

DESIGN ASSUMPTIONS HEIGHT:
 8' TO 12'; SOIL BEARING VALUE EQUALS 3300 #/FT. (MIN.) HEIGHT:
 OVER 12' TO 25'; SOIL BEARING VALUE EQUALS 3800 #/FT. (MIN.)

SECTION A-A
 LATERAL CONNECTIONS TO MATCH MAINLINE CROWN. CONNECTION AT EX. SHELF HEIGHT UNACCEPTABLE
 KOR-N-SEAL BOOT CONNECTION (TYP.)

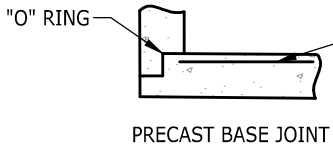
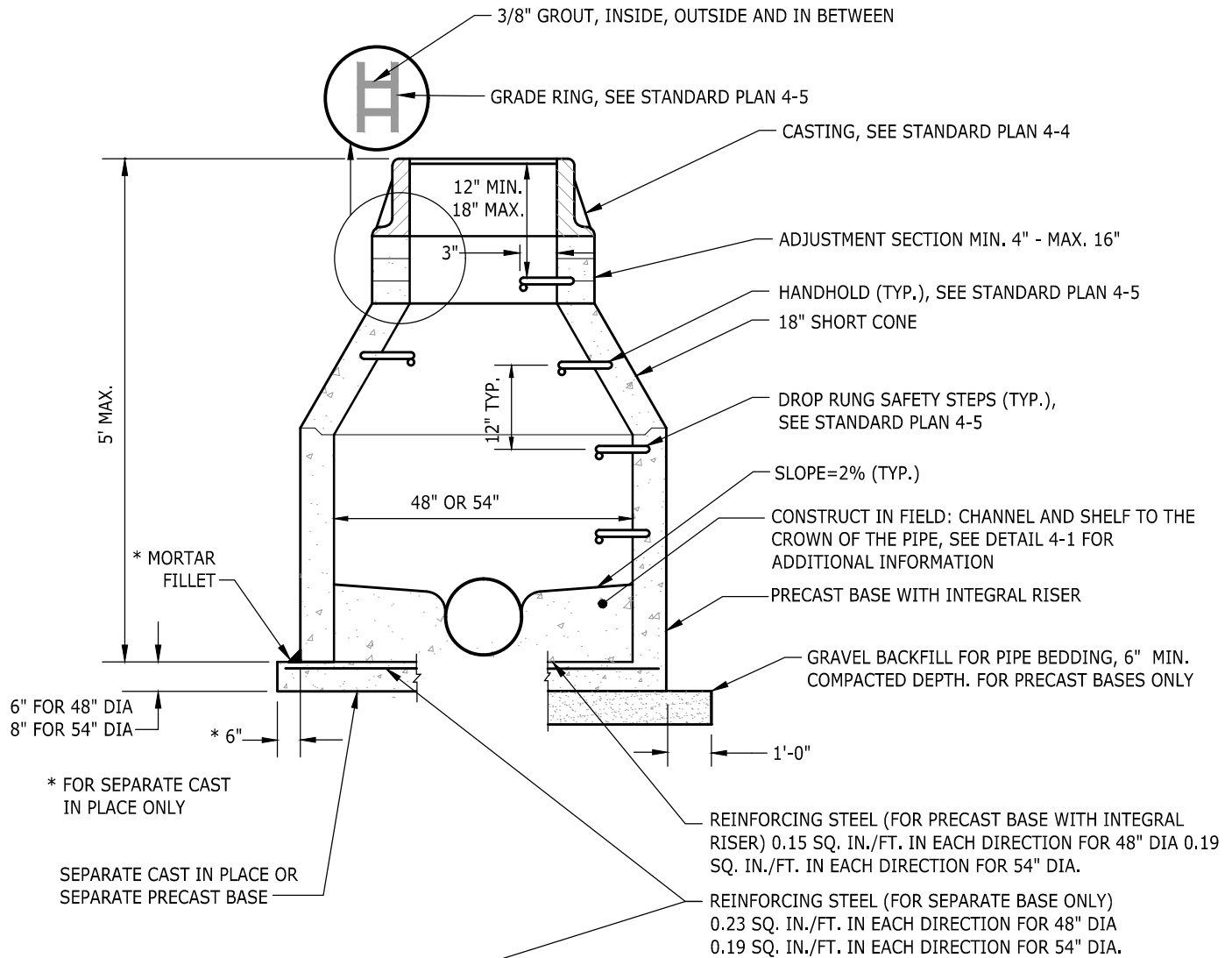
NOTES:

1. MANHOLE REQUIRED WHEN CONNECTION TO MAIN IS 8" DIA. OR GREATER.
2. MANHOLES TO BE CONSTRUCTED IN ACCORDANCE W/ AASHTO M-199 AND (ASTM C 478) UNLESS OTHERWISE SHOWN ON PLANS OR NOTED IN THE WSDOT STD. SPECS.
3. PRECAST BASES SHALL BE FURNISHED WITH CUTOUTS OR KNOCKOUTS. KNOCKOUTS SHALL HAVE A WALL THICKNESS OF 2" MINIMUM.
4. KNOCKOUT OR CUTOUT HOLE SIZE IS EQUAL TO PIPE OUTER DIAMETER PLUS MANHOLE WALL THICKNESS. MAX. HOLE SIZE IS 36" FOR 48" MANHOLE , 42" FOR 54" MANHOLE. MIN. DISTANCE BETWEEN HOLES IS 8".
5. MANHOLE RINGS & COVERS SHALL BE IN ACCORDANCE WITH WSDOT STANDARD SPECIFICATIONS & MEET THE STRENGTH REQUIREMENTS OF FEDERAL SPECIFICATION RR-F-621D. MATING SURFACES SHALL BE FINISHED TO ASSURE NON-ROCKING FIT WITH ANY COVER POSITION.
6. ALL BASE REINFORCING STEEL SHALL HAVE A MIN. YIELD STRENGTH OF 60,000 PSI AND BE PLACED IN THE UPPER HALF OF THE BASE WITH 1" MIN. CLEARANCE.
7. ALL SANITARY SEWER MANHOLES SHALL BE VACUUM TESTED. IN LOCATIONS WITH HIGH WATER TABLES, EXTERIOR COATING AND JOINT SEALANT TAPE WILL BE REQUIRED TO PREVENT HYDRO STATIC WATER INFILTRATION OF MANHOLE.
8. MORTAR 3/8" LINING OUTSIDE, INSIDE, AND IN BETWEEN THE ADJUSTMENT SECTION TO FORM A SMOOTH WATERTIGHT FINISH.
9. GROUT ALL MANHOLE SECTION JOINTS AND PICKHOLES OUTSIDE AND INSIDE TO A SMOOTH FINISH.
10. 400 FT MAXIMUM SPACING OF MANHOLES (TYP).



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		CITY OF KENT ENGINEERING DEPARTMENT	
		SANITARY SEWER MANHOLE TYPE 1 48" & 54"	
DESIGNED: COK	SCALE: NONE	STANDARD PLAN	
DRAWN: COK	DATE: 9/2020	4-1	
CHECKED: COK	ENGINEER		
APPROVED:			



NOTES:

1. FLAT TOPS MUST BE APPROVED BY THE ENGINEER.
2. GROUT ALL MANHOLE SECTION JOINTS AND PICKHOLES OUTSIDE AND INSIDE TO A SMOOTH FINISH.
3. GROUT FILL RING OR BRICK ADJUSTMENTS ON ALL SIDES. THE CASTING IS TO BE SEATED IN GROUT PLACED ON THE RING OR BRICK.
4. MORTAR A 3/8" LINING OUTSIDE AND INSIDE OF THE ADJUSTMENT SECTION TO FORM A SMOOTH WATERTIGHT FINISH.
5. ALL SANITARY SEWER MANHOLES SHALL BE VACUUM TESTED. IN AREAS OR LOCATIONS WHERE HIGH GROUND WATER TABLE EXIST, THE EXTERIOR OF THE MANHOLE SHALL BE COATED AND JOINT SEALANT TAPE USED TO PREVENT HYDROSTATIC WATER INFILTRATION.


