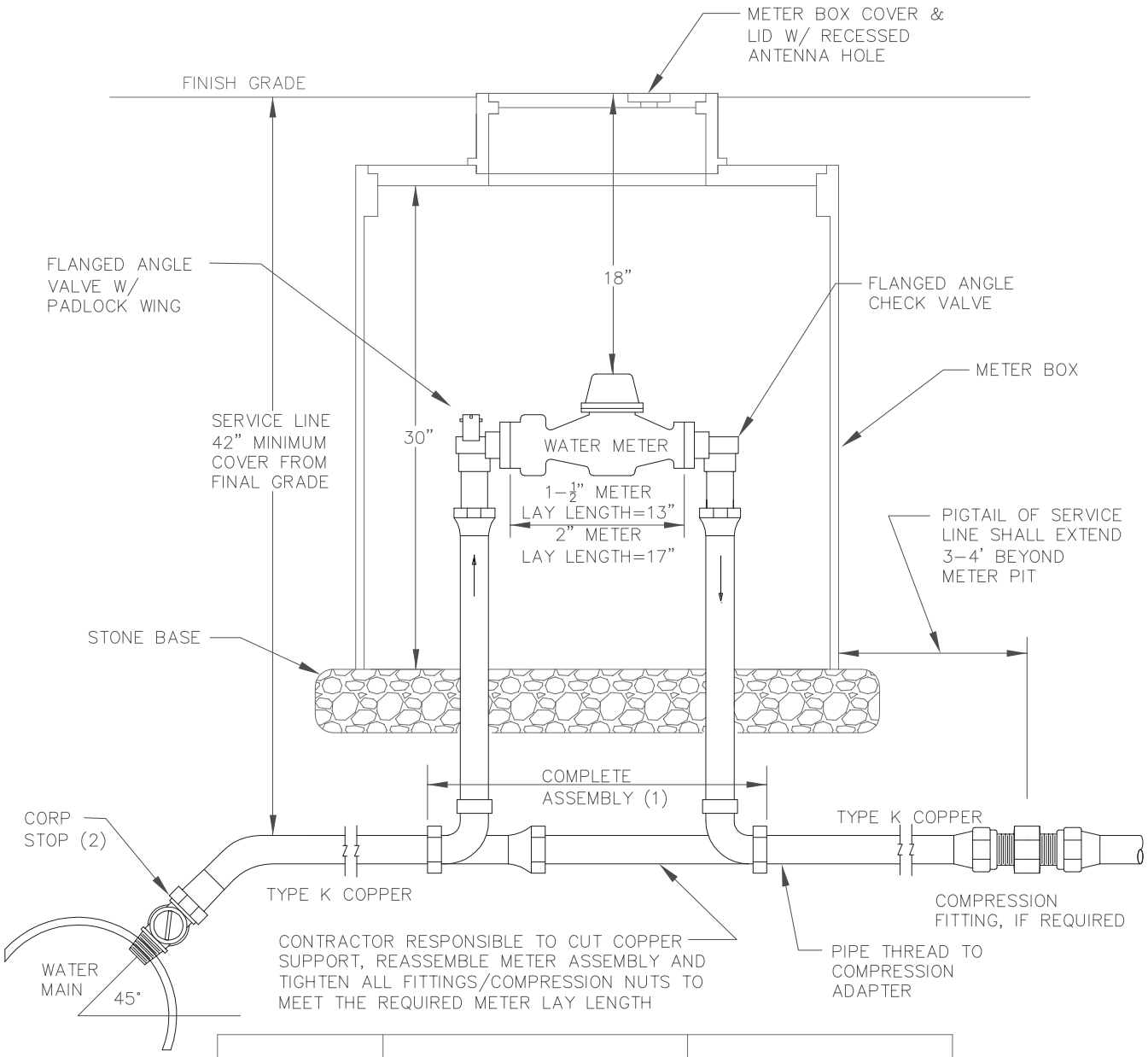
NOTE:

1. METERS SHALL BE PURCHASED FROM CCWRD
2. COMPLETE ASSEMBLY TO BE USED.

METER SIZE	COMPLETE ASSEMBLY
1 1/2"	VH76-18-11-66-G-NL
2"	VH77-18-11-77-G-NL

NO SCALE

CLERMONT COUNTY WATER RESOURCES DEPARTMENT APPROVED _____ DATE _____ REVISED DEC 2013	1-1/2" & 2" DOMESTIC CUSTOM METER ASSEMBLY	DRAWING NO. W3.3



METER SIZE	COMPLETE ASSEMBLY (1)	CORP STOP (2)
1 1/2"	FORD VH76-18-11-66-G-NL OR APPROVED EQUAL	FORD FB1000-6-G-NL OR APPROVED EQUAL
2"	FORD VH77-18-11-77-G-NL OR APPROVED EQUAL	FORD F1000-7-G-NL OR APPROVED EQUAL

NOTES:
1. WATER METER COMPLETE ASSEMBLY IS PROVIDED AND PROGRAMMED BY COUNTY. CONTRACTOR IS RESPONSIBLE FOR INSTALLATION AND THE THE COST OF THE METER AND ANTENNA. ANTENNA IS NOT SHOWN FOR CLARITY.
2. METER BOX SHALL BE OLD CASTLE HEAVY WALL 0030-30 H Body MS3030B.
3. COMPRESSION FITTINGS SHALL BE FORD GRIP JOINT COUPLING (C44-XX-G-NL) STYLE, FORD PACK JOINT COUPLING (C44-XX-NL) STYLE, OR APPROVED EQUAL.
4. FORD 202BS TAPPING SADDLES WITH STAINLESS STEEL STRAP AND BRASS BODY WITH CC THREAD OUTLET REQUIRED FOR CONNECTIONS TO C-900 PVC WATER MAIN.
5. METER BOX FRAME, RAISER AND LID SHALL BE VESTAL EXPANDER RING - MODEL ER-2030, VESTAL 32-055 MONITOR RING, AND VESTAL 20" MONITOR COVER W/TR & SN, OR APPROVED EQUAL.

NOT TO SCALE

CLERMONT COUNTY
WATER RESOURCES DEPARTMENT

APPROVED _____
DATE _____

1 1/2" & 2" METER BOX DETAIL

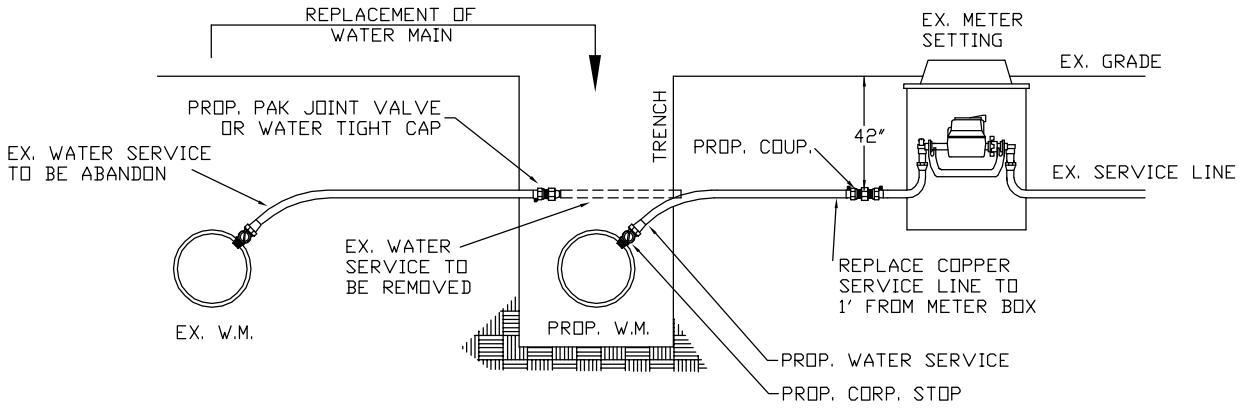
DRAWING NO.
W3.3.1

DECEMBER 2020

WATER MAIN RELOCATION–SERVICE RECONNECTIONS

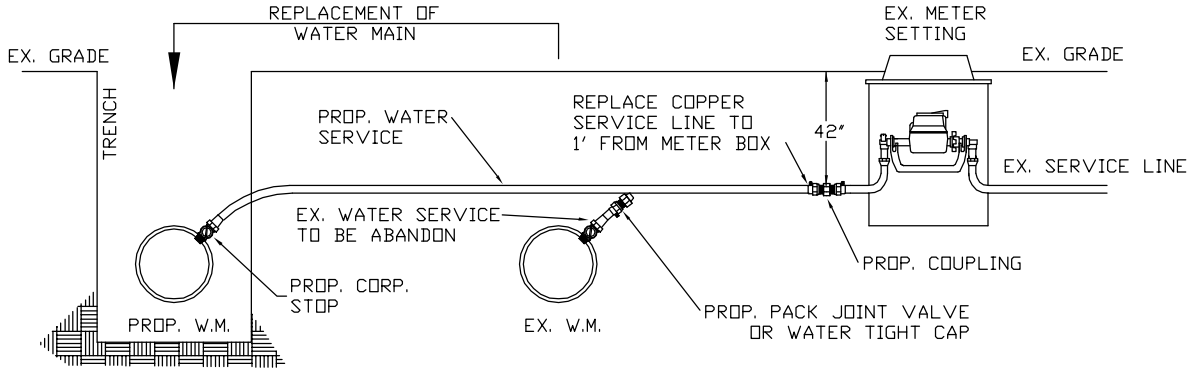
TYPE 1 CONNECTION

PROPOSED WATER MAIN INSTALLED BETWEEN THE EXISTING WATER MAIN AND THE WATER METER (SHORTER SERVICE)



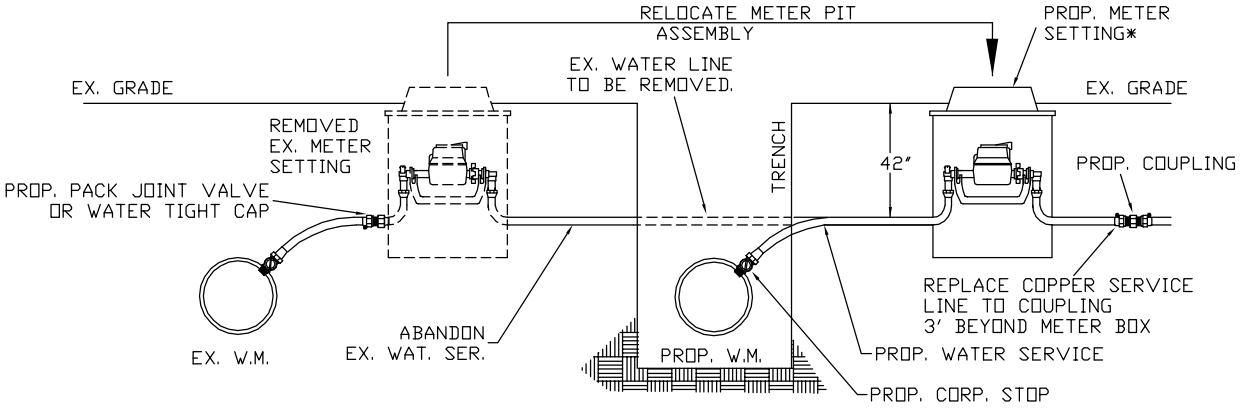
TYPE 2 CONNECTION

PROPOSED WATER MAIN INSTALLED ON OPPOSITE SIDE OF EXISTING WATER MAIN, FROM THE METER SETTING (LONG SERVICE)



TYPE 3 CONNECTION

PROPOSED WATER MAIN IS INSTALLED BEHIND THE EXISTING WATER METER (MOVE WATER METER)



*METER SETTING, METER, AND METER BOX SHALL BE REPLACED. THE METER SHALL BE SUPPLIED BY COUNTY. EXISTING LID TO BE REUSED.

CONTRACTOR TO FREEZE SERVICE TO MAKE ALL CONNECTIONS. NO CRIMPING WILL BE PERMITTED. CONTRACTOR TO CAP ALL WATER SERVICE LINES TO BE ABANDONED.

ALL NEW PIPE, FITTINGS & FIXTURES SHALL MEET THE NEW EPA LEAD-FREE RULES.

NOT TO SCALE

CLERMONT COUNTY WATER RESOURCES DEPARTMENT APPROVED _____ DATE _____ REVISED APRIL 2016	WATER SERVICE CONNECTION DETAIL	DRAWING NO. W3.4

CLERMONT COUNTY
WATER RESOURCES DEPARTMENT

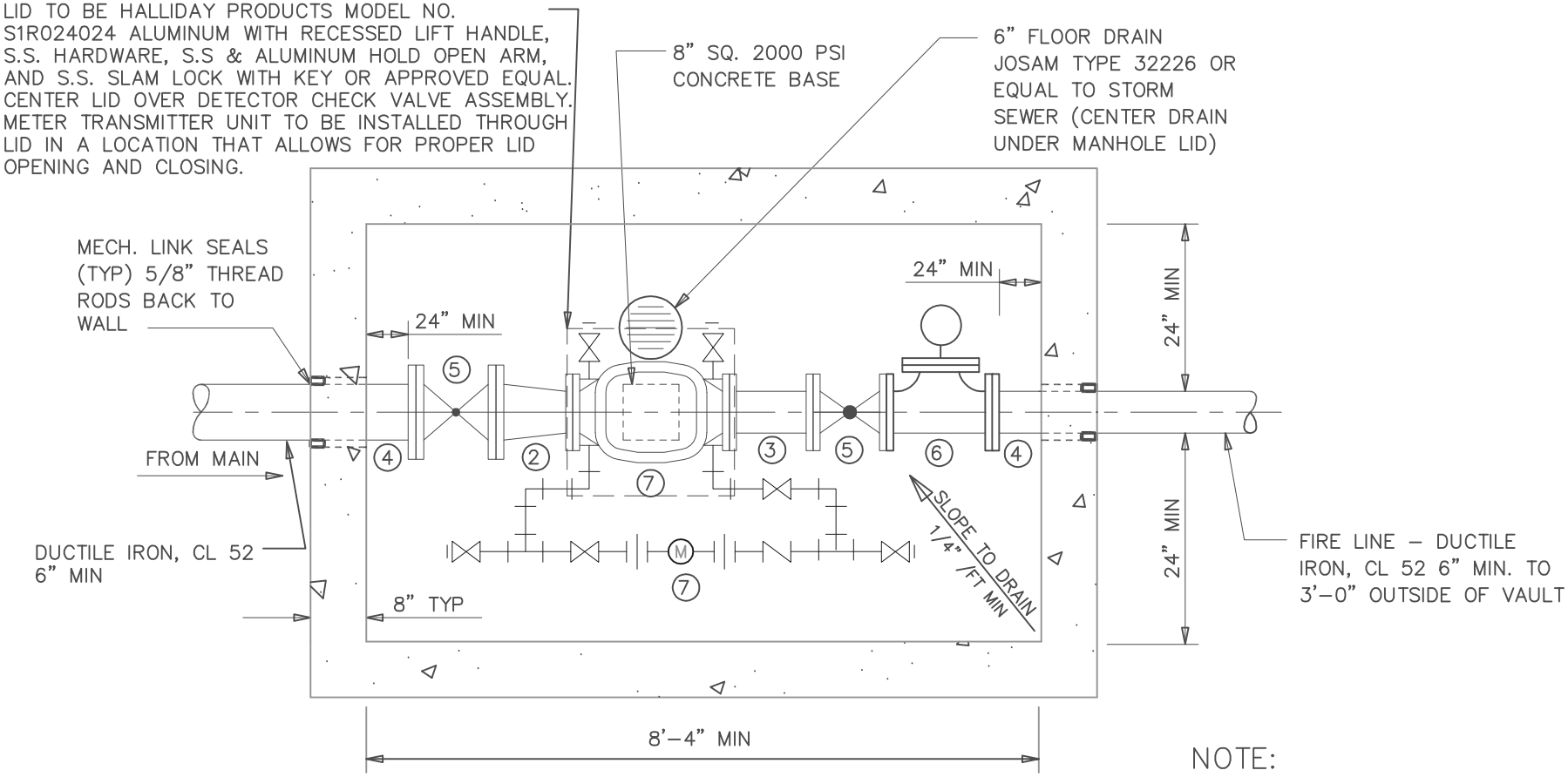
APPROVED _____
DATE _____

REVISED DEC. 2018

FIRE PROTECTION WITH DETECTOR CHECK

DRAWING NO. W4.1

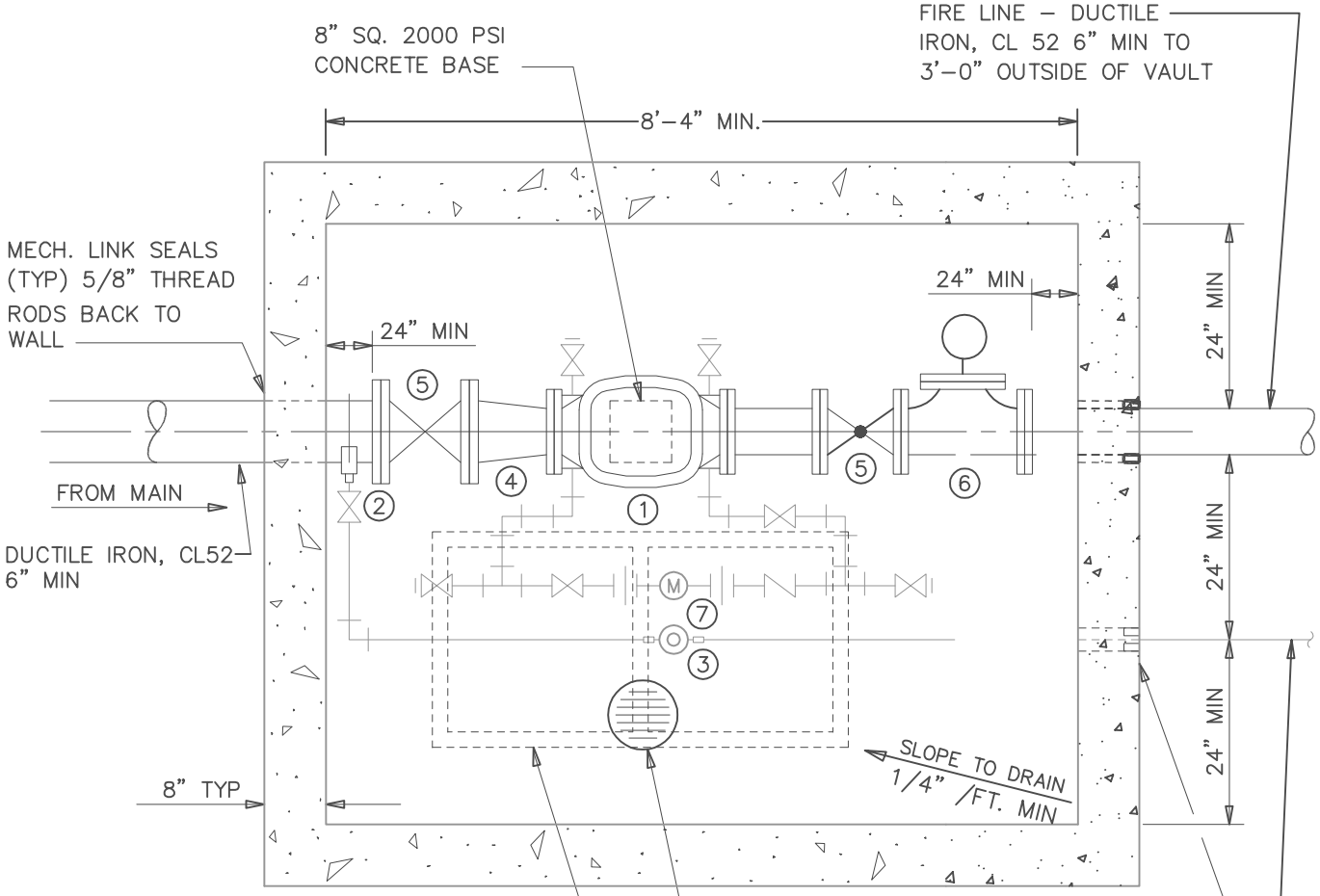
NO SCALE



NOTE:

SEE CCWRD STANDARD DWGS W4.5 & W4.6 FOR WATER SYSTEM CHAMBER DETAILS

1. DETECTOR CHECK VALVE ASSEMBLY. SEE CCWRD STD. DWG. W3.1
2. FLANGED CONCENTRIC REDUCER
3. FLANGED SPOOL x 12" LENGTH
4. FLANGED – PLAIN END (3' MIN. LENGTH)
5. FLANGED INDICATOR GATE VALVE W/ HANDWHEEL OR POST INDICATOR VALVE, AS REQUIRED BY FIRE DEPARTMEMT
   ELECTRONIC SUPERVISION OF VALVE AS REQUIRED
6. FIRE DEPARTMENT CONNECTION AND/OR FIRE ALARM SYSTEM, IF REQUIRED BY FIRE DEPARTMENT
7. LEAK DETECTOR – SENSUS 1" ACCUSTREM WATER METER WITH TRANSMITTER UNIT, PURCHASED FROM THE COUNTY



LID TO BE HALLIDAY PRODUCTS MODEL NO. S1R024048 ALUMINUM WITH RECESSED LIFT HANDLES, S.S. HARDWARE, S.S & ALUMINUM HOLD OPEN ARM, AND S.S. SLAM LOCK WITH KEY OR APPROVED EQUAL. CENTER LID LENGTHWISE OVER DOMESTIC METER. METER TRANSMITTER UNITS TO BE INSTALLED THROUGH LID IN A LOCATION THAT ALLOWS FOR PROPER LID OPENING AND CLOSING.

6" FLOOR DRAIN
JOSAM TYPE 32226 OR
EQUAL TO STORM
SEWER (CENTER DRAIN
UNDER MANHOLE LID)

MASTIC
WATER TIGHT SEAL
UR227 NS JOINT
SEALANT OR EQUAL

TO DOMESTIC SERVICE
TYPE K COPPER TO
3' OUTSIDE OF PIT

① DETECTOR CHECK VALVE ASSEMBLY
SEE CCWRD STD. DWG. W3.1

② TAPPING SADDLE & CORPORATION STOP

③ DOMESTIC METER – SEE CCSD STD. DWGS. W3.2 & W3.3

④ FLANGED CONCENTRIC REDUCER

⑤ FLANGED INDICATOR GATE VALVE W/ HANDWHEEL OR POST INDICATOR VALVE, AS REQUIRED BY FIRE DEPARTMENT ELECTRONIC SUPERVISION OF VALVE AS REQUIRED

⑥ FIRE DEPARTMENT CONNECTION

⑦ LEAK DETECTOR – SENSUS 1" ACCUSTREM WATER METER WITH TRANSMITTER UNIT, PURCHASED FROM THE COUNTY.

NOTE:

SEE CCWRD STANDARD DWGS W4.5 & W4.6 FOR WATER SYSTEM CHAMBER DETAILS

NO SCALE

CLERMONT COUNTY WATER RESOURCES DEPARTMENT	DUAL SERVICE BRANCH SETTING– DOMESTIC METERS (2" & SMALLER)	DRAWING NO. W4.2
APPROVED _____ DATE _____ REVISED DEC. 2020		

CLERMONT COUNTY
WATER RESOURCES DEPARTMENT

APPROVED _____

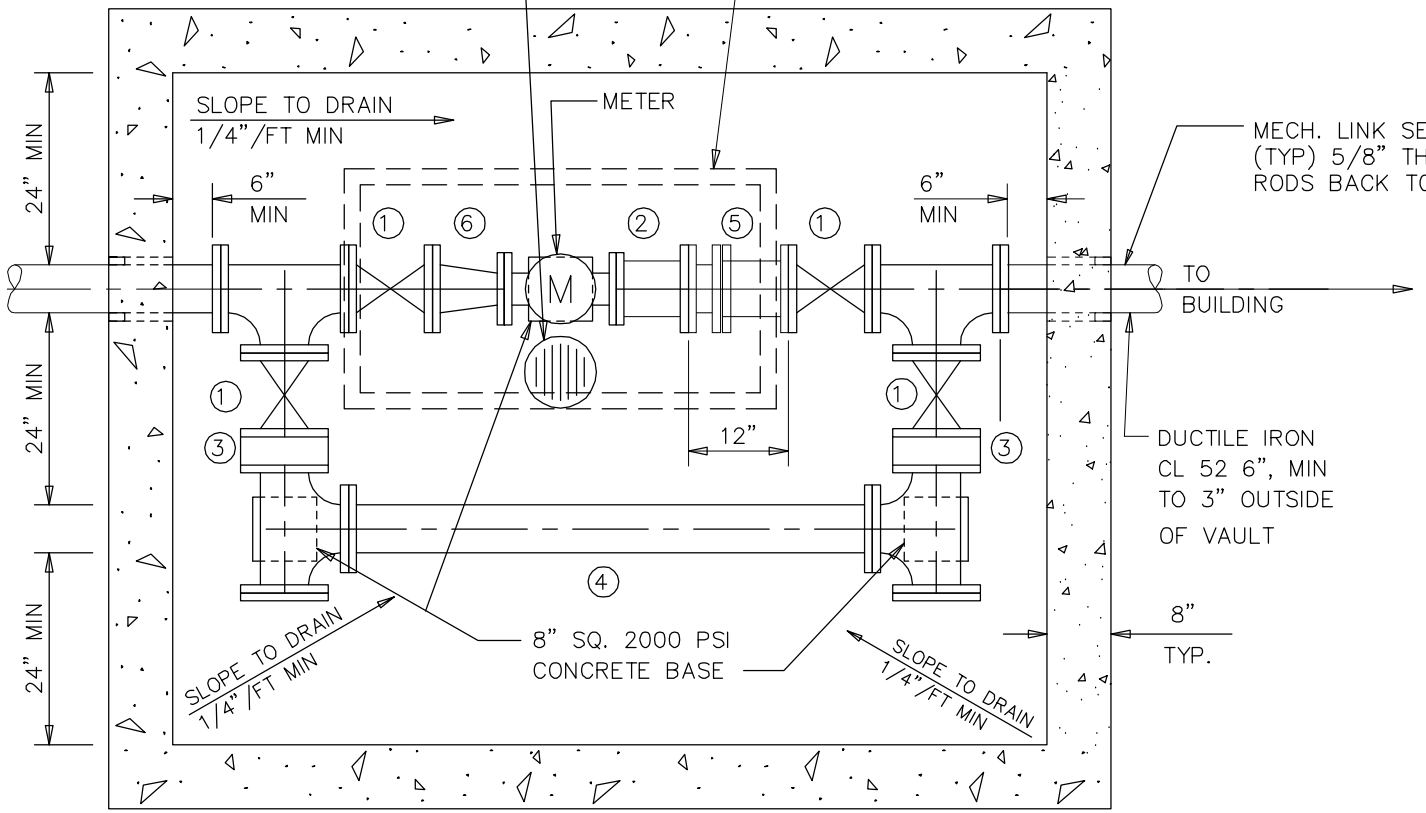
DATE _____

REVISED JUNE 2016

3" & LARGER STANDARD METER PIT ARRANGEMENT

DRAWING NO. W4.3

NO SCALE



① FLANGED INDICATOR GATE VALVE W/ HANDWHEEL

② FLANGED SPOOL OR SPACER

③ FILLER FLANGE OR SPOOL PIECE AS RQUIRED

④ BY–PASS LINE TO BE SAME SIZE AS DOMESTIC LINE

⑤ FLANGED ADAPTER EQUAL TO DRESSER STYLE 128 WITH 2" NPT TAP & PLUG (TEST PORT)

⑥ FLANGED STRAINER

NOTE:

SEE CCWRDD STANDARD DWGS W4.5 & W4.6 FOR WATER SYSTEM CHAMBER DETAILS

CLERMONT COUNTY
WATER RESOURCES DEPARTMENT

APPROVED _____

DATE _____

REVISED DEC. 2020

DUAL SERVICE BRANCH SETTING– 3" & LARGER METERS

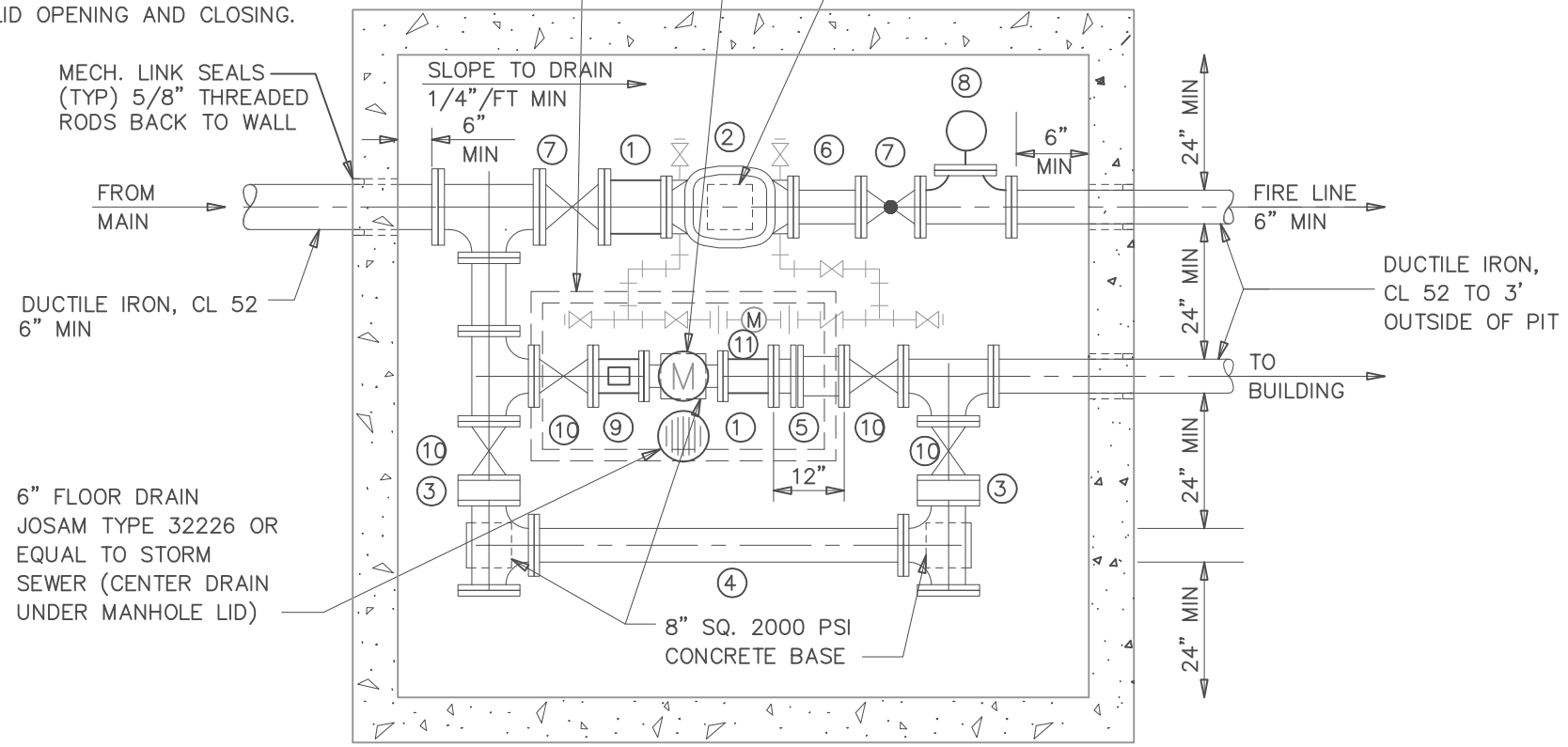
DRAWING NO. W4.4

NO SCALE

LID TO BE HALLIDAY PRODUCTS MODEL NO. S1R024048 ALUMINUM WITH RECESSED LIFT HANDLES, S.S. HARDWARE, S.S & ALUMINUM HOLD OPEN ARM, AND S.S. SLAM LOCK WITH KEY OR APPROVED EQUAL. CENTER LID LENGTHWISE OVER DOMESTIC METER. METER TRANSMITTER UNITS TO BE INSTALLED THROUGH LID IN A LOCATION THAT ALLOWS FOR PROPER LID OPENING AND CLOSING.

NOTE:

SEE CCWRD STANDARD DWGS W4.5 & W4.6 FOR WATER SYSTEM CHAMBER DETAILS



① FLANGED SPOOL OR SPACER

② DETECTOR CHECK VALVE ASSEMBLY. SEE CCWRD STD. DWG. W3.1

③ FILLER FLANGE OR SPOOL PIECE AS REQUIRED

④ BY–PASS LINE TO BE SAME SIZE AS DOMESTIC LINE

⑤ FLANGED ADAPTER EQUAL TO DRESSER STYLE 128 WITH 2" NPT TAP & PLUG (TEST PORT)

⑥ FLANGED SPOOL 12" x LENGTH

⑦ FLANGED INDICATOR GATE VALVE W/ HANDWHEEL OR POST INDICATOR VALE, AS REQUIRED BY FIRE DEPARTMENT ELECTRONIC SUPERVISION OF VALVE AS REQUIRED

⑧ FIRE DEPARTMENT CONNECTION.

⑨ FLANGED STRAINER

⑩ FLANGED GATE VALVE W/ HANDWHEEL

⑪ LEAK DETECTOR – SENSUS 1" ACCUSTREM WATER METER WITH TRANSMITTER UNIT, PURCHASED FROM THE COUNTY.

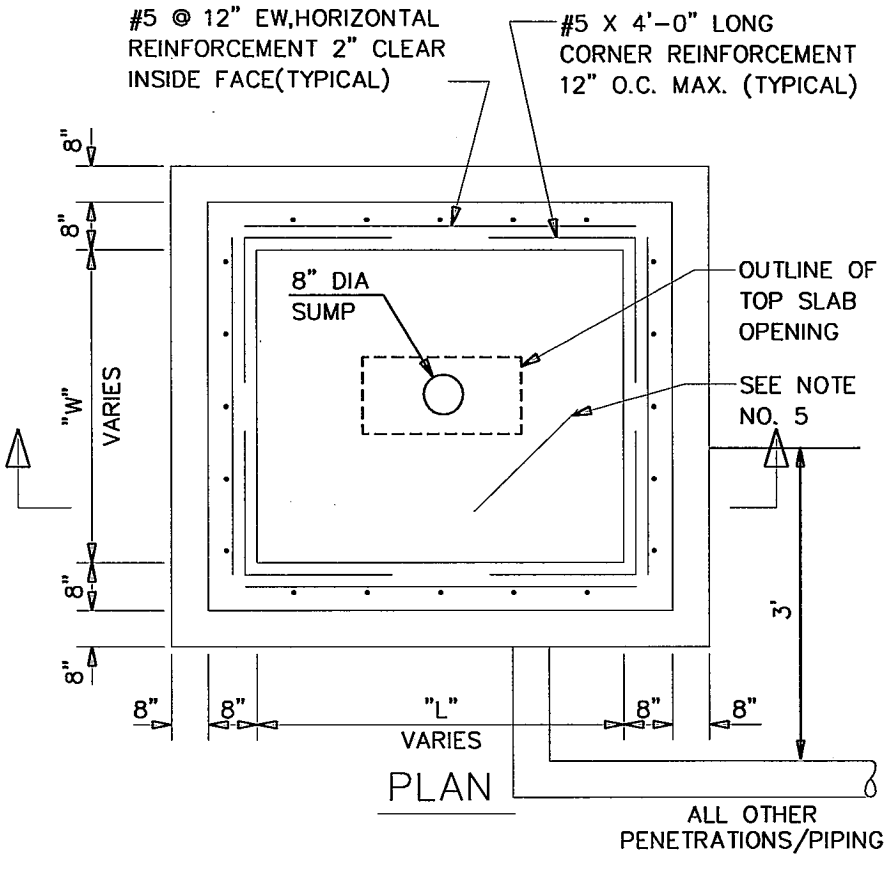
CLERMONT COUNTY
WATER RESOURCES DEPARTMENT

APPROVED _____
DATE _____

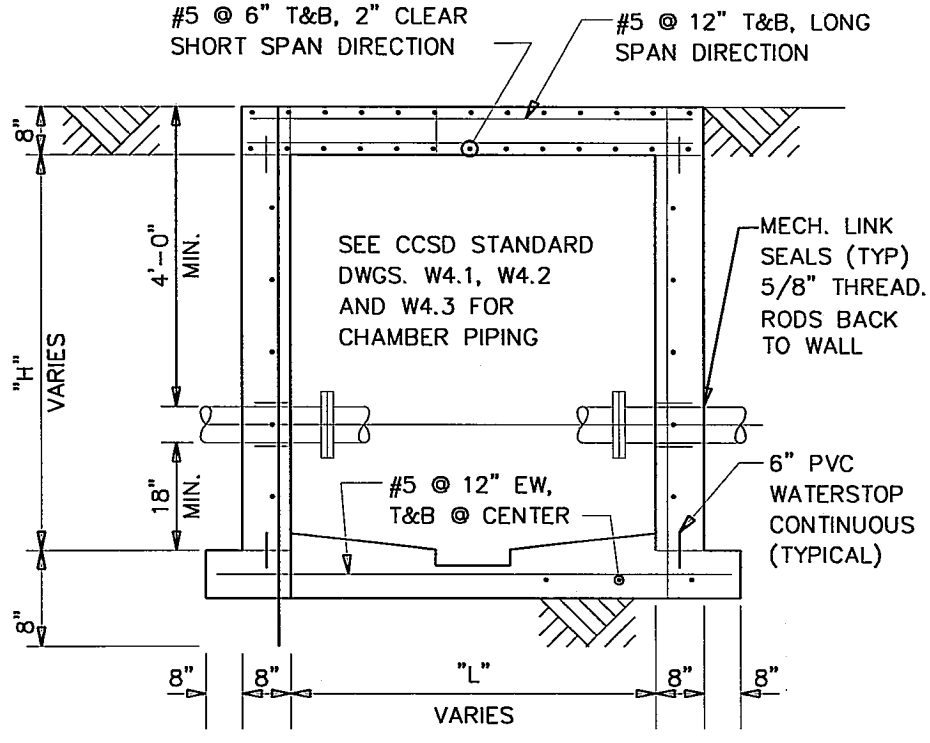
STANDARD WATER SYSTEM CHAMBER

DRAWING NO. W4.5

NO SCALE



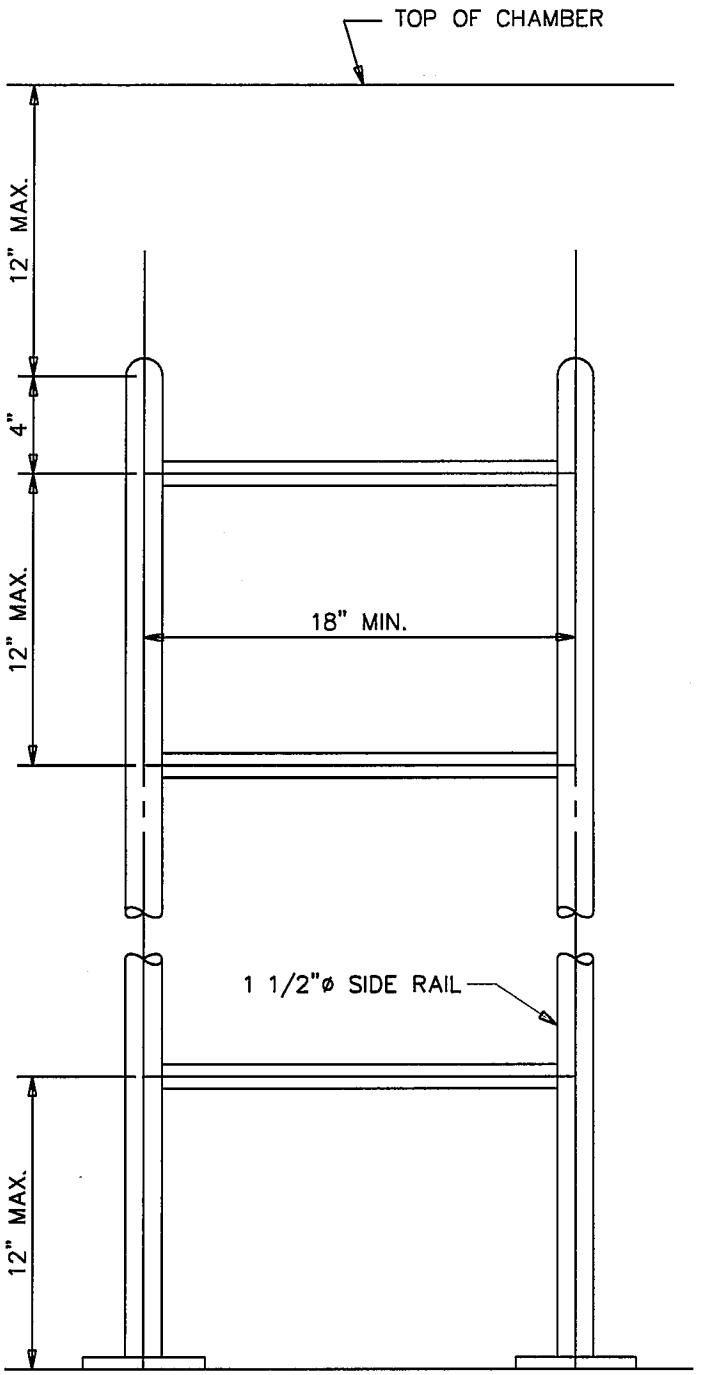
PLAN

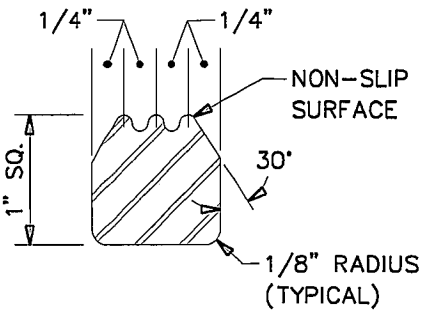


SECTION

NOTES:

1. IF A STORM SEWER IS UNAVAILABLE FOR THE 6" PVC SDR 23.5 CHAMBER DRAIN CONNECTION, AN 8 INCH DIAMETER SUMP SHALL BE PROVIDED. SUMP SHALL BE CAST MONOLITHICALLY WITH BASE SLAB. SUMP PUMPS MAY BE CONSIDERED ONLY FOR FIRE SUPPRESSION VAULTS WITH ELECTRONIC MONITORING ONLY IF POSITIVE DRAINAGE CANNOT BE PROVIDED. ELECTRIC CIRCUIT MUST BE GFCI PROTECTED & INSTALLED IN ACCORDANCE TO NATIONAL ELECTRIC CODE. FROM MINIMUM HORIZONTAL CLEARANCE OF 3 FEET.
2. 6" FLOOR DRAIN SHALL BE JOSAM TYPE 32226 OR EQUAL. DRAIN SHALL BE CENTERED UNDER MANHOLE LID.
3. FOR MINIMUM CHAMBER DIMENSIONS: "L", "W", "H" AND LID PLACEMENT & SIZING, SEE CCWRD STANDARD DWGS. W4.1, W4.2 AND W4.3.
4. SEE CCWRD STANDARD DWG. W4.6 FOR CHAMBER ACCESS LADDER.
5. ADDITIONAL REINFORCEMENT SHALL BE PROVIDED AT EACH CORNER OF EVERY TOP SLAB OPENING–#5 X 2'–0" LONG T&B MINIMUM.
6. REINFORCEMENT SHOWN IS MINIMUM REQUIRED. TOP AND BASE SLABS SHALL BE DESIGNED FOR A UNIFORM LOADING OF 300 PSF LIVE LOAD, WALLS SHALL BE DESIGNED FOR A UNIFORM VARYING LOAD OF 80 PCF PER FOOT FOOT OF DEPTH, WITH A SAFETY OF 1.7 MIN.
7. CHAMBERS SHALL BE CAST–IN–PLACE OR PRECAST CONCRETE (4000 PSI)
8. ALL OTHER PENETRATIONS SHALL BE NO MORE THAN 18" BELOW SURFACE





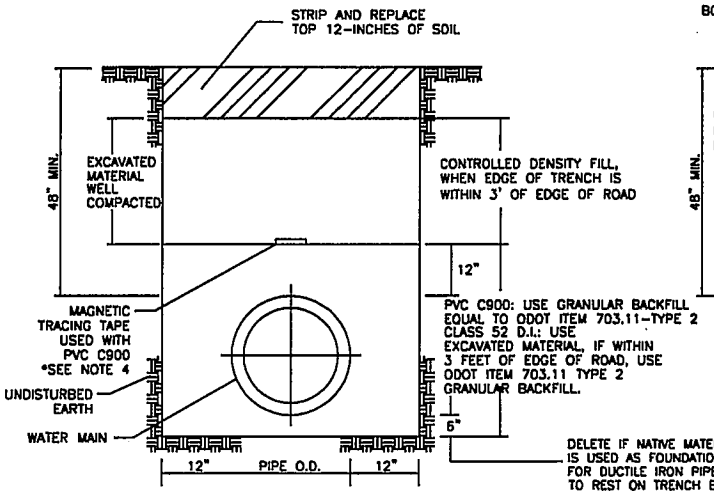
RUNG DETAIL

NOTES:

1. LADDERS SHALL BE FABRICATED FROM ALUMINUM TUBING, PLATES & BARS CONFORMING TO ALLOY & TEMPER 6061-T6.
2. TUBING SHALL HAVE A 1/8" MIN. WALL THICKNESS.
1. LADDER MUST BE FASTENED TO WALL AND FLOOR WITH STAINLESS STEEL ANCHORS.

