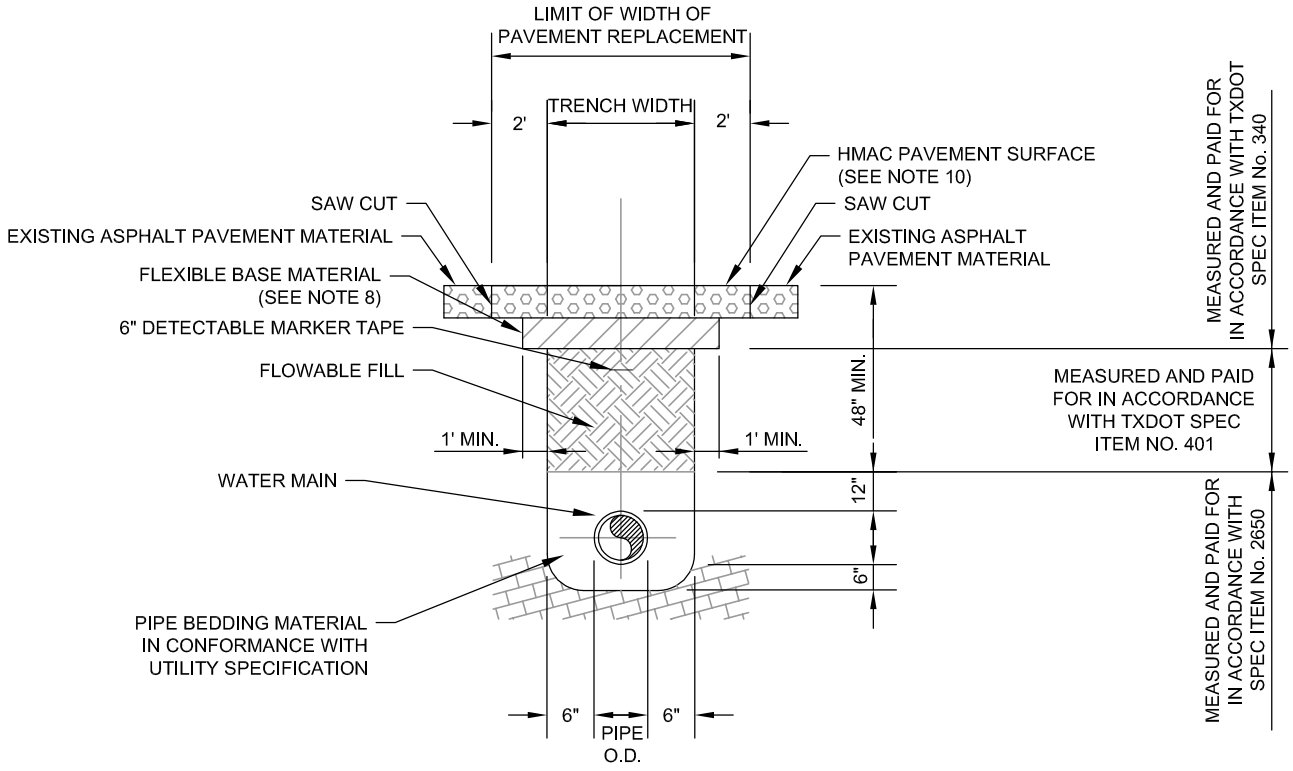


TRENCH AND BACKFILL NOTES:

1. ADEQUATE BARRICADES & WARNING SIGNS SHALL BE ERECTED BEFORE ANY WORK IS STARTED IN PUBLIC RIGHT-OF-WAY.
2. THE ROADWAY SHALL BE CUT ONLY WHERE REQUIRED.
3. NO MORE THAN HALF OF THE WIDTH OF THE ROAD SHALL BE CUT & OPENED AT ONE TIME.
4. REFER TO SPECIFICATIONS FOR ANY SPECIAL REQUIREMENTS OR CONDITIONS
5. BACKFILL SHALL BE COMPLETED IMMEDIATELY AFTER PIPELINE LAYING WITHIN PUBLIC RIGHT-OF-WAYS OR CROSSING PUBLIC RIGHT-OF-WAYS & PRIVATE DRIVEWAYS.
6. THE EXISTING PAVING SURFACE SHALL BE SAW CUT IN A STRAIGHT LINE A MINIMUM OF 12" WIDER THAN UNDISTURBED SIDE OF THE TRENCH ASYMMETRICAL ABOVE THE CENTER LINE OF THE EXCAVATION.
7. ANY CONCRETE PAVING SHALL BE SAW CUT 6" WIDER THAN UNDISTURBED SIDES OF THE EXCAVATION.
8. LOCAL STREETS SHALL BE 10" AND MAJOR/MINOR STREETS SHALL BE 12" THICK. BASE MATERIAL SHALL BE PLACED 2' WIDER THAN TRENCH WIDTH ON BOTH SIDES. FLEXIBLE BASE SHALL BE TXDOT ITEM 247 TYPE A, GRADE 1.
9. DAMAGED PAVEMENT OUTSIDE THE TRENCH CUT SHALL BE REMOVED AND REPLACED WITH A BASE. THICKNESS OF 10" OR A THICKNESS MATCHING EXISTING, WHICHEVER IS GREATER, AT NO ADDITIONAL COST TO THE OWNER.
10. REPLACEMENT AC SURFACE LAYER SHALL BE OF THE TYPE AND THICKNESS BASED ON FUNCTIONAL CLASSIFICATION.
    A. MIN. 2" HMAC SHALL BE TXDOT ITEM 340, TYPE D FOR TRENCH REPAIR IN LOCAL/RESIDENTIAL STREETS AND DRIVEWAYS.
    B. MIN. 3" HMAC SHALL BE TXDOT ITEM 340, TYPE D FOR TRENCH REPAIR IN COLLECTION/ARTERIAL STREETS.

TRENCH SAFETY NOTES

1. TRENCH SAFETY SYSTEM, SHORING OR SIDE SLOPE TO BE IN ACCORDANCE WITH OSHA STANDARDS.
2. TRENCH SAFETY SYSTEM PLAN TO BE PROVIDED BY CONTRACTOR PRIOR TO CONSTRUCTION.

NOT TO SCALE

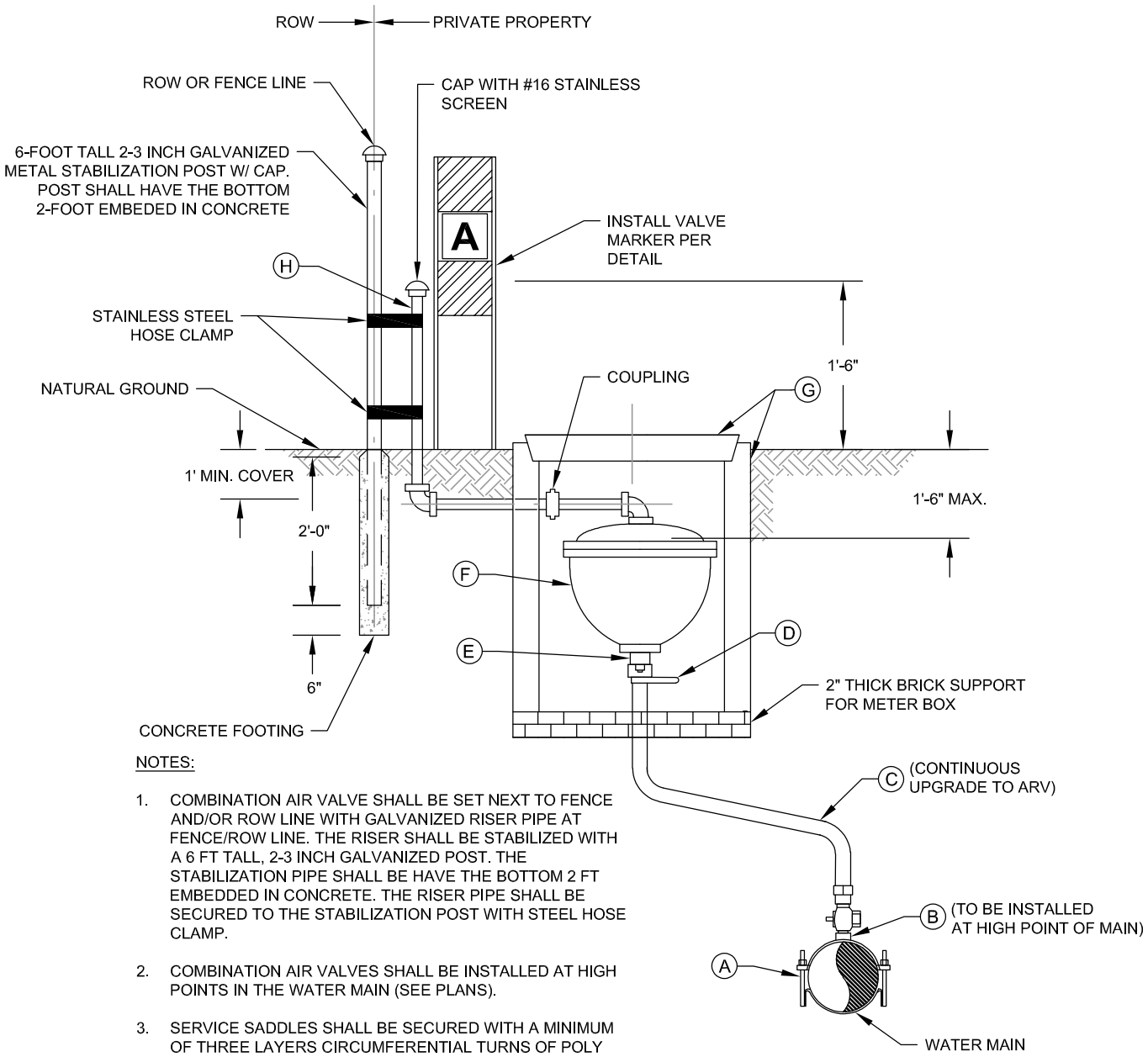
PROPERTY OF CRYSTAL CLEAR Est. 1964 Special Utility District

ASPHALT PAVEMENT AND DRIVEWAY (TRENCH REPAIR)

M&S ENGINEERING
POWER & UTILITY ENGINEERS
TXENG FIRM #F-1394 | TBPELS FIRM #10169800
www.MSENGR.com | 830-228-5446

APPROVED	REVISION
OCT 2018	OCT 2025

SHEET 1 OF 1



NOTES:

1. COMBINATION AIR VALVE SHALL BE SET NEXT TO FENCE AND/OR ROW LINE WITH GALVANIZED RISER PIPE AT FENCE/ROW LINE. THE RISER SHALL BE STABILIZED WITH A 6 FT TALL, 2-3 INCH GALVANIZED POST. THE STABILIZATION PIPE SHALL BE HAVE THE BOTTOM 2 FT EMBEDDED IN CONCRETE. THE RISER PIPE SHALL BE SECURED TO THE STABILIZATION POST WITH STEEL HOSE CLAMP.
2. COMBINATION AIR VALVES SHALL BE INSTALLED AT HIGH POINTS IN THE WATER MAIN (SEE PLANS).
3. SERVICE SADDLES SHALL BE SECURED WITH A MINIMUM OF THREE LAYERS CIRCUMFERENTIAL TURNS OF POLY TAPE.

TAP MATERIAL LIST		MATERIAL LIST SIZES	
LABEL	ITEM	1-INCH TAP	2-INCH TAP
A	APPROVED TAPPING SADDLE	1"	2"
B	CORPORATION STOP	1"	2"
C	CTS SDR9 HDPE TUBING	1"	2"
D	BRASS BALL VALVE WITH LEVER	1"	2"
E	BRASS NIPPLE THREADED	1"	2"
F	COMBINATION AIR VALVE	PER AEL*	
G	METER BOX AND LID	DFW2830FD OR DFW2836FD**	
H	GALVANIZED IRON PIPE AND FITTINGS	1"	2"

* AEL = APPROVED EQUIPMENT LIST
** METER BOX TO BE INSTALLED AS NECESSARY TO COVER FULL DEPTH OF COMBINATION AIR RELEASE VALVE.

NOT TO SCALE

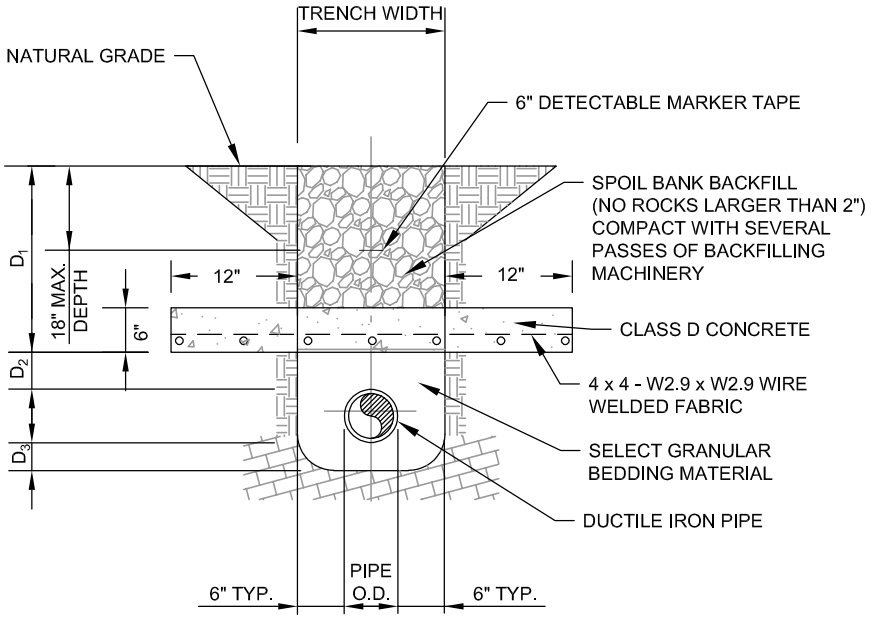
PROPERTY OF CRYSTAL CLEAR Est. 1964 Special Utility District

COMBINATION AIR VALVE DETAIL

M&S ENGINEERING
POWER & UTILITY ENGINEERS
TXENG FIRM #F-1394 | TBPELS FIRM #10169800
www.MSENGR.com | 830-228-5446

APPROVED	REVISION
JUN 2015	OCT 2020

SHEET 1 OF 1



	D_1	D_2	D_3
4" OR SMALLER	36"	6"	4"
6"-8"	30"	12"	6"
12" OR LARGER	42"	12"	6"

NOTES

1. SEE PLANS FOR PIPE DIAMETER AND LENGTH WITH RESTRAINED PUSH-ON JOINTS.
2. WRAP DUCTILE IRON PIPE IN POLYWRAP AND SECURE WITH POLYTAPE.
3. CENTER JOINT OF PIPE ON CROSSING CENTERLINE.

TRENCH SAFETY NOTES

1. TRENCH SAFETY SYSTEM, SHORING OR SIDE SLOPE TO BE IN ACCORDANCE WITH OSHA STANDARDS.
2. TRENCH SAFETY SYSTEM PLAN TO BE PROVIDED BY CONTRACTOR PRIOR TO CONSTRUCTION.

NOT TO SCALE

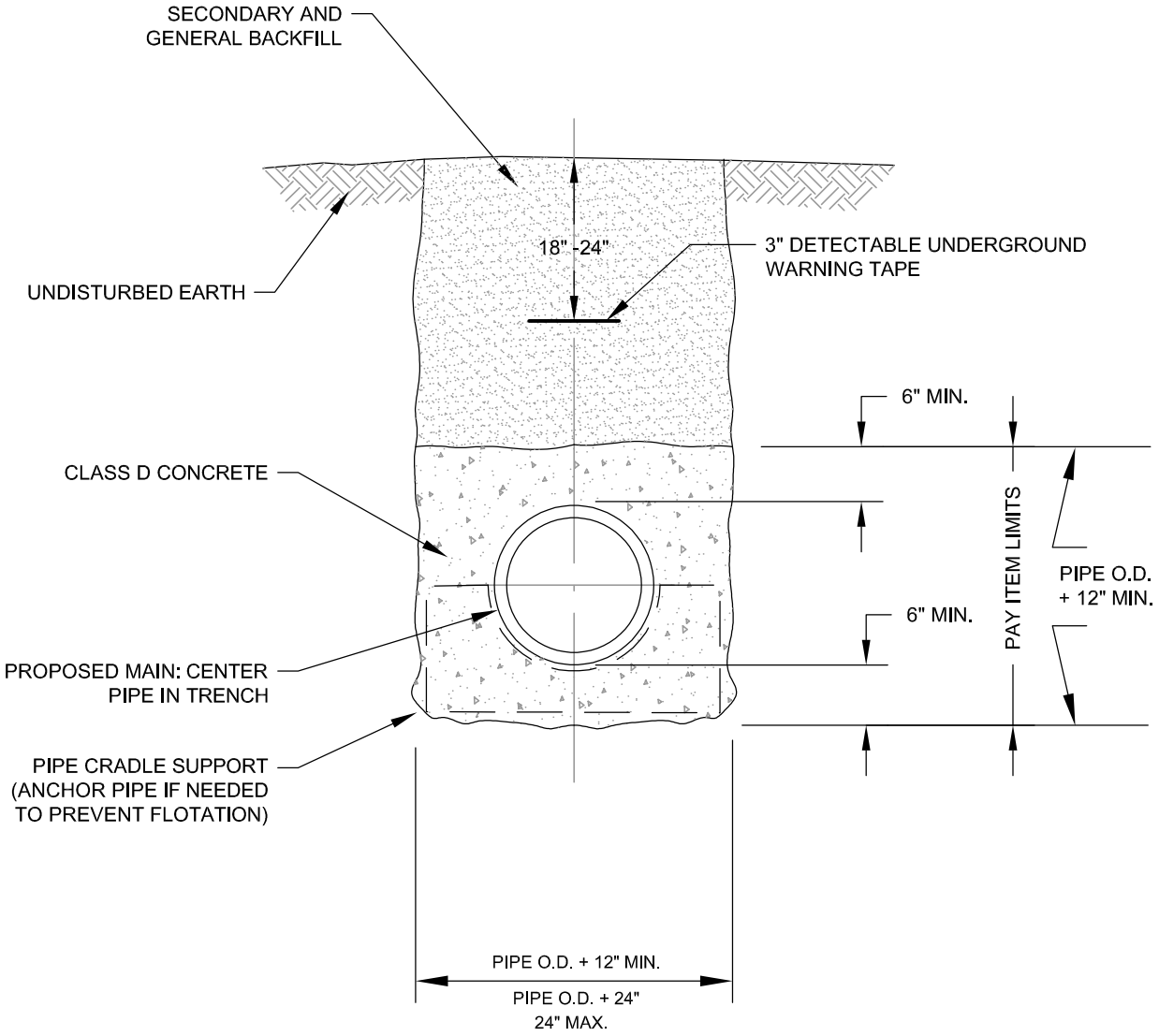
PROPERTY OF CRYSTAL CLEAR Est. 1964 Special Utility District

