

CITY OF LAS CRUCES UTILITY STANDARDS

October 2023

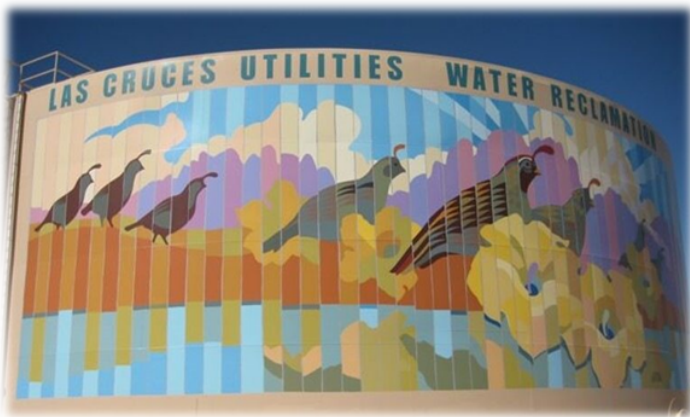


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SECTION 000

UTILITY STANDARDS REVISION INFORMATION

CLC UTILITY STANDARDS REVISION INFORMATION

SECTION 100 – GENERAL INFORMATION			
SUB SECTION	PAGE	REV DATE	REMARKS
111.1	100-10	OCT 2023	<ul style="list-style-type: none"> • Change Contracts Administrator to contract administrator
111.2	100-11, 12	OCT 2023	<ul style="list-style-type: none"> • Add coupons for waterline connections
111.7	100-14	OCT 2023	<ul style="list-style-type: none"> • Add “prior to initiation of excavation”
111.14	100-19, 20, 22, 23	OCT 2023	<ul style="list-style-type: none"> • Delete gradation ranges table • Add density requirements
111.17	100-25	OCT 2023	<ul style="list-style-type: none"> • Add coupons for waterline connections
111.19	100-27	OCT 2023	<ul style="list-style-type: none"> • Add “following the NMDOT Back fill Specifications”
111.22	100-28	OCT 2023	<ul style="list-style-type: none"> • Add “POTHOLING/EXPLORATION”
111.23	100-28	OCT 2023	<ul style="list-style-type: none"> • Add “GPS LOCATE OF NEW UTILITY LINE”

CLC UTILITY STANDARDS REVISION INFORMATION - CONTINUED

SECTION 200 – GAS DESIGN STANDARDS			
SUB SECTION	PAGE	REV DATE	REMARKS
200	200-4	OCT 2023	<ul style="list-style-type: none"> • Add “...new gas pipeline construction will follow and abide by all federal...”
203	200-7	OCT 2023	<ul style="list-style-type: none"> • Clarify note #2 in table Vertical Separation
206.1	200-10	OCT 2023	<ul style="list-style-type: none"> • Add “which abuts a building wall”
207	200-11	OCT 2023	<ul style="list-style-type: none"> • Add “and approved by the Deputy Director of Natural Gas and Energy” • Delete “Utilities Engineering”
209	200-11, 12, 13	OCT 2023	<ul style="list-style-type: none"> • Change hip to HP • Delete “intermediate” • Add “with the following exceptions” & “improvement plans” • Add “Exceptions for gas service line sizing”

CLC UTILITY STANDARDS REVISION INFORMATION - CONTINUED

SECTION 300 – GAS MATERIAL SPECIFICATIONS			
SUB SECTION	PAGE	REV DATE	REMARKS
ITEM 1	300-3	OCT 2023	<ul style="list-style-type: none"> • Add to Colum “DESCRIPTION” • Change Size Dia-Wall 4”, 6” & 8” • Delete “Electric Resistance” • Add “All Steel pipe to be American made”
ITEM 2	300-3	OCT 2023	<ul style="list-style-type: none"> • Add to Colum “DESCRIPTION” • Delete “size” • Add “FBE -14-16 mil & ARO – 30 mil” • Add to Colum “SPECIFICATION” • Add to Colum “MANUFACTURER”
ITEM 8	300-6	OCT 2023	<ul style="list-style-type: none"> • Add to Colum “DESCRIPTION” • Add “Extension range of 28”–36”” • Add “Per manufactures specifications” • Delete “manufacturers” • Add “Handley Industries”
ITEM 9	300-7	OCT 2023	<ul style="list-style-type: none"> • Add “Farwest Corrosion – UltraMag Anode”
ITEM 16	300-9	OCT 2023	<ul style="list-style-type: none"> • Delete “manufacturers” • Add “GarLock Ranger II Casing Spacers”
ITEM 17	300-9	OCT 2023	<ul style="list-style-type: none"> • Delete “manufacturers” • Add “GarLock Model “S””
ITEM 23	300-10	OCT 2023	<ul style="list-style-type: none"> • Add “SDR 10 or 11” • Add “JM Eagle (US Poly), Dura Line”
ITEM 27	300-12	OCT 2023	<ul style="list-style-type: none"> • Delete “30 volt rating” • Add “Yellow direct bury wire connector, rated up to 600v. Silicon filled.” • Add “Three (3) #12 Solid copper conductors. Model 90120” • Add “Per manufactures specifications” • Add “Ideal – Model #60”

CLC UTILITY STANDARDS REVISION INFORMATION - CONTINUED

SECTION 400 – GAS CONSTRUCTION SPECIFICATIONS			
SUB SECTION	PAGE	REV DATE	REMARKS
401	400-6	OCT 2023	<ul style="list-style-type: none"> • Delete “and all High Intermediate Pressure (HIP)”
401.1	400-6	OCT 2023	<ul style="list-style-type: none"> • Add “All materials, labor and equipment required ...”
403.1	400-8, 9	OCT 2023	<ul style="list-style-type: none"> • Delete “CLC Purchasing Agent or the Contracts Administrator” • Add “Project Manager” • Add “49 CFR part 199. The letter shall identify all contractor...” • Add “Any work performed by an employee...”
407.3	400-14	OCT 2023	<ul style="list-style-type: none"> • Delete Pursuant to DOT, 49 CFR § 192.321, • Change 2 years to 3 years
407.5	400-15, 16	OCT 2023	<ul style="list-style-type: none"> • Change Section “STEEL PIPE COATING” with “PIPE COATING TESTING”
407.6	400-17	OCT 2023	<ul style="list-style-type: none"> • Add “American made” • Delete “X42, X46” & “or ERW” • Change Diameter wall thickness 8”, 6” & 4” • Delete • Change “30 or 37 ½” to “30o (+5o)” • Delete “has no API markings” Add “does not have the required markings” • Add “which may impair the strength or quality of the pipe” • Add “shall not be accepted by the Las Cruces Utility Gas section” • Add “gas pipeline system”
407.7	400-18	OCT 2023	<ul style="list-style-type: none"> • Delete “Steel Fittings, etc.” • Change “30 or 37 ½” to “30o (+5o)”
410	400-21	OCT 2023	<ul style="list-style-type: none"> • Delete “required” • Add “a minimum of five (5) feet of pipe”, “per applicable LCU Standard Operating Procedure” & closed with a welded”

412		OCT 2023	<ul style="list-style-type: none"> • Delete “(or iron)” • Change “P.M., OR DESIGNEE, or his” to “Gas Inspector” • Delete “Pipe that has been properly Holiday...” • Add “See Section 407.5 for testing requirements”
413	400-24, 25, 26	OCT 2023	<ul style="list-style-type: none"> • Change “fifteen (15)” to “twelve (12) to thirty (30)” • Add “twisted together” • Change “an appropriate size wire nut which shall then be placed inside a 3M brand Direct Bury Splice kit (DBR), or approved equal, of appropriate size” to “a silicon filled direct bury wire connector” • Change “CP” to Cathodic protection” • Delete “cable tie wrapped (using PE cable ties) ...” • Add “wrapped a minimum of three times around the riser and extend to the top of the riser threads.” • Delete “by the Contractor and at his expense...” • Add “Locatability Check: Must be requested a minimum of 48 hours...”
415	400-28	OCT 2023	<ul style="list-style-type: none"> • Change “cast iron of the Buffalo type...” to “slip style, two piece plastic” • Delete “Smooth clay bricks...” • Add “and concrete collars around valves shall be installed per standard detail UG-7”
416.3	400-32	OCT 2023	<ul style="list-style-type: none"> • Add “A new Test Station, with tracing and/or anode wire(s)...”
417	400-34, 35, 36	OCT 2023	<ul style="list-style-type: none"> • Add “The Gas Inspector shall coordinate...”, “Acceptance of submittals and required documentation...” & “Failure to comply with 2(a) and 2(b) above...” • Delete “Black Hawk Industries...” add “...ANSI 150# may be used...”

418	400-36, 37, 38	OCT 2023	<ul style="list-style-type: none"> • Delete existing content • Add “All sections of low pressure shall only...” • Add MINIMUM DURATION OF TEST IN HOURS Table • Add “Upon completion of successful pressure testing...”
419	400-38, 39	OCT 2023	<ul style="list-style-type: none"> • Delete “Immediately after testing...” • Add “Contractor shall be required...”, “When a pipeline is being purged of air...” & “When a pipeline is being purged of gas...” • Add “Purging is incidental to the project”
420	400-40	OCT 2023	<ul style="list-style-type: none"> • Change “wood 2 x 4” to “yellow poly marker” • Add “The marker and the tracing wire...” • Change “twenty-four (24)” to “forty-eight (48) hours (two full working days)”
421	400-41	OCT 2023	<ul style="list-style-type: none"> • Delete “not exceeding 1-1/4 inch in size”, “tags or” & “Use of plastic tie wraps is not allowed” • Change “(1) inch for 1/2 inch and...” to “1 inch for 3/4-inch service...”
422	400-42	OCT 2023	<ul style="list-style-type: none"> • Add “IPS SDR 10 or 11”
423	400-43, 44, 45	OCT 2023	<ul style="list-style-type: none"> • Change “WELDERS” to “JOINERS” • Add “Las Cruces Utilities Gas Section has PE 2406/2708 Joining Procedures...”
424	400-45, 46	OCT 2023	<ul style="list-style-type: none"> • Delete existing content • Add “All steel arc welding and welding certifications shall be done using City of Las Cruces Standard Welding Procedure Specification...”
426	400-47, 48	OCT 2023	<ul style="list-style-type: none"> • Change “2 inch and larger steel butt” to “HP” • Change “The Owner shall supply the x ray...” to “The Project Manager or the Gas Systems...” • Change “Root and Face Bend...” to “Root Bend, Nick Break and Tensile...”

429	400-51, 52	OCT 2023	<ul style="list-style-type: none"> • Change “PIPELINE HOLIDAY TESTING AND FIELD TAPING OR COATING OF STEEL AND IRON PIPING COMPONENTS” to “PIPELINE HOLIDAY TESTING AND FIELD TAPING OR COATING OF STEEL PIPING COMPONENTS” • Delete “and iron” • Change “at a test voltage not less than 10,000 volts...” to “detector and tested as identified in Section 407.5” • Delete “or iron” • Add “or two(2)”
430		OCT 2023	<ul style="list-style-type: none"> • Add “pressure test and returned to the owner” • Change “between 150 percent of design pressure and 175 percent of design pressure. to “a minimum of 600 psig or at a test pressure determined by the Las Cruces Utilities Gas section to maintain the pipeline MAOP” • Add “. Las Cruces Utilities Gas Section approved Data Loggers are allowed” • Add “(by a licensed Engineer)” • Change “or until the P.M., or designee, is satisfied there are no leaks.” to “Upon completion of successful pressure testing (accepted by the PM or designee)...”

CLC UTILITY STANDARDS REVISION INFORMATION - CONTINUED

SECTION 500 – SANITARY SEWER DESIGN STANDARDS			
SUB SECTION	PAGE	REV DATE	REMARKS
503	500-7	OCT 2023	<ul style="list-style-type: none"> • Clarify note #2 in table Vertical Separation
504.2	500-9	OCT 2023	<ul style="list-style-type: none"> • Change “The CLC Utilities responsibility ceases at the main unless” to “The customer is responsible for maintenance (ex. sewer stoppages) of the line...” • Add “Any repairs and/or replacement to the service line...” • Change “neighbors” to “neighbor’s” • Change “10 foot wide” to “10-foot-wide” • Change “The sewer service in the recorded easement will be maintained and owned by the customer...” to “The sewer service line in the recorded easement will be maintained and owned by the customer...” • Add “refer to 509.3 for cleanout requirement and location”
509.3	500-13	OCT 2023	<ul style="list-style-type: none"> • Change “or within ten (10) feet of the property line...” to “The cleanout shall be installed at subdivision...”
510	500-14	OCT 2023	<ul style="list-style-type: none"> • Add “Sanitary sewer pipe shall be installed continuously thru manholes including fittings where feasible.” • Add “if not continuous pipe.” • Add “Where the drop is less than 1.5 feet the invert shall be placed at the base of the manhole.”

CLC UTILITY STANDARDS REVISION INFORMATION - CONTINUED

SECTION 600 – SANITARY SEWER MATERIAL SPECIFICATIONS			
SUB SECTION	PAGE	REV DATE	REMARKS
ITEM 6	600-4	OCT 2023	<ul style="list-style-type: none"> • Add “to 6ft” • Add “Leco Industries”
ITEM 15	600-5	OCT 2023	<ul style="list-style-type: none"> • Delete “30 volt rating” • Add “Yellow direct bury wire connector, rated up to 600v. Silicon filled.” • Add “Three (3) #12 Solid copper conductors. Model 90120” • Add “Per manufactures specifications” • Add “Dryconn Model 90120 connector Ideal – Model #60”

CLC UTILITY STANDARDS REVISION INFORMATION - CONTINUED

SECTION 700 – SANITARY SEWER CONSTRUCTION SPECIFICATIONS			
SUB SECTION	PAGE	REV DATE	REMARKS
702	700-3	OCT 2023	<ul style="list-style-type: none"> • Add “All materials, labor and equipment required to adhered to CLC utility standards referenced specifications, CLC O&M Manual, and CLC Standard Operating procedures shall be considered incidental to construction.
704	700-8, 10	OCT 2023	<ul style="list-style-type: none"> • Delete gradation ranges table • Add “For all Utility lines refer to NMDOT for suitable backfill. Providing suitable backfill will be required per specifications.” • Change “must be allowed a minimum of 24 hours curing time...” to “shall have minimum 2/3 strength or as directed by the P.M...”
705	700-10, 11, 12	OCT 2023	<ul style="list-style-type: none"> • Change “fifteen (15) to eighteen (18) inches above the final utility surface” to “twelve (12) to thirty (30) above the mains and twelve (12) inches for services.” • Change “The tracing wire will be tested for continuous signal...” to “The tracing wire is required to be successfully tested...”

CLC UTILITY STANDARDS REVISION INFORMATION - CONTINUED

SECTION 800 – WATER DESIGN STANDARDS			
SUB SECTION	PAGE	REV DATE	REMARKS
802.4	800-6	OCT 2023	<ul style="list-style-type: none"> • Change “(AWWA) C605-94” to “(AWWA) C605-13” • Change “AWWA C600-99” to “AWWA C600-17”
803	800-9	OCT 2023	<ul style="list-style-type: none"> • Clarify note #2 in table Vertical Separation
808	800-13	OCT 2023	<ul style="list-style-type: none"> • Change “within 400 feet from the end of the street” to “at the end of the street or provide a 2-inch flushing hydrant.” • Add “and approved”
809.1	800-14	OCT 2023	<ul style="list-style-type: none"> • Add “If the Fire hydrant is not located at the end of Cal-De-Sac, as the water demand decreases then the main line size can be decrease from 8” and 6” to 4”.”
809.2	800-14	OCT 2023	<ul style="list-style-type: none"> • Add “, such as irrigation,”
810	800-15	OCT 2023	<ul style="list-style-type: none"> • Add “, unless otherwise requested by Las Cruces Utilities. Cul de sacs shall have separate valves off the main for isolation. Stubouts require valves.”

CLC UTILITY STANDARDS REVISION INFORMATION - CONTINUED

SECTION 900 – WATER MATERIAL SPECIFICATIONS			
SUB SECTION	PAGE	REV DATE	REMARKS
ITEM 1	900-3	OCT 2023	<ul style="list-style-type: none"> • Change “C900-07” to “C900-18”
ITEM 2	900-3		<ul style="list-style-type: none"> • Change “McWayne” to “McWane Ductile”
ITEM 4	900-3	OCT 2023	<ul style="list-style-type: none"> • Delete “Polyethylene (PE) Pressure Tubing for Water Service – Copper Tubing Sized (CTS), Code PE 3608, Minimum Pressure Class 200, Color to be Blue. (To be discontinued in July 2019) Or” • Add “(use PEX only)” • Change “AWWA: C901-08” to “AWWA C904-16”
ITEM 5	900-3	OCT 2023	<ul style="list-style-type: none"> • Add “– (See General Note 3 this Section) • Change “AWWA:C906-99” to “AWWA: C906-15”
ITEM 6	900-3	OCT 2023	<ul style="list-style-type: none"> • Add “A.Y. McDonald Mfg. Co.”
ITEM 7	900-4	OCT 2023	<ul style="list-style-type: none"> • Add “A.Y. McDonald Mfg. Co.”
ITEM 8	900-4	OCT 2023	<ul style="list-style-type: none"> • Add “A.Y. McDonald Mfg. Co.”
ITEM 9	900-4	OCT 2023	<ul style="list-style-type: none"> • Add “A.Y. McDonald Mfg. Co.”
ITEM 10	900-4	OCT 2023	<ul style="list-style-type: none"> • Add “Kennedy – Guardian K81D, East Jordan Iron Works”
ITEM 14	900-5	OCT 2023	<ul style="list-style-type: none"> • Change “, 5 ½” to “5 ¼”” • Add “East Jordan Iron Works”
ITEM 15	900-6	OCT 2023	<ul style="list-style-type: none"> • Add “ANSI/AWWA – C153/A21.53 UL Requirements” • Add “Sigma Corporation”
ITEM 17	900-6	OCT 2023	<ul style="list-style-type: none"> • Add “Sigma Corporation”
ITEM 19	900-6	OCT 2023	<ul style="list-style-type: none"> • Change “30 volt rating.” To “Yellow direct bury wire connector, rated up to 600v. Silicon filled.” • Add “Per manufactures specifications” • Add “Dryconn connector & Ideal – Model #60”
ITEM 26	900-8	OCT 2023	<ul style="list-style-type: none"> • Add “Sigma Corporation & A.Y. McDonald Mfg. Co.”

ITEM 28	900-8	OCT 2023	<ul style="list-style-type: none">• Add “Standard Traffic Bearing Box; Completed Water Meter Box...”• Add “AASHTO M 199; AASHTO M 306-05”• Add “East Jordan Iron Works product number – 32131035A02; Western Precast Concrete Inc.; DFW Plastic Inc. – 1500 series; DFW1500.12.1 for 5/8” x 3/4” – 1”, 1 1/2”-, 2” and 3” – 4” meters.
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CLC UTILITY STANDARDS REVISION INFORMATION - CONTINUED

SECTION 1000 – WATER CONSTRUCTION STANDARDS			
SUB SECTION	PAGE	REV DATE	REMARKS
1000	1000-3	OCT 2023	<ul style="list-style-type: none"> • Add “or rehabilitation of” • Add “Existing water lines found in the field...” • Add “All DI fittings or corresponding bolts...”
1002	1000-3	OCT 2023	Add “All materials, labor and equipment...”
1004	1000-9, 11	OCT 2023	<ul style="list-style-type: none"> • Delete gradation ranges table • Add “For all Utility lines refer to NMDOT for suitable backfill...” • Change “Road Construction Specifications” to “Standard Specifications for Roadway Construction, latest edition.” • Add “For emergency or schedule repairs less than 300...” • Change “eight (8) inch thick, 4000 psi (containing 2...” to “constructed per standard detail UW-4.” • Add “Taps All taps to the existing water system...”
1005	1000-11, 13	OCT 2023	<ul style="list-style-type: none"> • Change “depth fifteen (15) inches below the final grade.” to “height of twelve (12) to thirty (30) inches above the mains and twelve (12) inches for services.” • Change “On all hydrants the tracing wire shall be run...” to “All hydrants shall have Test Boxes...” • Change “The tracing wire will be tested for continuous signal...” to “The tracing wire is required to be successfully tested...”
1006	1000-14, 15	OCT 2023	<ul style="list-style-type: none"> • Add “Contractors are required...” • Change “CA” to “Utilities Director or P.M.” • Add “for filling and venting air” • Delete “repeated. until the allowable leakage requirements have been met.”

			<ul style="list-style-type: none">• Delete “The testing allowance is defined...”
1007	1000-15, 16, 18	OCT 2023	<ul style="list-style-type: none">• Change “AWWA C651-99” to “AWWA C651-14”• Change “AWWA B300-92” to “AWWA B300-18”• Add “The Granular Method:”

CLC UTILITY STANDARDS REVISION INFORMATION - CONTINUED

SECTION 1100 – UTILITY PLAN REVIEW STANDARDS			
SUB SECTION	PAGE	REV DATE	REMARKS
1101	1100-3	FEB 2013	<ul style="list-style-type: none"> • CHANGE “C.L.C. UTILITIES DIVISION” TO “LAS CRUCES UTILITIES” • UPDATE CLEARANCE REQUIREMENT BETWEEN TREES AND UTILITY SERVICE LINES
1102	1100-4	FEB 2013	<ul style="list-style-type: none"> • CHANGE “C.L.C. UTILITIES DIVISION” TO “LAS CRUCES UTILITIES”

CLC UTILITY STANDARDS REVISION INFORMATION – CONTINUED

SECTION 1200 – UTILITY DRAWING DETAILS			
SUB SECTION	PAGE	REV DATE	REMARKS
-----	All pages	OCT 2023	• Revise Title block and City of Las Cruces Logo
-----	1200-1, 2, 3, 4, 5	OCT 2023	• Revise Utility Details Index to reflect new details sheets
-----	UA-1	OCT 2023	• Add Note 3 “Any deviation to the...”
-----	SW-1	OCT 2023	• New detail “DUMPSTER PLAN AN DETAILS”
-----	UG-1	OCT 2023	• Add dimension “12” TO 30””
-----	UG-2	OCT 2023	• Add “Lock Wing Valve”
-----	UG-3	OCT 2023	• Add “Lock Wing Valve” • Change service riser height from 42” to a range 36” min to 42” max
-----	UG-4	OCT 2023	• Add “Lock Wing Valve” • Change service riser height from 42” to a range 36” min to 42” max • Add note 5 “Bury line marker on the riser.”
-----	UG-5	OCT 2023	• Add “Note: Bury line marker on the riser.”
-----	UG-6	OCT 2023	• Add Note2 “Bury line marker on the riser.” • Change service riser height from 42” to a range 36” min to 42” max
-----	UG-7	OCT 2023	• Add Flow of traffic arrow
-----	UG-8	OCT 2023	• Delete Concrete Collar cloud detail • Change cast iron slip to plastic slip
-----	UG-11	OCT 2023	• Add Note 2 “24” octagon concrete collar to be installed.”
-----	UG-12	OCT 2023	• Add Note 4 “24” octagon concrete collar to be installed.”
-----	UG-13	OCT 2023	• Add Note 5 “24” octagon concrete collar to be installed.” • Add “Loop & knot tracing wire”
-----	UG-14	OCT 2023	• Add Note 6 “24” octagon concrete collar to be installed.”
-----	UG-15	OCT 2023	• Add Note 5 “Non insulated lock wing valve”

-----	UG-17	OCT 2023	<ul style="list-style-type: none"> • New detail “SINGLE COMMERCIAL GAS METER”
-----	US-1	OCT 2023	<ul style="list-style-type: none"> • Change dimension depth of warning tape • Add Asterisk note “The thickness of the pavement patch shall match...”
-----	US-2	OCT 2023	<ul style="list-style-type: none"> • Add “Subdivision stage (Reference Section 504.2)” • Add 2” dimension, 1’ past sidewalk • Add Install single clean-out per US-3 without concrete collar • Add Sealed cap at subdivision stage threaded cap by home builder and adjust to final grade
-----	US-3	OCT 2023	<ul style="list-style-type: none"> • Add Flow
-----	US-5	OCT 2023	<ul style="list-style-type: none"> • Change “4,000 PSI conc...” to “See detail US-9”
-----	US-6	OCT 2023	<ul style="list-style-type: none"> • Add on Note 1 “with prior approval”
-----	US-7	OCT 2023	<ul style="list-style-type: none"> • Change “US-5” to US-9”
-----	US-9	OCT 2023	<ul style="list-style-type: none"> • Add 5’ Octagon concrete collar • Add “8” thick 4000 psi concrete...” • Add Flow of traffic with arrow
-----	US-15	OCT 2023	<ul style="list-style-type: none"> • Add Note 4 “Tracing wire shall...” • Add Note 5 “24” Octagon concrete collar to be installed” • Add “Loop & knot tracing wire” • Delete “Wrapped once around...” • Delete “Tee splice tracing wire...”
-----	UW-1	OCT 2023	<ul style="list-style-type: none"> • Change dimension depth of warning tape • Add Asterisk note “The thickness of the pavement patch shall match...”
-----	UW-2A	OCT 2023	<ul style="list-style-type: none"> • Change page number/name “UW-2-1” to “UW-2A”
-----	UW-4	OCT 2023	<ul style="list-style-type: none"> • Add 24” Octagon concrete collar • Add Flow of traffic with arrow
-----	UW-5	OCT 2023	<ul style="list-style-type: none"> • Add Note 4 “Bypass water meter...”
-----	UW-7	OCT 2023	<ul style="list-style-type: none"> • Add “30” Cast Iron”
-----	UW-9	OCT 2023	<ul style="list-style-type: none"> • Add “30” w/”City”
-----	UW-13	OCT 2023	<ul style="list-style-type: none"> • Add “Wrap tracing wire minimum...” • Add “Break-away collar to be 2”...”

			<ul style="list-style-type: none"> • Add Note 3 “Test boxes...”
-----	UW-13-1	OCT 2023	<ul style="list-style-type: none"> • New detail “FLUSH HYDRANT DETAIL”
-----	UW-14	OCT 2023	<ul style="list-style-type: none"> • Add 2 post • Add a post description “Offset either direction to provide best protection” • Add “Round concrete cap”
-----	UW-16	OCT 2023	<ul style="list-style-type: none"> • Add Note 4 “Utility system piping...”
-----	UW-21	OCT 2023	<ul style="list-style-type: none"> • Add Note 5 “24” Octagon concrete collar to be installed” • Add “Loop & knot tracing wire”
-----	FIRE-1	OCT 2023	<ul style="list-style-type: none"> • New detail “REDUCE PRESSURE BACKFLOW PRENTOR SCHEMATIC”
-----	FIRE-2	OCT 2023	<ul style="list-style-type: none"> • New detail “FIRE DEPARTEMENT CONNECTION (FDC)”
-----	US-ALL-1	OCT 2023	<ul style="list-style-type: none"> • Add all Gas Utilities Sheets 1of 2
-----	US-ALL-1	OCT 2023	<ul style="list-style-type: none"> • Add all Gas Utilities Sheets 1of 2
-----	UG-ALL-1	OCT 2023	<ul style="list-style-type: none"> • Add all Sewer Utilities Sheets 1of 2
-----	UG-ALL-2	OCT 2023	<ul style="list-style-type: none"> • Add all Sewer Utilities Sheets 1of 2
-----	UW-ALL-1	OCT 2023	<ul style="list-style-type: none"> • Add all Water Utilities Sheets 1 of 3
-----	UW-ALL-2	OCT 2023	<ul style="list-style-type: none"> • Add all Water Utilities Sheets 2 of 3
-----	UW-ALL-3	OCT 2023	<ul style="list-style-type: none"> • Add all Water Utilities Sheets 3 of 3

SECTION 100
GENERAL INFORMATION

**SECTION 100
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100 GENERAL NOTES CONCERNING THESE STANDARDS AND SPECIFICATIONS

These standards and specifications are published by the Las Cruces Utilities as an aid in design and construction to entities working in the City of Las Cruces. All main line utility design must be done under the direction of and stamped by an engineer registered in the State of New Mexico. These design standards are minimum standards applicable to City projects and permits and do not relieve the engineer of following sound engineering principles that protect the health, safety, and welfare of the public.

Las Cruces Utilities may perform random construction inspections without prior notifications.

Any contractors found to be installing material other than the approved material from a certified submittal will be banned for a minimum of 3 years from completing any projects for Las Cruces Utilities or for projects that will be dedicated to Las Cruces Utilities. By accepting projects inside the City Limits or for utility projects outside City Limits for service by the City, contractors are agreeing to these specifications.

Industries having direct or indirect wastewater discharge are required to comply with the municipal Ordinance No. 1815, and its revisions. They are also required to complete a permit application and questionnaire, available from Las Cruces Utilities.

101 CITY REIMBURSEMENT POLICIES

As a general rule all utility improvements are paid for by the entity that requests the improvement. In certain instances (line oversizing, Capital Improvement Projects, main line extensions) the City may agree to reimburse the entity requesting the utility improvement for a portion of the expenses associated with design and construction of the utility. Copies of current line extension reimbursement policies and City of Las Cruces standard operating procedures are available at Las Cruces Utilities.

102 PROCEDURES FOR VARIANCE FROM STANDARDS

The Utilities Director, or designee, may approve a request for variances from these standards. A variance from these standards shall not set any precedent for future variances. It is recommended that Las Cruces Utilities staff be contacted prior to submitting a formal request for variance.

103 BACKFLOW PREVENTION

Backflow prevention is specifically addressed in City of Las Cruces Ordinance No. 1694, and its revisions. The Building Inspection Department of the City of Las Cruces Community Development Department as well as Las Cruces Utilities Pollution Prevention Office under the Regulatory Environmental Services Section which regulates backflow prevention. All questions concerning backflow prevention should be referred to the Building Inspection Department or the Pollution Prevention Office for Las Cruces Utilities Department.

104 GREASE TRAPS

Grease traps fall under the International Plumbing Code and are regulated by the Building Inspection Department of the City of Las Cruces Community Development Department and the Pollution Prevention Office under the Regulatory Environmental Services Section of Las Cruces Utilities.

105 UTILITY EXTENSION LIMITS

All City owned utility mains that are extended for service to a property shall be extended to the most distant limits of any property that is being developed. In the event that a dedicated and paved right of way is constructed, all utilities must be constructed to paving limits of the project, or road limits plus 5 feet, as determined by Las Cruces Utilities.

106 UTILITY SERVICE CONNECTION

Every lot in the city shall have separate city-owned utility service connections, unless specifically authorized by the Utilities Director, or designee.

107 NON CITY OF LAS CRUCES JURISDICTION

For City owned utility mains or service lines needing a permit from an entity other than the City of Las Cruces, the permit request of the other entity must be initiated by the person requesting the proposed construction. The party making the permit request is responsible for any fees associated with the permit process.

108 PERMITS

The Utility Contractor shall be responsible for all construction permits for the work site.

108.1 CITY OWNED UTILITIES LOCATED OUTSIDE CITY LIMITS

Utilities located outside the limits of the City of Las Cruces or outside City owned Right of Way shall conform to the requirements of the City of Las Cruces AND the requirements of the appropriate jurisdiction.

108.2 PROCEDURE FOR OBTAINING PERMITS TO PLACE CITY OWNED UTILITIES IN THE NEW MEXICO STATE DEPARTMENT of TRANSPORTATION (NMDOT) RIGHT OF WAY

Permissions to place utilities in NMDOT Right of Way are granted to the City of Las Cruces from the NMDOT. Consequently the permit application form must be reviewed and signed by the Utilities Director prior to being submitted to NMDOT.

The entity responsible for construction of the utilities may obtain a permit application form either from City of Las Cruces Utilities or from NMDOT.

The entity responsible for construction of the utilities is responsible for completing the permit application form and for all expense associated with completing the form.

An archeological clearance must be obtained from the NMDOT prior to the review by City of Las Cruces Utilities.

The phone number and address for the NMDOT Archeology Department may be obtained from City of Las Cruces Utilities.

Actual submission of the permit application form to the NMDOT is done by City of Las Cruces Utilities.

In compliance with NMDOT requirements, AS-BUILT drawings of utility installation within the Right of Way must be submitted to the NMDOT through City of Las Cruces Utilities department within 30 days of completion of the permitted work on the project. Failure to submit AS-BUILT drawings will result in cancellation of the permit and withdrawal of approval of the utility installation by the City of Las Cruces. The AS-BUILT drawings must be submitted to City of Las Cruces Utilities for review prior to being submitted to NMDOT. A copy of NMDOT requirements for AS-BUILT drawings may be obtained either from City of Las Cruces Utilities or from NMDOT.

108.3 PROCEDURE FOR OBTAINING PERMITS TO PLACE CITY OWNED UTILITIES IN DONA ANA COUNTY RIGHT OF WAY

Permission to place utilities in Dona Ana County Right of Way is granted to the City of Las Cruces from Dona Ana County. Consequently the Dona Ana County permit application form must be reviewed and signed by the Utilities Director prior to being submitted to Dona Ana County.

The entity responsible for construction of the utilities may obtain a permit application form either from City of Las Cruces Utilities or from Dona Ana County.

The entity responsible for construction of the utilities is responsible for completing the permit application form and for all expense associated with completing the form.

108.4 PROCEDURE FOR OBTAINING PERMITS TO PLACE CITY OWNED UTILITIES IN ELEPHANT BUTTE IRRIGATION DISTRICT (EBID) RIGHT OF WAY

Permissions to place utilities in EBID Right of Way are granted to the City of Las Cruces from the EBID. Consequently the

permit application form must be reviewed and signed by the Utilities Director prior to being submitted to EBID.

The entity responsible for construction of the utilities may obtain a permit application form either from City of Las Cruces Utilities or from EBID.

The entity responsible for construction of the utilities is responsible for completing the permit application form and for all expense associated with completing the form.

108.5 PROCEDURE FOR OBTAINING PERMITS TO PLACE CITY OWNED UTILITIES IN BURLINGTON NORTHERN AND SANTA FE RAILROAD RIGHT OF WAY

All permitting within Railroad right of way shall be done only by the City of Las Cruces with assistance as required from the entity responsible for construction of the utilities. The entity responsible for construction of the utilities is responsible for completing the permit application form and for all expense associated with the form and permit.

109 EXISTING UTILITIES

Existing Utilities within the boundaries of a project shall be adjusted as required to conform with the final grades of a project. The entity responsible for construction of the utilities is responsible for all expense associated with all adjustments.

110 LIMITATIONS ON EASEMENT USE AND MINIMUM WIDTH

Use of land encumbered by City of Las Cruces Utility Easements is limited to uses that do not interfere with the operation, maintenance, or construction of the utilities within the easement.

Easement widths stated in these standards are minimum widths only. The Utilities Director may request greater widths than the stated minimums, when the extra width is necessary for operation, maintenance, or construction of the utilities within the easement.

Easements for utilities should be located such that the utilities can be maintained by wheeled light construction equipment. No permanent structures can be located on an easement without specific written approval from the Utilities Director. Utilities located through areas that will be expensive to repair or maintain (i.e. extensive landscaping, drainage ponds, etc.) will require sleeving of the utility. For utility easements in commercial areas, parking lots or paved drives are preferred.

111 GENERAL CONSTRUCTION SPECIFICATION

111.1 DEFINITIONS

1. ENTITIES:

OWNER – The City of Las Cruces, Dona Ana County, New Mexico, a Municipal Corporation. The Owner’s representative shall be the contract administrator (herein: **C.A.**), who shall be in charge for the Owner, acting personally or through any and all assistants duly authorized such as: Project Managers, Engineers, Inspectors (herein: **P.M., or designee**).

CONTRACTOR – The entity being in responsible charge of the construction improvements.

SUPERINTENDENT – That individual, or individuals, having authority to represent the Contractor on a daily basis regarding the project.

2. PROJECT – The permitted installation, alteration, or adjustment of any portions of the City of Las Cruces water distribution system, or sewer collection system, or natural gas transmission or distribution systems, either by contract to the City of Las Cruces or authorized by permit issued by the City of Las Cruces.

3. CONTRACT DOCUMENTS – The set of plans, specifications, agreements, these Standards, and all referenced applicable standards and specifications and Ordinances appurtenant to the Project.

4. BRAND NAME OR EQUAL - Where the brand name or equal specification is shown within these standards, drawings, and specifications, the use of the brand name is for the purpose of describing the standard of quality, performance, and characteristics desired and is not intended to limit or restrict competition. All manufacturers' products listed are preferred. Others may be submitted to the Utilities Director, or designee, for pre-approval, prior to bid opening for CLC contracted projects.

111.2 ACCEPTANCE OF IMPROVEMENTS, SUBMITTALS, RECORD DRAWINGS, AND WARRANTIES

Utility Work Contracted Directly by the City of Las Cruces: For preliminary acceptance of utility improvements, and prior to connection to the City of Las Cruces utility system, the Contractor shall be required to submit utility blue-line drawings, annotated with any and all Project changes ("As-Builts"), for review and approval by the P.M. Such drawings shall be submitted to the P.M., or designee, for approval and acceptance. Utility improvements cannot be tied into the existing system until As-Built working drawings (Contractor generated blue prints are acceptable) of the improvement have been submitted to, and accepted, by the P.M. on that project. All coupons for waterline connections shall be removed and accounted for by the P.M. or designee and documented on project as-builts. PM or designee shall inspect and approve equipment used prior to tapping. If a coupon is lost during tap operation, the contractor shall immediately notify PM or designee. Contractor shall coordinate with Water Section to determine probable coupon location. Contractor shall be responsible for all coupon retrieval or cost thereof.

Utility Work Not Contracted Directly by the City of Las Cruces: With a request for final acceptance of utility improvements, the Contractor shall finalize and complete all Project changes to the As-Builts and submit one (1) set of said completed As-builts, and a computer-aided drawing on recordable computer disc,

or other electronic format acceptable to the P.M., and a detailed material listing, said submittal being herein the Project Record Drawings submittal, and is required prior to Subdivision approval and acceptance. The P.M., or designee, shall inspect said improvements to determine whether the installations are acceptable and whether they conform to these Utilities Standards and the Contract Documents. The submittal of electronic drawing files may be waived by the P.M. Upon approval and acceptance by the P.M., the Record Drawing submittals are the Project's "Record Drawings". These requirements are intended to mirror and incorporate the City of Las Cruces Subdivision Code, latest applicable edition.

The P.M. shall be the final authority for acceptance or rejection of pipe and other materials installed. The entity responsible for construction (herein: Contractor), and their representative (herein: Superintendent), shall ensure that all materials and procedures are proper and in compliance with Las Cruces Utilities requirements in every respect. The Contractor shall be held responsible and accountable for everything that comes under or is related to the proper and complete execution of the utility systems installation, either directly or indirectly. All coupons for waterline connections shall be removed and accounted for by the P.M or designee and documented on project as-builts. PM or designee shall inspect and approve equipment used prior to tapping. If a coupon is lost during tap operation, the contractor shall immediately notify PM or designee. Contractor shall coordinate with Water Section to determine probable coupon location. Contractor shall be responsible for all coupon retrieval or cost thereof.

Submittals

Submittals for construction of water and sewer utility improvements may be required at the option of the P.M., or the Utilities Director. See Section 402 for required pre-construction and post-construction submittals for gas utility improvements.

As-Builts / Record Drawings

The Contractor shall submit As-Builts (Project and Contract Documents annotated with any and all Project changes) on the construction site at all times. The drawings shall be maintained and kept current with all changes daily throughout the Project. For additional applicable information, see the City of Las Cruces General Conditions – 2004 edition, or applicable edition.

The requirements of as-builts/record drawings shall be in conformance with City of Las Cruces Subdivision Code Sec 37-305, or applicable edition.

Warranties

The Contractor shall provide warranties as per the applicable sections of the City of Las Cruces General Conditions and the City of Las Cruces Subdivision Code, applicable editions of each.

111.3 CONCRETE MIX DESIGN

The Contractor shall submit a copy of an approved concrete mix design to be used on City projects and permits to the P.M., or designee. The approved copy of the mix design can be obtained from a concrete supplier. The concrete supplier should have in his file a copy of a City approved mix design to be used.

The submitted mix design must be an original (no photocopies) and embossed with the seal of and signed by, the New Mexico Professional Engineer certifying the mix design.

The pre-approved copy of the mix design will be cross-checked against the copy that the supplier previously submitted, to ensure that they match and it is the current approved mix design.

No concrete shall be placed on any project until the P.M., or designee, has approved the concrete mix design.

111.4 ASPHALT MIX DESIGN

The Contractor shall submit an asphalt mix design to the P.M. for approval. No asphalt shall be placed on any project until the P.M. has approved the asphalt mix design.

The submitted mix design must be original (no photocopies) and embossed with the seal of, and signed by, the Professional Engineer certifying the mix design.

The asphaltic concrete classification to be placed on any project shall conform to the City of Las Cruces Standard Specifications for Road Construction, 2000 edition, or applicable.

111.5 REMOVALS

In accordance with the referenced General Conditions, the Contractor shall comply with City Ordinance 1231 and any revisions, approved by the City Council on May 6, 1991, which states that all removals shall be disposed of at a "permitted sanitary landfill", or City approved site.

111.6 TRAFFIC CONTROL PLAN

The Contractor shall submit a Traffic Control Plan (TCP). The TCP shall meet the requirements of the latest edition of the Manual of Uniform Traffic Control Devices ("MUTCD"). The submittal shall be approved by the P.M., or designee (see Definitions, Sec.111.1.1), prior to commencing construction. TCP's shall be in conformance with MUTCD traffic control specifications and applicable City of Las Cruces Standards, where applicable.

111.7 SAW CUTTING AND PATCHING EXISTING PAVEMENT

The Contractor shall make pavement cuts for utility connections and other required operations by saw

cutting the existing asphalt pavement in neat, straight lines prior to initiation of excavation as directed by the P.M., or designee, and by the Contract Documents. The method and equipment used for saw cutting shall be approved by the C.A. before any such cuts are made.

All pavement cuts shall be made producing square, clean and straight edges parallel to or at right angles with the street or roadway right-of-way line (whichever is appropriate) while being of uniform width throughout. No repaving (patching) shall be allowed until these pavement cut conditions are met.

Pavement cuts shall be kept to the minimum width necessary to perform the required utility, roadway, or drainage work, or to accommodate the Contractors paving equipment.

The Contractor shall not be allowed to leave more than 1,000 linear feet of utility trench asphalt patching incomplete. The P.M. shall stop any further removal of asphalt until such time as the Contractor has caught up with patching per the above limit.

Workmanship and materials will be in accordance with the City of Las Cruces Standard Specifications for Road Construction, Section 355, 2000 edition, or applicable edition.

If the Contractor does not repave (patch) for a period during which the weather changes radically, or in excess of one (1) week, the P.M. shall retake density tests at the Contractor's expense. Any rework or further testing to bring the subgrade to the required 95 percent of Modified Proctor will be at the Contractor's sole expense. Base course must be primed and be in acceptable condition to allow for an excess of one week prior to patching.

111.8 LANDSCAPING

The Contractor shall minimize the removal or damage to any landscaping or improvements within or adjacent to

the parkway and sidewalks. Any removal of landscaping or improvements will have to be approved by the P.M. prior to removal. Any removed/damaged landscaping or improvements shall be replaced to existing condition with like material. All replacement items shall be approved by the P.M. prior to installation. The installation of replacement items shall be to the P.M.'s satisfaction. Any replacement of damaged or removed items will be at the Contractor's expense, and shall be specifically included within supplied warranties, see Section 111.1.

111.9 SIGNAGE

The Contractor shall minimize the removal or damage to any signage within or adjacent to the parkway and sidewalks. Any removal of signage will have to be approved by the P.M. prior to removal. Any removed/damaged signage shall be replaced to existing condition with like material. All replacement items shall be approved by the P.M. prior to installation. The installation of replacement items shall be to the P.M.'s satisfaction. Any replacement of damaged or removed items will be at the Contractor's expense.

111.10 GENERAL NOTES

The Contractor shall coordinate work schedules with the public, farmer's irrigation/work schedules while working in the temporary construction easements.

The Contractor shall repair all asphalt/gravel driveways and turnouts that are damaged during construction, to existing condition.

Water for construction purposes is the sole responsibility and expense of the Contractor that requires the water. Water for construction purposes is usually available for a fee from the City system. If a contractor desires water from the City system, an application may be made to the Customer Service Section of Las Cruces Utilities. Construction water is generally made available by means of a City furnished

meter attached to a fire hydrant. In cases where the contractor does not have an air-gap method of utilizing the water, a city-furnished backflow preventer must be used. The charges for City furnished construction water consist of a monthly rental fee plus a cost based on the actual amount of water usage recorded by the meter. Since fees vary, the contractor is encouraged to determine the current cost of the service prior to utilizing the service.

111.11 LAYOUT OF WORK

The Contractor shall employ registered professional surveyors to accomplish all project control staking and base line staking, as becomes necessary, and shall ensure proper locations of the pipeline and its appurtenances.

The Contractor shall be responsible for adherence to the lines and grades of the plans and profiles as designed. The method of adherence will be by placing cut stakes along the project and observing the directions of the cut stakes, as may be appropriate. It is the responsibility of the Contractor that professional standards of meeting lines and grades are required.

When any control or base line staking, triangulation station, benchmark, corner, monument, witness mark, or other similar reference point that becomes removed or obliterated by reason of the construction, out of accident or necessity, it shall be the Contractors responsibility to cause said points to be established by a registered surveyor and to record a plat of that survey to be recorded with the County Clerk, in conformance with applicable surveying standards.

111.12 PIPELINE ROUTE

The Contractor shall realize and consider that the pipeline and appurtenance routes will be intersected by underground and above ground obstructions. The Contractor is responsible for determining the existence and location of any obstructions and for adequately and

properly avoiding and protecting any permanent obstructions, or obstructions having ownership or value, from harm or damage. The pipeline and appurtenances shall be installed along the routes and in the locations shown on the Contract Documents contained herein as specified herein or as specified by the P.M. The pipeline shall be laid along the centerline of those routes and at the depths specified.

The Contractor shall employ licensed surveyors to accomplish all project control staking and base line staking, as becomes necessary, and shall ensure proper locations of the pipeline and its appurtenances.

Accurate as-builts shall be maintained and kept current daily throughout the project. The as-built drawings shall indicate the location of mainline and service lines with respect to right-of-way and property lines. All stopples, valves and fittings, etc., shall be adequately referenced to obvious, easily described, permanent objects. The as-builts shall be turned in to the P.M. before a tie in to the existing system is allowed.

The Contractor shall return everything along the construction route to its original condition to the satisfaction of the P.M. All damage to property that occurs as a result of the Contractor's work shall be completely repaired or replaced to its original condition and to the satisfaction of the P.M.

111.13 GAS ROUTING UNDER & AROUND OBSTACLES

When the pipeline has to be routed under an existing or future utility or structure, the Contractor shall slope the trench bottom in both directions such that the pipeline is supported throughout and is able to naturally "sag" (with no stressing or forcing) under the existing utility or structure with a minimum of twelve (12) inch clearance. In situations where the top of pipe depth is required to exceed 6'-0" in order to go under a utility or structure, the Contractor may, only with the P.M.'s approval, use weld elbows to accomplish this "routing under" instead of having to "sag" the pipeline. This work will be

incidental to the contract unless deemed otherwise by the P.M.

111.14 TRENCHING, EXCAVATIONS, AND BACKFILLING

All trenches shall be dug and maintained as per the requirements of the latest OSHA Trench Safety Standards and Specifications. The working conditions in the trench shall also conform to these Standards.

The Contractor shall utilize proper equipment and methods as are necessary to properly locate the trench or excavation along the lines required by the Contract Documents and to dig the trench or excavation to the proper depths in accordance with these Standards.

Removal of unknown, unforeseen, unidentified, underground obstacles (such as concrete, rocks, metal objects, wood objects, hard soil, etc.), if not addressed elsewhere in contractual documents with the Owner, shall be considered a change of conditions to the Project and shall be referred to the P.M. for concurrence.

The Contractor shall perform all excavations to the depths indicated in the permitted Project documents or specified herein. Any excavation beyond the authorized depths shall be filled with suitable compacted material up to the proper depth (before installation of the pipeline) at the Contractor's expense.

Utility Soil Bedding and Backfilling shall conform to:

Utilities should be bedded in fine-grained granular material such as fine, poorly graded (uniform) sand in a fashion to avoid the development of any voids around utility lines placed. Embedment material shall be provided and installed such that a minimum of 85% Modified Proctor, per American Association of State Highway and Transportation Officials (AASHTO) T-180, densities are achieved for the pipe zone backfill.

For all Utility lines refer to NMDOT for suitable backfill. Providing suitable backfill will be required per specifications.

All soil bedding materials used should be non-plastic. All soil bedding materials should extend a minimum of 4 inches in all directions, except for gas lines having 6" minimum above and below the pipe.

All utility trenches should be backfilled with compacted soil below structural elements, including foundations, interior and exterior flat concrete work, and paved parking or drive areas. Although the backfill should be compacted, care should be taken not to damage the utility during backfilling and subsequent compaction.

Backfill materials may be native soils free of contaminants such as debris and rubble, however, no material having a maximum individual particle size or agglomeration clod size greater than two and one-half (2½) inches shall be placed within twelve (12) inches of the utility piping installed.

Minimum Backfill Compaction Requirements

Utility Construction	Percent of Modified Proctor Density (ASTM D-1557)		
	Existing Surface Preparation	Fill or Backfill Placement	Maximum Finished Lift Thickness (in.)
In Roadway: Shallower than 36 " of Grade	N/A	95	6
In Roadway: Deeper than 36 " of Grade	N/A	95	12
Outside Roadway: Shallower than 36 " of Grade	N/A	90	12
Outside Roadway: Deeper than 36 " of Grade	N/A	90	18

Note: ASTM herein refers to the American Society for Testing and Materials.

During excavation, material suitable for backfilling must be stockpiled in an orderly manner. Materials unsuitable for back filling, as directed by the P.M., shall be wasted in a suitable location. Where material is excavated from a trench and piled adjacent to the trench that material shall be piled in such a way that the toe of the slope of the material is at least two (2) feet from the edge of the trench. Alongside streets or roadways, material excavated from the trench shall, wherever possible, be piled along the street or roadway (traffic) side of the trench.

Should any rock, coarse stone, boulders, gravel, or other materials be encountered which would prevent the obtainment of suitable bedding, the trench shall be excavated to at least six (6) inches, for coated steel gas lines, four (4) inches for all other utilities, of extra depth and backfilled and properly compacted to grade with suitable material.

The Contractor shall furnish all work and items necessary for the completion and maintenance of the trench, including flood or water control, shoring, cofferdams, diversion dikes, sheeting, piling, bracing, sloping, etc.

All grading in the vicinity of trenches or other excavations shall be controlled to prevent surface water from flowing into the excavations or damaging other property. Any water accumulated in the excavations shall be removed by pumping or by other Owner's approved methods, at the Contractor's expense.

Should the trench or excavation bottom become unstable from the entrance of surface water into the open excavation, the saturated soil shall be removed and suitable backfill placed and compacted to grade, at the Contractor's expense.

All trenches shall be cut to the line and grade as shown on the permitted Project documents and as specified herein. The bottom of the trench shall be smooth, without discontinuities and shall provide uniform support

along the entirety of the pipeline without allowing the pipe to bend or sag.

Trench sides shall be smooth, uniform, free of discontinuities and protrusions such as roots, limbs, abandoned utility lines, asphalt material or other matter which may present a hazard to either the pipe, pipe coating or personnel.

The minimum allowable trench width shall be as shown in the Contract Documents.

All coated and/or wrapped utilities damaged during trenching or other excavations shall be cleaned up and again coated and wrapped throughout the excavation (throughout the exposed length) in accordance with the applicable Standards at no added expense to the Owner. This coat and wrap shall be proven to be proper and complete by the Contractor. This shall be done in part by completely Holiday testing steel wrapped lines (jeeping). These recoated and rewrapped (or exposed) lines shall be tested in the presence of the P.M., or designee, immediately prior to backfilling.

All harmful debris such as sharp stones, rocks, boulders, cans, paper, skids, stumps, roots, miscellaneous vegetation, tires, loose wire, and other extraneous matter shall be removed from the trench prior to lowering of the pipe and/or backfilling. No such debris which may be injurious to the pipe or pipe coating or which may create a corrosive cell or hot spot shall come in contact with the pipe or pipe coating before, during, or after backfilling.

Minimum density requirements for backfill shall be as follows:

- Within street, roadway, highway, or railroad rights-of-way shall be 95 percent of Modified Proctor maximum density at a moisture content within plus or minus two percent (+/- 2%) of optimum moisture.

- Outside of street, roadway, highway, or railroad rights-of-way shall be 90 percent of Modified Proctor maximum density.
- Utility service lines in yards (min. four (4) inches wide, max. six (6) inches wide) shall be 85 percent of Modified Proctor maximum density.

Tamping to consolidate backfill shall be done by placing the backfill in layers and compacting with the proper tools. Compaction methods and equipment may utilize hand or mechanical tampers, rollers, etc. The equipment and procedures proposed shall be subject to the approval of the P.M. The use of "Hydro-Hammers" and other such "stampers" shall not be allowed.

Minimum soil densities on trenching work shall be as designated in the City of Las Cruces Standard Specifications for Roadway Construction, latest edition.

The Contractor shall take extreme care and shall ensure that all drain ditches, spillways, watercourses, streets, highways, roadways and railroads are kept open at all times. The Contractor shall at all times keep the construction area cleanup completed to within one (1) block of the completed backfill, or 1000 lineal feet of trench, as directed by the P.M., see Section 111.6.

The location of mechanical compression couplings in existing steel gas piping uncovered during construction shall be brought to the attention of the P.M., or designee, and shall be shown on as-built drawings.

Flowable fill may be used in shallow, narrow trench excavations. Materials shall conform to the City of Las Cruces Standard Specifications for Road Construction, 2000 edition or applicable. Flowable fill may not be used for utility embedment material unless authorized by the P.M., or designee. Use of flowable fill is discouraged in areas of collapse prone soils and expansive soils that are moisture sensitive and in areas of large excavations. The Contractor shall be responsible for all paving, repaving, and pavement patching in accordance with the said Road Construction Standards.

On streets and roadways having surfaces which have been graveled or stabilized with base material, the Contractor shall blade the surfacing material away from the area of the trench and stockpile such material in a windrow which is clear of the construction operations. After the utility line has been installed and the trench backfilled and compacted, the area shall be properly graded and the surfacing material shall be re-spread to its original lines and stabilized by watering and rolling to its original condition.

111.15 INTERFERENCE WITH SERVICE, NOTICE AND SCHEDULE OF WORK

The Contractor shall obtain the permission of the P.M., or designee, before making any connections with existing utility mains. The required operations of the existing system components will be performed by the P.M., or designee, as per the City of Las Cruces General Conditions, 2004 or applicable, edition.

The Contractor shall submit a work plan, detailing the performance of necessary activities, for prior approval of the P.M., or designee. The Contractor shall notify the P.M. of all utility shutoffs that he plans to make, the day and time they are to be made, the estimated length of time the utility will be out of service, and manpower available for the performance of same. The Contractor may be required to perform certain work activities at night when, in the opinion of the P.M., or designee, it will be necessary for the convenience of the Owner and the general public. Work shall be started upon the direction of the P.M., or designee, and shall be completed in a prompt, efficient manner in coordination and cooperation with any and all other utilities concerned.

The Contractor, with prior approval of the P.M., shall notify the utility customers that will be affected of the impending shutoff. The utility customers shall be given ample time, 48 hours, to provide themselves with temporary supply measures. Notification shall be by

personal contact, or door hanger notice, and by notice in a local newspaper.

Any interruption of service shall be for as short a time as possible. No service shall be interrupted for a period longer than four hours except by permission of the P.M., or designee.

When construction work requires that service to the City customers be interrupted, the Contractor must request approval for the interruption from the P.M., or designee, at least 48 hours in advance. The P.M., or designee, may adjust scheduled interruptions to occur during minimum use periods.

If an emergency interruption occurs, the Contractor shall immediately notify the P.M. and City of Las Cruces Utilities and shall restore service as soon as possible.

It shall be the P.M., or designee's, option to assist the Contractor in restoring service during scheduled or emergency interruptions if, in their opinion, work to restore service is not progressing in a timely manner. Costs incurred by the City will be reimbursed to the City by the Contractor based upon City's invoice.

111.16 PROCEDURES

Subgrade to be established ± 0.2 FT prior to any utility corridor being utilized.

Sewer corridor to be installed first, followed by water and gas. All main lines shall be installed, tested, and accepted by the P.M., or designee, prior to final subgrade elevations and lines being established.

111.17 UTILITY STUBOUTS

Locations of utility stubouts and services shall be marked on the curb top, once only, by branding as "S" for sewer, "W" for water, and "G" for gas. Failure to mark stubouts and services, within 12 inches of their horizontal placement, shall constitute grounds for

rejection of the subdivision plat and/or rejection of the utility system extension. All coupons for waterline connections shall be submitted and accounted for by the P.M. on that project and a memo certifying such has occurred to be submitted to the Deputy Director of Water.

111.18 CONSTRUCTION NOTES

CLEANUP – The Contractor shall leave the project in a clean and neat condition.

MATERIAL TESTING FAILURES – The cost of all density re-tests, due to failures, shall be paid for by the Contractor. A receipt from the testing lab indicating that the Contractor has met his obligations will be necessary prior to acceptance of the utility project by the Utilities Department. A certificate will also be required from the testing lab certifying that all failures have been successfully retested.

“AS BUILT” and “RECORD” DRAWINGS – **For utility work on City of Las Cruces contracts**, the Contractor shall prepare an accurate, detailed set of “As Built” drawings for the utilities installed (water, sewer, and gas). The Owner will provide the Contractor with a set of plans for the preparation of the “Record” drawings and the Contractor shall record thereon locations, depth, size, type of material, any other pertinent data, and all changes made in the utility system. The Contractor shall turn over the completed set of plans to the owner prior to acceptance of the project by the City of Las Cruces. Reference applicable Sections herein.

VALVE BOX AND MANHOLE RAISING – The Contractor shall be responsible for raising all valve boxes and manhole rings and covers after roadway surface treatment.

111.19 CONNECTION TO EXISTING SYSTEM

At least 48 hours prior to starting any work involving connections to the existing system, the Contractor shall

notify the P.M., or designee. Replacement of paving shall follow the backfill by not more than three (3) days, nor more than 1000 lineal feet of trench width following the NMDOT Back fill Specifications. See additional sections herein for further detail.

111.20 PUBLIC CONVENIENCE AND ACCESS

The Contractor shall conduct and schedule his work at all times so that a minimum of obstructions to traffic and other inconveniences to the public occurs. The Contractor shall maintain access to properties. The testing, purging, transfer of service and backfill of each section of line shall immediately follow the installation.

Where the pipeline routes cross secondary streets, the excavation shall be backfilled to provide a roadway prior to the end of the workday. Construction by open excavation across major streets and thoroughfares shall be carried and completed to approximately the roadway centerline and the trench backfilled prior to excavation across the remaining roadway section so that traffic will not be interrupted.

The Contractor shall provide and set barricades and flashing lights along all open excavations and at points where the construction operation creates hazards to the public. Spacing of barricades and lights shall be adequate to insure the public a warning of the hazard, and shall be in compliance with the MUTCD Standards and directions of the P.M., or designee. Flares and/or lights shall be kept burning from sunset to sunup. Barricades shall be painted and fitted with reflectors to increase visibility.

111.21 EARTH RETAINING STRUCTURES

A design drawing stamped by a registered professional engineer must be submitted for any retaining wall that protects City-operated utility infrastructure. The design must be approved by Utilities staff (it may also require Public Works approval). The construction must be

permitted through Community Development and inspected by Public Works.

111.22 POTHOLING/EXPLORATION

Shall be done in accordance with the Underground Damage Protection Law (UDPL)

- Contractor shall call 811 prior to starting construction.
- When potholing, it is the contractor's responsibility to find the marked utility within the UDPL's 18" tolerance zone.
- No horizontal excavating without enlarging the size of the excavation.
- If the line cannot be found within the 18" tolerance zone, contract the utility owner. For CLC utilities, the contact number is 575-528-3573.

111.23 GPS LOCATE OF NEW UTILITY LINE

All new utility lines shall be surveyed as built (GPS'd in the trench) by the LCU Locating & Mapping Program prior to any backfilling. The coordination of this survey will be through the Public Works Department Inspector assigned to the project. A 60-minute minimum notice will be given to the Locating and Mapping Program and the contractor shall ensure that the newly installed pipe is SET in the trench in a manner so that pipe will not be moved and ready to be GPS'd. This minimum notice will expedite GPS task. The Inspector will contact the Damage Prevention Dispatcher @ (575) 528-3573.

SECTION 200
GAS DESIGN STANDARDS

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200 GENERAL NOTES ABOUT GAS STANDARDS

Conditions may exist which will necessitate deviations from these standards. Deviations from these standards shall have prior approval of the Utilities Director before being designed. Nothing in these standards shall relieve the designing engineer from the responsibility of meeting the current standards of all entities having jurisdiction over segments of the particular project being designed. These standards apply to all gas lines owned or operated by the City of Las Cruces.

In addition to required regulatory compliance for operation and maintenance, the Las Cruces Utilities Gas Line of Business requires that all new gas pipeline construction will follow and abide by all federal, state, and local gas pipeline regulations.

Entities having possible jurisdiction over projects in the Las Cruces area include, but are not restricted to, the following agencies.

New Mexico Department of Transportation
Elephant Butte Irrigation District
All Railroads
Dona Ana County

201 GAS SYSTEM MODEL

The current gas system model being utilized by the City of Las Cruces shall be used by City of Las Cruces Utilities to establish gas flow conditions, line sizes, valve location, and other design elements that depend on analysis of gas flow characteristics.

202 STANDARD LOCATIONS

202.1 ENTRY TO LOT (SERVICES)

Special cases not covered in the table below will be determined on a case-by-case basis in consultation with City of Las Cruces Utilities.

TYPE OF LOT	LOCATION OF SERVICE – ORIENT BY STANDING IN STREET AND FACING LOT
RESIDENTIAL-36 FT WIDE OR GREATER	5 FT. LEFT OF RIGHT PROPERTY LINE
MULTIFAMILY	5 FT. LEFT OF RIGHT PROPERTY LINE-THEN MANIFOLDED FOR MULTIPLE METERS
COMMERCIAL USE WITHIN A SUBDIVISION	5 FT. LEFT OF RIGHT PROPERTY LINE
COMMERCIAL NOT IN A SUBDIVISION	SITE SPECIFIC
MOBILE HOME PARK	ONE SERVICE LINE TO TWO LOTS LOCATED 2 FT. TO THE LEFT OF THE COMMON LOT LINE
MOBILE HOME SUBDIVISION	5 FT. LEFT OF THE RIGHT PROPERTY LINE
<ol style="list-style-type: none"> 1. Location of gas service different than the standard shown above requires approval of Utilities Director, preference shall be given to adherence to these standards. 2. Services and risers shall be perpendicular to the main line on straight roads, radial on curves, and straight from the main to the property line. If a cul-de-sac terminates in a bulb, the gas main wraps around the bulb prior to being capped, and services are radial to the gas main. 3. Lot entry standards for corner lots are measured from the pc of the lot corner. 	

202.2 IN STREET RIGHT OF WAY (MAINS)

202.2.1 NEW CONSTRUCTION

Gas mains shall typically be located in a dedicated City street right of way 10 ft. from the centerline of the street on the South or West side of the street. Gas main location will be considered on a case-by-case basis for a street that changes

direction to the extent that maintaining standard utility location would cause utility lines to cross.

Approval of the Utilities Director is required for a deviation in standard location, such as the case described above.

203 STANDARD SEPARATION

Minimum standard separation of gas mains or service lines from other utilities shall be as shown below.

FOR UTILITY LINES THAT ARE PARALLEL HORIZONTAL SEPARATION (MEASURED FROM CENTER OF UTILITY)						
	GAS MAIN	GAS SERVICE	SEWER MAIN	SEWER SERVICE	WATER MAIN	WATER SERVICE
GAS MAIN	5 FT.	5 FT.	10 FT.	5 FT.	10 FT.	5 FT.
GAS SERVICE	5 FT.	5 FT.	5 FT.	5 FT.	5 FT.	5 FT.
SEWER MAIN	10 FT.	5 FT.	∅10 FT.	5 FT.	∅10 FT.	5 FT.
SEWER SERVICE	5 FT.	5 FT.	5 FT.	5 FT.	5 FT.	5 FT.
WATER MAIN	10 FT.	5 FT.	∅10 FT.	5 FT.	*5 FT.	5 FT.
WATER SERVICE	5 FT.	5 FT.	5 FT.	5 FT.	5 FT.	5 FT.
STORM SEWER*	10 FT.	5 FT.	10 FT.	5 FT.	*5 FT.	5 FT.
WIRE UTILITY	5 FT.	5 FT.	5 FT.	5 FT.	5 FT.	5 FT.
MAN-HOLE	10 FT.	6 FT.	NA	NA	10 FT.	6 FT.
* - Separation may vary with field conditions and Utilities Director approval. Reference drawings UA-1, and UA-2 ∅ - 10 ft. separation between water and sewer mains to be measured from outside of pipe to outside of pipe.						