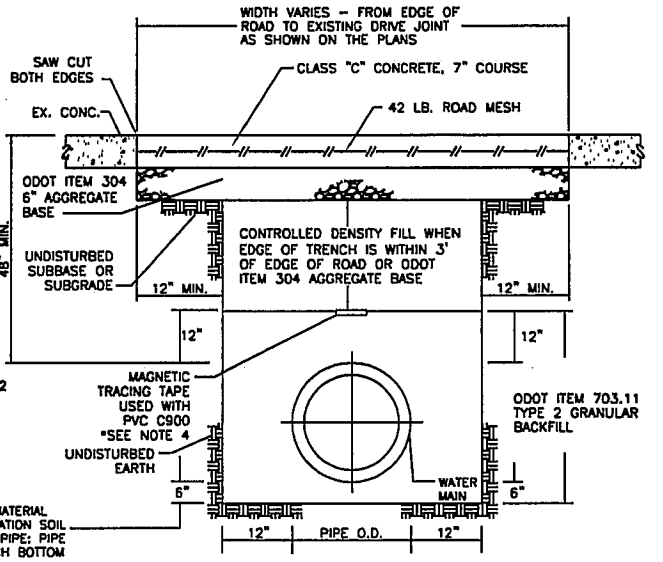
NO SCALE

CLERMONT COUNTY WATER RESOURCES DEPARTMENT	CHAMBER ACCESS LADDER	DRAWING NO. W4.6
APPROVED _____ DATE		



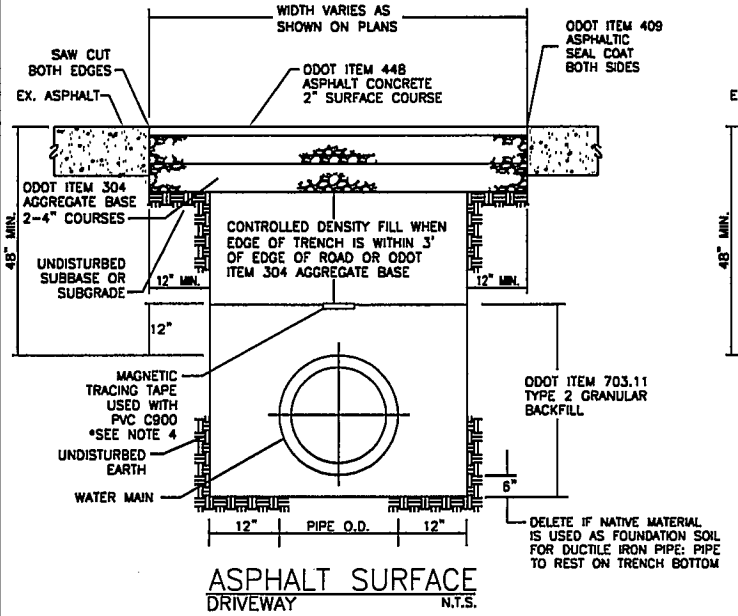
STANDARD TRENCH
OUTSIDE ROADWAY N.T.S.

NOTE:
WHEN NATIVE MATERIAL IS FOUND ACCEPTABLE AS A FOUNDATION SOIL, HOLES MUST BE CONSTRUCTED TO RECEIVE THE PIPE BELL.



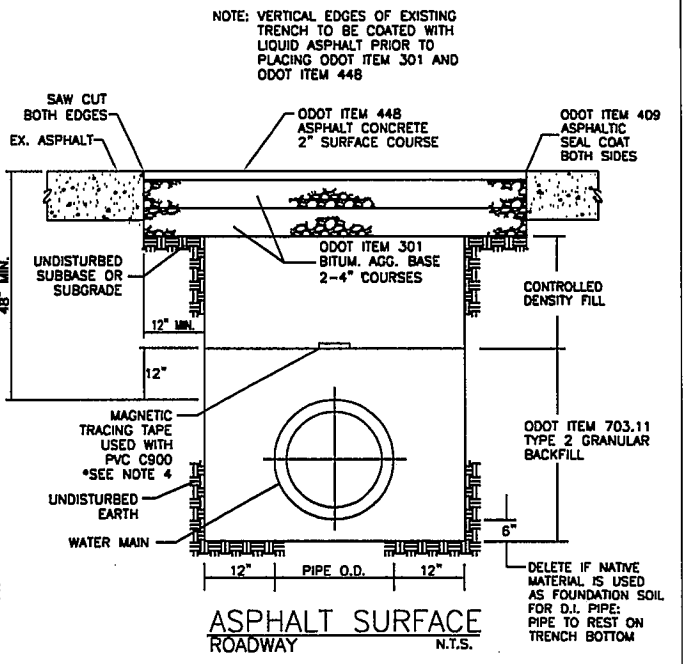
CONCRETE SURFACE
DRIVEWAY N.T.S.

NOTE: VERTICAL EDGES OF EXISTING TRENCH TO BE COATED WITH LIQUID ASPHALT PRIOR TO PLACING ODOT ITEM 304 AND ODOT ITEM 448



ASPHALT SURFACE
DRIVEWAY N.T.S.

NOTE: VERTICAL EDGES OF EXISTING TRENCH TO BE COATED WITH LIQUID ASPHALT PRIOR TO PLACING ODOT ITEM 301 AND ODOT ITEM 448



ASPHALT SURFACE
ROADWAY N.T.S.

NOTES:

1. "PAVEMENT" AS USED IN THIS DETAIL SHALL ALSO MEAN SIDEWALKS, CURBS, SLABS & OTHER GRADED STRUCTURES.
2. ALL BACKFILL & BEDDING IS TO BE COMPACTED AS CALLED FOR IN THE SPECIFICATIONS.
3. BEDDING AND BACKFILL MATERIALS SHALL BE IN ACCORDANCE WITH THE SPECIFICATION FOR THE SPECIFIC PIPE MATERIAL BEING INSTALLED.
4. IN ADDITION TO MAGNETIC TRACER TAPE, ALL PVC WATER MAIN SHALL INCLUDE A TRACER WIRE SYSTEM INSTALLED IN ACCORDANCE WITH SECTION 2120 OF THE CCWRD STANDARD SPECIFICATIONS
5. 6' LONG CLAY BULKHEADS TO BE INSTALLED AROUND PIPE EVERY 100' IN ACCORDANCE WITH SECTION 1200 OF THE CCWRD SPECIFICATIONS.

NO SCALE

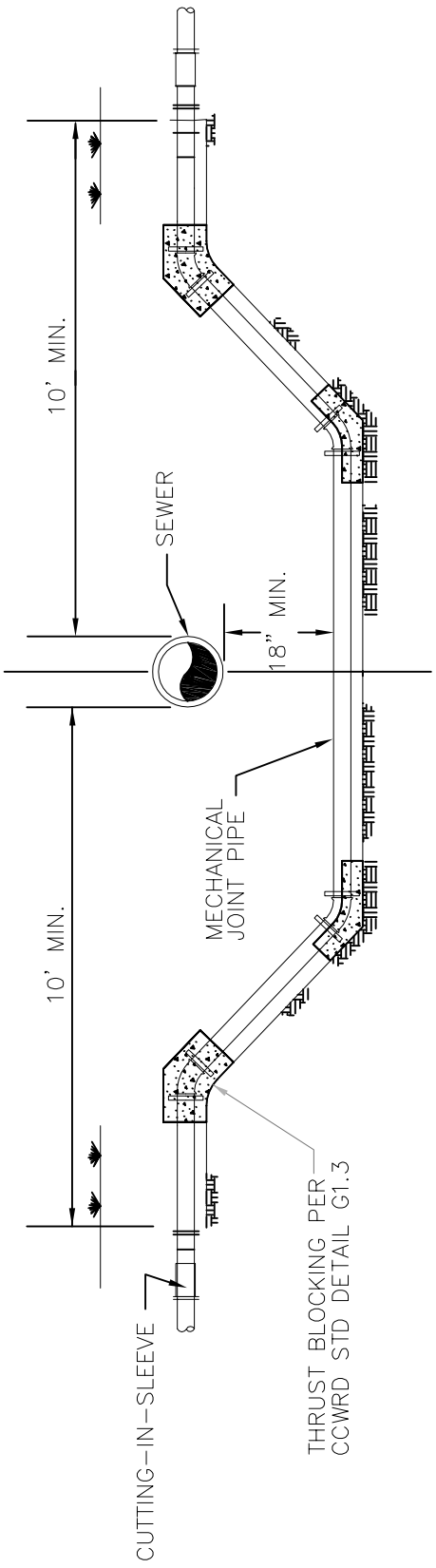
CLERMONT COUNTY
WATER RESOURCES DEPARTMENT

APPROVED _____

DATE

WATER MAIN TRENCH SECTION

DRAWING NO.
W5.1



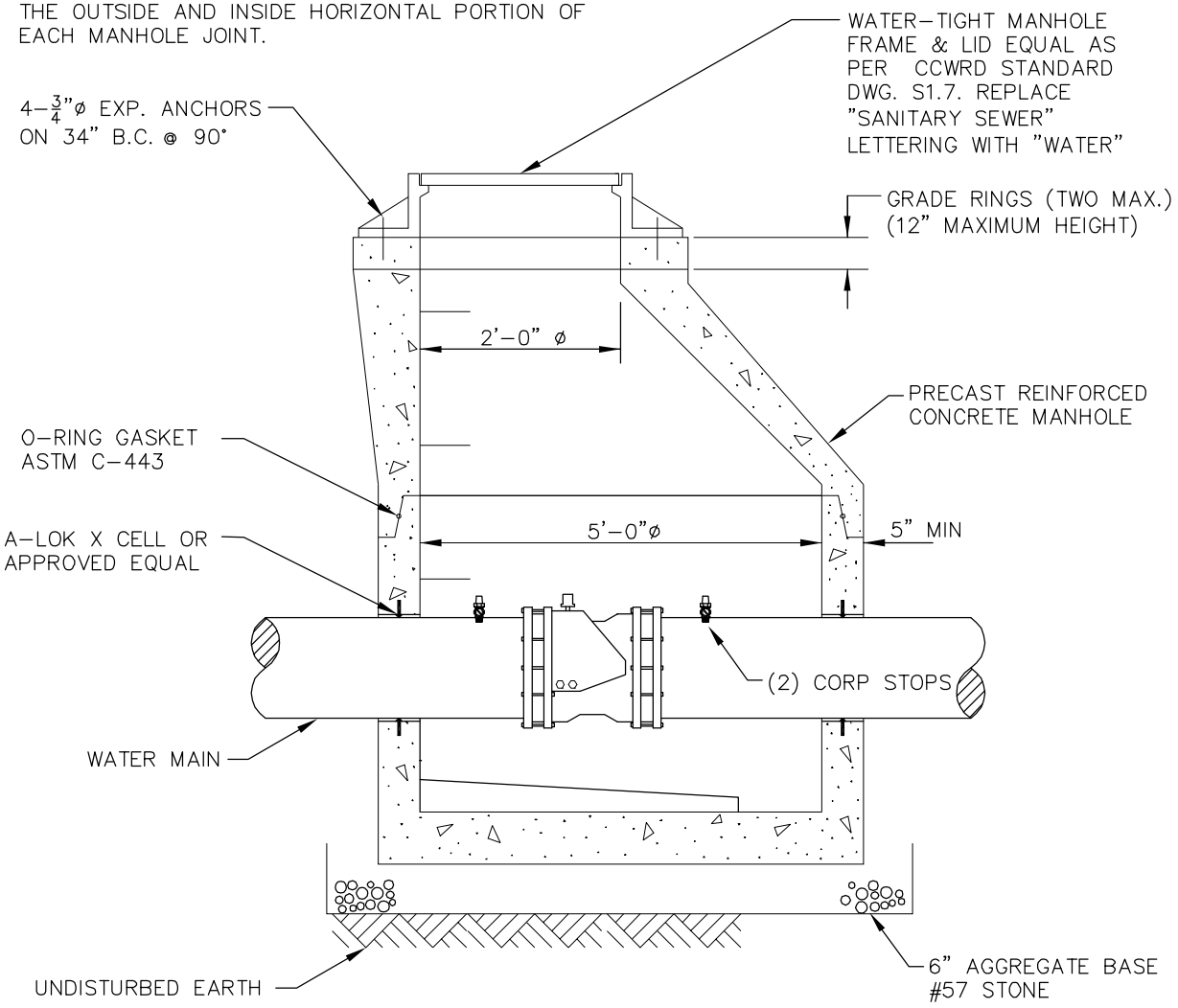
NOTE

DUCTILE IRON RETAINER GLANDS SHALL BE USED ON ALL FITTINGS AND PIPE.

NOT TO SCALE

CLERMONT COUNTY WATER RESOURCES DEPARTMENT APPROVED _____ DATE _____	WATER MAIN LOWERING DETAIL	DRAWING NO. W5.2

NOTE: FLEXIBLE BUTYL RUBBER SEALANT EQUAL TO CONSEAL TYPE CS–102 SHALL BE USED TO: SEAL CASTING TO MANHOLE, TO SEAL ADJUSTING RINGS TOGETHER AND TO RISERS, AND TO SEAL MANHOLE RISER JOINTS. THE SEALANT MUST BE APPLIED TO THE OUTSIDE AND INSIDE HORIZONTAL PORTION OF EACH MANHOLE JOINT.



WATER MAIN SIZE	VALVE TYPE	CORP SIZE
< 12"	GATE	1"
≥ 12"	BUTTERFLY	2"

THE VALVE AND MANHOLE OPENING SHALL BE ALIGNED TO PERMIT OPERATION OF THE VALVE NUT FROM OUTSIDE AND ABOVE THE MANHOLE.
WHERE CALL FOR ON THE CONTRACT DRAWINGS, FLAT TOP MANHOLE LID WITH RISER SHALL BE SUBSTITUTE FOR THE ECCENTRIC RISER.

NO SCALE

CLERMONT COUNTY WATER RESOURCES DEPARTMENT	ISOLATION/ACCESS VALVE AND MANHOLE	DRAWING NO. W6.1
APPROVED _____ DATE _____		

APRIL 2016

GENERAL NOTES

GENERAL
ALL WORK AND MATERIALS SHALL CONFORM TO THE LATEST RULES AND REGULATIONS OF THE CLERMONT COUNTY WATER RESOURCES DEPARTMENT FOUND AT WRD.CLERMONTCOUNTYOHIO.GOV. IT IS THE INTENT OF THESE CONSTRUCTION DRAWINGS AND SPECIFICATIONS TO DESCRIBE A COMPLETE FUNCTIONING SYSTEM IN ALL RESPECTS, WHETHER OR NOT EVERY SUB-ELEMENT OF THE TOTAL SYSTEM IS ACTUALLY DEFINED IN WRITING AND/OR DETAIL. PAYMENT TO THE CONTRACTOR(S) SHALL BE INFERRED TO COVER WORK AND MATERIALS REQUIRED FOR A COMPLETE FUNCTIONING SYSTEM SUCH THAT WHEN FINAL PAYMENT IS MADE, THE SYSTEM IS COMPLETELY OPERABLE AND FUNCTIONS IN ALL RESPECTS AS REQUIRED BY THE CONTRACT DOCUMENTS.

THE WORK TO BE PERFORMED UNDER THESE SPECIFICATIONS INCLUDES FURNISHING ALL MATERIALS, EQUIPMENT, AND LABOR NECESSARY TO COMPLETE THE WORK CALLED FOR IN THE CONTRACT DOCUMENTS.

THE CONTRACTOR SHALL PROVIDE ALL NECESSARY ELECTRIC, WATER, SANITARY FACILITIES AND WASTE DISPOSAL TO COMPLETE THE WORK.

A SITE VISIT IS HIGHLY RECOMMENDED PRIOR TO SUBMISSION OF BID.

THE EXISTING UTILITIES ARE SHOWN BASED ON FIELD SURVEYS AND THE BEST AVAILABLE INFORMATION. THE CONTRACTOR IS RESPONSIBLE TO FIELD VERIFY THE LOCATION OF ALL UTILITIES PRIOR TO THE START OF WORK.

EXISTING WASTEWATER FLOWS MUST BE MAINTAINED DURING CONSTRUCTION. ADEQUATE SIZING OF THE TEMPORARY PUMPS REQUIRED TO CONVEY THE EXISTING FLOW IS THE RESPONSIBILITY OF THE CONTRACTOR. ANY TEMPORARY PUMPING REQUIRED FOR SATISFACTORY CONSTRUCTION OF THIS PROJECT SHALL COME AT NO ADDITIONAL EXPENSE TO THE OWNER. BYPASS PUMPING MAY BE REQUIRED.

CONTRACTOR IS RESPONSIBLE TO PROVIDE SUPPORT TO THE EXISTING UTILITY POLES, AS NECESSARY TO COMPLETE THE WORK CALLED FOR IN THE CONTRACT DRAWINGS AND SPECIFICATIONS

PAVEMENT
ALL PAVEMENT AND/ROADWAY SURFACE DISTURBED BY THE CONTRACTOR SHALL BE RESTORED BY THE CONTRACTOR AT HIS EXPENSE AND IN CONFORMANCE WITH THE REGULATIONS OF THE GOVERNING AUTHORITY OF SAID ROADWAYS. IN THE ABSENCE OF SUCH REGULATIONS, THE RESTORATION SHALL BE IN ACCORDANCE WITH INSTRUCTIONS BY THE OWNER'S REPRESENTATIVE WITH THE OBJECTIVE OF RESTORING THE PAVING OR ROADWAY SURFACE TO ITS ORIGINAL CONDITION.

RESTORATION
ALL RESTORATION IS THE RESPONSIBILITY OF THE CONTRACTOR. PRIOR TO CONSTRUCTION, THE CONTRACTOR IS RESPONSIBLE TO VIDEO TAPE AND PHOTOGRAPH ALL AREAS THAT WILL BE DISTURBED AS A RESULT OF HIS CONSTRUCTION ACTIVITIES AND WILL DELIVER TO THE OWNER'S REPRESENTATIVE A COPY OF THE VIDEO TAPE AND PHOTOGRAPHS. ALL PICTURES SHALL BE LABELED WITH THE LOCATION WHERE THEY WERE TAKEN. NONCOMPLIANCE MAY RESULT IN THE CONTRACTOR'S LIABILITY FOR ALL DISPUTED PROPERTY RESTORATIONS.

EROSION CONTROL
THE CONTRACTOR SHALL INSTALL AND MAINTAIN EROSION AND SEDIMENT CONTROL MEASURES AS NECESSARY TO COMPLETE THE WORK AS OUTLINED IN THESE DRAWINGS AND PROJECT SPECIFICATIONS TO THE SATISFACTION OF THE OWNER'S REPRESENTATIVE. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE CLERMONT COUNTY WATER MANAGEMENT AND SEDIMENT CONTROL REGULATIONS AND TO THE SATISFACTION OF THE OWNER'S REPRESENTATIVE

UTILITIES
THE EXISTENCE, LOCATION, AND CONDITION OF UTILITIES AND STRUCTURES, BOTH ABOVE AND BELOW GROUND, SHALL BE INVESTIGATED AND VERIFIED IN THE FIELD BY THE CONTRACTOR BEFORE STARTING WORK. EXCAVATION IN THE VICINITY OF SUCH UTILITIES AND STRUCTURES SHALL BE DONE CAREFULLY AND BY HAND IF NECESSARY. THE CONTRACTOR SHALL PROTECT ALL SUCH UTILITIES AND STRUCTURES, BOTH MARKED AND UNMARKED, AND BE HELD RESPONSIBLE FOR DAMAGE TO THEM. THIS INCLUDES ALL EXISTING AND PROPOSED SPRINKLER AND ELECTRIC LINES. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO ISOLATE, BRACE, SUPPORT, SHEET, ETC. AND PROTECT THE EXISTING UTILITIES FROM MOVING EITHER HORIZONTALLY OR VERTICALLY. IF SUCH MOVEMENT DOES OCCUR DUE TO THE CONTRACTOR'S OPERATIONS, HE SHALL REPAIR THE UTILITY TO THE SATISFACTION OF THE UTILITY OWNER AT THE CONTRACTOR'S EXPENSE. THE CONTRACTOR SHALL GIVE WRITTEN NOTICE TO ALL OWNERS OF ADJACENT UTILITIES, FIXTURES, AND/OR PROPERTY, OF HIS IMPENDING OPERATIONS, BUT IN NO WAY APPROPRIATE UTILITY COMPANY AT LEAST 48 HOURS IN ADVANCE OF EXCAVATION IN THE VICINITY OF SAID UTILITY. FIELD LOCATION SHALL BE MADE BY THE UTILITY OR ITS AUTHORIZED AGENCY BEFORE ANY WORK IS PERFORMED BY THE CONTRACTOR. IF AT ANY TIME DURING WORK, AN EXISTING UTILITY IS DAMAGED IN ANY WAY, THE CONTRACTOR SHALL IMMEDIATELY CONTACT THE APPROPRIATE GOVERNING ENTITY AND THE OWNER'S REPRESENTATIVE.

CONTRACTOR TO REMOVE, REPLACE, AND PROVIDE TEMPORARIES OF ALL STREET SIGNS, MAILBOXES, ETC. AS NEEDED FOR CONSTRUCTION OF THE PROJECT

PVC GRAVITY SEWER MAIN
ALL PVC GRAVITY SEWER MAIN THROUGH 15" DIAMETER SHALL CONFORM TO ASTM D-3034. ALL PVC GRAVITY SEWER MAIN 18" DIAMETER AND LARGER SHALL CONFORM TO ASTM F-679, TYPE I. ELASTOMERIC GASKET JOINTS FOR BOTH TYPES OF PVC GRAVITY SEWER MAIN SHALL CONFORM TO ASTM D-3212. MATERIAL FOR PVC GRAVITY SEWER MAIN SHALL CONFORM TO THE REQUIREMENTS OF ASTM D-1784 FOR CELL CLASSIFICATION 12364 OR 12454. PVC GRAVITY SEWER MAIN PIPE SHALL ALSO CONFORM TO THE FOLLOWING SCHEDULE:

DEPTH OF COVER (FROM TOP OF PIPE)	SDR SCHEDULE
<15' OF COVER	35
15' UP TO <28' OF COVER	26
28' AND OVER OF COVER	17

ALL PVC GRAVITY SEWER MAIN SHALL BE INSTALLED IN ACCORDANCE WITH ASTM D-2321.

PIPE INSTALLATION
THE PROPOSED LOCATION OF THE GRAVITY SEWER MAIN IS SHOWN ON THE PLANS. CONSTRUCTION SHALL BEGIN AT THE FURTHEST DOWNSTREAM POINT OF THE PROJECT, UNLESS APPROVED OTHERWISE BY THE OWNER'S REPRESENTATIVE. A WATER-TIGHT BULKHEAD MUST BE INSTALLED AT THE FURTHEST DOWNSTREAM MANHOLE TO SEPARATE THE NEW WORK FROM THE EXISTING SEWER SYSTEM. AT THE SUCCESSFUL CONCLUSION OF TESTING, THE CONTRACTOR MUST REMOVE THE BULKHEAD.

INFILTRATION AND EXFILTRATION TESTING FOR GRAVITY SEWER PIPE
THE OWNER'S REPRESENTATIVE MAY ORDER THE CONTRACTOR TO MAKE INFILTRATION (LEAKAGE) TESTS OF AS MANY SECTIONS OF THE SANITARY SEWERS AND ITS LATERALS, AS, IN THE OWNER'S REPRESENTATIVE OPINION, MAY BE NECESSARY TO DETERMINE WHETHER WORK COMPLIES WITH THE ABOVE REQUIRED RATE OF INFILTRATION. GENERALLY, A SECTION OF SEWER SHALL MEAN THE DISTANCE BETWEEN MANHOLES. SUCH TESTS WILL BE OF 30 MINUTE MINIMUM DURATION AND WILL ONLY BE MADE AT THE TIME OF MAXIMUM HEIGHT OF GROUND WATER, PROVIDED THAT SUCH MAXIMUM HEIGHT OF GROUND WATER MUST BE AT LEAST TWO (2) FEET ABOVE THE ELEVATION OF THE OUTSIDE TOP OF THE SEWER AT THE UPSTREAM LIMIT OF THE SECTION BEING TESTED. THE INFILTRATION TEST SHALL BE MADE BY INSTALLING A WEIR OR OTHER MEASURING DEVICE APPROVED BY THE OWNER'S REPRESENTATIVE IN THE LOWER END OF THE SEWER SECTION TO BE TESTED. THE QUANTITY OF GROUND WATER INFILTRATION INTO THE SEWER WILL BE MEASURED AND SHALL NOT EXCEED THE ALLOWABLE LEAKAGE.

THE WATER RESOURCES DEPARTMENT MAY ALSO ORDER EXFILTRATION TESTS TO BE MADE. FOR EXFILTRATION TESTS, THE CONTRACTOR SHALL FILL THE SEWER WITH WATER TO AN ELEVATION OF TWO (2) FEET ABOVE THE OUTSIDE TOP OF THE SEWER AT THE UPSTREAM LIMIT OF THE SECTION BEING TESTED. THE EXFILTRATION SHALL NOT EXCEED THE RATE OF 100 GALLONS PER INCH OF TRIBUTARY PIPE DIAMETER, PER 24 HOURS PER MILE OF LENGTH, AS SPECIFIED FOR INFILTRATION.

THE CONTRACTOR SHALL ALSO PERFORM A DEFLECTION TEST IN ALL SECTIONS OF GRAVITY SEWER PIPE. THE TEST SHALL BE CONDUCTED AFTER THE FINAL BACKFILL HAS BEEN IN PLACE AT LEAST 30 DAYS. PRIOR TO MAKING THE DEFLECTION TESTS, THE LINES SHALL BE FLUSHED AND SWABBED. SWABBING SHALL BE BY AN INFLATED RUBBER BALL OR OTHER APPROVED METHOD. THE DEFLECTION OF ANY SEWER PIPE SHALL NOT EXCEED 5 PERCENT. THE DEFLECTION TEST SHALL BE MADE BY USING A RIGID BALL OR MANDREL AND SHALL HAVE A DIAMETER EQUAL TO 95 PERCENT OF THE INSIDE DIAMETER OF THE PIPE. ALL TESTING SHALL BE CONDUCTED UNDER THE SUPERVISION OF THE OWNER'S REPRESENTATIVE. THE TEST SHALL BE PERFORMED WITHOUT MECHANICAL PULLING DEVICES. CORRECTION OF ANY SECTION OF SEWER PIPE NOT MEETING THE DEFLECTION TEST SHALL BE APPROVED BY THE OWNER'S REPRESENTATIVE.

PVC GRAVITY SEWER MAIN PIPE TESTING
AN APPROVED TYPE OF LOW PRESSURE AIR TEST MAY BE USED IN LIEU OF THE ABOVE EXFILTRATION TESTS AT THE OPTION OF THE OWNER'S REPRESENTATIVE. UNLESS OTHERWISE DIRECTED BY THE OWNER'S REPRESENTATIVE, THE SEWER WILL BE TESTED AT 5 POUNDS OF PRESSURE FOR 5 MINUTES WITH NO LOSS OF PRESSURE.

GRAVITY SEWER LATERALS
LATERALS SHALL BE CONSTRUCTED WITH A 6 INCH MINIMUM DIAMETER. THEY SHALL BE CONSTRUCTED AT THE SAME STANDARD DIMENSION RATIO (SDR) AS THE SEWER MAIN IT IS BEING CONNECTED TO. IF THE SEWER MAIN IS NOT PVC, THE LATERAL SHALL BE PVC WITH A STANDARD DIMENSION RATIO CORRESPONDING TO THE SCHEDULE ESTABLISHED IN SECTION 3110 PVC GRAVITY SEWER MAIN.

LOCATION OF MANHOLE(S)
MANHOLES SHALL BE INSTALLED AT POINTS OF CHANGE IN SEWER GRADE, SIZE, OR DIRECTION, AT JUNCTIONS, AT INTERMEDIATE POINTS AND AT THE END OF EACH LINE. MANHOLES FOR SEWERS 36 INCHES AND LARGER IN DIAMETER SHALL BE LOCATED NEAR POINTS OF CHANGE IN SEWER GRADE, SIZE OR DIRECTION IN ORDER THAT STANDARD COMPONENTS MAY BE USED. MANHOLES SHALL BE INSTALLED AT MAXIMUM INTERVALS OF 400 FEET FOR SEWERS 15 INCHES IN DIAMETER AND SMALLER, AND 500 FEET FOR SEWERS 18 INCHES TO 48 INCHES IN DIAMETER.

DROP MANHOLE(S)
DROP MANHOLES SHALL BE USED WHEN THE INVERT OF THE INFLOW SEWER IS TWO FEET OR MORE ABOVE THE MANHOLE INVERT. WHEN THIS DIFFERENCE IN ELEVATION IS LESS THAN TWO FEET, THE MANHOLE INVERT SHALL BE FILLETED TO PREVENT SOLIDS DEPOSITION. DROP MANHOLES SHALL BE CONSTRUCTED WITH INSIDE DROP PIPES AS SHOWN ON THE WATER RESOURCES DEPARTMENT STANDARD DRAWINGS. INSIDE DROP CONNECTIONS, WHEN APPROVED BY THE DEPARTMENT, SHALL BE CONSTRUCTED OF SDR-23.5 PVC SEWER PIPE, SECURELY FASTENED TO THE INSIDE FACE OF THE MANHOLE WITH STAINLESS ANCHORS AND PIPE SUPPORTS. DROP MANHOLES SHALL BE CONSTRUCTED WITH THE RELINER INSIDE DROP SYSTEM OR EQUAL AS DETERMINED BY THE WATER RESOURCES DEPARTMENT.

MATERIALS FOR MANHOLE(S)
PRECAST CONCRETE BASES, RISERS AND TOPS SHALL BE CONSTRUCTED OF REINFORCED CONCRETE AND SHALL CONFORM TO THE REQUIREMENTS OF THE "SPECIFICATIONS FOR CIRCULAR PRECAST REINFORCED CONCRETE MANHOLE SECTIONS", ASTM C-478, EXCEPT AS MODIFIED HEREIN. PIPE CONNECTION TO MANHOLE BASES SHALL BE MADE WITH FLEXIBLE RUBBER COMPRESSION GASKETS CONFORMING TO ASTM C923. PIPE TO MANHOLE CONNECTOR FOR SANITARY SYSTEMS SHALL BE A-LOK X-CEL OR EQUAL AS DETERMINED BY THE WATER RESOURCES DEPARTMENT.
JOINTS BETWEEN PRECAST MANHOLE SECTIONS SHALL BE FLEXIBLE WATERTIGHT RUBBER GASKETS CONFORMING TO ASTM C-443. ADDITIONAL FLEXIBLE BUTYL RUBBER SEALANT EQUAL TO CONSEAL TYPE CS-102 SHALL BE APPLIED TO THE OUTSIDE AND INSIDE HORIZONTAL PORTION OF EACH MANHOLE JOINT. CARE MUST BE EXERCISED TO ENSURE THE JOINTS ARE CLEAN AND FREE OF DIRT, DEBRIS AND GREASE TO ASSURE ADHESION OF THE SEAL MATERIAL.

1-1/4 INCH HOLES FOR HANDLING MAY BE CAST IN THE DOME AND RINGS. THESE HOLES SHALL BE PLUGGED AND SEALED ONCE THE MANHOLE IS IN PLACE.

PRECAST ADJUSTING RINGS SHALL BE REINFORCED WITH ONE (1) NO. 3 GAGE WIRE OR EQUIVALENT. A MAXIMUM OF 12 INCHES IN HEIGHT OF ADJUSTING RINGS SHALL BE ALLOWED FOR EACH MANHOLE. NO MORE THAN TWO (2) ADJUSTING RINGS WILL BE PERMITTED FOR EACH MANHOLE. A FLEXIBLE BUTYL RUBBER SEALANT EQUAL TO CONSEAL TYPE CS-102 SHALL BE USED TO SEAL THE JOINT BETWEEN THE MANHOLE TOP AND FIRST ADJUSTING RING AND EACH SUCCEEDING JOINT BETWEEN SAID RINGS.

COMPOSITE ADJUSTING RINGS SHALL BE INFRA-RISER MULTI-PURPOSE RUBBER COMPOSITE ADJUSTMENT RISER BY EAST JORDAN IRON WORKS OR EQUAL AS DETERMINED BY THE WATER RESOURCES DEPARTMENT.

IN GENERAL, THE MANHOLES SHALL BE CONSTRUCTED SO THE TOP OF THE CASTING IS AT THE ELEVATION OF THE PROPOSED STREET GRADE OR TO A POINT 2 INCHES ABOVE THE PRESENT GROUND SURFACE OR TO A POINT 24 INCHES ABOVE THE GROUND SURFACE OF A CULTIVATED FIELD OR AS ORDERED. THE MANHOLE CASTING SHALL BE SET ON A FLEXIBLE BUTYL RUBBER SEALANT EQUAL TO CONSEAL TYPE CS-102, TO PROVIDE A SEAL BETWEEN THE MANHOLE CASTING AND THE MANHOLE STRUCTURE. SPECIAL CARE SHALL BE EXERCISED TO PREVENT THE ENTRANCE OF EARTH OR DEBRIS INTO MANHOLES AND PIPE LINES. ALL SUCH EARTH AND DEBRIS SHALL BE REMOVED FROM THE MANHOLES AND PIPE LINES DURING CONSTRUCTION OPERATIONS.
PIPE TRENCH OVER-EXCAVATION REQUIRED FOR MANHOLE INSTALLATION SHALL BE BACKFILLED WITH COMPACTED GRANULAR BACKFILL AS SPECIFIED IN THE WATER RESOURCES DEPARTMENT SPECIFICATIONS FOR PIPE BEDDING AND INITIAL BACKFILL.

