


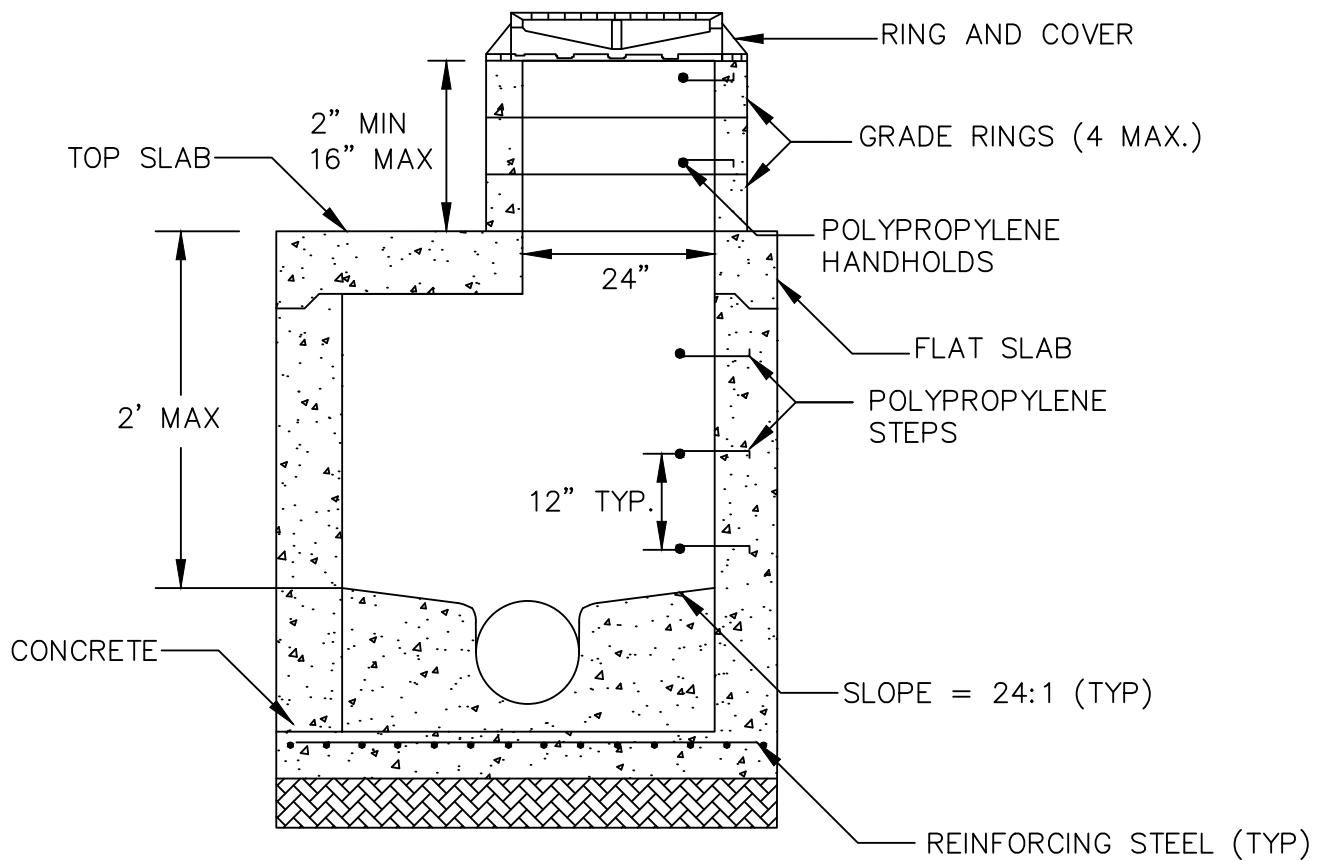
GENERAL NOTES:

THIS DETAIL OUTLINES THE CITY OF CASTLE ROCK MODIFICATIONS TO THE WSDOT TYPE 1 48 INCH, 54 INCH, AND 60 INCH MANHOLE.

NOTES:

1. PRECAST MANHOLES SHALL MEET THE REQUIREMENTS OF ASTM C478. JOINTS SHALL BE RUBBER GASKETED, CONFORMING TO ASTM C443 AND SHALL BE GROUTED FROM THE INSIDE. LIFT HOLES SHALL BE GROUTED FROM THE OUTSIDE AND THE INSIDE OF THE MANHOLE.
2. THE FIRST STEP OR HANDHOLD SHALL BE A MAXIMUM OF 12" FROM THE TOP OF THE COVER.
3. CONNECTION TO THE MANHOLE SHALL BE MADE BY KOR-N-SEAL FITTING ONLY. KOR-N-SEAL SHALL BE INSTALLED ACCORDING TO MANUFACTURER'S SPECIFICATIONS. KNOCKOUTS WILL NOT BE ALLOWED.
4. SEE STANDARD PLAN CR003SS FOR MANHOLE COLLAR INSTALLATION.
5. A "SEWER GUARD" SHALL BE INSTALLED IN ANY MANHOLE SUBJECT TO FLOODING, PER CITY DIRECTION.

CITY OF CASTLE ROCK			
TYPE 1 MANHOLE			
APPROVED: 			DWG. NO. CR001SS
BY CITY _____			
DATE: 07-20-20			DATE
DATE: 11/19	DRWN: W.M.	CHKD: T.E.G.	SCALE: NONE



GENERAL NOTES:

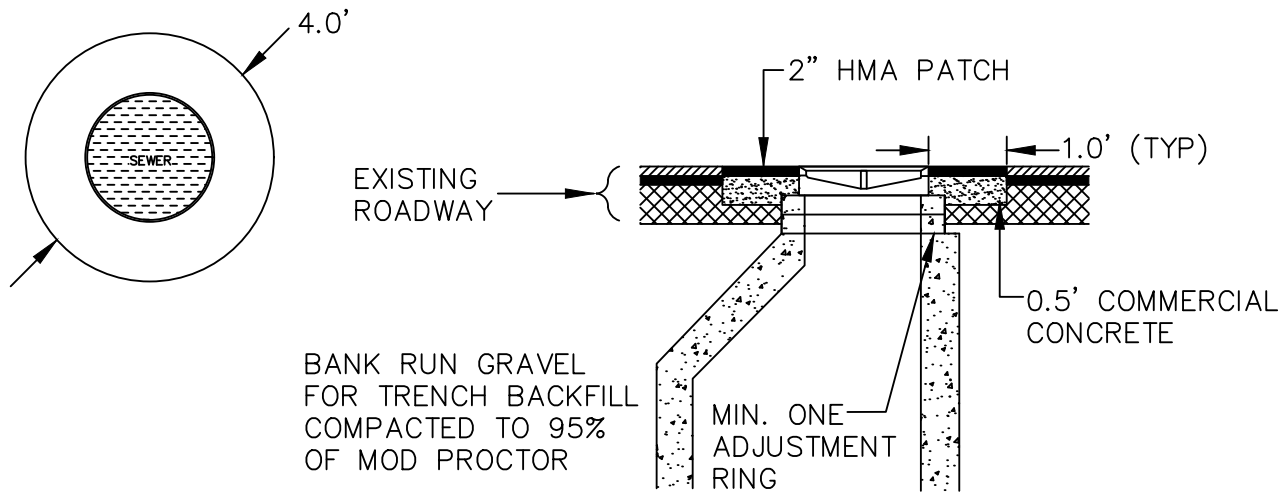
THIS DETAIL OUTLINES THE CITY OF CASTLE ROCK MODIFICATIONS TO THE WSDOT TYPE 3 MANHOLE FOR SHALLOW INSTALLATIONS.

NOTES:

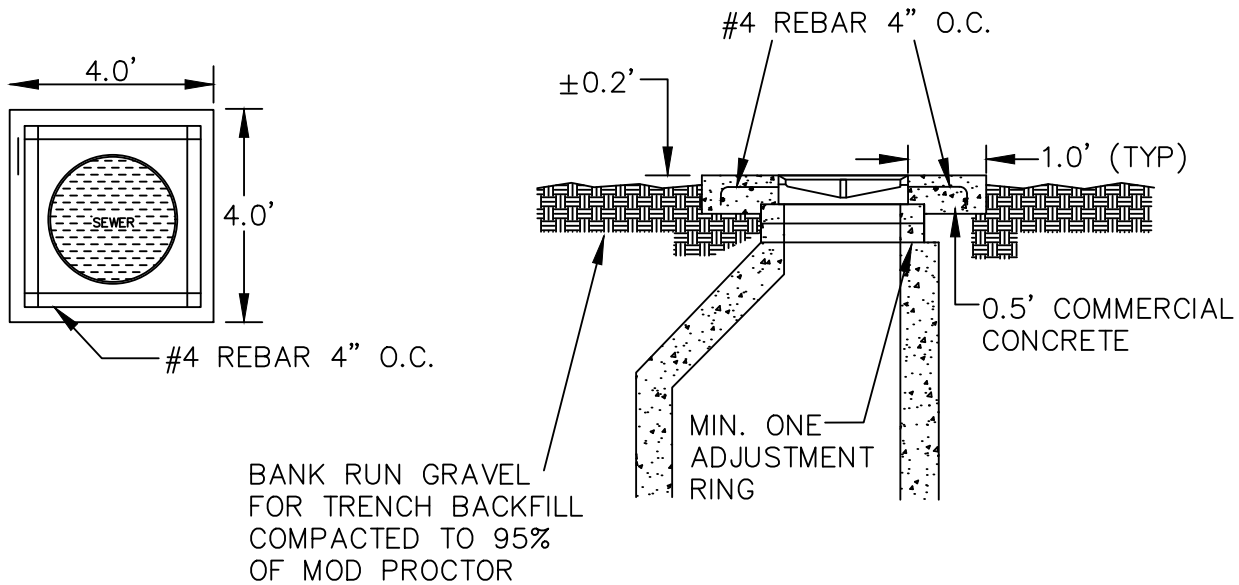
1. PRECAST MANHOLES SHALL MEET THE REQUIREMENTS OF ASTM C478. JOINTS SHALL BE RUBBER GASKETED, CONFORMING TO ASTM C443 AND SHALL BE GROUTED FROM THE INSIDE. LIFT HOLES SHALL BE GROUTED FROM THE OUTSIDE AND THE INSIDE OF THE MANHOLE.
2. THE FIRST STEP OR HANDHOLD SHALL BE A MAXIMUM OF 12" FROM THE TOP OF THE COVER.
3. CONNECTION TO THE MANHOLE SHALL BE MADE BY KOR-N-SEAL FITTING ONLY. KOR-N-SEAL SHALL BE INSTALLED ACCORDING TO MANUFACTURER'S SPECIFICATIONS. KNOCKOUTS WILL NOT BE ALLOWED.
4. SEE STANDARD PLAN CR003SS FOR MANHOLE COLLAR INSTALLATION.
5. A "SEWER GUARD" LID INSERT AS PRODUCED BY PRECO SHALL BE INSTALLED IN ANY MANHOLE SUBJECT TO SURFACE FLOODING, PER CITY DIRECTION.

CITY OF CASTLE ROCK			
SHALLOW MANHOLE			
APPROVED: <i>[Signature]</i>		07-20-20	DWG. NO. CR002SS
BY CITY		DATE	
DATE: 11/19	DRWN: W.M.	CHKD: T.E.G.	SCALE: NONE

MANHOLE IN ASPHALT



MANHOLE OUTSIDE ASPHALT



NOTES:

- ON MANHOLE OUTSIDE ASPHALT ADD REINFORCING STEEL AS SHOWN ABOVE. DEFORMED BAR TO MEET ASTM A615 GRADE 60 FY=60,000 P.S.I.
- OPENING IN LID FOR MANHOLE HOOK IS REQUIRED

CITY OF CASTLE ROCK

MANHOLE COLLAR

APPROVED:

Debra Vona

07-20-20

DWG. NO.