**FOR UTILITY LINES THAT ARE CROSSING
VERTICAL SEPARATION
MEASURED FROM OUTER SURFACE OF UTILITY**

	*GAS MAIN	GAS SERVICE	SEWER MAIN	SEWER SERVICE	WATER MAIN	WATER SERVICE
*GAS MAIN	12 IN.	6 IN.	12 IN.	12 IN.	12 IN.	12 IN.
GAS SERVICE	6 IN.	6 IN.	6 IN.	6 IN.	12 IN.	12 IN.
SEWER MAIN	12 IN.	6 IN.	12 IN.	6 IN.	24 IN.	6 IN.
SEWER SERVICE	6 IN.	6 IN.	6 IN.	6 IN.	6 IN.	6 IN.
WATER MAIN	12 IN.	12 IN.	24 IN.	6 IN.	12 IN.	6 IN.
WATER SERVICE	12 IN.	12 IN.	6 IN.	6 IN.	6 IN.	6 IN.
STORM SEWER	12 IN.	6 IN.	12 IN.	6 IN.	12 IN.	6 IN.
WIRE UTILITY	12 IN.	12 IN.	12 IN.	6 IN.	12 IN.	6 IN.

1. In intersections gas mains go under all other utilities except sewer.
2. Gas mains passing under sewer mains will be sleeved. Sleeves shall extend a minimum of 5 feet to each side from the outer side of the sewer main. Sleeves can be any pipe material if the sleeve color is yellow or painted yellow. Pipe spacers shall be used to protect the carrier pipe.
3. When water mains cross sewer mains the crossing shall be arranged so that the sewer joints will be equidistant and as far as possible from the water main joints.
4. When it is impossible to obtain proper horizontal and vertical separation as stipulated in the above two tables, the sewer shall be designed and constructed equal to water pipe and shall be pressure tested, throughout the limits of watertight construction and a minimum of 10 feet each side of the obstruction, to assure watertight connections prior to backfilling. The minimum limits of pressure pipe installation shall be 10' each side of line obstruction.
- *5. The vertical separations listed for gas mains apply to poly lines only and do not apply to steel gas lines. Vertical separations from steel lines shall be twenty-four (24) inches for a High Pressure and eighteen (18) inches for Low Pressure.

When it is impossible to obtain proper horizontal and vertical separation as stipulated in the above two tables, the sewer shall be designed and constructed equal to water pipe and shall be pressure tested to assure watertight connections prior to backfilling. In this case, approval by the Utilities Director is required.

204 GAS LINES OUTSIDE OF STREET/ROAD RIGHT OF WAY

204.1 MAINS

A gas main is a distribution line that serves as a common source of supply for more than one service line (See 204.2 for definition of Gas Service Line).

Gas mains shall be in either a City utility easement or City right-of-way of adequate width for installation and maintenance. The minimum acceptable width is 15 ft. for a single line. Gas lines shall be installed at the center of the easement. Additional utilities within an easement may require an easement width greater than the minimum.

The placement of any City utility within drainage ways and other non-standard utility corridors requires Utilities Director approval.

City utility easements in Mobile Home Parks require the same standards as above. For privately owned Mobile Home Park streets, the minimum easement for utilities in the street is the total paved width of the street, or a minimum of 30 ft. if the street is not paved.

204.2 SERVICES

A gas service line is a distribution line that transports gas from a common source of supply to an individual customer, to two adjacent or adjoining residential or small commercial customers, or to multiple residential or small commercial customers served through a meter header or manifold.

For a single meter service line in the customer's property, no dedicated City utility easement is required. The utility has an implied easement to the gas meter.

Placing a service line through a neighbor's property to reach a different customer is discouraged but, when allowed by the Utility Director, requires a minimum 10 feet wide gas utility easement to the City of Las Cruces. In addition, service lines serving two adjacent properties will also require a utility easement.

All new or entirely replaced service lines not exceeding 1-1/4 inch in size are to be protected with the installation of an approved excess flow valve (EFV). These shall be in conformance to the U.S. Department of Transportation Regulation 49 CFR Part 192.381, and any applicable updates or replacements.

204.3 GAS METER LOCATION AND PROTECTION

Gas meters shall be placed in a suitable location which will provide protection from accidental vehicle damage in both residential and commercial locations. All meters installed within five (5) feet of any pathway (driveways, parking areas, loading docks, streets/roads) used for vehicle travel or parking shall be protected from accidental damage by use of natural or existing barriers. If natural or existing barriers are not available or suitable, the meter shall be protected by use of bollards installed as per UG-16. Natural or existing barriers may be guard rails, steep increases in grade, ditches, trees, shrubs, chimneys, recesses wall, fences, etc. which in the opinion of a Gas Utility Representative will provide adequate meter protection.

205 STANDARD DEPTH OF LINE BELOW FINISHED GRADE

The standard depth for Gas Mains shall be as shown below.

GAS MAIN	
LOCATION	DEPTH TO TOP OF PIPE
IN ESTABLISHED STREET	3 FT. MINIMUM - 5 FT. MAXIMUM
NOT IN ESTABLISHED STREET	4 FT. MINIMUM - 5 FT. MAXIMUM - SITE SPECIFIC
ARROYOS	5 FT. MINIMUM – SITE SPECIFIC - REQUIRES UTILITIES DIRECTOR APPROVAL

The standard depths for gas service lines shall be as shown in the table below.

GAS SERVICE LINE	
LOCATION	DEPTH TO TOP OF PIPE
IN CUSTOMER'S YARD	1.5 FT. MINIMUM - 4 FT. MAXIMUM
IN ESTABLISHED STREET	2 FT. MINIMUM - 4 FT. MAXIMUM
NOT IN ESTABLISHED STREET	3 FT. MINIMUM – SITE SPECIFIC - REQUIRES UTILITIES DIRECTOR APPROVAL - 4 FT. MAXIMUM
ARROYOS	5 FT. MINIMUM – SITE SPECIFIC - - REQUIRES UTILITIES DIRECTOR APPROVAL

206 GAS LINES BELOW CONCRETE

206.1 GAS LINES BELOW EXISTING CONCRETE

Any gas service riser line under a concrete slab, which abuts a building wall shall be constructed in accordance with Standard Details UG-4.

207 GAS SYSTEM PRESSURES

The distribution system has three pressure zones being High Pressure (HP), High Intermediate Pressure (HIP), and Low Pressure (LP). The HP and HIP systems are the back bone of the distribution system. The HP system feeds the HIP system which in turn feeds the LP system thru the use of regulator stations. Customers' service lines are connected to the LP system. The pressures in the LP system can vary considerably depending on line sizes, loads and proximity to regulator stations.

The standard delivery pressure for residential and commercial customers is 4 ounces (or 0.25 psig). Elevated pressures up to 2 psig may be allowed thru a request submitted and approved by the Deputy Director of Natural Gas and Energy. The request will be reviewed on a case-by-case basis to determine if load warrants elevated pressure and if distribution system can sustain requested pressure at identified location.

208 DESIGN LOADS

Design loads for modeling purposes for single-family residential units shall be 100 cubic feet per hour, unless actual loads are known. All other design loads shall be based on actual expected load.

209 MINIMUM LINE SIZE AND MATERIAL TYPE

All high-pressure (HP) mains shall be steel with a minimum 2-inch diameter, see Materials Specification Section.

All high pressure (HP) mains shall be steel with a minimum 2-inch diameter, see Material Specification Section.

All low-pressure mains shall be polyethylene and shall have the minimum diameters as shown in the table below. Larger diameters may be required based on available pressures and demands. Existing low-pressure lines of materials other than polyethylene, typically steel or PVC or ABS, are in the system. All newly installed lines connecting to lines of

differing materials shall utilize an approved transition fitting at the connection point. See also Material Specification Section.

ZONING CLASSIFICATION	MINIMUM DIAMETER OF GAS MAIN (Low Pressure)
ALL R-1 ZONES, R-2	2 INCH
R-3, R-4	2 INCH
O-1	2 INCH
C-1,	2 INCH
C-2	4 INCH
M-1, M-2	4 INCH

Any condition not mentioned above, including overlay zones and Planned Unit Developments shall be determined on a case-by-case basis in coordination with City of Las Cruces Utilities.

All service lines to individual customers shall have the minimum diameter shown below with the following exceptions. Larger diameters may be required based on improvement plans, available pressures and demands.

Exceptions for gas service line sizing:

- 1) Intent of the minimum diameter for gas service line is to serve as a guideline for new residential and commercial subdivisions when gas demands are unknown. At such time, gas stubouts should be sized based on the table per zoning classification of the subdivision. When gas demand data becomes available at a later time and the available gas service stubout is determined to be oversized, the diameter of the oversized stubout should be maintained and extended to the riser, line size can be reduced after the riser.
- 2) For a residential or commercial lot with known gas demand and an existing gas service line/stubout that is large enough to handle the demand but not conforming to the standard size as shown in the table – use the existing service line size or stubout size.
- 3) For a residential or commercial lot with known gas demand but no existing service stubout – install a stubout and service line that is large enough to handle the demand. Do not oversize.

ZONING CLASSIFICATION	MINIMUM DIAMETER OF GAS SERVICE
ALL R-1 ZONES, R-2	¾ INCH
R-3, R-4	1 ¼ INCH
C-1, C-2, O-1	1 ¼ INCH
M-1, M-2	1 ¼ INCH

210 VALVES

The location and type of all valves will be determined by City of Las Cruces Utilities.

For valves on steel lines, extensions shall be furnished and installed to ensure that the operating nut and grease fittings are within 3 inches of finished grade.

Excessive flow valves are required herein for all service lines not exceeding 1-1/4 inch in size to remain in conformance United States Department of Transportation Regulation 49 CFR Part 192.381, and any applicable updates or replacements. These valves shall be as close as practicable to the source of supply (main).

No mechanical joints are allowed on any components of the gas system, whether valves or other components.

211 REGULATOR STATIONS

The location and design of all regulator stations will be accomplished by City of Las Cruces Utilities.

212 INSERTING NEW GAS LINES INTO ABANDONED GAS LINES

Insertion of a new gas line into an existing, abandoned gas line requires prior written approval of the Utilities Director. The Contractor shall, at their expense, demonstrate that an inserted low-pressure gas line is undamaged. This is to be based on a visual inspection and acceptance, by the P.M. or designee, of the leading 10 feet of inserted line.

SECTION 300

GAS MATERIAL SPECIFICATIONS

MATERIAL SPECIFICATION LIST

GAS UTILITY

General:

1. All manufacturers' products listed are preferred. Others may be submitted to the Utilities Director for pre-approval, prior to bidding on CLC projects.
2. All new underground low-pressure gas lines shall be polyethylene, unless otherwise specified by the Utilities Director.
3. All materials used shall be new, not new surplus.
4. All specification references include any and all updates or replacements.
5. All materials used shall comply with the U.S. Department of Transportation Pipeline Safety Regulations, Code of Federal Regulations (CFR) Title 49, Part 192, "Transportation of Natural or Other Gases by Pipeline: Minimum Federal Safety Standards".
6. Abbreviations used herein:

API	American Petroleum Institute
NACE	National Association of Corrosion Engineers
CSA	Canadian Standards Association
ASTM	American Society for Testing and Materials
MSS	Manufacturers Standardization Society
ASME	American Society of Mechanical Engineers
AWWA	American Water Works Association
ANSI	American National Standards Institute
ASA	American Standard for Steel

ITEM	DESCRIPTION	SIZE	SPECIFICATION	MANUFACTURER
1.	<p>Steel Pipe – Pipe certificates are required to be submitted (see Construction Standards herein). All steel pipe shall: 1. Be undamaged, free from rust, have the factory API markings and original factory lacquer when installed (or immediately prior to factory coating applications). 2. Have a 30 (+5) degree bevel for butt-welding, with a 1/16 inch root face. 3. be in double random lengths. All bare pipe will be marked with the following every 15 feet along pipe:</p> <ol style="list-style-type: none"> 1) Pipe Wall Thickness 2) Pipe Heat Number 3) Pipe API 5L Number 4) Pipe Manufacture and/or tracking number 5) Pipe OD <p>All pipe to be shipped with end caps</p>	<p><u>Dia-Wall</u> 2"-0.154" 4"-0.237" 6"-0.280" 8"-0.322" 10"-0.365" 12"-0.375"</p>	<p>API standard, specification 5L (Line Pipe) X42 X46 X52 Seamless</p>	<p>All steel pipe to be American made</p>
2.	<p>Steel Pipe Coating – Coating certificates are required to be submitted (see Construction Standards herein). "ENTEC" brand name extruded high-density polyethylene coating only. See the Construction Standards sections for further coating requirements. All coated pipe shall have both FBE and ARO. Only one manufacturer shall be permitted to apply both coatings ARO color shall be Tan, Brown, Yellow or pre-approved by PM Pipe Markings (every 10 feet along pipe):</p> <ol style="list-style-type: none"> 1) FBE and ARO Thickness 2) Date of coating application 3) Coaters name 4) Pipe Manufacture and/or tracking numbers 5) Pipe Heat Number 6) Pipe API 5L Number 7) Pipe wall thickness 8) Pipe OD 	<p>FBE – 14-16 mil ARO – 30 mil</p>	<p>Applicable Sections of: ASTM Standards CSA Z245.21 – External polyethylene coating for pipe. NACE No. 3/SSPC SP6 Specification – commercial blast cleaning. API RP 5LT API %L1 SSPC SP-1 SSPC SP-10 SSPC VIS-1 NACE SP-0394 NACE SP-0490 NAPCA 12-78-04</p>	<p>Bredero-Shaw Group. Liberty Coating Co. 3M Scotchkote 6233 3M Scotchkote 6352 Valspar PipeClad 2000 Valspar Pipeclad 2040 Axalta Nap-Gard 7-2500 series Axalta Nap Gard 7-2610M</p>

ITEM	DESCRIPTION	SIZE	SPECIFICATION	MANUFACTURER
3.	<p>Steel Pipe Fittings – All fittings shall be Ladish, Tube Turn, weld-end types. All ells, tees, reducers, returns, and caps shall have a wall thickness at least that of the pipe being attached to, and shall be of the same grade of steel or better. All ells shall be long radius types. Where the wall thickness is greater than that of the pipe by 0.092”, for pipe larger than 2”, and 0.034” for pipe 2” and smaller, the beveled ends shall be factory precision machined (transitioned, back-beveled, and taper bored) to give each weld bevel the same internal diameter as the pipe. All weld fittings shall be clearly stamped with the wall thickness, fitting size, grade, and manufacturers name or trademark.</p>		<p>ASA B16.9 and B16.25 (dimensional specification), API A234 Grade B material</p>	
4.	<p>Steel Pipe Stopples, and related fittings</p>	<p>ASME Class 150, 300</p>		<p>T.D. Williamson, Inc.</p>

ITEM	DESCRIPTION	SIZE	SPECIFICATION	MANUFACTURER
5.	<p>Steel Valves – Only Plug Type valves are allowed on CLC systems. All valves to be flanged. Valves shall be full port valves with 8” and larger to include torque gear reducer. All valves to include operating stem and grease port fitting extensions installed as required by CLC Gas Section. All underground valves shall be one quarter (1/4) turn full operation (open to close).</p>	ANSI Class 150 & Class 300	ANSI B 1.20.1, ANSI B 16.10, ANSI B 16.11, ANSI B 16.25, ANSI B 16.34, API 6FA, API 5B, API 6D, API 6A, API 599, API 607, MSS SP-6-2001, MSS SP-25-1998, MSS SP-55-2001, MSS SP-72-1999, MSS SP-85-2002	Nordstrum/Rockwell– dynamically balanced ball valves. Mueller
6.	<p>Excess Flow Valves - Sized to match piping on upstream and downstream sides. Valves shall be by-pass type to allow re-pressure of service line automatically after flow is corrected. Valves shall be in full compliance with the referenced Specifications and these Standards</p>	¾” and 1 ¼”	DOT 49 CFR Part 192.381 ASTM F2138 ASTM F1802 MSS SP-115	UMAC Inc. Series 1800 model 41 Series 5500 model 41

ITEM	DESCRIPTION	SIZE	SPECIFICATION	MANUFACTURER
7.	<p>Warning Tape – Six inch width, with a permanent APWA gas line yellow pigment and bold, black lettering on one side at a minimum of 30” along its length reading “<i>CAUTION GAS LINE BURIED BELOW</i>”. The tape material shall be formulated from 100% virgin polyolefin or polyethylene resins. Resins shall be chemically inert and shall not degrade when exposed to acids, alkalis and other destructive substances found in soil.</p>		<p><u>ASTM Method/ Property/ Value</u> D2103-05/ Thickness/ 4.0 mil. D2103/ Weight/ 18.5 lbs/1000 ft² D882-02/ 3” Tensile Strength/ 34lbs,2,800 psi D882-75b/ Elongation/ 800% D-2582/ PPT Resistance/ 14 LBF D2578/ Printability/ 45 Dynes Mfg. Specs./ Message Repeat/ Varies by Legend Mfg. Specs./ Printed Inks/ Flexo 9605</p>	<p>PRO-LINE Safety Products – Non-detectable underground utility marking tape, super stretch.</p> <p>Reef Industries Terra Tape-Standard</p>
8.	<p>Valve Boxes - Slip type two-piece cast iron box, with “GAS” cast in lid. Extension range of 27” – 32”. Slip type two-piece plastic valve box, with “GAS” cast in yellow lid. #PI-5562S-105. Shaft Debris Trap: #ODSDEBRISPI2 Paving adaptors: #GRE5A-x</p>	<p>Extension range of 28” – 36”, 5 ¼”</p>	<p>Per manufactures specifications</p>	<p>Handley Industries</p>

ITEM	DESCRIPTION	SIZE	SPECIFICATION	MANUFACTURER
9.	Galvanic Anodes – Magnesium high potential anodes. Required to meet the minimum weights and sizes as specified by CLC Utilities. Cores to extend at least 75% of anode length. Pre-wired at factory with #12 copper TW, red in color.	As specified by CLC.	ASTM B843, for M1C anodes. ASTM G97 <u>Chemical composition</u> Aluminum – 0.01% max. Manganese – 0.50-1.3% Silicon – 0.05% max. Copper – 0.02% max. Nickel – 0.001% max. Iron – 0.03% max. Others, each – 0.05% max. Remainder – Magnesium	Garfield Alloys – Maxmag anode. Timminco Metals – Galvomag anode. Farwest Corrosion – UltraMag Anode
10.	Anode Test Station - non-conductive ABS plastic construction, 2 ½" I.D., 18" shaft length, with flared ends, and cast iron lid and collar. Terminal block of reinforced polyester laminate with 2 wire terminals. Yellow, locking lid with pentagonal bolt cast in the center, allowing a quarter turn to open.			C.P. Test Services – C.P. Mini Box.
11.	Isolation Test Station – non-conductive ABS plastic construction, 3 ½" I.D., 18" shaft length, with flared ends, and cast iron lid and collar. Terminal block of reinforced polyester laminate with 5 wire terminals. Yellow, locking lid with pentagonal bolt cast in the center, allowing a quarter turn to open.			C.P. Test Services – model Glen 4

ITEM	DESCRIPTION	SIZE	SPECIFICATION	MANUFACTURER
12.	<p>Isolation (Insulator) Fittings – Weld end by weld end required, with no special weld precautions. Must exceed the pipe strength, no amperage leakage at 10,000 volts, no moving parts</p>			Kerotest Manufacturing – 720 WOG, KZ units.
13.	<p>Tape & Primer – Cold applied tape coating system for corrosion protection of field joints, fittings, and specialty piping. Made from materials that provide high electrical resistivity, resistance to corrosive environments, and low moisture absorption and permeability. Primer shall be a liquid adhesive, with 30% solids, that is applied without heat and shall produce an effective bond between the surface to be protected and the applied tape.</p>	35 mils thickness	<p>AWWA C-209, ASTM D1000, ASTM G 8, ASTM E257, ASTM F1249, ASTM D149. Physical Properties Elongation: 150% Peel Adhesion to Primed Pipe: 225 oz/in Dielectric Strength: 21kV. Cathodic Disbondment: 0.25 in. radius. Water Vapor Transmission Rate: 0.04g/100 in²/24 hr. Volume Resistivity: 2.5x10E16 ohm-cm. Temp. Range: -30d to 150d F.</p>	Polyken #930-35, with #1027 Primer layer

ITEM	DESCRIPTION	SIZE	SPECIFICATION	MANUFACTURER
14.	General Purpose Coating – All underground pipeline appurtenances that are not factory coated or primed and taped (such as couplings, service tees, valves and flanges) shall be coated with Trenton Tem Coat Primer prior to wrapping with Trenton #1 (#2 for above ground applications) Wax Tape.		Applied as per manufacturer's recommendations.	Trenton - Trenton Temcoat 3000 with Trenton #1 Wax Tape
15.	Casing – Black, plain end, standard schedule steel pipe.		API Grade B, or ASTM A 53	
16.	Casing Spacers (insulators) – Injection molded high-density polyethylene material with low friction coefficient and high dielectric strength.			GarLock Ranger II Casing Spacers
17.	Casing End Seals – Complete with stainless steel adjustable band clamps.			GarLock Model "S"
18.	Service Valve Tees – For service connections onto a low pressure steel gas main. Weld-by-Weld fitting with metal-to-metal valve seat in both full open and full closed.		ASTM A105 ASTM A126CL.B	T.D. Williamson, Inc. – Flat Bottom Tees.
19.	Lockwing (Meter) Valves –		ASME B16.33	
20.	Utility Markers –			Carsonite International – Part No. CRM 306602

ITEM	DESCRIPTION	SIZE	SPECIFICATION	MANUFACTURER
21.	<p>Transition Fittings – Fittings shall conform to the material and size of the associated pipeline and materials. No socket or mechanical fittings shall be allowed, weld ends only. All fittings are required to be butt fusion types. Epoxy coating shall be electrostatically applied on external metal surfaces.</p>	Sizing shall match pipeline and materials.	ASTM D2513	R.W. Lyall & Co., Central Plastics
22.	<p>High Density Polyethylene Pipe - PE 3408 – Material used shall conform to the referenced standards and shall have a Plastic Pipe Institute (PPI) hydrostatic design basis (HDB) of 1600 psi at a temperature of 73.4d F. HDPE shall be for use only upon pre-approval for the City of Las Cruces or other systems.</p>	<u>Dia- Thickness</u> 6" IPS – SDR 11 4" IPS – SDR 11 2" IPS – SDR 11 1 ¼" IPS – SDR 11	ASTM D3350 ASTM D2513 ASTM D2837 ASTM D3261 ASTM F1055 ASTM F1924	Performance Pipe (Chevron Phillips Chemical) US Poly
23.	<p>Medium Density Polyethylene Pipe - PE 2406 - Material used shall conform to the referenced standards and shall have a Plastic Pipe Institute (PPI) hydrostatic design basis (HDB) of 1250 psi at a temperature of 73.4d F.</p>	<u>Dia – Thickness</u> 4" IPS – SDR11.5 2" IPS – SDR 11 1 ¼" IPS – SDR 10 or 11 1" IPS – SDR 11 ¾" IPS – SDR 11 ½" CTS – 0.090"	ASTM D3350 ASTM D2513 ASTM D2837 ASTM D3261 ASTM F1055 ASTM F1924	Performance Pipe (Chevron Phillips Chemical) JM Eagle (US Poly) Dura Line

ITEM	DESCRIPTION	SIZE	SPECIFICATION	MANUFACTURER
24.	Medium Density Polyethylene Pipe Fittings - Fittings shall conform to the material and size of the associated pipeline. No socket or mechanical fittings shall be allowed, weld end only. All fittings are required to be heat fusion types.	<u>Dia-Thickness</u> 6" IPS – SDR 11 4" IPS – SDR 11 2" IPS – SDR 11 1 ¼" IPS – SDR 11 ¾" IPS – SDR11 ½" CTS - 0.090"	ASTM D3350 ASTM D2513 ASTM D2837 ASTM D3261	Performance Pipe (Chevron Phillips Chemical) JM Eagle (US Poly)
25.	High Density Polyethylene Pipe Fittings - Fittings shall conform to the size of the associated pipeline.	<u>Dia-Thickness</u> 6" IPS – SDR 11 4" IPS – SDR 11 2" IPS – SDR 11 1 ¼" IPS – SDR 11 ¾" IPS – SDR11 ½" CTS - 0.090"	ASTM D3350 ASTM D2513 ASTM D2837 ASTM F1055	Central Plastics Friatec (Frialen)

26.	Tracing Wire - HMW-PE insulation, 45 mils, yellow, solid copper conductor	#12 AWG		Paigespec, Kris-Tech Wire Co. Coleman Cable
27.	Direct Bury Splice Kits - Yellow direct bury wire connector, rated up to 600v. Silicon filled. Dryconn connector	Three (3) #12 Solid copper conductor s. Model 90120	Per manufacturer specifications.	3M – DBR kits. King Safety Products – Direct Bury Wire Connector. Ideal – Model #60
28.	Anodeless Meter Risers – Factory assembled, pre-bent risers. Epoxy coating required to be electro-statically applied prior to bending. Coating shall be 10 mil +/- 3 mil in thickness.		ASTM F1973-02 ASTM D2513-04a ASTM A53 ASTM A513	R.W. Lyall & Company. Central Plastics.
29.	Polyethylene Valves – PE 2406 or PE 3408 material to match pipeline. (see above for Excess Flow Valves)	SDR 11	ANSI B16.40 ASTM D2513	Perfection Corp. Kerotest Nordstrum Uponor R.W. Lyall & Co.

SECTION 400
GAS CONSTRUCTION SPECIFICATIONS

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401 DEFINITIONS:

1. PRESSURE ZONES – See Section 207 for additional detail. All High Pressure (HP) gas lines shall be built to the indicated HP standards. All Low Pressure (LP) gas lines shall be built with polyethylene pipe and shall conform to the indicated LP standards.

401.1 REFERENCED SPECIFICATIONS

The following documents, as applicable, are hereby incorporated into these Contract Documents by reference. If any referenced specification is in conflict with a City of Las Cruces specification, the specification requiring the most stringent condition shall take precedence. All materials, labor and equipment required to adhere to CLC utility standards referenced specification, CLC OME Plan, and CLC Standard Operating procedures shall be considered incidental to construction.

U.S. DEPARTMENT OF TRANSPORTATION
PIPELINE SAFETY REGULATIONS, CODE OF
FEDERAL REGULATIONS (CFR) TITLE 49, PART 192,
193, 199, "TRANSPORTATION OF NATURAL OR
OTHER GASES BY PIPELINE: MINIMUM FEDERAL
SAFETY STANDARDS". Herein "DOT Safety Regs."

CITY OF LAS CRUCES STANDARD
SPECIFICATIONS FOR ROAD CONSTRUCTION -
latest applicable edition

CITY OF LAS CRUCES GENERAL CONDITIONS –
latest applicable edition.

CITY OF LAS CRUCES SUBDIVISION CODE –
latest applicable edition.

MANUAL ON UNIFORM TRAFFIC CONTROL
DEVICES (MUTCD) - latest applicable edition.

AMERICAN SOCIETY FOR TESTING AND MATERIALS - latest applicable edition. Herein "ASTM"

INTERNATIONAL BUILDING CODE – latest applicable edition.

AMERICAN CONCRETE INSTITUTE BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE (ACI 318-83) - latest applicable supplements. Herein "ACI 318"

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS - Standard Test Methods. Herein "AASHTO"

OCCUPATIONAL SAFETY AND HEALTH ACT - Construction Industry Standards; Safety Requirements Herein: "OSHA"

NEW MEXICO Underground Property Damage Law, Chapter 62, Article 14, NMSA 1978, and as may be amended

SUBCONTRACTOR'S FAIR PRACTICES ACT, NMSA 1978, and as may be amended

AMERICANS WITH DISABILITIES ACT, latest applicable edition

AMERICAN PIPELINE INSTITUTE, Natural Gas Pipe Standards. Herein "API"

AMERICAN STANDARD FOR STEEL, Steel weld fitting standards. Herein "ASA"

NATIONAL ASSOCIATION OF CORROSION ENGINEERS, Corrosion control standards. Herein "NACE"

402 GAS SUBMITTALS

Material and product submittals are required prior to and during construction.

- 1.) Official mill report of pipe (Steel pipe only, see Sec. 407.4.1).
- 2.) Official coating application certificates (Steel pipe only, see Sec. 407.4.2).
- 3.) Material and product specifications for all steel fittings, polyethylene pipe and fittings, warning tape and tracing wire, valves and stopple fittings, and valve suppliers certificates (see Sec. 407.8).
- 4.) Pressure test reports (see Sec. 418, 429).
- 5.) Joiners Certificates of Qualifications (see Sec. 422, 423).
- 6.) Pipeline Inspection Cards
- 7.) Continuity Test results.

403.1 SAFETY: DRUG & ALCOHOL TESTING

The Contractor shall establish and maintain separate programs for testing its employees for drug use and alcohol use, together with training for its employees, which programs shall comply with all of the requirements of 49 CFR part 199, Department of Transportation Gas Pipeline Safety Regulations. No work shall begin on a Project until the City has determined that the Contractor's program meets such requirements. After the bids have been opened, the low bidder shall submit copies of their Drug and Alcohol Testing Program to the City's Risk Management Section for review and comments. The Contractor shall then submit a letter of compliance from Risk Management to the Project Manager stating that the Contractor does have testing programs in place and that such programs are currently in compliance with 49 CFR §199. The letter shall identify all contractor employees by full name and City of Las Cruces OQ number. It is mandatory that Risk Management review and issue a new compliance letter prior for each project. Submitting a compliance letter from a previous project is NOT allowed.

The City, as a system operator, is responsible for compliance by the Contractor with the above regulations and in recognition of that responsibility the Contractor agrees to make its drug testing and alcohol testing program records available to a duty authorized

representative of the City at any reasonable time. The Contractor further agrees that should the City determine that an employee of the Contractor who is working on the project has not met the requirements of the Contractor's programs or the above regulations; Contractor will immediately prevent such employee from performing any safety sensitive work until such time as the employee meets such requirements. Any work performed by an employee who is not Operator Qualified or under an approved Drug and Alcohol Plan is subject to review and removal/replacement from the gas system at no cost to the City.

403.2 SAFETY: ELECTRICAL

General: This section pertains to the process of work performance and/or duration of construction activities. In the various overhead electrical transmission line corridors located on Las Cruces Utilities services area. These specifications are intended to supplement existing OSHA, NESC, New Mexico Underground Property Damage Law other rules and regulations affecting this type of work. These specifications adopt and require the Contractor to abide by these and all applicable codes, regulations, and requirements.

When these specifications conflict with existing ones, the most stringent shall apply. It shall be the Contractor's responsibility to ascertain the existence of and comply with all applicable requirements.

This section is not all-inclusive and only covers those items specifically discussed. It does not apply to static electrical charge conditions. The Contractor is advised to reference the materials manufacturers safety advisories.

Description of Electrical Transmission Line Corridor: The path identified by 69,000 volt and greater overhead electric lines and defined by the easement, deed, or other document providing right of way to the Owning utility. The height of the wires above ground varies with temperature and could be 20' or less at times.

Description of Electrical Distribution Line Corridor: The path identified by overhead electric lines of less than 69,000 volts and defined by the easement, deed, or other document providing right of way to the Owning utility. The height of the wires above ground varies with temperature and could be 20' or less at times.

The Contractor shall adhere to the "New Mexico One Call-NM811" requirements for excavation since he will encounter underground lines as well as overhead lines.

Specific Requirements for Employees: Attention is called to the Occupational Safety and Health Administration rules and regulations governing this type of work. Specific sections are quoted to draw particular attention to a requirement, however all applicable sections shall be followed.

For more information on the requirements refer to applicable portions of OSHA 1910. And OSHA 1926. including OSHA 1910.331 through 1910.335, 1926.550, and 1926.950 through 1926.960 as applicable.

A qualified person shall supervise all work around energized electric transmission and distribution lines. A qualified person is one as defined by OSHA and specifically has adequate training to perform and supervise work around energized power lines.

Only employees trained in and familiar with work around electrically energized equipment shall handle pipe while being moved, operate equipment, or perform other duties that could bring them in contact with energized lines or equipment, or bring them within 15' of energized lines or equipment. Employees shall be constantly supervised during these times.

Unintentional actions such as slipping, jerking of cranes or other lifting equipment, allowing the pipe to swing, etc., shall be considered when determining these distances. Suspended pipe shall not be left unattended. The Contractor shall not assume that employees will attempt to keep out of these spaces.

Specific Work Requirements: The purpose of these grounding requirements is to prevent the accidental shock to personnel or public from induced voltages while the pipe is on the ground as a result of its proximity to the overhead lines. There are more stringent requirements here and in applicable codes and regulations for bringing a conducting object such as a length of pipe close to an energized conductor or piece of equipment, and they are covered later.

The Contractor shall ground the pipe at intervals not to exceed $\frac{1}{4}$ mile. It is the intent of this requirement to have a minimum of four (4) grounds installed per mile when the pipe is out of the trench and either personnel or the public could come in contact with bare metal.

The Contractor shall leave the line grounded at the above-described intervals until it is in the trench and covered. Grounds shall not be removed until contact with the bare metal pipe is not possible, at which point the grounds shall be removed.

The grounding attachment to the pipe shall be mechanical, not just casual such as in the case of wrapping a piece of chain around it. The ground wire shall be fine stranded insulated cable such as welding cable and shall be a minimum of #4 AWG. The grounding electrode shall be a driven 5/8"X8' copper clad ground rod or 3/4"X8' rigid steel pipe. The connection between the cable and the electrode shall be an approved grounding clamp.

Operating Equipment and Handling Pipe While Under or Near Energized Lines: This section applies in those instances when the Contractor is working under or around power lines near the construction route, or when handling pipe that might come within prescribed distances of the overhead line conductors. The Contractor shall make every effort to have the owning utility deenergize the power line.

When operating equipment or handling pipe under or near energized power lines, the Contractor shall follow all OSHA and NESC regulations governing such actions. Particular attention is drawn to OSHA 1910.333 Table S-5 Approach Distances For Qualified Employees and to 1910.333 ©(3)(I)(A)

Unqualified Persons and shall apply even when the employee is on the ground, if a conducting object can come within those distances.

Accidents, including slipping, falling, malfunction of equipment, etc., shall be included in determining whether a conducting

object can come within the prescribed distances. The Contractor shall make every effort to keep conducting objects 15 feet or more from an energized line, but in those instances when that clearance is impossible to maintain, only the most experienced and qualified people shall operate the equipment and handle pipe when working under or near energized lines.

The Contractor may not store materials or park equipment under or near energized lines.

404 CONTRACTOR PERSONNEL REQUIREMENTS

Because natural gas is highly explosive, the Contractor's personnel dealing with natural gas utilities on the Project site shall be fully qualified as per the latest, applicable DOT regulations. These qualified personnel shall remain on the job site throughout the working day. These qualified personnel shall be knowledgeable in natural gas operations, and shall have a fire extinguisher, on the job site and be trained and ready to use them.

405 MATERIALS TESTING

Las Cruces Utilities shall pay for all testing of materials, such as soils, asphalt, concrete, and welds, unless otherwise specified. The number, type, and location of tests shall be determined by the P.M., OR DESIGNEE, The P.M., OR DESIGNEE, may supplement tests by the approved testing laboratory with his own test for checking of compliance, in which case the Contractor shall furnish a laborer, if required, for assistance.

Retests: Any required retesting due to failed tests shall be at the expense of the Contractor.

406 PRESSURE / LEAK TESTING

Steel high pressure gas lines on all projects shall be leak tested to a minimum of 600 psig for a minimum of 24 hours. Low-pressure polyethylene gas lines on all projects shall be leak tested to a minimum of 100 psig for High Density Polyethylene or 70 psig for Medium Density Polyethylene. All 24 hour chart tests (low pressure or high pressure) shall record a minimum of 24 hours, but not to exceed 24.5 hours. See Sections 418, and 430 for additional details. In the event a test chart fails or is rejected, the chart must be submitted along with documentation detailing the root cause of the failure/rejection and the course of action implemented to correct the failure.

407 PIPING MATERIALS AND QUALITY**407.1 GENERAL QUALITY**

Las Cruces Utilities intends that only new, first class pipe and associated appurtenances are to be installed by the entity responsible for construction. No poor quality materials will be acceptable.

407.2 PRESSURE ZONE MATERIAL

All new underground low-pressure gas lines shall be polyethylene, and above ground low pressure gas lines shall be steel as specified herein unless approved prior to construction by the Utilities Director. All other gas piping shall be steel.

407.3 STORAGE

Materials shall be adequately stored, sheltered and protected to ensure that none become damaged and to maintain the original quality of the materials. Materials installed and found to be ruined or damaged shall be removed and completely replaced at no expense to Las Cruces Utilities. Unacceptable or defective workmanship shall also be reason for removal, and

replacement of those materials involved at no expense to Las Cruces Utilities.

No polyethylene pipe that is past 3 years from the date of manufacture shall be acceptable for use on any CLC system. Any pipe with unreadable original factory markings, or whose markings indicate that the pipe is past the 3 years maximum, shall be deemed "unacceptable". Pipe must be covered and capped during storage.

407.4 PIPE CERTIFICATES

Required Pipe Certificates. The pipe supplier shall submit to the P.M., OR DESIGNEE, the following certification on all steel gas pipe to be supplied and installed by the Contractor (see Section 400-417 for additional submittal requirements).

407.4.1 MILL REPORTS

Official mill reports specifically referenced to this gas system installation (herein: Project) by showing the supplier's name and order number, the Contractor's name and order number, the Owner's name and Project number (contract number), the date and the amount (footage of pipe) involved. The report shall certify country of origin of the steel and of the pipe. Each mill report shall also attest to the size, wall thickness and API specification of the pipe. The report shall be signed and notarized by responsible authorities of the mill or the supplier, and shall be signed by the president or owner of the construction contracting firm that has purchased and will install the pipe. All documents shall be properly referenced to each other.

407.4.2 COATING CERTIFICATES

Official coating application certificates specifically referenced to this Project by showing the supplier's name and order number, the Contractor's name and order number, the Owner's name and Project number (contract number), the date, and the amount (footage of

pipe) involved. Each coating certificate shall also attest to the procedures used in applying the coating, the coating specifications and the pipe specifications. Each coating certificate shall be signed and notarized by responsible authorities of the coating application company, and shall be signed by the president or owner of the construction contracting firm that has purchased and will install the coated pipe. All documents shall be properly referenced to each other.

407.5 PIPE COATING TESTING

All new gas steel pipeline will be coated with Fusion Bonded Epoxy (FBE) and a layer of Abrasive Resistant Overlay (ARO) applied over the FBE by the coating manufacture. See Section 300 (2) for minimum requirements for thickness and required coating markings. Other pipe coating materials are present in the LCU gas system and care must be taken to avoid damage to coating while performing Holiday Testing. Test voltage must be adjusted to match the coating material to avoid coating disbondment.

All coated steel pipe and appurtenances shall be Holiday Tested (jeeped) in the presence of the Gas Inspector immediately prior to backfilling. Pipe that has been properly Holiday Tested and approved over or in the trench shall be immediately lowered directly to the bottom of a properly padded trench. If for some reason the pipe has to be set back down temporarily on skids, the skids shall be properly padded with heavy, resilient pads to prevent damage to the pipe coating. These pads shall be of adequate width to prevent the pipe from falling directly on the unpadded portion of the skid or the ground. Additional Holiday Testing of the pipe shall be done by the Contractor, if the pipeline has been lowered into the trench (even if previously Holiday tested), moved/disturbed at the bottom of the trench or final visual inspection prior to backfilling reveals dents, nicks, gouges or any other forms of damage to the pipeline or coating. In the event the coating is damaged during the backfilling process, the section of line, plus 25 feet

(upstream and downstream) from the point of damaged shall be excavated and Holiday Tested.

All steel pipe, fittings, valves, etc. to be buried shall, just prior to backfilling, be subjected to a holiday detection test for the full circumference and length of the pipe, fitting, valves, etc. using a spark discharge holiday detector. Holiday detection instruments shall be preset by the instrument manufacturer. The travel rate of the holiday detector shall not exceed one (1) foot per second. Defective locations shall immediately be clearly indicated by a circular mark or cross upon discovery by either visual examination or by the holiday detector. All damaged areas and holidays shall be repaired immediately as specified (using approved repair procedures) and re-tested with the holiday detector. All fittings and valves must also be examined with the detector. Holiday detectors shall be provided by the Contractor. Care shall be taken in all instances to ensure that the pipe or component being Holiday tested is properly and completely grounded.

The coating shall be one hundred (100%) percent Holiday Tested at the following voltage(s):

XT Coating		
Pipe Size	Coating Thickness (Mils)	Test Voltage
2	27	3,375
4	32	4,000
6	36	4,500
8	45	5,625
10	45	5,625
12	45	5,625

-FBE with ARO will be tested at 5,750 volts

-Coal Tar will be tested at 4,000 volts

-Polyken Tape will be tested at 8,750 volts

-Wax Tap will be tested at 10,000 volts

All Holidays will be repaired per applicable repair procedure and re-tested.

407.6 STEEL PIPE

Steel gas pipe shall be American made API 5L X 52 line pipe, seamless, Standard schedule, and shall have the following diameters and wall thickness':

<u>Diameter (inches)</u>	<u>Wall Thickness (inches)</u>
12"	0.375"
10"	0.365"
8"	0.322"
6"	0.280"
4"	0.237"
2"	0.154"

- 1.) All steel pipe shall be new, undamaged, free from corrosion and shall have the original factory API markings and original factory lacquer intact when installed (or, in the case of factory coated pipe, immediately prior to the surface preparation and coating application).
- 2.) All steel pipe shall have a 30° (+5°) bevel on each end for butt-welding with a 1/16-inch root face on each bevel.
- 3.) All steel pipe shall be ordered in double random lengths.
- 4.) Any steel pipe that does not comply with the specifications as identified in this Section and Section 300(2) and/or does not have a correct bevel, has excessive rust, is pitted, has poor quality coating, is damaged, does not have the required markings, is of poor quality, does not have the proper mill reports or coating certificates, and/or has any other deficiencies which may impair the strength or quality of the pipe shall be properly marked and shall not be accepted by the Las Cruces Utility Gas section and/or will be removed from the project and shall not be used or become a part of the gas pipeline system.
- 5.) The pipe supplier, coating applicator, pipe transporter and construction Contractor shall

handle all pipe with extreme care, ensuring that no damage occurs to the pipe or the pipe coating. The pipe shall be shipped using sufficient padding to prevent damage to the pipe and the coating. No chains, steel bands, steel cables or other steel objects shall be allowed to come in contact with the coating.

- 6.) All coated pipe shall be newly coated within the previous six (6) months and the coating shall be new condition and unweathered.
- 7.) Steel pipe must be stored covered and capped, and both interior and exterior of pipe must be checked for corrosion before use.

407.7 STEEL FITTINGS

All steel fittings shall be Ladish, Tube Turns or an approved equal brand and shall be new, undamaged, free from rust, have the original factory lacquer or paint intact, and (on butt weld fittings) have a 30° (+5°) bevel on each weld end with a 1/16-inch root face on each bevel when installed.

All weld elbows (ells), tees, reducers, returns and caps shall conform with the ASA B16.9 and B16.25 Dimensional Specifications and the ASTM A234 Grade B material specifications. All weld fittings shall have a wall thickness equal to or greater than that of the pipe being welded to and shall be the same or better grade steel. Where the wall thickness of the fitting is greater than that of the pipe by 0.092 inches for pipe larger than two (2") inches and 0.034 inches for pipe two (2") inches and smaller, the beveled ends of the fittings shall be factory precision machined (transitioned, back-beveled, taper bored) to give each weld bevel the same internal diameter as the pipe or an internal diameter complying with those acceptable bore diameters for each pipe size as listed in the materials specifications herein. All elbows shall be long radius elbows. In all cases, the weld fittings shall be clearly stamped with the wall thickness, fitting size, grade, and manufacturers name or trademark.

407.8 STEEL VALVES

Steel valves shall be ANSI Class 150 or 300, as applicable. All valves to be installed shall be new, not “new surplus”, undamaged, free from rust and shall have the original factory paint and specification plates intact. All valves shall be flanged. Contractor shall supply valves as specified within these standards. The valve supplier shall submit a certificate from the valve manufacturer stating that the supplier is indeed a certified distributor for the particular valve. The valves shall be supplied with an operating nut extension and grease fitting extension (reference Design Standards, herein).

All valves shall be installed in such a manner as to eliminate all strains on the valves and pipe and fittings. Pipe shall not be jacked or sprung to meet valve ends.

408 EXISTING GAS LINES, VALVES, VALVE BOXES, ANODES, TEST BOXES, CASING VENTS AND OTHER GAS LINE APPURTENANCES

The contractor shall exercise extreme caution and care, whenever digging, to avoid breaking or damaging any gas facilities. All breaks or other damage shall be immediately reported to the JU Dispatch at (575 526-0500), P.M., or his designee and NM811, by the Contractor. Las Cruces Utilities Gas Department Standard Operating Procedures require that all repairs will be made by Las Cruces Utilities Gas Department, however, under special conditions and at the sole discretion of the Gas Operations & Compliance Coordinator, or his designee, Contractors may be authorized to effect repairs provided the Contractor possess the required OQ certifications. Repairs will be made at the Contractors expense.

409 GAS LINE DAMAGES

The Contractor shall exercise extreme caution and care, whenever digging, to avoid breaking any utility lines. All breaks or other damage shall be immediately reported

to the utility owner, P.M., or designee and NM811, by the Contractor and shall immediately be properly repaired at the Contractor's expense. All utility breaks or other damages shall be the sole financial responsibility of the Contractor. The Contractor shall be fully aware and compliant with the New Mexico Underground Damage Law (Excavation Law), being Chapter 62, Article 14, NMSA 1978.

If the Contractors' equipment makes contact with an underground facility, the Contractor must notify the PM and is also required by law to stop excavation and notify the facility owner immediately. Contact means nick, dent, gouge, cut, scrape or scratch the coating or insulating jacket. Contacting the facility owner allows the facility owner the opportunity to investigate, examine and correct potential future hazards. Failure to notify the facility owner of these occurrences could result in future corrosion and/or failure or other life threatening situations. These investigations are required as facilities that are damaged, pulled or dislocated could break at a location away from the actual excavation site. Damage may not only occur at the point of contact but may also occur at one or both ends of the pipe, cable or wire by damaging the termination points where the facilities enter buildings or are fed from other facilities.

In the event an underground gas facility is damaged, the Contractor is required to follow the procedures described in the Excavators Handbook published in cooperation by the New Mexico Public Regulation Commission, Department of Transportation, bureau of Pipeline Safety and New Mexico One Call, Inc. (Current Version).

Included in this document are a few of the said procedures:

- 1) If the operator can safely do so, turn off the motor to prevent possible ignition of any gas and abandon the equipment immediately. **DO NOT** attempt to start (or restart) any motors in the excavation area.
- 2) Clear the immediate area of all personnel. Avoid use of cellular phones, machinery and other devices that can cause a spark.

- 3) **DO NOT** cover the damaged pipe with dirt as a means to stopping the leak. **DO NOT** crimp plastic gas facilities. **DO NOT** attempt to plug damaged pipes. Allow gas to vent to atmosphere.
- 4) Move away from the area and from a safe location; notify 911 to seek aid from local law enforcement and fire departments
- 5) Notify Las Cruces Utilities Dispatch at (575) 526-0500.
- 6) The Contractor shall have at all times at the actual work site, easily accessible, adequate, fully charged and completely operable fire extinguishers and all other necessary safety equipment and first aid supplies. Fire extinguishers shall display a current inspection sticker. Fire extinguishers are for protection of personnel **ONLY**. If the gas ignites, **DO NOT** attempt to extinguish the flames. Clear the area, move to a safe location and wait for further instruction from police, fire or Las Cruces Utilities gas personnel.

Although only a few of the safety procedures are listed here, the Contractor is required to adhere to all procedures described in the Excavator Handbook.

410 PIPELINE ABANDONMENT, REMOVAL, TRANSFERS, ETC.

In any situation where the existing gas line to be abandoned conflicts with the location of the new gas line, the Contractor shall remove a minimum of five (5) feet of pipe and dispose of that conflicting portion of existing gas line and shall cut off, purged per applicable LCU Standard Operating Procedure, and closed with a welded cap the remaining portions at no extra cost to the Owner.

411 MAINTENANCE OF COMPLETED TRENCH AND PIPELINE ROUTE IN EXISTING PAVED ROADWAYS

Once a portion of piping trench or any excavation is backfilled and up until the time that repaving (pavement replacement) and cleanup is completed to the Owner's

satisfaction, the Contractor shall maintain each trench and excavation with soil placed and compacted up to (flush with) the ground, roadway or street surface. The Contractor shall ensure that the trench or excavation is kept smooth and flush with the existing ground, roadway, or street surface at all times and that no ruts, potholes or other traffic obstructions or annoyances exist. No loose rocks, pavement, soil, etc. shall be left on any street or roadway. The trench or excavation and the roadway, or street shall be maintained, properly watered down and compacted as necessary on a daily basis to (7 days per week, day or night) to keep traffic moving smoothly and without disturbances.

412 GAS PIPELINE AND APPURTENANCES INSTALLATION

Prior to lowering any new gas piping or appurtenance into a trench or other excavation, the trench or excavation shall be cleaned of all extraneous debris and rocks (see Sec. 111). Any means of lowering is acceptable provided that such means does not in any way injure the pipe, appurtenance or coating.

No piping or appurtenance shall be jacked, sprung, otherwise deflected or forced into place in any manner such that any stress is placed on any piping or appurtenance. The Contractor shall ensure that all fabrication and installation is accomplished in such a manner that no stressing of the pipe or appurtenance is required or occurs during or after installation.

The pipeline shall be lowered into the trench in a manner that will leave the pipeline "snaked" in the trench in order to provide slack in the pipeline. When the pipeline is laid on skids over or in the trench, prior to final installation, the pipeline shall be "snaked" on the skids in a like manner in order to allow for the extra pipe needed for "snaking" during final installation.

Where over-bends are installed in any steel pipeline, they shall be installed in a manner that allows for the

pipe at the point of the bend to clear the high point of the bottom of the ditch by at least six (6) inches. Where side-bends are installed in any steel pipeline, they shall be placed in the bottom of the trench in such a manner that they lie against the outside wall of the curved trench.

Pipe slings shall be utilized at all times when handling or lowering coated steel or polyethylene pipe. All slings shall be of the rubber, nylon or canvas belt type with a removable pin and clevis on the end to allow for the removal of the sling without damage to the pipe coating. All pipe slings utilized by the Contractor shall have a width equal to or greater than the pipe diameter and shall be such that they do not in any way damage the pipe or pipe coating. The use of ropes, hooks, chains, or cables is prohibited.

All coated steel pipe and appurtenances shall be Holiday Tested (jeeped) in the presence of Gas Inspector immediately prior to backfilling. See Section 407.5 for testing requirements

After Holiday Testing and repair of coatings on pipe or appurtenances, the pipe or appurtenances shall be handled in a manner that prevents damage to the coating. The pipe or appurtenances shall not be dropped, rolled or impacted against solid objects. Coated and Holiday Tested pipe and appurtenances shall not be allowed to touch the ground prior to being lowered into the trench and no one shall be allowed to walk on the coatings at any time. When being lowered, the pipe or appurtenance shall be prevented from swinging into the trench wall or any other object and shall be prevented from being scraped or scuffed by the trench wall or any other object.

Backfilling shall be done immediately after the pipe or appurtenance is laid in place at the bottom of the trench and approved by the P.M., OR DESIGNEE, or his Inspector. Backfilling shall be accomplished in a very careful manner that prevents any damage to the pipe, appurtenance or coating.

Each pipe joint shall be thoroughly cleaned by pulling a swab through the joint to remove all dirt and foreign matter from inside the pipe joint immediately prior to line up and welding (or fusion). When pipe is double jointed or welded in a firing line manner, the ends of these long sections of piping shall be covered (sealed off) immediately after welding until the time that these long sections are later welded into the pipeline.

The open ends of the pipeline shall be closed at the end of each day's work. A suitable covering or nightcap shall be used on each end of the pipeline, and shall be capable of preventing the entrance of small animals, water, dirt, or other foreign material into the lines. Care shall be taken during the course of the work to eliminate possibilities of intrusion of undesirable elements into the pipeline including water and any other foreign item. Any obstructions or foreign items remaining in the pipeline after installation shall be removed at the Contractor's expense.

All gas lines that are replaced with new gas lines or otherwise disconnected from the gas system shall be: properly cut off, completely purged with compressed air in their entirety, capped with weld caps at all open ends, and abandoned in place; or shall be removed and disposed of in a proper manner.

Immediately prior to pressure testing the gas line after all service taps have been completed, the gas main shall be pigged in the trench to remove all foreign elements.

413 WARNING TAPE AND TRACING WIRE

TAPE: During the backfilling process, all steel and polyethylene gas pipelines, service lines and pipeline appurtenances shall have a continuous warning tape placed directly above them and throughout their length at a height of twelve (12) to thirty (30) inches above the mains and twelve (12) inches for services. The tape shall be six (6) inches wide. Tape material shall be formulated from 100 percent virgin polyolefin resins.

Resins shall be pigmental for chemical stability and resistance to sulfide staining (color fastness).

Tape material shall be formulated from 100% virgin polyolefin or polyethylene resins. Resins shall be chemically inert and shall not degrade when exposed to acids, alkalis and other destructive substances found in soil. Tape shall be six inch width and able to provide a 800 percent elongation prior to rupture as per ASTM-D882.

The tape shall meet or exceed the standards provided in the Materials Specification List, included in these Standards.

The warning tape shall be manufactured with a permanent APWA gas line yellow pigment at a minimum of every thirty (30) inches along its length, be imprinted with a continuous warning message as follows:

CAUTION GAS LINE BURIED BELOW

At tees, tape ends, etc., the warning tape shall be tied together (spliced) with knot to create a continuous warning tape throughout the length of the pipeline and associated branch lines, appurtenances, etc.

TRACING WIRE: In addition to the installation of warning tape, copper tracing wire is to be installed with all polyethylene gas pipe. This includes all mains and individual poly service lines. The tracing wire shall be affixed, using electrical tape on top of the pipe at five (5) foot centers, for the total length of the pipe.

The tracing wire shall be 12 AWG (average wire gauge), solid core, copper wire (solid core meaning one (1) single continuous strand of copper wire). In addition, the wire insulating coating (jacket) shall be yellow in color and shall have 45 mils of polyethylene insulation thickness and high molecular weight. Also the tracing wire shall be HMW – PE and rated for UL 600V construction. The wire shall be suitable for wet or dry applications. The wire size (gauge) shall be

continuously affixed (printed on) the entire length of all tracing wire coating and shall be easily read.

Where a splice is required, or when a three (3) way splice is necessary, the wires shall be twisted together and joined with a silicon filled direct bury wire connector. No bare wire shall be left exposed anywhere. All wires shall be spliced to all other wires for a continuous tracing wire system.

On all polyethylene service lines, the tracing wire shall be run up and along each cathodic protection free (anodeless) riser above ground and shall be wrapped a minimum of three times around the riser and extend to the top of the riser threads.

No electrical connections of the tracing wire to any metal pipes or metal service lines will be allowed and care shall be taken to ensure that the tracing wire is not damaged during installation. The tracing wire is required to be successfully tested prior to subgrade preparation. Locatability Check: Must be requested a minimum of 48 hours (two working days) prior to tie-in. Locatability check will be conducted by the Utility Locating Program of the Utilities Department. Tracing wire must have a continuous locating signal before pipe is accepted by the P.M., or designee. If an issue is found with the locatability of the utility line (Gas, Water, Sewer, or Reclaimed Water) it is the responsibility of the contractor at his expense to correct those issues prior to tie-in.

414 BORES AND CASINGS

Bores and casings shall be installed along the lines, grades and burial depths as shown in the Contract Documents or specified herein. All bores and casings shall be installed level and at right angles to the right-of-way lines unless otherwise specified herein or by the P.M., or designee.

All bores and casings shall comply with the Contract Documents and these Standards.

The process of boring shall be done by augers, jacking, or pneumatic penetrators. No water boring or jetting is allowed. Casing pipe shall be bare and completely free of coating, enamels, or mastics and shall be cathodically protected by two (2) 17# anodes.

The carrier pipe shall be insulated from the casing. Reference to Section 300 for the acceptable casing manufacturer. The carrier pipe shall be inserted into the casing in such a manner that the pipe, pipe coating, and casing insulators are not damaged. The casing ends shall be sealed with type of end seals shown in Section 300. Vents shall be installed as directed by the P.M., or designee. Two (2) vents are required. One (1) vent shall be installed from the bottom of the casing and the other vent from the top. Refer to the Utility Detail Drawings herein for additional detail. On oversized casings, eccentric weld reducers and short "pups" may be installed on each end of the casing in order to allow for the use of standard insulators and end seals.

All casings shall be made from new Gr. B or better, ERW or seamless, bare, steel pipe with a minimum wall thickness of 0.250." The type and grade of pipe shall be clearly stamped on the casing pipe. All casings shall have two (2) each two (2) inch, Schedule 40, steel, entirely welded vents. All casings shall have a minimum eighteen (18) inch vertical clearance and a minimum three (3) foot horizontal clearance from all other utilities or other structures, unless otherwise specified, and shall have a minimum burial depth of five (5) feet unless otherwise specified. Casings for Low Pressure lines and services may be other materials, see Utility Drawing Details herein.

The Contractor shall ensure by whatever means necessary that all bores and casings end up being installed with a maximum variance on burial depth at the bore (casing) ending point of plus or minus two feet (2'-0") and a maximum variance on horizontal location at the bore (casing) ending point of plus or minus three feet (3'-0"). No variance of any kind will be allowed for

bore (casing) starting point depth and horizontal locations and for minimum allowable burial depths under highways, streets, roadways, railroads, canals, side slopes, swales, ditches, etc., in accordance with the applicable permits.

All casings shall be completely and properly cleaned internally of all dirt, water, debris and foreign matter of any kind immediately before the carrier pipe (gas pipeline) is installed in the casing. Immediately after installing the carrier pipe (with insulators) inside the casing, the Contractor shall install the casing end seals. Vent pipe weld connections to the casing shall be made prior to the installation of the carrier pipe within the casing. Incomplete vent pipes shall be kept sealed at all times to prevent the intrusion of dirt, water or any foreign matter into the vent or the casing.

Before tying the carrier pipe (pipeline through the casing) into the rest of the pipeline and before backfilling the casing ends, the Contractor shall notify the P.M., or designee, who shall notify the Gas Corrosion Section of Las Cruces Utilities to run a test on the adequacy of the insulation of the carrier pipe from the casing and the adequacy of the anode installations. The gas carrier pipe must be pulled completely through the casing with all casing insulators, end seals, anodes, etc., placed as specified. The gas carrier pipe shall be in its completed, installed permanent state and shall not be in contact with the surrounding earth or water at any location.

415 GAS VALVE BOXES

Valve boxes shall be slip style, two piece plastic with "GAS" clearly cast in the lid. These boxes shall, in all cases, be of a type that is able to stand up under continual heavy traffic loads. All valve boxes and concrete collars around valves shall be installed per standard detail UG-7.

416 CATHODIC PROTECTION

Anodes, test boxes, insulating flange sets and all other cathodic protection items shall be installed in accordance with these Standards, Utility Drawing Details, and the permitted Contract Documents shown on the plans and the specifications as contained herein.

Working from one end of each steel pipeline, "Maxmag," or approved equal, prepackaged anodes shall be installed on the pipeline, at exactly the intervals specified by the P.M., or designee, starting at a point exactly half (1/2) the specified interval distance from the end or starting point of the new pipeline. If an interval point falls within the span of a casing, the P.M., or designee, shall specify the location of the anodes on either side of the casing and the Contractor shall resume placing anodes at the specified intervals from the first anode beyond the end of the casing. The P.M., or designee, shall determine what, if any, anode location variations, additions or deletions shall be made.

All steel to plastic transition fittings shall have prepackaged anodes cadwelded to the steel portion in accordance with these Standards.

Anode test stations shall be installed on each steel pipeline with the locations to be specified by the P.M., or designee, at the time of construction. NOTE: The Contractor shall be prepared to install the test stations as much as twenty-five (25) feet from their tie-in point on the pipeline.

All anodes on casings shall be 17# prepackaged anodes or approved equal (see Sec. 300). Each casing shall have two (2) 17# anodes (one at each end).

416.1 ANODE INSTALLATION

The installed anode shall meet all of the following criteria upon complete installation by the Contractor:

The anode will be located a minimum of three (3) feet and a maximum of ten (10) feet horizontally from the pipe. All anodes will be installed vertically. All anodes will be installed at a depth to assure that the top of the anode is below the top of the pipe.

The anode wire will be wrapped once around the pipe and tied off to provide an anchor point between the anode and the cadweld.

The anode wire shall have a minimum burial depth of three (3) feet throughout its length.

A minimum of five (5) gallons of water shall be used to wet the anode prior to backfilling.

The soil adjacent to and above the anode shall be compacted as specified for the pipeline.

416.2 THERMITE BRAZING (CADWELDING) PROCEDURE

Cadweld materials and procedures only are approved for use in affixing permanent conductors to steel pipe.

Remove six (6) inch by four (4) inch section of coating from the top of the pipe.

The exposed metal of the pipe will be cleaned to a shining metal surface in preparation for cadwelding. The cleaning operation shall employ either filing or power brushing.

The cadwelding shall employ Cadweld #15 cartridges for steel piping. Proper sleeves shall be crimped on the anode wires in accordance with the manufacturer's recommendation. All cadwelding shall employ like new (no slop) molds. All vertical riser cadwelds shall use vertical molds only.

The completed cadweld shall be allowed to cool one (1) full minute prior to application of primer and tape.

The exposed metal surface and the cadwelded area shall be primed and taped with the Polyken 930 tape system or approved equal.

416.3 TEST STATION (BOX) INSTALLATION

All test stations shall be installed in accordance with the Contract Documents and the Utility Drawing Details included within these Standards.

Wiring to anode test station shall be one (1) anode lead wire AWG #12, Type TW, single strand wire terminated on the wiring post on the terminal block, and one lead wire AWG #12, Type TW, single strand wire cadwelded to the gas line and terminating on the same wiring post on the terminal block as is shown on the Utility Drawing Details.

Wiring to insulation (isolation) test station shall be one (1) each AWG #12, Type TW, single strand wire from each side of the isolating fitting on the gas line terminating on separate wiring posts on the terminal block and one (1) each AWG #8, Type TW, seven (7) strand wire from each side of the isolation fitting on the gas line terminating on separate wiring posts on the terminal block as is shown on the Utility Drawing Details.

All wiring connections on steel gas lines shall be cadwelded, unless specified otherwise herein.

All wiring to test boxes will be continuous and without splices except for the one (1) splice required on an anode lead when the anode pre-wired lead wire is not of sufficient length to meet the installation requirements. All underground wires shall have a minimum burial depth of three (3) feet throughout their entire length.

All wiring to test stations will require a slack loop within the test box which will allow the test box lid to be raised twelve (12) inches above the test box after installation.

Unless otherwise specified, all test stations installed shall be flagged with a six (6) foot section of two (2) inch steel pipe installed with three (3) feet below ground and the portion above ground properly primed and painted red.

All splices will be made by inserting both wire leads into Cadweld Adapter sleeves #CA26180 and firmly crimping the entire length of the sleeve. All splices will be primed and taped with Polyken 930-35 Tape and 1027 Primer, or approved equal.

All holidays in the pipe or wiring shall be repaired by priming and taping with Polyken 930-35 Tape and 1027 Primer, or approved equal.

New test station and anode shall be installed at every steel to poly transition (See UG-14).

A new Test Station, with tracing and/or anode wire(s), is required at the following locations:

- 1.) As identified by the Gas Corrosion Section to ensure proper cathodic protection of all steel gas pipelines.
- 2.) As identified by the Locating and Mapping Section to ensure proper traceability (signal strength) of gas pipelines.
- 3.) At the ends (dead ends) of all gas mains.
- 4.) At all Steel-to-Poly transitions.
- 5.) At any Black to Yellow Poly main line transitions to ensure complete traceability of newly installed gas pipeline.

416.4 GALVANIC ANODES

Anodes shall be prepackaged high purity magnesium alloy galvanic anodes (see also Sec. 300 herein).

The Contractor shall ensure that any and all anodes are properly stored and protected in a dry, sheltered storage area.