INSTALLATION OF MANHOLE
MANHOLES SHALL BE WATERTIGHT STRUCTURES CONSTRUCTED IN ACCORDANCE WITH ONE OF THE FOLLOWING METHODS:
1. PRECAST MANHOLE BASES, IN COMBINATION WITH RISER SECTIONS, TRANSITION SECTIONS, CONES AND/OR FLAT SLAB TOPS AS SHOWN ON THE DRAWINGS.
2. MONOLITHIC CONCRETE CAST-IN-PLACE BASES, IN COMBINATION WITH PRECAST RISER SECTIONS, CONES AND/OR FLAT SLAB TOPS.

MANHOLES WITH PRECAST BASE SECTIONS SHALL BE PLACED ON A 6 INCH COMPACTED LAYER OF AGGREGATE BASE #57 STONE.

WHERE SHAPING OF MANHOLE WALLS AND BOTTOMS IS REQUIRED OR ORDERED TO PROVIDE FOR PIPE JUNCTIONS, CHANNELS, ETC.; SUCH WORK SHALL BE MADE WITH CLASS "F" CONCRETE CONFORMING TO THE REQUIREMENTS OF ODOT ITEM 499 AND 511. THE INVERT CHANNEL AND MANHOLE BENCH SHALL BE CONSTRUCTED AS SHOWN IN THE STANDARD DRAWINGS. IN GENERAL, THE INVERT CHANNEL SHALL BE A SMOOTH CONTINUATION OF THE PIPE AND USHAPED. THE BENCH SHALL PROVIDE GOOD FOOTING FOR WORKMEN AND HAVE A 1 INCH BATTER TOWARDS THE INVERT CHANNEL.

TESTING FOR MANHOLE(S)
THE MANHOLES WILL BE TESTED AND INSPECTED FOR DAMAGE PRIOR TO PLACING IN SERVICE, UNDER THE WATER RESOURCES DEPARTMENT SUPERVISION, AFTER INSTALLATION IS COMPLETE TO SHOW THEY ARE WATERTIGHT. THIS SPECIFICATION SHALL GOVERN THE VACUUM TESTING OF SANITARY SEWER MANHOLES AND STRUCTURES AND SHALL BE USED AS A METHOD OF DETERMINING ACCEPTABILITY IN ACCEPTING MAINTENANCE OF A SANITARY SEWER MANHOLE OR STRUCTURE. VACUUM TESTING SHALL BE ACCORDING TO ASTM C1244, EXCEPT AS SPECIFIED OTHERWISE HEREIN. ALL NEW SANITARY SEWER MANHOLES AND STRUCTURES SHALL BE TESTED BY VACUUM TEST AS SPECIFIED HEREIN TO TEST FOR LEAKS. MANHOLES SHALL BE TESTED AFTER INSTALLATION WITH ALL CONNECTIONS IN PLACE. IF A MANHOLE FAILS THE VACUUM TEST, THE MANHOLE SHALL BE REPAIRED WITH MATERIAL APPROVED BY CLERMONT COUNTY. THE VACUUM TEST SHALL THEN BE REPEATED UNTIL A SATISFACTORY TEST IS OBTAINED. ALL TEMPORARY PLUGS AND BRACES SHALL BE REMOVED AFTER EACH TEST.

PROCEDURE FOR TESTING SHALL BE AS FOLLOWS:
1. TEMPORARILY PLUG, WITH THE PLUGS BEING BRACED TO PREVENT THE PLUGS OR PIPES FROM BEING DRAWN INTO THE MANHOLE, ALL PIPES ENTERING THE MANHOLE AT LEAST SIX INCHES INTO THE SEWER PIPE(S). THE PLUG MUST BE INFLATED AT A LOCATION PAST THE MANHOLE/PIPE GASKET.
2. THE TEST HEAD SHALL BE PLACED INSIDE THE FRAME AT THE TOP OF THE MANHOLE AND INFLATED, IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
3. A VACUUM OF TEN INCHES OF MERCURY (10"HG) SHALL BE DRAWN ON THE MANHOLE. SHUT THE VALVE ON THE VACUUM LINE TO THE MANHOLE AND SHUT OFF THE PUMP OR DISCONNECT THE VACUUM LINE FROM THE PUMP.
4. THE PRESSURE GAUGE SHALL BE LIQUID-FILLED, HAVING A 3.5 INCH DIAMETER FACE WITH A READING FROM ZERO TO THIRTY INCHES OF MERCURY.
5. THE MANHOLE SHALL BE CONSIDERED TO PASS THE VACUUM TEST IF THE TIME FOR THE VACUUM READING TO DROP FROM 10" TO 9" HG MEETS OR EXCEEDS THE VALUES INDICATED IN THE FOLLOWING TABLE:

MINIMUM TEST TIMES FOR VARIOUS MANHOLE DIAMETERS (MINUTES AND SECONDS)

MH DEPTH (FEET)	4' DIAMETER MH	5' DIAMETER MH	6' DIAMETER MH
15 FEET OR LESS	50 SEC.	1 MIN. & 5 SEC.	1 MIN. & 20 SEC.
15.01 TO 30 FEET	1 MIN. & 20 SEC.	1 MIN. & 45 SEC.	2 MIN. & 10 SEC.

DATE	8/13/24
REVISION NO.	
ISSUED	

GENERAL SANITARY SEWER NOTES

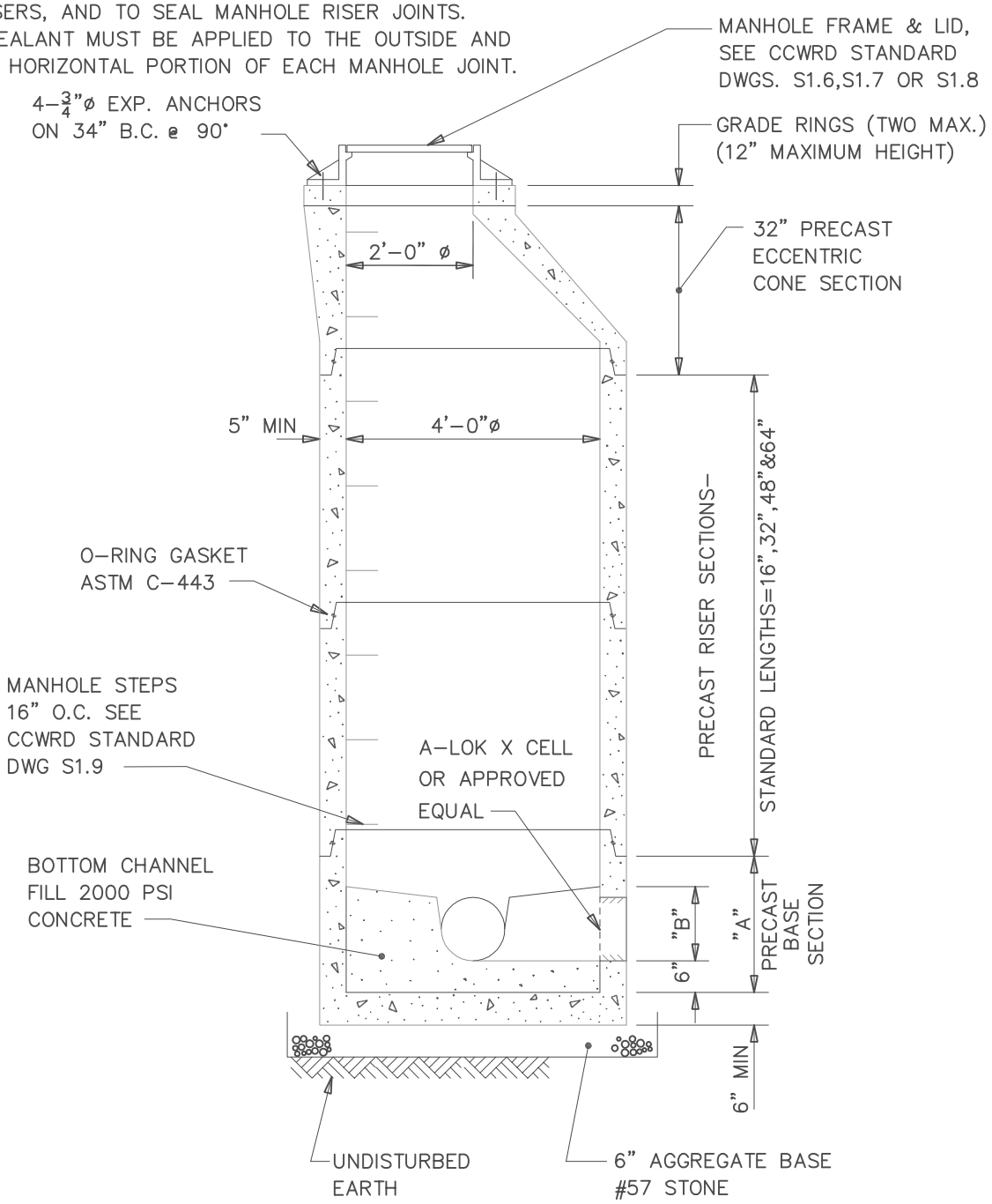
SCALE: N/A

DATE: AUGUST 2024

S 1.0

NOTE:

FLEXIBLE BUTYL RUBBER SEALANT EQUAL TO CONSEAL TYPE CS–102 SHALL BE USED TO: SEAL CASTING TO MANHOLE, TO SEAL ADJUSTING RINGS TOGETHER AND TO RISERS, AND TO SEAL MANHOLE RISER JOINTS. THE SEALANT MUST BE APPLIED TO THE OUTSIDE AND INSIDE HORIZONTAL PORTION OF EACH MANHOLE JOINT.



"A" DIMENSION	SEWER SIZE
24"	8" & 10"
30"	12" & 15"
38"	18"

"B" DIMENSION	SEWER SIZE
PIPE ID + 2"	8",10"&12"
1/2 PIPE ID + 2"	15" & LARGER

KOR–N–SEAL I OR APPROVED EQUAL FOR CONNECTION TO EXISTING MANHOLES

NO SCALE

CLERMONT COUNTY
WATER RESOURCES DEPARTMENT

APPROVED _____

DATE _____

REVISED DEC. 2018

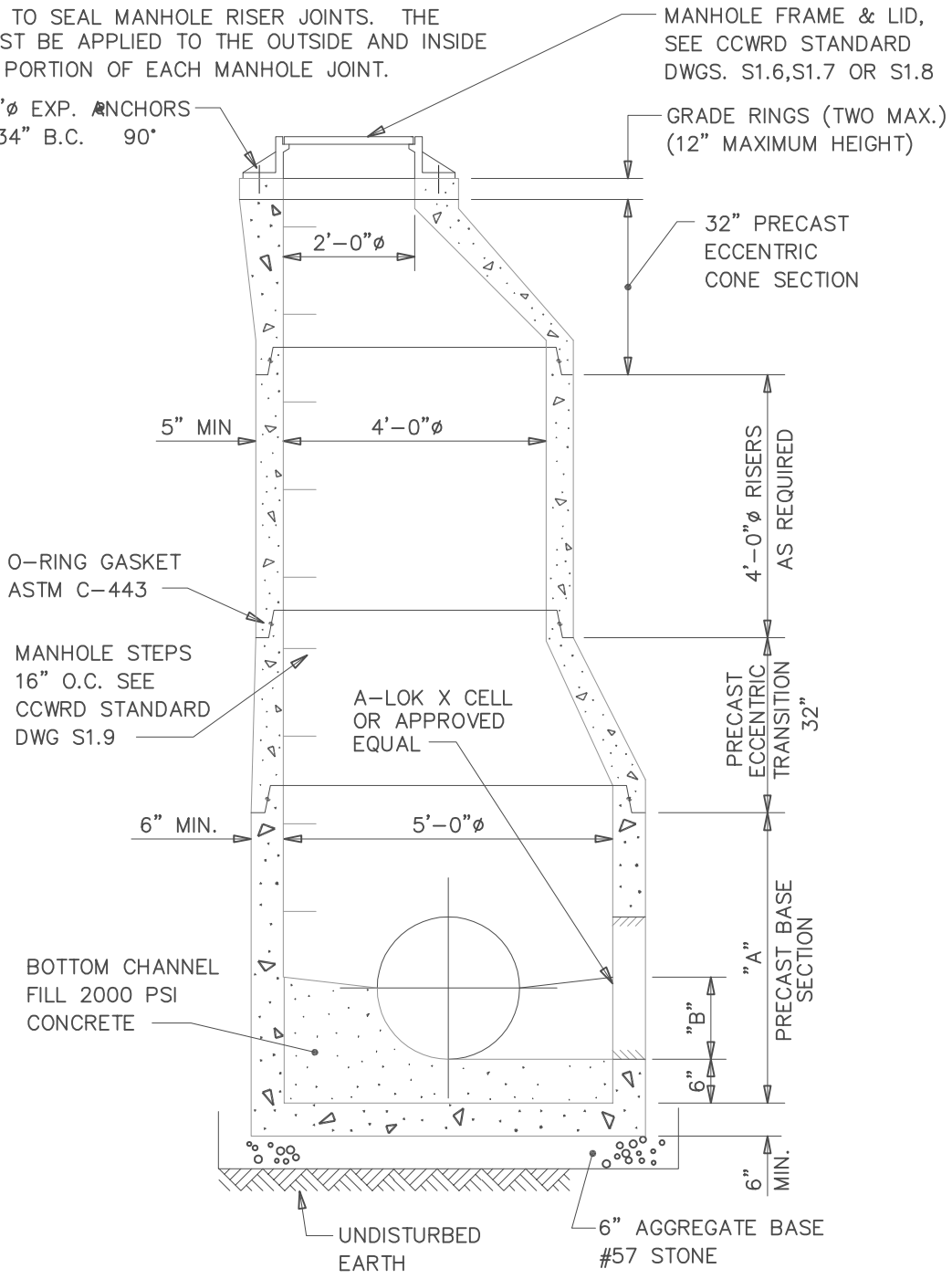
STANDARD MANHOLE FOR SEWERS 8" TO 18"

DRAWING NO.

S1.1

NOTE:

FLEXIBLE BUTYL RUBBER SEALANT EQUAL TO CONSEAL TYPE CS–102 SHALL BE USED TO: SEAL CASTING TO MANHOLE, SEAL ADJUSTING RINGS TOGETHER AND TO RISERS, AND TO SEAL MANHOLE RISER JOINTS. THE SEALANT MUST BE APPLIED TO THE OUTSIDE AND INSIDE HORIZONTAL PORTION OF EACH MANHOLE JOINT.



"A" DIMENSION	SEWER SIZE
42"	21" – 27"
58"	30" – 36"

"B" DIMENSION	SEWER SIZE
1/2 PIPE ID + 2"	ALL

KOR–N–SEAL I OR APPROVED EQUAL FOR CONNECTION TO EXISTING MANHOLES

NO SCALE

CLERMONT COUNTY
WATER RESOURCES DEPARTMENT

APPROVED _____

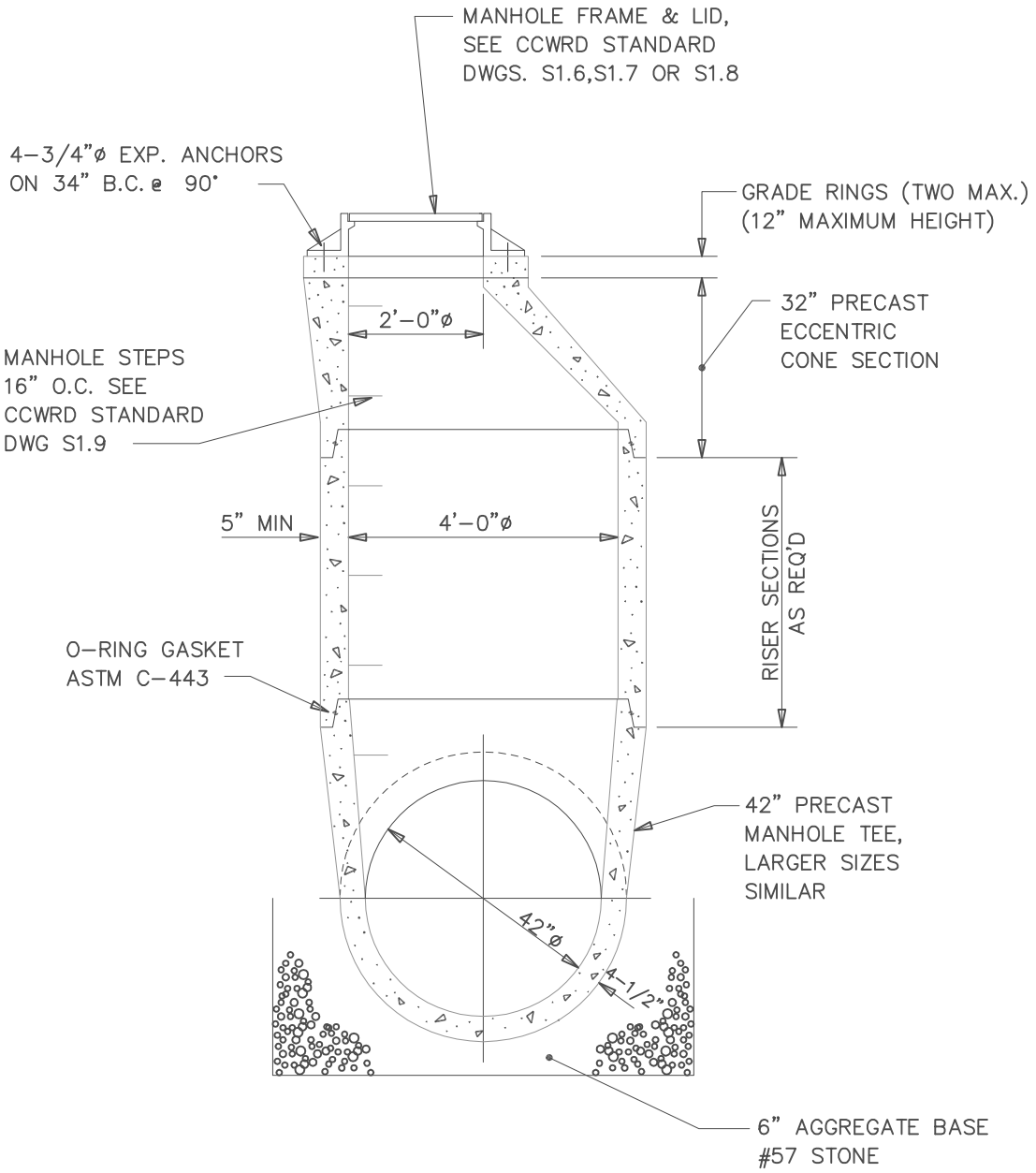
DATE _____

REVISED DEC. 2018

STANDARD MANHOLE FOR SEWERS 21" TO 36"

DRAWING NO.

S1.2



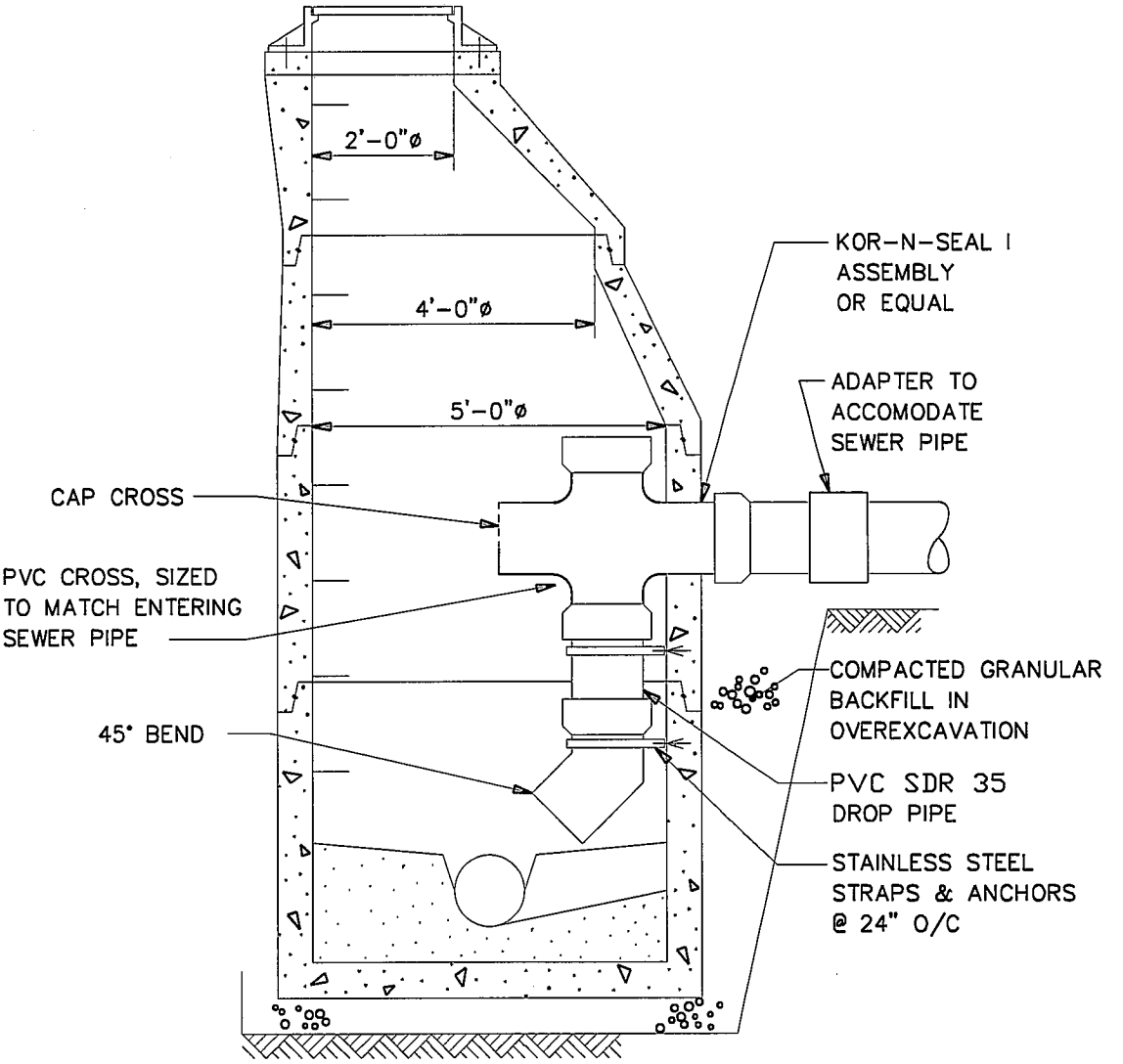
NOTES:

1. MANHOLE RISER SHALL BE CAST MONOLITHICALLY WITH 8" LG. PIPE SECTION.
2. FLEXIBLE BUTYL RUBBER SEALANT EQUAL TO CONSEAL TYPE CS–102 SHALL BE USED TO: SEAL CASTING TO MANHOLE, SEAL ADJUSTING RINGS TOGETHER AND TO RISERS, AND TO SEAL MANHOLE RISER JOINTS. THE SEALANT MUST BE APPLIED TO THE OUTSIDE AND INSIDE HORIZONTAL PORTION OF EACH MANHOLE JOINT.

NO SCALE

CLERMONT COUNTY WATER RESOURCES DEPARTMENT	STANDARD MANHOLE FOR SEWERS 42" & LARGER	DRAWING NO. S1.3
APPROVED _____ DATE _____		

REVISED DEC. 2018



SEWER PIPE SIZE	DROP PIPE SIZE
8"	8"
10"	10"
12"	12"
15" & OVER	12" UNLESS OTHERWISE APPROVED

NOTES:

1. IN LIEU OF THE DROP STRUCTURE SHOWN, A RELINER BRAND INSIDE DROP SYSTEM MAY BE USED.
2. ALL OTHER CHARACTERISTICS ARE SIMILAR TO THE STANDARD MANHOLES. SEE CCWRD STANDARD DWGS. S1.1–S1.3.

NO SCALE

CLERMONT COUNTY
WATER RESOURCES DEPARTMENT

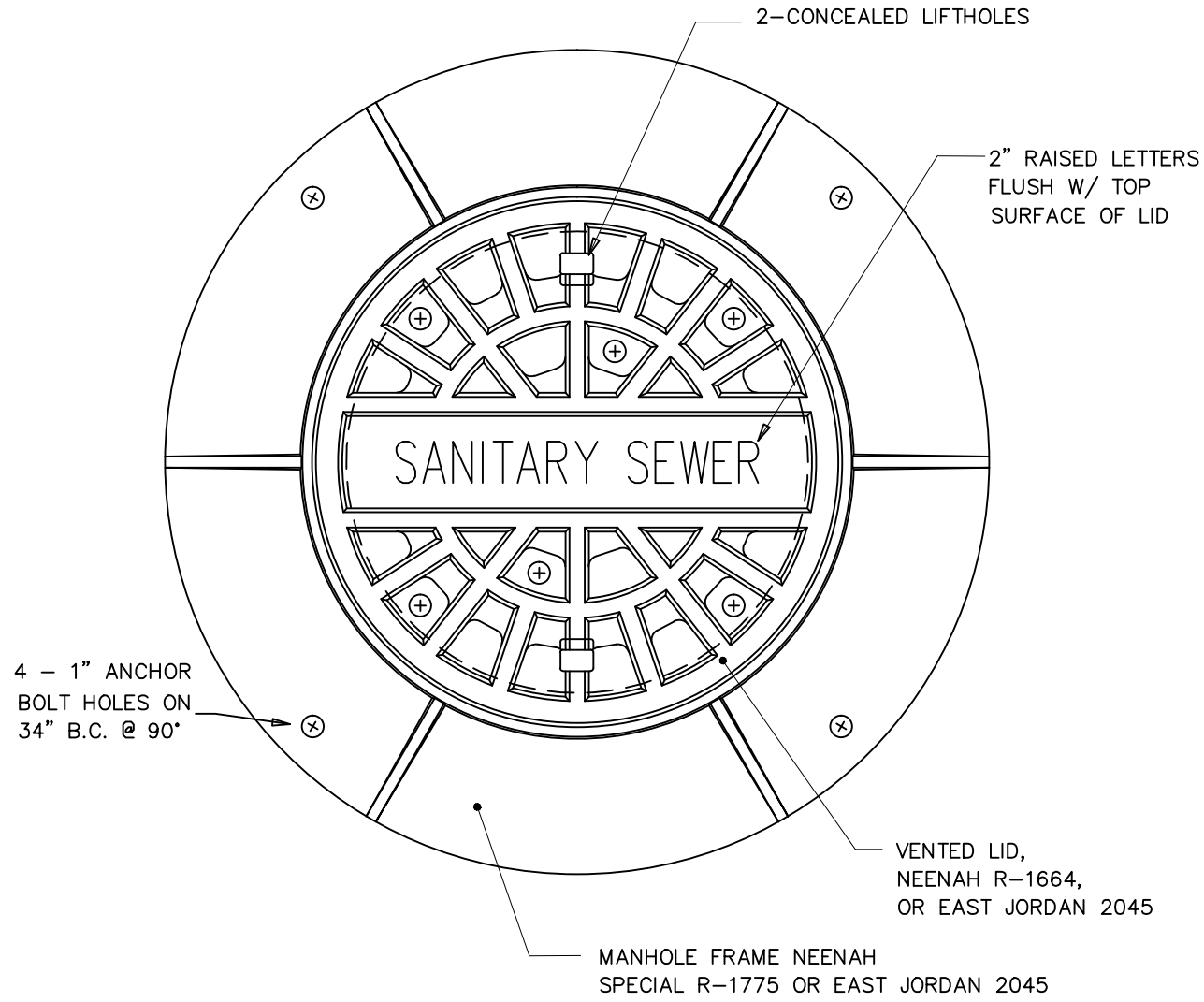
APPROVED _____

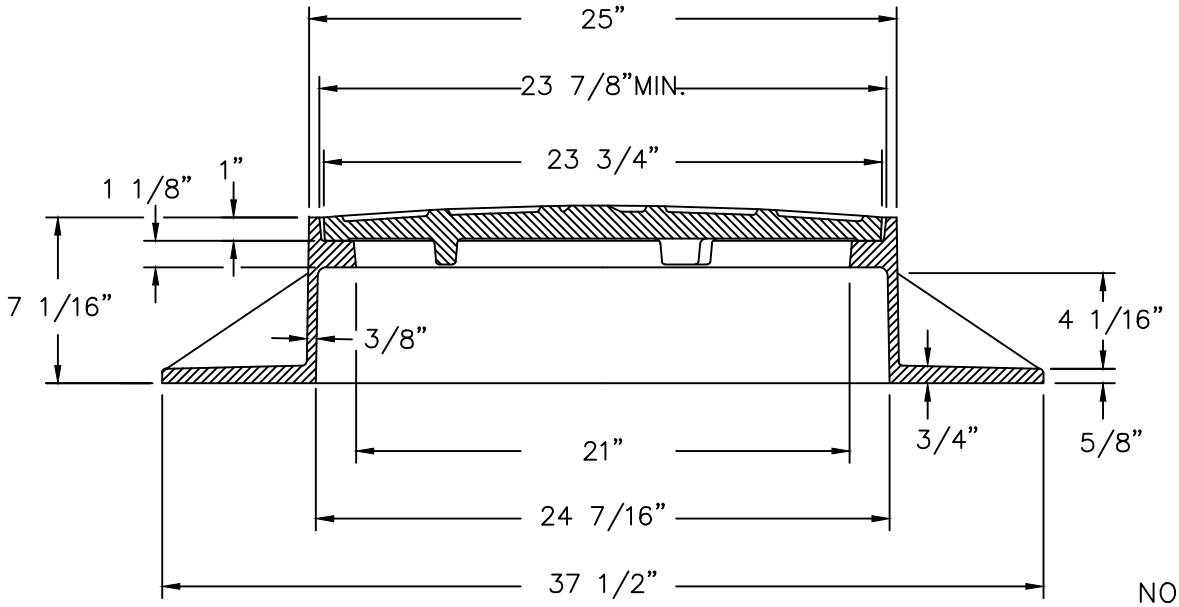
DATE

INSIDE DROP MANHOLE

DRAWING NO.

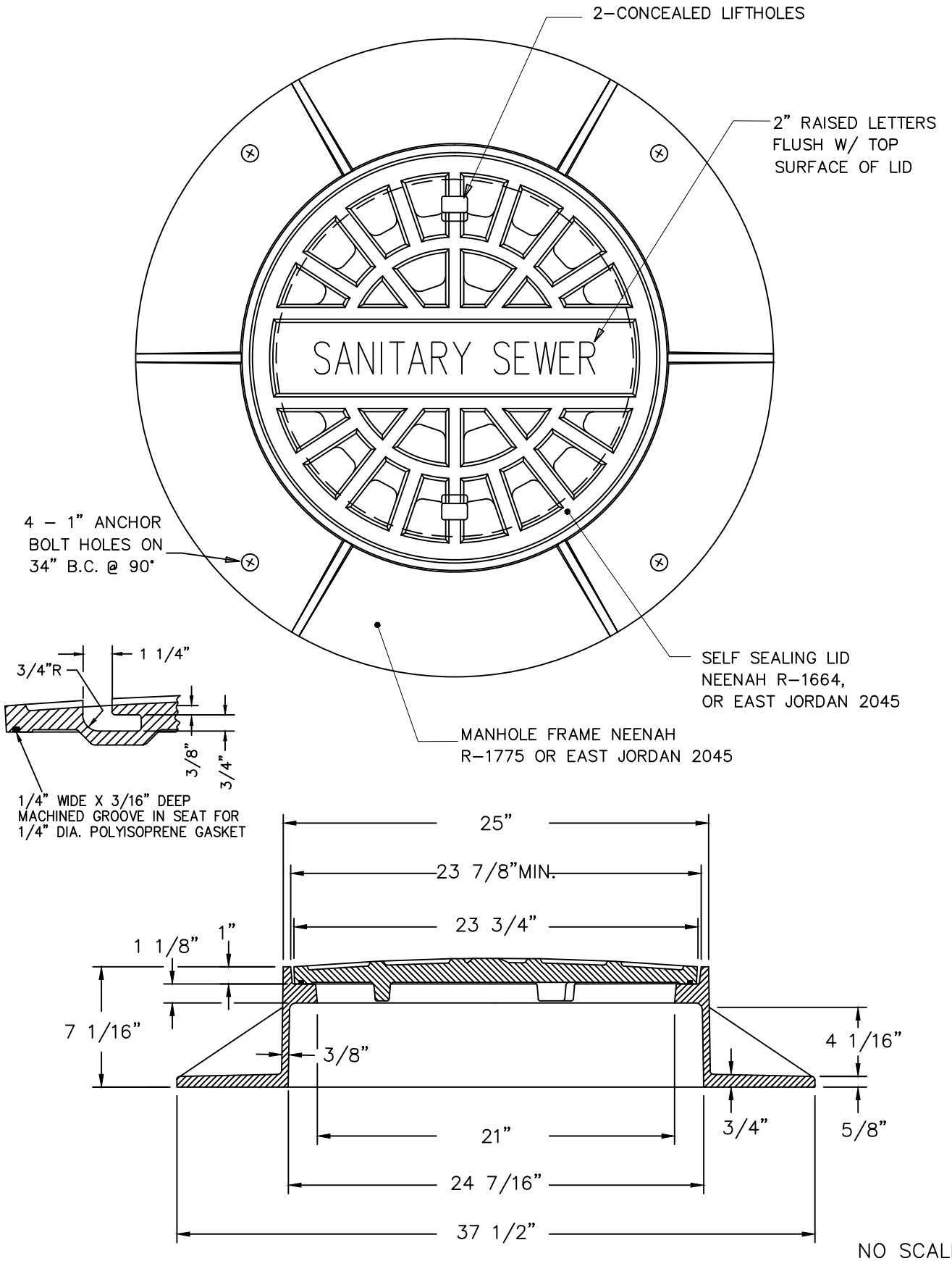
S1.4





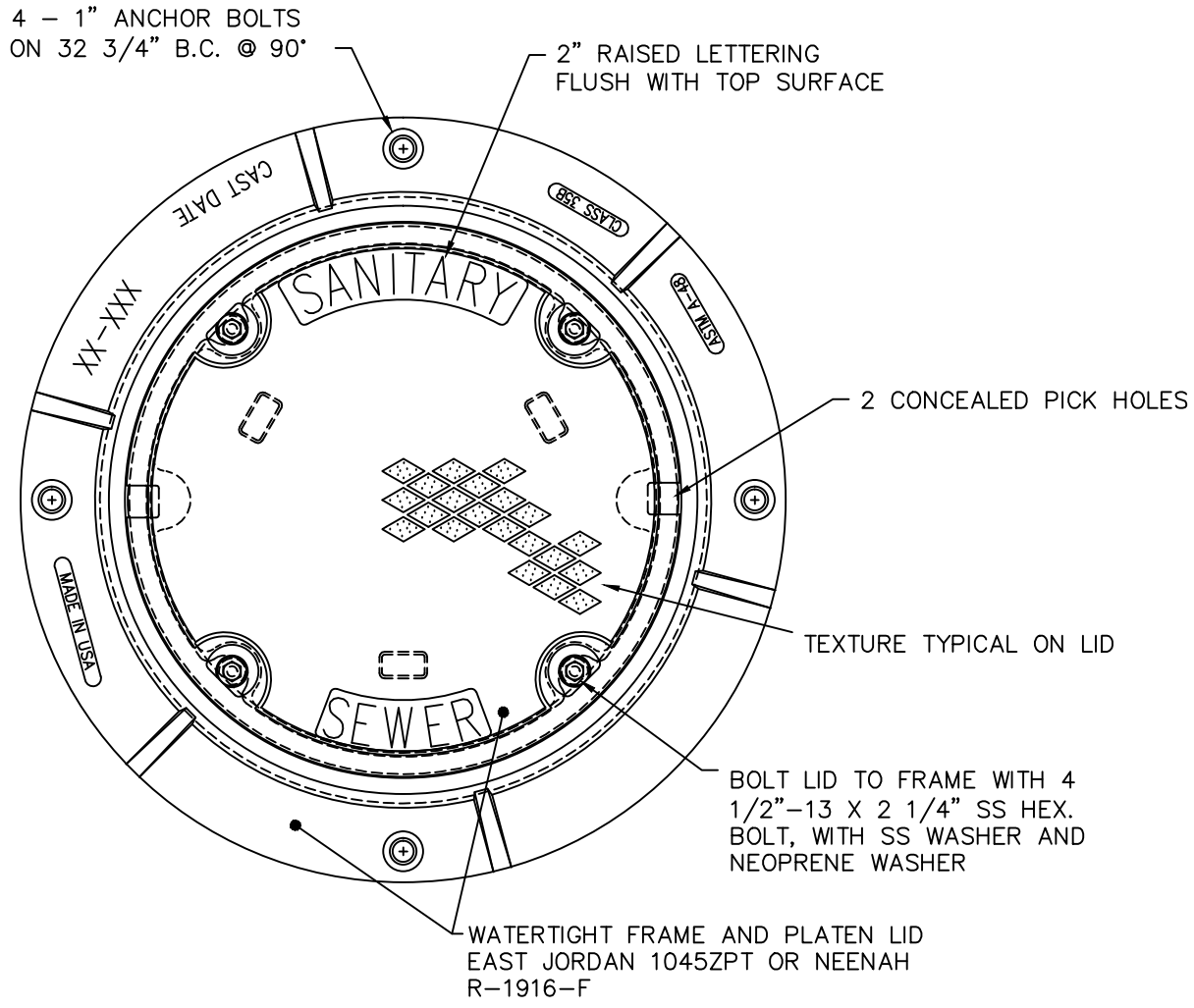
NO SCALE

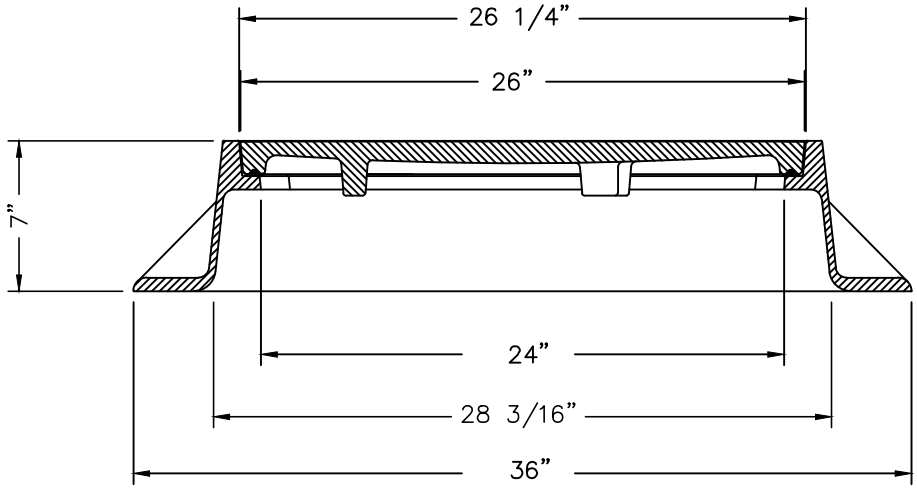
CLERMONT COUNTY WATER RESOURCES DEPARTMENT APPROVED _____ DATE _____ REVISED JUNE 2013	MANHOLE FRAME WITH VENTED LID	DRAWING NO. S1.6