CONCRETE CAP DETAIL

M&S ENGINEERING
POWER & UTILITY ENGINEERS
TXENG FIRM #F-1394 | TBPELS FIRM #10169800
www.MSENGR.com | 830-228-5446

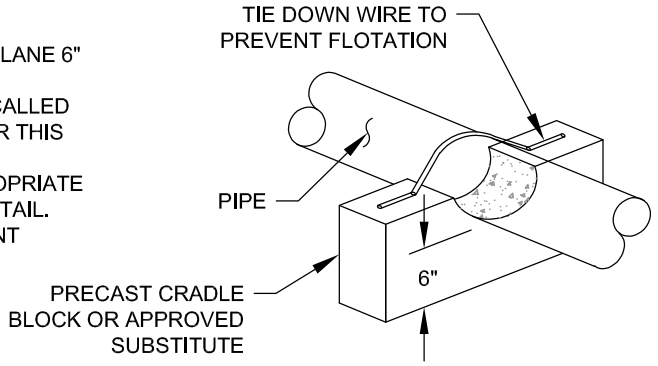
APPROVED	REVISION
OCT 2025	

SHEET 1 OF 1



CONCRETE ENCASEMENT

NOTES:
1. ALL CONCRETE ENCASEMENT SHALL BE POURED AT A PLANE 6" ABOVE THE PIPE BETWEEN EXCAVATED TRENCH WALL.
2. CONCRETE ENCASEMENT WILL BE USED ONLY WHERE CALLED OUT IN THE PLANS AND LIMITS OF PAYMENT WILL BE PER THIS DETAIL.
3. BACKFILL AND RESTORATION WORK WILL BE PER APPROPRIATE TRENCH DETAIL WITH EMBEDMENT FOLLOWING THIS DETAIL.
4. SUPPORTS ARE SUBSIDIARY TO CONCRETE ENCASEMENT

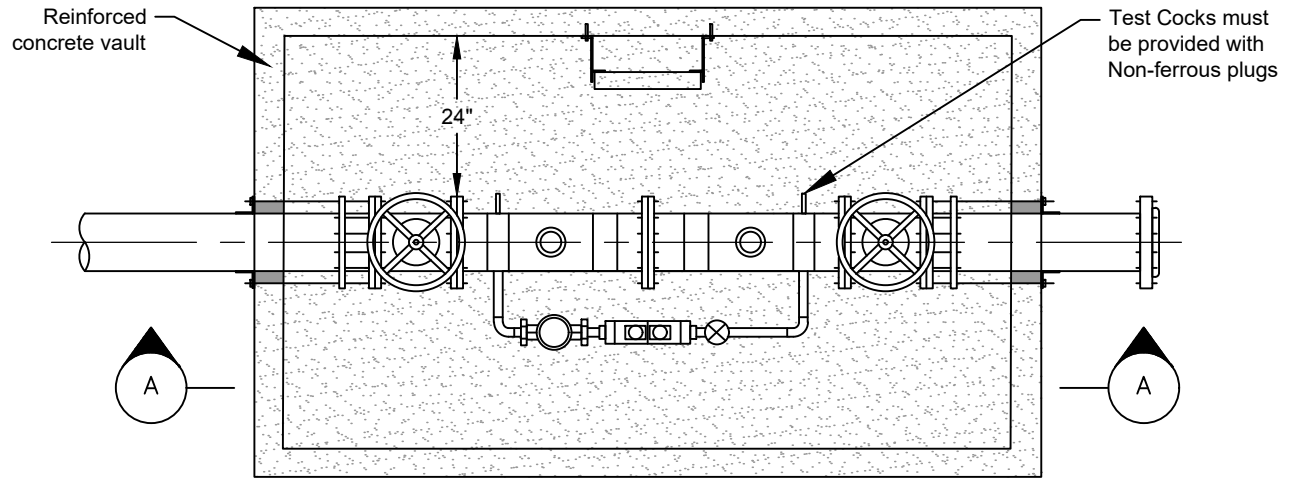


PIPE CRADLE SUPPORT

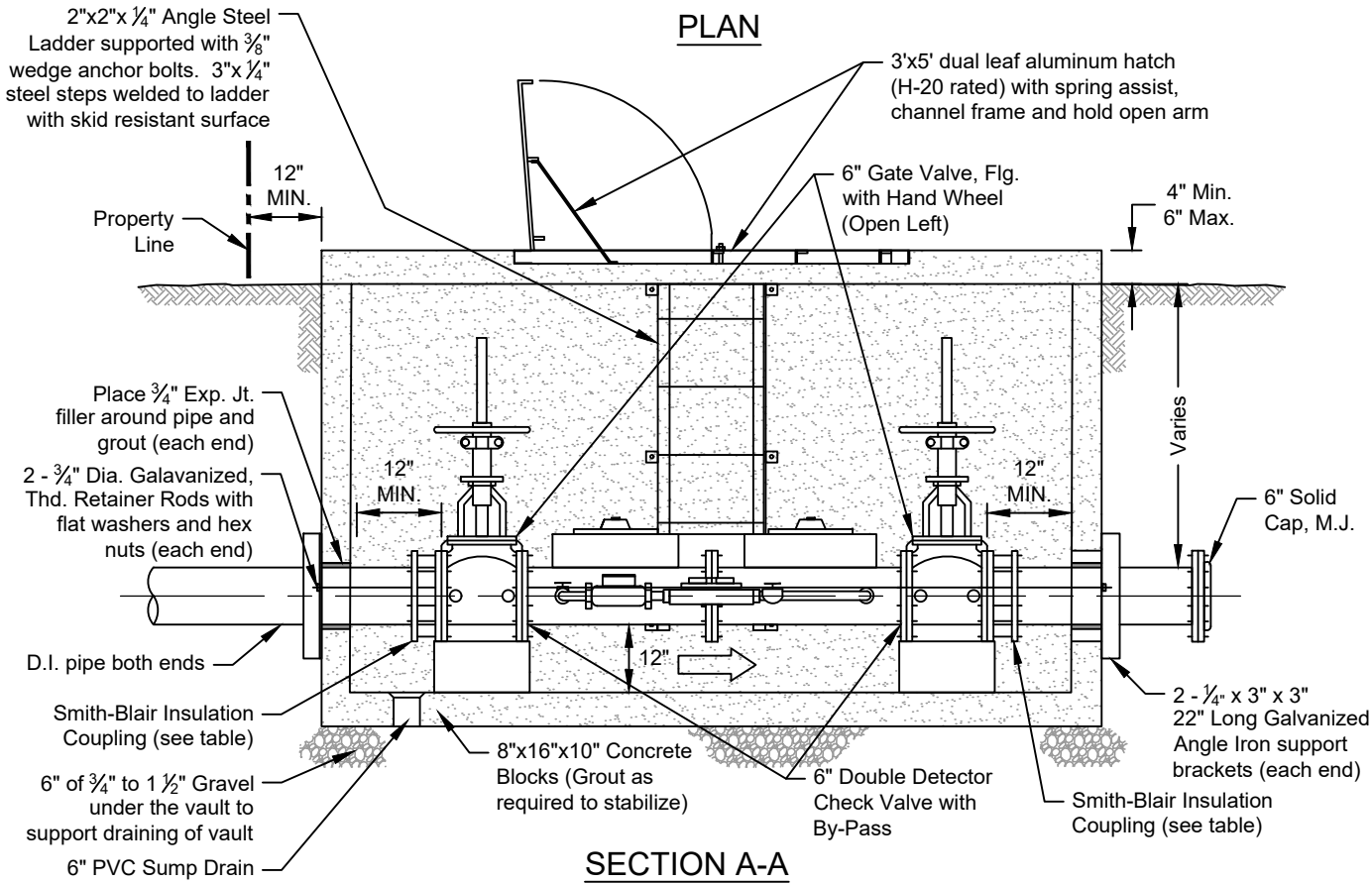
NOT TO SCALE

PROPERTY OF CRYSTAL CLEAR Est. 1964 Special Utility District	CONCRETE ENCASEMENT DETAIL	M&S ENGINEERING POWER & UTILITY ENGINEERS TXENG FIRM #F-1394 | TBPELS FIRM #10169800 www.MSENGR.com | 830-228-5446	APPROVED: MAY 2016 / REVISION: FEB 2022
			SHEET 1 OF 1

PIPE DIAMETER	DOUBLE DETECTOR CHECK	BY-PASS METER	SMITH-BLAIR COUPLING
4"	4"	5/8" - 3/4"	932
6"	6"	5/8" - 3/4"	932
8"	8"	5/8" - 3/4"	932



PLAN



SECTION A-A
N.T.S.

NOTES:

1. APPROVED ASSEMBLIES ARE REQUIRED TO HAVE RESILIENT SEATED SHUT-OFF VALVES AND TEST COCKS AS INTEGRAL PARTS OF THE ASSEMBLIES, OTHERWISE APPROVAL IS VOIDED.
2. THE BYPASS METER WILL BE SUPPLIED BY CCSUD AND PAID FOR BY THE CUSTOMER.
3. NO CONNECTIONS OR TEES WILL BE ALLOWED BETWEEN SERVICE CONNECTION AND ASSEMBLY.
4. FOR ADDITIONAL INFORMATION, REFER TO CCSUD WATER DESIGN CRITERIA AND TECHNICAL SPECIFICATIONS.

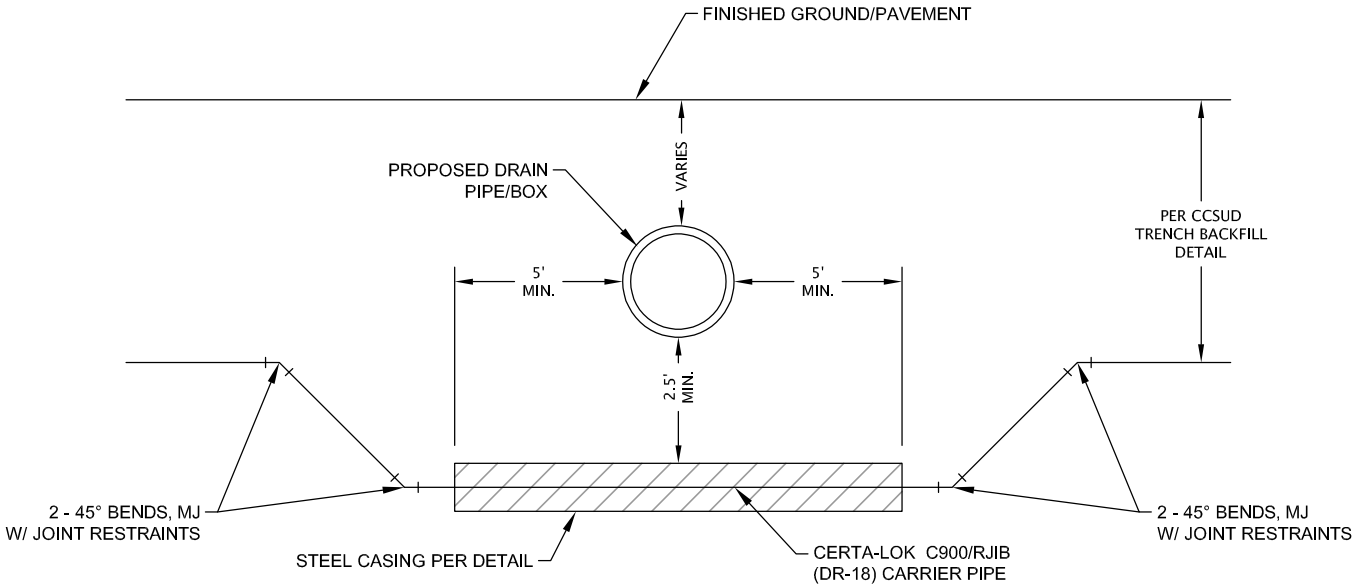
PROPERTY OF CRYSTAL CLEAR Est. 1964 Special Utility District

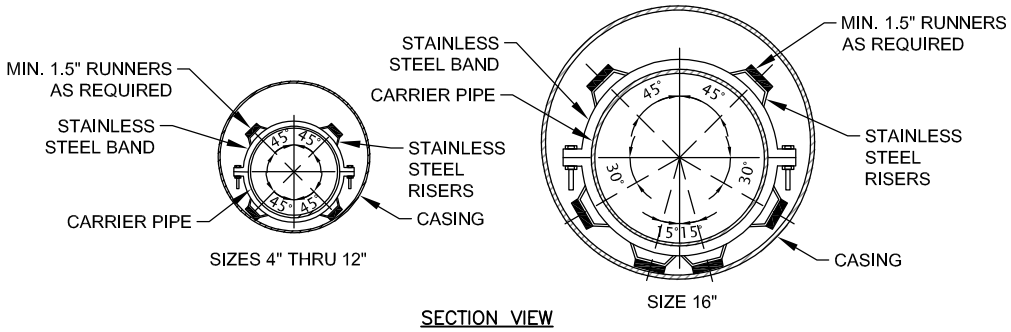
DOUBLE CHECK DETECTOR ASSEMBLY (DCDA) DETAIL

M&S ENGINEERING
POWER & UTILITY ENGINEERS
TXENG FIRM #F-1394 | TBPELS FIRM #10169800
www.MSENGR.com | 830-228-5446

APPROVED	REVISION
DEC 2022	JUN 2023

SHEET 1 OF 1





SECTION VIEW

Carrier Pipe (DR 18)	Casing Size	Steel Casing (0.375 IN Wall)	Casing Spacers	
Nominal Size (IN)		Inside Diameter (IN)	Min. Band Width (IN)	No. of Runners Per Tie
4	16	15.25	7	2 TOP, 2 BOTTOM
6	16	15.25	7	2 TOP, 2 BOTTOM
8	24	23.25	7	2 TOP, 2 BOTTOM
12	24	23.25	7	2 TOP, 2 BOTTOM
16	30	29.25	7	2 TOP, 4 BOTTOM

NOTES:

1. POLYVINYL CHLORIDE (PVC) CARRIER PIPE THAT IS 4-INCH IN DIAMETER SHALL BE C900 DR 18, FULLY RESTRAINED THROUGH THE CASING. POLYVINYL CHLORIDE (PVC) CARRIER PIPE SHALL BE CERTA-LOK C900/RJIB (DR 18) FOR 6-INCH TO 12-INCH AND CERTA-LOK C905/RJ (OR APPROVED EQUAL) FOR 16-INCH TO 24-INCH PIPE DIAMETERS.
2. STEEL CASING SHALL BE STANDARD WEIGHT OR HEAVIER PIPE CONFORMING TO ASTM A-36, ASTM A-568, ASTM A-135, ASTM A-139 OR OTHER ACCEPTABLE STANDARD SPECIFICATION. PIPE JOINTS SHALL BE WELDED IN ACCORDANCE WITH AWWA C-206.
3. SUBSEQUENT CASING SPACERS ARE REQUIRED FOR 4" TO 14" PIPE SIZES TO BE AT 10 FEET APART AND FOR 16" TO 30" PIPE SIZES TO BE AT 8 FEET APART WITHIN THE CASING WITH AT LEAST 3 SPACERS PER JOINT ON PIPE. ONE CASING SPACER SHALL BE REPLACED WITHIN 2 FEET OF ENDS OF CASING FOR ALL PIPE SIZES.
4. CASING SPACERS SHALL BE MADE FROM T-304 STAINLESS STEEL OF A MINIMUM 14 GAUGE THICKNESS.
5. CASING SPACERS SHALL HAVE A SYNTHETIC RUBBER OR PVC LINER TO INSULATE THE PIPELINE FROM THE SPACER.
6. CASING SPACERS SHALL HAVE A MIN. 1.5" WIDE GLASS REINFORCED PLASTIC OR UHMW POLYMER RUNNERS TO INSULATE THE SPACER FROM THE CASING.