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		CITY OF KENT ENGINEERING DEPARTMENT	
		SPECIAL SHALLOW MANHOLE	
DESIGNED <u>COK</u>	SCALE <u>NONE</u>	STANDARD PLAN	
DRAWN <u>COK</u>	DATE <u>12/2019</u>	4-2	
CHECKED <u>COK</u>	ENGINEER		
APPROVED			


NOT
USED

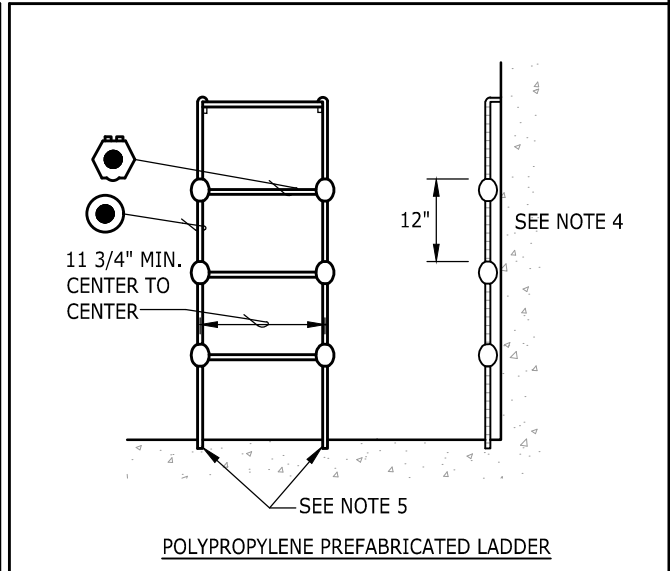
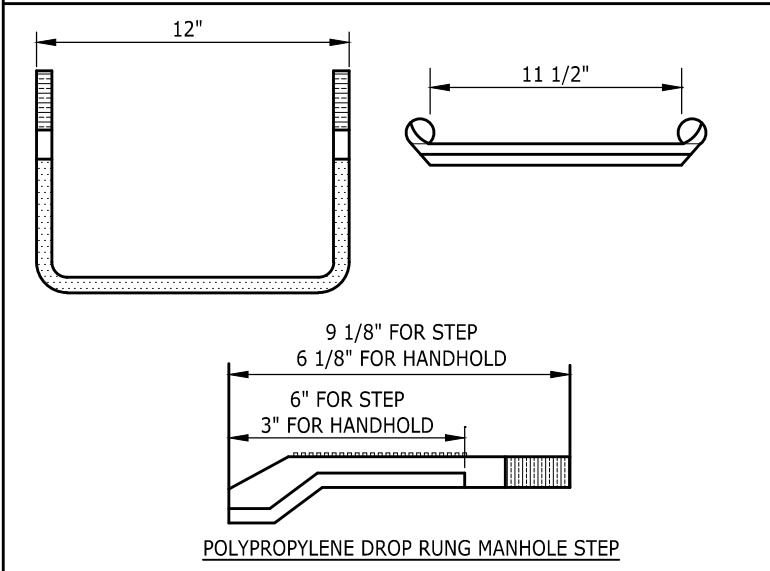
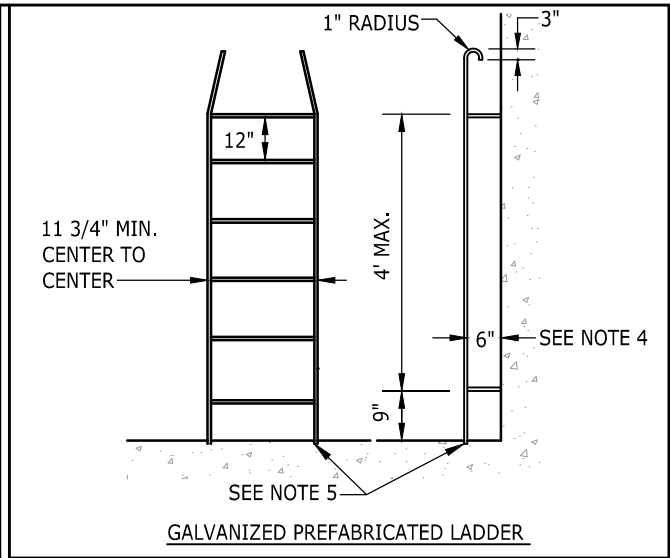
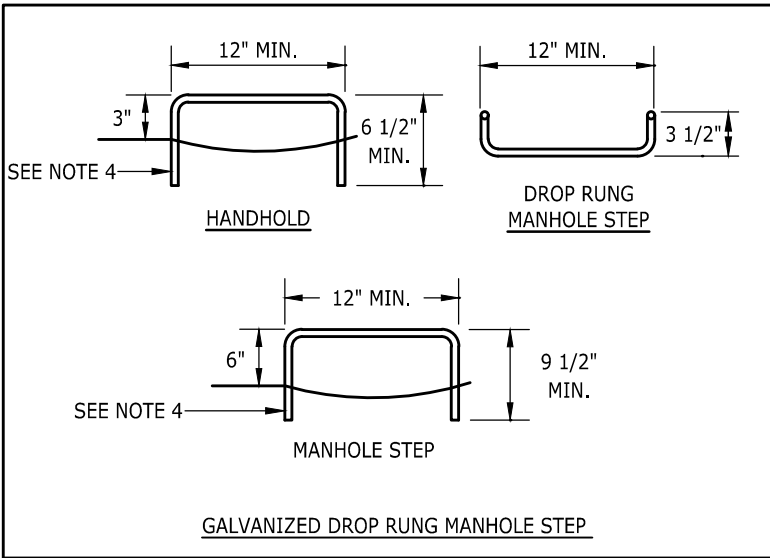
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	CITY OF KENT ENGINEERING DEPARTMENT	
	XXXX XXXX	
DESIGNED _____ COK	SCALE _____ NONE	STANDARD PLAN
DRAWN _____ COK	DATE _____ 12/2019	4-3
CHECKED _____ COK	ENGINEER _____	
APPROVED _____		

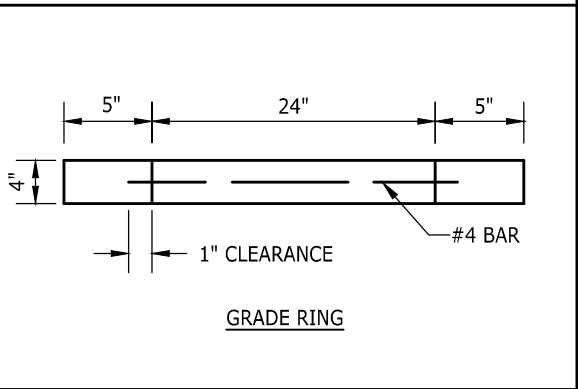
NOT
USED

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	CITY OF KENT ENGINEERING DEPARTMENT	
	XXXX XXXX	
DESIGNED _____ COK	SCALE _____ NONE	STANDARD PLAN
DRAWN _____ COK	DATE _____ 12/2019	4-4
CHECKED _____ COK	ENGINEER _____	
APPROVED _____		



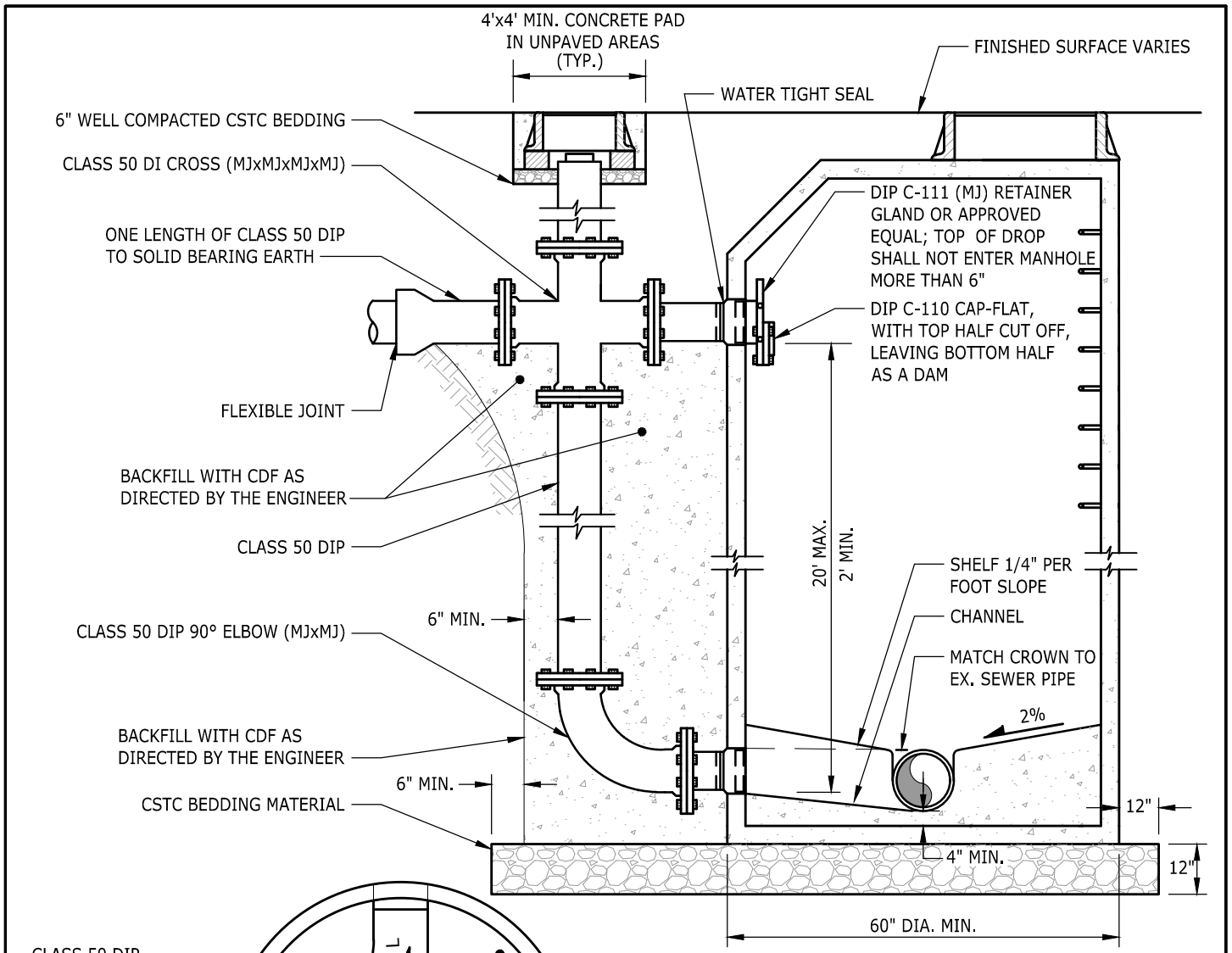
- NOTES:**
1. MANHOLE STEPS CONFORMING TO SECTION R, ASTM C-478. AASHTO M-199 REQUIREMENTS AND REQUIREMENTS OF ASTM D-4101 FOR POLYPROPYLENE AND ASTM A-615 FOR 1/2" GRADE 60 DEFORMED REINFORCING BAR FOR POLYPROPYLENE STEPS, AND ALL WISHA AND OSHA SPECIFICATIONS, ARE ACCEPTABLE PROVIDED THEY ARE PRE-APPROVED BY THE ENGINEER.
 2. PREFABRICATED LADDERS ARE TO BE #7 GALVANIZED SMOOTH STEEL.
 3. MANHOLE PREFABRICATED LADDER STEPS SHALL BE PARALLEL OR APPROXIMATELY RADIAL AT THE OPTION OF THE MANUFACTURER, EXCEPT THAT ALL STEPS IN ANY MANHOLE SHALL BE THE SAME.
 4. PENETRATION OF OUTER WALL BY A STEP LADDER OR LADDER LEG IS PROHIBITED. USE FLANGED END FOR BOLTING TO WALL.
 5. EMBED FOOT OF GALVANIZED PREFABRICATED LADDER IN CONCRETE IN POURED OR CHanneled FLOOR.
 6. MANHOLE STEPS OR LADDERS ARE NOT REQUIRED WHEN THE COVER TO BOTTOM OF MANHOLE IS LESS THAN 4'.