NO SCALE

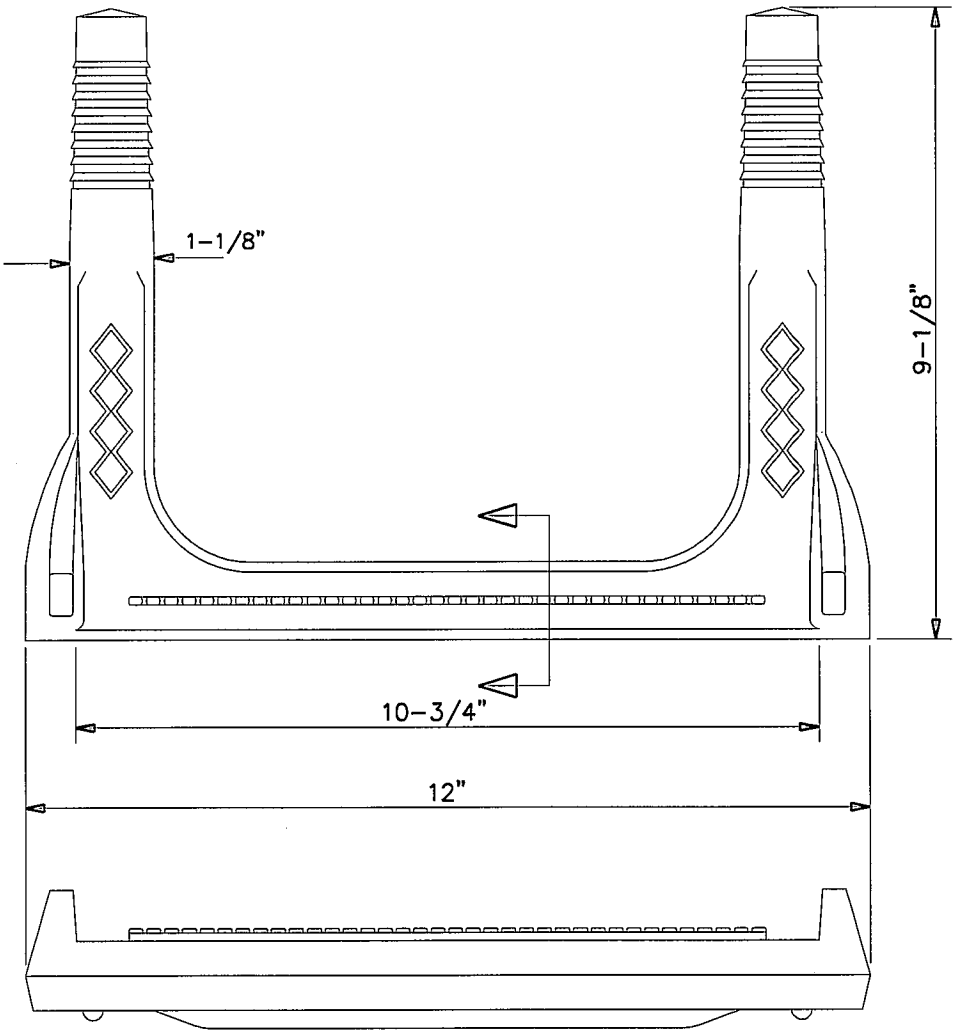
CLERMONT COUNTY WATER RESOURCES DEPARTMENT APPROVED _____ DATE _____ REVISED JUNE 2013	MANHOLE FRAME WITH SELF SEALING LID	DRAWING NO. S1.7

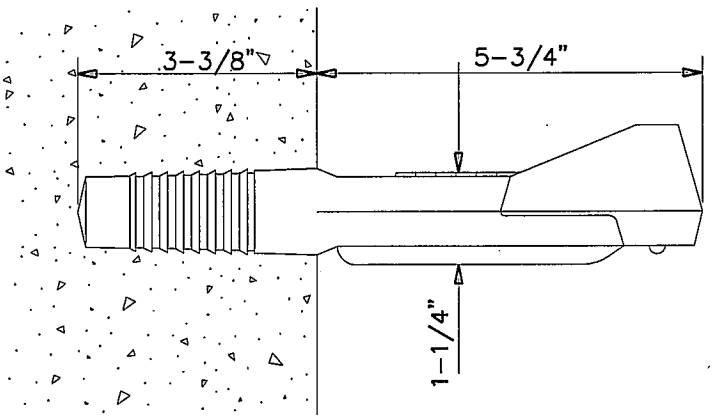


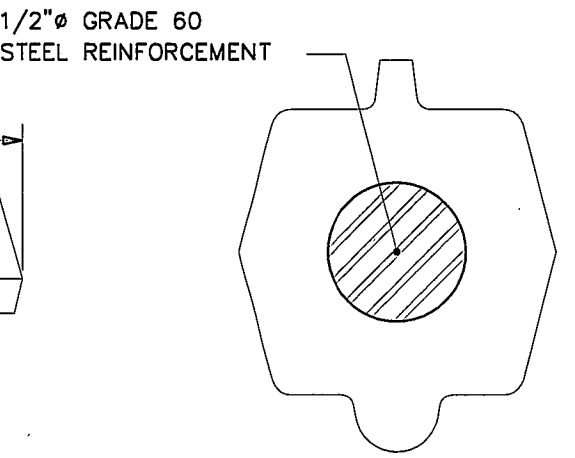


NO SCALE

CLERMONT COUNTY WATER RESOURCES DEPARTMENT APPROVED _____ DATE _____ REVISED JUNE 2013	WATERTIGHT FRAME WITH BOLT DOWN LID	DRAWING NO. S1.8



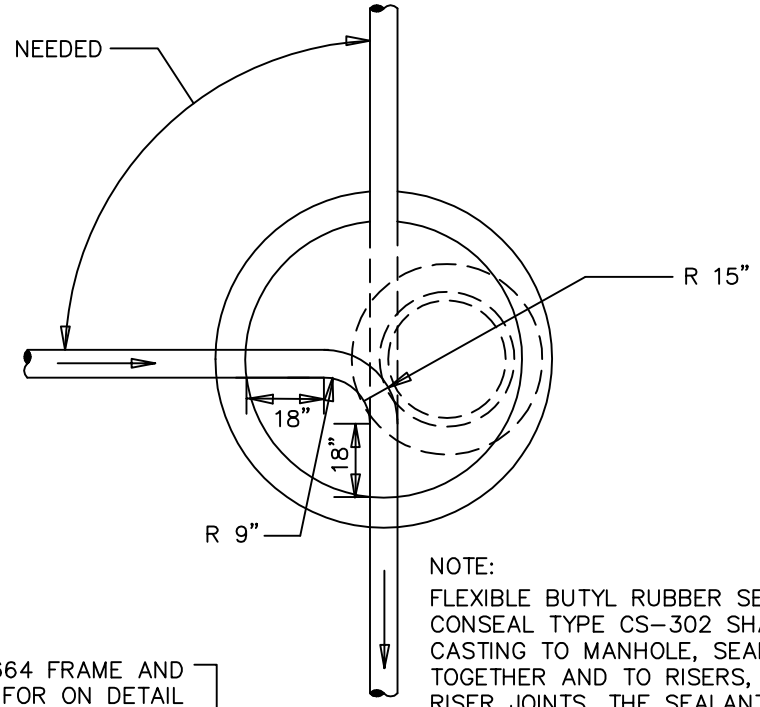




SECTION

NO SCALE

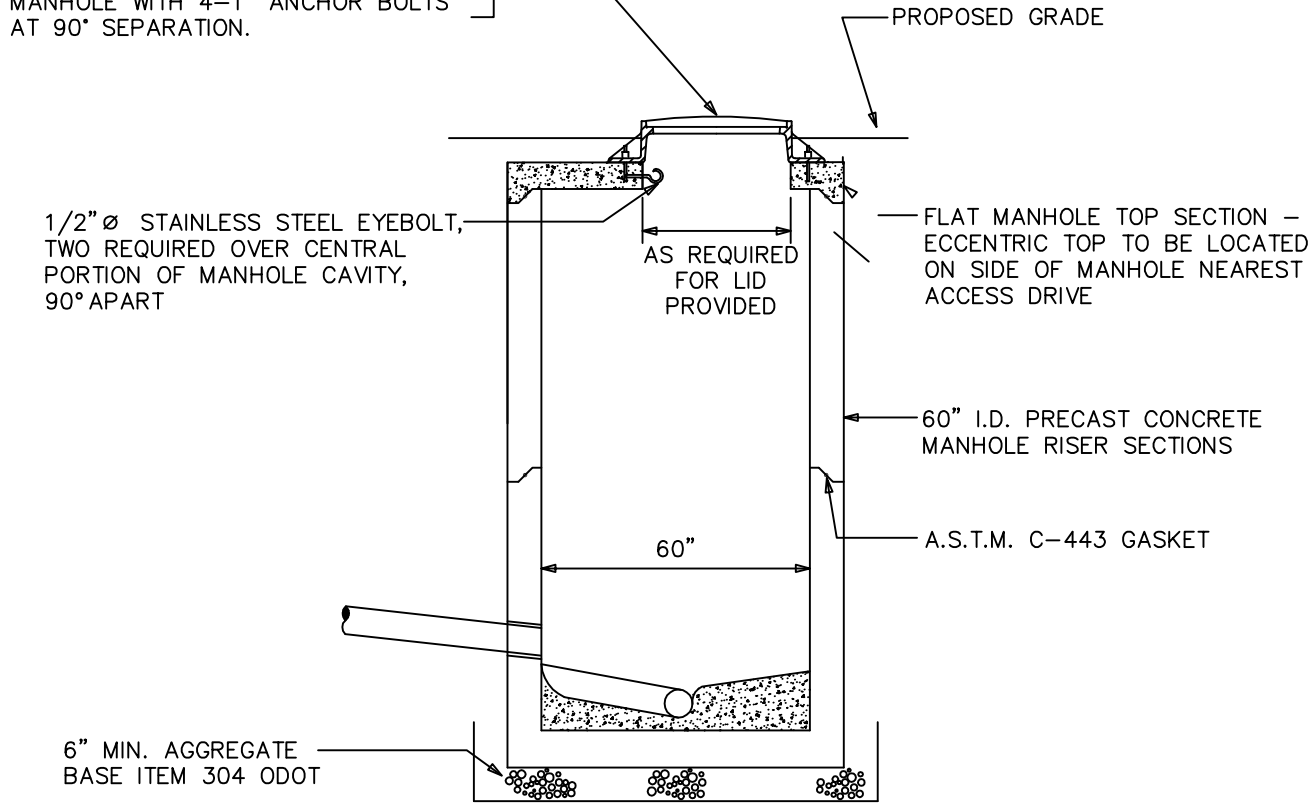
CLERMONT COUNTY WATER RESOURCES DEPARTMENT APPROVED _____ DATE	MANHOLE STEP– COPOLYMER	DRAWING NO. S1.9



NOTE:
FLEXIBLE BUTYL RUBBER SEALANT EQUAL TO CONSEAL TYPE CS–302 SHALL BE USED TO SEAL CASTING TO MANHOLE, SEAL ADJUSTING RINGS TOGETHER AND TO RISERS, AND TO SEAL MANHOLE RISER JOINTS. THE SEALANT MUST BE APPLIED TO THE OUTSIDE AND INSIDE HORIZONTAL PORTION OF EACH MANHOLE JOINT.

INSTALL NEENAH R–1664 FRAME AND SOLID LID AS CALLED FOR ON DETAIL S1.7, OR APPROVED EQUAL, WITH "SANITARY SEWER" LETTERING ON SURFACE OF LID.

FRAMES SHALL BE SECURED TO MANHOLE WITH 4–1" ANCHOR BOLTS AT 90° SEPARATION.

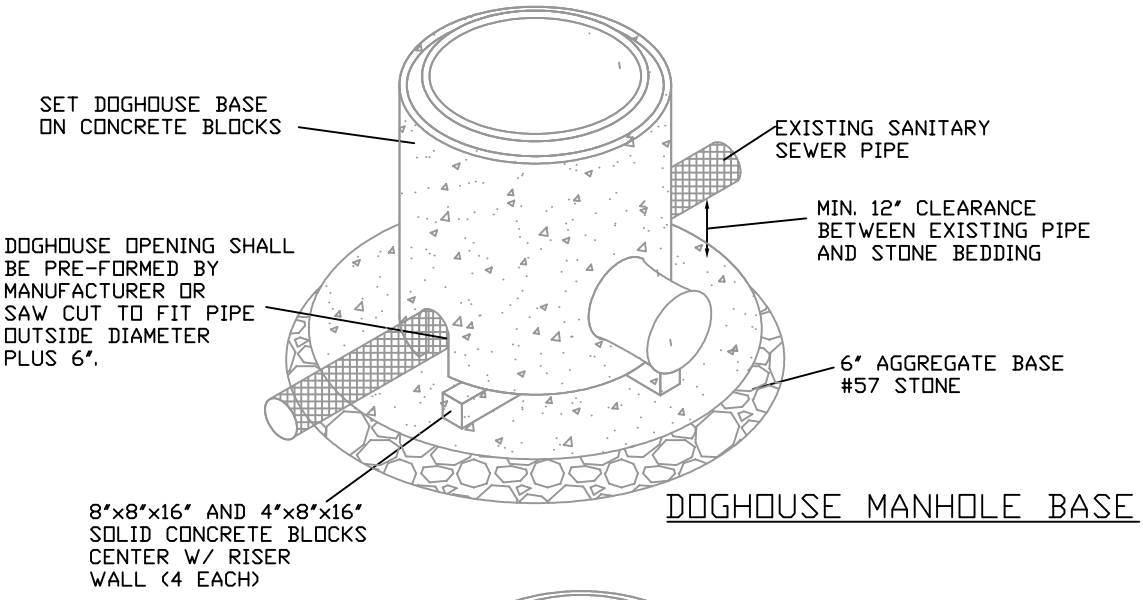


NOTE: SAMPLE MANHOLES ARE TO BE LOCATED OUT OF PAVED AREA WHERE EVER POSSIBLE. IF LOCATED IN PAVED AREA, MANHOLE SHALL NOT BE LOCATED IN LOW LAYING AREA.

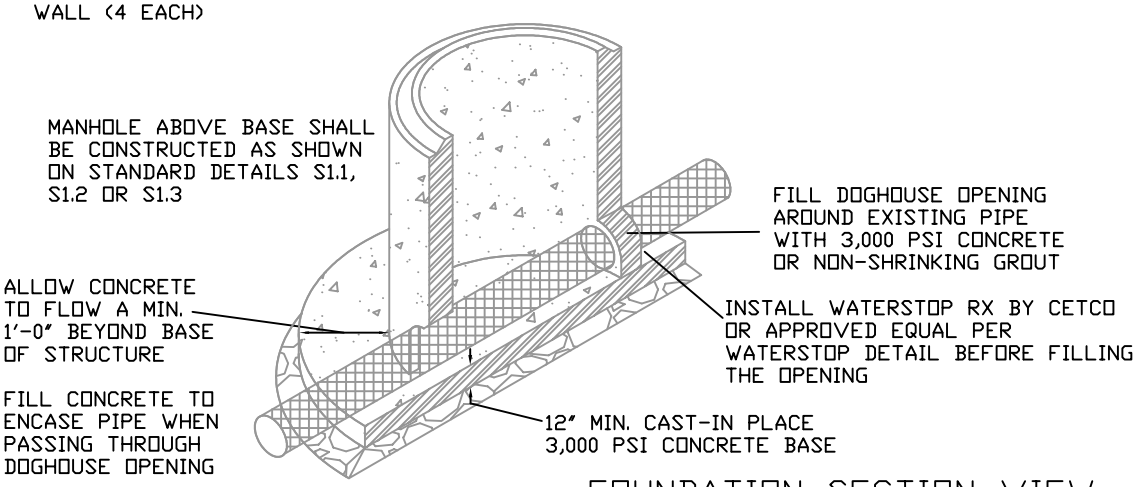
NO SCALE

CLERMONT COUNTY WATER RESOURCES DEPARTMENT APPROVED _____ DATE _____ REVISED APRIL 2018	INDUSTRIAL PRE–TREATMENT (IWPT) SAMPLING MANHOLE	DRAWING NO. S1.10

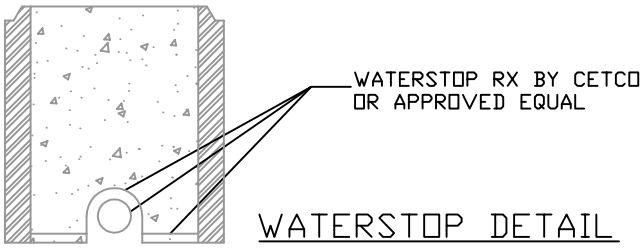
PRECAST CONCRETE MANHOLE BASES SHALL BE FABRICATED IN ACCORDANCE WITH SECTION 3200 OF THE CCWRD SPECIFICATIONS.



DOGHOUSE MANHOLE BASE



FOUNDATION SECTION VIEW

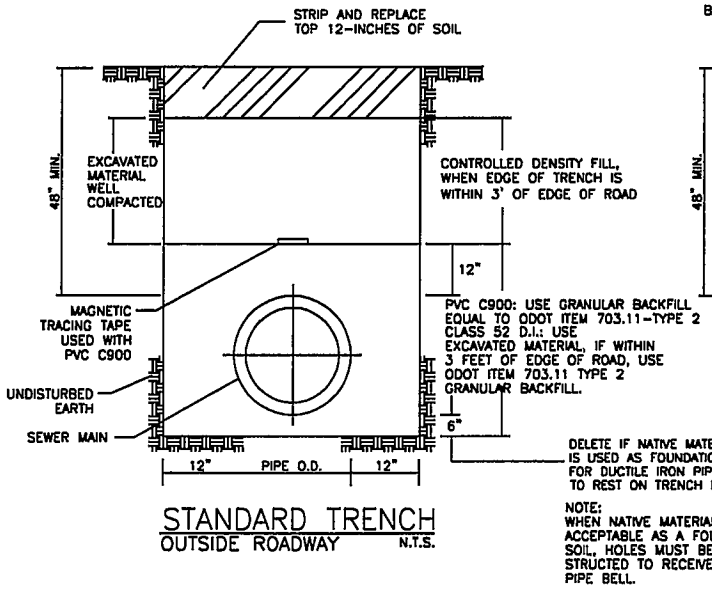


WATERSTOP DETAIL

NOTES:

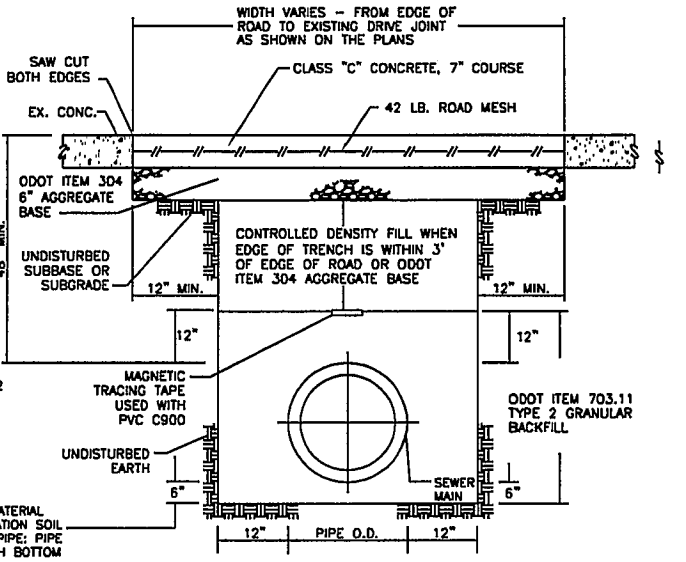
1. CONSTRUCT A FORMED INVERT FROM NEW SEWER LINE TO ALLOW FLOW TO THE EXISTING PIPE.
2. POUR A BENCH TO THE LOWER HALF OF THE EXISTING PIPE.
3. CUT AND REMOVE THE TOP HALF OF EXISTING PIPE TO WITHIN 6" OF THE MANHOLE WALLS AFTER THE INVERT AND BENCH HAVE BEEN FORMED, AND THE MH HAS BEEN FULLY TESTED IN ACCORDANCE WITH CCWRD SPECIFICATIONS.

CLERMONT COUNTY WATER RESOURCES DEPARTMENT APPROVED _____ DATE _____	MANHOLE BASE "DOGHOUSE" INSTALLATION	DRAWING NO. S1.11



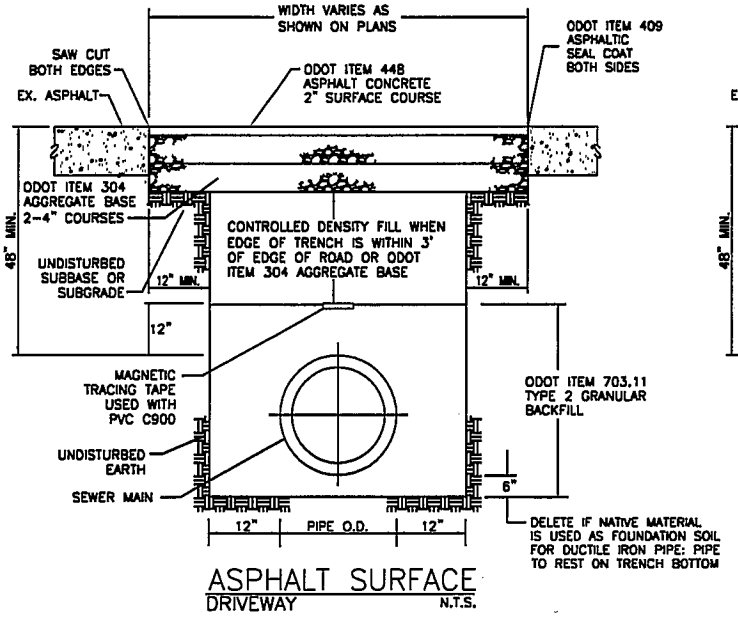
STANDARD TRENCH
OUTSIDE ROADWAY N.T.S.

NOTE:
WHEN NATIVE MATERIAL IS FOUND ACCEPTABLE AS A FOUNDATION SOIL, HOLES MUST BE CONSTRUCTED TO RECEIVE THE PIPE BELL.



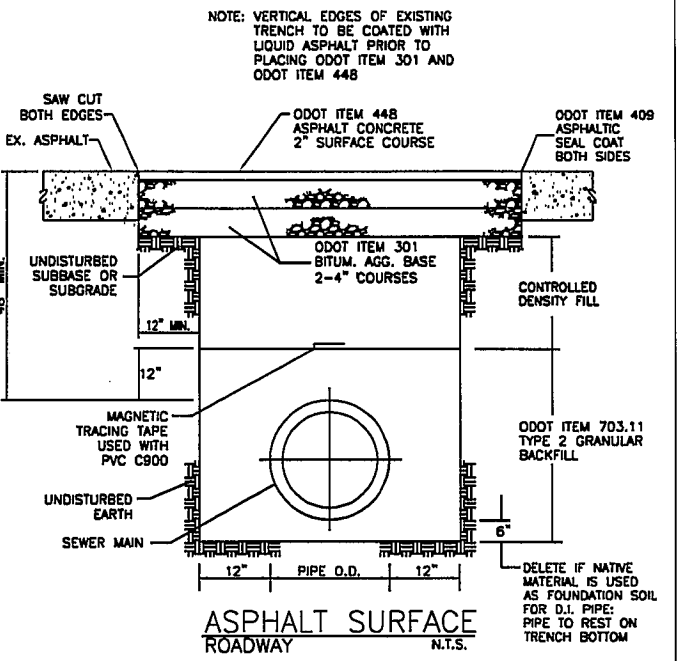
CONCRETE SURFACE
DRIVEWAY N.T.S.

NOTE: VERTICAL EDGES OF EXISTING TRENCH TO BE COATED WITH LIQUID ASPHALT PRIOR TO PLACING ODOT ITEM 304 AND ODOT ITEM 448



ASPHALT SURFACE
DRIVEWAY N.T.S.

NOTE: VERTICAL EDGES OF EXISTING TRENCH TO BE COATED WITH LIQUID ASPHALT PRIOR TO PLACING ODOT ITEM 301 AND ODOT ITEM 448



ASPHALT SURFACE
ROADWAY N.T.S.

NOTES:

1. "PAVEMENT" AS USED IN THIS DETAIL SHALL ALSO MEAN SIDEWALKS, CURBS, SLABS & OTHER GRADED STRUCTURES.
2. ALL BACKFILL & BEDDING IS TO BE COMPACTED AS CALLED FOR IN THE SPECIFICATIONS.
3. BEDDING AND BACKFILL MATERIALS SHALL BE IN ACCORDANCE WITH THE SPECIFICATION FOR THE SPECIFIC PIPE MATERIAL BEING INSTALLED.
4. 6' LONG CLAY BULKHEADS TO BE INSTALLED AROUND PIPE EVERY 100' IN ACCORDANCE WITH SECTION 1200 OF THE CCWRD SPECIFICATIONS.

NO SCALE

CLERMONT COUNTY
WATER RESOURCES DEPARTMENT

APPROVED _____

DATE

SANITARY SEWER TRENCH SECTIONS

DRAWING NO.

S2.1

CLERMONT COUNTY
WATER RESOURCES DEPARTMENT

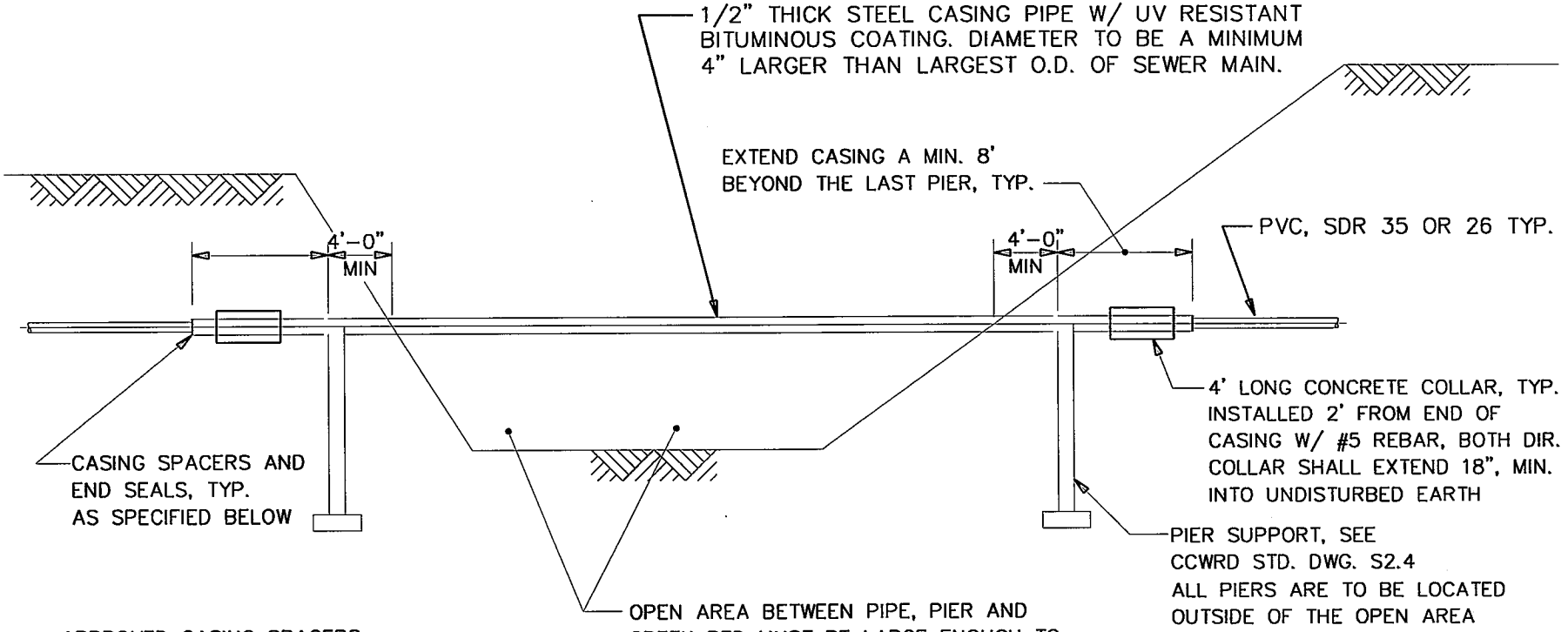
APPROVED _____

DATE _____

CREEK CROSSING
AERIAL TYPE

DRAWING NO.
S2.3

NO SCALE



APPROVED CASING SPACERS:
MODEL CCS, CASCADE WATERWORKS
MODEL BWM-SS, BWM COMPANY

APPROVED END SEALS:
MODEL CCES, CASCADE WATERWORKS
MODEL BWM-PO, BWM COMPANY

ELEVATION

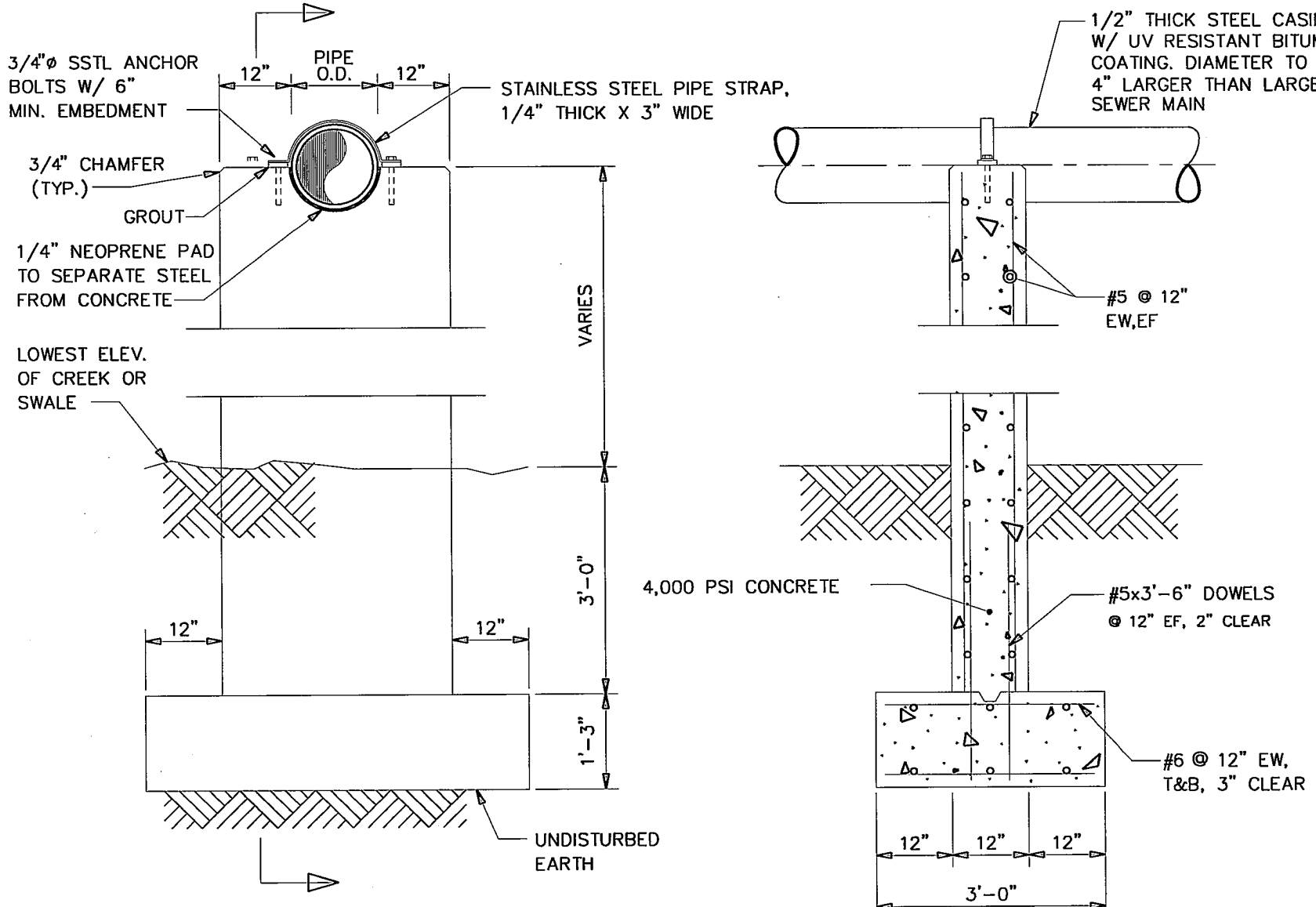
NOTE:
THIS DETAIL IS A MINIMUM STANDARD ONLY. ACTUAL AERIAL STRUCTURE AND PIPE SUPPORT TO BE DESIGNED BY A PROFESSIONAL ENGINEER AND APPROVED BY THE CCWRD.

CLERMONT COUNTY
WATER RESOURCES DEPARTMENT

APPROVED _____
DATE _____

SUPPORT PIER

DRAWING NO.
S2.4

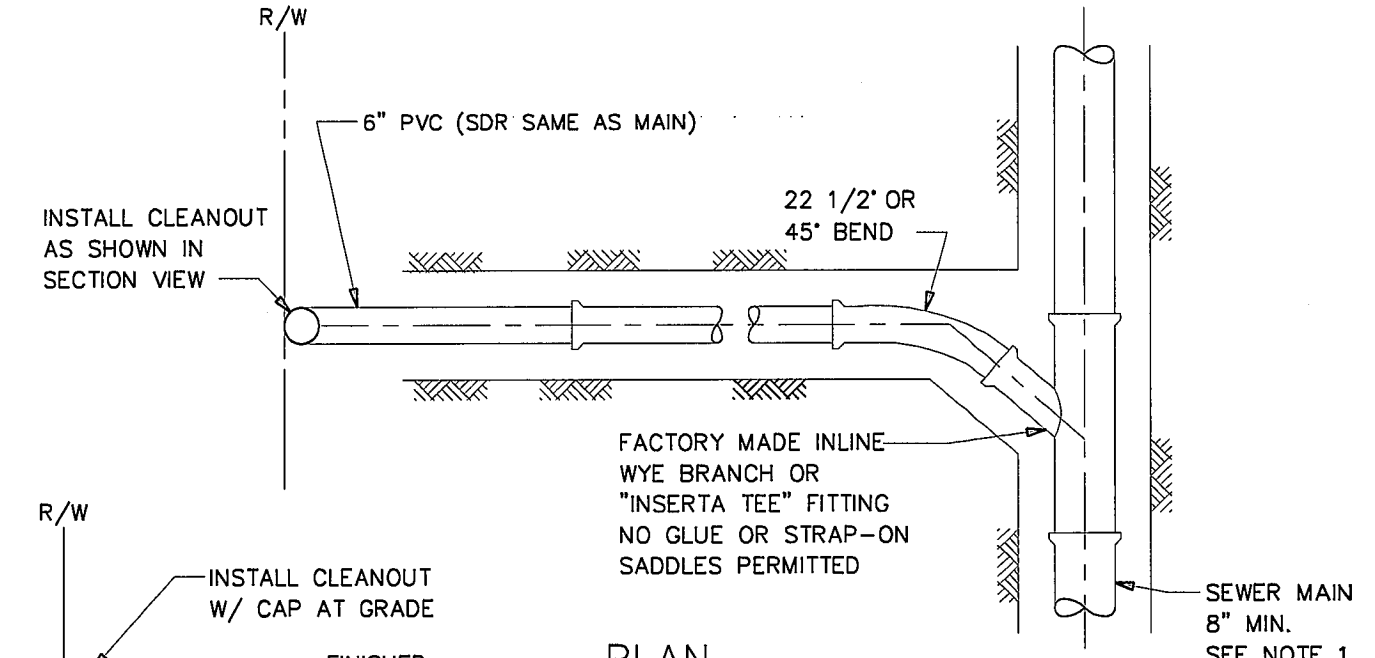


ELEVATION

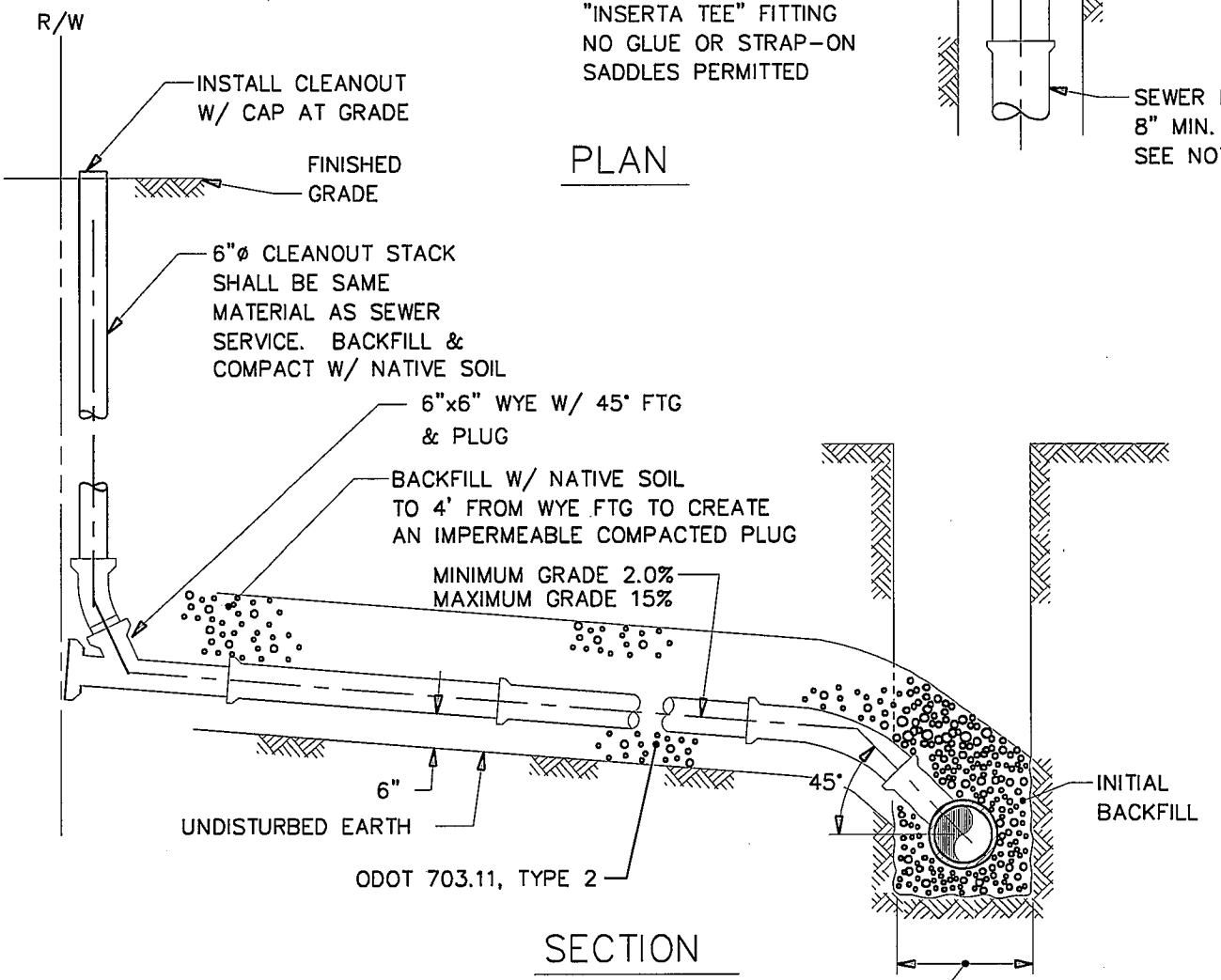
NO SCALE

SECTION

NOTE:
THIS DETAIL IS A MINIMUM STANDARD ONLY. ACTUAL PIER DIMENSIONS AND STEEL REINFORCING TO BE DESIGNED BY A PROFESSIONAL ENGINEER AND APPROVED BY THE CCWRD



PLAN



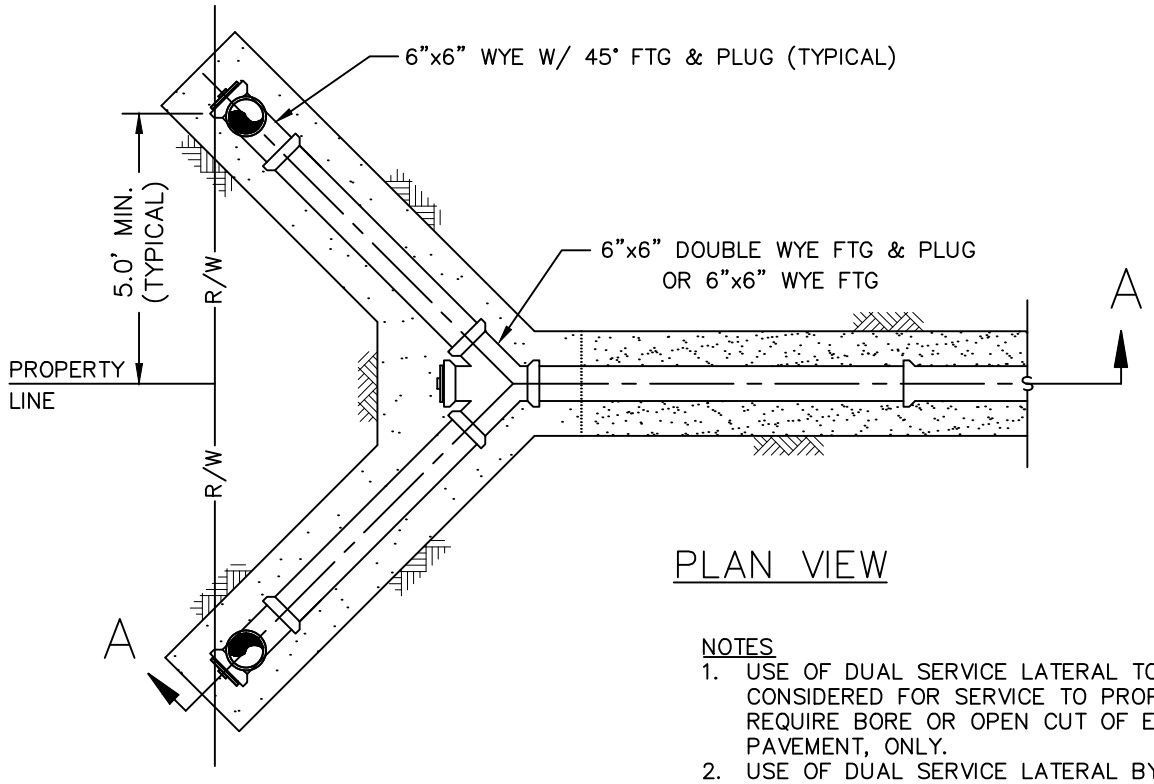
SECTION

NOTES:

1. SEWER LATERAL PIPE SHALL BE THE SAME MATERIAL AS THE MAIN (PVC SDR 35, 26, or 17)
2. DURING CONSTRUCTION OF THE SEWER MAIN AND LATERALS THE CLEANOUT SHALL BE BURIED APPROXIMATELY 3 FEET WITH A 2" BY 2" POLE SET ON THE BACK SIDE OF THE CLEAN OUT. WHEN THE STUCTURE IS CONNECTED, THE CLEANOUT SHALL BE BROUGHT TO GRADE AS DETAILED.