416.5 ANODE TEST STATION WIRING

Shall be one (1) 12 AWG, Type TW insulated single strand copper wire from anode. See the Utilities Drawing Details herein.

416.6 WIRING CONNECTIONS TO THE PIPE

Shall be made by the Thermitite Brazing Method, "Cadweld" or prior approved equal.

416.7 ANODE TEST BOX

Shall be a one (1)-piece assembly with locking cast iron cover that is secured into cast iron collar. The locking feature of the cast iron cover will have a pentagonal bolt cast in the center. The test box shall have a two and one half (2-1/2) inch internal diameter (ID) and an eighteen (18) inch plastic shaft length. The terminal block shall have two (2) point test posts with nickel-plated machine screws and nuts. Refer to Utility Drawing Details and Material Specification Lists (Sections 300 and 1200) herein for acceptable manufacturer and further details.

416.8 ISOLATION TEST BOX

Shall be a one (1)-piece assembly with locking cast iron cover and collar suitable for curb, sidewalk and roadway installation. The locking feature of the cast iron cover will have a pentagonal bolt cast in the center. The isolation test box shall have a three and one half (3-1/2) inch internal diameter and an eighteen (18) inch plastic shaft length. The terminal block shall have five (5) point test posts with nickel plated machine screws and nuts. See the Utility Drawing Details and Material Specification Lists (Sections 300 and 1200) herein for acceptable manufacturer and further details.

417 TIE-INS TO EXISTING SYSTEMS

Utility improvements cannot be tied (activated) into the existing system until "As-Built" drawings (Contractor

generated blue prints, Test Records, Main and Service record cards and all required material documentation such as Mill Reports, Coating Certificates, etc.) of the improvement have been submitted to, and accepted, by both the Contracts Administration and the CLC Utilities Department. See Section 100 herein for further detail.

The Contractor shall not make tie-ins to the existing gas system until after all pressure/leak testing, pigging and cleaning has been completed and is acceptable. The Contractor shall test at least an extra twenty (20) feet of each size and type of pipe installed in order to have extra tested pipe to make tie-ins and any necessary repairs. All tie-in welds and other connections not pressure tested shall be soap tested at line pressure. No leaks of any kind will be allowed.

The Contractor shall notify the P.M., or designee, at least forty-eight (48) hours prior to doing any tie-in work and shall only do such work in the presence of the P.M., or designee. Requests for tie-ins shall be made only after submittal and acceptance of all As-Built drawings and required documentation. The Gas Inspector shall coordinate pressure monitoring (if required) with the Pressure & Service Supervisor and shall schedule the tie-in for the earliest available time (within 2 working days of the tie-in approval) based on availability of the Gas Inspector and manpower of the Gas Pressure & Service sub-section.

Acceptance of submittals and required documentation does not constitute ownership of the pipeline by the City of Las Cruces. The City of Las Cruces Utilities Department Gas Section will not assume ownership of the pipeline until a successful tie-in to the existing gas system has occurred. All pressure test records must be submitted to the Las Cruces Utilities Gas Section within 4 working days of the pressure test date for review and acceptance (review and acceptance not to exceed 2 working days from date of submittal to the Gas Section). Tie-ins must occur within ten (10) working days of the acceptance date. In the event the submittal or tie-ins are

delayed, additional testing and/or acceptance will be based on the following for all gas pipeline:

- 1.) Failure to submit pressure test records for review and acceptance within 4 working days of the pressure test date: The entire pipeline must be retested in accordance with Section 418 of the Utility Standard.
- 2.) Failure to perform a successful tie-in procedure within ten (10) working days from date of pressure test acceptance:
 - a) Contractor must submit an Operation and Maintenance Plan to ensure the integrity of the pipeline and compliance to all Federal Regulations (CFR 192) and New Mexico Excavation Laws. The plan must identify all Covered Tasks, employees' Operator Qualified to perform these tasks and training records. As these are federal documents, all documents, including all maintenance activities, such as line locating, must be submitted to the Las Cruces Utilities Gas section at time of tie-in request.
 - b) Prior to tie-in, the entire pipeline must be retested in accordance with Section 418 of the Utility Standard.

Failure to comply with 2(a) and 2(b) above will result in automatic rejection of all pipeline. Pipeline must be removed and be replaced with new.

Gas line tie ins, transfers, hot taps, valve replacements and so on will have to be scheduled for low gas system demand (low pressure and volume requirement) periods as specified by the P.M., or designee.

Connections of new gas lines to the existing system will be made while the existing lines are under pressure. All connections to the existing system shall be made in such a manner that loss of gas is held to a minimum. Branch and straight connections to existing lines under pressure shall be made with pressure tapping equipment and fittings. Taps for branch fittings shall be drilled out with a full opening of not less than 75 percent of the area of the branch line. All connections and taps introducing gas into newly constructed lines shall be

made only with the approval and presence of the P.M., or designee, during the work. Where service is being furnished from a line to be replaced, it may be necessary to place the new line in service and still maintain service from the existing main while transfer operations are in progress.

All tie in joints, fittings and connections which are not pressure tested shall be soap tested in the presence of the P.M., or designee, under line pressure prior to installation of protective covering and/or acceptance of the new system.

All welds, joints, fittings, valves (and connections that are not a part of a tie in shall be hydrotested, nitrogen tested (or air tested) in their fully completed and installed state with the rest of the pipeline. "Stopples" fittings, "3-way" tees and spherical tees shall be manufactured by T.D. Williamson and shall be 300# ANSI for HP pipelines. ANSI 150# may be used on low pressure systems with approval from the Gas Section. All 3-way spherical tees shall have an outlet (welding neck) internal diameter equal to that of the pipe that will be welded to the tee or complying with those acceptable bore diameters for each pipe size as listed.

418 AIR TESTING LOW PRESSURE GAS LINES

All sections of low pressure shall only be pressure and leak (air) tested after they are in an entirely complete state. All associated services, service stubouts, main stubouts, etc., shall have been connected and shall be tested as a unit with the main.

High Density Polyethylene shall be tested at 100 psig or one and half times the MAOP, whichever is greater.

Medium Density Polyethylene shall be tested at 70 psig or one and half times the MAOP, whichever is greater.

All LP steel lines shall be tested at 100 psig or one and half times the MAOP, whichever is greater.

All polyethylene gas lines shall be installed in accordance with accepted standards. All polyethylene gas lines shall be tested before being placed into service. The test must be completed in accordance with the following procedures:

- 1.) Test Medium: Air or inert gas will be used for all testing.
- 2.) Duration of Test: At a minimum all pressure testing shall be at a duration that all leaks may be identified. (See Table below).
- 3.) All pressure test gauges used for pressure testing shall be calibrated on a quarterly basis.
- 4.) All pressure test must be conducted with a city issued data logger or chart recorder..
- 5.) Tie-In Connections:
 - a. Non-welded tie-ins shall be leak tested at existing operating pressure.
 - b. All welded connections shall be leak tested at existing operating pressure.

MINIMUM DURATION OF TEST IN HOURS

LENGTH FEET	NOMINAL SIZE, INCHES								
	1/2"	1"	2"	3"	4"	6"	8"	10"	12"
50 or less	1/4	1/2	1/2	1/2	1/2	1/2	1	1 1/2	2 1/2
100 or less	1/4	1/2	1/2	1/2	1/2	1	2	3	4 1/2
200 or less	1/2	1/2	1/2	1	1	2	4	6	9
400 or less	1/2	1/2	1/2	1	2	5	8	13	18
600 or less	1/2	1/2	1/2	2	3	7	12	19	27
800 or less	1/2	1/2	1/2	2 1/2	4	9	16	25	36
1,000 or less	1/2	1/2	1	3	5	12	20	32	45
2,000 or less	1/2	1/2	2 1/2	6	11	23	40	63	
3,000 or less	1/2	1/2	3 1/2	9	16	35	60		
4,000 or less	1	1	5	12	21	47			
5,000 or less	1	1	6	15	26	58			
10,000 or less	2	2	12	30	52				
20,000 or less	3 1/2	3 1/2	24	60					

Upon completion of successful pressure testing (accepted by the PM or designee), the Contractor shall reduce the pressure to seventy (70) psig and cap the line. This pressure shall be maintained until the pipeline is tied into the system. The new "left as" pressure shall be recorded on the as-builds and the test record. The

“left as” pressure must be verified prior to tie-in. All calibration records for pressure testing equipment shall be submitted and attached to the test record.

All test results must be acceptable to the P.M., or designee, and the LCU Gas Section prior to roadway subgrade preparation.

At the P.M., or designee’s, discretion, up to 500 lineal feet of low pressure gas lines may be gauge tested at one time.

419 PURGING

Contractor shall be required to perform purging of 100% of new and/or abandoned gas pipelines as outlined in Utility Standard Operating Procedure (SOP) GS-A9. Prior to requesting a Tie-in, the contractor shall submit a purging routine for review and approval. The purging routine shall clearly identify all tie-in locations, all purging points, name of any personnel involved in the purging activity by full name and OQ number, any valve operations (main line valves may only be operated by Utility Gas personnel) and a complete step-by-step sequence of operations required to achieve an acceptable purge of the pipeline. The Gas Pressure & Service Tech shall monitor the purge points by use of a calibrated CGI, and the contractor shall document the final gas readings on the purge routine. The completed purge documentation must be submitted to the owner. All purging activity must be done in the presence of the P.M or designee. In addition to monitoring the purging activity, Gas Pressure & Service section is responsible for assigning sufficient staff to also monitor both the upstream and downstream pipeline to ensure no adverse effects occur on the gas system due to actions taken during the purging process. Monitoring of the gas system pressure is required when any action such as, but not limited to, main valve operation, Regulator Station Operations, gas main pipeline pinching, tie-ins or purging may affect the gas system pipeline pressure or flow.

When a pipeline is being purged of air by use of gas, the gas must be released into one end of the line in a moderately rapid and continuous flow. If gas cannot be supplied in sufficient quantity to prevent the formation of a hazardous mixture of gas and air, a slug of inert gas must be released into the line before the gas.

When a pipeline is being purged of gas by use of air, the air must be released into one end of the line in a moderately rapid and continuous flow. If air cannot be supplied in sufficient quantity to prevent the formation of a hazardous mixture of gas and air, a slug of inert gas must be released into the line before the air.

Natural gas for purging and filling the pipeline shall be furnished by the Owner. The Contractor shall obtain a successful (complete) purge of each line segment. The Contractor shall furnish taps, blow-offs, etc. to properly perform the purging process. Purging is incidental to the project.

420 GAS SERVICES & SERVICE LINES

Where new service lines and meter risers are installed to replace existing facilities, the Contractor shall supply all materials up to and including the lock wing valve. The Contractor shall purge the service line, leave the gas cock closed and call for the Owner to reestablish service.

All new or entirely replaced service lines not exceeding 1-1/4 inch in size are required to have an Excess Flow Valve installed, see additional Sections herein.

All service lines shall be tied into mains with a tapping valve tee with the maximum possible size of tap that can be made (at least 75 percent of the nominal service line diameter) or with a full tee, valve and valve box as specified.

All stubbed out service lines to vacant lots, etc., shall have a yellow poly marker buried two (2) feet in the ground and sticking two (2) feet above the ground at the end of each stubout. The marker and the tracing wire shall extend a minimum of one (1) foot above final grade and wrapped a minimum of three (3) times around the poly line.

The sequence of operations which involve the interruption of service to a gas user shall be as follows (see Section 100 herein for further detail):

- 1.) The Contractor shall notify the P.M., or designee, at least forty-eight (48) hours (two full working days) prior to the start of construction of any gas work where service will be interrupted.
- 2.) The Contractor, with prior approval of the P.M., shall notify the utility customers that will be affected of the impending shutoff. The utility customers shall be given ample time, 48 hours, to provide themselves with temporary supply measures. Notification shall be by personal contact, or door hanger notice, and by notice in a local newspaper.

Any interruption of service shall be for as short a time as possible. No service shall be interrupted for a period longer than four hours except by permission of the P.M., or designee.

When construction work requires that service to the City customers be interrupted, the Contractor must request approval for the interruption from the P.M., or designee, at least 48 hours in advance. The P.M., or designee, may adjust scheduled interruptions to occur during minimum use periods.

- 3.) The Contractor shall then interrupt service at the meter to all affected customers.
- 4.) Las Cruces Utilities and the Contractor shall coordinate and determine the responsible party for purging and re-lights. The responsible party shall then purge the affected lines and will perform all re-lights. All connections shall be appropriately

tested by the Contractor in the presence of the Las Cruces Utilities, or designee. No leaks of any kind will be permitted.

No interruption in customer service which extends beyond the construction period of any one day's operation will be allowed.

421 EXCESS FLOW VALVES

All new or entirely replaced service lines shall be equipped with Excess Flow Valves (EFV).

All EFV's installed shall meet the requirements of the Las Cruces Utilities, and the U.S. Department of Transportation (DOT) Regulation 49 CFR Part 192.381 and all other applicable DOT Regulations, and ASTM F2138, ASTM F1802, and MSS SP-115, and associated manufacturer's requirements for installation.

EFV's shall be installed as close as practical to the polyethylene tapping tee at the gas main. EFV's are directional and shall be properly installed with respect to the gas flow direction. No dirt or other contaminants shall be allowed within the EFV. No on-site modifications shall be allowed to pre-packaged EFV's. No EFV shall be allowed to be installed in a service line tubing with a bend radius under the minimum cold bending radius allowed by the tubing manufacturer.

All EFV's installed shall be back pressure tested, and shall be flow tested to ensure proper function.

All service risers shall have washers permanently affixed, which indicate that said service line is protected by an EFV. Washers shall be galvanized with an inner diameter of one 1 inch for $\frac{3}{4}$ -inch service, 1 $\frac{1}{2}$ inch diameter for 1- $\frac{1}{4}$ inch service and 2 $\frac{5}{8}$ inch for 2-inch service. The washer shall be installed below the gas lock wing. Washer shall be stamped "EFV". Engraving is not allowed.

422 POLYETHYLENE PIPE, FITTINGS, PROCEDURES AND ADDITIONAL REQUIREMENTS.

All polyethylene piping work shall comply with the material and procedure requirements as outlined in the Contract Documents and as specified within these Standards.

In no case will homemade polyethylene gas pinching (squeeze-off) tools be allowed. All pinching tools shall be manufactured tools approved by the P.M., or designee, prior to being used or purchased by the Contractor. Each pinching tool, in order to prevent “over pinching” and damage to the pipe, shall be fitted with mechanical stops for each pipe diameter. Each pinching tool (or set of tools) shall be specifically designed for use on 2406 medium density, polyethylene, gas piping of the following diameters and wall thickness:

<u>Diameter</u>	<u>Wall Thickness</u>
4-inch (4.5" O.D.) IPS	SDR-11.5
2-inch (2.375" O.D.) IPS	SDR-10 or 11
1-1/4" (1.66" O.D.) IPS	SDR-11
1-inch (1.315" O.D.) IPS	SDR-11
3/4-inch (1.05" O.D.) IPS	SDR-11
1/2-inch (5/8" O.D.) CTS	0.090"

423 QUALIFICATION OF AND PROCEDURES FOR POLYETHYLENE JOINERS

Prior to the start of any polyethylene materials fusion, the Contractor shall, at his expense, certify his polyethylene Joiners in accordance with the latest, applicable “Federal Safety Regulations for Gas Distribution Systems, Title 49 CFR, Part 192” (DOT Regs.). Said certifications shall be submitted to the Owner.

All polyethylene welding and welding certifications shall be done using City of Las Cruces Standard Welding and Fusion procedures. All welding and fusion certifications shall be current and shall be acceptable to the P.M., or

designee. Acceptable certification processes are available through Las Cruces Utilities.

Any and all polyethylene welding procedures performed on all projects shall be accomplished by a Joiner certified for that procedure.

During dry weather, the Contractor shall adequately water the soil in all dusty right-of-ways to protect the quality of welding (fusion) and to limit inconveniences to the public.

During inclement weather, the P.M., or designee, may shut down any welding (fusion). Welding tents or other suitable protection may be used to continue operations with the consent of the P.M., or designee. The P.M., or designee, will have the final decision on welding (fusion) during inclement weather. There will be no extra charges or costs to the Owner for situations where welding (fusion) or other work on this project is shut

down due to the weather or weather related situations, or where special provisions have to be made by the Contractor because of weather or weather related situations.

Procedures

Pipe joining procedures are available through Las Cruces Utilities. The Las Cruces Utilities shall be contacted for verification of current procedures.

Las Cruces Utilities Gas Section has PE 2406/2708 Joining Procedures for the following methods and will facilitate the certification tests listed. The Joiner must supply all required equipment and materials for the certification test(s). Equipment will be inspected for compliance and operational conformity prior to testing. All Polyethylene Fusion Certifications must be obtained through the LCU Gas Section

The employee/joiner must have successfully completed all the Operator Qualification (OQ) requirements and be in good standing prior to applying for Polyethylene

Fusion Certifications. The employee/joiner also will be evaluated on Knowledge (of the applicable covered task and his/her ability to recognize and react to Abnormal Operating Conditions), Skills and Abilities. All test parameters (Knowledge, Skills and Ability) will be documented and maintained as an OQ record.

Butt Fusions

LCU Gas Section has an approved procedure for butt fusion of PE 2406/2708 utilizing a fusion machine. Certifications must be obtained through the LCU Gas Section. The following three (3) tests are required to be certified on the following pipe sizes:

- Certification on 3/4" – certifies the welder on 1/2", 3/4", and 1-1/4"
- Certification on 2" – certifies the welder on 2"
- Certification on 4" – certifies the welder on 4" and 6"

The joiner must test and pass on all three (3) pipe sizes to obtain Butt Fusion Certifications.

Saddle Fusions

LCU Gas Section has an approved procedure for saddle fusion of PE2406/2708 utilizing a force measuring device. Certifications must be obtained through the LCU Gas Section. The following tests are required to be certified on the following saddle fusion tapping tees:

- 2" x 3/4"
- 4" x 3/4"

The joiner must test and pass both to be certified on Saddle Fusion Certifications. Certification on tapping tees with a 3/4" outlet automatically certifies for up to 1-1/4" outlet. It also automatically certifies up to a 6" tapping tee.

Electro-fusion

Electro-fusions are only allowed in the following situations:

- Joining of dissimilar PE materials
- Tapping tees which LCU does not certify on as listed above
- In restricted spaces that does not allow sufficient room for saddle or butt fusion. (at the discretion of

the LCU gas foreman, or CLC gas inspector)

The following tests are required to be certified on electro-fusion:

- 2" electro-fusion coupling
- 2" x 3/4" electro-fusion tap

The joiner must test and pass both fusions to be certified on Electro-Fusion certifications.

424 CONTRACTOR REQUIREMENTS FOR STEEL WELDING AND STEEL WELDING CERTIFICATION

All steel arc welding and welding certifications shall be done using City of Las Cruces Standard Welding Procedure Specification.

One hundred percent (100%) of the HP or Transmission welds will be non-destructively tested (NDT) via X-ray or other API 1104 NDT method approved such as dye penetrant by the Gas Systems Compliance Inspector or his designee.

All steel gas piping (1-1/2" diameter and larger) shall be joined entirely by welding utilizing the electric-arc method. All welding shall be performed in conformance with the latest version of API 1104 adopted by the New Mexico Pipeline Safety Bureau and the Las Cruces Utilities Gas Welding Procedures.

Prior to the start of any steel arc welding, all Joiners engaged in the work shall submit to the Owner a Joiner's Certification of Qualification certifying the Joiner's capability under the latest adopted revision of API Standard 1104, Standard for Welding Pipelines and Related Facilities. This Certificate shall be obtained by means of destructive testing at the Gas Training Center. All certification welds must be verified and accepted/passed by the City of Las Cruces Gas System Compliance Inspector or designee. Welders must obtain a welding certification for each different pipe size grouping (established by the City of Las Cruces welding procedures) or welding position encountered in the project. If the certification weld fails the Destructive

Testing or other API 1104 Standards, the welder cannot weld on the job.

All cost associated with obtaining the certification shall be incidental to the project. Welders may maintain their welding certification by re-certifying twice per calendar year, not to exceed 7 1/2 months from date of last successful certification weld.

Low pressure systems do not require X-ray testing of steel welds; however, welders must obtain welding certifications as noted above.

Any welder who, at any point during the project, has more than two (2) welds designated as unacceptable under radiographic inspection in accordance with API-1104, such that they are required to be cut out and replaced, shall be removed from the project.

The welds on a pipeline to be operated at a pressure that produces a hoop stress of 20 percent or more of SMYS :

One (1) weld per Joiner shall be destructively tested per mile (or fraction thereof if the total length is less than one (1) mile) for each size pipeline at the cost of the Owner. The weld(s) will be selected at random and at the sole discretion of the Gas Department Gas Inspector or designee.

Should the weld be found defective, a second weld by the same Joiner shall be removed, replaced, and tested immediately at the expense of the Contractor. Any and all repairs / replacements shall be at the expense of the Contractor.

Failure of a second weld shall be cause to remove the Joiner from the project. Failure of a third weld shall be cause to require the Contractor to remove and replace, at his expense, all welds made by the Joiner. Failure of a second weld shall be reason for testing a third weld. As with the second weld test, the expense shall be borne by the Contractor.

425 STANDARD WELDING PROCEDURES

Pipe joining procedures are available through Las Cruces Utilities. They shall be contacted for verification of current procedures.

426 STEEL WELD X-RAYS AND DESTRUCTIVE TESTING

All HP welds shall be 100 percent X-rayed (radiographically inspected) in accordance with API-1104. The Project Manager or the Gas Systems Compliance Inspector may allow the use of an approved API 1104 nondestructive testing (NDT) method in situations where X-ray testing is not physically possible. All X-ray films and reports shall become the property of Las Cruces Utilities. All welds shall be totally acceptable under API-1104. All X-ray (or other NDT) reports shall be completed in its entirety and shall also identify the weld location by milepost, engineering station or geographic location. All rejected welds (repaired or cutout) must be identified on the X-ray report as well as the disposition of the rejects. It is the Contractor's responsibility to ensure that all repaired and/or cutout welds and replacements have been retested and documented on the X-ray report. It is the responsibility of the Gas Inspector to attach a copy of each steel pipe MIL Report to the X-Ray Report.

All welds found to be unacceptable shall be repaired or cut out (whichever is necessary), replaced and re-tested at the Contractor's expense until all welds are totally acceptable. All re-x-ray, and repair work shall be considered incidental to the construction and no separate payment shall be made to the Contractor for this work.

If any weld is unacceptable to the Owner or to the x-ray lab, that weld shall, as required by the Owner, be repaired or removed and replaced by the Contractor at the Contractor's expense. The Contractor shall ensure that only first class welds, in accordance with API-1104, are produced under this Contract.

The Contractor shall ensure that, in all instances, the public, the Contractor's employees, and the City's representatives are properly warned of and protected from the radiation produced by the radiographic inspection equipment. Proper barriers and signing located at the appropriate distances from the x-ray work shall, in all cases, be maintained by the Contractor. Traffic, pedestrians, and homeowners shall be properly warned and controlled by the Contractor at all times.

In all situations, the Contractor shall set up proper traffic and pedestrian control as well as homeowner notification and protection for all x-ray work done.

The x-ray lab shall determine what proper precautions are necessary and the Contractor shall be responsible and accountable for all precautions. All laws and regulations pertaining to these precautions shall be strictly adhered to by the Contractor.

The Owner shall have the right to test any production welds by subjecting them to destructive testing. The Contractor shall remove the completed welds, re-weld the pipeline, and section the test welds into specimens. The Owner will perform the destructive testing. Welds shall be tested by the Root Bend, Nick Break and Tensile Test (if applicable). All testing and basis for rejection of welds will be in accordance with API 1104.

Destructive tests of welds in addition to the one per mile per Joiner may be required by the Owner. The Contractor shall be paid for the removal and re-welding of such additional tests, which prove to be acceptable, an amount equal to the unit price bid for eight (8) lineal feet of the pipe being tested. Additional welds tested and found defective shall be at the expense of the Contractor.

427 X-RAY TESTING OF HIGH PRESSURE STEEL GAS LINES

Unless otherwise specified, Las Cruces Utilities shall provide all x-ray testing required on all high-pressure

steel gas lines. Any required re-testing due to failed tests shall be at the expense of the Contractor.

All x-rays shall be turned over to Las Cruces Utilities Gas Department for archiving.

428 STEEL PIPE BENDING AND MANUFACTURED ELBOWS

The Contractor shall employ competent and well-experienced engineers and assistants to properly determine the location and size of all bends and to layout and accomplish all bends in accordance with the Contract Documents. All bends shall be cold bends produced using an appropriate bending shoe or mandrel. Any utilization of a cold bend, elbow, or trimmed elbow to make a directional change shall be approved by the P.M., or designee. No payment will be made to the Contractor for these directional changes unless they are deemed necessary by and approved by the P.M., or designee, and are not required due to Contractor error or negligence in installing or preparing the pipeline, pipeline route, associated pipeline components, or other pipeline appurtenances. No hot bends or wrinkle bends will be allowed.

No cold bend having a total deflection angle of over 35 shall be utilized. Any bends with deflection angles between 35 and 90 shall be made using manufactured 45 or 90 long radius weld elbows (ells) trimmed down to fit angles other than 45 or 90.

All over-bends (upward vertical bends), sags (downward vertical bends), and side-bends (horizontal bends) shall be made prior to any external cleaning and prime-and-tape work taking place. All bends shall be installed in such a manner, within the pipeline, that an adequate amount of slack is always maintained for "snaking" of the pipeline.

The bending machine shall produce a smooth, symmetrical bend with no stretching or thinning of the pipe wall. No flattening or distortion of the pipe

circumference will be permitted. All bends shall be free from buckling, kinking, or any other evidence of physical damage.

The maximum degree of pipe bending shall be 1.5 per each distance along the pipe equal to one (1) pipe diameter. Successive 1-1/2 bends shall be separated by a minimum distance along the pipeline of one (1) pipe diameter. This means that, for instance, a 30 bend on eight 8-inch pipe will have a total length along the pipe of at least 14' - 4 1/2" and a 30 bend on 4-inch pipe will have a total length along the pipe of at least 7' - 6".

Bending shall not be permitted any closer than six (6) feet from the end of any pipe joint (from any circumferential weld). In no case shall a circumferential weld be placed within or closer than six (6) feet from any cold bend directional change. Only on pipe joints containing cold bends shall the longitudinal weld in the pipe be placed along the top center of the pipeline for horizontal bends and along the side center of the pipeline for vertical bends. Otherwise, each pipe joint shall have the longitudinal weld staggered from one side of the pipeline to the other alternately at 45 from top center.

The P.M., or designee, shall approve all pipe bends. Any bend or straight section of pipe that is buckled, kinked, flattened or distorted shall be cut out and replaced by the Contractor at no extra cost to the Owner. The Contractor is responsible and accountable for making proper bends in compliance with the Contract Documents.

Manufactured ells that are trimmed shall be trimmed back and rebeveled in a complete, accurate, acceptable manner that complies with the specifications contained herein. For example, on a 4-inch, long radius ell, the length of the centerline arc on the outside of the ell in inches shall be 0.1440 times the angle required in degrees:

$$0.1440 \times \text{Angle} = \text{4-inch Ell Outside Arc}$$

On a 4-inch, long radius ell, the length of the centerline inside arc (crotch) shall be determined as follows:

$$0.0654 \times \text{Angle} = 4\text{-inch Ell Inside Arc.}$$

On an eight 8-inch, long radius ell, the length of the centerline arc on the outside of the ell in inches shall be 0.2847 times the angle required in degrees:

$$0.2847 \times \text{Angle} = 8\text{-inch Ell Outside Arc.}$$

On an eight 8-inch, long radius ell, the length of the centerline inside arc (crotch) shall be determined as follows:

$$0.1342 \times \text{Angle} = 8\text{-inch Ell Inside Arc.}$$

No mitered or skewed butt weld ends will be allowed on trimmed down, manufactured ells.

429

PIPELINE HOLIDAY TESTING AND FIELD TAPING OR COATING OF STEEL PIPING COMPONENTS

All steel pipe, fittings, valves, etc. to be buried shall, just prior to backfilling, be subjected to a holiday detection test for the full circumference and length of the pipe, fitting, valves, etc. using a spark discharge holiday detector and tested as identified in Section 407.5.

All damaged areas and holidays shall be repaired immediately as specified herein and re-tested with the holiday detector.

All bare steel pipe, pipe fittings, valves and holidays in the coating shall be protected with primer and tape or, as otherwise specified herein, with Tem Coat Primer and Trenton #1 (#2 for above ground applications) Wax Tape.

No wrap of tape shall be applied over welds or other heated areas until the temperature of that area has dropped to below 135 F. Quenching by water or other means of accelerating the cooling will not be permitted. Pipe coating shall, in all cases, extend to a point six (6)

inches above the final ground surface elevation or into valve vaults, etc.

All underground weld joints, fittings and areas where the pipe coating is damaged shall be completely coated with Polyken taping system, or pre-approved equal.

Apply one (1) coat of Polyken 927 Primer and a spirally wrapped layer of four (4) or two (2) inch wide, 35 mil, Polyken 930-35 Tape overlapping half (1/2) width with each wrap of the tape for a double thickness layer of tape. Only two (2) inch wide Polyken 930-35 Tape shall be used on two (2) inch diameter and smaller pipe.

Prior to application of the tape, the existing coating shall be trimmed back to remove any damaged sections to the point where the existing coating is tightly bonded to the pipe. All surfaces to be covered shall be wire brushed and wiped clean and dry. The primer shall be applied evenly over the entire surface of the pipe and adjacent coating and must extend a minimum of 1" beyond the outer edge of the Polyken tape. The tape shall then immediately be spirally wrapped around the pipe using the half lap method such that two (2) thickness of tape cover all taped areas. The tape shall be neatly formed around corners and irregular surfaces. The application shall be performed in such a manner that the tape tightly adheres to and is securely bonded to the pipe or fitting and preceding layers forming a covering which will prevent air and moisture from coming in contact with the metal surfaces. The primer and tape shall overlap the shop applied or other existing pipe coating by not less than six (6) inches at pipe ends, both sides of holidays or damaged areas of the existing coating, at pipe taps, and at anode cadwelds.

The tape shall be neatly applied in a workmanlike manner without loose ends, wrinkles, bulges and changes in wrapping direction or overlap. Wax Tape shall be used for all steel valves, flanges and any other hard to coat fittings where use of Polyken Taping System is deemed non-effective as a pipe coating repair method.

Where pipe has been bent for a directional change, in accordance these Standards, and in any other circumstance, any bubbles, wrinkles, splits, breaks or other damage to the coating shall be cut away and the affected area shall be completely and properly primed and taped.

Grease and oil shall be removed from bare pipe, etc. prior to prime and tape by utilizing a completely volatile solvent such as naphtha or benzene on a clean cloth used to wipe the pipe clean. Kerosene, diesel fuel, gasoline, etc. shall not be used for cleaning. Soap, if used for leak detection or otherwise, shall be removed completely with water. The pipe shall be completely clean, dry, dust-free and frost-free before application of the primer and tape.

All damaged areas shall be repaired using the primer and spiral wrap method only, except where Roscote and glass mesh were previously utilized for a field applied coating.

Taping (Polyken, or pre-approved equal) primer and coating (Roscote, or pre-approved equal) mastic shall never, under any circumstances, be thinned by the addition of any thinner or solvent.

Field applied primers, tapes and coatings shall only be applied where the primer, tape or coating has been warmed and maintained by an appropriate method at a temperature of at least 40 F. and not more than 100 F., and when the ambient temperature is at least 30 F. or above. Otherwise, at ambient temperatures below 30 F., the pipe as well as the primer, tape and/or coating shall be warmed and maintained by an appropriate method at a temperature of at least 50 F. and not more than 100 F. immediately before and during the application process.

A double coating (twice that specified above) shall be applied to all bare pipe, pipe fittings, valves, areas where coatings need repair, etc. that are to be placed within a casing or are buried within three (3) feet of any

metal pipeline or other metal object (valve boxes, culverts, etc.).

430 HYDROTESTING, NITROGEN TESTING STEEL GAS LINES

All steel gas pipelines (and their components) shall be 100 percent hydrotested, or nitrogen tested in their entirety or in sections by the Contractor, at his expense, prior to tying in, purging and placing in service of the pipelines. The pipelines or pipeline sections and all components shall be 100 percent complete and installed prior to hydrotesting or nitrogen testing. All tie-in welds shall be soap tested under line pressure. No leaks of any kind shall be allowed. At least an additional (extra) twenty (20) feet of each size of pipe being tested shall be tested during each hydrotest, pressure test and returned to the owner. All hydrotesting and/or nitrogen testing shall be considered as being incidental to the construction and no separate payment shall be made to the Contractor for this work.

Each hydrotest shall be performed after completely and properly filling the pipeline with water, shading (backfilling) the pipeline (including test heads) and allowing the water in the pipeline to stabilize to the ground temperature for a minimum of twenty-four (24) hours. Test pressure recorders, etc. shall always be placed at the high point in the pipeline.

After the stabilization period is completed, the pipeline or pipeline section shall be pressurized a minimum of 600 psig or at a test pressure determined by the Las Cruces Utilities Gas section to maintain the pipeline MAOP. The P.M., or designee, shall specify the upper and lower pressure limits for each hydrotest. This pressure shall be maintained (shut in) at that initial pressure for twenty-four (24) hours without adding or bleeding pressure. During this twenty-four (24) hour period, the pressure and test media temperature shall be recorded on a pressure recorder utilizing an 11-inch diameter, 0 to 1000 psi, circular charts with 10-psi graduations for high-pressure tests. Las Cruces Utilities

Gas Section approved Data Loggers are allowed. The media temperature shall be taken by at least one probe "inserted" in the media via a "well." At the beginning and at the end of the twenty-four (24) hour test, the pressure shall be read and recorded utilizing an accurate, calibrated dead weight tester provided by the Contractor. The chart recorder may not be allowed to exceed 24.5 hours of recording. The test shall be repeated until the beginning and ending pressures are equal or pressure/temperature calculations (by a licensed Engineer) show the beginning and ending volumes are the same. Upon completion of successful pressure testing (accepted by the PM or designee), the Contractor shall reduce the pressure to the operating pressure of the gas pipeline as determined by the LCU Gas Section. This pressure shall be documented on the as-builds and pressure test record(s). This pressure will be maintained until the pipeline is tied into the system.

All pressures shall be checked at the beginning, during and after the end of each test (in the presence of the P.M., or designee) by the Contractor utilizing accurate, calibrated dead-weight testers and test gages. The costs of testing shall be the responsibility of the Contractor.

The Contractor shall make all repairs and/or replacements on any defects or leaks discovered during testing or inspection at no additional cost to the Owner.

After the pipeline(s), pipeline section(s), meter station(s) and/or regulator station(s) is (are) placed in service, the Owner will leak survey the pipeline(s), pipeline section(s), meter station(s) and/or regulator station(s) as often as the Owner deems necessary.

The Contractor shall be responsible for removing and disposing of the tainted test water from the hydrostatic test in an approved manner. The Contractor is also responsible for "pigging" the line completely dry to the satisfaction of the P.M., or designee.

Guarantees and warranties shall be as specified in the City of Las Cruces General Conditions, latest edition.

431 PIPELINE MARKER

Unless otherwise specified, Gas Pipeline Utility Markers will be furnished and installed by the Contractor in accordance the applicable Department of Transportation standards for high-pressure gas lines, and with the following:

- 1.) Utility markers shall be supplied by acceptable manufacturer shown in Section 300. The markers shall be five and one half (5 1/2) feet overall length, and yellow in color. The marker shall have a plastic decal applied on both sides of the utility marker by the manufacturer. The plastic decal shall be the manufacturer's standard C-100 & P101, black on yellow, with the following words added to the standard script, "Call City of Las Cruces, (575) 526-0500." This marking shall be in addition to the word "WARNING", or "CAUTION", or "DANGER", and followed by "GAS PIPELINE", as required by the referenced DOT regulation. All lettering shall be at least one inch high with one-quarter inch stroke.
- 2.) The horizontal location of the markers from the gas trench will be decided in the field by the P.M., or designee.
- 3.) Utility markers shall be set in the ground by driving them into the soil two and one half (2 1/2) feet with a manufacturer's handheld driver.
- 4.) Utility markers shall be set at the following locations unless otherwise specified by Las Cruces Utilities, or the P.M., or designee.
 - a. Every one-fourth (1/4) of a mile for transmission lines or wherever practical to maintain visibility between markers and at each side of a highway and railroad and bridge crossing.
 - b. Main line markers are to be installed at each Railroad and Public Road crossing within Class 1 & Class 2 areas or, wherever necessary to identify the location to reduce the possibility of damage or interference.

- c. Pipelines aboveground – Line markers must be placed and maintained along each section of a main and transmission line that is located aboveground in an area accessible to the public.

432 MISCELLANEOUS ITEMS

432.1 PAINT

Metal surfaces required to be painted, as per Contract Documents, shall include sandblasting all surfaces to receive paint of 95% of visible rust, mill scale and paint from the surface. Also includes adding primer the same day as sandblasting occurs. Primer shall be Sherwin Williams, A5, Ken Kromik Metal Primer, No B50W21 or pre approved equal, 3.0 mils thickness. Also includes painting the pipe with Sherwin Williams, series B54, E21 industrial Enamel, or pre-approved equal, 2.4 mils dry or 10 mils wet film thickness. The contractor will apply two coats to the pipe. One coat will be allowed to dry for 24 hours prior to the application of the second coat. Color to be yellow, or as selected by the P.M., or designee.

SECTION 500

SANITARY SEWER DESIGN STANDARDS

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500 GENERAL NOTES ABOUT SANITARY SEWER STANDARDS

Conditions may exist which will necessitate deviations from these standards. Deviations from these standards shall have prior approval of Utilities Director before being constructed. Nothing in these standards shall relieve the designing engineer from the responsibility of meeting the current standards of all entities having jurisdiction over the particular project being designed. Entities having possible jurisdiction over projects in the Las Cruces area include but are not restricted to the following agencies.

New Mexico Department of Transportation
Elephant Butte Irrigation District
All Railroads
All Mutual Domestic Water Consumer Associations
Dona Ana County
United States Environmental Protection Agency
New Mexico Environment Department

501 SEWER SYSTEM MODEL

Included herein by reference is the “City of Las Cruces Water and Wastewater System Master Plan Update, dated June 1995,” and any updates thereof. Relevant, specific information from that document, and any updates thereof, are appurtenant to the design and installation of water and wastewater systems and are to be considered in said design and installation.

The current Master Plans utilized by the City of Las Cruces shall be used and interpreted by the City to determine fluid flow conditions, line sizes, manhole location, and other design elements that depend on analysis of fluid flow characteristics. Sewer system design should conform to the Recommended Standards for Wastewater Facilities published by the Great Lakes-Upper Mississippi River Board of State Public Health, 1997 or latest edition, and Environmental Managers and shall consider the ASCE Manual “Sulfide in Wastewater Collection and Treatment Systems.”

502 STANDARD LOCATIONS

502.1 ENTRY TO LOT (SERVICES)

Special cases not covered in the table below will be determined on a case-by-case basis in consultation with Las Cruces Utilities.

TYPE OF LOT	STANDARD LOCATION OF SERVICE – ORIENT BY STANDING IN STREET AND FACING LOT
RESIDENTIAL-36 FT WIDE OR GREATER	10 FT. LEFT OF WATER
MULTIFAMILY	10 FT. LEFT OF WATER THEN MANIFOLDED AT PROPERTY LINE BY PROPERTY OWNER AS REQUIRED
COMMERCIAL USE WITHIN A SUBDIVISION	10 FT. LEFT OF WATER
COMMERCIAL NOT IN A SUBDIVISION	SITE SPECIFIC
MOBILE HOME PARK	SITE SPECIFIC
MOBILE HOME SUBDIVISION	10 FT. LEFT OF WATER
<ol style="list-style-type: none"> 1. Services shall be perpendicular to the main line on straight roads, radial on curves, and straight from the main or manhole (manhole is preferred) to the property line at the termination of cul-de-sacs. 2. Lot entry standards for corner lots are measured from the pc of the lot corner. 	

502.2 NON-STANDARD LOT ENTRY LOCATIONS

To avoid utility conflicts due to manholes and utility services on opposite side of street, the following protocol shall be used. Any deviation from the standards stated in the above table will require dimensioning of the utility moved.

1. Sewer can vary from 5-15 feet left from water if necessary to avoid utility conflicts.
2. If moving the sewer will not avoid conflicts,
 - A. The water can be moved up to 5 ft left or right with the sewer 10 ft. left of centerline location.

B. The sewer can then vary from 5-15 feet left from water as required.

Any lot entry location that differs from the above protocol requires approval of the Utilities Director.

502.3 IN STREET RIGHT OF WAY (MAINS)

502.3.1 NEW CONSTRUCTION

Sewer mains shall typically be located in a dedicated City right of way along the centerline of the street.

503 STANDARD SEPARATION

Standard separation of Sewer mains or services from other utilities shall be as shown below.

FOR UTILITY LINES THAT ARE PARALLEL HORIZONTAL SEPARATION (MEASURED FROM CENTER OF UTILITY)						
	GAS MAIN	GAS SERVICE	SEWER MAIN	SEWER SERVICE	WATER MAIN	WATER SERVICE
GAS MAIN	5 FT.	5 FT.	10 FT.	5 FT.	10 FT.	5 FT.
GAS SERVICE	5 FT.	5 FT.	5 FT.	5 FT.	5 FT.	5 FT.
SEWER MAIN	10 FT.	5 FT.	∅10 FT.	5 FT.	∅10 FT.	5 FT.
SEWER SERVICE	5 FT.	5 FT.	5 FT.	5 FT.	5 FT.	5 FT.
WATER MAIN	10 FT.	5 FT.	∅10 FT.	5 FT.	*5 FT.	5 FT.
WATER SERVICE	5 FT.	5 FT.	5 FT.	5 FT.	5 FT.	5 FT.
STORM SEWER*	10 FT.	5 FT.	10 FT.	5 FT.	*5 FT.	5 FT.
WIRE UTILITY	5 FT.	5 FT.	5 FT.	5 FT.	5 FT.	5 FT.
MAN- HOLE	10 FT.	6 FT.	NA	NA	10 FT.	6 FT.
* - Separation may vary with field conditions and Utilities Director approval. ∅ - 10 ft. separation between water and sewer mains to be measured from outside of pipe to outside of pipe.						

**FOR UTILITY LINES THAT ARE CROSSING
VERTICAL SEPARATION
MEASURED FROM OUTER SURFACE OF UTILITY**

	*GAS MAIN	GAS SERVICE	SEWER MAIN	SEWER SERVICE	WATER MAIN	WATER SERVICE
GAS MAIN	12 IN.	6 IN.	12 IN.	12 IN.	12 IN.	12 IN.
GAS SERVICE	6 IN.	6 IN.	6 IN.	6 IN.	12 IN.	12 IN.
SEWER MAIN	12 IN.	6 IN.	12 IN.	6 IN.	24 IN.	6 IN.
SEWER SERVICE	6 IN.	6 IN.	6 IN.	6 IN.	6 IN.	6 IN.
WATER MAIN	12 IN.	12 IN.	24 IN.	6 IN.	12 IN.	6 IN.
WATER SERVICE	12 IN.	12 IN.	6 IN.	6 IN.	6 IN.	6 IN.
STORM SEWER	12 IN.	6 IN.	12 IN.	6 IN.	12 IN.	6 IN.
WIRE UTILITY	12 IN.	12 IN.	12 IN.	6 IN.	12 IN.	6 IN.

1. In intersections gas mains go under all other utilities except sewer.
2. Gas mains passing under sewer mains will be sleeved. Sleeves shall extend a minimum of 5 feet to each side from the outer side of the sewer main. Sleeves can be any pipe material if the sleeve color is yellow or painted yellow. Pipe spacers shall be used to protect the carrier pipe.
3. When water mains cross sewer mains the crossing shall be arranged so that the sewer joints will be equidistant and as far as possible from the water main joints.
4. When it is impossible to obtain proper horizontal and vertical separation as stipulated in the above two tables, the sewer shall be designed and constructed equal to water pipe and shall be pressure tested, throughout the limits of watertight construction and a minimum of 10 feet each side of the obstruction, to assure watertight connections prior to backfilling. The minimum limits of pressure pipe installation shall be 10' each side of line obstruction.
5. *The vertical separations listed for gas mains apply to poly lines only and do not apply to steel gas lines. Vertical separation from steel lines shall be twenty-four (24) inches for a High Pressure and eighteen (18) inches for Low Pressure.

504 SEWER LINES OUTSIDE OF STREET/ROAD RIGHT OF WAY

504.1 MAINS

Sewer mains shall be in either a City utility easement or City right-of-way of adequate width for installation and maintenance. Manholes must always have vehicular access from a dedicated roadway.

FOR SEWER LINES NOT IN A STREET	
DEPTH TO INVERT	MINIMUM REQUIRED EASEMENT WIDTH
3 FT. TO 6 FT.	15 FEET
6 FT. TO 10 FT.	20 FEET.
GREATER THAN 10 FT.	30 FEET.
LINE IN A CASED SLEEVE	10 FEET
1. Additional utilities within an easement will require an easement width greater than the minimum.	

Sewer mains may be located between residential lots in City utility easements along lot/property lines with prior approval by the Utilities Director, or designee. Sewer mains along lot/property lines must be sleeved in a steel casing accessible from both ends and have a 15 ft. minimum width utility easement. No walls, parallel to the sewer utility placement, will be allowed within seven (7) feet of the sewer placement.

Location of any City utility within drainage ways and other non-standard utility corridors requires Utilities Director approval. Such drainage ways shall not have rigid (concrete) lining.

City utility easements in Mobile Home Parks require the same standards as above. For privately owned Mobile Home Park streets, the minimum easement for utilities in the street is the total paved width of the road.

504.2 SERVICES

For Service lines in a customer's yard, no dedicated City utility easement is required. The customer is responsible for maintenance (ex. Sewer stoppages) of the line from the yard to where the service line intercepts the main sewer line.

Any repairs and/or replacement to the service line from the property line to where the service line intercepts the main sewer line is the responsibility of CLC Utilities.

Placing a service line through a neighbor's yard to reach a different customer is discouraged but, when allowed by the Utilities Director, requires a minimum 10-foot-wide recorded utility easement from property owner to property owner. The sewer service line in the recorded easement will be maintained and owned by the customer up to where the service line intercepts the main sewer line.

All sewer service lines shall have a cleanout at the point where the service line leaves the City right of way or easement, refer to 509.3 for cleanout requirements and location. This cleanout is not intended to replace any sewer cleanout that is required under other codes or ordinances.

505 MINIMUM DEPTH OF LINE BELOW FINISHED GRADE

505.1 GRAVITY MAIN LINES

The minimum depth for Gravity PVC Sewer Mains shall be as required to adequately serve the proposed connection and shall be at least as shown in the table below. Sump pumps are not allowed for individual connections without approval of the Utilities Director.

GRAVITY PVC SEWER MAIN	
LOCATION	DEPTH FROM CENTERLINE FINISH GRADE TO INVERT OF PIPE
IN EXISTING OR FUTURE STREET	6 FT. MINIMUM
NOT IN EXISTING OR FUTURE STREET	6 FT. MINIMUM – SITE SPECIFIC
ARROYOS	6 FT. MINIMUM – SITE SPECIFIC –Additional protection may be required, based on engineering requirements.
ALL LOCATIONS	20 FT. RECOMMENDED MAXIMUM DEPTH. Depths deeper than 20 ft. may be allowed on a case-by-case basis. For depths greater than 15 ft., design documentation or calculations may be required from the engineer.

Lines shallower than the above table may be allowed on a case-by-case basis under the following conditions: 1. Prior approval of the Utilities Director is obtained, 2. Ductile Iron pipe is used, and there is sufficient depth to run sewer services below any water and gas main crossings.

505.2 GRAVITY SERVICE LINES

The minimum depths for sewer service lines shown below are for typical city subdivisions. Sewer service line depths should be designed to serve the entire lot especially for non-standard residential and commercial lots. Deeper than the minimum sewer service line depths may be required on a case-by-case basis and the service line depths should be shown on the construction plans.

PVC SERVICE LINE	
LOCATION	DEPTH TO TOP OF PIPE
IN CUSTOMER'S YARD	2.5 FT.
IN ESTABLISHED STREET	3.0 FT.
NOT IN ESTABLISHED STREET	3.0 FT.

The maximum depth of sewer service lines shall be five (5) feet from the finish grade to the top of the pipe measured at the property line, unless prior approval is obtained from the Utilities Director.

506 DESIGN LOADS

Design loads for single-family residential units shall be 107 gallons/unit/day x 3 (peak day) x 3.2 (persons per unit). All other design loads shall be based on actual expected load.

507 MINIMUM GRAVITY LINE SIZE

507.1 GRAVITY MAINS

All gravity mains that are capable of being extended shall be a minimum 8-inch diameter. Dead end mains that can never be extended may be 6-inch diameter, if sufficient capacity exists in the line.

507.2 GRAVITY SERVICES

All service lines to individual customers shall have a minimum diameter of 4 inches. Larger diameters may be required based on actual loads.

508 SEWAGE LIFT STATIONS

Sewage lift stations shall be designed on a case-by-case basis and shall be subject to the approval of the Utilities Director. In all cases, sewage pumps will be three phase and three phase power must be available at the lift station unless otherwise approved by the Utilities Director. Prior to design, designer is to meet with Las Cruces Utilities to review the design requirements.

509 GRAVITY LINE DESIGN CRITERIA

509.1 HORIZONTAL ALIGNMENT

A manhole is required for any change in horizontal alignment that is greater than pipe manufacturer’s recommendation, or any change in vertical alignment, or where 2 or more main lines connect.

Curved sewer lines are allowed in accordance with pipe manufacturers’ recommendations. No fittings shall be used to change direction in lieu of a manhole.

509.2 VERTICAL ALIGNMENT

The minimum slope for a sewer line shall be as shown in the accompanying table.

MINIMUM SLOPE ALLOWED	
PIPE DIAMETER	SLOPE
6 INCHES	0.6 PERCENT
8 INCHES	0.4 PERCENT
10 INCHES	0.3 PERCENT
12 INCHES	0.2 PERCENT
15 INCHES	0.2 PERCENT
18 INCHES	0.2 PERCENT
21 INCHES	0.2 PERCENT
24 INCHES	0.2 PERCENT
GREATER THAN 24 INCHES	0.2 PERCENT

All sewer lines shall be bedded in suitable embedment materials (see Sec. 704). All sewer lines designed for slopes at or less than 0.5% shall be bedded in suitable embedment materials that have been pre-shaped. Pre-shaping the **consolidated** placement surface shall be by means of a template made to fit the lower part of the sewer pipe exterior for a width of at least 60% of the sewer pipe breadth. The minimum thickness of the suitable embedment materials is four (4) inches, see drawing US-1.

For sewer lines greater than 8-inch diameter, the design flow must warrant the increased line size to utilize a larger size. A larger than required line diameter will not be allowed without design flow justification, and approval of the Utilities Director.

509.3 SERVICE LINES

The minimum slope for a 4-inch sewer service will be 2 percent and for a 6-inch sewer service line will be 1 percent.

Service lines shall be located below gas mains or water mains.

All service lines must have a cleanout where the service lines enter private property. The cleanout shall be installed at the subdivision stage, see detail on US-2. The home builder will be responsible to adjust clean out to grade and for repairing the cleanout if damaged during home construction.

No manifolding of service lines is allowed between different owners. Individual service lines must run from customer to main only unless a variance is approved by the Utilities Director.

Service connections to sewer mains shall be made with standard WYES installed at the time of main construction.

For services to be installed on standard PVC or ductile iron sewer mains where no WYE exists, approved sewer saddles may be used.

Insert a Tee® connections may be used on services connecting into existing concrete pipe or ribbed PVC interceptor (large diameter) sewers, with the approval of the Utilities Director. See detail drawing US-13.

510 MANHOLE DESIGN CRITERIA

A manhole is required for any change in horizontal alignment that is greater than pipe manufacturer's recommendation, any change in vertical alignment, where 2 or more main lines connect, and at a spacing not to exceed 450 ft. Manhole spacing is measured from center of manhole to center of manhole. A manhole shall be required where 2 or more main lines connect. A manhole or cleanout (see detail drawings) is required at the end of any line.

Curved sewer lines are allowed in accordance with pipe manufacturers' recommendations. No fittings shall be used to change direction in lieu of a manhole. Upon recommendation of the Utilities Director, spacing between manholes may be limited to a maximum of 350 feet for curved sewer lines.

A cleanout may be used at the upstream end of a line that can never be extended (see detail drawing US-4). All service lines must connect to the sewer main downstream from the cleanout.

Manholes shall be Pre-Cast Concrete designed to meet the American Association of State Highway and Transportation Officials (AASHTO) H-20 loading. (see detail drawings)

Manholes shall be accessible by 2-wheel drive vehicles 24 hours every day and shall be approachable by dedicated 15 ft. (minimum) Right of Way or City utility easement.

Sanitary sewer pipe shall be installed continuously thru manholes including fitting where feasible. There shall be a minimum drop of 0.10 ft. in the direction of flow across a manhole if not continuous pipe. If a pipe is run through a manhole, the top half of a 36-inch section of the pipe must be removed within the manhole to allow access for inspection, and the minimum slopes (Sec.509.2) shall apply. Only sanitary sewer pipes are allowed within a manhole.

Any main line and service line entering a manhole with an invert elevation greater than 1.5 ft. higher than the crown of the downstream pipe shall utilize a Drop Manhole (see detail drawing US-6). Where the drop is less than 1.5 feet the invert shall be placed at the base of the manhole.

Manholes in areas prone to flooding or running water may be required to have a bolted and watertight cover, see detail drawings US-10 and US-11. The P.M., or designee, may require manholes to be of this type, based on field conditions.

Insert a Tee® connections may be used on mains connecting into existing concrete pipe or ribbed PVC interceptor (large diameter) sewers, with the approval of the Utilities Director. See detail drawing US-12.

Manholes shall be coated with a pre-approved coating system when required at the discretion of the Las Cruces Utilities. Coating systems and application methods shall be approved prior to design acceptance.

511 FORCE MAIN DESIGN CRITERIA

All force mains shall conform to previously mentioned design criteria and to the following.

All force mains shall be C-900 PVC or Ductile Iron with a minimum cover of 36 inches to the top of the pipe.

All bends requiring a fitting shall have restrained joints. All fittings on force mains shall be restrained joint.

Force mains shall enter the manhole with the force main invert within 1 ft. above the crown of the downstream main leaving the manhole. A pipefitting will be required to divert the flow from the force main entering the manhole, such that the gap and angle between the manhole outflow and the force main is minimized in order to maintain sanitary conditions.

Force mains shall be designed under the same hydraulic constraints as water lines including the use of air release - vacuum relief valves as necessary.

All force main designs shall be reviewed on an individual basis by Las Cruces Utilities.

512 LOW PRESSURE SEWER SYSTEMS

It is the policy of Las Cruces Utilities to utilize conventional gravity sewer systems in combination with regional lift stations and wet wells.

The Utilities Director may, at his sole discretion, on a case-by-case basis, grant a waiver to approve a low-pressure sewer system (LPSS).

LPSS waiver criteria that must be met include, but are not limited, to the following.

1. LPSS is limited to a maximum of the equivalent of approximately 50 residential customers.
2. Information must be shown to indicate that a conventional system is not practical or feasible. Relative initial cost will be considered but will not necessarily be a determining factor.
3. Ownership, operation, and maintenance of the individual grinder pumps will rest with the customer and not with the City.
4. Future expandability of the current Las Cruces Utilities sewer system must not be compromised by the LPSS.
5. Appropriate notice must be given to potential LPSS customers concerning the ownership operation, and maintenance of the various components of the system.
6. Individual grinder pumps that empty directly into an existing sewer main will be considered on a case-by-case basis, with ownership operation, and maintenance of the grinder pump and accessories resting with the customer.
7. Owners and occupants of premises served by LPSS should expressly release Las Cruces Utilities from any and all liabilities associated with the use, operation, and/or malfunction of the LPSS.
8. Developers and property owners should bear all the expense of the design, permitting, and construction of LPSS.
9. If a LPSS is desired to be utilized, a request must be made to the Utilities Director and a written decision must be obtained prior to submitting construction plans for review. Approval of a LPSS by waiver does not indicate approval of LPSS construction plans; it merely establishes the right to submit plans for a LPSS.

512.1 OWNERSHIP AND MAINTENANCE RESPONSIBILITY

The customer is responsible for all operation, maintenance, operation, and associated costs for all components of the LPSS located upstream of the City ROW line.

The system will be owned and maintained by Las Cruces Utilities from all points downstream of the City ROW line.

512.2 LPSS DESIGN REQUIREMENTS

Some of the design requirements Las Cruces Utilities will expect are listed below. It should be noted that meeting the requirement listed below is not sufficient in and of itself to assure approval. Since the systems have several components that interact, the requirements may be changed to meet specific conditions.

System should be designed so that “design flow” is achieved twice a day with a minimum of 2 ft/sec velocity in the force main. $Q = AN + 20$ from the EPA is an acceptable formula for general design purposes, where Q in gpm; A=0.5; N is number of residences upstream of location analyzed; 20=gpm.

A professional engineer using an accepted modeling system such as KY-Pipes should analyze the total system, or a system developed by the manufacturer. The analysis should be furnished to Las Cruces Utilities as part of the approval process.

System should be designed to prevent undue retention time of wastes in the pressure sewer where biological and chemical activity may produce gases.

Force main location for LPSS should be in the centerline of the road and should conform to force main design standards outlined in Section 511. Variations from centerline location will be on a case by case basis and will require approval of the Utilities Director.

A two-way cleanout will be placed between each grinder/station and the ROW line. An isolation valve will be placed on the Las Cruces Utilities side of the cleanout. Complete and accurate as-builts must be provided prior to acceptance of the system.

The Utilities Director may, at his sole discretion, on a case-by-case basis, require odor control measures at the downstream exit point of the force main.

The grinder/pump station, including associated components, should be placed near the front lot line in the standard sewer

service location outside of the City ROW and within a utility easement. Station should not be within an enclosed building. It is anticipated that the station will be located within an approximate 4 ft. square easement created specifically for the station adjacent to the ROW. The owner/developer/engineer is responsible for a joint meeting with Las Cruces Utilities staff, City Community Development staff, and wire utilities representatives to resolve easement concerns. This joint meeting and any final easement decisions must occur prior to Final Plat and Construction Plans submittal.

The grinder/pump station should be designed to meet the International Plumbing Code (IPC) Section 712 requirements for Sumps and Ejectors.

The grinder/pump station should be an integrated unit with the wet well. The grinder/pump station should be installed concurrent with and as part of the construction of the residence/house. The pump station will require inspection in conjunction with the plumbing inspection. All components including the grinder/pump station should be completed prior to certificate of occupancy is issued.

512.3 LPSS DESIGN RECOMMENDATIONS

Engineer is encouraged to consult EPA manual "ALTERNATIVE WASTEWATER COLLECTION SYSTEMS" Chapter 2 – October 1991 publication date.
[Http://www.epa.gov/ord/nrmrl/pubs/625191024/625191024ch2.pdf](http://www.epa.gov/ord/nrmrl/pubs/625191024/625191024ch2.pdf).

It is recommended that the grinder/ pump station manufacturer should have a minimum of 25,000 units installed and operating. The Manufacturer of the grinder/pump station should have a service center with sufficient expertise and spare parts within 100 miles from Las Cruces.

SECTION 600

SANITARY SEWER MATERIAL SPECIFICATIONS

MATERIAL SPECIFICATION LIST

SEWER UTILITY

General:

1. All manufacturers' products listed are preferred. Others may be submitted to the Utilities Director for pre-approval, prior to construction.
2. Sewer distribution piping from 4" through 15" may be smooth exterior wall per ASTM D3034, above 12" may be profile exterior (ribbed) pipe per ASTM F794.
3. All specification references include any and all updates, replacements and revisions.
4. Abbreviations used herein:

ASTM	American Society for Testing and Materials
Uni-Bell	Uni-Bell PVC Pipe Association
AASHTO	American Association of State Highway and Transportation Officials
ACI	American Concrete Institute
AWG	American Wire Gauge
HMW-PE	High Molecular Weight-Polyethylene

ITEM	DESCRIPTION	SIZE	SPECIFICATION	MANUFACTURER
1.	<p>PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings - The standard dimension ratio (SDR) of all pipe and fittings shall be a minimum of 35. Pipe joints shall be integral bell, bell and spigot type with rubber gasket.</p> <p>Smooth wall interior, exterior may be ribbed pipe. Fittings (force mains, drop manholes) shall be full body and/or gasketed.</p>	4" – 36"	<p>ASTM D 3034 (pipe) ASTM D 3212 (joints) ASTM F 477 (gaskets)</p> <p>ASTM F679 ASTM F794 ASTM F949 Uni-Bell Uni-B-9</p>	
2.	<p>Polyvinyl Chloride Pipe (C-900 PVC) - Pressure Class 150 min. Integral bell end w/ elastomeric gaskets, GREEN color only for sewer line.</p>		See Water Utility Material Specification List.	
3.	<p>Ductile Iron Pipe and fittings with ceramic epoxy lining – See also Water Material Spec. for D.I. pipe and fittings.</p>	4" – 64"	<p>See also Water Material Spec.</p> <p>Lining qualified under: ASTM E-96, G-95, B-117, G-14, D-714, D-1308. Lining shall be 40 mil, nominal.</p>	<p>See also Water Material Spec.</p> <p>Protecto 401 Ceramic Epoxy</p>
4.	Polyethylene (PE) Pipe and Fittings	4" – 63"	<p>See also Water Material Spec. AWWA C906-99</p>	See also Water Material Spec.
5.	<p>Manhole Frames and Covers - To meet H-20 Loading, Labeling required</p>	Per US-8, 9, 10, 11	<p>AASHTO M 306-05 (or latest publication) Made in America</p>	<p>East Jordan Iron Works – 2023 (std.), 134283 (watertight), V2339 (bolted, vented).</p>

ITEM	DESCRIPTION	SIZE	SPECIFICATION	MANUFACTURER
6.	Concrete Precast Manholes – 4 to 6ft dia., 24 or 36-inch cones, 5-inch min. wall thickness. 6ft. dia., flat top, 7-inch min. wall thickness. Completed manholes must meet AASHTO H-20 loading requirements. Joints to be sealed.	Per US-5, 6, 7	ASTM C 478 AASHTO M 199 ACI Standard 318	Western Precast Concrete, Inc. Leco Industries
7.	Inflow Protectors - Sized to fit manhole and removable, with relief or check valve to vent at one psi.	Per US-11		East Jordan Iron Works, Pollard Water, J.C. Utility Sales.
8.	Inserta Tees® -			Inserta Fittings Co.
9.	Sewer Saddles		Romac "CB" Sewer Saddles Strap – Stainless Steel Casting - Ductile Iron Gasket - ASTM D 2000	Romac Industries
10.	Casing End Seals – Complete with stainless steel adjustable band clamps.			T.D. Williamson, Inc. – Z seals PWM – Wrap-around End Seal
11.	Casing Spacers (insulators) – Injection molded high-density polyethylene material with low friction coefficient and high dielectric strength.			T.D. Williamson, Inc. – M-2 Plastic Thinsolator Public Works Marketing – Raci casing spacers

ITEM	DESCRIPTION	SIZE	SPECIFICATION	MANUFACTURER
12.	Extruded Sealing Tape (Joint Sealant) - Butyl Resin Sealant formula, conforming to Federal and State Highway Specifications, summer grades or warmer climates.		ASTM C-990	Public Works Marketing, Inc.- Ram Neck. NPC Bidco, Inc. – Bidco C-56 preformed butyl mastic sealant Concrete Sealants Inc. – CS 102, CS 102B
13.	Manhole Stop Rings		ASTM C-923	Newby Rubber, Inc.-Water Works Gaskets
14.	Tracing Wire – (force mains only) HMW-PE insulation, 45 mils, solid copper conductor, color shall be green.	#12 AWG		Paigespec, Kris-Tech Wire Co. Coleman Cable
15.	Direct Bury Splice Kits - Yellow direct bury wire connector, rated up to 600v. Silicon filled.	Three (3) #12 solid copper conductors	Per manufacturer specifications	3M – DBR kits. King Safety Products – Direct Bury Wire Connector. Dryconn Model 90120 connector Ideal – model #60

ITEM	DESCRIPTION	SIZE	SPECIFICATION	MANUFACTURER
16.	<p>Warning Tape – Six inch width, with a permanent APWA sewer line green pigment and bold, black lettering on one side at a minimum of 30” along its length reading “<i>CAUTION SEWER LINE BURIED BELOW</i>”. The tape material shall be formulated from 100% virgin polyolefin or polyethylene resins. Resins shall be chemically inert and shall not degrade when exposed to acids, alkalis and other destructive substances found in soil.</p>		<p><u>ASTM Method/ Property/ Value</u> D2103-05/ Thickness/ 4.0 mil. D2103/ Weight/ 18.5 lbs/1000 ft² D882-02/ 3” Tensile Strength/ 34lbs,2,800 psi D882-75b/ Elongation/ 800% D-2582/ PPT Resistance/ 14 LBF D2578/ Printability/ 45 Dynes Mfg. Specs./ Message Repeat/ Varies by Legend Mfg. Specs./ Printed Inks/ Flexo 9605</p>	<p>PRO-LINE Safety Products – Non-detectable underground utility marking tape, super stretch.</p> <p>Reef Industries Terra Tape-Standard</p>
17.	<p>Test Station – Non-conductive ABS plastic construction, 2½” I.D., 18” shaft length, with flared ends, and cast-iron lid and collar. Terminal block of reinforced polyester laminate with 2 wire terminals. Green, locking lid with pentagonal bolt cast in the center, allowing a quarter turn to open.</p>			<p>Handley Industries – PT5L</p> <p>C.P. Test Services – C.P. Mini Box.</p>
18.	<p>Casing – Black, plain end, standard schedule steel pipe.</p>		<p>API Grade B, or ASTM A 53</p>	

ITEM	DESCRIPTION	SIZE	SPECIFICATION	MANUFACTURER
19.	<p>Repair Couplings – Strong Back RC Series Repair Couplings - flex seal adjustable repair coupling with 0.012" stainless steel shield and molded in bushing.</p> <p>Connecting: Clay to Clay Clay to Cast Iron or Plastic Clay to Asbestos Cement Fibre or Ductile Iron Concrete to concrete Concrete to Cast Iron or Plastic Asbestos Cement Fibre (AC) or Ductile Iron to Cast Iron or Plastic AC or Ductile Iron to AC or Ductile Iron CI, PL, Copper, ST or Lead to CI, PL, Copper, ST or Lead</p>		<p>Gasket – Manufactured to meet material requirements of CSA B602, ASTM D 5926, ASTM C 1173 Hardness, Shore"A", Inst.+5... 65 Tensile Strength, Min. psi.....1000 Elongation at Rupture, Min%...250 Tear Strength, Min.....150 lb/in Brittleness Temperature.....-40°F</p> <p>Clamps – Manufactured to the requirements of CSA B602 Clamp Housing - 301 Stainless Steel Clamp Band - 301 Stainless Steel Clamp Screw - 305 Stainless Steel Installation torque 60" lbs</p> <p>Shear Ring – 0.12" thick,300 Series Stainless Steel Width manufactured according to coupling width (1.50", 2.13", or 4") Length manufactured according to coupling diameter. Clamps spot welded in place.</p> <p>Coupling – Manufactured to conform to the performance requirements of ASTM C 1173, CSA B602 Maximum test pressure: 4.3 PSI (29.6KPA) Maximum operating temperature: 140°F nonconsistent</p>	<p>Fernco Inc. Mission Rubber Company LLC</p>

SECTION 700

SANITARY SEWER CONSTRUCTION SPECIFICATIONS

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700 GENERAL

This standard covers the installation of sanitary sewer piping systems that are intended for integration into Las Cruces Utilities sewer collection system. All piping and accessory materials shall be new and unused. The sewer line and appurtenances shall be installed as shown on the Contract Documents. Deviations from these minimum standards shall have prior approval of the Utilities Director before being constructed.

