

REGIONAL SEWER DISTRICT
MONTGOMERY COUNTY, INDIANA
STANDARD CONSTRUCTION
DETAILS AND SPECIFICATIONS

DIRECTIONS FOR USE

- 1. THE ENTIRE SET OF FULL SIZE STANDARDS SHALL BE ATTACHED TO THE CONSTRUCTION DRAWINGS AND SHALL BE CONSIDERED PART THERETO. PARTIAL SET MAY BE USED FOR SMALL PROJECTS WHEN APPROVED BY THE MONTGOMERY COUNTY REGIONAL SEWER BOARD.
- 2. DETAILS PREPARED BY OUTSIDE SOURCES SHALL NOT BE INCLUDED IN THE CONSTRUCTION DRAWINGS WHEN SAID DETAILS COVER WORK WHICH IS COVERED BY MCRSD STANDARDS.
- 3. INDIVIDUAL MCRSD STANDARDS THAT DO NOT APPLY MAY BE CROSSED-OUT BY DESIGN ENGINEER THROUGH THE PLACEMENT OF A SINGLE LARGE X OVER DETAIL. MINOR REFERENCE NOTATIONS MAY BE PLACED ADJACENT TO INDIVIDUAL STANDARD TILES FOR COORDINATION. HOWEVER, THE STANDARDS THEMSELVES SHALL NOT BE MODIFIED IN ANY WAY.
- 4. DETAILS PREPARED BY OUTSIDE SOURCES COVERING WORK WHICH IS NOT COVERED BY MCRSD STANDARDS ARE THE SOLE RESPONSIBILITY OF THE DESIGN ENGINEER AND SHALL BE PLACED ON SHEETS OTHER THAN THE MCRSD STANDARDS SHEETS.


GENERAL NOTES

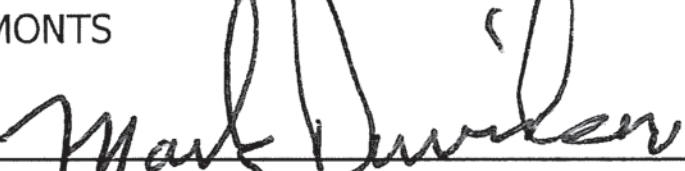
- 1. CONTRACTOR SHALL VERIFY THE EXACT LOCATION OF ALL EXISTING UTILITIES AT LEAST 48 HOURS PRIOR TO ANY CONSTRUCTION OR EXCAVATION. DURING CONSTRUCTION, ALL UTILITIES SHALL BE ADEQUATELY SUPPORTED TO MINIMIZE DAMAGE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING OR REPLACING DAMAGED UTILITIES TO THE SATISFACTION OF THE MCRSD AND THE OWNER OF THE AFFECTED UTILITY.

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MONTGOMERY COUNTY REGIONAL SEWER DISTRICT
BOARD OF DIRECTORS


TERRY HOCKERSMITH


BRAD MONTS


MARK DAVIDSON



JOE McCUTCHEON


DAN GUARD

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NO.	DATE	DESCRIPTION	BY

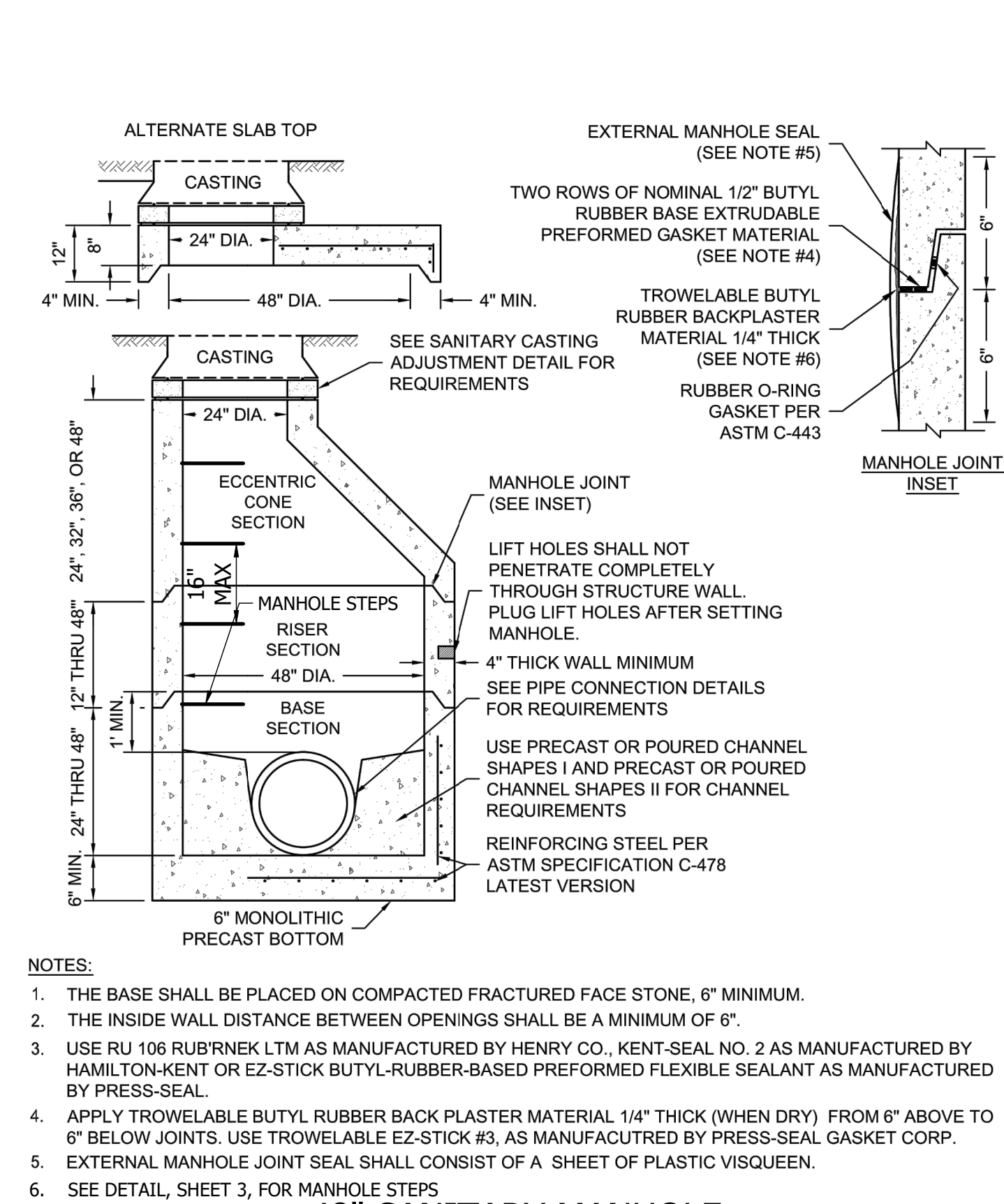


RECOMMENDED FOR APPROVAL		08/21/2019
	DESIGN ENGINEER	DATE
DESIGNED:	LMY	DRAWN: KDK
CHECKED:	ARM	CHECKED: ARM

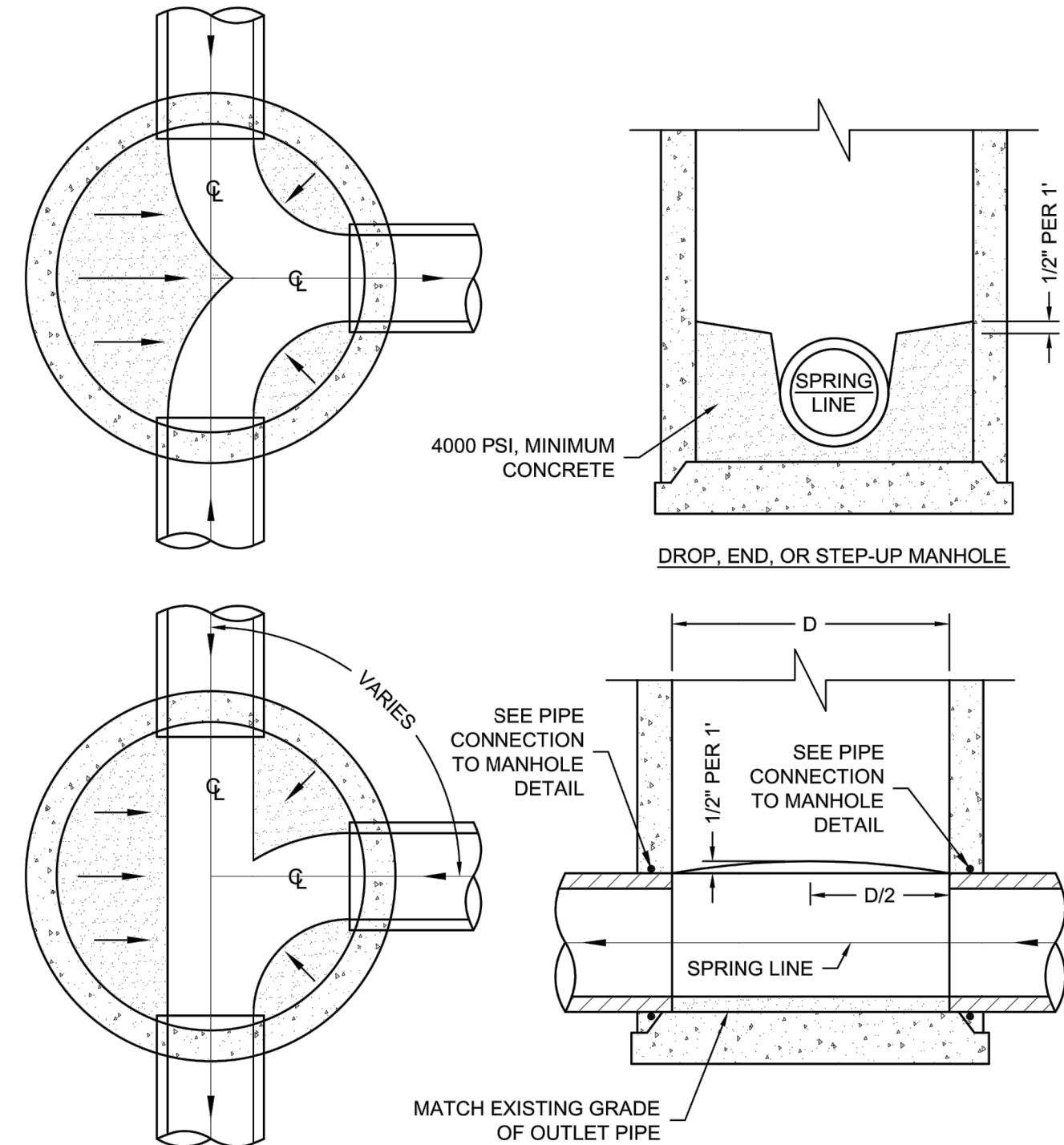
MONTGOMERY COUNTY SEWER DISTRICT
TITLE SHEET

HORIZONTAL SCALE
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VERTICAL SCALE
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SHEETS
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PROJECT
13-3041

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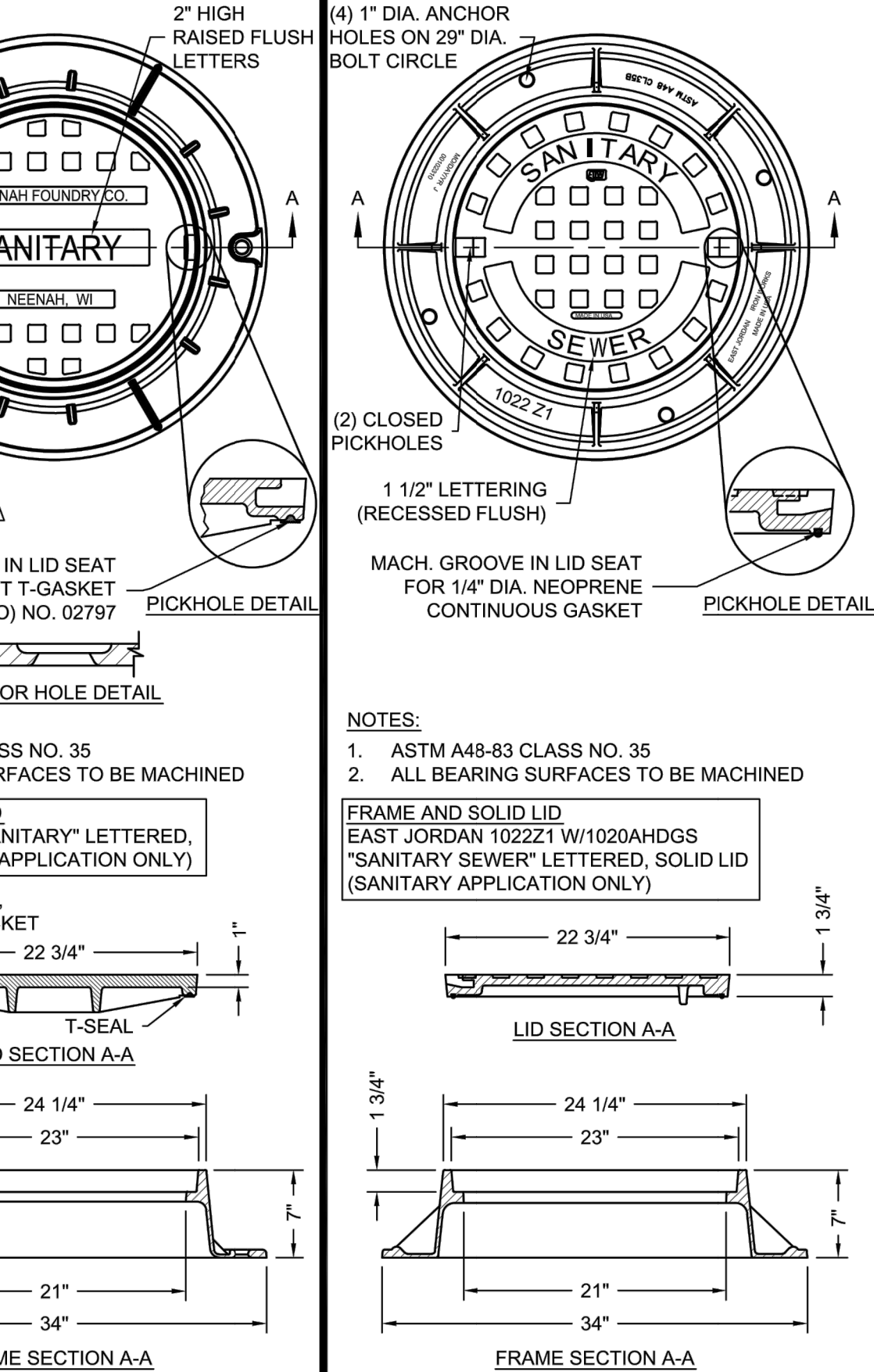


48" SANITARY MANHOLE

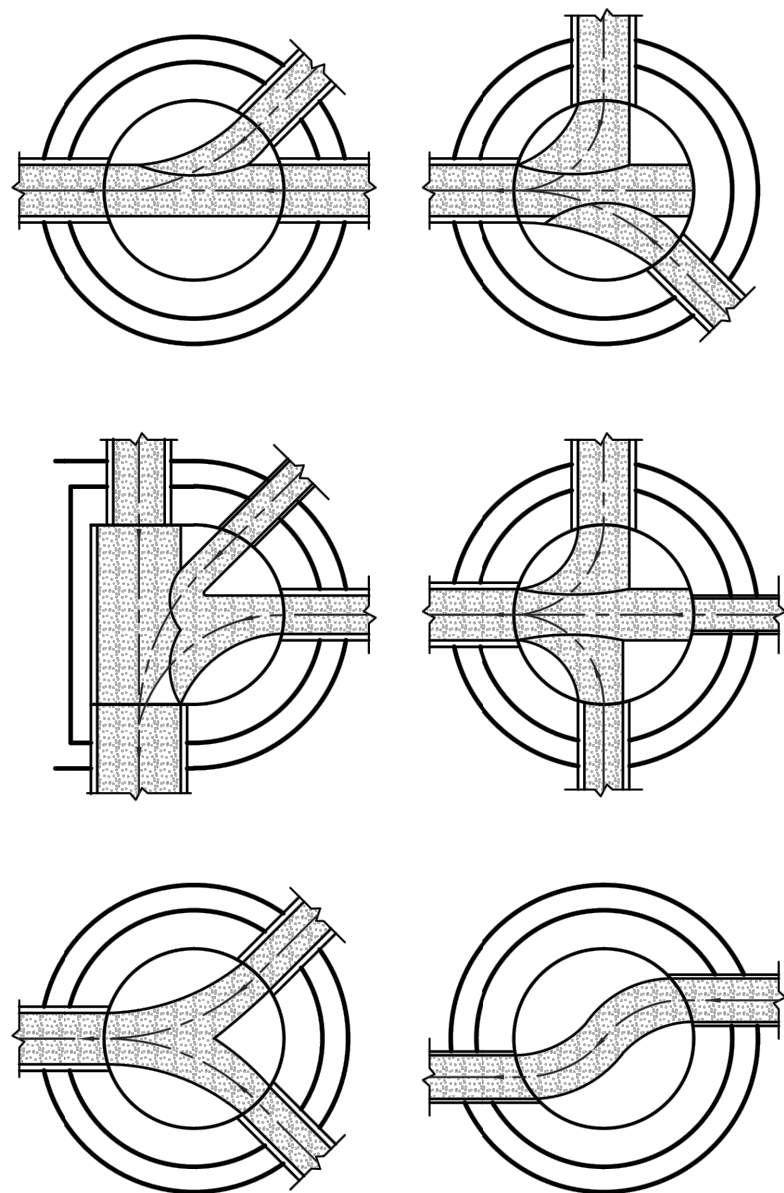


- NOTES:
- OF ALL PIPES TO INTERSECT OF MANHOLE. INVERTS TO BE POURED UNDER DRY PIPE CONDITIONS.
 - WHEN INCREASING PIPE DIAMETER BY 6" OR LESS, CROWN ELEVATIONS SHALL MATCH AT OF MANHOLE.
 - WHEN INCREASING PIPE DIAMETER BY MORE THAN 6", SPRING LINES SHALL MATCH AT OF MANHOLE.