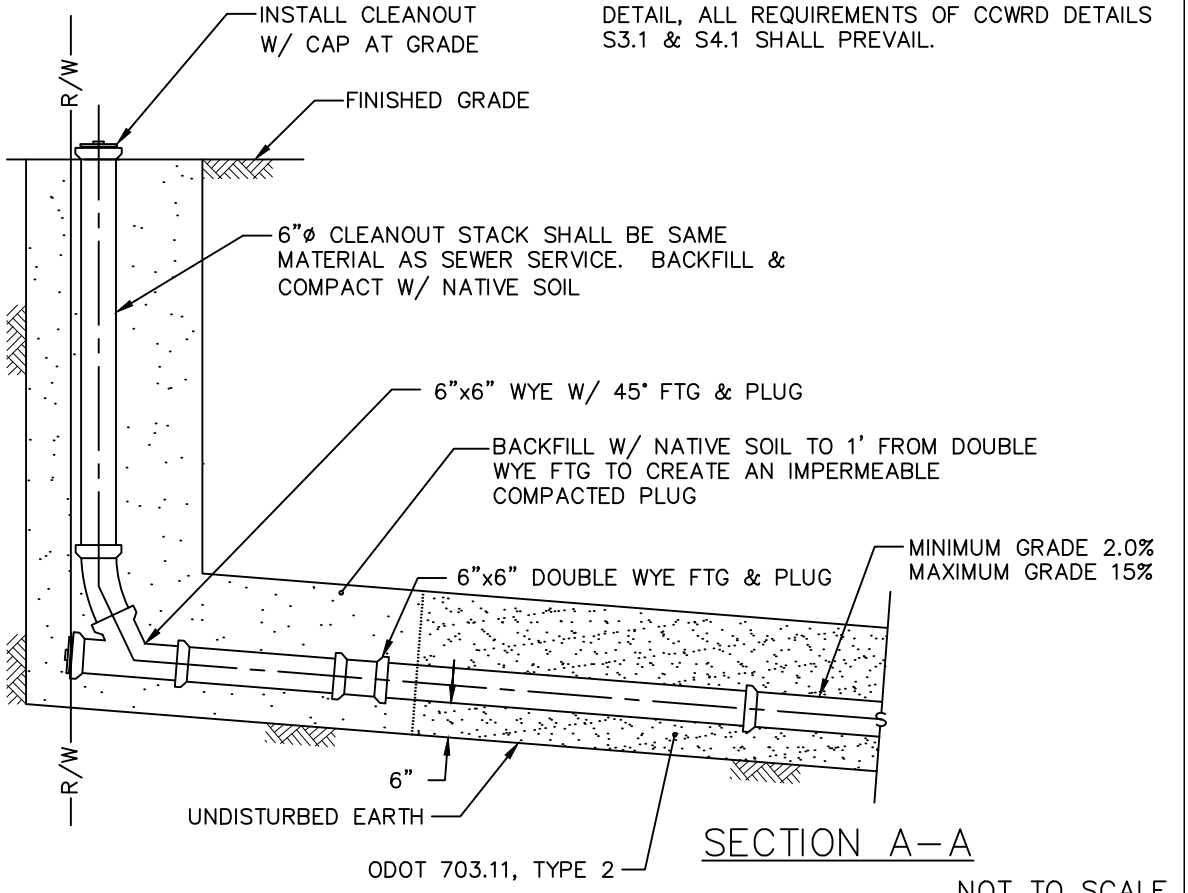
NO SCALE

CLERMONT COUNTY WATER RESOURCES DEPARTMENT	SEWER LATERAL INSTALLATION	DRAWING NO. S3.1
APPROVED _____ DATE		



PLAN VIEW

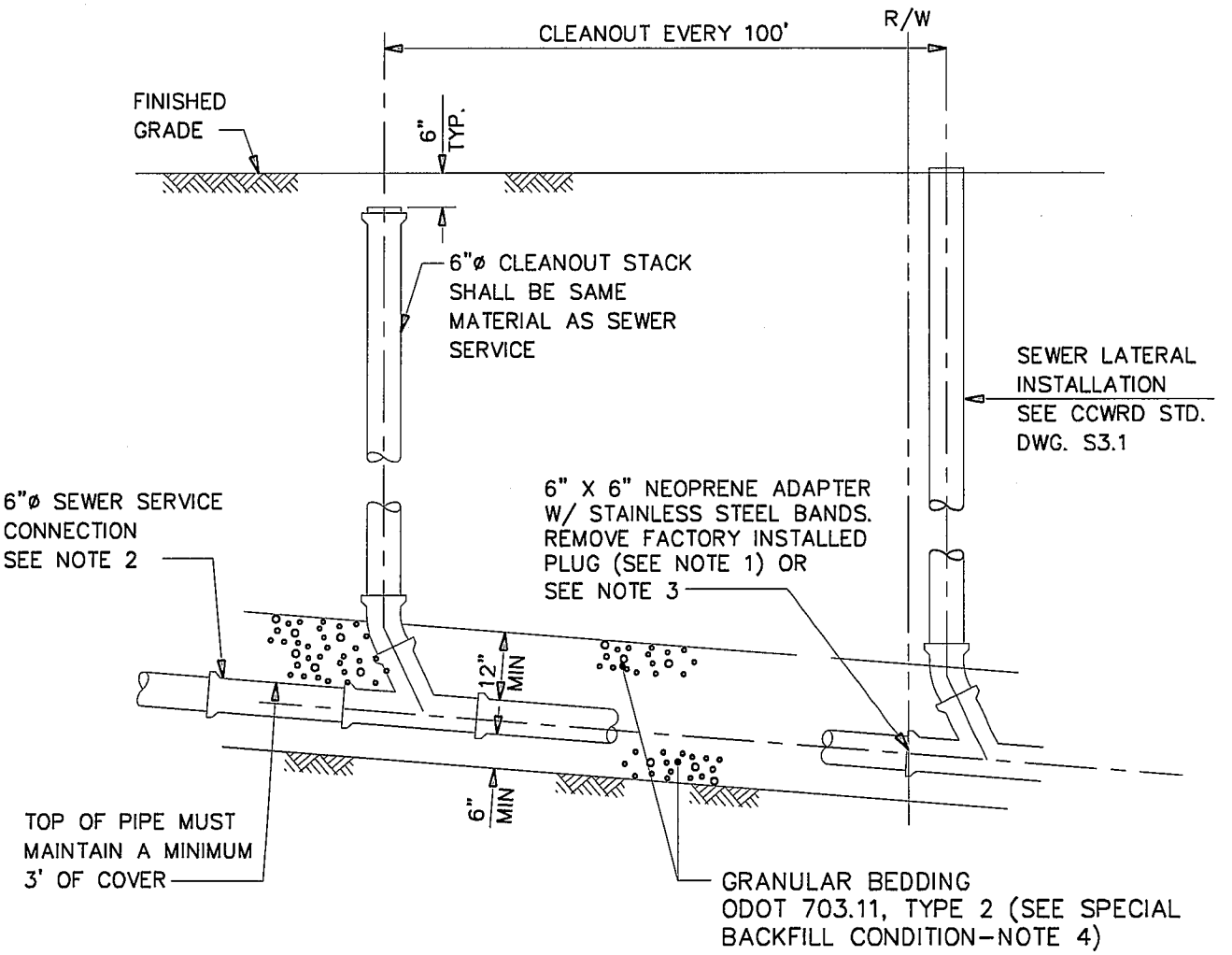
NOTES
1. USE OF DUAL SERVICE LATERAL TO BE CONSIDERED FOR SERVICE TO PROPERTIES WHICH REQUIRE BORE OR OPEN CUT OF EXISTING PAVEMENT, ONLY.
2. USE OF DUAL SERVICE LATERAL BY APPROVAL OF THE DIRECTOR OF UTILITIES, ONLY.
3. WHERE NOT SPECIFICALLY ATLERED BY THIS DETAIL, ALL REQUIREMENTS OF CCWRD DETAILS S3.1 & S4.1 SHALL PREVAIL.



SECTION A–A

NOT TO SCALE

CLERMONT COUNTY WATER RESOURCES DEPARTMENT APPROVED _____ DATE _____	DUAL SERVICE RESIDENTIAL LATERAL	DRAWING NO. S3.2

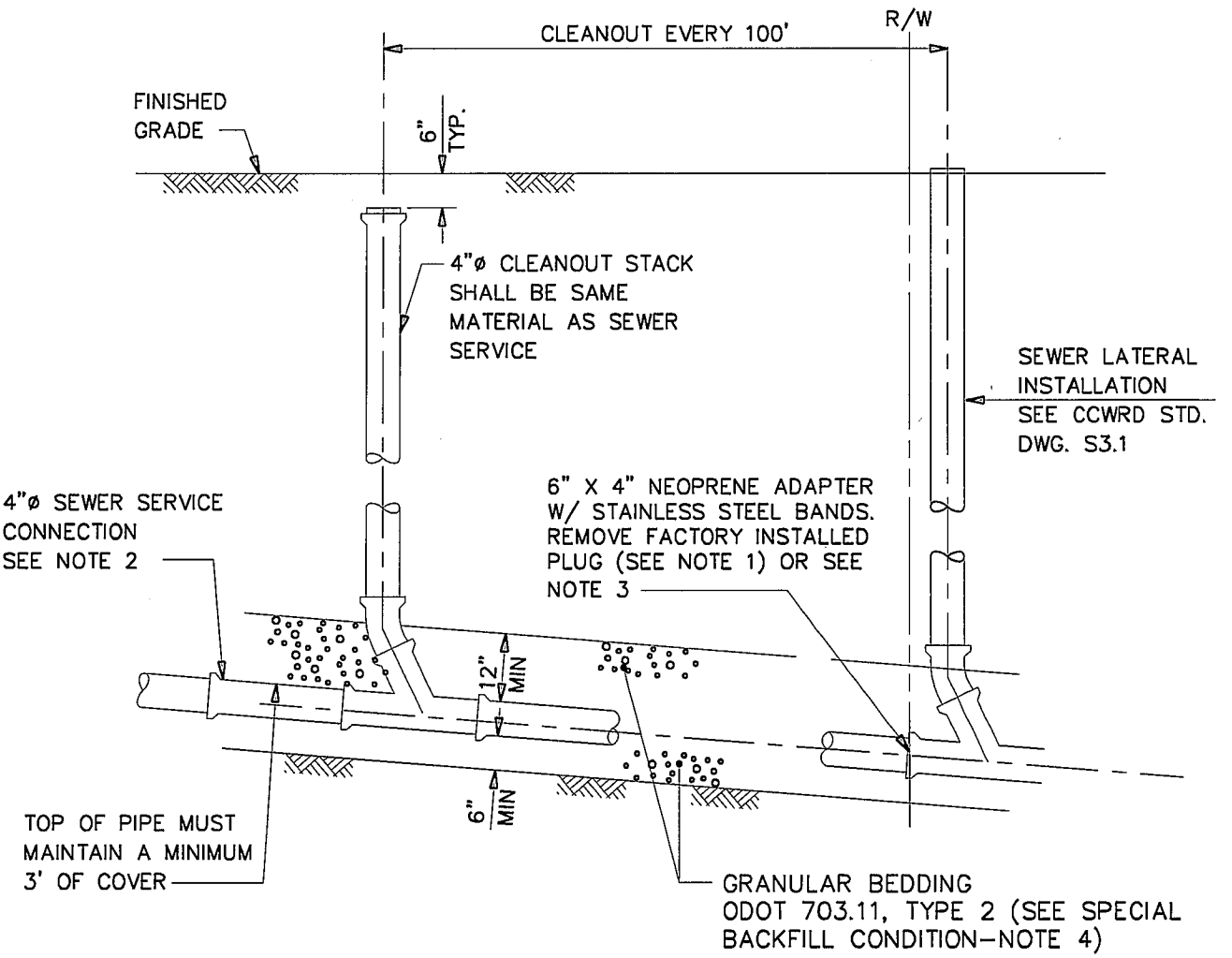


NOTES:

1. SEWER SERVICE CONNECTION TO SEWER LATERAL SHALL BE BY MEANS OF FLEXIBLE PIPE CONNECTORS (SHIELDED COUPLING AND DONUT TYPE) WHEN JOINING PIPES OF DIFFERENT MATERIAL.
2. SEWER SERVICE PIPE MATERIAL SHALL BE ANY OF THE FOLLOWING: PVC SCH-40 SOLID WALL, ASTM-D3034 WITH GLUED JOINTS, PVC SDR 35, OR (WHEN SEWER IS 15' OR DEEPER) PVC SDR 26
3. IN LIEU OF CONNECTING TO THE WYE FITTING AT THE R/W LINE, THE BUILDING SEWER MAY BE CONNECTED DIRECTLY TO THE 6" CLEANOUT PIPE, USING THE APPROPRIATE FITTINGS AS EXPLAINED IN NOTE 1.
4. AT A DISTANCE APPROXIMATELY 20' FROM THE STRUCTURE NATIVE SOIL (IN LIEU OF ODOT 703.11) WILL BE USED AS BACKFILL FOR APPROXIMATELY 4' TO CREATE AN IMPERMEABLE COMPACTED PLUG.

NO SCALE

CLERMONT COUNTY WATER RESOURCES DEPARTMENT	COMMERCIAL SEWER SERVICE INSTALLATION	DRAWING NO. S4.1
APPROVED _____ DATE		



NOTES:

1. SEWER SERVICE CONNECTION TO SEWER LATERAL SHALL BE BY MEANS OF FLEXIBLE PIPE CONNECTORS (SHIELDED COUPLING AND DONUT TYPE) WHEN JOINING PIPES OF DIFFERENT MATERIAL.
2. SEWER SERVICE PIPE MATERIAL SHALL BE ANY OF THE FOLLOWING: PVC SCH–40 SOLID WALL, ASTM–D3034 WITH GLUED JOINTS, PVC SDR 35, OR (WHEN SEWER IS 15' OR DEEPER) PVC SDR 26
3. IN LIEU OF CONNECTING TO THE WYE FITTING AT THE R/W LINE, THE BUILDING SEWER MAY BE CONNECTED DIRECTLY TO THE 6" CLEANOUT PIPE, USING THE APPROPRIATE FITTINGS AS EXPLAINED IN NOTE 1.
4. AT A DISTANCE APPROXIMATELY 20' FROM THE STRUCTURE NATIVE SOIL (IN LIEU OF ODOT 703.11) WILL BE USED AS BACKFILL FOR APPROXIMATELY 4' TO CREATE AN IMPERMEABLE COMPACTED PLUG.

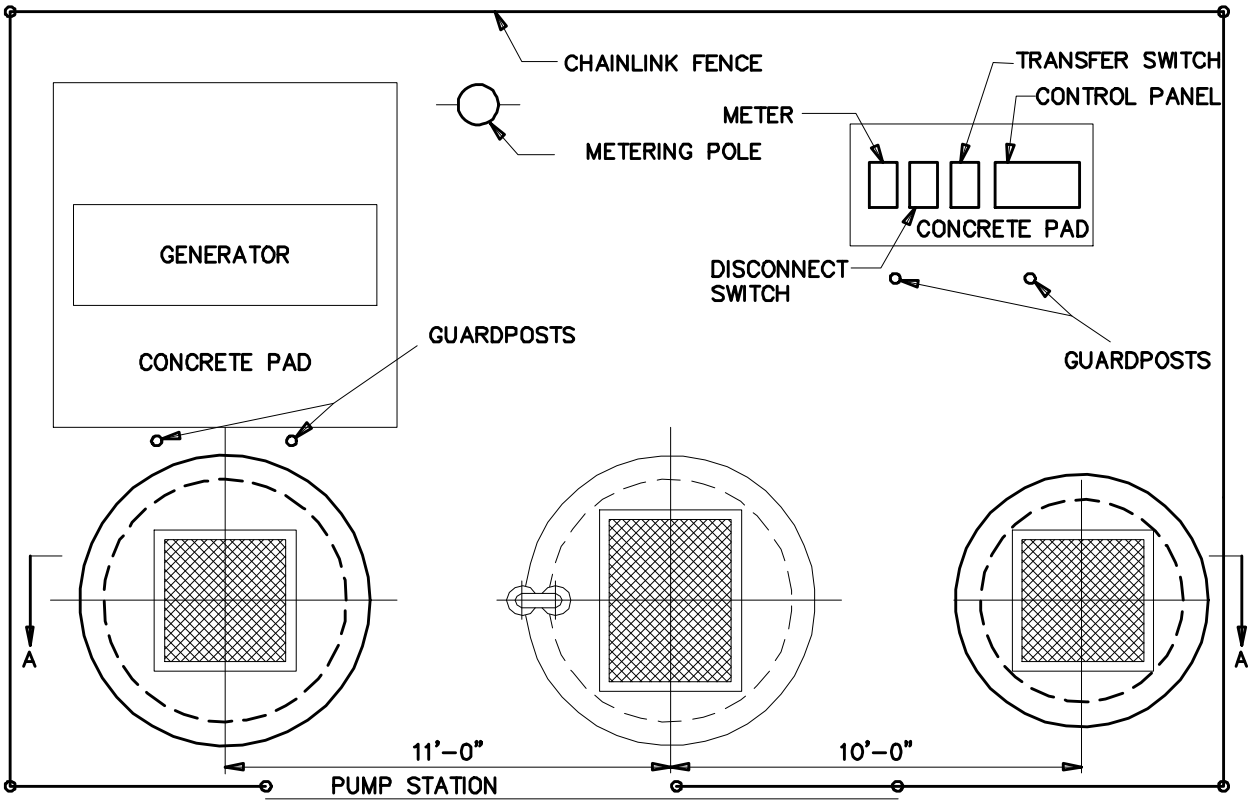
NO SCALE

CLERMONT COUNTY WATER RESOURCES DEPARTMENT	RESIDENTIAL SEWER SERVICE INSTALLATION	DRAWING NO. S4.2
APPROVED _____ DATE		

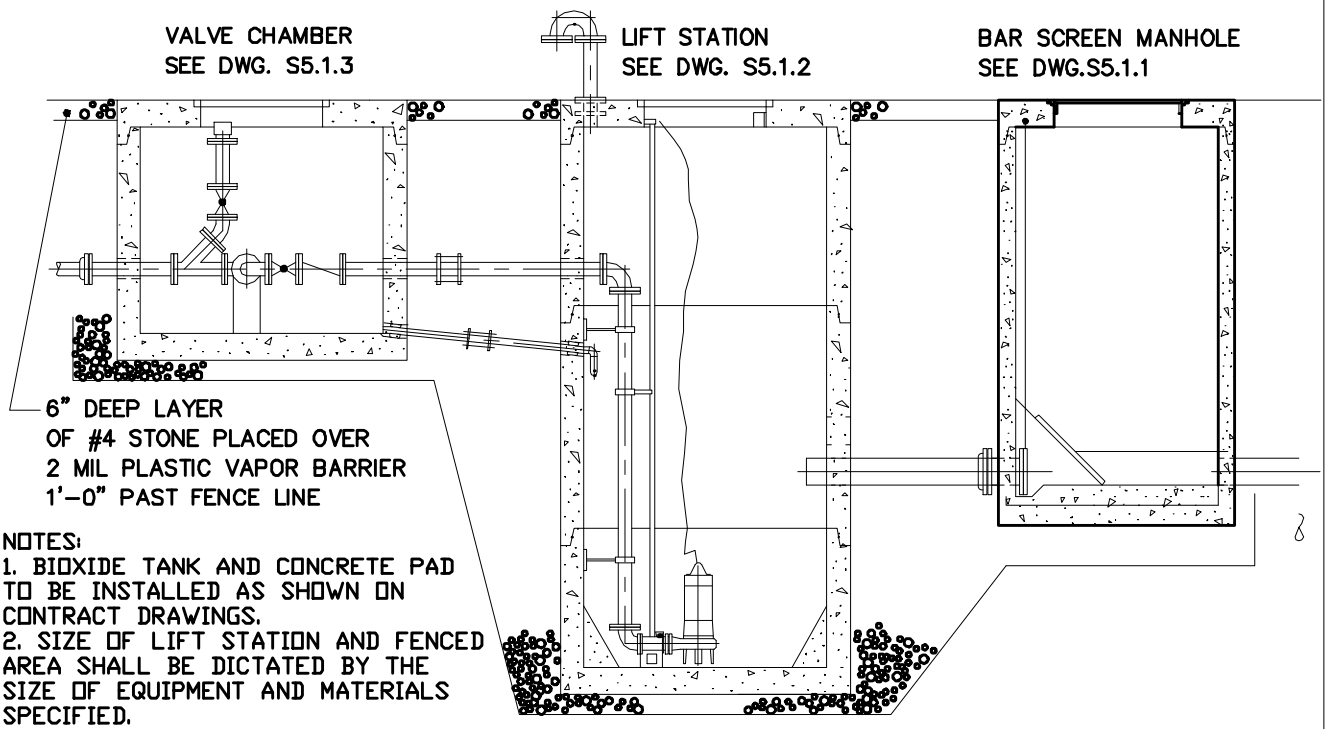
NOTES:
1. SEWER LATERAL AND SEWER SERVICE CONNECTION TO BE CONSTRUCTED IN ACCORDANCE WITH CCWRD STANDARD DETAILS S3.1, S4.1, AND S4.2.
2. STRUCTURE PLUMBING SHOWN FOR REFERENCE ONLY. ALL INTERIOR PIPING SHALL BE IN ACCORDANCE WITH APPLICABLE PLUMBING CODES.

NO SCALE

CLERMONT COUNTY WATER RESOURCES DEPARTMENT APPROVED _____ DATE _____ OCTOBER 2016	STANDARD CONNECTION TO SEWERS 12" AND LARGER	DRAWING NO. S4.3



TOP PLAN

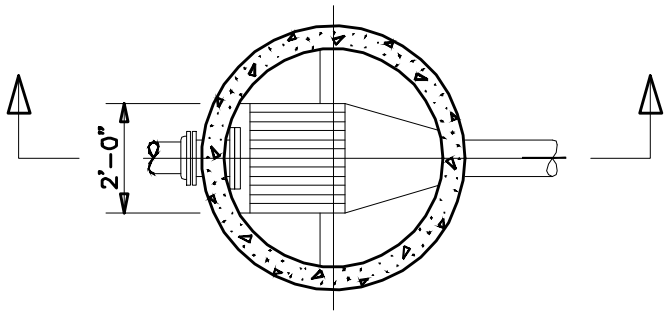


SECTION A-A

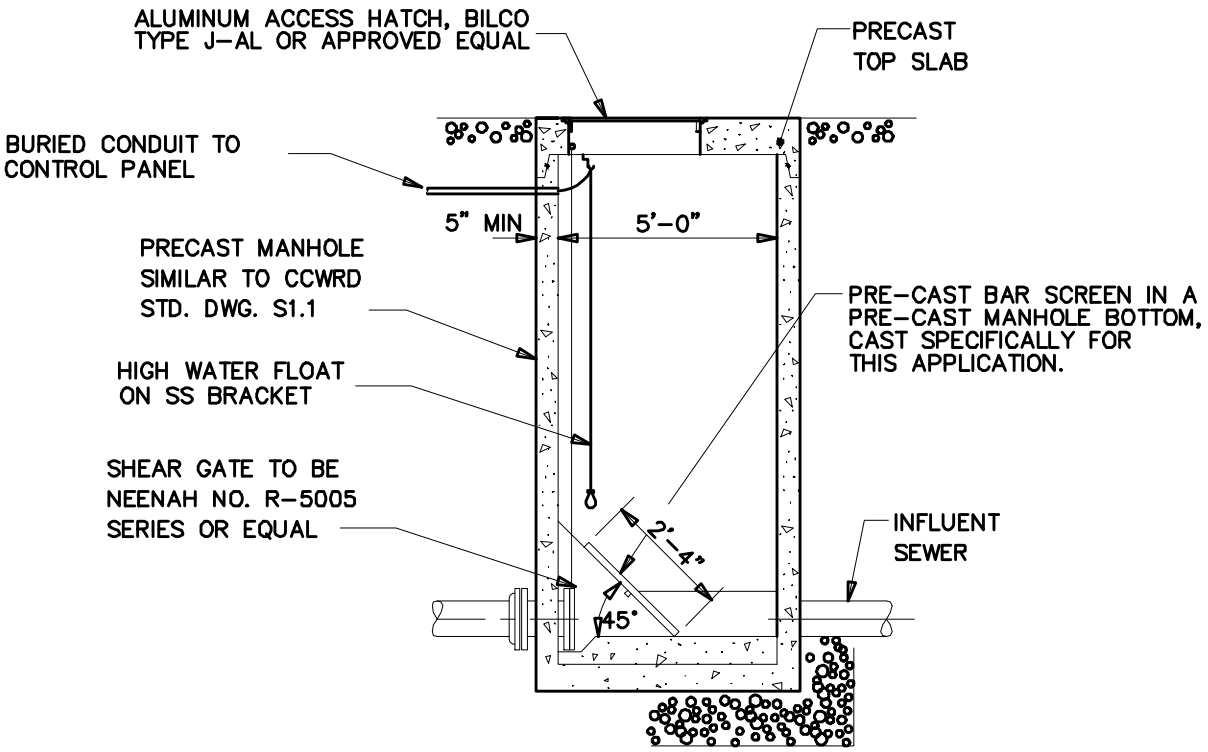
NOTES:
1. BIOXIDE TANK AND CONCRETE PAD TO BE INSTALLED AS SHOWN ON CONTRACT DRAWINGS.
2. SIZE OF LIFT STATION AND FENCED AREA SHALL BE DICTATED BY THE SIZE OF EQUIPMENT AND MATERIALS SPECIFIED.
3. BOLLARDS SHALL BE INSTALLED AS NEEEDED TO PROTECT GENERATOR AND OTHER ELECTRICAL STRUCTURES.
4. IF UNDERGROUND ELECTRIC SERVICE, CONNECTION SHALL BE MADE FROM SERVICE POLE TO METER LOCATED ON CONTROL PANEL CONCRETE PAD.
5. SLIDE OR SWING GATE TO BE INSTALLED ACCORDING TO CONTRACT DRAWINGS.

NO SCALE

CLERMONT COUNTY WATER RESOURCES DEPARTMENT APPROVED _____ DATE _____ REV. MARCH 2019	LIFT STATION LAYOUT	DRAWING NO. S5.1



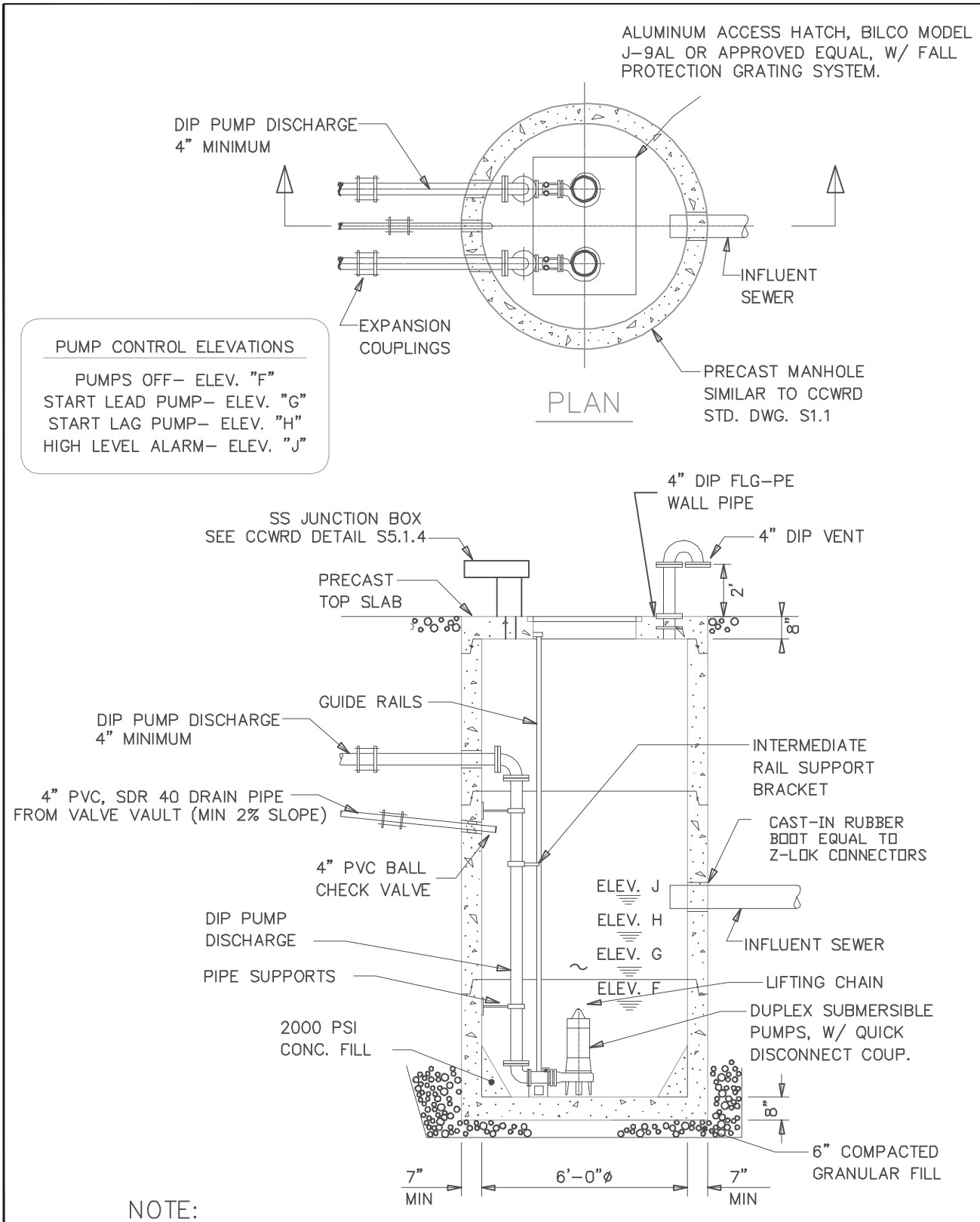
PLAN



SECTION

NO SCALE

CLERMONT COUNTY WATER RESOURCES DEPARTMENT APPROVED _____ DATE _____ REVISED MARCH 2019	BAR SCREEN MANHOLE DETAIL	DRAWING NO. S5.1.1

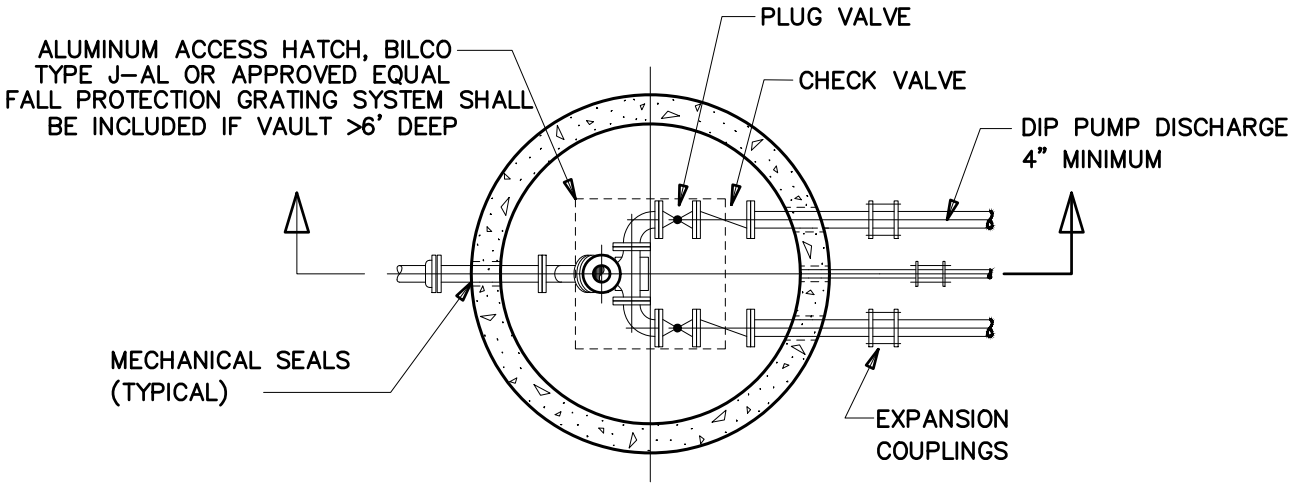


NOTE:

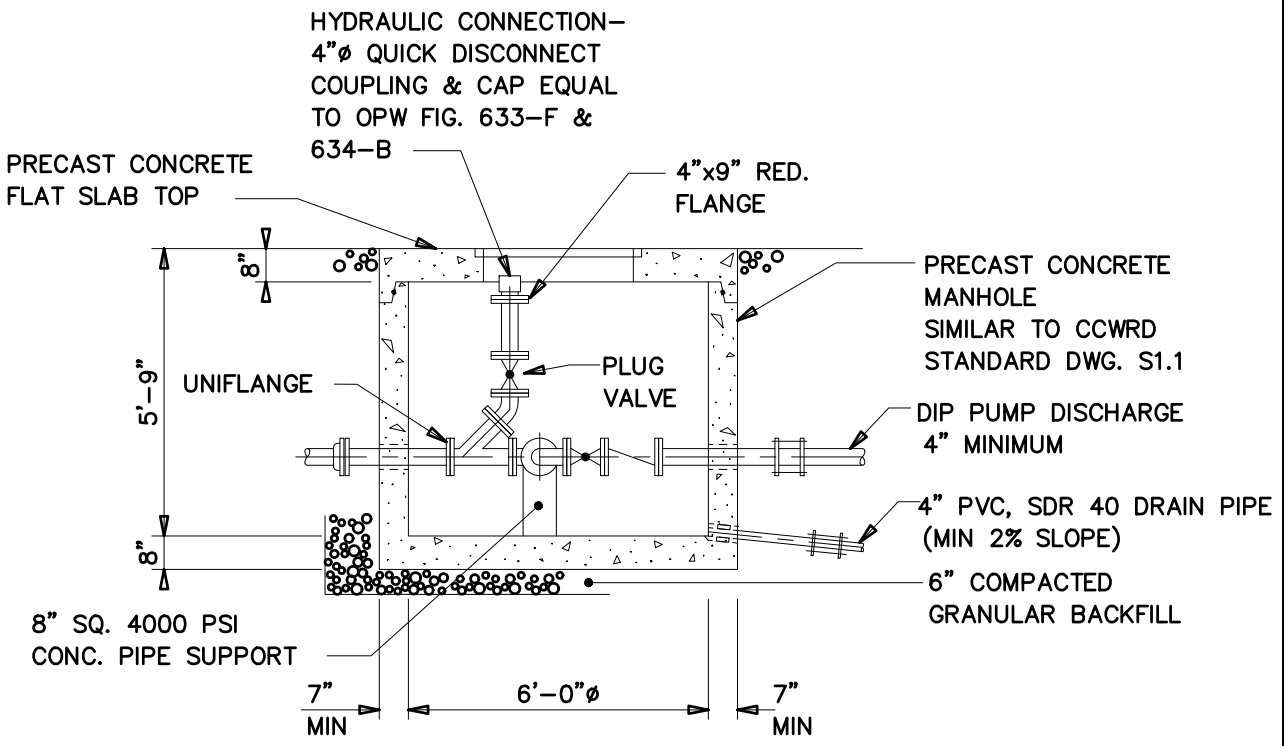
LEVEL CONTROL FLOAT, LEVEL TRANSDUCER, & BRACKET NOT SHOWN. SEE CCWRD DETAIL S5.1.4

NO SCALE

CLERMONT COUNTY WATER RESOURCES DEPARTMENT APPROVED _____ DATE _____ REVISED APRIL 2017	LIFT STATION DETAIL	DRAWING NO. S5.1.2



PLAN



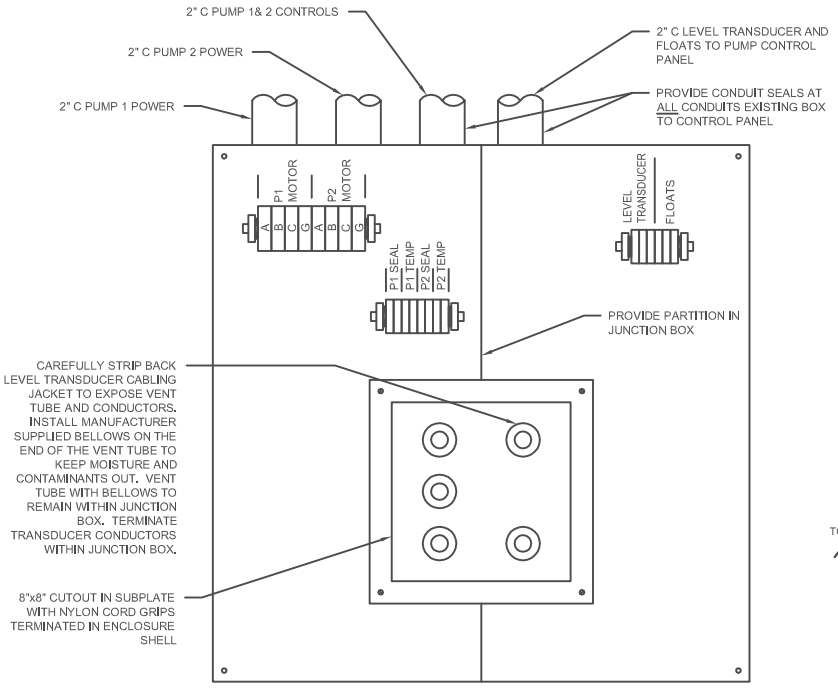
SECTION

NOTES:
1. MAGNETIC FLOW METER AND FORCE MAIN SHUT OFF VALVE TO BE INSTALLED WITHIN VALVE CHAMBER WHEN CALLED FOR ON THE CONTRACT DRAWINGS OR AS DIRECTED BY OWNER'S REPRESENTATIVE. PRESENCE OF A MAGNETIC FLOW METER AND/OR SHUT OFF VALVE MAY REQUIRE LARGER VALVE CHAMBER STRUCTURE.
2. MAGNETIC FLOW METER SHALL BE REQUIRED FOR ALL LIFT STATIONS HAVING A SINGLE FAMILY EQUIVALENT (SFE) OF 50 OR MORE.