CR003SS

BY CITY

DATE

DATE:

11/19

DRWN:

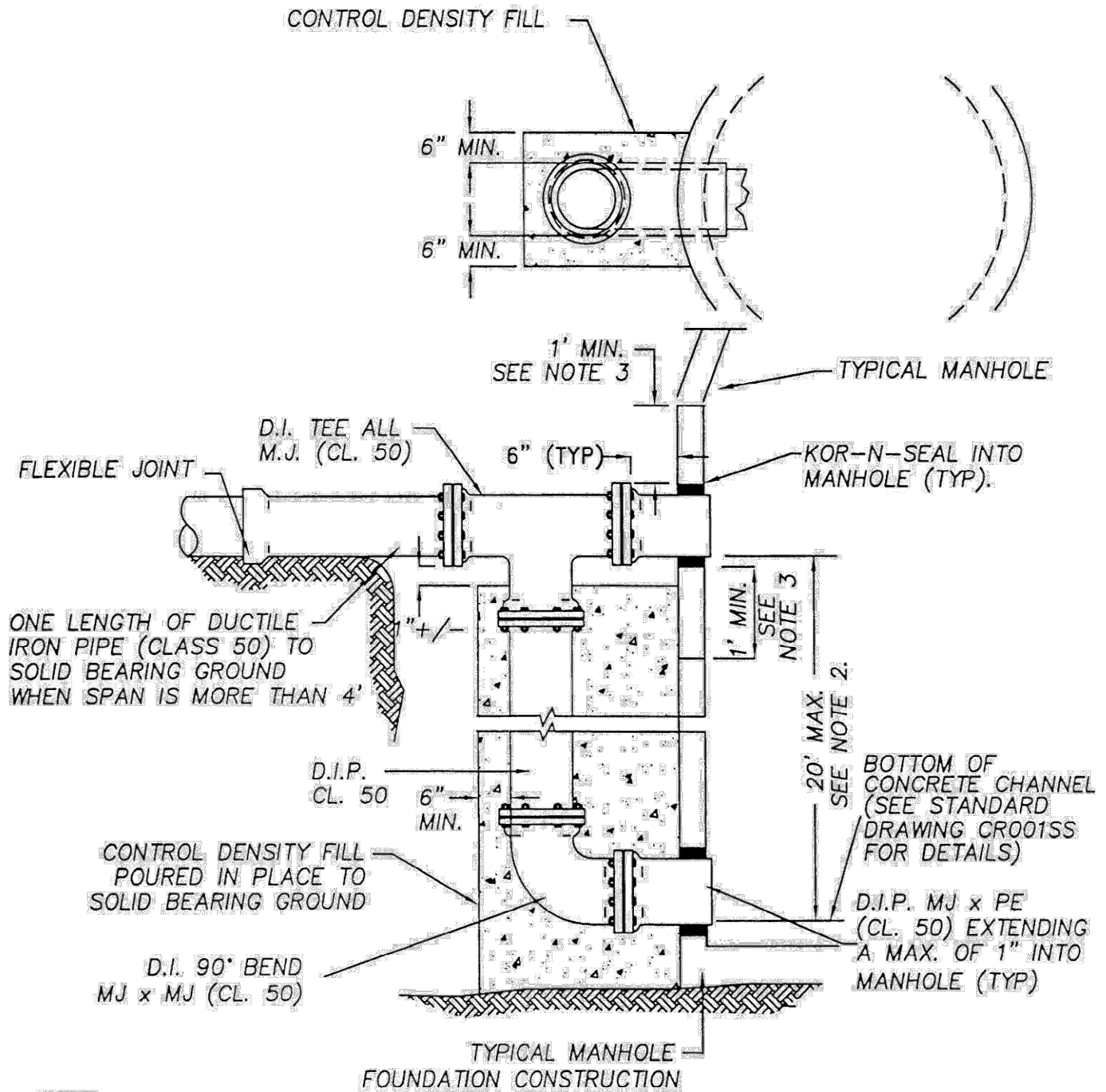
W.M.

CHKD:

T.E.G.


SCALE:

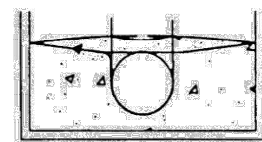
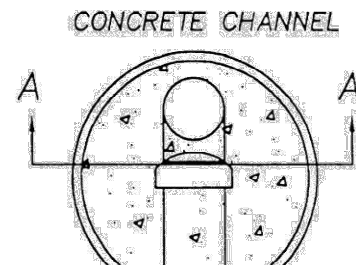
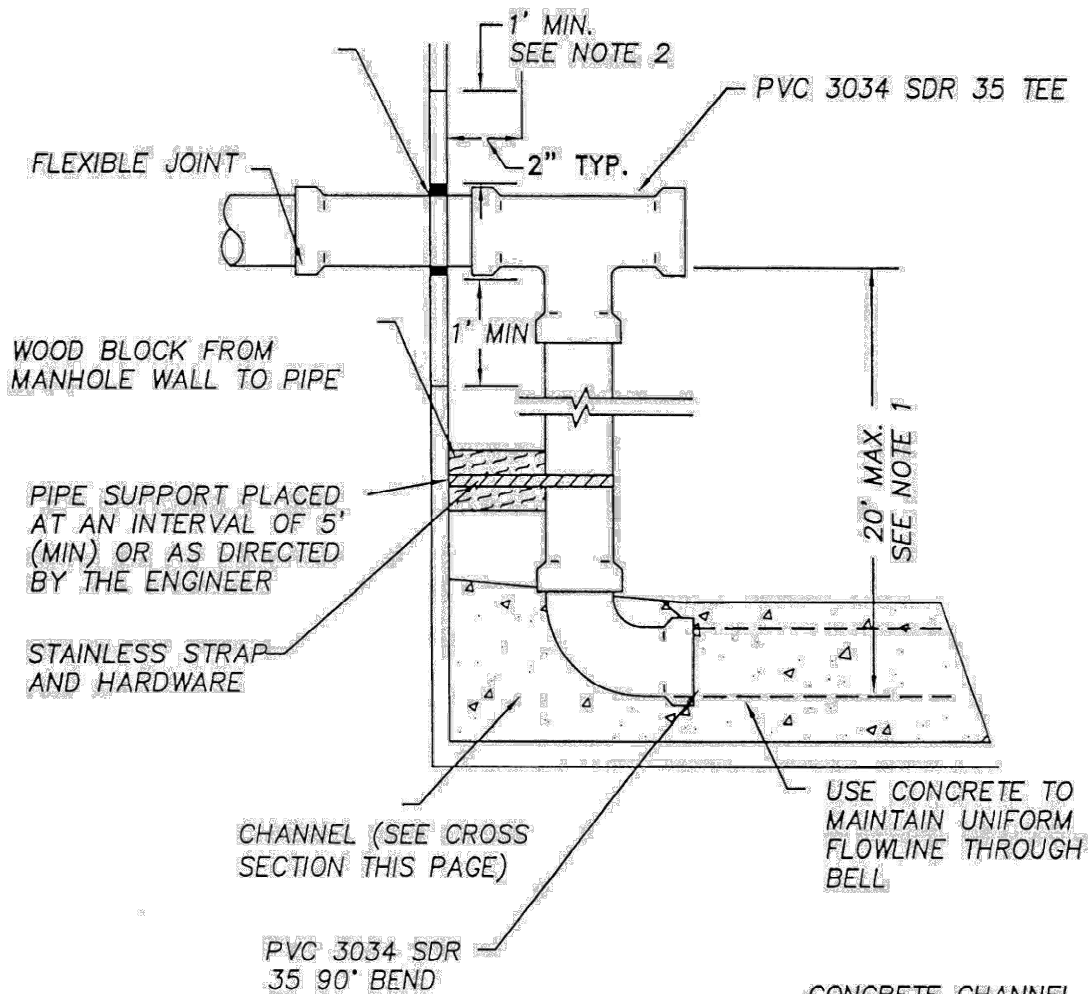
NONE



NOTE:

1. THE INTERIOR OF ALL DUCTILE IRON SHALL BE COATED WITH EPOXY OR MANUFACTURER'S STANDARD WASTEWATER RESILIENT COATING.
2. DEPTHS OVER 20' MAY BE ALLOWED IF MEGA-LUG JOINTS ARE USED.
3. MAINTAIN A MINIMUM OF 1' BETWEEN MANHOLE JOINTS AND TEE.

CITY OF CASTLE ROCK			
OUTSIDE DROP CONNECTION			
APPROVED:  BY CITY _____			DWG. NO. CR004SS
DATE: 07-20-20 DATE			
DATE: 11/19	DRWN: W.M.	CHKD: T.E.G.	SCALE: NONE



SECTION A-A

NOTE:

1. DEPTHS OVER 20" MAY BE ALLOWED WHEN PROPER SUPPORT IS PROVIDED, AS APPROVED BY THE CITY ENGINEER.
2. MAINTAIN A MINIMUM SEPARATION OF 1" BETWEEN MANHOLE JOINTS AND PIPE PENETRATIONS.
3. INSIDE DROP IS ONLY ALLOWED WHEN APPROVED BY THE CITY ENGINEER.

CITY OF CASTLE ROCK

INSIDE DROP CONNECTION

APPROVED:

Dan Vora

07-20-20

BY CITY

DATE

DWG. NO.

CR005SS

DATE:

11/19

DRWN:

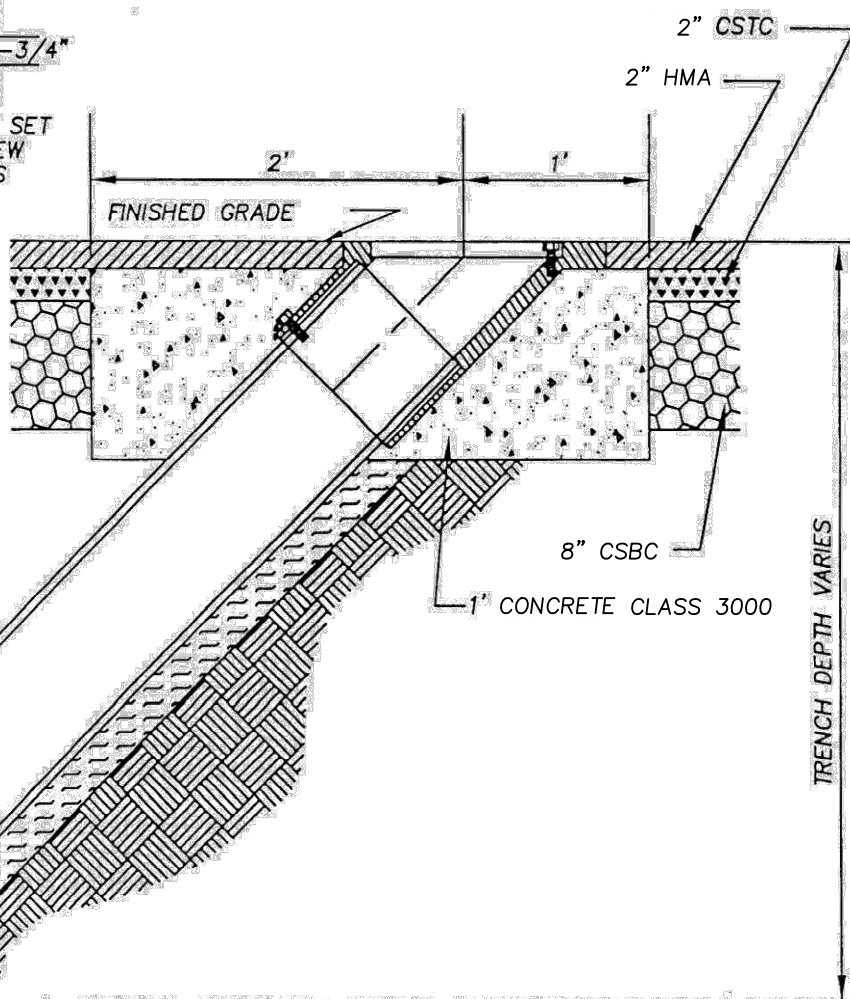
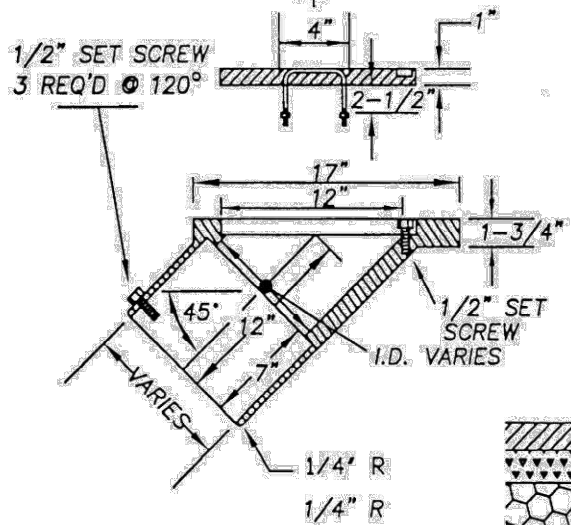
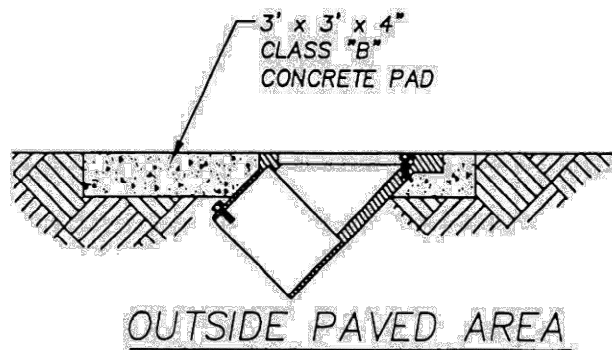
W.M.