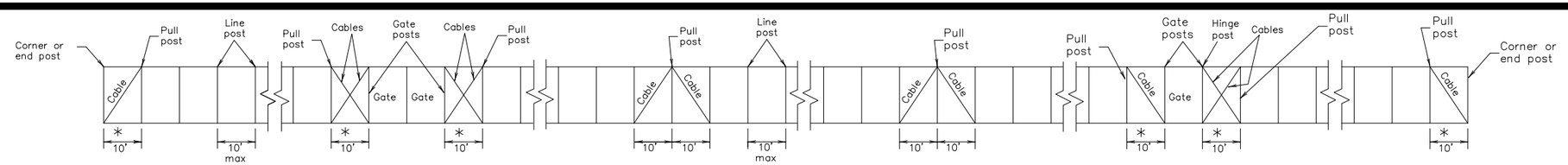
PROPERTY OF CRYSTAL CLEAR Est. 1964 Special Utility District

DRAINAGE CROSSING DETAIL

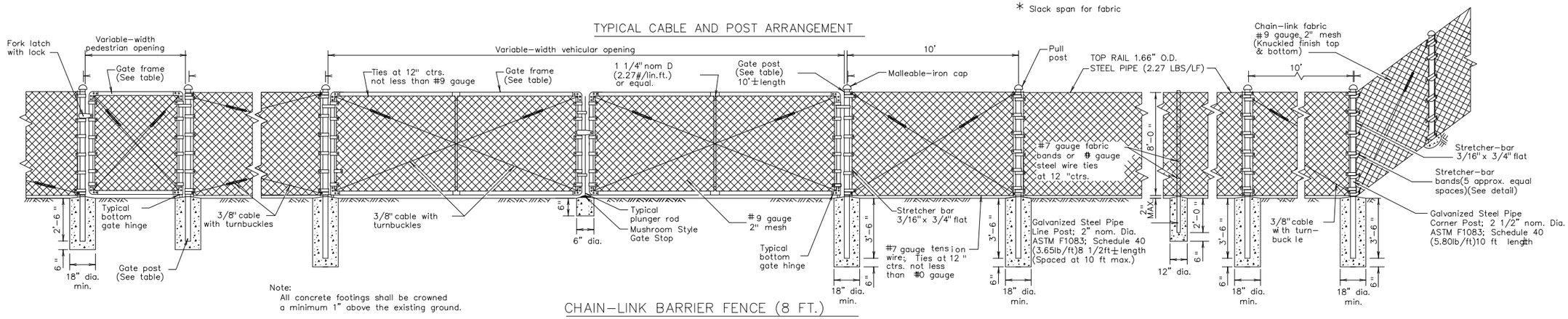
M&S ENGINEERING
POWER & UTILITY ENGINEERS
TXENG FIRM #F-1394 | TBPELS FIRM #10169800
www.MSENGR.com | 830-228-5446

APPROVED	REVISION
OCT 2025	

SHEET 1 OF 1

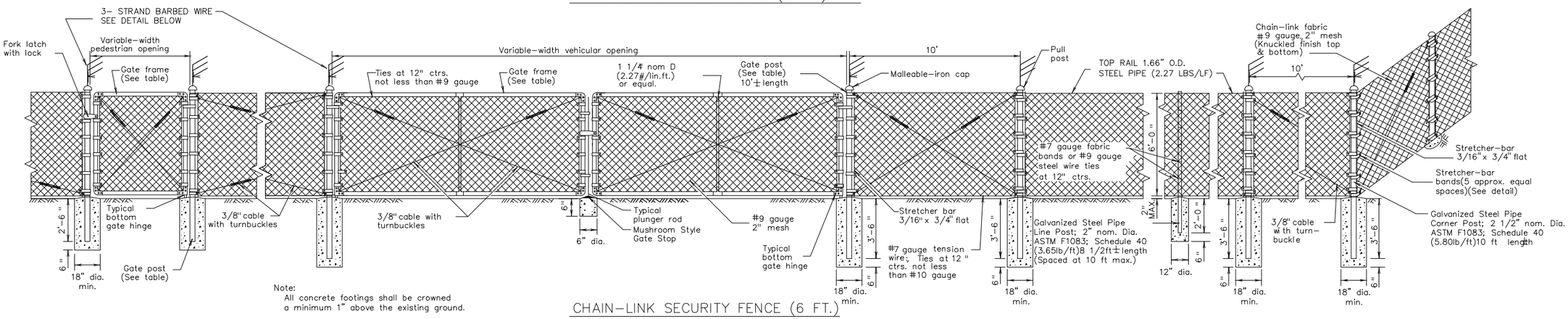


TYPICAL CABLE AND POST ARRANGEMENT



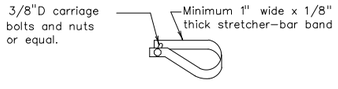
Note:
All concrete footings shall be crowned a minimum 1" above the existing ground.

CHAIN-LINK BARRIER FENCE (8 FT.)



Note:
All concrete footings shall be crowned a minimum 1" above the existing ground.

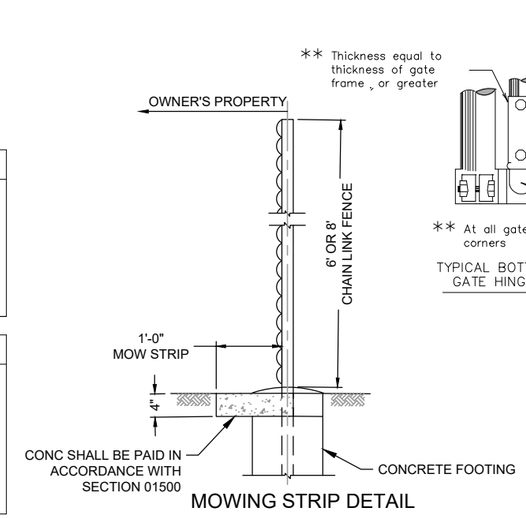
CHAIN-LINK SECURITY FENCE (6 FT.)



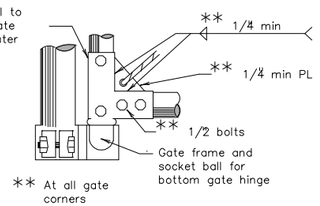
TYPICAL STRETCHER-BAR BAND

GATE (TYPES AND SIZES)	
Single Inclusive: Up to 6' / Over 6' to 12' / Over 12' to 18' / Over 18'	Double Inclusive: Up to 12' / Over 12' to 26' / Over 26' to 36' / Over 36'

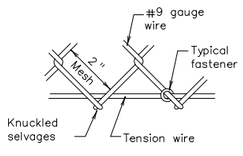
GATE FRAME (WEIGHT)		GATE POST (WEIGHT)	
SIZE	WT./LIN. FT.	SIZE	WT./LIN. FT.
1 1/2" nom dia. or equal	2.72 Lbs.	2 1/2" nom dia. or equal	5.79 Lbs.
		3 1/2" nom dia. or equal	9.11 Lbs.
		6" nom dia.	18.97 Lbs.
		8" nom dia.	24.70 Lbs.



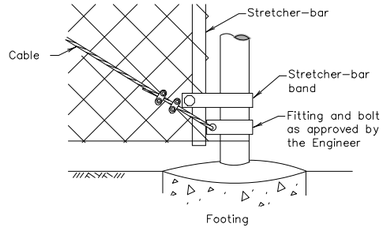
MOWING STRIP DETAIL



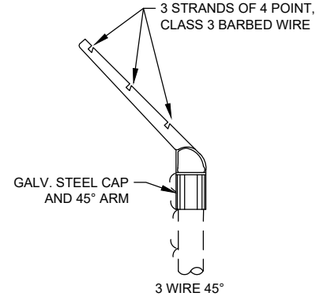
TYPICAL BOTTOM GATE HINGE



FABRIC & TENSION WIRE DETAIL, BOTTOM ONLY



TERMINAL POST DETAIL



3 WIRE 45° BARBED WIRE ARM FOR CHAIN LINK SECURITY FENCE

GENERAL NOTES:

1. ITEMS HEREON SHALL CONFORM TO SECTION 1800, "CHAIN LINK FENCE".
2. TYPICAL INSTALLATION PLAN MAY VARY AS SHOWN ELSEWHERE ON THE PLANS OR AS DIRECTED BY THE ENGINEER. LOCATION OF GATES SHOWN ON PLANS.
3. GATE-FRAME MEMBERS SHALL BE BOLTED AT FRAME CORNERS TO JOINT FITTINGS WITH FOUR 1/2" BOLTS PER JOINT.
4. ALL CABLE CONNECTIONS ARE TO BE MADE WITH TWO 3/8" CABLE CLAMPS.
5. ALL PULL POSTS AND END POSTS AND THEIR FOUNDATIONS SHALL HAVE THE SAME RESPECTIVE DIMENSIONS AS THOSE SHOWN FOR CORNER POSTS.
6. ALL PULL POST SHALL BE FURNISHED WITH TWO STRETCHER BARS.
7. ONE END OF EACH TURNBUCKLE MAY BE ATTACHED DIRECTLY TO FITTINGS WITH A CLEVIS.
8. CONCRETE FOOTINGS ARE TO BE CROWNED AT THE TOP TO SHED WATER.

NOT TO SCALE

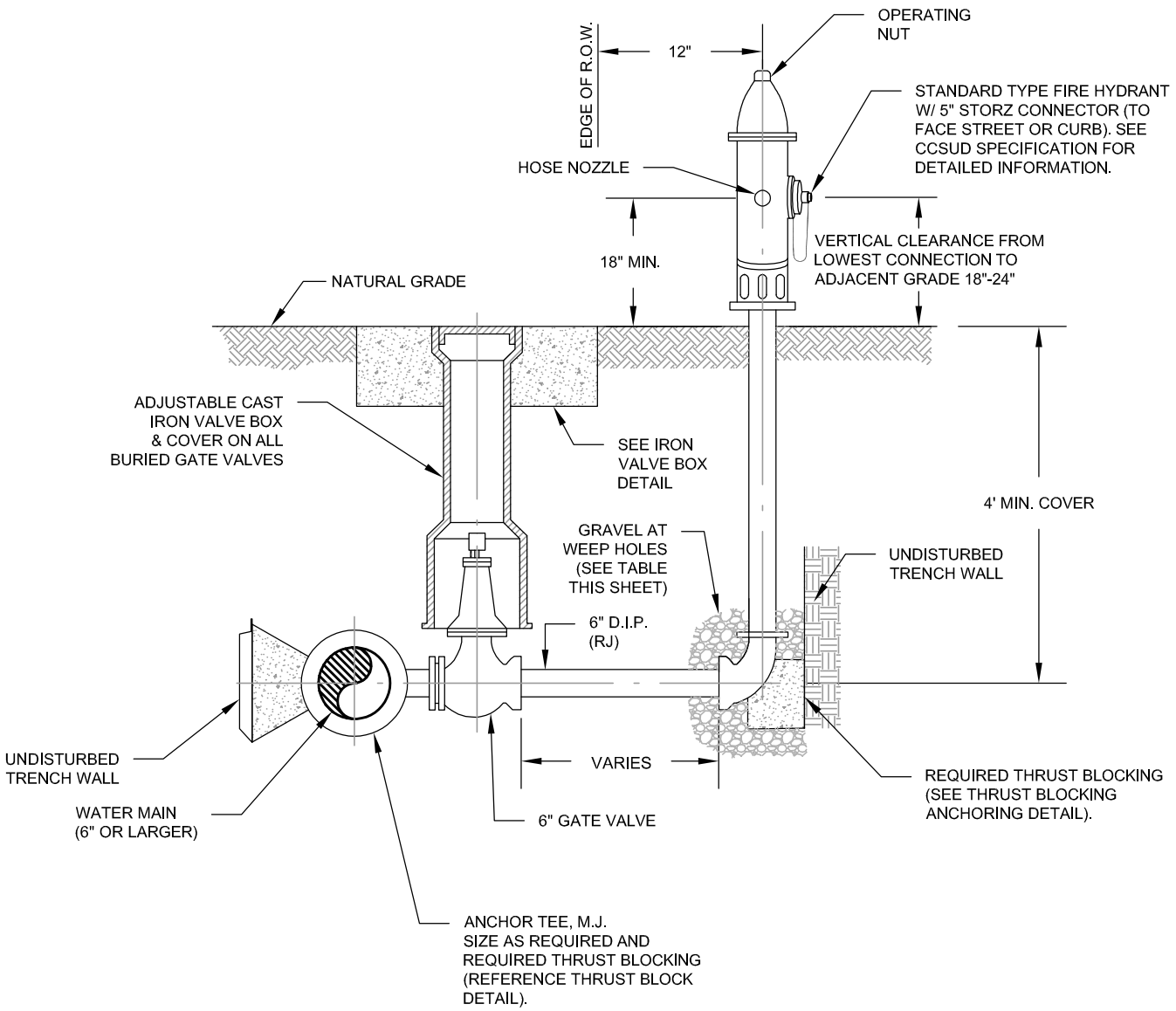
PROPERTY OF CRYSTAL CLEAR Est. 1964 Special Utility District

CHAIN LINK FENCE DETAIL

M&S ENGINEERING
POWER & UTILITY ENGINEERS
TXENG FIRM # F-1394 | TBPELS FIRM #10169800
WWW.MSENGR.COM | (830) 228-5446

APPROVED	REVISION
JUL 2024	

SHEET 1 OF 1



GRAVEL AT WEEPHOLE	
LENGTH OF HYDRANT RISER	CU. FT. OF GRAVEL REQUIRED
3'	2.5
4'	3
5'	3.5
6'	4
>6'	TBD BY CCSUD

NOTE:

1. THE EARTHBEARING SURFACE SHALL BE THE UNDISTURBED TRENCH WALL.
2. ALL PIPE JOINTS SHALL BE KEPT FREE FROM CONCRETE.
3. POLYWRAP SHALL BE SECURED WITH A MINIMUM OF THREE CIRCUMFERENTIAL TURNS OF POLY TAPE.
4. 12"x12"x4" THICK CONCRETE BLOCKS SHALL BE INSTALLED DIRECTLY UNDER ALL VALVES, FITTINGS, ETC.

NOT TO SCALE

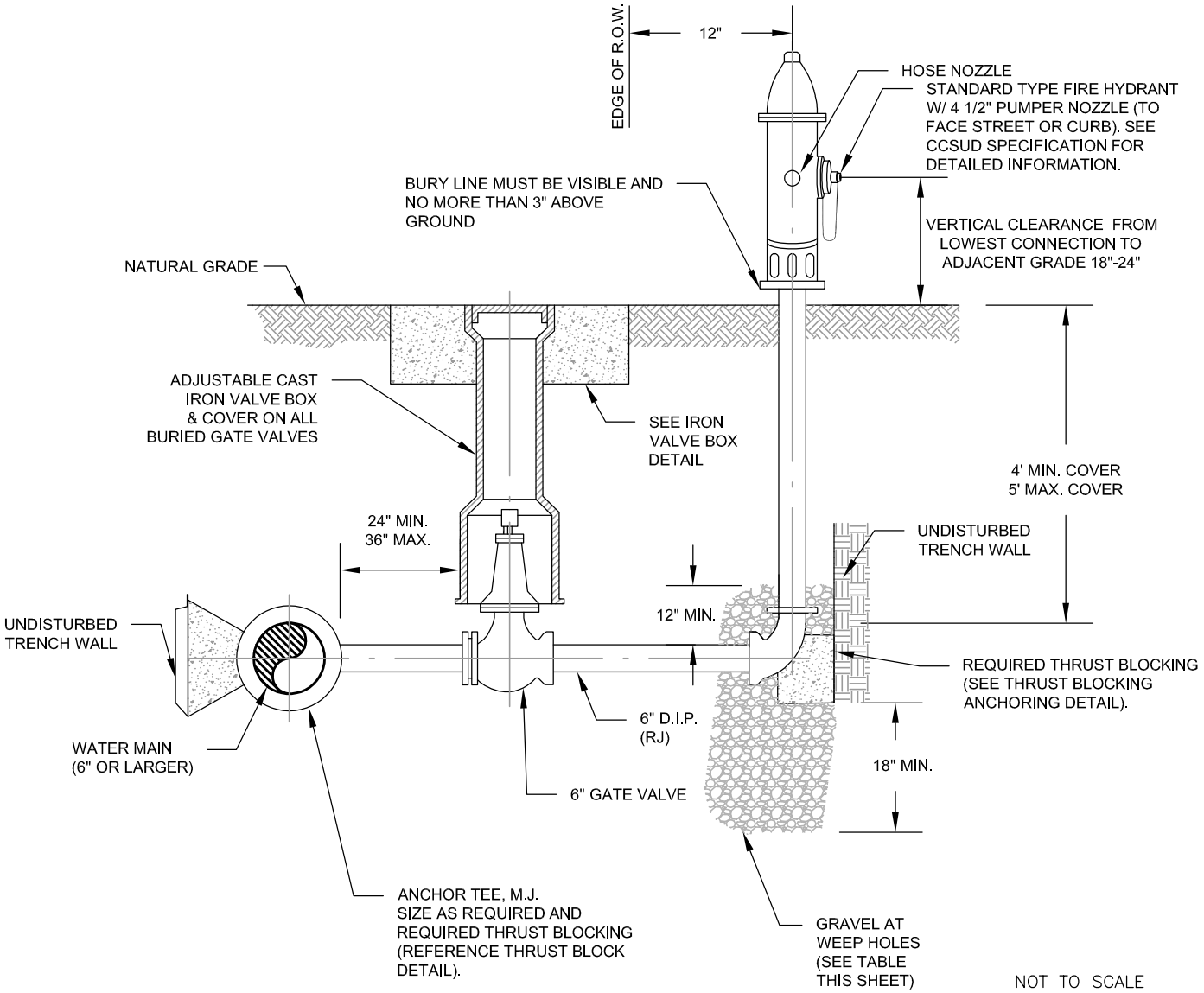
PROPERTY OF CRYSTAL CLEAR Est. 1964 Special Utility District

FIRE HYDRANT ASSEMBLY DETAIL (NEW BRAUNFELS)

M&S ENGINEERING
POWER & UTILITY ENGINEERS
TXENG FIRM #F-1394 | TBPELS FIRM #10169800
www.MSENGR.com | 830-228-5446

APPROVED	REVISION
JUN 2015	NOV 2021

SHEET 1 OF 1



NOT TO SCALE

GRAVEL AT WEEPHOLE	
LENGTH OF HYDRANT RISER	CU. FT. OF GRAVEL REQUIRED
3'	2.5
4'	3
5'	3.5
6'	4
>6'	TBD BY CCSUD

NOTE:

1. THE EARTHBEARING SURFACE SHALL BE THE UNDISTURBED TRENCH WALL.
2. ALL PIPE JOINTS SHALL BE KEPT FREE FROM CONCRETE.
3. ALL FITTINGS AND FITTING JOINTS MUST BE WRAPPED W/ THREE LAYERS OF 8-MIL POLYETHYLENE IN ACCORDANCE WITH AWWA C105-10, OR LATEST REVISION THERE OF.
4. POLYWRAP SHALL BE SECURED WITH A MINIMUM OF THREE CIRCUMFERENTIAL TURNS OF POLY TAPE.
5. THE FIRE HYDRANT SHALL BE PLACED A MINIMUM OF FIVE FEET FROM ALL OBSTRUCTIONS.
6. A BLUE REFLECTIVE PAVEMENT MARKER MUST BE PLACED WITH EVERY FIRE HYDRANT ADJACENT TO A ROADWAY 6" -10" OFF CENTER LINE OF ROAD ON FIRE HYDRANT SIDE.