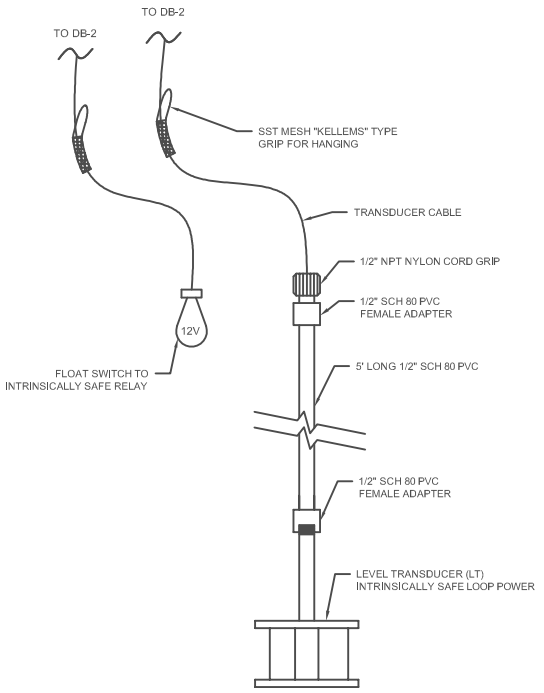
NO SCALE

CLERMONT COUNTY WATER RESOURCES DEPARTMENT	VALVE CHAMBER DETAIL	DRAWING NO. S5.1.3
APPROVED _____ DATE _____		

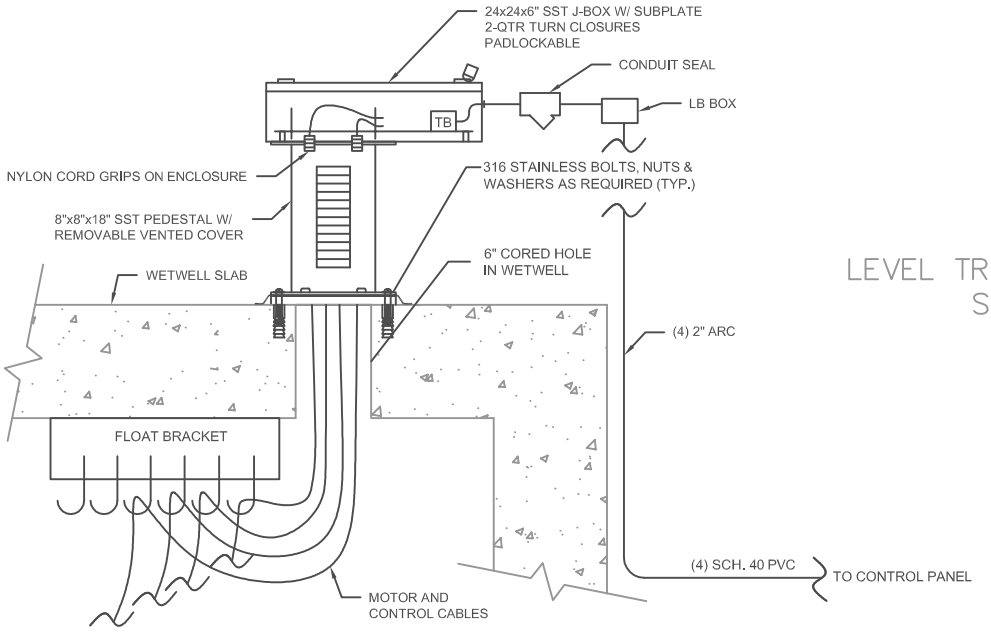
REVISED MARCH 2019



WET WELL JUNCTION BOX
PLAN VIEW



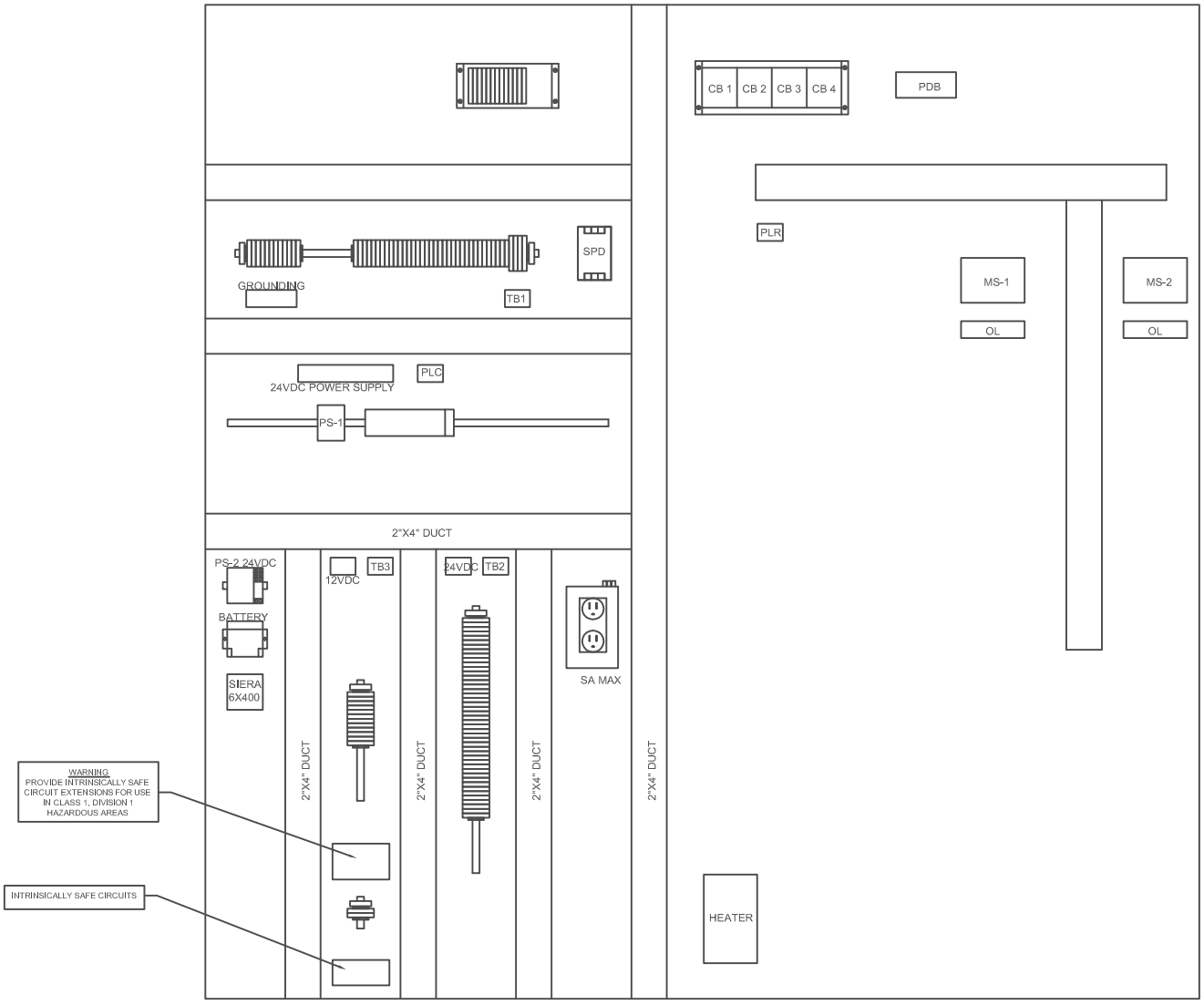
LEVEL TRANSDUCER & FLOAT
SWITCH DETAIL



WET WELL JUNCTION BOX
PROFILE VIEW

NO SCALE

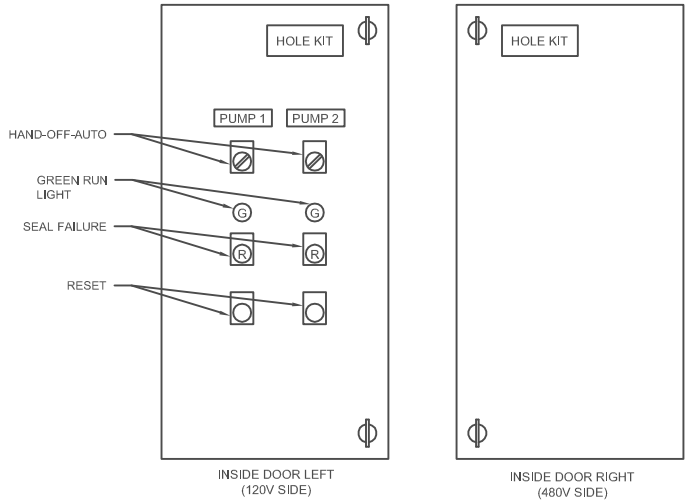
CLERMONT COUNTY WATER RESOURCES DEPARTMENT	WET WELL ELECTRIC DETAIL	DRAWING NO. S5.1.4
APPROVED _____ DATE _____ REVISED JUNE 2016		



PANEL INTERIOR

NOTES:

1. TYPICAL GENERAL LAYOUT SHOWN FOR SEPARATION OF 480V AND 120V DEVICES AND LOCATION OF CIRCUIT BREAKERS WITHIN DOOR HOLE KITS.
2. SOME ANCILLARY PANEL DEVICES MAY NOT BE SHOWN. CONTRACTOR IS RESPONSIBLE TO PROVIDE ALL NECESSARY MATERIALS AND APPURTENANCES FOR A COMPLETE AND FULLY FUNCTIONAL PANEL IN ACCORDANCE WITH DRAWING INTENT AND SPECIFICATIONS.
3. USE COPPER MTW FOR INDIVIDUAL CONDUCTORS WITHIN THE CONTROL PANEL SIZED PER UL 50BA, 16 AWC MINIMUM. USE BLACK FOR AC POWER WIRING, RED FOR 120 VAC CONTROL WIRING, WHITE FOR ALL 120 VAC NEUTRAL WIRING, BLUE FOR +24 VDC WIRING, BLUE/WHITE FOR ALL 24 VDC COM WIRING, AND YELLOW FOR ALL VOLTAGE SUPPLIED EXTERNAL TO THE PANEL.
4. FOR ANALOG SIGNAL CABLE USE 18 AWG TSP INTERNAL PANEL WIRING AND 16 AWG TSP FOR EXTERNAL WIRING.
5. REFERENCE CCWRD STANDARD DETAIL S5.1.6 FOR PLC I/O LIST.



PANEL SUB-DOORS

NO SCALE

CLERMONT COUNTY WATER RESOURCES DEPARTMENT APPROVED _____ DATE _____ JUNE 2016	DUPLEX LIFT STATION CONTROL PANEL GENERAL LAYOUT	DRAWING NO. S5.1.5

DUPLEX/TRIPLEX STATION I/O LIST

Port	Description	Comments	
I:0/0	High Level	Input Present when High Water Float Closed (INPUT FROM 12VDC RELAY)	
I:0/1	Pumps Stop Level	**Input Present when Control/Stop Float Closed**	**Inputs 1,2 &3 only wired to terminal strip (no field floats when transducer is installed)**
I:0/2	Lead Pump Start Level	**Input Present when Lead Float Closed**	
I:0/3	Lag Pump Start Level	**Input Present when Lag Float Closed**	
I:0/4	Pump 1 Running	Input Present when Pump #1 Running	
I:0/5	Pump 1 Fault	Input Present when Pump #1 Faulted / Jumper to disable pump	
I:0/6	Pump 2 Running	Input Present when Pump #2 Running	
I:0/7	Pump 2 Fault	Input Present when Pump #2 Faulted / Jumper to disable pump	
I:0/8	Pump 3 Running	Input Present when Pump #3 Running	
I:0/9	Pump 3 Fault	Input Present when Pump #3 Faulted / Jumper to disable pump	
I:0/10	Transfer Sw on Emergency	Input Present when Transfer connected to Utility Power, Jumper w/ no Gen.	
I:0/11	Utility Power Fault	Input Present when Utilty Power Normal/ Phase Monitor Working	
I:0/12	Generator Fault	Input Present when Generator Faulted/ Input Off w/No Generator	
I:0/13	Desiel Tank Low Level	Input Present when Diesel Tank Level Low/ Off w/ No Generator	
I:0/14	Rain Guage	Pulse input if Rain Guage Present/ Off w/ No Rain Guage	
I:0/15	Tranducer/Float	Jumper to 24vdc + when on Transducer/ Remove jumper for Float Control	
O:0/0	Pump 1 Run	Output Present when Pump #1 Called to Run	
O:0/1	Pump 2 Run	Output Present when Pump #2 Called to Run	
O:0/2	Pump 3 Run	Output Present when Pump #3 Called to Run	
O:0/3	Pump 1 Run (Reverse)	Output Present when Pump #1 Called to Run in Reverse	
O:0/4	Pump 2 Run (Reverse)	Output Present when Pump #2 Called to Run in Reverse	
O:0/5	Pump 3 Run (Reverse)	Output Present when Pump #3 Called to Run in Reverse	
O:0/10	Chemical Pump Run	Output Present when Chemical Pump Called to Run	
O:0/11	High Level Output	Output present upon High Level Condition, Floats or Transducer	
IV0	Spare		
IV1	Spare		
IV2	Spare		
IV3	Spare		
Analog Expansion Card #1 (1762-IF4)			
IV1:0	Station Well Level	Wet Well Transducer Input 4-20mA	
IV1:1	Chemical Tank Level	Chemical Tank Level Input 4-20mA	
IV1:2	Flow Meter	Flow Meter Input 4/20mA	
IV1:3	Spare		
Analog Expansion Card #2 (1762-IF4)			
IV2:0	Pump 1 Amps	Pump 1 Amps Inpput 4-20mA	
IV2:1	Pump 2 Amps	Pump 2 Amps Input 4-20mA	
IV2:2	Pump 1 Speed Reference	Pump 1 Speed Reference from VFD 4/20mA	
IV2:3	Pump 2 Speed Reference	Pump 2 Speed Reference from VFD 4/20mA	
Analog Expansion Card #3 (1762-OF4)			
OV3:0	Pump 1 Speed Control	Pump 1 Speed Control to VFD 4/20mA	
OV3:1	Pump 2 Speed Control	Pump 2 Speed Control to VFD 4/20mA	
OV3:2	Pump 3 Speed Control	Pump 3 Speed Control to VFD 4/20mA	
OV3:3	Spare		
Analog Expansion #4 (1762-IF4) - Only required for Triplex			
IV4:0	Pump 3 Amps	Pump 3 Amps Input 4-20mA	
IV4:1	Pump 3 Speed Reference	Pump 3 Speed Reference from VFD 4/20mA	
IV4:2	Spare		
IV4:3	Spare		

LIFT STATION CONDUIT AND WIRE SCHEDULE

Minimum conduit and wire sizes shown, conduit and wire sizes may increase as necessary to meet code

WIRE	EQUIPMENT NAME	CONDUIT ID	CONDUIT	COMMENTS
4-3# w/G	100A Utility Service	A	2"	From Utility to Service Disconnect
4-#3 w/G	100A Feeder	B	2"	From Service Disconnect to Current Transformer Cabinet
4-#3 w/G	100A Feeder	C	2"	From Current Transformer Cabinet to Automatic Transfer Switch
4-#3 w/G	100A Feeder	D	2"	From Automatic Transfer Switch to Motor Control Panel
4-#3 w/G	100A Feeder	E	2"	From Generator to Automatic Transfer Switch
3-#12 w/G	Pump 1 Feeder	F	2"	From Motor Control Panel to Wetwell J-Box
3-#12 w/G	Pump 2 Feeder	G	2"	From Motor Control Panel to Wetwell J-Box
4-#14 w/G	Pump 1 & 2 Seal/Overtemp	H	2"	From Motor Control Panel to Wetwell J-Box
sh.PR & 2-#14	Level Transducer & High Level Switch 1	I	2"	From Motor Control Panel to Wetwell J-Box
2-#14	High Level Switch 2	J	1"	From Motor Control Panel to Bar Screen Manhole
2-#14	Transfer Switch on Emergency	J	1"	From Motor Control Panel to Automatic Transfer Switch
FM Cable	Flow Transmitter 1	K	1"	From Flow Transmitter 1 Xmtr to Flow Element 1 Sensor
2-#14 w/G	Generator Start	M	1"	From Motor Control Panel to Generator
2-#14	Generator Fault	M		
2-#14	Generator Low Fuel	M		
2-#12 w/G	Generator Batt Charger	N	1"	From Motor Control Panel to Generator
2-#12 w/G	Generator Block Heater	N		
2-#14 w/G	Chemical Pump Call to run	O	1"	From Motor Control Panel to Generator
SH.PR.	Chemical Level Transducer	P	1"	

NO SCALE

CLERMONT COUNTY
WATER RESOURCES DEPARTMENT

APPROVED _____

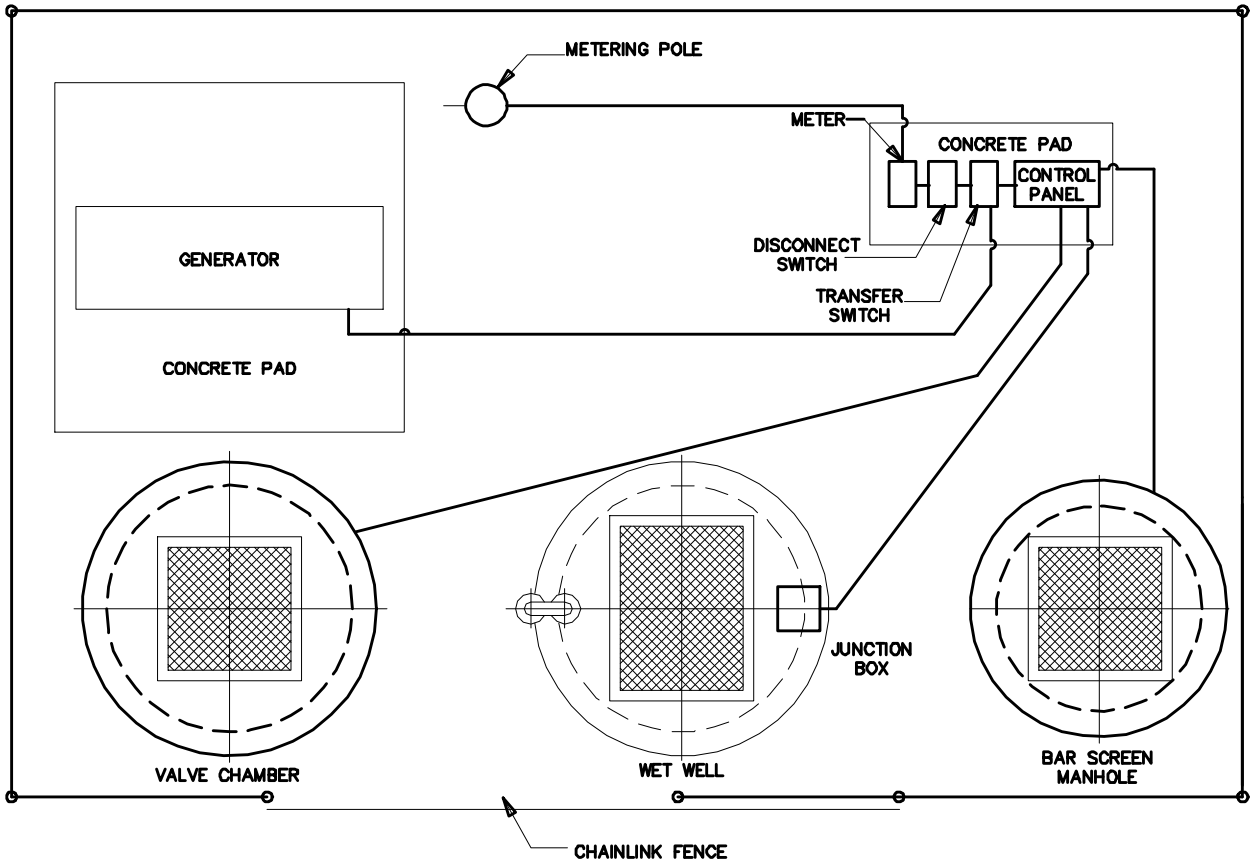
DATE _____

JUNE 2023

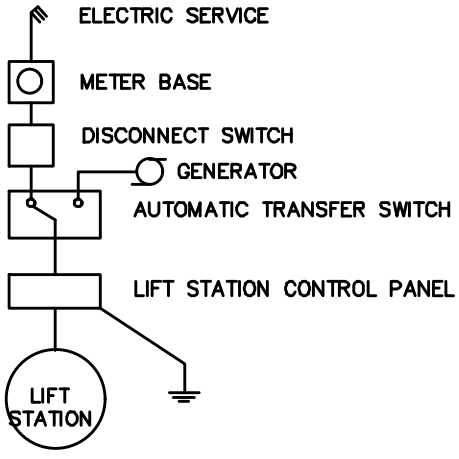
DUPLEX/TRIPLEX LIFT STATION I/O LIST

DRAWING NO.

S5.1.6



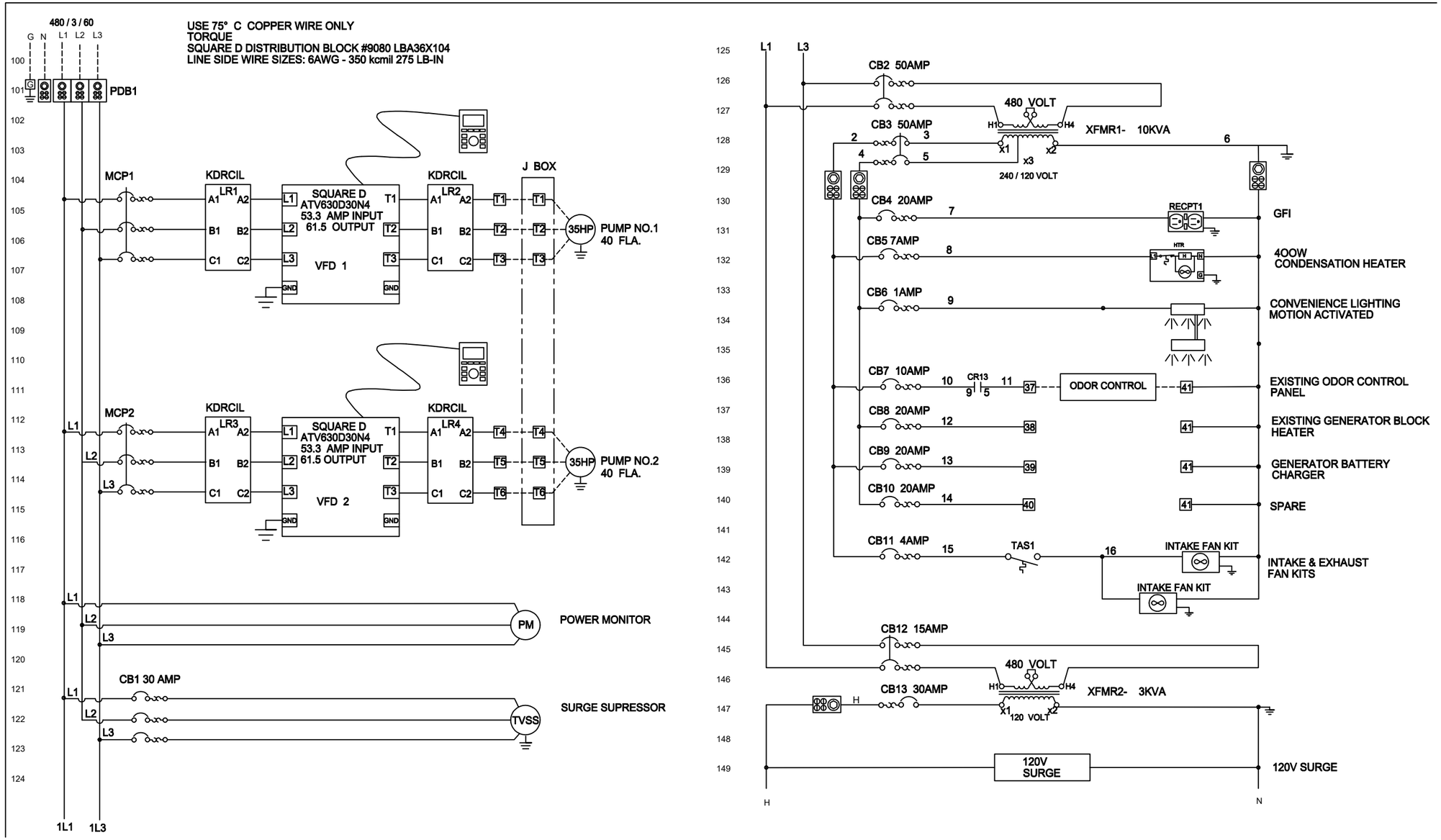
SINGLE LINE DIAGRAM



NOTES:
1. CONDUIT ROUTING SHOWN IS MINUMUM AND TYPICAL FOR A DUPLEX LIST STATION.
2. SPECIFICATIONS OF CONDUIT SIZE, QUANTITY, AND WIRE TYPE MAY DIFFER FOR A TRIPLEX OF NON-STANDARD LIFT STATION, AND SHALL FOLLOW THE CONTRACT DRAWINGS.
3. GUARDPOSTS TO BE INSTALLED AT LOCATIONS SHOWN ON STANDARD DRAWING S5.1.

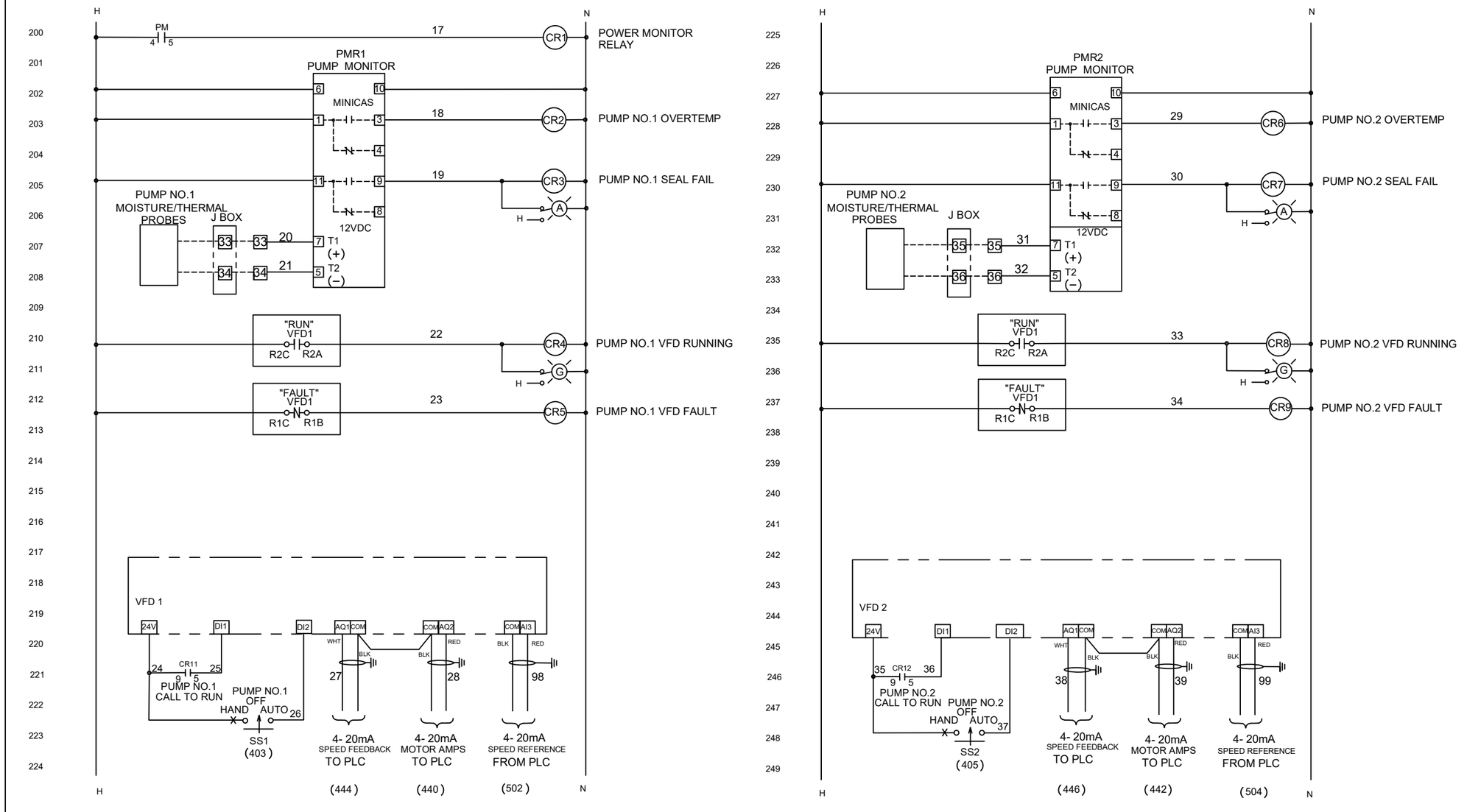
NOT TO SCALE

CLERMONT COUNTY WATER RESOURCES DEPARTMENT APPROVED _____ DATE _____ MARCH 2019	LIFT STATION CONDUIT ROUTING	DRAWING NO. S5.1.7



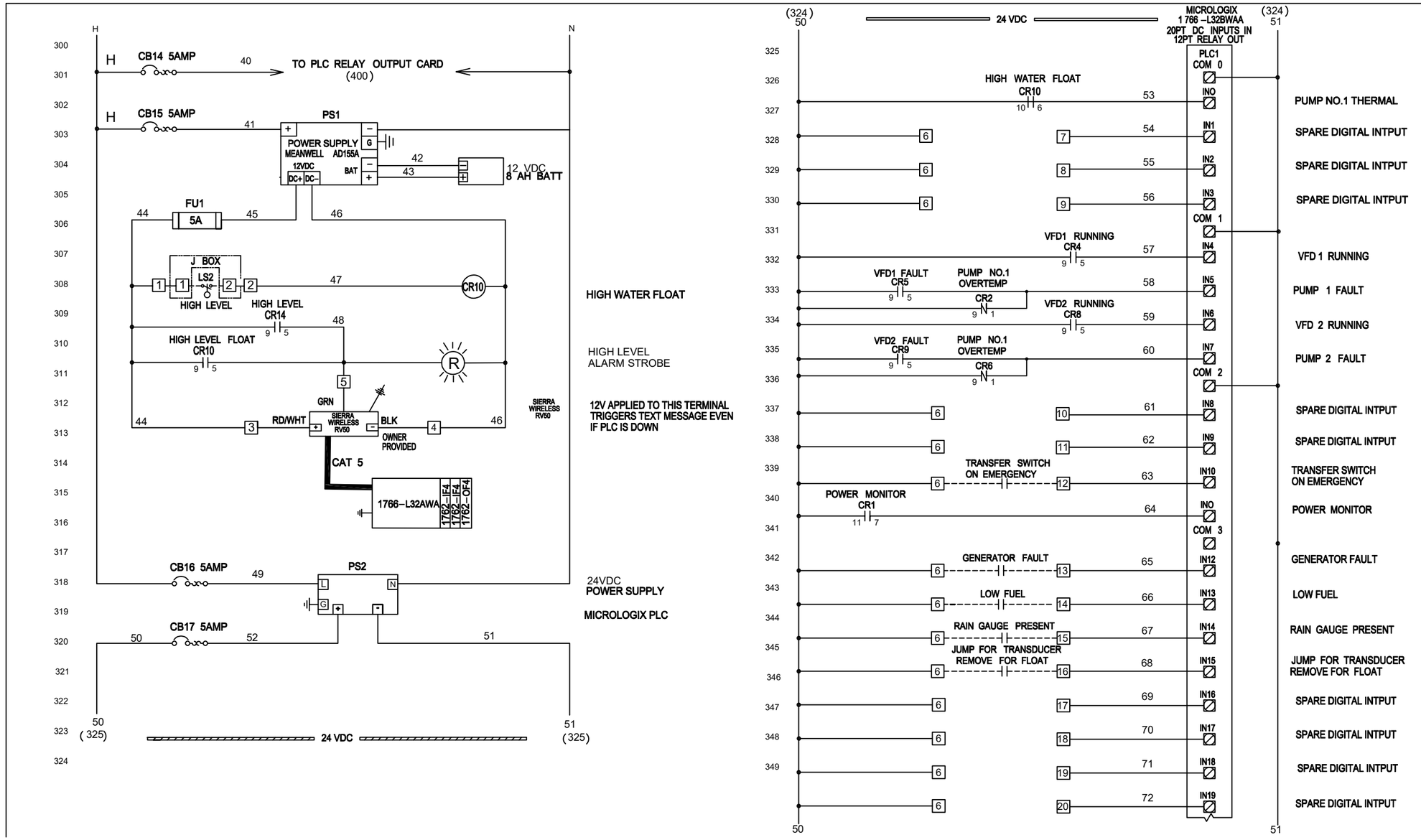
NOT TO SCALE

CLERMONT COUNTY WATER RESOURCES DEPARTMENT APPROVED _____ DATE _____ AUGUST 2023	DUPLEX CONTROL PANEL SAMPLE DRAWINGS (1 OF 7)	DRAWING NO. S5.1.8



NOT TO SCALE

CLERMONT COUNTY WATER RESOURCES DEPARTMENT APPROVED _____ DATE _____ AUGUST 2023	DUPLEX CONTROL PANEL SAMPLE DRAWINGS (2 OF 7)	DRAWING NO. S5.1.9



NOT TO SCALE

CLERMONT COUNTY
WATER RESOURCES DEPARTMENT

APPROVED _____

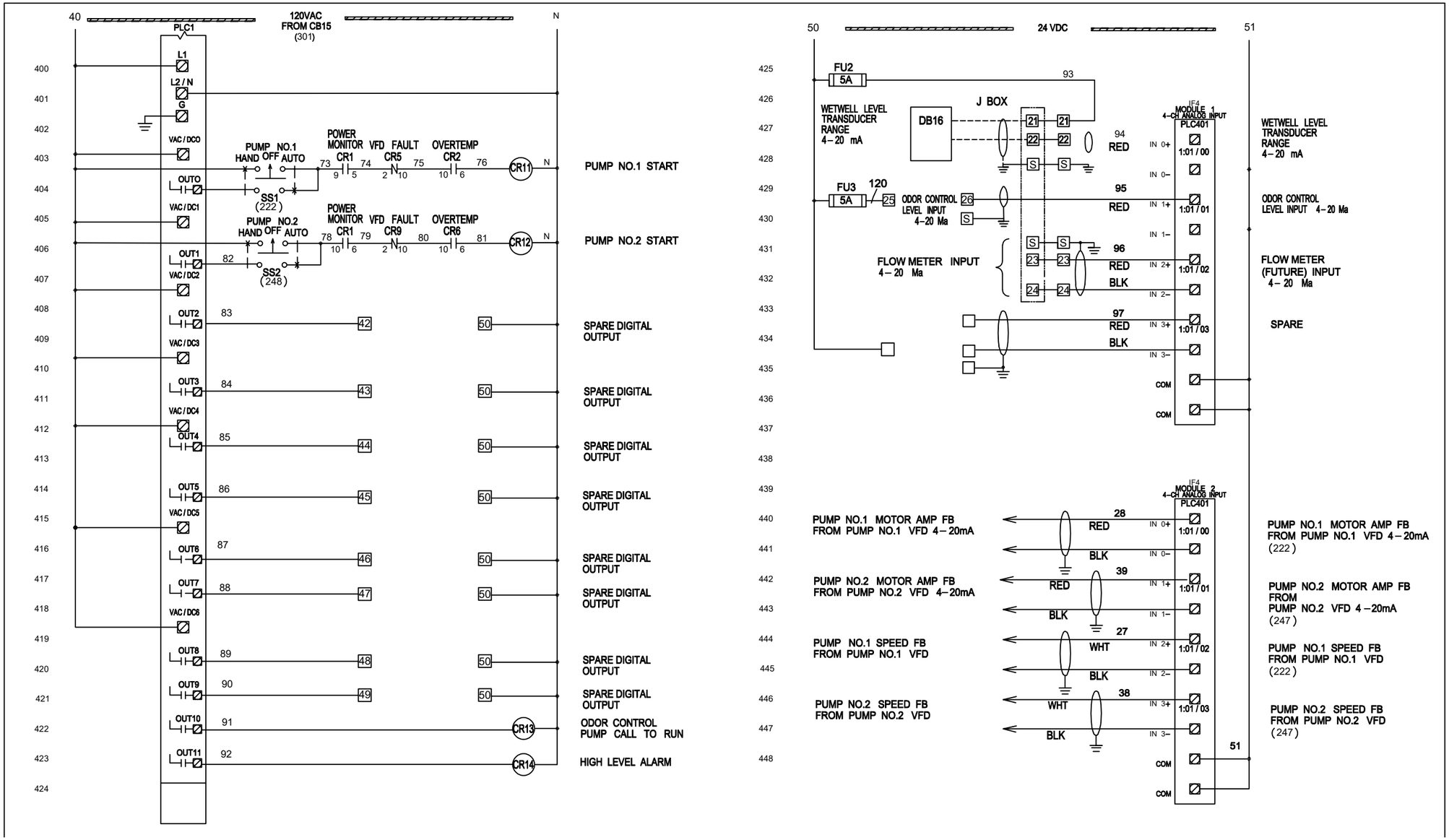
DATE _____

AUGUST 2023

DUPLEX CONTROL PANEL
SAMPLE DRAWINGS (3 OF 7)

DRAWING NO.