CHKD:

T.E.G.

SCALE:

NONE



45° ELBOW

TRENCH BOTTOM

BEDDING AS REQUIRED

CITY OF CASTLE ROCK

CLEAN OUT

APPROVED:

De Vore

07-20-20

BY CITY

DATE _____

DWG. NO.

CR006SS

DATE:
06/20

DRWN:
W.M.

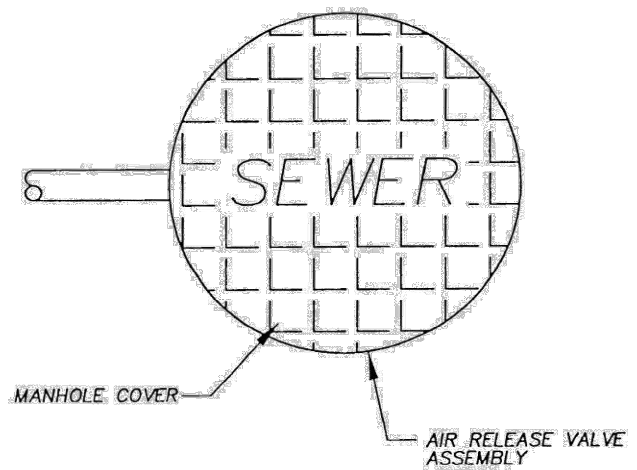
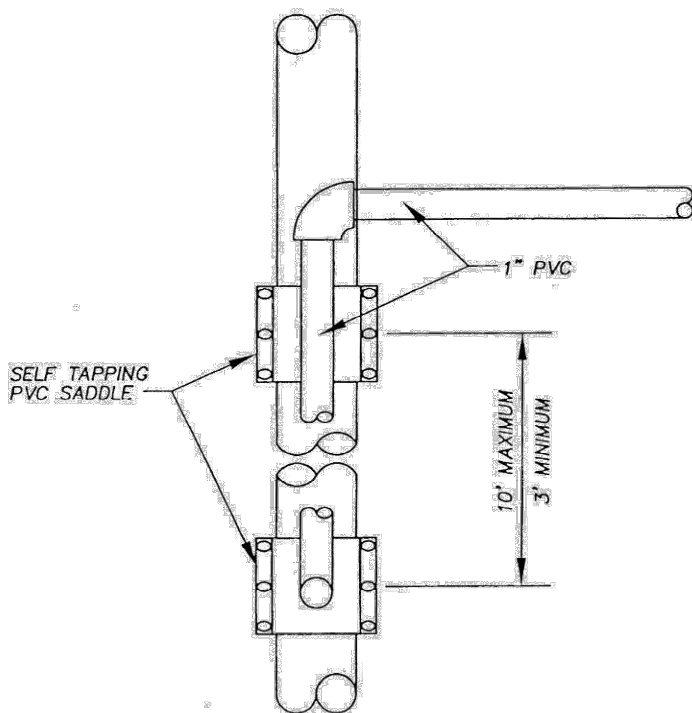
CHKD:
T.E.G.

SCALE:
NONE

NOTES:

1. ALL SEWER PIPE SHALL BE ASTM 3034 SDR 35. USE DUCTILE IRON IN SHALLOW COVER AREAS.
2. CLEANOUTS SHALL NOT BE INSTALLED ON SEWER MAINS LARGER THAN 8" DIAMETER.

NONE



NOTE:

1. SEE ALSO STANDARD DRAWINGS CR008SS & CR010SS

CITY OF CASTLE ROCK

MANIFOLD CONNECTION PLAN DETAIL

APPROVED:

Dan Vora

07-20-20

BY CITY

DATE

DWG. NO.

CR009SS

DATE:

11/19

DRWN:

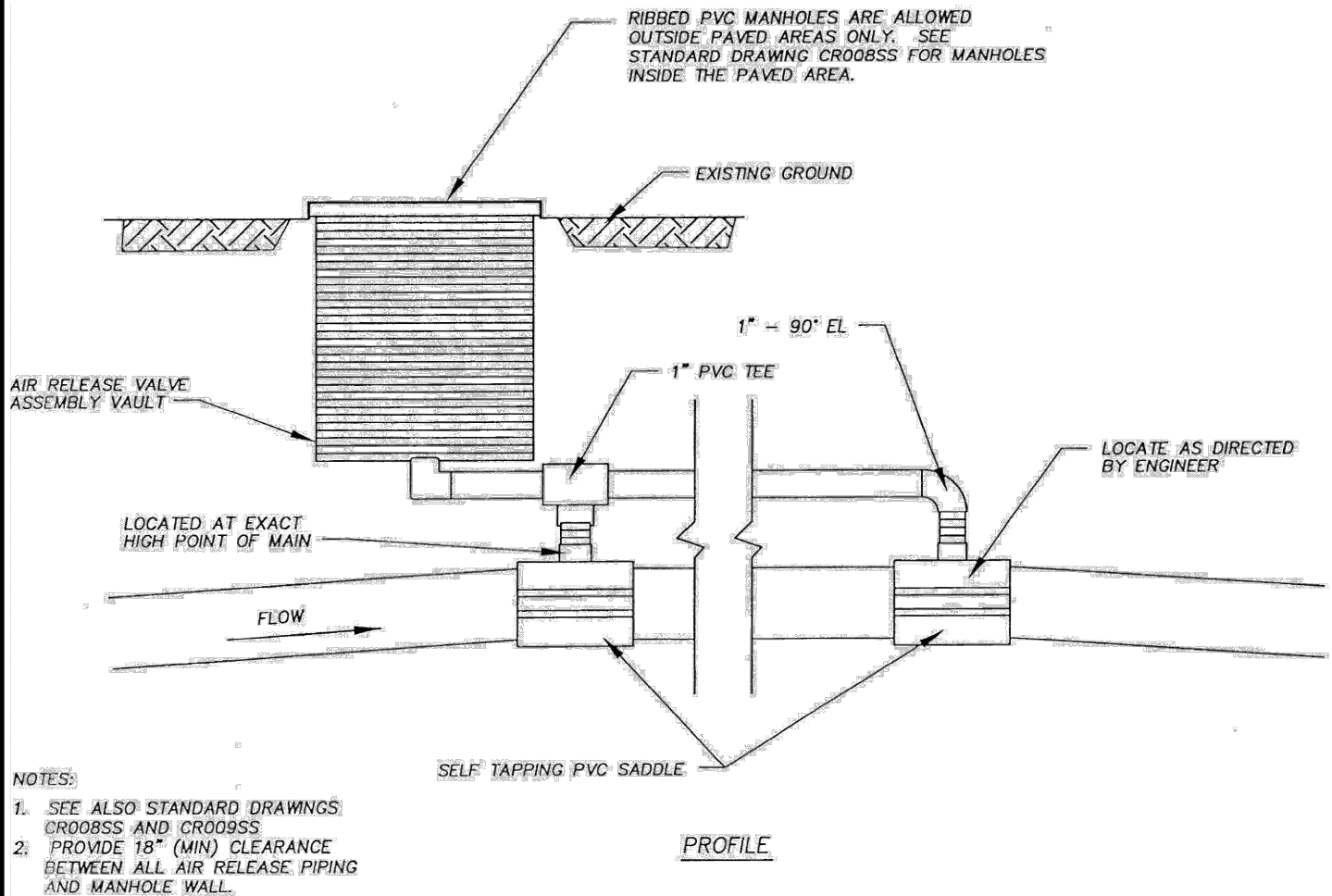
W.M.


CHKD:

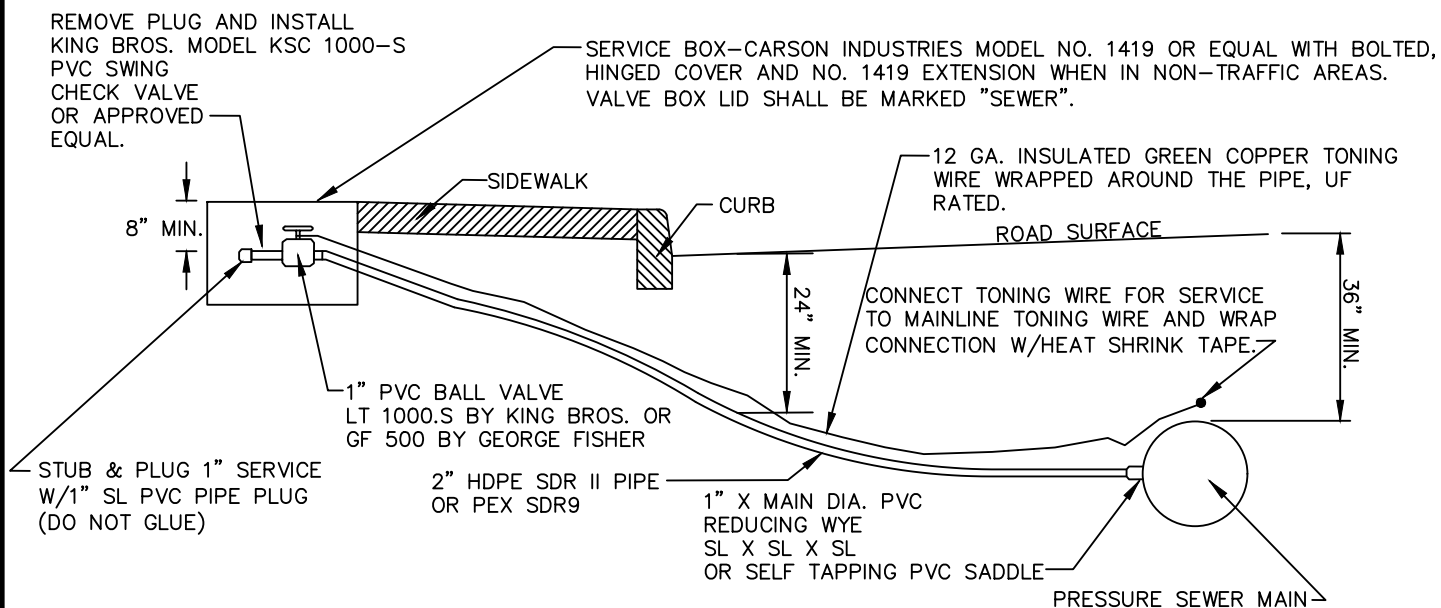
T.E.G.