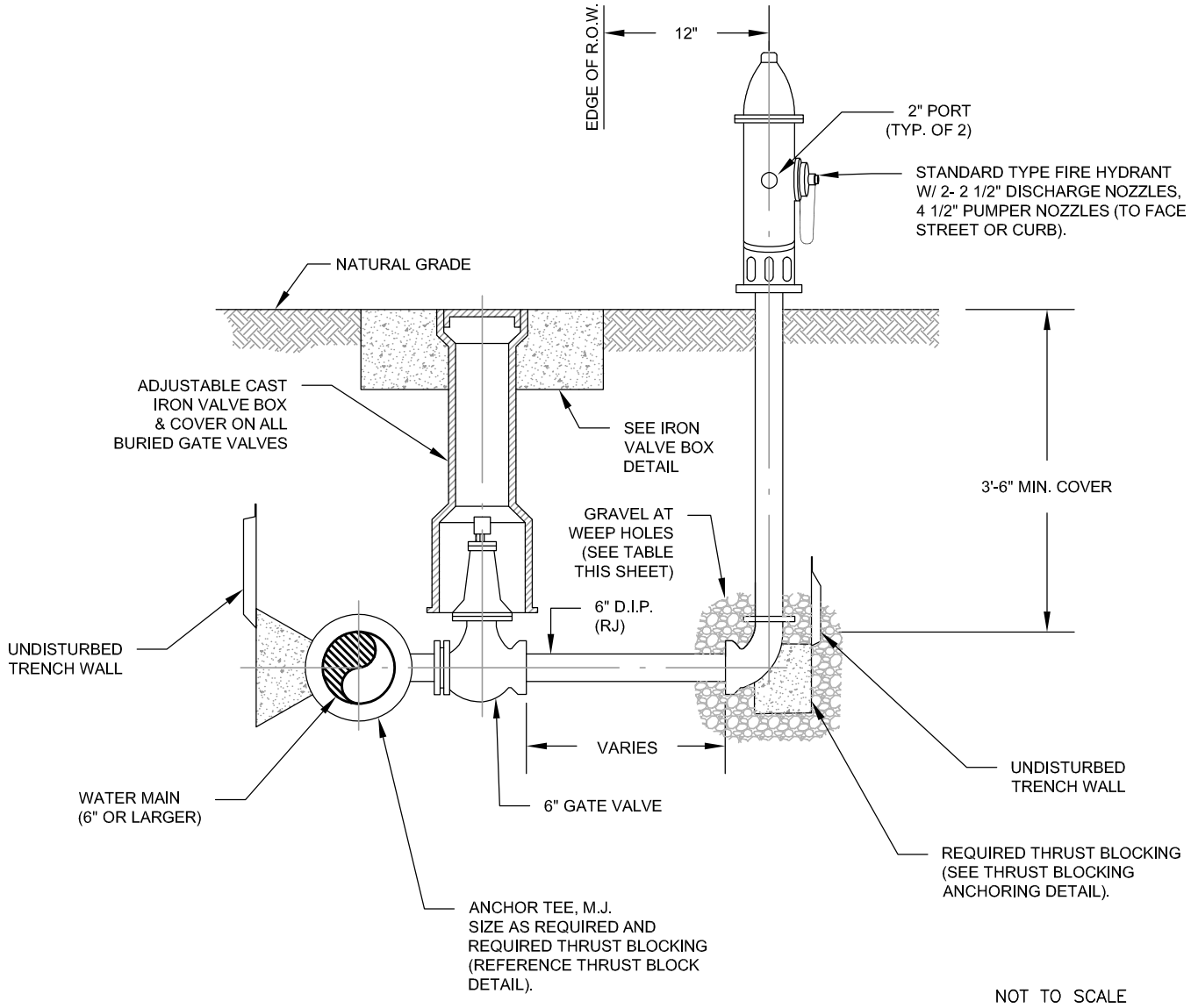
PROPERTY OF CRYSTAL CLEAR Est. 1964 Special Utility District

FIRE HYDRANT ASSEMBLY DETAIL (SAN MARCOS)

M&S ENGINEERING
POWER & UTILITY ENGINEERS
TXENG FIRM #F-1394 | TBPELS FIRM #10169800
www.MSENGR.com | 830-228-5446

APPROVED	REVISION
JUN 2015	JUL 2021

SHEET 1 OF 1



NOT TO SCALE

GRAVEL AT WEEPHOLE	
LENGTH OF HYDRANT RISER	CU. FT. OF GRAVEL REQUIRED
3'	2.5
4'	3
5'	3.5
6'	4
>6'	TBD BY CCSUD

NOTE:

1. THE EARTHBEARING SURFACE SHALL BE THE UNDISTURBED TRENCH WALL.
2. ALL PIPE JOINTS SHALL BE KEPT FREE FROM CONCRETE.
3. ALL FITTINGS AND FITTING JOINTS MUST BE WRAPPED W/ THREE LAYERS OF 8-MIL POLYETHYLENE IN ACCORDANCE WITH AWWA C105-10, OR LATEST REVISION THERE OF.
4. 12"x12"x4" THICK CONCRETE BLOCKS SHALL BE INSTALLED DIRECTLY UNDER ALL VALVES, FITTINGS, ETC.

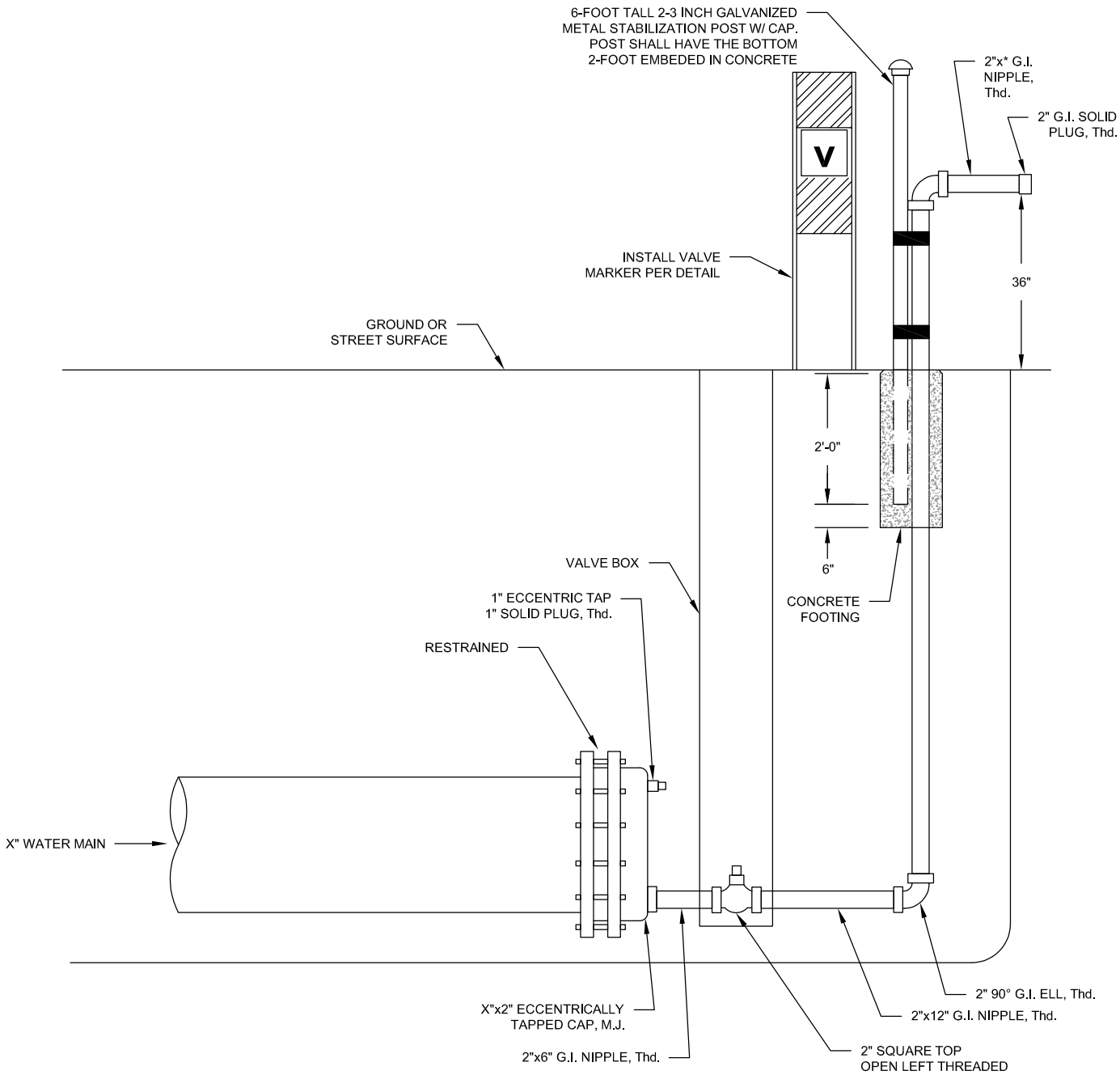
PROPERTY OF CRYSTAL CLEAR Est. 1964 Special Utility District

FIRE HYDRANT DETAIL

M&S ENGINEERING
POWER & UTILITY ENGINEERS
TXENG FIRM #F-1394 | TBPELS FIRM #10169800
www.MSENGR.com | 830-228-5446

APPROVED	REVISION
JUN 2015	JUL 2021

SHEET 1 OF 1



NOTE:

1. BURIED PIPING, FITTINGS, AND FITTINGS JOINTS SHALL BE WRAPPED IN POLYWRAP.
2. THE EARTHBEARING SURFACE SHALL BE THE UNDISTURBED TRENCH WALL.
3. ALL PIPE JOINTS SHALL BE KEPT FREE FROM CONCRETE.
4. POLYWRAP SHALL BE SECURED WITH A MINIMUM OF THREE CIRCUMFERENTIAL TURNS OF POLY TAPE.

NOT TO SCALE

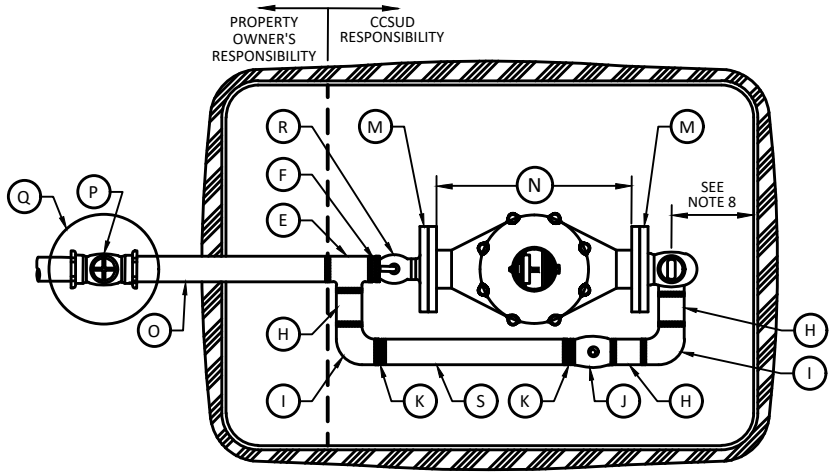
PROPERTY OF CRYSTAL CLEAR Est. 1964 Special Utility District

FLUSH VALVE DETAIL

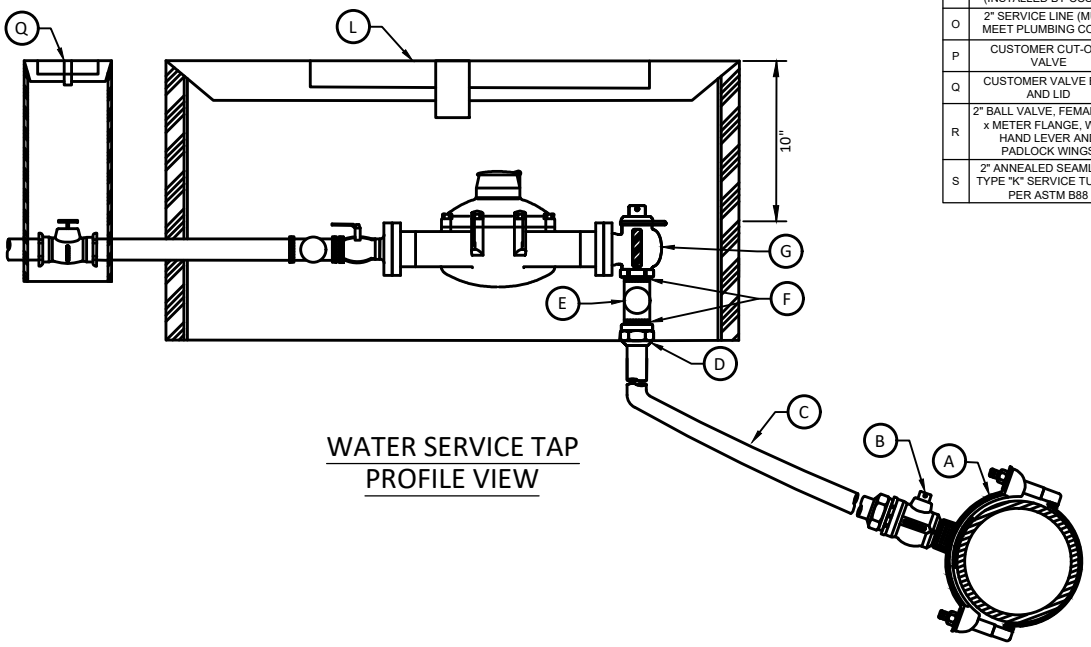
M&S ENGINEERING
POWER & UTILITY ENGINEERS
TXENG FIRM #F-1394 | TBPELS FIRM #10169800
www.MSENGR.com | 830-228-5446

APPROVED	REVISION
OCT 2020	DEC 2024

SHEET 1 OF 1



PLAN VIEW



WATER SERVICE TAP
PROFILE VIEW

1.5 IN AND 2 IN MATERIAL LIST		APPROVED BRAND/MODEL
A	SERVICE SADDLE	FORD/SMITH BLAIR
B	2" GATE VALVE	MATCO/MUELLER
C	2" AWWA C901-SDR-9 WATER SERVICE PIPE	CONTINENTAL
D	2" BRASS COUPLING - COMPRESSION TO MALE IPT	FORD
E	2" BRASS TEE - FEMALE IPT	FORD
F	2" BRASS CLOSE - NIPPLE	FORD
G	2" ANGLE METER STOP, FEMALE IPT x METER FLANGE	FORD
H	2" BRASS NIPPLE	FORD
I	2" BRASS ELBOW, FEMALE IPT	FORD
J	2" LOCKABLE CURB STOP - FEMALE IPT INLET & OUTLET	FORD
K	2" BRASS COUPLING - SERVICE TUBING TO MALE IPT	FORD
L	METER BOX AND LID	DFW PLASTICS
M	2"x1-1/2" BRASS METER ADAPTER (FOR 1-1/2" METER ONLY - NOT SHOWN)	FORD
N	2" WATER METER, LENGTH 17", PURCHASED FROM CCSUD; OR 1.5" WATER METER, LENGTH 13" (INSTALLED BY CCSUD)	KAMSTRUP
O	2" SERVICE LINE (MUST MEET PLUMBING CODE)	
P	CUSTOMER CUT-OFF VALVE	
Q	CUSTOMER VALVE BOX AND LID	
R	2" BALL VALVE, FEMALE IPT x METER FLANGE, WITH HAND LEVER AND PADLOCK WINGS	FORD
S	2" ANNEALED SEAMLESS TYPE "K" SERVICE TUBING PER ASTM B88	

NOTES:

1. WATER SERVICE PIPE SHALL BE POLYETHYLENE PIPE, COPPER TUBING SIZE (CTS), MEETING THE REQUIREMENTS OF AWWA C901 AND NSF 61 CERTIFIED FOR USE WITH POTABLE DRINKING WATER.
2. SERVICE SADDLE SHALL BE WRAPPED COMPLETELY WITH 8 MIL POLYETHYLENE FILM.
3. TOP OF BOXES MUST BE 2" ABOVE GROUND OR FLUSH WITH PAVEMENT SURFACE.
4. ALL 1-1/2" AND 2" METERS SHALL BE INSTALLED ON SEPARATE SERVICE CONNECTIONS.
5. BEDDING AND BACKFILL FOR ALL PIPING, TUBING AND APPURTENANCES SHALL BE PER CCSUD SPECIFICATIONS.
6. SHORT SERVICE METERS SHALL BE PLACED WITH FRONT OF METER BOX 2-FEET BEHIND THE WATER MAIN. LONG SERVICE METERS SHALL BE PLACED WITH FRONT OF METER BOX 2-FEET BEHIND THE PROPERTY LINE. ALL METERS SHALL BE PLACED WITHIN THE CCSUD EASEMENT.
7. METER BOXES SHALL NOT BE PLACED IN SIDEWALKS, DRIVEWAYS, PARKING AREAS, OR VEHICULAR TRAFFIC AREAS.
8. ANGLE STOP PLACED A MAXIMUM OF 4" FROM BACK OF BOX THAT FACES CURB.
9. SERVICES FOR NON-RESIDENTIAL CUSTOMERS OR IRRIGATION USES SHALL BE EQUIPPED WITH A BACKFLOW PREVENTION ASSEMBLY AS REQUIRED BY THE CCSUD CROSS-CONNECTION AND BACKFLOW CONNECTION PREVENTION PROGRAM. BYPASS NOT PERMITTED ON SERVICES THAT ARE IRRIGATION ONLY.