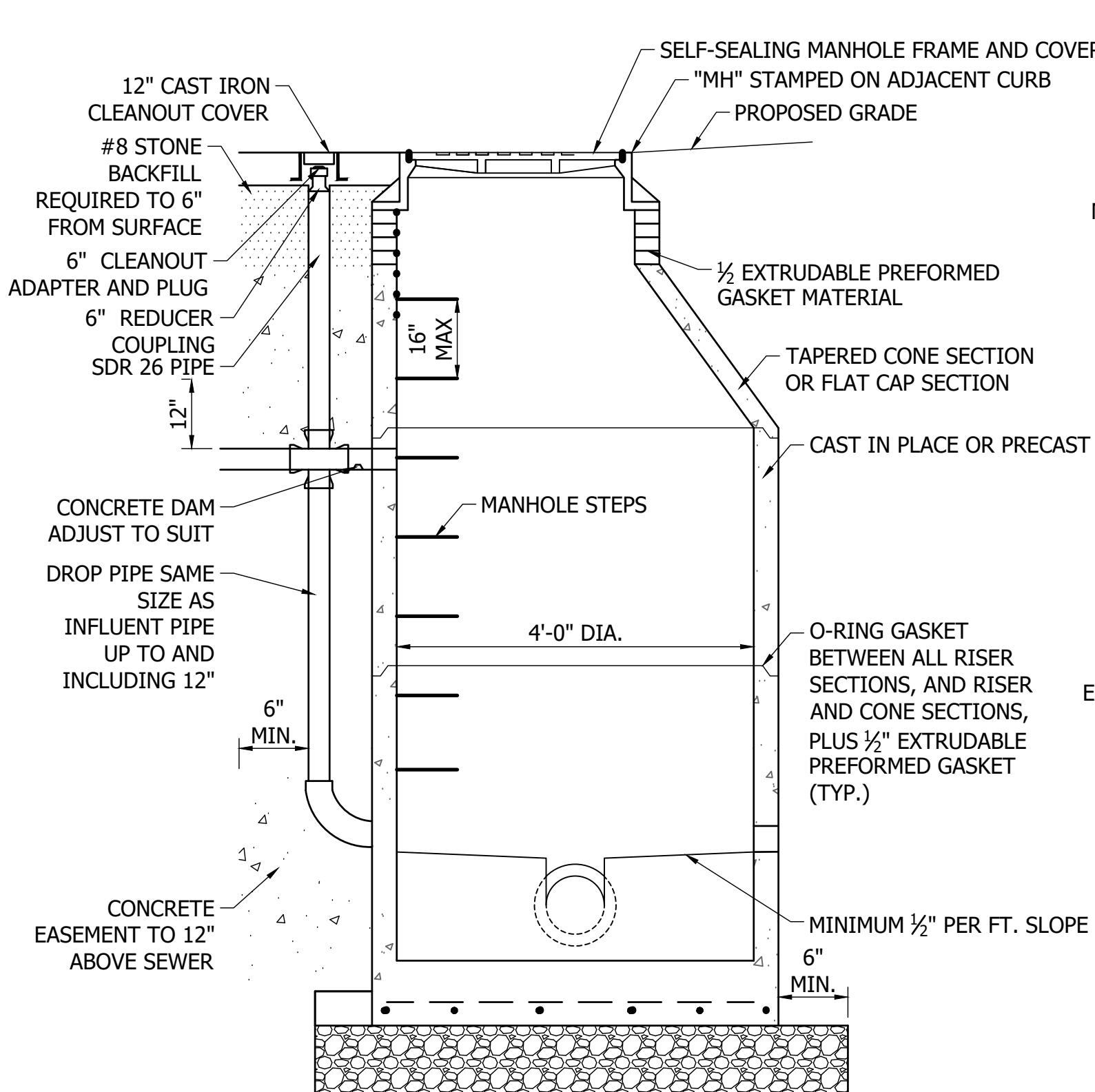
POURED CHANNEL SHAPES I



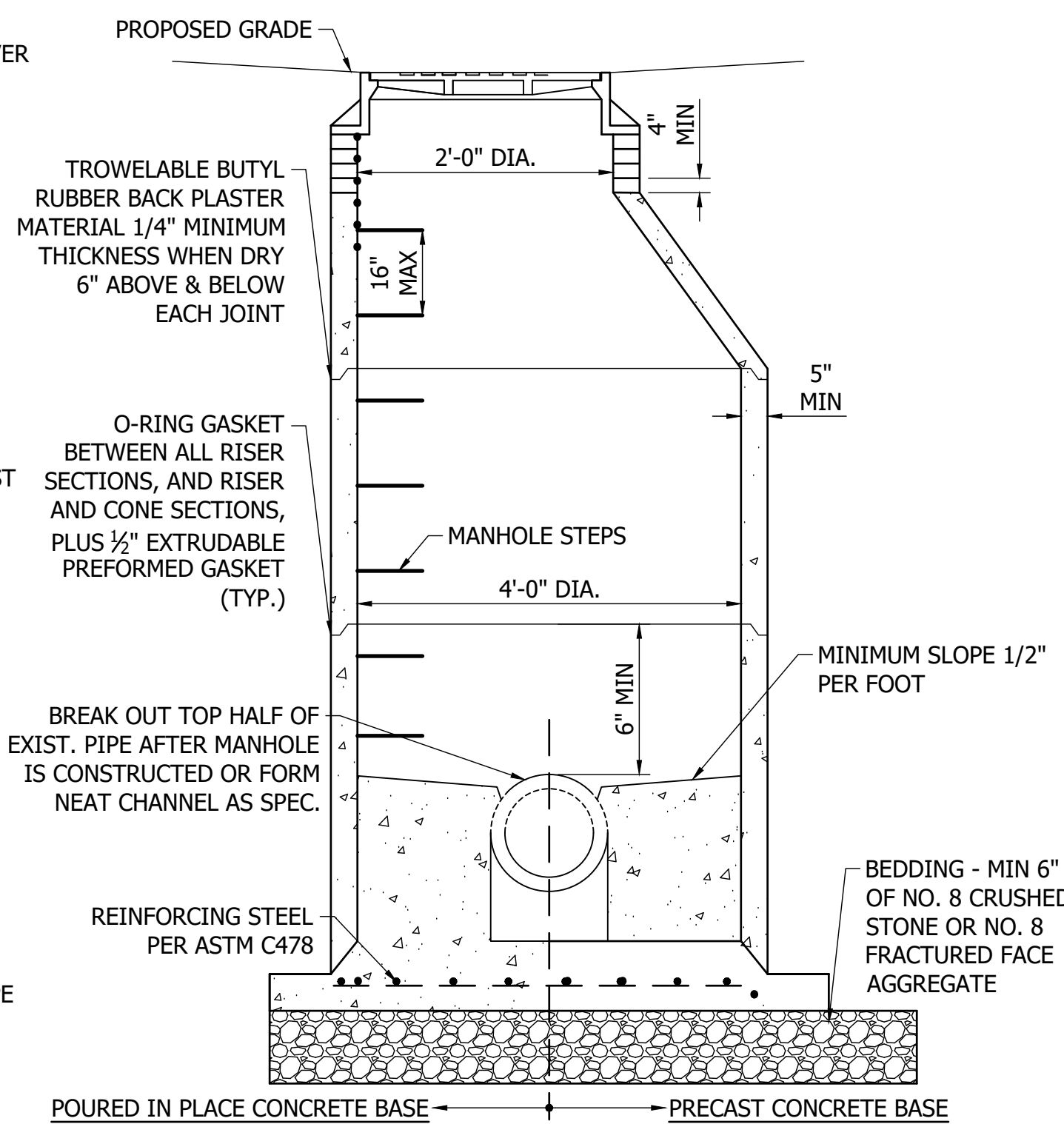
24" SANITARY CASTING



POURED CHANNEL SHAPES II

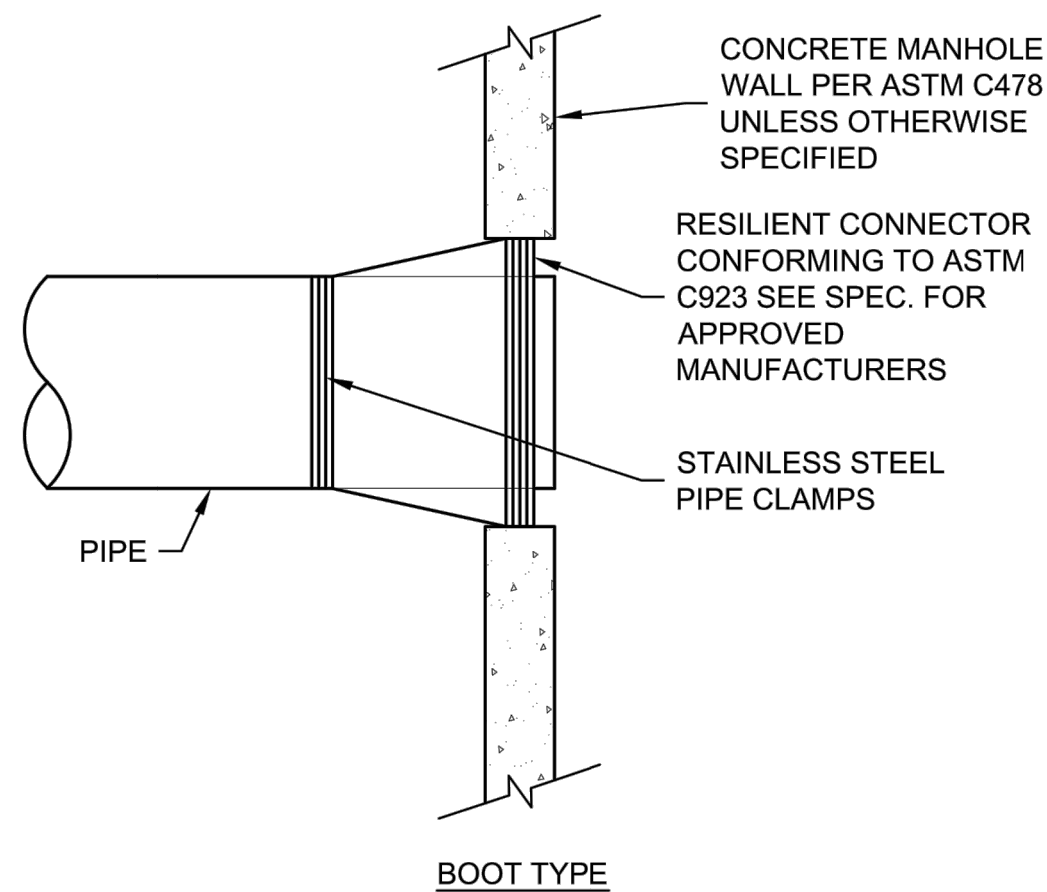


DROP CONNECTION FOR MANHOLES - OUTSIDE

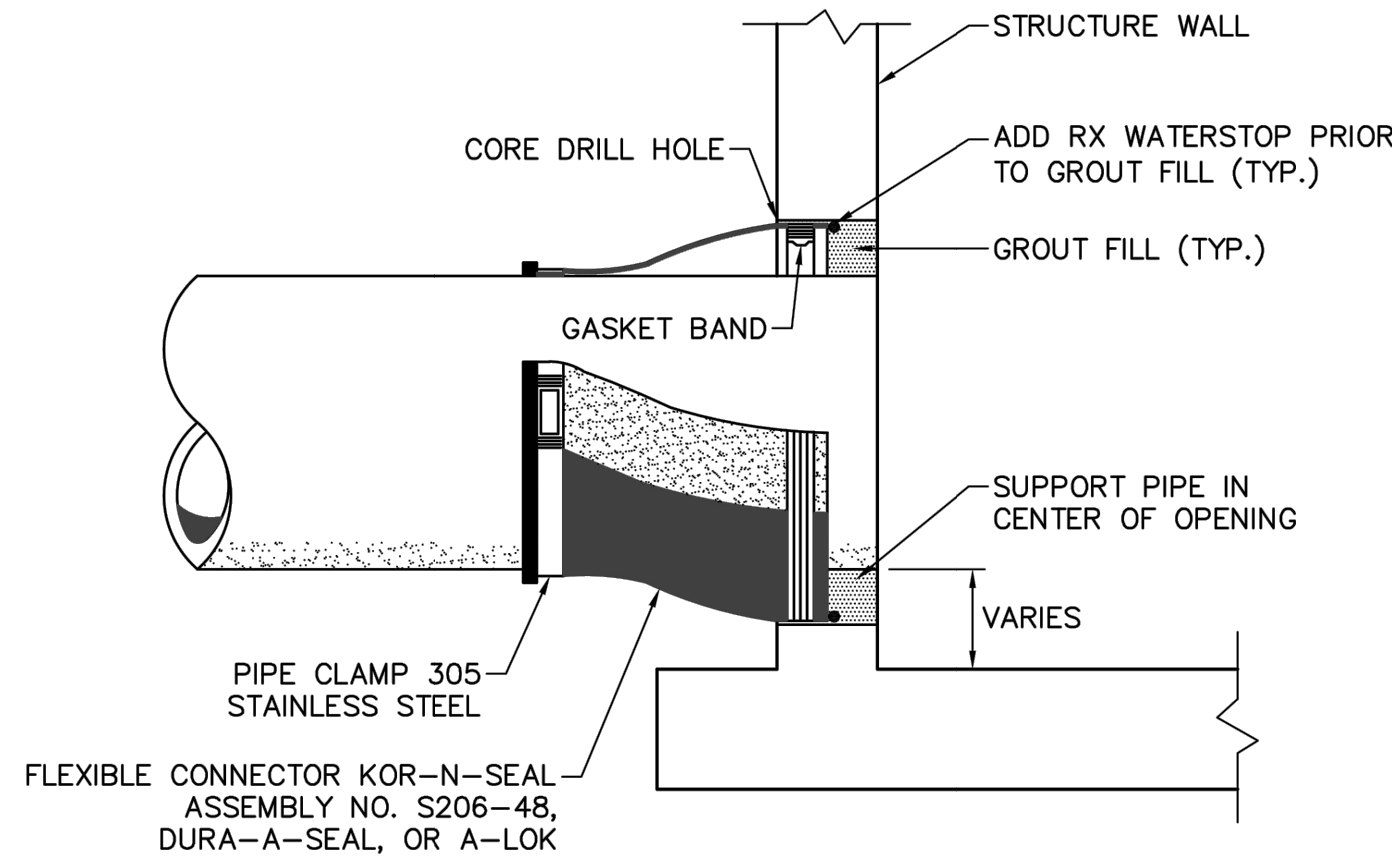


- NOTES:
- DOGHOUSE OPENING MAY ONLY BE USED WHEN PLACING A NEW MANHOLE OVER AN EXISTING LINE; OTHERWISE, THE OPENING MUST BE CAST. SIZE, LOCATION AND ANGLE OF ENTRY SHOULD BE AS REQUIRED BY THE PLANS.
 - OPENINGS IN THE PRECAST UNITS ARE TO BE A 4" MINIMUM TO 8" MINIMUM LARGER THAN THE OUTSIDE DIAMETER OF THE PROPOSED PIPE.

DOGHOUSE MANHOLE

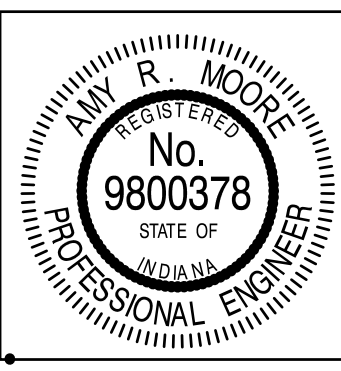


PIPE CONNECTION TO MANHOLE - BOOT



NEW CONNECTION TO EXISTING MANHOLE

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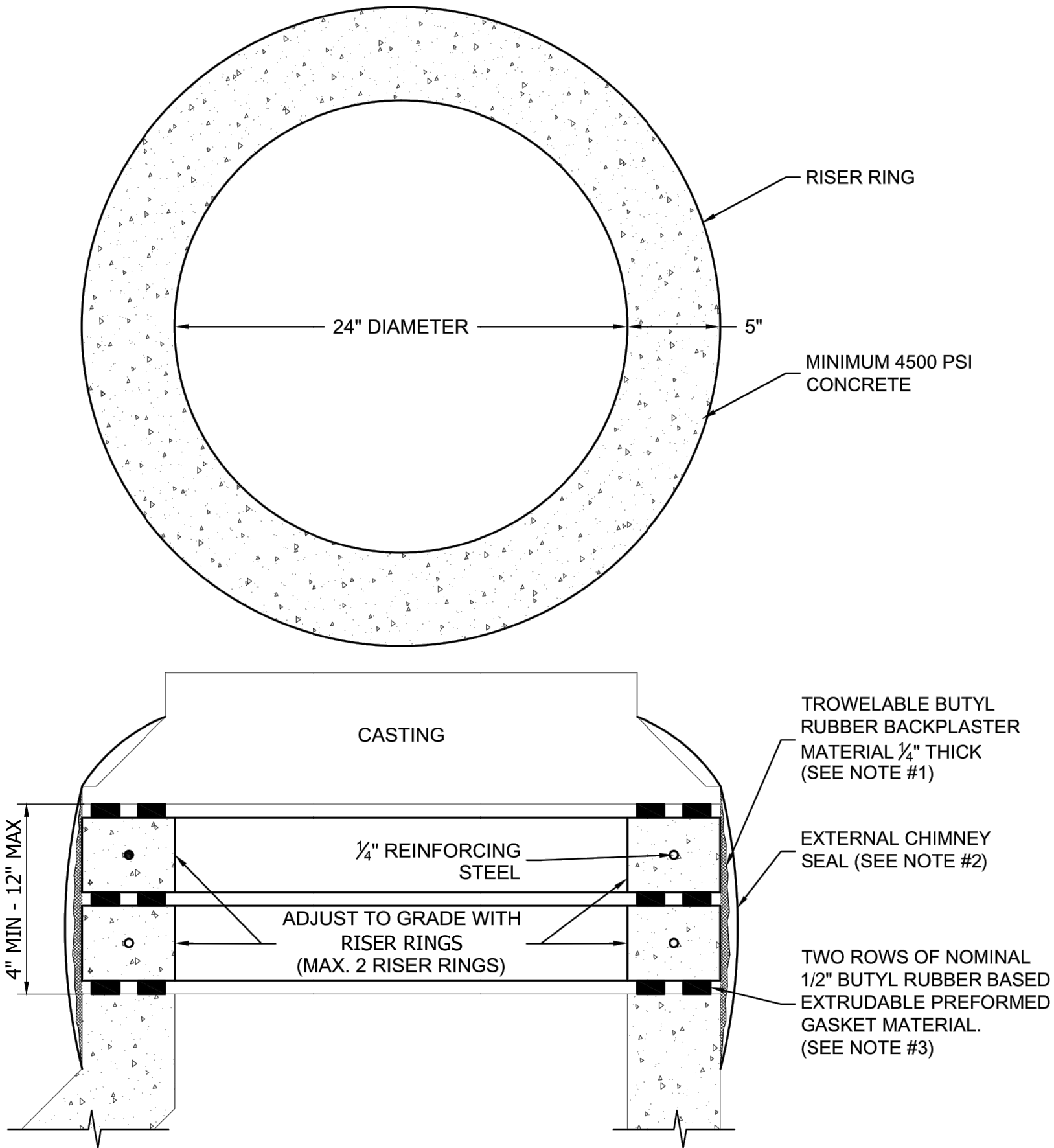


