

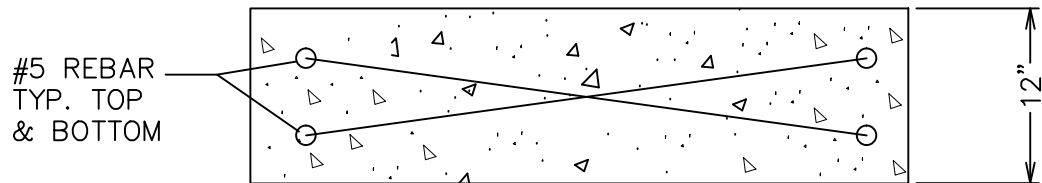
APPENDIX B
STANDARD DRAWINGS
CLERMONT COUNTY WATER RESOURCES DEPARTMENT
CLERMONT COUNTY, OHIO

STANDARD DRAWINGS

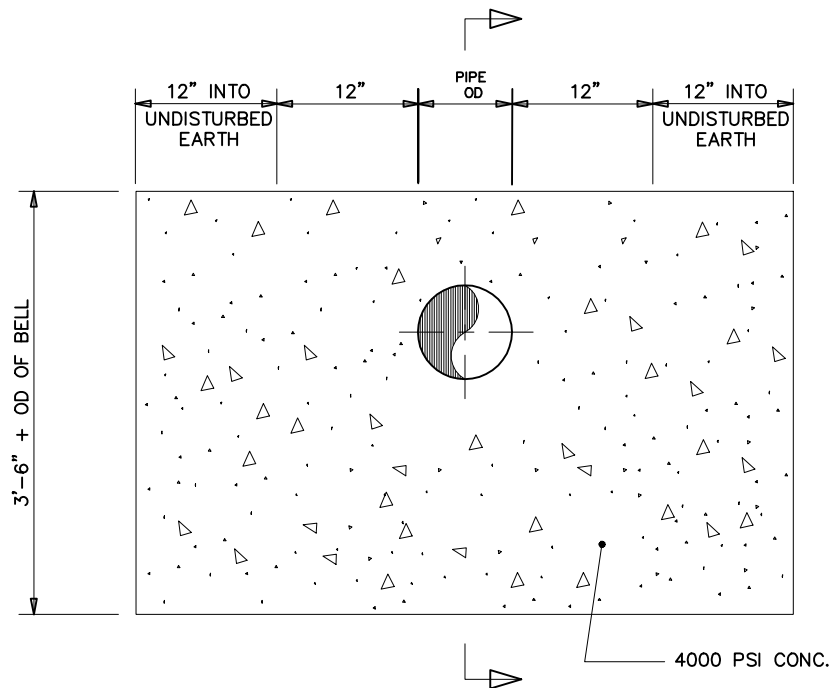
<u>Drawing No.</u>	<u>Title</u>
General Details	
G1.1	Keyblock Anchors for Water or Sewer Mains on Steep Slopes
G1.2	Stream Crossing Concrete Encasement Detail
G1.3	Concrete Blocking for Pipe Fittings on Water & Force Mains
Water Distribution System	
W1.0	General Water Notes
W1.1	Gate and Butterfly Valves
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
W3.3.1	1-1/2"& 2" Meter Box Detail
W3.4	Water Service Connection Detail
W4.1	Fire Protection with Detector Check
W4.2	Dual Service Branch Setting-Domestic Meters 2" & Smaller
W4.3	3" & Larger Standard Meter Pit Arrangement
W4.4	Dual Service Branch Setting-3" & Larger Meters
W4.5	Standard Water System Chamber
W4.6	Chamber Access Ladder
W5.1	Water Main Trench Section
W5.2	Water Main Lowering Detail
W6.1	Isolation/Access Valve and Manhole
Wastewater Collection System	
S1.0	General Sanitary Sewer Notes
S1.1	Standard Manhole for Sewers 8" to 18"
S1.2	Standard Manhole for Sewers 21" to 36"
S1.3	Standard Manhole for Sewers 42"& Larger
S1.4	Inside Drop Manhole
S1.6	Manhole Frame with Vented Lid
S1.7	Manhole Frame with Self Sealing Lid
S1.8	Watertight Frame with Bolt Down Lid
S1.9	Manhole Step – Copolymer
S1.10	IWPT Sampling Manhole
S1.11	Manhole Base "Doghouse" Installation
S2.1	Sanitary Sewer Trench Section
S2.3	Creek Crossing Aerial Type
S2.4	Support Pier
S3.1	Sewer Lateral Installation
S3.2	Dual Service Residential Lateral

S4.1	Commercial Sewer Service Installation
S4.2	Residential Sewer Service Installation
S4.3	Standard Connection to Sewers 12" and Larger

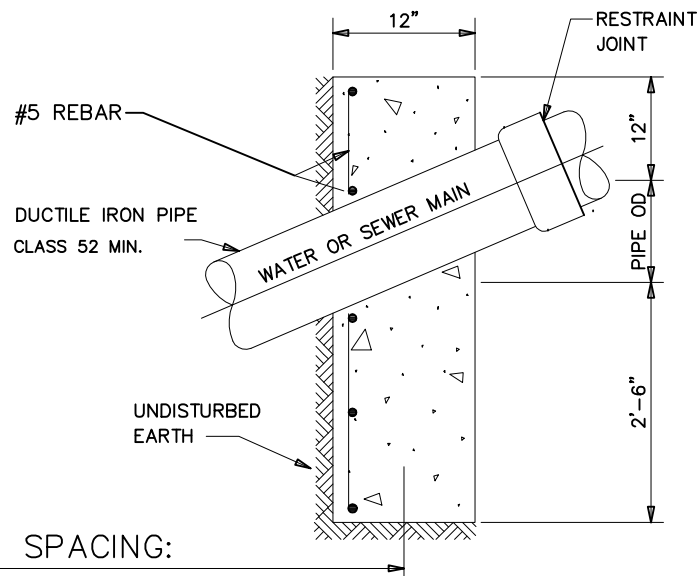
<u>Drawing No.</u>	<u>Title</u>
S5.1	Lift Station Layout
S5.1.1	Bar Screen Manhole Detail
S5.1.2	Lift Station Detail
S5.1.3	Valve Chamber Detail
S5.1.4	Wet Well Electric Detail
S5.1.5	Duplex Lift Station Control Panel General Layout
S5.1.6	Duplex Lift Station I/O List
S5.1.7	Lift Station Conduit Routing
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)
S6.1.1	Standard Septic Tank Effluent Gravity (STEG)
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

KEYBLOCK ANCHORS FOR
WATER OR SEWER MAINS
ON STEEP SLOPES

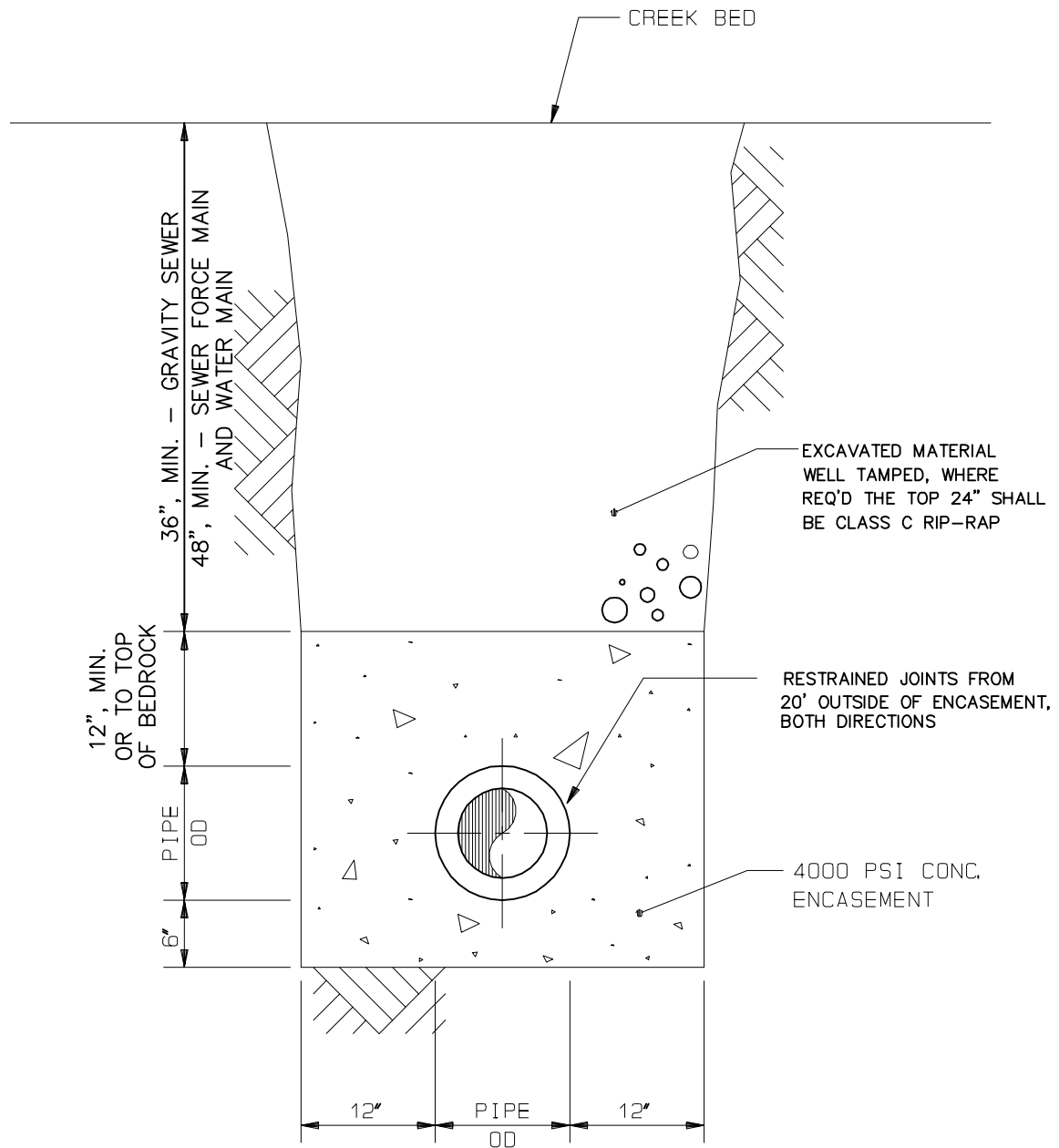
DRAWING NO.

G1.1

APPROVED _____

DATE _____

REVISED JUNE, 2013



NO SCALE

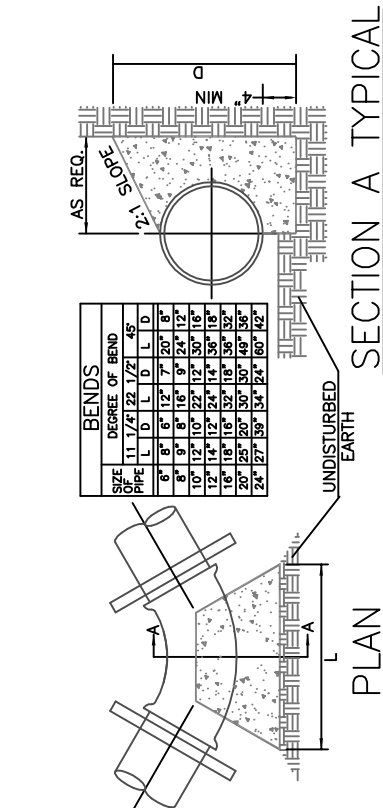
CLERMONT COUNTY
WATER RESOURCES DEPARTMENT

APPROVED _____
DATE _____

STREAM CROSSING
CONCRETE
ENCASEMENT DETAIL

DRAWING NO.

G1.2



SECTION A TYPICAL

BENDS 45° AND UNDER

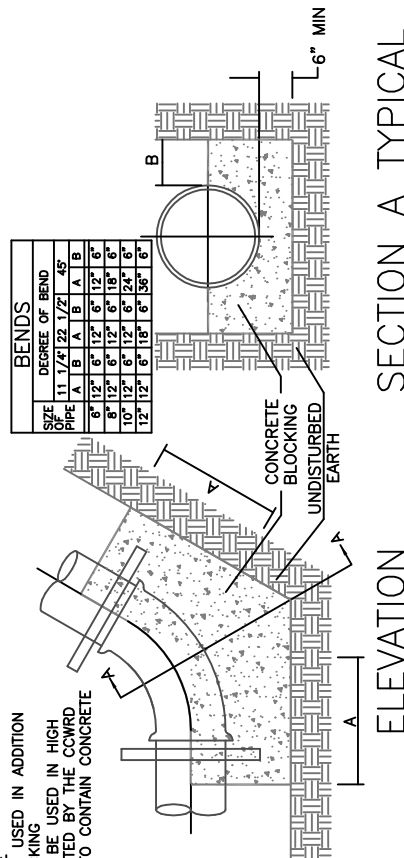
SECTION A TYPICAL

ELEVATION

TOP VERTICAL BENDS

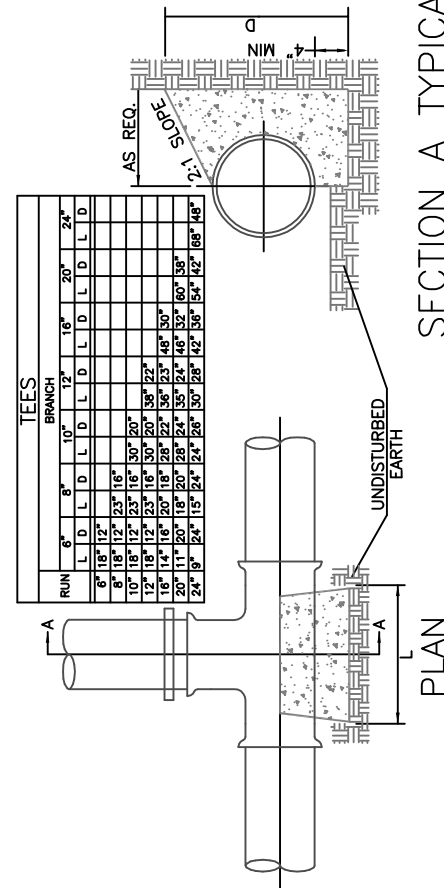
N.T.S.

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 CCMWD
8. INDUSTRY FORMS USED TO CONTAIN CONCRETE IN THRUST AREA



SECTION A TYPICAL

BOTTOM VERTICAL BENDS

D/S:
N.T.S.

SECTION A TYPICAL

TEES
N.T.S.

N.T.S.

CLERMONT COUNTY
WATER RESOURCES DEPARTMENT

APPROVED _____
DATE _____

REVISED DEC. 2018

CONCRETE BLOCKING FOR PIPE FITTINGS ON WATER & FORCE MAINS

DRAWING NO.

G1.3

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 CONTRACTOR IS EXPECTED TO BE FAMILIAR WITH THE SITE PRIOR TO CONSTRUCTION.

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

CONTRACTOR IS REQUIRED TO SHORE 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 THEIR 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 THE ORIGINAL CONDITION OF SAME.

RESTORATION: TEMPORARY RESTORATION AND RESTORATION WITHIN AND 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 THEIR 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, THEY 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 THEIR IMPENDING OPERATIONS, BUT IN NO WAY SHALL SUCH NOTICE RELIEVE THE CONTRACTOR OF THEIR 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:

- CONTRACTOR MUST CHOOSE DATE THAT ALLOWS MAINTENANCE AT LEAST 1 WEEK TO PLAN SHUTDOWN
- 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 APPURTENANCES MUST BE PROPERLY DISINFECTED 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, PER CCWRD INSTRUCTION. 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 ACCORDANCE 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 CLERMONT COUNTY WATER RESOURCES DEPARTMENT. 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 AWWA 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 APPURTENANCES, 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 TORQUE 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 HENRY 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.

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.

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.

ANGLE VALVES FOR RELOCATED ¾" 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
¾" 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 IF STILL IN OPERABLE CONDITION. CONTRACTOR IS RESPONSIBLE FOR REPLACING ANY SUCH COMPONENTS DAMAGED WHILE ATTEMPTING TO REMOVE.

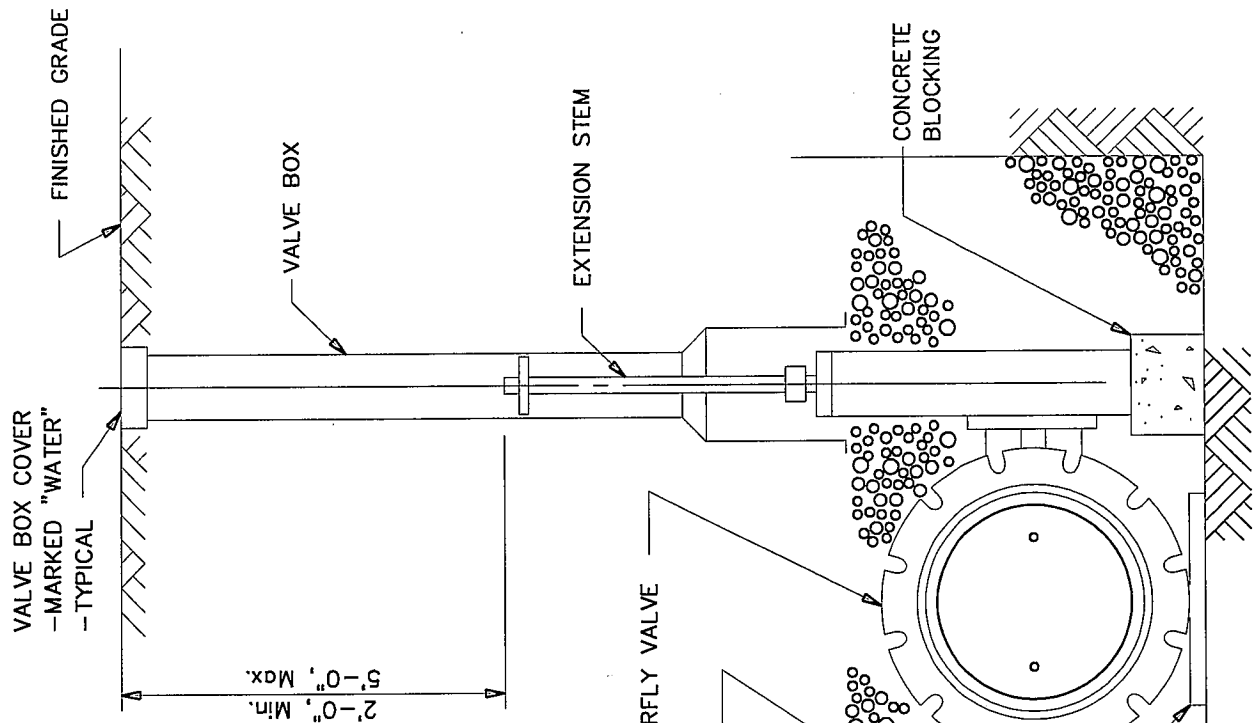
METER ASSEMBLIES FOR 1 ½" AND 2" DOMESTIC METERS SHALL BE IN ACCORDANCE WITH THE FOLLOWING SCHEDULE AND INSTALLED ACCORDING TO CLERMONT COUNTY WATER RESOURCES 1 DEPARTMENT STANDARD DRAWINGS:
1 ½" METERS- FORDVH76-18-11-66-G-NL
2" METERS- FORDVH77-18-11-77-G-NL.

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.

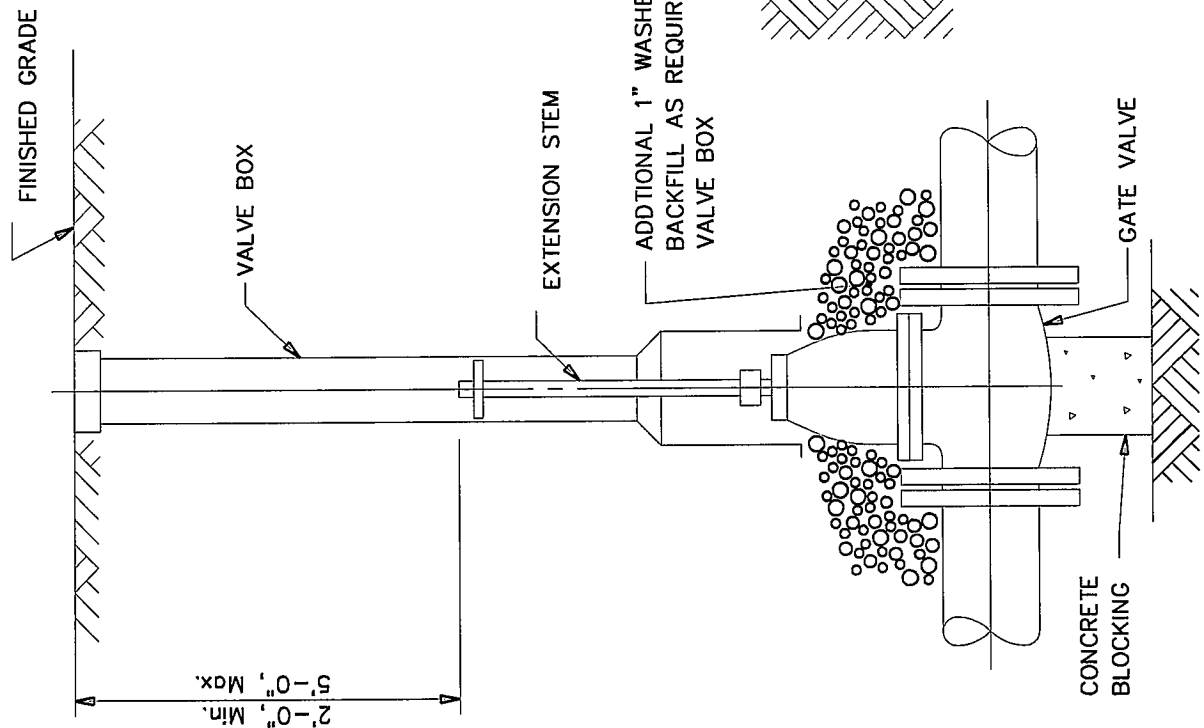
CONTRACTOR MUST SUBMIT LITERATURE AND/OR CATALOG CUT SHEETS FOR REVIEW AND APPROVAL PRIOR TO ORDERING OF ALL MATERIAL AND FITTINGS TO BE USED ASSOCIATED WITH THE INSTALLATION OF 2" AND SMALLER SINGLE, DOMESTIC WATER SERVICES.

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	GENERAL WATER NOTES
REVISION #1 – GATE VALVES & BUTTERFLY VALVES	3/13/17	
REVISION #2 – TESTING OF WATER MAIN	8/19/17	
REVISION #3 – ADDITIONAL COMMENTS	9/13/17	
REVISION #4 – FURTHER LANGUAGE UPDATES	2/27/26	SCALE: N/A
	DATE: FEBRUARY 2026	W 1.0



BUTTERFLY VALVE BOX



GATE VALVE BOX

NO SCALE

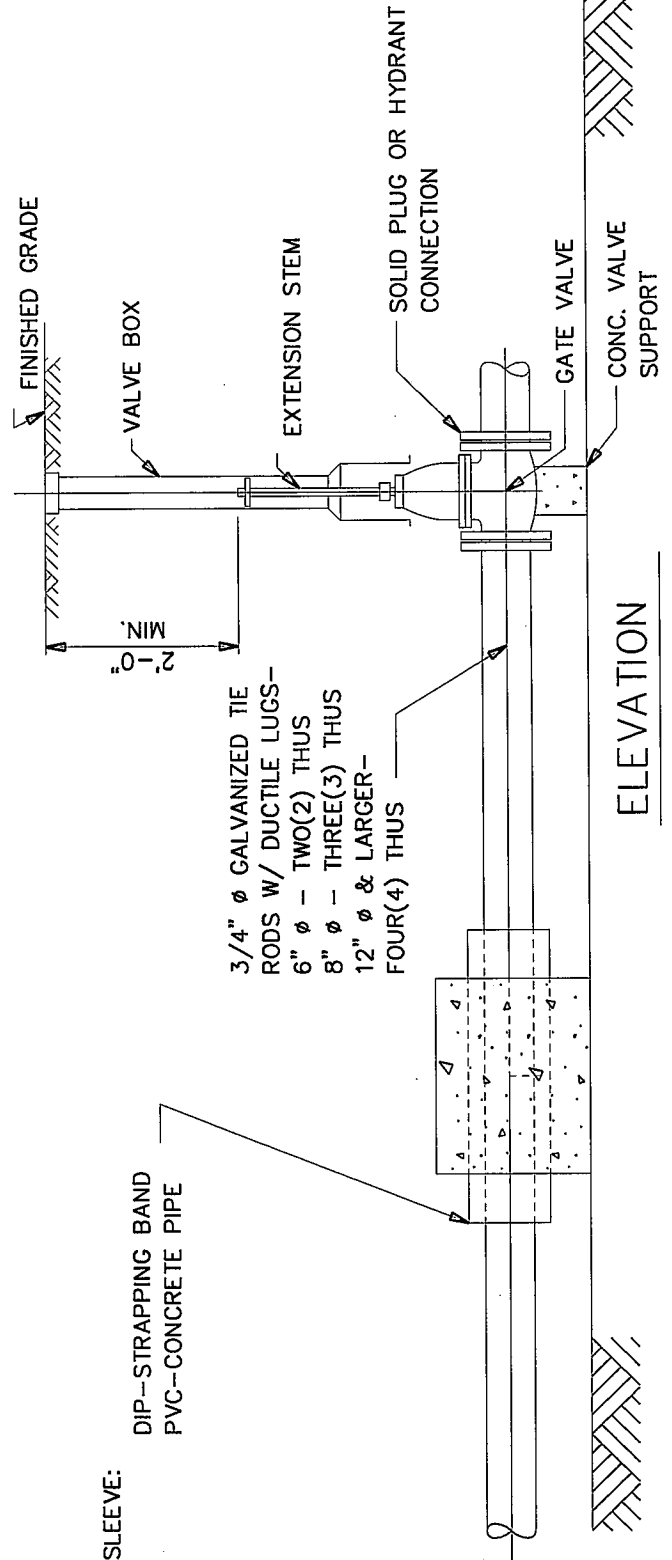
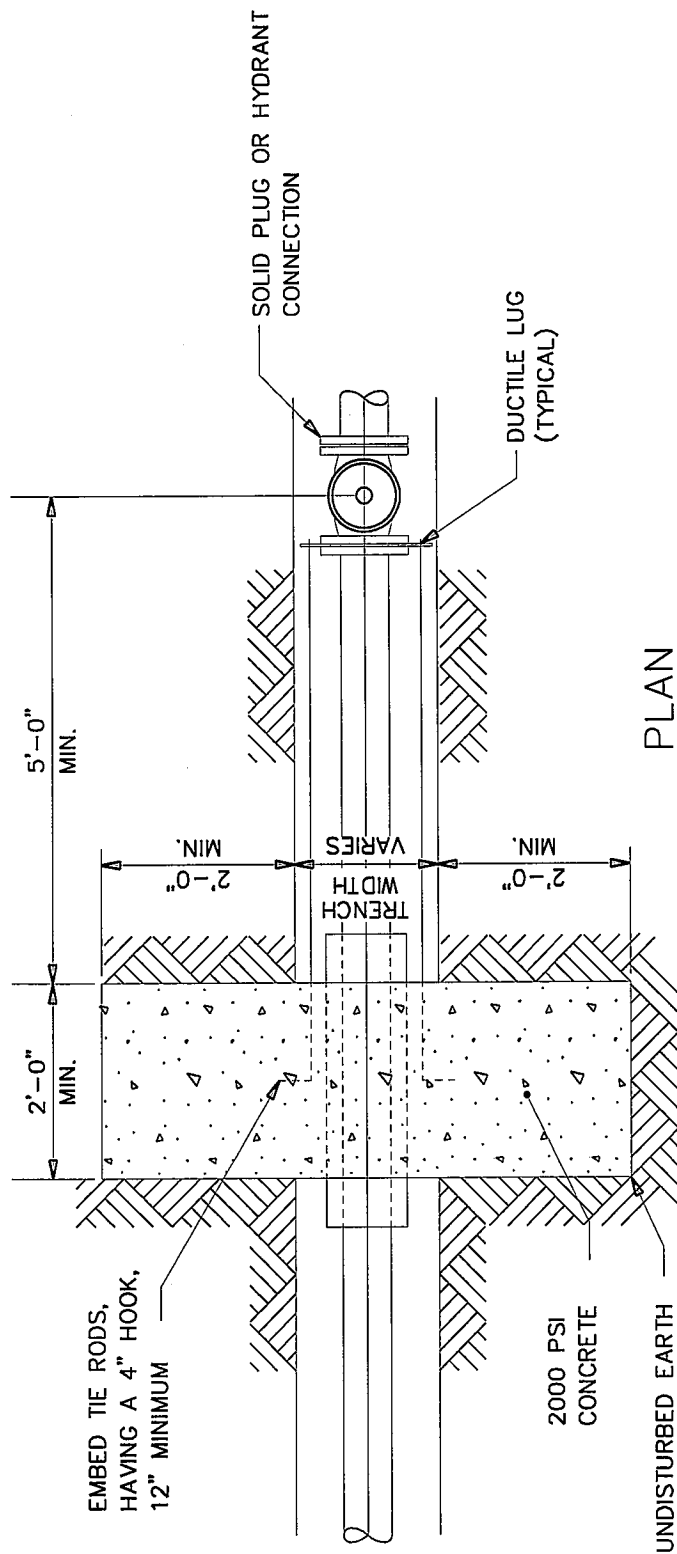
CLERMONT COUNTY
WATER RESOURCES DEPARTMENT

APPROVED _____
DATE _____

GATE & BUTTERFLY
VALVES

DRAWING NO.

W1.1



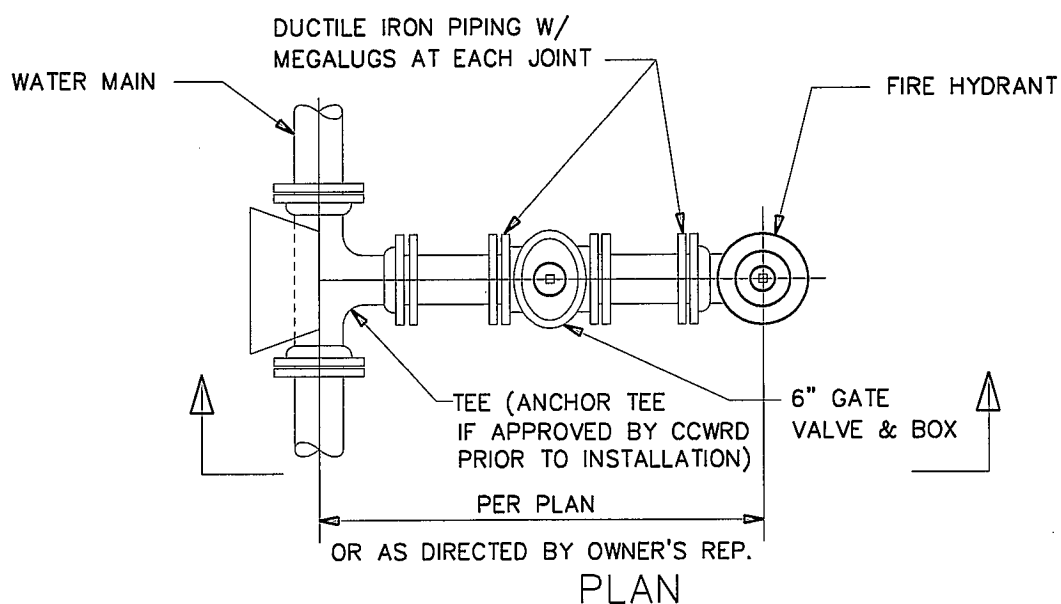
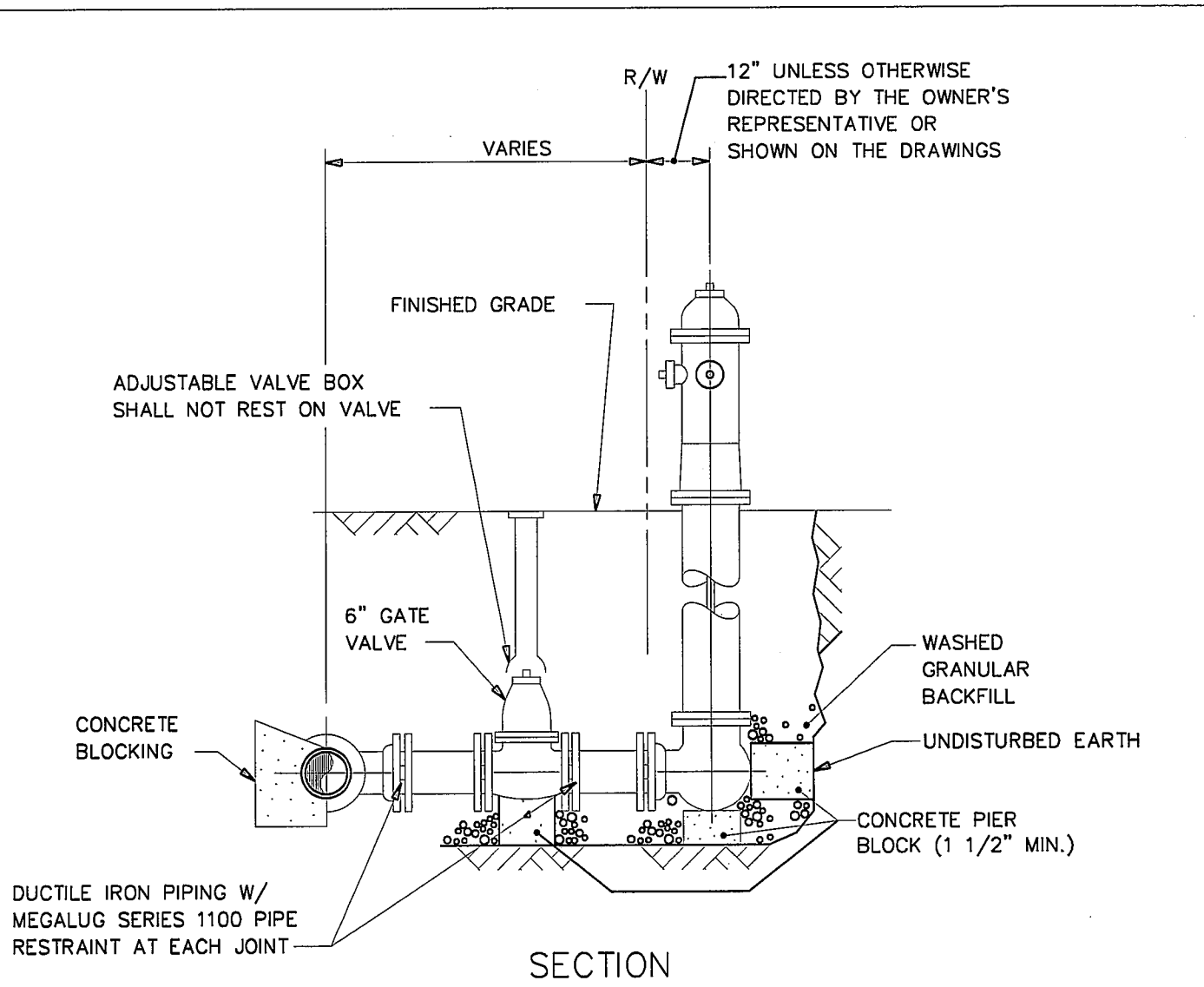
CLERMONT COUNTY
WATER RESOURCES DEPARTMENT

APPROVED _____
DATE _____

VALVE RESTRAINT
BLOCKING

DRAWING NO.