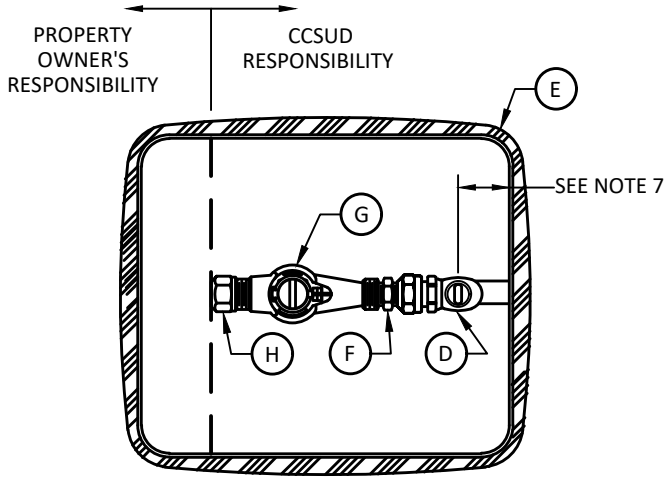
CRYSTAL CLEAR Est. 1964 Special Utility District

LARGE METER DETAIL
1.5-INCH AND 2-INCH

M&S ENGINEERING
POWER & UTILITY ENGINEERS
TXENG FIRM # F-1394 | TBPELS FIRM #10169800
WWW.MSENGR.COM | (830) 228-5446

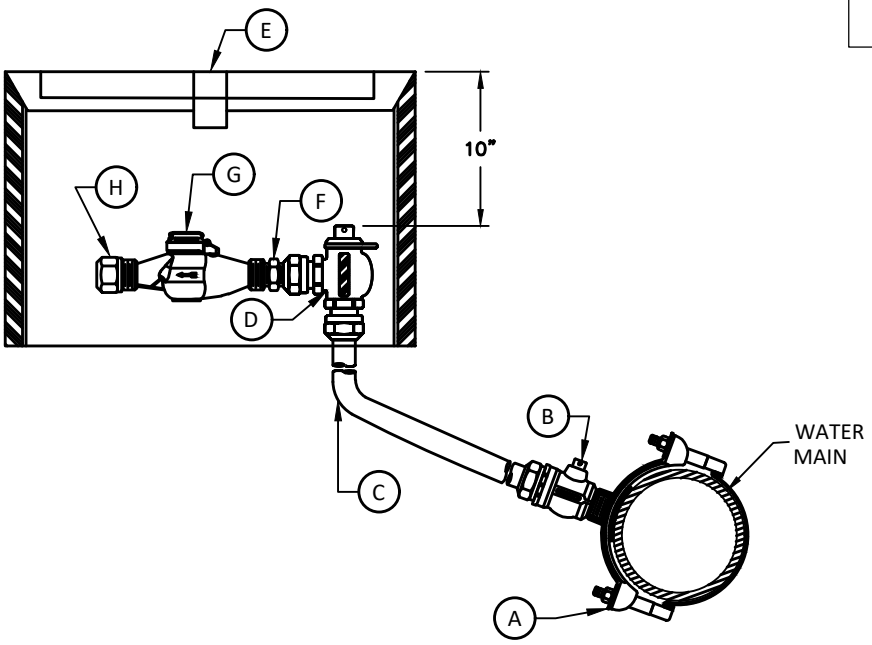
APPROVED	REVISION
OCT 2025	

SHEET
1 OF 1

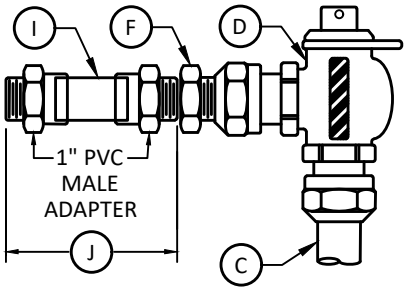


PLAN VIEW

1 IN MATERIAL LIST		APPROVED BRAND/MODEL
A	1" SERVICE SADDLE	FORD
B	1" CORPORATION STOP	FORD
C	POLYETHYLENE AWWA, C901-SDR-9	CONTINENTAL
D	1"x1" ANGLE METER STOP	FORD
E	METER BOX AND LID	DFW PLASTICS
F	BRASS METER BUSHING - SIZE AS REQUIRED TO CONNECT ANGLE METER STOP TO METER	FORD
G	WATER METER INSTALLED BY CCSUD	KAMSTRUP
H	BRASS WATER METER COUPLING MALE IPT x SWIVEL COUPLING NUT	FORD
I	1 1/4" THREADED NIPPLE	
J	TEMPORARY METER SPACER (10 3/4" IN LENGTH)	



PROFILE VIEW



PRIOR TO METER INSTALLATION

NOTES:

1. WATER SERVICE PIPE SHALL BE POLYETHYLENE PIPE, COPPER TUBING SIZE (CTS), MEETING THEIR REQUIREMENTS OF AWWA C901 AND NSF 61 CERTIFIED FOR USE WITH POTABLE DRINKING WATER.
2. SERVICE SADDLE SHALL BE WRAPPED COMPLETELY WITH 8 MIL POLYETHYLENE FILM.
3. TOP OF BOXES MUST BE 2" ABOVE GROUND OR FLUSH WITH PAVEMENT SURFACE.
4. BEDDING AND BACKFILL FOR ALL PIPING, TUBING AND APPURTENANCES SHALL BE PER CCSUD SPECIFICATIONS.
5. SHORT SERVICE METERS SHALL BE PLACED WITH FRONT OF METER BOX 2-FEET BEHIND THE WATER MAIN. LONG SERVICE METERS SHALL BE PLACED WITH FRONT OF METER BOX 2-FEET BEHIND PROPERTY LINE. ALL METERS SHALL BE PLACED WITHIN CCSUD EASEMENT.
6. METER BOXES SHALL NOT BE PLACED IN SIDEWALKS, DRIVEWAYS, PARKING AREAS, OR VEHICULAR TRAFFIC AREAS.
7. ANGLE STOP PLACED A MAXIMUM OF 4" FROM BACK OF BOX THAT FACES CURB.
8. SERVICES FOR NON-RESIDENTIAL CUSTOMERS OR IRRIGATION USES SHALL BE EQUIPPED WITH A BACKFLOW PREVENTION ASSEMBLY AS REQUIRED BY THE CCSUD CROSS-CONNECTION AND BACKFLOW PREVENTION PROGRAM. BYPASS NOT PERMITTED ON SERVICES THAT ARE IRRIGATION ONLY.

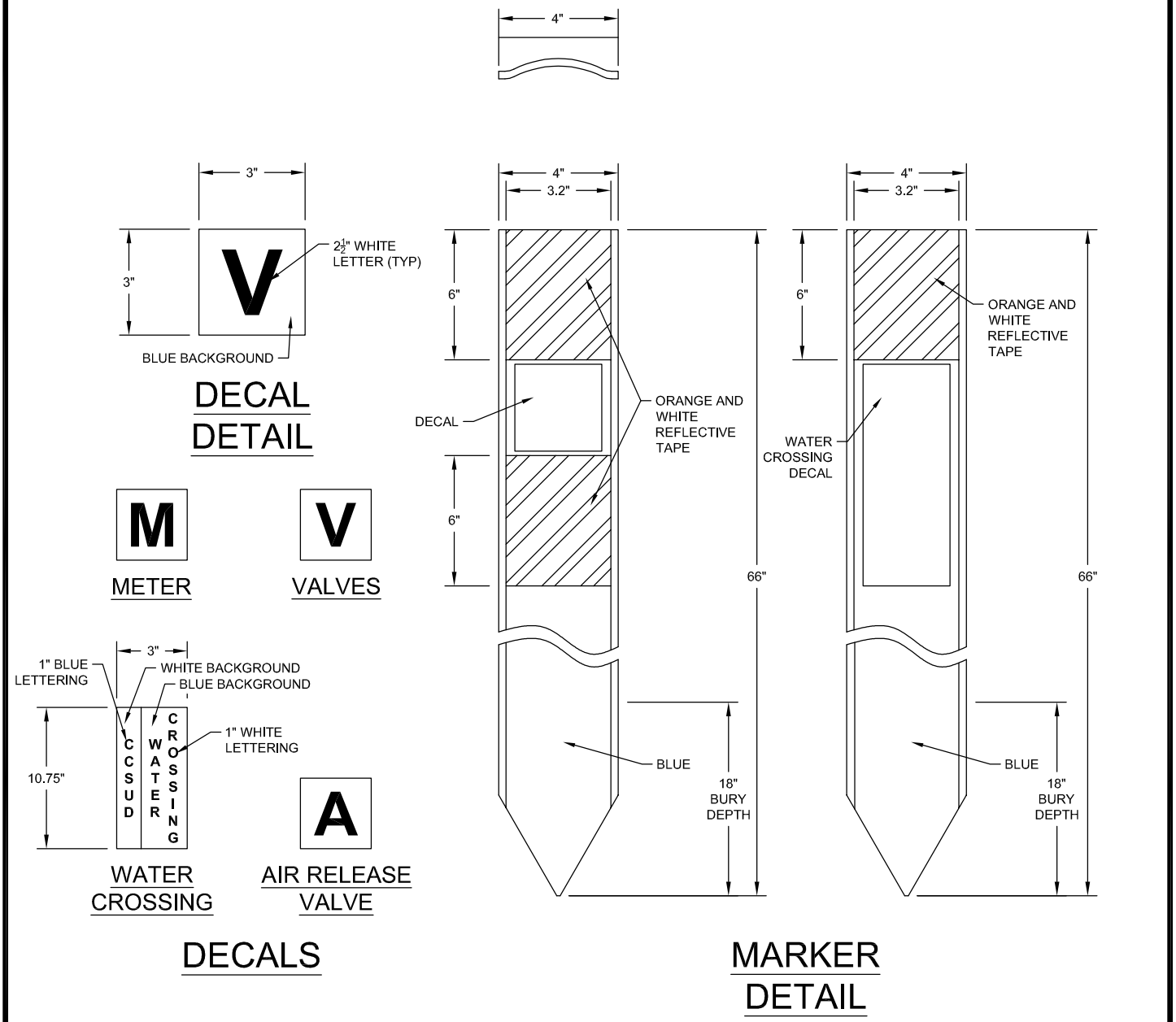
CRYSTAL CLEAR Est. 1964 Special Utility District

LARGE METER DETAIL
1-INCH

M&S ENGINEERING
POWER & UTILITY ENGINEERS
TXENG FIRM # F-1394 | TBPELS FIRM #10169800
WWW.MSENGR.COM | (830) 228-5446

APPROVED	REVISION
DEC 2025	

SHEET
1 OF 1



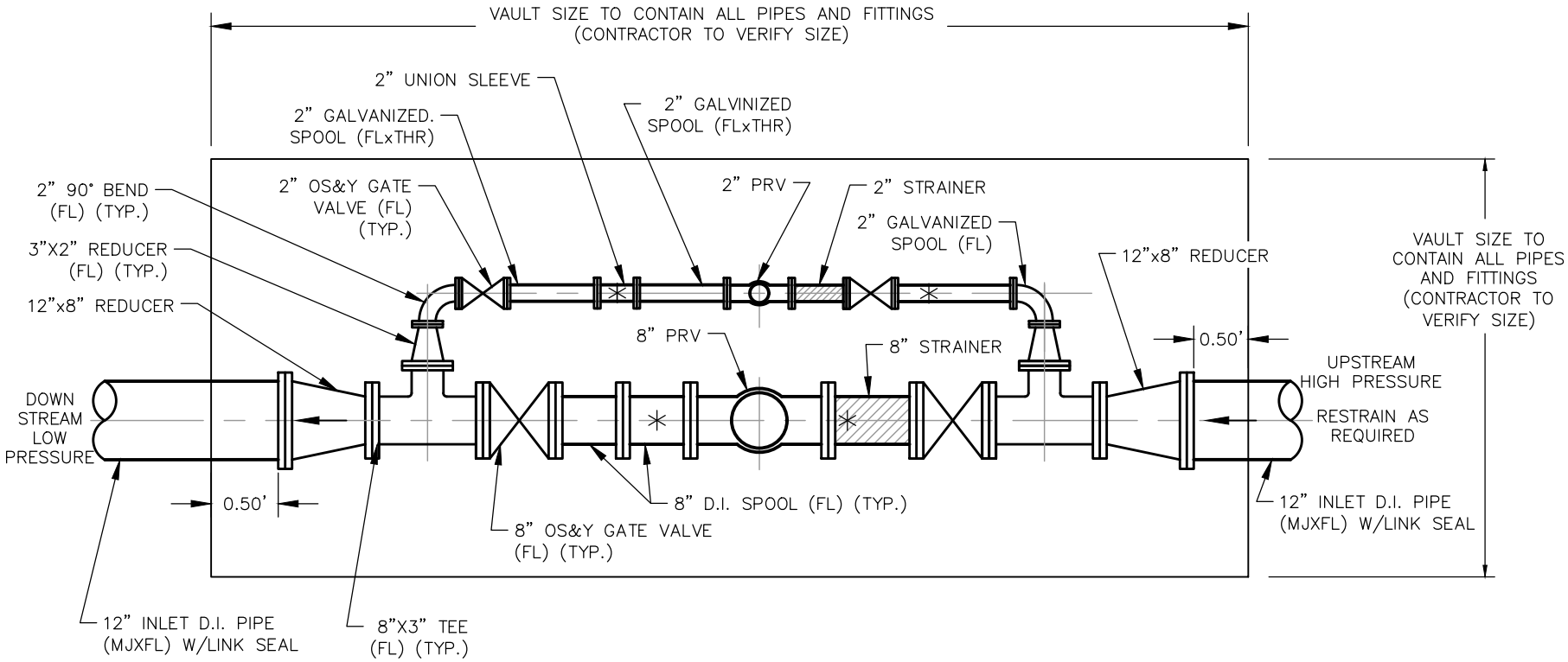
NOTES:

1. MARKERS SHALL BE 66" COMPOSITE POSTS SIMILAR TO RHINO FIBERCURVE COMPOSITE MARKER POST.
2. MARKERS SHALL BE PLACED AT ALL GATE VALVES, FLUSHING VALVES, & AIR RELEASE VALVES PER ITEM DETAIL.
3. MARKERS SHALL BE PLACED AT WATER METERS AS SPECIFIED ON PLANS
4. PIPELINE MARKERS SHALL BE PLACED ON R.O.W./FENCE LINE AT ALL ROAD CROSSINGS.

NOT TO SCALE

PROPERTY OF CRYSTAL CLEAR Est. 1964 Special Utility District	MARKER DETAILS	M&S ENGINEERING POWER & UTILITY ENGINEERS TXENG FIRM #F-1394 | TBPELS FIRM #10169800 www.MSENGR.com | 830-228-5446	APPROVED: JUN 2015 / REVISION: NOV 2019
			SHEET 1 OF 1

Date: Sep 19, 2025, 10:14am User ID: kvogler
File: C:\Users\kvogler\AppData\Local\Temp\AcPublish_20008\Pressure Reducing Valve Details.dwg



NOTES:

1. PRESSURE REDUCING VALVES (PRV) SHALL BE CLA-VAL MODEL 90-01H WITH BRONZE PILOT CONTROL AND H-STYLE STRAINER MODEL NO. X43H, ASTM A536, 250 PRESSURE CLASS, OR APPROVED EQUAL.
2. THE PRV SHALL INCLUDE UPSTREAM AND DOWNSTREAM PRESSURE GAUGES (CLA-VAL MODEL NO. X141) TAPPED INTO THE BODY.
3. RESTRAIN ONE (1) BELL JOINT UPSTREAM AND DOWNSTREAM OF ENCLOSURE.
4. D.I. SPOOLS SHALL BE SIZED AS NEEDED.
5. THERE SHALL BE MINIMUM 12-INCHES OF CLEARANCE FROM THE BOTTOM OF THE VAULT TO BOTTOM OF THE PIPE.

✳ – PIPE SUPPORT

NOT TO SCALE

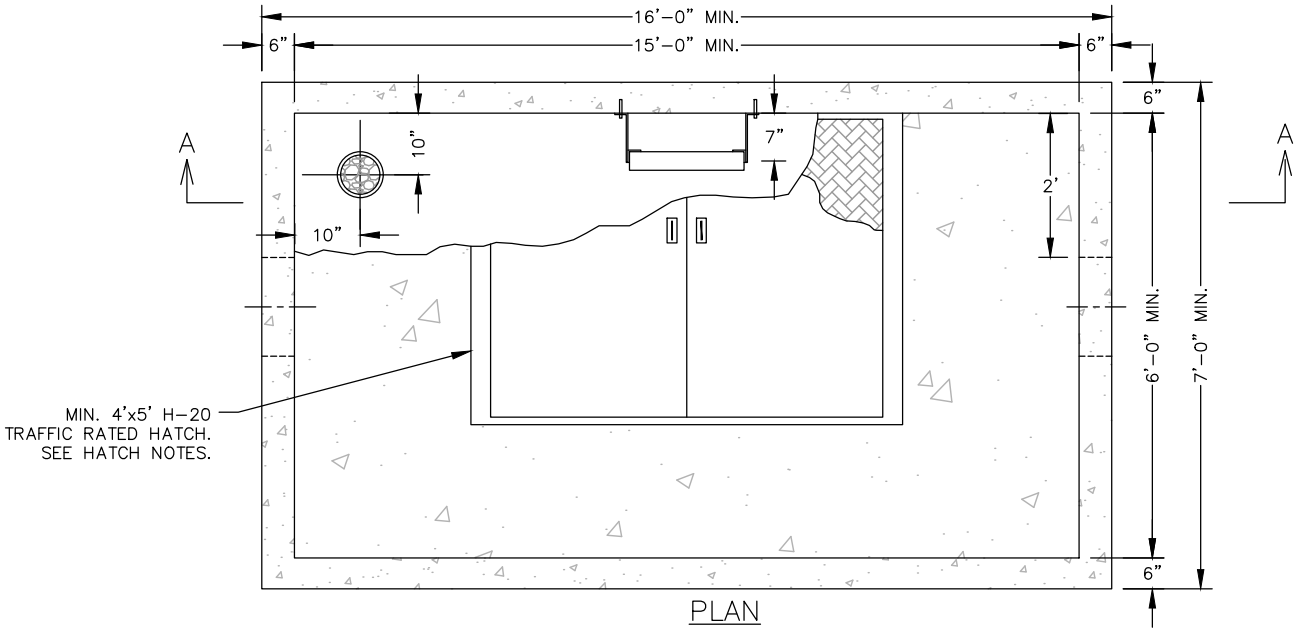
PROPERTY OF CRYSTAL CLEAR Est. 1964 Special Utility District

PRESSURE REDUCING VALVE
PIPING PLAN

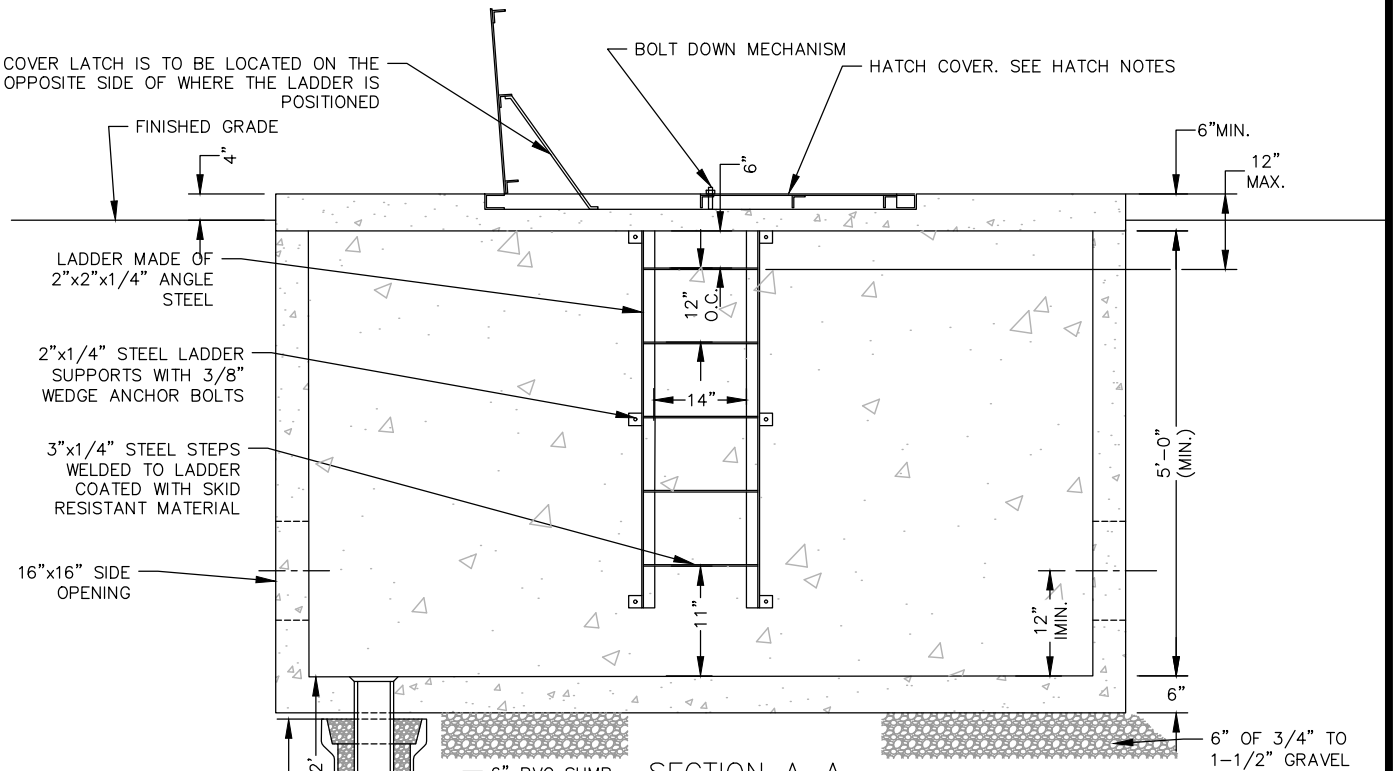
M&S ENGINEERING
POWER & UTILITY ENGINEERS
TXENG FIRM # F-1394 | TBPELS FIRM #10169800
WWW.MSENGR.COM | (830) 228-5446

APPROVED	REVISION
NOV 2024	JUL 2025

SHEET
1 OF 2

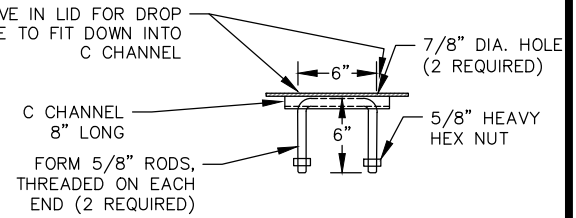


PLAN



SECTION A-A

OPTION FOR DRAIN:
1. INSTALL 6" OF 3/4" TO 1-1/2" GRAVEL UNDER VAULT.
2. PROVIDE 6" PVC SLEEVE THROUGH VAULT FLOOR.