SCALE:

NONE



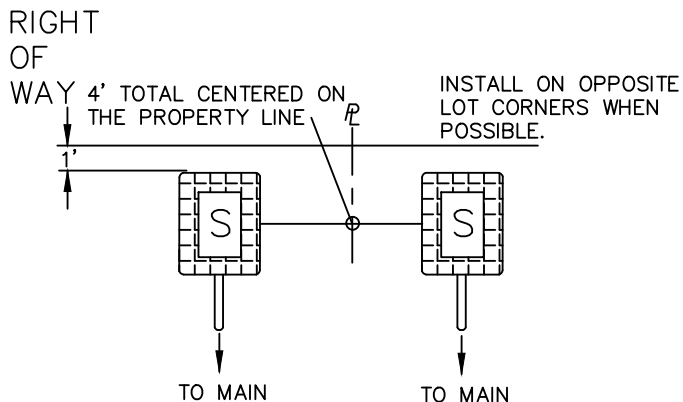
CITY OF CASTLE ROCK			
MANIFOLD CONNECTION SECTION DETAIL			
APPROVED:  BY CITY			DWG. NO. CR010SS
DATE: 11/19			DATE 07-20-20
DRWN: W.M.	CHKD: T.E.G.	SCALE: NONE	




NOTE:

IF LIVE TAP IS REQUIRED, THE CONTRACTOR SHALL EXPOSE THE EXISTING STEP SEWER MAIN. THE CONTRACTOR WILL FURNISH AND INSTALL TAPPING SLEEVE AND 1" BALL VALVE. THE VALVES AT THE SERVICE BOX MUST BE INSTALLED PRIOR TO THIS OPERATION.

DOUBLE SERVICE CONFIGURATION



CITY OF CASTLE ROCK			
TYPICAL PRESSURE SEWER SYSTEM SERVICE CONNECTION			
APPROVED: 		07-20-20	DWG. NO. CR011SS
BY CITY		DATE	
DATE: 06/20	DRWN: W.M.	CHKD: T.E.G.	SCALE: NONE

1. THE GATE VALVES SHALL BE RESTRAINED TO VAULT TO PREVENT MOVEMENT DUE TO THRUST FORCE.
2. ALL DUCTILE IRON PIPE AND FITTINGS SHALL BE EPOXY COATED.



APPROVED:

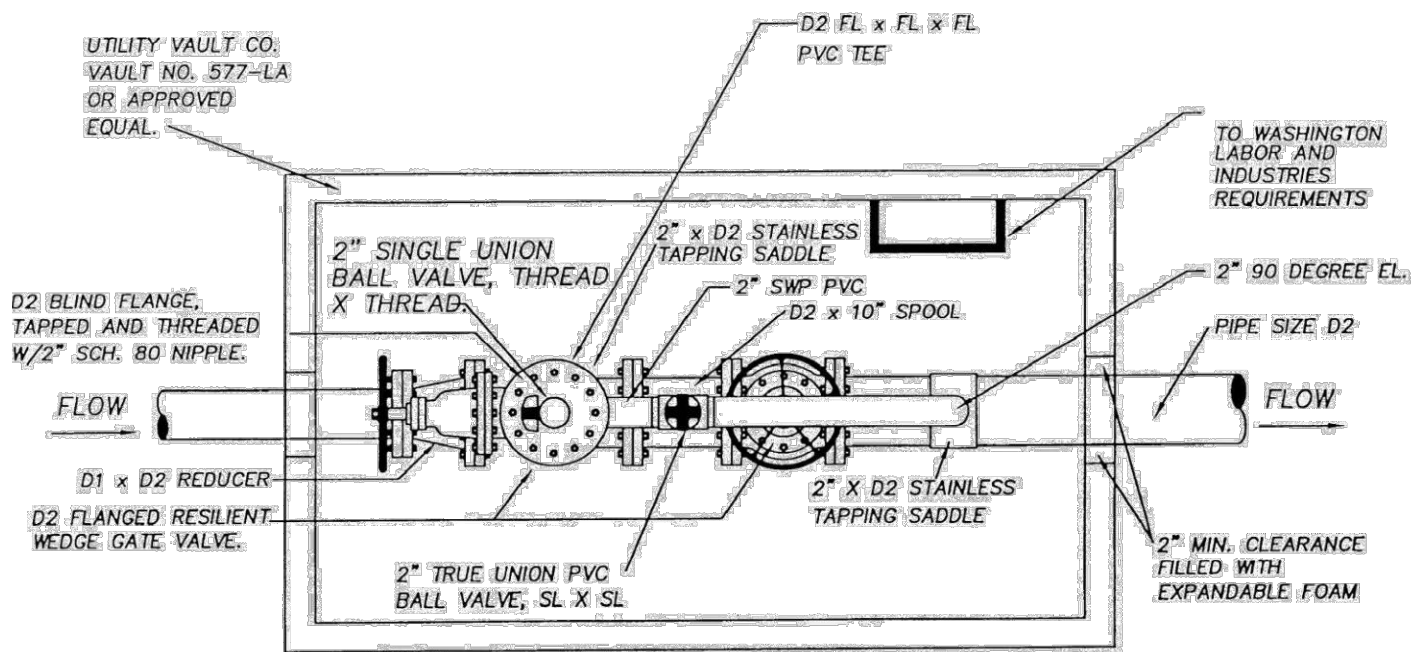
07-20-20

DATE _____

CR012SS

SCALE:

NONE



CITY OF CASTLE ROCK

PIGG PORT PLAN VIEW

APPROVED:

Dan Vora

07-20-20

DWG. NO.

CR013SS

BY CITY

DATE

DATE:

11/19

DRWN:

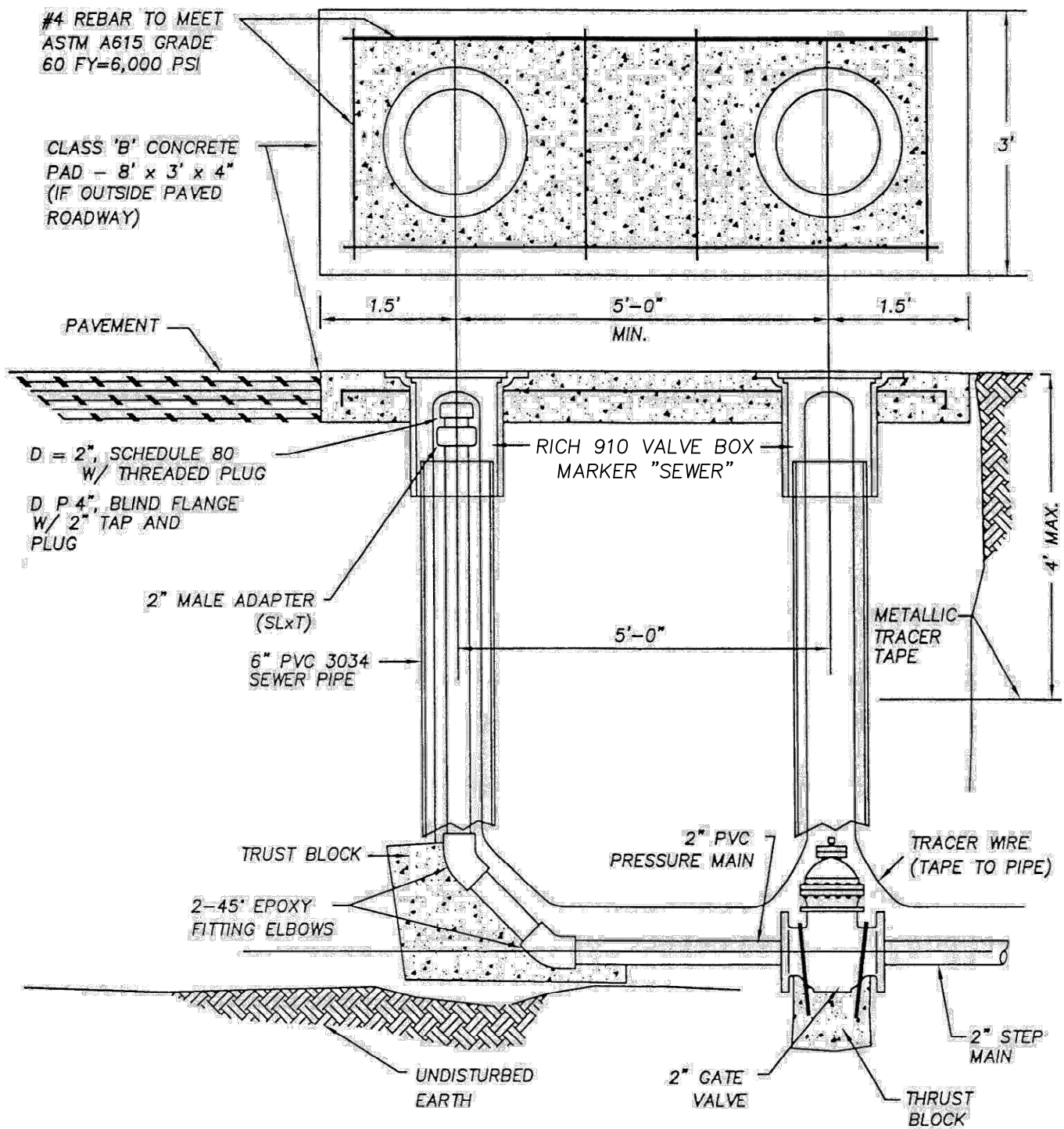
W.M.

CHKD:

T.E.G.

SCALE:

NONE



NOTES

1. A PIG PORT DETAIL SHALL BE SUBMITTED TO THE CITY FOR APPROVAL BY THE CITY ENGINEER WHEN USED WITH STEP MAINS LARGER THAN 2".

CITY OF CASTLE ROCK

TERMINUS PIGG LAUNCH PORT

APPROVED:

Dan Vora

07-20-20

BY CITY

DATE

DWG. NO.

CR014SS

DATE:

06/20

DRWN:

W.M.


CHKD:

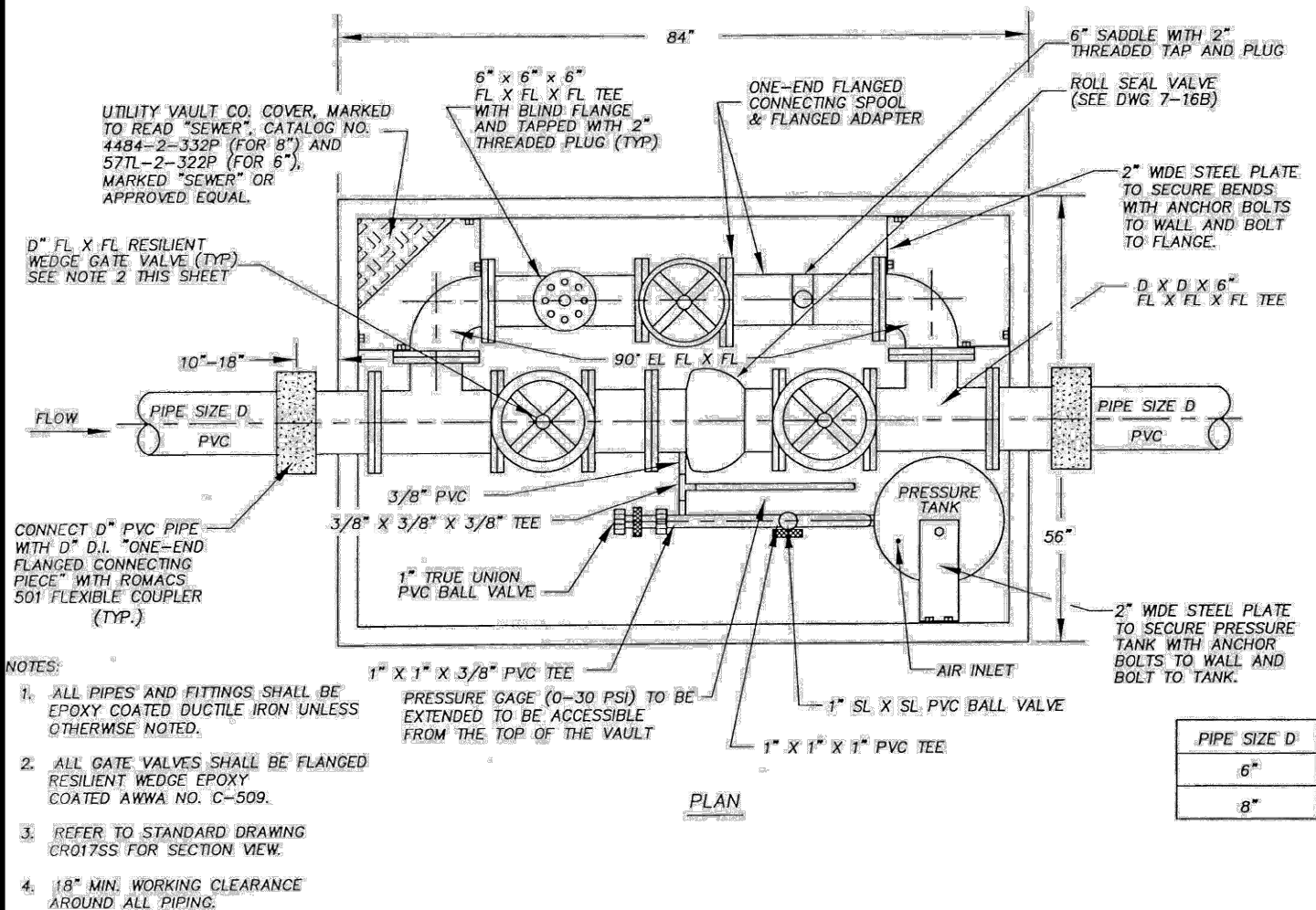
T.E.G.