W1.2



NO SCALE

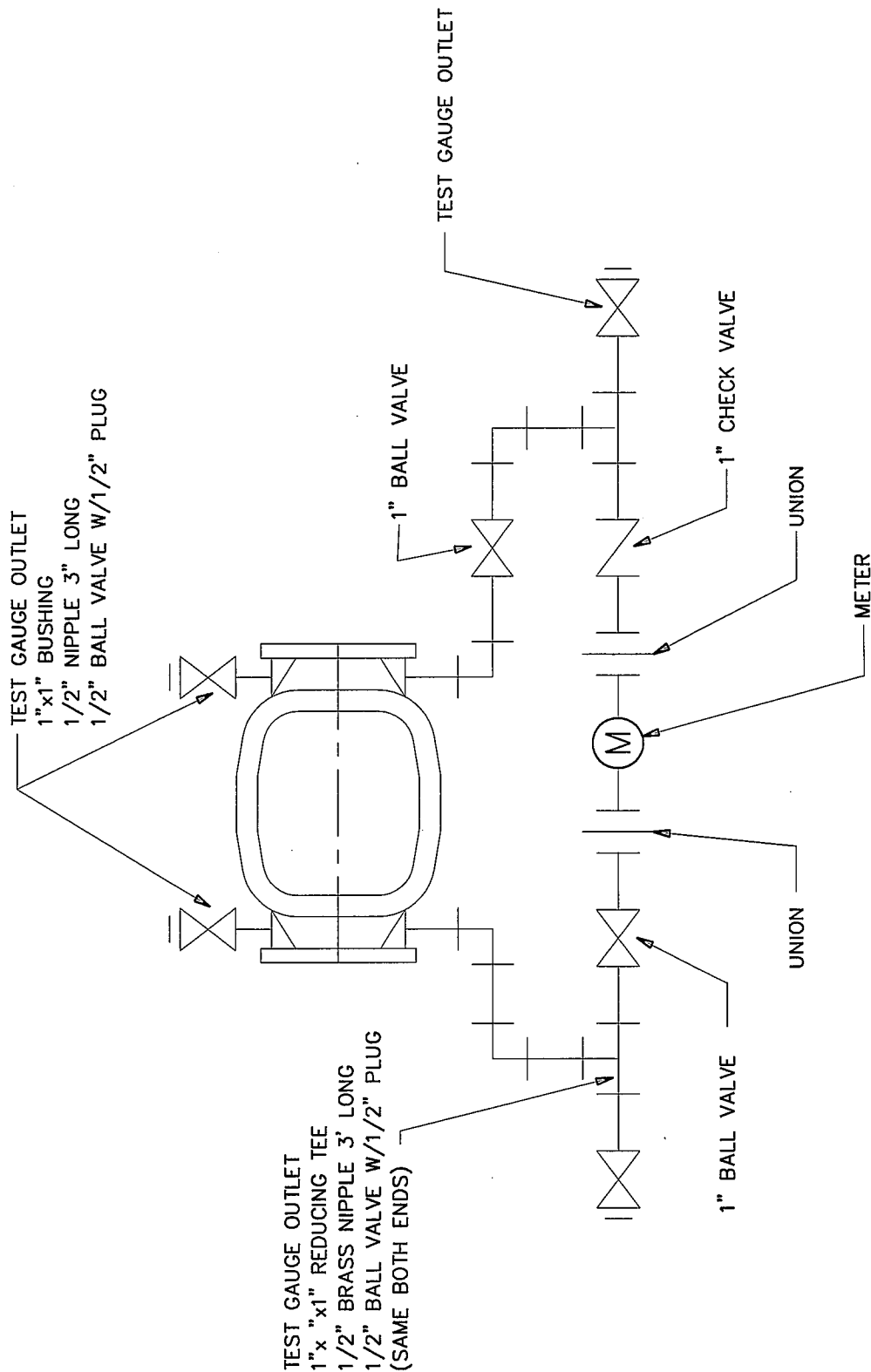
CLERMONT COUNTY
WATER RESOURCES DEPARTMENT

APPROVED _____
DATE _____

FIRE HYDRANT
LAYOUT & ASSEMBLY

DRAWING NO.

W2.1



NO SCALE

CLERMONT COUNTY
WATER RESOURCES DEPARTMENT

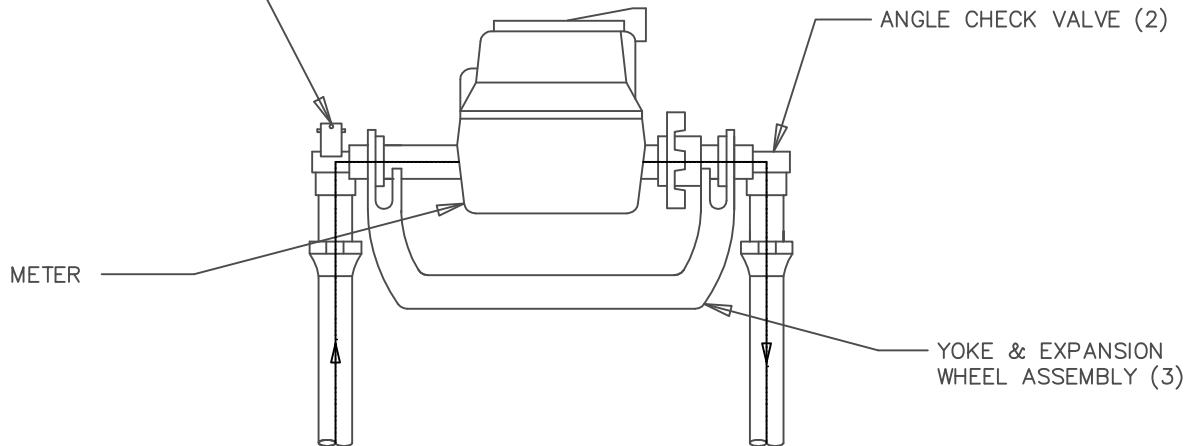
APPROVED _____
DATE _____

DETECTOR
CHECK VALVE
ASSEMBLY

DRAWING NO.

W3.1

ANGLED YOKE VALVE
COMPRESSION COPPER
W/ PADLOCK WING (1)



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

NOTE:

METERS SHALL BE PURCHASED FROM CCWRD

METER SIZE	1	2	3
$\frac{5}{8}$ " $\times$ $\frac{3}{4}$ "	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 _____

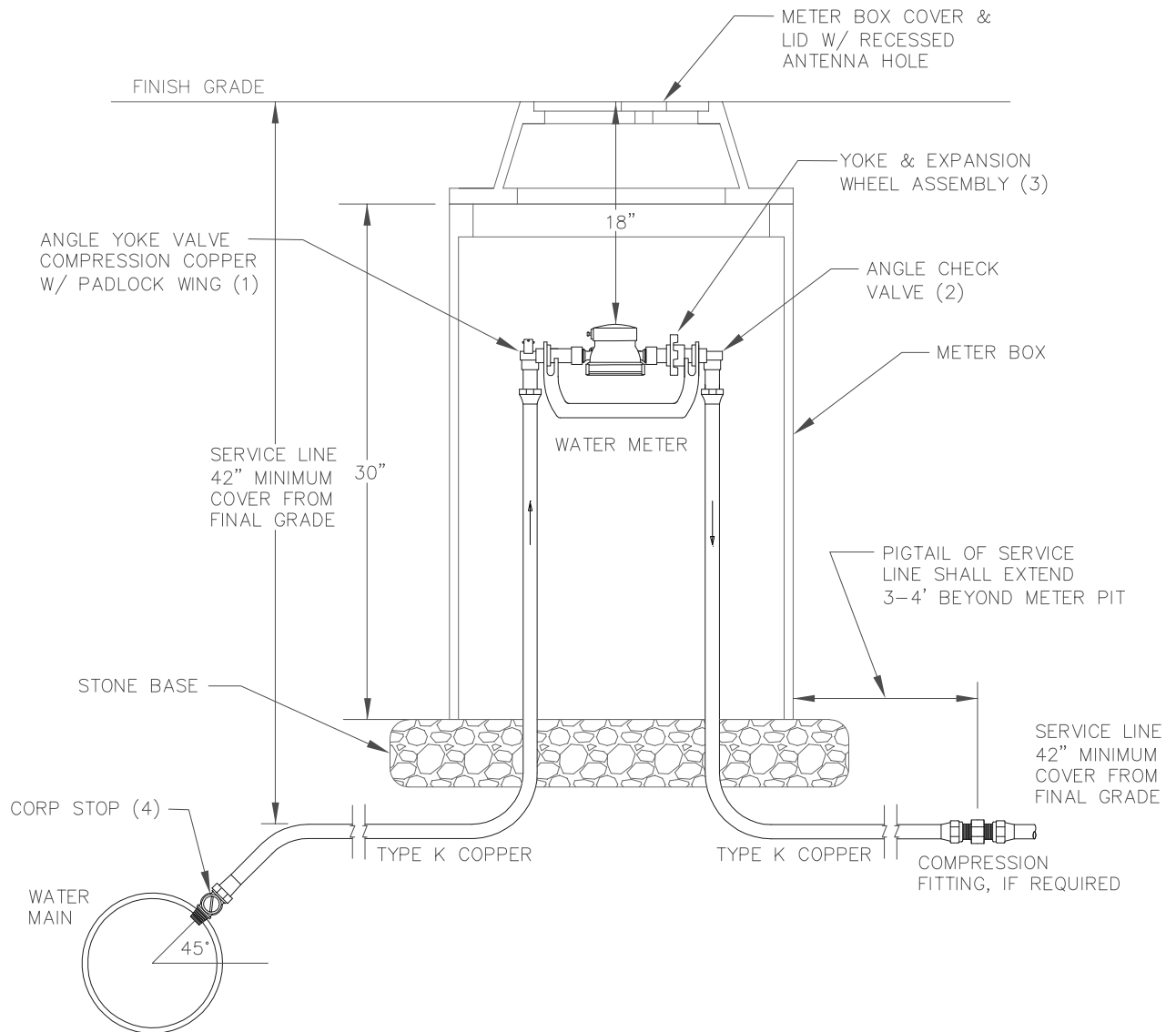
DATE _____

REVISED MAY 2016

$\frac{5}{8}$ " $\times$ $\frac{3}{4}$ " & 1"
DOMESTIC METERS
ASSEMBLY

DRAWING NO.

W3.2



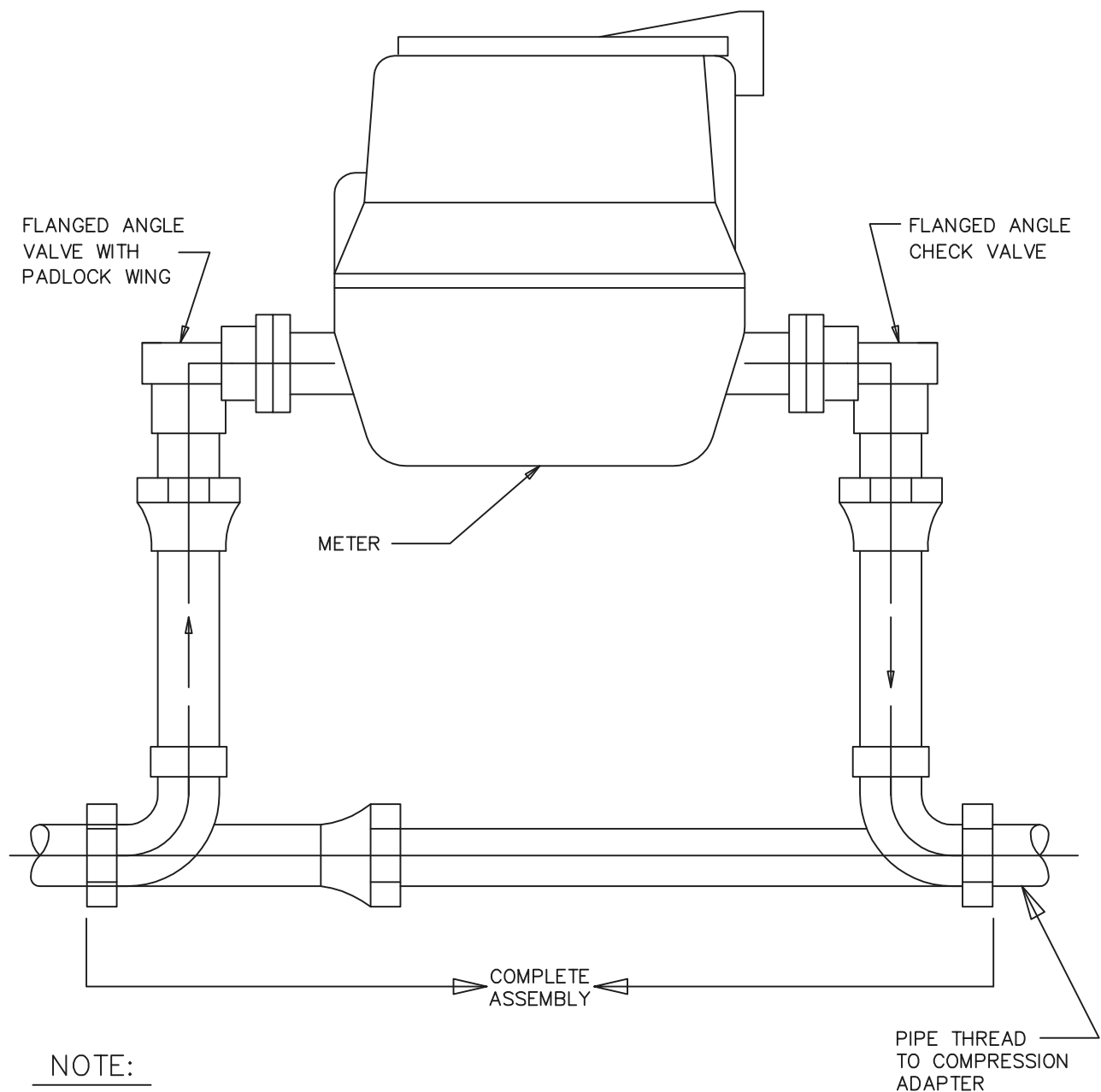
METER SIZE	ANGLE YOE VALVE W/ PADLOCK WING (1)	ANGLE CHECK VALVE (2)	YOKE & EXPANSION WHEEL ASSEMBLY (3)	CORP STOP (4)
5/8" x 3/4"	FORD AV94-323-WG-NL OR APPROVED EQUAL	FORD HA94-323-G-NL OR APPROVED EQUAL	YOKE - FORD Y502, WHEEL-EC-23-NL OR APPROVED EQUAL	3/4" ONLY FORD F1000-3-G-NL
1"	FORD AV94-444-WG-NL 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	5/8"X3/4" & 1" METER BOX DETAIL	DRAWING NO. W3.2.1
APPROVED _____ DATE _____		



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 _____

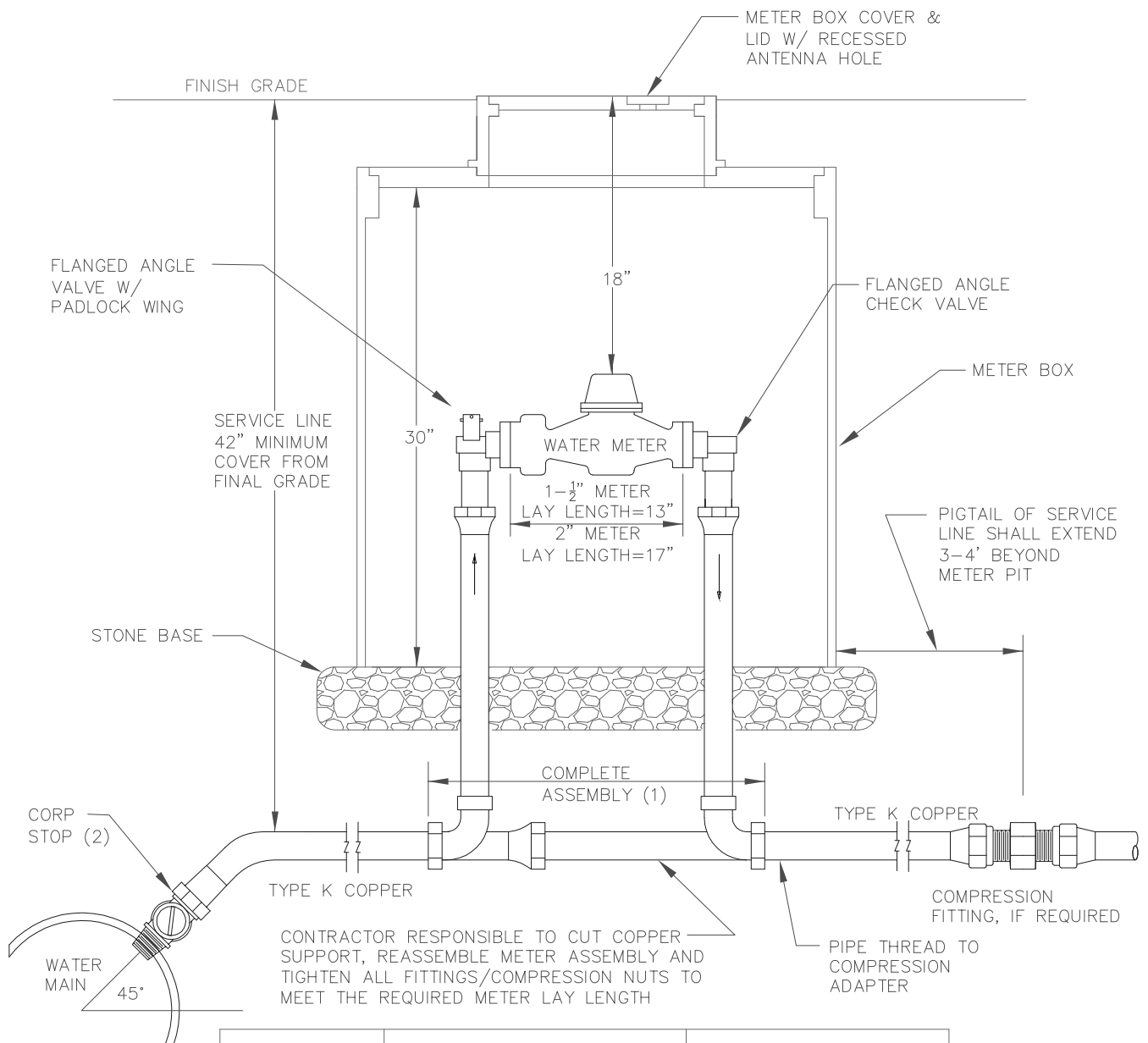
DATE _____

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	1 1/2" & 2" METER BOX DETAIL	DRAWING NO. W3.3.1
APPROVED _____ DATE _____		

TYPE 1 CONNECTION

Diagram illustrating the proposed water service line replacement project:

- REPLACEMENT OF WATER MAIN:** Indicated by a bracket at the top of the diagram.
- EX. WATER SERVICE TO BE ABANDON:** The existing service line on the left side of the diagram.
- PROP. PAK JOINT VALVE OR WATER TIGHT CAP:** Located at the intersection of the existing water main and the proposed water service line.
- EX. WATER SERVICE TO BE REMOVED:** The existing water service line on the right side of the diagram.
- EX. W.M. (Existing Water Main):** Represented by a circle on the left.
- PROP. W.M. (Proposed Water Main):** Represented by a circle on the right.
- TRENCH:** A vertical line indicating the excavation path for the proposed water main.
- PROP. COUP. (Proposed Coupling):** Located at the intersection of the proposed water main and the proposed water service line.
- EX. GRADE:** The existing ground level, indicated by a horizontal line.
- EX. METER SETTING:** The existing meter box, shown as a rectangular structure.
- EX. SERVICE LINE:** The existing service line on the far right.
- 42":** The vertical distance from the existing grade to the top of the meter box.
- REPLACE COPPER SERVICE LINE TO 1' FROM METER BOX:** A note indicating the replacement of the existing copper service line near the meter box.
- PROP. WATER SERVICE:** The proposed water service line, shown as a solid line.
- PROP. CORP. STOP:** The proposed corporation stop, located at the intersection of the proposed water main and the proposed water service line.

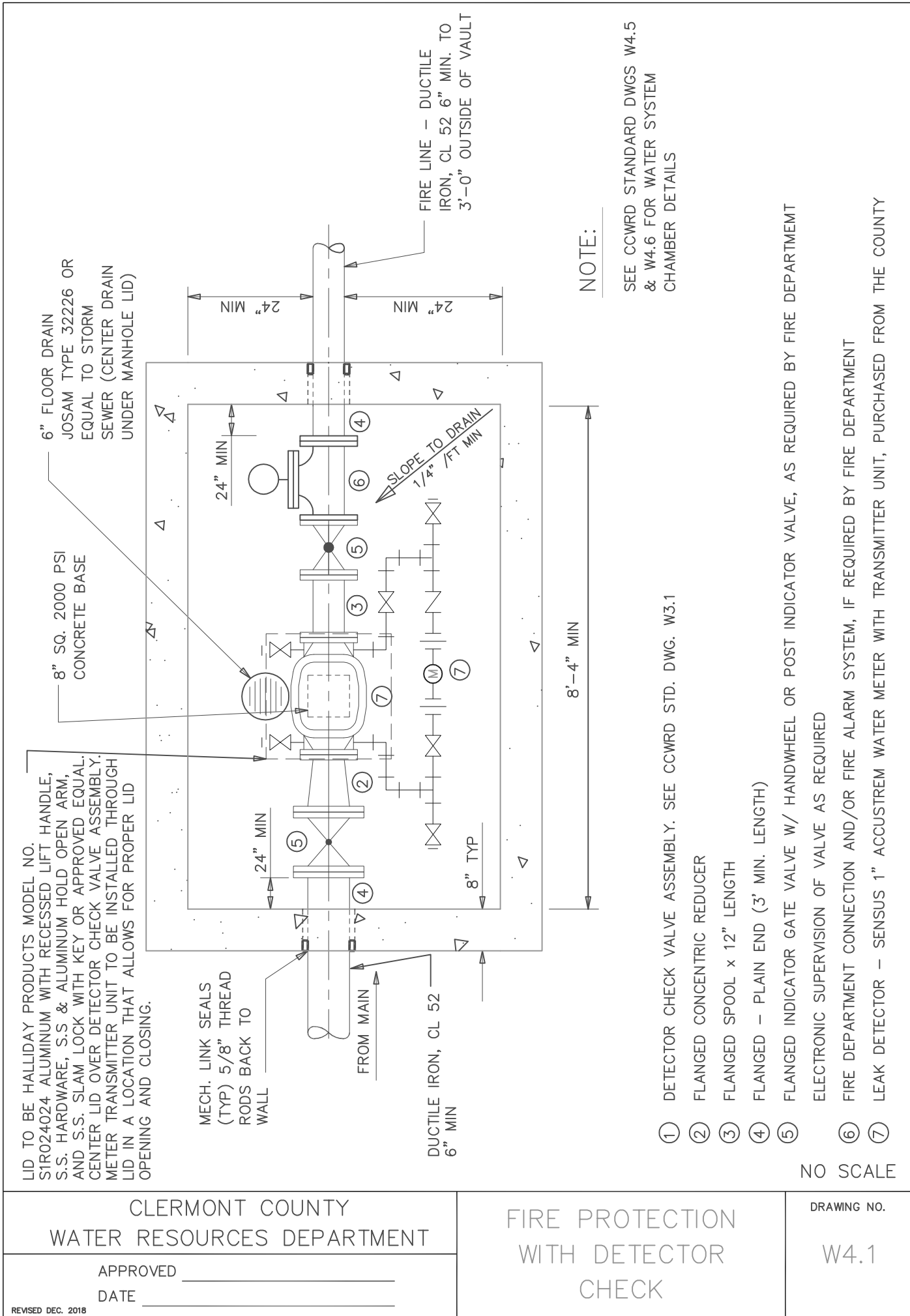
The diagram illustrates the layout for a water meter replacement. Key components and labels include:

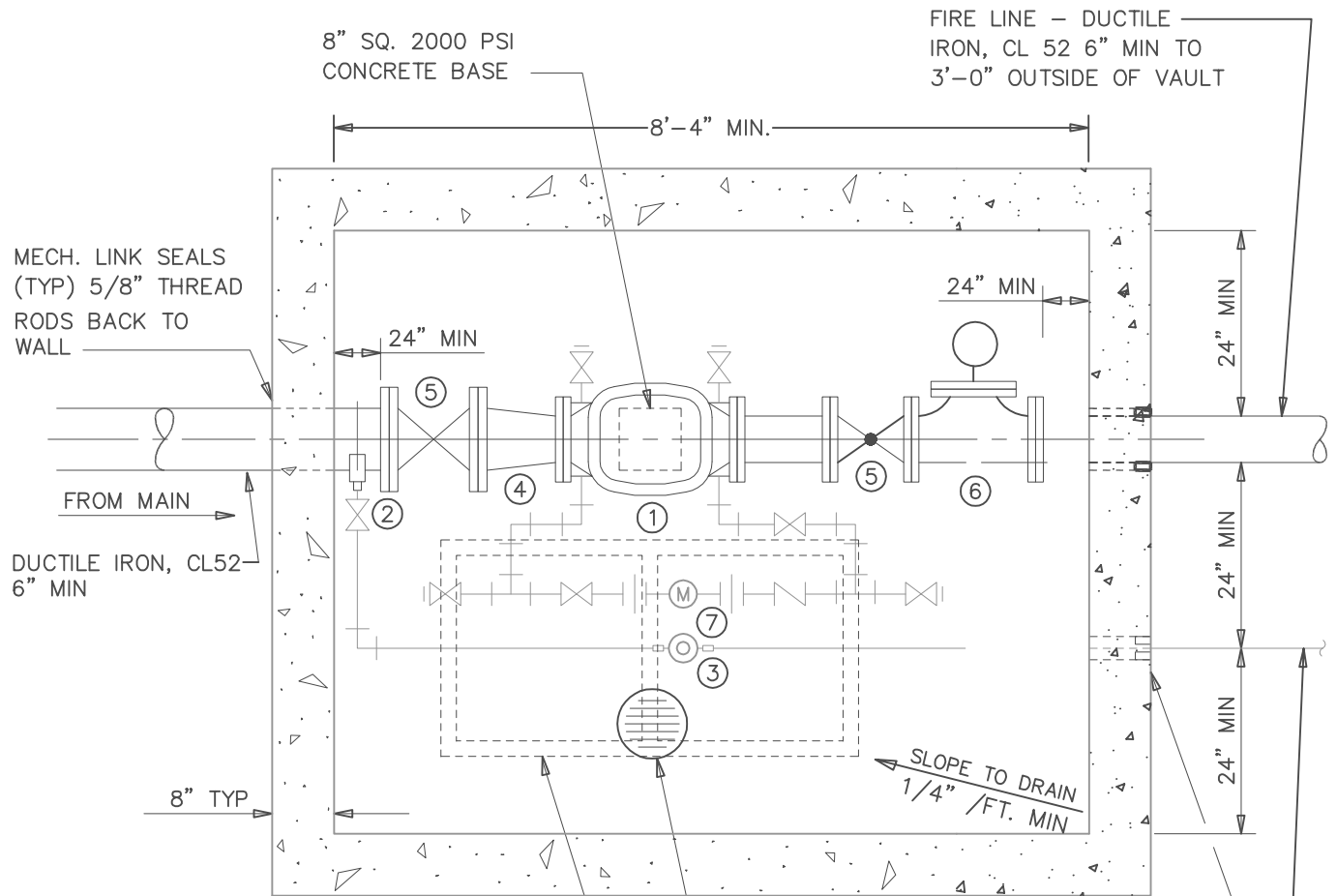
- REPLACEMENT OF WATER MAIN**: Indicated by a line at the top of the diagram.
- EX. GRADE**: Ground level markers on the left and right sides.
- TRENCH**: A vertical line on the left side representing the excavation.
- PROP. WATER SERVICE**: The new service line being installed.
- EX. WATER SERVICE TO BE ABANDON**: The existing service line to be removed.
- PROP. CORR. STOP**: A proposed corrosion stop on the new service line.
- EX. W.M.**: Existing water main connection points.
- REPLACE COPPER SERVICE LINE TO 1' FROM METER BOX**: A note indicating the section of the service line to be replaced near the meter.
- 42"**: A dimension indicating the depth of the meter box.
- EX. METER SETTING**: The existing meter and its setting.
- EX. SERVICE LINE**: The existing service line exiting the meter box.
- PROP. COUPLING**: A proposed coupling for the new service line.
- PROP. PACK JOINT VALVE OR WATER TIGHT CAP**: A proposed valve or cap for the new service line.

The diagram illustrates the process of relocating a water meter. On the left, an existing meter is shown within a dashed box labeled 'REMOVED EX. METER SETTING'. It is connected to an 'EX. W.M.' (existing water main) via a 'PROP. PACK JOINT VALVE OR WATER TIGHT CAP'. A line labeled 'EX. WATER LINE TO BE REMOVED.' extends from the meter. A 'RELOCATE METER PIT ASSEMBLY' is shown being moved to a new location on the right. The new assembly is connected to a 'PROP. W.M.' (proposed water main) via a 'PROP. CORR. STOP' (proposed corrosion stop). The 'PROP. WATER SERVICE' line runs from the stop to the meter, with a note to 'REPLACE COPPER SERVICE LINE TO COUPLING 3' BEYOND METER BOX'. The meter is connected to the 'PROP. METER SETTING*' and a 'PROP. COUPLING'. The entire setup is shown relative to 'EX. GRADE' (existing ground level) and a 'TRENCH'.

APPROVED _____
DATE _____

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





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.

MASTIC WATER TIGHT SEAL
UR227 NS JOINT
SEALANT OR EQUAL

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

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

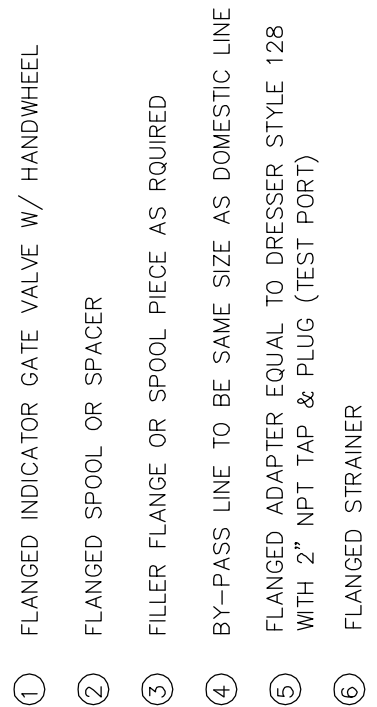
CLERMONT COUNTY
WATER RESOURCES DEPARTMENT

DUAL SERVICE
BRANCH SETTING—
DOMESTIC METERS
(2" & SMALLER)

DRAWING NO.

W4.2

APPROVED _____
DATE _____



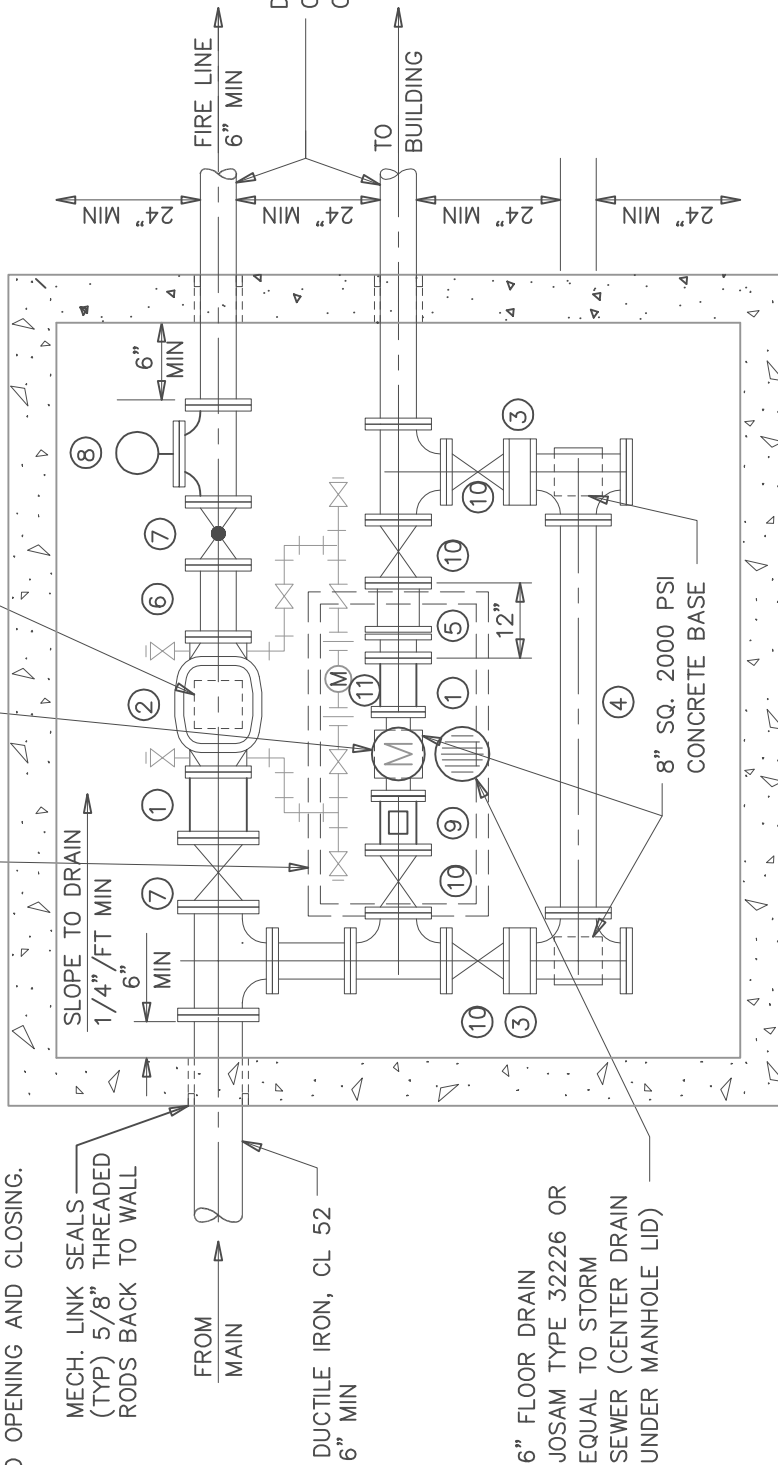
SEE CCWRDD STANDARD DWGS W4.5
& W4.6 FOR WATER SYSTEM
CHAMBER DETAILS

W4.3

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.