RECOMMENDED FOR APPROVAL	<i>Amy R. Moore</i>	08/21/2019
DESIGNED:	LMY	DRAWN: KDK
CHECKED:	ARM	CHECKED: ARM

MONTGOMERY COUNTY SEWER DISTRICT	
SANITARY SEWER DETAILS STRUCTURES	

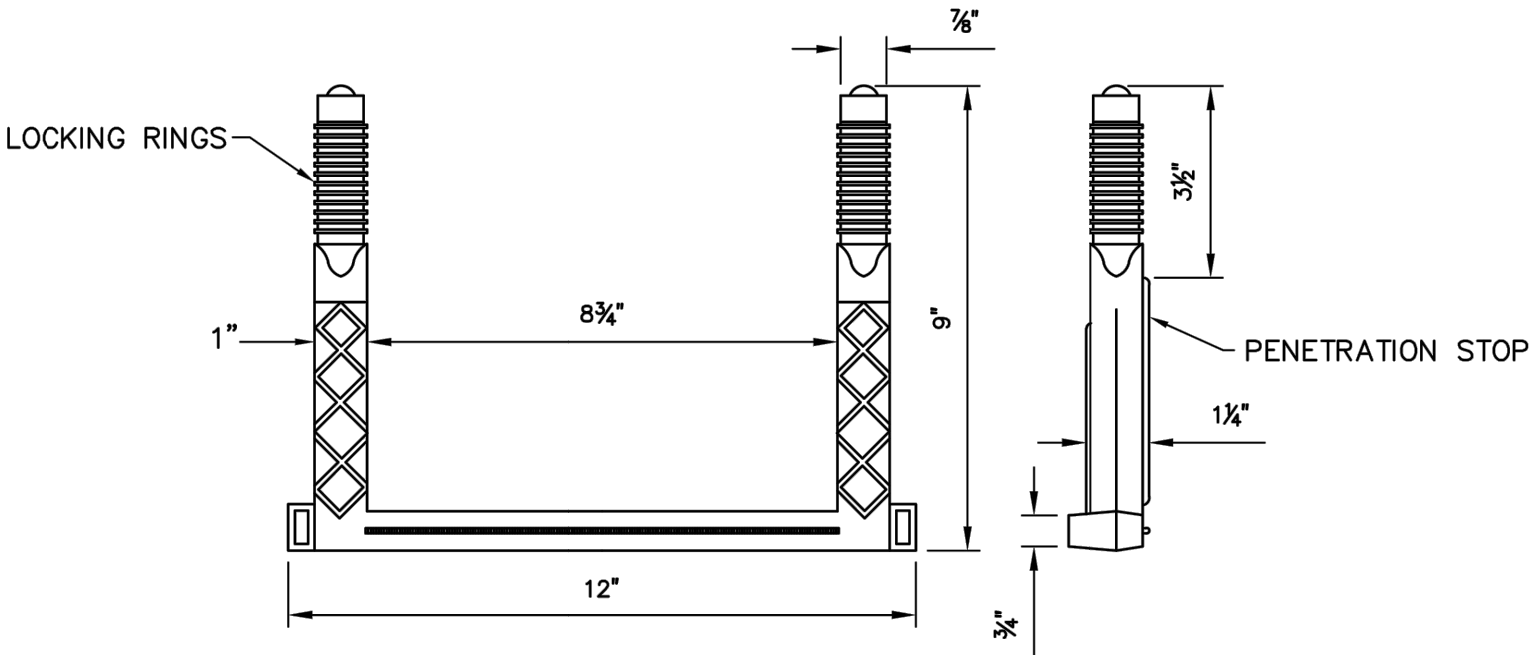
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- NOTES:
1. APPLY TROWELABLE BUTYL RUBBER BACKPLASTER MATERIAL 1/4" THICK (WHEN DRY) OVER RISER RINGS FROM 6" ABOVE TO 6" BELOW RISER RING JOINTS. USE TROWELABLE EZ-STICK #3, AS MANUFACTURED BY PRESS-SEAL GASKET CORP.
 2. EXTERNAL CHIMNEY SEAL SHALL CONSIST OF A HEAT-SHRINKING WRAP-AROUND SLEEVE (USE WRAPIDSEAL AS MANUFACTURED BY CANUSA) OR EXTERNAL CHIMNEY SEAL (AS MANUFACTURED BY CRETEX).
 3. USE RU 106 RUB'RNEK LTM AS MANUFACTURED BY HENRY CO., KENT-SEAL NO. 2 AS MANUFACTURED BY HAMILTON-KENT OR EZ-STICK BUTYL-RUBBER-BASED PREFORMED FLEXIBLE SEALANT AS MANUFACTURED BY PRESS-SEAL.

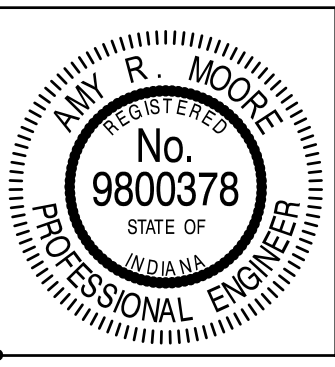
SANITARY CASTING ADJUSTMENT



- NOTES:
1. TO BE INSTALLED WITH NON-SHRINK MORTAR OR EPOXY GROUT.
 2. STEPS SHALL NOT BE SITUATED DIRECTLY ABOVE INLET OR OUTLET PIPES.

FIBERGLASS REINFORCED POLYPROPYLENE MANHOLE STEPS

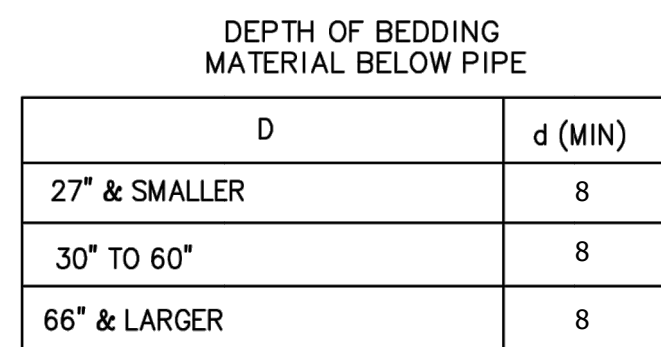
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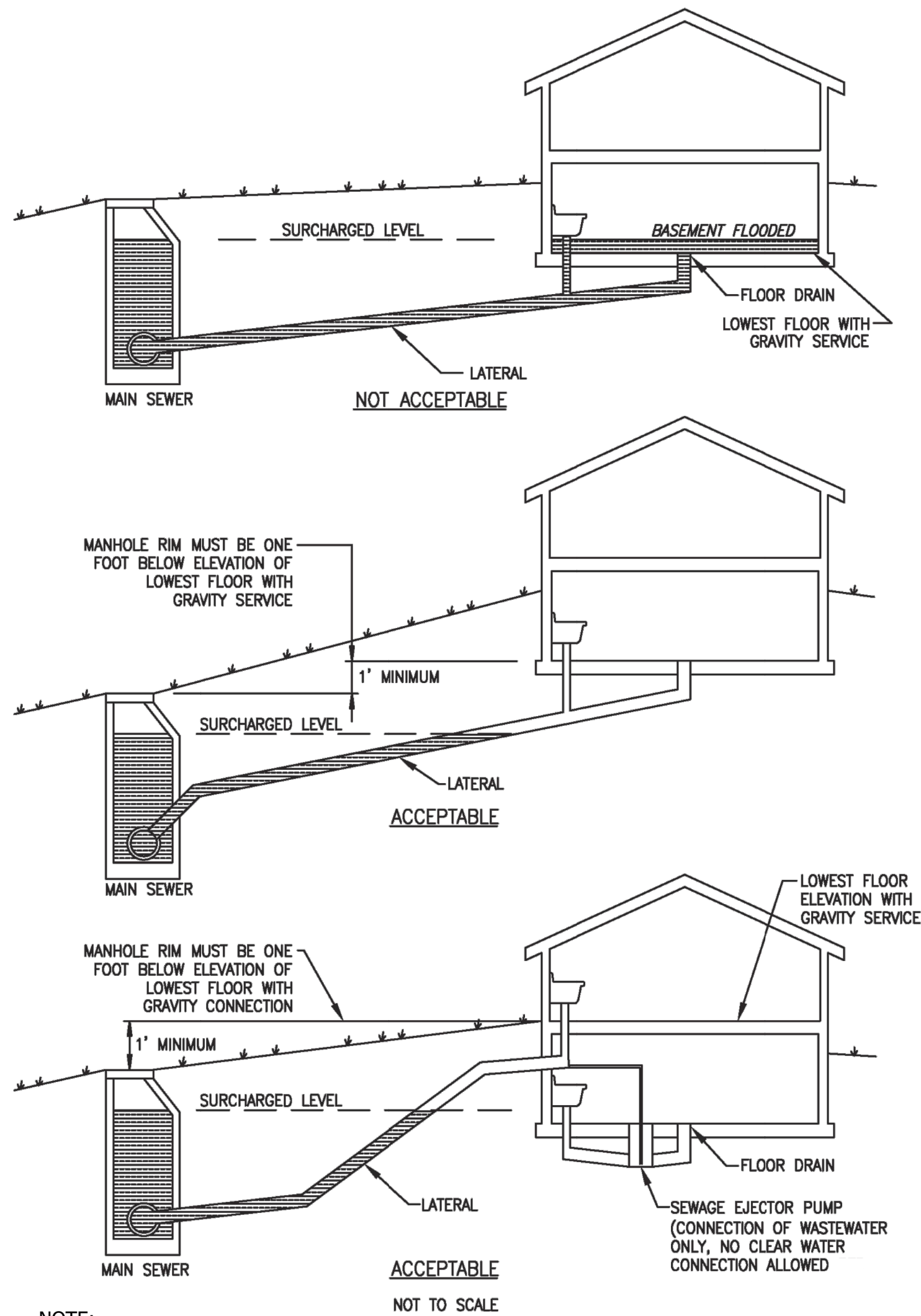
RECOMMENDED FOR APPROVAL	<u>Amy R Moore</u> DESIGN ENGINEER	08/21/2019 DATE
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CHECKED: ARM	CHECKED: ARM	

MONTGOMERY COUNTY SEWER DISTRICT
SANITARY SEWER DETAILS STRUCTURES

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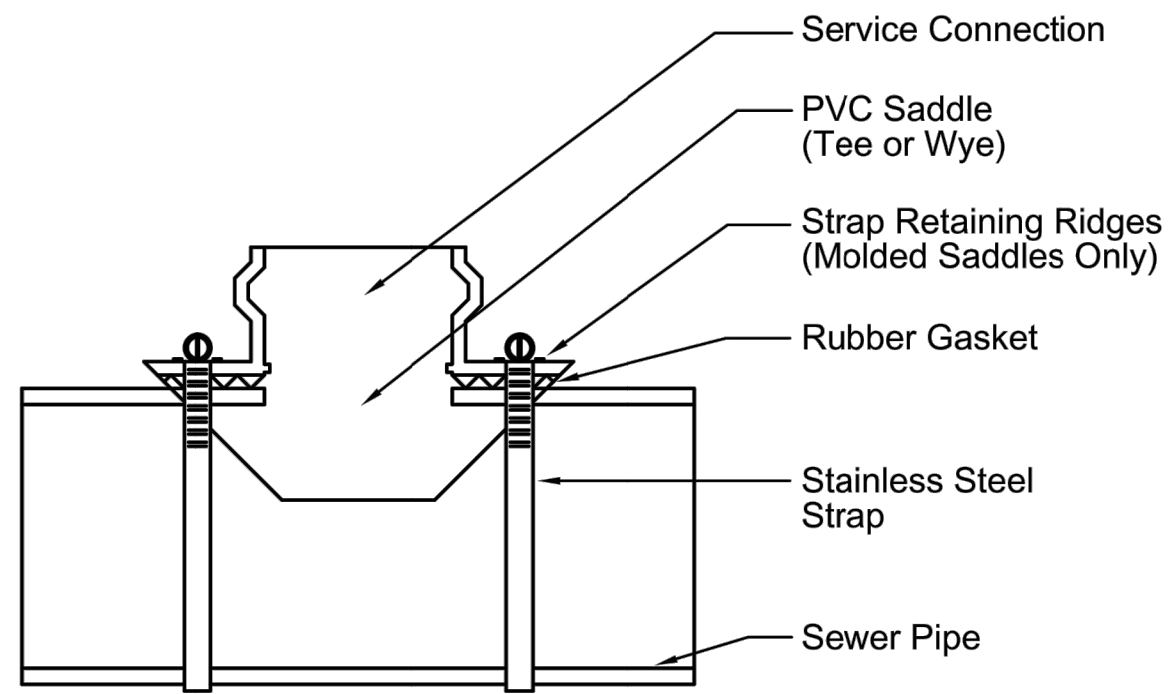


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NOTE:
1. BOTH DOWNSTREAM AND UPSTREAM MANHOLES SHALL APPLY

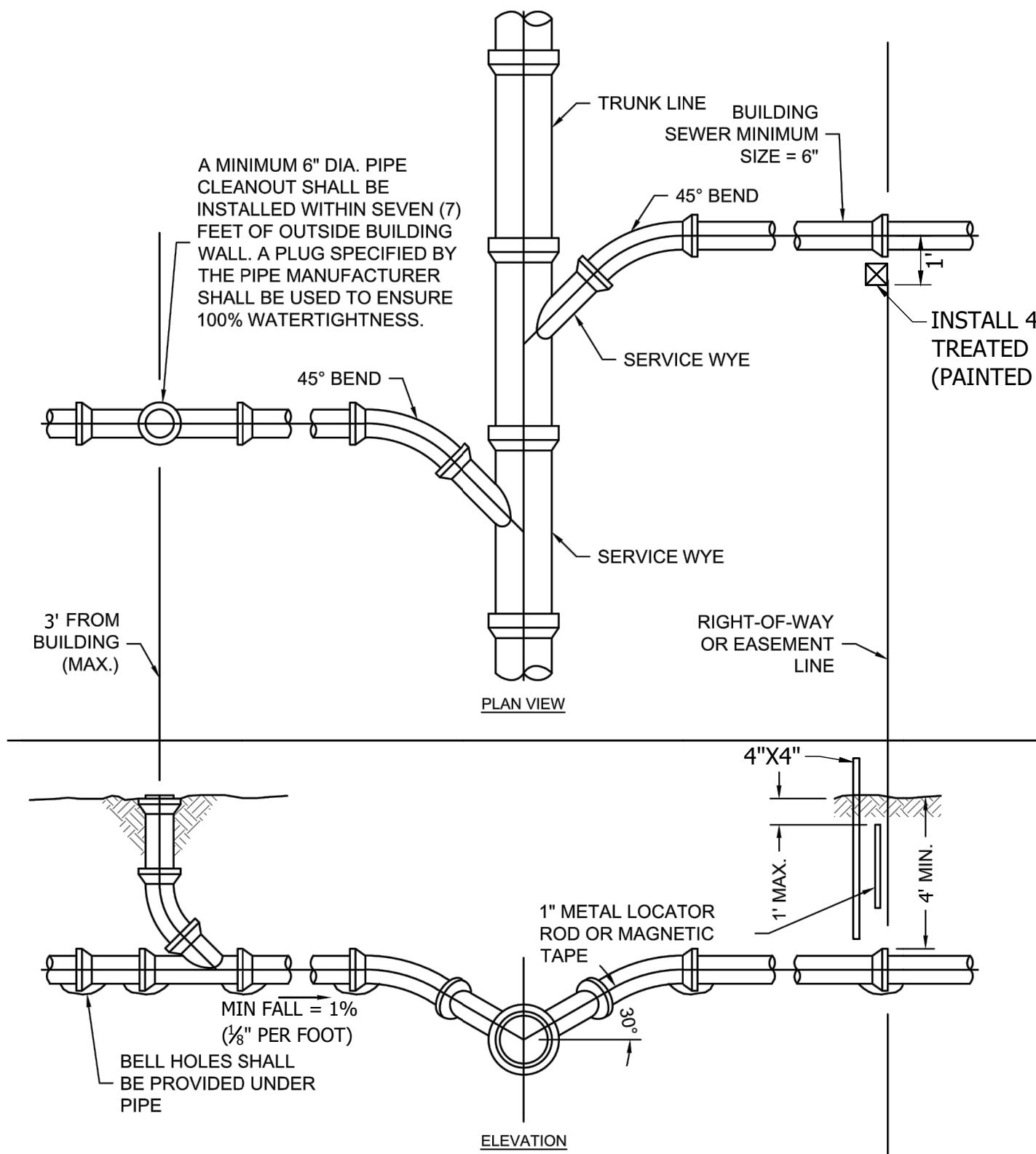
MINIMUM ELEVATION FOR GRAVITY CONNECTION DETAIL



Saddle Installation

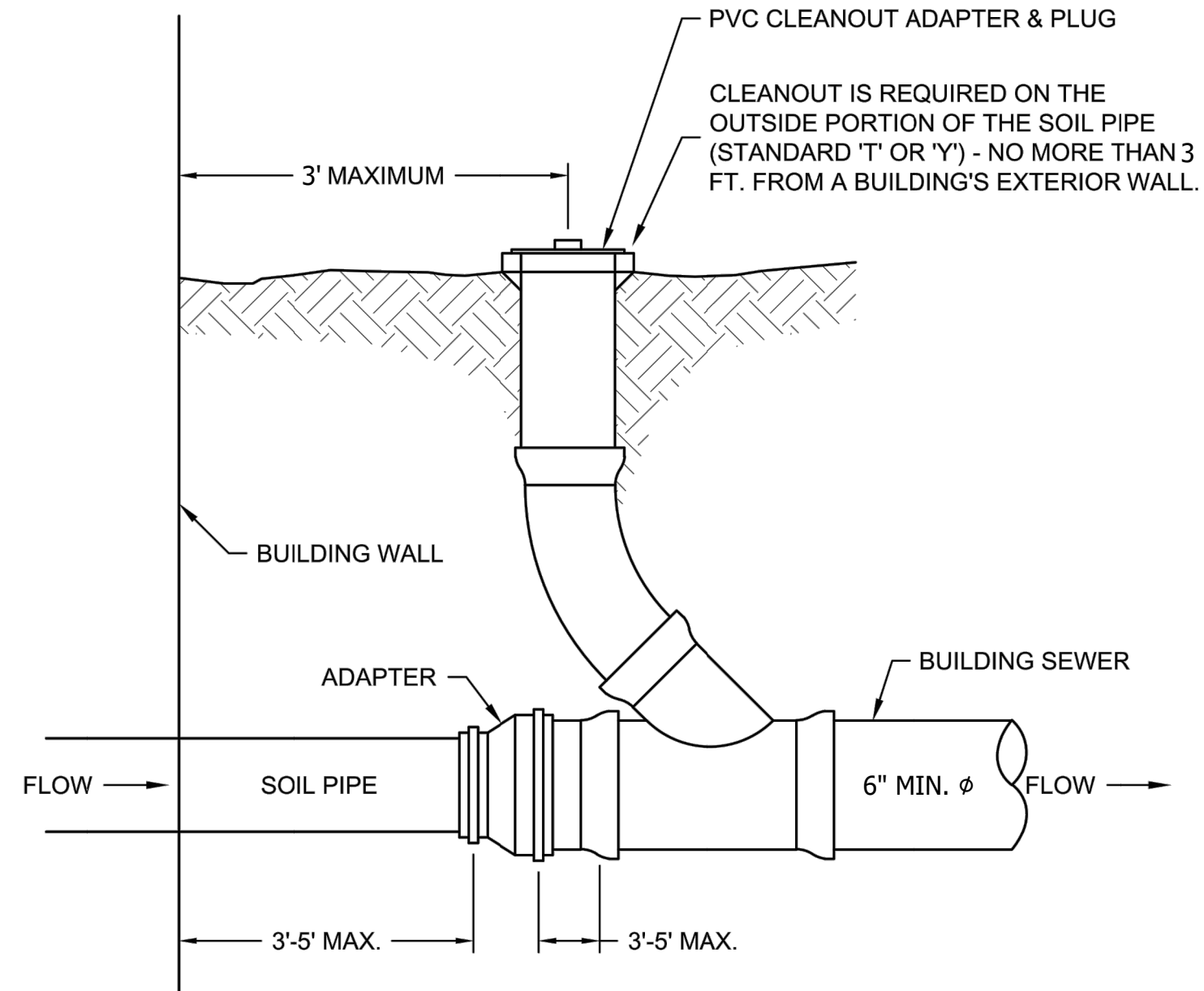
1. Place Saddle on Pipe in the Desired Location. Draw the Hole Size by Placing Marking Pencil Inside the Branch Opening and Marking Pipe.
2. Cut 1/4" Outside the Line. Remove Coupon from Inside of Pipe. Scrape any Burrs that Appear Around the Hole.
3. Place Saddle on Pipe to Assure that the Pipe Opening is Large Enough to Prevent Obstruction. Enlarge Hole as Necessary.