SCALE:

NONE



CITY OF CASTLE ROCK			
TYPICAL FORCE MAIN PLUG VALVE 2" OR GREATER			
APPROVED: 		07-20-20	DWG. NO. CR015SS
BY CITY		DATE	
DATE: 11/19	DRWN: W.M.	CHKD: T.E.G.	SCALE: NONE



CITY OF CASTLE ROCK

6" AND 8" PRESSURE SUSTAINING DEVICE PLAN VIEW

APPROVED:

Dan Vora

07-20-20

DWG. NO.

CR016SS

BY CITY

DATE

DATE:

11/19

DRWN:

W.M.

CHKD:

T.E.G.

SCALE:

NONE

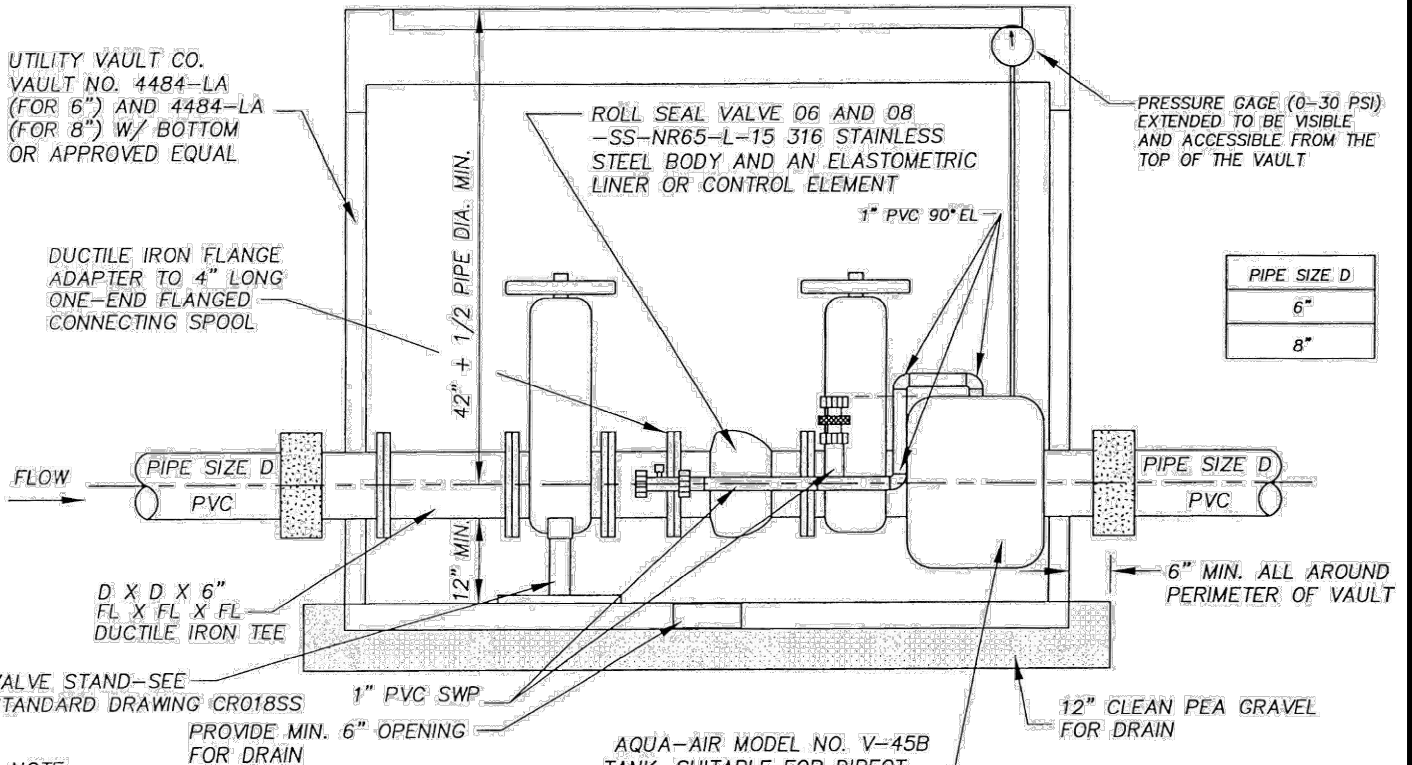
UTILITY VAULT CO.
VAULT NO. 4484-LA
(FOR 6") AND 4484-LA
(FOR 8") W/ BOTTOM
OR APPROVED EQUAL

DUCTILE IRON FLANGE
ADAPTER TO 4" LONG
ONE-END FLANGED
CONNECTING SPOOL

ROLL SEAL VALVE 06 AND 08
-SS-NR65-L-15 316 STAINLESS
STEEL BODY AND AN ELASTOMETRIC
LINER OR CONTROL ELEMENT

PRESSURE GAGE (0-30 PSI)
EXTENDED TO BE VISIBLE
AND ACCESSIBLE FROM THE
TOP OF THE VAULT

PIPE SIZE D
6"
8"



VALVE STAND-SEE
STANDARD DRAWING CR018SS

1" PVC SWP
PROVIDE MIN. 6" OPENING
FOR DRAIN

AQUA-AIR MODEL NO. V-45B
TANK, SUITABLE FOR DIRECT
BURY OR APPROVED EQUAL

12" CLEAN PEA GRAVEL
FOR DRAIN

NOTE:

1. ALL PIPES AND FITTINGS SHALL BE EPOXY COATED DUCTILE IRON UNLESS OTHERWISE NOTED.
2. ALL GATE VALVES SHALL BE FLANGED RESILIENT WEDGE EPOXY COATED, AWWA NO. C-509

SECTION

CITY OF CASTLE ROCK

6" AND 8" PRESSURE SUSTAINING
DEVICE SECTION VIEW

APPROVED:

Dail Vora

07-20-20

BY CITY

DATE

DWG. NO.

CR017SS

DATE:

11/19

DRWN:

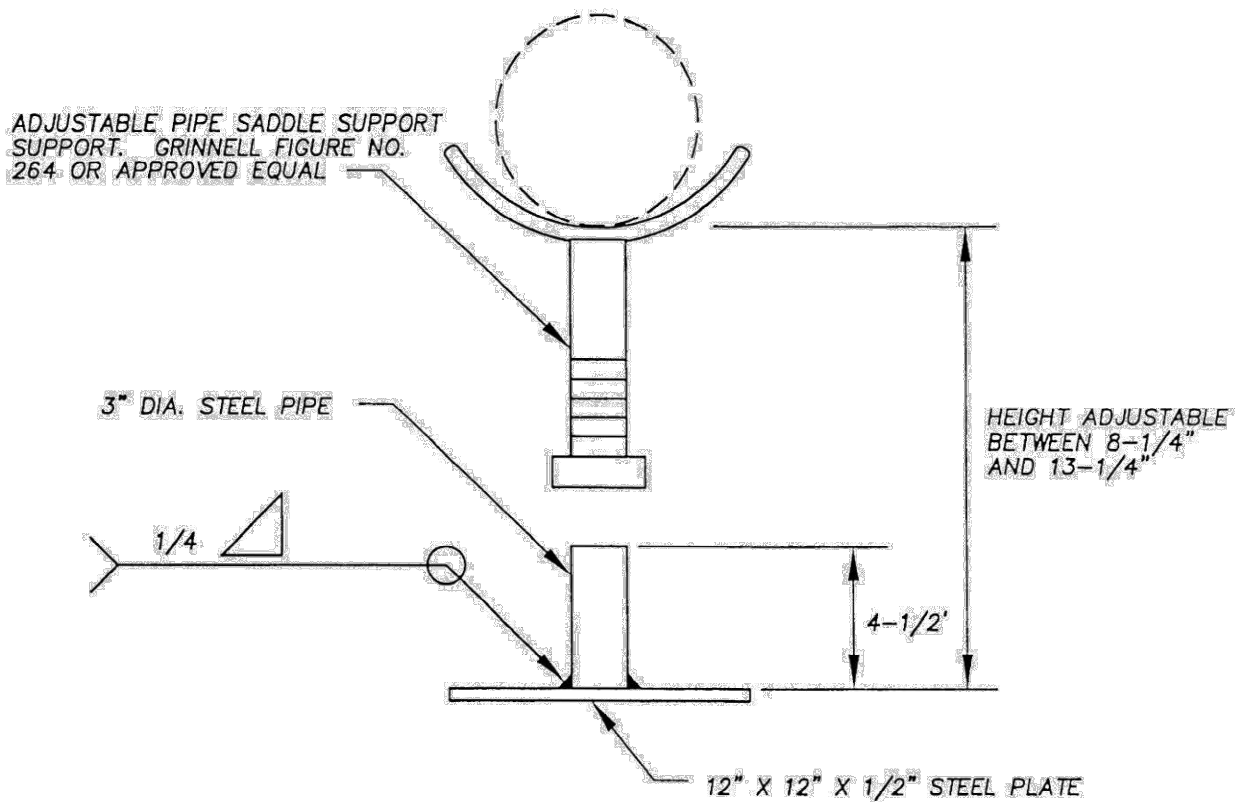
W.M.

CHKD:

T.E.G.

SCALE:

NONE



NOTE:

1. AFTER FABRICATION, THE VALVE STAND BASE SHALL BE CLEANED, PRIMERED WITH FULLER O'BRIEN 621-04 BLOX-RUST ALKYD METAL PRIMER OR APPROVED EQUAL AND THEN PAINTED WITH FULLER O'BRIEN 612-XX HEAVY DUTY ALKYD ENAMEL OR APPROVED EQUAL.

CITY OF CASTLE ROCK

TYPICAL VALVE STAND

APPROVED:

Dan Vora

07-20-20

BY CITY

DATE

DWG. NO.

CR018SS

DATE:

11/19

DRWN:

W.M.