HATCH NOTES:
1. HATCH OPENING SHALL BE SIZED SO THAT THE OPENINGS EXTENDS OVER THE 8-INCH PRV SECTION OF THE ASSEMBLY.
2. THE DOOR AND FRAME SHALL BE WATERTIGHT, MADE OF ALUMINUM WITH STAINLESS STEEL HINGES AND HARDWARE.
3. THE FRAME AND COVER SHALL BE CAST IN FLUSH WITH TOP OF CONCRETE.
4. THE LID SHALL HAVE COMPRESSION SPRINGS FOR ADDED LIFT ASSISTANCE, AN AUTOMATIC HOLD OPEN ARM AND SAFETY GRATE.

NOT TO SCALE

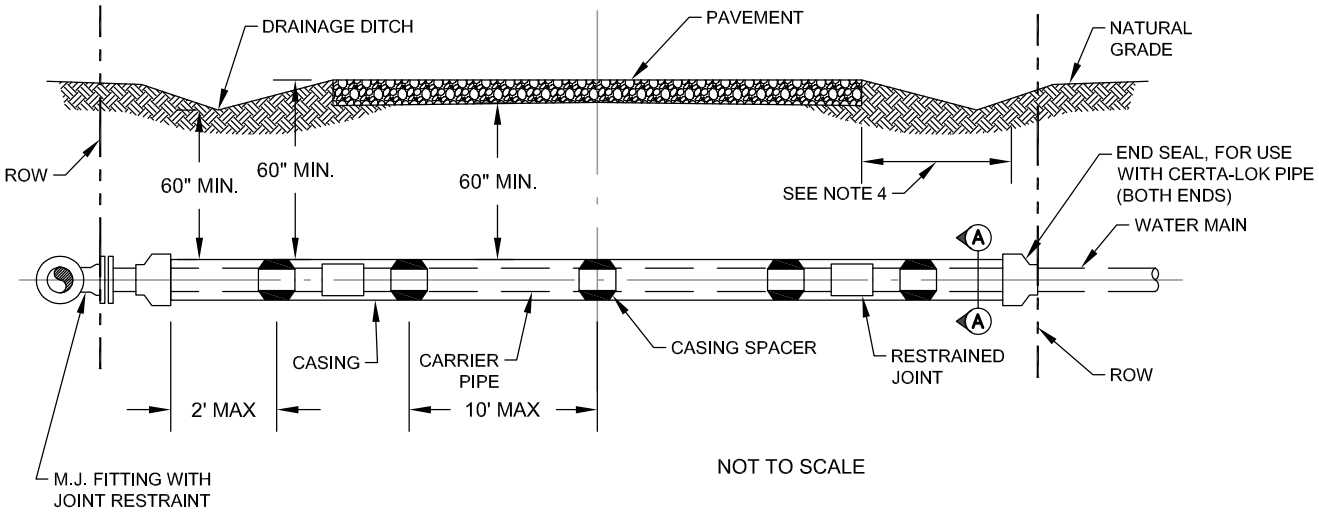
PROPERTY OF CRYSTAL CLEAR Est. 1964 Special Utility District

PRESSURE REDUCING VALVE CONCRETE ENCLOSURE DETAILS

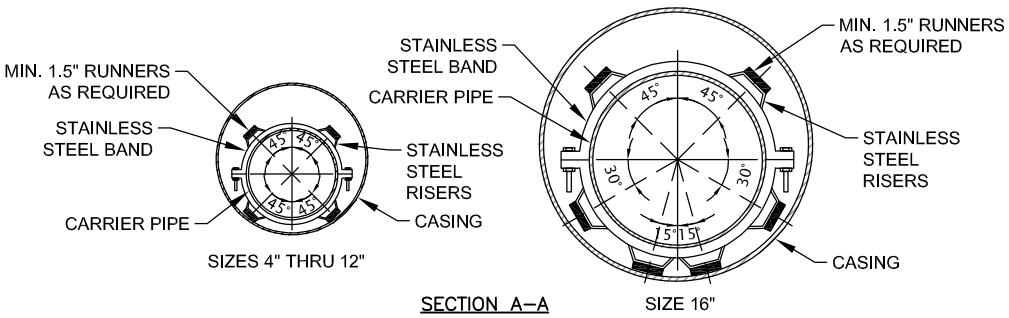
M&S ENGINEERING
POWER & UTILITY ENGINEERS
TXENG FIRM #F-1394 | TBPELS FIRM #10169800
www.MSENGR.com | 830-228-5446

APPROVED	REVISION
NOV 2024	JUL 2025

SHEET 2 OF 2



NOT TO SCALE



SECTION A–A

Carrier Pipe (DR 18)	Casing Size	Steel Casing (0.375 IN Wall)	PVC Casing (DR 25)	HDPE Casing (DR 21)	Casing Spacers	
Nominal Size (IN)		Inside Diameter (IN)			Min. Band Width (IN)	No. of Runners Per Tie
4	16	15.25	15.92	13.755	7	2 TOP, 2 BOTTOM
6	16	15.25	15.92	15.643	7	2 TOP, 2 BOTTOM
8	24	23.25	23.61	19.419	7	2 TOP, 2 BOTTOM
12	24	23.25	23.61	23.195	7	2 TOP, 2 BOTTOM
16	30	29.25	29.29	28.769	7	2 TOP, 4 BOTTOM

NOTES:

1. POLYVINYL CHLORIDE (PVC) CARRIER PIPE THAT IS 4-INCH IN DIAMETER SHALL BE C900 DR 18, FULLY RESTRAINED THROUGH THE CASING. POLYVINYL CHLORIDE (PVC) CARRIER PIPE SHALL BE CERTA-LOK C900/RJIB (DR 18) FOR 6-INCH TO 12-INCH AND CERTA-LOK C905/RJ (OR APPROVED EQUAL) FOR 16-INCH TO 24-INCH PIPE DIAMETERS.
2. STEEL CASING SHALL BE STANDARD WEIGHT OR HEAVIER PIPE CONFORMING TO ASTM A-36, ASTM A-568, ASTM A-135, ASTM A-139 OR OTHER ACCEPTABLE STANDARD SPECIFICATION. PIPE JOINTS SHALL BE WELDED IN ACCORDANCE WITH AWWA C-206. HDPE CASING MAY BE USED IN LIEU OF STEEL CASING PER FIGURE: 43 TAC §21.40(a)(2)(A).
3. SUBSEQUENT CASING SPACERS ARE REQUIRED FOR 4" TO 14" PIPE SIZES TO BE AT 10 FEET APART AND FOR 16" TO 30" PIPE SIZES TO BE AT 8 FEET APART WITHIN THE CASING WITH AT LEAST 3 SPACERS PER JOINT ON PIPE. ONE CASING SPACER SHALL BE REPLACED WITHIN 2 FEET OF ENDS OF CASING FOR ALL PIPE SIZES.
4. THE ENCASEMENT SHALL EXTEND TO THE PROPERTY LINE, TO WITHIN TWO FEET OF A CONNECTING WATER MAIN OR FIVE FEET BEYOND THE FACE OF THE CURB, AS APPLICABLE. ENCASEMENT SHALL NOT END UNDER CONCRETE, SIDEWALKS OR ROADWAY PAVEMENT.
5. CASING SPACERS SHALL BE MADE FROM T-304 STAINLESS STEEL OF A MINIMUM 14 GAUGE THICKNESS.
6. CASING SPACERS SHALL HAVE A SYNTHETIC RUBBER OR PVC LINER TO INSULATE THE PIPELINE FROM THE SPACER.
7. CASING SPACERS SHALL HAVE A MIN. 1.5" WIDE GLASS REINFORCED PLASTIC OR UHMW POLYMER RUNNERS TO INSULATE THE SPACER FROM THE CASING.
8. CASING END SEALS SHALL BE MADE OF 1/8" THICK NEOPRENE RUBBER AND INCLUDE 1/2" WIDE T-304 STAINLESS STEEL BANDINGS.

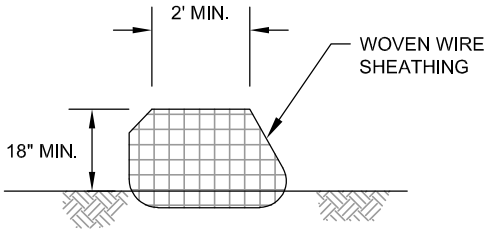
PROPERTY OF CRYSTAL CLEAR Est. 1964 Special Utility District

ROADWAY CASING DETAIL

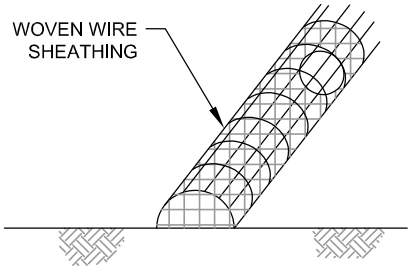
M&S ENGINEERING
POWER & UTILITY ENGINEERS
TXENG FIRM #F-1394 | TBPELS FIRM #10169800
www.MSENGR.com | 830-228-5446

APPROVED	REVISION
JUN 2015	OCT 2025

SHEET 1 OF 1



CROSS-SECTION



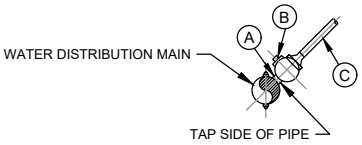
ISOMETRIC

GENERAL NOTES

1. USE ONLY OPEN GRADED ROCK 4-8 INCH DIAMETER FOR STREAM FLOW CONDITIONS. USE OPEN GRADED ROCK 3-5 INCH DIAMETER FOR OTHER CONDITIONS.
2. THE ROCK BERM SHALL BE SECURED WITH A WOVEN WIRE SHEATHING HAVING MAXIMUM 1 INCH OPENING AND MINIMUM WIRE DIAMETER OF 20 GAUGE.
3. THE ROCK BERM SHALL BE INSPECTED WEEKLY OR AFTER EACH RAIN, AND THE STONE AND/OR FABRIC CORE-WOVEN WIRE SHEATHING SHALL BE REPLACED WHEN THE STRUCTURE CEASES TO FUNCTION AS INTENDED, DUE TO SILT ACCUMULATION AMONG THE ROCKS, WASHOUT, CONSTRUCTION TRAFFIC DAMAGE, ETC.
4. WHEN SILT REACHES A DEPTH EQUAL TO ONE-THIRD THE HEIGHT OF THE BERM OR ONE FOOT, WHICHEVER IS LESS, THE SILT SHALL BE REMOVED AND DISPOSED OF IN APPROVED SITE AND IN A MANNER AS TO NOT CREATE A SILTATION PROBLEM.
5. DAILY INSPECTION SHALL BE MADE ON SEVERE SERVICE ROCK BERMS. SILT SHALL BE REMOVED WHEN ACCUMULATION REACHES 6 INCHES.
6. WHEN THE SITE IS COMPLETELY STABILIZED, THE BERM AND ACCUMULATED SILT SHALL BE REMOVED AND DISPOSED OF IN AN APPROVED MANNER.

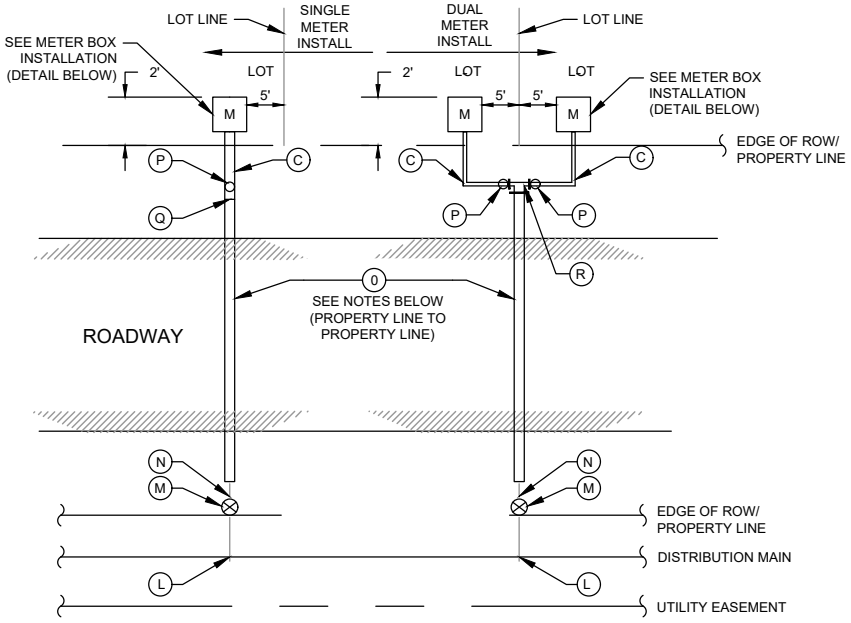
NOT TO SCALE

PROPERTY OF CRYSTAL CLEAR Est. 1964 Special Utility District	ROCK BERM DETAILS	M&S ENGINEERING POWER & UTILITY ENGINEERS TXENG FIRM #F-1394 | TBPELS FIRM #10169800 www.MSENGR.com | 830-228-5446	APPROVED	REVISION
			JUN 2015	JUN 2015
			SHEET 1 OF 1	



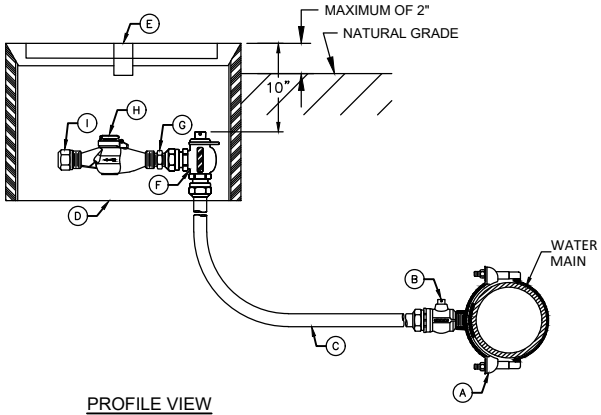
NOTES:
1. FOR SHORT SERVICE CONNECTIONS THE HOUSE SIDE OF THE METER BOX SHALL BE LOCATED 2 FEET BEHIND THE PROPOSED DISTRIBUTION MAIN INSIDE PRIVATE PROPERTY BETWEEN THE WATER MAIN AND THE HOUSE OR BUILDING THAT IS BEING SERVICED BY THAT METER.
2. ALL SHORT SERVICES SHALL HAVE THEIR OWN INDIVIDUAL SADDLE TAP.
3. ONE (1) 3/4" CORPORATION STOP SHALL BE INSTALLED FOR SINGLE METER INSTALLATION. REFER TO LONG SERVICE DETAIL FOR LAYOUT AND TYPE.
4. METERS SHALL BE HORIZONTALLY PLACED 5 FEET FROM THE LOT LINE.

SHORT SERVICE DETAIL

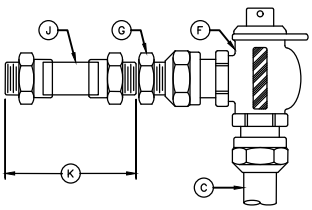


NOTES:
1. HDPE CASING SHALL BE USED WHEN SERVICE LINES ARE BORED.
2. SCHEDULE 80 PVC MAY BE USED FOR OPEN CUT INSTALLATIONS.
3. FOR LONG SERVICE CONNECTION, THE HOUSE SIDE OF THE METER BOX SHALL BE 2 FEET INSIDE THE EASEMENT IN PRIVATE PROPERTY.
4. METERS SHALL BE HORIZONTALLY PLACED 5 FEET FROM THE LOT LINE.