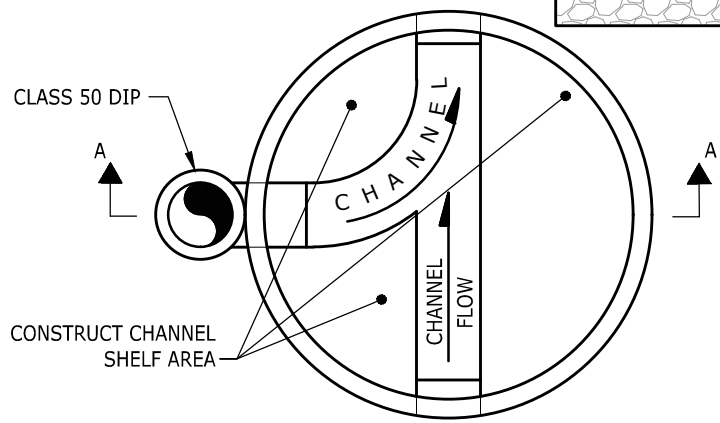
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		CITY OF KENT ENGINEERING DEPARTMENT	
		MANHOLE GRADE RING, SAFETY STEPS & LADDER	
DESIGNED: COK	SCALE: NONE	STANDARD PLAN	
DRAWN: COK	DATE: 12/2019	4-5	
CHECKED: COK	ENGINEER		
APPROVED:			



ELEVATION SECTION A-A




CHANNEL PLAN VIEW

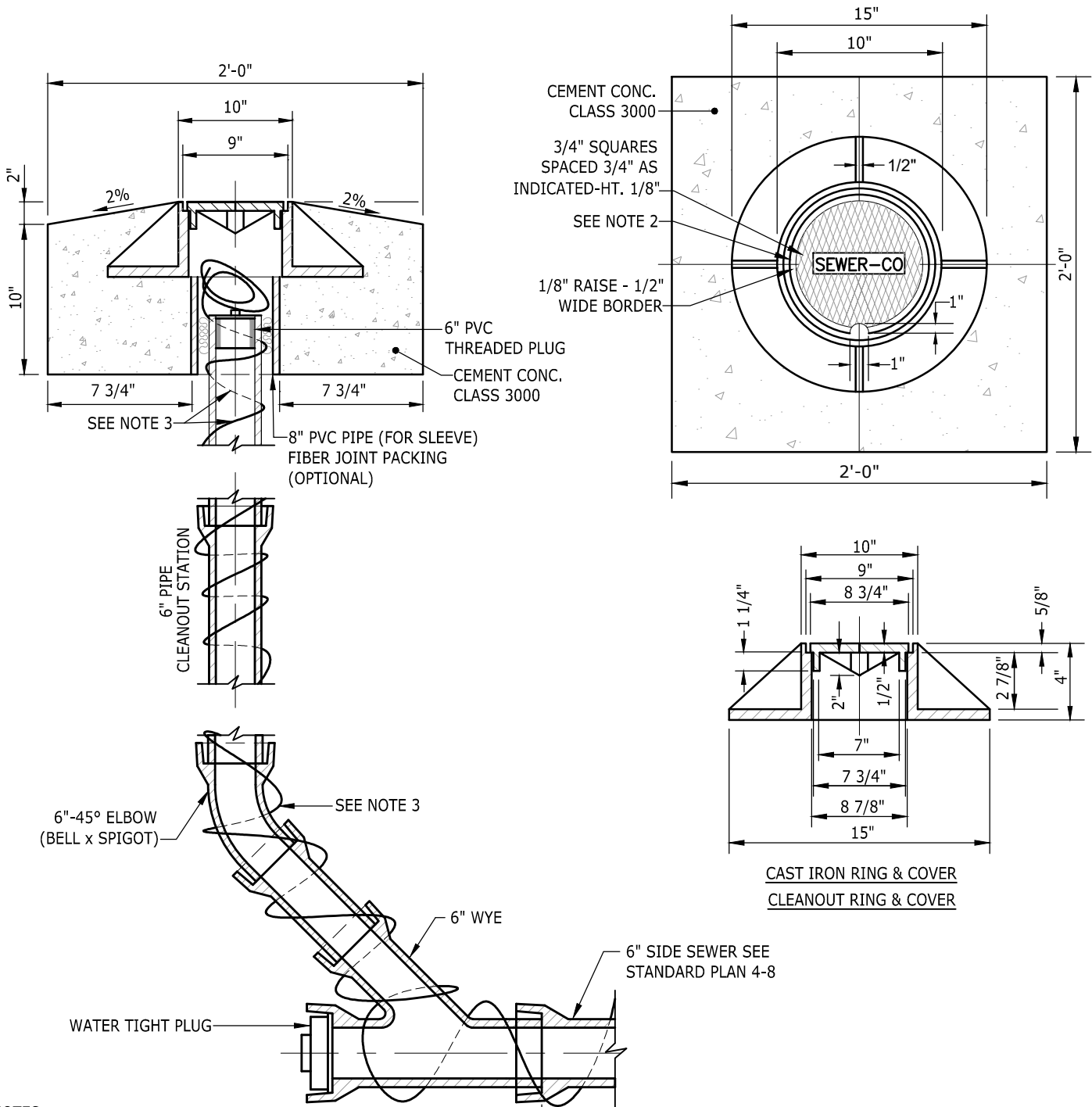
NOTES:

1. OUTSIDE DROPS MUST BE CONSTRUCTED WITH DUCTILE IRON AS SHOWN; CONCRETE ENCASED PVC IS NOT ACCEPTABLE.
2. USE RESTRAINED FITTINGS AT ALL DROP CONNECTION POINTS.
3. SNUG RETAINER GLAND AS CLOSE TO MANHOLE FACE AS PRACTICAL.
4. IF DROP HEIGHT IS LESS THAN 2', A DROP CONNECTION IS NOT ALLOWED.