METER & TRANSMITTER UNIT

8" SQ. 2000 PSI CONCRETE BASE



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.

NO SCALE

DRAWING NO.

W4.4

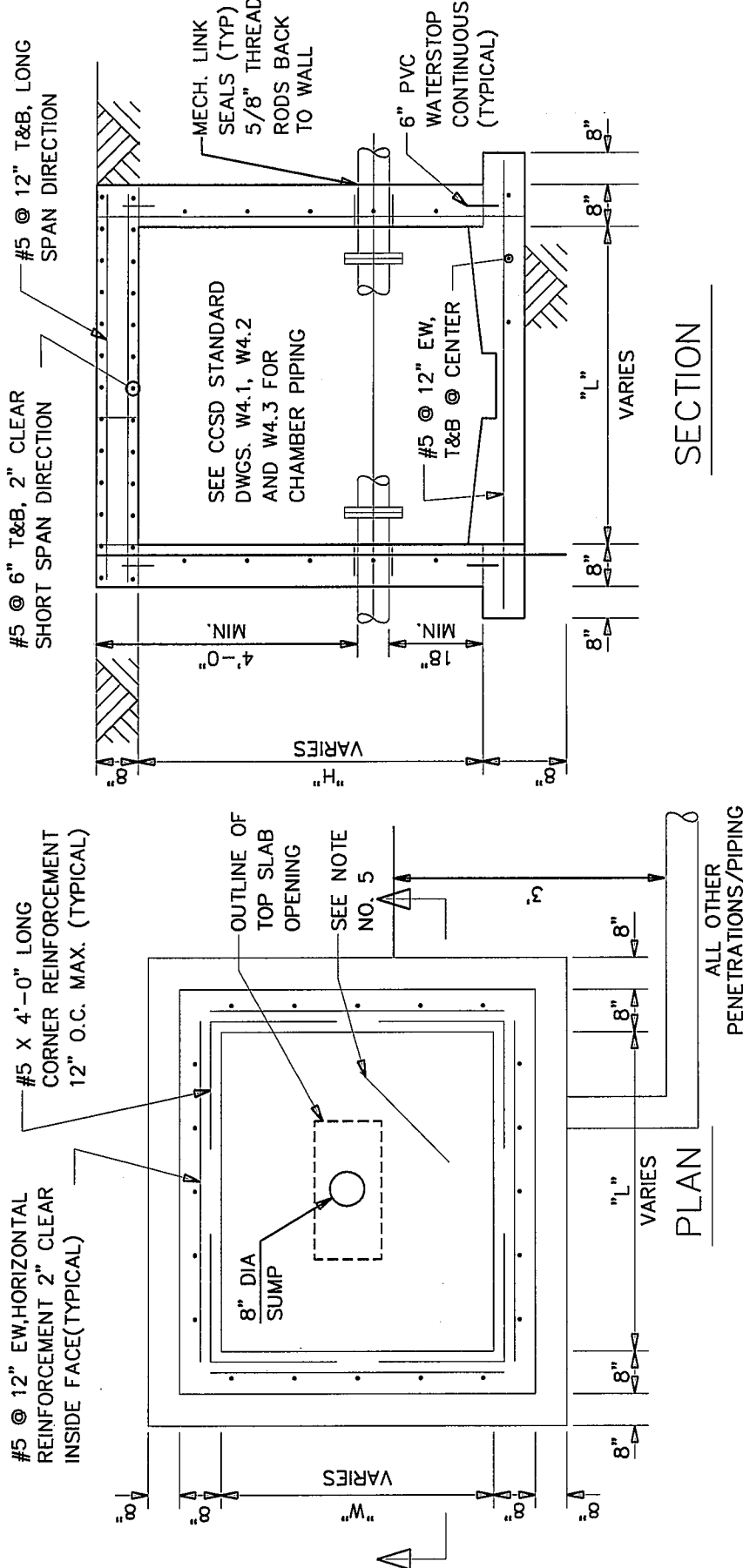
CLERMONT COUNTY
WATER RESOURCES DEPARTMENT

APPROVED _____
DATE _____

DUAL SERVICE
BRANCH SETTING— 3"
& LARGER METERS

NOTE:

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



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 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

NO SCALE

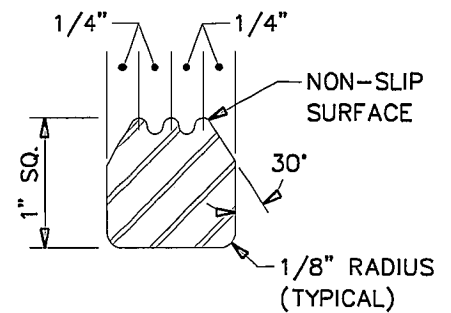
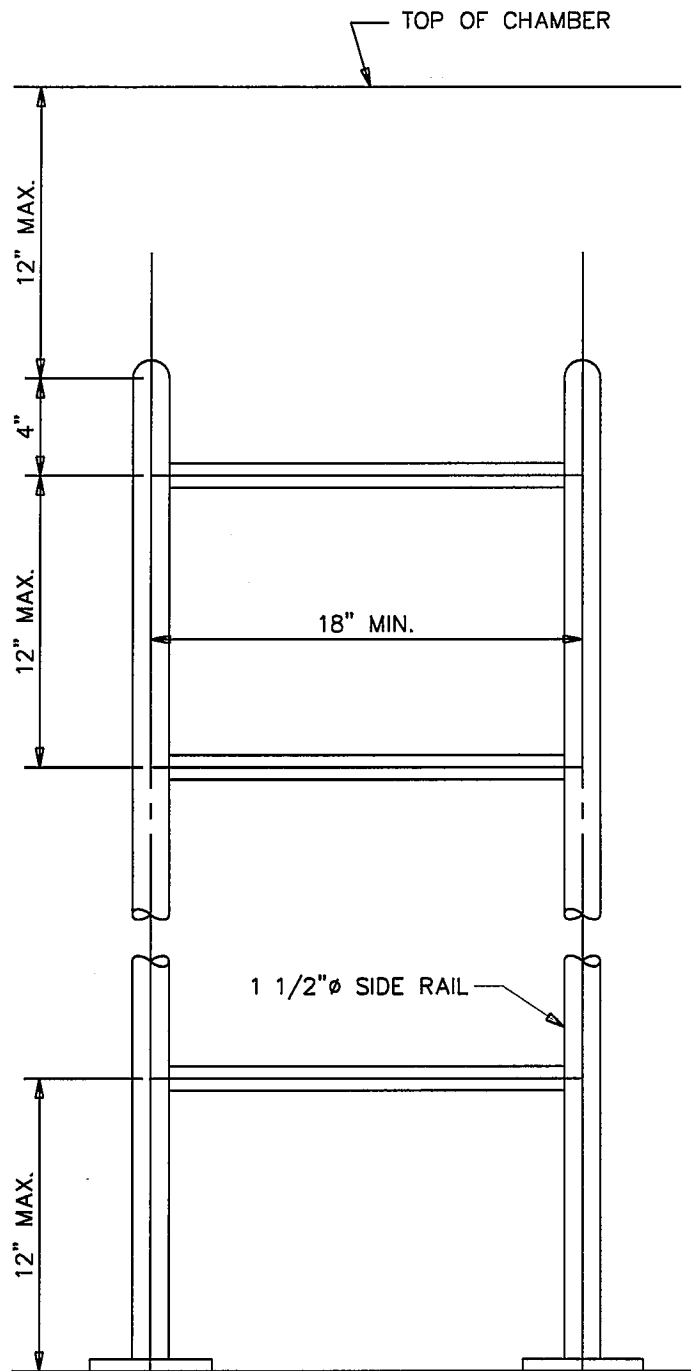
CLERMONT COUNTY
WATER RESOURCES DEPARTMENT

APPROVED _____
DATE _____

STANDARD
WATER SYSTEM
CHAMBER

DRAWING NO.

W4.5



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

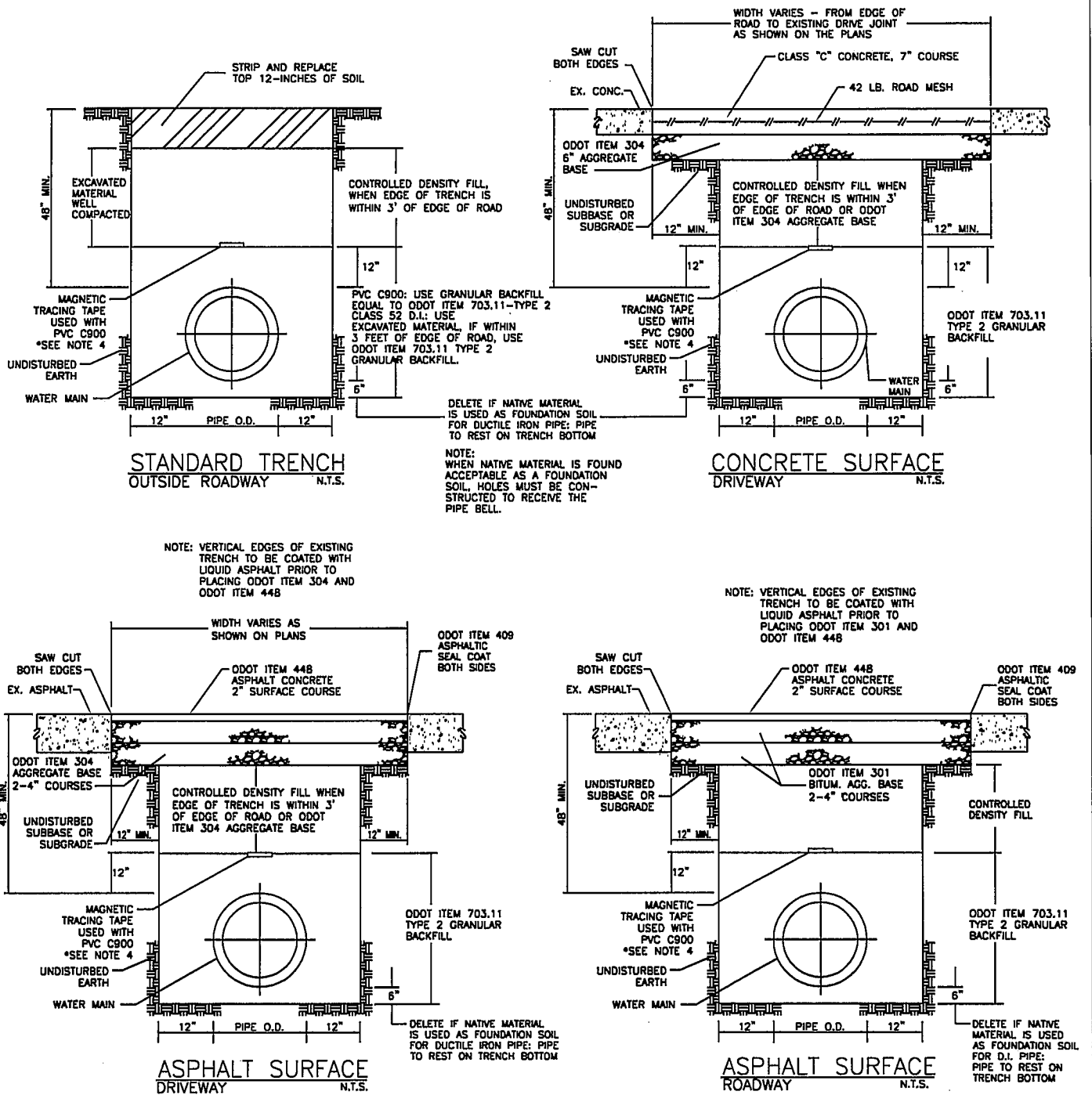
CLERMONT COUNTY
WATER RESOURCES DEPARTMENT

CHAMBER ACCESS
LADDER

DRAWING NO.

W4.6

APPROVED _____
DATE _____



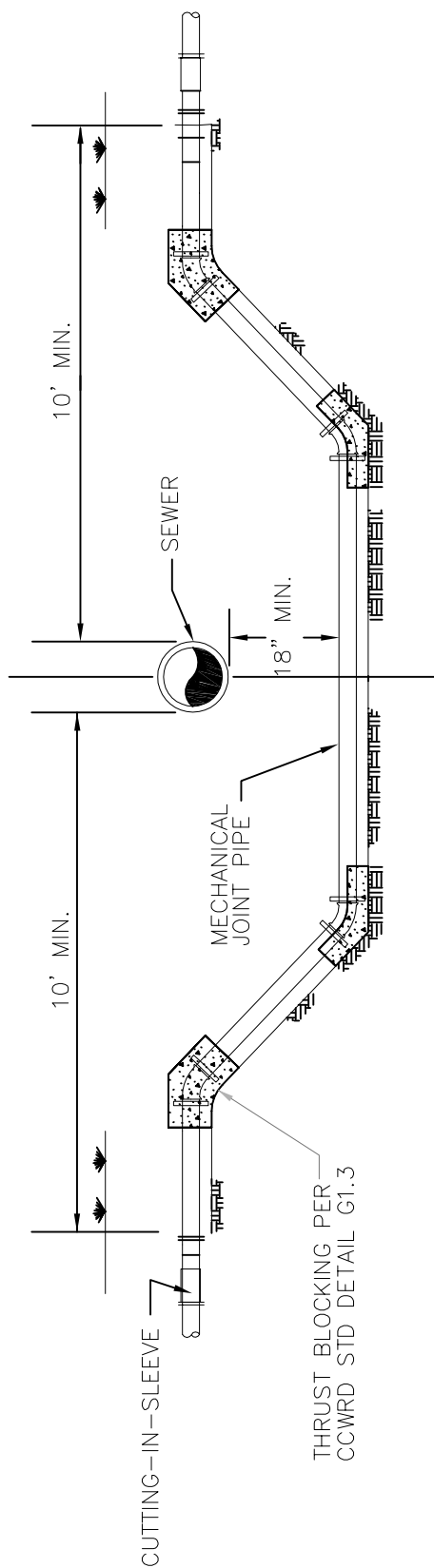
CLERMONT COUNTY
WATER RESOURCES DEPARTMENT

APPROVED _____
DATE _____

WATER MAIN
TRENCH SECTION

DRAWING NO.
W5.1

NO SCALE



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

NOT TO SCALE

CLERMONT COUNTY
WATER RESOURCES DEPARTMENT

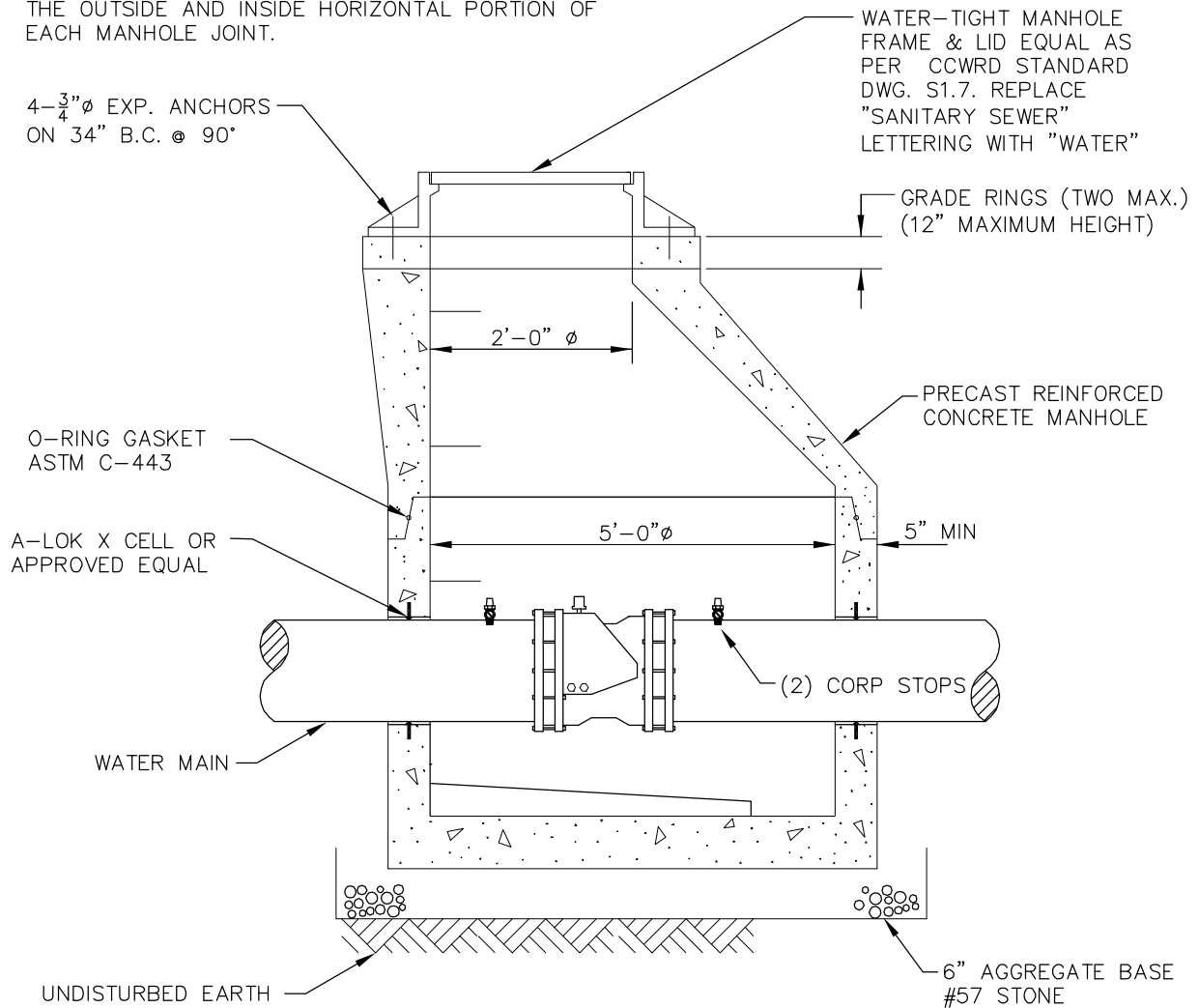
APPROVED _____
DATE _____

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 _____

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:

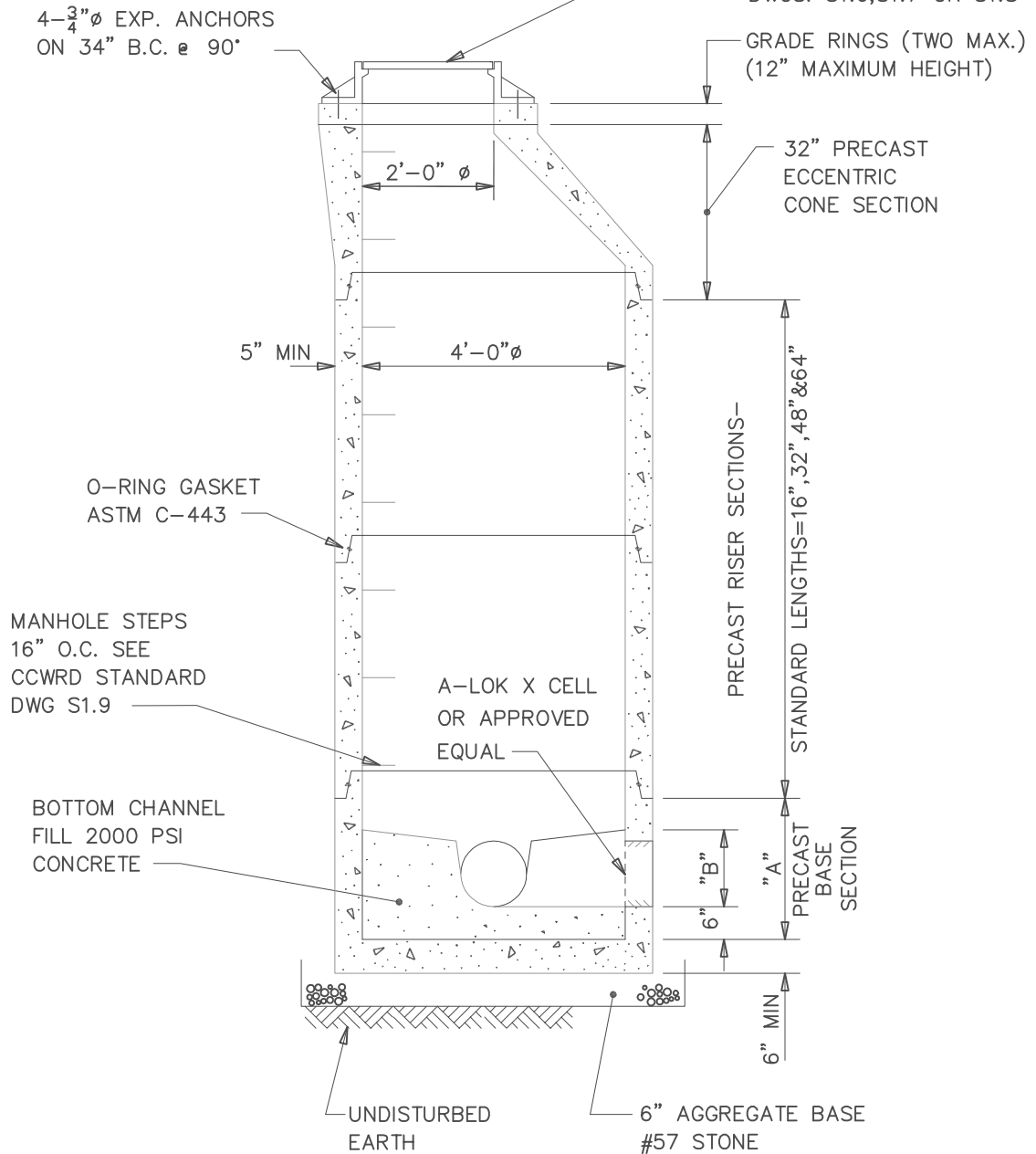
MINIMUM TEST TIMES FOR VARIOUS MANHOLE DIAMETERS (MINUTES AND SECONDS)

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

STANDARD MANHOLE
FOR SEWERS
8" TO 18"

DRAWING NO.

S1.1

APPROVED _____
DATE _____

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.

4- $\frac{3}{4}$ " ϕ EXP. ANCHORS
ON 34" B.C. 90°

MANHOLE FRAME & LID,
SEE CCWRD STANDARD
DWGS. S1.6,S1.7 OR S1.8

GRADE RINGS (TWO MAX.)
(12" MAXIMUM HEIGHT)

32" PRECAST
ECCENTRIC
CONE SECTION

5" MIN

4'-0" ϕ

O-RING GASKET
ASTM C-443

MANHOLE STEPS
16" O.C. SEE
CCWRD STANDARD
DWG S1.9

A-LOK X CELL
OR APPROVED
EQUAL

6" MIN.

5'-0" ϕ

BOTTOM CHANNEL
FILL 2000 PSI
CONCRETE

4'-0" ϕ RISERS
AS REQUIRED

PRECAST
ECCENTRIC
TRANSITION
32"

"A"
"B"
PRECAST BASE
SECTION

6" MIN.

UNDISTURBED
EARTH

6" AGGREGATE BASE
#57 STONE

"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

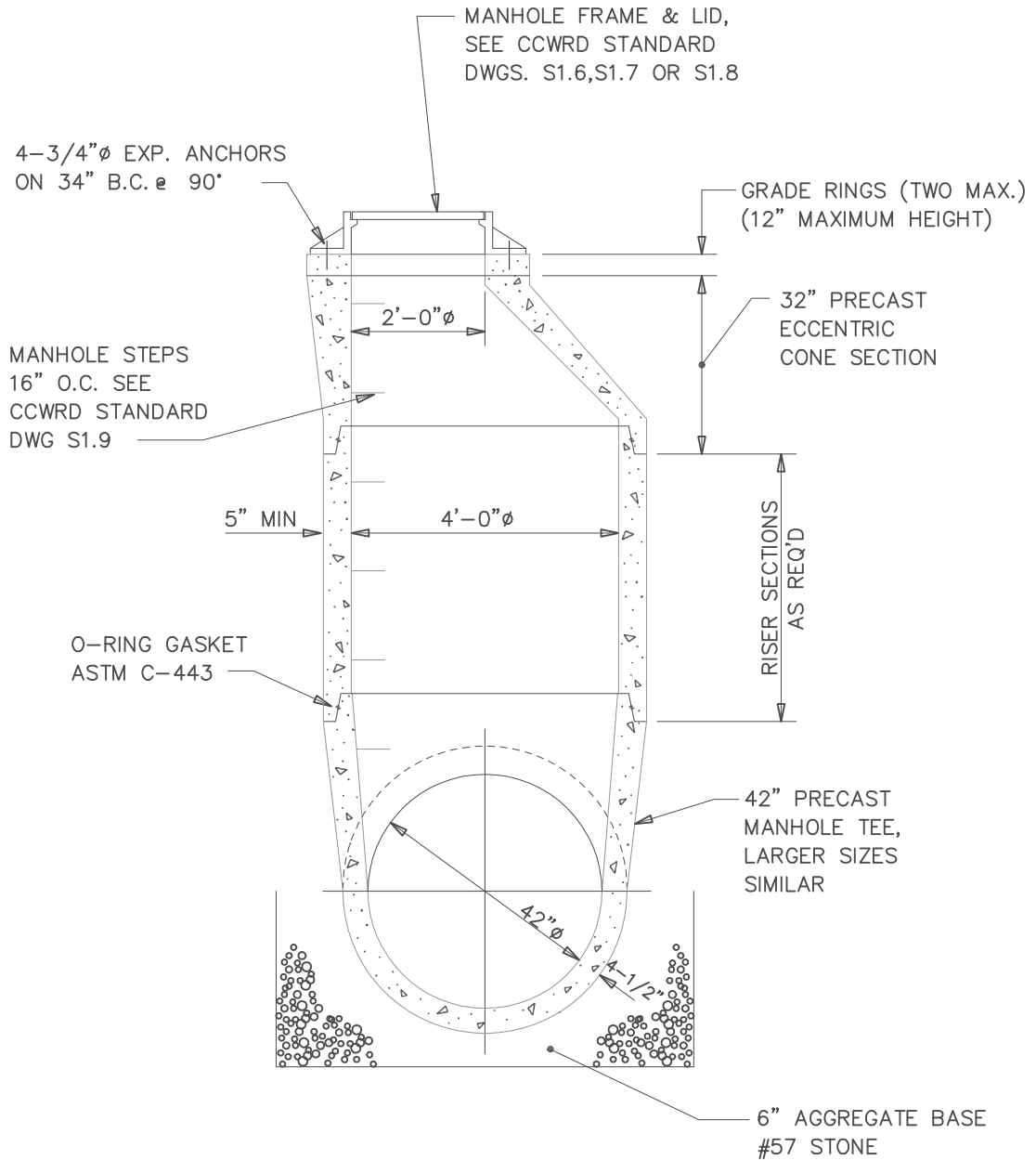
CLERMONT COUNTY
WATER RESOURCES DEPARTMENT

STANDARD MANHOLE
FOR SEWERS
21" TO 36"

DRAWING NO.

S1.2

APPROVED _____
DATE _____



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

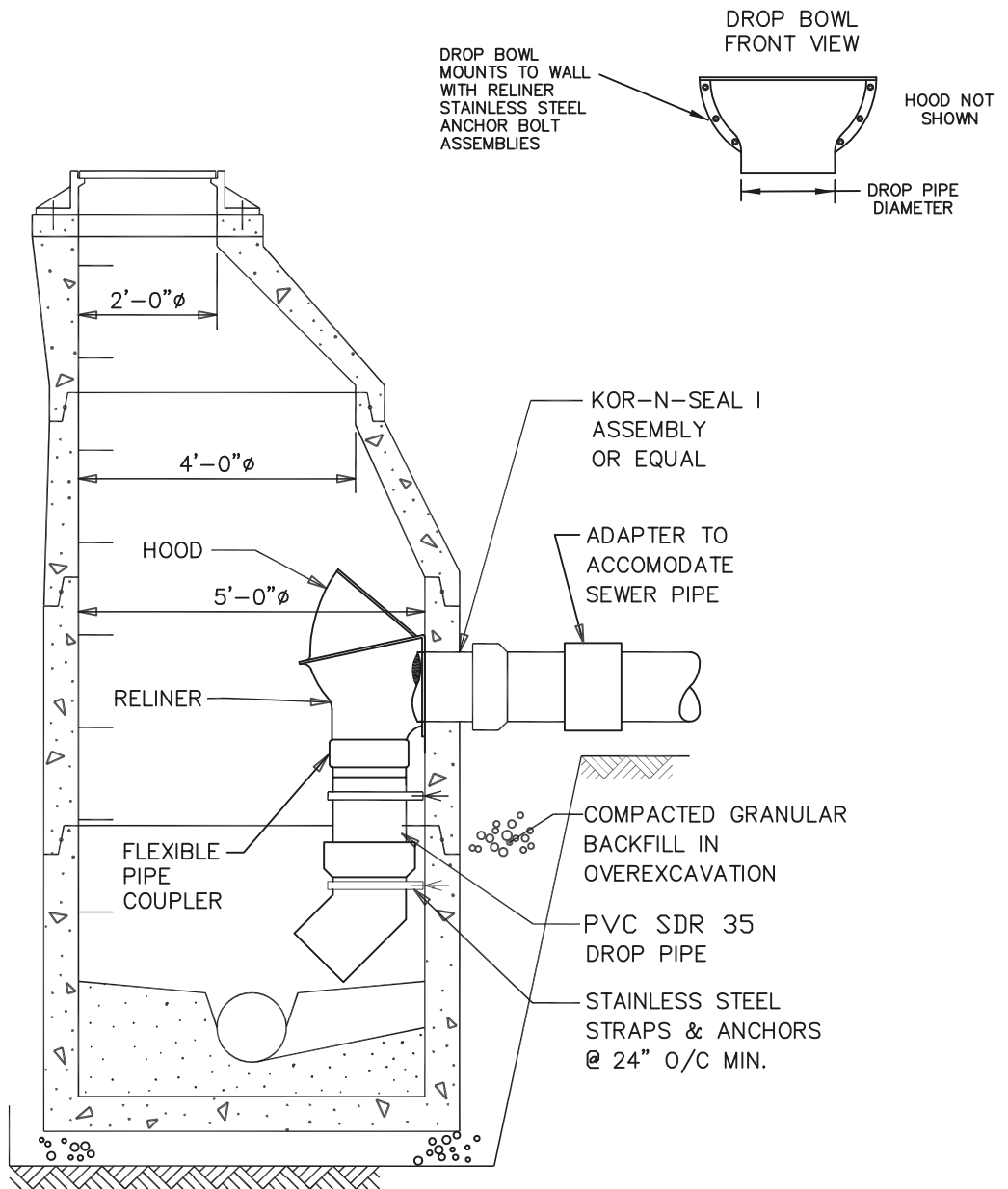
APPROVED _____
DATE _____

REVISED DEC. 2018

STANDARD MANHOLE
FOR SEWERS
42" & LARGER

DRAWING NO.

S1.3



SEWER PIPE DIAMETER	RELINER & DROP PIPE DIAMETER
4"	6"
6"	8"
8"	10"
10"	12"
12"	14"
14" & OVER	TBD

NOTES:

1. RELINER/DURAN, INC. BRAND INSIDE DROP SYSTEM REQUIRED. INSTALLATION PER MANUFACTURER RECOMMENDATIONS.
2. RELINER HOOD REQUIRED FOR FORCE MAIN DISCHARGE.
3. MANHOLE INSTALLATION PER CCWRD STANDARD DRAWINGS S1.1-S1.3.
4. DISCHARGE MANHOLES SHALL BE EPOXY COATED PER CCWRD STANDARD SPECIFICATIONS.