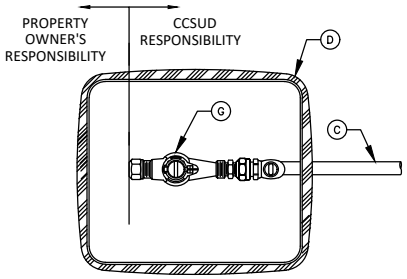
LONG SERVICE DETAIL



PROFILE VIEW



PRIOR TO METER INSTALLATION



PLAN VIEW

MATERIAL LIST*		
	SHORT SERVICE	LONG SERVICE
A	3/4" SERVICE SADDLE FORD #S91 OR SMITH-BLAIR MODEL 317	-
B	3/4" CORP. STOP (I.P. x COMP) FORD #FB1100-3-G-NL	-
C	3/4" POLYETHYLENE AWWA, C901-SDR 9	
D	PLASTIC METER BOX, MODEL NO. DFW1300.12.1C OR DFW1600X.12.1C	
E	METER BOX LID, MODEL NO. DFW1200.1CLID OR DFW1500.1C.LID	
F	3/4" BALL VALVE (METER CONV. x COMP.) FORD #BA43-332W-G-NL	
G	BRASS METER BUSHING	
H	5/8" x 3/4" WATER METER (BY CCSUD)	
I	BRASS METER COUPLING MALE IPT x SWIVEL COUPLING NUT	
J	1" THREADED NIPPLE	
K	TEMPORARY METER SPACER (7 1/2" IN LENGTH)	
L	-	2" SERVICE SADDLE FORD #S91
M	-	2" GATE VALVE
N	-	2" HARCO ADAPTOR OR BRASS/GALVANIZED NIPPLE WITH SIDE BOLT DRESSER
O	-	2" PVC SCH 80 INSIDE 4" BORED CASING
P	-	MALE END 3/4" CORP. STOP
Q	-	2" x 3/4" PVC ADAPTER (SINGLE SERVICE)
R	-	2" x 3/4" x 3/4" TEE (DUAL SERVICE)

NOTES:
1. METER BOX SHALL BE SET INTO GROUND TO SIT SLIGHTLY ABOVE NATURAL GRADE (NO MORE THAN 2").
2. USE NATIVE TOP SOIL TO BACKFILL TO EDGE OF METER BOX LID. BACKFILL TO NATURAL GRADE.

*MATERIALS SHALL BE PER THE APPROVED EQUIPMENT LIST (AEL) OR APPROVED EQUIVALENT.

NOT TO SCALE

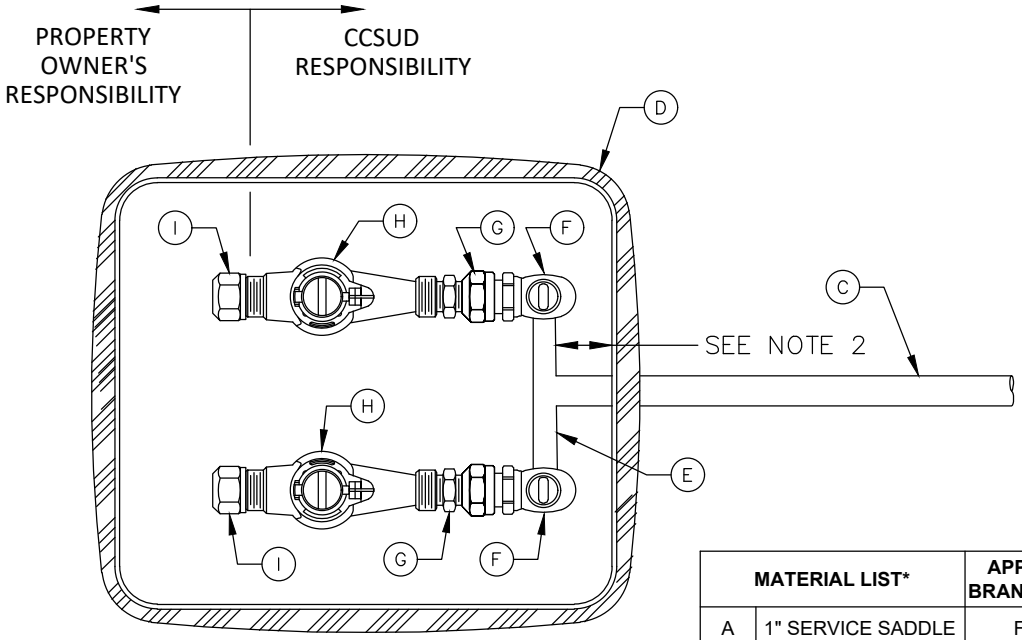
PROPERTY OF CRYSTAL CLEAR Est. 1964 Special Utility District

STANDARD SERVICE CONNECTION DETAILS

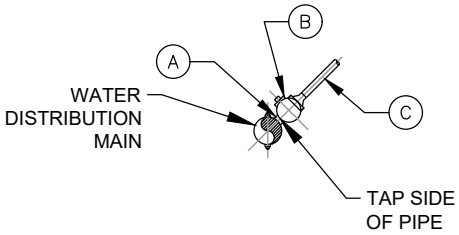
M&S ENGINEERING
POWER & UTILITY ENGINEERS
TXENG FIRM #F-1394 | TBPELS FIRM #10169800
www.MSENGR.com | 830-228-5446

APPROVED	REVISION
JUN 2015	DEC 2025

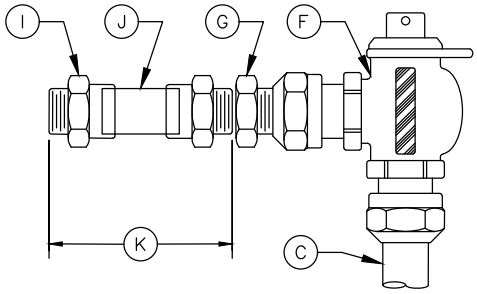
SHEET 1 OF 2



PLAN VIEW



METER TAP PROFILE



PRIOR TO METER INSTALLATION

MATERIAL LIST*		APPROVED BRAND/MODEL
A	1" SERVICE SADDLE	FORD
B	1" CORPORATION STOP	FORD
C	POLYETHYLENE AWWA, C901-SDR 9	CONTINENTAL
D	METER BOX AND LID	DFW PLASTICS
E	1"x3/4"x7 1/2" U BRANCH MANIFOLD CONNECTION	MUELLER
F	LOCKABLE 3/4" ANGLE METER STOP WITH PADLOCK	
G	BRASS METER BUSHING	KAMSTRUP
H	WATER METER INSTALLED BY CCSUD	FORD
I	BRASS METER COUPLING MALE IPT X SWIVEL COUPLING NUT	
J	1" THREADED NIPPLE	
K	TEMPORARY METER SPACER (7 1/2" IN LENGTH)	

*MATERIALS SHALL BE PER THE APPROVED EQUIPMENT LIST (AEL) OR APPROVED EQUIVALENT.

NOTES:
1. METER BOXES SHALL NOT BE PLACED IN SIDEWALKS, DRIVEWAYS, PARKING AREAS, OR VEHICULAR TRAFFIC AREAS.
2. ANGLE STOP PLACED A MAXIMUM OF 4" FROM BACK OF BOX THAT FACES CURB.
3. SERVICES FOR NON-RESIDENTIAL CUSTOMERS OR IRRIGATION USES SHALL BE EQUIPPED WITH A BACKFLOW PREVENTION ASSEMBLY AS REQUIRED BY CCUSD CROSS-CONNECTION AND BACKFLOW PREVENTION PROGRAM. BYPASS NOT PERMITTED ON SERVICES THAT ARE IRRIGATION ONLY.

NOT TO SCALE

PROPERTY OF CRYSTAL CLEAR Est. 1964 Special Utility District

STANDARD SERVICE CONNECTION WITH IRRIGATION METER DETAILS

APPROVED	REVISION
JUN 2015	DEC 2025

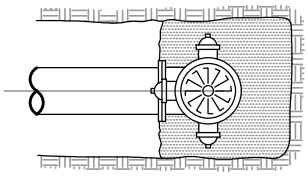
SHEET 2 OF 2

PIPE SIZE	DIMENSION "B" (SQUARE)				
	PLUGS & TEES	90° BENDS	45° BENDS	22 1/2° BENDS	VALVES
4"&6"	1'-3"	1'-6"	1'-0"	9"	1'-3"
8"	1'-9"	2'-0"	1'-6"	1'-0"	1'-6"
10"	2'-10"	2'-0"	1'-9"	1'-3"	2'-0"
12"	2'-6"	3'-0"	2'-3"	1'-6"	2'-3"
16"	3'-3"	4'-0"	2'-9"	2'-0"	2'-9"
20"	3'-9"	4'-6"	3'-3"	2'-3"	3'-3"

DIMENSION "A" SHALL BE A MINIMUM OF 1'-0" BUT IS TO BE INCREASED WHERE NECESSARY TO PROVIDE BEARING AGAINST UNDISTURBED TRENCH WALL.

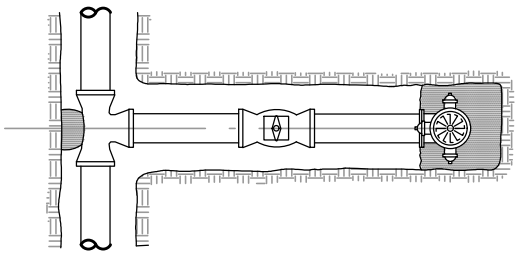
NOTES:

1. THE EARTHBEARING SURFACE SHALL BE THE UNDISTURBED TRENCH WALL.
2. CONCRETE SHALL BE PLACED SO THAT FITTING, VALVES AND PIPE JOINTS ARE ACCESSIBLE FOR REPAIR OR REPLACEMENT.
3. ALL THRUST BLOCKS SHALL CONTAIN A MINIMUM OF 1 1/2 CUBIC YARDS OF CONCRETE.
4. CONCRETE SHALL BE 3000 P.S.I. AT 28 DAYS MINIMUM.
5. ALL FITTINGS AND FITTING JOINTS MUST BE WRAPPED W/ POLYWRAP. POLYWRAP SHALL BE SECURED WITH A MINIMUM OF THREE CIRCUMFERENTIAL TURNS OF POLY TAPE.
6. 12"x12"x4" THICK CONCRETE BLOCKS SHALL BE INSTALLED DIRECTLY UNDER ALL FITTINGS.

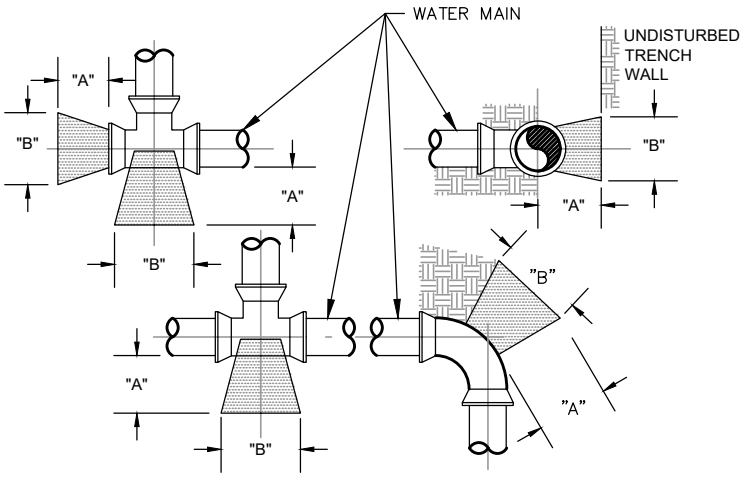


PLAN
POUR BASE AFTER HYDRANT HAS BEEN PLACED

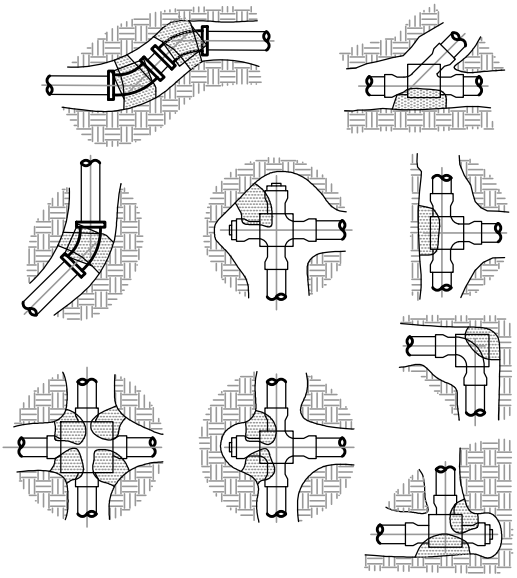
ELEVATION



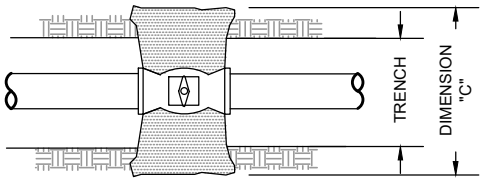
THRUST BLOCK FOR HYDRANTS DETAIL



THRUST BLOCK DIMENSIONING



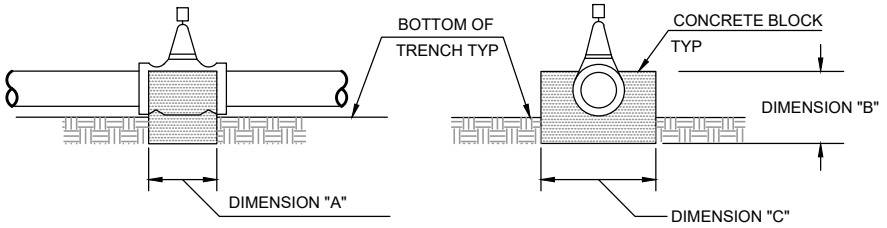
THRUST BLOCK FOR FITTINGS DETAIL



VALVE SUPPORT PLAN

VALVE THRUST BLOCK DIMENSIONS AND NOTES:

1. DIMENSION "A" = WIDTH OF THE VALVE BODY.
2. DIMENSION "B" = PIPE DIAMETER PLUS D3 DEPTH FROM TRENCH BACKFILL DETAIL.
3. DIMENSION "C" = TRENCH WIDTH PLUS TWO TIMES THE PIPE DIAMETER.
4. CONCRETE THRUST BLOCKS SHALL NOT COVER VALVE ENDS, BONNET, STEM, NUTS OR BOLTS. THEY SHALL COVER THE VALVE BODY ONLY PER THE GIVEN DIMENSIONS.



VALVE SUPPORT ELEVATION

THRUST BLOCK FOR VALVES DETAIL

NOT TO SCALE

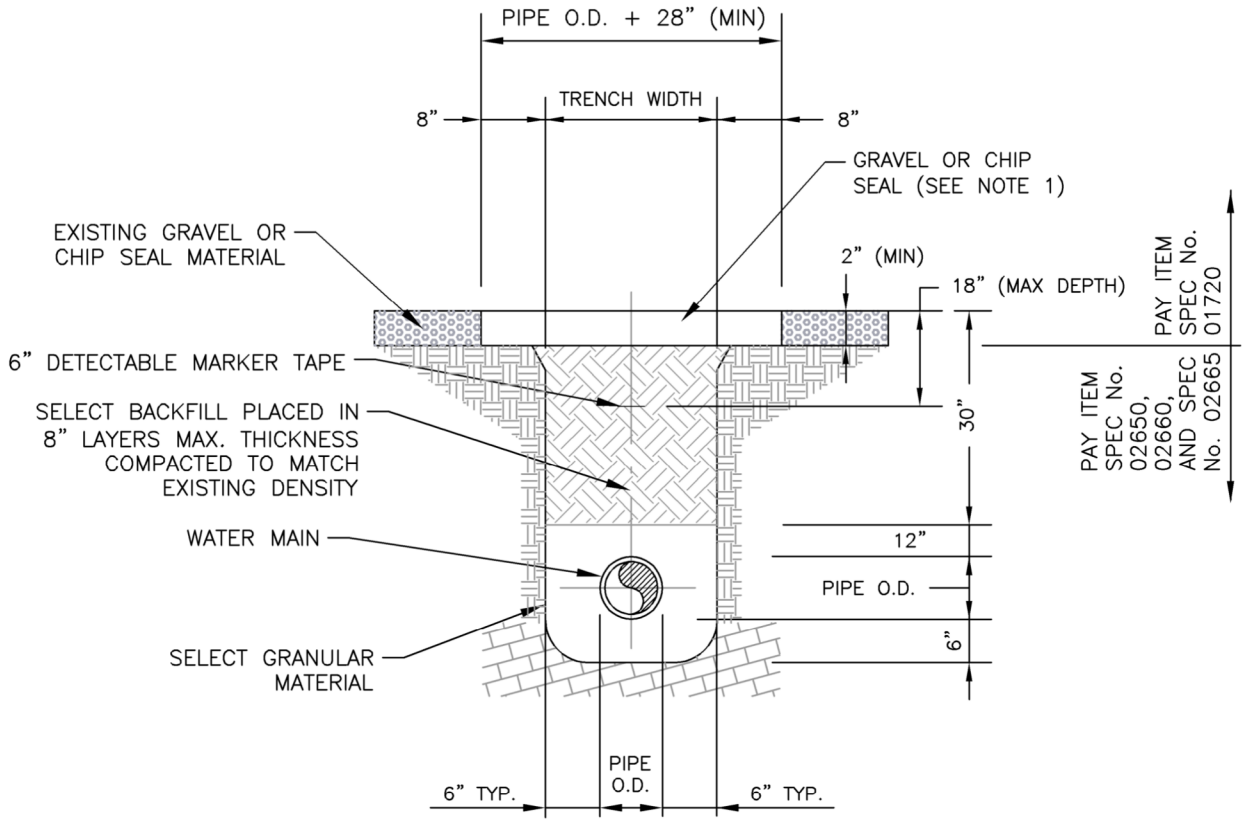
PROPERTY OF CRYSTAL CLEAR Est. 1964 Special Utility District

THRUST BLOCKING DETAILS

M&S ENGINEERING
POWER & UTILITY ENGINEERS
TXENG FIRM #F-1394 | TBPELS FIRM #10169800
www.MSENGR.com | 830-228-5446

APPROVED	REVISION
JUN 2015	JUL 2024

SHEET 1 OF 1



NOTES

1. GRAVEL OR CHIP SEAL (MATCH EXISTING PAVEMENT TYPE) SHALL BE A MINIMUM OF 2" THICK.
2. ROAD BASE AND SURFACE MATERIALS IN THE TRENCH CUT SHALL BE REPLACED IN KIND, OF EQUAL THICKNESS

TRENCHING NOTES

1. ADEQUATE BARRICADES & WARNING SIGNS SHALL BE ERECTED BEFORE ANY WORK IS STARTED IN PUBLIC RIGHT-OF-WAY.
2. THE DRIVEWAY SHALL BE CUT ONLY WHERE REQUIRED BY THE ENGINEER.
3. DRIVEWAY SHALL REMAIN ACCESSIBLE AT ALL TIMES.
4. REFER TO SPECIFICATIONS FOR ANY SPECIAL REQUIREMENTS OR CONDITIONS
5. BACKFILL SHALL BE COMPLETED IMMEDIATELY AFTER PIPELINE LAYING WITHIN PRIVATE DRIVEWAYS.