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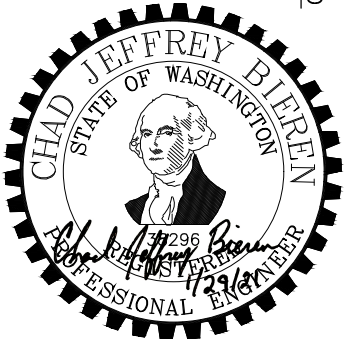


		CITY OF KENT ENGINEERING DEPARTMENT	
		DUCTILE IRON DROP CONNECTION	
DESIGNED <u>COK</u>	SCALE <u>NONE</u>	STANDARD PLAN	
DRAWN <u>COK</u>	DATE <u>12/2019</u>	4-6	
CHECKED <u>COK</u>	ENGINEER		
APPROVED _____			



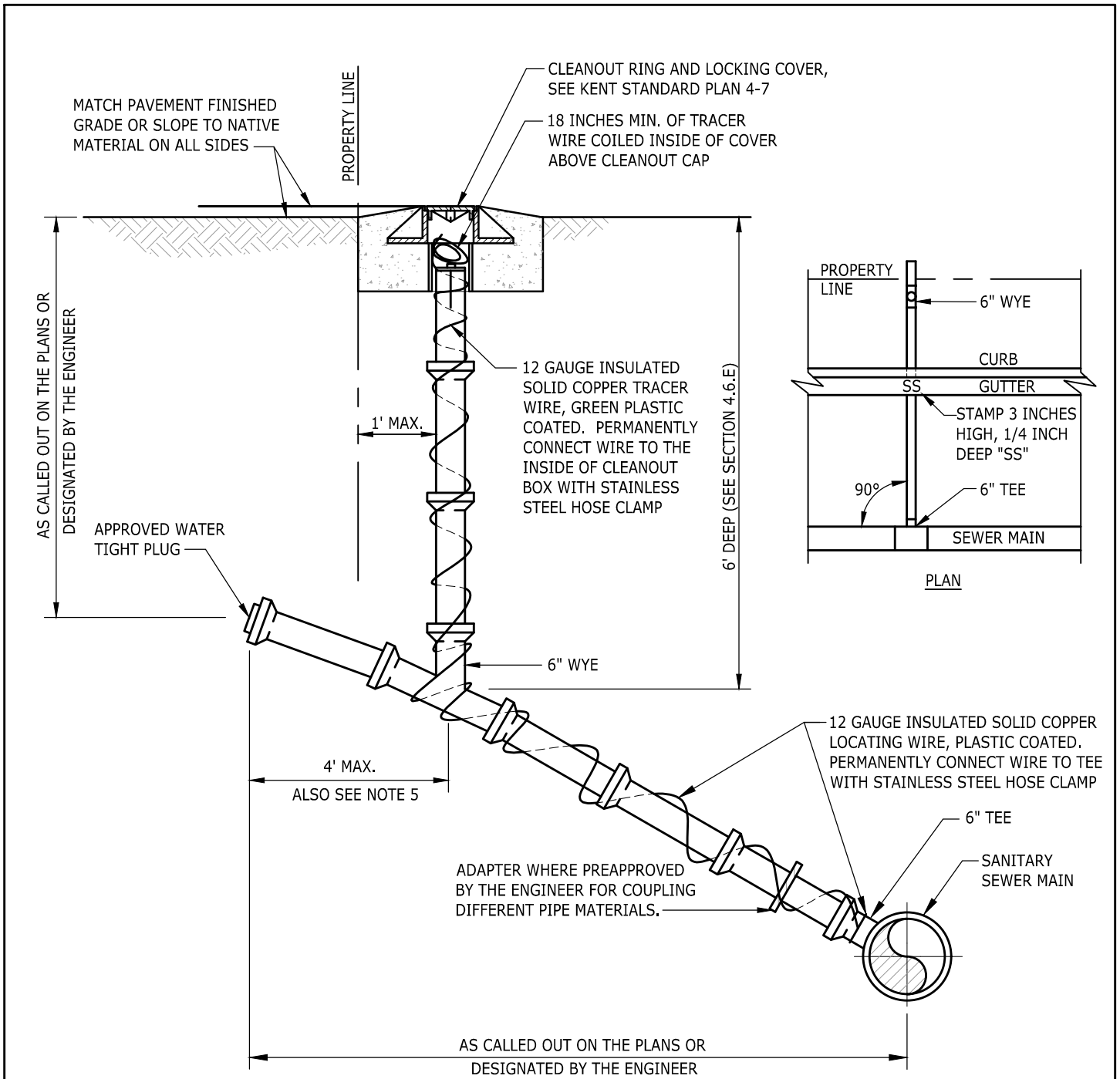
NOTES:

1. CAST IRON TO CONFORM TO A.S.T.M. A48-56 CLASS 30.
2. COVER SHALL BE OLYMPIC FOUNDRY M1007 OR EQUIVALENT MARKED "SEWER-CO" OR "CO".
3. TRACER WIRE = 12 GAUGE INSULATED SOLID COPPER WIRE, GREEN PLASTIC COATED. BARE END OF WIRE PERMANENTLY CONNECTED TO TEE AT MAIN WITH A SS HOSE CLAMP. WRAP SIDE SEWER AND INSTALL WIRE WITHIN CLEANOUT COVER, COIL ENOUGH LENGTH TO BRING ABOVE GRADE 18 INCHES FOR LOCATE PURPOSES.



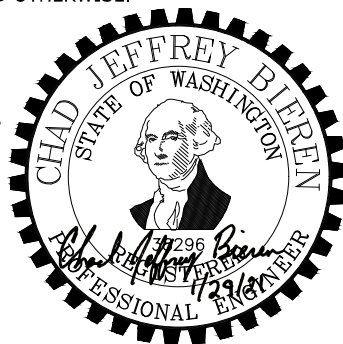
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		CITY OF KENT ENGINEERING DEPARTMENT	
		6" CLEANOUT	
DESIGNED	COK	SCALE	NONE
DRAWN	COK	DATE	12/2019
CHECKED	COK	ENGINEER	
APPROVED		4-7	



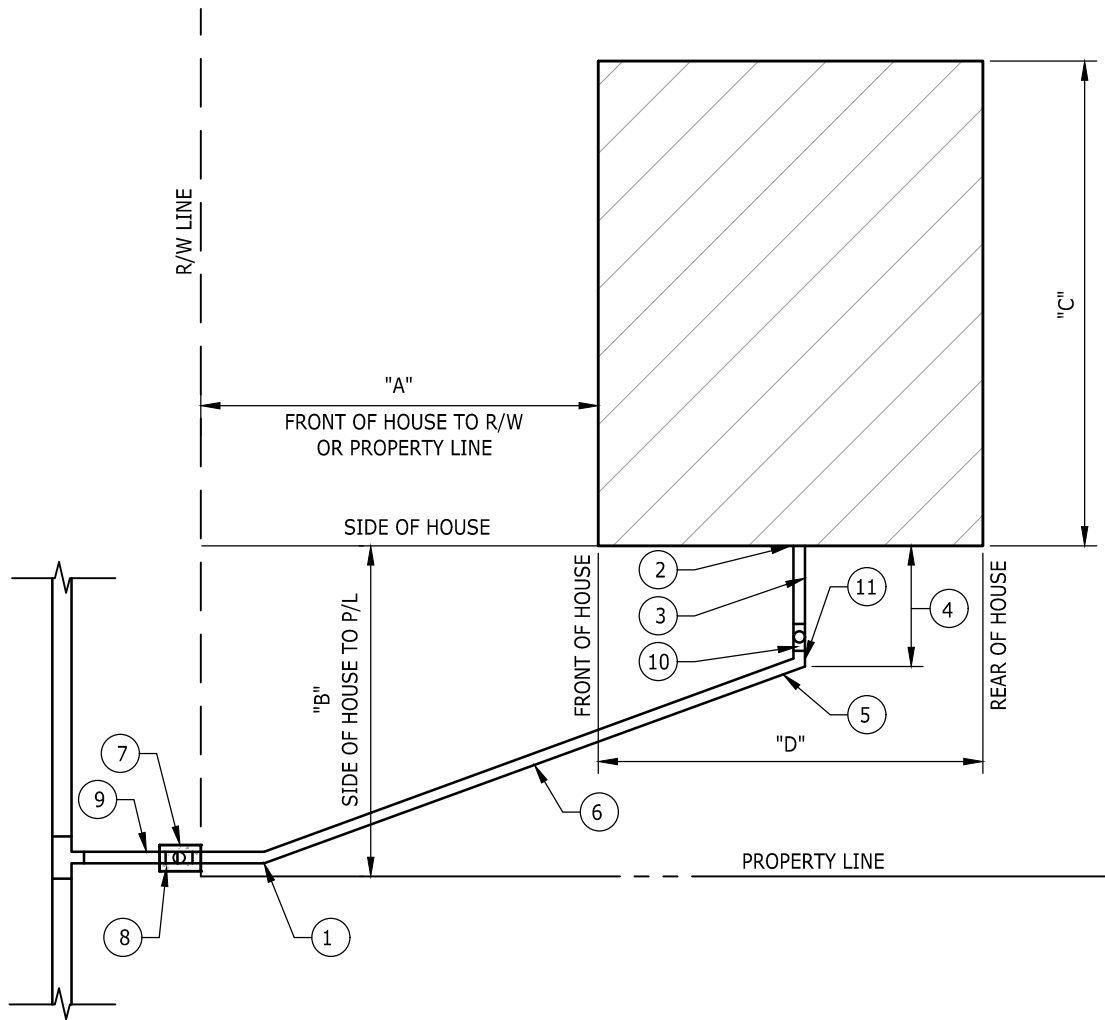
NOTES:

1. JOINT DEFLECTION SHALL NOT BE GREATER THAN RECOMMENDED BY THE PIPE MANUFACTURER AND APPROVED BY THE ENGINEER.
2. MINIMUM SLOPE SHALL BE 1%. MAX. PERMISSIBLE SLOPE SHALL BE 2 HORIZ. TO 1 VERT. UNLESS SPECIFIED OTHERWISE.
3. PIPE SHALL BE PVC, CAST IRON, OR DUCTILE IRON CLASS 50, MIN. SIZE 6". SIZE AND MATERIAL SHALL BE AS SPECIFIED ON THE PLANS OR APPROVED BY THE ENGINEER.
4. 5' MINIMUM SEPARATION BETWEEN SEWER MAIN TAPS.
5. STUBS SHALL EXTEND 2' BEYOND ANY DRY UTILITY EASEMENTS.