SADDLE CONNECTION



- NOTES:
1. COMPACTION OF GRANULAR BACKFILL IS CRITICAL UNDER WYE AND BEND.
 2. WYES SHALL BE USED FOR ALL MAINLINE PIPE LESS THAN 15" IN DIAMETER.

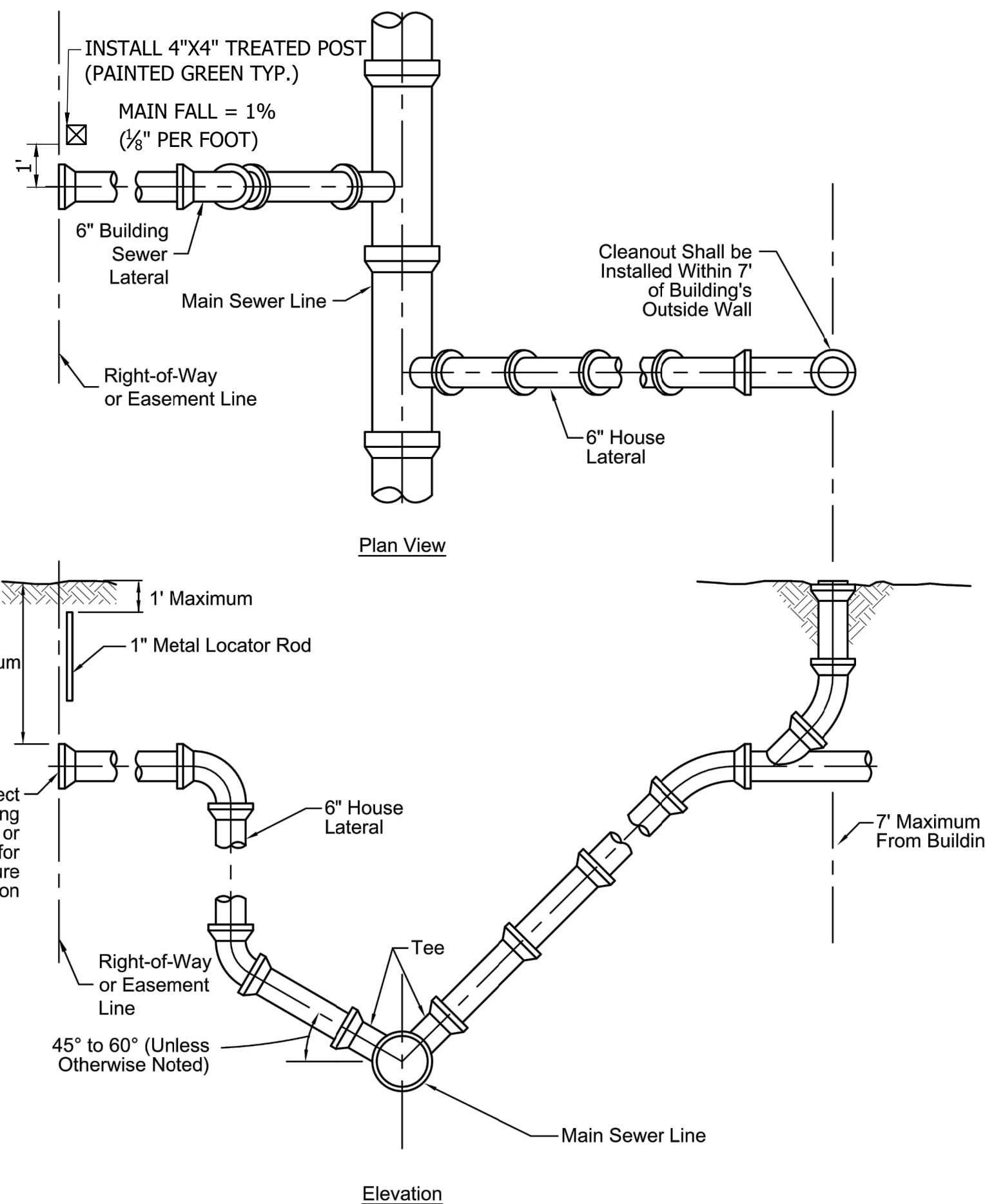
SHALLOW SERVICE CONNECTION (< 15' DEEP)



1. INSTALL CLEANOUT AT MAXIMUM 100 FEET SPACING OR ALL CHANGES OF DIRECTION.
2. WHEN CLEANOUT IS LOCATED IN PAVED AREA, INSTALL FLUSH WITH PAVEMENT USING CLEANOUT CASTING, SHEET 07, AND SURROUNDED BY 6" CONCRETE PAD.

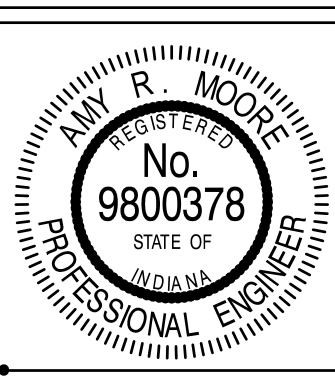
BUILDING ADAPTOR AND CLEANOUT

Notes:
1. Minimum Lateral Slope: 1/8" Per Foot



DEEP SERVICE CONNECTION (≥ 15' DEEP)

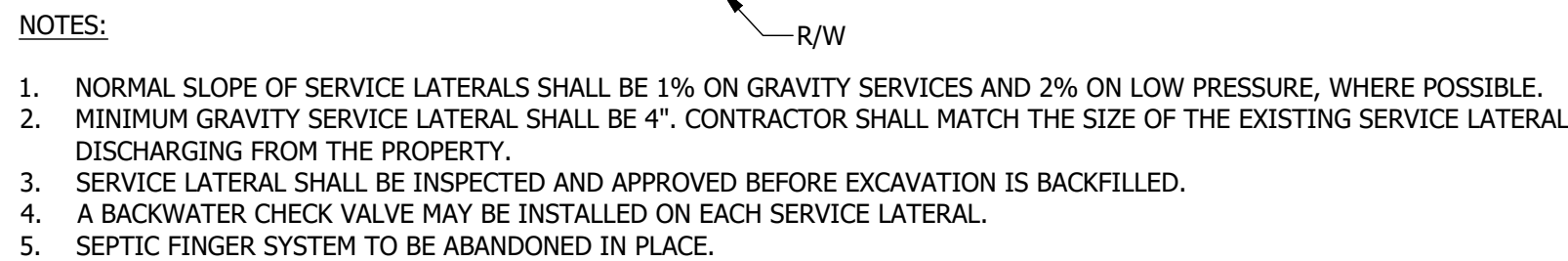
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MONTGOMERY COUNTY SEWER DISTRICT
SANITARY SEWER DETAILS
GRAVITY SERVICE CONNECTIONS

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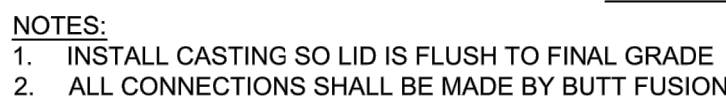


STANDARD CLEANOUT CASTING
3" THREADED PVC CAP
ANCHOR BOTH TRACING WIRES WITH
#53/73 SPECIAL BACKFILL. LEAVE 4" TO 6"
OF WIRE INSIDE CASTING.

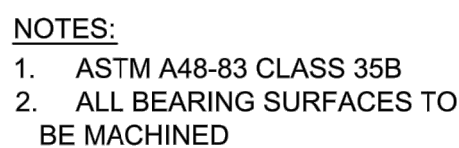
EXISTING GRADE
TRACING WIRE
EXISTING GROUND
18"

#53/73
SPECIAL
BACKFILL
3" IPS
MOLDED
LINE TEE
STAINLESS STEEL
TRANSITION
FITTING
3" HDPE
INSULATED #10 COPPER TRACING WIRE
(SPLICED TO HDPE MAIN LINE WIRE)
WDIRECT BURY CONNECTOR

3" HDPE
3" FORCE MAIN
3" HDPE



LOW PRESSURE COLLECTION SYSTEM DISCHARGE



SOLID LID SECTION A-A

11 1/4"

5/8"

1 1/4"

12 13/16"

11 9/16"

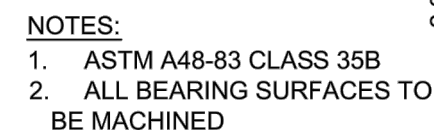
1 5/16"

10"

12 27/32"

20"

FRAME SECTION A-A



TO

7/16"

11 1/4"

1 5/16"

2 3/4"

SOLID LID SECTION A-A

FRAME AND SOLID LID
EAST JORDAN 1578 FRAME & SOLID LID

9 15/32"

11 1/2"

1 5/16"

8"

9 3/4"

13"

20"

FRAME SECTION A-A



NOTES:

1. CONTRACTOR SHALL BE RESPONSIBLE FOR BRACING VALUE TO PREVENT ANY TYPE OF MOVEMENT.
2. CONTRACTOR SHALL INSTALL COMBINATION VALVE OFF-SET FROM CENTER OF STRUCTURE AND ON OPPOSITE SIDE OF MAN-HOLE ACCESS TO PROVIDE UNIMPEDED ACCESS TO STRUCTURE.
3. WEIGHT OF COMBINATION VALVE SHALL NOT BE SUPPORTED BY THE FORCE MAIN PIPE.
4. CONTRACTOR SHALL BRACE AND PROP TO PROVIDE VALVE AND SET WITH MINIMUM CLEARANCE.
5. MINIMUM CLEARANCE OF STRUCTURE SHALL BE 6 FT. FROM FLOOR TO STRUCTURE CEILING.
6. CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR CONTROLLING MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES FOR CONSTRUCTION AND IS THEREFORE RESPONSIBLE FOR CONTROLLING THE QUALITY OF WORK.

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MONTGOMERY COUNTY SEWER DISTRICT
SANITARY SEWER DETAILS PRESSURE SEWERS

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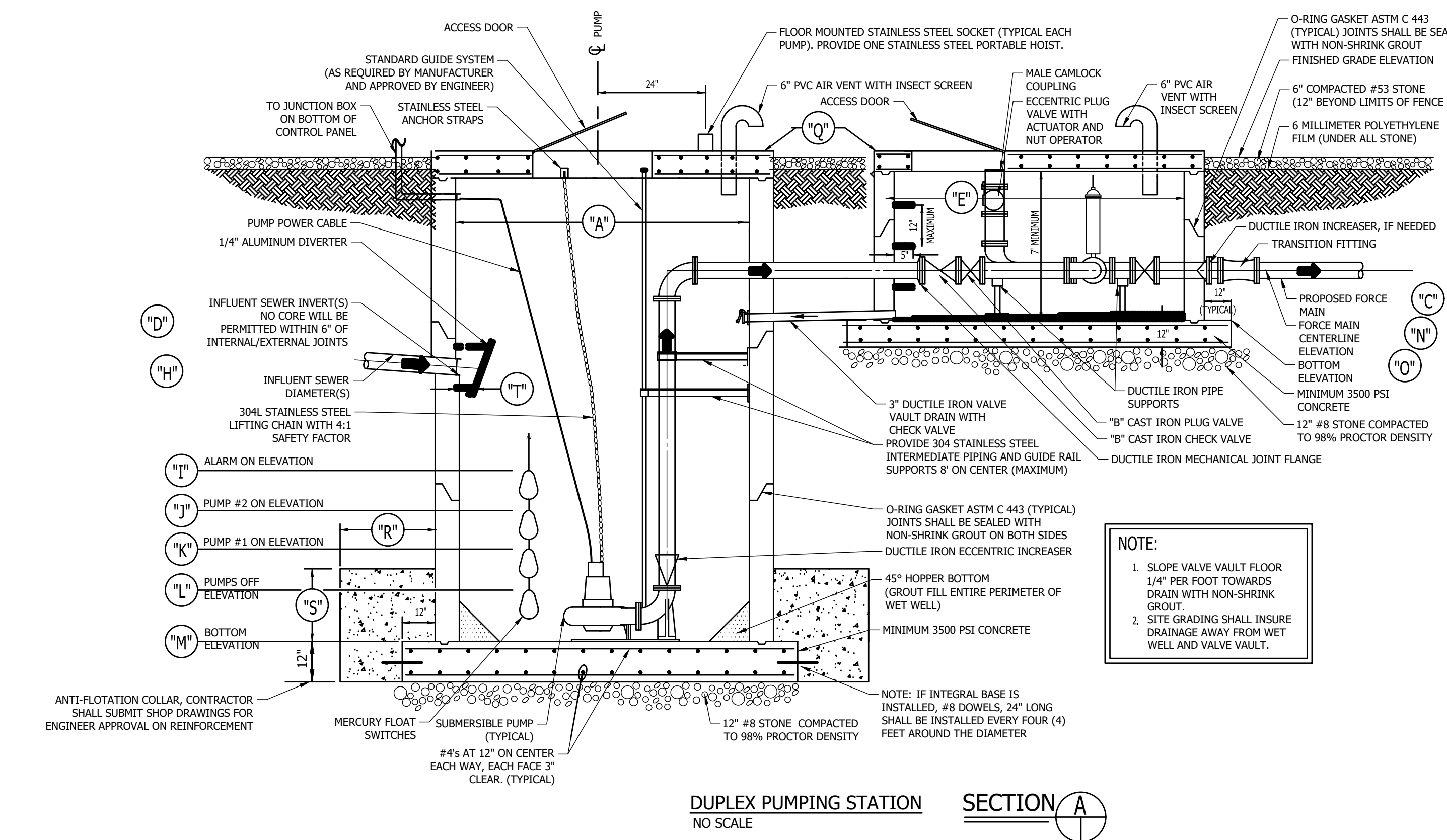
GENERAL NOTES