TRENCH SAFETY NOTES

1. TRENCH SAFETY SYSTEM, SHORING OR SIDE SLOPE TO BE IN ACCORDANCE WITH OSHA STANDARDS.
2. TRENCH SAFETY SYSTEM PLAN TO BE PROVIDED BY CONTRACTOR PRIOR TO CONSTRUCTION.
3. ALL EXCAVATION GREATER THAN 5' DEEP SHALL MEET TRENCH SAFETY NOTE.

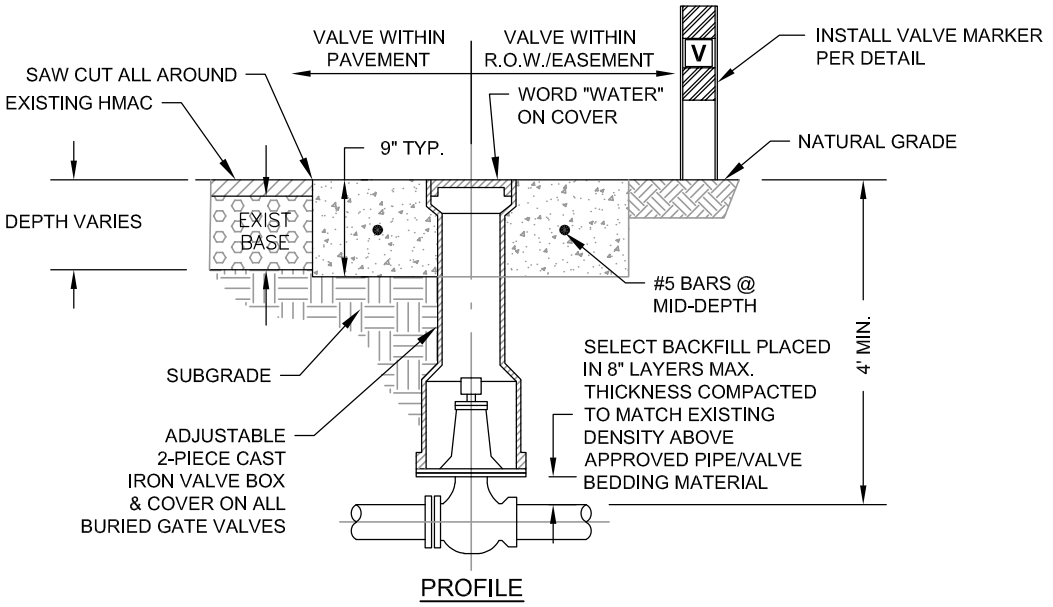
PROPERTY OF CRYSTAL CLEAR Est. 1964 Special Utility District

TYPICAL GRAVEL/CHIP SEAL DRIVEWAY REPAIR DETAIL

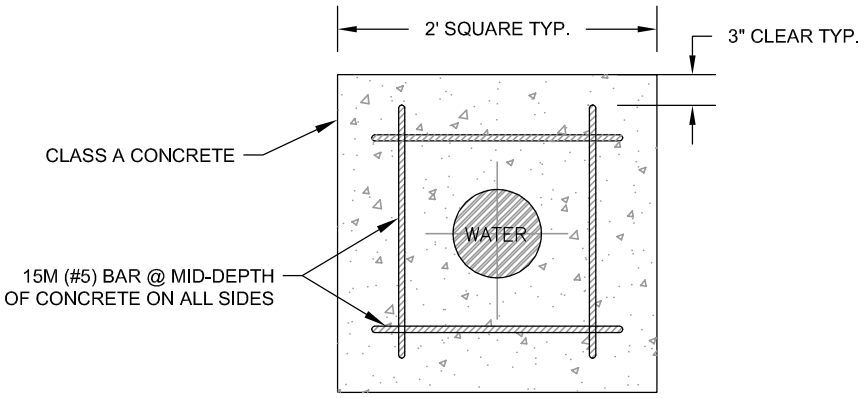
M&S ENGINEERING
POWER & UTILITY ENGINEERS
TXENG FIRM #F-1394 | TBPELS FIRM #10169800
www.MSENGR.com | 830-228-5446

APPROVED	REVISION
JUL 2019	OCT 2025

SHEET 1 OF 1



PROFILE



PLAN

NOTES:

1. VALVE BOXES SHALL BE FITTED WITH PLASTIC VALVE ID TAGS (BLUE EMEDCO 3-1/2" X 2-3/4") INDICATING OWNER (CCSUD) VALVE SIZE, YEAR OF INSTALLATION AND # OF TURNS TO OPEN.
2. SUBGRADE SHALL BE COMPACTED AS PER SPECIFICATIONS
3. VALVE CASTINGS SHALL BE ADJUSTED TO GRADE AFTER FINAL LIFT OF OVERLAY IS IN PLACE.
4. CLEAN VALVE BOX OF ALL DEBRIS DOWN TO THE BASE OF THE VALVE.
5. REMOVE EXISTING RISER PIPE DOWN 18" AND REPLACE TO THE NEW ELEVATION USING NEW PIPE AND A COLLAR CASTING.
6. WHEN CAST IRON CASTINGS TO BE REMOVED REQUIRE EXCAVATION GREATER THAN 20" DEEP, CONTRACTOR MAY ELECT TO FILL EXCAVATION WITH CONTROLLED LOW STRENGTH MATERIAL TO THE UNDERSIDE OF THE CONCRETE. PAVEMENT PATCH IN LIEU OF COMPACTED BACKFILL.
7. REINFORCING STEEL SHALL MEET SPECIFICATIONS.
8. VALVE BOXES MUST BE INSTALLED IN A STRAIGHT, VERTICAL POSITION.
9. VALVE MARKERS SHALL BE INSTALLED BEHIND EACH VALVE BOX WHEN VALVE IS LOCATED WITHIN EASEMENT OR R.O.W.

NOT TO SCALE

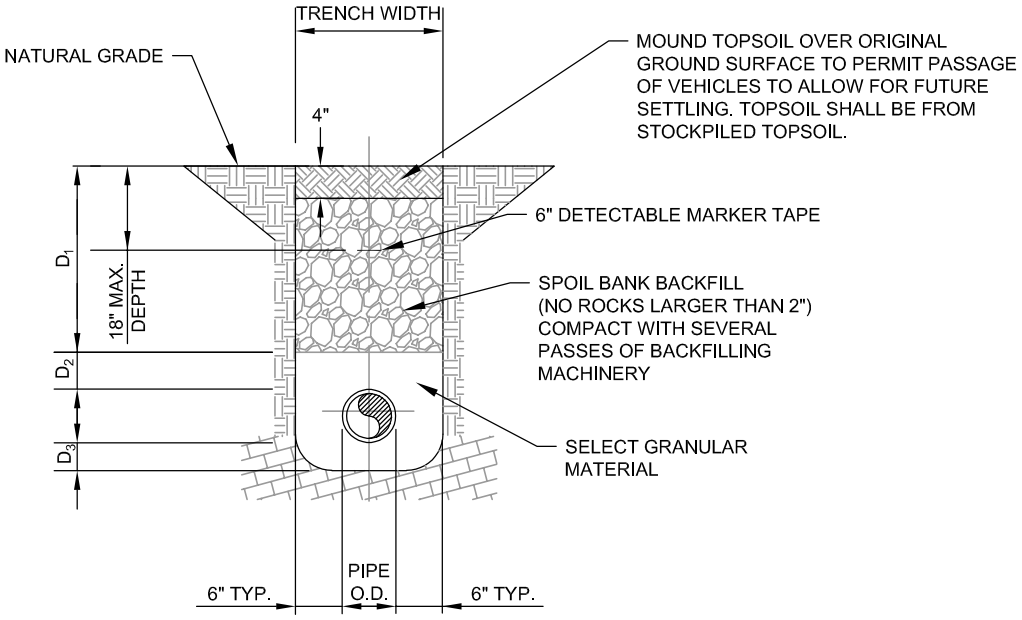
PROPERTY OF CRYSTAL CLEAR Est. 1964 Special Utility District

TYPICAL IRON VALVE BOX DETAILS

M&S ENGINEERING
POWER & UTILITY ENGINEERS
TXENG FIRM #F-1394 | TBPELS FIRM #10169800
www.MSENGR.com | 830-228-5446

APPROVED	REVISION
JUN 2015	OCT 2025

SHEET 1 OF 1



	D_1	D_2	D_3
4" OR SMALLER	36"	6"	4"
6"-8"	30"	12"	6"
12" OR LARGER	42"	12"	6"

TRENCHING NOTES

1. ADEQUATE BARRICADES & WARNING SIGNS SHALL BE ERECTED BEFORE ANY WORK IS STARTED IN PUBLIC RIGHT-OF-WAY.
2. REFER TO SPECIFICATIONS FOR ANY SPECIAL REQUIREMENTS OR CONDITIONS.
3. BACKFILL SHALL BE COMPLETED IMMEDIATELY AFTER PIPELINE LAYING WITHIN PUBLIC RIGHT-OF-WAYS OR CROSSING PUBLIC RIGHT-OF-WAYS & PRIVATE DRIVEWAYS.

TRENCH SAFETY NOTES

1. TRENCH SAFETY SYSTEM, SHORING OR SIDE SLOPE TO BE IN ACCORDANCE WITH OSHA STANDARDS.
2. TRENCH SAFETY SYSTEM PLAN TO BE PROVIDED BY CONTRACTOR PRIOR TO CONSTRUCTION.

NOT TO SCALE

PROPERTY OF CRYSTAL CLEAR Est. 1964 Special Utility District

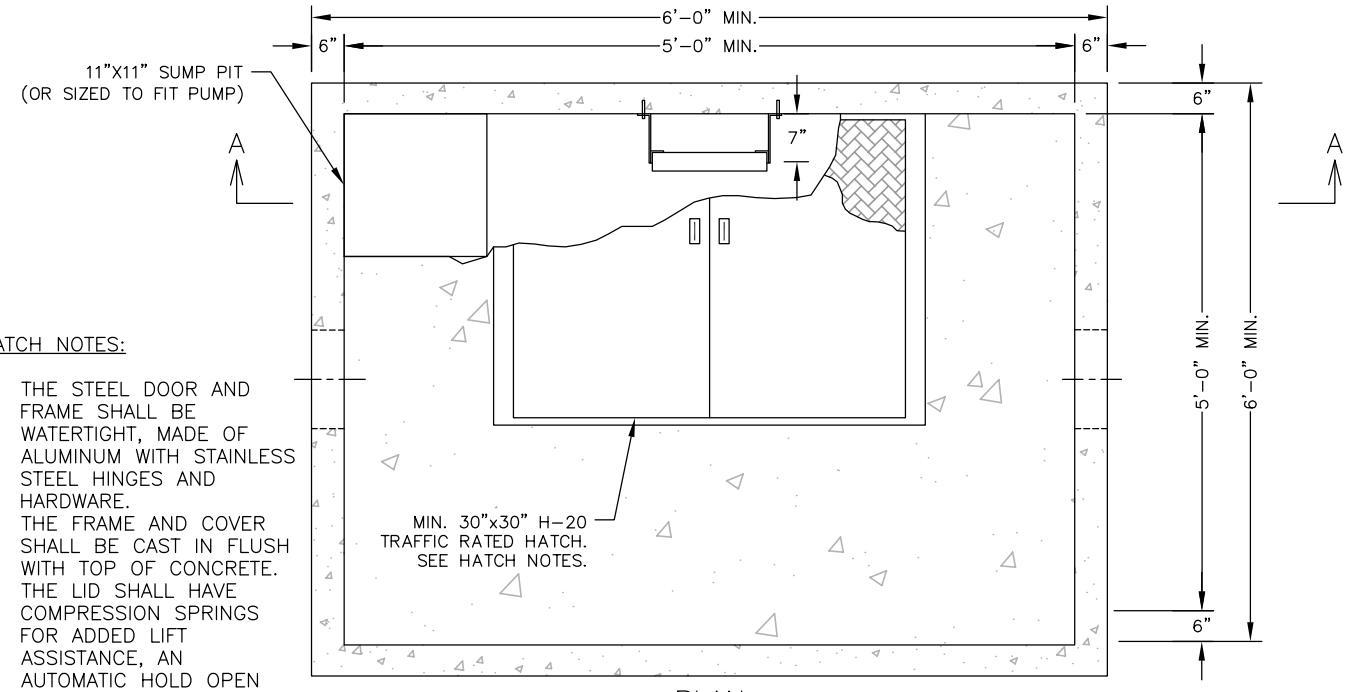
TYPICAL TRENCH BACKFILL DETAIL

M&S ENGINEERING
POWER & UTILITY ENGINEERS
TXENG FIRM #F-1394 | TBPELS FIRM #10169800
www.MSENGR.com | 830-228-5446

APPROVED	REVISION
JUN 2015	OCT 2025

SHEET 1 OF 1

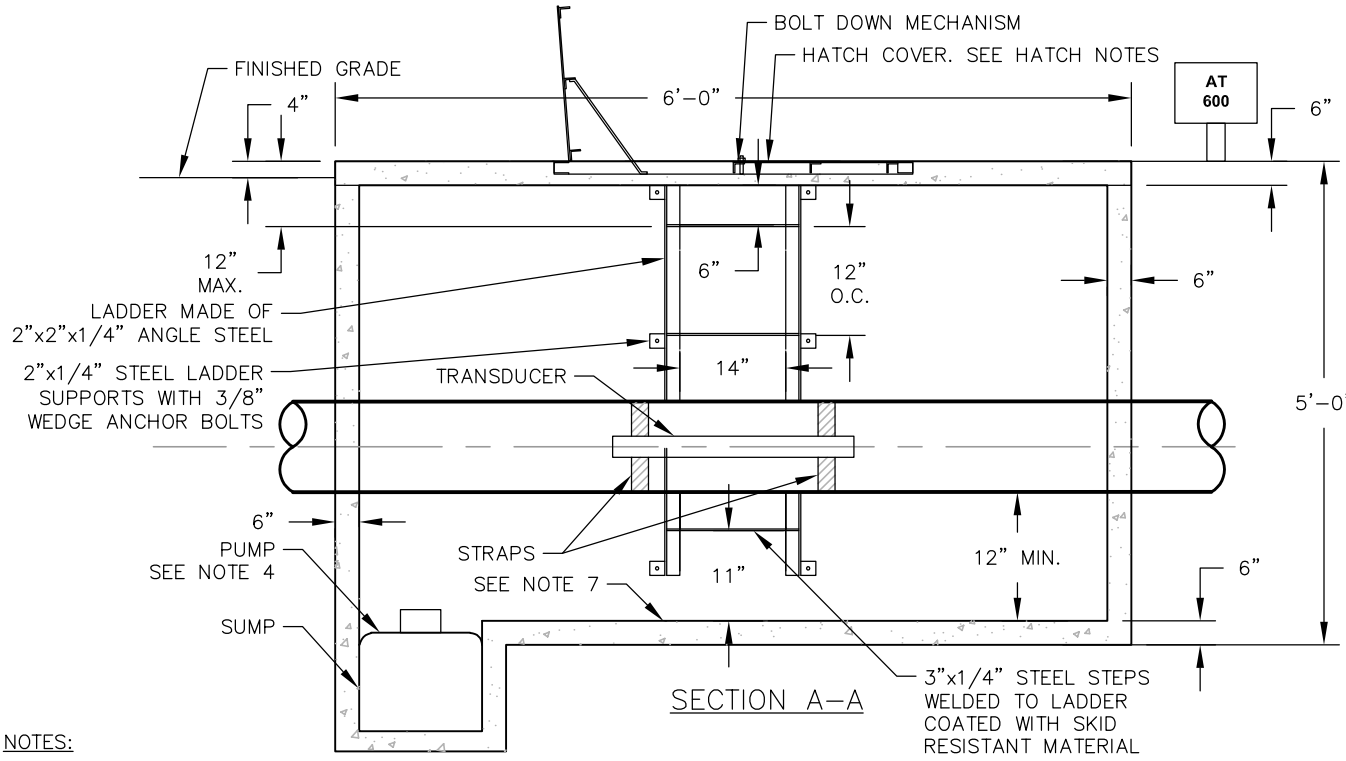
Date: Sep 19, 2025, 10:19am User ID: kvogler
File: S:\Standards\02 Details\07 Utility District\CRYSTAL CLEAR SUD\CCSUD Wtr Details\Ultrasonic Flow Meter Detail.dwg



PLAN

HATCH NOTES:

1. THE STEEL DOOR AND FRAME SHALL BE WATERTIGHT, MADE OF ALUMINUM WITH STAINLESS STEEL HINGES AND HARDWARE.
2. THE FRAME AND COVER SHALL BE CAST IN FLUSH WITH TOP OF CONCRETE.
3. THE LID SHALL HAVE COMPRESSION SPRINGS FOR ADDED LIFT ASSISTANCE, AN AUTOMATIC HOLD OPEN ARM AND SAFETY GRATE.



SECTION A-A

NOTES:

1. CONTRACTOR SHALL FURNISH AQUATRANS AT600 ULTRASONIC FLOW METER MODEL NUMBER AT6-C1-AT10-24IN-2-1MAT01E-0, TO BE INSTALLED BY OTHERS.
2. CONTRACTOR SHALL FURNISH AND INSTALL THE VAULT AND HATCH PER THIS DETAIL.
3. CONTRACTOR SHALL FURNISH A PLC CABINET THAT IS COMPATIBLE WITH CCSUD'S SCADA SYSTEM, TO BE INSTALLED BY OTHERS. CALL HIERHOLZER ENGINEERING WITH QUESTIONS, 830-372-4808.
4. CONTRACTOR SHALL FURNISH AND INSTALL A GRAINGER SUMP PUMP WITH A FLOAT SWITCH.
5. CONTRACTOR SHALL INSTALL A 20 AMP SERVICE TO OPERATE FLOW METER AND SUMP PUMP.
6. THERE SHALL BE A MINIMUM 12 INCHES OF CLEARANCE FROM BOTTOM OF VAULT TO BOTTOM OF PIPE.
7. VAULT FLOOR SHALL DRAIN TO SUMP.

NOT TO SCALE

PROPERTY OF
CRYSTAL CLEAR
Est. 1964
Special Utility District

ULTRASONIC FLOW METER DETAIL

M&S ENGINEERING
POWER & UTILITY ENGINEERS
TXENG FIRM #F-1394 | TBPELS FIRM #10169800
www.MSENGR.com | 830-228-5446

APPROVED	REVISION
JUL 2025	

SHEET
1 OF 1