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		CITY OF KENT ENGINEERING DEPARTMENT	
		SIDE SEWER STUB CONNECTION	
DESIGNED	COK	SCALE	NONE
DRAWN	COK	DATE	12/2019
CHECKED	COK	ENGINEER	
APPROVED		4-8	



NOTES:


1. 45°-90° BEND
2. CONNECTION TO BUILDING SEWER
3. RUBBER COUPLING REQUIRED TO PIPE AT HOUSE
4. 3' MIN., 5' MAX. DISTANCE FROM HOUSE
5. 24" MIN. COVER
6. 4" DIA. SIDE SEWER TO HOUSE
7. 6" X 4" REDUCER
8. CLEANOUT (SEE STANDARD PLANS 4-7 AND 4-8)
9. 6" DIA. SIDE SEWER STUB TO PROPERTY LINE (SEE STANDARD PLAN 4-8)
10. BEND, WYE AND CLEANOUT
11. CLEANOUT BELOW GRADE. 1' MAX.

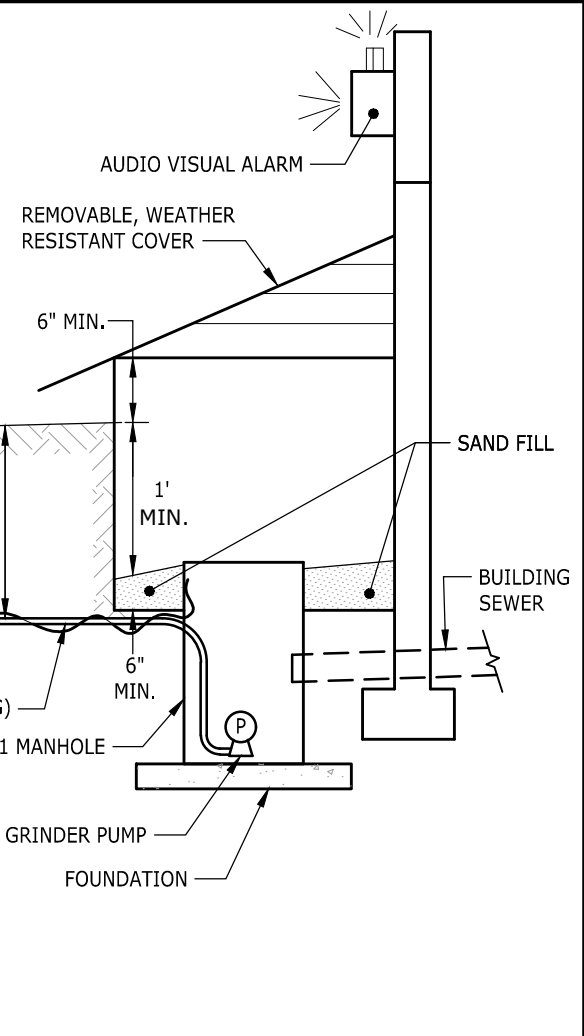
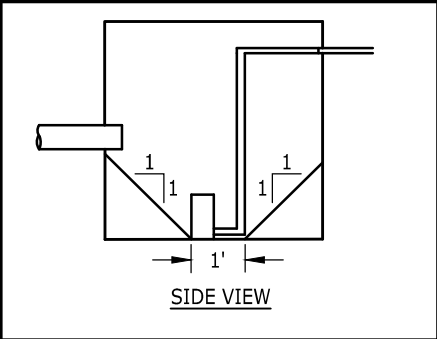
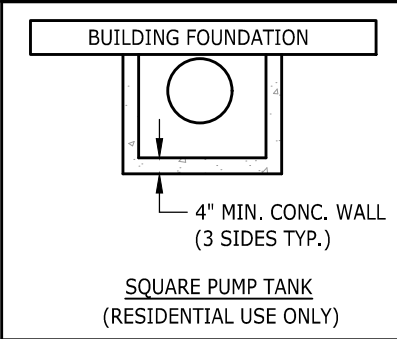
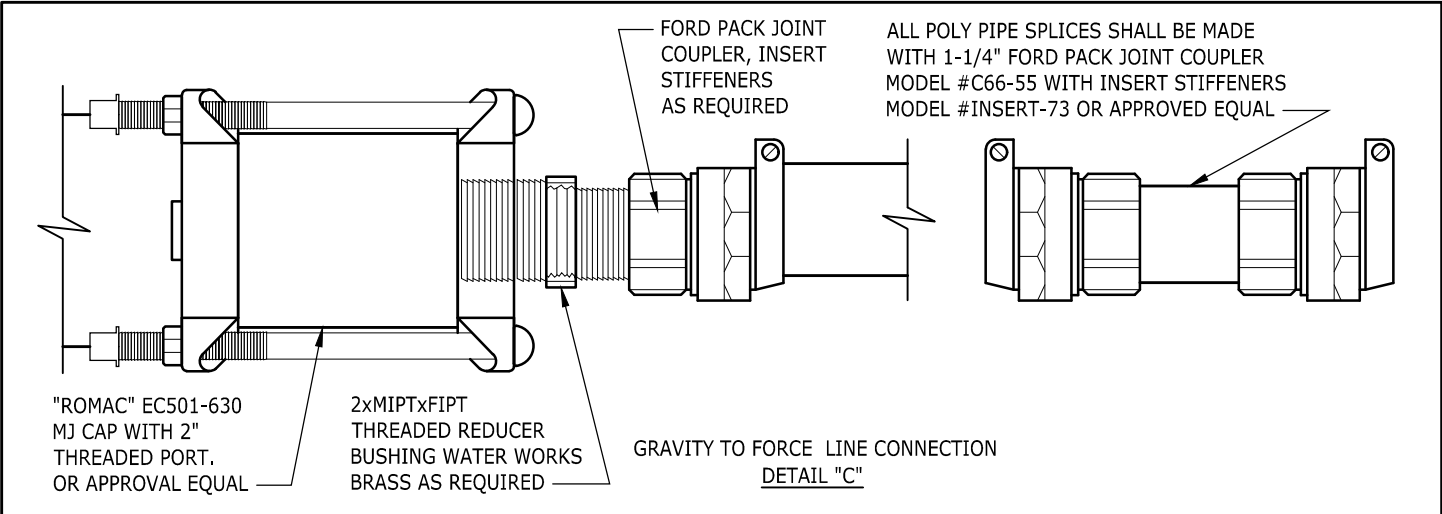
SIDE SEWER PIPE

1. 4" (MIN. SIZE) SEWER PIPE REQUIRED ON PROPERTY.
2. 2% MIN. GRADE (1/4" FALL PER FT) FOR 4" PIPE 100% MAX. GRADE (12" PER FT).
3. JOINTS MUST BE MADE WITH RUBBER TYPE GASKET APPROVED BY THE ENGINEER.
4. CONSTRUCTION ON PRIVATE PROPERTY MAY BE DONE BY OWNER BUT REQUIRES A PERMIT.

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	CITY OF KENT ENGINEERING DEPARTMENT	
	RESIDENTIAL SIDE SEWER CONNECTION	
DESIGNED <u>COK</u>	SCALE <u>NONE</u>	STANDARD PLAN
DRAWN <u>COK</u>	DATE <u>12/2019</u>	4-9
CHECKED <u>COK</u>	ENGINEER	
APPROVED _____		