NO SCALE

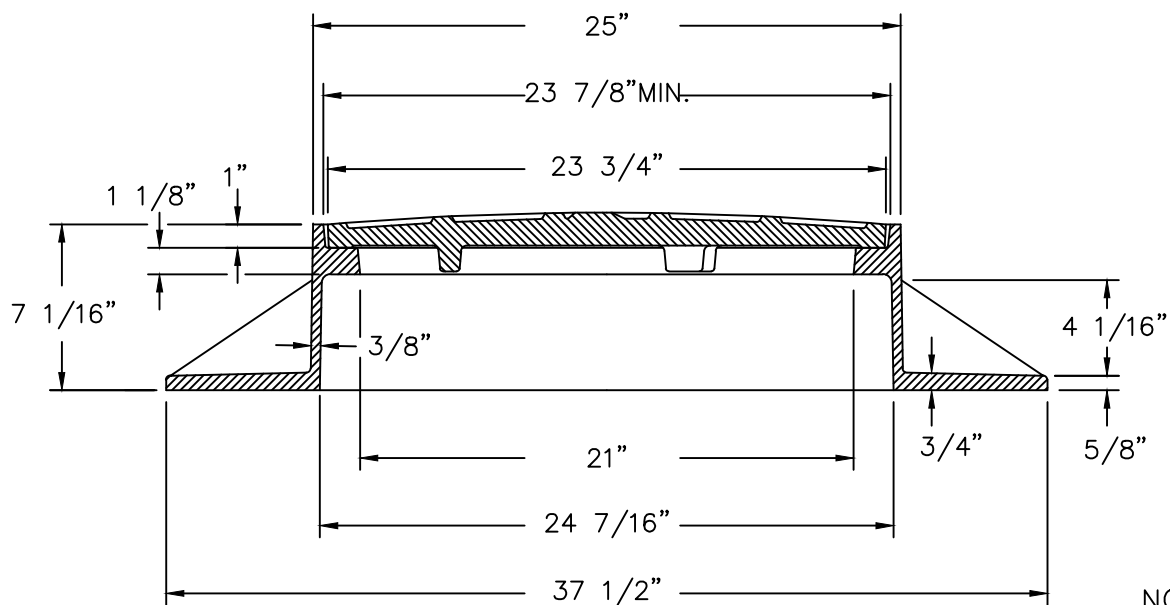
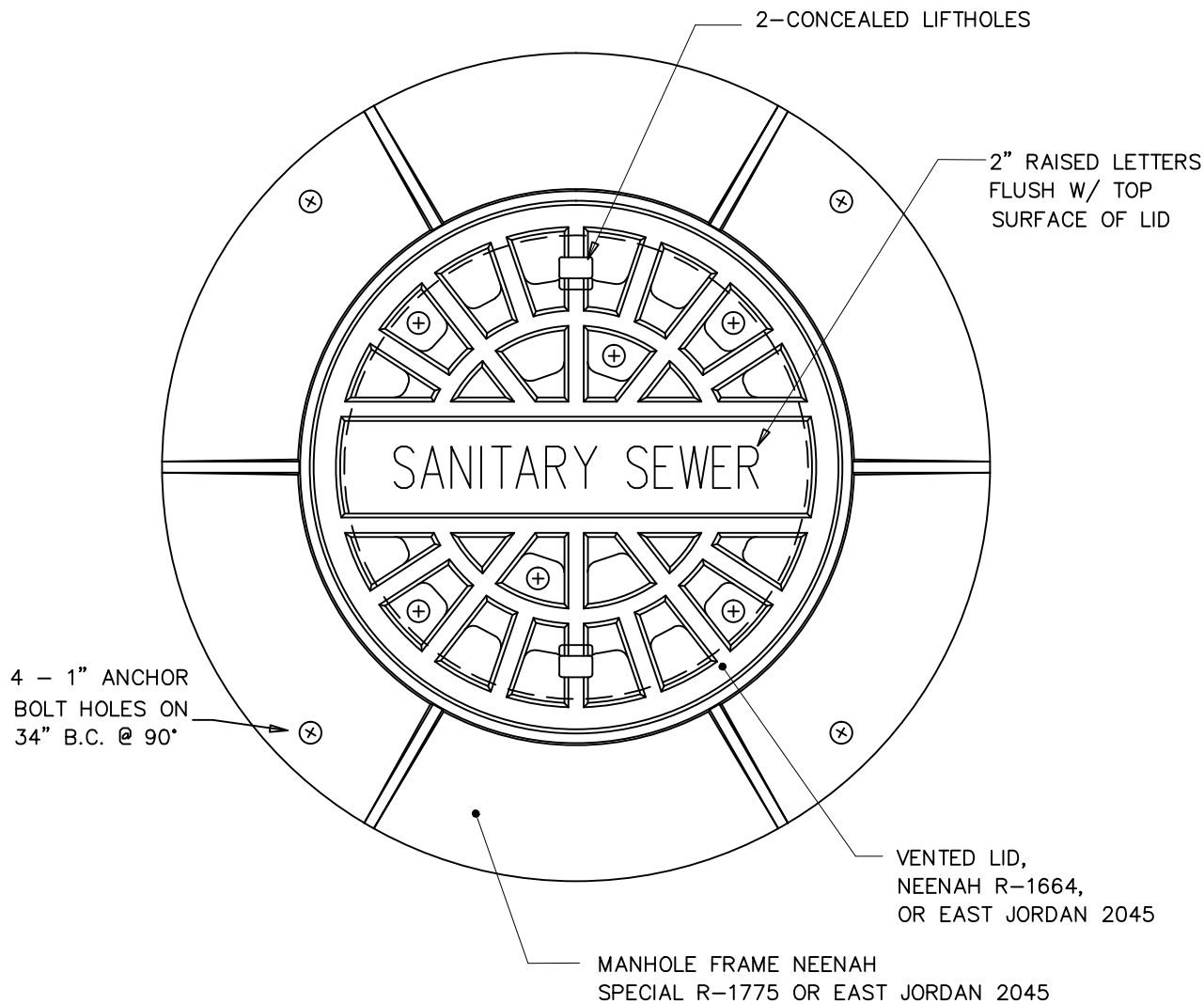
CLERMONT COUNTY
WATER RESOURCES DEPARTMENT

APPROVED _____
DATE _____

INSIDE DROP
MANHOLE

DRAWING NO.

S1.4



NO SCALE

CLERMONT COUNTY
WATER RESOURCES DEPARTMENT

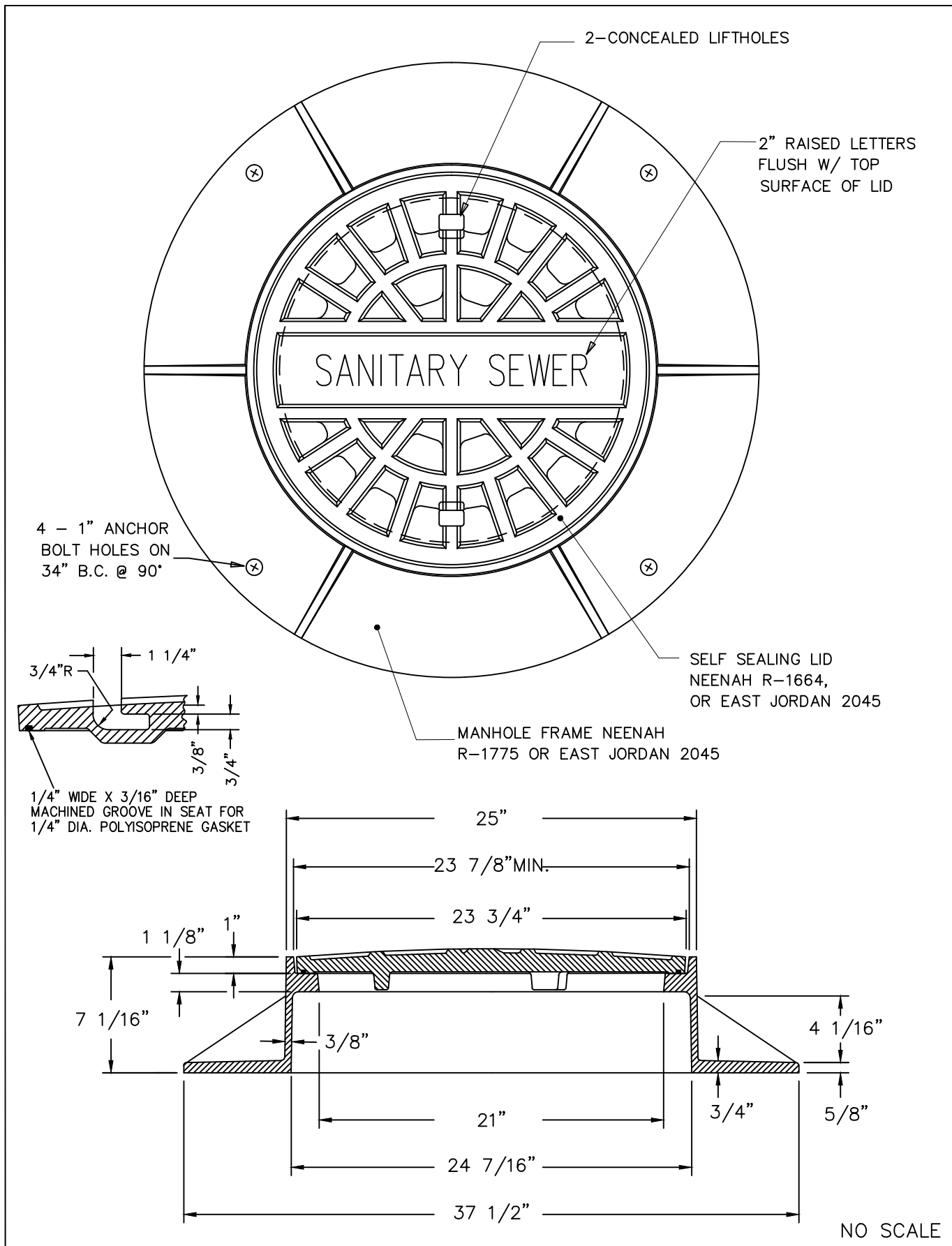
MANHOLE FRAME WITH
VENTED LID

DRAWING NO.

S1.6

APPROVED _____

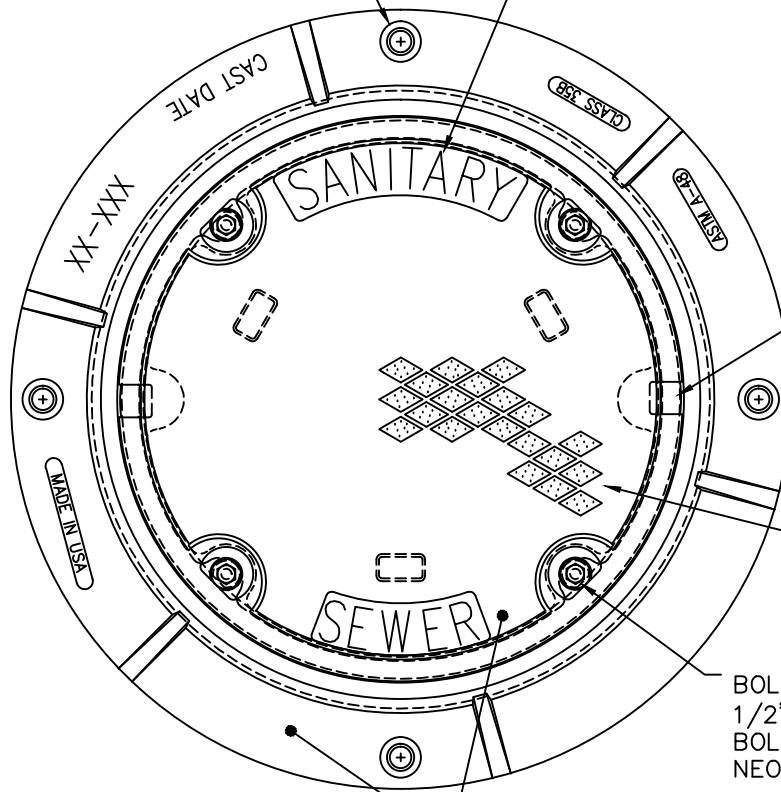
DATE _____



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

4 - 1" ANCHOR BOLTS
ON 32 3/4" B.C. @ 90°

2" RAISED LETTERING
FLUSH WITH TOP SURFACE

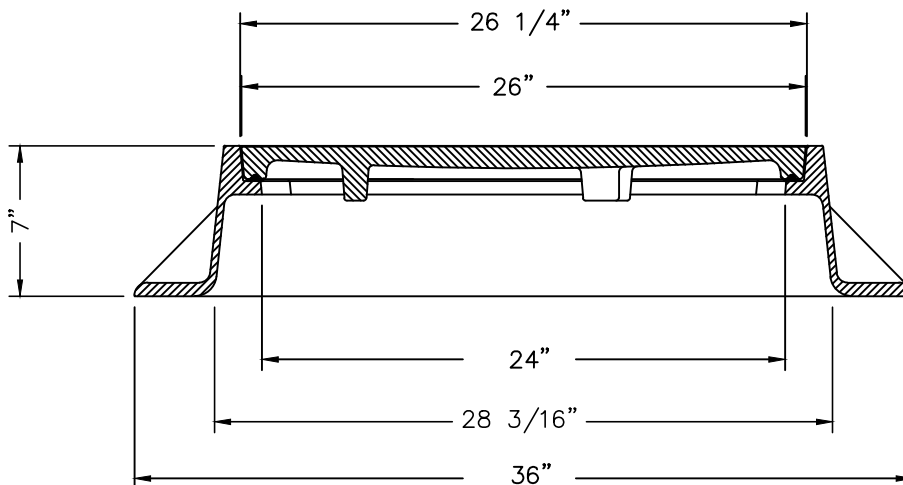


2 CONCEALED PICK HOLES

TEXTURE TYPICAL ON LID

BOLT LID TO FRAME WITH 4
1/2"-13 X 2 1/4" SS HEX.
BOLT, WITH SS WASHER AND
NEOPRENE WASHER

WATERTIGHT FRAME AND PLATEN LID
EAST JORDAN 1045ZPT OR NEENAH
R-1916-F



NO SCALE

CLERMONT COUNTY
WATER RESOURCES DEPARTMENT

WATERTIGHT FRAME
WITH BOLT DOWN LID

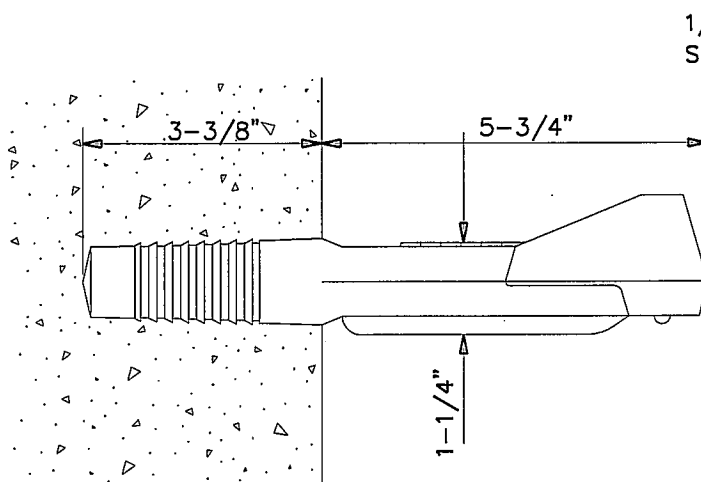
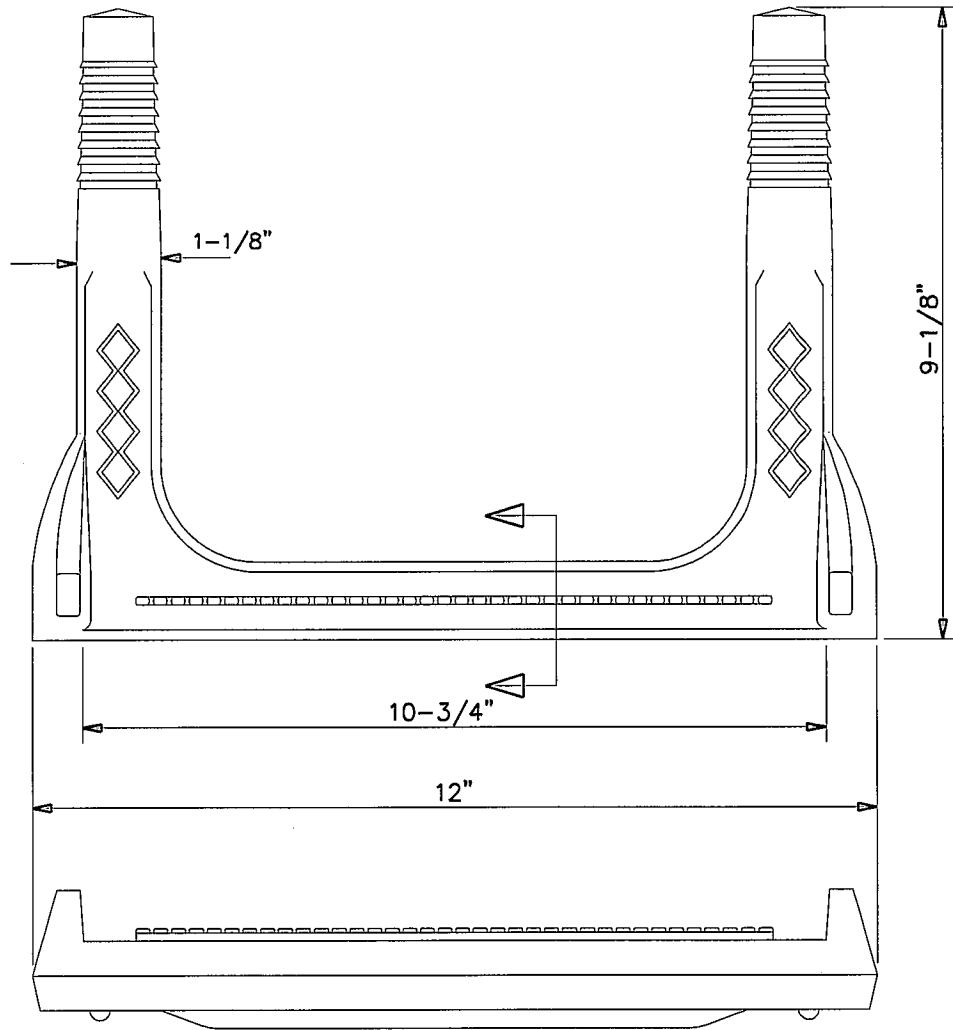
DRAWING NO.

S1.8

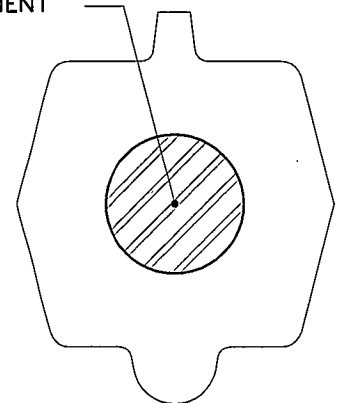
APPROVED _____

DATE _____

REVISED JUNE 2013



$\frac{1}{2}" \phi$ GRADE 60
STEEL REINFORCEMENT



SECTION

NO SCALE

CLERMONT COUNTY
WATER RESOURCES DEPARTMENT

APPROVED _____
DATE _____

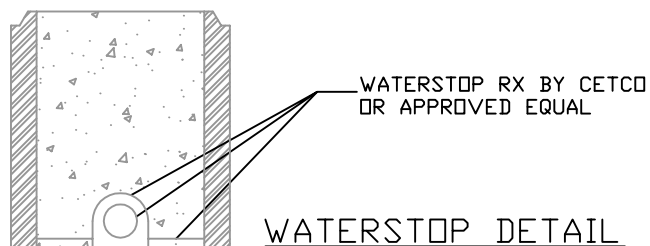
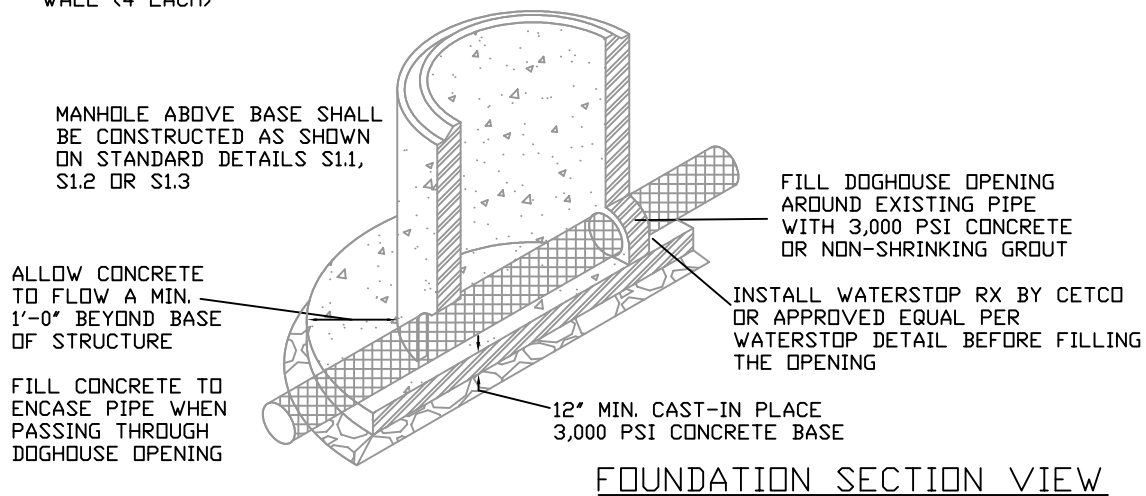
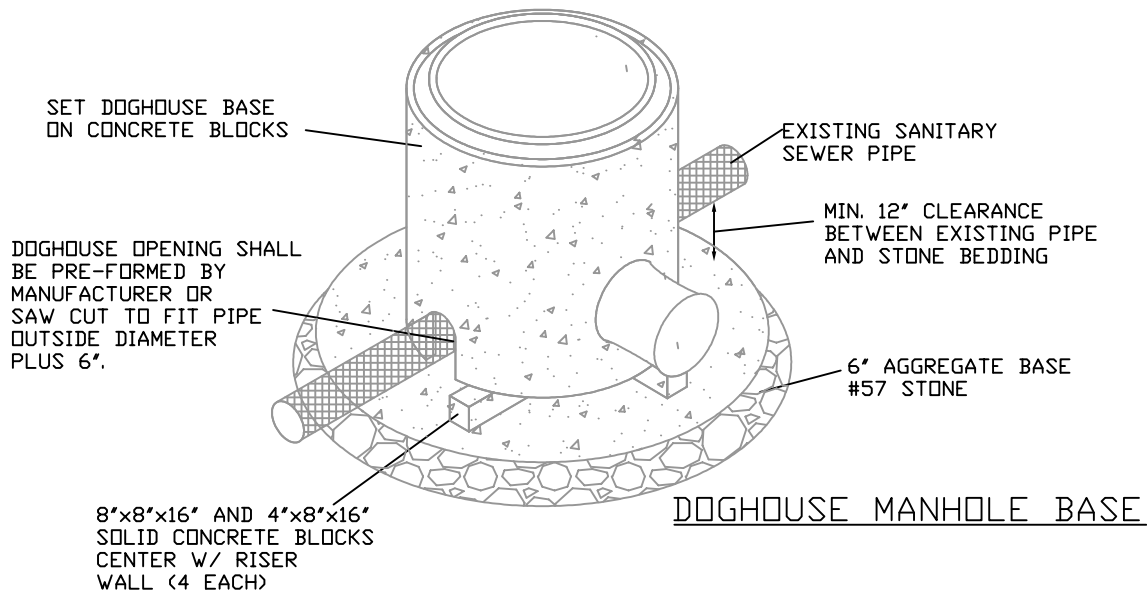
MANHOLE STEP-
COPOLYMER

DRAWING NO.

S1.9



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



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.

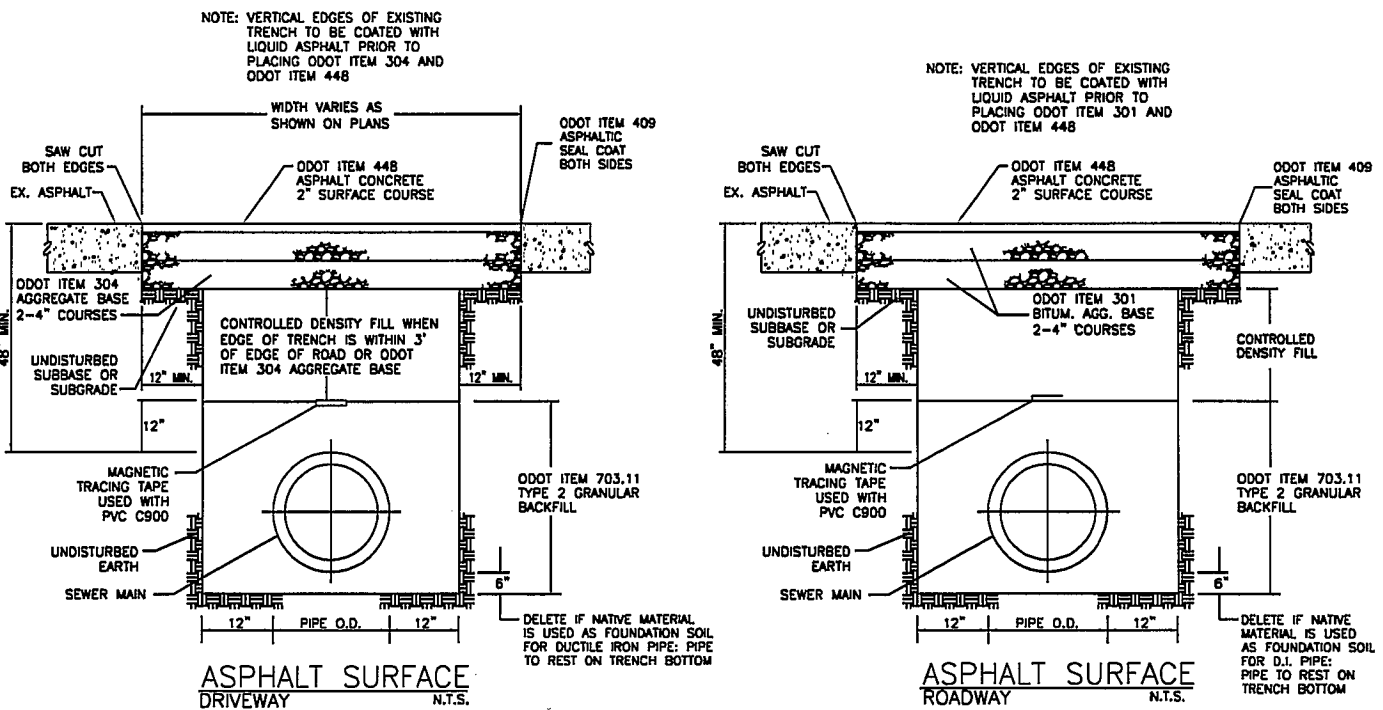
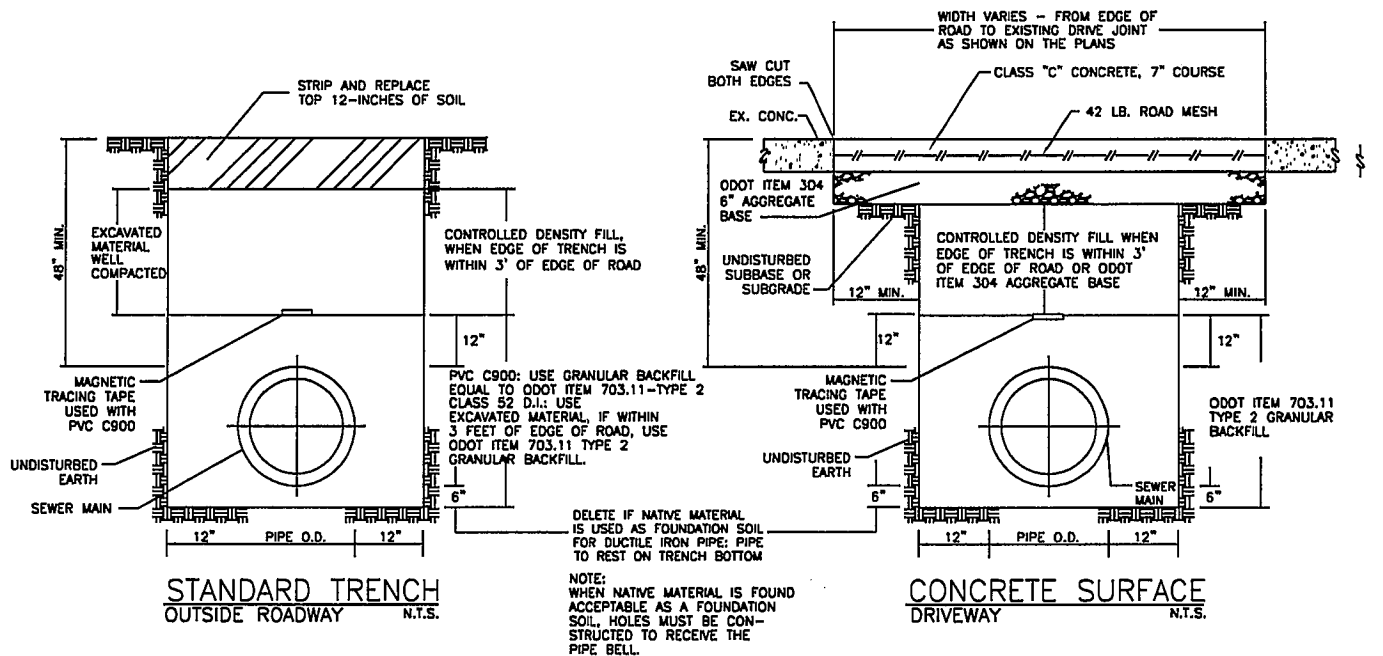
CLERMONT COUNTY
WATER RESOURCES DEPARTMENT

APPROVED _____
DATE _____

MANHOLE BASE
"DOGHOUSE"
INSTALLATION

DRAWING NO.

S1.11



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

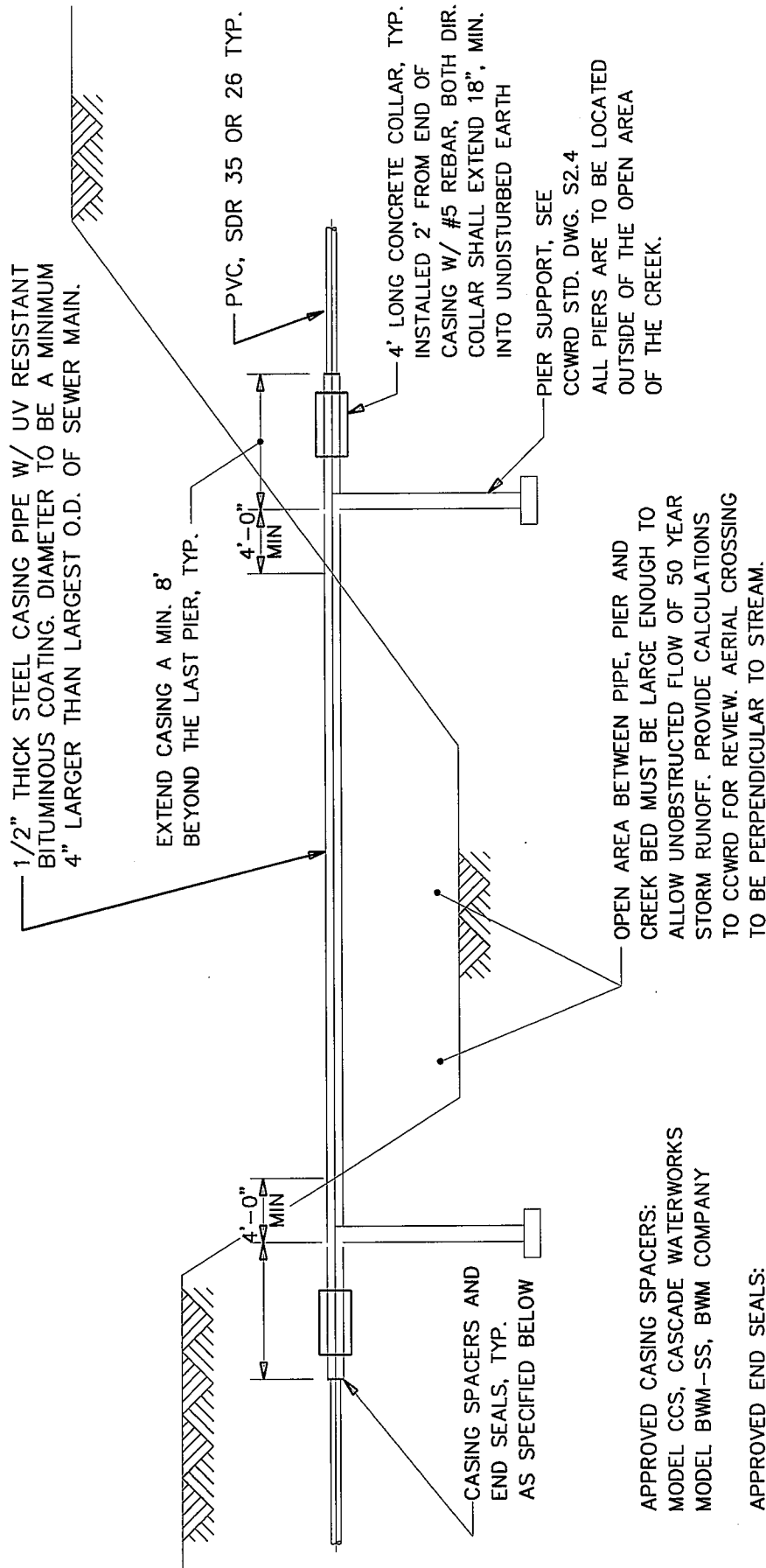
CLERMONT COUNTY
WATER RESOURCES DEPARTMENT

SANITARY SEWER
TRENCH SECTIONS

DRAWING NO.

S2.1

APPROVED _____
DATE _____



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.