S5.1.10



NOT TO SCALE

CLERMONT COUNTY
WATER RESOURCES DEPARTMENT

APPROVED _____

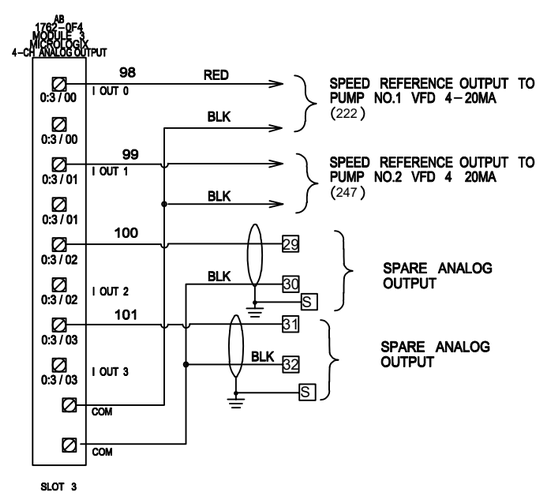
DATE _____

AUGUST 2023

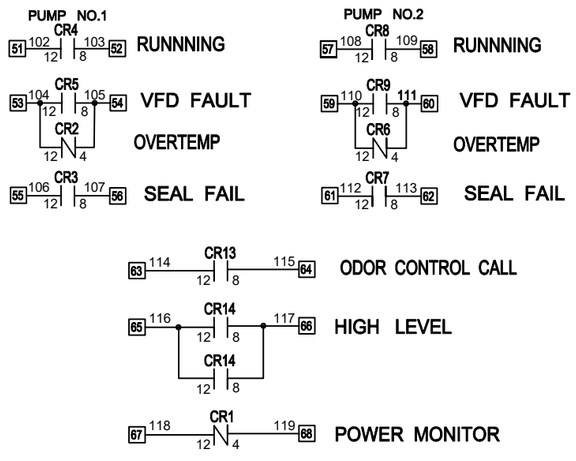
DUPLEX CONTROL PANEL
SAMPLE DRAWINGS (4 OF 7)

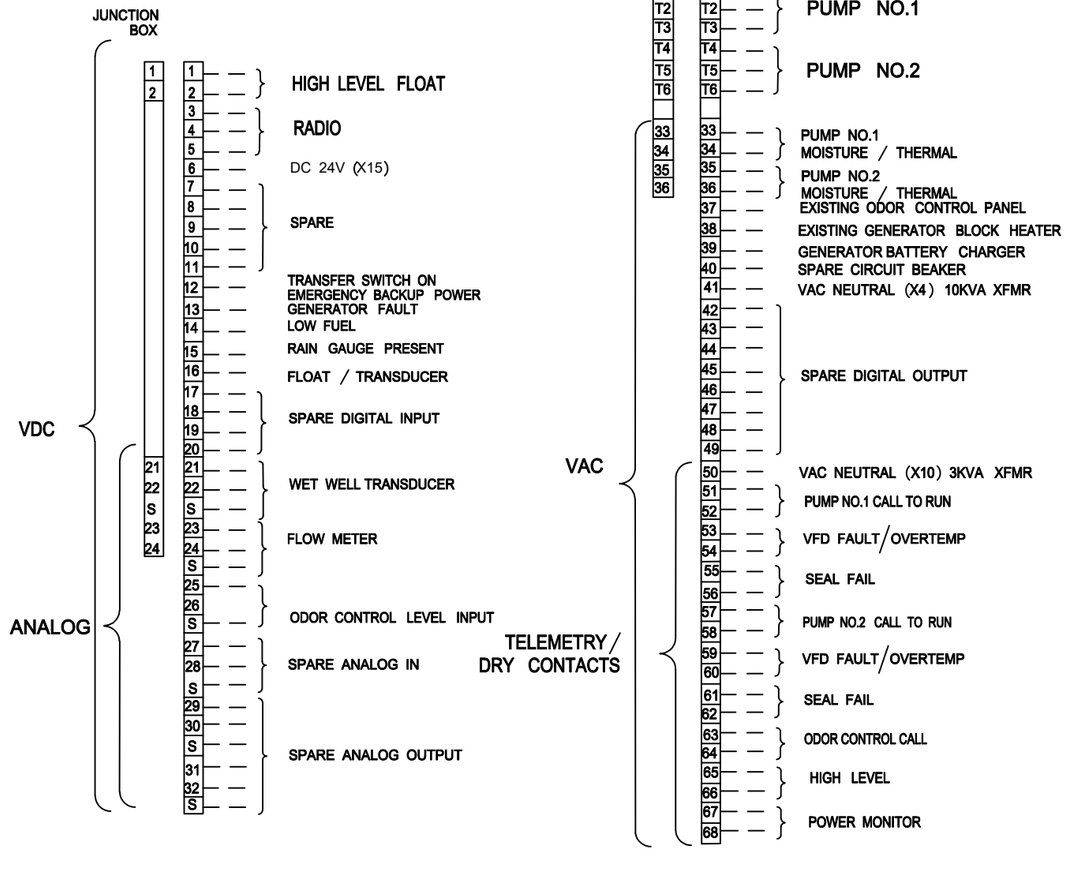
DRAWING NO.

S5.1.11



TELEMETRY CONTACTS





NOT TO SCALE

CLERMONT COUNTY
WATER RESOURCES DEPARTMENT

APPROVED _____

DATE _____

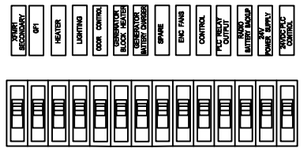
AUGUST 2023

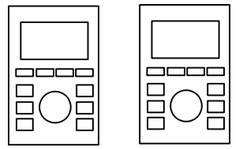
DUPLEX CONTROL PANEL
SAMPLE DRAWINGS (5 OF 7)

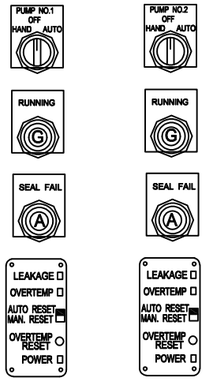
DRAWING NO.

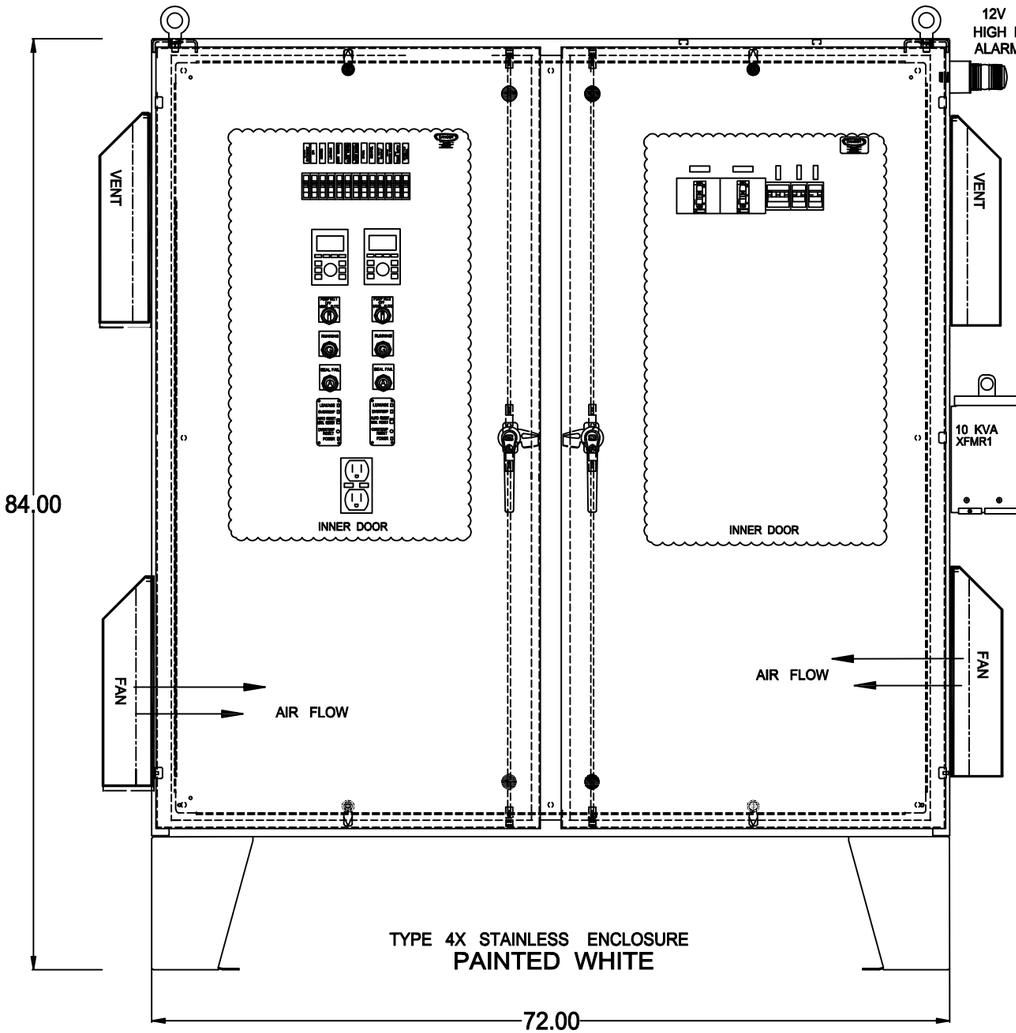
S5.1.12

INNER LEFT DOOR DETAIL

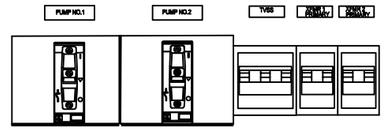








INNER RIGHT DOOR DETAIL



NOTE: TRANSFORMERS ARE RATED AS NEMA 3R THEREFORE THE ENCLOSURE RATING WILL BE DECLASSIFIED TO NEMA 3R AS WELL, HOWEVER IT WILL NOT AFFECT THE OVERALL NEMA 4X INTEGRITY OF THE ENCLOSURE AND ITS CONTENTS

NOTE:

1) ALL INNER DOOR COMPONENT NAMEPLATES ENGRAVED WITH STANDARD ADHESIVE MOUNTING .
2) WRAP TYPE BRADY LABEL WIRE MARKERS.
3) ALL WIRES TO HAVE SOLDIER-LESS COMPRESSION FITTINGS (FERRALS).
4) ALL SPARES WIRED TO TERMINALS FROM PLC .
5) LAYOUT SHOWN IS TYPICAL AND MAY CHANGE DURING PRODUCTION.
6) ENCLOSURE STAINLESS STEEL PAINTED WHITE
7) NOTE THIS IS A TYPICAL STANDARD PANEL FOR CLERMONT COUNTY WATER DISTRICT

NOT TO SCALE

CLERMONT COUNTY
WATER RESOURCES DEPARTMENT

APPROVED _____

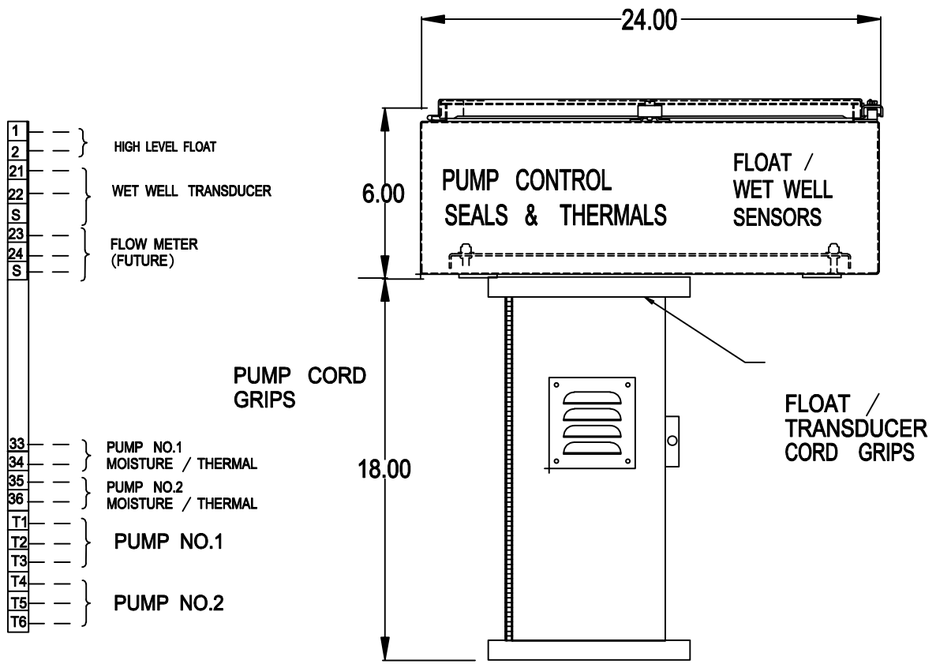
DATE _____

AUGUST 2023

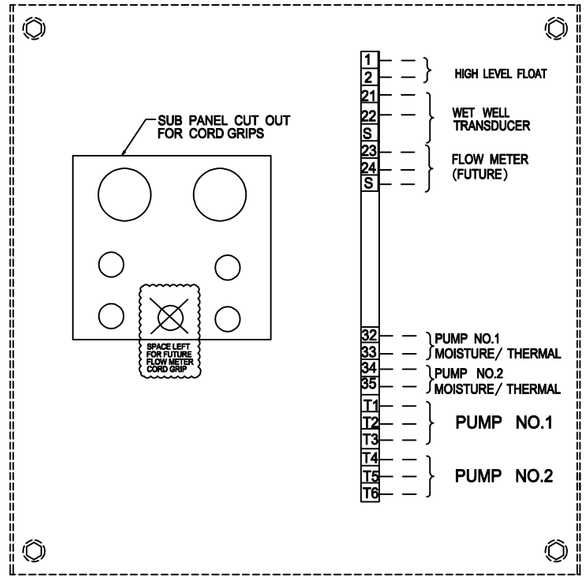
DUPLEX CONTROL PANEL
SAMPLE DRAWINGS (6 OF 7)

DRAWING NO.

S5.1.13

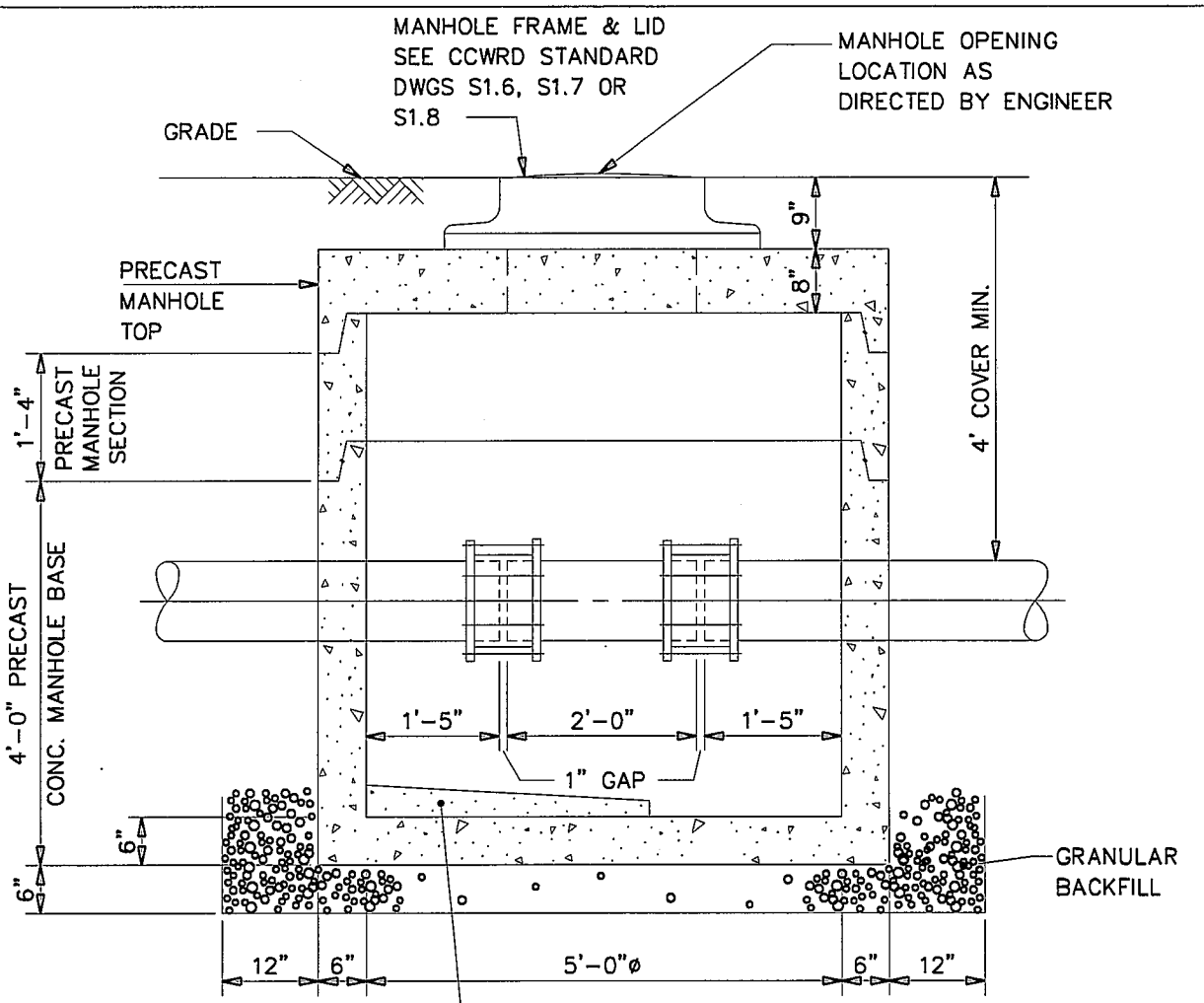


TYPE 4X STAINLESS J BOX

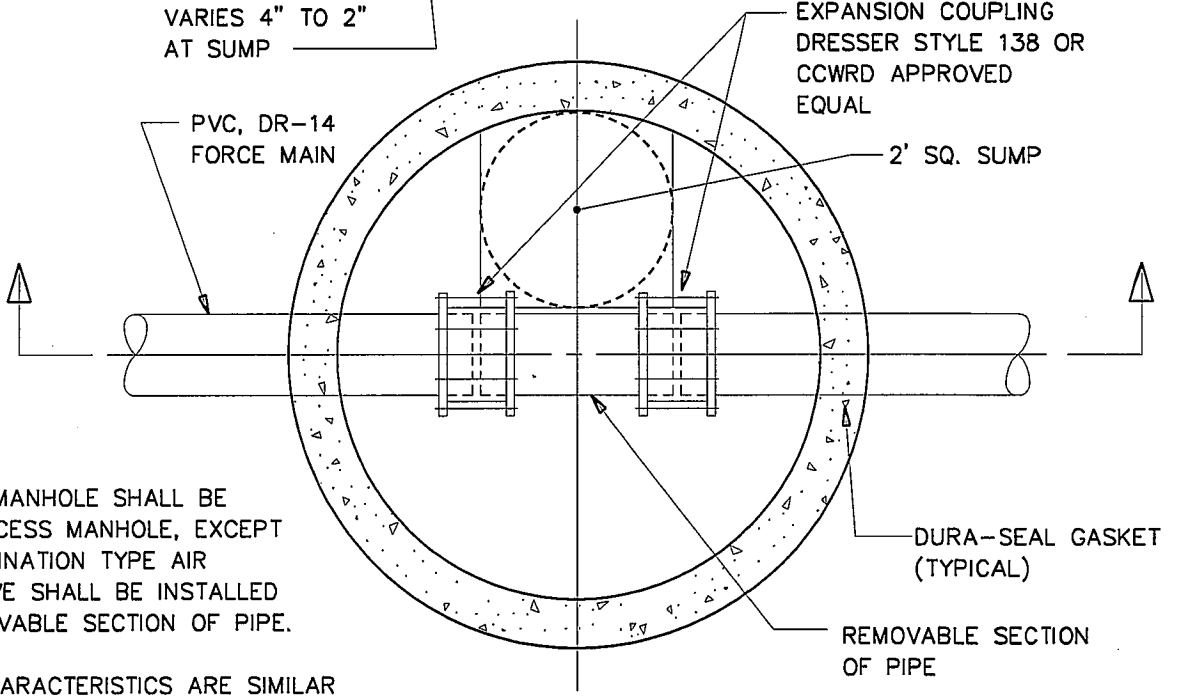


NOT TO SCALE

CLERMONT COUNTY WATER RESOURCES DEPARTMENT APPROVED _____ DATE _____ AUGUST 2023	DUPLEX CONTROL PANEL SAMPLE DRAWINGS (7 OF 7)	DRAWING NO. S5.1.14



SECTION



PLAN

NO SCALE

NOTES:

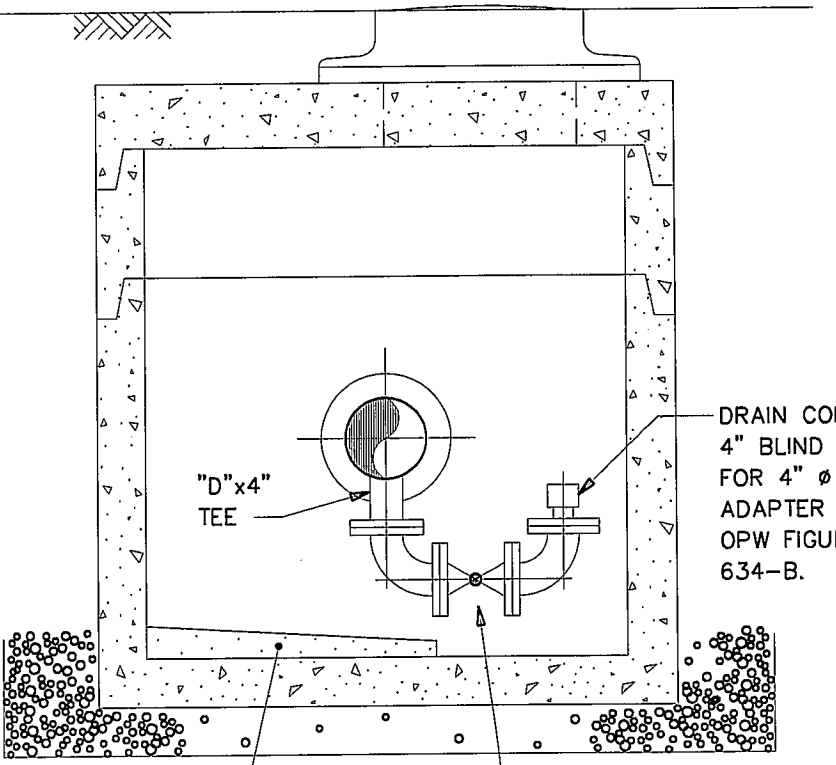
1. SUMMIT TYPE MANHOLE SHALL BE EQUAL TO ACCESS MANHOLE, EXCEPT THAT A COMBINATION TYPE AIR RELEASE VALVE SHALL BE INSTALLED ON THE REMOVABLE SECTION OF PIPE.

2. ALL OTHER CHARACTERISTICS ARE SIMILAR TO STANDARD MANHOLE AS SHOWN ON CCWRD STANDARD DRAWING S1.1.

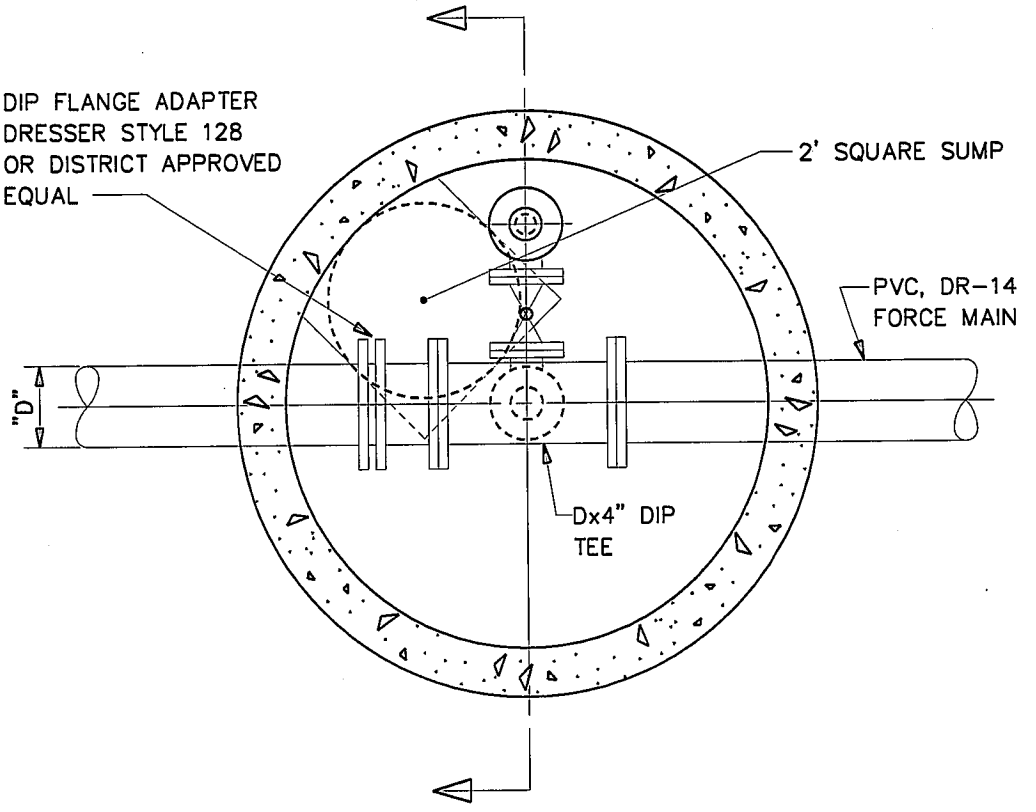
CLERMONT COUNTY WATER RESOURCES DEPARTMENT	STANDARD FORCE MAIN ACCESS MANHOLE	DRAWING NO. S5.2.1
APPROVED _____ DATE		

NOTE:

MANHOLE OTHERWISE SIMILAR TO CCWRD STANDARD DWG. S5.2.1



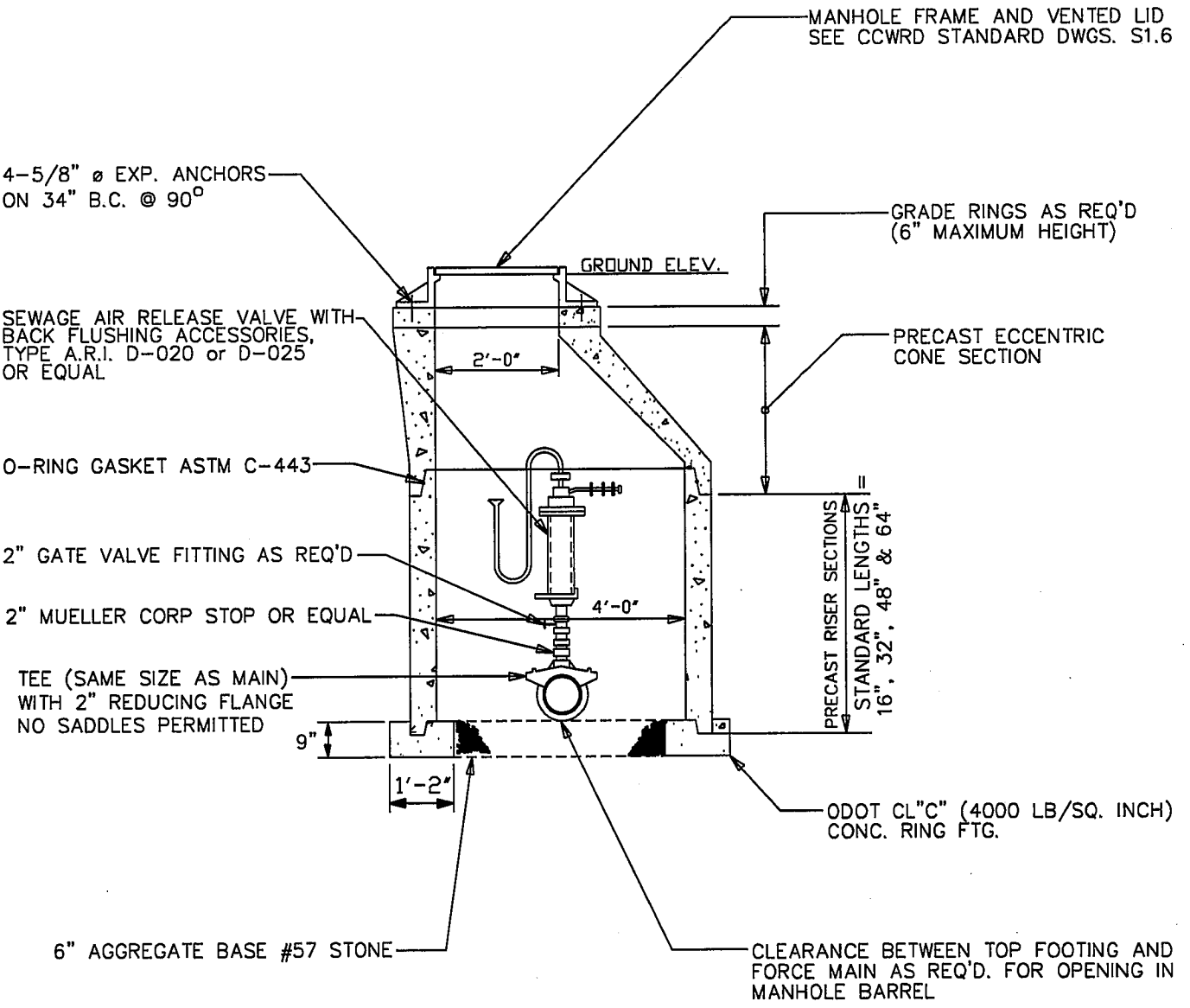
SECTION



PLAN

NO SCALE

CLERMONT COUNTY WATER RESOURCES DEPARTMENT APPROVED _____ DATE _____	STANDARD FORCE MAIN LOW POINT MANHOLE	DRAWING NO. S5.2.2



NOTE:

FLEXIBLE BUTYL RUBBER SEALANT EQUAL TO CONSEAL TYPE CS-302 SHALL BE USED: TO SEAL CASTING TO MANHOLE, TO SEAL ADJUSTING RINGS TOGETHER AND TO RISERS, AND TO SEAL MANHOLE RISER JOINTS.

INSTALL KOR-N-SEAL GASKETS AT MANHOLE INTERFACE WITH PIPE

NO SCALE

CLERMONT COUNTY WATER RESOURCES DEPARTMENT	AIR RELEASE VALVE IN MANHOLE	DRAWING NO. S5.2.3
APPROVED _____ DATE _____		

CLERMONT COUNTY
WATER RESOURCES DEPARTMENT

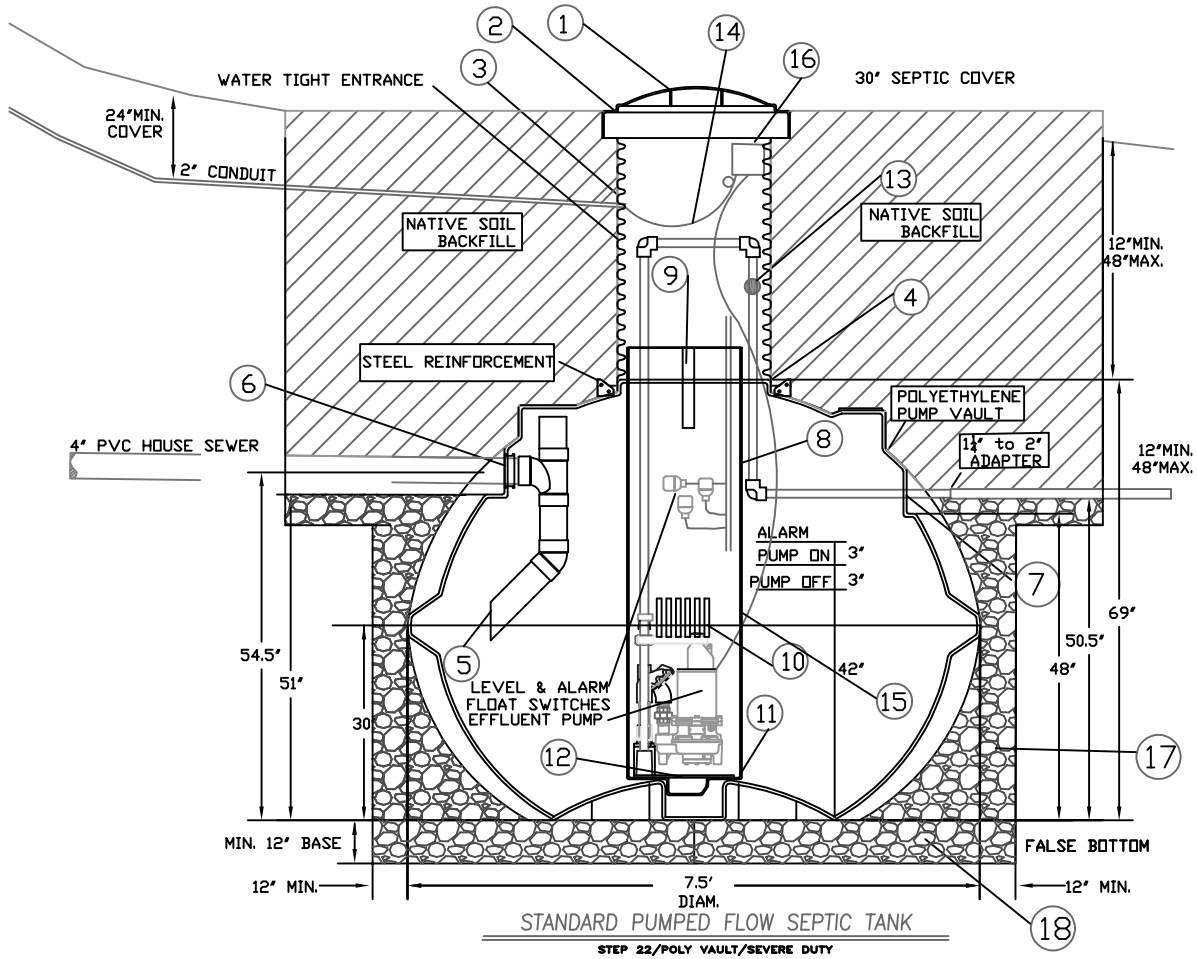
APPROVED _____

DATE _____

REVISED FEB. 2023

PUMPED FLOW SEPTIC TANK STANDARD FEATURES

1. High density structure foam polyethylene manhole cover.
2. Overhanging lip on the manhole cover for security and odor prevention.
3. Hi density polyethylene corrugated riser.
4. Water tight riser to tank connection with gasket tape and stainless steel lag screws.
5. Factory installed PVC baffle which meets the requirements of ASTM D2729, sewer and drain pipe.
6. Gasketed bell, field installed. 4" PVC SDR 35 (ASTM D3034).
7. Custom fit neoprene grommet sized for 2" SCH 80 discharge pipe.
8. High density polyethylene pump vault.
9. Pump vault lift-out holes.
10. Pump vault inlet holes located in septic tank clear zone.
11. Guiding flanges to assure proper pump vault alignment.
12. Heavy duty pump support pad, 3/8" thick.
13. 1 1/4" Ball Valve and Union.
14. Provide a minimum of 6" slack of ⅛ TC cable from conduit point of entry to J-Box. Coil and tie wrap extra cable length for future service and repairs.
15. Provide 1/4" galvanized and coated wire rope from pump lifting bracket to J-Hook at top of riser for pump removal and service.
16. Install SS 3/8" X 3" J-Hook with fender washers and lock nuts inside and outside the riser with 1' of the top of riser. Hang pump/float J-Box and pump lifting cable from J-Hook using (2) ¼" SS Quick links.
17. Aggregate-#67 crushed washed stone. to be backfilled to base of incoming and outgoing sewer pipe.
18. 12" of #67 crushed washed stone.



STANDARD PUMPED FLOW SEPTIC TANK

STEP 22/POLY VAULT/SEVERE DUTY

NO SCALE

STANDARD SEPTIC TANK EFFLUENT PUMP (STEP)

DRAWING NO. S6.1

CLERMONT COUNTY
WATER RESOURCES DEPARTMENT

APPROVED _____

DATE _____

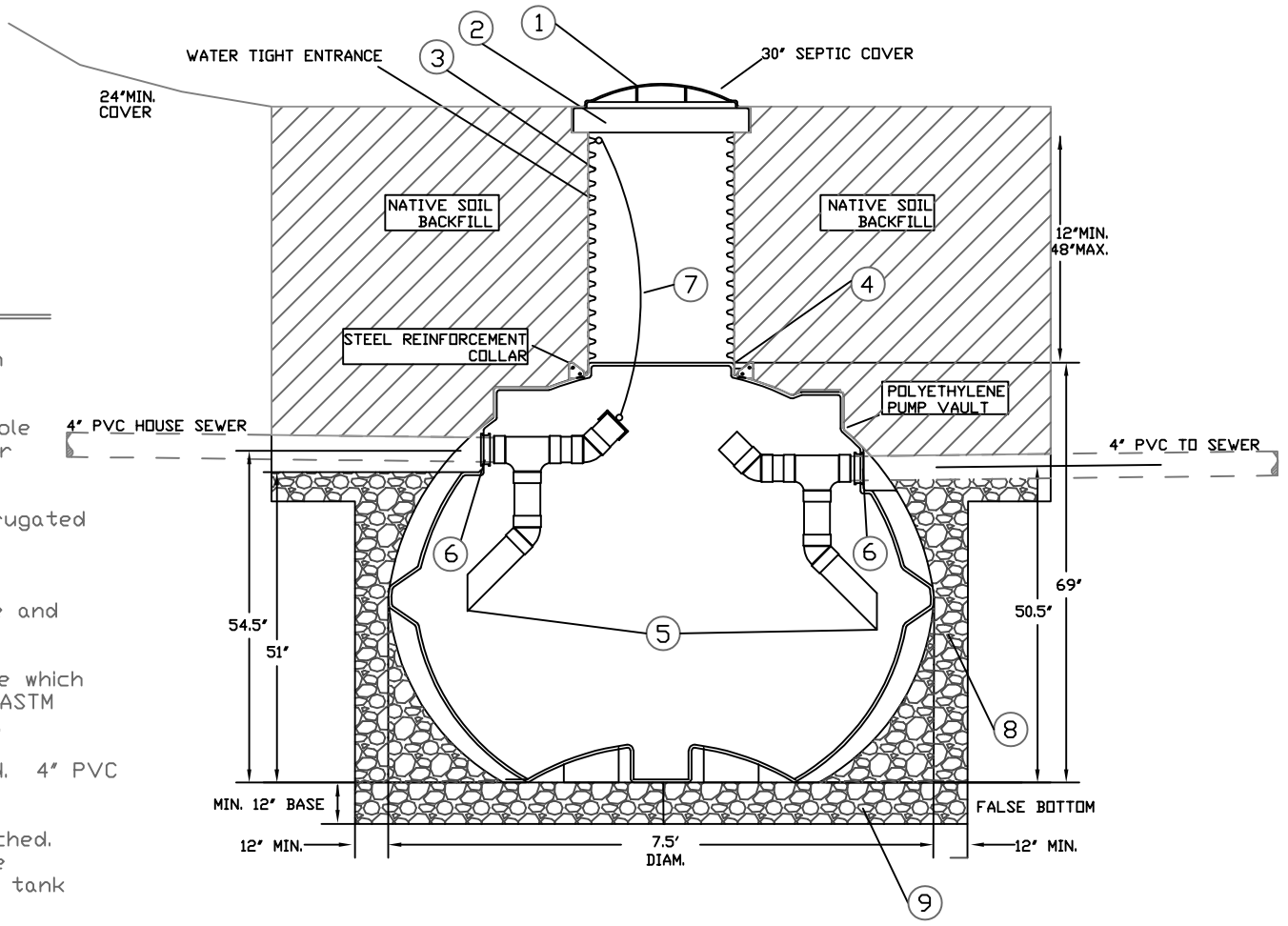
CREATED FEB. 2023

STANDARD SEPTIC
TANK EFFLUENT
GRAVITY (STEG)

DRAWING NO.
S6.1.1

GRAVITY FLOW SEPTIC TANK STANDARD FEATURES

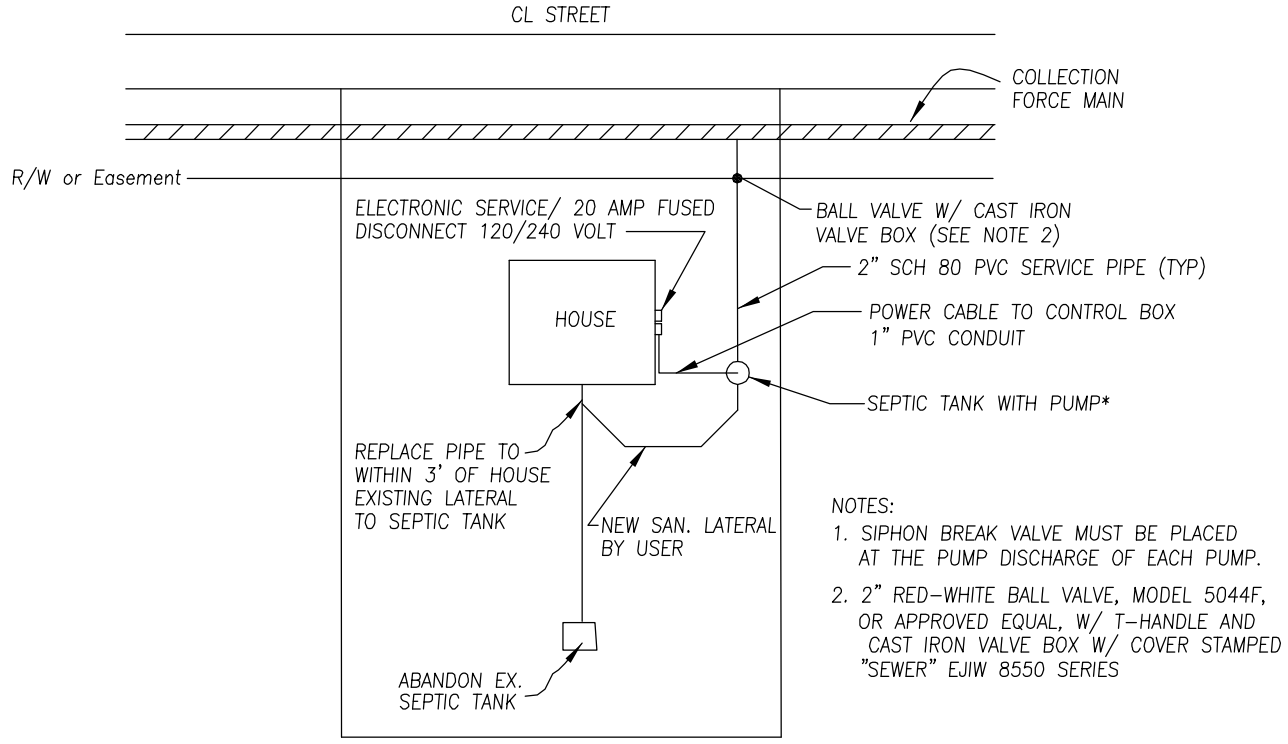
1. High density structure foam polyethylene manhole cover.
2. Overhanging lip on the manhole cover for security and odor prevention.
3. Hi density polyethylene corrugated riser.
4. Water tight riser to tank connection with gasket tape and stainless steel lag screws.
5. Factory installed PVC baffle which meets the requirements of ASTM D2729, sewer and drain pipe.
6. Gasketed bell, field installed. 4" PVC SDR 35 (ASTM D3034).
7. 4" PVC cap with cable attached. Opposite end of cable to be attached to eyelit fixed to tank wall.
8. Aggregate - #67 crushed washed stone, to be backfilled to base of incoming and outgoing sewer pipe
9. 12" of #67 crushed washed stone.