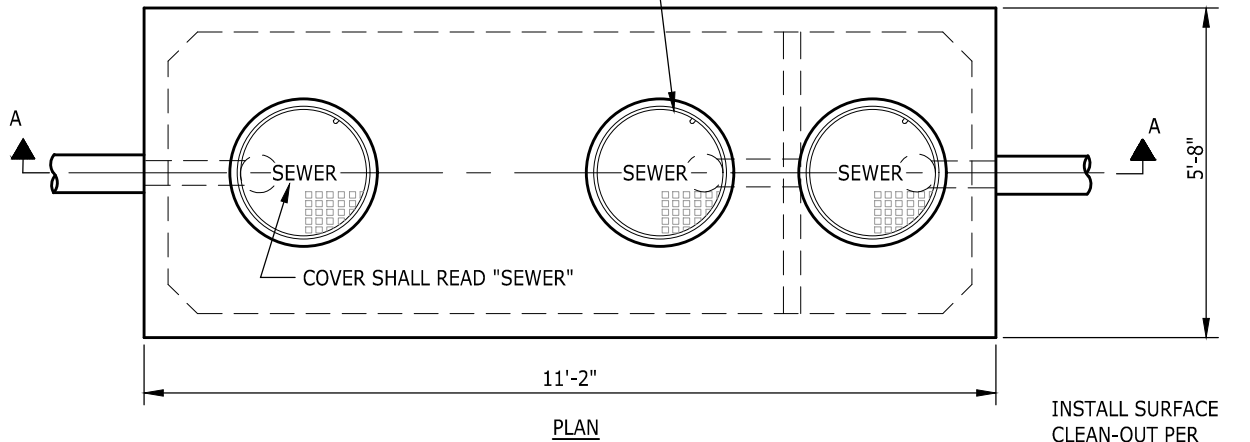
- NOTES:**
1. ALL ELECTRICAL SHALL MEET WASHINGTON STATE ELECTRIC CODES.
 2. GRINDER PUMP AND TANK SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
 3. TYPE 1 MANHOLES SHALL BE FOR COMMERCIAL USE ONLY. SEE STANDARD PLANS 4-1 AND 4-2. THE BASE OF THE MANHOLE SHALL BE SLOPED AS SHOWN IN THE "SIDE VIEW" ABOVE.
 4. CLEAN OUT SHALL BE INSTALLED PER STANDARD PLANS 4-7 AND 4-8.
 5. FOUNDATION AND WALLS SHALL BE DESIGNED FOR SITE CONDITIONS.
 6. SEE SECTION 4.8.C OF THE CITY OF KENT DEVELOPMENT STANDARDS FOR PRESSURE TEST REQUIREMENTS.
 7. STRUCTURE MAY NOT BE ALLOWED WITHIN BSBL. RECOMMEND NOT USED IN 100 YR FLOOD PLAIN.



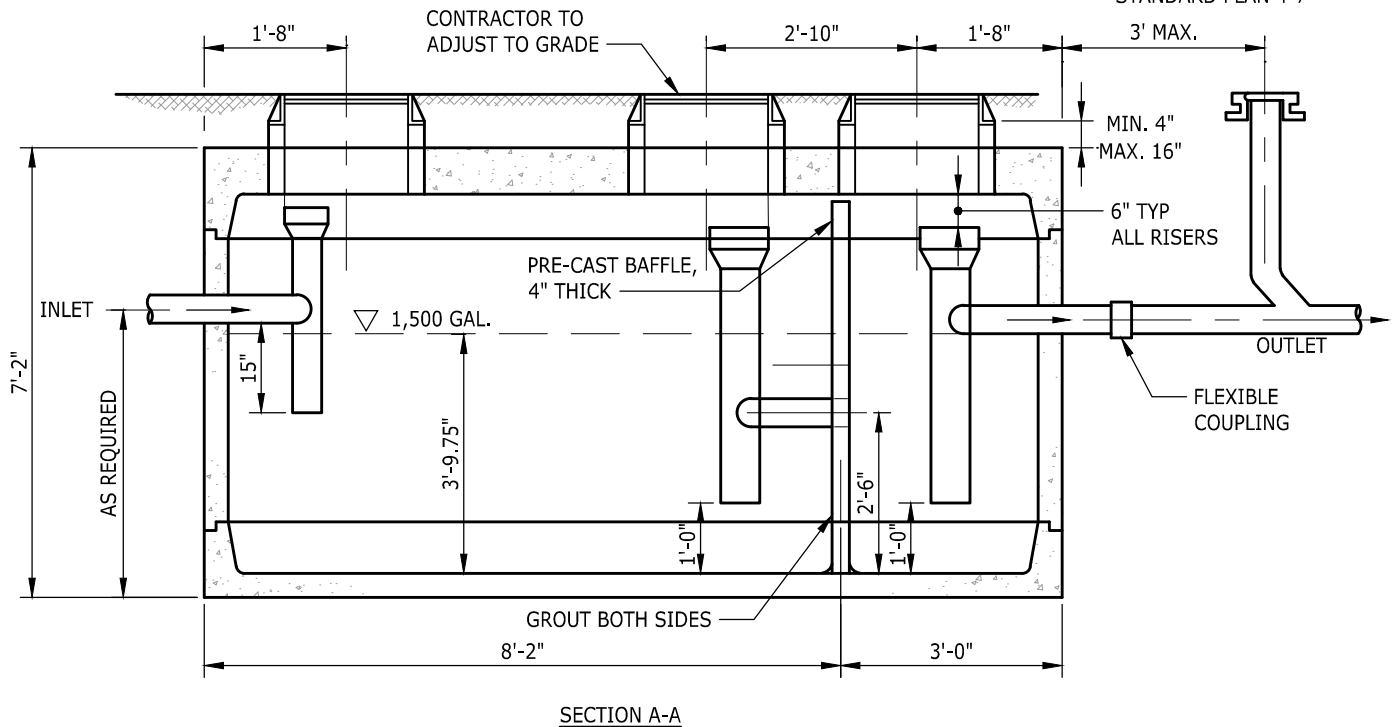
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		CITY OF KENT ENGINEERING DEPARTMENT	
		LOW PRESSURE GRINDER PUMP	
DESIGNED	COK	SCALE	NONE
DRAWN	COK	DATE	9/2020
CHECKED	COK	ENGINEER	
APPROVED		4-10	

24" DIA. LOCKING FRAME AND COVER AIR AND GAS TIGHT-3 PLACES-
(LOCATE AS SHOWN, ON CENTERLINE) SEE STANDARD PLAN 4-4



INSTALL SURFACE
CLEAN-OUT PER
STANDARD PLAN 4-7




NOTES:

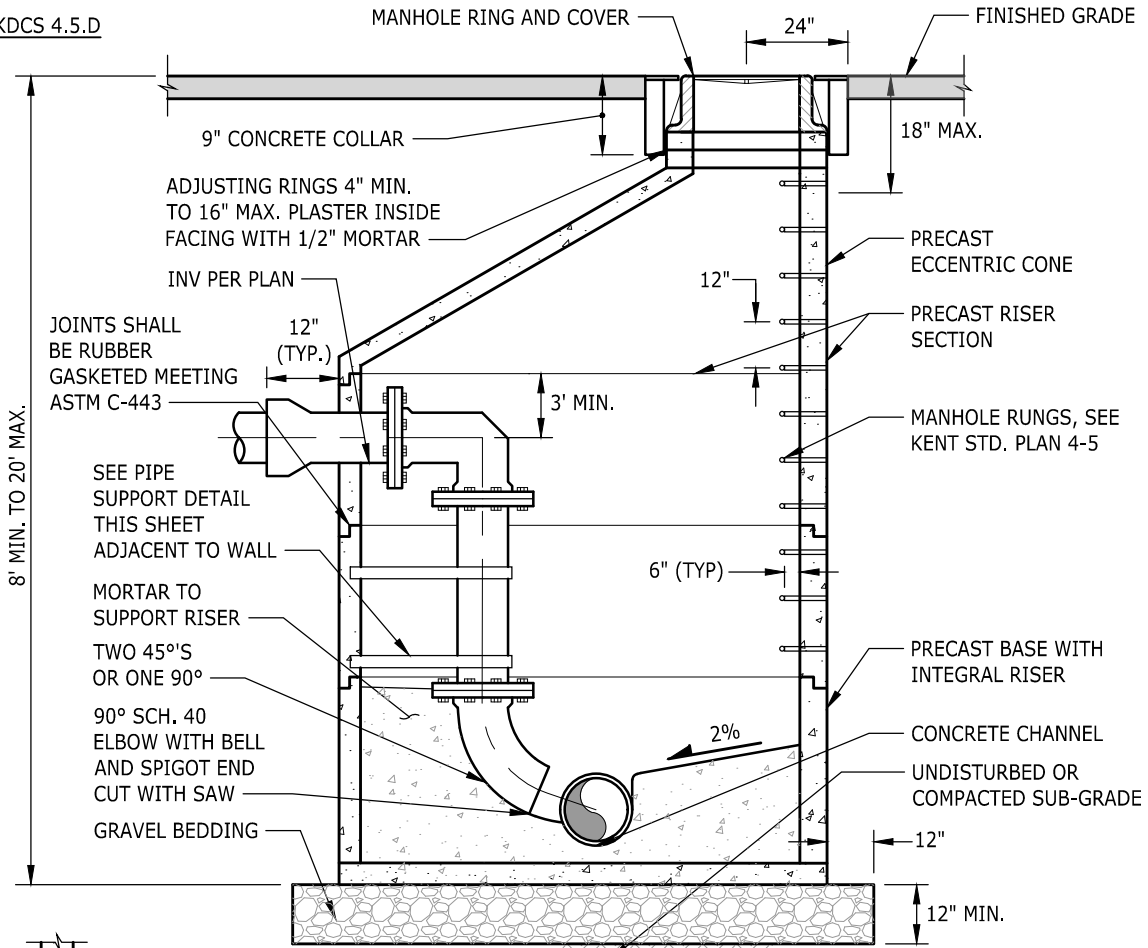
1. LOCATE STRUCTURE ADJACENT TO DRIVE AND FOR ACCESS BY MAINTENANCE VEHICLE.
2. FILL WITH CLEAN WATER PRIOR TO START UP OF SYSTEM.
3. INTERCEPTOR TO BE MAINTAINED BY OWNER AND ANNUAL MAINTENANCE REPORT WILL BE REQUIRED.
4. UTILITY VAULT CO., INC. MODEL NO. 5106 GA OR EQUAL.
5. CONNECTIONS TO CONCRETE WALLS WITH PVC PIPE REQUIRES KOR-N-SEAL CONNECTOR OR A.C. X PVC BAND ADAPTER OR APPROVED EQUAL. SEAL ALL PIPE CONNECTIONS WITH NON-SHRINK GROUT.
6. 6" PVC SHALL BE USED THROUGHOUT. PIPE MATERIAL SHALL BE PER STANDARDS. TOP OF "TEES" TO BE KEPT OPEN.
7. GRAY WATER ONLY. BLACK WATER SHALL BE CARRIED BY SEPARATE SIDE SEWER.
8. ANY CHANGES REQUIRE PRIOR APPROVAL BY THE ENGINEER