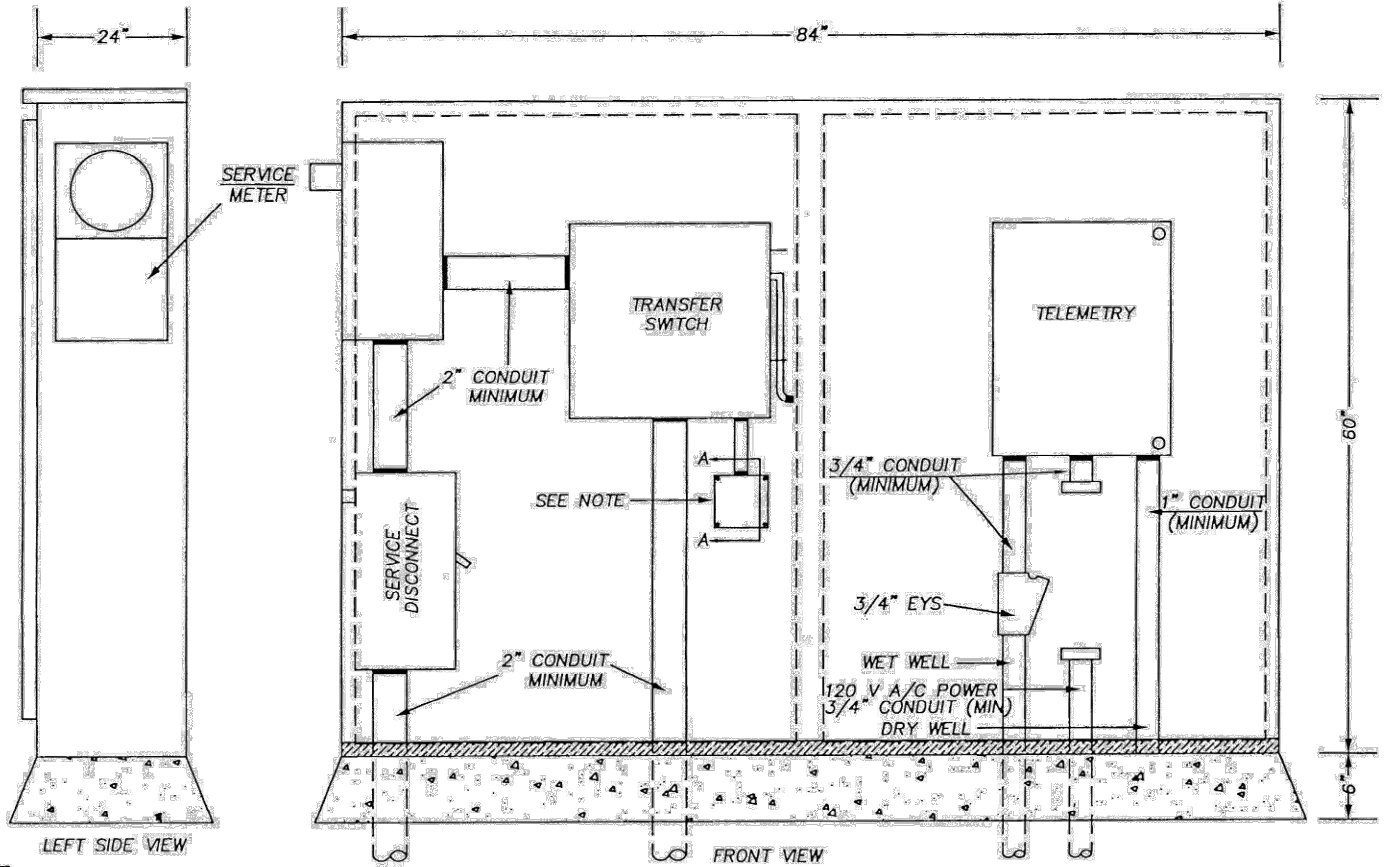
CHKD:

T.E.G.

SCALE:

NONE

GENERAL PANEL LAYOUT



NOTE:

1. SEE STANDARD DRAWING CR020SS FOR SECTION A-A & TOP SLAB PLAN

CITY OF CASTLE ROCK

STANDARD LIFT STATION
CONTROL LAYOUT

APPROVED:

Dan Vora

07-20-20

BY CITY

DATE

DWG. NO.

CR019SS

DATE:

11/19

DRWN:

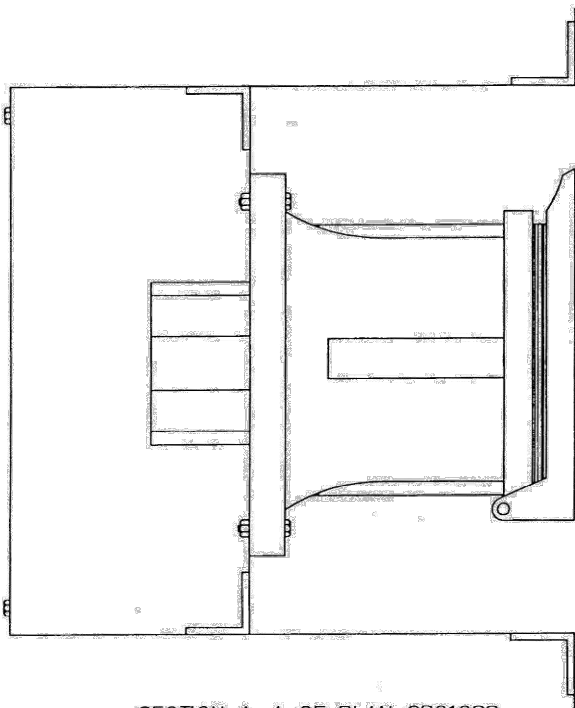
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CHKD:

T.E.G.

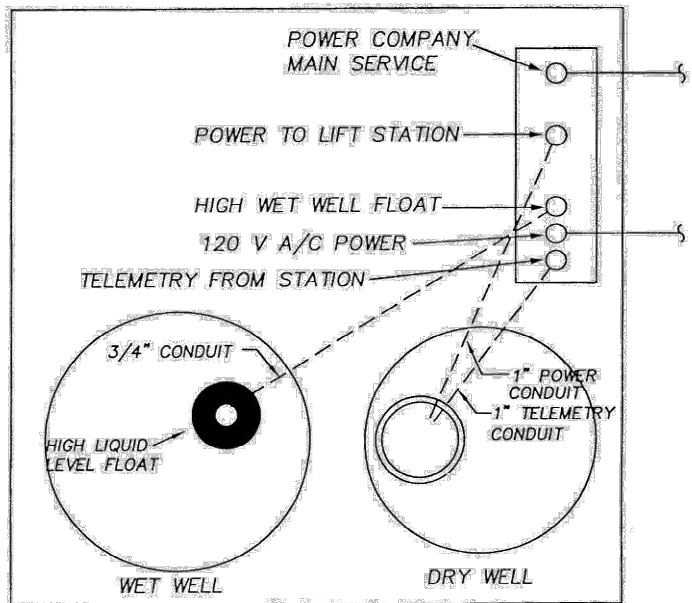
SCALE:

NONE



SECTION A-A OF PLAN CR019SS
GENERAL RECEPTACLE

NOTE: OTHER LAYOUTS MAY BE APPROVED
TO MEET SPECIFIC NEEDS PROVIDING
ALL ELEMENTS ARE PROVIDED



TOP SLAB PLAN
SEE PLAN CR019SS FOR CONDUIT SIZES

CITY OF CASTLE ROCK

STANDARD LIFT STATION LAYOUT

APPROVED:

Dan Vora

07-20-20

BY CITY

DATE

DWG. NO.

CR020SS

DATE:

11/19

DRWN:

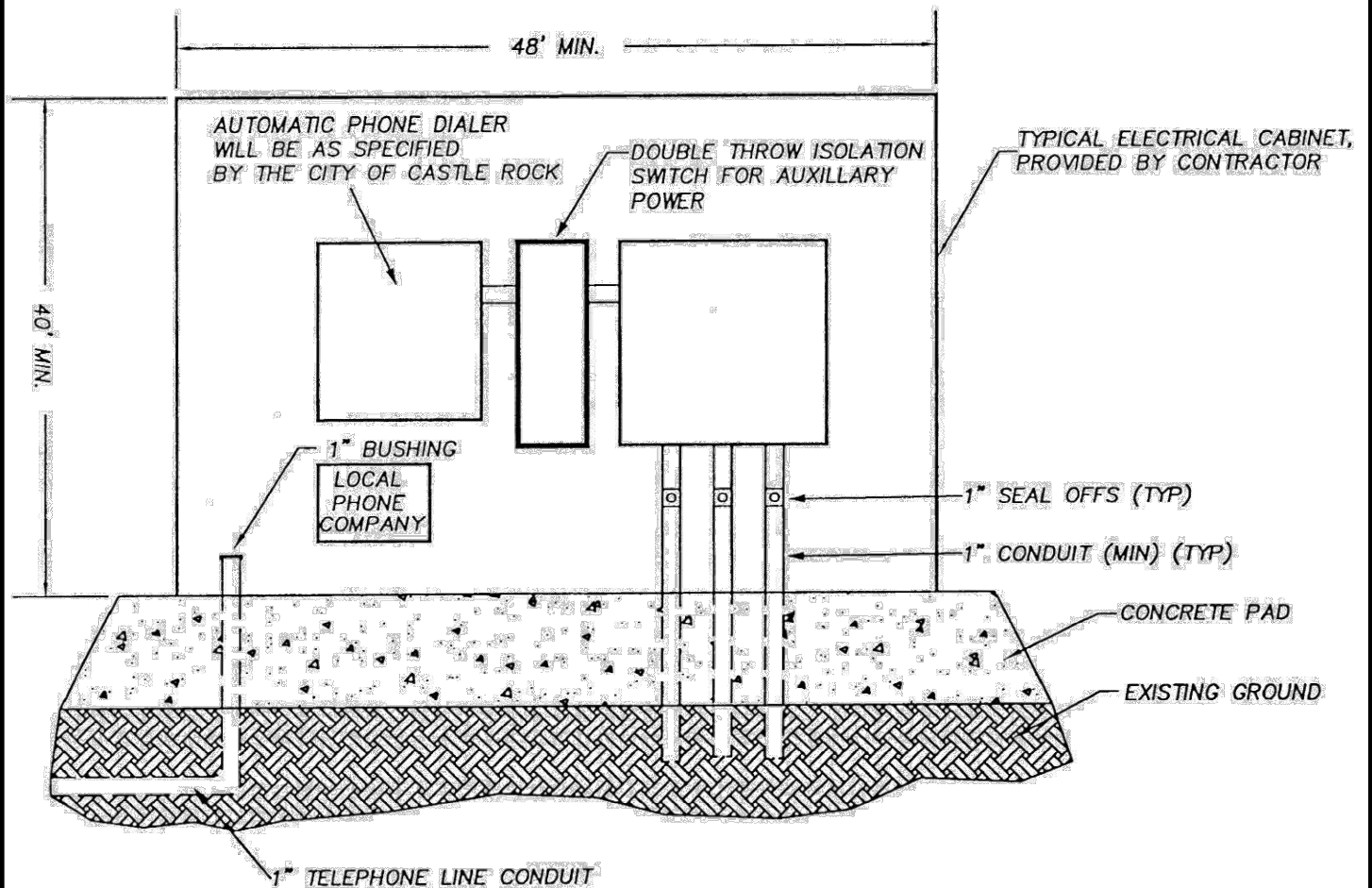
W.M.

CHKD:

T.E.G.

SCALE:

NONE



CITY OF CASTLE ROCK			
COMMERCIAL/MULTI-FAMILY PRESSURE SEWER SYSTEM ELECTRICAL CABINET LAYOUT			
APPROVED: <i>Dan Vora</i>		07-20-20	DWG. NO. CR022SS
BY CITY		DATE	
DATE: 11/19	DRWN: W.M.	CHKD: T.E.G.	SCALE: NONE

THRUST AT FITTINGS IN POUNDS DUE TO WATER PRESSURE

	PRESSURE PSI	TEES DEAD ENDS	90 DEG. BEND	45 DEG BEND	22 1/2 DEG BEND
3"	100	1220	1720	931	474
	150	1330	1880	1020	519
	200	1610	2270	1230	628
4"	100	1940	2750	1490	759
	150	2020	2860	1550	790
	200	2350	3330	1800	919
6"	100	3830	5420	2930	1500
	150	4100	5800	3140	1600
	200	4750	6710	3630	1850
8"	100	6580	9310	5040	2570
	150	6980	9870	5340	2720
	200	7910	11200	6050	3090
10"	50	9820	13900	7510	3830
	100	10300	14600	7890	4020
	150	11300	15900	8620	4400
	200	12300	17400	9450	4810
12"	50	13800	19500	10600	5390
	100	14600	20600	11200	5700
	150	15900	22500	12200	6210
	200	17200	24400	13200	6720

SAFE BEARING LOADS

SOIL

SAFE BEARING LOAD
(PSF)

MUCK, PEAT, ETC.*

0

SOFT CLAY

1,000

SAND

2,000

SAND AND GRAVEL

3,000

SAND AND GRAVEL CEMENTED WITH CLAY

4,000

HARD SHALE

10,000

*IN MUCK OR PEAT, ALL THRUSTS ARE RESISTED BY PILES OR TIE RODS TO SOLID FOUNDATIONS OR BY REMOVAL OF MUCK OR PEAT AND REPLACEMENT WITH BALLAST OF SUFFICIENT STABILITY TO RESIST THRUSTS.