ELEVATION

NO SCALE

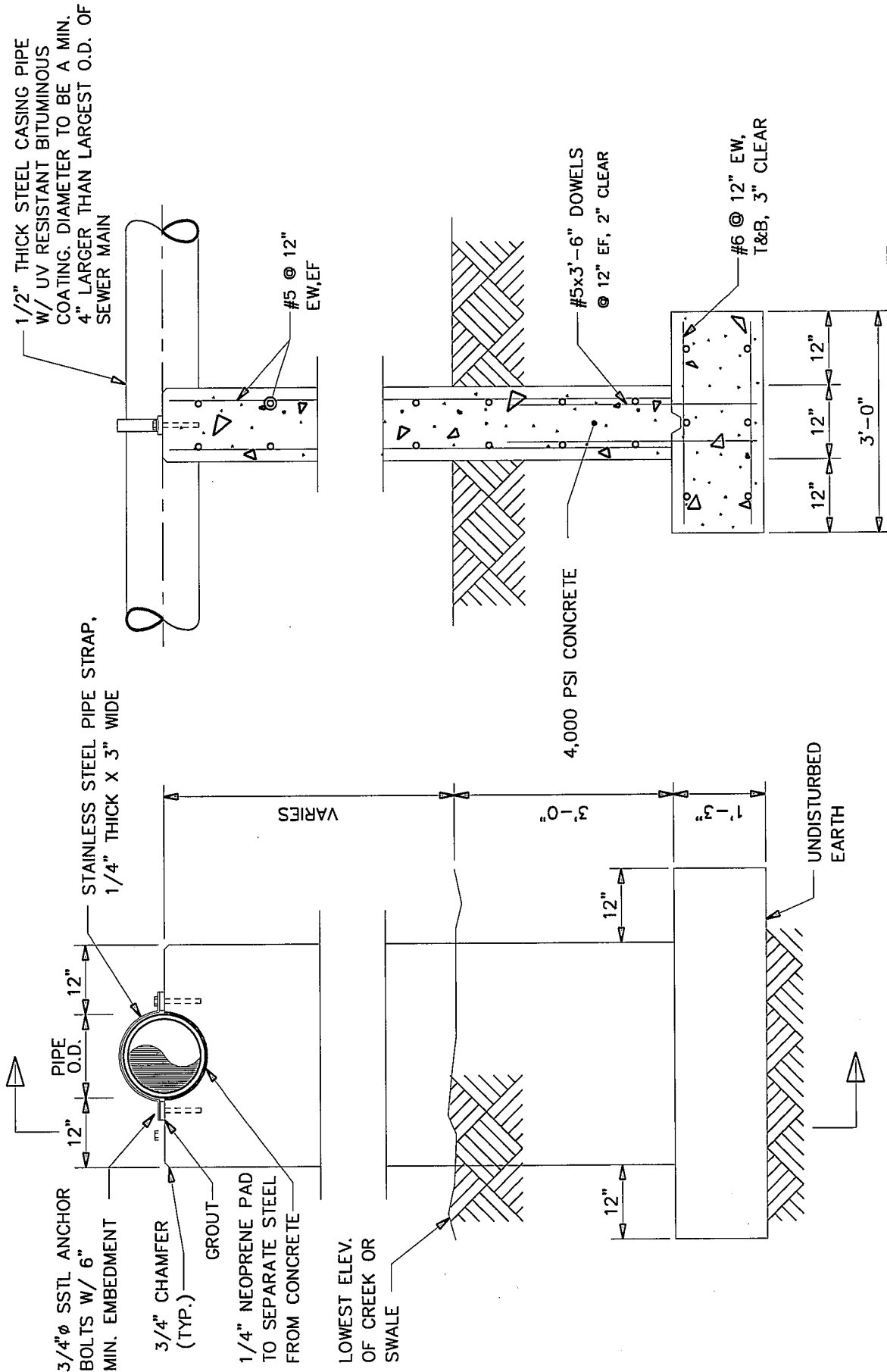
CLERMONT COUNTY
WATER RESOURCES DEPARTMENT

APPROVED _____
DATE _____

CREEK CROSSING
AERIAL TYPE

DRAWING NO.

S2.3



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

SECTION

ELEVATION

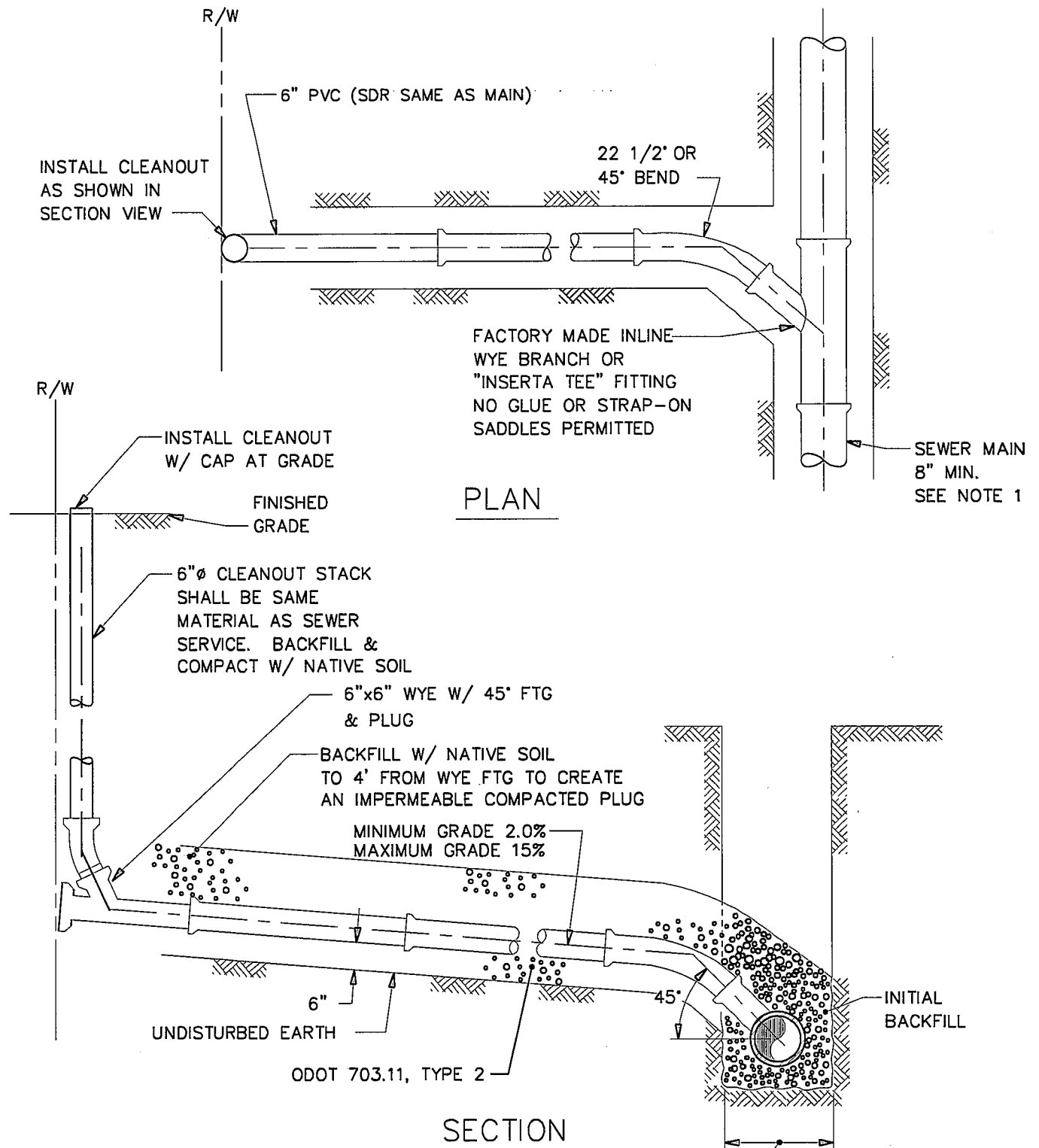
NO SCALE

CLERMONT COUNTY
WATER RESOURCES DEPARTMENT

SUPPORT PIER

DRAWING NO.
S2.4

APPROVED _____
DATE _____



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 STRUCTURE IS CONNECTED, THE CLEANOUT SHALL BE BROUGHT TO GRADE AS DETAILED.

NO SCALE

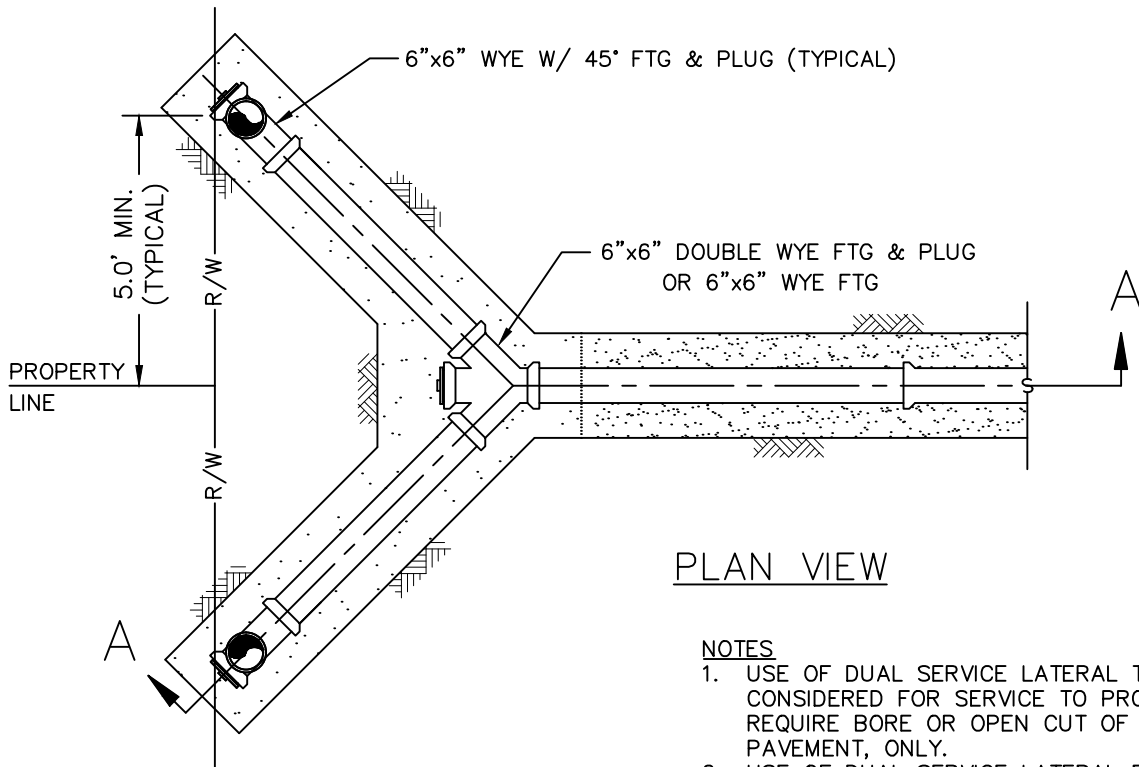
CLERMONT COUNTY
WATER RESOURCES DEPARTMENT

SEWER LATERAL
INSTALLATION

DRAWING NO.

S3.1

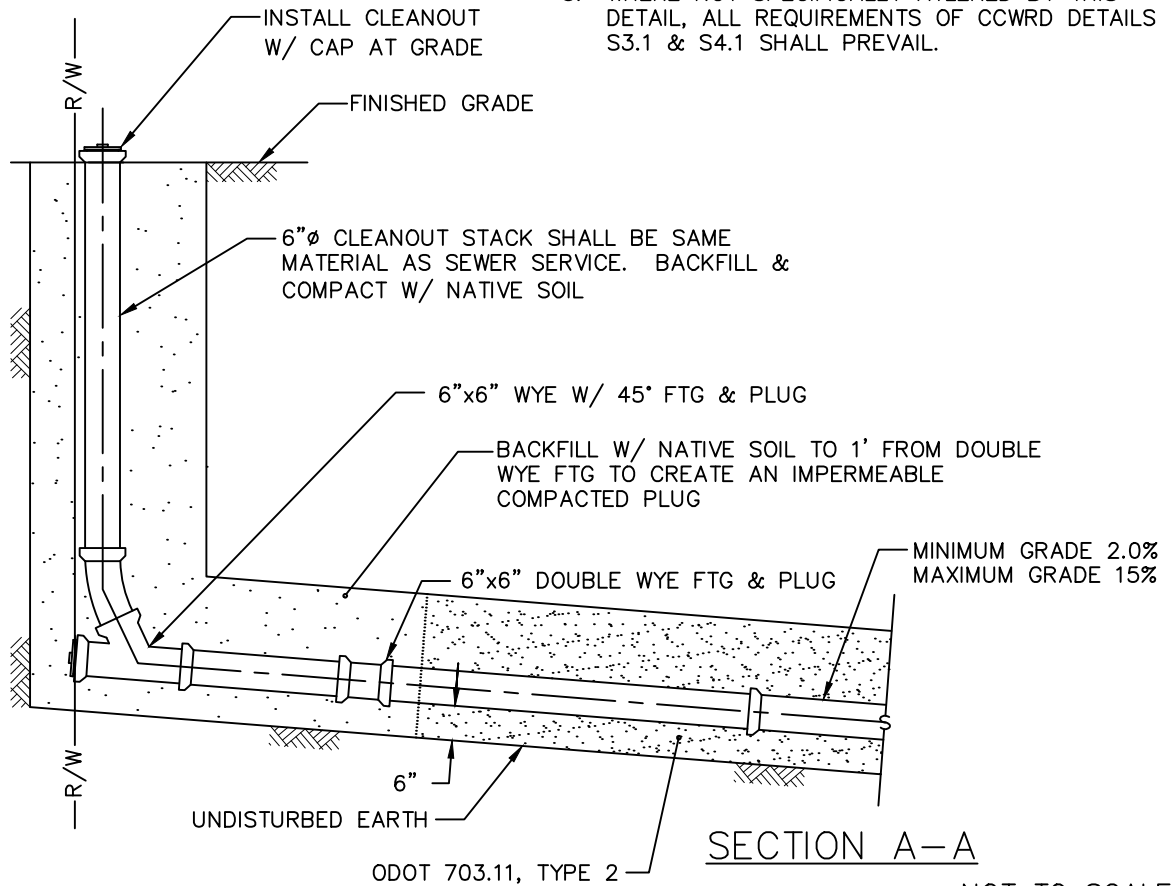
APPROVED _____
DATE _____



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 ALTERED BY THIS DETAIL, ALL REQUIREMENTS OF CCWRD DETAILS S3.1 & S4.1 SHALL PREVAIL.



NOT TO SCALE

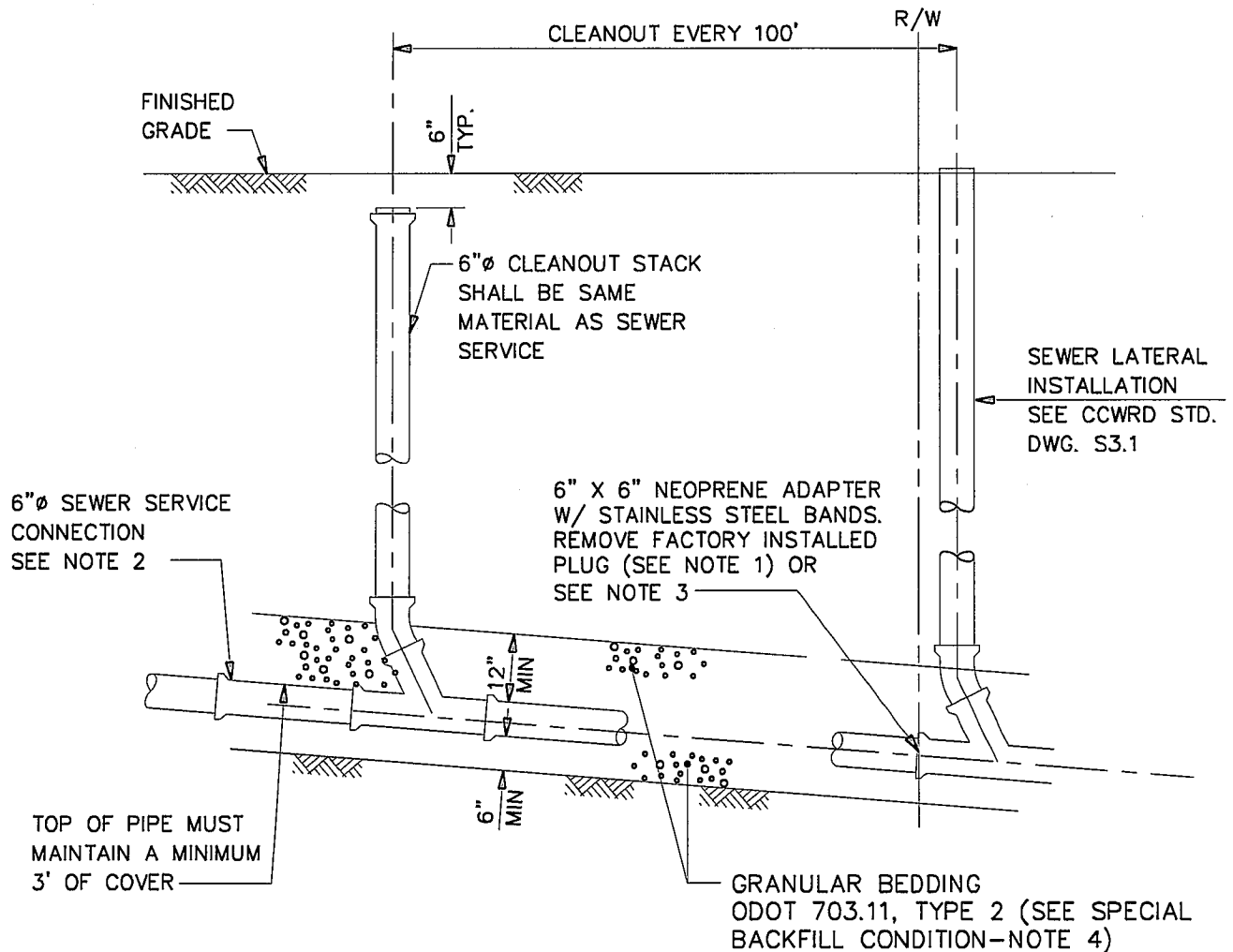
CLERMONT COUNTY
WATER RESOURCES DEPARTMENT

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

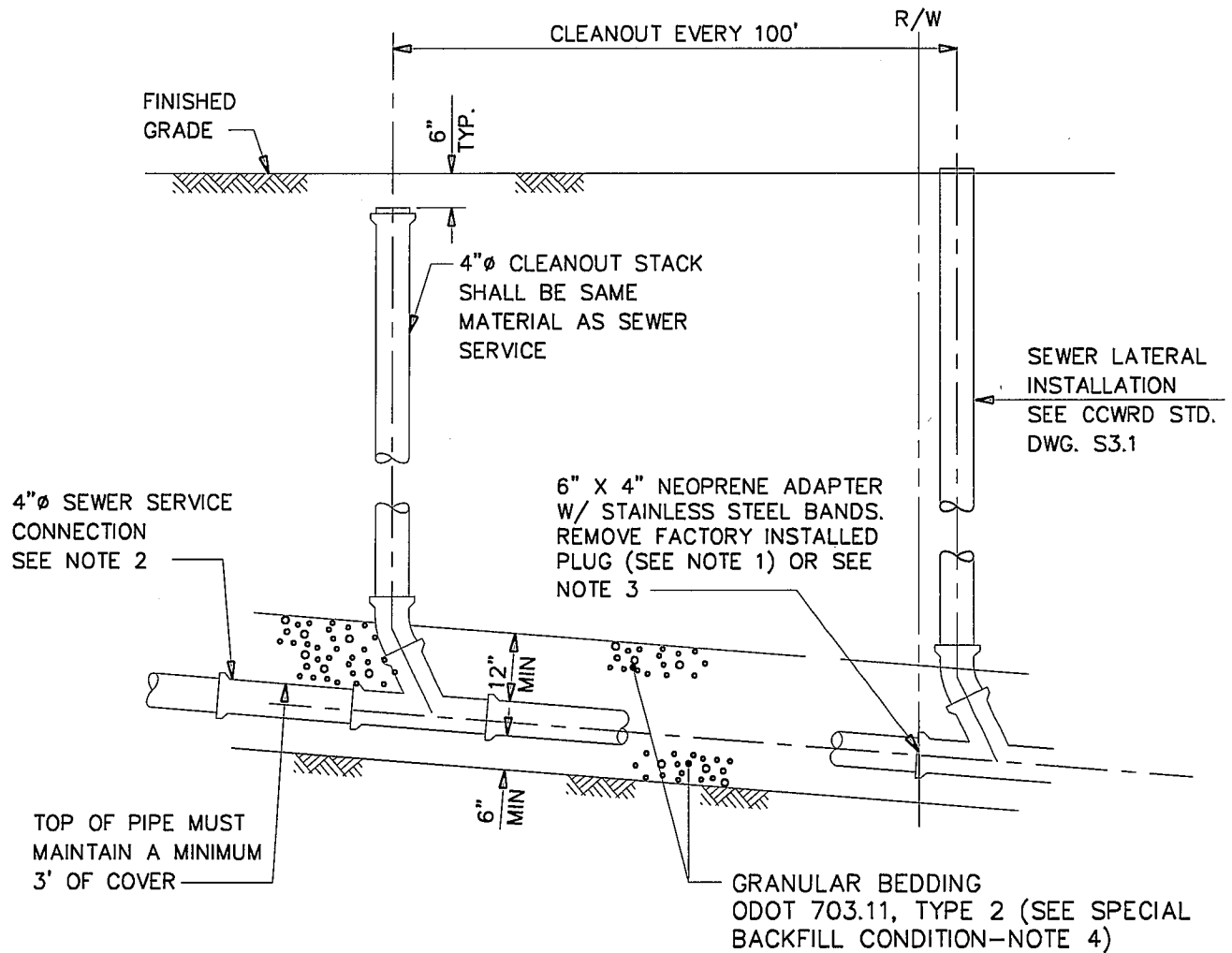
CLERMONT COUNTY
WATER RESOURCES DEPARTMENT

APPROVED _____
DATE _____

COMMERCIAL
SEWER SERVICE
INSTALLATION

DRAWING NO.

S4.1



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

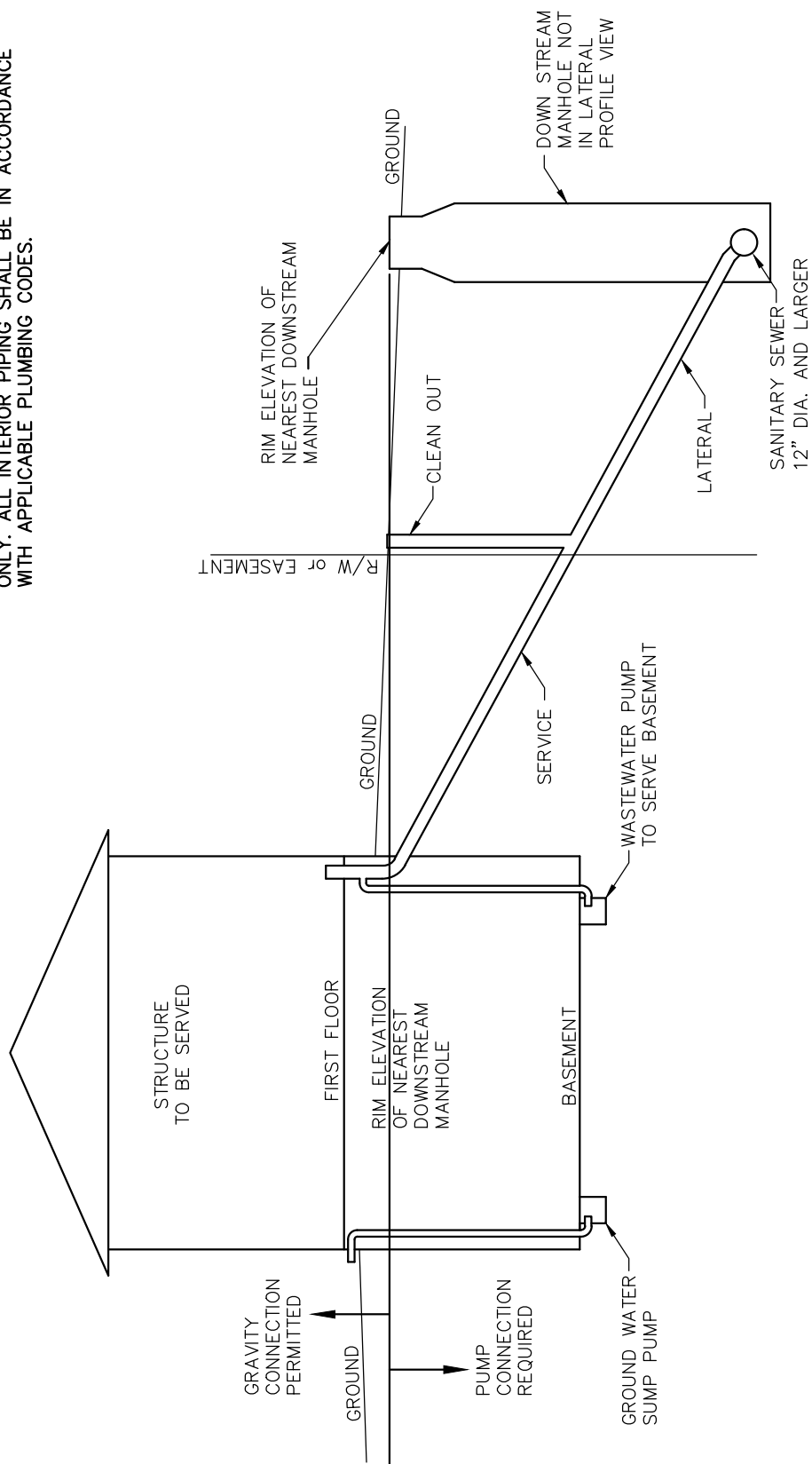
APPROVED _____
DATE _____

RESIDENTIAL
SEWER SERVICE
INSTALLATION

DRAWING NO.

S4.2

- 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

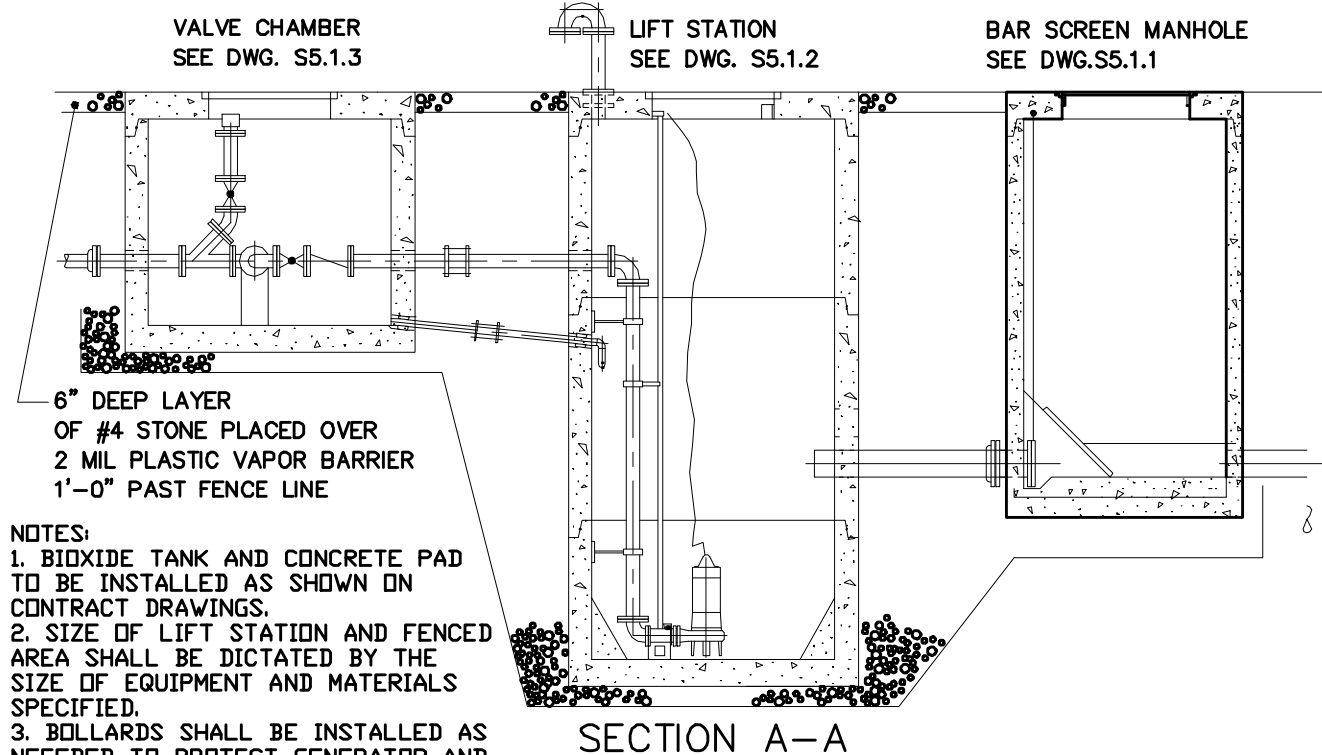
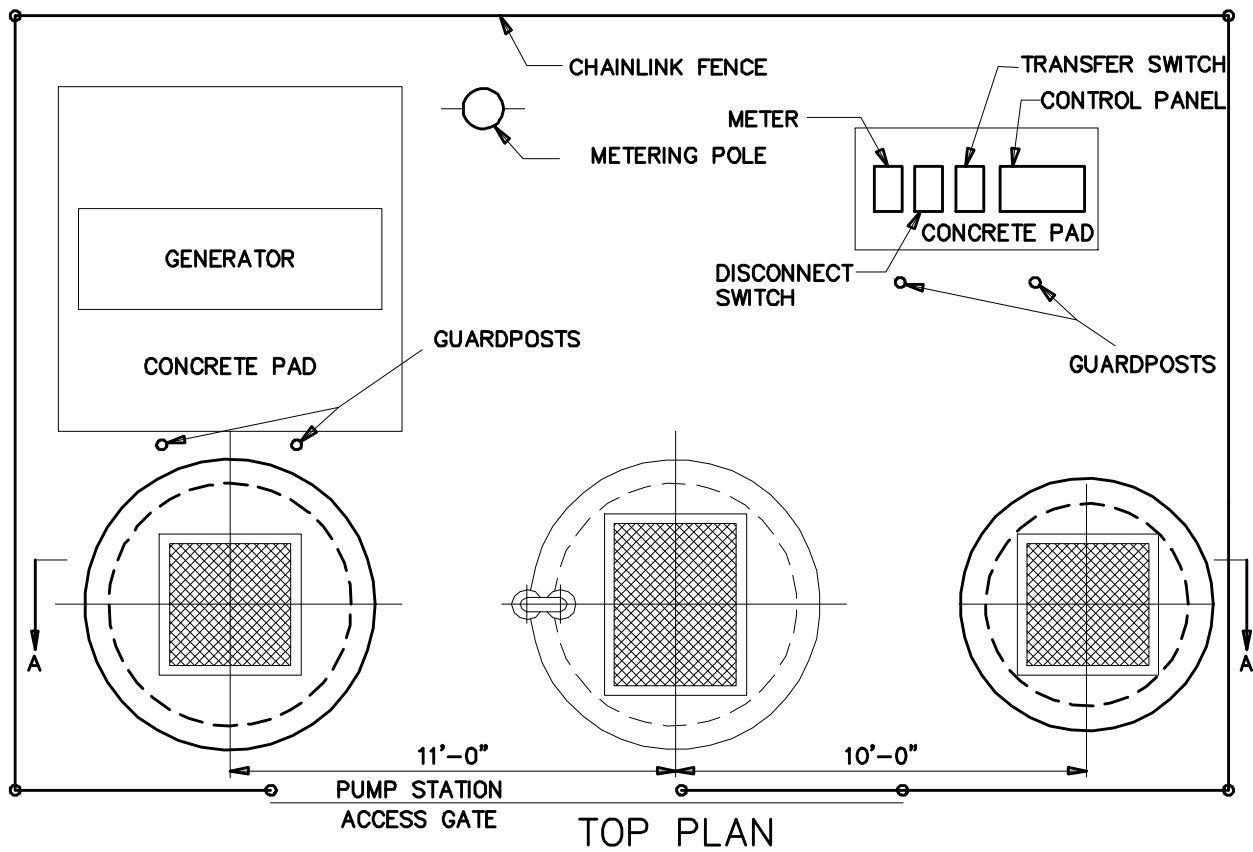
STANDARD CONNECTION
TO SEWERS 12" AND
LARGER

DRAWING NO.

S4.3

APPROVED _____
DATE _____

OCTOBER 2016



- 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 NEEDED 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

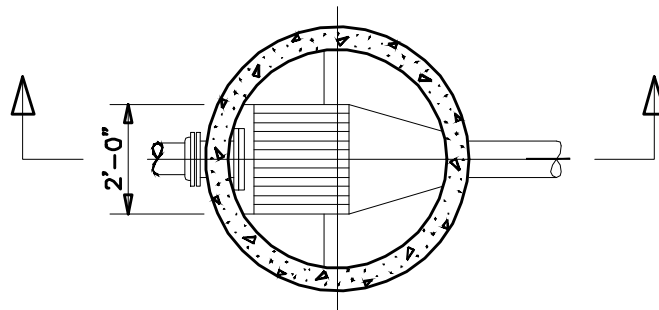
LIFT STATION
LAYOUT

DRAWING NO.

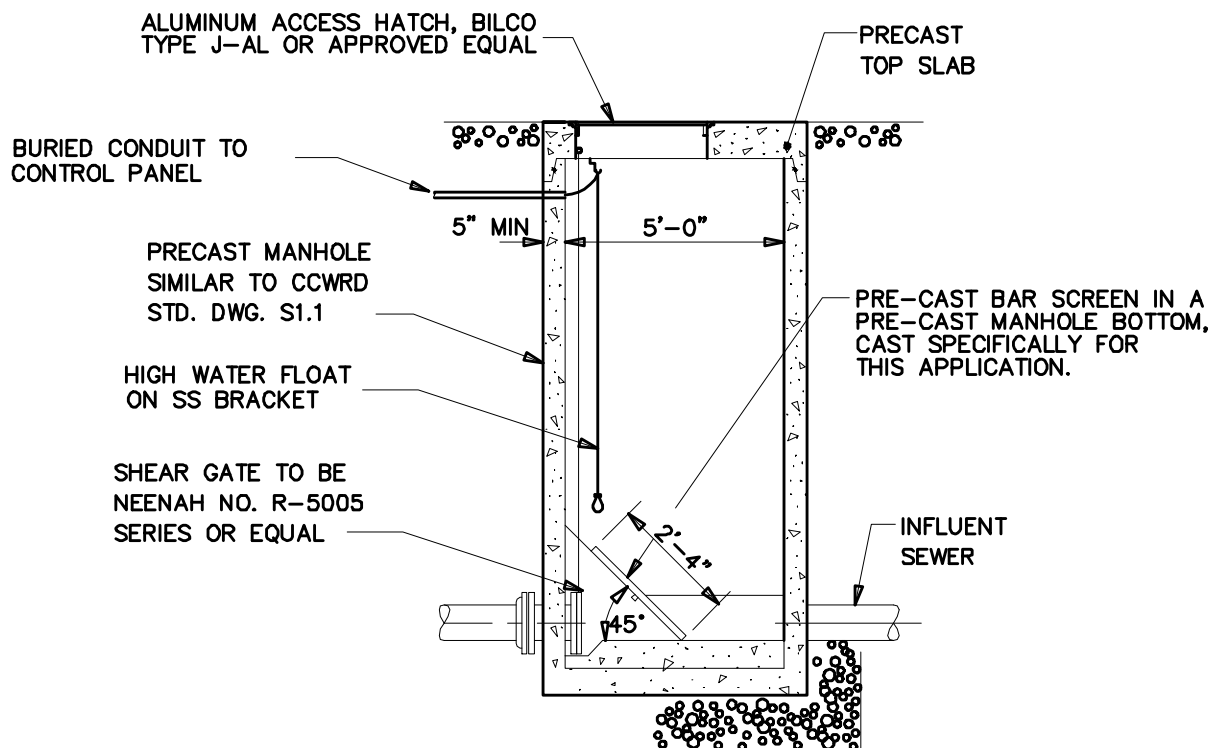
S5.1

APPROVED _____
DATE _____

REV. MARCH 2019



PLAN



SECTION

NO SCALE

CLERMONT COUNTY
WATER RESOURCES DEPARTMENT

BAR SCREEN
MANHOLE
DETAIL

DRAWING NO.