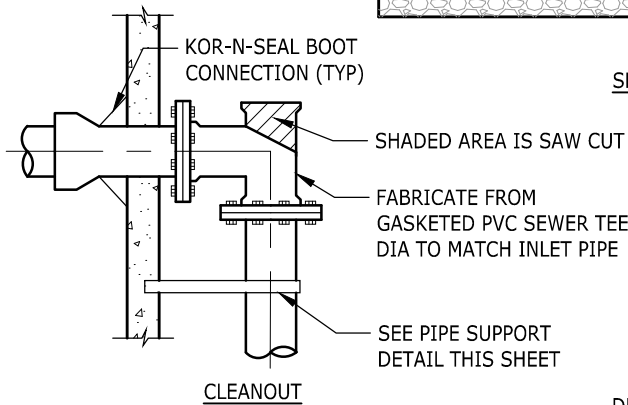
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		CITY OF KENT ENGINEERING DEPARTMENT	
		1,500 GALLON GREASE INTERCEPTOR	
DESIGNED	COK	SCALE	NONE
DRAWN	COK	DATE	12/2019
CHECKED	COK	ENGINEER	
APPROVED		4-11	

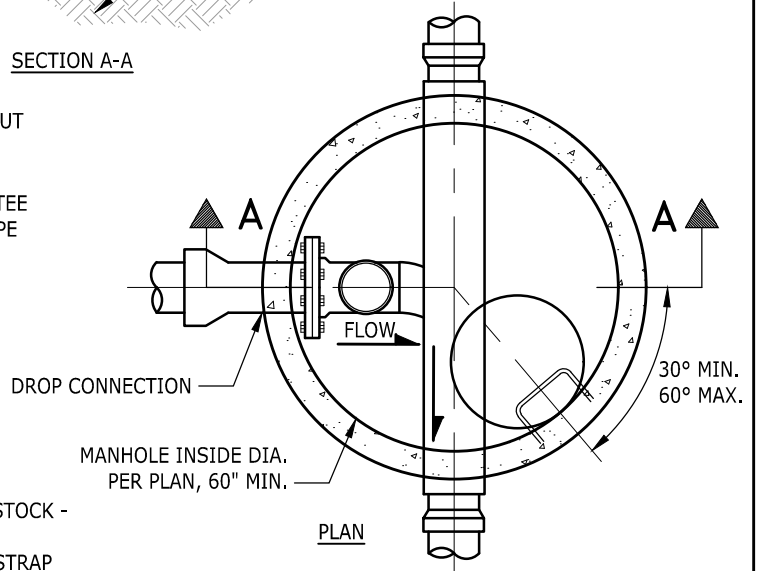
NOTE: SEE KDCS 4.5.D



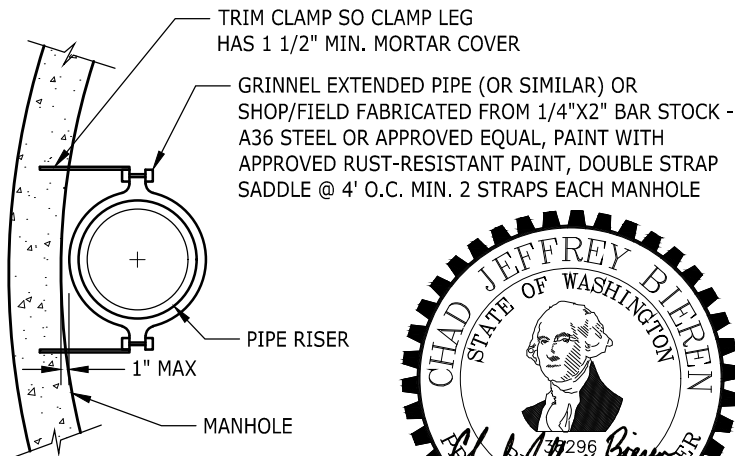
SECTION A-A



CLEANOUT



PLAN



PIPE SUPPORT DETAIL

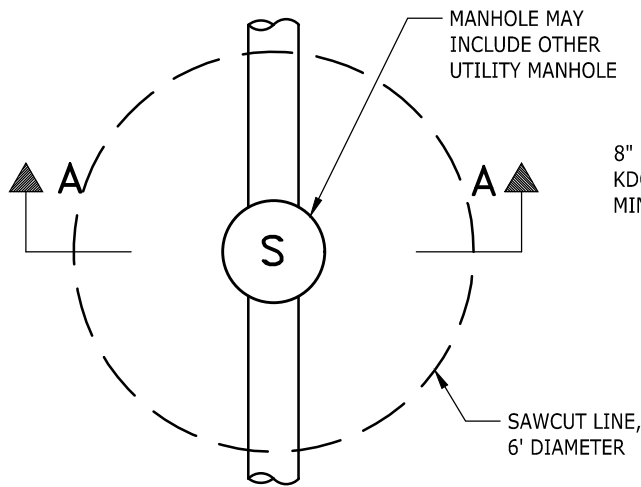
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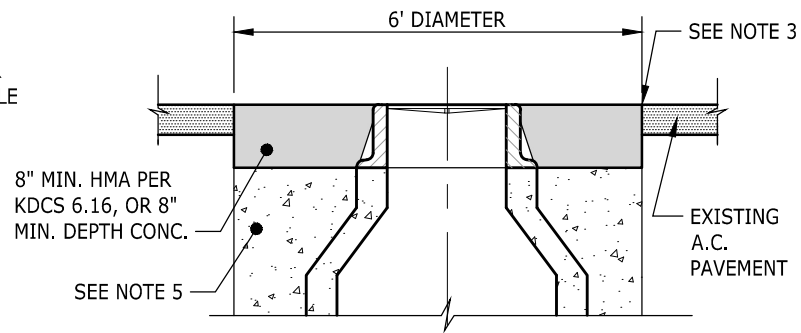
CITY OF KENT
ENGINEERING DEPARTMENT

INSIDE DROP SANITARY SEWER MANHOLE

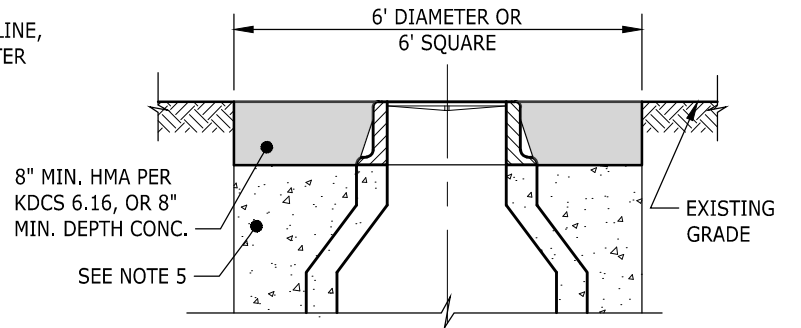
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DRAWN	COK	DATE	9/2020	4-12
CHECKED	COK	ENGINEER		
APPROVED				