CITY OF CASTLE ROCK

THRUST BLOCKING DETAILS
FOR FORCE MAINS

APPROVED:

David Vora

07-20-20

BY CITY

DATE

DWG. NO.

CR026SS

DATE:

11/19

DRWN:

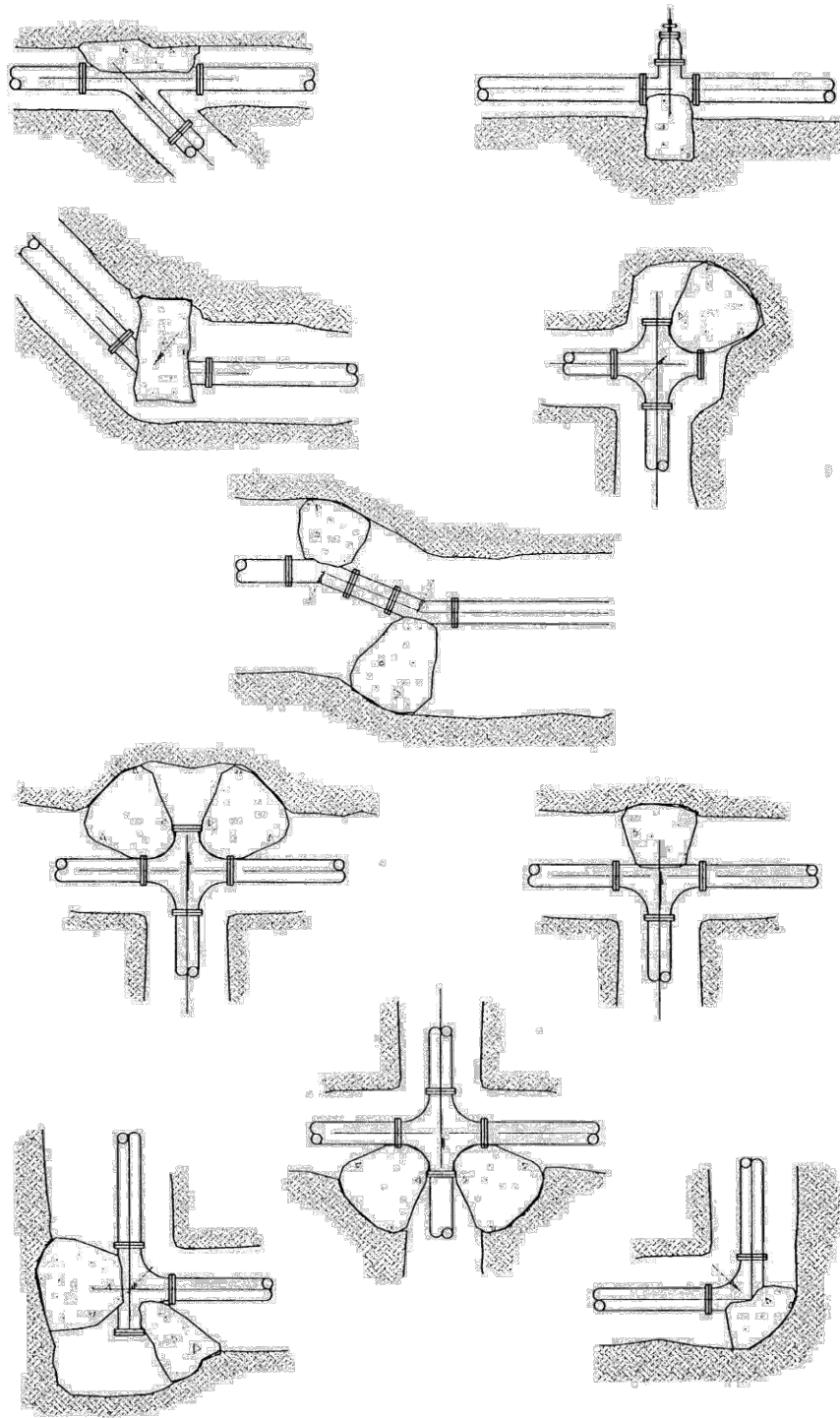
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CHKD:

T.E.G.

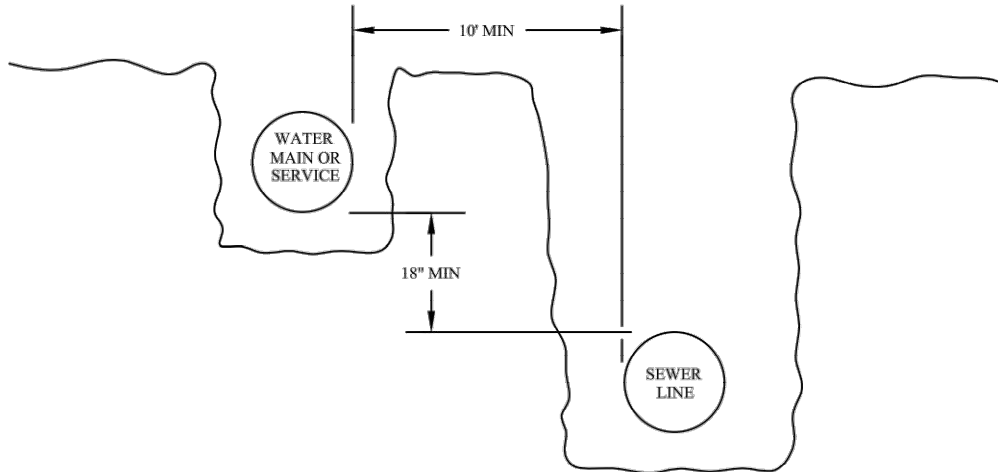
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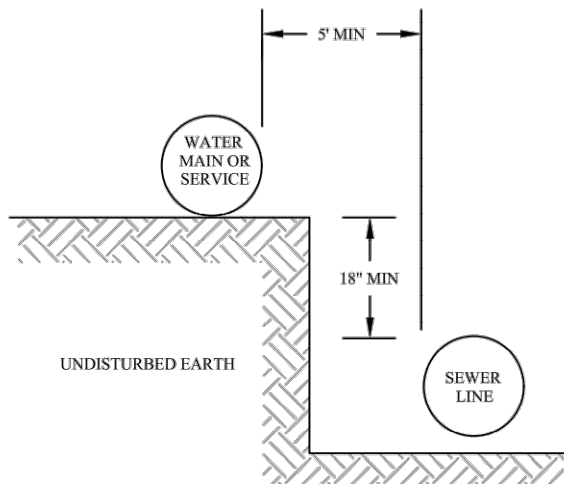
CITY OF CASTLE ROCK			
THRUST BLOCKING DETAILS (SECTIONS) FOR FORCE MAINS			
APPROVED: <i>Dan Vora</i>		07-20-20	DWG. NO. CR027SS
BY CITY		DATE	
DATE: 11/19	DRWN: W.M.	CHKD: T.E.G.	SCALE: NONE

NORMAL PARALLEL CONDITION: A MINIMUM HORIZONTAL SEPARATION OF 10 FEET BETWEEN ANY SANITARY SEWER AND WATER LINES, AND A MINIMUM VERTICAL SEPARATION OF 18" BETWEEN THE BOTTOM OF THE WATER LINE AND THE CROWN OF THE SEWER, SHALL BE MAINTAINED. THE DISTANCE SHALL BE MEASURED EDGE TO EDGE. LINES MUST BE LAID IN SEPARATE TRENCHES.



UNUSUAL PARALLEL CONDITIONS: WHEN SPECIAL CONDITIONS PREVENT THE SEPARATIONS DESCRIBED ABOVE, A SEWER MAY BE INSTALLED CLOSER THAN 10 FEET HORIZONTALLY OR 18" VERTICALLY TO A WATER LINE, PROVIDED:

- 1) LESS THAN 18" OF VERTICAL SEPARATION REQUIRES CL 52 D.I., OR C-900 P.V.C. FOR SEWER PIPE MATERIAL (C-905 FOR GREATER THAN 12" DIA). THE ENGINEER MAY APPROVE LESS THAN 10 FEET OF HORIZONTAL SEPARATION PROVIDED SEPARATE TRENCHES CAN BE MAINTAINED.
- 2) IF SEWER AND WATER LINES MUST BE LOCATED IN THE SAME TRENCH, BOTH SEWER LINES AND WATER LINES SHALL INCLUDE A CASING PIPE OF PRESSURE RATED PIPE MATERIAL DESIGNED TO WITHSTAND A MINIMUM STATIC PRESSURE OF 150 P.S.I. COMMERCIAL PIPE SKIDS AND AN APPROVED END CLOSURE IS REQUIRED AS NEEDED. A MINIMUM OF 5 FEET HORIZONTAL AND 18" OF VERTICAL CLEARANCE IS REQUIRED. (SEE ILLUSTRATION BELOW)



CITY OF CASTLE ROCK

SANITARY SEWER/WATER MAIN
PARALLEL CONSTRUCTION DETAIL

APPROVED:

Dan Vora

07-20-20

BY CITY

DATE

DWG. NO.

CR028SS

DATE:

12/19

DRWN:

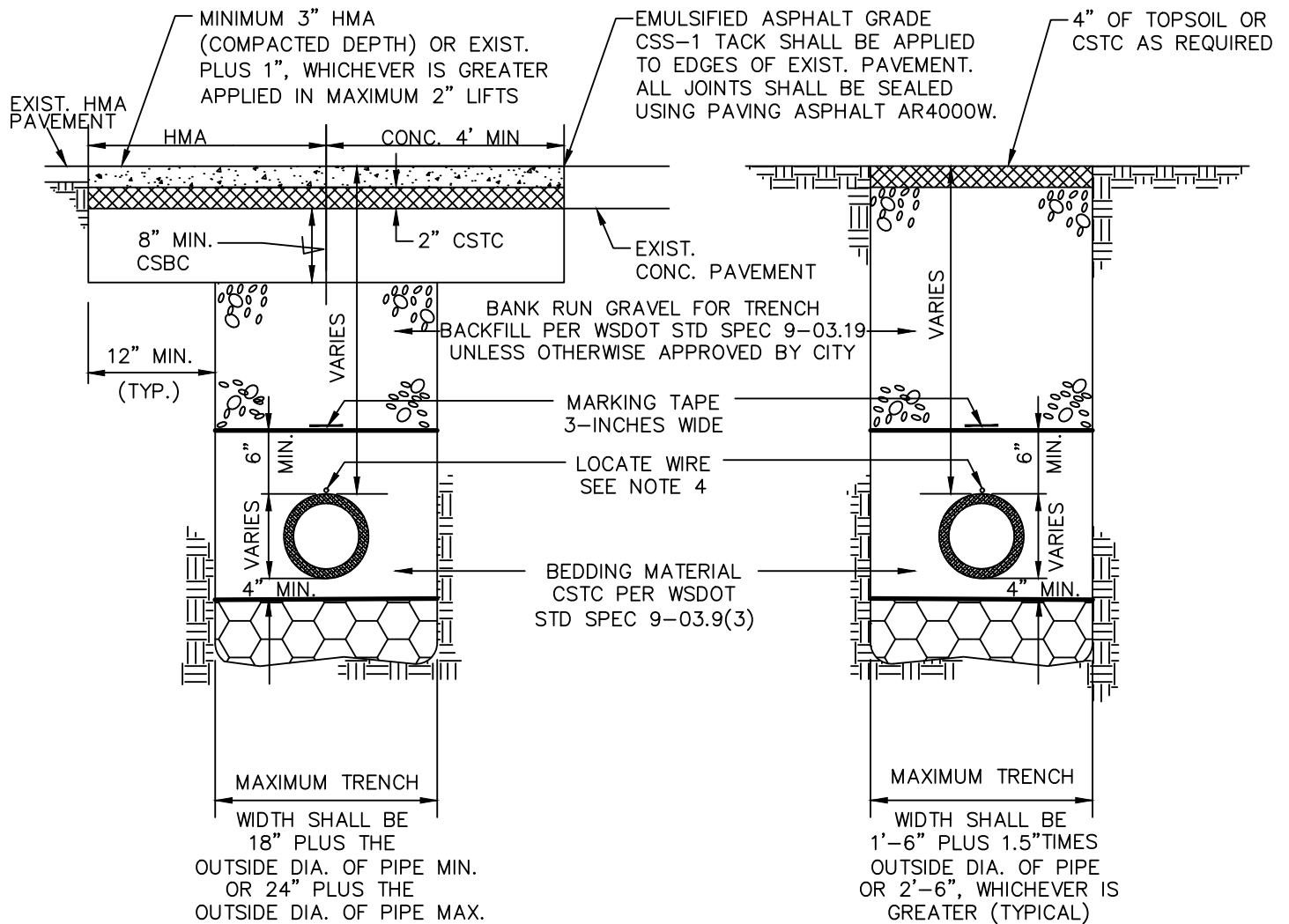
K.A.R.