1. ACTUAL LIFT STATION DIMENSIONS, CONTROL SETTINGS, AND PUMP SELECTION TO BE AS INDICATED BY THE DESIGN ENGINEER'S CERTIFICATION.
2. PUMPS "A" AND "B" SHALL BE IDENTICAL, CENTRIFUGAL, SUBMERSIBLE, SOLIDS HANDLING, NON-CLOG DESIGN CAPABLE OF HANDLING 3 INCH SPHERE SOLIDS, FIBROUS MATERIAL, SLUDGE, AND MATERIAL FOUND IN TYPICAL RAW SEWAGE. FIT REPLACEABLE BRONZE WEAR RING TO VOLUTE. PUMPS SHALL BE HYDROMATIC, FLYGT, OR MCRSD APPROVED EQUAL. MANUFACTURER SHALL WARRANT THE PUMPS FOR ONE YEAR AFTER INSTALLATION.
3. ALL MATING SURFACES INTENDED TO BE WATERTIGHT SHALL BE MACHINED AND FITTED WITH NITRILE RUBBER O-RINGS WITH SEALING COMPLETE WHEN METAL TO METAL CONTACT IS MADE, RESULTING IN CONTROLLED COMPRESSION OF O-RINGS WITHOUT SPECIFIC TORQUE LIMIT. FASTENERS SHALL BE 316 S.S.
4. MECHANICAL SHAFT SEAL SYSTEM RUNNING IN AN OIL RESERVOIR SHALL HAVE SEPARATE, CONSTANTLY LUBRICATED LAPPED SEAL FACES. THE LOWER SEAL UNIT BETWEEN MEDIA AND OIL RESERVOIR SHALL CONSIST OF ONE STATIONARY SEAT AND ONE ROTATING RING HELD IN PLACE BY ITS OWN SPRING. THE ROTATING SEAT RING AND THE STATIONARY SEAT RING SHALL BE MADE OF TUNGSTEN-CARBIDE. THE LOWER SEAL SHALL BE REMOVABLE WITHOUT DISASSEMBLING THE SEAL CHAMBER. THE UPPER SEAL BETWEEN SEAL CHAMBER AND MOTOR SHALL BE OF THE SAME DESIGN WITH ITS OWN SPRING. SEALS SHALL BE MAINTENANCE FREE, BUT SHALL BE EASILY INSPECTABLE.
5. LOWER SEAL FAILURE ALARM SHALL BE ENGAGED BY SEAL FAILURE SENSOR PROVIDED IN THE SEAL CHAMBER WHICH SENSES WATER INTRUSION THROUGH LOWER SEAL.
6. OVER TEMPERATURE ALARM, AND PUMP SHUT DOWN, SHALL BE ENGAGED BY HEAT SENSOR ATTACHED TO THE MOTOR WINDINGS. MOTOR WINDING AND STATOR LEAD INSULATION SHALL BE CLASS F WITH MAXIMUM TEMPERATURE CAPABILITY OF 155° C OR BETTER. HOUSING SHALL BE FILLED WITH HIGH DIELECTIC OIL. AIR FILLED HOUSING MAY BE ACCEPTABLE WHEN APPROVED BY MCRSD. PUMP AND MOTOR SHALL BE DESIGNED TO OPERATE PARTIALLY OF FULLY SUBMERGED IN PUMPED MEDIA WITHOUT THE USE OF COOLING JACKETS.
7. RAIL SYSTEM SHALL ENABLE THE EASY REMOVAL OF THE PUMP WITHOUT THE NEED FOR A PERSON TO ENTER THE WET WELL. A NON-CORROSE FRP I-BEAM SHALL BE PROVIDED FOR EACH PUMP. THE GUIDE RAIL SHALL BE SUPPORTED AT THE BOTTOM BY THE DISCHARGE ELBOW, ALIGNED PERFECTLY PLUMB AND SECURELY AFFIXED TO ACCESS FRAME. ONE INTERMEDIATE GUIDE RAIL SUPPORT IS REQUIRED FOR EACH 8' OF GUIDE RAIL LENGTH. SCHEDULE 40 S.S GUIDE RAILS MAY BE ACCEPTABLE IF PUMP IS APPROVED BY MCRSD.
8. CHECK VALVE SHALL BE BRONZE SEATED AND SHALL BE PROVIDED WITH BOLTED COVERS FOR EASY ACCESS TO THE DISCS. VALVE SHALL BE OUTSIDE ADJUSTABLE WEIGHT AND LEVER AS MUELLER A-2600-6-01, KENNEDY/CLOW 1106LW, OR AS APPROVED BY MCRSD. THE VALVE SHALL BE FURNISHED WITH FUSION BONDED EPOXY COATING INSIDE AND OUT IN ACCORDANCE WITH AWWA C-550.
9. PROVIDE SUFFICIENT LIFT CHAIN, FLOAT MOUTING CABLE, AND PUMP POWER AND SENSOR CABLE TO ENABLE NON-SPLICED FIELD ADJUSTMENT. LIFT CHAIN SHALL HAVE A MINIMUM WORK LOAD LIMIT OF 1100 POUNDS. FLOAT MOUNTING CABLE SHALL BE HELD IN PLACE BY WEIGHT, FLOATS SHALL BE FASTENED TO CABLE WITH S.S. CLAMPS NEAR EACH FLOAT LOCATION. PUMP POWER AND SENSOR CABLE SHALL BE SUITABLE FOR SUBMERSIBLE PUMP APPLICATIONS AND THIS SHALL BE SO INDICATED BY A CODE/LEGEND PERMANENTLY EMBOSSED ON THE CABLE.
10. PLUG VALVE SHALL BE AN ECCENTRIC BUNA-N RUBBER FACED PLUG WITH HAND LEVER OPERATION IN-LINE AND GEAR OPERATION ON BYPASS. VALVE SHALL BE VALMATIC F-5800-R, KENNEDY/CLOW F-5412, OR AS APPROVED BY MCRSD. THE VALVE SHALL BE FURNISHED WITH FUSION BONDED EPOXY COATING INSIDE AND OUT IN ACCORDANCE WITH AWWA C-550.
11. PRESSURE GUAGE SHALL BE TRERICE MODEL 450 LFB OR MCRSD APPROVED EQUAL. DRILL AND TAP RUN OF PIPE TO INSTALL PRESSURE GUAGE.
12. PIPING AND FITTINGS IN WET WELL AND VALVE PIT SHALL BE FACTORY PRIMED TNEC SERIES PURPLE PRIME TO A DRY FILM THICKNESS OF 5.0 TO 11.0 MILS AND SHALL BE FIELD PAINTED WITH TNEC SERIES 69-COLOR TO A DRY FILM THICKNESS OF 5.0 TO 6.0 MILS. FITTINGS SHALL BE MANUFACTURED BY CLOW, TYLER, MUELLER, OR AS APPROVED BY MCRSD.
13. DAMP PROOF EXTERIOR VERTICAL SURFACES WHICH ARE BACKFILLED AGAINST WITH BITUMINOUS COATING, MASTERSEAL 614.
14. HORIZONTAL PROJECTIONS FROM PRECAST INTEGRAL BASE AND RISER MAY BE REQUIRED TO ENABLE THE WEIGHT OF THE VERTICAL SOIL RING ABOVE THE PROJECTION TO RESIST BUOYANCY FORCES. SEE DESIGN ENGINEER'S CERTIFICATION SHEET.
15. CAMLOCK COUPLING AND ECCENTRIC PLUG VALVE ON BYPASS LINE SHALL BE 4 INCH DIAMETER WITH TRANSITION TO FORCE MAIN SIZE OCCURING WITH CONCENTRIC REDUCER PLACED ON TOP OF BASE ELBOW. FIX OPERATING NUT FOR ECCENTRIC PLUG IN VERTICAL POSITION TO ENABLE WRENCH OPERATION FROM SURFACE. LAYOUT OF ALL VALVE VAULT FITTINGS AND EQUIPMENT TO BE BASED UPON BYPASS LINE BEING CLOSE TO HATCH OPENING, AS SHOWN.
16. ALUMINUM HATCHES SHALL BE CHANNEL FRAME TYPE FLYGT SAFE-HATCH. LEAF SHALL BE 1/2 INCH ALUMINUM DIAMOND PLATE LIVE LOAD RATED TO 300 PSF. CHANNEL FRAME SHALL BE 1/2 INCH EXTRUDED ALUMINUM WITH A MILL FINISH AND BITUMINOUS COATING ON EXTERIOR SURFACES. HATCH SHALL BE PROVIDED WITH TYPE 316 S.S. HARDWARE THROUGHOUT, AUTOMATIC HOLD-OPEN ARM WITH RELEASE HANDLE, SLAM LOCK WITH REMOVABLE HANDLE, 1-1/2 INCH DRAIN COUPLING, PADLOCK HASP, AND USF FABRICATION FALL-THROUGH PROTECTION HATCH SAFETY NET.
17. SEWER CONNECTION TO WET WELL SHALL BE KOR-N-SEAL, A-LOK, PRESS-SEAL, OR MCRSD APPROVED EQUAL.
18. FORCEMAIN PENETRATIONS OF WET WELL AND VALVE PIT SHALL BE MADE WATERTIGHT THROUGH THE USE OF PORTLAND CEMENT GROUT.
19. AUTOMATIC PUMP CONTROL PANEL SHALL INCLUDE ALL NECESSARY ITEMS AND APPURTENANCES WHICH MIGHT NORMALLY BE CONSIDERED A PART OF A COMPLETE SYSTEM, INCLUDING BUT NOT LIMITED TO: CONDENSATE HEATER; PUSH TO TEST BUTTON (EXTERNAL); PUSH TO SILENCE BUTTON (EXTERNAL); ALTERNATOR SELECTOR SWITCH FOR MANUAL DESIGNATION OF LEAD PUMP; TIME DELAY RELAY FOR LAG PUMP START; AND PUMP RUN TIME HOUR METERS. SYSTEM SHALL BE SUPPLIED BY ONE MANUFACTURE AND SHALL BE FACTORY ASSEMBLED, WIRED, TESTED, AND SHALL BE PER COMPLETE ELECTRICAL DRAWINGS AND INSTRUCTIONS. MAJOR COMPONENTS AND SUB- ASSEMBLIES SHALL BE IDENTIFIED BY THEIR FUNCTION WITH LAMINATED, ENGRAVED, BAKELITE NAMEPLATES. SYSTEM SHALL BE BUILT IN A MINIMUM 60"x36"x12" NEMA 4X S.S. ENCLOSURE SUITED FOR SPECIFIC HORSEPOWER AND VOLTAGE OF THE PUMPS. THE OUTER DOOR OF THE PANEL SHALL BE A HINGED DEAD FRONT WITH PROVISIONS FOR PADLOCKING. INSIDE SHALL BE SEPARATE HINGED PANEL TO PROTECT ALL ELECTRICAL COMPONENTS, H-O-A SWITCHES, RUN LIGHTS, CIRCUIT BREAKERS, ETC. MOUNTED SUCH THAT ONLY THE FACES PROTRUDE THROUGH SAID PANEL WITH NO WIRING FIXED TO SAID PANEL. THE MANUFACTURER SHALL WARRANT THE CONTROL CENTER FOR ONE YEAR AFTER INSTALLATION COVERING 100% PARTS AND LABOR.
20. PROVIDE THE SERVICES OF A FACTORY TRAINED, QUALIFIED REPRESENTATIVE TO INSPECT, ADJUST, PLACE THE SYSTEM IN TROUBLE FREE OPERATION, AND INSTRUCT OPERATING PERSONNEL IN THE PROPER OPERATION AND CARE OF THE SYSTEM.
21. ALL MAJOR COMPONENTS OF CONTROL CENTER SHALL BE AMERICAN-MADE AND AVAILABLE FROM LOCAL SOURCES. PUMP MANUFACTURER SHALL ACCEPT THE CONTROL CENTER IN WRITING TO ENSURE UNIT RESPONSIBILITY AND WARRANTY.
22. PROVIDE A MANUAL TRANSFER TYPE DISCONNECT SWITCH HOUSED IN A SEPARATE NEMA 4X S.S. ENCLOSURE WITH EXTERNAL OPERATION HANDLE CAPABLE OF BEING LOCKED IN THE "ON" NORMAL POSITION OR THE "ON" SECONDARY POSITION WITH A MIDDLE "OFF" POSITION.
23. A LIGHTNING ARRESTOR SHALL BE PROVIDED AT THE PHASE RELAY BLOCK AND CONNECTED TO EACH LINE OF THE INCOMING SIDE OF THE POWER INPUT TERMINALS. A SINGLE MAIN FUSIBLE/BREAKER DISCONNECT SWITCH OF ADEQUATE SIZE TO PROVIDE POWER FOR CONTROL, OPERATION, AND APPURTENANT COMPONENTS SHALL BE PROVIDED. PROVIDE A CIRCUIT BREAKER AND MAGNETIC STARTER WITH EACH LEG MANUAL RESET OVERLOAD PROTECTED FOR EACH PUMP. STARTERS SHALL HAVE AUXILIARY CONTACTS ON 3ø APPLICATIONS TO OPERATE BOTH PUMPS SIMULTANEOUSLY. PROVIDE A PHASE MONITOR WITH PHASE FAIL RELAY. PROVIDE A CIRCUIT BREAKER AND TRANSFORMER TO POWER THE CONTROL PANEL WITH 1Ø , 115 VOLT SERVICE FOR ALL CONTROL FUNCTIONS INCLUDING OMNISITE DATA ACQUISITION SYSTEM, RADIO AND FLOW METER. PROVIDE A GREEN "RUN" LIGHT, AND H-O-A SWITCH TO ENABLE FIELD CONNECTIONS.
24. MATERIALS AND INSTALLATION OF THE REQUIRED EQUIPMENT GROUNDING SHALL BE IN ACCORDANCE WITH NEC SECTION 250-83(c). ALL WIRING SHALL HAVE NOT LESS THAN 600 VOLT INSULATION. WIRING AND BUSS SHALL BE IN ACCORDANCE WITH NEC, STATE, LOCAL, AND NEMA STANDARDS. ALL WIRING SHALL BE COLOR CODED. MINIMUM 4 INCH DIAMETER, SCHEDULE 40 CONDUIT SHALL BE PROVIDED FROM WET WELL TO CONTROL PANEL ENABLING PUMP POWER AND SENSOR CABLES, AND FLOAT SWITCH CABLES TO BE EASILY PULLED. SEAL CONDUIT AT CONTROL PANEL TO PREVENT SEWER GASES FROM ENTERING. ALL CONDUITS, FITTINGS, OR CONNECTIONS SHALL ENTER FROM THE BOTTOM OF ENCLOSURES.
25. SUMP LEVEL RISE TO LEAD PUMP RUN FLOAT CAUSES LEAD PUMP TO OPERATE. LEAD PUMP OPERATING AND SUMP LEVEL FALLING TO PUMPS OFF FLOAT CAUSES LEAD PUMP TO SHUT OFF. LEAD PUMP OPERATING AND SUMP LEVEL RISING TO LAG PUMP RUN FLOAT CAUSES LAG PUMP TO OPERATE. LAG PUMP OPERATING AND SUMP LEVEL FALLING TO PUMPS OFF FLOAT CAUSES BOTH PUMPS TO SHUT OFF. SUMP LEVEL RISE TO HIGH LEVEL ALARM CAUSES HIGH LEVEL ALARM TO OPERATE. AN ALTERNATING RELAY SHALL BE PROVIDED TO CAUSE PUMPS TO ALTERNATE WHENEVER PUMPS OFF FLOAT IS DE-ENERGIZED. IF ONE PUMP FAILS FOR ANY REASON, THE REMAINING PUMP SHALL OPERATE UPON SUMP LEVEL RISE TO LAG PUMP RUN FLOAT. AN HOUR METER SHALL BE PROVIDED FOR EACH PUMP TO RECORD THE ELAPSED OPERATING TIME OF EACH PUMP.
26. FOUR MANUALS SHALL BE PRESENTED TO THE OWNER WHICH SHALL INCLUDE THE FOLLOWING MINIMUM INFORMATION: 1) OPERATION INSTRUCTIONS; 2) MAINTENANCE INSTRUCTIONS; 3) RECOMMENDED SPARE PARTS LIST; 4) LUBRICATION SCHEDULE; 5) STRUCTURAL DIAGRAMS; 6) AS-BUILT WIRING DIAGRAMS; AND 7) BILL OF MATERIALS. GENERATOR RECEPTACLES TO BE CROUSE-HINDS ARKTITE AR1042 100 AMP RECEPTACLE OR CROUSE-HINDS ARKTITE AR2041 200 AMP RECEPTACLE WITH FACTORY SEALED SWITCH FOR RECEIPT OF A PORTABLE GENERATOR SET.
27. PROVIDE OMNISITE XR 50 DATA ACQUISITION SYSTEM FOR DUPLEX PUMP STATIONS AND OMNISITE CRYSTAL BALL DATA ACQUISITION SYSTEM FOR TRIPLEX PUMP STATIONS THAT INCORPORATES; 1 SPARE INPUT/OUTPUT, 1 INPUT FOR FLOWMETER, 5 OUTPUTS TO CONTROL BEING LEAD REMOTE ON, LEAD REMOTE OFF, LAG REMOTE ON, LAG REMOTE OFF, REMOTE ALARM ACKNOWLEDGE, 10 INPUTS FROM CONTROL BEING HATCH(ES) OPEN ALARM, PANEL(S) OPEN ALARM, PUMP "A" ON, PUMP "B" ON, PUMP "A" FAIL, PUMP "B" FAIL, PHASE FAIL ALARM, POWER FAIL ALARM, HIGH WATER ALARM, AND PUMP(S) SEAL FAILURE. REMOTE LEAD PUMP OVERRIDE AND REMOTE LAG PUMP OVERRIDE.
28. ECCENTRIC REDUCER TO BE INSTALLED AS REQUIRED FOR FORCEMAIN SIZE. CONSULT MCRSD IF FORCEMAIN PIPING IS GREATER THAN 6 INCH DIAMETER.
29. 1/4 INCH STAINLESS STEEL DEFLECTOR PLATE REQUIRED ON ALL INFLUENT PIPES. AS SUPPLIED BY MOORESVILLE WELDING OR MCRSD APPROVED EQUAL.
30. AIR/VACUUM RELEASE VALVE SHALL BE AN APCO VALVE AND PRIMER CORPORATION MODEL 400 AIR RELEASE VALVE FOR WASTEWATER AND SHALL BE SIZED BY THE DESIGN ENGINEER ACCORDING TO THE VOLUME OF MAIN AND MAXIMUM FORCE MAIN OPERATING PRESSURE. THE PIPE NIPPLES AND GATE VALVE FOR THE AIR/VACUUM RELEASE VALVE SHALL BE STAINLESS STEEL.

DUCTILE IRON PIPE SIZE	DEPTH OF COVER (INVERT TO FINAL GRADE)	THICKNESS CLASS
6" - 8"	UP TO 20 FEET OVER 20 FEET CONTACT ENGINEER	CLASS 50
10" - 12"	UP TO 20 FEET OVER 20 FEET CONTACT ENGINEER	CLASS 51
14" - 16"	UP TO 20 FEET OVER 20 FEET CONTACT ENGINEER	CLASS 52
18" - 20"	UP TO 20 FEET OVER 20 FEET CONTACT ENGINEER	CLASS 53
24"	UP TO 20 FEET OVER 20 FEET CONTACT ENGINEER	CLASS 55
GREATER THAN 24" DIAMETER	GREATER THAN 20 FEET DEEP	CONTACT ENGINEER (EITHER CASE)

NOTE: NO PRESSURE RATED PIPE WILL BE PERMITTED.

NOTE:
* DENOTES DIMENSIONS TO BE SUBMITTED WITH SHOP DRAWINGS AND APPROVED BY DESIGN ENGINEER.

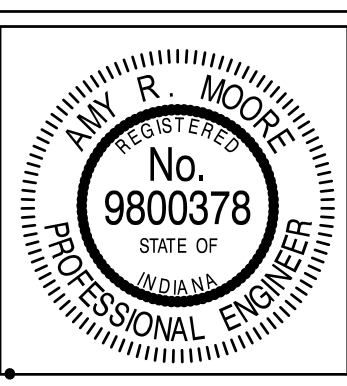


* DESIGN ENGINEER SHALL DETERMINE SPECIFIC DIMENSIONS AND BE RESPONSIBLE FOR SHOP DRAWING REVIEWS.

DIMENSION CHART	
Symbol	Description
(A)	WET WELL DIAMETER
(B)	STATION PIPING SIZE
(C)	FORCE MAIN SIZE
(D)	INFLUENT SANITARY SEWER DIAMETER(S)
(E)	VALVE VAULT DIMENSIONS
(F)	CENTER OF WET WELL TO CENTER OF VALVE VAULT
(G)	PUMP DISCHARGE SIZE
(R)	WIDTH OF ANTI-FLOATATION COLLAR
(S)	DEPTH OF ANTI-FLOATATION COLLAR
(T)	DIVERTER PLATE SEPARATION(S)

ELEVATION CHART	
Symbol	Description
(H)	INFLUENT SANITARY SEWER INVERT(S)
(I)	INITIAL
(J)	INITIAL
(K)	INITIAL
(L)	INITIAL
(M)	INITIAL
(N)	INITIAL
(O)	INITIAL
(P)	INITIAL
(Q)	INITIAL

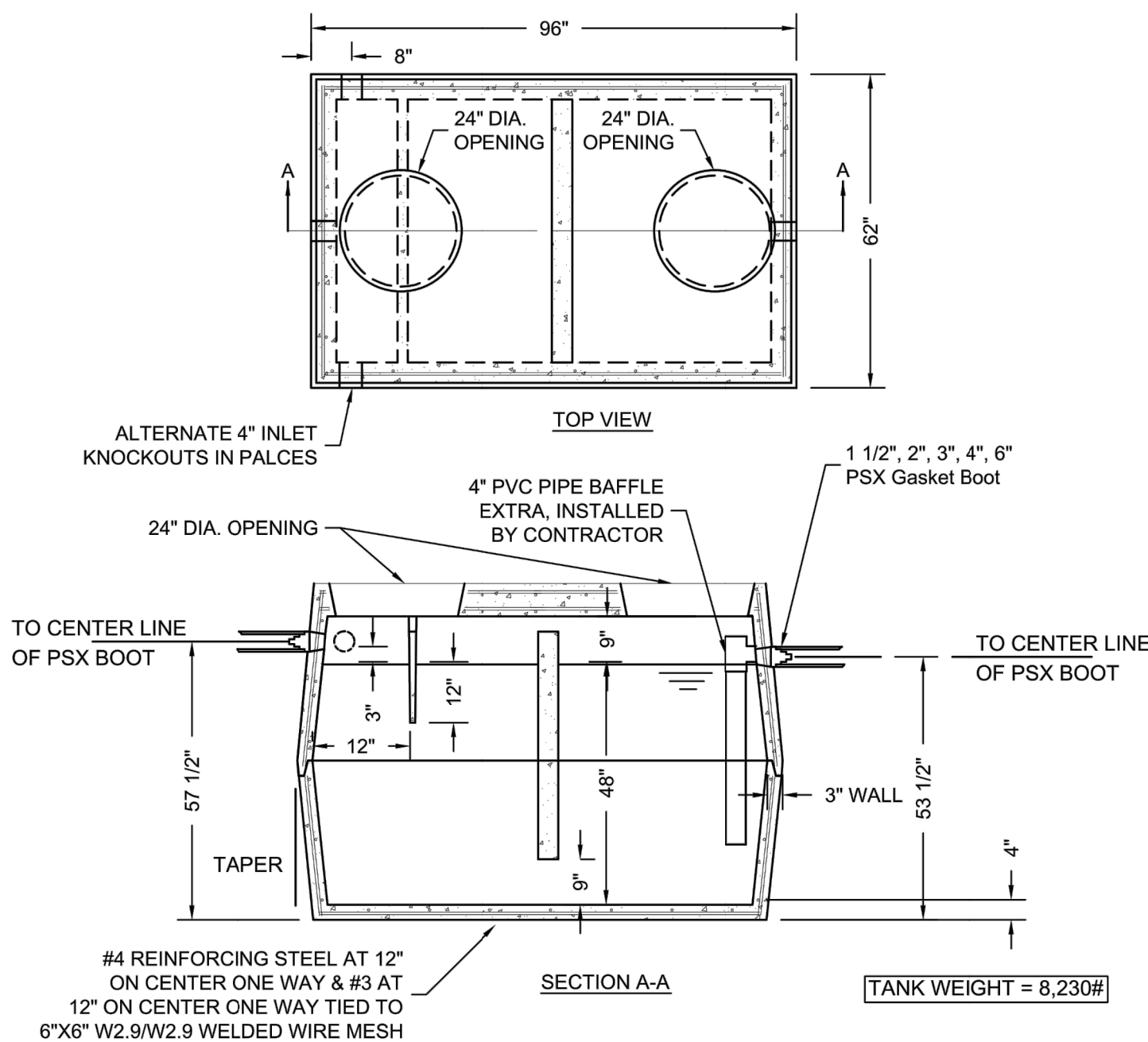
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NO.	DATE	DESCRIPTION	BY