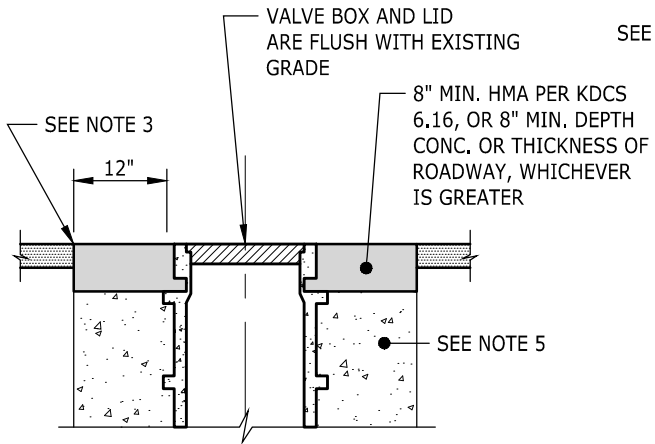
TYPICAL PLAN VIEW OF MANHOLE (OR CB) IN ASPHALT AREA



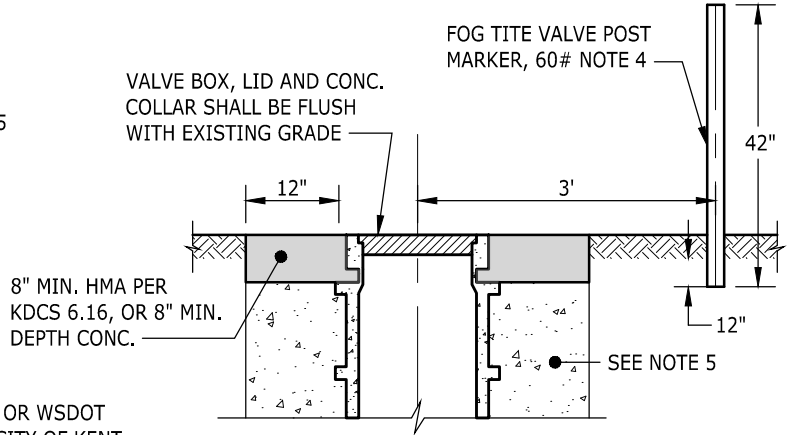
SECTION A-A



MANHOLE OR CATCH BASIN IN UNIMPROVED AREA



VALVE BOX IN ASPHALT AREA

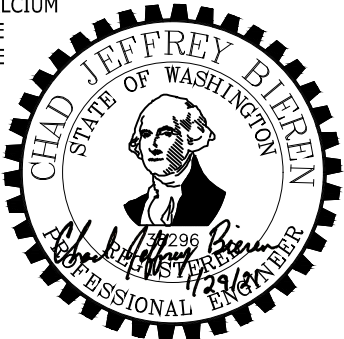


VALVE BOX IN UNIMPROVED AREA

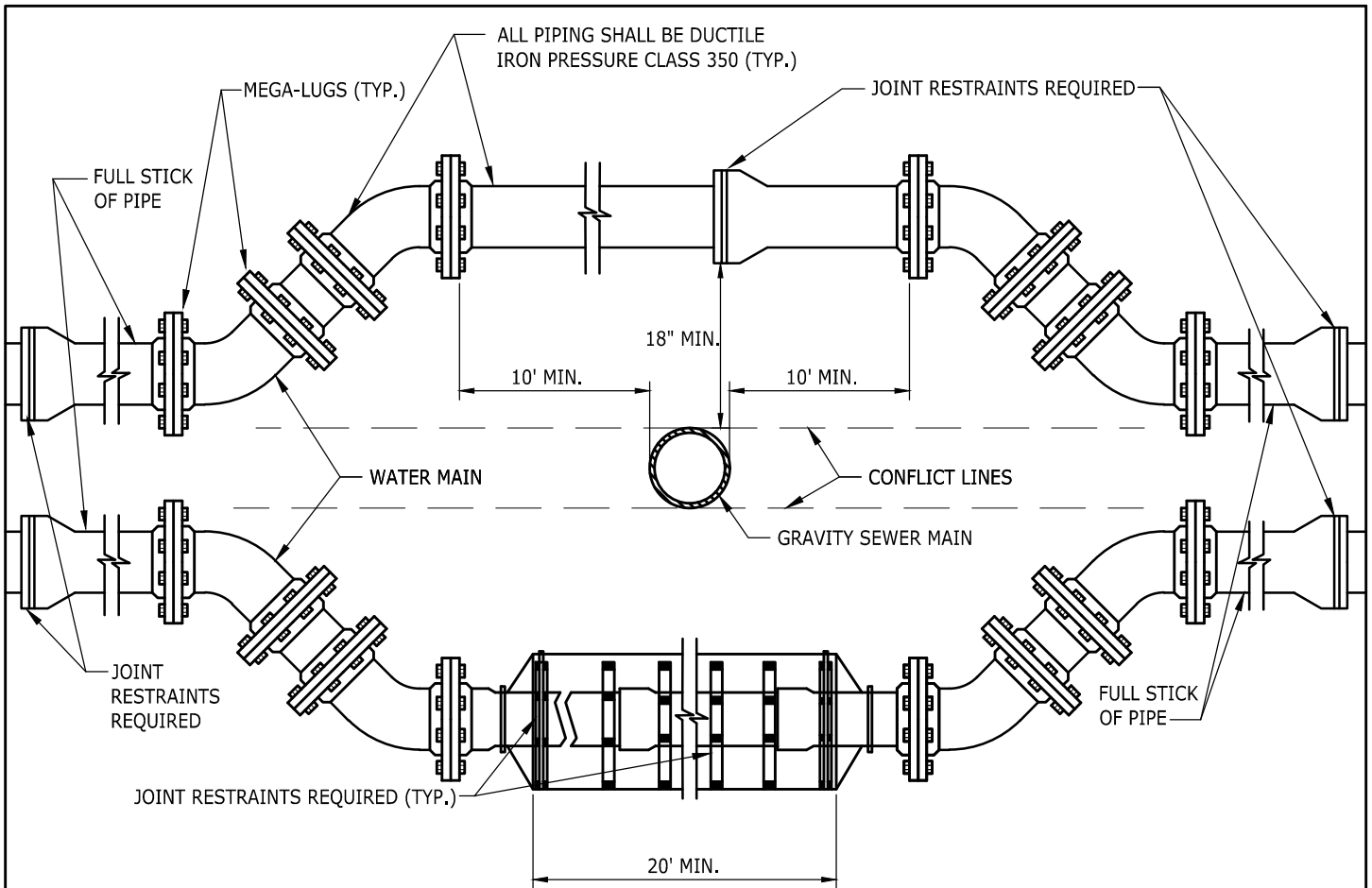
NOTES:

1. ADJUSTMENT OF UTILITY STRUCTURES SHALL BE PER KENT OR WSDOT SPECIAL PROVISION SECTION 7-05.3(1), AS DIRECTED BY CITY OF KENT.
2. ALL ADJUSTMENTS SHALL BE COMPLETED AFTER FINISHED PAVING.
3. SURFACE SEAL AT MATCHLINE SHALL BE AR-4000.
4. VALVE IN UNIMPROVED AREAS SHALL HAVE A MARKER.
5. FILL ANY VOIDS OR DISTURBED AREAS BELOW CASTING WITH QUICK SETTING CEMENT CONCRETE. NO CALCIUM ACCELERANT PERMITTED. CONCRETE SHALL EXTEND A MIN. OF 2" ABOVE CASTING FLANGE.

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KENT WASHINGTON		
CITY OF KENT ENGINEERING DEPARTMENT		
ADJUSTMENT OF NEW AND EXISTING UTILITY STRUCTURES TO FINISH GRADE		
DESIGNED <u>COK</u>	SCALE <u>NONE</u>	STANDARD PLAN
DRAWN <u>COK</u>	DATE <u>12/2019</u>	4-13
CHECKED <u>COK</u>	ENGINEER	
APPROVED _____		



NOTES:

1. THE ENTIRE RUN SHALL BE DUCTILE IRON AND RESTRAINED.
2. FOR CASING REQUIREMENTS SEE DETAIL 3-25.
3. A FULL LENGTH OF PIPE SHALL BE INSTALLED AT BOTH BEGINNING AND END OF THE DEFLECTED RUNS. SEE ABOVE DETAIL.
4. THE FIRST BELL END JOINT AFTER THE DEFLECTED RUNS SHALL BE RESTRAINED.
5. WHEN THE WATER MAIN IS REQUIRED TO BE INSTALLED OVER THE SEWER MAIN (DEFLECTED) AND DOES NOT MEET THE 18" SEPARATION A CASING SHALL BE INSTALLED USING THIS EXAMPLE SHOWN ABOVE.
6. THE MINIMUM DEPTH OF THE WATER MAIN SHALL BE 3.5' BUT WHEN DEFLECTING THE WATER MAIN OVER THE SEWER MAIN USING A CASING, THE SEPARATION BETWEEN THE BOTTOM OF THE CASING AND TOP OF THE SEWER MAIN MAY BE 6". FILL SEPARATION WITH FOUNDATION MATERIAL CLASS A OR B PER WSDOT STD. SPEC. 9-03.17, OR AS REQUIRED BY THE ENGINEER.
7. WHEN DEFLECTING THE WATER MAIN OVER THE SEWER MAIN WITHOUT A CASING THE MINIMUM DEPTH OF THE DEFLECTED WATER MAIN MAY BE 3'. THE MINIMUM SEPARATION BETWEEN THE BOTTOM OF THE WATER MAIN AND TOP OF THE SEWER MAIN SHALL BE 18".
8. AT NO TIME SHALL A PRESSURE SEWER MAIN BE INSTALLED OVER THE WATER MAIN OR SERVICE.



NOTE: THIS PLAN IS NOT A LEGAL ENGINEERING DOCUMENT BUT AN ELECTRONIC DUPLICATE. THE ORIGINAL, SIGNED BY THE ENGINEER AND APPROVED FOR PUBLICATION IS KEPT ON FILE AT THE CITY OF KENT. A COPY MAY BE OBTAINED UPON REQUEST.

		CITY OF KENT ENGINEERING DEPARTMENT	
		DEFLECTED WATER MAIN INSTALLATION FOR GRAVITY SEWER ONLY	
DESIGNED	COK	SCALE	NONE
DRAWN	COK	DATE	9/2020
CHECKED	COK	ENGINEER	
APPROVED			
			STANDARD PLAN
			4-14