701 DEFINITIONS

See General Information Section

702 REFERENCES

The following documents, as applicable, are hereby incorporated into these Contract Documents by reference. If any referenced specification conflicts with a Las Cruces Utilities specification, the specification requiring the most stringent condition shall take precedence. All materials, labor and equipment required to adhere to CLC utility standards referenced specifications, CLC O&M Manual, and CLC Standard Operating procedures shall be considered incidental to construction.

CITY OF LAS CRUCES STANDARD SPECIFICATIONS FOR ROAD CONSTRUCTION - 2000 or applicable edition.

CITY OF LAS CRUCES GENERAL CONDITIONS - July 1, 1992 or applicable edition.

CITY OF LAS CRUCES SUBDIVISION CODE – applicable edition.

MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) - 2001 or applicable edition.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (Herein: “ASTM”) - 1992 or applicable edition.

INTERNATIONAL BUILDING CODE – 2003 or applicable edition.

INTERNATIONAL PLUMBING CODE – 2003 or applicable edition.

ACI BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE (ACI 318-05) – or applicable edition. Herein: “ACI 318”

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (Herein: “AASHTO”) - Standard Test Methods

OCCUPATIONAL SAFETY AND HEALTH ACT (Herein: “OSHA”) - Construction Industry Standards; Safety Requirements

NEW MEXICO Underground Property Damage Law, Chapter 62, Article 14, NMSA 1978

SUBCONTRACTOR'S FAIR PRACTICES ACT, NMSA 1978

AMERICANS WITH DISABILITIES ACT, Latest Edition

AMERICAN WATER WORKS ASSOCIATION STANDARDS (Herein: “AWWA”), as applicable and the latest editions of:

AWWA Manual M3, Safety Practices for Water Utilities
AWWA C600-99, Installation of Ductile Iron Water Mains...
AWWA C605-94, Underground Installation of Polyvinyl Chloride (PVC) Pressure Pipe and ...

UNI-BELL PVC PIPE ASSOCIATION STANDARDS, as applicable, and specifically the latest editions of:

UNI-B-6, Recommended Practice for Low-Pressure Air Testing of Installed Sewer Pipe (and ASTM F 1417-92)
UNI-PUB-6, Installation Guide for PVC Solid-Wall Sewer Pipe (4-15 inch)

703

RECEIVING, HANDLING, AND STORAGE

It is the responsibility of the Contractor to receive, handle, and store all pipe and appurtenances in such a manner as to insure delivery

and placement in their final location in sound, undamaged condition as per this Standard, and to the acceptance of the Owner.

All materials, handling methods, and storage conditions at the Project location are subject to the Owner's inspection. Neither inspection nor the lack of Owner's inspection shall relieve the Contractor of the responsibility to provide and install materials meeting these Standards.

Stored materials shall be kept free from damage. Interiors of pipe and appurtenances shall be always kept free from dirt or other foreign matter. Pipe gaskets shall be stored out of direct sunlight, away from heat sources. Factory installed gaskets shall not be removed from the joints unless damaged or subject to damage.

Damaged or otherwise unacceptable materials, as determined by the P.M., or designee, shall be removed from the Project site and replaced as necessary at no cost to Las Cruces Utilities.

The interior of pipe and appurtenances shall be thoroughly cleaned of foreign matter before lowering into the trench and shall be kept clean during operations. Plugging or other means acceptable to the Owner shall be required of all pipe and appurtenances "open ends at all times" when work on that pipe is not in progress.

704 PIPE INSTALLATION

Pipe shall be laid to the lines and grades as indicated in the Contract Documents, and as staked on site, beginning at the low point of the project. Pipe shall be laid upgrade in a continuous operation from structure to structure with the socket (bell) ends of the pipe directed upgrade. The Contractor shall verify existing system components for any conflicts with the Contract Documents, and shall immediately notify the P.M., or designee, of any such conflicts prior to continuing.

Trench excavations shall be made to at least four (4) inches below the pipe barrel to allow for the placement of embedment material. If the foundation of the trench is yielding, the Contractor shall over excavate and stabilize the trench. Where running or standing water occurs in the trench bottom, the water shall be removed from the trench. The trench shall be kept free from water during installation operations by suitable means until the pipe has been installed and backfill placed and compacted to a sufficient height to prevent pipe

flotation. Soil migration in the pipe zone shall be prevented by use of a geotextile material or embedment material gradation or other suitable means with prior approval of the Owner. All pipe that has the grade or joint disturbed after lying shall be taken up and re-laid at no cost to Las Cruces Utilities. Pipe shall not be laid in water or when trench or weather conditions are unsuitable for the work, except by permission of the Owner. All unconnected ends of pipes shall have a valve, plug, or cap installed.

Embedment material shall be added for a minimum of four (4) inches in depth, uniform in cross-section and profile, and shall be compacted to a minimum of 90% Standard Proctor, AASHTO T-99 for Type III or Type IV trenches (see referenced AWWA Standards).

Bell holes at each joint shall be provided to permit the joint to be assembled and the pipe to be supported uniformly for the full length of the pipe. Pipe shall be laid to the line and/or grade as indicated in the Contract Documents.

Field cuts for PVC pipe may be made with circular saws, handsaws or similar equipment. Field cuts shall provide a smooth end at a right angle to the longitudinal axis of the pipe. Spigot ends shall be deburred, beveled, and re-marked with the insertion line. The length and angle of field bevels should match the factory bevels.

Field cuts for ductile iron pipe (DI), when used, may be made with abrasive pipe saws, rotary wheel cutters, or similar equipment if allowed by the pipe manufacturer. Cut ends and rough edges shall be ground smooth, and for push-on joints, the cut end shall be beveled as per the manufacturer's recommendations.

The sealing surface of the pipe spigot end, the pipe bell, fitting, and the electrometric gaskets shall be cleaned immediately before assembly. Factory installed gaskets should not be removed for cleaning. The joint shall be free of dirt, sand, grease, or foreign material. Pipe manufacturers approved lubricants shall be applied as specified to gasketed joints when assembling. Only gaskets supplied by the pipe and fittings manufacturer shall be used.

Push-on joints shall be made by insertion of the spigot end into the bell end. The installed pipe joint shall be kept straight while pushing the joint to completion at the insertion depth as specified by the manufacturer. Any deflections required by the Contract Documents

shall be made after the joint is assembled. Timber headers shall be used against the pipe when mechanical equipment is used for pushing. Visual inspection of all assembled joints is required of the Contractor. Additional inspections by feeler gauge or other methods may be required by the Owner.

Mechanical joints on PVC shall be assembled in accordance with the fittings manufacturer's published recommendations. Pipe spigot ends may require shortening for use with mechanical joints or fitting joints.

Mechanical joints on DI shall have the socket and plain ends cleaned. Lubrication and additional cleaning should be provided by brushing both the gasket and plain end with soapy water or an approved pipe lubricant (per AWWA C111/A21.11) just prior to installing the gasket on the plain end. The gland and then the gasket shall be installed on the plain end. Keeping the joint straight during assembly, the pipe shall be inserted into the socket firmly and evenly around the circumference. Assemble the gland and socket components and insert the joint manufacturer's bolts and nuts and hand tighten. Any required deflections shall be made after joint assembly but before tightening the bolts. Tighten the bolts to the normal range of torque as indicated in AWWA C600-99 (75-90 ft.lb. for 4"-24" joints with $\frac{3}{4}$ " bolts) while maintaining approximately the same distance between the gland and the face of the flange at all points around the socket. Tightening the joint is accomplished by a process of alternately tightening bolts on opposing sides. The process is repeated until all bolts are within the required torque range.

Any restrained joints used, on PVC or DI, shall be installed as per the manufacturer's published recommendations.

PVC pipe may accommodate longitudinal bending, if the Contract Documents require curvature of lines. The Contractor shall block or brace pipe joints to ensure that bending of PVC pipe does not result in axial deflection in the gasketed or mechanical joints exceeding the manufacturer's published limits. The longitudinal bending in the PVC pipe barrel shall not result in a bending radius that is less than the minimum limits established in AWWA C605-94, or latest edition and also not less than 200 ft. Bending of PVC pipe barrels larger than 12 inches nominal diameter is to be done only with prior

approval of the Utilities Director and shall be determined by the pipe manufacturer's published axial-joint-deflection limits.

DI pipe may be deflected at the joints when required by the alignments specified in the Contract Documents. The amount of joint deflection shall not exceed that shown in AWWA C600-99, or latest edition. The deflections listed are maximum deflections and shall not be exceeded. For design purposes, deflection shall be limited to 80 percent of the values listed in the referenced standard. The design values are tabulated in Section 802.4 of these Standards.

Embedment material shall be provided and installed such that 90% Standard Proctor densities are achieved for the pipe zone backfill, per ASSHTO T-99.

Utility Soil Bedding and Backfilling Materials shall conform to:

Utilities should be bedded in fine-grained granular material such as fine, poorly graded (uniform) sand in a fashion to avoid the development of any voids around utility lines placed.

For all Utility Lines refer to NMDOT for suitable backfill. Providing suitable backfill will be required per specifications.

All soil bedding materials used should be non-plastic. All soil bedding materials should extend a minimum of 4 inches in all directions.

All utility trenches should be backfilled with compacted soil below structural elements, including foundations, interior and exterior flat concrete work, and paved parking or drive areas. Although the backfill should be compacted, care should be taken not to damage the utility during backfilling and subsequent compaction.

Backfill materials may be native soils, however, no material having a maximum individual particle size or agglomeration clod size greater than two and one-half (2½) inches shall be placed within twelve (12) inches of the utility piping installed.

Sewers at or less than 0.5% slope:

All sewer lines shall be bedded in suitable embedment materials (see Sec. 509.2). All sewer lines designed for slopes at or less than

0.5% shall be bedded in suitable embedment materials that have been pre-shaped. Pre-shaping the **consolidated** placement surface shall be by means of a template made to fit the lower part of the sewer pipe exterior for a width of at least 60% of the sewer pipe breadth. The minimum thickness of the suitable embedment materials is four (4) inches, see drawing US-1.

Minimum Backfill Compaction Requirements

Utility Construction	Percent of Modified Proctor Density (ASTM D-1557)		
	Existing Surface Preparation	Fill or Backfill Placement	Maximum Finished Lift Thickness (in.)
In Roadway: Shallower than 36 " of Grade	N/A	95	6
In Roadway: Deeper than 36 " of Grade	N/A	95	12
Outside Roadway: Shallower than 36 " of Grade	N/A	90	12
Outside Roadway: Deeper than 36 " of Grade	N/A	90	18

Fittings shall be provided and installed as indicated within the Contract Documents and these Standards. All fittings shall be of the full-bodied, gasketed type. Tees and wyes shall be installed at an angle of 45 degrees above horizontal. If the depth of mains deviates such that a more vertical, or less vertical, position is deemed necessary, the Contractor may request a deviation in the placement of fittings from the P.M., or designee.

Force mains shall be constructed as per applicable Sections within these Standards for Water Utilities. Any valves, such as air release, plug, or shutoff valves, which are used or needed in force mains, shall be as required by Las Cruces Utilities and as approved by the Utilities Director.

Service lines shall be installed at not less than the minimum depth and slopes indicated herein (see detail drawing US-2). Risers may be utilized where main line depths exceed seven (7) feet and while maintaining greater than minimum slopes. Care shall be taken to

provide lateral support for the riser to prevent excessive pipe deflection.

Manholes shall conform to all other applicable Sections within these Standards. Concrete manhole base sections shall have minimum 2/3 strength or as directed by the P.M., or designee, prior to the placement of any extension barrels or backfill. Manholes at grade should be constructed per standard detail US-5. Concrete collars around manholes are to be constructed per standard detail US-9. Penetration into existing manholes shall be cored. A damaged manhole barrel will not be accepted. Coring into base will not be allowed.

705 **WARNING TAPE & TRACING WIRE**

TAPE: During the backfilling process, all sewer mains, service lines and system appurtenances shall have a continuous warning tape placed immediately above them and throughout their length at a height of twelve (12) to thirty (30) inches above the mains and twelve (12) inches for services. The tape shall be six (6) inches wide. Tape material shall be formulated from 100 percent virgin polyolefin resins. Resins shall be pigmental for chemical stability and resistance to sulfide staining (color fastness).

Tape shall be constructed by the mechanical (non-adhesive) lamination of two plies of three layer blown film in such a manner as to produce a bi-axially oriented structure. The tape shall be able to provide a 700 percent elongation prior to rupture as per ASTM-D882.

The tape shall meet or exceed the standards provided in the Materials Specification List, included in these Standards.

The warning tape shall be manufactured with a permanent APWA sewer line green pigment at a maximum spacing of every thirty (30) inches along its length, be imprinted with a continuous warning message as follows:

CAUTION SEWER LINE BURIED BELOW

At tees, tape ends, etc., the warning tape shall be tied together (spliced) with knot to create a continuous warning tape throughout the length of the pipeline and associated branch lines, appurtenances, etc.

TRACING WIRE: In addition to the installation of warning tape, copper-tracing wire is to be installed with all force sewer mains. The tracing wire shall be taped, using electrical tape, on top of the pipe at ten (10) foot centers, for the total length of the pipe.

The tracing wire shall be 12 AWG (average wire gauge), solid core, copper wire (solid core meaning one (1) single continuous strand of copper wire). In addition, the wire insulating coating (jacket) shall be green in color and shall have 45 mils of polyethylene insulation thickness and high molecular weight. Also, the tracing wire shall be HMW – PE and rated for UL 600V construction. The wire shall be suitable for wet or dry applications. The wire size (gauge) shall be continuously affixed (printed on) the entire length of all tracing wire coating and shall be easily read.

Where a splice is required, or when a three (3) way splice is necessary, the wires shall be joined together with an appropriate size (green) wire nut which shall then be placed inside a 3M brand Direct Bury Splice kit (DBR) or approved equal of appropriate size. No bare wire shall be left exposed anywhere. All wires shall be spliced to all other wires for a continuous tracing wire system.

This wire end shall not be bare but shall have the coating jacket intact. Location and frequency of test boxes shall be as directed by Owner. Test boxes, connected onto tracing wire system as per detailed drawings herein, shall be required at the force main ends and where spacing exceeds 500 feet. Test box locations shall be outside any street and curbing and as directed by the P.M., or designee.

No electrical connections of the tracing wire to any metal pipes or metal service lines will be allowed and care shall be taken to ensure that the tracing wire is not damaged during installation. The tracing wire is required to be successfully tested, using an approved (by Gas L&M Supervisor) electromagnetic locating equipment such as Subsite Utili-gard, Rigid, Metrotec, or 3M, by the Contractor and at his expense, for continuous signal (continuity test) across all main and service lines before asphalt is installed, and prior to subgrade preparation. Locatability Check: Must be requested a minimum of 48 hours (two working days) prior to tie-in. Locatability check will be conducted by the Utility Locating Program of the Utilities Department. Tracing wire must have a continuous locating signal before pipe is accepted by the P.M., or designee. If an issue is found

with the locatability of the utility line (Gas, Water, Sewer, or Reclaimed Water) it is the responsibility of the contractor at his expense to correct those issues prior to tie-in.

706 INSPECTION AND TESTING

All testing required herein, including tracing wire and manhole testing, shall be accepted by the P.M., or designee, prior to roadway sub grade preparation.

All sewer lines installed shall be tested for leakage. All manholes installed may be tested for leakage at the option of the P.M., or designee. All PVC sewer lines shall be mandrel tested. All sewer mains laid at slopes flatter than or equal to the minimums, as specified within these Standards, shall be visually tested by closed circuit television camera. All testing indicated above, will be at the Contractor's expense and shall be inspected by the P.M. or designee. Visual testing of any sewer mains steeper than minimums shall be at the option of the P.M.

Mandrel testing of sewer piping by the Contractor is required of all PVC sewer mains. The mandrel testing is intended to be in compliance with ASTM D3034, latest revision. Mandrel's shall be sized for a test limit of 7½% of the statistical base inside diameter of the test section of piping. ASTM and pipe manufacturer's pipe dimensions and tolerances shall be used to determine the required mandrel sizing. The Contractor shall present such dimensions and sizing data to the Owner at the time of testing. The test shall consist of the Contractor pulling or pushing the mandrel through the test section.

Leakage testing for sewer piping (includes all mains, branches, laterals, tees, wyes, services and stubs) shall be in compliance with ASTM F 1417-92, using the time-pressure drop method, or UNI-B-6-98, or their latest revisions. The Contractor shall furnish all equipment and personnel necessary for conducting these tests and making measurements. All piping components failing these tests shall be located, and repaired or replaced and failed sections shall be retested. All sections tested shall maintain air pressure with a pressure drop not exceeding 0.5 psi from 3.5 to 3.0 psi in excess of any ground water pressure above the top of the sewer for a minimum amount of time (see below). Test pressures shall be adjusted by 0.43 psi for every foot of water above the top of the pipe.

Lowering ground water levels, or selection of alternative test methods, approved by the Utilities Director, will be required if the air pressure required for the test exceeds nine (9) psi.

After all piping ends have been plugged or capped, air shall be slowly added to the test section until the pressure reaches 4.0 psi (plus any ground water adjustment). The pressure shall be maintained at between 3.5 to 4.0 psi for at least 2.0 minutes for stabilization of temperature conditions. After stabilization, the air shall be disconnected, lowered to 3.5 psi (plus any ground water adjustment). The time required for the pressure to decrease from 3.5 to 3.0 psi shall be recorded and compared to the minimum holding times required by pipe diameter as shown by the following table:

**Minimum Specified Time Required for a 0.5 psig Pressure Drop
For Size and Length of Pipe Indicated**

Pipe Dia. (in.)	Min. Time (min:sec)	Length for Min. Time (ft.)	Time for Longer Length (sec.)	Specification Time for Length (L) Shown (min:sec)							
				100'	150'	200'	250'	300'	350'	400'	450'
4	1:53	597	0.190L	1:53	1:53	1:53	1:53	1:53	1:53	1:53	1:53
6	2:50	398	0.427L	2:50	2:50	2:50	2:50	2:50	2:50	2:51	3:12
8	3:47	298	0.760L	3:47	3:47	3:47	3:47	3:48	4:26	5:04	5:42
10	4:43	239	1.187L	4:43	4:43	4:43	4:57	5:56	6:55	7:54	8:54
12	5:40	199	1.709L	5:40	5:40	5:42	7:08	8:33	9:58	11:24	12:50
15	7:05	159	2.671L	7:05	7:05	8:54	11:08	13:21	15:35	17:48	20:02
18	8:30	133	3.846L	8:30	9:37	12:49	16:01	19:14	22:26	25:38	28:51
21	9:55	114	5.235L	9:55	13:05	17:27	21:49	26:11	30:32	34:54	39:16
24	11:20	99	6.837L	11:24	17:57	22:48	28:30	34:11	39:53	45:35	51:17
27	12:45	88	8.653L	14:25	21:38	28:51	36:04	43:16	50:30	57:42	64:54
30	14:10	80	10.683L	17:48	26:43	35:37	44:31	53:25	62:19	71:13	80:07
33	15:35	72	12.926L	21:33	32:19	43:56	53:52	64:38	75:24	86:10	96:57
36	17:00	66	15.384L	25:39	38:28	51:17	64:06	76:55	89:44	102:34	115:23

NOTE: Test sections with laterals or branches within them that fail the above required time interval, may have their required time recalculated as per the above referenced documents and be retested.

Leakage testing of manholes shall be accomplished by the Contractor at the request of the C.A., or his designee. All sanitary sewer manholes to be tested shall be tested for leakage by plugging the inlet and outlet piping with leak-proof plugs, filling the manhole with water to a depth of four (4) feet above the top of the pipe or two (2) feet above the existing ground water level, whichever is greater, and allowing one hour for saturation of the manhole material. After the one-hour saturation period, the manhole shall be refilled to the original level. Two hours after the refilling, the difference in water surface elevation from original to final level shall be measured and converted into gallons per hour lost through manhole leakage.

The allowable leakage for manholes shall be 0.75 gallons per hour per foot diameter of the manhole. All manholes are required to be waterproof to the above leakage rate.

Manholes constructed into the groundwater may be tested at the option of the C.A. by observing the rate of infiltration over time similarly to the above depths and time rates.

Visual testing of the sewer piping may be conducted. Visual testing of all sewer mains installed at minimum slope or at flatter than minimum slopes shall be conducted at the option of the Owner. This inspection shall be by closed circuit television camera equipped with the means for measuring slopes (inclinometer). This inspection shall be performed by Las Cruces Utilities, and shall be at the Contractor's expense, regardless of passing or failure.

Failure of the visual testing procedure, if conducted, shall be based on the existence of any occurrences of reversal of slopes (dips or sags) located in the tested piping. Failure of any sections shall require the Contractor to excavate and re-lay or re-bed the negative slope sections of the piping.

SECTION 800

WATER DESIGN STANDARDS

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800 GENERAL NOTES ABOUT WATER STANDARDS

Conditions may exist which will necessitate deviations from these standards. Deviations from these standards shall have prior approval of the Utilities Director before being designed. Nothing in these standards shall relieve the designing engineer from the responsibility of meeting the current standards of all entities having jurisdiction over segments of the particular project being designed. Entities having possible jurisdiction over projects in the Las Cruces area include, but are not restricted to, the following agencies:

- New Mexico Department of Transportation
- Elephant Butte Irrigation District
- All Railroads
- New Mexico Environment Department

The designer is reminded that the Las Cruces Fire Department reviews construction projects to ensure compliance with the Uniform Fire Code and appropriate fire flow standards as mandated by various entities.

801 WATER SYSTEM MODEL

Included herein by reference is the “City of Las Cruces Water and Wastewater System Master Plan Update, dated June 1995”, and any updates thereof. Relevant, specific information from that document, and any updates thereof, are appurtenant to the design and installation of water and wastewater systems and are to be considered in said design and installation.

The current water system model being utilized by the City of Las Cruces shall be used for verification of fluid flow conditions, line sizes, fire flow requirements, and other design elements that depend on analysis of fluid flow characteristics. Such verification, performed by Las Cruces Utilities as needed shall verify the continuity of designed elements to the existing system.

During peak day conditions, velocities in water mains shall not exceed 5 feet per second (fps). During peak day, including fire flow conditions, velocities in water mains shall not exceed 7 fps.

802 STANDARD LOCATIONS

802.1 ENTRY TO LOT (SERVICES)

Special cases not covered in the table below will be determined on a case-by-case basis in consultation with Las Cruces Utilities.

TYPE OF LOT	LOCATION OF SERVICE – ORIENT BY STANDING IN STREET AND FACING LOT
RESIDENTIAL-36 FT WIDE OR GREATER	CENTER OF LOT
MULTIFAMILY	CENTER OF LOT THEN MANIFOLDED TO INDIVIDUAL METERS AS REQUIRED
COMMERCIAL USE WITHIN A SUBDIVISION	CENTER OF LOT
COMMERCIAL NOT IN A SUBDIVISION	SITE SPECIFIC
MOBILE HOME PARK	SITE SPECIFIC
MOBILE HOME SUBDIVISION	CENTER OF LOT
<ol style="list-style-type: none"> 1. Services shall be perpendicular to the main line on straight roads, radial on curves, and straight from the main to the property line at the termination of cul-de-sacs. 2. Lot entry standards for corner lots are measured from the pc of the lot corner. 3. Concrete driveways must not be placed over water meters and service lines. If the service line must be relocated, it will be at property owner’s expense. 	

802.2 NON-STANDARD LOT ENTRY LOCATIONS

To avoid utility conflicts due to manholes and utility services on opposite side of street, the following protocol shall be used. Any deviation from the standards stated in the above table will require dimensioning of the utility moved.

1. Sewer can vary from 5-15 feet left from water if necessary to avoid utility conflicts.
2. If moving the sewer will not avoid conflicts,
 - A. The water can be moved up to 5 ft left or right with the sewer 10 ft. left of lot centerline location.
 - B. The sewer can then vary from 5-15 feet left from water as required.

Any lot entry location that differs from the above protocol requires approval of the Utilities Director.

802.3 IN STREET RIGHT OF WAY (MAINS)

802.3.1 NEW CONSTRUCTION

Water mains shall typically be located in a dedicated street right of way 10 ft. from the centerline of the street on the North or East Side of the street. Water main location may be considered on a case-by-case basis for a street that changes direction to the extent that maintaining standard utility location would cause utility lines to cross. Approval of the Utilities Director is required for a deviation in standard location, such as the case described above.

Utility system piping thrust is to be restrained by the use of restrained joint fittings. Concrete thrust blocking shall be utilized only where Project site conditions are not applicable to the use of restrained joint fittings. The Utilities Director, or designee, shall approve of the use of concrete thrust blocking where applicable. The size and shape of concrete thrust blocks shall be as indicated within these Standards. The concrete shall be placed such that no concrete is in contact with any bolts or nuts on the piping system. The lengths of restrained joint piping and details of joint restraint glands, clamps, friction slabs or anchors shall be as indicated within these Standards and in conformance with the manufacturer's published recommendations.

802.4 CURVED ALIGNMENTS

Curved alignments are allowed when the geometry of the Project configuration dictates. Utility line locations through such curved portions shall typically follow the standard locations as indicated above.

Curved alignments of water mains by pipe or joint deflection shall not exceed those limits as indicated in the American Waterworks Association (AWWA) C605-13, for PVC materials, and AWWA C600-17, for Ductile Iron materials, or the applicable edition.

For PVC materials the longitudinal bending in the PVC barrel shall not result in a bending radius that is less than the following minimum limits (see C605-94 for additional):

Nominal Pipe Size (in.)	Minimum Bending Radius (ft.)
4	100
6	144
8	189
10	231
12	275

For Ductile Iron materials, joints may be deflected when required. Joint deflections shall not exceed the values listed in AWWA C600-99. For design purposes, joint deflections shall not exceed 80% of those values. The design values to be used are listed below:

Nominal Pipe Size	Approx. Radius of Curve (ft.)			
	Push-On Joint		Mechanical Joint	
	<u>18 ft. joint</u>	<u>20 ft. joint</u>	<u>18 ft. joint</u>	<u>20 ft. joint</u>
4	260	290	155	170
6	260	290	180	200
8	260	290	240	270
10	260	290	240	270
12	260	290	240	270
14	430	480	360	400
16	430	480	360	400
18	430	480	430	480
20	430	480	430	480
24	430	480	540	600

803 STANDARD SEPARATION

Standard separation of water mains or service lines from other utilities shall be as shown below (or as shown on Drawing UA-1):

PARALLEL UTILITY LINES – HORIZONTAL SEPARATION (MEASURED FROM CENTER OF UTILITY)						
	GAS MAIN	GAS SERVICE	SEWER MAIN	SEWER SERVICE	WATER MAIN	WATER SERVICE
GAS MAIN	5 FT.	5 FT.	10 FT.	5 FT.	10 FT.	5 FT.
GAS SERVICE	5 FT.	5 FT.	5 FT.	5 FT.	5 FT.	5 FT.
SEWER MAIN	10 FT.	5 FT.	∅10 FT.	5 FT.	∅10 FT.	5 FT.
SEWER SERVICE	5 FT.	5 FT.	5 FT.	5 FT.	5 FT.	5 FT.
WATER MAIN	10 FT.	5 FT.	∅10 FT.	5 FT.	*5 FT.	5 FT.
WATER SERVICE	5 FT.	5 FT.	5 FT.	5 FT.	5 FT.	5 FT.
STORM SEWER*	10 FT.	5 FT.	10 FT.	5 FT.	*5 FT.	5 FT.
WIRE UTILITY	5 FT.	5 FT.	5 FT.	5 FT.	5 FT.	5 FT.
MAN-HOLE	10 FT.	6 FT.	NA	NA	10 FT.	6 FT.
* - Separation may vary with field conditions and Utilities Director approval. ∅ - 10 ft. separation between water and sewer mains to be measured from outside of pipe to outside of pipe.						

**FOR UTILITY LINES THAT ARE CROSSING
VERTICAL SEPARATION
MEASURED FROM OUTER SURFACE OF UTILITY**

	*GAS MAIN	GAS SERVICE	SEWER MAIN	SEWER SERVICE	WATER MAIN	WATER SERVICE
GAS MAIN	12 IN.	6 IN.	12 IN.	12 IN.	12 IN.	12 IN.
GAS SERVICE	6 IN.	6 IN.	6 IN.	6 IN.	12 IN.	12 IN.
SEWER MAIN	12 IN.	6 IN.	12 IN.	6 IN.	24 IN.	6 IN.
SEWER SERVICE	6 IN.	6 IN.	6 IN.	6 IN.	6 IN.	6 IN.
WATER MAIN	12 IN.	12 IN.	24 IN.	6 IN.	12 IN.	6 IN.
WATER SERVICE	12 IN.	12 IN.	6 IN.	6 IN.	6 IN.	6 IN.
STORM SEWER	12 IN.	6 IN.	12 IN.	6 IN.	12 IN.	6 IN.
WIRE UTILITY	12 IN.	12 IN.	12 IN.	6 IN.	12 IN.	6 IN.

1. In intersections gas mains go under all other utilities except sewer.
2. Gas mains passing under sewer mains will be sleeved. Sleeves shall extend a minimum of 5 feet to each side from the outer side of the sewer main. Sleeves can be any pipe material if the sleeve color is yellow or painted yellow. Pipe spacers shall be used to protect the carrier pipe.
3. When water mains cross sewer mains the crossing shall be arranged so that the sewer joints will be equidistant and as far as possible from the water main joints.
4. When it is impossible to obtain proper horizontal and vertical separation as stipulated in the above two tables, the sewer shall be designed and constructed equal to water pipe and shall be pressure tested, throughout the limits of watertight construction and a minimum of 10 feet each side of the obstruction, to assure watertight connections prior to backfilling. The minimum limits of pressure pipe installation shall be 10" each side of line obstruction.
5. *The vertical separations listed for gas mains apply to poly lines only and do not apply to steel gas lines. Vertical separation from steel gas lines shall be twenty-four (24) inches for a High Pressure and eighteen (18) inches for Low Pressure.

803.1 WATER LINES OUTSIDE OF STREET/ROAD RIGHT OF WAY

803.1.1 MAINS

All City owned water mains shall be in either a City utility easement or City right-of-way of adequate width for installation and maintenance. The minimum acceptable width is 15 ft. for a single line. Additional utilities within an easement will require an easement width greater than the minimum.

Location of any City utility within drainage ways and other non-standard utility corridors requires Utilities Director approval.

Water distribution lines may be located between residential lots in City utility easements along lot/property lines with prior approval by the Utilities Director. Water mains along lot/property lines must be sleeved in a steel casing accessible from both ends and have a 15 ft. minimum width utility easement. No walls, parallel to the water utility placement, will be allowed within seven (7) feet of the water utility placement.

City utility easements in Mobile Home Parks require the same standards as above. For privately owned Mobile Home Park streets, the minimum easement for utilities in the street is the total paved width of the street, or a minimum of 30 ft. if the street is not paved.

Location and width of transmission main easements outside of dedicated street right of way shall be approved on a case-by-case basis by the Utilities Director.

Distribution lines in commercial centers, shopping malls, and multifamily complexes shall be located 20 feet from any structures and preferably shall be located in parking areas or driveways, in lieu of landscaped areas.

803.1.2 SERVICES

For Service lines in a customer's yard, no dedicated City utility easement is required. The utility has an implied easement to the water meter.

Placing a service line through a neighbor’s yard to reach a different customer is discouraged but, when allowed by the Utilities Director, requires a minimum 10-foot-wide recorded utility easement from property owner to property owner. The water service in the recorded easement will be maintained and owned by the customer up to the water meter, located at the City Right of Way line. Connecting a service line to a fire hydrant assembly is discouraged but may be allowed by the Utilities Director or designee.

804 STANDARD DEPTH OF LINE BELOW FINISHED GRADE

The standard depth for Water Mains shall be as shown in the table below.

WATER MAIN	
LOCATION	DEPTH TO TOP OF PIPE
IN ESTABLISHED STREET	3 FT. MINIMUM - 5 FT. MAXIMUM IS ALLOWED
NOT IN ESTABLISHED STREET	4 FT. MINIMUM - 5 FT. MAXIMUM IS ALLOWED - SITE SPECIFIC
ARROYOS	5 FT. MINIMUM – SITE SPECIFIC

The standard depth for Water service lines shall be as shown below.

WATER SERVICE LINE	
LOCATION	DEPTH TO TOP OF PIPE
IN CUSTOMER’S YARD	1.5 FT. MIN. – 5 FT. MAX.
IN ESTABLISHED STREET	2 FT. MIN. – 5 FT. MAX.
NOT IN ESTABLISHED STREET	3 FT. MIN. – SITE SPECIFIC. 5 FT. MAX.
ARROYOS	5 FT. MINIMUM – SITE SPECIFIC

805 WATER LINES BELOW CONCRETE

Water lines may be placed under concrete slabs if Ductile Iron pipe and fittings are used. Blockouts in the concrete must be provided (see UW-12) for valves and other fittings where access is required. Service lines and lines downstream from the water meter may be placed under concrete.

806 DESIGN PRESSURES

Design pressures for water pressure zones shall be as shown below.

MAXIMUM OPERATING PRESSURE	MINIMUM OPERATING PRESSURE
STATIC CONDITION - 100 PSIG	STATIC CONDITION - 50 PSIG
	DYNAMIC PEAK DAY USAGE - 40 PSIG
	FIRE FLOW CONDITIONS - 20 PSIG RESIDUAL DYNAMIC PEAK DAY

807 DESIGN DEMAND

Design demand for single-family residential units shall be 1.0 gallon per minute per residence for the peak day. All other design loads shall be based on actual expected load.

808 FIRE FLOW CONSIDERATIONS

For fire lines in commercial centers serving sprinkler systems within buildings, the fire line shall be owned and operated by the City of Las Cruces up to the point where the sprinkler line leaves a city owned right of way or City utility easement associated with said line. A valve is required on the fire line adjacent to the main. (see detail drawing UW-15).

Fire lines in commercial centers serving hydrants shall be owned and operated by the City of Las Cruces up to and including the hydrant. A City utility easement of 15 feet (minimum) shall be provided for the above fire lines.

Fire lines in commercial centers serving hydrants shall not be extended from one commercial property to another without approval of the Utilities Director.

The minimum fire flow for all R-1 and R-2 areas shall be 1000 GPM plus the peak day demand with 20 psi residual pressure at the hydrant as determined by the City Water System Model. ***Under the above conditions, the maximum design velocity allowed in water mains is 7 feet per second.***

In R-1 and R-2 zones, fire hydrants shall be located at a spacing not to exceed 500 feet. For dead end streets and cul de sacs, a fire hydrant must be located at the end of the street or provide a 2-inch flushing hydrant. The distance between fire hydrants is measured by the centerline distance of the roads adjacent to the fire hydrants.

Fire flow requirements and hydrant spacing shall be reviewed and approved by the City of Las Cruces Fire Department.

For R-3, R-4 and all Non-residential zones, fire flow requirements and hydrant spacing will be determined on a case-by-case basis in consultation with the City of Las Cruces Fire Marshall.

The preferred location of fire hydrants is at the point of curvature of property lines at street intersections. If it is necessary to locate fire hydrants away from intersections, the preferred location is at the extensions of property lines.

If the sidewalk is adjacent to the curb in a City Right of Way, the standard location for fire hydrants is behind the sidewalk. If a parkway exists between the curb and sidewalk, the standard location for the fire hydrant is in the parkway. A clear area must be maintained for a minimum radius of 3 feet from the center of the fire hydrant adjacent to the hose and pumper nozzles and for a minimum radius of 1.5 feet to the rear of the hydrant as shown in detail drawing UW-13, and UW-14. No structures that would interfere with the accessibility and operation of the fire hydrant are allowed in the clear area.

In all cases, fire hydrants shall be located such that the location does not conflict with American Disabilities Act (ADA) requirements.

Fire hydrants that are not protected from traffic by curbs or other structures shall be protected by steel bollards located such that the bollards do not interfere with the accessibility and operation of the fire hydrant. Reference detail drawing UW-14.

809 MINIMUM LINE SIZE

809.1 MAINS

All mains that are capable of being extended shall have a minimum diameter of 8 inches. Larger diameters may be required based on available pressures and demands. Lines less than 8-inch diameter may be used if supported by the City Water System Model. If the Fire hydrant is not located at the end of Cal-De-Sac, as the water demand decreases then the main line size can be decrease from 8" and 6" to 4".

809.2 SERVICES & METERS

All service lines to individual customers shall be $\frac{3}{4}$ inch minimum diameter. Larger diameters may be required based on available pressures and demands.

The City may require a one-inch (1") minimum water service line to an individual customer. This potential requirement, for residential uses, will be based on the lot size, projected water demand, and when projected static pressures for individual customers are at 60 psi or below, based on the design lot elevation.

Domestic meters 2" and smaller are to be sized as per the International Plumbing Code. All other meters are to be sized as per the American Water Works Association standards. Intermittent use, such as irrigation, shall not exceed 3 hours per day. All water meters are supplied by the Las Cruces Utilities.

810 VALVES

Location of valves shall be designed to minimize service disruptions due to water outages of any kind. As general design criteria, valve locations should be designed to limit the number of connections without service to 30, in the event of a water outage. When locating valves to meet the above criteria, valves shall be located at the intersection of mains with one less valve than the number of lines leading into the intersection, unless otherwise requested by Las Cruces Utilities. Cul de sacs shall have separate valves off the main for isolation. Stub-outs require valves.

All *main line* ties into the existing water system, that are not extensions of existing lines shall be accomplished using a tapping tee and tapping valve with no water outage associated with the tie into the existing system.

Valve stem extensions shall be required and installed on all valves for which the valve operator is more than 5 feet below the finished grade.

811 PUMPING STATIONS

The location and design of all pumping stations will be accomplished under the direction of Las Cruces Utilities.

812 LOOPING OF WATER MAINS

Where feasible, it is a requirement that water mains be looped in order to improve circulation and reliability and to reinforce pressure.

SECTION 900

WATER MATERIAL SPECIFICATIONS

MATERIAL SPECIFICATION LIST

WATER UTILITY

General:

1. All manufacturers' products listed are preferred. Others may be submitted to the Utilities Department Director for pre-approval, prior to construction.
2. All brass fittings are to be of Domestic manufacture only. Brass fittings from Mueller Co., or Ford Meter Box Co. (Ford) are acceptable.
3. Water distribution piping from 4" through 12" may be C-900 DR 18 PVC or Ductile Iron. Water transmission piping of 14" or greater shall be Ductile Iron only. Polyethylene (PE) pressure piping will be approved on a case-by-case basis, as determined by the Utilities Director, or designee.
4. Other materials typically used in well houses, and pump stations are not included herein. Needs for information on these should be addressed as necessary to the Utilities Director, or designee.
5. All backflow devices shall comply with the City of Las Cruces applicable Backflow Ordinances.
6. All specification references include any and all updates or replacements.
7. Abbreviations used herein:

AWWA	American Waterworks Association
ASTM	American Society for Testing and Materials

ITEM	DESCRIPTION	SIZE	SPECIFICATION	MANUFACTURER
1.	Polyvinyl Chloride Pipe (C-900 DR 18 PVC) - Pressure Class 235 min. Integral bell end w/ elastomeric gaskets	4" – 12"	AWWA: C900-18	
2.	Ductile Iron Pipe (DI) - Mechanical Joints (MJ) or Push On Joints, Cement-Mortar Lining, Asphaltic Coating or Polyethylene Casement	4" – 64"	AWWA: C151/A21.51-96, C111/A21.11-00, C104/A21.4-95, C150/A21.50-96, C105/A21.5-99	U.S. Pipe, American Ductile Iron Pipe, McWane Ductile, Griffin.
3.	DI and Gray Iron Fittings, and Compact (Short Body) Fittings - MJ or MJ by Flanged, Asphaltic Coating, Cement-Mortar Lined and Asphaltic Lined or Epoxy Lined (see also Sewer Material Section)	4" – 48"	AWWA: C110/A21.10-98, C153/A21.53-00, C111/A21.11-00, C104/A21.4-95, C116/A21.16-98	
4.	Cross-linked Polyethylene (PEX) 3306. Color to be Blue. (use PEX only)	¾" – 2"	AWWA: C904-16	
5.	Polyethylene (PE) Pressure Piping and Fittings – (See General Note 3 this section.	4" – 63"	AWWA: C906-15	
6.	Service Saddles - For C900 PVC pipe and DI pipe and A.C. pipe, sized 4"-12" for taps sized ¾" – 2", saddles may be nylon or epoxy coated Ductile Iron with double stainless steel (304L) straps. All saddle taps shall be threaded AWWA Taper (CC) thread.	¾" – 2"	AWWA: C800-01	Mueller Co. DR2S, SS5 & SS7 series. Smith Blair series 317. Romac 202N, 306. Ford Meter FS303, FC202. JCM 406 A.Y. McDonald Mfg. Co.

ITEM	DESCRIPTION	SIZE	SPECIFICATION	MANUFACTURER
7.	Corporation Stops - Brass plug type, 100psi rating for ¾" and 1", 300psi for 1 ½" and 2", inlet AWWA Taper (CC) thread, outlet (to PE tubing, CTS) ¾" and 1" by Mueller Insta-Tite, 1 ½" and 2" by compression connection.	¾" – 2"	AWWA: C800-01	Mueller B-25008, P-25008, B-25006, H-15013, P-15013, H-15008, P-15008, H-15006. Ford Meter F1000, FB1000 A.Y. McDonald Mfg. Co. – 4701 B-22
8.	Angle Meter Valves - Brass fitting, pack joint or Mueller Insta-Tite or Conductive Compression for PE tubing (CTS) by meter flange fitting (for 1 ½"-2"), or by meter swivel nut (for ¾" – 1")	¾" – 2"	AWWA: C800-01	Mueller- H-14258, P-14258, H-14267, H-14277, P14277. Ford Meter- FV43 Series, BA43 Series, KV43 Series A.Y. McDonald Mfg. Co.
9.	Valve Boxes - Two-piece, screw adjustable, w/"WATER" cast in lid, extension range of 27"-32" or as required. Valve box must be able to accommodate a locking lid.			Tyler Pipe, Star Pipe Products. East Jordan Iron Works. A.Y. McDonald Mfg. Co.
10.	Gate Valves - Resilient seat, non-rising stem (NRS), 2" square nut driver, epoxy coating, pressure ratings 4" – 12" = 200psi, 16" and 20" = 150psi. No Double Disc allowed. CCW opening, "O" ring stem seals. Tapping valves shall match the above, and sized for full size shell cutter use, and shall be flanged with alignment lip to fit tapping sleeve, outlet to be MJ with flange for attachment of drilling machine and adapter.	4" – 72"	AWWA: C509-01 or C515, C550-01	Mueller Co. Clow Valve Co. Kennedy – Guardian K81D East Jordan Iron Works

ITEM	DESCRIPTION	SIZE	SPECIFICATION	MANUFACTURER
11.	Butterfly Valves -Elastomeric seat, cast iron disc with stainless steel disc edge, gear actuator type, 2" square nut driver, MJ ends, Epoxy coating interior.	14" – 72"	AWWA: C504-00, C550-01	Mueller Linesal III, class 150. Clow Valve Co. Groundhog Valve
12.	Air Release, Air/Vacuum and Combination Air Valves –		AWWA: C512-99	APCO, Val-Matic.
13.	Control Valves, Pressure Actuating Valves, Pressure Sustaining Valves, Pressure Reducing Valves, Check Valves –	4" – 72"	AWWA: C510-97 C511-97 C512-99	Cla-Val or approved equal
14.	Fire Hydrants - Dry barrel, compression, traffic type. 1 ½" Pentagon operating nut (bronze) w/weather proof and tamper resistant cap, opening CCW, Two each 2 ½" and one 4 ½" nozzles with N.S.T. threads, 5 ¼" main valve opening, 6" inlet shoe, MJ connection for DI or C-900 PVC, ground line within 2" of a two piece breakaway flange, non-kinking nozzle cap chains, epoxy interior lining, exterior painted red, all hydrants shall be complete with all accessories included and shall be lubricated.		AWWA: C502-94, C111/A21.11-00, C110/A21.10-98, C151/A21.51-02, C550-01	Mueller Co. – Super Centurion 200, Clow – Medallion, Kennedy – Guardian K81D East Jordan Iron Works

ITEM	DESCRIPTION	SIZE	SPECIFICATION	MANUFACTURER
15.	Restrained Joint Fittings - Couplings for DI, PVC, with MJ	4" – 72"	ANSI/AWWA – C153/A21.53 UL Requirements	U.S. Pipe - Field Lok, TR Flex, XTRA Flex, USIFlex. JCM Ind. – SUR-Grip. Romac Ind. - GripRing, 600 Series, 400 Series. EBAA Iron – MEGALUG, 2000PV Series. Mueller – AquaGrip fitted components. Star Pipe Products – StarGrip. American Fast Grip Gasket Sigma Corporation
16.	Tapping Saddles - Full Circle type			Romac Ind.- SST Smith Blair - 662, 663 Mueller - H304, H300DI JCM 432, 462
17.	Transition Fitting - Epoxy coating (Nylon optional), stainless steel bolts/nuts			Romac Ind. – 501 Viking Johnson Smith Blair – OMNI Mueller – 500series, MaxiFit series. Total Piping Solutions- Hymax 2000 Sigma Corporation
18.	Tracing Wire - HMW-PE insulation, 45 mils, blue, solid copper conductor	#12 AWG		Paigespec, Kris-Tech Wire Co. Coleman Cable
19.	Direct Bury Splice Kits - Yellow direct bury wire connector, rated up to 600v. Silicon filled.		Per manufacturer's specifications.	3M – DBR kits. King Safety Products – Direct Bury Wire Connectors. Dryconn connector. Ideal – Model #60

ITEM	DESCRIPTION	SIZE	SPECIFICATION	MANUFACTURER
21.	Casing Spacers (insulators) – Injection molded high-density polyethylene material with low friction coefficient and high dielectric strength.			T.D. Williamson, Inc. – M-2 Plastic Thinsolator Public Works Marketing – Raci casing spacers
22.	Casing End Seals – Complete with stainless steel adjustable band clamps.			T.D. Williamson, Inc. – Z seals PWM – Wrap-around End Seal
23.	Extruded Sealing Tape (Joint Sealant) - Butyl Resin Sealant formula, conforming to Federal and State Highway Specifications, summer grades or warmer climates.		ASTM C-990	Public Works Marketing, Inc.- Ram Neck. Concrete Sealants Inc. – CS 102, CS 102B
24.	Test Station - Non conductive ABS plastic construction, 2 ½” I.D., 18” shaft length, with flared ends, and cast iron lid and collar. Terminal block of reinforced polyester laminate with 2 wire terminals. Blue, locking lid with pentagonal bolt cast in the center, allowing a quarter turn to open.			Handley Industries – PT5L C.P. Test Services – C.P. Mini Box.
25.	Casing – Black, plain end, standard schedule steel pipe.		API Grade B, or ASTM A 53	

ITEM	DESCRIPTION	SIZE	SPECIFICATION	MANUFACTURER
26.	Curb Stops – Brass fitting, Pack Joint or Mueller Insta-Tite or conductive compression for PE tubing (CTS) Both ends.	¾" – 2"	AWWA: C800-01	Mueller H-15209, P-15209 - H-5215 Ford Meter B41-333 Sigma Corporation A.Y. McDonald Mfg. Co.
27	Warning Tape – Six inch width, with a permanent APWA water line blue pigment and bold, black lettering on one side at a minimum of 30" along its length reading "CAUTION WATER LINE BURIED BELOW". The tape material shall be formulated from 100% virgin polyolefin or polyethylene resins. Resins shall be chemically inert and shall not degrade when exposed to acids, alkalis and other destructive substances found in soil.		<u>ASTM Method/ Property/ Value</u> D2103-05/ Thickness/ 4.0 mil. D2103/ Weight/ 18.5 lbs/1000 ft ² D882-02/ 3" Tensile Strength/ 34lbs,2,800 psi D882-75b/ Elongation/ 800% D-2582/ PPT Resistance/ 14 LBF D2578/ Printability/ 45 Dynes Mfg. Specs. / Message Repeat/ Varies by Legend Mfg. Specs. / Printed Inks/ Flexo 9605	PRO-LINE Safety Products – Non-detectable underground utility marking tape, super stretch. Reef Industries Terra Tape-Standard
28	Water meter Box – Standard Traffic Bearing Box Completed Water Meter Box must meet AASHTO H-20 loading requirements. Water Meter Box lid shall be designed to meet the American Association of State Highway and Transportation Officials AASHTO H-20 loading. (see detail drawing UW-2)		<u>AASHTO M 199</u> <u>AASHTO M 306-05</u>	East Jordan Iron Works product number – 32131035A02 Western Precast Concrete Inc. DFW Plastic Inc. – 1500 series DFW1500.12.1 for 5/8" x ¾" – 1", 1 ½", 2" and 3" – 4" meters.

SECTION 1000

WATER CONSTRUCTION SPECIFICATIONS

**SECTION 1000
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1000 GENERAL

This standard covers the installation of water piping systems, which are, or intended for, integration into or rehabilitation of the Las Cruces Utilities water distribution system. All piping and accessory materials shall be new and unused. The water line and appurtenances shall be installed as shown on the Contract Documents.

Existing water lines found in the field without tracing wire shall be reported immediately and kept uncovered until GPS'd by Las Cruces Utilities' Staff. Contractor required to keep waterline uncovered until LCU Locator arrives and completes GPS.

All DI fittings or corresponding bolts shall be wrapped in 6 mil plastic.

1001 DEFINITIONS

See General Information Section

1002 REFERENCES

The following documents, as applicable, are hereby incorporated into these Contract Documents by reference. If any referenced specification is in conflict with a City of Las Cruces specification, the specification requiring the most stringent condition shall take precedence. All materials, labor and equipment required to adhere to CLC utility standards referenced specification, CLC O&M Manual, and CLC Standard Operating procedures shall be considered incidental to construction.

CITY OF LAS CRUCES STANDARD
SPECIFICATIONS FOR ROAD CONSTRUCTION -
latest applicable edition

CITY OF LAS CRUCES GENERAL CONDITIONS –
latest applicable edition

CITY OF LAS CRUCES SUBDIVISION CODE –
latest applicable edition

MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) - latest applicable edition

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM) - latest applicable edition

INTERNATIONAL BUILDING CODE – latest applicable edition

INTERNATIONAL PLUMBING CODE – latest applicable edition

AMERICAN CONCRETE INSTITUTE BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE (ACI 318) - latest applicable supplements. Herein: “ACI 318”

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO) - Standard Test Methods

OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA) - Construction Industry Standards; Safety Requirements

NEW MEXICO ENVIRONMENT DEPARTMENT, all latest applicable regulations including:
Solid Waste Bureau, 20 NMAC 9.1
Air Quality Bureau, Asbestos section and all applicable regulations

CODE OF FEDERAL REGULATIONS, all latest applicable regulations including:
40 CFR part 763
29 CFR part 1926

NEW MEXICO Underground Property Damage Law, Chapter 62, Article 14, NMSA 1978, and as may be amended

SUBCONTRACTOR'S FAIR PRACTICES ACT, NMSA 1978, and as may be amended

AMERICANS WITH DISABILITIES ACT, latest applicable edition

AMERICAN WATER WORKS ASSOCIATION STANDARDS, (AWWA) the latest applicable editions of:

AWWA Manual M3, Safety Practices for Water Utilities

AWWA Manual M17, Installation...of Fire Hydrants

AWWA C600-99, Installation of Ductile Iron Water Mains...

AWWA C605-94, Underground Installation of Polyvinyl Chloride (PVC)...

AWWA C651, Disinfecting Water Mains

UNI-BELL PVC PIPE ASSOCIATION STANDARDS (UNI-BELL), as applicable, and specifically the latest editions of:

UNI-B-8, Recommended Practice for Direct Tapping of Polyvinyl Chloride...

UNI-PUB-8, Tapping Guide for PVC Pressure Pipe

1003 RECEIVING, HANDLING, AND STORAGE

It is the responsibility of the Contractor to receive, handle, and store all pipe and appurtenances in such a manner as to insure delivery and placement in their final location in sound, undamaged condition as per this Standard, and AWWA Standards, and to the acceptance of the P.M., or designee, All materials, handling methods, and storage conditions at the Project location are subject to the P.M., or designee, inspection. Neither inspection nor the lack of P.M., or designee, inspection shall relieve the Contractor of the responsibility to provide and install materials meeting these Standards.

Stored materials shall be kept free from damage. Interiors of pipe and appurtenances shall be kept free from dirt or other foreign matter at all times. Pipe gaskets shall be stored out of direct sunlight, away from heat sources. Factory installed gaskets shall not be removed from the joints unless damaged or subject to damage.

Pipe stored outdoors and expected to be exposed to direct sunlight for periods of one year or more after delivery shall be

covered with canvas or other opaque material with provision for adequate air circulation, as per ANSI/AWWA Standard C605-94. PVC pipe that has been subjected to excess ultraviolet radiation as identified by color fading or chalking shall be considered damaged and shall not be used.

Damaged or otherwise unacceptable materials shall be removed from the Project site and replaced as necessary.

The interior of pipe and appurtenances shall be thoroughly cleaned of foreign matter before lowering into the trench and shall be kept clean during operations. Plugging or other means acceptable to the P.M., or designee, shall be required of all pipe and appurtenances open ends at all times when work on that pipe is not in progress.

1004 PIPE INSTALLATION

Trench excavations shall be made to at least four (4) inches below the pipe barrel to allow for the placement of bedding material. If the foundation of the trench is yielding, the Contractor shall over excavate and stabilize the trench. Where running or standing water occurs in the trench bottom, the water shall be removed from the trench. The trench shall be kept free from water during installation operations by suitable means until the pipe has been installed and backfill placed and compacted to a sufficient height to prevent pipe flotation. Soil migration in the pipe zone shall be prevented by use of a geotextile material or embedment material gradation or other suitable means with prior approval of the P.M., or designee. All pipe that has the grade or joint disturbed after laying shall be taken up and re-laid. Pipe shall not be laid in water or when trench or weather conditions are unsuitable for the work, except by permission of the P.M., or designee. All unconnected ends of pipes shall have a valve, plug, or cap installed.

Bedding material shall be added for a minimum of four (4) inches in depth, uniform in cross-section and profile, and shall be compacted to a minimum of 90% Standard Proctor, AASHTO T-99 for Type III or Type IV trenches (see referenced AWWA Standards).

Bell holes at each joint shall be provided to permit the joint to be assembled and the pipe to be supported uniformly for the full length of the pipe. Pipe shall be laid to the line and/or grade as indicated in the Contract Documents.

Field cuts for PVC pipe may be made with circular saws, handsaws or similar equipment. Field cuts shall provide a smooth end at a right angle to the longitudinal axis of the pipe. Spigot ends shall be deburred, beveled, and re-marked with the insertion line. The length and angle of field bevels should match the factory bevels.

Field cuts for ductile iron pipe (DI) may be made with abrasive pipe saws, rotary wheel cutters, or similar equipment if allowed or specified by the pipe manufacturer. Cut ends and rough edges shall be ground smooth, and for push-on joints, the cut end shall be beveled as per the manufacturers' recommendations.

The sealing surface of the pipe spigot end, the pipe bell, fitting, and the elastomeric gaskets shall be cleaned immediately before assembly. Factory installed gaskets should not be removed for cleaning. The joint shall be free of dirt, sand, grease, or foreign material. Pipe manufacturers approved lubricants shall be applied as specified to gasketed joints when assembling. Only gaskets supplied by the pipe and fittings manufacturer shall be used.

Push-on joints shall be made by insertion of the spigot end into the bell end. The installed pipe joint shall be kept straight while pushing the joint to completion at the insertion depth as specified by the manufacturer. Any deflections required by the Contract Documents shall be made after the joint is assembled. Timber headers shall be used against the pipe when mechanical equipment is used for pushing. Visual inspection of all assembled joints is required of the Contractor. Additional inspections by feeler gauge or other methods may be required by the P.M., or designee.

Mechanical joints on PVC shall be assembled in accordance with the fittings manufacturer's published recommendations. Pipe spigot ends may require shortening for use with mechanical joints or fitting joints.

Mechanical joints on DI shall have the socket and plain ends cleaned. Lubrication and additional cleaning should be provided by brushing both the gasket and plain end with soapy water or an approved pipe lubricant (per AWWA C111/A21.11) just prior to installing the gasket on the plain end. The gland and then the gasket shall be installed on the plain end. Keeping the joint straight during assembly, the pipe shall be inserted into the socket firmly and evenly around the circumference. Assemble the gland and socket components and insert the joint manufacturer's bolts and nuts and hand tighten. Any required deflections shall be made after joint assembly but before tightening the bolts. Tighten the bolts to the normal range of torque as indicated in AWWA C600-99 (75-90 ft.lb. for 4"-24" nominal diameter joints with $\frac{3}{4}$ " bolts) while maintaining approximately the same distance between the gland and the face of the flange at all points around the socket. Tightening the joint is accomplished by a process of alternately tightening bolts on opposing sides. The process is repeated until all bolts are within the required torque range.

Any restrained joints used, on PVC or DI, shall be installed as per the manufacturer's published recommendations.

PVC pressure pipe may accommodate longitudinal bending, if the Contract Documents require curvature of lines. The Contractor shall block or brace pipe joints to ensure that bending of PVC pressure pipe does not result in axial deflection in the gasketed or mechanical joints that exceeds the manufacturer's published limits. The longitudinal bending in the PVC pipe barrel shall not result in a bending radius that is less than the minimum limits established in AWWA C605-94, or latest edition. Bending of PVC pipe barrels larger than 12 inches nominal diameter is to be done only with prior approval of the Utilities Director and shall be determined by the pipe manufacturer's published axial-joint-deflection limits. PVC pressure pipe greater than 12 inches nominal diameter may be used on Projects only with the prior approval of the Utilities Director.

DI pipe may be deflected at the joints when required by the alignments specified in the Contract Documents. The amount of joint deflection shall not exceed that shown in AWWA C600-

99, or latest edition. The deflections listed are maximum deflections and shall not be exceeded. For design purposes, deflection shall be limited to 80 percent of the values listed in the referenced standard. The design values are tabulated in Section 802.4 of these Standards.

Water Main and Service Line Soil Bedding and Backfilling shall conform to:

Water lines should be bedded in fine-grained granular material such as fine, poorly graded (uniform) sand in a fashion to avoid the development of any voids around the water lines placed. Bedding material shall be provided and installed such that 90% Standard Proctor, per ASSHTO T-99, densities are achieved for the pipe zone. Testing frequencies are to be per applicable City of Las Cruces Standard Specifications for Roadway Construction, latest edition.

For all Utility lines refer to NMDOT for suitable backfill. Providing suitable backfill will be required per specifications.

All soil bedding materials used should be non-plastic. All soil bedding materials should extend a minimum of 4 inches in all directions.

All utility trenches should be backfilled with compacted soil below structural elements, including foundations, interior and exterior flat concrete work, and paved parking or drive areas. Although the backfill should be compacted, care should be taken not to damage the utility during backfilling and subsequent compaction. Testing frequencies are to be per applicable City of Las Cruces Standard Specifications for Roadway Construction, latest edition. For emergency or schedule repairs less than 300 linear feet, a minimum of 2 densities are required (1 mid-level and 1 final grade) during normal working hours per open excavation. After hours work requires final grade densities morning of next working day.

Backfill materials may be native soils, however, no material having a maximum individual particle size or agglomeration clod size greater than two and one-half (2½) inches shall be placed within twelve (12) inches of the utility piping installed.

Minimum Backfill Compaction Requirements

Utility Construction	Percent of Modified Proctor Density (ASTM D-1557)		
	Existing Surface Preparation	Fill or Backfill Placement	Maximum Finished Lift Thickness (in.)
In Roadway: Shallower than 36 " of Grade	N/A	95	6
In Roadway: Deeper than 36 " of Grade	N/A	95	12
Outside Roadway: Shallower than 36 " of Grade	N/A	90	12
Outside Roadway: Deeper than 36 " of Grade	N/A	90	18

Thrust restraints shall be provided for each dead end, valve, bend, tee, and any unrestrained hydrant, at reducers or fittings otherwise unrestrained, and where changes in pipe diameters or directions occur.

Utility system piping thrust is to be restrained by the use of restrained joint fittings. Concrete thrust blocking shall be utilized only where Project site conditions are not applicable to the use of restrained joint fittings. The P.M., or designee, shall approve of the use of concrete thrust blocking where applicable. The size and shape of concrete thrust blocks shall be as indicated within these Standards. The concrete shall be placed such that no concrete is in contact with any bolts or nuts on the piping system. The lengths of restrained joint piping and details of joint restraint glands, clamps, friction slabs or anchors shall be as indicated within these Standards and in conformance with the manufacturer's published recommendations.

Fittings and valves shall be provided and installed as indicated within the Project Documents and these Standards. All valves shall be placed with operating stems vertical, excepting butterfly valve operating stems, which shall be horizontal. The full weight of valves and fittings shall not be carried by the pipe. Thrust blocking or restraint shall be provided for fittings

and valves as indicated within these Standards. Concrete collars around valves are to be constructed per standard detail UW-4.

Hydrants shall be installed as per these Standards and AWWA Manual M17.

Taps – All taps to the existing water system shall have a level 3 operator, as a minimum, overseeing the work in accordance with 20.7.4 NMAC.