S5.1.1

APPROVED _____

DATE _____

REVISED MARCH 2019

ALUMINUM ACCESS HATCH, BILCO MODEL J-9AL OR APPROVED EQUAL, W/ FALL PROTECTION GRATING SYSTEM.

DIP PUMP DISCHARGE
4" MINIMUM

EXPANSION
COUPLINGS

INFLUENT
SEWER

PRECAST MANHOLE
SIMILAR TO CCWRD
STD. DWG. S1.1

PLAN

PUMP CONTROL ELEVATIONS

PUMPS OFF- ELEV. "F"
START LEAD PUMP- ELEV. "G"
START LAG PUMP- ELEV. "H"
HIGH LEVEL ALARM- ELEV. "J"

SS JUNCTION BOX
SEE CCWRD DETAIL S5.1.4

PRECAST
TOP SLAB

4" DIP FLG-PE
WALL PIPE

4" DIP VENT

DIP PUMP DISCHARGE
4" MINIMUM

GUIDE RAILS

4" PVC, SDR 40 DRAIN PIPE
FROM VALVE VAULT (MIN 2% SLOPE)

4" PVC BALL
CHECK VALVE

DIP PUMP
DISCHARGE

PIPE SUPPORTS

2000 PSI
CONC. FILL

INTERMEDIATE
RAIL SUPPORT
BRACKET

CAST-IN RUBBER
BOOT EQUAL TO
Z-LOK CONNECTORS

ELEV. J

ELEV. H

ELEV. G

ELEV. F

INFLUENT SEWER

LIFTING CHAIN

DUPLEX SUBMERSIBLE
PUMPS, W/ QUICK
DISCONNECT COUP.

6" COMPACTED
GRANULAR FILL

7"
MIN

6'-0"Ø

7"
MIN

NOTE:

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

SECTION

NO SCALE

CLERMONT COUNTY
WATER RESOURCES DEPARTMENT

LIFT STATION
DETAIL

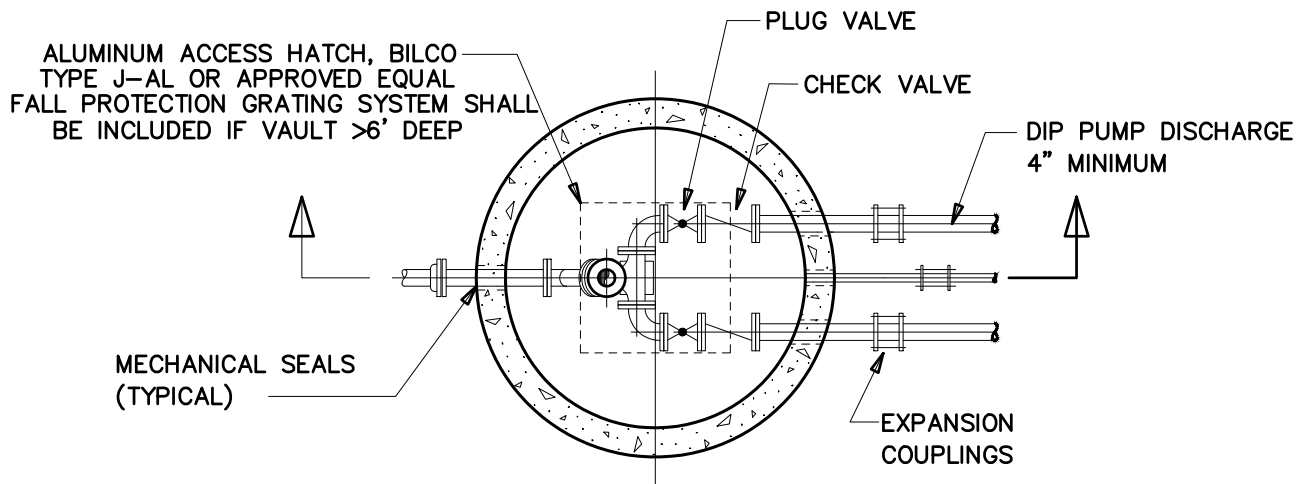
DRAWING NO.

S5.1.2

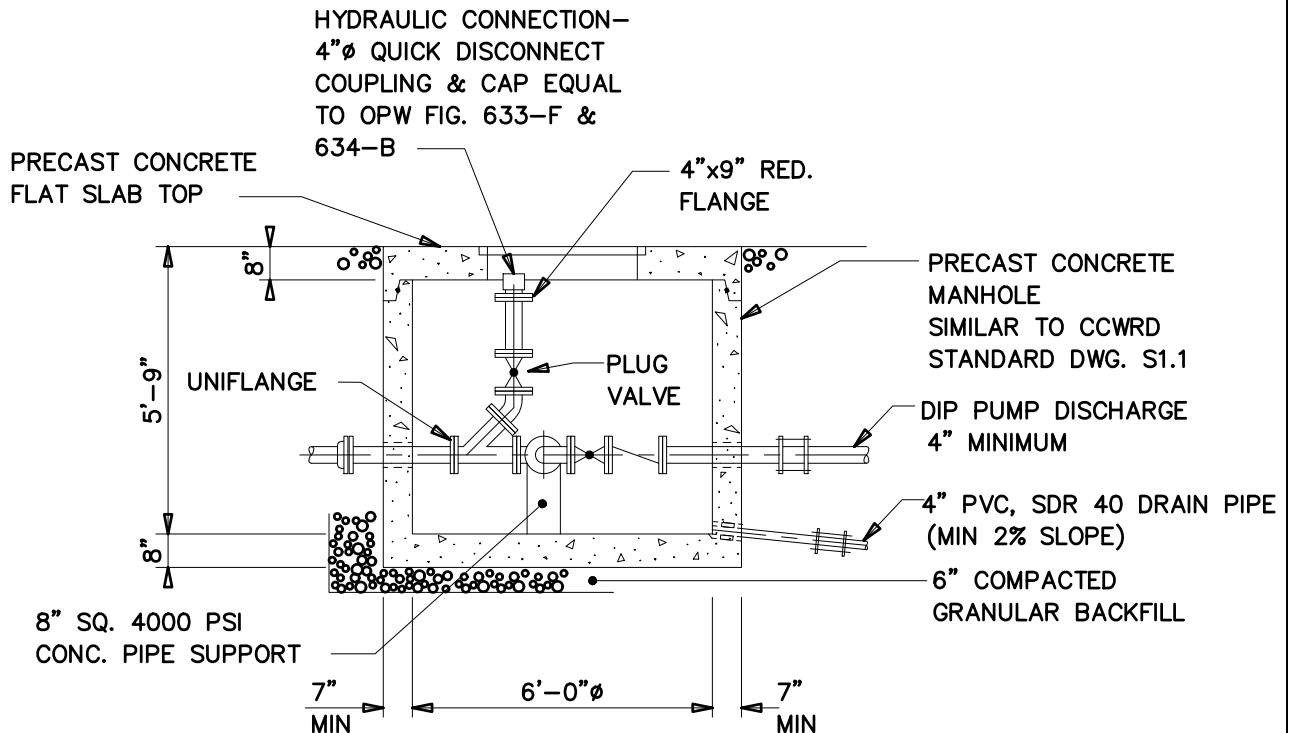
APPROVED _____

DATE _____

REVISED APRIL 2017



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

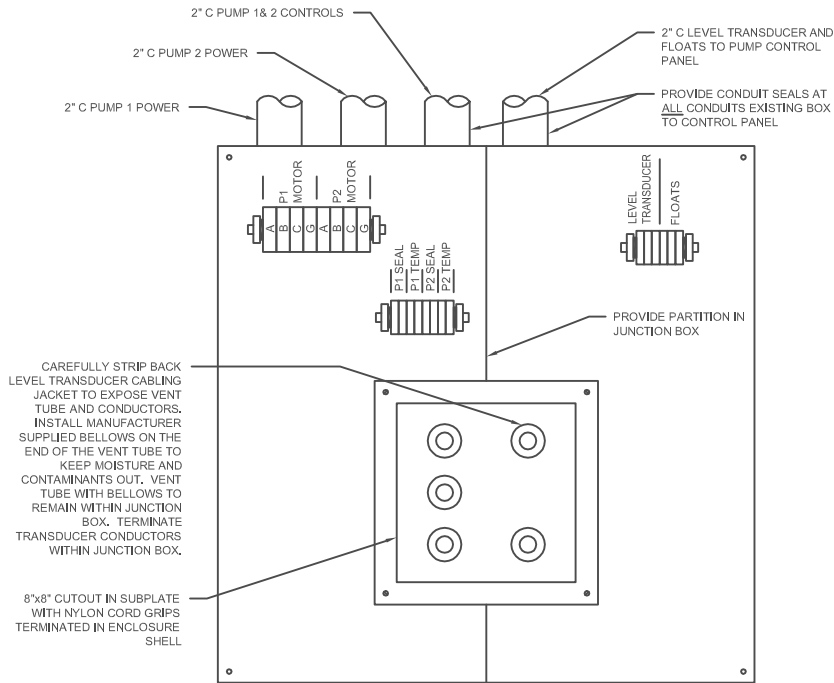
CLERMONT COUNTY
WATER RESOURCES DEPARTMENT

VALVE CHAMBER
DETAIL

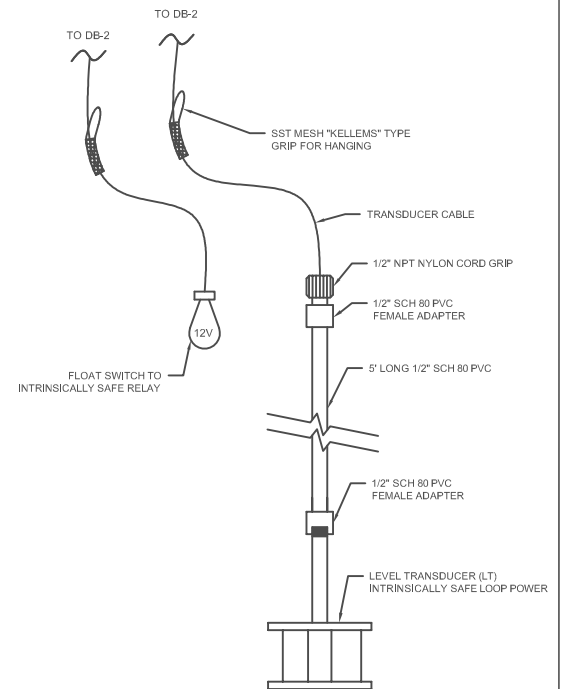
DRAWING NO.

S5.1.3

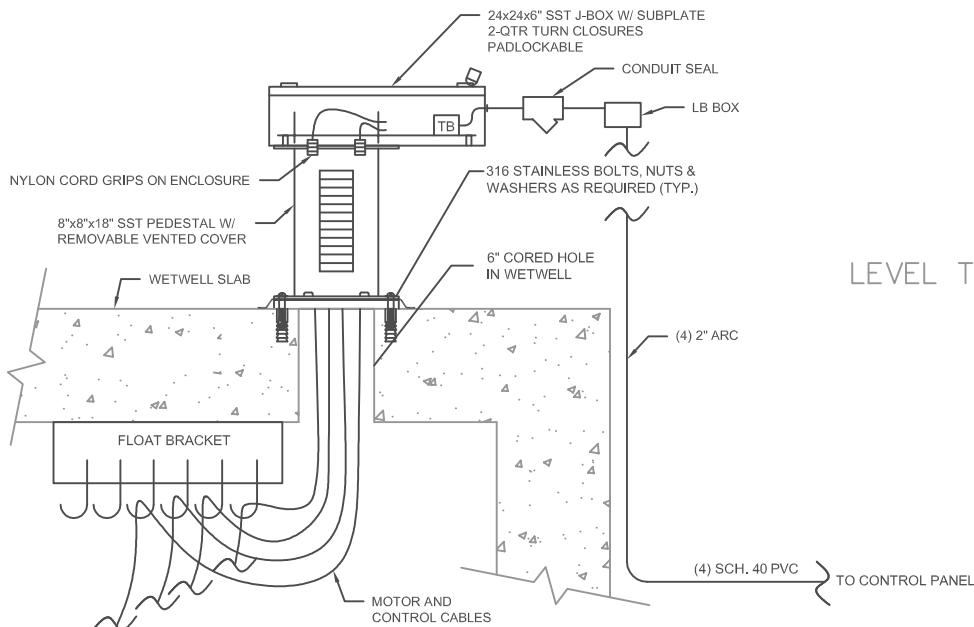
APPROVED _____
DATE _____



WET WELL JUNCTION BOX
PLAN VIEW



LEVEL TRANSDUCER & FLOAT
SWITCH DETAIL



WET WELL JUNCTION BOX
PROFILE VIEW

NO SCALE

CLERMONT COUNTY
WATER RESOURCES DEPARTMENT

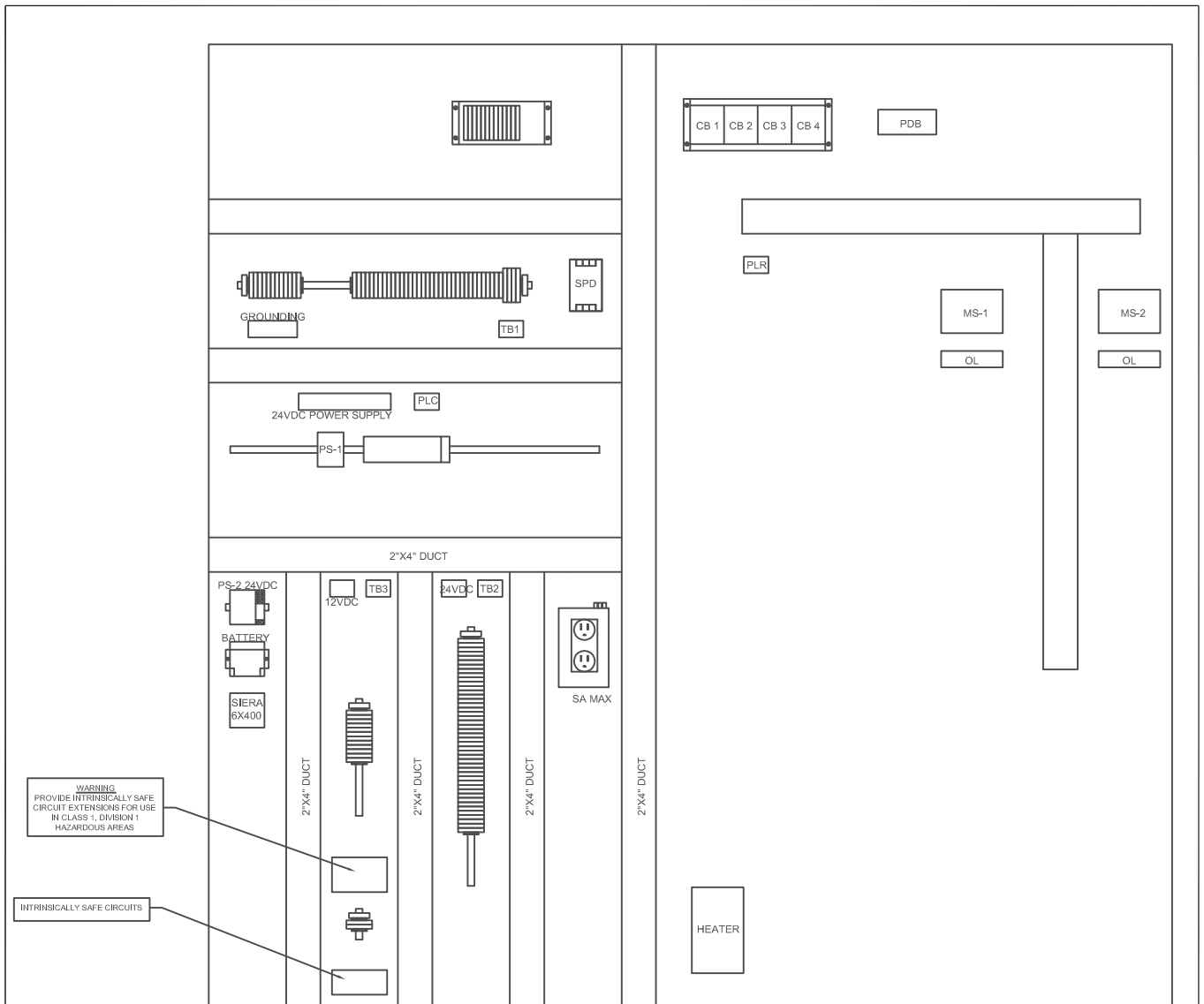
WET WELL ELECTRIC
DETAIL

DRAWING NO.

S5.1.4

APPROVED _____
DATE _____

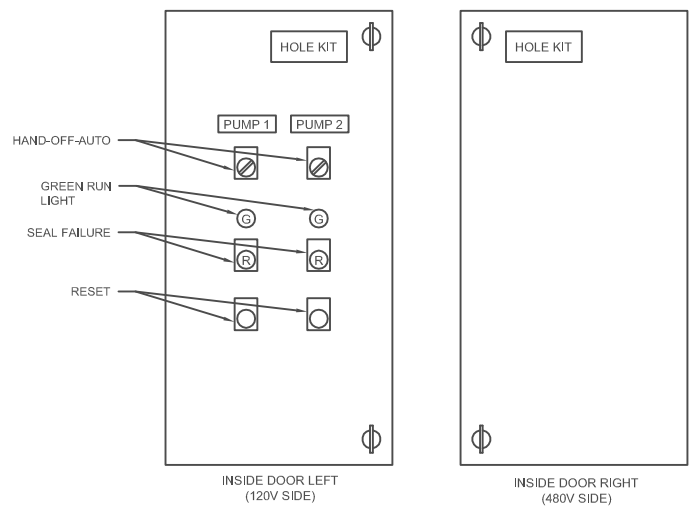
REVISED JUNE 2016



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 AWG 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 Utility Power Normal/ Phase Monitor Working							
I:0/12	Generator Fault	Input Present when Generator Faulted/ Input Off w/No Generator							
I:0/13	Diesel 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

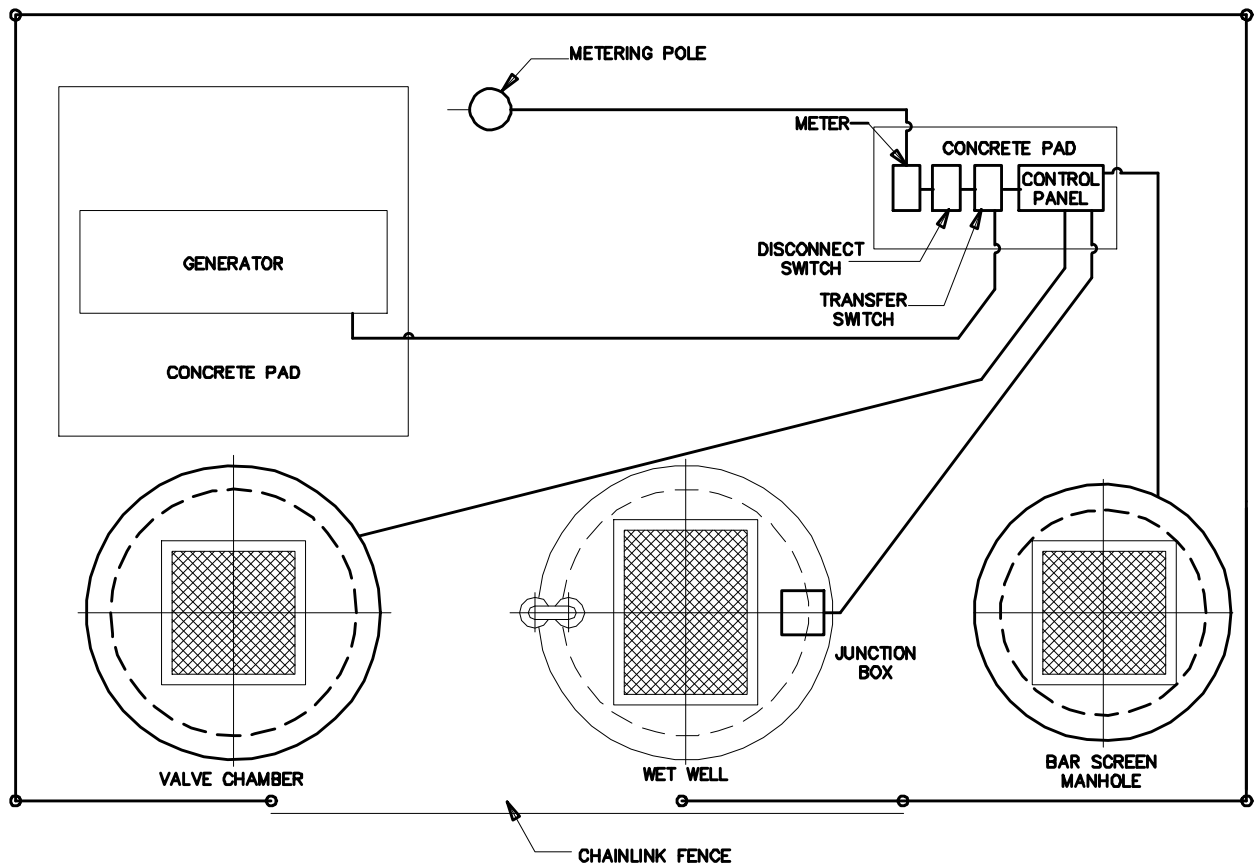
APPROVED _____
DATE _____

JUNE 2023

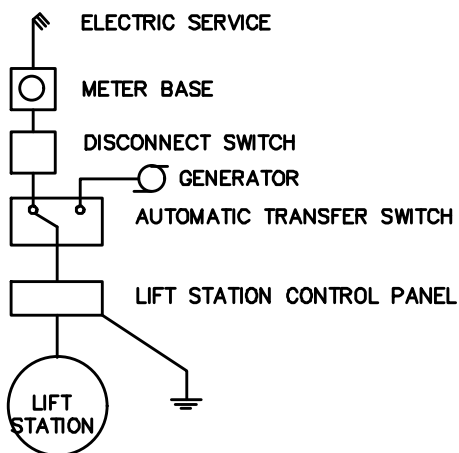
DUPLEX/TRIPLEX LIFT
STATION I/O LIST

DRAWING NO.

S5.1.6



SINGLE LINE DIAGRAM



NOTES:

1. CONDUIT ROUTING SHOWN IS MINIMUM AND TYPICAL FOR A DUPLEX LIFT STATION.
2. SPECIFICATIONS OF CONDUIT SIZE, QUANTITY, AND WIRE TYPE MAY DIFFER FOR A TRIPLEX OR 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

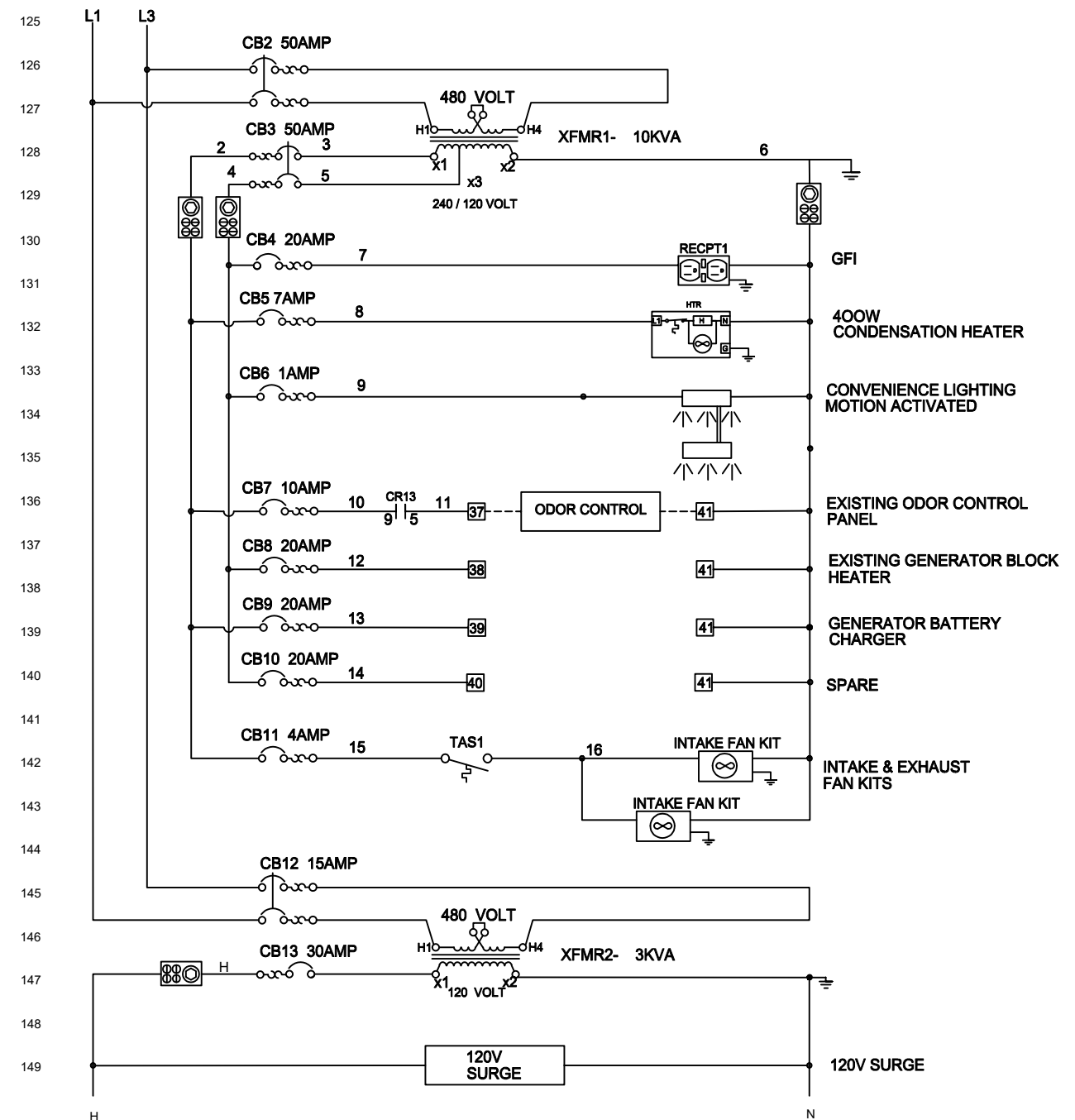
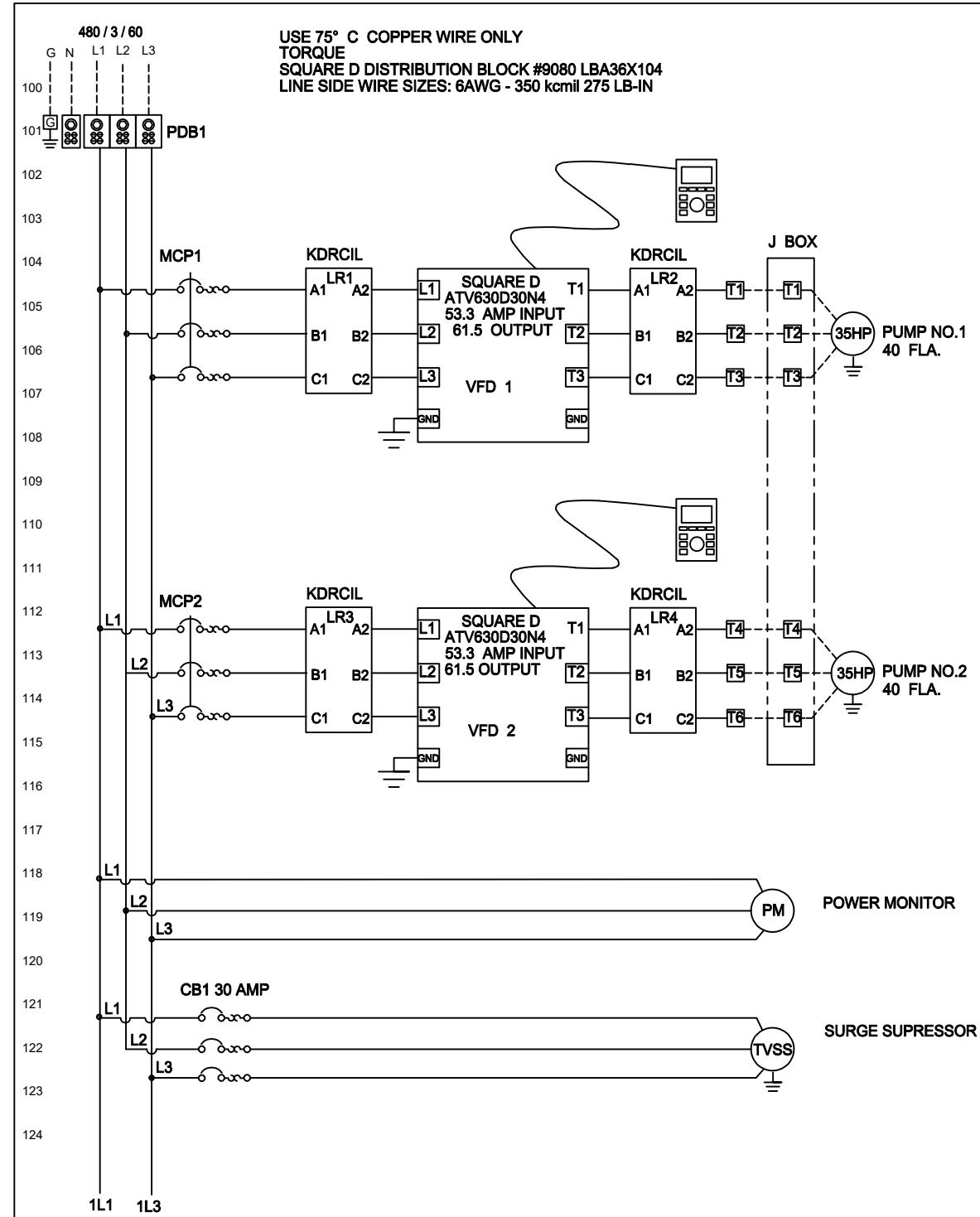
LIFT STATION
CONDUIT ROUTING

DRAWING NO.

S5.1.7

APPROVED _____
DATE _____

MARCH 2018



NOT TO SCALE

CLERMONT COUNTY
WATER RESOURCES DEPARTMENT

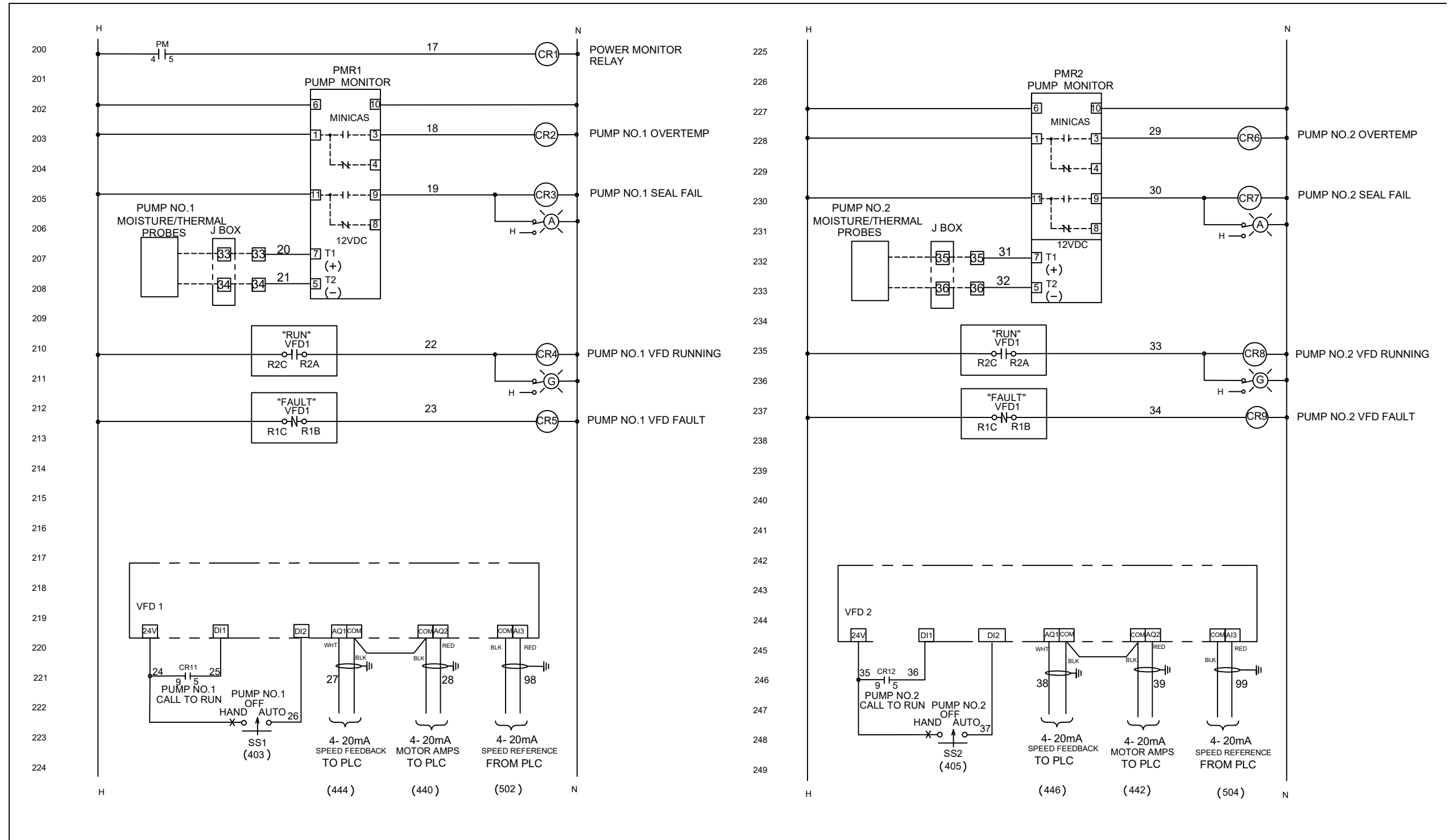
APPROVED _____
DATE _____

AUGUST 2023

DUPLEX CONTROL PANEL
SAMPLE DRAWINGS (1 OF 7)

DRAWING NO.