RECOMMENDED FOR APPROVAL	<i>Amy R. Moore</i>	08/21/2019
DESIGNED:	LMY	DRAWN: KDK
CHECKED:	ARM	CHECKED: ARM

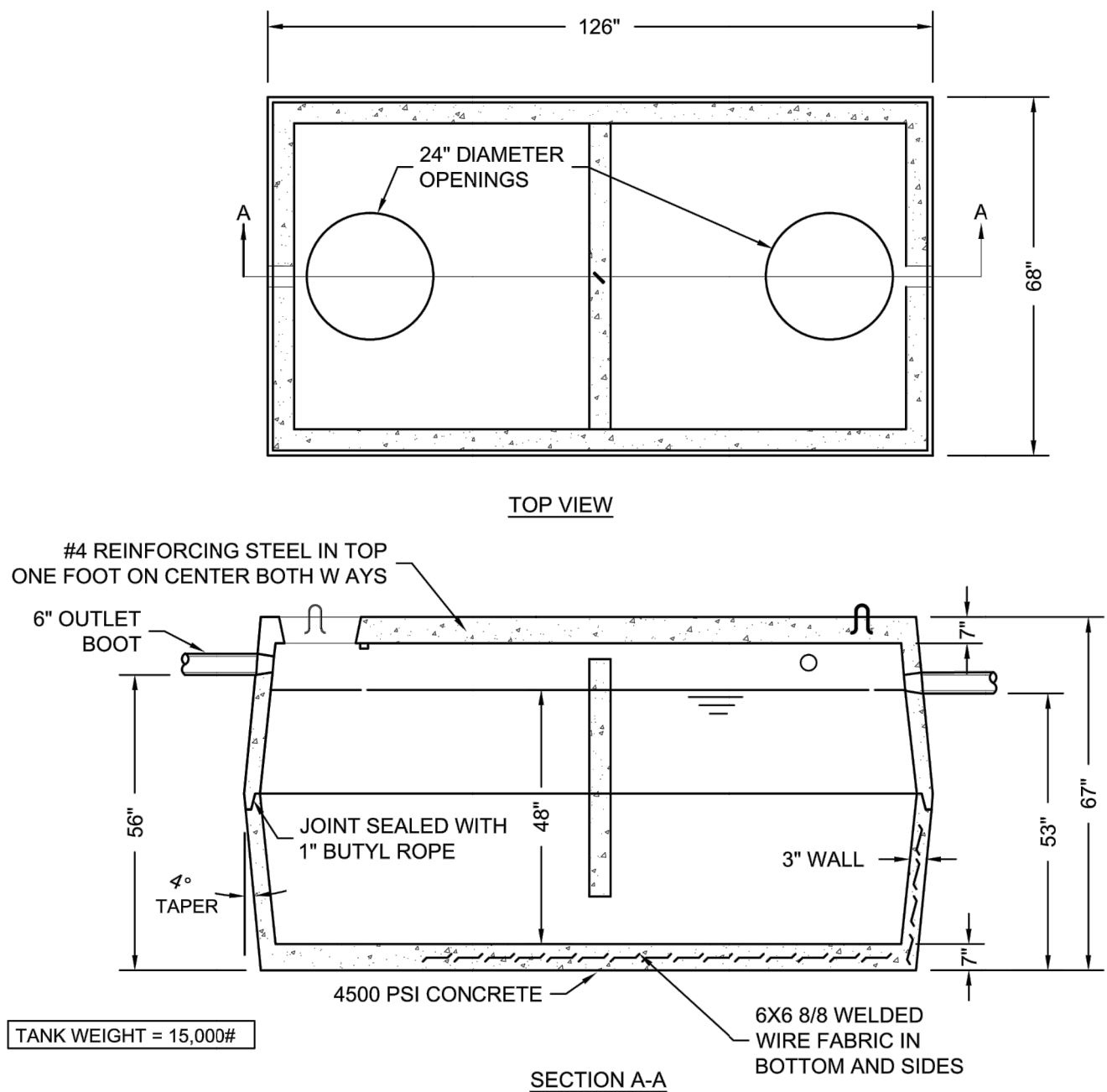
MONTGOMERY COUNTY SEWER DISTRICT	
LIFT STATION STANDARD DETAILS	
HORIZONTAL SCALE AS NOTED	
VERTICAL SCALE AS NOTED	
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PROJECT 13-3041	

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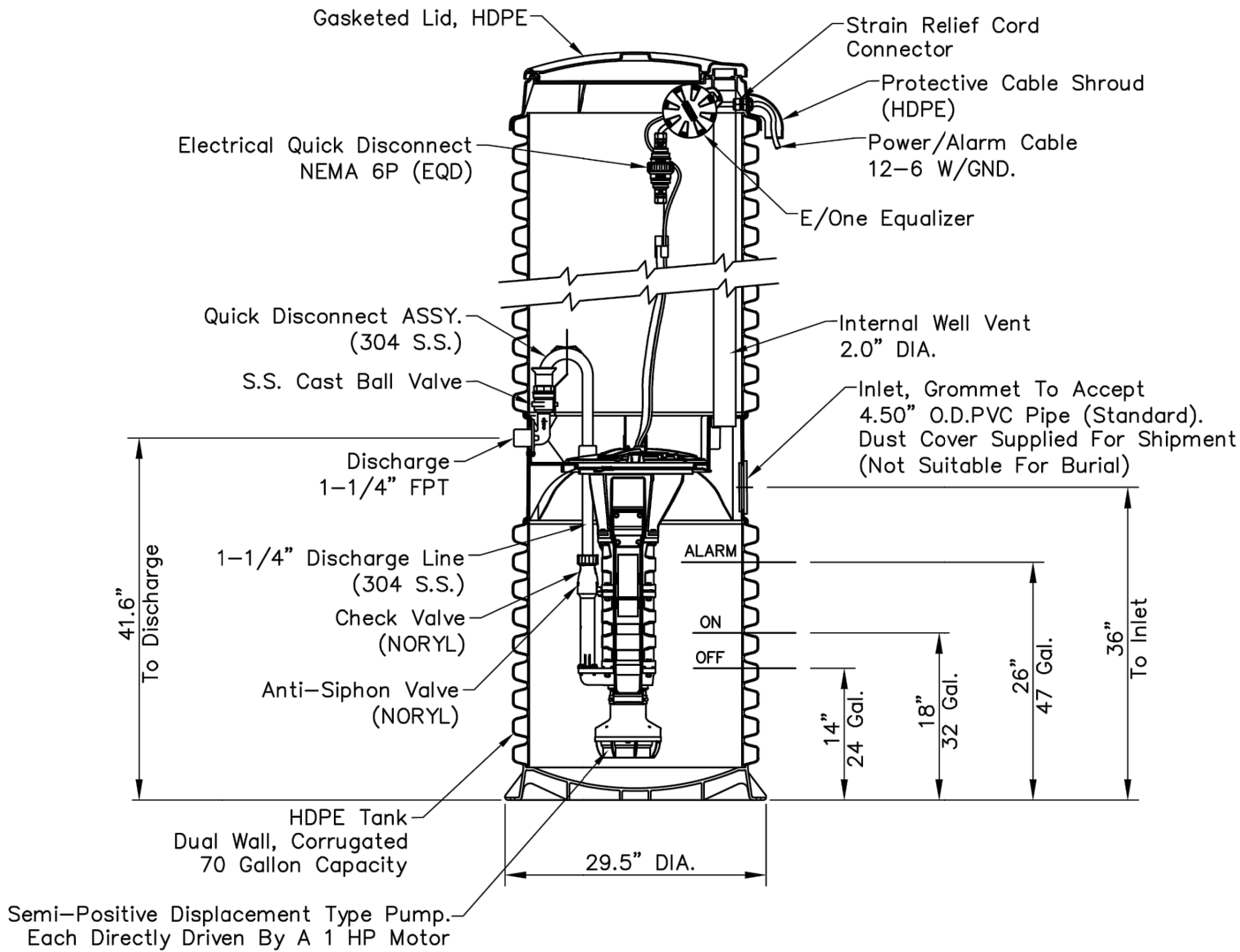
- NOTES:
1. OPTIONAL TANK RISERS SHOULD BE ORDERED TO GRADE.
 2. MINIMUM 4500 PSI AT 28 DAYS CONCRETE.
 3. REINFORCING BARS SHALL CONFORM TO ASTM A-615 GRADE 60 STEEL.
 4. ALL REINFORCING BARS SHALL BE CUT AND FORMED TO THE DIMENSIONAL TOLERANCES SPECIFIED IN ACI-315 OR ACI-318 EXCEPT WHERE NOTED ON DRAWINGS.
 5. ALL BARS SHALL BE BENT COLD. BARS WITH KINKS AND BENDS NOT INDICATED SHALL NOT BE USED. HEATING AND REBENDING OF BARS IS NOT PERMITTED.
 6. REINFORCING STEEL SHALL BE #4 REBAR AT 12" O.C. BOTH WAYS TIED TO 6X6 10/10 WELDED WIRE MESH. TOP OF GREASE TRAP TO HAVE DOUBLE LAYER OF STEEL.
 7. EARTH COVER: 2'-0" MINIMUM UP TO 5'-0" MAXIMUM. SIZE PAD ACCORDING TO AMOUNT OF EARTH COVER.
 8. ALL TANK JOINTS SHALL BE SEALED WATERTIGHT WITH BUTYL RUBBER EXTRUDABLE PREFORMED GASKET MATERIAL, HAMILTON KENT-SEAL, OR EQUAL.
 9. ALL OUTSIDE RISER RINGS SURFACES SHALL BE WATERPROOFED 3/8" WITH TROWLEABLE GRADE BUTYL RUBBER BACK PLASTER
 10. PIPE SEALS SHALL BE TUF-TITE, POLYLOK, OR EQUAL.
 11. MCRSD MAY ACCEPT ALTERNATIVE INTERCEPTOR DESIGNS ON A CASE-BY-CASE BASIS.

1000 GALLON HEAVY DUTY GREASE INTERCEPTOR



- NOTES:
1. RISER RINGS SHOULD BE ORDERED TO GRADE.
 2. MINIMUM 4500 PSI AT 28 DAYS CONCRETE.
 3. REINFORCING BARS SHALL CONFORM TO ASTM A-615 GRADE 60 STEEL.
 4. ALL REINFORCING BARS SHALL BE CUT AND FORMED TO THE DIMENSIONAL TOLERANCES SPECIFIED IN ACI-315 OR ACI-318 EXCEPT WHERE NOTED ON DRAWINGS.
 5. ALL BARS SHALL BE BENT COLD. BARS WITH KINKS AND BENDS NOT INDICATED SHALL NOT BE USED. HEATING AND REBENDING OF BARS IS NOT PERMITTED.
 6. REINFORCING STEEL SHALL BE #4 REBAR AT 12" O.C. ONE WAY OR 6X6 10/10 WELDED WIRE MESH.
 7. EARTH COVER: 6" MINIMUM UP TO 3'-0" MAXIMUM. SIZE PAD ACCORDING TO AMOUNT OF EARTH COVER.
 8. ALL TANK JOINTS SHALL BE SEALED WATERTIGHT WITH BUTYL RUBBER EXTRUDABLE PREFORMED GASKET MATERIAL, HAMILTON KENT-SEAL, OR EQUAL.
 9. ALL OUTSIDE RISER RINGS SURFACES SHALL BE WATERPROOFED 3/8" WITH TROWLEABLE GRADE BUTYL RUBBER BACK PLASTER
 10. PIPE SEALS SHALL BE TUF-TITE, POLYLOK, OR EQUAL.
 11. MCRSD MAY ACCEPT ALTERNATIVE INTERCEPTOR DESIGNS ON A CASE-BY-CASE BASIS.

1500 GALLON PRECAST GREASE INTERCEPTOR

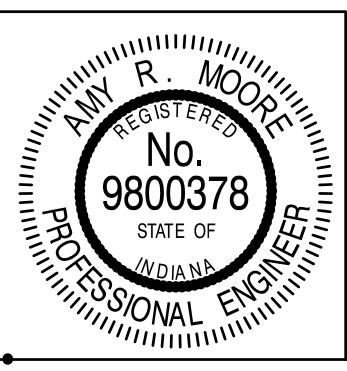


- NOTE:
- 1.) Concrete Ballast May Be Required See Installation Instruction For Details.
 - 2.) Dimensions Are For Reference Only.

GRINDER PUMP STATION DETAIL

Scale: None

REVISIONS			
NO.	DATE	DESCRIPTION	BY



RECOMMENDED FOR APPROVAL	<u>Amy R Moore</u> DESIGN ENGINEER	08/21/2019 DATE
DESIGNED: LMY	DRAWN: KDK	
CHECKED: ARM	CHECKED: ARM	

MONTGOMERY COUNTY SEWER DISTRICT
SANITARY SEWER DETAILS MISCELLANEOUS

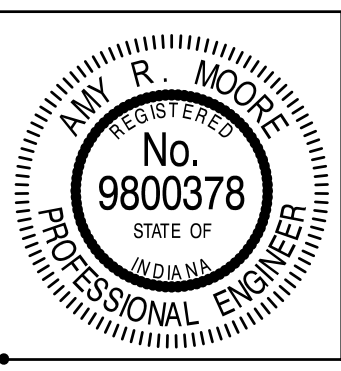
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PLOTTED BY: Jmowery
DATE:Aug 16,2019 - 4:05pm