Saddle tapping of water mains shall be as per AWWA Manual M23, and UNI-BELL UNI-PUB-8. Direct tapping of corporation stops into water mains is not allowed. No handheld drills, twist drills, or auger bits shall be allowed in tapping PVC or Ductile Iron. Shell type cutters, which retain the cut coupon, shall be used in the tapping machines. Taps shall be made at 9 and 3 o'clock around the circumference of the main. Two spiral wraps of three-mil PTFE (Teflon) tape shall be applied clockwise to the inlet threads on the closed corporation stop. Liquid sealants or other thread lubricants shall not be used. The maximum outlet size by use of a corporation stop or service saddle shall be 2 inch. If larger taps are required, a tapping sleeve and valve or other applicable fitting shall be used.

Service lines shall be installed at not less than the minimum depth indicated. The Contractor shall leave the water turned on or off as it was found prior to meter transfers to obviate inconvenience to the customer in the first case or damage in the second. Water service lines, including the piping, meter, and the meter box, shall lie in a line perpendicular to the street's centerline. Services lines shall be snaked in trench 12 inches to 24 inches from the corporation stop.

1005

WARNING TAPE & TRACING WIRE

TAPE: During the backfilling process, all PVC and Ductile Iron water mains, service lines and system appurtenances shall have a continuous warning tape placed immediately above them and throughout their length at a height of twelve (12) to thirty (30) inches above the mains and twelve (12) inches for services. The tape shall be six (6) inches wide.

Tape material shall be formulated from 100 percent virgin polyolefin resins. Resins shall be pigmental for chemical stability and resistance to sulfide staining (color fastness).

Tape shall be constructed by the mechanical (non-adhesive) lamination of two plies of three layer blown film in such a manner as to produce a bi-axially oriented structure. The tape shall be able to provide a 700 percent elongation prior to rupture as per ASTM-D882.

The tape shall meet or exceed the standards provided in the Materials Specification List, included in these Standards.

The warning tape shall be manufactured with a permanent APWA water line blue pigment at a maximum of every thirty (30) inches along its length, be imprinted with a continuous warning message as follows:

CAUTION WATER LINE BURIED BELOW

At tees, tape ends, etc., the warning tape shall be tied together (spliced) with knot to create a continuous warning tape throughout the length of the pipeline and associated branch lines, appurtenances, etc.

TRACING WIRE: In addition to the installation of warning tape, copper tracing wire is to be installed with all water mains. This includes all mains, and individual hydrants. The tracing wire shall be taped, using electrical tape, on top of the pipe at ten (10) foot centers, for the total length of the pipe.

The tracing wire shall be 12 AWG (average wire gauge), solid core, copper wire (solid core meaning one (1) single continuous strand of copper wire). In addition, the wire insulating coating (jacket) shall be blue in color and shall have 45 mils of polyethylene insulation thickness and high molecular weight. Also, the tracing wire shall be HMW – PE and rated for UL 600V construction. The wire shall be suitable for wet or dry applications. The wire size (gauge) shall be continuously affixed (printed on) the entire length of all tracing wire coating and shall be easily read.

Where a splice is required, or when a three (3) way splice is necessary, the wires shall be joined together with an appropriate size (blue) wire nut which shall then be placed inside a 3M brand Direct Bury Splice kit (DBR), or approved equal, of appropriate size. No bare wire shall be left exposed anywhere. All wires shall be spliced to all other wires for a continuous tracing wire system.

All hydrants shall have Test Boxes, connected onto the tracing wire system as per detailed drawings herein, shall be required.

No electrical connections of the tracing wire to any metal pipes or metal service lines will be allowed and care shall be taken to ensure that the tracing wire is not damaged during installation. The tracing wire is required to be successfully tested, using an approved (by Gas L&M Supervisor) electromagnetic locating equipment such as Subsite Utili-gard, Rigid, Metrotec, or 3M, by the Contractor and at his expense, for continuous signal (continuity test) across all main and service lines before asphalt is installed, and prior to subgrade preparation. Locatability Check: Must be requested a minimum of 48 hours (two working days) prior to tie-in. Locatability check will be conducted by the Utility Locating Program of the Utilities Department. Tracing wire must have a continuous locating signal before pipe is accepted by the P.M., or designee. If an issue is found with the locatability of the utility line (Gas, Water, Sewer, or Reclaimed Water) it is the responsibility of the contractor at his expense to correct those issues prior to tie-in.

1006 INSPECTION & TESTING

Contractors are required to provide on-site personnel to verify that all valves are functional and open, the valve boxes and covers are clear of debris and installed correctly during and at final inspection.

Lines shall be filled slowly with potable water while venting all air. Precautions shall be taken to prevent entrapping air in the lines. After filling, lines shall be flushed at blow offs and dead ends at a high velocity. Valves shall be closed slowly to prevent excessive surges while maintaining positive pressure at all times throughout the new line. Flushing water shall be discharged without causing erosion damage, nuisance, or

interruption of traffic. Disposal of flushing water shall be as indicated in the Contract Documents or as directed by the P.M., or designee.

The Contractor is required to hydrostatic test all water mains, laterals, dead ends, service lines and appurtenances in accordance with AWWA C600-99 (for Ductile Iron lines), or AWWA C605-94 (for PVC lines). The test shall be conducted in the presence of the P.M., or designee. The test shall be conducted without being connected to the existing Las Cruces Utilities system, unless approved in advance by the Utilities Director or P.M. If connection to the existing Las Cruces Utilities system is approved, the Contractor shall assume any and all responsibility in case of damage or failure of the existing system. Leakage through connections to the existing system, leaks in the existing lines, or leaking existing valves under the test pressure will invalidate the test. The Contractor shall provide all taps, gauges, and necessary equipment for filling and venting air and personnel for conducting the tests. All such equipment shall be subject to the approval of the P.M., or designee. Tests shall be performed only after the pipeline has been properly filled, flushed, and purged of all air. The specified test pressure shall be applied by means of an approved pumping assembly connected to the pipe in a manner satisfactory to the P.M., or designee. If necessary, the test pressure shall be maintained by additional pumping for the specified time during which the system and all exposed pipe, fittings, valves, and hydrants shall be examined for leakage. All visible leaks shall be corrected. All defective elements shall be repaired or removed and replaced and the test repeated.

The Contractor may perform simultaneous pressure and leakage tests or perform separate pressure and leakage tests on the installed system at test durations and pressures specified. The Contractor is responsible for the costs of all testing.

The duration of the pressure test shall be one hour, continuous. The applied pressure shall be one hundred fifty (150) pounds per square inch (psi) or 1.5 times the normal working pressure of the line, whichever is greater.

The leakage test shall be maintained for a period of two continuous hours. A leakage test pressure of one hundred fifty (150) psi, or 1.5 times the normal working pressure of the line, shall be applied to all lines.

The simultaneous pressure and leakage test shall be of two (2) hour duration, at an applied pressure of 150 psi, or 1.5 times the normal working pressure of the line, whichever is greater.

For any and all of the above tests, accurate measurements shall be made of the volume of water required to maintain the test pressure, the variation in test pressure, and starting and ending test times.

1007 DISINFECTION

The Contractor is required to disinfect all new potable water mains, and their appurtenances, and all existing water system portions that have undergone repairs or reconfigurations as part of the Project Documents. The disinfection procedures and requirements shall be in accordance with AWWA C651-14, or applicable revisions.

The sanitary handling of materials, the practices during construction, and the continual inspection of the work are the primary means for ensuring the sanitary condition of the water main. Three methods of disinfecting newly constructed water mains are typically utilized, depending on the circumstances involved.

The Tablet Method consists of adding dry calcium hypochlorite, conforming to AWWA B300-18 or latest revision, in granular form or in 5-gram (g) tablets containing approximately 65% available chlorine by weight. This method may be used only if the pipe and appurtenances are kept clean and dry during construction. The method gives an average chlorine dose of approximately 25 mg/L over a required contact time of 24 hours. The granules are placed in the upstream end of the first section of pipe, at the upstream end of each branch main, and at 500-foot intervals. If tablets are used, they are attached by a food grade adhesive (such as Permatex clear RTV Silicone Adhesive Sealant by Loctite

Corp.) on the inside, top of the main and equally distributed at each end of the pipe joint. The number of tablets required per joint of pipe are given below, with one tablet being required to be placed in each hydrant, hydrant branch, and other appurtenances:

Number of 5-g. calcium hypochlorite tablets required (25 mg/L dose).

Nominal Pipe Diameter (in.)	<u>Length of Pipe Joint (ft.)</u>				
	<u>13 or less</u>	<u>18</u>	<u>20</u>	<u>30</u>	<u>40</u>
4	1	1	1	1	1
6	1	1	1	2	2
8	1	2	2	3	4
10	2	3	3	4	5
12	3	4	4	6	7
16	4	6	7	10	13

The Granular Method: The amount of granular calcium hypochlorite to be at the beginning of the main and at each 500-foot interval, if granules are used shall be as follows:

Ounces of Calcium Hypochlorite granules per 500-foot interval

<u>Nominal Pipe Diameter</u>	<u>Calcium Hypochlorite granules</u>
4 in.	1.7
6 in.	3.8
8 in.	6.7
10 in.	10.5
12 in.	15.1
14 in. and larger	$D \times D \times 15.1$

(Where D is the inside pipe diameter in feet.)

The tablet method precludes preliminary flushing of the main. When the installation is complete, the main shall be filled slowly and all air pockets eliminated. This water shall remain in the piping for at least 24 hours. Detectable chlorine residuals should be found at each sampling point after the 24-hour period. The residuals must be reported to the P.M., or designee.

The continuous feed method consists of placing calcium hypochlorite granules in the main during construction (optional). The main is then flushed to remove all particulates and re-filled with chlorinated potable water. The chlorinated water shall be feed into the new system at a measured rate. Within 10 feet of the feed point, a constant rate of chlorine injection shall be fed into the system such that the water will have not less than 25 mg/L of free chlorine. Chlorination shall not cease until the new system is fully filled with the heavily chlorinated water. This water shall be chlorinated so that after a 24-hour holding period in the main there will be a free chlorine residual of not less than 10 mg/L.

The slug method may also be used in disinfecting large diameter mains where continuous feed methods are impractical. This method consists of placing calcium hypochlorite granules as per the above method, flushing the main, then chlorinating the main by slowly flowing through the main a slug of water dosed with chlorine to a concentration of 100 mg/L. The slow rate of flow shall completely fill the main and its appurtenances and will expose them to the chlorinated water for a period of not less than 3 hours.

Flushing of the pipeline and appurtenances shall occur after the applicable retention period, and at other points depending on the method of chlorination. This flushing shall be into an area subject to the approval of the P.M., or designee. Flushing velocities in the main lines shall be a minimum of 2.5 feet per second.

Water samples shall then be taken from the newly installed piping system by the Contractor. The sampling process shall be witnessed by the P.M., or designee. The P.M. shall, at the time of sampling and from the same sampling port, test the discharge for residual chlorine. Residual chlorine values shall be below 0.5 parts per million (ppm). Higher residual chlorine values shall require the Contractor to re-flush the new piping system prior to re-sampling. When residual values are in the acceptable range, the Contractor shall take two consecutive sets of acceptable samples, taken at least 24 hours apart. At least one set of samples shall be collected from every 1,200 feet of the new water main, plus one set from the end of the line, and one set from each branch. The Contractor shall collect and submit samples to the local New Mexico

Environment Department certified laboratory for testing. Testing shall be for the absence of coliform and the presence of chlorine residual. Testing results shall be forwarded to the Contractor and the P.M., or designee, before acceptance of the tested system or portion. Testing costs shall be the responsibility of the Contractor.

If trench water or excessive debris has entered the new main during construction, the samples shall be taken at intervals of approximately 200 feet. These samples shall be taken of water that has stood in the new main for at least 16 hours after final flushing.

Failure to produce satisfactory bacteriological results shall be cause for the new main to be reflashed and resampled. If these check samples also fail to produce acceptable results, the main shall be re-chlorinated by the continuous feed or slug method until satisfactory results are obtained. In no case shall an existing service be transferred to a new line, or a new service connected to a meter until the bacteriological analyses are satisfactory.

When small installations are constructed without the extensions of mains, such as main line taps only, chlorination of trench and equipment used, and materials (tapping valves, fittings) is required. See AWWA C651-14, or latest edition, for further details.

1008 ASBESTOS CONTAINING MATERIALS

All asbestos containing materials encountered in the process of accomplishing the Project shall be dealt with in strict conformance to the cited references contained herein, see previous Sections and Section 1002.

It is the Contractor's responsibility to follow all EPA, OSHA, NM Solid Waste Management Regulations, and all other regulations when working with asbestos-cement pipe. Cutting of AC pipe shall not be allowed. At the point of tie-in to existing AC lines, the Contractor shall excavate to the nearest joints and remove the section of pipe in one piece. The AC pipe must remain wet and encapsulated with 6 ml or thicker plastic bag per NM Solid Waste Management Regulations until the pipe is delivered to the Special Waste Facility. Existing AC water line pipe shall remain abandoned in place wherever possible.

SECTION 1100

UTILITY PLAN REVIEW STANDARDS

**SECTION 1100
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1101 BUILDING PERMIT REVIEW

For all new construction that does not include utility main extensions, with the exception of single family residential subdivisions, a site plan must be submitted that contains the information required in the most recent edition of the Chapter 30, Las Cruces Municipal Code (Buildings and Building Regulations, aka Las Cruces Building Code) for the type of permit requested.

The information shown below is specifically requested for review by Las Cruces Utilities, for the utility phase review. It is recognized that, depending upon the permit requested, there is some overlap and duplication of requirements.

- North arrow, scale and address of proposed building
- Party making the tie in to existing city utilities (City or Contractor)
- Point of utility service connection to utility main and size of utility service line
- Location and size of all existing utility main lines, service lines, meters, electrical enclosures, and easements
- Location of all concrete flat work
- Location of all retaining walls & details
- Location of all trees or the following note - TREES NOT TO BE PLANTED WITHIN 10 FEET OF SERVICE LINE
- Required BTUH or MCFH to adequately size gas service line & meter
- Required water demand in GPM based on appropriate codes and intended use
- City owned Utility mains in private property need adequate easements to the City of Las Cruces for operations and maintenance. All necessary easement locations must be shown on the plans when submitted for review. All easements must be filed and recorded in the Dona Ana County public records, and a recorded copy of the easements must be delivered to Las Cruces Utilities before final approval of the plans.
- Location of all proposed and existing fire hydrants
- Location of all proposed and existing manholes
- Location of all proposed and existing valves
- Location of all existing power lines

1102 BUILDING PERMIT REVIEW INCLUDING UTILITY EXTENSIONS

For all new construction that includes utility main extensions, with the exception of single family residential subdivisions, a site plan must be submitted that contains the information required in the most recent edition of the Chapter 30, Las Cruces Municipal Code (Buildings and Building Regulations, aka Las Cruces Building Code) for the type of permit requested. All main line utility design must be done under the direction of and stamped by an engineer registered in the State of New Mexico.

The information shown below is specifically requested for review by Las Cruces Utilities, for the utility phase review. It is recognized that, depending upon the permit requested, there is some overlap and duplication of requirements.

- Party making the tie in to existing city utilities (City or Contractor)
- Location of all existing & proposed utilities
- All proposed fittings must be labeled on the plans
- Sanitary & Storm sewer line sizes, slopes, and invert elevations
- Manhole stationing and rim elevation
- Pipe sizes & depth depicted
- Final plans must be signed, dated & stamped by the person in responsible charge of the work
- Las Cruces Utilities owned utility mains in private property need adequate easements to the City of Las Cruces for operations and maintenance. All necessary easement locations must be shown on the plans when submitted for review. All easements must be filed and recorded in the Dona Ana County public records, and a recorded copy of the easements must be delivered to Las Cruces Utilities before final approval of the plans.

1103 SUBDIVISION PLAN REVIEW

All construction plans for subdivisions shall contain the information required in the most recent edition of the City of Las Cruces Subdivision Code, as well as the following information.

- All proposed fittings and valves must be shown and labeled on the plans
- For sewer lines pipe distance is measured horizontally from center of manhole to center of manhole

SECTION 1200

UTILITY DRAWING DETAILS

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UTILITY DRAWING DETAILS**

*Changes are described in the “COMMENTS” section of each drawing.

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*Changes are described in the “COMMENTS” section of each drawing.

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*Changes are described in the “COMMENTS” section of each drawing.

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WATER	FIRE HYDRANT DETAIL	UW-13
WATER	FLUSH HYDRANT DETAIL	UW-13-1
WATER	FIRE HYDRANT BOLLARDS	UW-14
WATER	FIRE LINE	UW-15
WATER	CONCRETE BLOCKING DETAILS	UW-16
WATER	WATER LINE LOWERING	UW-17
WATER	RESTRAINED TEE	UW-18
WATER	RESTRAINED DEAD END AND REDUCER	UW-19
WATER	RESTRAINED HORIZONTAL BEND	UW-20
WATER	TRACING WIRE TEST BOX	UW-21

**INDEX TO:
UTILITY DRAWING DETAILS - CONTINUED**

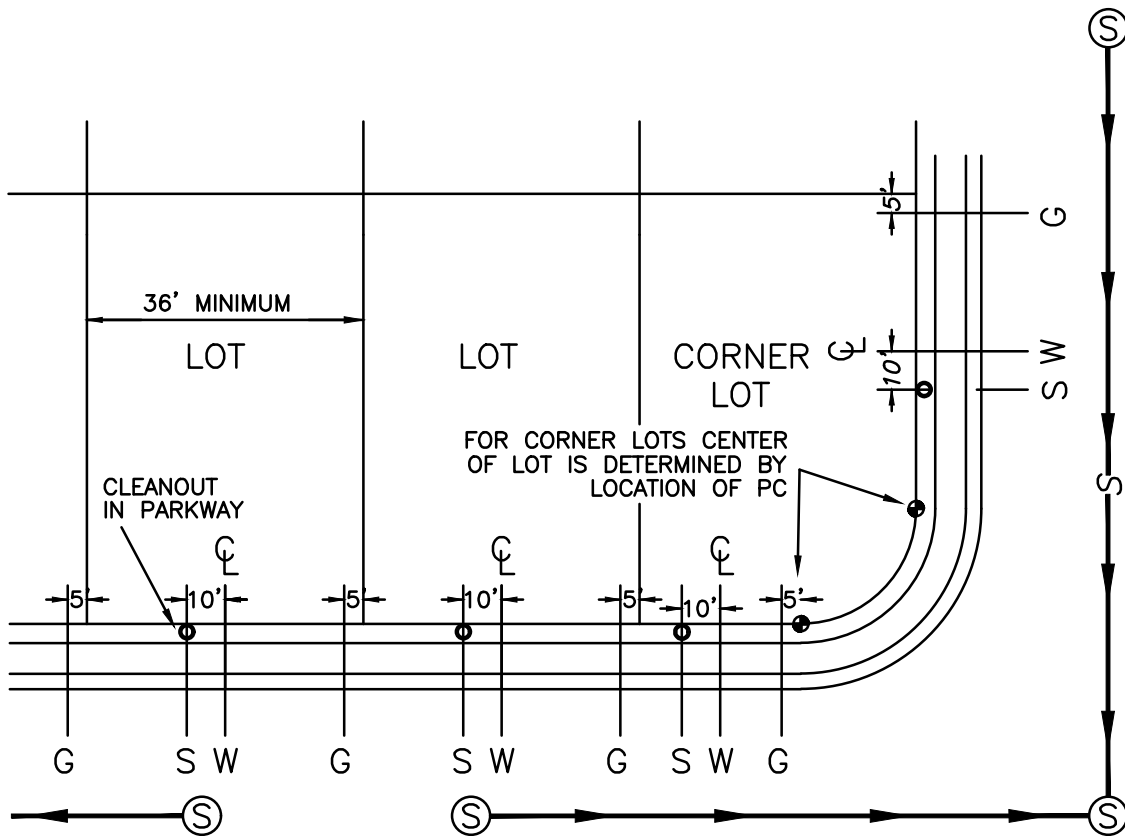
*Changes are described in the “COMMENTS” section of each drawing.

UTILITY	SUBJECT	DRAWING No.
FIRE	REDUCE PRESSURE BACKFLOW PRENTOR SCHEMATIC	FIRE-1
FIRE	FIRE DEPARTEMENT CONNECTION (FDC)	FIRE-2
GAS	ALL GAS UTILITY DETAILS SHEET 1 OF 2	UG-ALL-1
GAS	ALL GAS UTILITY DETAILS SHEET 2 OF 2	UG-ALL-2
SEWER	ALL SEWER UTILITY DETAILS SHEET 1 OF 2	US-ALL-1
SEWER	ALL SEWER UTILITY DETAILS SHEET 2 OF 2	US-ALL-2
WATER	ALL WATER UTILITY DETAILS SHEET 1 OF 3	UW-ALL-1
WATER	ALL WATER UTILITY DETAILS SHEET 2 OF 3	UW-ALL-2
WATER	ALL WATER UTILITY DETAILS SHEET 3 OF 3	UW-ALL-3

Abbreviations used herein citing Standards and References:

ASTM - American Society for Testing and Materials

AASHTO - American Association of State Highway and Transportation Officials



NOTES:

1. THE WATER LINE WILL ENTER AT THE CENTER OF THE LOT FRONTAGE THE SEWER LINE WILL ENTER 10' TO THE LEFT OF THE WATER ENTRY GAS WILL ENTER 5' LEFT OF RIGHT LOT LINE, AS VIEWED FROM THE STREET.
2. FOR CORNER LOTS UTILIZE STANDARD LOCATIONS AS NEEDED. FOR NONSTANDARD LOT ENTRY LOCATIONS, SEE 802.2.
3. ANY DEVIATION TO THE UTILITY SERVICE LOCATION NEEDS PRIOR APPROVAL BY LCU OPERATIONS ENGINEER WITH A VARIANCE REQUEST.



CITY OF LAS CRUCES

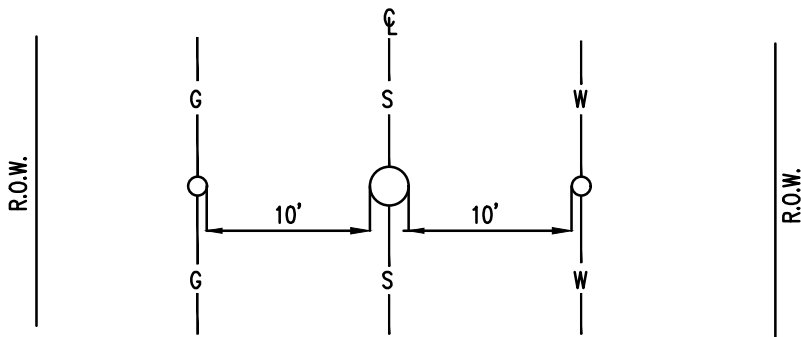
STANDARD UTILITY SERVICE LOCATION

N.T.S.

FILE NAME: 2023 CLC UTILITY STANDARD DETAILS.DWG ORIG. DATE: 8/17/00

LAST REVISION: SEPT 2023

DRAWING NO. UA-1

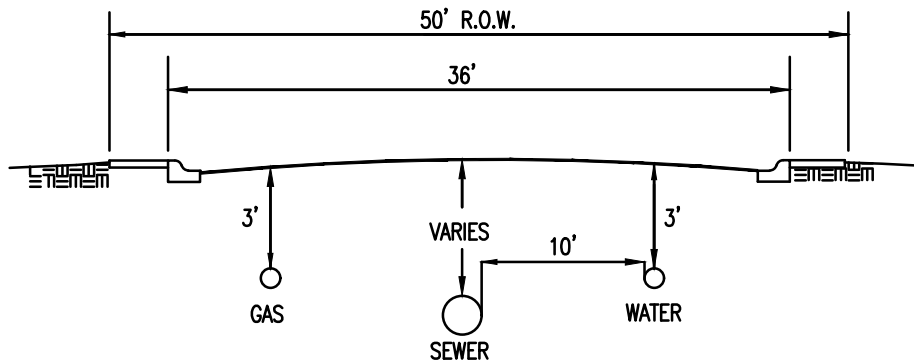


GAS MAIN ON SOUTH OR WEST SIDE OF STREET

WATER MAIN ON NORTH OR EAST SIDE OF STREET

NONSTANDARD LOCATIONS REQUIRE THE APPROVAL OF THE C.L.C. UTILITIES DIVISION DIRECTOR.

LOWER GAS MAIN AT CROSSINGS



10' DIMENSION FROM OUTSIDE OF PIPE TO OUTSIDE OF PIPE



CITY OF LAS CRUCES

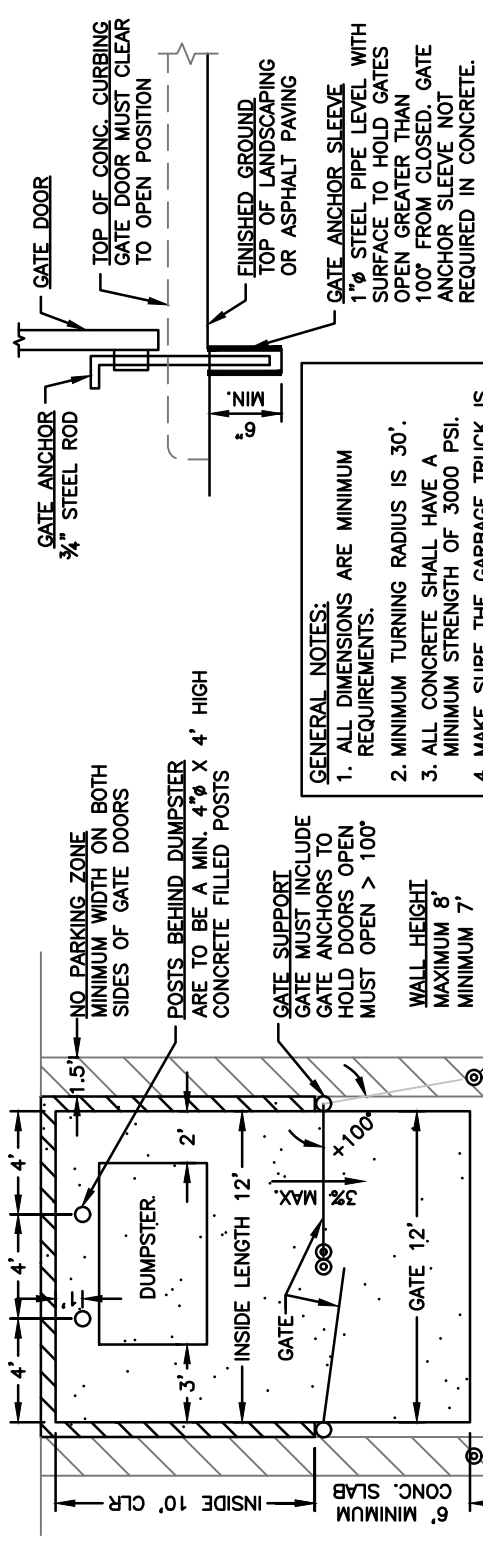
**NEW CONSTRUCTION
TYPICAL UTILITY MAIN LOCATIONS**

N.T.S.

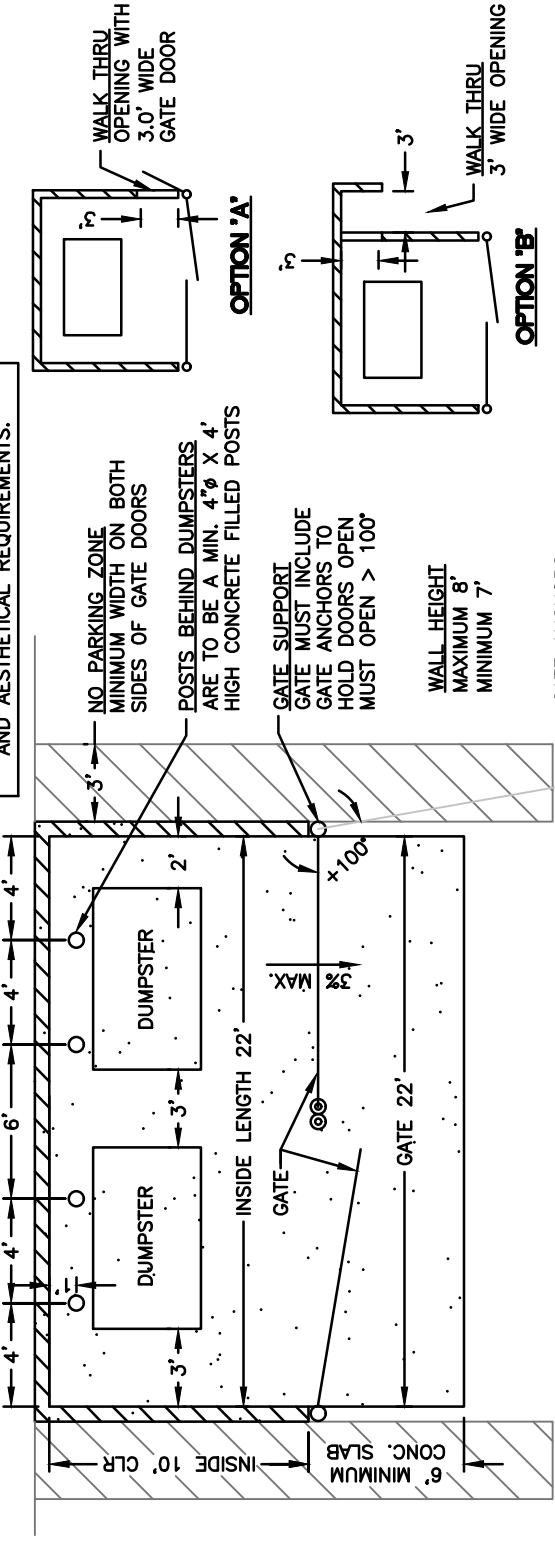
FILE NAME: 2023 CLC UTILITY STANDARD DETAILS.DWG ORIG. DATE: 8/14/00

LAST REVISION: SEPT 2023

DRAWING NO. UA-2



PLAN DETAIL FOR ENCLOSURE FOR DUMPSTER
NOT TO SCALE

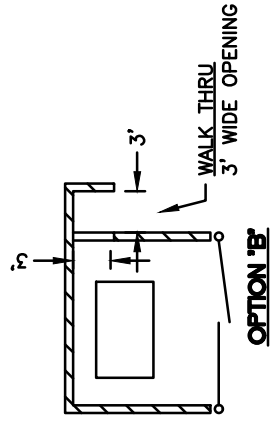
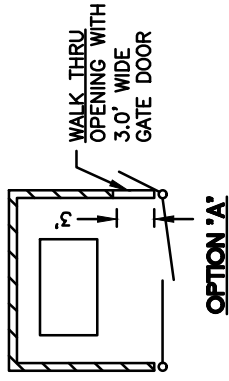
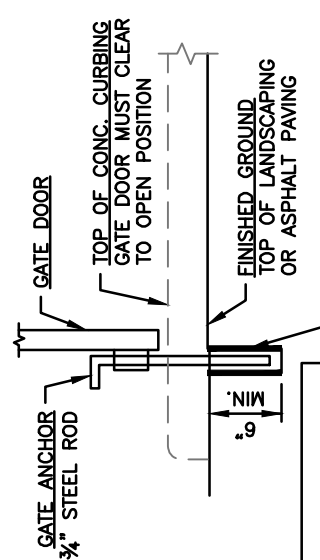


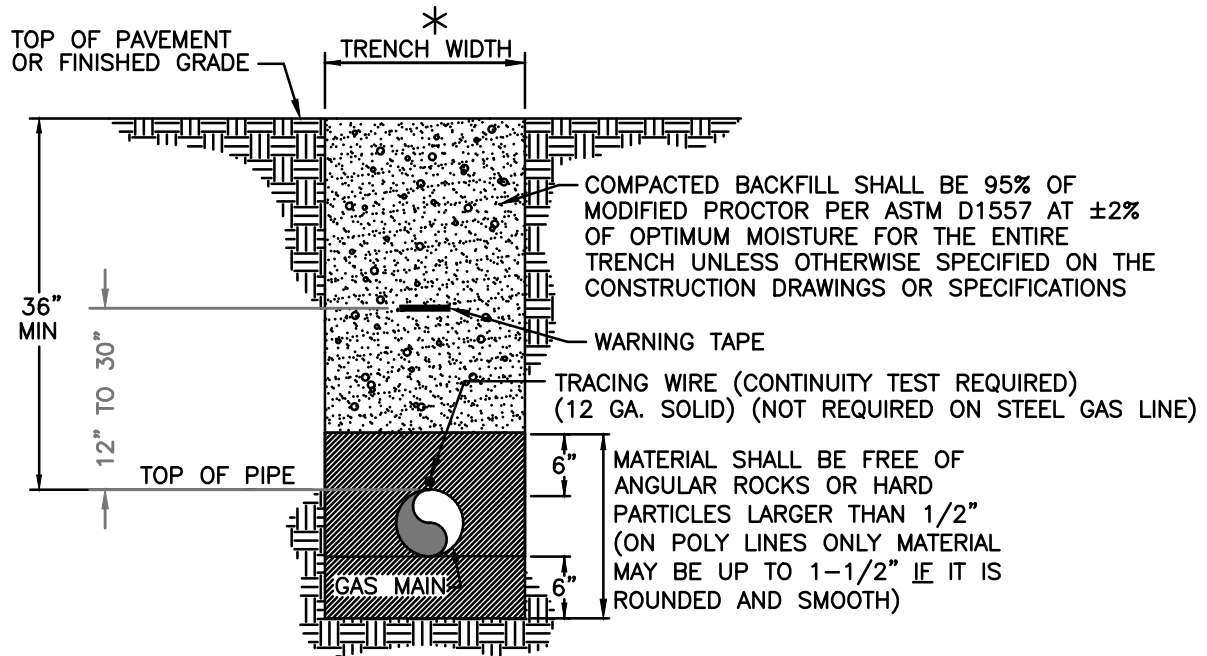
PLAN DETAIL FOR ENCLOSURE FOR TWO DUMPSTERS
NOT TO SCALE

OPTIONAL WALK THRU DETAILS
NOT TO SCALE

- GENERAL NOTES:**
1. ALL DIMENSIONS ARE MINIMUM REQUIREMENTS.
 2. MINIMUM TURNING RADIUS IS 30'.
 3. ALL CONCRETE SHALL HAVE A MINIMUM STRENGTH OF 3000 PSI.
 4. MAKE SURE THE GARBAGE TRUCK IS ABLE TO DRIVE UP AND ALIGN WITH DUMPSTER.
 5. ENCLOSURE WALL AND GATE MUST BE CONSTRUCTED WITH NON-COMBUSTIBLE MATERIAL & MEET CLC ZONING CODE FOR SCREENING AND AESTHETICAL REQUIREMENTS.

GATE ANCHOR DETAIL
NOT TO SCALE





* MAIN LINE TRENCH SHALL HAVE THE FOLLOWING MINIMUM WIDTHS:

- 3 PIPE DIAMETERS OR 12 INCHES, WHICHEVER IS GREATER FOR TRENCHES REQUIRING COMPACTION TESTS
- 3 PIPE DIAMETERS FOR OTHER TRENCHES
- TRENCH WIDTHS, CROSS SECTIONS, SHALL BE COMPLIANT TO ALL APPLICABLE SAFETY STANDARDS AND REGULATIONS
- TRENCH WIDTH IS TYPICAL FOR POLY PIPE.
- TRENCH WIDTHS SHALL BE DESIGNED ON A PER CASE BASIS FOR STEEL PIPE.
- TRACING WIRE TO BE TAPED TO GAS LINE @ 5 FT. O.C.
- TRACING WIRE TO BE ACCESSIBLE, WITHIN VALVE BOX, SERVICE POINT, OR WITHIN AN INSTALLED TWO POINT BOX, AT 500 FT. MAXIMUM ON CENTER.



CITY OF LAS CRUCES

GAS MAIN LINE TRENCH DETAIL

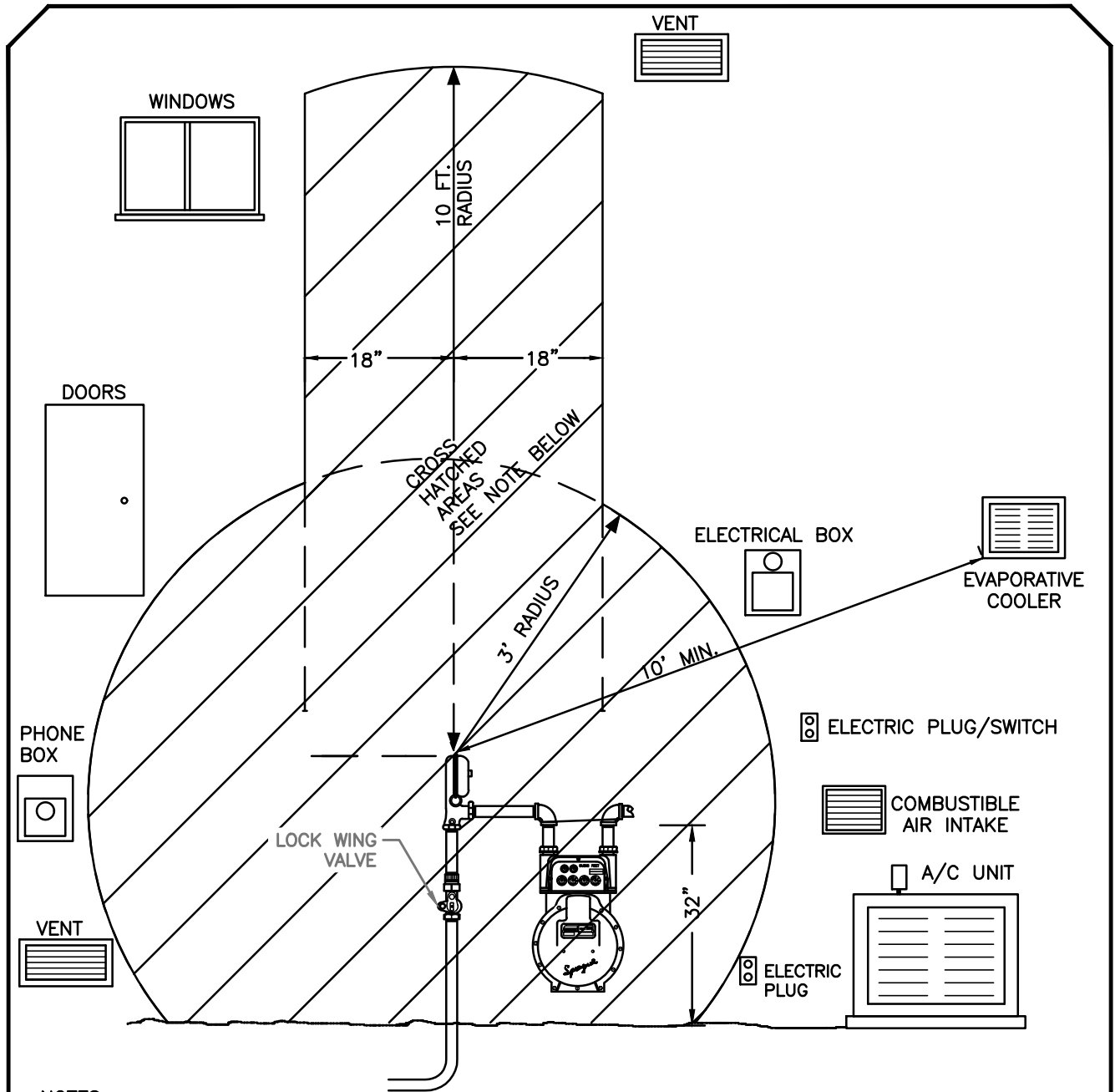
N.T.S.

FILE NAME: 2023 CLC Utility Standard Details.dwg

ORIG. DATE: 8/14/00

LAST REVISION: SEPT 2023

DRAWING NO. **UG-1**



NOTES:

1. DIMENSIONS SHOWN ARE MINIMUMS.
2. METERS ARE INSTALLED BY CITY.
3. GAS METERS SHALL BE LOCATED AS PER CITY OF LAS CRUCES – DIVISION OF UTILITIES "STANDARD OPERATING PROCEDURES" LATEST EDITION.
4. NO AIR INTAKES/SOURCES OF VENTILATION/SOURCES OF IGNITION WITHIN CROSS HATCHED AREAS SHOWN.(EXCEPT: EVAP. COOLER MIN. DISTANCE IS 10 FT.)



CITY OF LAS CRUCES

LOCATION OF GAS METERS

N.T.S.

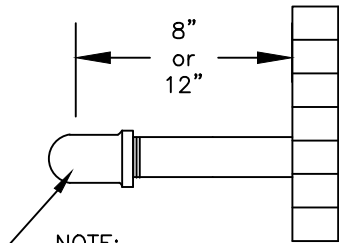
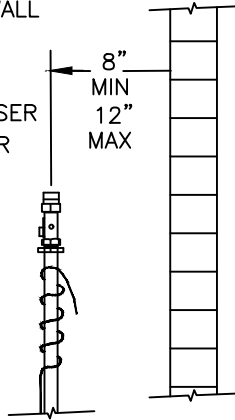
NOTES:

CITY SIDE

CUSTOMER SIDE

SEPARATION FROM WALL TO THE CENTER OF RISER

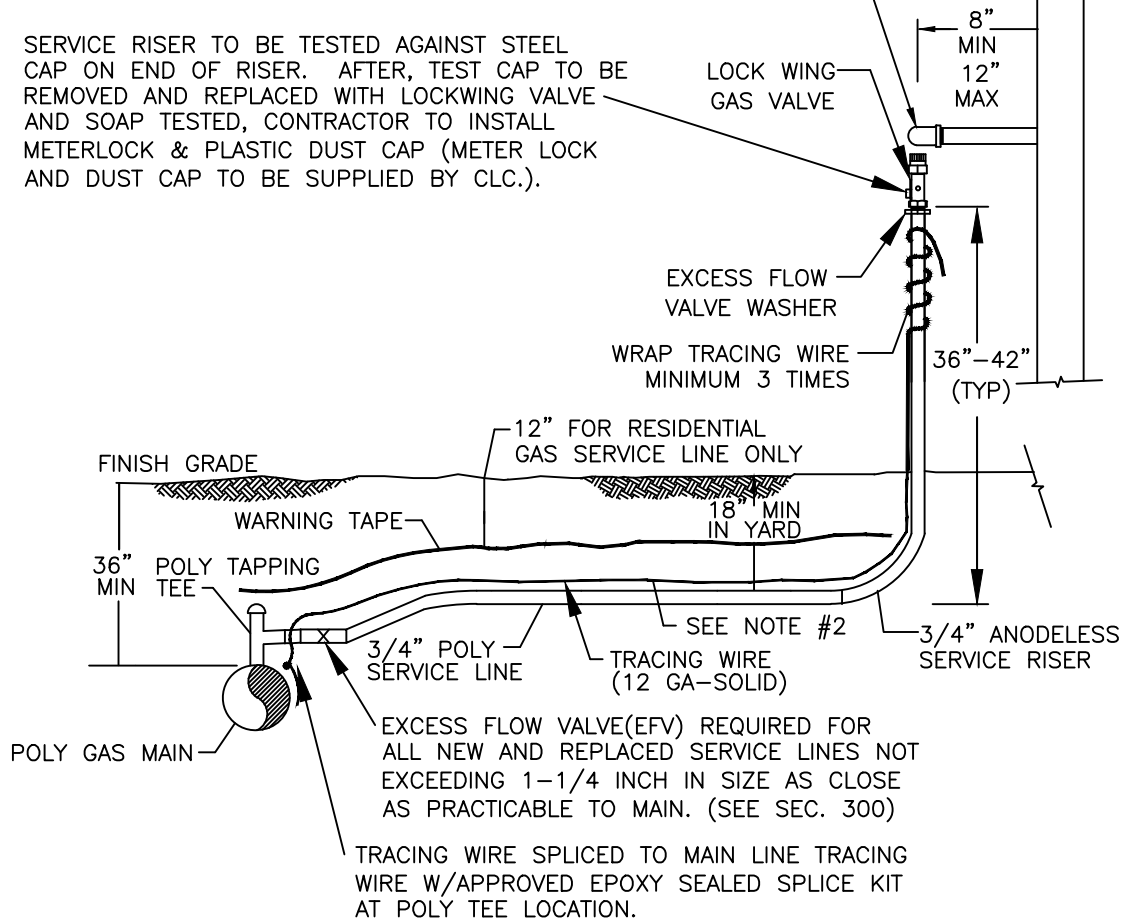
- 8" FOR 3/4" RISER
- 12" FOR 1 1/4" OR LARGER RISER



NOTE: CUSTOMER SIDE ELBOW TO MATCH CITY RISER DISTANCE OF 8" OR 12"

EXTERIOR FINISHED WALL

SERVICE RISER TO BE TESTED AGAINST STEEL CAP ON END OF RISER. AFTER, TEST CAP TO BE REMOVED AND REPLACED WITH LOCKWING VALVE AND SOAP TESTED, CONTRACTOR TO INSTALL METERLOCK & PLASTIC DUST CAP (METER LOCK AND DUST CAP TO BE SUPPLIED BY CLC.).



NOTES:

1. CONTINUITY TEST REQUIRED ON TRACING WIRE.
2. TAPE TRACING WIRE TO CARRIER PIPE MAIN AND SERVICE @ 5 FT. O.C.



CITY OF LAS CRUCES

GAS SERVICE LINE DETAIL

N.T.S.

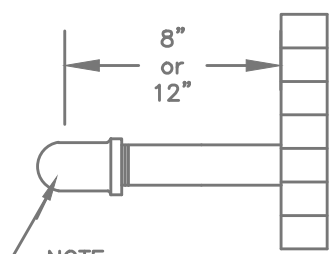
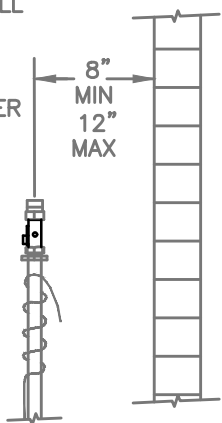
NOTES:

CITY SIDE

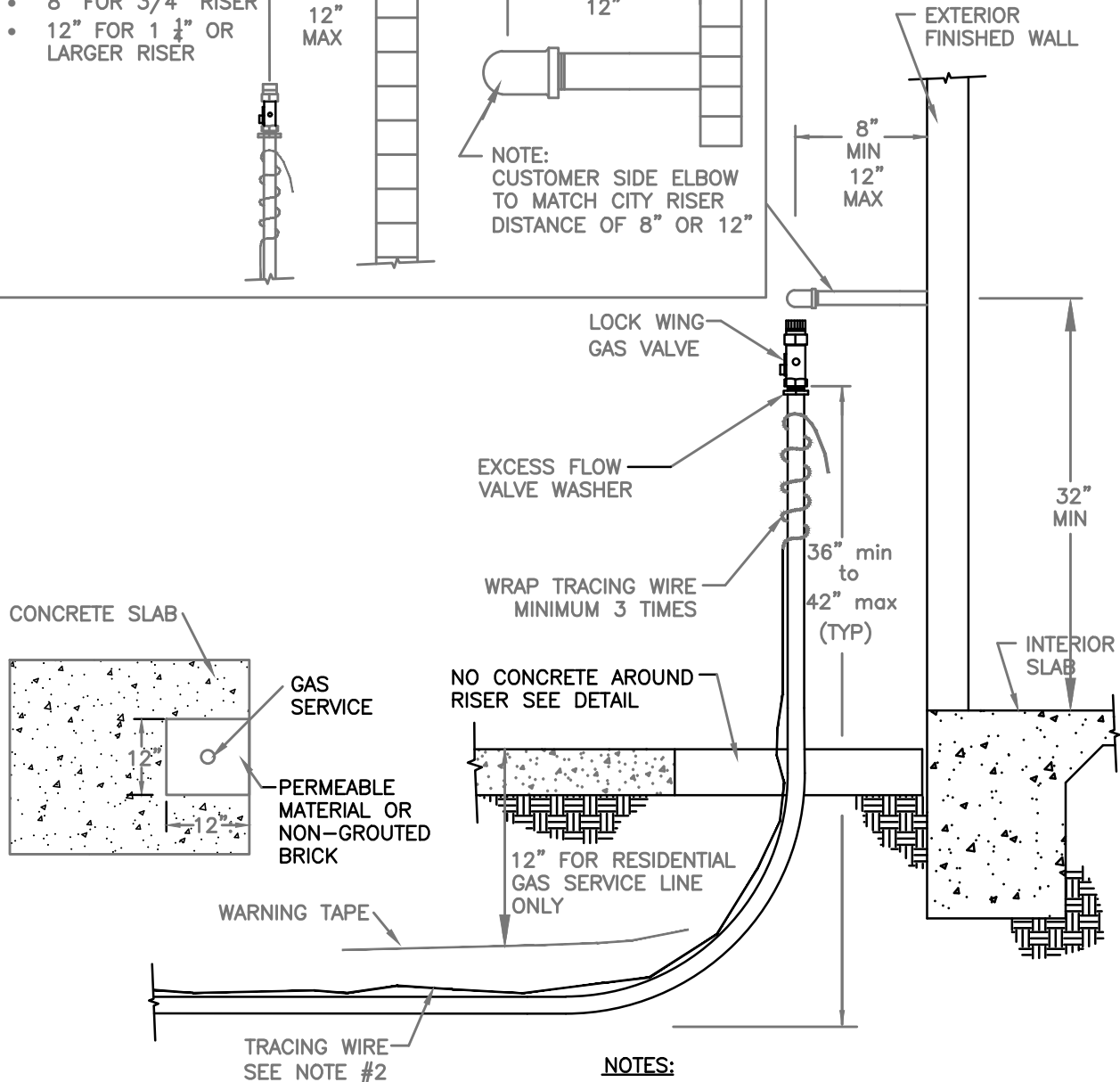
CUSTOMER SIDE

SEPARATION FROM WALL TO THE CENTER OF RISER

- 8" FOR 3/4" RISER
- 12" FOR 1 1/4" OR LARGER RISER

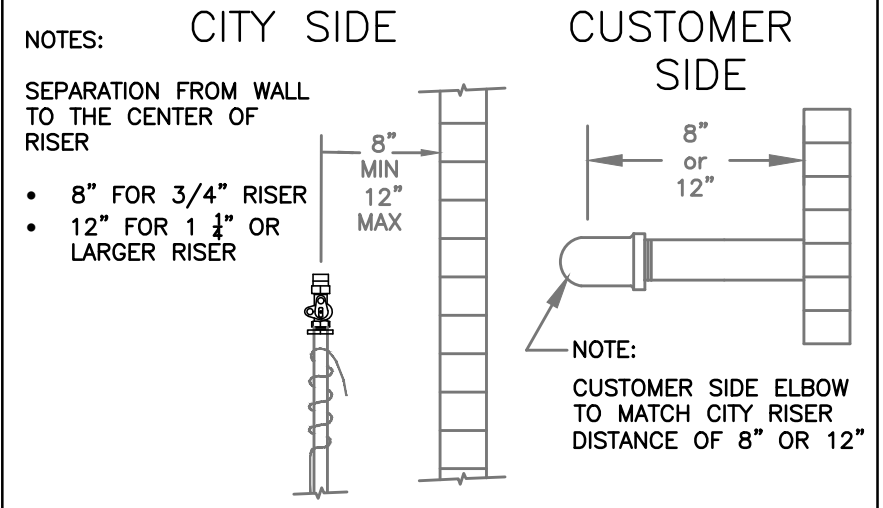


NOTE: CUSTOMER SIDE ELBOW TO MATCH CITY RISER DISTANCE OF 8" OR 12"

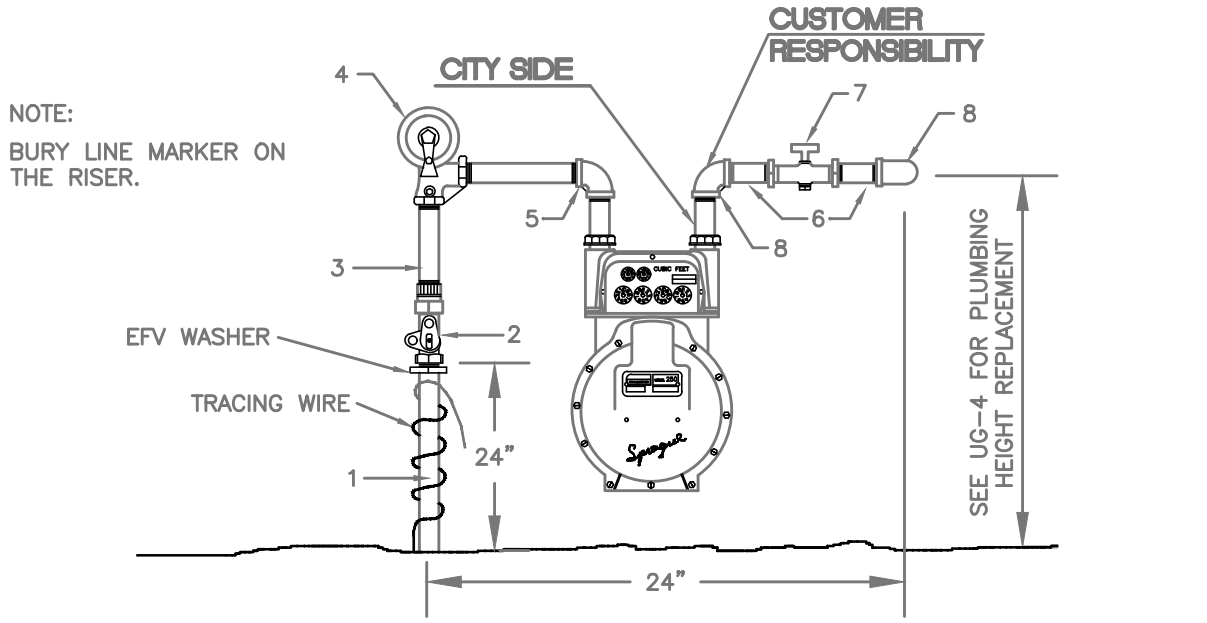


NOTES:

1. TYPICAL UNDER CONCRETE PAVING.
2. TAPE TRACING WIRE TO CARRIER PIPE MAIN AND SERVICE @ 5 FT. O.C.
3. CONTINUITY TEST REQUIRED ON TRACING WIRE.
4. WRAP AND TIE TRACING WIRE TO RISER.
5. BURY LINE MARKER ON THE RISER.



TYPICAL SECTION

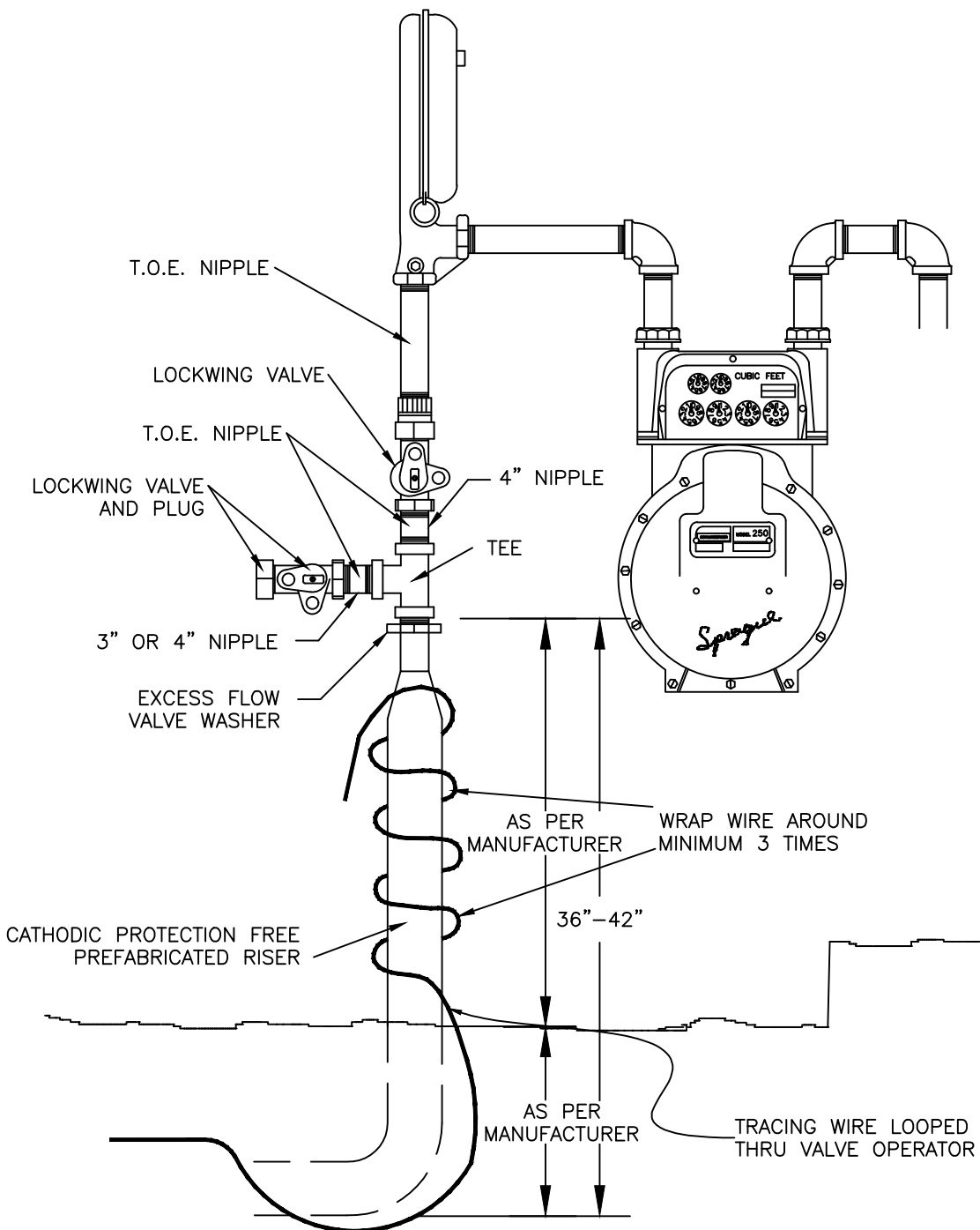


CITY SIDE

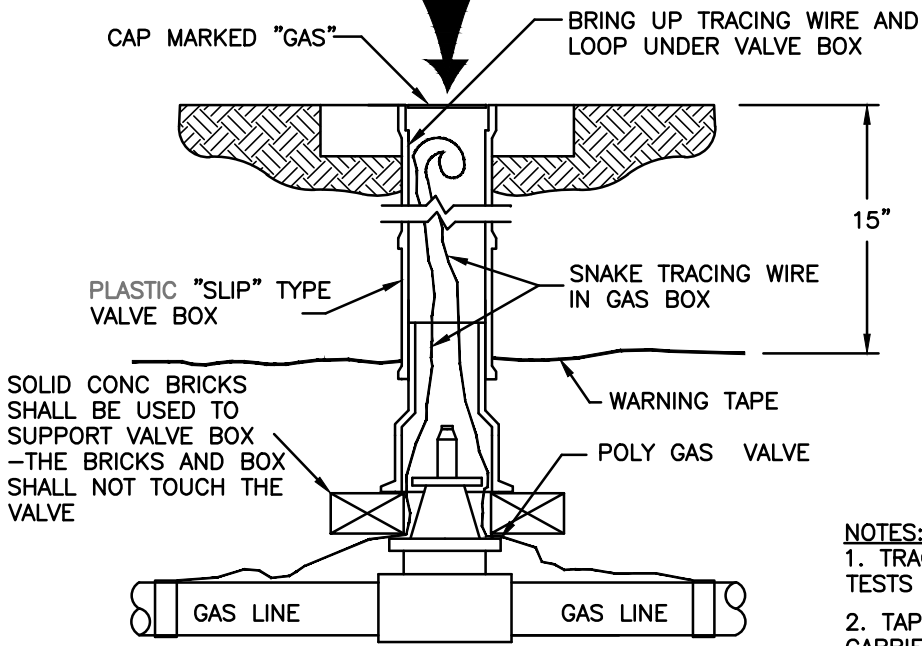
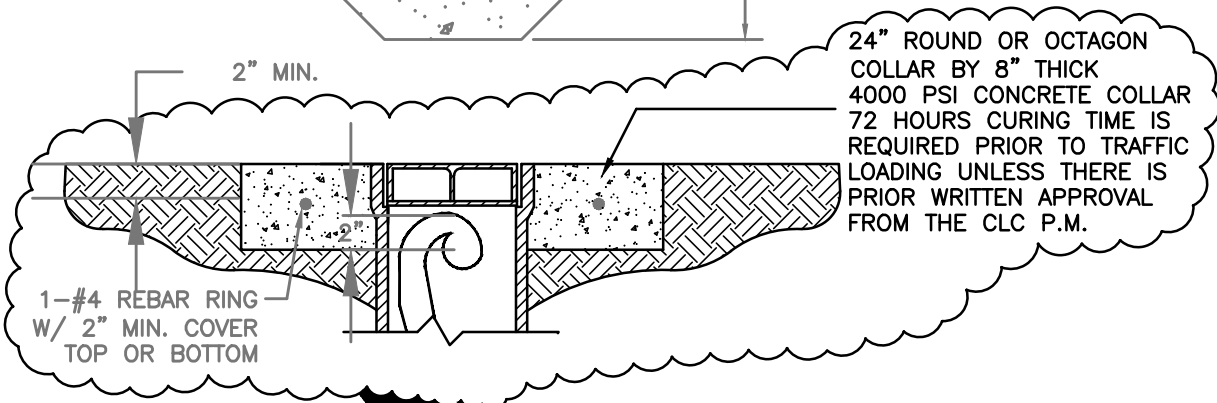
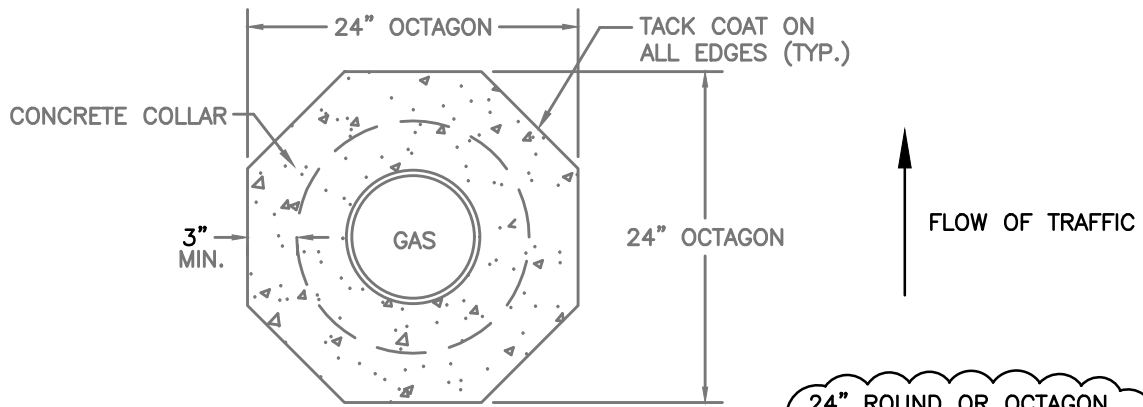
CONTRACTOR (CUSTOMER) RESPONSIBILITY

1. CITY GAS SERVICE RISER
2. GAS SERVICE VALVE
3. CITY PROVIDED GAS PIPING
4. HOUSE GAS REGULATOR
5. 1" ELBOW

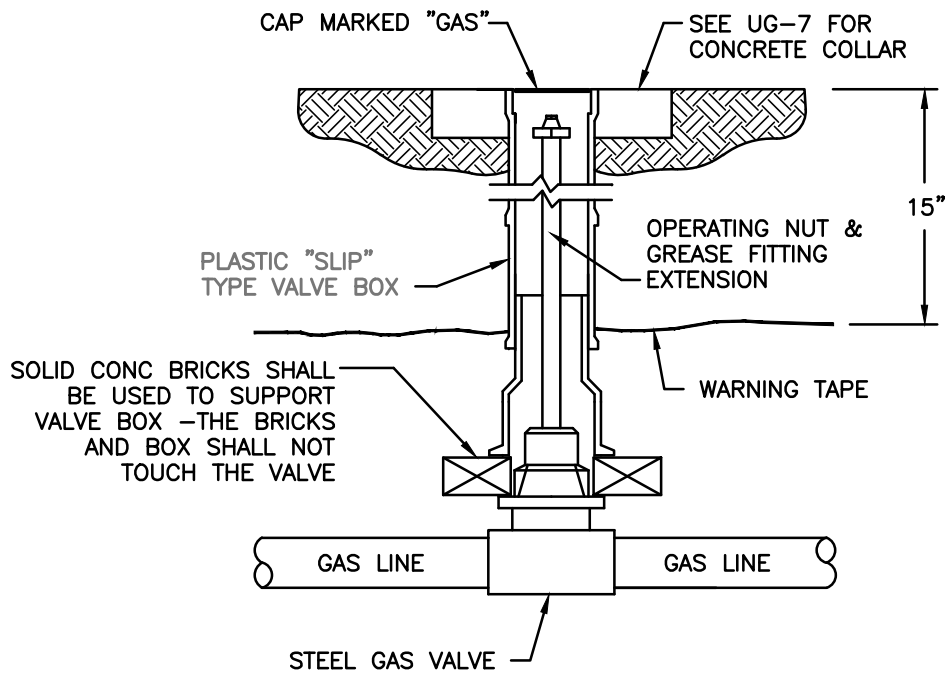
6. GAS PIPING 4" NIPPLES
7. 1" ELBOW



- NOTE:
1. TRACING WIRE CONTINUITY TEST REQUIRED.
 2. BURY LINE MARKER ON THE RISER



- NOTES:**
1. TRACING WIRE CONTINUITY TESTS REQUIRED.
 2. TAPE TRACING WIRE TO CARRIER PIPE @ 5 FT. O.C.