S5.1.8



NOT TO SCALE

CLERMONT COUNTY
WATER RESOURCES DEPARTMENT

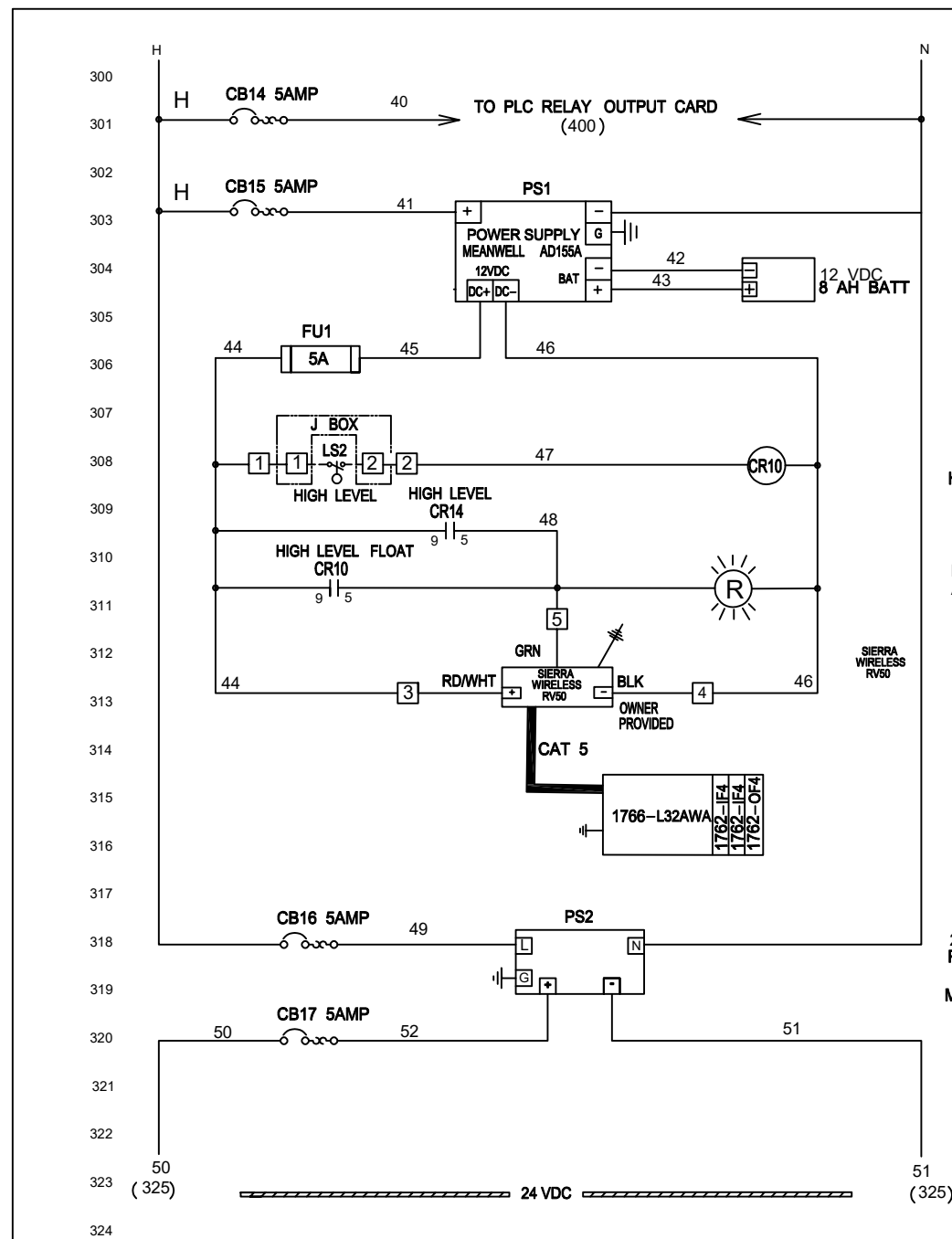
APPROVED _____
DATE _____

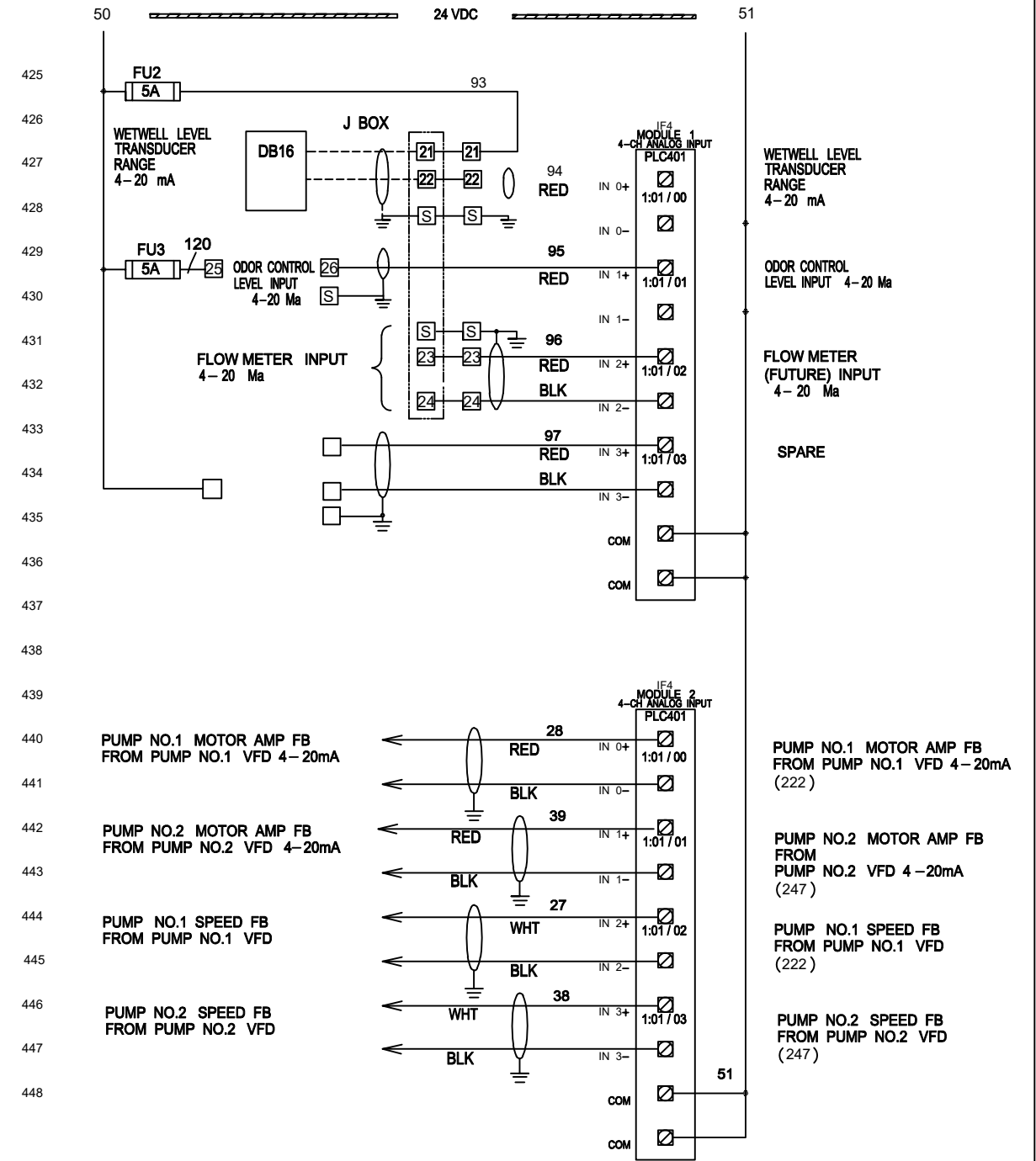
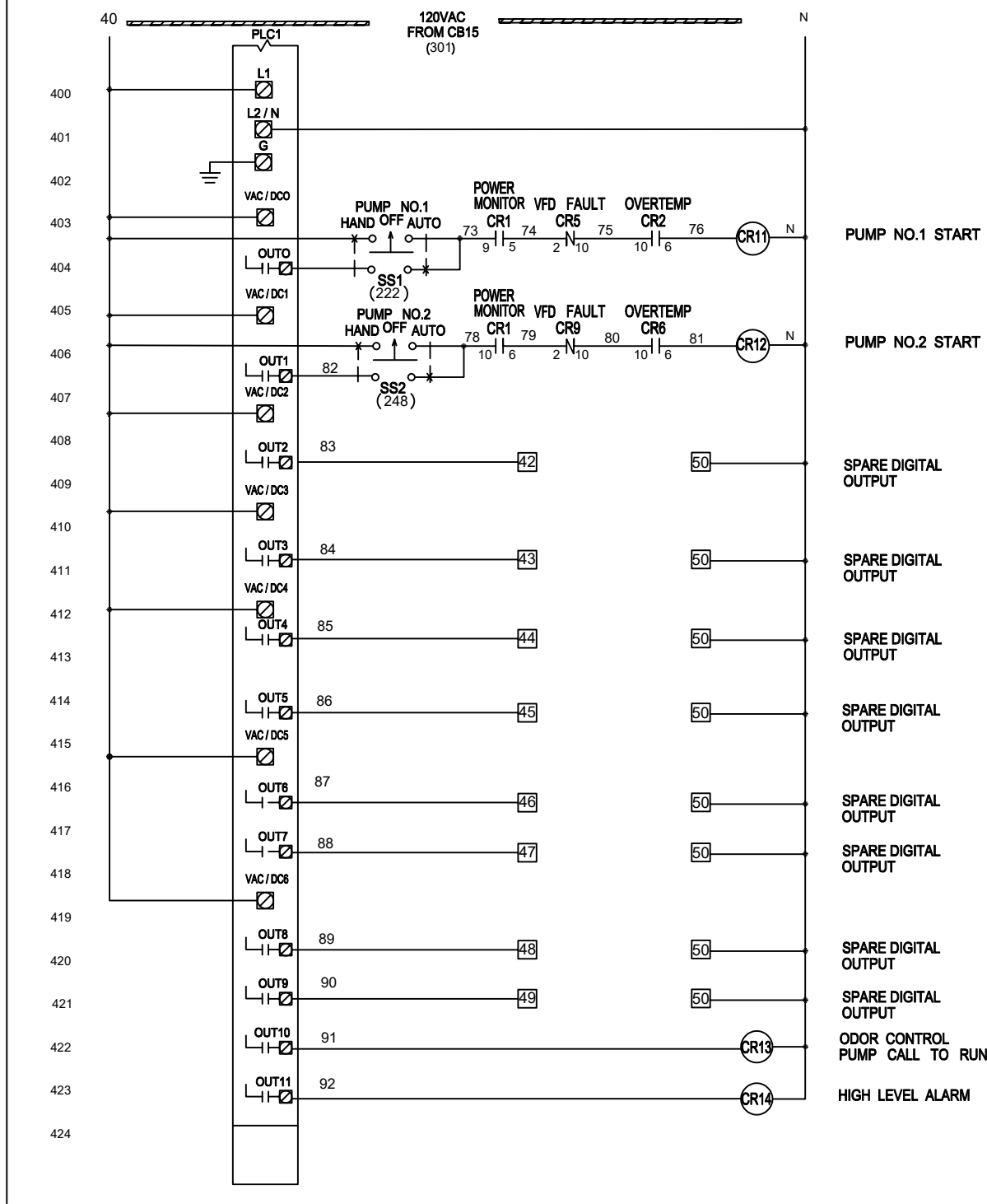
AUGUST 2023

DUPLEX CONTROL PANEL SAMPLE DRAWINGS (2 OF 7)

DRAWING NO.

S5.1.9





NOT TO SCALE

CLERMONT COUNTY
WATER RESOURCES DEPARTMENT

APPROVED _____
DATE _____

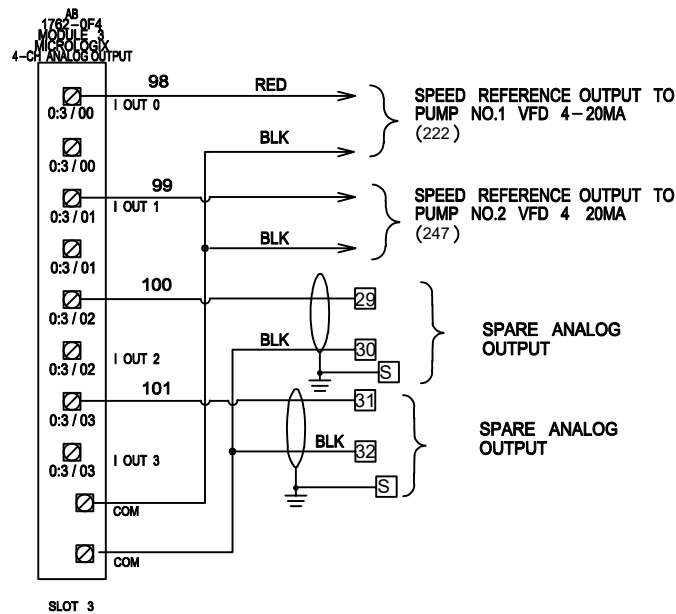
AUGUST 2023

DUPLEX CONTROL PANEL
SAMPLE DRAWINGS (4 OF 7)

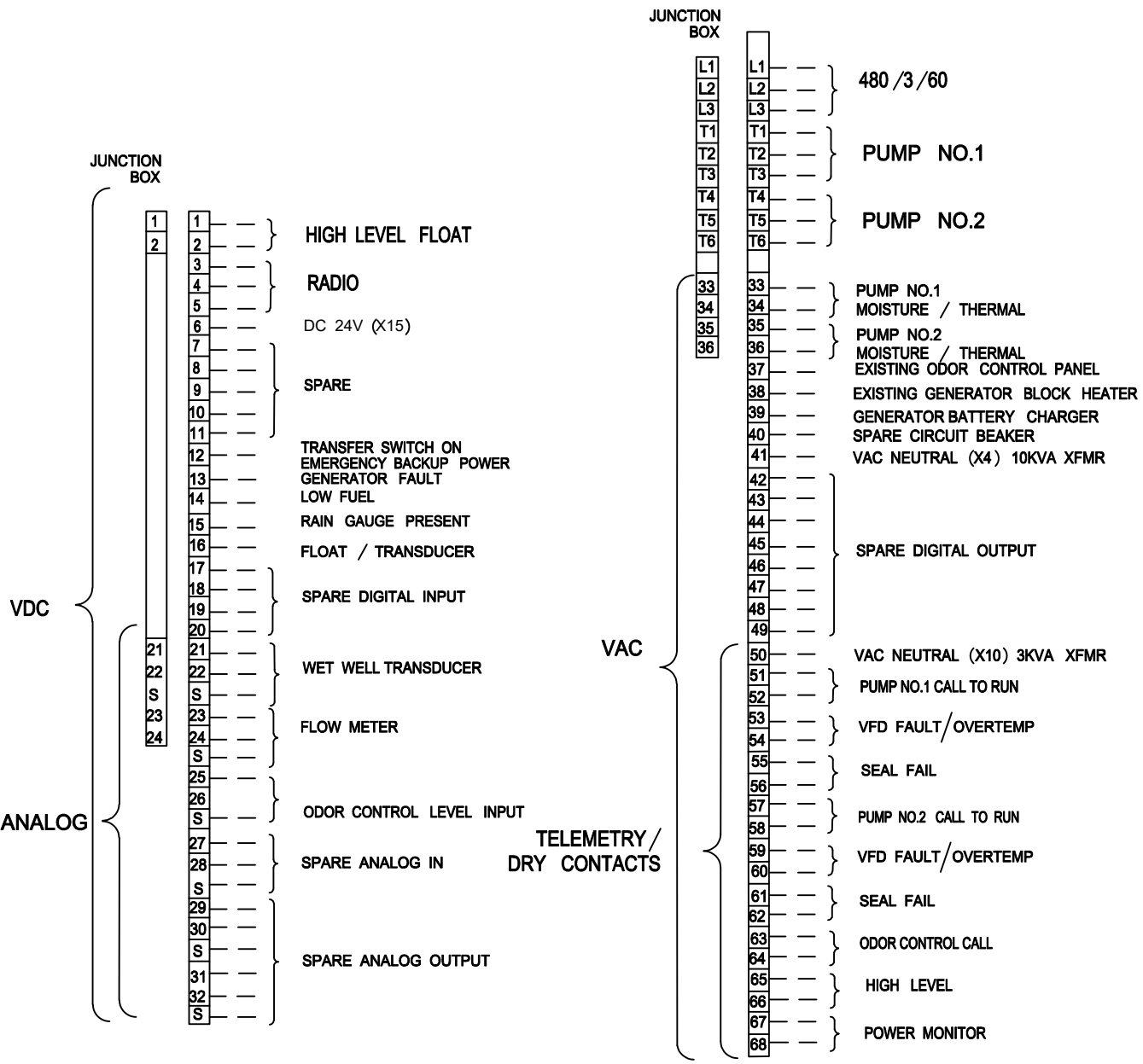
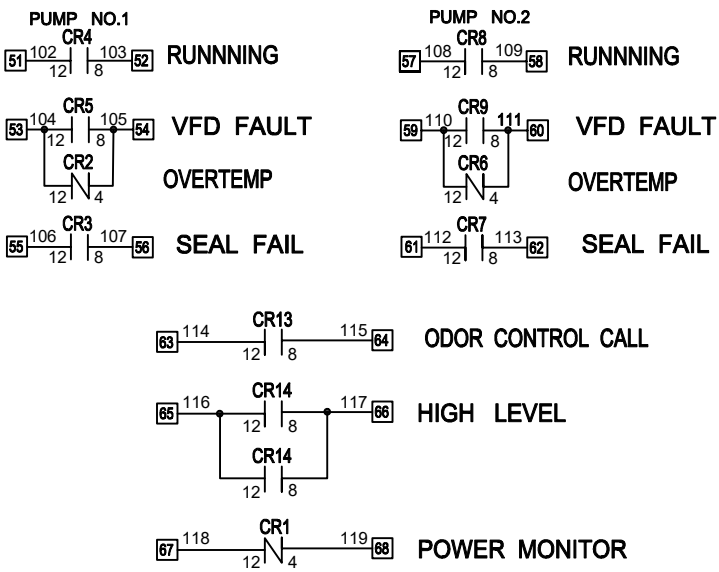
DRAWING NO.

S5.1.11

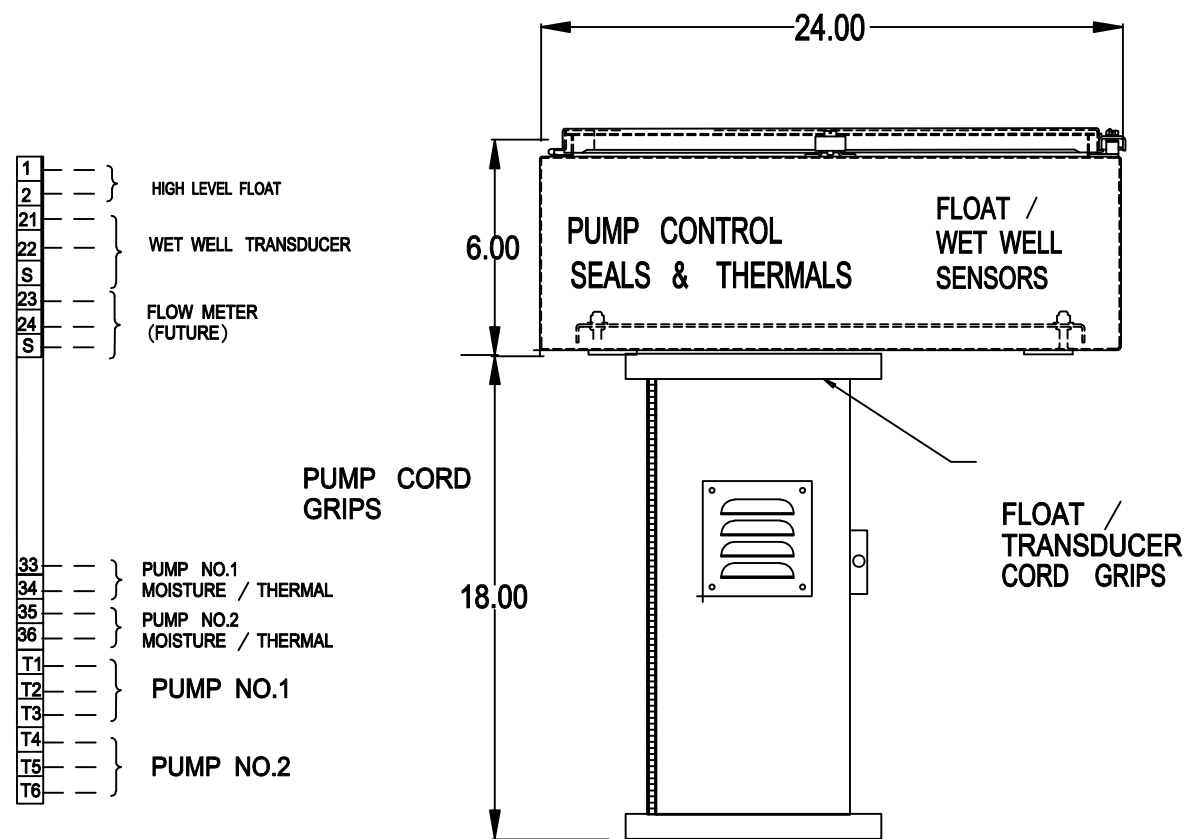
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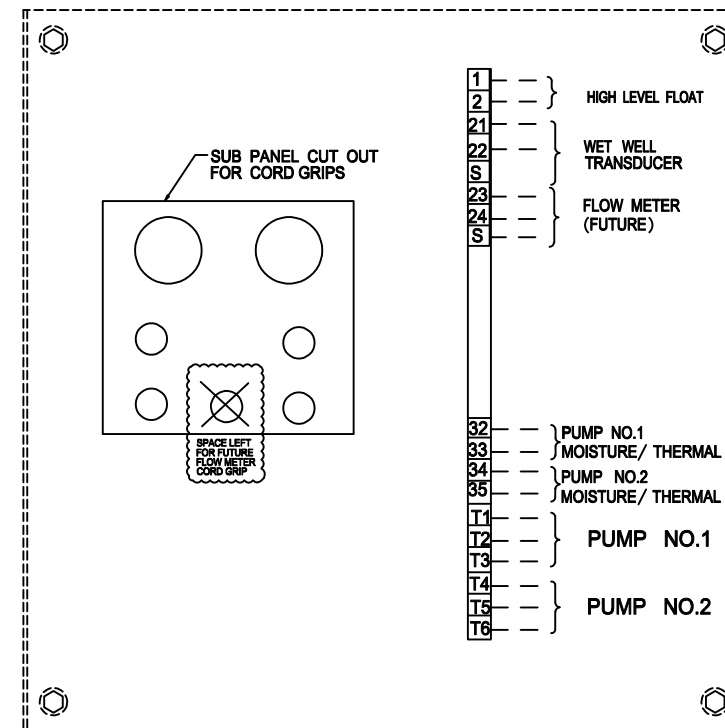
TELEMETRY CONTACTS



NOT TO SCALE



TYPE 4X STAINLESS J BOX



NOT TO SCALE

CLERMONT COUNTY
WATER RESOURCES DEPARTMENT

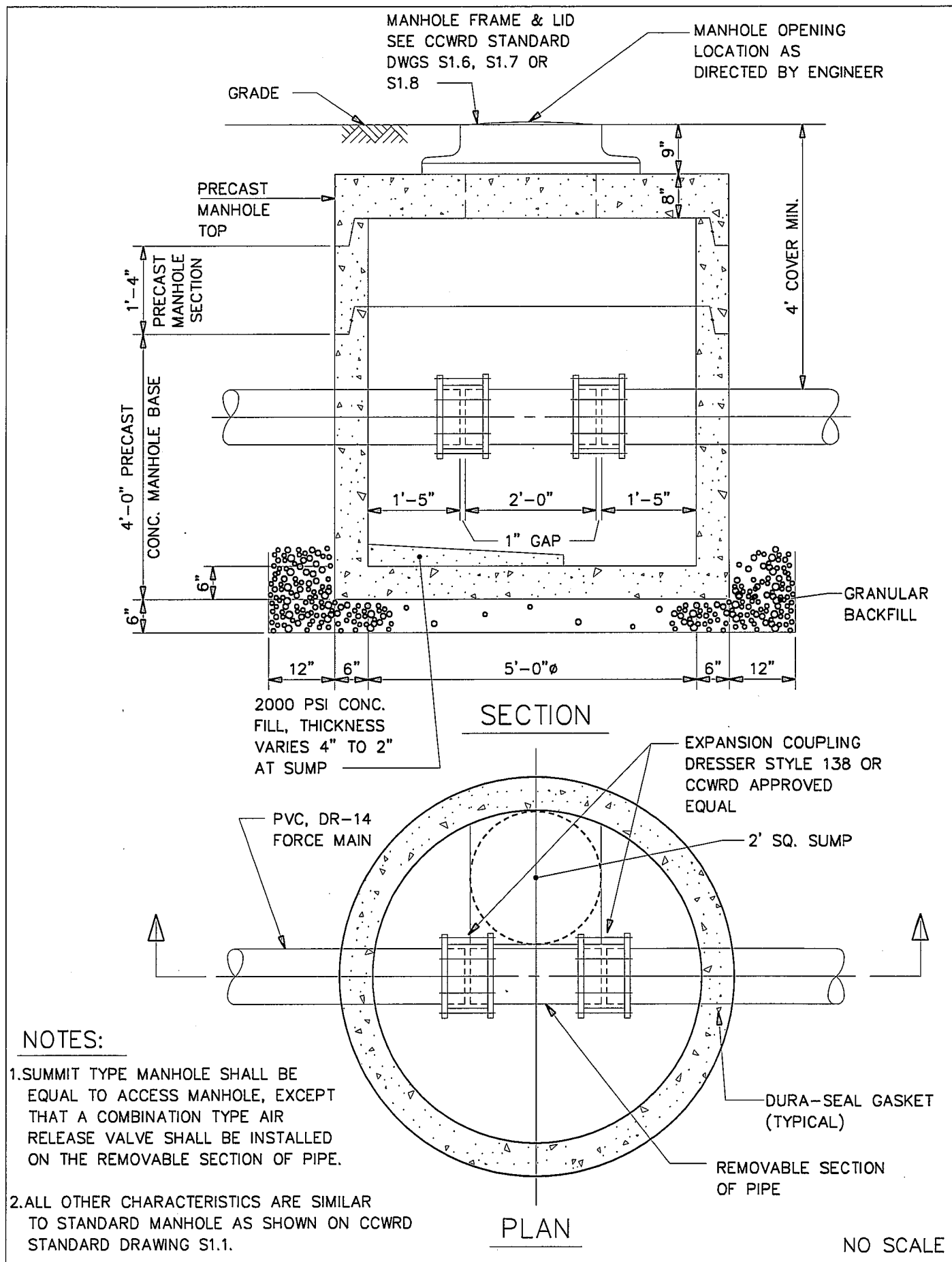
APPROVED _____
DATE _____

AUGUST 2023

DUPLEX CONTROL PANEL
SAMPLE DRAWINGS (7 OF 7)

DRAWING NO.

S5.1.14



NO SCALE

CLERMONT COUNTY
WATER RESOURCES DEPARTMENT

STANDARD FORCE
MAIN ACCESS
MANHOLE

DRAWING NO.

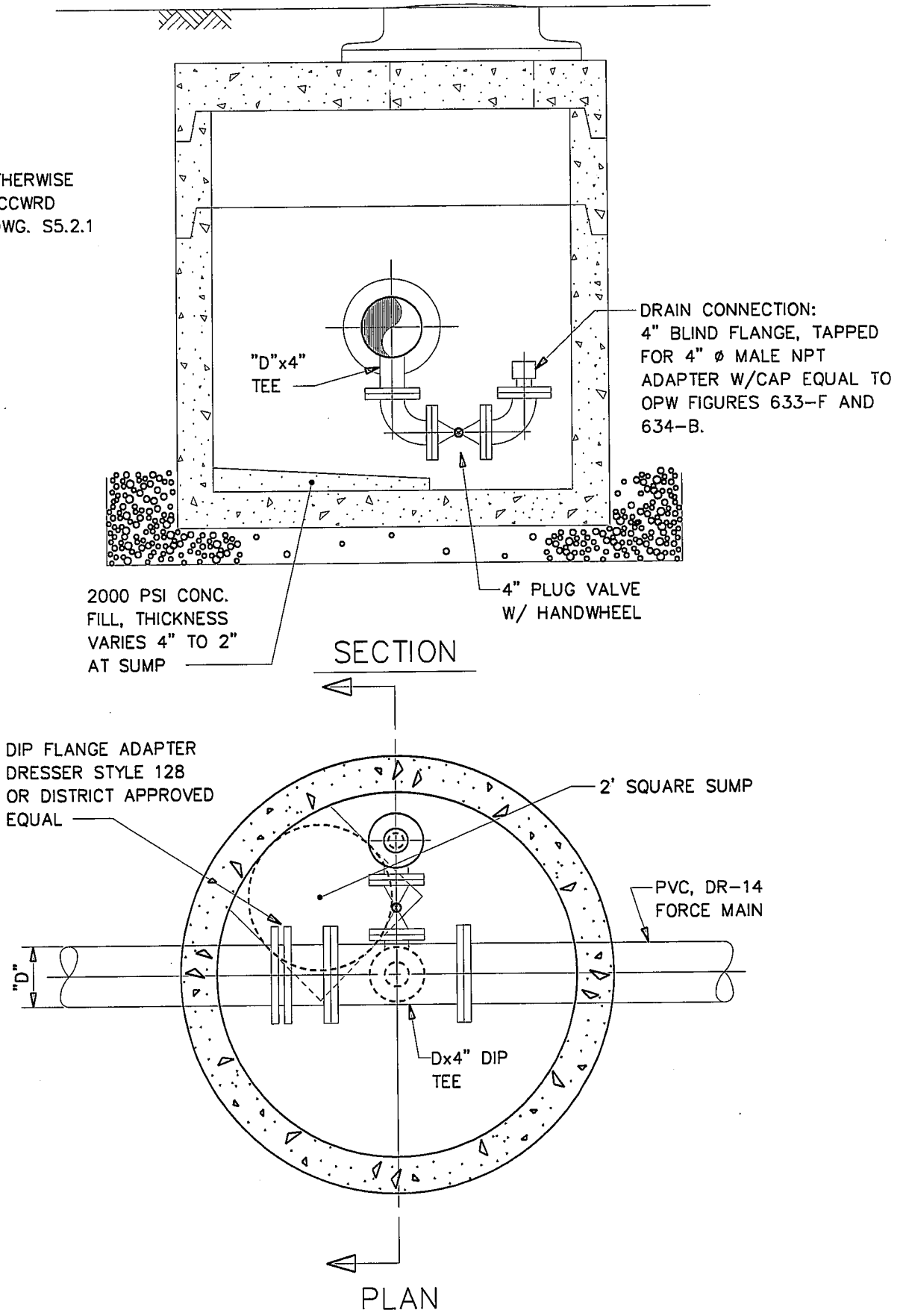
S5.2.1

APPROVED _____

DATE

NOTE:

MANHOLE OTHERWISE
SIMILAR TO CCWRD
STANDARD DWG. S5.2.1



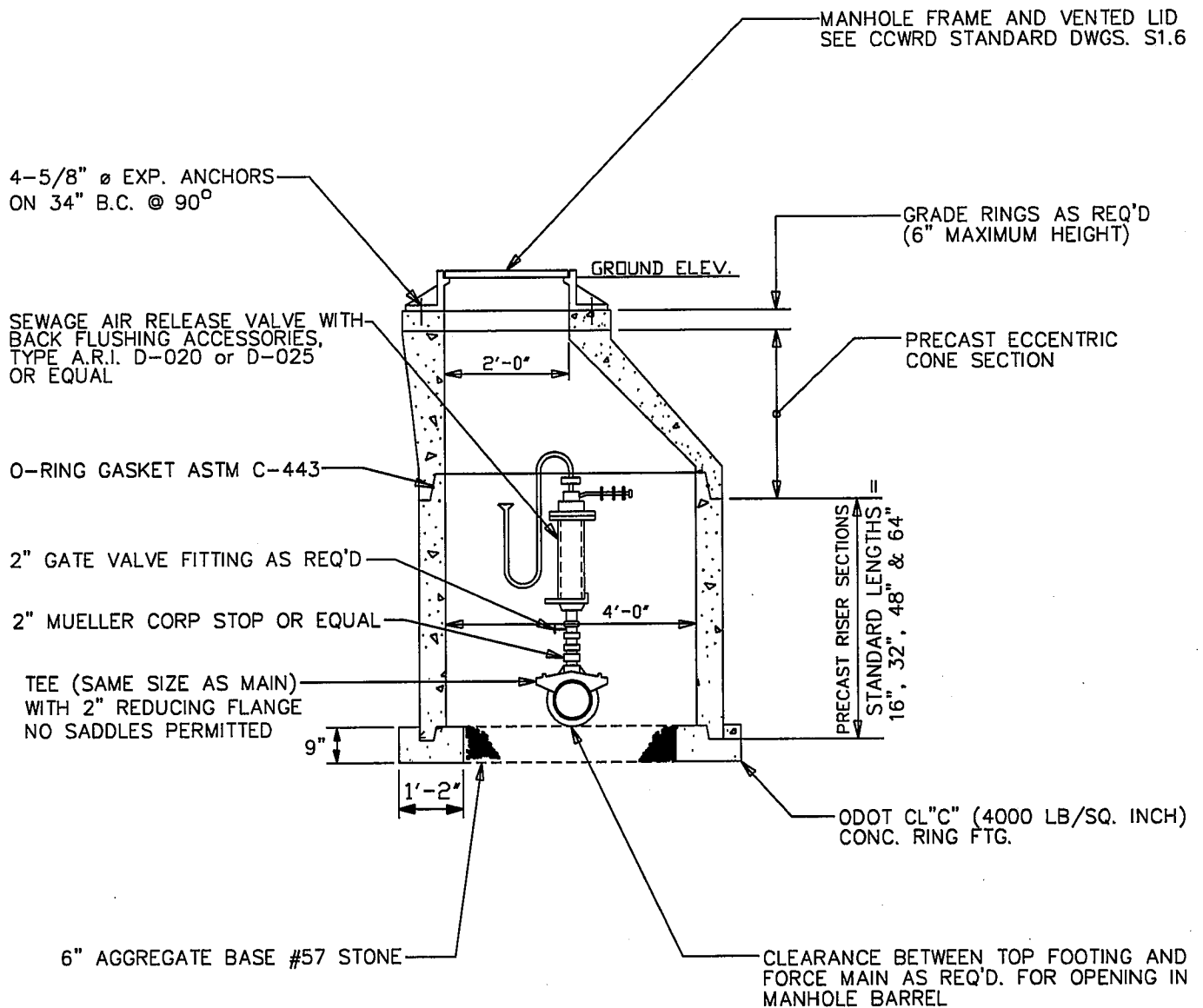
NO SCALE

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

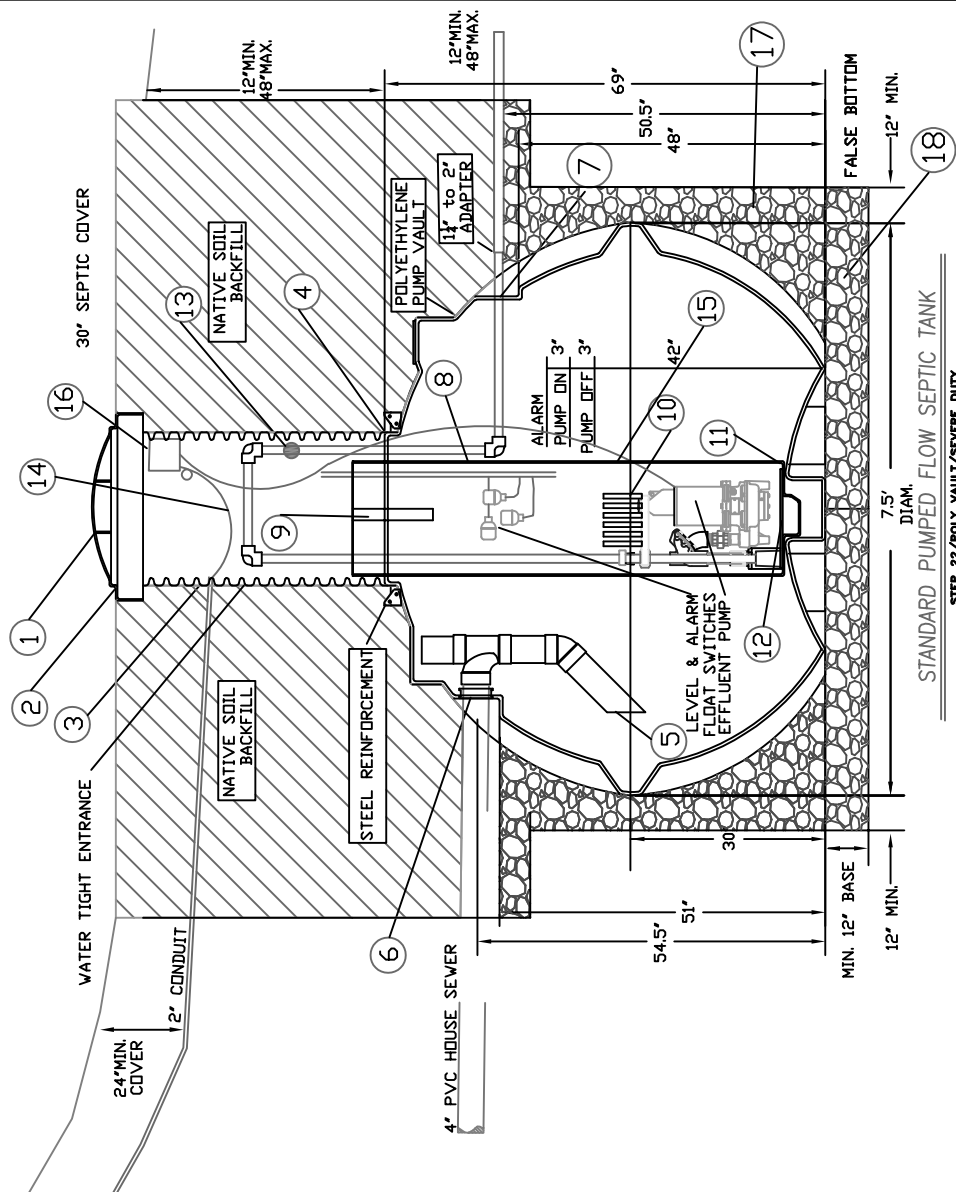
CLERMONT COUNTY
WATER RESOURCES DEPARTMENT

APPROVED _____
DATE _____

AIR RELEASE
VALVE IN
MANHOLE

DRAWING NO.