C.	POLYVINYL CHLORIDE PIPE (PVC)		IN ACCORDANCE WITH AWWA C906, DR14. PIPE SHALL BE SIZED IN ACCORDANCE WITH DIPS. ALL MATERIAL SHALL HAVE A HYDROSTATIC DESIGN BASIS OF 1600 PSI. THE PIPE SHALL CONTAIN NO RECYCLED COMPOUND EXCEPT THAT GENERATED IN THE MANUFACTURER'S OWN PLANT FROM RESIN OF THE SAME SPECIFICATION FROM THE SAME RAW MATERIAL. ALL MATERIAL SHALL BE LISTED BY THE PLASTIC PIPE INDUSTRY IN THE NAME OF THE PIPE MANUFACTURER AND SHALL BE BASED UPON ASTM D-2837 AND PPI TR-3 TESTING AND VALIDATION FOR SAMPLES OF THE PIPE MANUFACTURER'S PRODUCTION PIPE.	3	CENTER-SLEEVE MATERIAL	TOTAL OF ADJUSTING RINGS SHALL BE ALLOWED FOR ADJUSTMENT OF THE MANHOLE FRAME AND COVER TO REQUIRED ELEVATION. GRADE RING JOINTS SHALL HAVE TWO ROWS OF ½" BUTYL RUBBER FLEXIBLE SEALANT CONFORMING TO ASTM C-990.		
	1	PIPE			a. SLEEVE SHALL BE STAINLESS STEEL			
	a. PVC FORCE MAIN SHALL CONFORM TO ASTM D-2241, AWWA C900 OR AWWA C905.		4	GASKET MATERIAL	9	ALL PRECAST CONCRETE FOR NEW MANHOLES THAT WILL BE RECEIVING A FORCE MAIN OR ARE WITHIN FIVE HUNDRED (500') FEET UPSTREAM OR DOWNSTREAM OF THE RECEIVING MANHOLE SHALL HAVE THE INTERIOR OF THE MANHOLE LINED WITH SPECTRASHIELD, CEMENTITIOUS LINERS WITH CALCIUM ALUMINATE MORTARS SUCH AS STRONGSEAL, SAUERISEN, MADEWELL, CONCO SPRAYROQ OR APPROVED EQUAL. APPLY COATING PER MANUFACTURER'S RECOMMENDATION.		
	b. PVC FORCE MAIN PIPE MATERIAL SHALL CONFORM TO ASTM SPECIFICATION D-1784, STANDARD SPECIFICATION OF RIGID POLYVINYL CHLORIDE AND CHLORINATED POLYVINYL CHLORIDE COMPOUNDS, CELL CLASS 12454 (PVC 1120).			a. GASKETS SHALL BE NATURAL OR SYNTETIC RUBBER RESISTANT TO SEWAGE				
	c. FOR ASTM D-2241, THE MATERIAL SHALL CONFORM TO ASTM D-1784, CELL CLASS 12454. THE MINIMUM PRESSURE CLASS/SDR RATING SHALL BE CLASS 200 / SDR 21.		5	METAL COMPONENT FINISH:	10	MINIMUM MANHOLE DIAMETERS		
	d. FOR AWWA C900, THE MATERIAL SHALL HAVE A DESIGN BASIS OF 4000 PSI AND THE MINIMUM PRESSURE CLASS / DR RATING SHALL BE CLASS 200 / DR 21.			a. FINISH SHALL BE A CORROSION-RESISTANT MATERIA	a.	THE FOLLOWING ARE MINIMUM MANHOLE DIAMETERS FOR SANITARY SEWERS ENTERING / EXITING A MANHOLE AT THE FOLLOWING RANGE OF ANGLES:		
	e. FOR AWWA C905, THE MATERIAL SHALL HAVE A HYDROSTATIC DESIGN BASIS OF 4000 PSI AND THE MINIMUM PRESSURE CLASS / DR RATING ACCEPTABLE SHALL BE CLASS 200 / DR 21.		2.5	CASING AND JACKING PIPE				
	f. PVC FORCE MAIN SHALL BE IN COMPLIANCE WITH AWWA C900 FOR 4-INCH THROUGH 12-INCH AND AWWA C905 FOR 14-INCHES AND GREATER.		E.	DESCRIPTION				
	g. ALL PLASTIC PIPE AND COUPLINGS SHALL BEAR IDENTIFICATION MARKINGS IN ACCORDANCE WITH SECTION 2.5.2 AND 2.5.3 OF AWWA C900, WHICH SHALL INCLUDE THE NATIONAL SANITATION FOUNDATION (NSF) SEAL OF APPROVAL. IN ADDITION, THE PLAIN END OF EACH PIPE LENGTH SHALL HAVE TWO (2) RINGS, ONE INCH (1") APART, PAINTED AROUND THE PIPE AT THE PROPER LOCATION TO ALLOW FIELD CHECKING OF THE CORRECT SETTING DEPTH OF THE PIPE IN THE BELL OR COUPLING.			1	ALL CASING AND JACKING PIPE AND HORIZONTAL BORES SHALL BE APPROVED BY MCRSD.			
			F.	STEEL CASING PIPE				
				1	STEEL CASING PIPE SHALL BE CONSTRUCTED IN ACCORDANCE WITH ASTM A-53 WITH 35,000 PSI MINIMUM YIELD STRENGTH, AND HAVE THE FOLLOWING MINIMUM WALL THICKNESSES:			
					a. 24-INCH STEEL CASING SHALL HAVE 0.250" MINIMUM WALL THICKNESS			
					b. 30-INCH STEEL CASING SHALL HAVE 0.375" MINIMUM WALL THICKNESS			
					c. 36-INCH STEEL CASING SHALL HAVE 0.375" MINIMUM WALL THICKNESS			
					d. 42-INCH STEEL CASING SHALL HAVE 0.375" MINIMUM WALL THICKNESS			
				2	ALL ENCASEMENT PIPE JOINTS SHALL BE WELDED.			
				3	THE CASING PIPE DIAMETER EQUALS THE CARRIER PIPE'S LARGES OUTSIDE DIAMETER PLUS 4-INCHES MINIMUM.			
				4	CARRIER PIPE: PER SECTION 2.3 OR 2.4 OF THESE SPECIFICATIONS.			
				C.	CASING SPACERS	C.	MANHOLE BASE CHANNELS	
					1	MANUFACTURED CASING SPACERS OR WOOD BLOCKING SPACERS ARE REQUIRED ON THE BOTTOM AND TOP TO PREVENT PIPE FROM "FLOATING" DURING GROUT FILLING PROCEDURE.	1	FOR ALL MANHOLES WITH EQUAL DIAMETER INFLUENT AND EFFLUENT PIPES, A MINIMUM OF 0.10 FOOT DROP BETWEEN THE INVERTS AND EFFLUENT PIPES SHALL BE MAINTAINED. FOR CHANGES IN DIRECTION 45 TO 90 DEGREES, A MINIMUM OF 0.20 FOOT DROP SHALL BE MAINTAINED.
					2	CASING SPACERS SHOULD BE AT 6-FOOT MAXIMUM, CENTER-TO-CENTER, PER DETAIL.		
				2.6	MANHOLES			
				A.	DESCRIPTION			
					1	STANDARD MANHOLES SHALL BE CONSTRUCTED COMPLETE, READY FOR USE, INCLUDING EXCAVATION, BACKFILL, CONCRETE WORK, CAST IRON FRAMES AND COVERS, AND PERTINENT WORK AS SHOWN ON THE DRAWINGS. ALL MANHOLES SHALL BE MADE WATERTIGHT, AND THE CONTRACTOR SHALL FURNISH ALL MATERIALS AND PERFORM ALL WORK NECESSARY FOR WATERTIGHT CONSTRUCTION.		
					2	ALL PROPOSED CASTINGS SET IN PAVED AREAS SHALL BE FLUSH WITH THE FINAL PAVEMENT ELEVATIONS. ALL PROPOSED CASTINGS TO BE SET IN NON-PAVED AREAS SHALL STAND APPROXIMATELY THREE (3) INCHES ABOVE FLUSH WITH THE FINAL GROUND.		
				B.	REINFORCED CONCRETE MANHOLES AND ACCESSORIES			
					1	MANHOLES SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE ASTM C-478 STANDARD SPECIFICATIONS FOR PRECAST REINFORCED CONCRETE MANHOLE SECTIONS. MANHOLES SHALL BE A MINIMUM DIAMETER OF 48 INCHES WITH A MINIMUM ACCESS DIAMETER OF 24 INCHES. THE MINIMUM WALL THICKNESS SHALL BE FOUR (4) INCHES FOR MANHOLES FOUR (4) FEET IN DIAMETER.		
					2	THE PRECAST TOPS SHALL BE OF THE ECCENTRIC CONE TYPE. PRECAST FLAT COVERS SHALL BE NOT LESS THAN EIGHT (8) INCHES THICK AND REINFORCED WITH TWO LAYERS OF STEEL WITH A MINIMUM AREA OF 0.12 SQUARE INCHES PER LINEAR FOOT IN BOTH DIRECTIONS IN EACH LAYER. PRECAST FLAT BOTTOMS OF MANHOLES SHALL ALSO BE REINFORCED THE SAME AS SPECIFIED HEREIN FOR PRECAST FLAT TOP. HOISTING LUGS OR HOOKS SHALL BE CAST IN PLACE FOR HANDLING AND SETTING OF THE RINGS. NO THROUGH HOLES SHALL BE PERMITTED. OPENINGS OF PROPER SIZES AND SUITABLE DESIGN SHALL BE CAST IN PLACE FOR RECEIVING THE SEWER AND/OR DROP PIPES AND CONNECTIONS. ADJUSTING RISER FINGS SHALL BE PROVIDED, WITH NO MORE THAN 12-INCHES OF RISER RINGS ALLOWED.		
					3	ALL MANHOLE JOINTS SHALL BE TONGUE AND GROOVE AND THEY SHALL BE SEALED WITH TWO ROWS OF ½" BUTYL MASTIC JOINT SEALANT MEETING ASTM C-990. CRACKED OR DAMAGED BARREL JOINTS SHALL NOT BE ALLOWED. ALL JOINTS SHALL ALSO HAVE AN EXTERIOR JOINT WRAP SIMILAR TO THE INFI-SHIELD GATOR WRAP AS MANUFACTURED BY SEALING SYSTEMS, INC. OR APPROVED EQUAL. THE JOINT WRAP SHALL BE A MINIMUM OF TWELVE-INCHES (12") IN WIDTH.		
					4	MANHOLE STEPS SHALL BE INSTALLED IN ALL SANITARY SEWER MANHOLES. MANHOLE STEPS SHALL BE POLYPROPYLENE. MANHOLE STEPS SHALL BE INSTALLED IN A VERTICAL ROW ON 16-INCH CENTERS.		
					5	MANHOLE BASES SHALL BE MONOLITHIC WITH FIRST RISER SECTION AND OF CAST-IN-PLACE OR PRECAST CONCRETE. WHERE SEWER LINES PASS THROUGH OR ENTER MANHOLES, THE INVERT CHANNELS SHALL BE SMOOTH AND SEMI-CIRCULAR IN CROSS SECTION WITH THE WALL EXTENDING TO FULL DEPTH ELEVATION OF THE PIPE. THE INVERT CHANNELS SHALL BE FORMED DIRECTLY IN THE CONCRETE OF THE MANHOLE BASE. CHANGES OF DIRECTION OF FLOW WITHIN THE MANHOLES SHALL BE MADE WITH A SMOOTH CURVE WITH AS LONG A RADIUS AS POSSIBLE. THE WALLS OF THE CHANNELS MAY BE FLARED OUT TO ALLOW TESTING EQUIPMENT TO BE INSERTED AND REMOVED. THE FLOOR OF THE MANHOLE OUTSIDE CHANNELS SHALL BE SMOOTH AND SLOPE TOWARD THE CHANNEL NOT LESS THAN ONE (1) INCH PER FOOT.		
					6	FOR CAST-IN-PLACE BASES, NO MORTAR OR CONCRETE SHALL BE PLACED IN WATER, AND NO WATER SHALL BE ALLOWED TO FLOW OVER OR AGAINST THE CONCRETE BEFORE IT HAS HAD ADEQUATE TIME TO SET IN ORDER TO PREVENT DAMAGE TO THE STRUCTURE.		
					7	THE STANDARD MANHOLE IS FORTY-EIGHT-INCHES (48") IN DIAMETER. LARGER DIAMETER MANHOLES MAY BE REQUIRED IN INSTANCES WITH LARGE PIPE DIAMETERS OR WITH CERTAIN INTERNAL DROPS, IF APPROVED. MANHOLE BARREL SECTIONS SHALL BE IN ONE, TWO, THREE, OR FOUR FOOT VERTICAL SECTIONS. THE CONE SECTION SHALL BE OF THE ECCENTRIC CONE TYPE, TWO OR THREE FEET IN LENGTH.		
					8	ADJUSTING RINGS: WHERE ONE (1) SOLID RISER OR BARREL SECTION CANNOT BE USED, FINAL ADJUSTMENTS IN ELEVATION OF THE FRAME AND COVER SHALL ONLY BE ACCOMPLISHED BY THE USE OF PRECAST CONCRETE ADJUSTING RINGS CONFORMING TO ASTM C-478. RINGS SHALL BE OF A NOMINAL THICKNESS OF FOUR (4"), SIX (6") INCHES OR TWELVE (12). NOT MORE THAN TWO (2) RINGS AND NOT MORE THAN TWELVE (12") INCHES		