CITY OF LAS CRUCES

STEEL GAS VALVE DETAIL

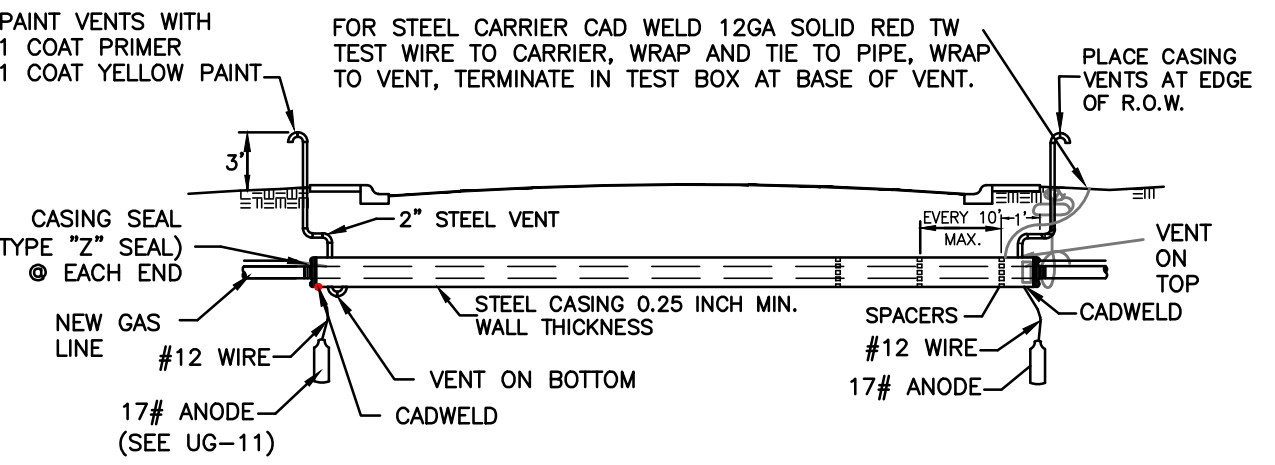
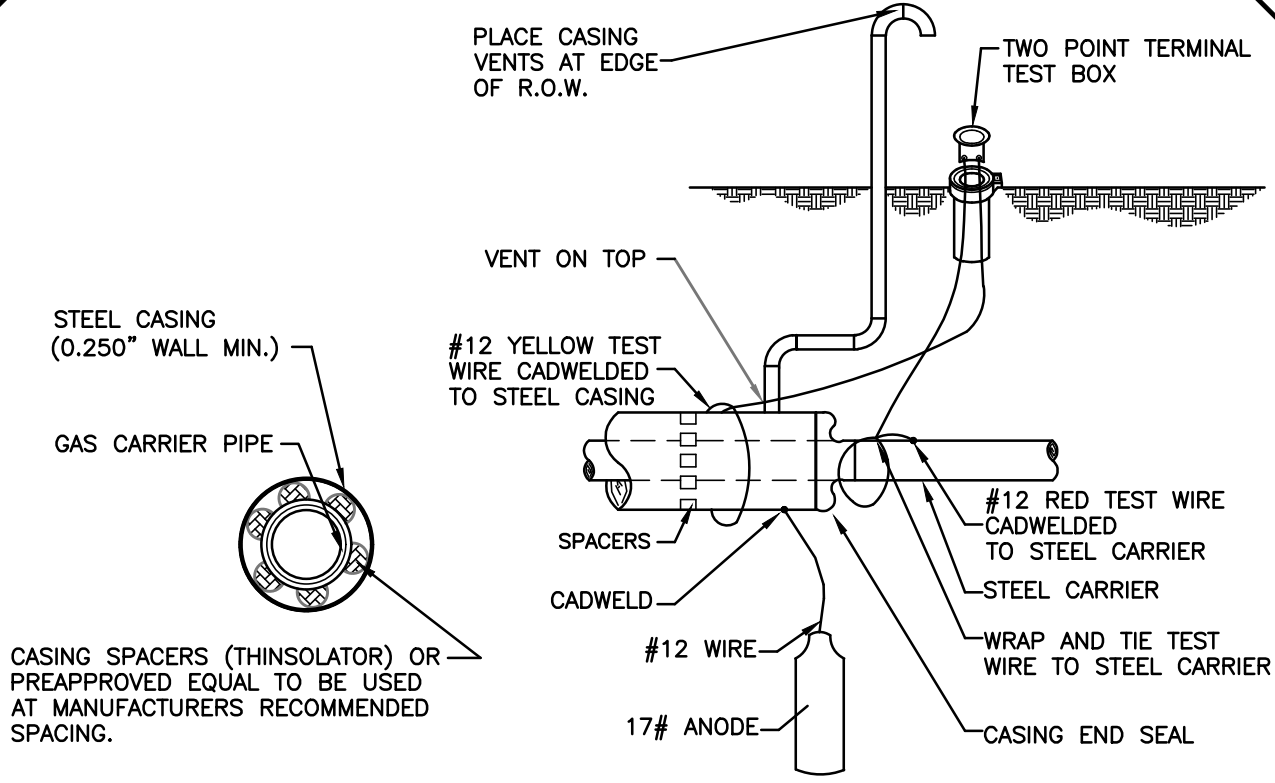
N.T.S.

FILE NAME: 2023 CLC Utility Standard Details.dwg

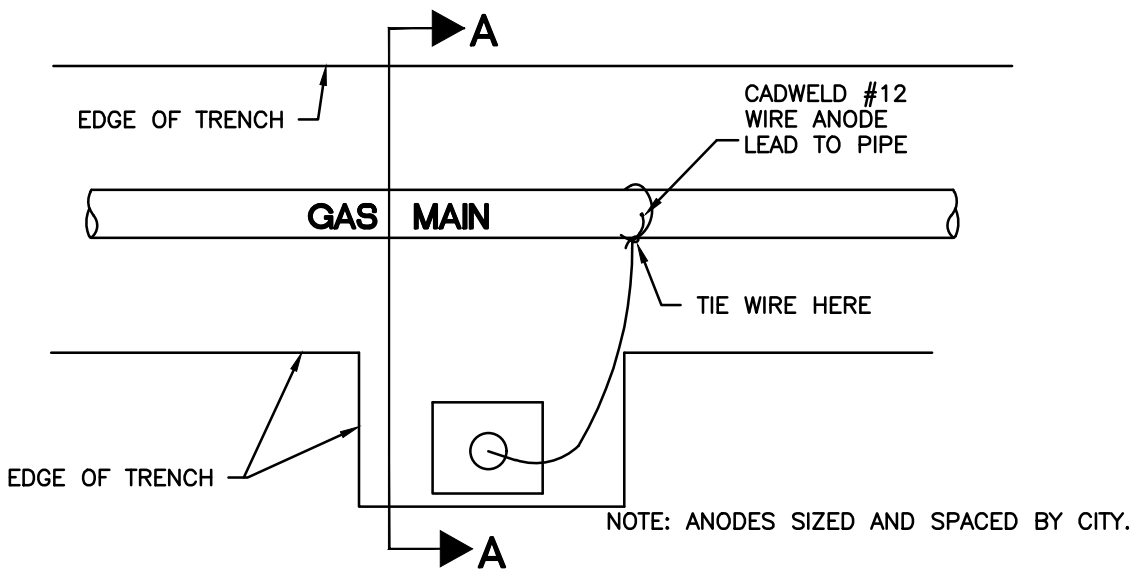
ORIG. DATE: 8/17/00

LAST REVISION: SEPT 2023

DRAWING NO. UG-8

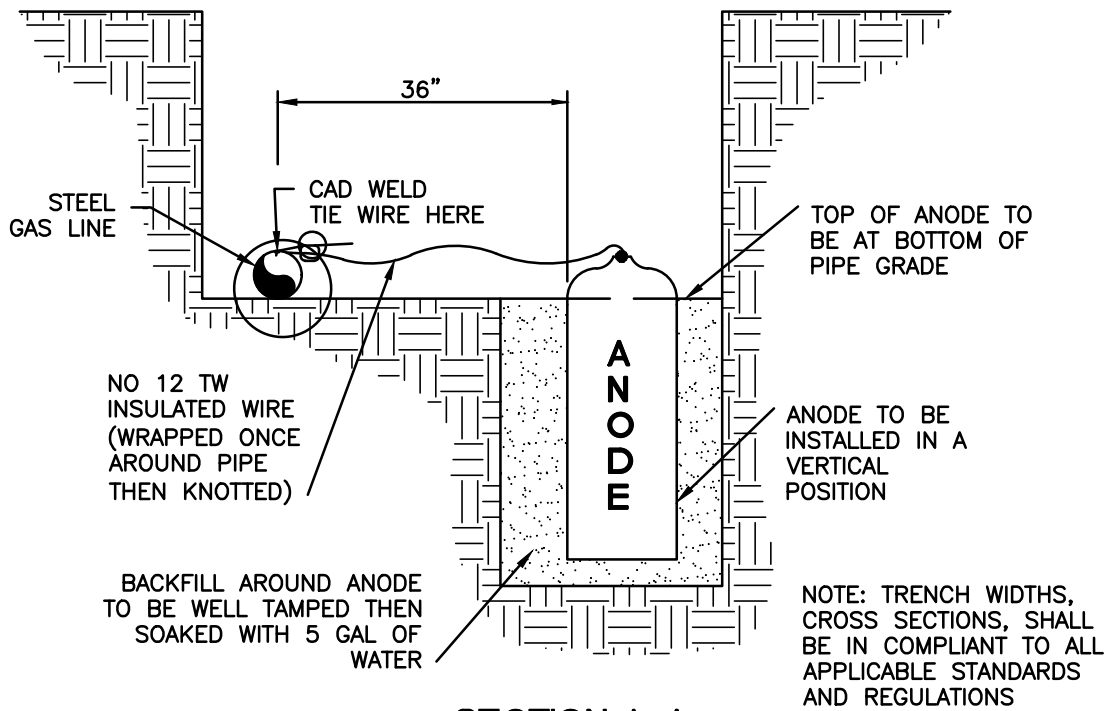


- NOTES:**
1. CASING SIZE TO BE SPECIFIED BY DESIGN ENGINEER (DEPENDENT ON LENGTH OF BORE, SERVICE LINE TYPE, ETC..)
 2. FOR STEEL CARRIER PIPE, SEE SPECIFICATIONS FOR REQUIRED TESTING PRIOR TO CONNECTION.
 3. TRACING WIRE IS PLACED THROUGH CASING WHEN CARRIER PIPE IS POLY.
 4. NO TESTWIRE REQUIRED WHEN CARRIER PIPE IS POLY.



PLAN VIEW

N.T.S.



SECTION A-A

N.T.S.

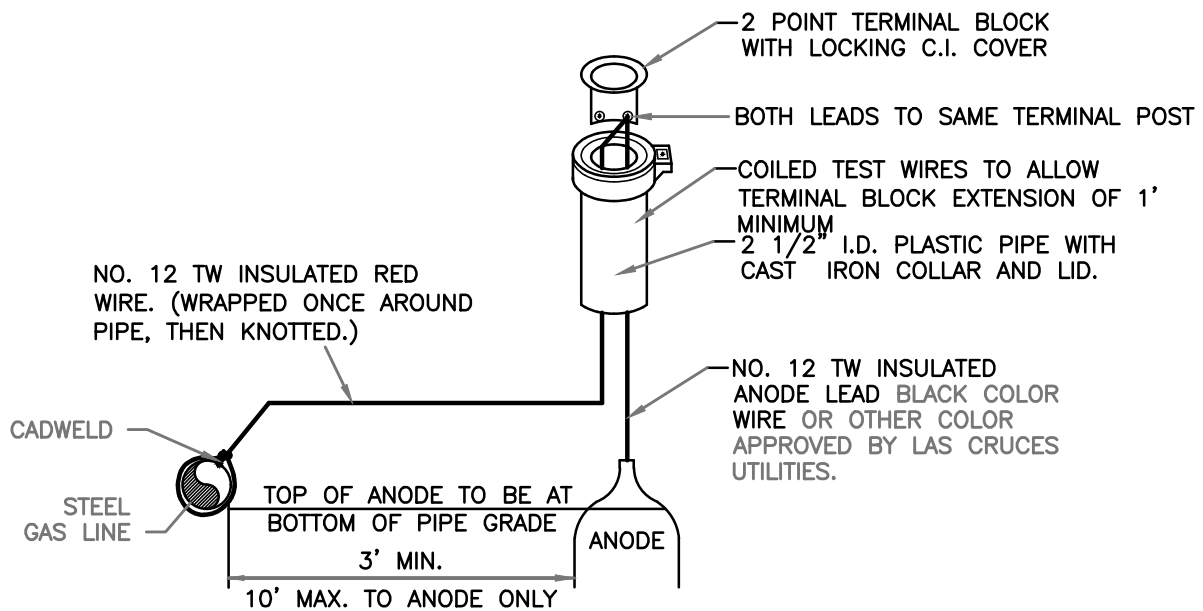
NOTE: TRENCH WIDTHS, CROSS SECTIONS, SHALL BE IN COMPLIANT TO ALL APPLICABLE STANDARDS AND REGULATIONS



CITY OF LAS CRUCES

TYPICAL ANODE INSTALLATION

N.T.S.



NOTE:

1. SPACING AND LOCATION DETERMINED BY THE CITY.
2. 24" OCTAGON CONCRETE COLLAR TO BE INSTALLED.

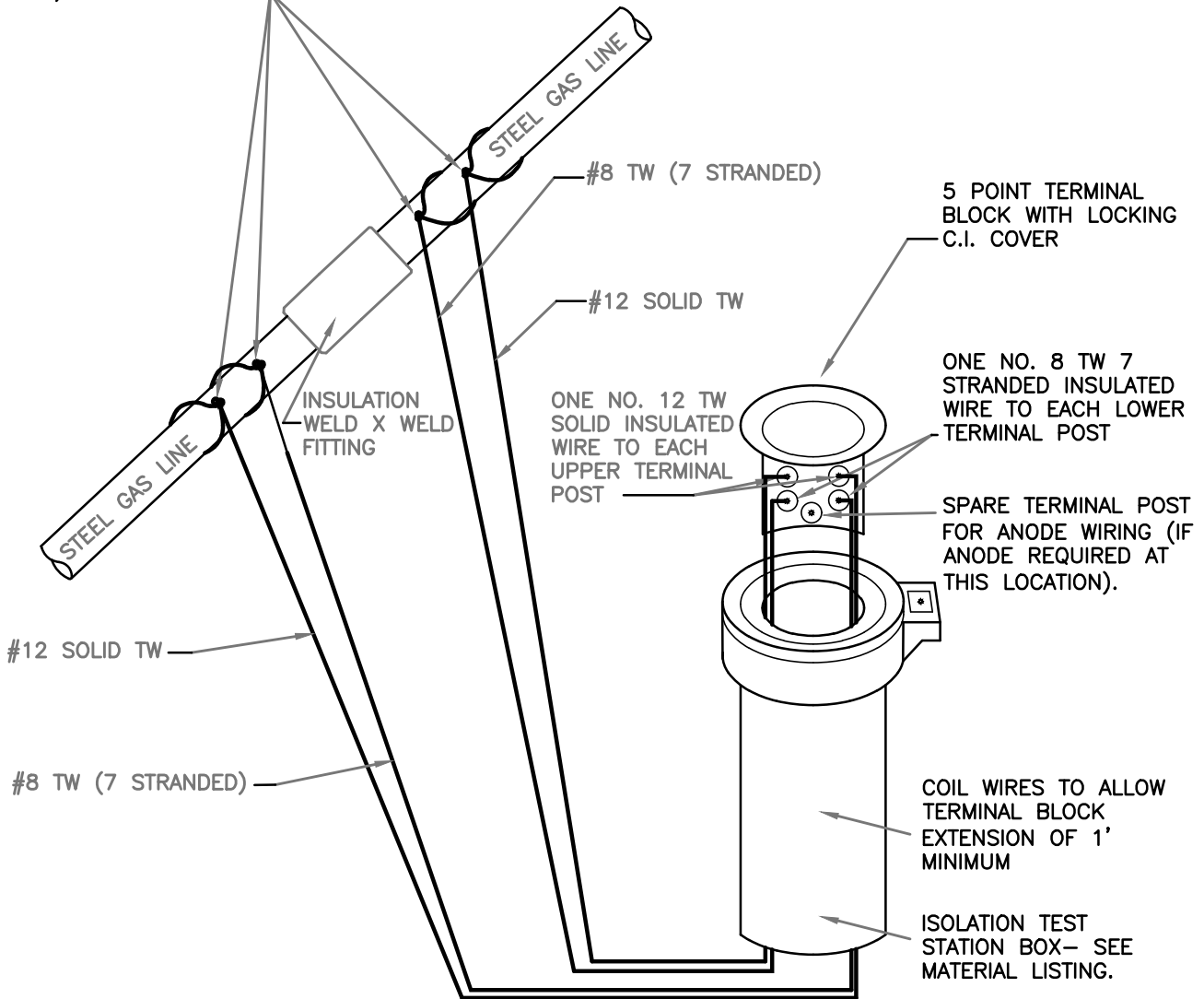


CITY OF LAS CRUCES

ANODE TEST STATION

N.T.S.

ALL WIRES TO BE THERMITE
WELDED (CAD WELDED)
WRAPPED ONCE AROUND
PIPE, THEN KNOTTED



NOTES:

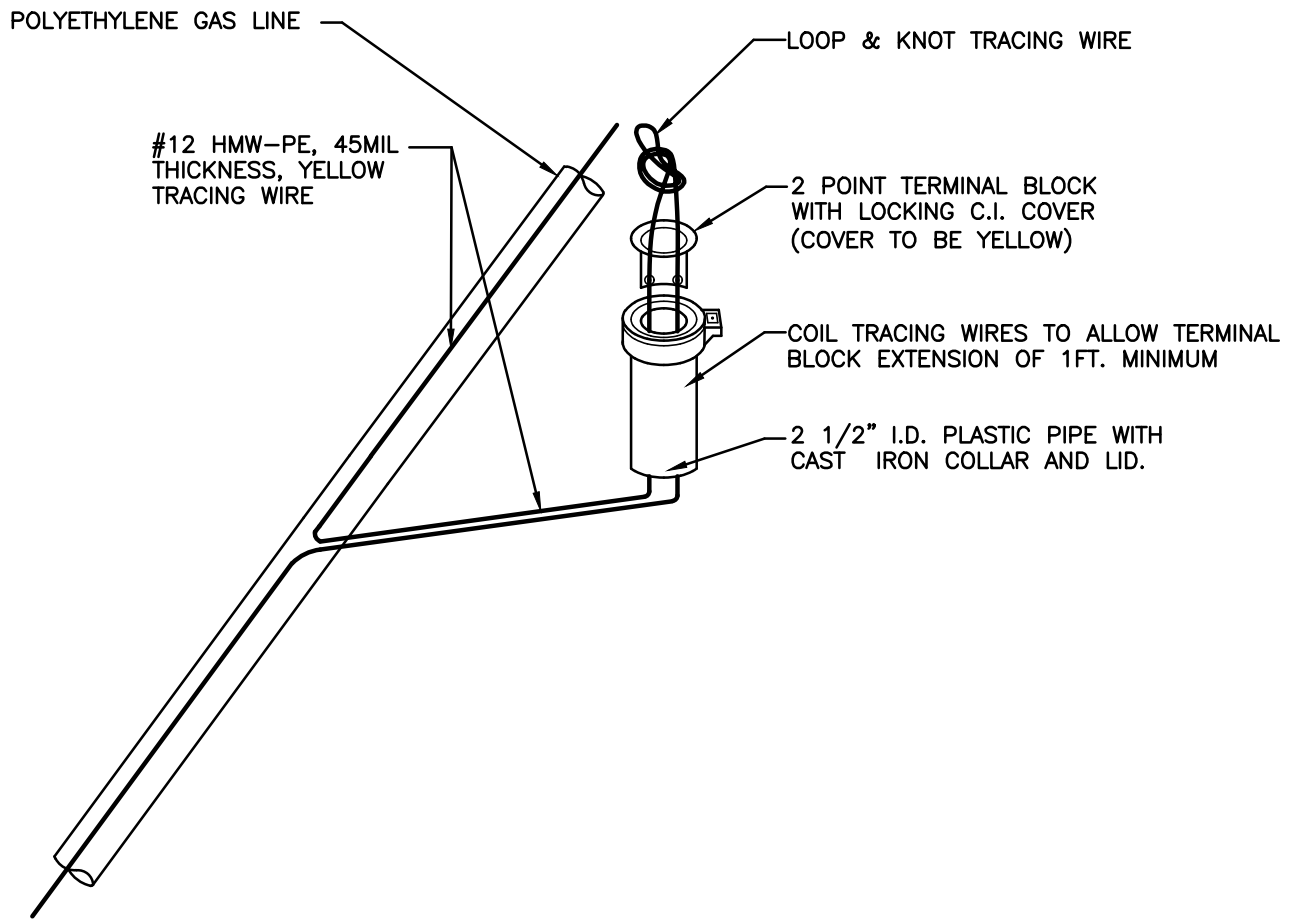
1. LOCATION OF TEST BOX TO BE DETERMINED BY THE CITY OF LAS CRUCES UTILITY DIVISION. THIS LOCATION MAY VARY UP TO 50FT. FROM GAS LINE.
2. NO SPLICES ALLOWED IN ISOLATION TEST STATION WIRING.
3. REFER TO STANDARDS AND MATERIALS LISTS FOR CADWELD PROCEDURES AND MATERIALS.
4. 24" OCTAGON CONCRETE COLLAR TO BE INSTALLED.



CITY OF LAS CRUCES

ISOLATION (INSULATION) TEST STATION

N.T.S.



NOTES:

1. SPACING AND LOCATION OF TEST BOXES TO BE DETERMINED BY THE CITY UTILITIES DIVISION.
2. TEST BOX LOCATION MAY VARY, UP TO 50 FT. FROM GAS LINE.
3. REFER TO STANDARDS AND MATERIALS LISTS FOR MATERIALS.
4. TRACING WIRE SHALL EXTEND A MINIMUM OF 12" ABOVE TEST STATION.
5. 24" OCTAGON CONCRETE COLLAR TO BE INSTALLED.



CITY OF LAS CRUCES

TRACING WIRE TEST STATION

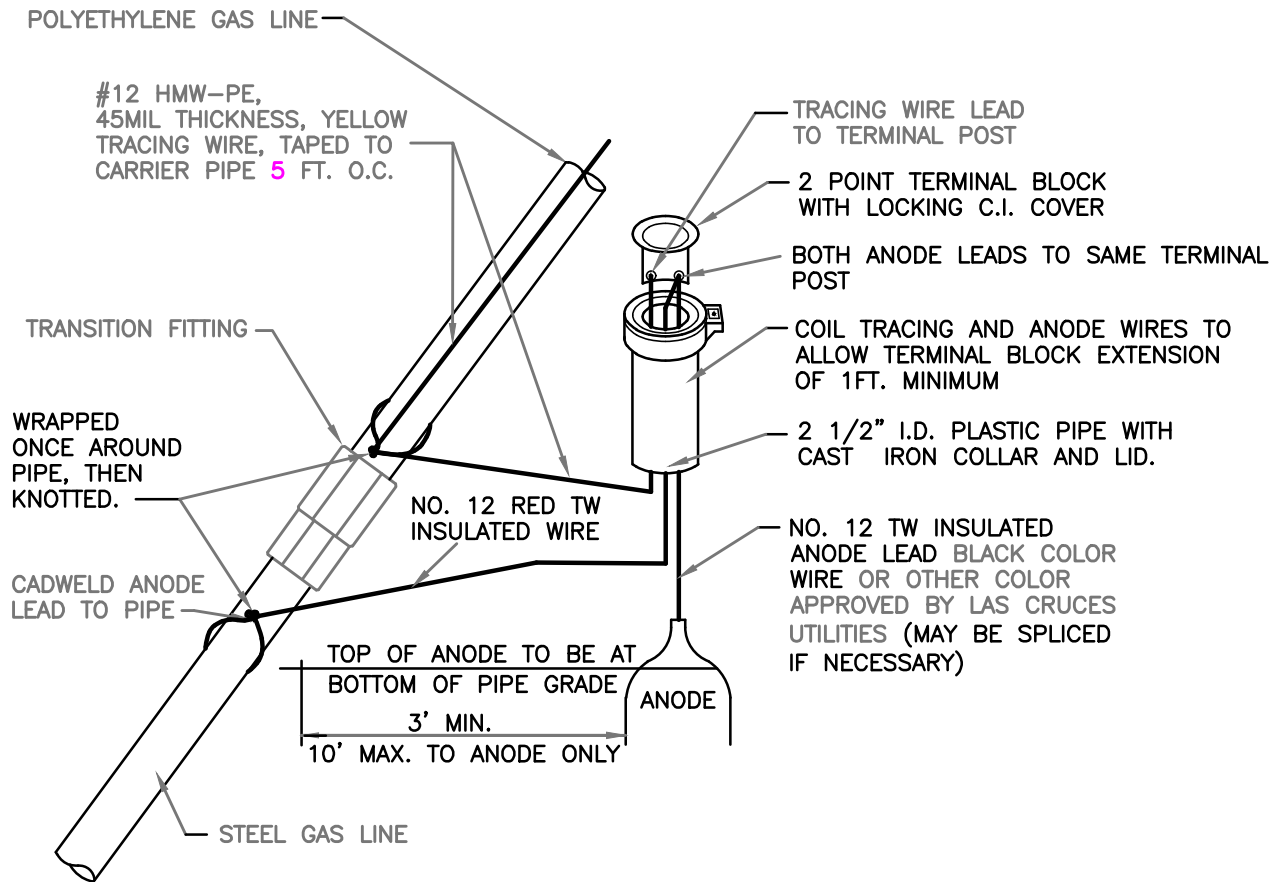
N.T.S.

FILE NAME: 2023 CLC Utility Standard Details.dwg

ORIG. DATE: 5/05/03

LAST REVISION: SEPT 2023

DRAWING NO. **UG-13**



NOTES:

1. SPACING AND LOCATION OF ANODES AND TEST BOXES TO BE DETERMINED BY THE CITY UTILITIES DEPARTMENT.
2. ANODES TO BE INSTALLED VERTICALLY.
3. TEST BOX LOCATION MAY VARY, UP TO 50 FT. FROM GAS LINE.
4. ANODE LEAD WIRE (TO TEST BOX AND TO CADWELD) IS THE ONLY WIRE WHICH MAY BE SPLICED. IF SPLICE IS NEEDED, SPLICE KITS (SEE MATERIAL LIST) WILL BE USED.
5. REFER TO STANDARDS AND MATERIALS LISTS FOR CADWELD PROCEDURES AND MATERIALS.
6. 24" OCTAGON CONCRETE COLLAR TO BE INSTALLED.

CHANGE TRACING WIRE TAPE REQUIREMENT



CITY OF LAS CRUCES

STEEL TO POLYETHYLENE TRANSITION

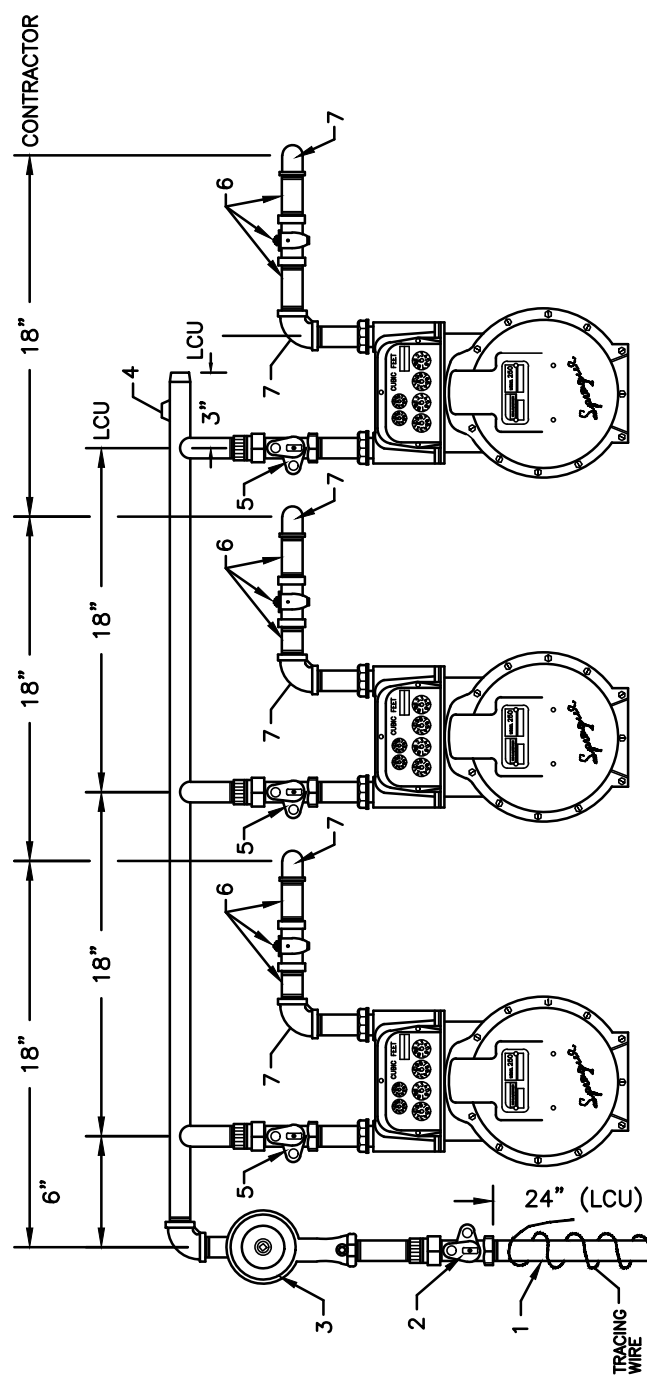
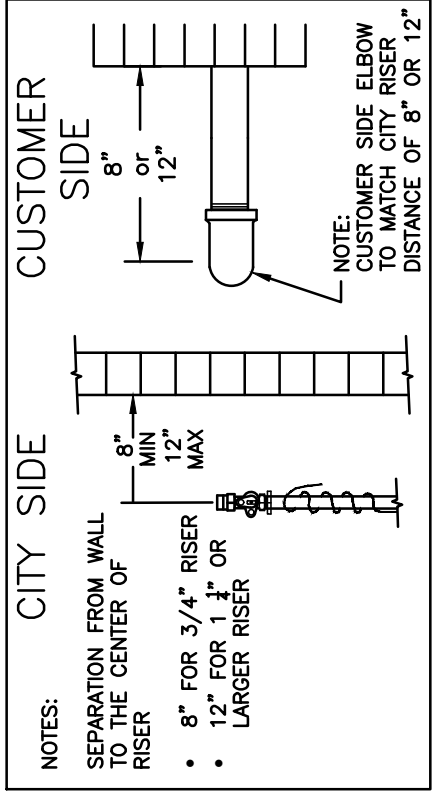
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FILE NAME: 2023 CLC Utility Standard Details.dwg

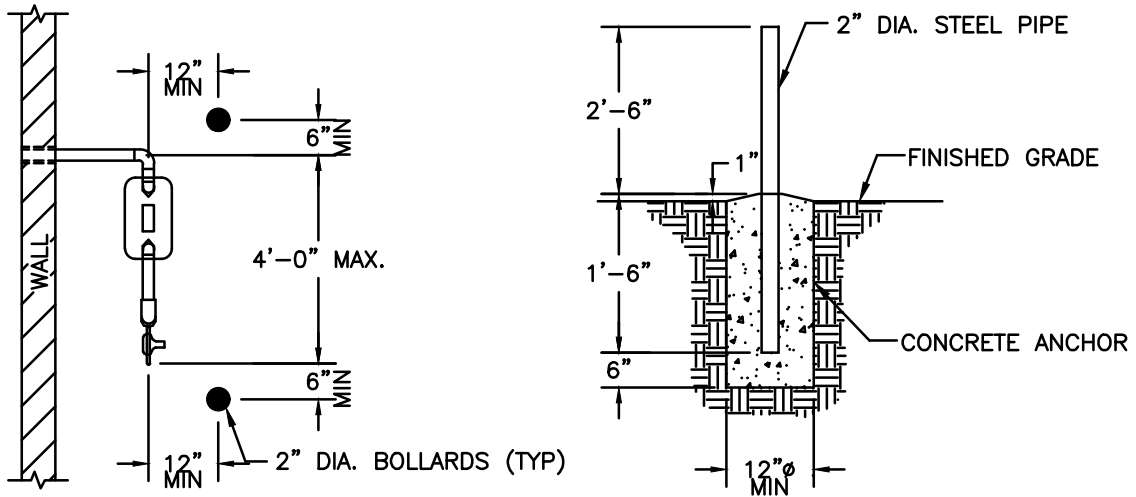
ORIG. DATE: 8/11/00

LAST REVISION: SEPT 2023

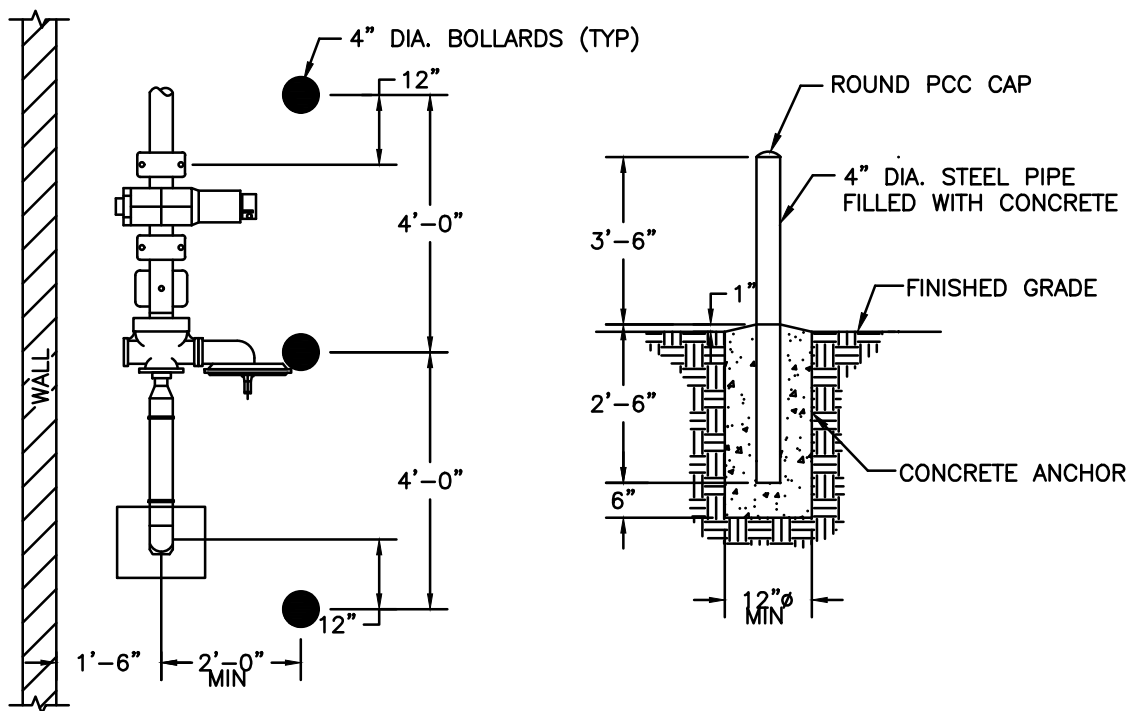
DRAWING NO. **UG-14**



- CITY SIDE**
1. CITY GAS SERVICE RISER (TOP OF RISER TO FINISH GRADE)
 2. INSULATED LOCK WING VALVE
 3. MULTIPLE METER SERVICE REGULATOR
 4. DISTRIBUTION GAS PRESSURE TAP THREAD-O-LET
 5. NON INSULATED LOCK WING VALVE
- CUSTOMER RESPONSIBILITY**
6. CUSTOMER PROVIDED SHUT-OFF VALVE/FITTINGS FROM BEGINNING OF CUSTOMER PIPING.
 7. 1" ELBOW



SMALL RESIDENTIAL/COMMERCIAL



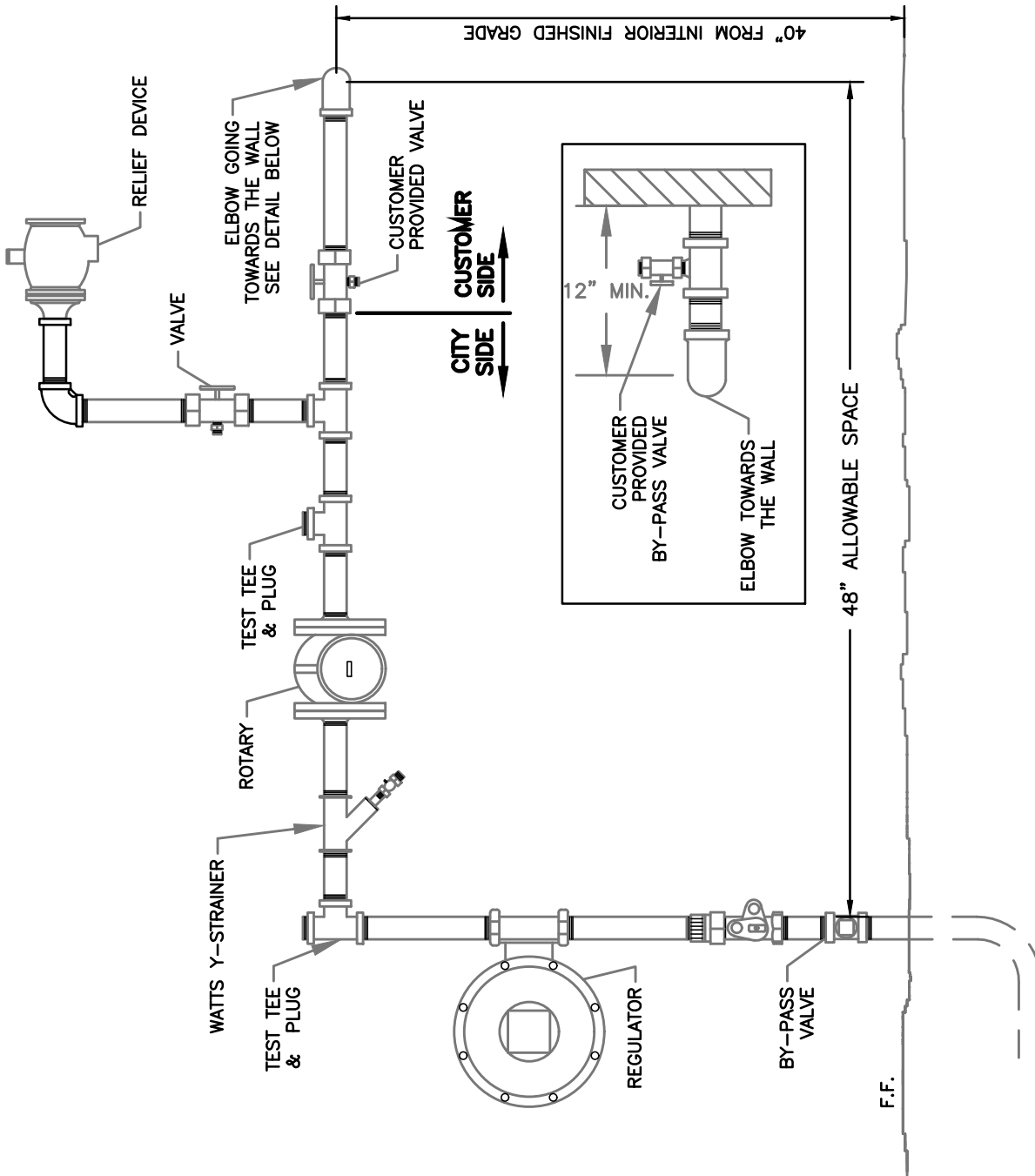
LARGE COMMERCIAL/INDUSTRIAL/MULTI-FAMILY



CITY OF LAS CRUCES

GAS METER BOLLARDS

N.T.S.



CITY OF LAS CRUCES

SINGLE COMMERCIAL GAS METER

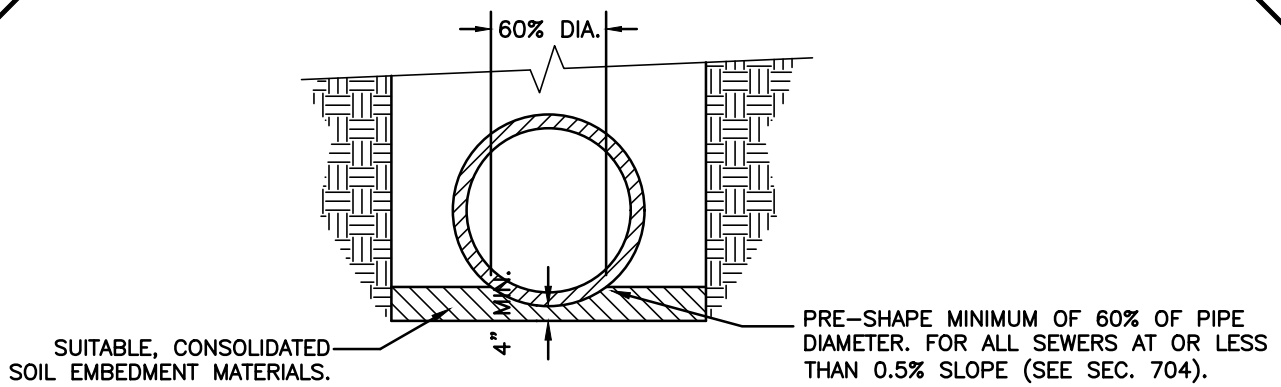
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FILE NAME: 2023 CLC Utility Standard Details.dwg

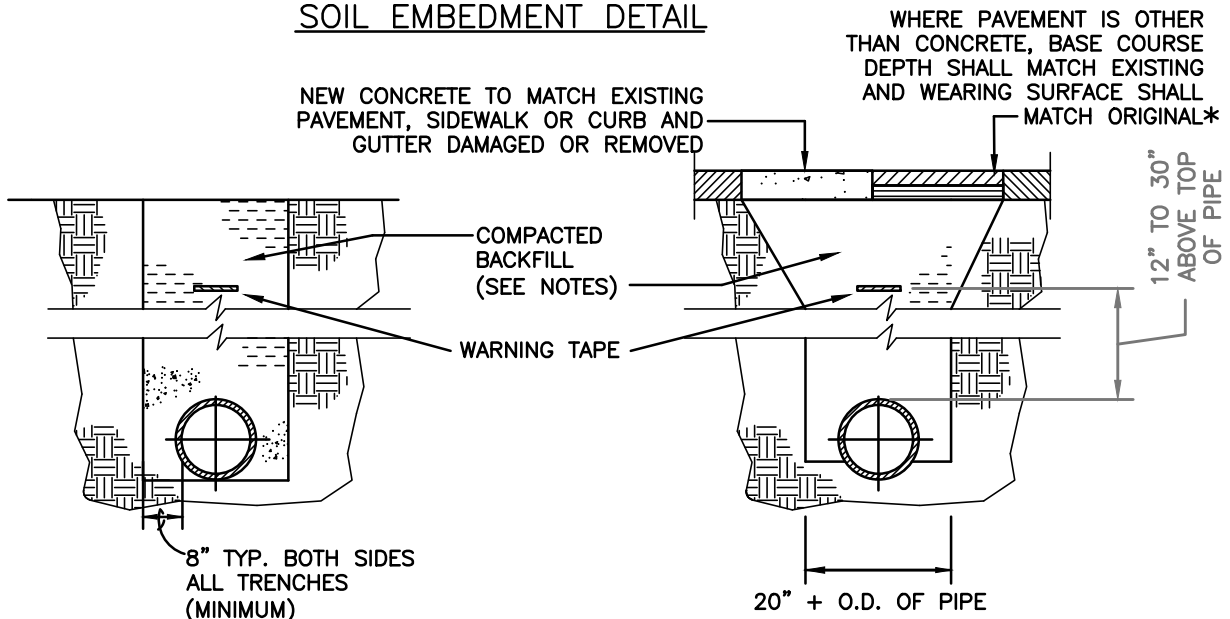
ORIG. DATE: 4/11/06

LAST REVISION: SEPT 2023

DRAWING NO. **UG-17**



SOIL EMBEDMENT DETAIL



UNPAVED ROAD TRENCH

BACKFILL IN UNPAVED STREETS, ALLEYS, AND DRIVEWAYS SHALL BE COMPACTED TO 90% COMPACTION AS DETERMINED BY AASHTO T-180 (ASTM D1557) UNLESS OTHERWISE NOTED

UNDER PAVEMENT

BACKFILL SHALL BE COMPACTED TO 95% COMPACTION AS DETERMINED BY AASHTO T-180 (ASTM D1557)

GENERAL NOTES:

1. TRENCH WIDTHS, CROSS SECTIONS, SHALL BE IN COMPLIANT TO ALL APPLICABLE SAFETY STANDARDS AND REGULATIONS.
2. TESTING REQUIREMENTS (SEC. 706) INCLUDE VISUAL TESTING OF ALL MAIN LINES LAID AT OR FLATTER THAN MINIMUM SLOPES (PG 700-11).
3. TRACING WIRE REQUIRED TO BE PLACED ABOVE ALL FORCE MAINS.
4. TRACING WIRE IF REQUIRED TO BE TAPED TO MAIN @ 10 FT. O.C.
5. TRACING WIRE TO BE ACCESSIBLE, WITHIN VALVE BOX, SERVICE POINT, OR WITHIN AN INSTALLED TWO POINT TEST BOX, @ 500 FT. O.C. MAXIMUM.

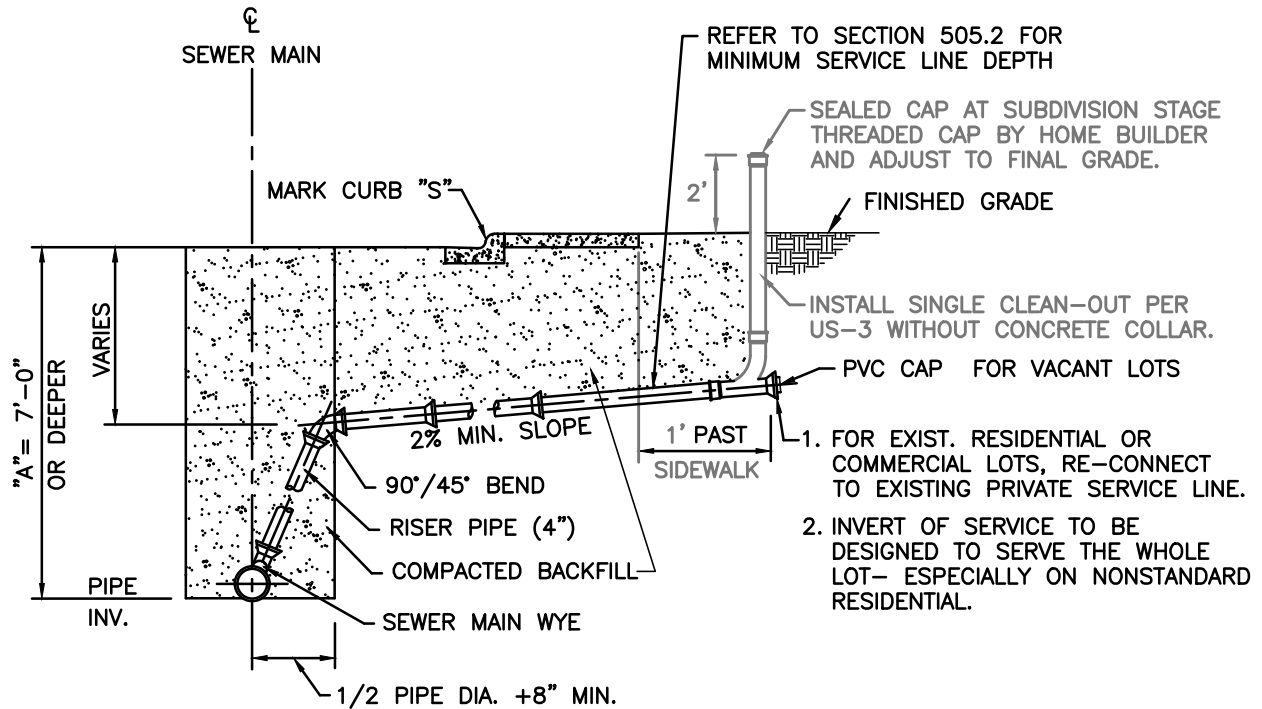
* THE THICKNESS OF THE PAVEMENT PATCH SHALL MATCH THE DEPTH OF THE ADJACENT PAVEMENT SURFACES PLUS ONE INCH AND SHALL BE A MINIMUM 3" THICK.



CITY OF LAS CRUCES

TYPICAL SEWER TRENCHING DETAILS

N.T.S.



NOTES:

WHEN "A" IS LESS THAN 7'-0", DELETE RISER PIPE. USE 45° ELL IN PLACE OF 90° ELL. TURN SEWER MAIN TEE OR WYE TOWARD SERVICE SIDE AT A 45° ANGLE.

CLEAN-OUT TO BE INSTALLED AT SUBDIVISION STAGE (REFERENCE SECTION 504.2).

TRENCH WIDTHS, CROSS SECTIONS, SHALL BE IN COMPLIANCE WITH ALL APPLICABLE SAFETY STANDARDS AND REGULATIONS.



CITY OF LAS CRUCES

TYPICAL SEWER SERVICE STUB-OUT

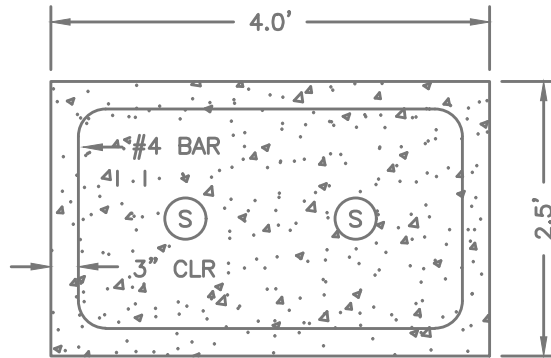
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FILE NAME: 2023 CLC Utility Standard Details.dwg

ORIG. DATE: 8/17/00

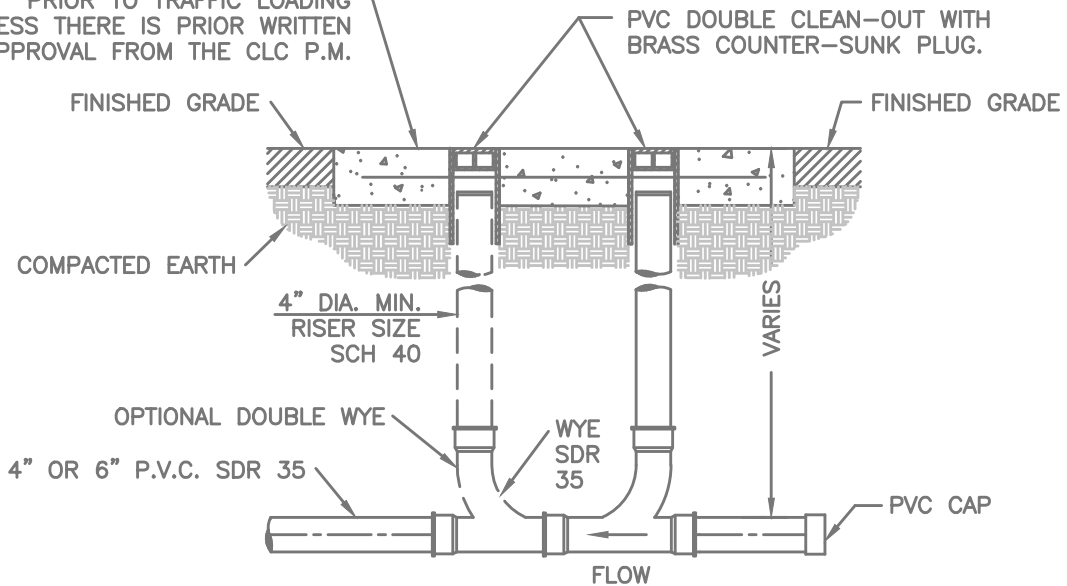
LAST REVISION: SEPT 2023

DRAWING NO. **US-2**



DOUBLE CLEAN-OUT PLAN VIEW

8" THICK 4000 PSI CONCRETE 72 HOURS CURING TIME IS REQUIRED PRIOR TO TRAFFIC LOADING UNLESS THERE IS PRIOR WRITTEN APPROVAL FROM THE CLC P.M.



CITY OF LAS CRUCES

SERVICE CLEAN-OUT DETAILS

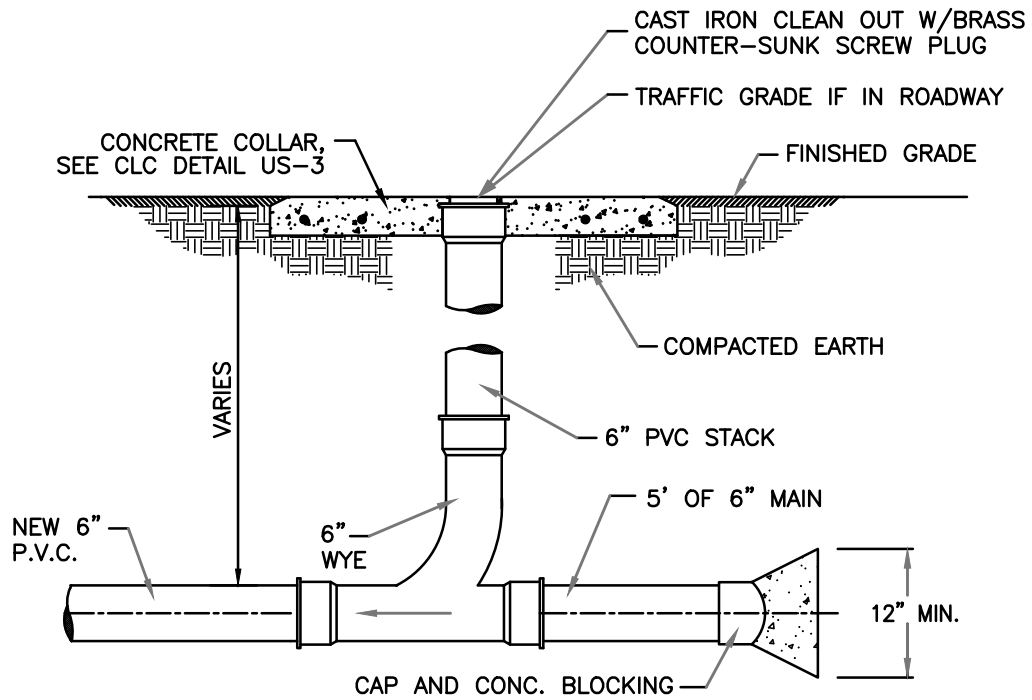
N.T.S.

FILE NAME: 2023 CLC Utility Standard Details.dwg

ORIG. DATE: 11/15/99

LAST REVISION: SEPT 2023

DRAWING NO. **US-3**



CITY OF LAS CRUCES

MAIN LINE CLEAN OUT

N.T.S.

FILE NAME: 2023 CLC Utility Standard Details.dwg

ORIG. DATE: 8/14/00

LAST REVISION: SEPT 2023

DRAWING NO. **US-4**

NOTES:

PRECAST PORTIONS OF MANHOLES, EXCLUDING CAST IN PLACE BOTTOM, SHALL CONFORM TO ASTM C478, LATEST REVISIONS.

CONCRETE COLLAR SEE DETAIL US-9.

THIS SIZE CONCRETE ONLY WHEN TOP OF MANHOLE IS ABOVE GROUND. (NO REINF.) 3-1/2" BOLTS DRILLED AND EPOXIED INTO CONE.

PRECAST CONCRETE CONE (6' M.H. ARE FLAT TOP)

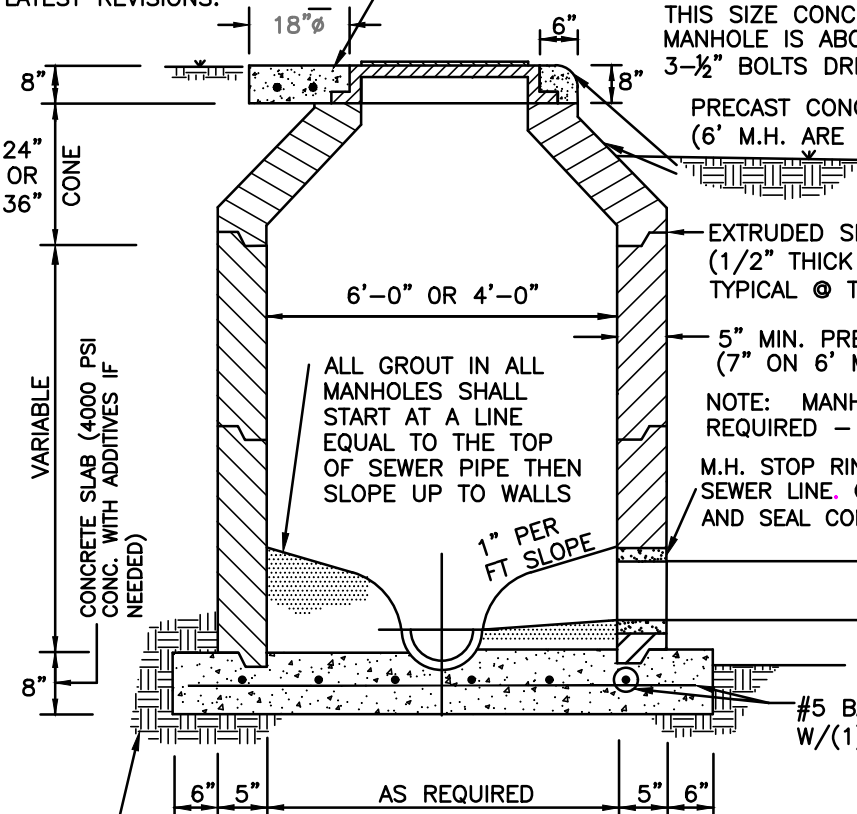
EXTRUDED SEALING TAPE AT ALL JOINTS (1/2" THICK RAM NECK OR EQUAL TYPICAL @ TOP & BOTTOM AND ALL JOINTS)

5" MIN. PRECAST RINGS (7" ON 6' M.H.)

NOTE: MANHOLE COATING MAY BE REQUIRED - SEE DESIGN STANDARDS

M.H. STOP RING GASKETED AROUND NEW SEWER LINE. GROUT AROUND NEW SEWER LINE AND SEAL COMPLETELY W/NON-SHRINK GROUT.

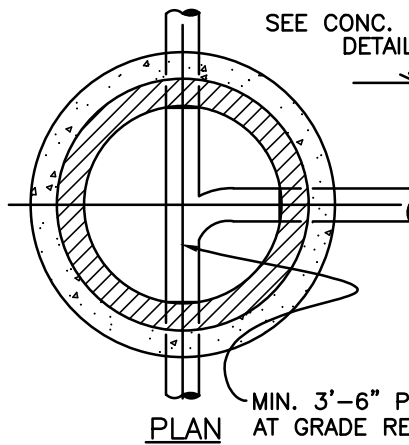
NOTE: WATER STOP GASKETS REQUIRED ON ALL PIPES ENTERING THE M.H.



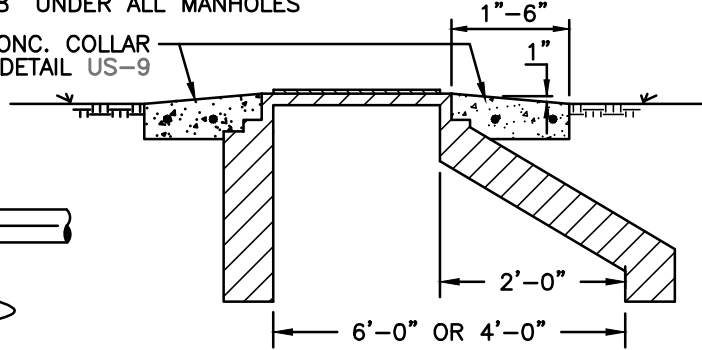
VARIABLE CONCRETE SLAB (4000 PSI CONC. WITH ADDITIVES IF NEEDED)

MATERIAL COMPACTED TO 95% OF MOD. PROCTOR (ASTM D1557) DENSITY 8" UNDER ALL MANHOLES

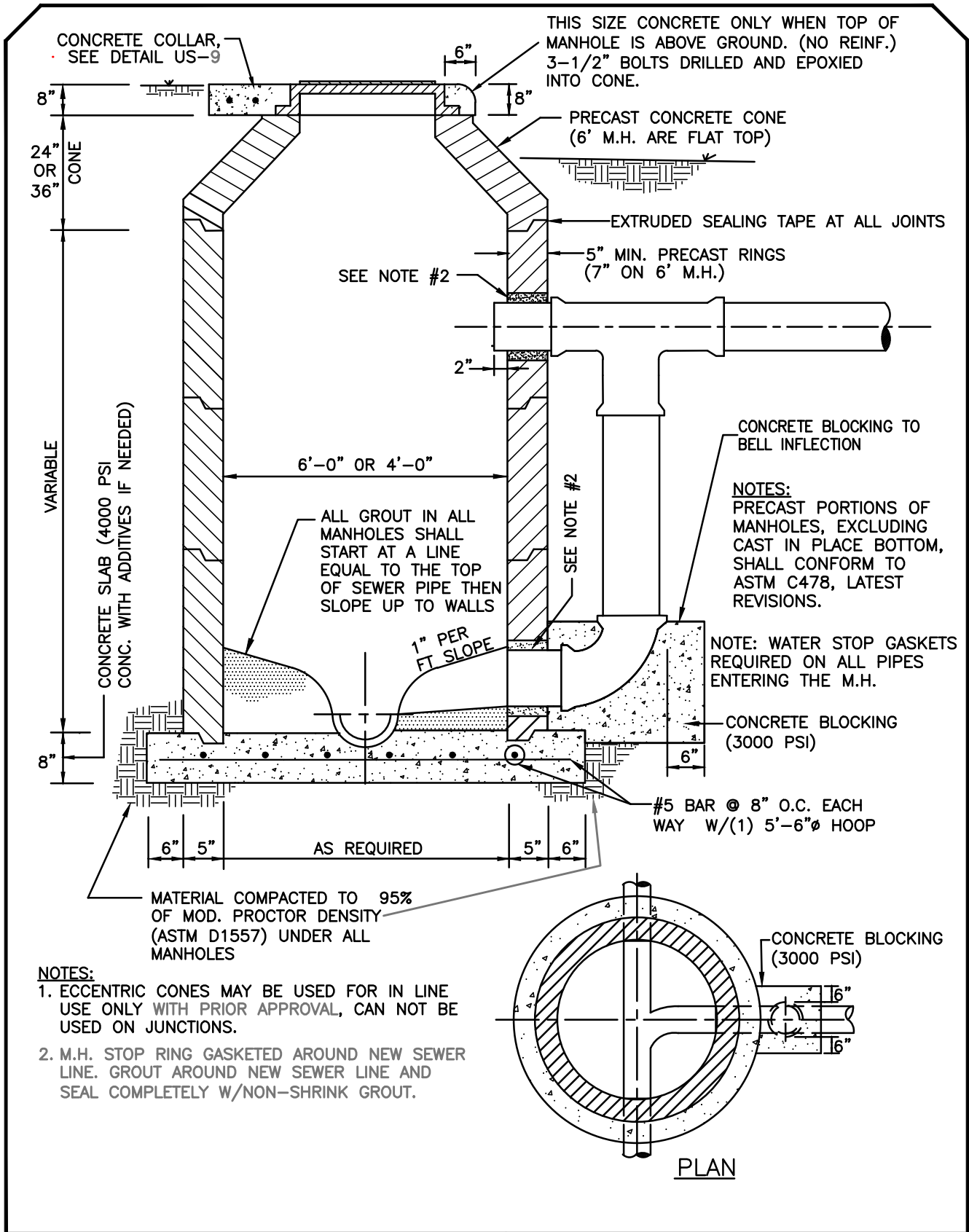
#5 BAR @ 8" O.C. EACH WAY W/(1) 5'-6" HOOP



PLAN MIN. 3'-6" PIPE OPENING AT GRADE REQUIRED



MANHOLE RING DETAIL-UNPAVED AREAS
NOTE: ECCENTRIC CONES MAY BE USED FOR IN LINE USE ONLY WITH PRIOR APPROVAL, CAN NOT BE USED ON JUNCTIONS.