CHKD:

T.E.G.

SCALE:

NONE



NOTES:

1. CSTC & CSBC MATERIAL SHALL BE COMPACTED IN 6-INCH MAXIMUM LIFTS TO 95% DENSITY.
2. COMPACTION: BEDDING SHALL BE COMPACTED TO 95% MAX. AS DETERMINED BY ASTM D1557. BACKFILL SHALL BE COMPACTED TO 95% IN THE ROADWAY PRISM, AND 85% OUTSIDE ROADWAY PRISM AS DETERMINED BY ASTM D1557.
3. ALL MATERIALS, WORKMANSHIP, AND INSTALLATION SHALL BE IN CONFORMANCE WITH THE STANDARD SPECIFICATIONS FOR ROAD, BRIDGE AND MUNICIPAL CONSTRUCTION AS AMENDED BY CITY STANDARDS.
4. SEE SPECIFIC UTILITY TRENCH DETAIL FOR WIRE TYPE AND COLOR.
5. WHEN CUT LINE IS LESS THAN THREE FEET FROM A CUT LINE, CURB, JOINT LINE, OR PAVEMENT EDGE, THE EXISTING PAVEMENT SHALL BE REMOVED TO THE CUT LINE.

CITY OF CASTLE ROCK

TRENCH - PAVEMENT RESTORATION

APPROVED:

Dan Vora

07-20-20

DWG. NO.

CRO08ST

BY CITY

DATE

DATE:

06/20

DRWN:

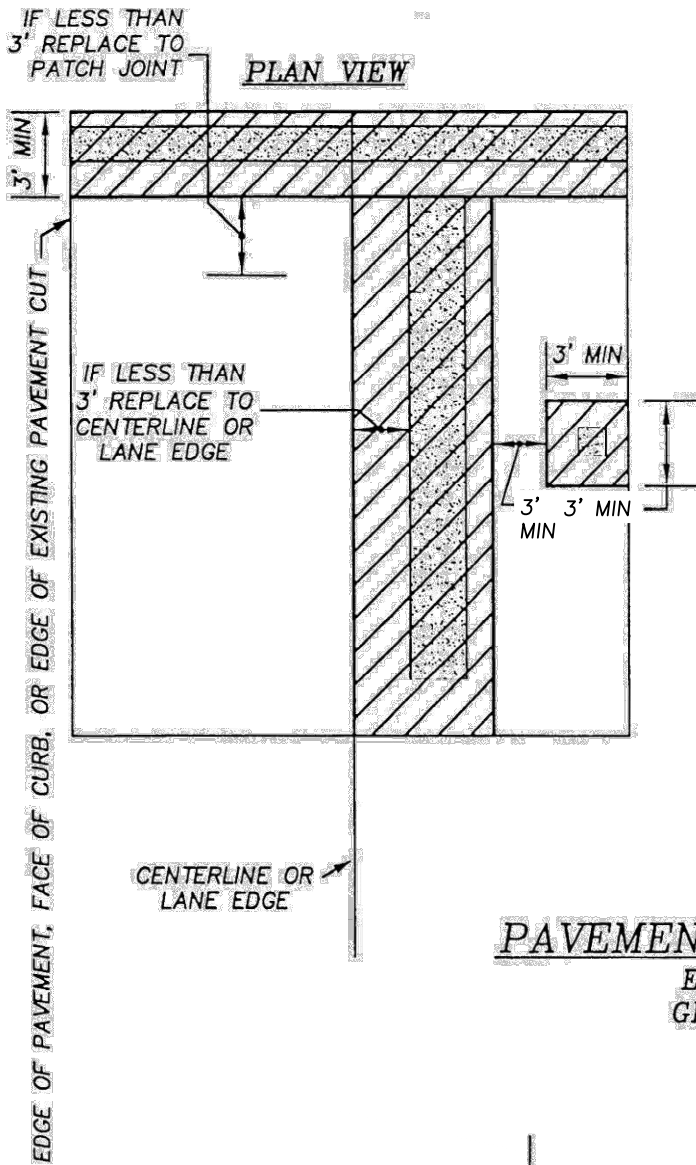
KAR

CHKD:

CLR

SCALE:

NONE






NOTES

1. THE EXTENT OF REPAIR OF ASPHALT CUTS NOT SHOWN ON THIS STANDARD OR FOR CUTS MADE WITHIN THREE FEET OF EXISTING PATCHES, CRACKS OR DETERIORATED PAVEMENTS SHALL BE DETERMINED BY THE ENGINEER AND PERFORMED PER THE SUBMITTED RESTORATION/PAVEMENT DESIGN.

2. ALL PAVEMENT REMOVALS SHALL BE MADE ON STRAIGHT LINE SAW CUTS. IF CUT LINE IS LESS THAN THREE FEET FROM A CUT LINE, EXPANSION JOINT OR EDGE, THE EXISTING PAVEMENT SHALL BE REMOVED TO THOSE CUT LINES, EXPANSION JOINT OR EDGE OR AS DIRECTED BY THE ENGINEER.

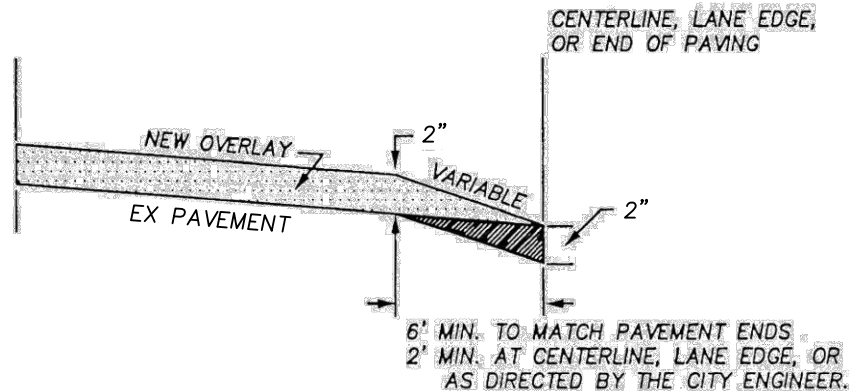
3. DURING EXCAVATION AND SUBGRADE PREPARATION, THE CONTRACTOR SHALL TAKE ALL NECESSARY STEPS TO INSURE THE PROTECTION OF ALL UTILITIES AND ADJACENT PAVEMENT SECTIONS.

LEGEND

-  EXCAVATION
-  AREA OF PAVEMENT TO BE REPLACED
-  SAW CUT

PAVEMENT CROSS SECTION

END OF PAVING GRINDING DETAIL



CITY OF CASTLE ROCK

ASPHALT PAVEMENT
REPLACEMENT

APPROVED:

Dan Vora

07-20-20

BY CITY

DATE

DWG. NO.

CR032SS

DATE:

12/19

DRWN:

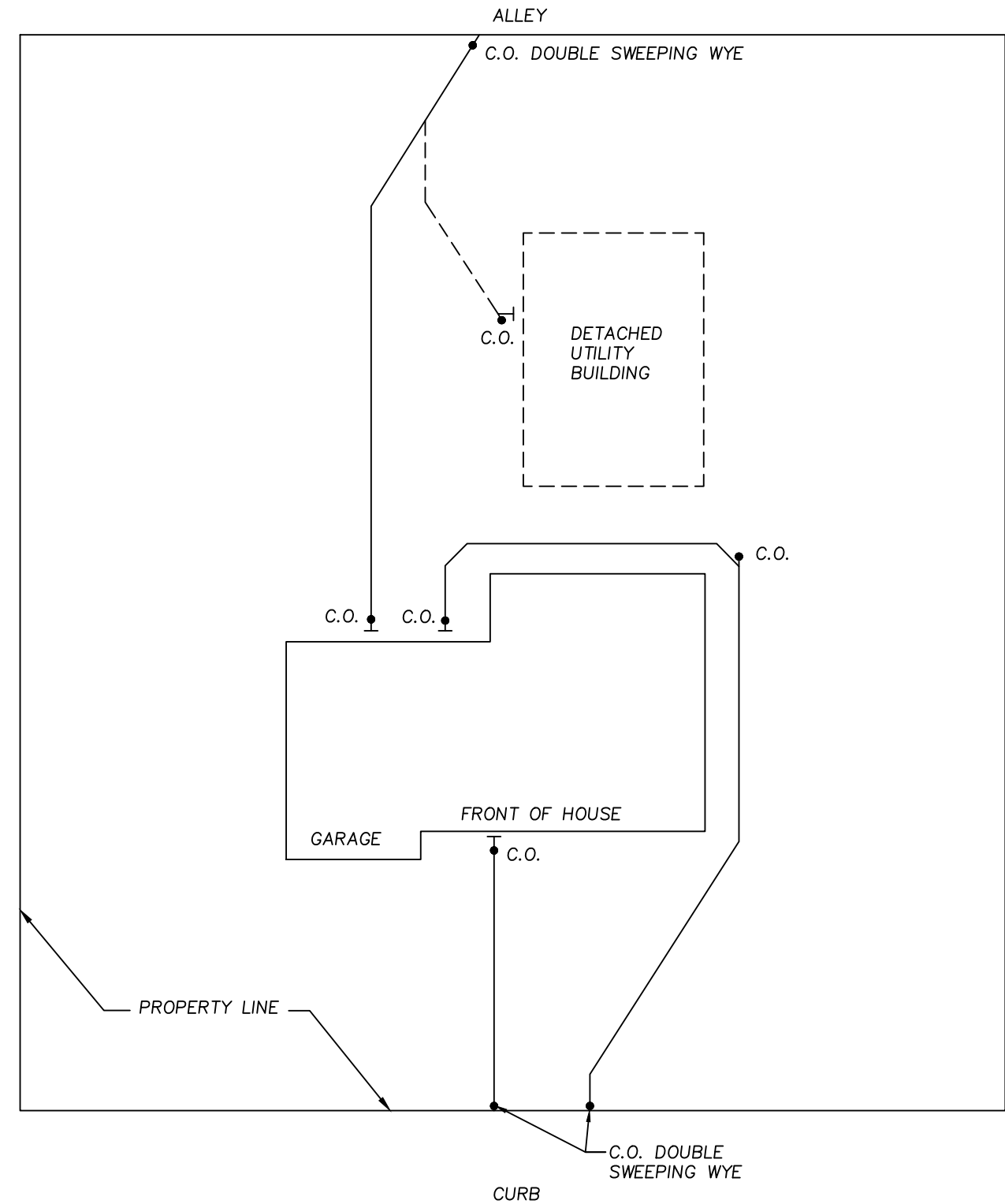
K.A.R.

CHKD:

T.E.G.

SCALE:

NONE



CITY OF CASTLE ROCK

SEWER DIAGRAM
EXAMPLE

APPROVED:

David Vora

07-20-20

DWG. NO.

CR033SS

BY CITY

DATE

DATE:

12/19

DRWN:

K.A.R.

CHKD:

T.E.G.

SCALE:

NONE