STANDARD GRAVITY FLOW SEPTIC TANK

STEP 22/POLY VAULT/SEVERE DUTY

NO SCALE



* CCWRD shall work with home owners and pump manufacturer to determine septic tank and pump location. Septic tank to be located as close to residence and roadway as possible.

TYPICAL RESIDENTIAL CONNECTION

NO SCALE

CLERMONT COUNTY WATER RESOURCES DEPARTMENT APPROVED _____ DATE _____ REVISED APRIL 2016	TYP. RESIDENTIAL STEP CONNECTION TO A LOW PRESSURE FORCE MAIN	DRAWING NO. S6.2

CLERMONT COUNTY
WATER RESOURCES DEPARTMENT

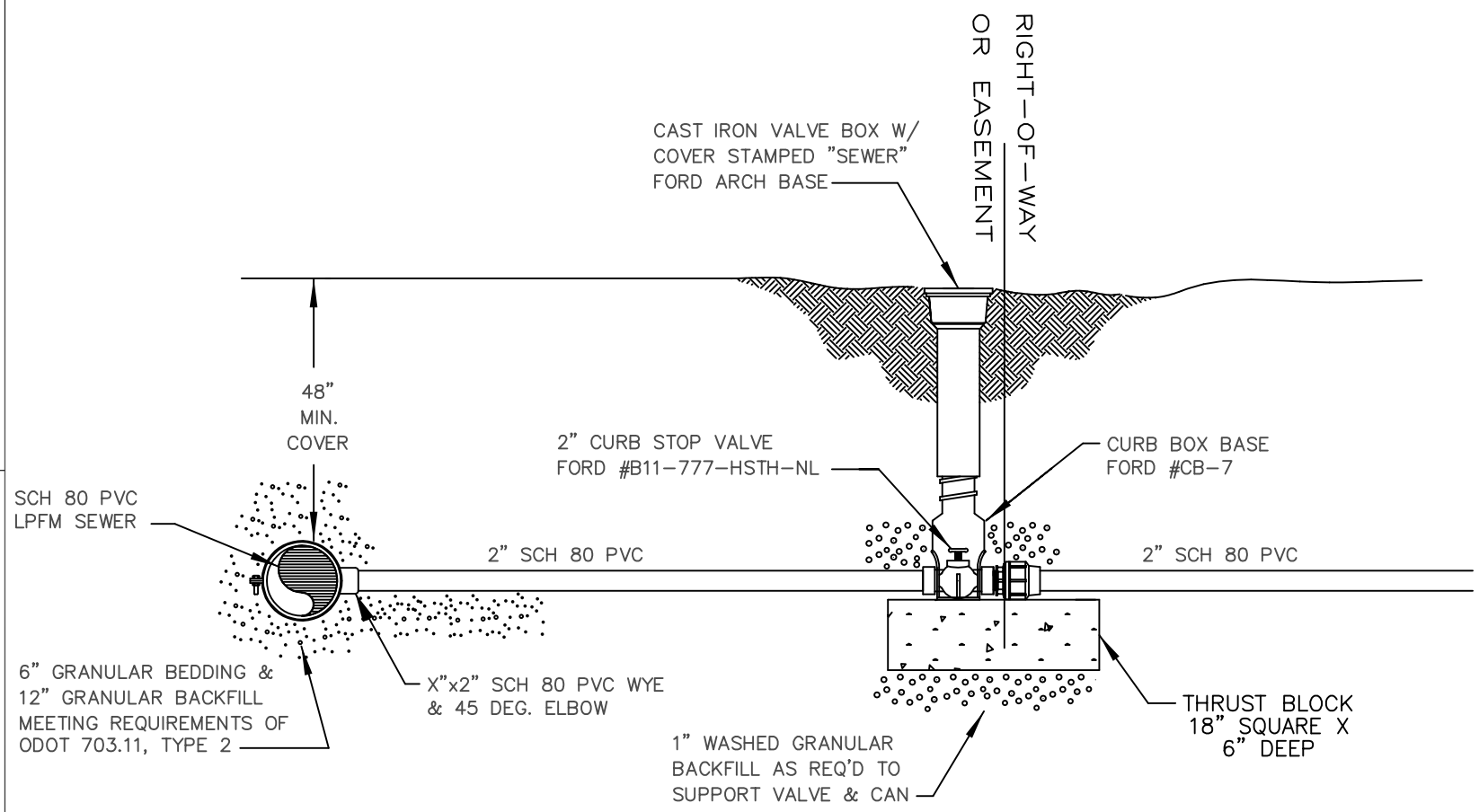
APPROVED _____

DATE _____

REVISED OCT. 2024

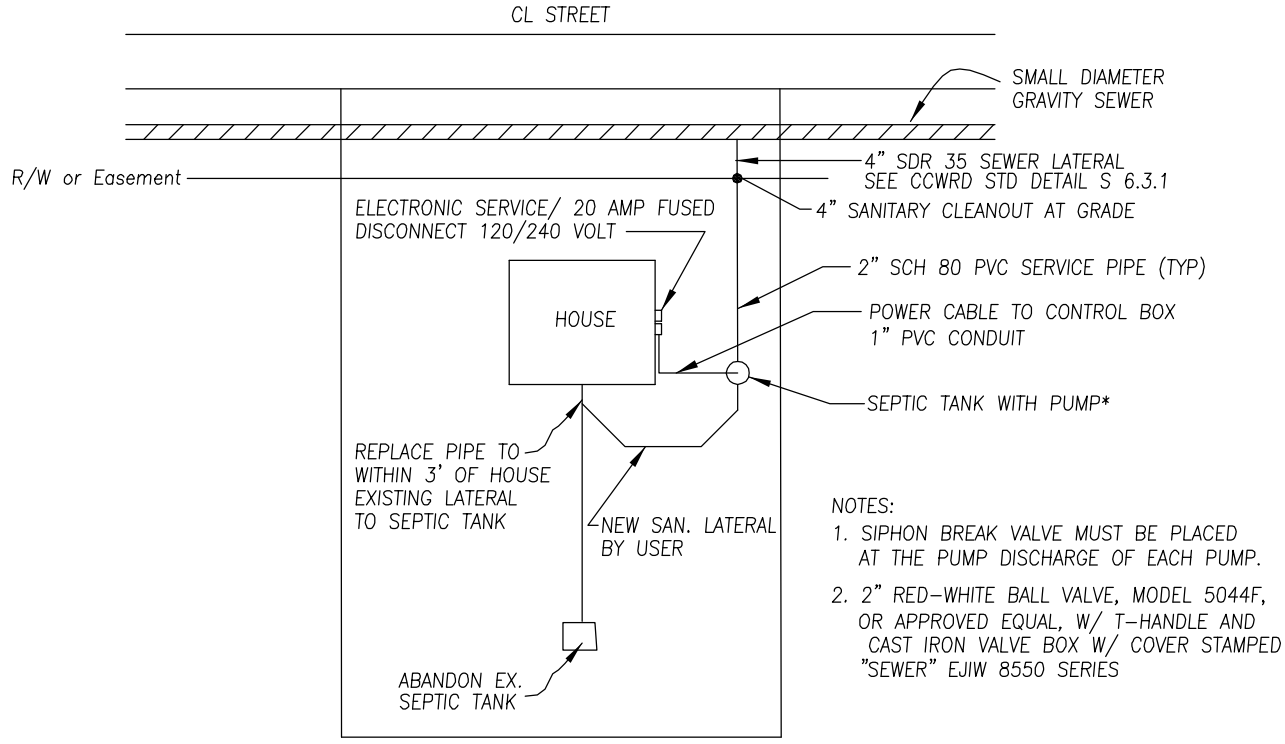
LOW PRESSURE FORCE MAIN (LPFM)
LATERAL INSTALLATION

DRAWING NO.
S6.2.1



TYPICAL LATERAL INSTALLATION

N.T.S.

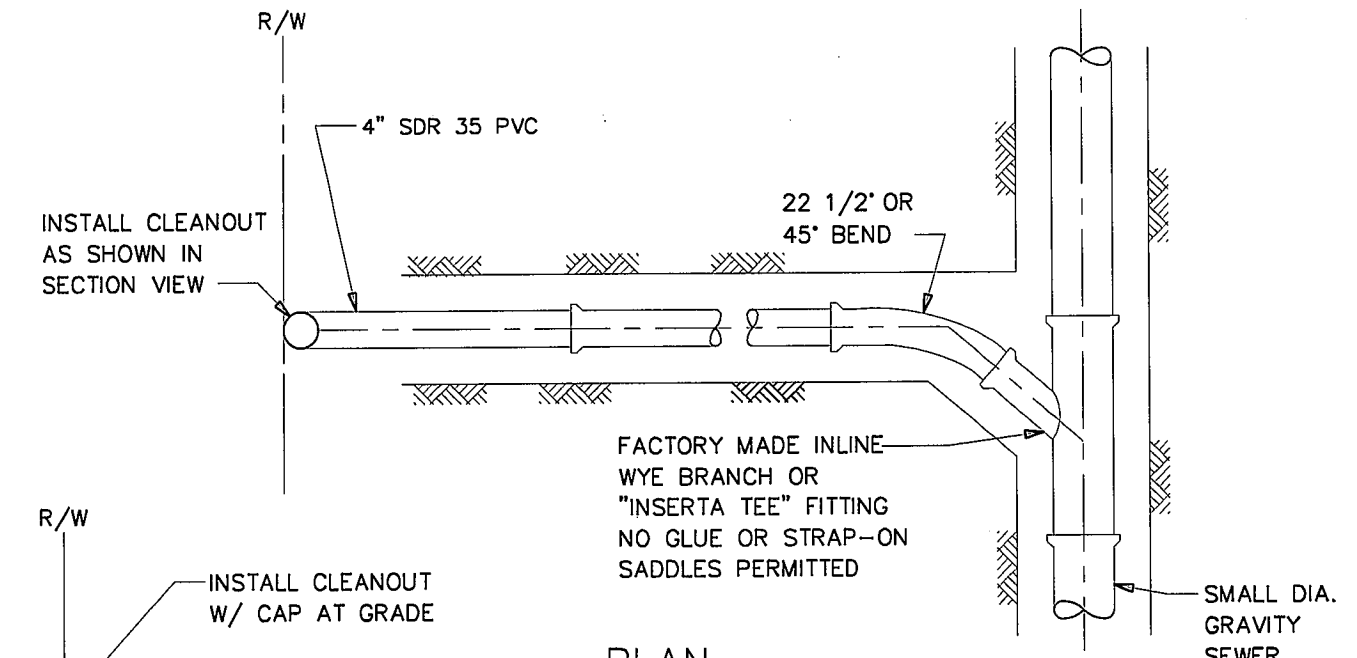


* CCWRD shall work with home owners and pump manufacturer to determine septic tank and pump location. Septic tank to be located as close to residence and roadway as possible.

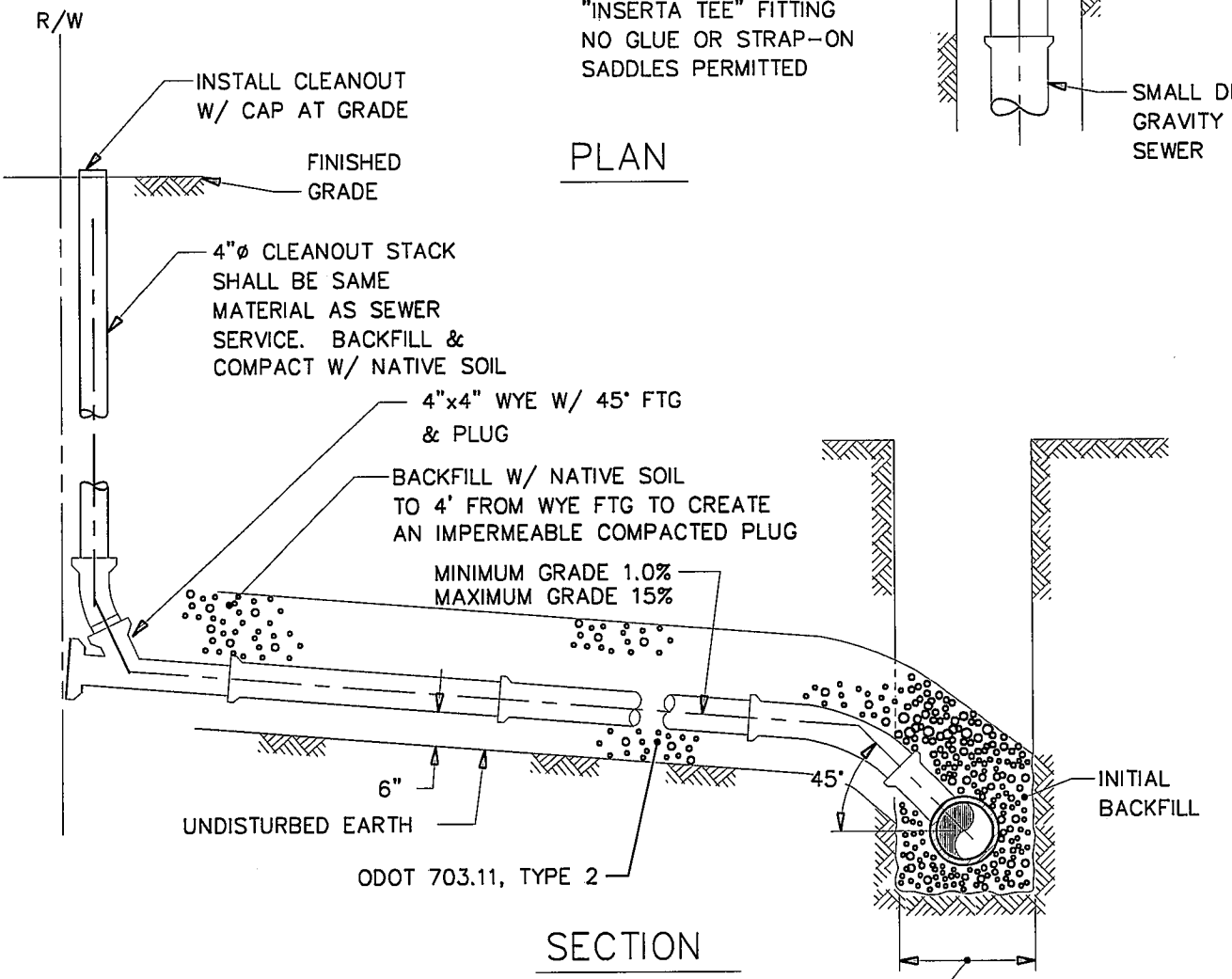
TYPICAL RESIDENTIAL CONNECTION

NO SCALE

CLERMONT COUNTY WATER RESOURCES DEPARTMENT APPROVED _____ DATE _____ REVISED APRIL 2016	TYP. RESIDENTIAL STEP CONNECTION TO SMALL DIAMETER GRAVITY SEWER	DRAWING NO. S6.3



PLAN



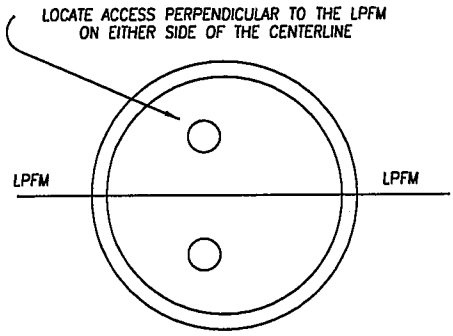
SECTION

NOTE:

1. DURING CONSTRUCTION OF THE SEWER MAIN AND LATERALS THE CLEANOUT SHALL BE BURIED APPROXIMATELY 3 FEET WITH A 2" BY 2" POLE SET ON THE BACK SIDE OF THE CLEAN OUT. WHEN THE STUCTURE IS CONNECTED, THE CLEANOUT SHALL BE BROUGHT TO GRADE AS DETAILED.

NO SCALE

CLERMONT COUNTY WATER RESOURCES DEPARTMENT	SMALL DIAMETER GRAVITY SEWER LATERAL INSTALLATION	DRAWING NO. S6.3.1
APPROVED _____ DATE _____		

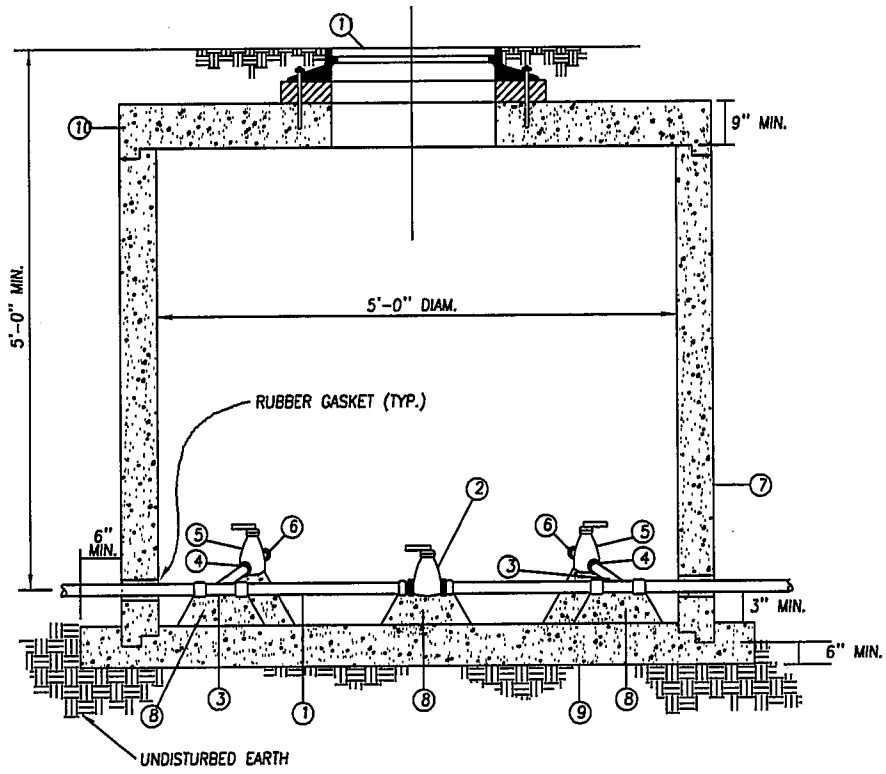


PLAN DETAIL

NOTES: WHERE APPLICABLE, ALL FEATURES NOT NOTED TO BE THE SAME AS SHOWN ON CLERMONT COUNTY STANDARD DETAILS AND SPECIFICATIONS.

ITEMS WITH DESIGNATIONS (3), (4), (5), AND (6) ARE TO BE ROTATED (ABOUT THE 3" WYE) TO A LOCATION WHICH IS LEVEL WITH THE FLOOR SLAB OR UP TO 30° ABOVE LEVEL AND SUPPORTED IN CONCRETE SUCH THAT NEITHER THE CHAMBER WALLS, FLOOR, OR THE CONCRETE SUPPORT RESTRICT CONNECTION TO THE 3" QUICK DISCONNECT FITTING.

MANHOLE ACCESS TO BE LOCATED PERPENDICULAR TO THE LPFM AS SHOWN IN THE PLAN DETAIL.

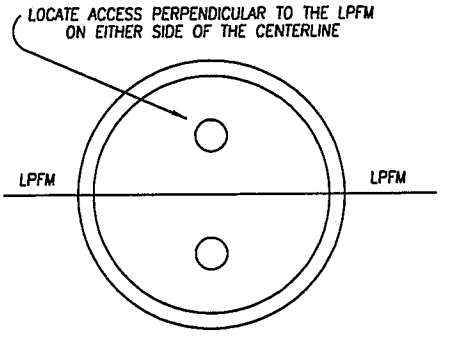


FLUSHING CONNECTION MANHOLE DESIGNATIONS AND GENERAL NOTES

1. LOW PRESSURE SEWER SYSTEM
2. BALL VALVE – FULLY PORTED SIZE OF LPSS MAIN WITH T-HANDLE*
3. WYE – SIZE OF LPSS MAIN W/ 3" BRANCH
4. 3" THREADED ADAPTER – SEARS OR EQUAL
5. 3" BALL VALVE – FULLY PORTED WITH T-HANDLE*
6. 3" STAINLESS STEEL OR ALUMINUM QUICK DISCONNECT FITTING WITH CAP
7. 5' DIAM. MANHOLE
8. CONCRETE SUPPORT
9. CONCRETE BOTTOM (CLASS "C")
10. PRECAST SLAB TOP PER CLERMONT COUNTY DETAILS AND SPECIFICATIONS.
11. WATERTIGHT COVER AND FRAME ADJUST TO GRADE WITH CONC. MH. ADJUSTMENT RINGS (NO BRICK). MORTAR (INSIDE) AND BUTYL MASTIC SEAL (OUTSIDE) TO BE USED BETWEEN RINGS, MH. TOP AND FRAME.

*BALL VALVES TO BE RED/WHITE, 600 WOG, 150 WSP, FIG. #5044F OR EQUAL WITH T-HANDLE

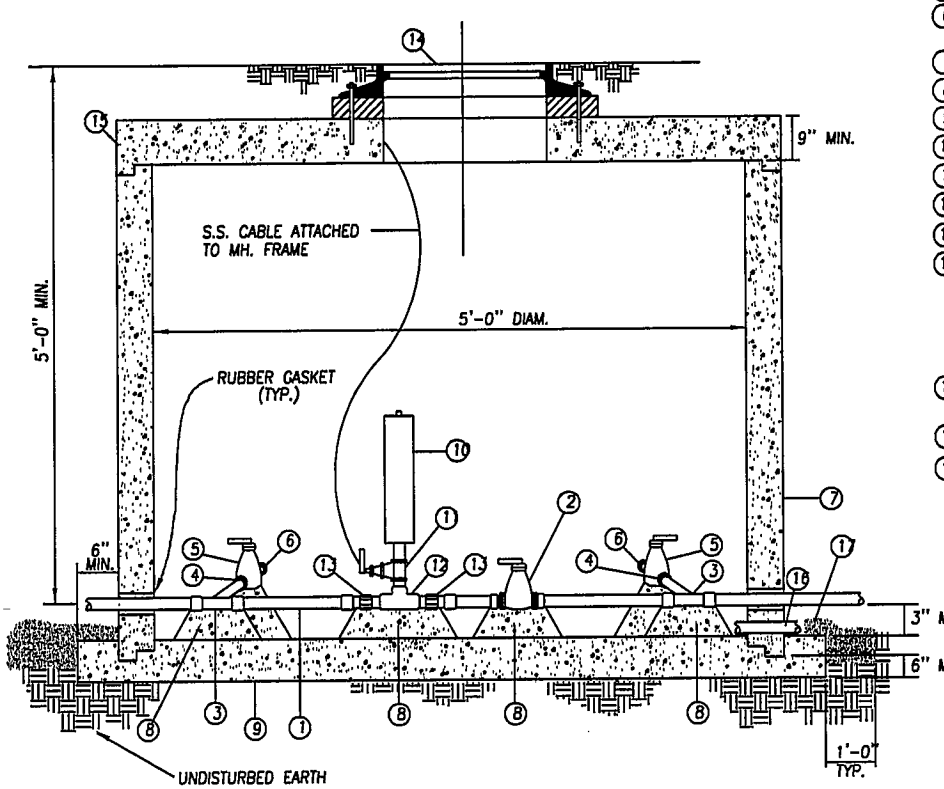
CLERMONT COUNTY WATER RESOURCES DEPARTMENT APPROVED _____ DATE _____	LOW PRESSURE FORCE MAIN FLUSHING CONNECTION MANHOLE	DRAWING NO. S6.4



PLAN DETAIL

NOTES: WHERE APPLICABLE, ALL FEATURES NOT NOTED TO BE THE SAME AS SHOWN ON CLERMONT COUNTY STANDARD DETAILS AND SPECIFICATIONS.

MANHOLE ACCESS TO BE LOCATED PERPENDICULAR TO THE LPFM AS SHOWN IN THE PLAN DETAIL.



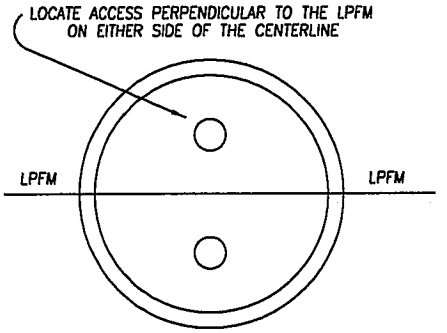
FLUSHING CONNECTION MANHOLE DESIGNATIONS AND GENERAL NOTES

1. LOW PRESSURE SEWER SYSTEM
2. BALL VALVE – FULLY PORTED SIZE PER LPFM WITH T-HANDLE*
3. WYE – SIZE OF LPFM MAIN W/ 3" BRANCH
4. 3" THREADED ADAPTOR – SEARS OR EQUAL
5. 3" BALL VALVE – FULLY PORTED WITH T-HANDLE*
6. 3" STAINLESS STEEL OR ALUMINUM QUICK DISCONNECT FITTING W/ CAP
7. 5' DIAM. MANHOLE
8. CONCRETE SUPPORT
9. CONCRETE BOTTOM (CLASS "C")
10. AIR-RELEASE VALVE**
11. BALL VALVE W/ S.S. CABLE WITH T-HANDLE*
12. TEE-SIZE PER LPFM
13. UNION-SIZE PER LPFM
14. VENTED COVER AND FRAME CLERMONT COUNTY DETAILS AND STANDARDS. ADJUST TO GRADE WITH CONC. MH. ADJUSTMENT RINGS (NO BRICK). NORTAR (INSIDE) AND BUTYL MASTIC SEAL (OUTSIDE) TO BE USED BETWEEN RINGS, MH. TOP AND FRAME.
15. PRECAST SLAB TOP PER CLERMONT COUNTY DETAILS AND STANDARDS.
16. 3" PVC DRAIN PIPE FROM FLOOR TO GRAVEL AREA
17. GRAVEL

*BALL VALVES TO BE RED-WHITE, 600 WOG, 150 WSP, FIG. #5044F OR EQUAL W/ T-HANDLE

**AIR-RELEASE VALVES TO BE APCO, MODEL 443WA OR EQUAL PAINTED WITH EITHER CHLORINATED RUBBER OR EPOXY PAINT IN ACCORDANCE WITH 708.

CLERMONT COUNTY WATER RESOURCES DEPARTMENT	LOW PRESSURE FORCE MAIN FLUSHING MH W/ AIR RELEASE VALVE	DRAWING NO. S6.5
APPROVED _____ DATE _____		

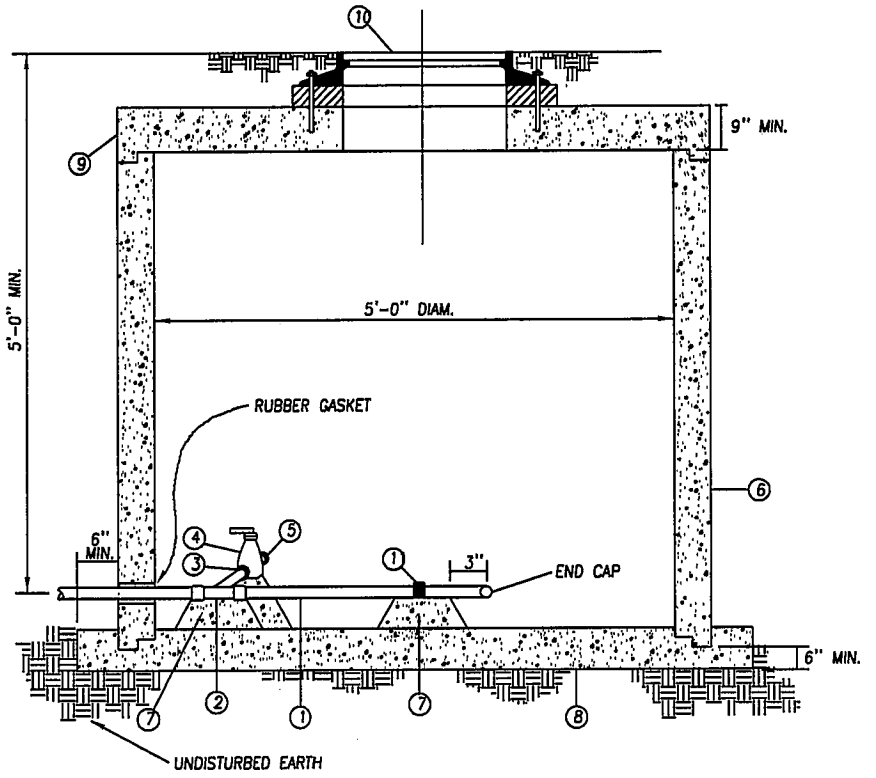


PLAN DETAIL

NOTES: WHERE APPLICABLE, ALL FEATURES NOT NOTED TO BE THE SAME AS SHOWN ON CLERMONT COUNTY STANDARD DETAILS AND SPECIFICATIONS.

ITEMS WITH DESIGNATIONS (2), (3), (4) AND (5) ARE TO BE ROTATED (ABOUT THE 3" WYE) TO A LOCATION WHICH IS LEVEL WITH THE FLOOR SLAB OR UP TO 30° ABOVE LEVEL AND SUPPORTED IN CONCRETE SUCH THAT NEITHER THE CHAMBER WALLS, FLOOR, OR THE CONCRETE SUPPORT RESTRICT CONNECTION TO THE 3" QUICK DISCONNECT FITTING.

MANHOLE ACCESS TO BE LOCATED PERPENDICULAR TO THE LPFM AS SHOWN IN THE PLAN DETAIL.



TERMINAL MANHOLE DESIGNATIONS AND GENERAL NOTES

(1) LOW PRESSURE SEWER SYSTEM

(2) WYE – SIZE OF LPSS MAIN W/ 3" BRANCH

(3) 3" THREADED ADAPTOR – SEARS OR EQUAL

(4) 3" BALL VALVE – FULLY PORTED WITH T-HANDLE*

(5) 3" QUICK DISCONNECT FITTING W/ CAP

(6) 5' DIAM. MANHOLE

(7) CONCRETE SUPPORT

(8) CONCRETE BOTTOM (CLASS "C")

(9) PRE-CAST SLAB TOP

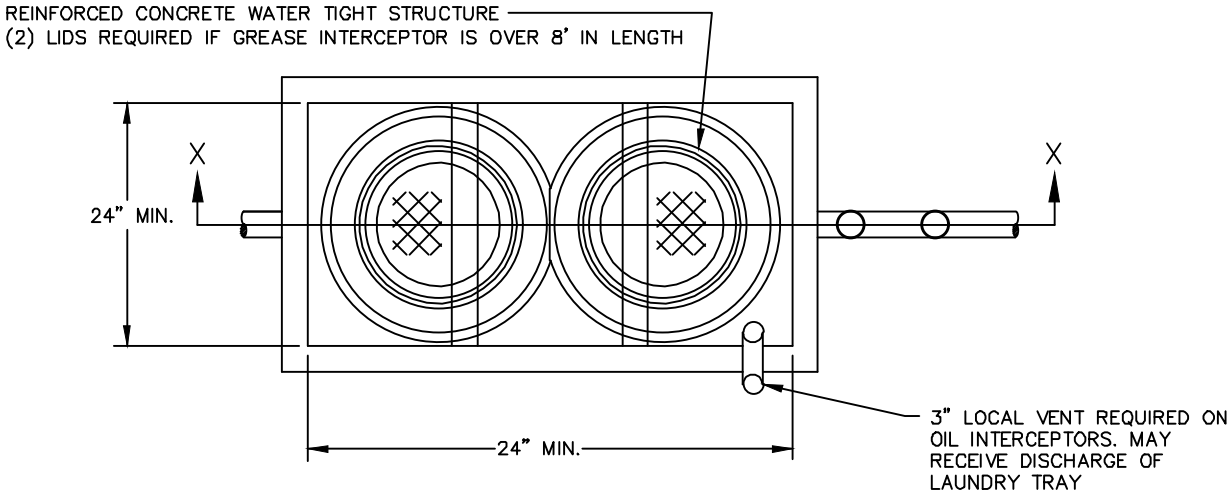
(10) WATERTIGHT COVER AND FRAME ADJUST TO GRADE WITH CONC. MH. ADJUSTMENT RINGS (NO BRICK), MORTAR (INSIDE) AND BUTYL MASTIC SEAL (OUTSIDE) TO BE USED BETWEEN RINGS, MH. TOP AND FRAME.

(11) FASTEN LPFM SECURELY TO BASE AND SUPPORT USING STAINLESS STEEL HARDWARE. STRAPS–2" WIDE, 1/4" THICK. BOLTS–3/8"X 2 1/4" LONG. ANCHORS MAY BE BULL DOG, RED HEAD, WEDGE IT OR QUICK BOLT.

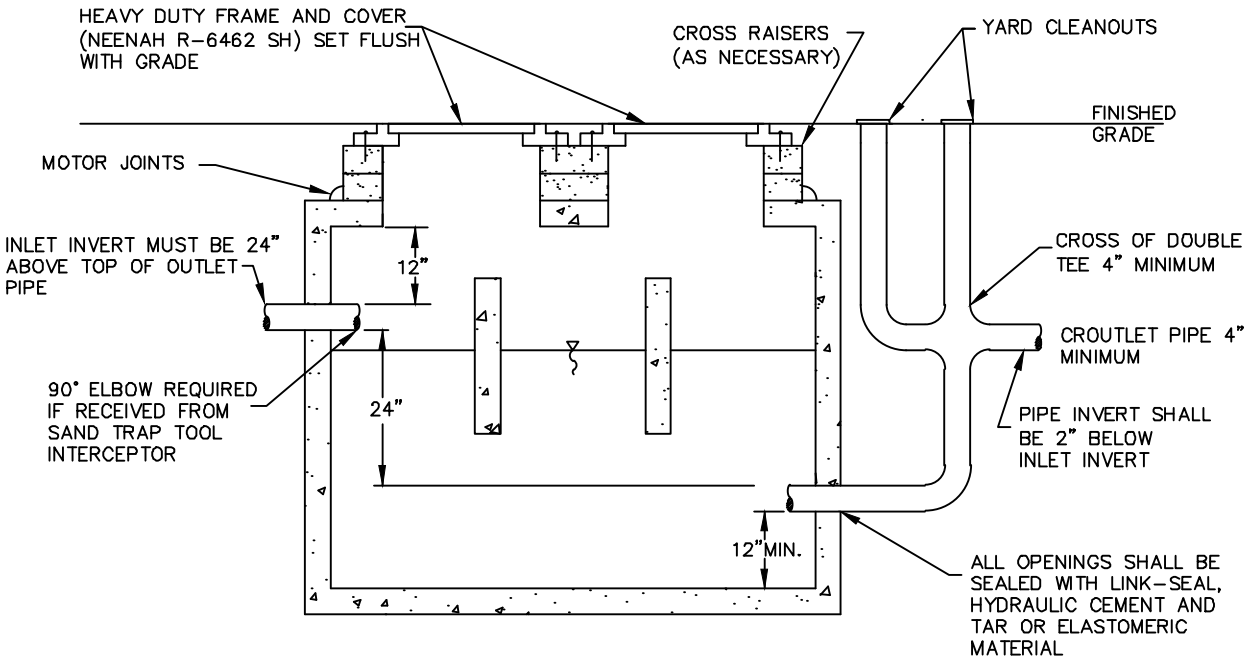
*BALL VALVE TO BE RED/WHITE, 600 WOG, 150 WSP, FIG. #5044F OR EQUAL WITH T-HANDLE.

MANHOLE ACCESS TO BE LOCATED PERPENDICULAR TO THE LPFM AS SHOWN IN THE PLAN DETAIL.

CLERMONT COUNTY WATER RESOURCES DEPARTMENT	LOW PRESSURE FORCE MAIN TERMINAL MANHOLE	DRAWING NO. S6.6
APPROVED _____ DATE _____		



PLAN



SECTION X-X

NOTES:

1. DRAWING IS FOR REFERENCE ONLY, NOT FOR CONSTRUCTION.

2. INTERCEPTOR SHALL BE DESIGNED AND SIZED IN ACCORDANCE WITH OAC 4101:3-10-01.

NO SCALE

CLERMONT COUNTY WATER RESOURCES DEPARTMENT APPROVED _____ DATE _____	GRAVITY GREASE INTERCEPTOR	DRAWING NO. S7.1