NOTES:

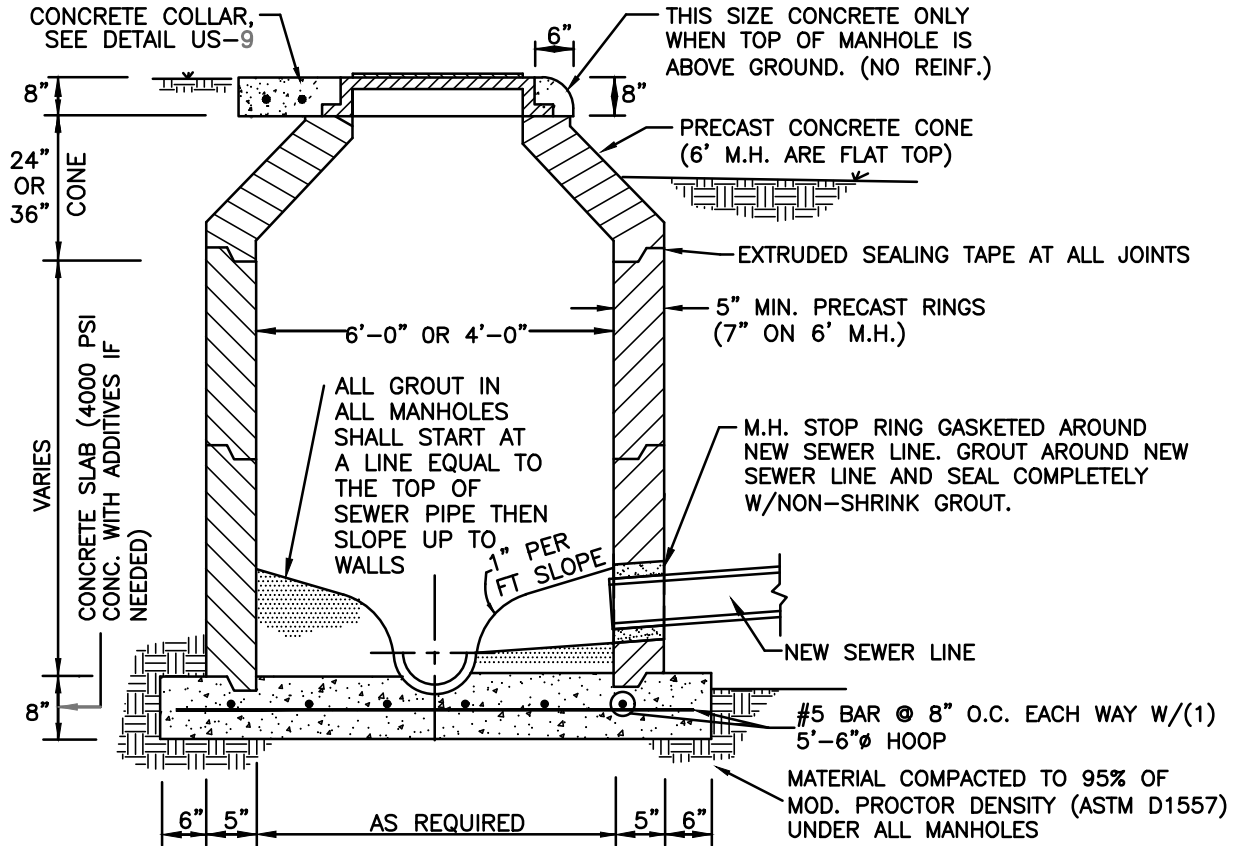
1. ECCENTRIC CONES MAY BE USED FOR IN LINE USE ONLY WITH PRIOR APPROVAL, CAN NOT BE USED ON JUNCTIONS.
2. M.H. STOP RING GASKETED AROUND NEW SEWER LINE. GROUT AROUND NEW SEWER LINE AND SEAL COMPLETELY W/NON-SHRINK GROUT.



CITY OF LAS CRUCES

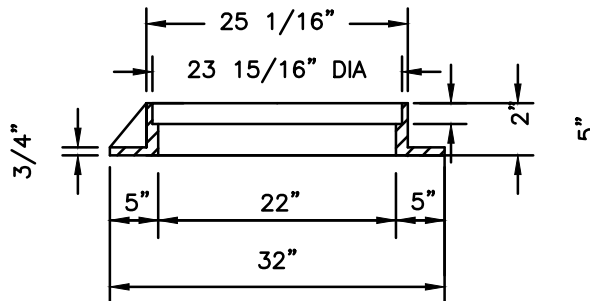
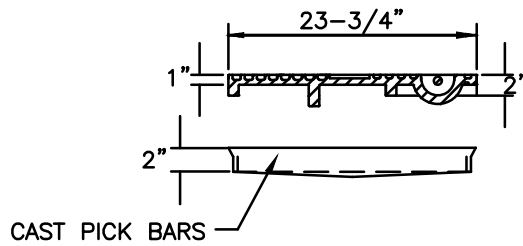
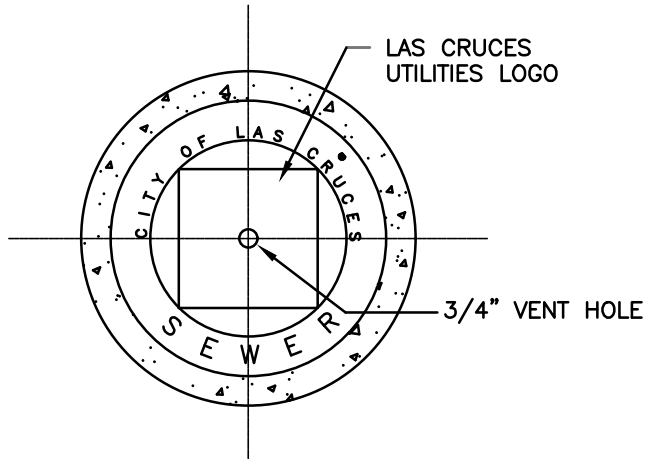
TYPICAL MANHOLE DETAIL W/DROP

N.T.S.



GENERAL NOTES:

1. IF NEW PIPE INVERT IS BELOW EXISTING GROUTED SHELF, SHELF IS TO BE CUT OUT AS NEEDED AND REGROUTED PER US-5.
2. PRECAST PORTIONS OF MANHOLES, EXCLUDING CAST IN PLACE BOTTOM, SHALL CONFORM TO ASTM C478, LATEST REVISIONS.



NOTES:

CAST IRON

MIN TOTAL WT. - 300 LBS.
 MIN COVER WT. - 134 LBS.
 MIN RING WT. - 165 LBS.

DUCTILE IRON

MIN TOTAL WT. - 266 LBS.
 MIN COVER WT. - 141 LBS.
 MIN RING WT. - 125 LBS.

MANHOLE SHALL MEET AASHTO M 306-05 (OR LATEST PUBLICATION) H-20 LOADING AND BE THE FOLLOWING: EAST JORDAN IRON WORKS 2023 MANHOLE LID AND RING (OR APPROVED EQUAL) WITH "CITY OF LAS CRUCES" AND "SEWER" OR "SANITARY SEWER" LETTERING AND LAS CRUCES UTILITY LOGO.



CITY OF LAS CRUCES

MANHOLE RING AND COVER

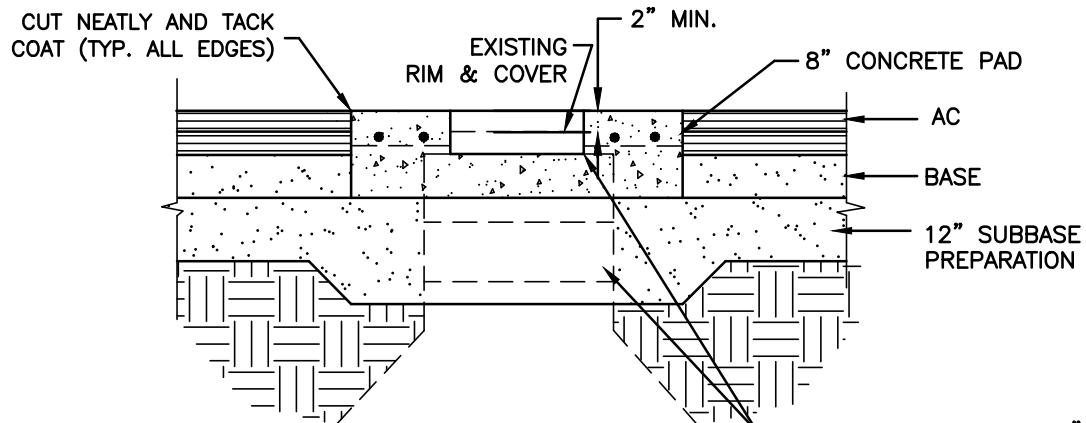
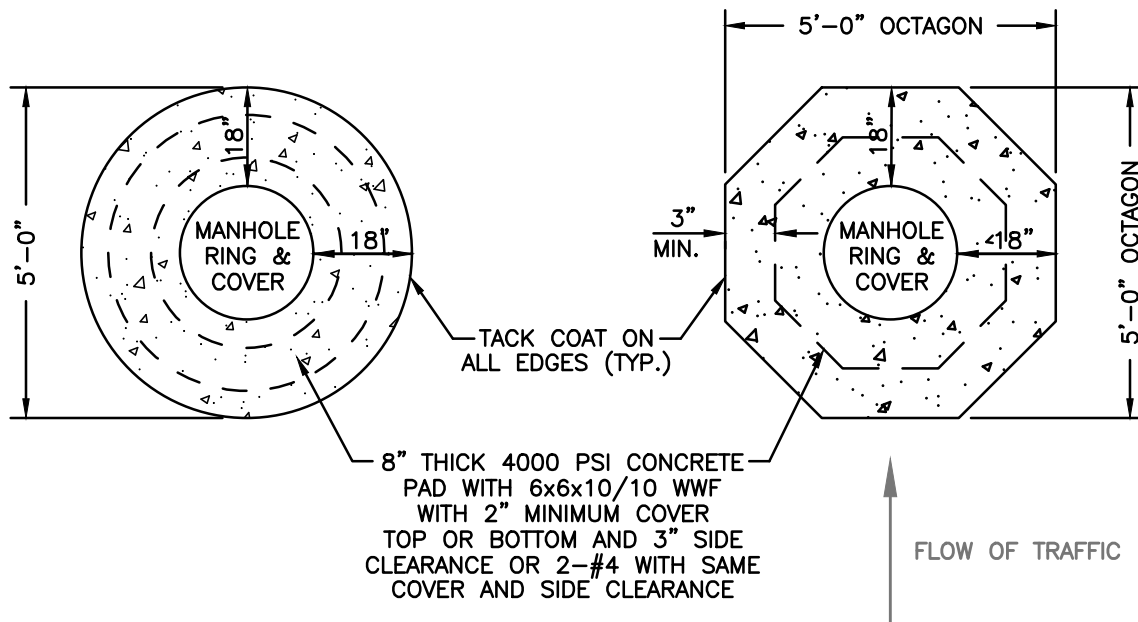
N.T.S.

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ORIG. DATE: 8/14/00

LAST REVISION: SEPT 2023

DRAWING NO. **US-8**



NOTES:
 PRECAST PORTIONS OF MANHOLES,
 EXCLUDING CAST IN PLACE BOTTOM,
 SHALL CONFORM TO ASTM C478,
 LATEST REVISIONS.

MAX. 3 COURSES OF 2" SOLID
 BRICKS OR CONCRETE PRE-CAST
 MANHOLE ADJUSTMENT RINGS AS
 REQUIRED BUT NO MORE THAN
 18" TOTAL OF ADJUSTMENT
 (RINGS AND BRICKS) CAN BE
 PLACED INCLUDING MANHOLE
 RING AND COVER.



CITY OF LAS CRUCES

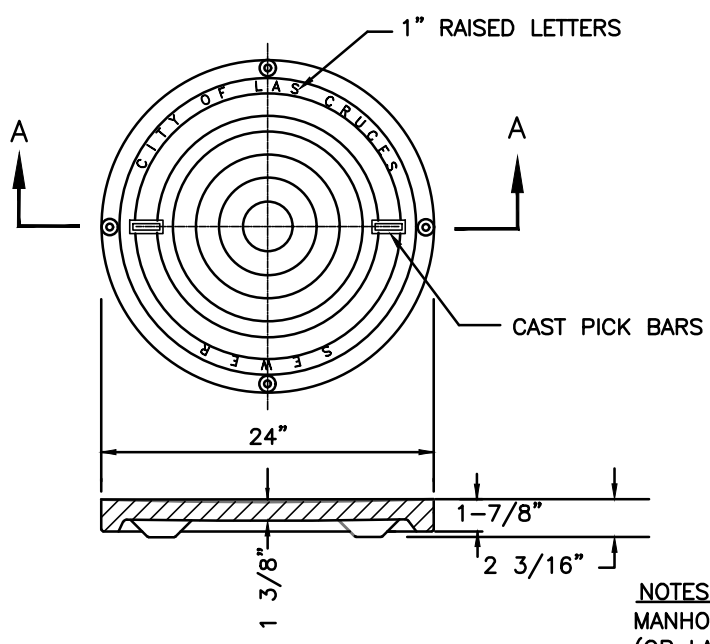
MANHOLE ADJUSTMENT DETAIL

N.T.S.

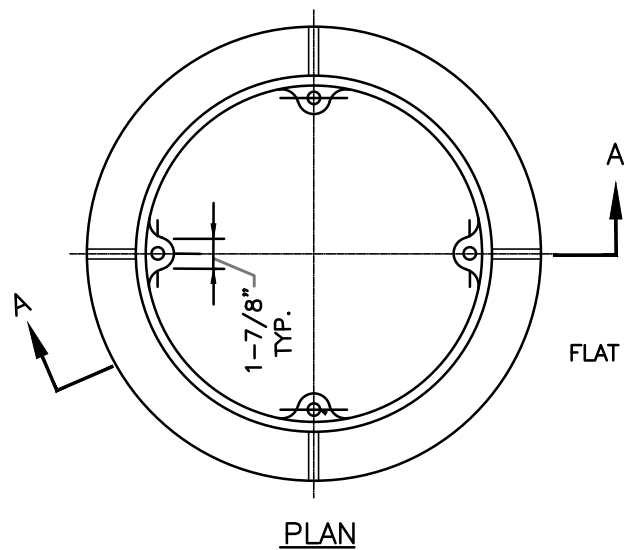
FILE NAME: 2023 CLC Utility Standard Details.dwg ORIG. DATE: 8/14/00

LAST REVISION: SEPT 2023

DRAWING NO. **US-9**

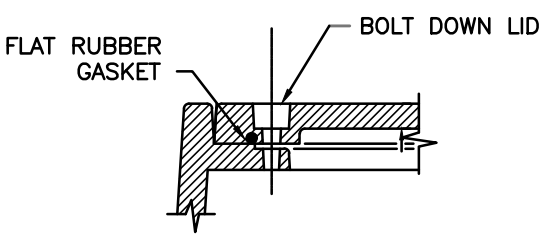


SECTION A-A

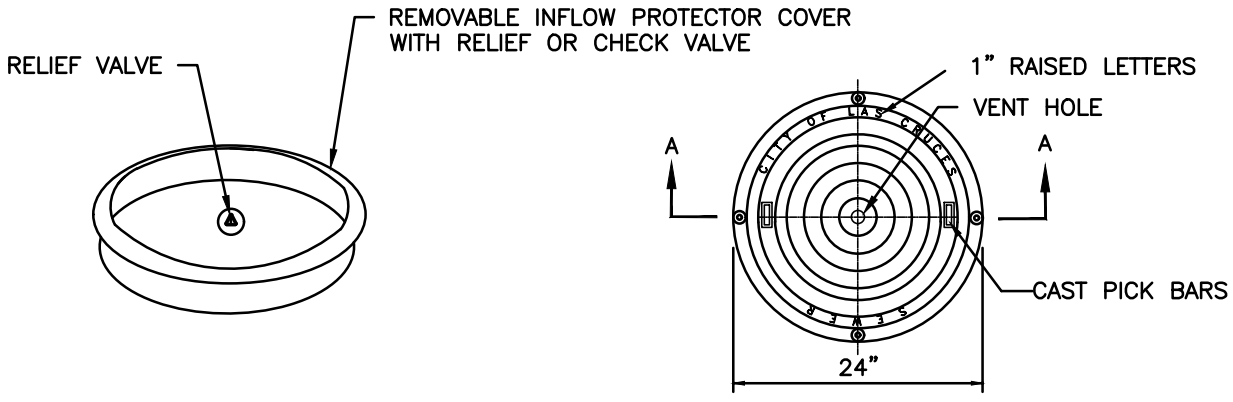
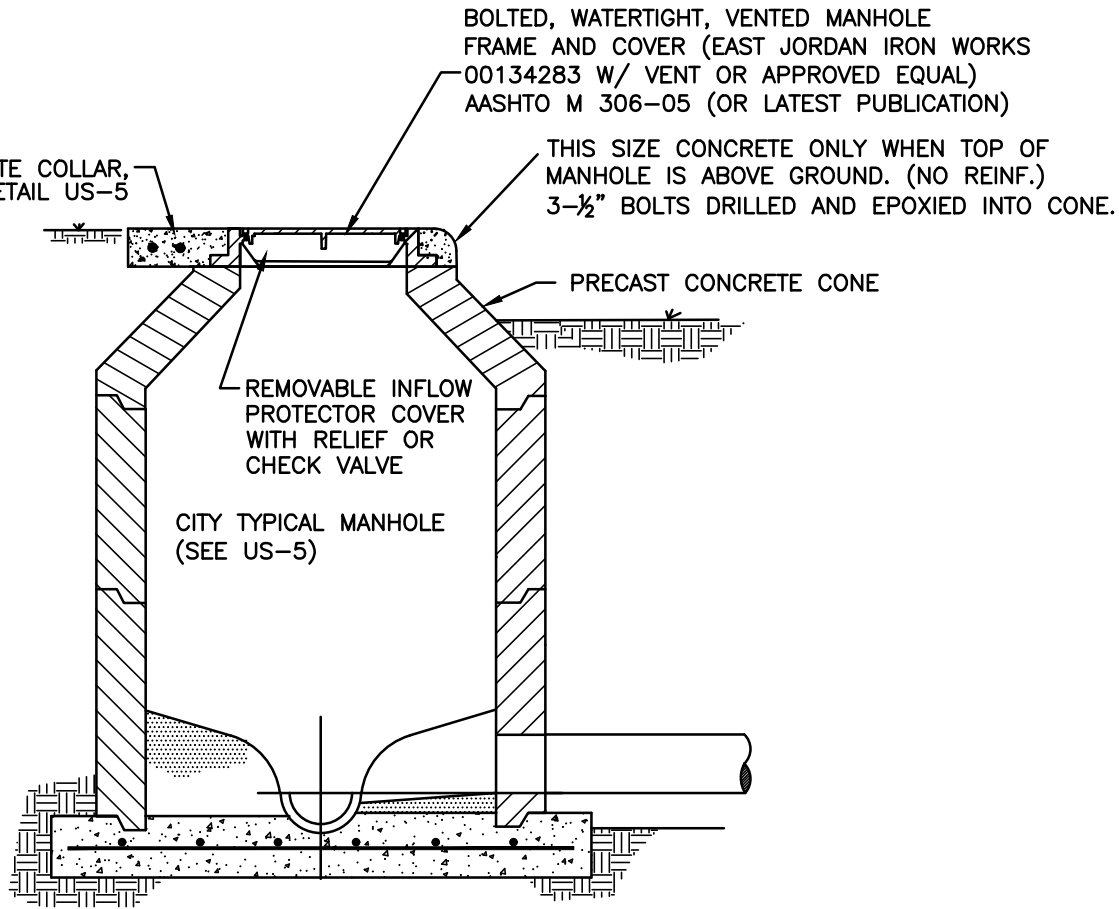


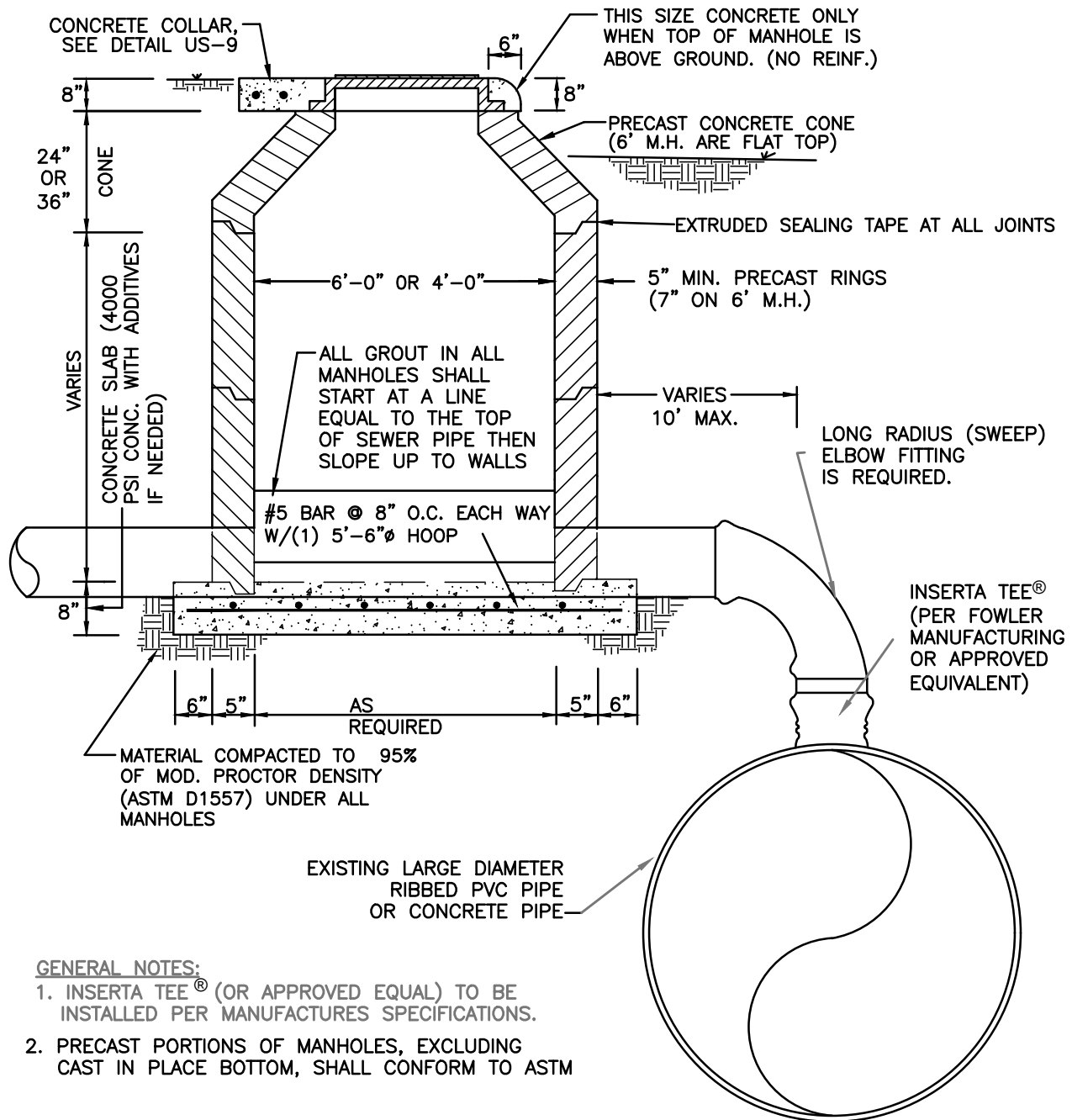
PLAN

NOTES:
 MANHOLE SHALL MEET AASHTO M 306-05 (OR LATEST PUBLICATION) H-20 LOADING AND BE THE FOLLOWING: EAST JORDAN IRON WORKS 00134283 (OR APPROVED EQUAL). MANHOLE LID AND RING W/ "CITY OF LAS CRUCES" AND "SEWER" OR "SANITARY SEWER" LETTERING
 MIN TOTAL WT.- 300
 LBS. MIN COVER 135
 LBS MIN RING WT. -165 LBS



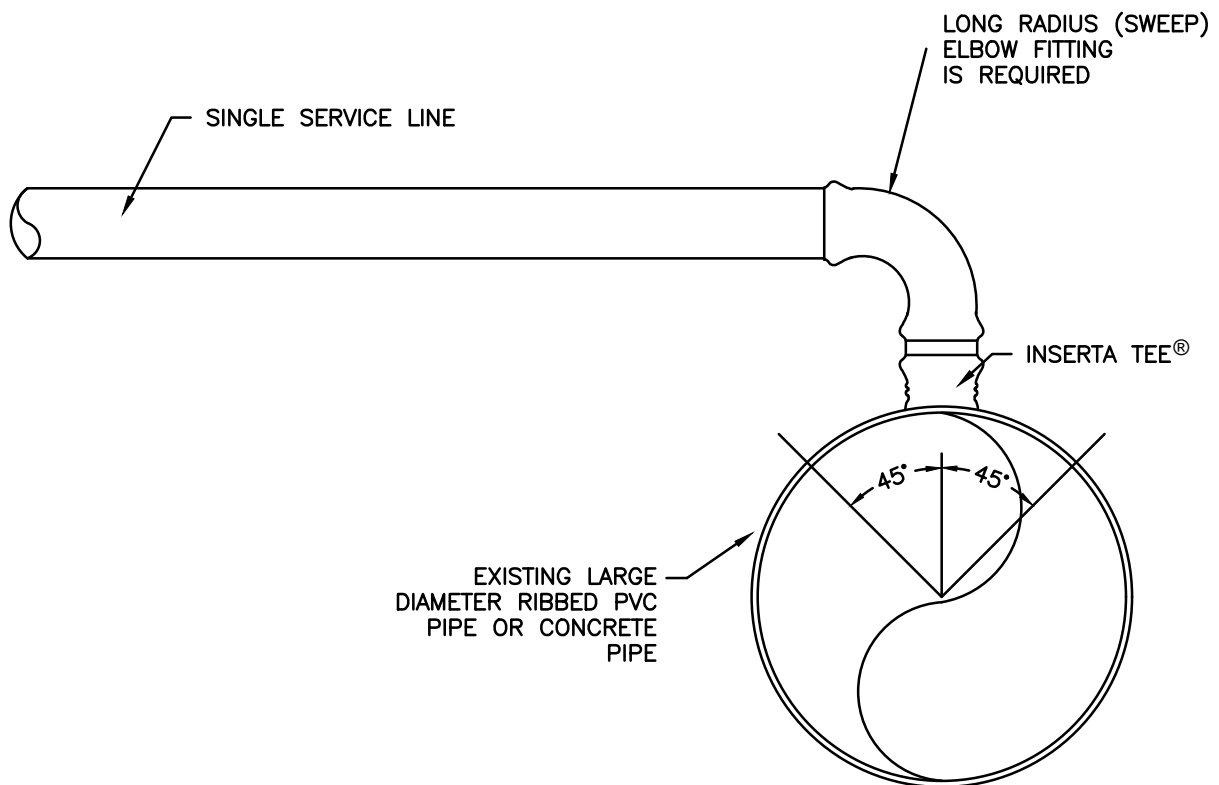
BOLT-DOWN DETAIL





GENERAL NOTES:

1. INSERTA TEE® (OR APPROVED EQUAL) TO BE INSTALLED PER MANUFACTURES SPECIFICATIONS.
2. PRECAST PORTIONS OF MANHOLES, EXCLUDING CAST IN PLACE BOTTOM, SHALL CONFORM TO ASTM



NOTES:

INSERTA TEE® (OR APPROVED EQUAL) TO BE INSTALLED PER MANUFACTURES SPECIFICATIONS.

TEE CONNECTION SHALL BE IN THE TOP OR WITHIN 45° OF THE TOP.



CITY OF LAS CRUCES

SERVICE LINE INSERTA TEE® CONNECTION

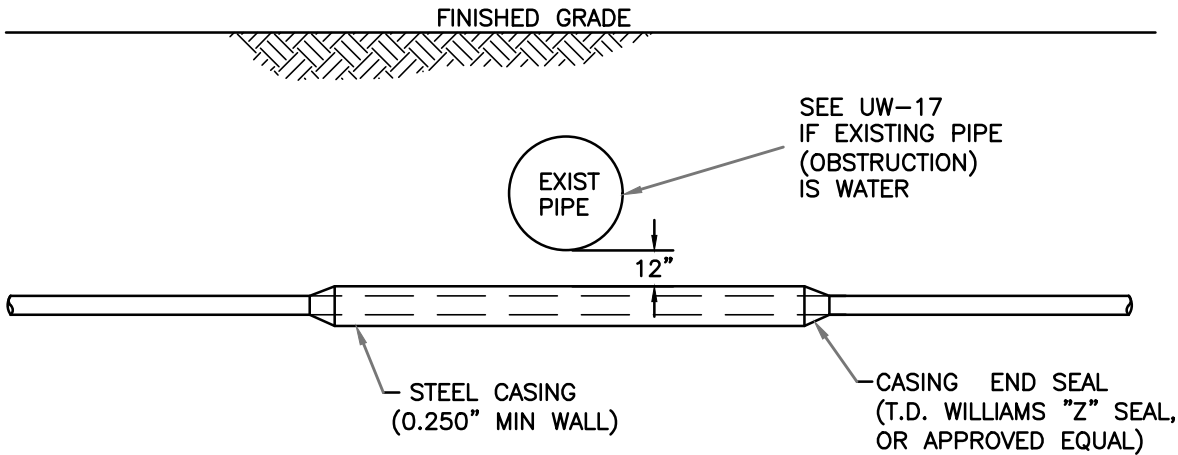
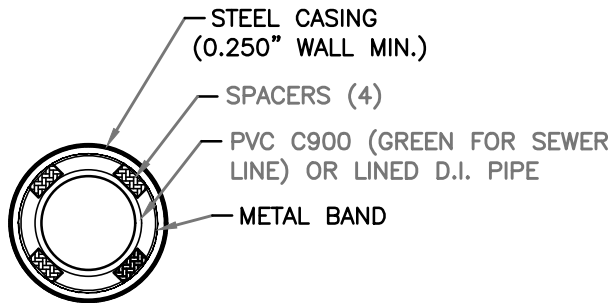
N.T.S.

FILE NAME: 2023 CLC Utility Standard Details.dwg

ORIG. DATE: 8/14/00

LAST REVISION: SEPT 2023

DRAWING NO. **US-13**



NOTES:

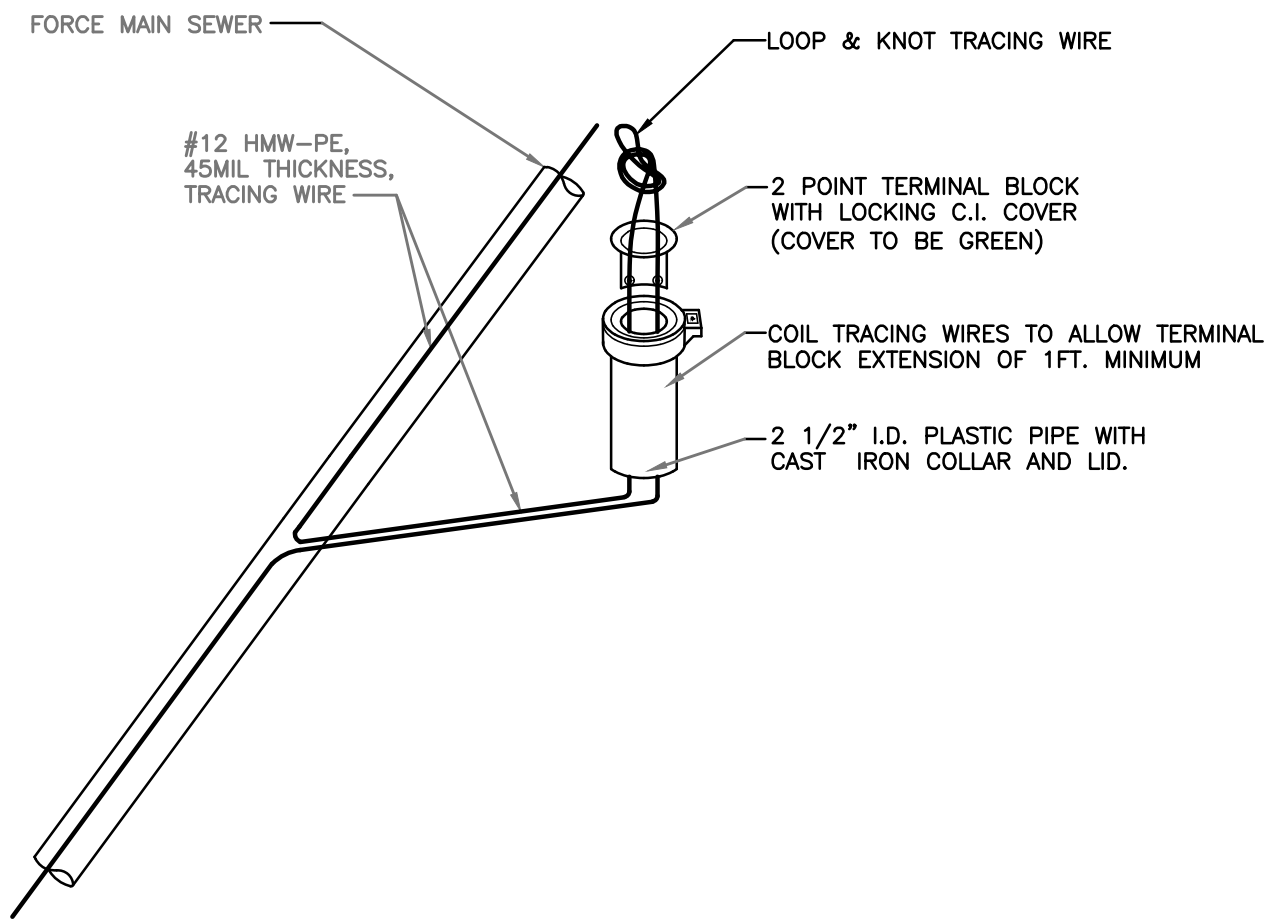
1. PUBLIC WORKS MARKETING, INC. (PWM) "RACI" SPACERS OR APPROVED EQUAL MAY BE SUBSTITUTED AT MANUFACTURERS RECOMMENDED SPACING.
2. PIPE JOINT INSIDE CASING SHALL BE JOINT RESTRAINED.
3. CASING SIZE TO BE SPECIFIED BY DESIGN ENGINEER (DEPENDENT ON LENGTH OF BORE, SERVICE LINE TYPE, ETC.)



CITY OF LAS CRUCES

SEWER LINE BORE AND CASE

N.T.S.



NOTES:

1. SPACING AND LOCATION OF TEST BOXES TO BE DETERMINED BY THE CITY UTILITIES DIVISION.
2. TEST BOX LOCATION MAY VARY, UP TO 50 FT. FROM GAS LINE.
3. REFER TO STANDARDS AND MATERIALS LISTS FOR MATERIALS.
4. TRACING WIRE SHALL EXTEND A MINIMUM OF 12" ABOVE TEST STATION.
5. 24" OCTAGON CONCRETE COLLAR TO BE INSTALLED.



CITY OF LAS CRUCES

TRACING WIRE TEST BOX

N.T.S.

FILE NAME: 2023 CLC UTILITY STANDARD DETAILS.DWG

ORIG. DATE: 5/05/03

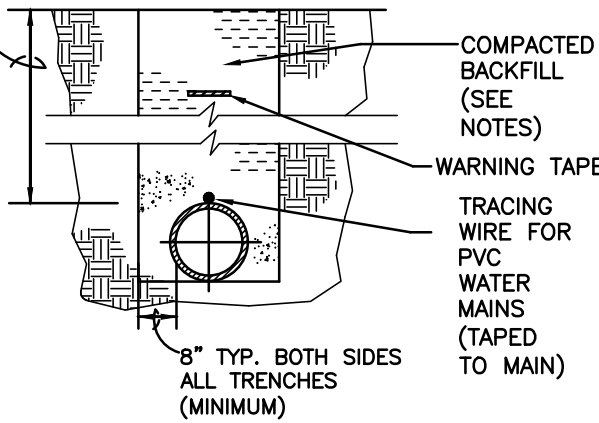
LAST REVISION: SEPT 2023

DRAWING NO. **US-15**

WHERE PAVEMENT IS OTHER THAN
CONCRETE, BASE COURSE DEPTH SHALL
MATCH EXISTING AND WEARING SURFACE
SHALL MATCH ORIGINAL*

NEW CONCRETE TO MATCH EXISTING
PAVEMENT, SIDEWALK OR CURB AND
GUTTER DAMAGED OR REMOVED

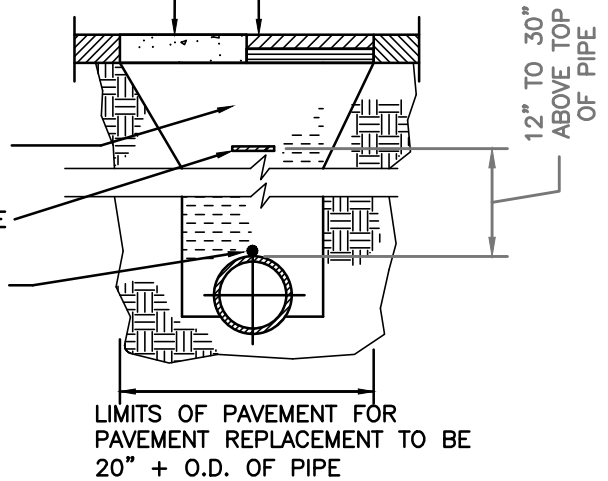
SEE PIPE MATERIAL REQUIREMENTS
WHEN 30" OR LESS



UNPAVED ROAD TRENCH

NOTES:
BACKFILL IN UNPAVED STREETS,
ALLEYS, AND DRIVEWAYS SHALL BE
COMPACTED TO 90% COMPACTION AS
DETERMINED BY AASHTO T-180 (ASTM
D1557) UNLESS OTHERWISE NOTED

- NOTES:**
1. TRACING WIRE REQUIRED TO BE PLACED ABOVE ALL MAINS AND TRANSMISSION LINES.
 2. TEST BOXES, CONNECTED INTO TRACING WIRE SYSTEM, SHALL BE REQUIRED WHERE HYDRANTS ARE NOT USED OR WHERE HYDRANT SPACING EXCEEDS 500 FEET.
 3. TRENCH WIDTHS, CROSS SECTIONS, SHALL BE IN COMPLIANT TO ALL APPLICABLE SAFETY STANDARDS AND REGULATIONS.



UNDER PAVEMENT

NOTES:
BACKFILL SHALL BE COMPACTED
TO 95% COMPACTION AS
DETERMINED BY AASHTO T-180
(ASTM D1557)

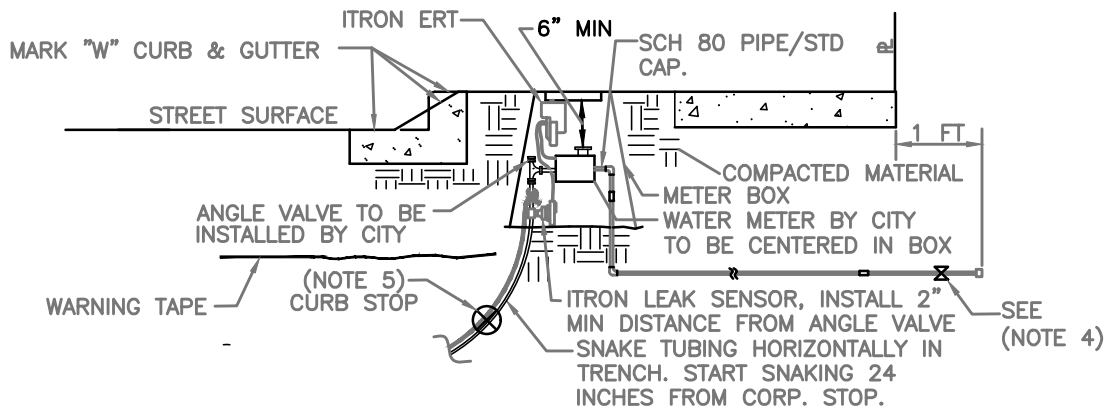
* THE THICKNESS OF THE PAVEMENT PATCH
SHALL MATCH THE DEPTH OF THE
ADJACENT PAVEMENT SURFACES PLUS ONE
INCH AND SHALL BE A MINIMUM 3" THICK.



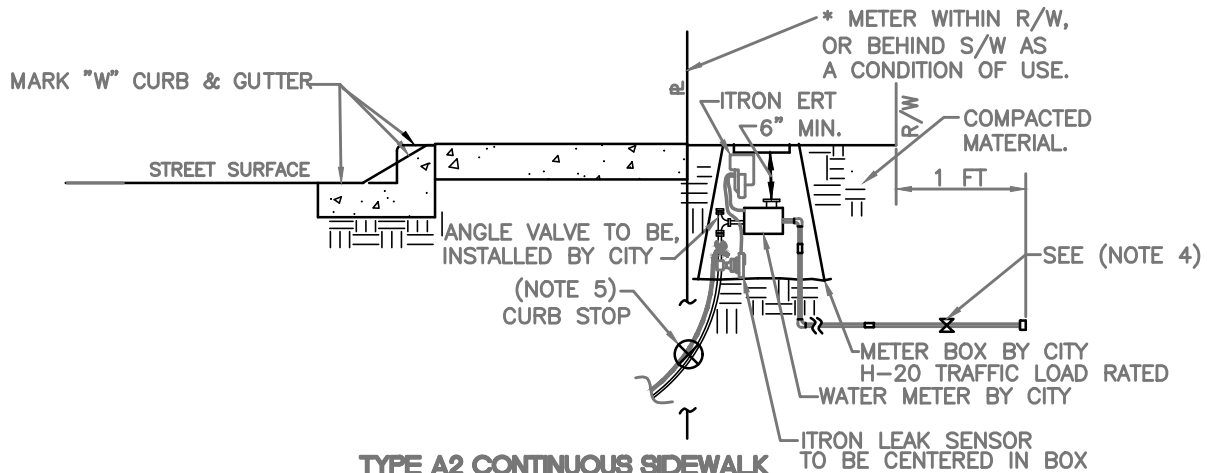
CITY OF LAS CRUCES

TYPICAL WATER TRENCHING DETAILS

N.T.S.



TYPE B NON-CONTIGUOUS SIDEWALK



TYPE A2 CONTINUOUS SIDEWALK

MAXIMUM NO. OF 5/8" METER BASED ON SERVICE LINE SIZE

3/4"	SERVICE LINE	2 METERS
1"	SERVICE LINE	3 METERS
2"	SERVICE LINE	6 METERS
4"	SERVICE LINE	12 METERS

NOTES:

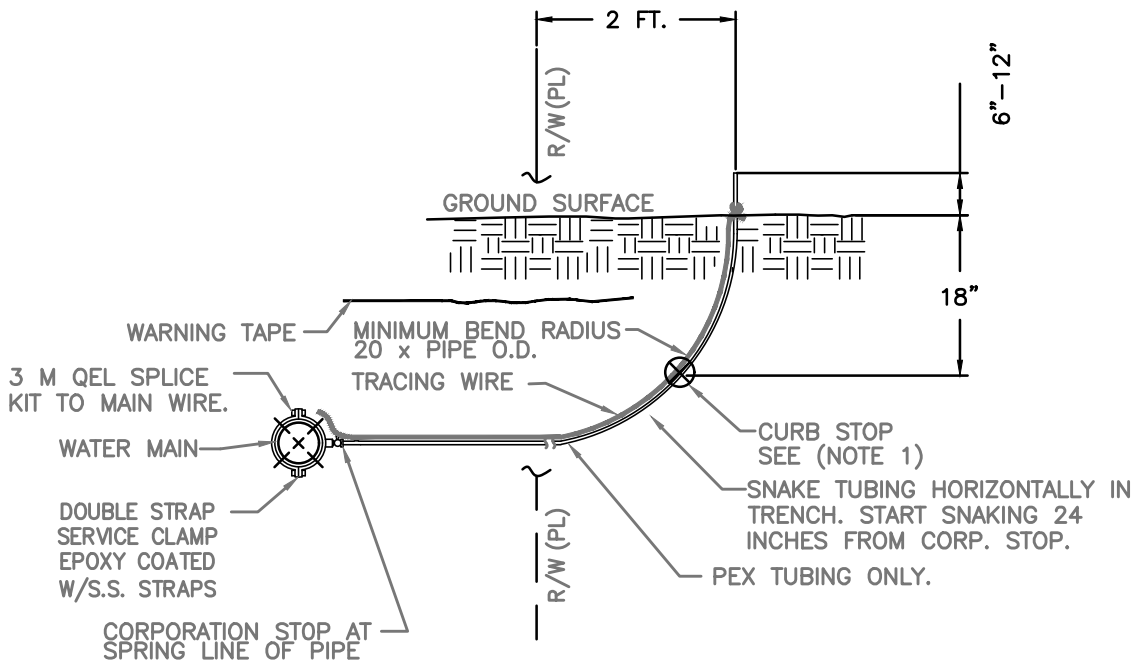
1. TUBING MUST BE BEDDED THROUGHOUT ITS LENGTH TO ENSURE THE SERVICE LINE IS NOT STRESSED DURING BACKFILLING. BEDDING MATERIAL MUST EXTEND 4" IN ALL DIRECTIONS FROM TUBING. TAPE TRACING WIRE TO SERVICE LINE EVERY 5FT AND EXTEND TRACING WIRE TO ANGLE VALVE/CURB STOP.
2. ITRON EQUIPMENT (ITRON ERT & LEAK SENSOR) IS SUPPLIED BY CITY WITHIN THE METER BOX.
3. TRACING WIRE SHOULD BE SPLICED (3M QEL SPLICE LAT) TO EXISTING MAIN TRACING WIRE, WHEN THERE IS NOT A MAIN TRACING WIRE, THE WIRE END REQUIRES WIRE CAP.
4. CUSTOMER VALVE INSTALLED BY CITY ARE TIED DURING NEW SERVICE CONNECTION, TO BE MAINTAINED BY CUSTOMER.
5. DURING NEW CONSTRUCTION, THE CONTRACTOR SHALL INSTALL CURB STOP 18" BELOW GRADE AND CONTINUE SERVICE LINE A MINIMUM 6"-12" ABOVE GRADE.



CITY OF LAS CRUCES

TYPICAL RESIDENTIAL 3/4" THRU 2" METERS

N.T.S.



NOTES:

1. DURING NEW CONSTRUCTION, THE CONTRACTOR SHALL INSTALL CURB STOP 18" BELOW GRADE AND CONTINUE SERVICE LINE A MINIMUM 6"-12" ABOVE GRADE.



CITY OF LAS CRUCES

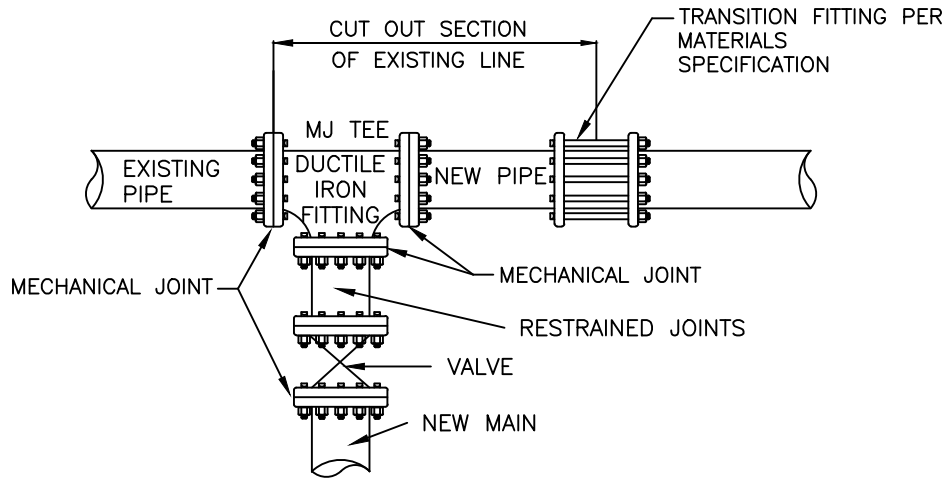
TYPICAL RESIDENTIAL WATER SERVICE LINE

N.T.S.

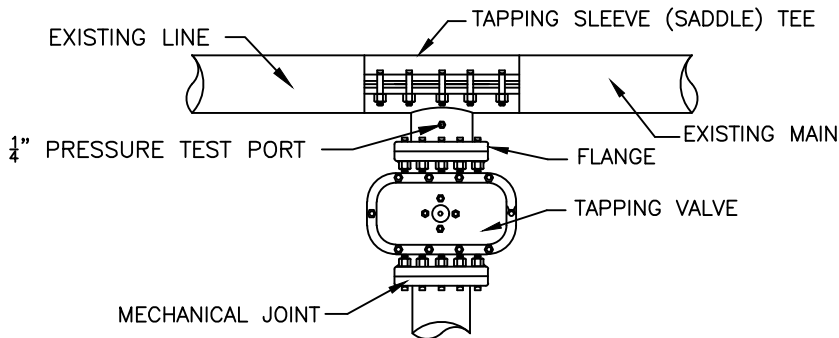
FILE NAME: 2023 CLC UTILITY STANDARD DETAILS.DWG | ORIG. DATE: 04/17/19

LAST REVISION: SEPT 2023

DRAWING NO. **UW-2A**



WET CONNECTION



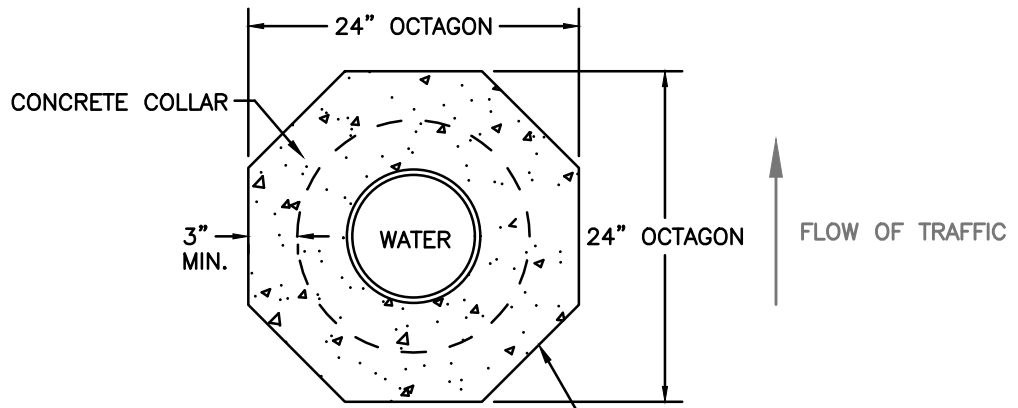
TAPPED CONNECTION



CITY OF LAS CRUCES

TYPICAL WATER CONNECTION

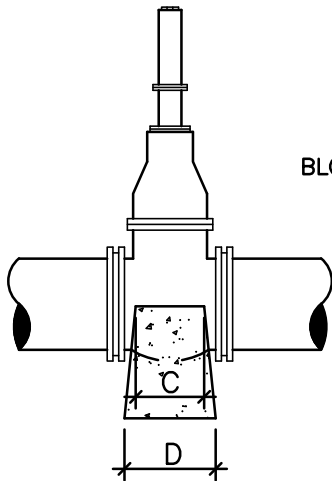
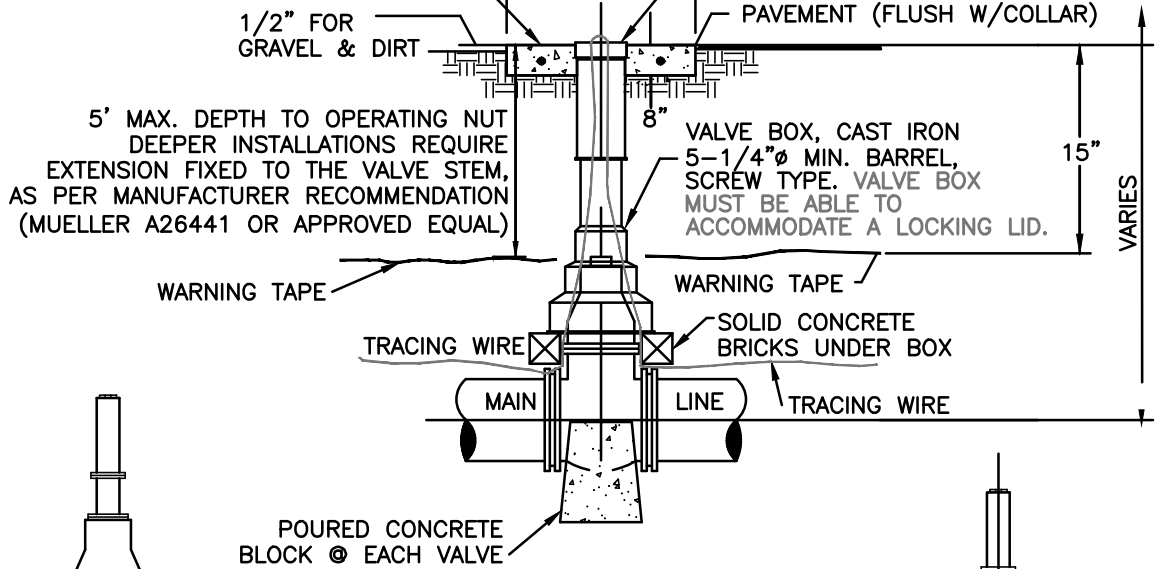
N.T.S.



CONCRETE COLLAR W/ 1-#4 REBAR RING
 W/ 2" MIN. COVER BOTTOM OR TOP
 4,000 PSI CONC. 8" THK.
 72 HOURS CURING TIME IS REQUIRED PRIOR
 TO TRAFFIC LOADING UNLESS THERE IS PRIOR
 WRITTEN APPROVAL FROM THE CLC P.M.

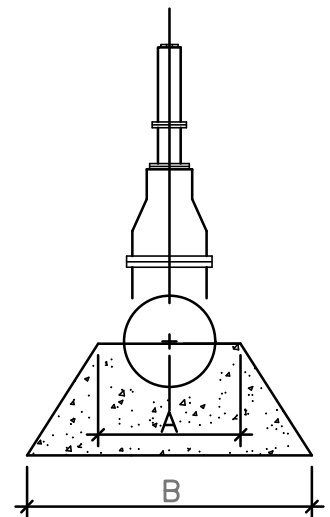
24" ROUND
 OR OCTAGON
 SHOWN HERE IN

TACK COAT ON
 ALL EDGES (TYP.)



NOTE: CONCRETE STRENGTH 3000 PSI.

VALVE SUPPORT TABLE				
VALVE SIZE	A	B	C	D
4"	10"	20"	4"	6"
8"	12"	22"	4"	8"
10"	14"	24"	4"	8"
12"	16"	24"	4"	8"
16"	24"	36"	6"	12"



CITY OF LAS CRUCES

WATER VALVE DETAIL

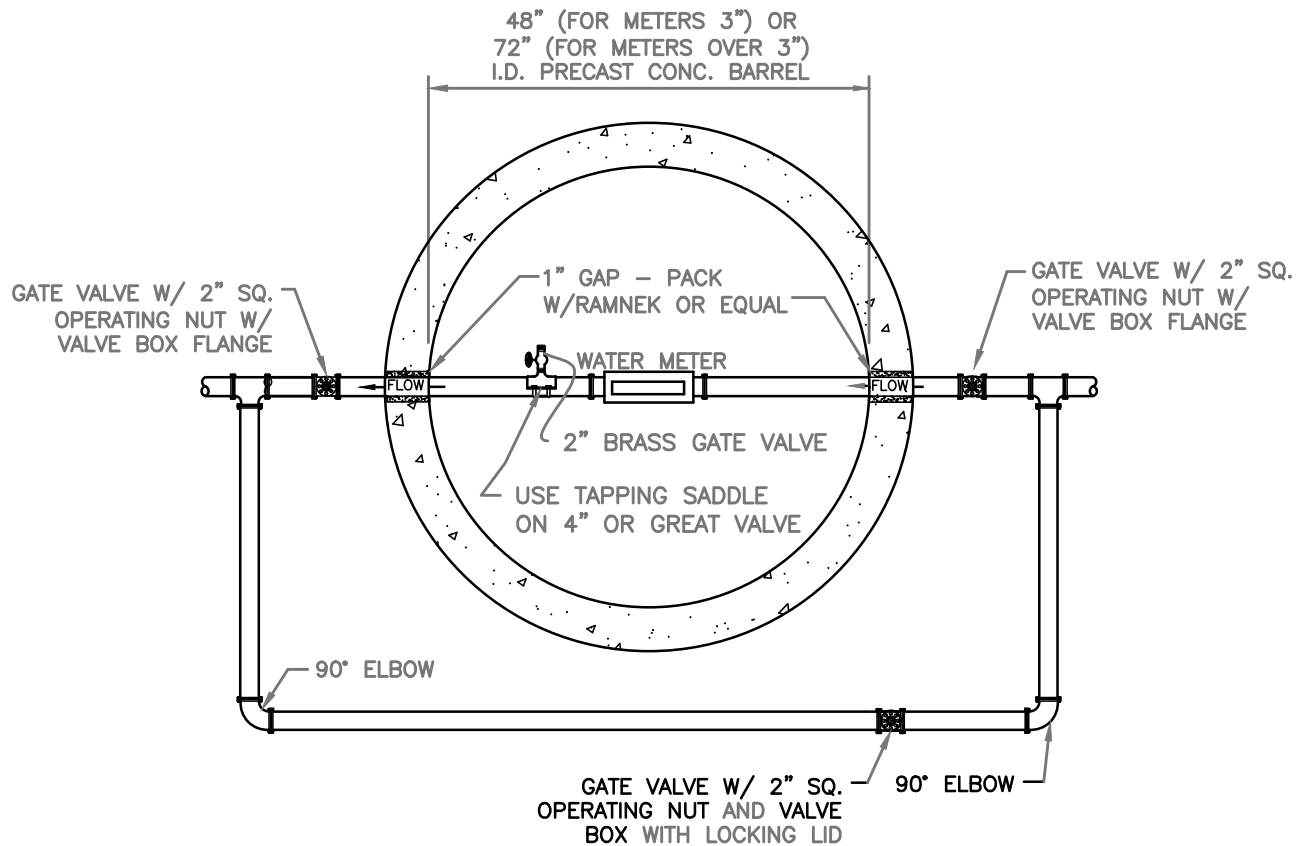
N.T.S.

FILE NAME: 2023 CLC UTILITY STANDARD DETAILS.DWG

ORIG. DATE: 8/17/00

LAST REVISION: SEPT 2023

DRAWING NO. UW-4



TOP VIEW

NOTES:

1. C-900 OR DUCTILE IRON PIPE ON 3" OR GREATER.
2. MAINTENANCE BY CLC UP TO AND INCLUDING THE METER AND THE BY PASS VALVE.
3. ALL CLC MAINTAINED WATER PIPING SHALL BE EVEN PIPE SIZES WITH 4" DIA MINIMUM.
4. BYPASS WATER METER SIZE DETERMINED BY TECHNICAL SUPPORT.



CITY OF LAS CRUCES

TYPICAL TRAFFIC WATER METER VAULT

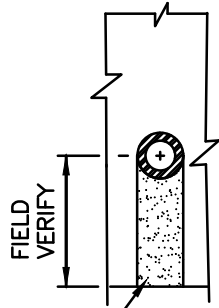
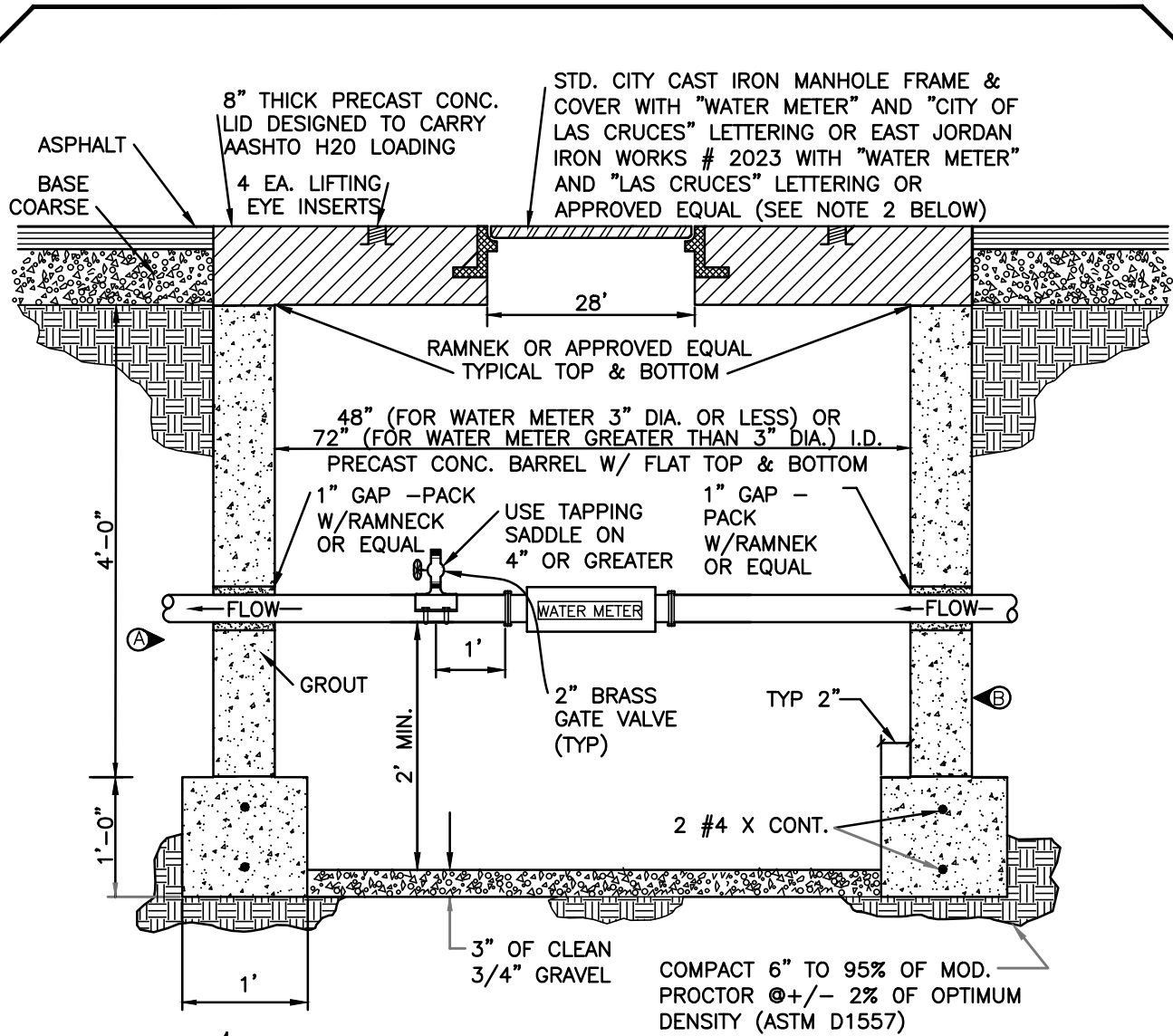
N.T.S.

FILE NAME: 2023 CLC UTILITY STANDARD DETAILS.DWG

ORIG. DATE: 3/19/98

LAST REVISION: SEPT 2023

DRAWING NO. **UW-5**

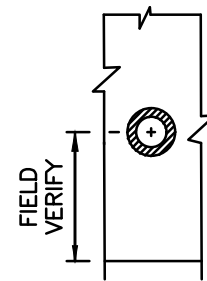


NON-SHRINK
GROUT

DETAIL (A)
TYPICAL ON
EXIST. LINE

GENERAL NOTES:

1. BYPASS IS REQ'D ON ALL METERS LARGER THAN 2" (SEE UW-5) FOR NON TRAFFIC BEARING APPLICATIONS, MANHOLE FRAME & COVER EAST JORDAN.
2. IRON WORKS EN104621 LIGHT DUTY INLET COVER OR APPROVED EQUAL MAY BE SUBSTITUTED.
3. PRECAST PORTIONS OF MANHOLES, EXCLUDING CAST IN PLACE FOOTING, SHALL CONFORM TO ASTM C478, LATEST REVISION.