S5.2.3



NO SCALE

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 1/2" IC 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) 1/2" 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.

CLERMONT COUNTY
WATER RESOURCES DEPARTMENT

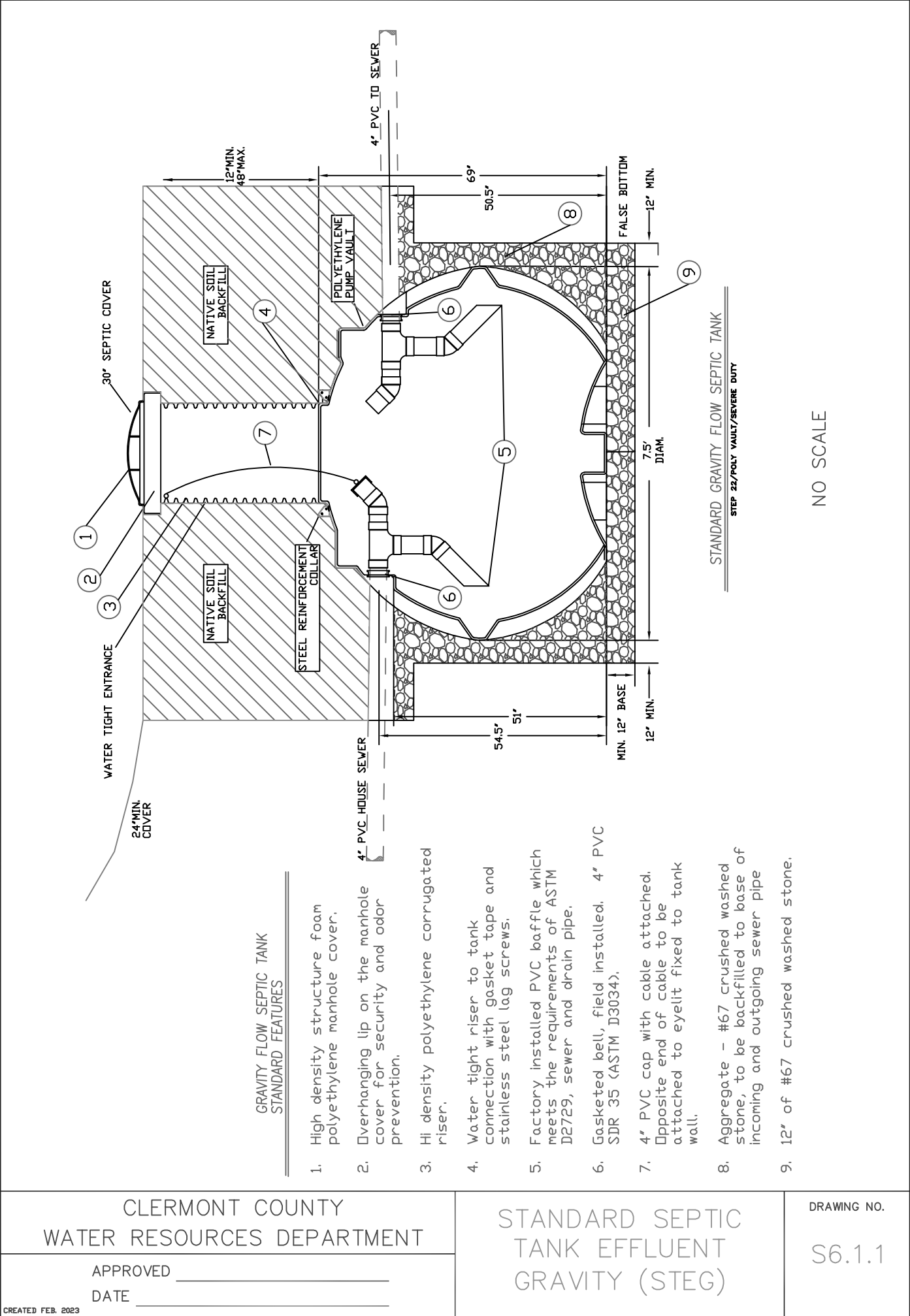
APPROVED _____
DATE _____

REVISÉD FEB. 2023

STANDARD SEPTIC TANK EFFLUENT PUMP (STEP)

DRAWING NO.

S6.1



CLERMONT COUNTY
WATER RESOURCES DEPARTMENT

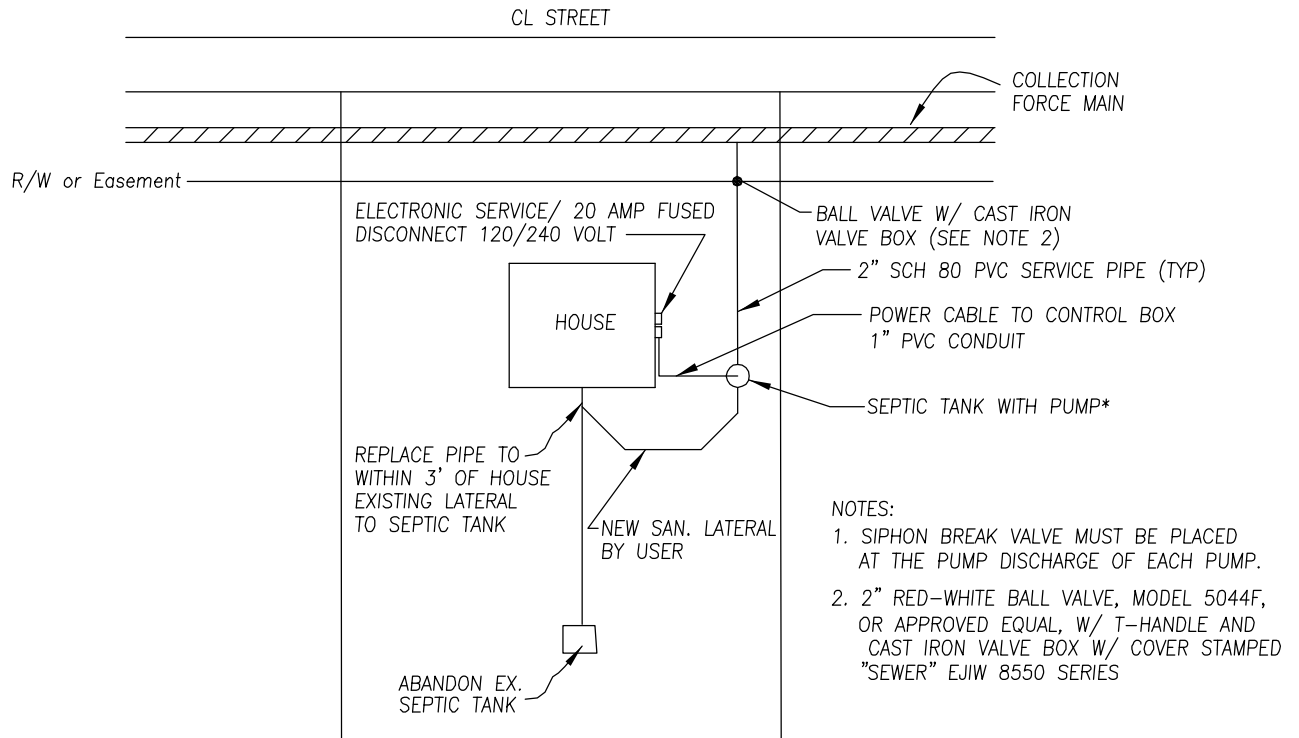
APPROVED _____
DATE _____

CREATED FEB. 2023

STANDARD SEPTIC
TANK EFFLUENT
GRAVITY (STEG)

DRAWING NO.

S6.1.1

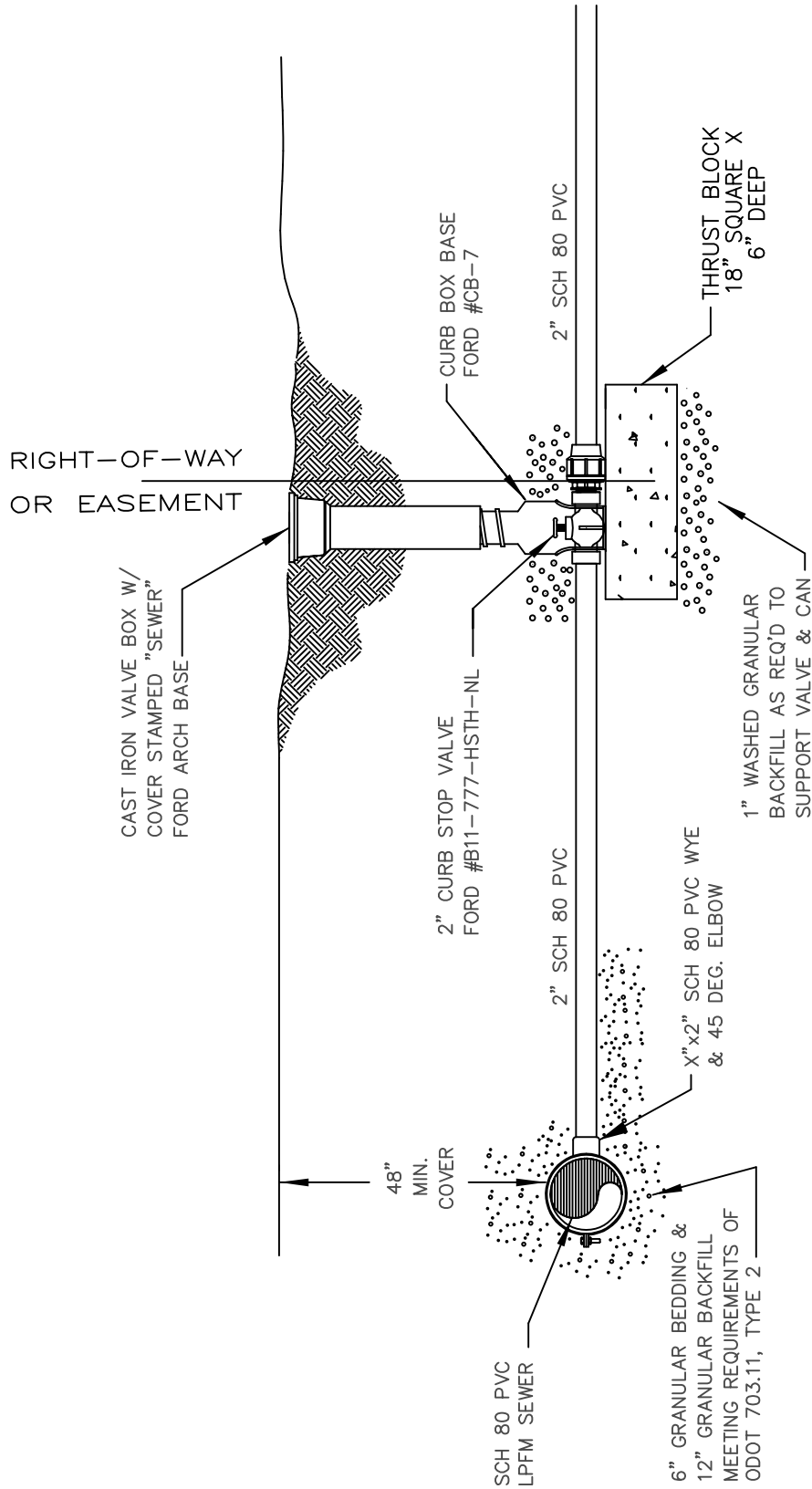


* CCWRD shall work with home owners and pump manufacturer to determine septic tank and pump location. Septic tank to be located as close to residence and roadway as possible.

TYPICAL RESIDENTIAL CONNECTION

NO SCALE

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



TYPICAL LATERAL INSTALLATION

N.T.S.

CLERMONT COUNTY
WATER RESOURCES DEPARTMENT

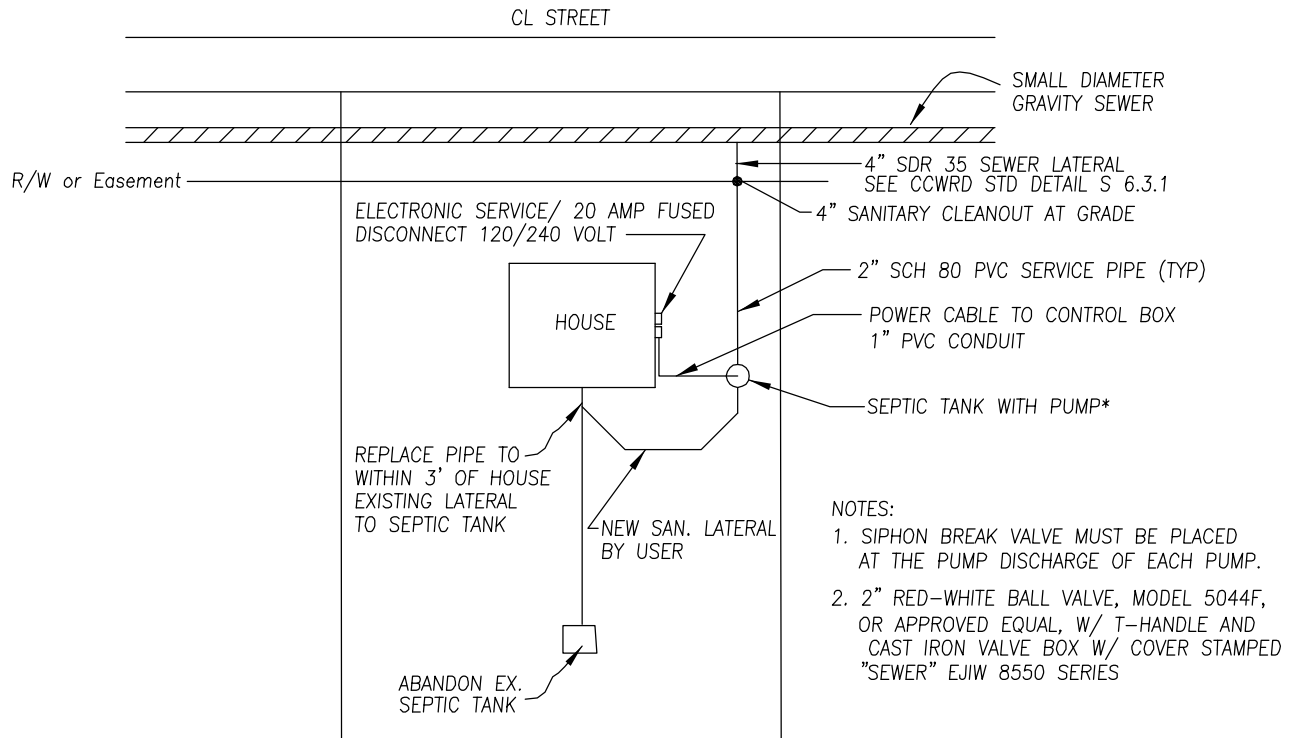
APPROVED _____
DATE _____

REVISED OCT. 2024

LOW PRESSURE FORCE
MAIN (LPFM)
LATERAL INSTALLATION

DRAWING NO.

S6.2.1



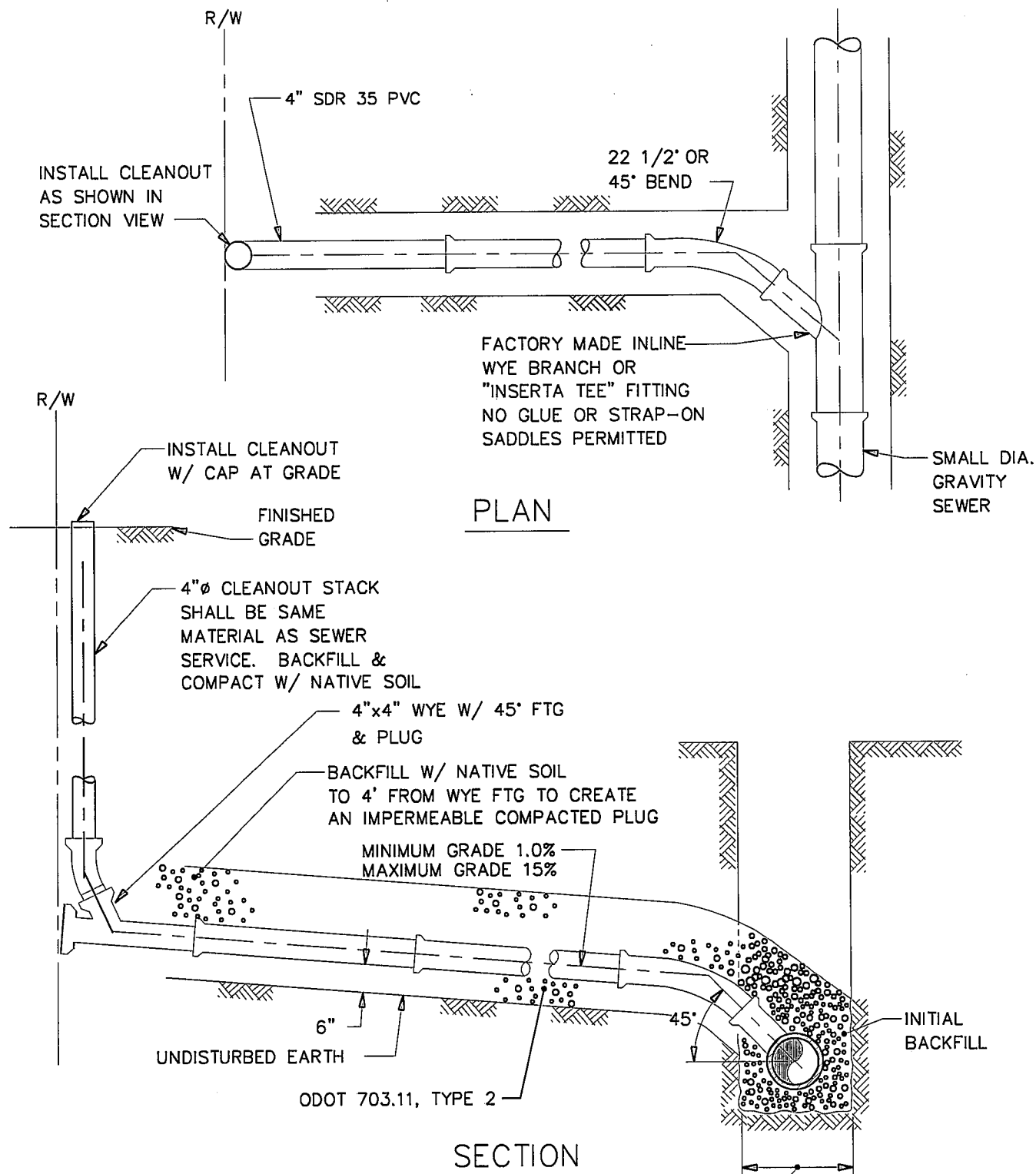
* CCWRD shall work with home owners and pump manufacturer to determine septic tank and pump location. Septic tank to be located as close to residence and roadway as possible.

TYPICAL RESIDENTIAL CONNECTION

NO SCALE

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

REVISED APRIL 2016



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 STRUCTURE IS CONNECTED, THE CLEANOUT SHALL BE BROUGHT TO GRADE AS DETAILED.

NO SCALE

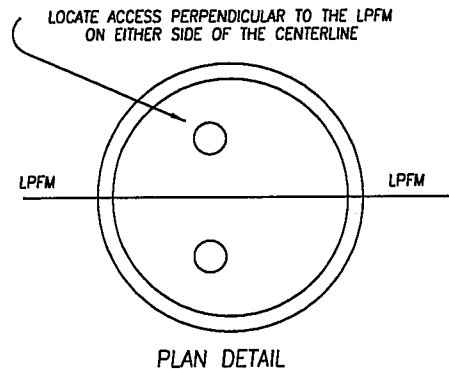
CLERMONT COUNTY
WATER RESOURCES DEPARTMENT

APPROVED _____
DATE _____

SMALL DIAMETER
GRAVITY SEWER
LATERAL INSTALLATION

DRAWING NO.

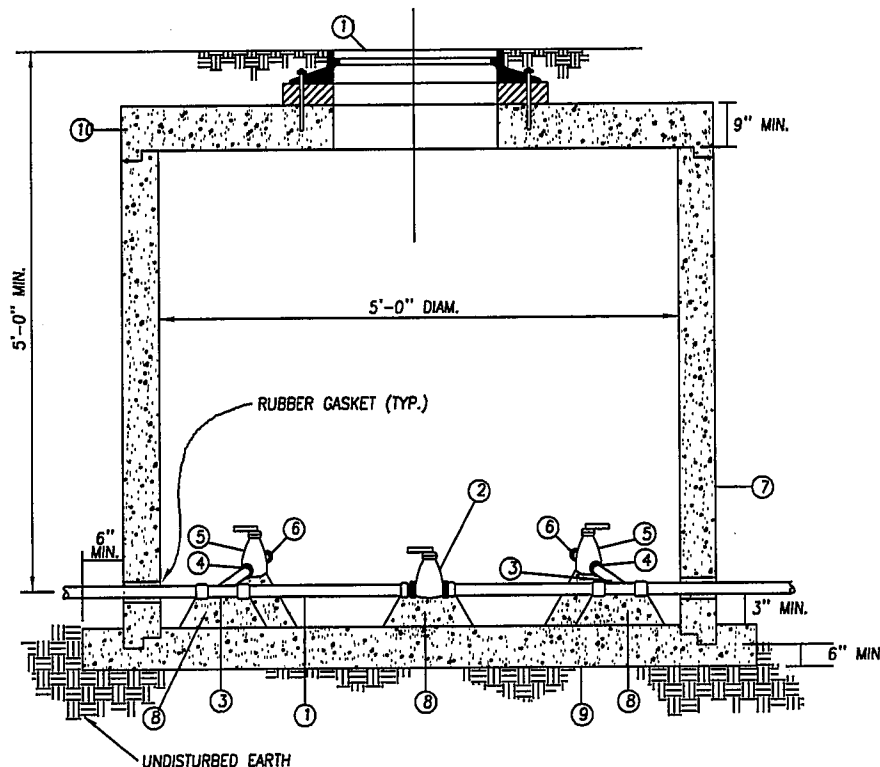
S6.3.1



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 _____

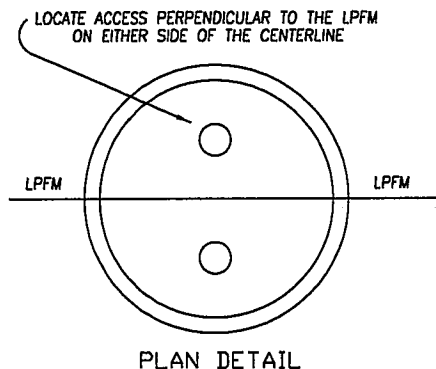
LOW PRESSURE FORCE
MAIN FLUSHING
CONNECTION MANHOLE

DRAWING NO.

S6.4



MANHOLE ACCESS TO BE LOCATED PERPENDICULAR
TO THE LPEM AS SHOWN IN THE 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.

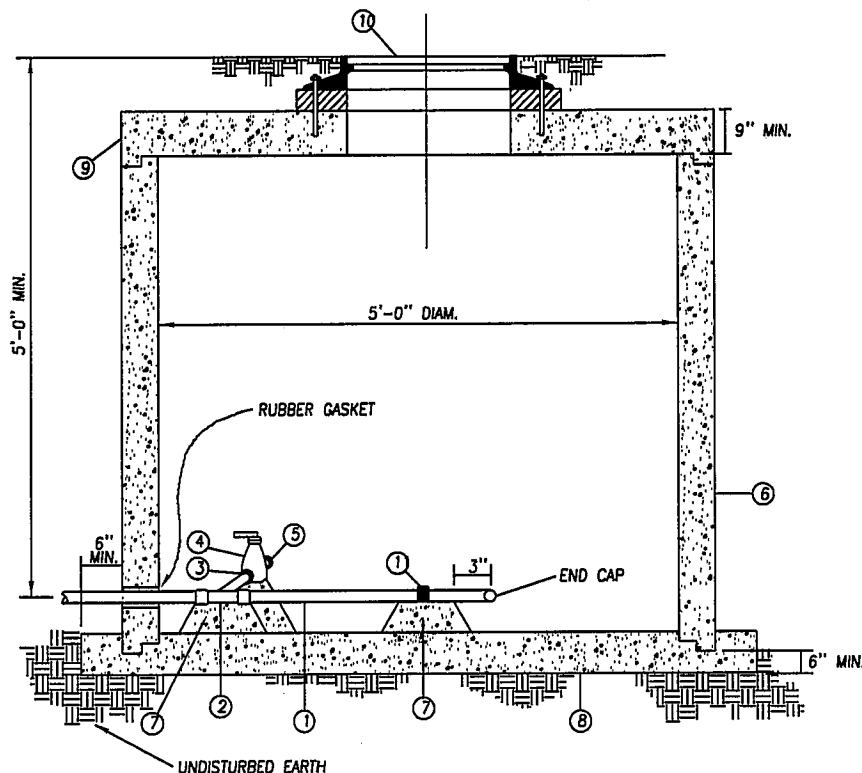
MANHOLE ACCESS TO BE LOCATED PERPENDICULAR TO THE LPFM AS SHOWN IN THE PLAN DETAIL.

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

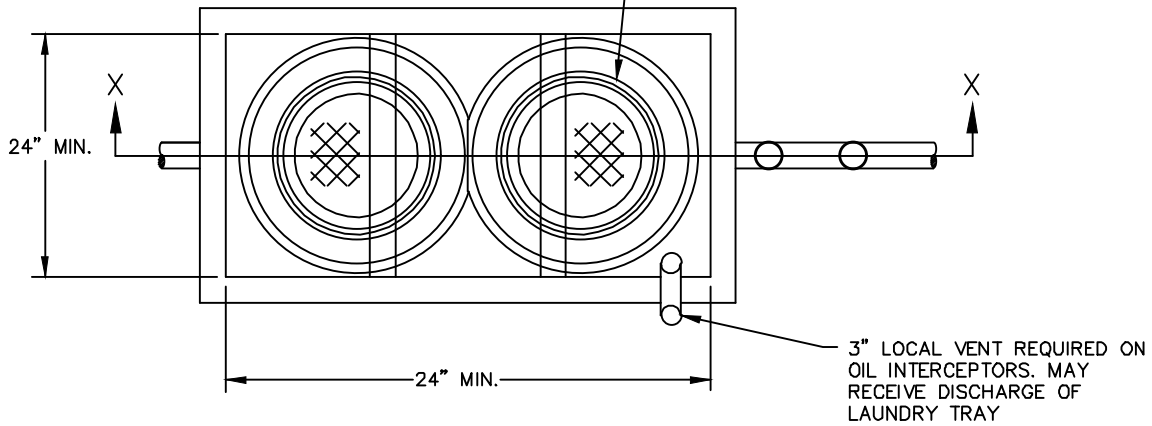
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DATE _____

LOW PRESSURE FORCE
MAIN TERMINAL
MANHOLE

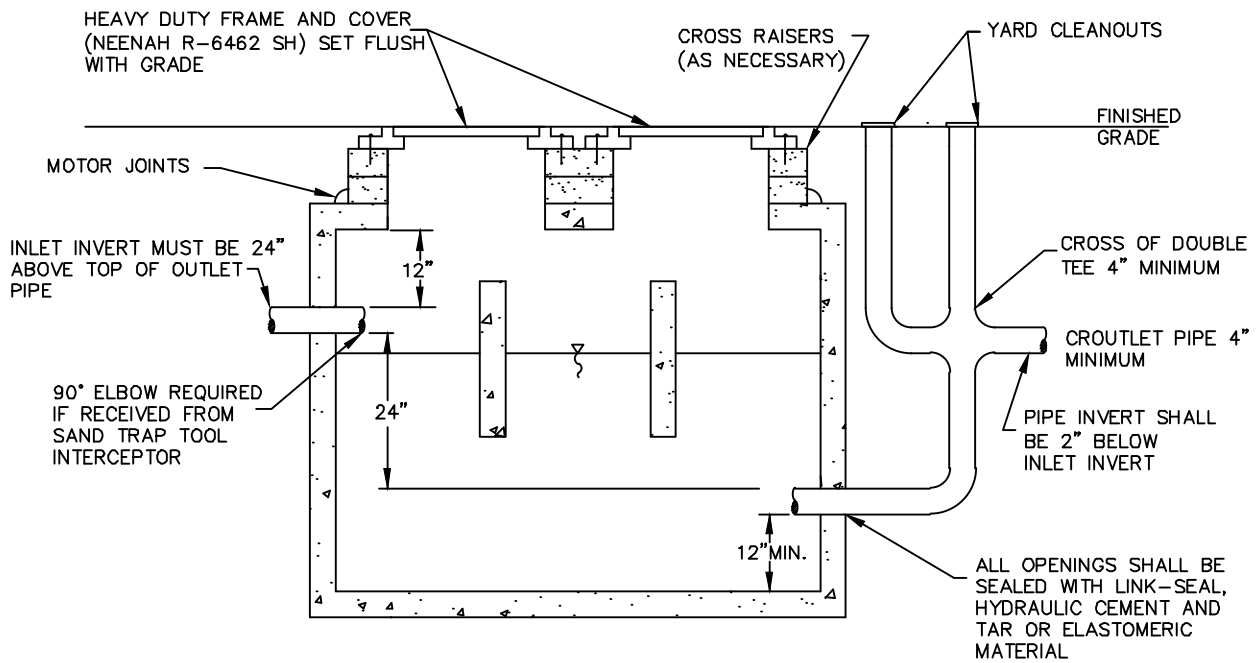
DRAWING NO.

S6.6

REINFORCED CONCRETE WATER TIGHT STRUCTURE
(2) LIDS REQUIRED IF GREASE INTERCEPTOR IS OVER 8' IN LENGTH



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	GRAVITY GREASE INTERCEPTOR	DRAWING NO. S7.1
APPROVED _____ DATE _____		