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D. PIPE LAYING		COMPONENTS OF DISSIMILAR METAL SHALL BE PROTECTED AGAINST CORROSION BY HAND APPLICATION OF A SUITABLE COATING OR BY ENCASEMENT OF THE ENTIRE ASSEMBLY WITH 8-MIL LOOSE POLYETHYLENE FILM IN ACCORDANCE WITH ANSI/AWWA C105/A21.5.		3 SET CLEANOUT FRAMES AND COVERS IN CONCRETE PAVEMENT AND ROADS WITH TOPS FLUSH WITH PAVEMENT SURFACE.		4 PREPARATION	
1 ALL PIPE, FITTINGS AND VALVES SHALL BE LOWERED CAREFULLY INTO THE TRENCH IN SUCH A MANNER AS TO PREVENT DAMAGE TO MATERIALS AND PROTECTIVE COATINGS AND LININGS. UNDER NO CIRCUMSTANCES SHALL PRESSURE SEWER MAIN MATERIALS BE DROPPED OR DUMPED INTO THE TRENCH. THE TRENCH SHALL BE DEWATERED PRIOR TO INSTALLATION OF THE PIPE.		a. GLANDS SHALL BE MANUFACTURED OF DUCTILE IRON CONFORMING TO ASTM A-536-80, GRADE 60-42-10. SET SCREWS SHALL BE HARDENED DUCTILE IRON. GLANDS SHALL BE LISTED WITH UL AND FACTORY MANUAL.		4 THE TOP OF THE CLEANOUT ASSEMBLY SHALL BE TWO (2") INCHES BELOW THE BOTTOM OF THE COVER TO PREVENT LOADS BEING TRANSFERRED FROM THE FRAME AND COVER TO THE PIPING.		a. MANHOLES SHALL BE TESTED AFTER INSTALLATION WITH ALL CONNECTIONS IN PLACE.	
2 EXAMINATION OF MATERIAL		H. AIR RELIEF		C. BUILDING SERVICE LINES		b. LIFT HOLES SHALL BE FILLED WITH NON-SHRINK GROUT, SEALED AND CURED.	
a. ALL PIPE, FITTINGS AND VALVES AND OTHER APPURTENANCES SHALL BE EXAMINED CAREFULLY FOR DAMAAGE AND OTHER DEFECTS IMMEDIATELY BEFORE INSTALLATION.		1 AIR RELIEF VALVES SHALL BE INSTALLED AT EVERY INTEMEDIAATE APEX POINT WHERE AIR MAY ACCUMULATE IN THE FORCE MAIN.		1 INSTALL SANITARY SEWER SERVICE LINES TO POINT OF CONNECTION WITHIN THREE (3') FEET OUTSIDE OF BUILDING(S) WHERE SERVICE IS REQUIRED AND MAKE CONNECTIONS.		c. MANHOLE VACUUM TESTING SHALL BE PERFORMED AFTER ALL ADJACENT UNDERGROUND UTILITIES HAVE BEEN INSTALLED AND ALL MANHOLES HAVE BEEN COMPLETELY BACKFILLED AND FINISHED TO GRADE. VACUUM TESTING PRIOR TO IINSTALLTION OF ALL UTILITIES MAY BE CONSIDERED UPON REQUEST TO THE MCRSD PRIOR TO INSTALLATION OF ALL UTILITIES IF THE MANHOLES ARE COMPLETELY BACKFILLED AND SEER LEAKAGE AND DEFLECTION TESTING IS COMPLETE. IF VACUUM TESTING IS PERFORMED PRIOR TO ALL UTILITIES BEING INSTALLED AND ANY MANHOLES ARE FOUND TO HAVE BEEN DISTURBED OR DAMAGED DURING INSPECTION DURING THE WARRANTY PERIOD, THE MANHOLES SHALL BE REPAIRED AND VVACUUM TESTED AGAIN TO ENSURE THAT THER IS NO LEAKAGE.	
3 PIPE ENDS		2 EACH AIR RELIEF VALVE THAT EXHAUSTS ABOVE GROUND MUST BE EQUIPPED WITH AN EXHAUST PIPE EXTENDING TO A DOWNWARD FACING ELBOW COVERED WITH A CORROSION-RESISTANT, TWENTY-FOUR (24) MESH SCREENED OPENING AT AN ELEVATION OF EIGHTEEN (18") INCHES ABOVE THE GROUND SURFACE AND ABOVE THE ONE HUNDRED (100) YEAR FLOOD ELEVATION.		2 THE SAMPLING MANHOLE SHALL HAVE A THREE (3') FOOT STRAIGHT LATERAL RUN ON BOTH SIDES OF THE MANHOLE.		d. IF A COATING OR LINING IS TO BE APPLIED TO THE INTERIOR OF THE MANHOLE, THE TEST MUST NOT BE PERFORMED UNTIL THE COATING IS CURED PER MANUFACTURER'S RECOMMENDATION.	
a. ALL LUMPS, BILSTERS, AND EXCESS COATING SHALL BE REMOVED FROM THE SOCKET AND PLAIN ENDS OF EACH PIPE, AND THE OUTSIDE OF THE PLAIN END AND INSIDE OF THE BELL SHALL BE WIPED CLEAN AND DRY AND BE FREE FROM DIRT, SAND, GRIT OR ANY FOREIGN MATERIALS BEFORE THE PIPE IS LAID.		3 MANUALLY OPERATED AIR RELIEF VALVES SHALL BE USED IN AREAS WITHIN THE ONE HUDRED (100) YEAR FLOOD PLAIN AND WHERE FLOODING MAY OCCUR.		PART 4 - TESTING		5 CONTRACTOR SHALL SUBMIT TO THE MCRSD THE RESULTS OF EACH MANHOLE VACUUM TEST. SUCH REPORTS SHALL INCLUDE A DESCRIPTION OF THE LOCATION OF THE MANHOLE, THE TIME, DATE, AND WEATHER OF THE TEST, A LIST OF ALL PERSONS PRESENT, THE DIAMETER AND DEPTH OF THE MANHOLE AND THE ALLOWABLE TEST RESULTS, AND THE ACTUAL TEST RESULTS.	
4 PIPE CLEANLINESS		3.6 HORIZONTAL BORING INSTALLATION		4.1 FIELD QUALITY CONTROL		6 ALL MANHOLES SHALL BE REPAIRED BY CONTRACTOR AND RETESTED AS DESCRIBED ABOVE UNTIL A SUCCESSFUL TEST IS MADE. AFTER EACH TEST, TEMPORARY PLUGS SHALL BE REMOVED.	
a. FOREIGN MATERIAL SHALL BE PREVENTED FROM ENTERING THE PIPE WHILE IT IS BEING PLACED IN THE TRENCH.		A. PIT OR APPROACH TRENCHES		A. ALL SYSTEMS SHALL BE INSPECTED AND TESTED. A MCRSD REPRESENTATIVE MUST BE PRESENT FOR ALL TESTING. MCRSD SHALL BE CONTACTED 48 HOURS PRIOR TO ANY TESTING. PRIOR TO FINAL ACCEPTANCE, PROVIDE A VIDEO RECORD OF ALL PIPING FOR SANITARY SEWER MAIN EXTENSIONS TO SHOW THE LINES ARE FREE FROM OBSTRUCTIONS, PROPERLY SLOPED AND JOINED.		E. LATERALS	
5 PIPE PLACEMENT		1 EXCAVATE APPROACH TRENCHES OR PITS AS SITE CONDITIONS REQUIRE.		B. GRAVITY SANITARY SEWERS		1 ALL LATERALS SHALL BE VISUALLY INSPECTED BY A MCRSD REPRESENTATIVE.	
a. AS EACH LENGTH OF PIPE IS PLACED IN THE TRENCH, THE JOINT SHALL BE ASSEMBLED AND THE PIPE BROUGHT TO CORRECT LINE AND GRADE. THE PIPE SHALL BE SECURED IN PLACE WITH SPECIFIED BACKFILL MATERIAL.		2 ENSURE CASING ENTRANCE FACES AS NEAR PERPENDICULAR TO ALIGNMENT AS CONDITIONS PERMIT.		1 ONCE CONSTRUCTED, ALL SANITARY SEWERS AND MANHOLES SHALL BE WATERTIGHT AND FREE FROM LEAKAGE. THE CONTRACTOR SHALL BE REQUIRED TO REPAIR ALL VISIBLE LEAKS. THE RATE OF INFILTRATION INTO THE SANITARY SEWER SYSTEM BETWEEN ANY TWO ADJACENT MANHOLES SHALL NOT BE IN EXCESS OF 100 GALLONS PER INCH OF PIPE DIAMETER PER MILE PER DAY.			
6 PIPE PLUGS		3 ESTABLISH VERTICAL ENTRANCE FACE AT LEAST 1 FOOT ABOVE TOP OF CASING.		2 ALL GRAVITY SANITARY SEWERS CONSTRUCTED OF FLEXIBLE PIPE SHALL BE DEFLECTION TESTED NO SOONER THAN THIRTY (30) DAYS AFTER INSTALLATION AND COMPLETE BACKFILL. THE DIAMETER OF THE RIGID BALL OR MANDREL USED FOR A DEFLECTION TEST SHALL BE NO LESS THAN NINETY-FIVE PERCENT (95%) OF THE BASE, INSIDE DIAMETER OF THE PIPE TO BE TESTED, DEPENDENT ON WHAT IS SPECIFIED IN THE CORRESPONDING ASTM STANDARD. THE TEST SHALL NOT BE PERFORMED WITH THE AID OF A MECHANICAL PULLING DEVICE.			
a. AT TIMES WHEN PIPE-LAYING IS NOT IN PROGRESS, THE OPEN ENDS OF PIPE SHALL BE CLOSED BY A WATERTIGHT PLUG. THE PLUG SHALL BE FITTED WITH A MEANS FOR VENTING. WHEN PRACTICAL, THE PLUG SHALL REMAIN IN PLACE UNTIL THE TRENCH IS PUMPED COMPLETELY DRY. CARE MUST BE TAKEN TO PREVENT PIPE FLOATATION, SHOULD THE TRENCH FILL WITH WATER.		4 INSTALL DEWATERING MEASURES AND EXCAVATION SUPPORTS.		3 ALL SEWERS TWENTY-FOUR (24") INCHES AND LESS SHALL BE TESTED BY MEANS OF A LOW-PRESSURE AIR TEST TO DETECT DAMAGED PIPING AND/OR IMPROPER JOINTING. TESTING SHALL BE DONE PER ASTM F-1417 FOR FLEXIBLE AND SEMI-RIGID PIPE.			
b. PRIOR TO REMOVAL OF THE PLUG FOR EXTENDING THE LINE OR FOR ANY OTHER REASON, AIR AND/OR WATER PRESSURE IN THE LINE SHALL BE RELEASED.		B. CASING PIPE		4 ALL SEWERS GREATER THAN TWENTY-FOUR (24") INCHES SHALL BE JOINT TESTED USING AIR OR WATER UNDER LOW PRESSURE. ALL JOINTS SHALL BE TESTED. TESTING PROCEDURES SHALL BE PER ASTM C-1103.			
E. JOINT ASSEMBLY		1 BORING		5 THE CONTRACTOR SHALL SUPPLY ALL EQUIPMENT NECESSARY TO PERFORM THE TEST REQUIRED.,			
1 JOINTS SHALL BE ASSEMBLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.		a. PUSH PIPE INTO GROUND WITH BORING AUGER, ROTATING WITHIN PIPE TO REMOVE SOIL.		6 ALL TESTS SHALL BE CONDUCTED UNDER THE OBSERVATIO NOF A REPRESENTATIVE OF THE MCRSD. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO SCHEDULE TESTING.			
2 ASSEMBLY		b. DO NOT ADVANCE CUTTING HEAD AHEAD OF CASING PIPE, EXCEPT FOR DISTANCE NECESSARY TO PERMIT CUTTING TEETH TO CUT CLEARANCE FOR PIPE.		7 ANY LEAKAGE FOUND DURING THE INFILTRATION TEST SHALL BE CORRECTED PRIOR TO ACCEPTANCE. GROUTING OF THE JOINT OR CRACK TO REPAIR THE LEAKAGE SHALL NOT BE PERMITTED FOR FLEXIBLE PIPE. IF THE DEFECTIVE PORTION OF THE SANITARY SEWER CANNOT BE LOCATED, THE CONTRACTOR SHALL REMOVE AND RECONSTRUCT AS MUCH OF THE WORK AS NECESSARY TO OBTAIN A SYSTEM THAT PASSES INFILTRATION REQUIREMENTS.			
a. AFTER PLACING A LENGTH OF PIPE IN THE TRENCH, THE MANUFACTURER'S LUBRICANT SHALL BE PROPERLY APPLIED. SPIGOT END SHALL THEN BE CENTERED IN THE BELL AND THE PIPE PUSHED HOME AND BROUGHT TO CORRECT LINE AND GRADE. PIPE AND FITTINGS WHICH DO NOT ALLOW A SUFFICIENT AND UNIFORM SPACE FOR JOINTS SHALL BE REMOVED AND REPLACED WITH PIPE OF PROPER DIMENSIONS TO INSURE SUCH UNIFORM SPACE. PRECAUTIONS SHALL BE TAKEN TO PREVENT DIRT FROM ENTERING THE JOINT SPACE.		c. ARRANGE MACHINE BORE AND CUTTING HEAD TO BE REMOVABLE FROM WITHIN PIPE.		8 ALL SEWER MAIN EXTENSIONS SHALL BE TELEVISED PRIOR TO ACCEPTANCE OF SEWER BY THE DISTRICT.			
3 PIPE CUTTING		d. ARRANGE FACE OF CUTTING HEAD TO PROVIDE BARRIER TO FREE FLOW OF SOFT MATERIAL.		C. PRESSURE PIPE			
a. CUTTING PIPE FOR INSERTION OF VALVES, FITTINGS, OR CLOSURE PIECES SHALL BE DONE IN CONFORMANCE WITH RECOMMENDATIONS OF THE MANUFACTURER OF THE CUTTING EQUIPMENT. CUTTING SHALL BE DONE IN A SAFE, WORKMANLIKE MANNER WITHOUT CREATING DAMAGE TO THE PIPE LINING. AN OXYACETYLENE TORCH SHALL NOT BE USED.		e. IF UNSTABLE SOIL IS ENCOUNTERED DURING BORING, RETRACT CUTTING HEAD INTO CASING TO PERMIT BALANCE BETWEEN PUSHING PRESSURE AND RATIO OF PIPE ADVANCEMENT TO QUANTITY OF SOIL.		1 AFTER THE PIPE HAS BEEN LAID AND BACKFILLED, ALL NEWLY LAID PRESSURE PIPE OR ANY VALVED SECTIONS OF IT SHALL, UNLESS OTHERWISE EXPRESSLY SPECIFIED, BE SUBJECTED TO A HYDROSTATIC PRESSURE TEST. THE DURATION OF EACH PRESSURE TEST SHALL BE FOR A PERIOD OF NOT LESS THAN TWO (2) HOURS AND NOT MORE THAN SIX (6) HOURS. THE BASIC PROVISIONS OF AWWA C600 (DI PIPE), C605 (PVC PIPE), SHALL BE FOLLOWED FOR ALL PRESSURE TESTING.			
b. CUT ENDS AND ROUGH EDGES SHALL BE GROUND SMOOTH, AND FOR PUSH-ON JOINT CONNECTIONS THE CUT END SHALL BE BEVELED BY METHODS RECOMMENDED BY THE MANUFACTURER.		f. GROUT TO FILL VOIDS IF VOIDS DEVELOP GREATER THAN OUTSIDE DIAMETER OF PIPE BY APPROXIMATELY 1 INC.		2 THE TEST PRESSURE SHALL NOT EXCEED PIPE AND/OR THRUST RESTRAINT DESIGN PRESSURES. THE TEST PRESSURE SHALL NOT VARY BY MORE THAN PLUS OR MINUS 5 PSI FOR THE DURATION OF THE TEST.			
F. INSTALLATION BY HORIZONTAL DIRECTIONAL DRILLING (HDD)		g. IF BORING IS OBSTRUCTED, RELOCATE, JACK OR TUNNEL AS DIRECTED BY MCRSD REPRESENTATIVE.		3 ALL NEWLY LAID PIPE OR ANY VALVED SECTION THEREOF SHALL BE SUBJECTED TO A HYDROSTATIC PRESSURE OF AT LEAST 1.5 TIMES THE MAXIMUM WORKING PRESSURE AT THE LOWEST ELEVATION IN THE LINE OR 1.25 TIMES THE MAXIMUM WORKING PRESSURE AT THE HIGHEST ELEVATION IN THE LINE. IN NOT CASE SHALL THE TEST PRESSURE BE LESS THAN FIFTY (50) PSI.			
1 EQUIPMENT		2 JACKING		4 PRESSURIZATION			
a. THE DIRECTIONAL DRILLING SYSTEM SHALL BE REMOTELY STEERABLE AND PERMIT ELECTRONIC MONITORING OF TUNNEL DEPTH AND LOCATION. THE SYSTEM SHALL BE ABLE TO CONTROL THE DEPTH AND DIRECTION OF THE PIPE AND MUST BE ACCURATE TO +/- 2 INCHES.		a. CONSTRUCT ADEQUATE THRUST WALL NORMAL TO PROPOSED LINE OF THRUST.		a. EACH VALVED SECTION OF PIPE SHALL BE SLOWLY FILLED WITH WATER AND THE SPECIFIED TEST PRESSURE, BASED UPON THE ELEVATION OF THE LOWEST POINT OF THE LINE OR SECTION UNDER TEST AND CORRECTED TO THE ELEVATION OF THE TEST GAUGE SHALL BE APPLIED BY MEANS OF A PUMP CONNECTED TO THE PIPE. THE PUMP, PIPE, PIPE CONNECTION AND ALL NECESSARY APPARATUS, INCLUDING GAUGES AND METERS SHALL BE FURNISHED BY THE CONTRACTOR. BEFORE APPLYING THE SPECIFIED TEST PRESSURE, AIR SHALL BE EXPELLED COMPLETELY FROM THE TEST SECTION. IF PERMANENT AIR-RELEASE VALVES ARE NOT LOCATED AT ALL HIGH POINTS, THE CONTRACTOR SHALL INSTALL CORPORATION COCKS AT ALL POINTS SO THAT THE AIR CAN BE EXPELLED AS THE WECTIION IS FILLED WITH WATER. AFTER ALL THE AIR HAS BEEN EXPELLED, THE CORPORATION COCKS SHALL BE CLOSED AND THE TEST PRESSURE APPLIED. AT THE CONCLUSION OF THE PRESSURE TEST THE CORPORATION COCKS SHALL BE REMOVED AND PLUGGED.			
b. THE SYSTEM SHALL UTILIZE A FLUID-CUTTING PROCESS, USING A LIQUID CLAY SUCH AS BENTONITE. THIS CLAY SHALL BE TOTALLY INERT AND CONTAIN NO RISK TO THE ENVIRONMENT.		b. IMPART THRUST LOAD TO PIPE, THROUGH SUITABLE THRUST RING SUFFICIENTLY RIGID TO ENSURE UNIFORM DISTRIBUTION OF THRUST LOAD ON FULL PIPE CIRCUMFERENCE.		b. ANY EXPOSED PIPE, FITTINGS, VALVES, AND JOINTS SHALL BE EXAMINED CAREFULLY DURING THE TEST. ANY DAMAGED OR DEFECTIVE PIPE, FITTINGS, VALVES, OR JOINTS THAT ARE DISCOVERED FOLLOWING THE PRESSURE TEST SHALL BE REPAIRED OR REPLACED WITH SOUND MATERIAL AND THE TEST SHALL BE REPEATED UNTIL IT PASSES.			
c. THE LIQUID CLAY SHALL REMAIN IN THE BORE HOLE TO INCREASE THE STABILITY OF THE BORE HOLE AND TO PROVIDE A LUBRICANT TO REDUCE FRICTIONAL DRAG WHEN THE PIPE IS INSTALLED.		3 CARRIER PIPE		c. PRESSURE TEST SHALL BE MAINTAINED FOR A MINIMUM OF TWO (2) HOURS.			
d. THE SPOILS SHALL BE RECOVERED BY USE OF A VACUUM SYSTEM MOUNTED ON A VEHICLE FOR REMOVAL OF THE SPOILS. SPOILS SHALL NOT BE DISCHARGED INTO SERVERS OR STORM DRAINS. THE CONTRACTOR IS RESPONSIBLE FOR DISPOSAL OF ALL SPOIL MATERIAL.		a. CLEAN AND INSPECT PIPE.		5 LEAKAGE TEST			
2 DRILLING PROCEDURE		b. PLACE CARRIER PIPE PER DETAIL. EXERCISE CARE TO PREVENT DAMAGE TO PIPE JOINTS WHEN CARRIER PIPE IS PLACED IN CASING.		a. AFTER THE COMPLETIOIN OF THE PRESSURE TEST, A LEAKAGE TEST SHALL BE CONDUCTED TO DETERMINE THE QUANTITY OF WATER LOST BY LEADAGE UNDER THE SPECIFIED TEST PRESSURE. LEAKAGE SHALL BE DEFINED AS THE QUANTITY OF WATER THAT MUST BE SUPPLIED INTO THE NEWLY LAID PIPE OR ANY VALVED SECTION THEREOF TO MAINTAIN PRESSURE WITHIN 5 PSI OF THE SPECIFIED TEST PRESSURE. AFTER THE PIPE HAS BEEN FILLED WITH WATER AND THE AIR HAS BEEN EXPELLED.			
a. CONTRACTOR SHALL CALIBRATE THE DIRECTIONAL DRILLING HEAD LOCATOR AT THE START OF THE DAY AND AT EACH NEW DIRECTIONAL DRILLING OPERATION.		c. SUPPORT PIPELINE WITHIN CASING SO NO EXTERNAL LOADS ARE TRANSMITTED TO CARRIER PIPE.		b. LEAKAGE SHALL NOT BE MEASURED BY A DROP IN PRESSURE IN A TEST SECTION OVER A PERIOD OF TIME.			
b. THE MAXIMUM DRILL ANGLE SHALL BE FIFTEEN DEGREES MEASURE PERPENDICULAR TO GRADE TO THE DESIGN DEPTH ELEVATION.		d. ATTACH SUPPORTS TO BARREL OF CARRIER PIPE. DO NOT REST CARRIER PIPE ON BELLS.		6 TEST ALL TRACER WIRES TO CONFIRM CONTINUITY.			
c. A PILOT HOLE SHALL BE DRILLED ON THE DRILL PATH WITH NO DEVIATIONS GREATER THAN 5% OF DEPTH OVER A LENGTH OF 100 FEET.		e. THE ANNULAR SPACE BETWEEN THE CASING PIPE AND THE CARRIER PIPE SHALL BE GROUT FILLED.		D. MANHOLES			
d. UPON SUCCESSFUL COMPLETION OF THE PILOT HOLE, CONTRACTOR WILL REAM THE DRILL HOLE TO A MINIMUM OF 25% GREATER THAN THE OUTSIDE DIAMETER OF THE INSATLLED PIPE USING THE APPROPPRIATE TOOLS.		3.7 MANHOLES		1 ALL MANHOLE VACUUM TESTS SHALL BE CONDUCTED IN THE PRESENCE OF A REPRESENTATIVE OF THE MCRSD AND IN ACCORDANCE WITH ASTM C-1244, STANDARD TEST METHOD FOR CONCRETE SEWER MANHOLES BY NEGATIVE AIR PRESSURE (VACUUM) TEST.			
e. THREE STRANDS OF TRACER WIRE SHALL BE PULLED BACK WITH THE PIPE. THE WIRES SHALL BE INSTALLED ALONG THE PIPE, FASTENED SECURELY TO THE PIPE AT FIVE (5') FOOT INTERVALS, AND TERMINATING ABOVE GROUND WITH THE LEAD TAPED AROUND EACH STRUCTURE.		A. INSTALLATION		2 100% OF ALL MANHOLES SHALL BE TESTED.			
f. TEST/PRESSURE RELIEF HOLES (POTHOLES) DUG EVERY 100 FEET SHALL BE REQUIRED ALONG THE BORE ROUTE TO CONFIRM ALIGNMENT AND GRADE, AND TO RELIEVE SUBSURFACE PRESSURE.		1 ALL MANHOLES SHALL BE INSTALLED SO THAT THE TOP OF THE MANHOLE CASTING AND FRAME:		3 THE VACUUM TEST EQUIPMENNT SHALL CONSIST OF INFLATABLE PLUGS FOR ALL INCOMING AND OUTGOING SEWER LINES, AN INFLATABLE TEST COLLAR TO SEAL THE MANHOLE AT THE MANHOLE FRAME, AND A VACUUM PUMP. A VACUUM LIQUID FILLED GAUGE SHALL BE LOCATED IN-LINE BETWEEN THE TEST COLLAR AND THE PUMP TO ACCURATELY INDIATE THE VACUUM IN INCHES OF MERCURY WITHIN THE MANHOLE. THE VACUUM GAUGE SHALL HAVE A MINIMUM OF 3.5 INCH DIAMETER FACE AND A RANGE TO NO MORE THAN THIRTY (30) INCHES OF MERCURY, WITH SCALE MARKINGS OF NO GREATER THAN ONE-HALF (1/2) INCH OF MERCERY VACUUM AND AN ACCURACY TO WITHIN ± TWO PERCENT (2%) OF TRUE VACUUM.			
g. AFTER THE PIPE HAS BEEN INSTALLED, ALLOW PIPE MANUFACTURER'S RECOMMENDED AMOUNT OF TIME, BUT NOT LESS THAN FOUR (4) HOURS, FOR COLLING AND RELAXATION DUE TO TENSILE STRESSING PRIOR TO HYDROSTATIC TESTING.		a. IN AREAS NOT SUBJECT TO TRAFFIC, THE LID SHALL BE SET AT THREE (3") INCHES ABOVE THE SURROUNDING SURFACE AFTER EARTH SETTLEMENT.					
G. THRUST RESTRAINT		b. IN AREAS SUBJECT TO TRAFFIC, THE LID SHALL BE FLUSH WITH THE FINAL GROUND ELEVATION.					
1 FITTINGS		c. IN AREAS WITHIN FLOODPLAIN, THE LID SHALL BE TWO (2) FEET ABOVE THE 100-YEAR FLOOD ELEVATION.					
a. ALL PLUGS, CAPS, TEES, REDUCERS AND BENDS, UNLESS OTHERWISE SPECIFIED, SHALL BE PROVIDED WITH SUITABLY RESTRAINED JOINTS, AS SHOWN ON THE PLANS. VALVES ARE CONSIDERED DEAD ENDS AND SHALL BE RESTRAINED AS SUCH.		2 ALL STRUCTURES SHALL BE BEDDED ON A MINIMUM OF SIX (6") INCHES OF COMPACTED AGGREGATE MEETING THE GRADATION OF #8 CRUSHED STONE PER INDIANA DEPARTMENT OF TRANSPORTATION (INDOT) STANDARD SPECIFICATIONS. NO STRUCTURE SHALL BE SET ON SOFT OR YIELDING SOILS. IF YIELDING SOILS ARE ENCOUNTERED, THE AREA SHALL BE EXCAVATED AND FILLED WITH COMPACTED CRUSHED STONE.					
2 DESIGN		3 ALL LIFT HOLES IN PRECAST SECTIONS SHALL BE WETTED AND COMPLETELY FILLED WITH NON-SHRINK GROUT, SMOOTHED AND COATED WITH BITUMINOUS WATERPROOFING MATERIAL TO ENSURE WATER TIGHTNESS.					
a. THE DESIGN PRESSURE IS THE MAXIMUM PRESSURE TO WHICH THE PIPELINE WILL BE SUBJECTED WITH CONSIDERATION GIVEN TO THE VULNERABILITY OF THE PIPE-SOIL SYSTEM WHEN THE PRESSURE IS EXPECTED TO BE APPLIED. IN MOST CASES, THIS WILL BE THE TEST PRESSURE OF THE PIPE, APPLIED SHORTLY AFTER INSTALLATION, WHEN THE PIPE-SOIL SYSTEM IS NORMALLY MOST VULNERABLE.		4 INSTALL EXTERIOR CHIMNEY AND JOINT WRAPS PER MANUFACTURER'S INSTRUCTIONS.					
b. FOR BURIED PIPELINES, THRUST RESTRAIN IS ACHIEVED BY TRANSFERRING THE THRUST FORCE TO THE SOIL STRUCTURE OUTSIDE THE PIPE. THE OBJECTIVE OF THE DESIGN IS TO DISTRIBUTE THE THRUST FORCES TO THE SOIL STRUCTURE IN SUCH A MANNER THAT JOINT SEPARATION WILL NOT OCCUR IN UNRESTRAINED JOINTS.		B. REGRADING					
3 RESTRAINING MECHANISMS FOR PUSH-ON OR MECHANICAL JOINTS: TIE RODS, CLAMPS, OR OTHER		1 RAISE OR LOWER EXISTING MANHOLES AND STRUCTURES FRAMES AND COVERS, CLEANOUT FRAMES AND COVERS AND VALVE BOXES IN REGRADED AREAS TO FINISH GRADE. CAREFULLY REMOVE, CLEAN AND SALVAGE CAST IRON FRAMES AND COVERS. ADJUST THE ELEVATION OF THE TOP OF THE MANHOLE OR STRUCTURE AS DETAILED ON THE DRAWINGS. ADJUST THE ELEVATION OF THE CLEANOUT PIPE RISER, AND REINSTALL THE CAP OR PLUG, RESET CAST IRON FRAM AND COVER, GROUTING BELOW AND AROUND THE FRAME. INSTALL CHIMNEY SEAL AROUND RESET FRAM AND COVER AS SPECIFIED FOR NEW CONSTRUCTION.					
		2 DURING PERIODS WHEN WORK IS PROGRESSING ON ADJUSTING MANHOLES OR STRUCTURES COVER ELEVATIONS, THE CONTRACTOR SHALL INSTALL A TEMPORARY COVER ABOVE THE BENCH OF THE STRUCTURE OR MANHOLE. THE TEMPORARY COVER SHALL BE INSTALLED ABOVE THE HIGH FLOW ELEVATION WITHIN THE STRUCTURE, AND SHALL PREVENT DEBRIS FROM ENTERING THE WASTEWATER STREAM.					
		3 APPURTENANCES					
		A. OIL AND GREASE INTERCEPTOR AND GREASE REMOVAL PIT INSTALLATION					
		1 PIPE AND FITTINGS SHALL BE PVC. PIPING SHALL BE USED INSIDE OF TRAP, BETWEEN TRAP AND BUILDINGS, AND BETWEEN TRAP AND MANHOLE.					
		2 MANWAYS AND ACCESS MANHOLES SHALL BE SET TO FINISH GRADE PROVIDING ADEQUATE ACCESS TO THE UNIT. SLOPE PAVEMENT AROUND THE ACCESS-WAY TO PREVENT STORMWATER FROM ENTERING THE UNIT.					
		B. CLEANOUT INSTALLATION					
		1 INSTALL CLEANOUTS AND RISER EXTENSIONS FROM SEWER PIPES TO CLEANOUTS AT GRADE. CLEANOUTS SHALL MATCH DETAIL. INSTALL PIPING SO CLEANOUTS OPEN IN DIRECTION OF FLOW IN SEWER PIPE.					
		2 SET CLEANOUT FRAMES AND COVERS IN EARTH IN CAST-IN-PLACE-CONCRETE, 18" BY 12" AND ONE (1") INCH ABOVE SURROUNDING GRADE.					



RECOMMENDED FOR APPROVAL		DESIGN ENGINEER		DATE	
DESIGNED: LMY		DRAWN: KDK			
CHECKED: ARM		CHECKED: ARM			

HORIZONTAL SCALE	
AS NOTED	
VERTICAL SCALE	
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SHEETS	
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SPECIFICATIONS