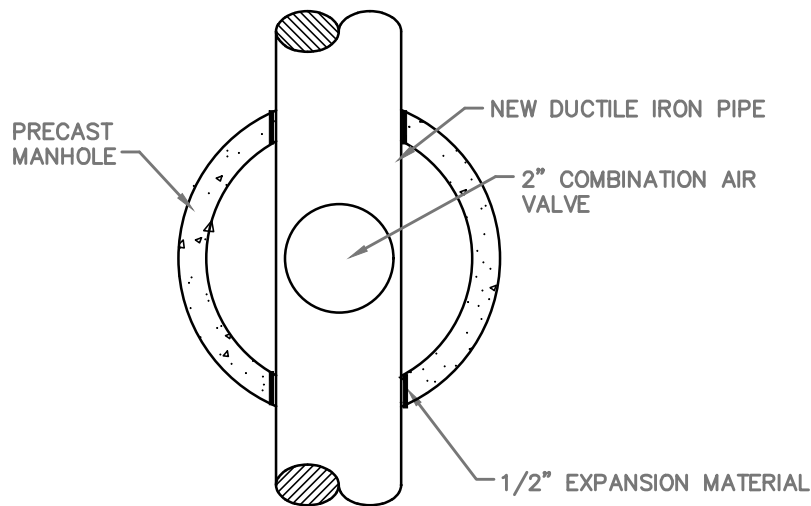
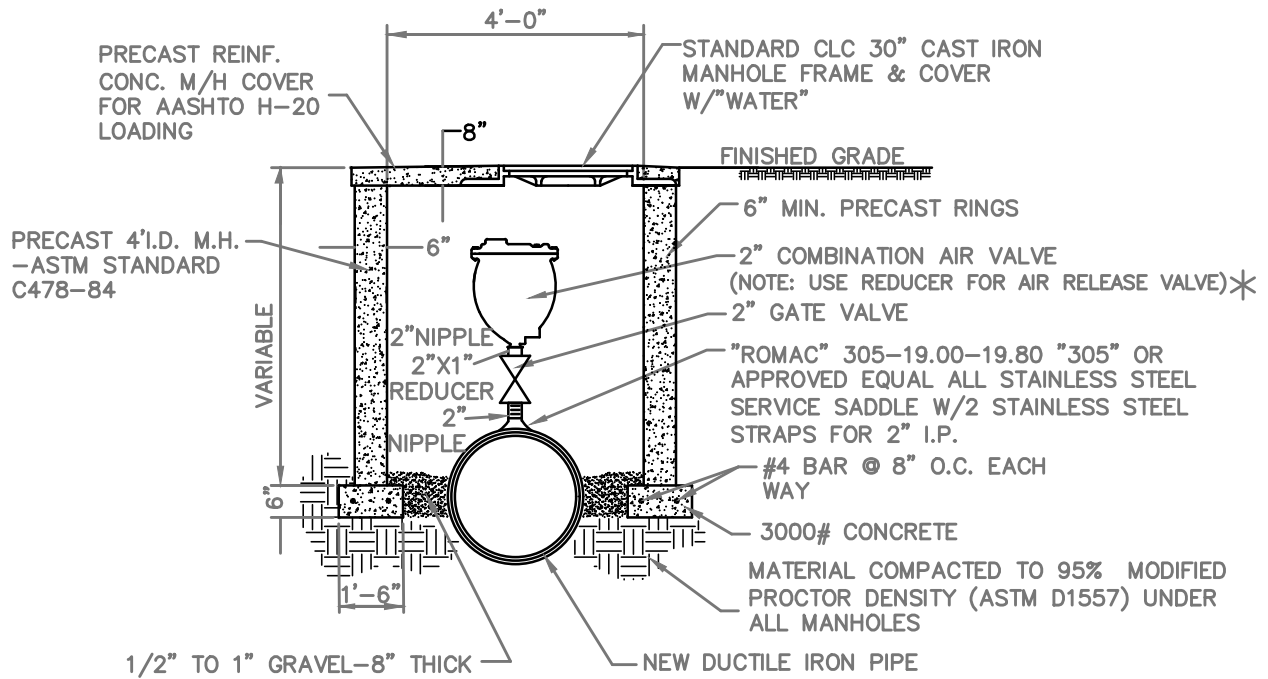
DETAIL (B)
TYPICAL ON NEW
INSTALLATION



CITY OF LAS CRUCES

**TYP. COMMERCIAL WATER METER
LARGER THAN 2"-TRAFFIC BEARING**

N.T.S.



* AIR VALVES LARGER THAN 2" WILL REQUIRE A 6' ID MANHOLE AND INCREASED PIPE COVER



CITY OF LAS CRUCES

AIR/VACUUM RELIEF VALVE

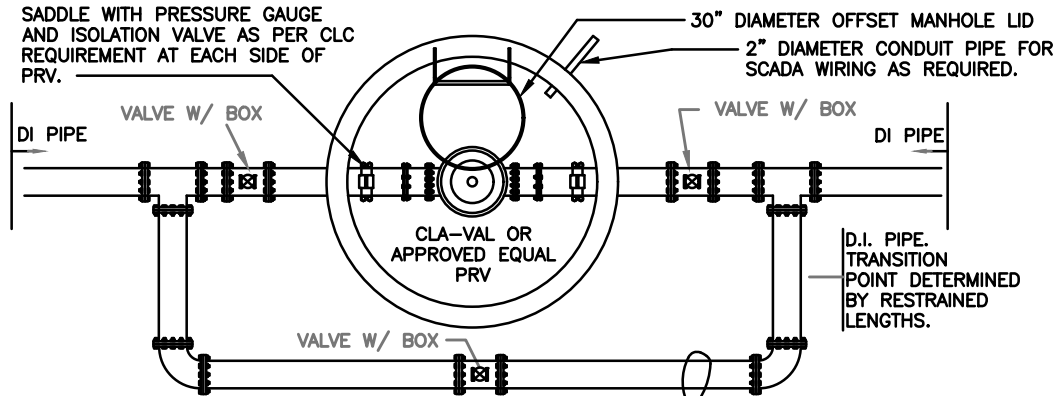
N.T.S.

FILE NAME: 2023 CLC UTILITY STANDARD DETAILS.DWG

ORIG. DATE: 6/28/00

LAST REVISION: SEPT 2023

DRAWING NO. UW-7

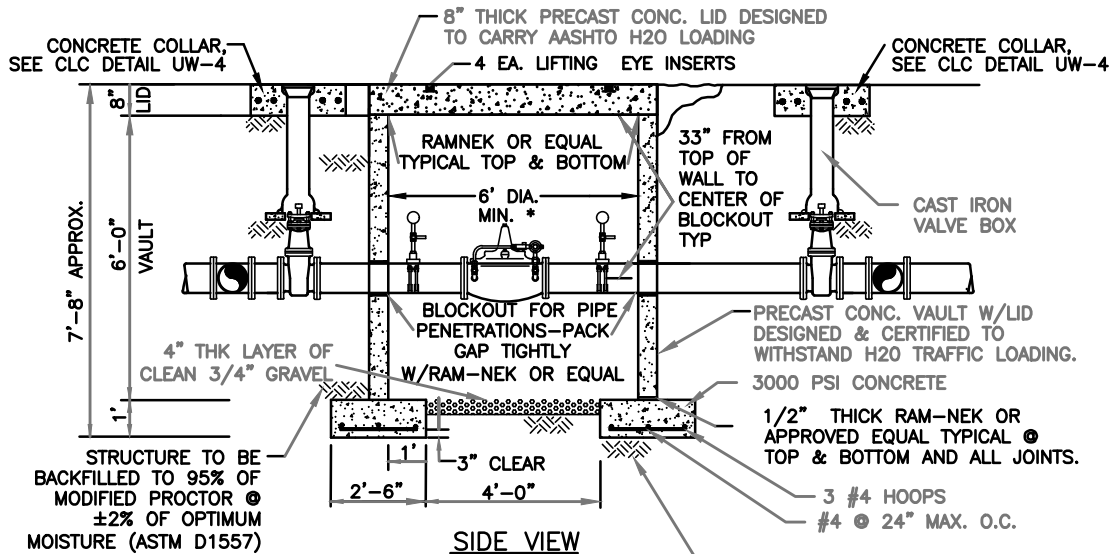


TOP VIEW

BY PASS SIZE AS APPROVED BY UTILITY OPERATIONS ENGINEER OR MAIN LINE SIZE

GENERAL NOTES:

- 1.) TYPICAL FOR PRV, PRESS SUST., CHECK VAULTS (SEE UW-9)
- 2.) SUPPORT VALVE PER MANUFACTURER
- 3.) PRECAST PORTIONS OF MANHOLES, EXCLUDING CAST IN PLACE FOOTING, SHALL CONFORM TO ASTM C478, LATEST REVISION



SIDE VIEW

AS PER CLC MANHOLE STANDARD W/ "CITY OF LAS CRUCES" "WATER" LETTERING, MANHOLE TO BE CASE BY CASE CONSULTATION WITH UTILITIES OPERATIONS ENGINEER

INDICATOR AS PER CLC REQUIREMENT

ALUMINUM STAND AT EACH SIDE OF PRV.

SCARIFY TOP 6" AND COMPACT TO 95% OF MODIFIED PROCTOR (ASTM D1557) ± 2% OF OPTIMUM MOISTURE 4'-6" WIDE CENTERED FOOTINGS

2" DIAMETER CONDUIT PIPE FOR SCADA WIRING AS REQUIRED.

ALUMINUM LADDER WITH ANTI SKID STEPS ANCHORED TO WALL AND FLOOR MUST MEET ANSI A 14.3 AND OSHA REQUIREMENTS.

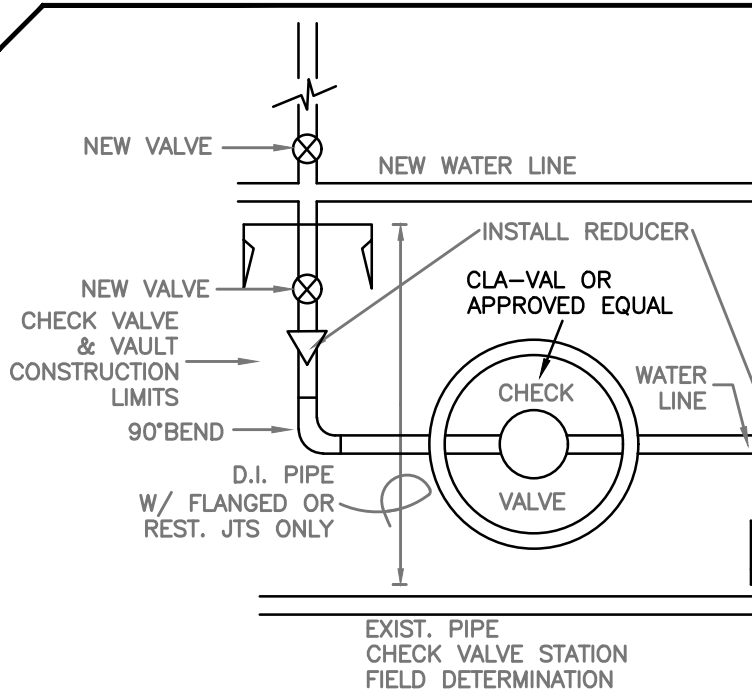
SIDE VIEW



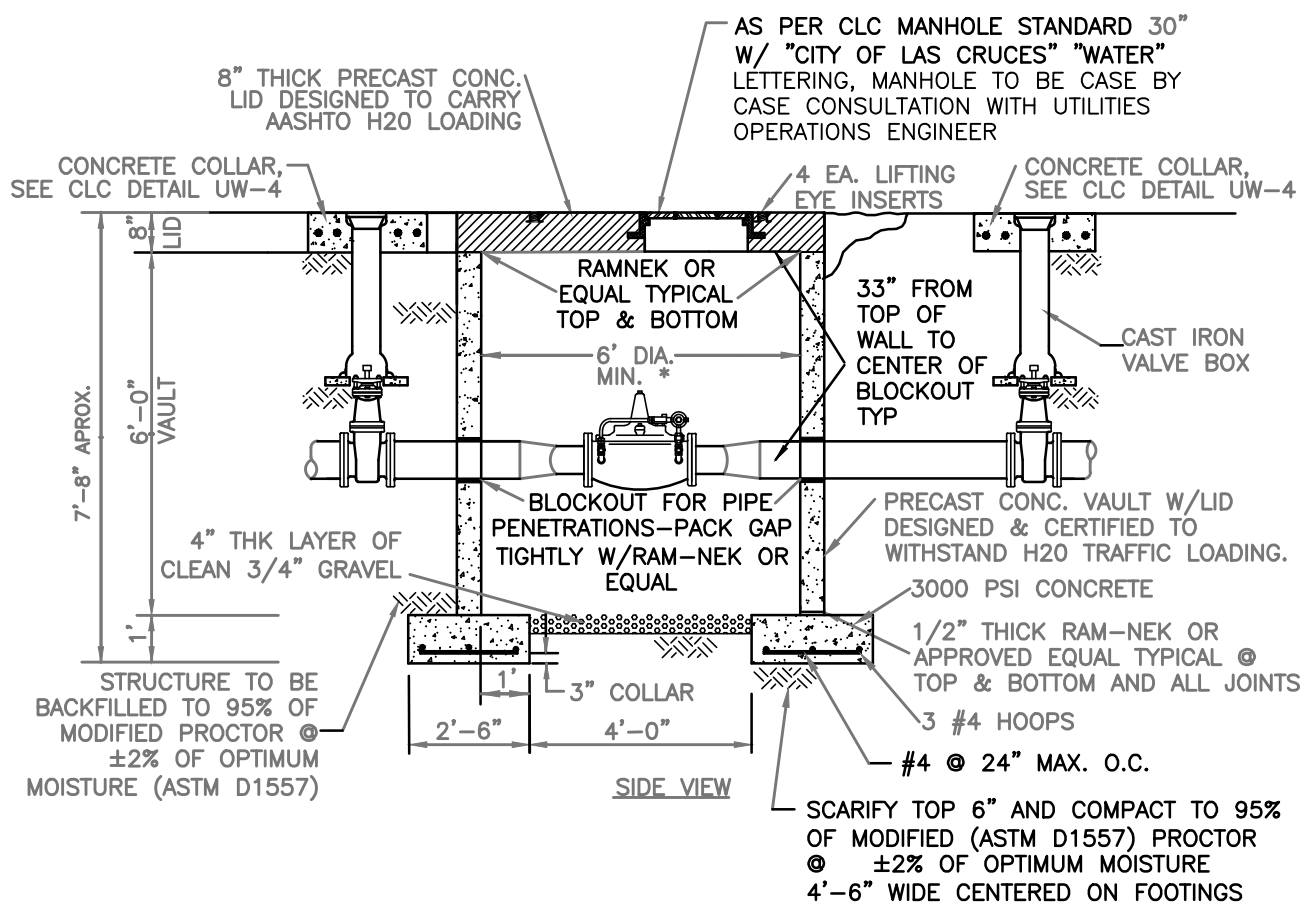
CITY OF LAS CRUCES

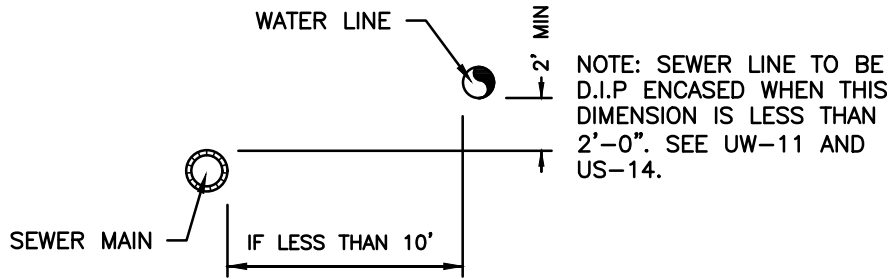
TYPICAL PRV VAULT

N.T.S.

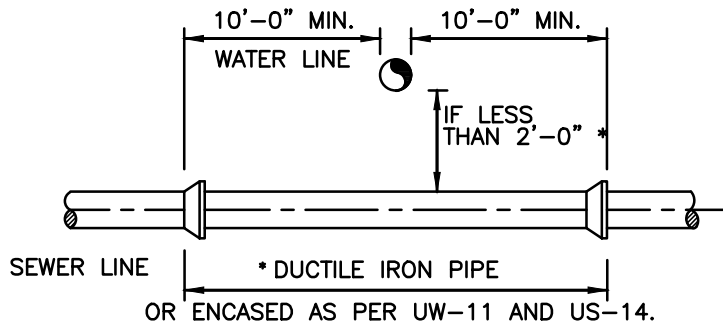


- GENERAL NOTES:**
 * SIZED BY UTILITY OPERATIONS ENGINEER.
1. TYPICAL FOR PRV, PRESS. SUST., CHECK VAULTS.
 2. SUPPORT VALVE PER MANUFACTURER.
 3. PRECAST PORTIONS OF MANHOLES, EXCLUDING CAST IN PLACE FOOTING, SHALL CONFORM TO ASTM C478, LATEST REVISION.





PARALLEL LINES



CROSSED LINES

EITHER THE WATER MAIN OF THE SEWER LINE SHALL BE ENCASED IN A WATERTIGHT CARRIER PIPE WHICH EXTENDS 10 FEET (3M) ON BOTH SIDES OF THE CROSSING, MEASURED PERPENDICULAR TO THE WATER MAIN. THE CARRIER PIPE SHALL BE OF MATERIALS APPROVED BY THE REGULATORY AGENCY FOR USE IN WATER MAIN CONSTRUCTION.

NOTES ADDED AT REQUEST OF STATE HEALTH DEPARTMENT

PROXIMITY OF WATER AND SEWER LINES

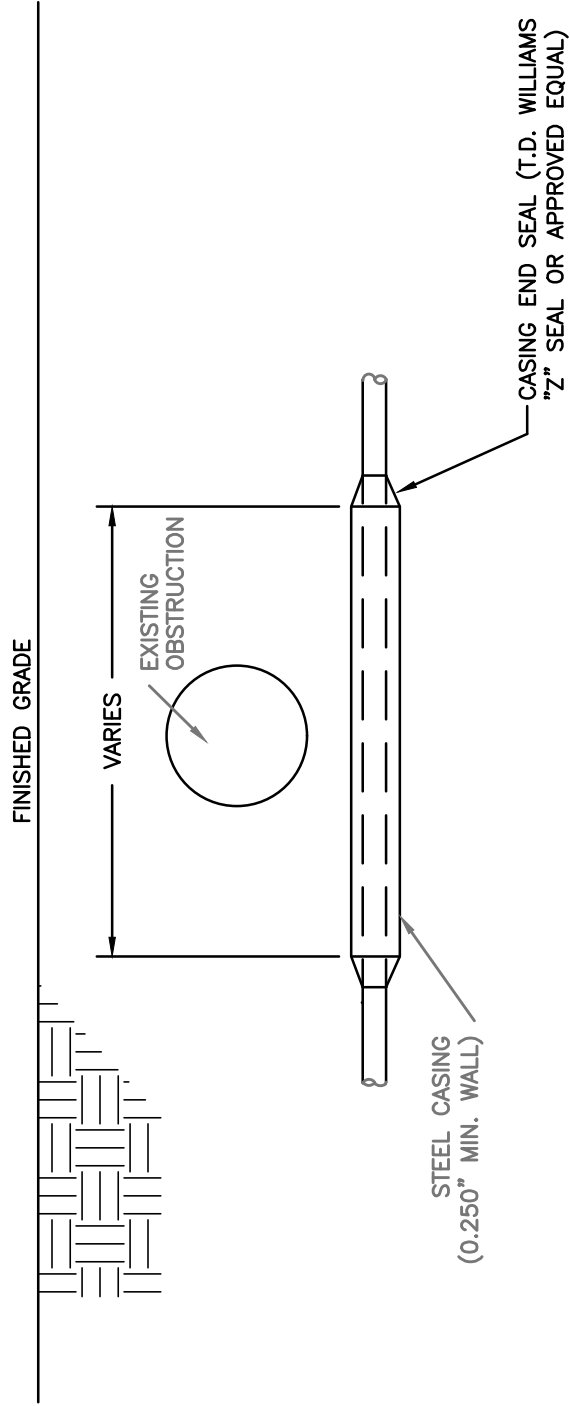
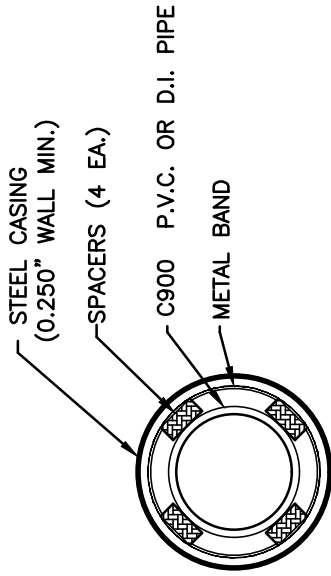
WHENEVER POSSIBLE, IT IS DESIRABLE TO LAY PARALLEL WATER AND SEWER LINES AT LEAST 10 FEET APART HORIZONTALLY, AND THE WATER LINE SHOULD BE AT A HIGHER ELEVATION THAN THE SEWER. IF THIS IS NOT POSSIBLE, SEPARATE TRENCHES SHALL BE REQUIRED IN ALL CASES (THIS SHALL BE EFFECTIVE EVEN THOUGH ONE LINE HAS BEEN INSTALLED PRIOR TO THE OTHER) AND THE WATER LINE SHALL BE AT LEAST TWO (2) FEET ABOVE THE SEWER. WHEN WATER AND SEWER LINES CROSS EACH OTHER, THE WATER LINE SHALL BE AT LEAST TWO (2) FEET ABOVE THE SEWER; OTHERWISE, THE SEWER SHALL BE OF DUCTILE PIPE, OR EQUIVALENT, FOR 10 FEET EACH SIDE OF THE WATER LINE.



CITY OF LAS CRUCES

PARALLEL AND CROSSED LINE

N.T.S.



NOTES:

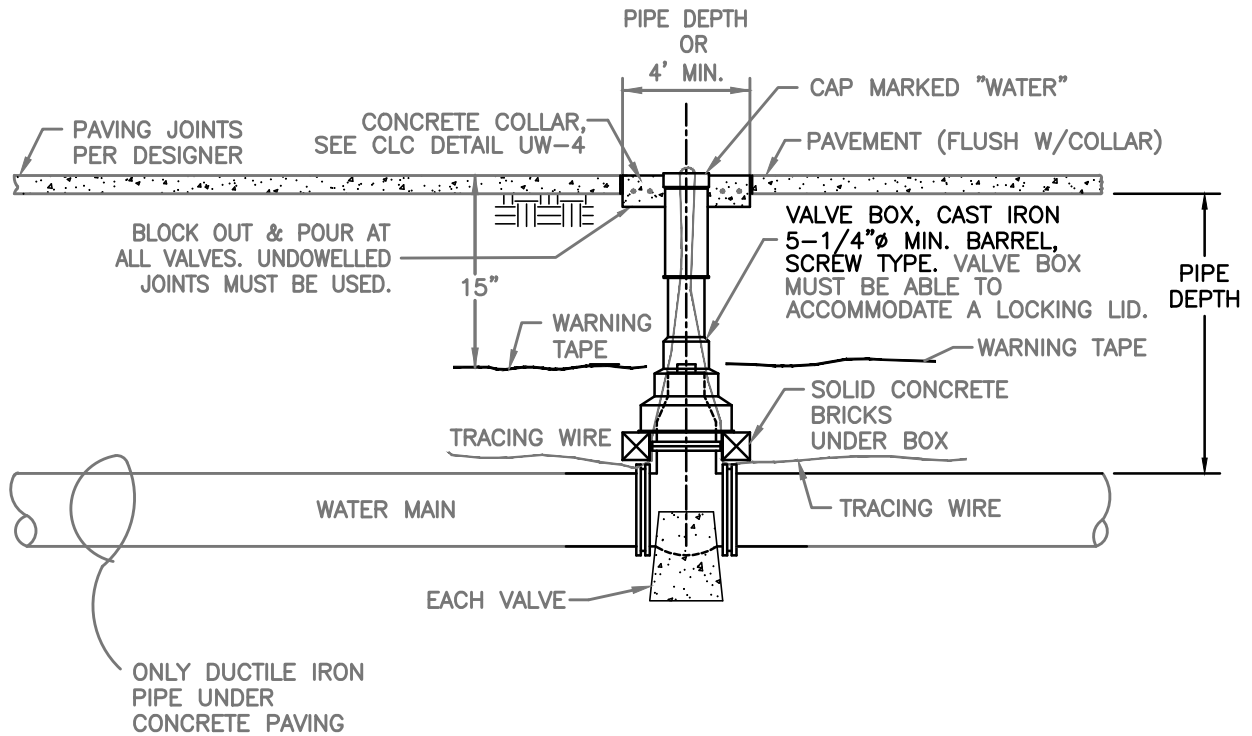
1. PUBLIC WORKS MARKETING, INC. (PWM) "RACI" SPACERS OR APPROVED EQUAL MAY BE SUBSTITUTED AT MANUFACTURERS RECOMMENDED SPACING.
2. PIPE JOINT INSIDE CASING SHALL BE JOINT RESTRAINED.



CITY OF LAS CRUCES

WATER LINE BORE AND CASE

N.T.S.



CITY OF LAS CRUCES

WATER MAIN UNDER RIGID PAVING

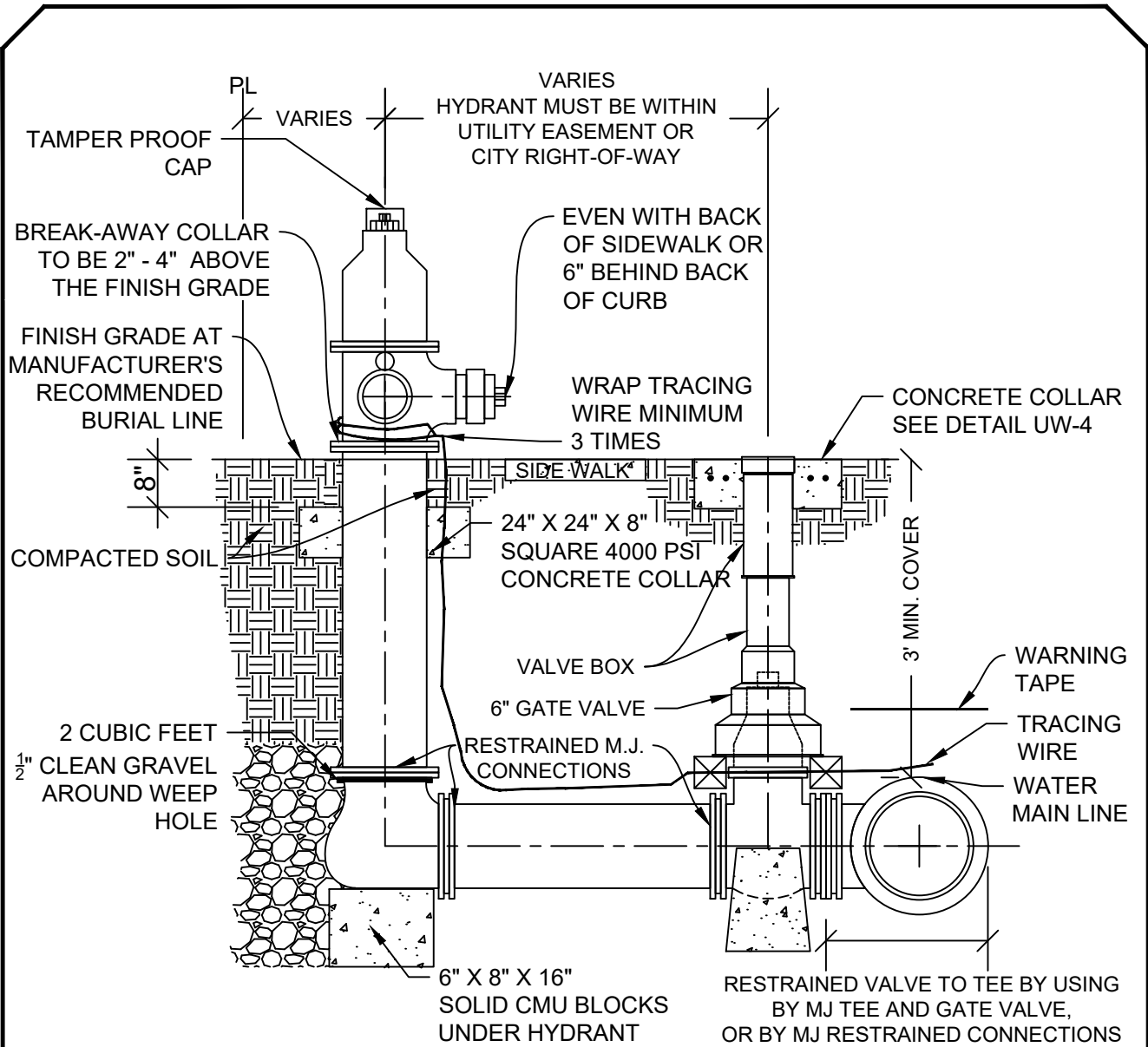
N.T.S.

FILE NAME: 2023 CLC UTILITY STANDARD DETAILS.DWG

ORIG. DATE: 10/11/02

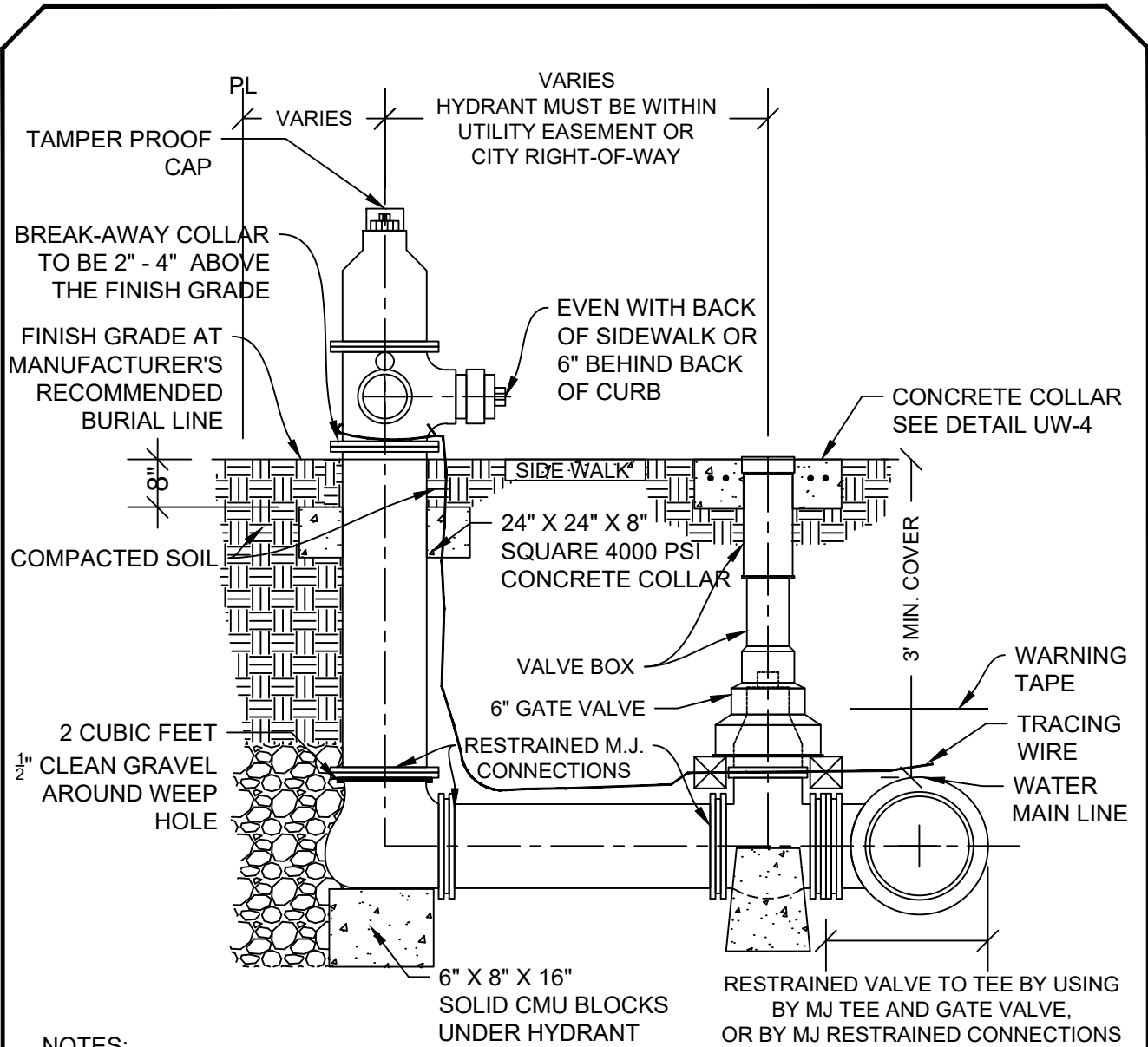
LAST REVISION: SEPT 2023

DRAWING NO. UW-12



NOTES:

1. LOCATE FIRE HYDRANT IN PARKWAY BEHIND CURB & GUTTER IF AVAILABLE, OTHERWISE PLACE FIRE HYDRANT AT DIRECTION OF UTILITY INSPECTOR.
2. FOR FIRE HYDRANTS ON LONG DEAD-END LINES OUTSIDE THE R.O.W., A SECOND VALVE MAY BE REQUIRED APPROXIMATELY 10 FEET FROM THE HYDRANT.
3. TEST BOXES, CONNECTED INTO TRACING WIRE SYSTEM, SHALL BE REQUIRED WHERE HYDRANTS ARE NOT USED OR WHERE HYDRANT SPACING EXCEEDS 500 FEET.



NOTES:

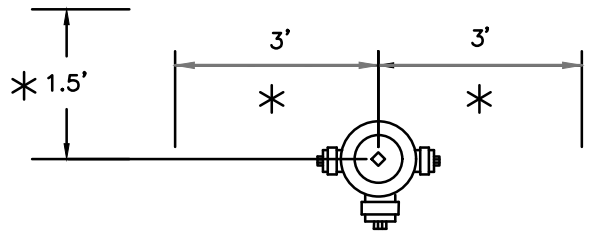
1. LOCATE FIRE HYDRANT IN PARKWAY BEHIND CURB & GUTTER IF AVAILABLE, OTHERWISE PLACE FIRE HYDRANT AT DIRECTION OF UTILITY INSPECTOR.
2. FOR FIRE HYDRANTS ON LONG DEAD-END LINES OUTSIDE THE R.O.W., A SECOND VALVE MAY BE REQUIRED APPROXIMATELY 10 FEET FROM THE HYDRANT.
3. TEST BOXES, CONNECTED INTO TRACING WIRE SYSTEM, SHALL BE REQUIRED WHERE HYDRANTS ARE NOT USED OR WHERE HYDRANT SPACING EXCEEDS 500 FEET.



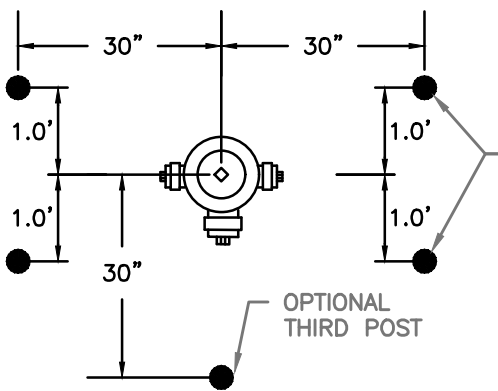
CITY OF LAS CRUCES

FLUSH HYDRANT DETAIL

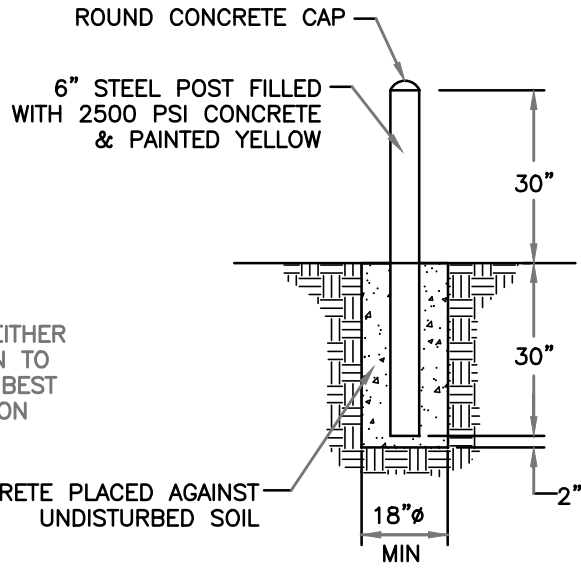
N.T.S.



SIDEWALK
 CURB * 1.5' AND 3' CLEARANCE TO ANY OBSTRUCTIONS SUCH AS WALLS, FENCES, ETC... (EXC. BOLLARDS AS BELOW)



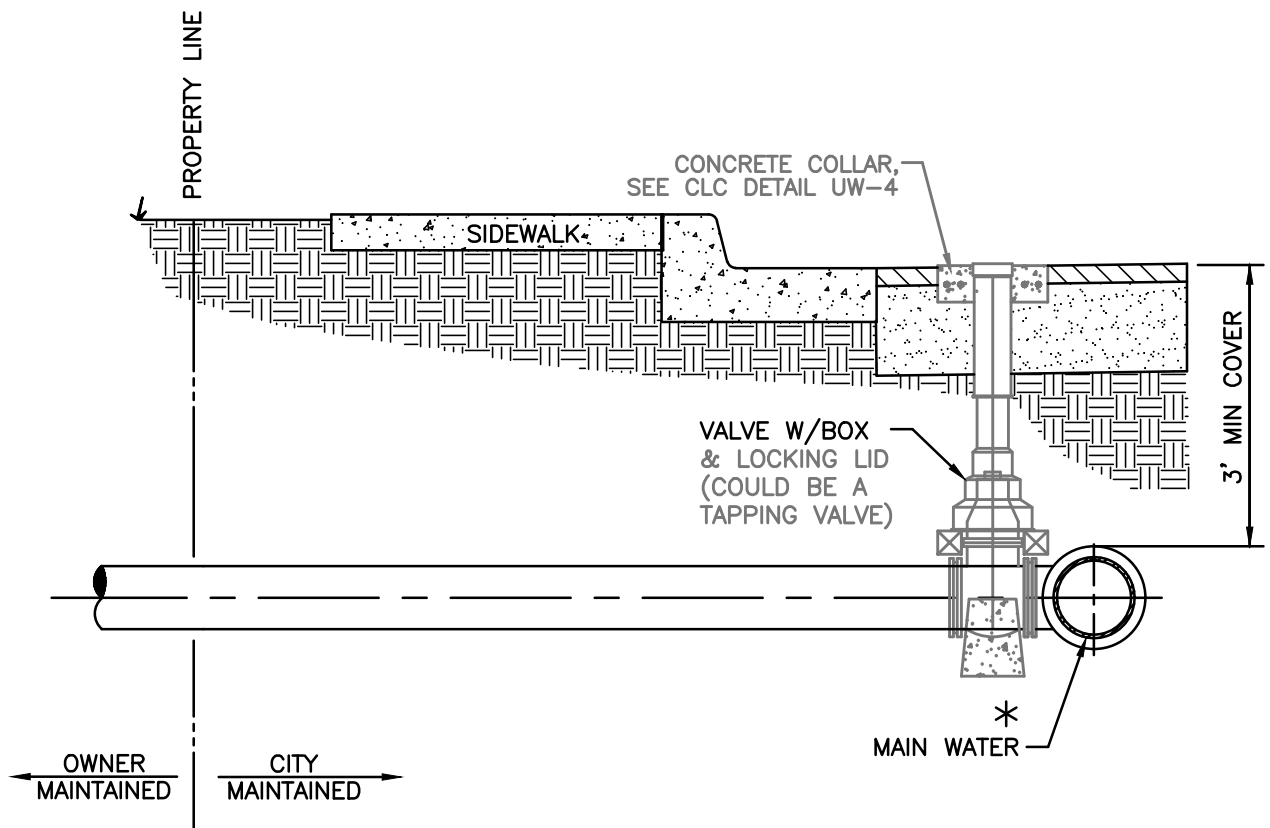
OFFSET EITHER DIRECTION TO PROVIDE BEST PROTECTION



CITY OF LAS CRUCES

FIRE HYDRANT BOLLARDS

N.T.S.



* THE LAS CRUCES UTILITIES WILL BE RESPONSIBLE TO THE PROPERTY LINE AND THE OWNER WILL BE RESPONSIBLE FOR MAINTENANCE FROM THE PROPERTY LINE TO THE BUILDING.



CITY OF LAS CRUCES

FIRE LINE

N.T.S.

FILE NAME: 2023 CLC UTILITY STANDARD DETAILS.DWG

ORIG. DATE: 8/14/00

LAST REVISION: SEPT 2023

DRAWING NO. UW-15

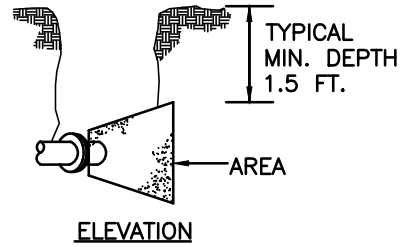
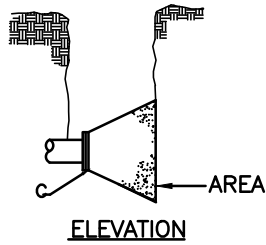
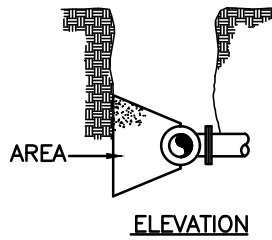
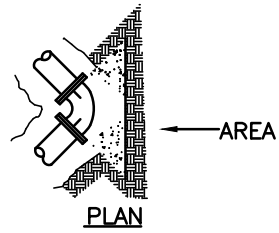
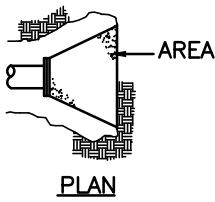
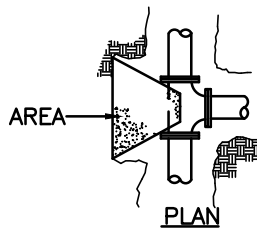


TABLE I

MINIMUM BEARING SURFACE AREA (IN SQUARE FEET)					
PIPE SIZE	BENDS				TEE OR DEAD END
	11 ¹ / ₄	22 ¹ / ₂	45	90	
4"	1	1	1	2	1.5
6"	1	1.5	2.5	4.5	3.5
8"	1.5	2.5	4.5	8	6
10"	2	3.5	7	12.5	9
12"	2.5	5	10	18	13.0

TABLE II

SOIL TYPE	MAX. ALLOWABLE SOIL BEARING VALUES	FACTOR FOR INCREASING AREAS IN TABLE I
LOOSE SAND	500 PSF	4
SOFT SANDY CLAY	1000 PSF	2
ADOBE	1000 PSF	2
COMPACT FINE SAND	2000 PSF	1
COMPACT COARSE SAND	2000 PSF	1
MEDIUM STIFF CLAY	2000 PSF	1

NOTES:

1. BEARING VALUES SHOWN IN TABLE 1 ARE BASED ON 150 P.S.I. TEST PRESSURE, AT 1.5 TO 1 SAFETY FACTOR AND 2000 P.S.F. SOIL BEARING VALUE.
2. THE DESIGN ENGINEER SHALL DETERMINE THE SAFE BEARING VALUES FOR EACH PROJECT AND THE FACTORS AS SHOWN IN TABLE II FOR INCREASING AREAS IN TABLE I SHALL BE UTILIZED BY THE CONTRACTOR WHERE APPLICABLE.
3. BEARING SURFACE AREAS ARE TO BE ON UNDISTURBED SOIL.
4. UTILITY SYSTEM PIPING THRUST IS TO BE RESTRAINED BY THE USE OF RESTRAINED JOINT FITTINGS, SEE SECTION 802.3.1.

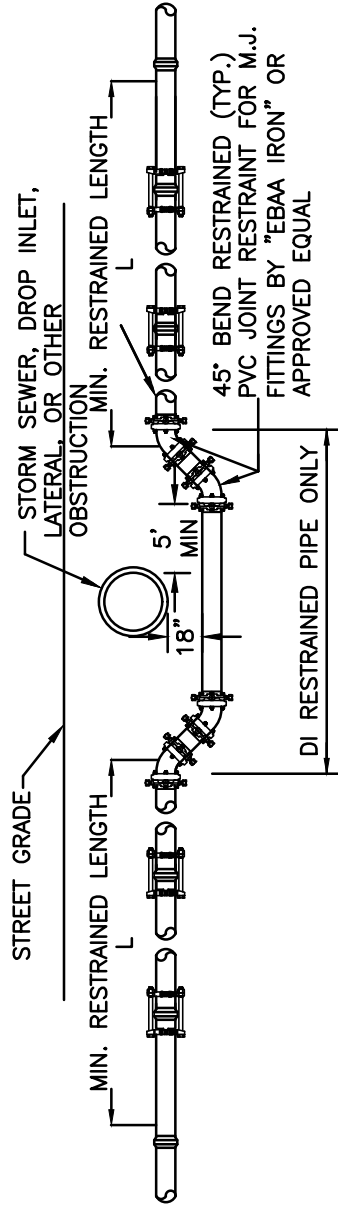


CITY OF LAS CRUCES

CONCRETE BLOCKING DETAILS

N.T.S.

PVC AND DUCTILE IRON RESTRAINED JOINTS BY "EBBA" IRON, ROMAC INDUSTRIES" OR APPROVED EQUAL



RESTRAINED LENGTH (L) IN FEET

PIPE SIZE	D.I.	PVC
4"	12'	22'
6"	17'	30'
8"	22'	40'
10"	26'	48'
12"	30'	56'

LENGTHS BASED ON: EBAA IRON RESTRAINT DESIGN SOFTWARE

NOTES:

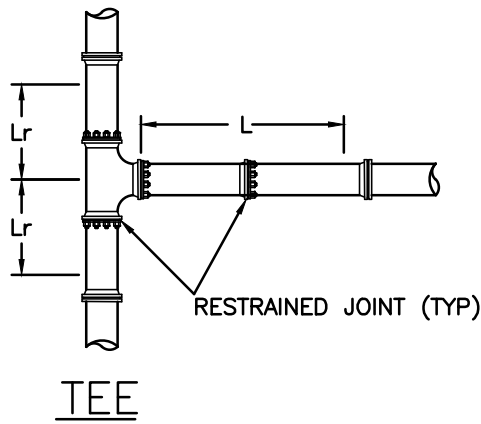
1. THIS TABLE OF RESTRAINED LENGTHS IS PROVIDED BASED ON ML (UNIFIED CLASSIFICATION) SOIL TYPES. THESE LENGTHS MAY ALSO BE USED FOR GP, GM, SM, SP, AND CL SOIL TYPES. THE USE OF OTHER RESTRAINED LENGTHS BASED ON OTHER SOIL CONDITIONS OR OTHER DESIGN PARAMETERS OR PIPE SIZES LARGER THAN 12 INCH SHALL BE DESIGNED AND SUBMITTED FOR APPROVAL.
2. RESTRAINT LENGTH CALCULATION BASED ON COMPACTED TYPE 4 TRENCH WITH 3' OF COVER. A TEST PRESSURE OF 150 PSI & A 1.5 TO 1 SAFETY FACTOR
3. POLYETHYLENE WRAPPED D.I. PIPE WILL REQUIRE SEPARATE CALCULATIONS



CITY OF LAS CRUCES

WATER LINE LOWERING

N.T.S.



NOTES:

1. RESTRAINED LENGTH CALCULATION BASED ON COMPACTED TYPE 4 TRENCH WITH 3' OF COVER. A TEST PRESSURE OF 150 PSI & A 1.5 TO 1 SAFETY FACTOR.
2. THIS TABLE OF RESTRAINED LENGTHS IS PROVIDED BASED ON ML (UNIFIED CLASSIFICATION) SOIL TYPES. THESE LENGTHS MAY ALSO BE USED FOR GP, GM, SP, AND CL SOIL TYPES. THE USE OF OTHER RESTRAINED LENGTHS BASED ON OTHER SOIL CONDITIONS OR OTHER DESIGN PARAMETERS OR PIPE SIZES LARGER THAN 12 INCH SHALL BE DESIGNED AND SUBMITTED FOR APPROVAL.
3. POLYETHYLENE WRAPPED D.I. PIPE WILL REQUIRE SEPARATE CALCULATIONS.
4. TEE FITTINGS REQUIRE THE RESTRAINT OF ALL JOINTS WITHIN A CALCULATED LENGTH ALONG THE BRANCH PIPE. THE RESTRAINED DESIGN ALSO REQUIRES THE SELECTION OF A LENGTH OF PIPE ALONG THE RUN (Lr) TO BE FREE OF JOINTS.

PIPE SIZE	LR= 5' MIN.		LR= 10' MIN.	
	D.I.	L(PVC)	D.I.	L(PVC)
12"X4"	1'	1'	1'	1'
12"X6"	6'	10'	1'	1'
12"X8"	27'	48'	1'	2'
12"X10"	42'	74'	21'	38'
12"X12"	56'	100'	39'	69'
10"X4"	1'	1'	1'	1'
10"X6"	12'	21'	1'	1'
10"X8"	32'	56'	10'	18'
10"X10"	45'	80'	28'	50'
8"X4"	1'	1'	1'	1'
8"X6"	18'	32'	1'	1'
8"X8"	36'	64'	19'	34'
6"X4"	4'	7'	1'	1'
6"X6"	23'	41'	7'	12'
4"X4"	12'	21'	1'	1'

LENGTHS BASED ON: EBAA IRON RESTRAINT DESIGN SOFTWARE

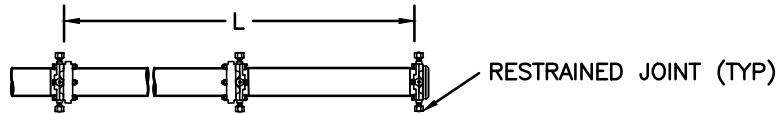


CITY OF LAS CRUCES

RESTRAINED TEE

N.T.S.

DEAD END



DEAD END REQUIRE RESTRAINT OF ALL JOINT WITHIN
THE CALCULATION LENGTH (L) EXTENDING FROM CAP

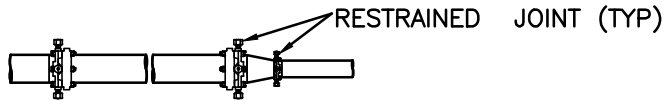
DEAD END RESTRAINED LENGTH (L) IN FEET

PIPE SIZE	D.I.	PVC
4"	28'	52'
6"	40'	74'
8"	52'	96'
10"	62'	115'
12"	73'	136'

NOTES:

1. RESTRAINT LENGTH CALCULATION BASED ON COMPACTED TYPE 4 TRENCH WITH 3' OF COVER. A TEST PRESSURE OF 150 PSI & A 1.5 TO 1 SAFETY FACTOR.
2. THIS TABLE OF RESTRAINED LENGTHS IS PROVIDED BASED ON ML (UNIFIED CLASSIFICATION) SOIL TYPES. THESE LENGTHS MAY ALSO BE USED FOR GP, GM, SP, AND CL SOIL TYPES. THE USE OF OTHER RESTRAINED LENGTHS BASED ON OTHER SOIL CONDITIONS OR OTHER DESIGN PARAMETERS OF PIPE SIZES LARGER THAN 12 INCH SHALL BE DESIGNED AND SUBMITTED FOR APPROVAL. POLYETHYLENE WRAPPED D.I. PIPE WILL REQUIRE SEPARATE CALCULATIONS.

REDUCER



REDUCERS REQUIRE RESTRAINT OF ALL JOINT WITHIN THE
CALCULATION LENGTH (L) EXTENDING FROM THE FITTING ON
THE SIDE OF THE LARGER PIPE, RESTRAINING THE SMALL SIDE
OF THE FITTING IS OPTIONAL

REDUCER RESTRAINED LENGTH (L) IN FEET

PIPE SIZE	D.I.	PVC
12"X4"	64'	118'
12"X6"	53'	99'
12"X8"	39'	72'
12X10"	36'	67'
10"X4"	51'	94'
10x6"	38'	71'
10"X8"	21'	39'
8"X4"	38'	69'
8"X6"	22'	40'
6"X4"	21'	38'

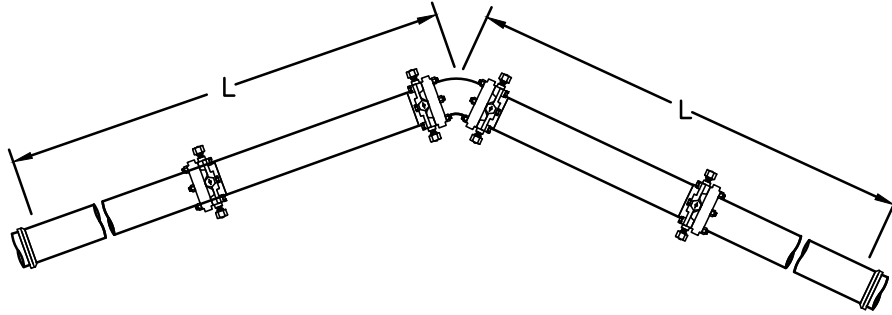
LENGTHS BASED ON: EBAA IRON RESTRAINT DESIGN SOFTWARE



CITY OF LAS CRUCES

RESTRAINED DEAD END AND REDUCER

N.T.S.



RESTRAINED LENGTH (FT) FOR DUCTILE IRON PIPE

PIPE SIZE	11 1/2°BEND	22 1/2°BEND	45°BEND	90°BEND
4"	1	3	6	14
6"	2	4	8	19
8"	2	5	10	25
10"	3	6	12	29
12"	3	7	14	34

RESTRAINED LENGTH (FT) FOR P.V.C. PIPE

PIPE SIZE	11 1/2°BEND	22 1/2°BEND	45°BEND	90°BEND
4"	2	3	7	17
6"	2	5	10	24
8"	3	6	13	31
10"	4	7	15	37
12"	4	9	18	44

NOTES:

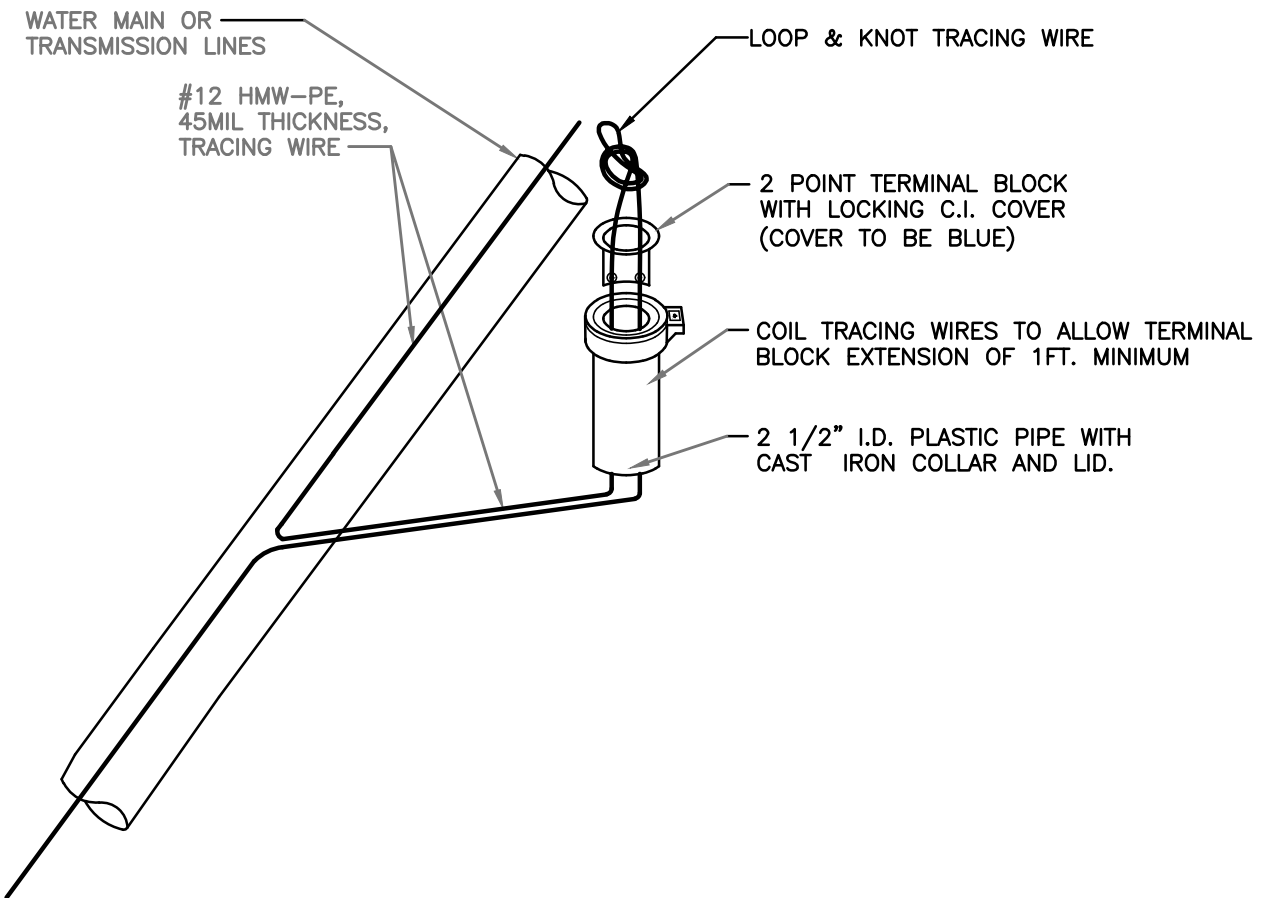
1. THIS TABLE OF RESTRAINED LENGTHS IS PROVIDED BASED ON ML (UNIFIED CLASSIFICATION) SOIL TYPES. THESE LENGTHS MAY ALSO BE USED FOR GP, GM, SM, SP, AND CL SOIL TYPES. THE USE OF OTHER RESTRAINED LENGTHS BASED ON OTHER SOIL CONDITIONS OR OTHER DESIGN PARAMETERS OR PIPE SIZES LARGER THAN 12 INCH SHALL BE DESIGNED AND SUBMITTED FOR APPROVAL.
2. RESTRAINED LENGTH CALCULATION BASED ON COMPACTED TYPE 4 TRENCH WITH 3' OF COVER. A TEST PRESSURE OF 150 PSI & A 1.5 TO 1 SAFETY FACTOR.
3. POLYETHYLENE WRAPPED D.I. PIPE WILL REQUIRE SEPARATE CALCULATIONS.
4. LENGTH BASED ON EBAA IRON RESTRAINT SOFTWARE.



CITY OF LAS CRUCES

RESTRAINED HORIZONTAL BEND

N.T.S.



NOTES:

1. TEST BOXES, CONNECTED INTO TRACING WIRE SYSTEM, SHALL BE REQUIRED WHERE HYDRANTS ARE NOT USED OR WHERE HYDRANT SPACING EXCEEDS 500 FEET.
2. SPACING AND LOCATION OF TEST BOXES TO BE DETERMINED BY THE CITY UTILITIES DIVISION. TEST BOX LOCATION MAY VARY, UP TO 50 FT. FROM WATER MAIN LINE.
3. REFER TO STANDARDS AND MATERIALS LISTS FOR MATERIALS.
4. TRACING WIRE SHALL EXTEND A MINIMUM OF 12" ABOVE TEST STATION.
5. 24" OCTAGON CONCRETE COLLAR TO BE INSTALLED.



CITY OF LAS CRUCES

TRACING WIRE TEST BOX

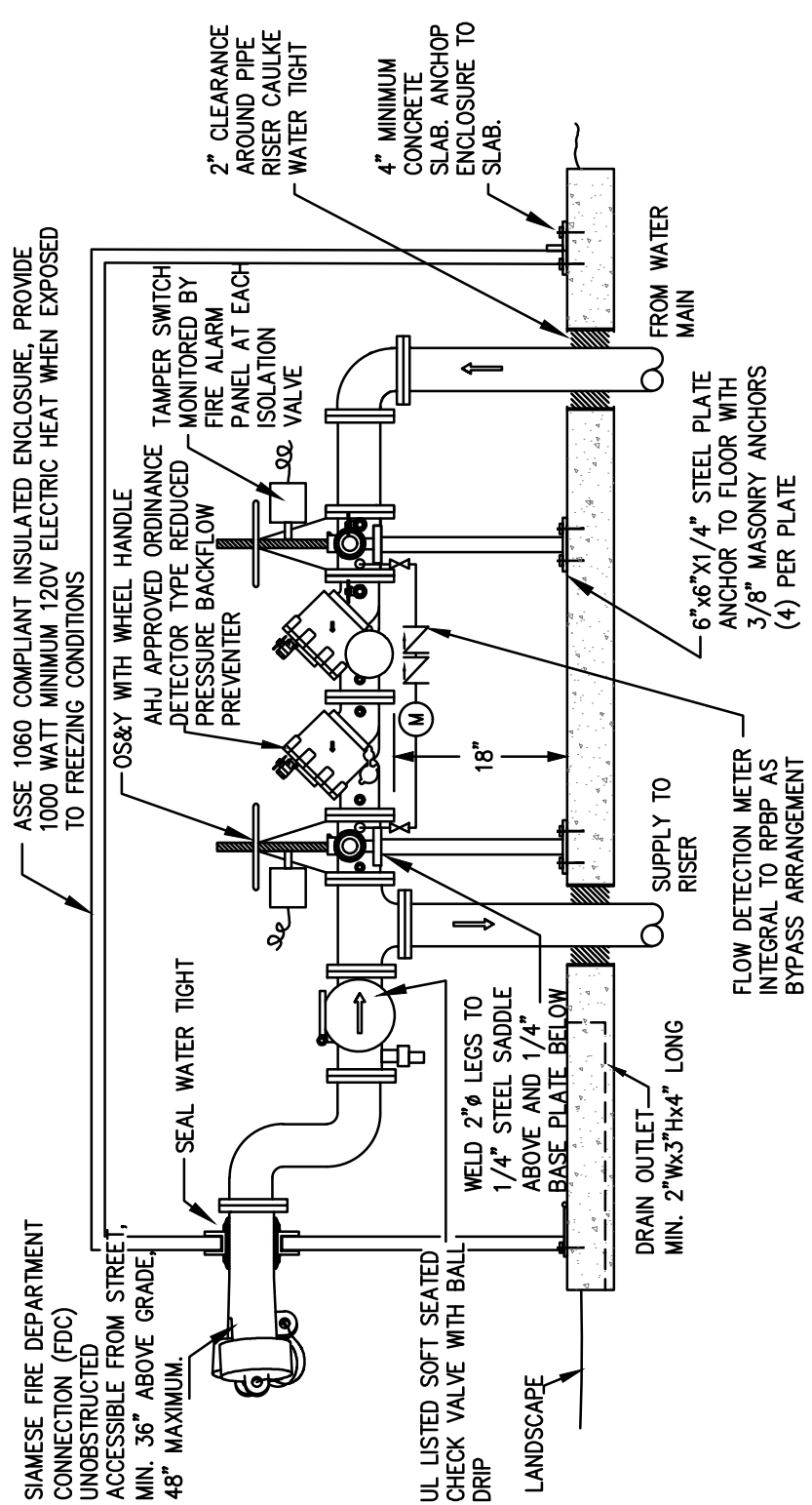
N.T.S.

FILE NAME: 2023 CLC UTILITY STANDARD DETAILS.DWG

ORIG. DATE: 5/05/03

LAST REVISION: SEPT 2023

DRAWING NO. UW-21



SIAMASE FIRE DEPARTMENT CONNECTION (FDC) UNOBSTRUCTED ACCESSIBLE FROM STREET, MIN. 36" ABOVE GRADE, 48" MAXIMUM.

ASSE 1060 COMPLIANT INSULATED ENCLOSURE, PROVIDE 1000 WATT MINIMUM 120V ELECTRIC HEAT WHEN EXPOSED TO FREEZING CONDITIONS

OS&Y WITH WHEEL HANDLE

AHJ APPROVED ORDINANCE TAMPER SWITCH

DETECTOR TYPE REDUCED PRESSURE BACKFLOW PREVENTER

FIRE ALARM ISOLATION VALVE

2" CLEARANCE AROUND PIPE RISER CAULKE WATER TIGHT

4" MINIMUM CONCRETE SLAB. ANCHOR ENCLOSURE TO SLAB.

FROM WATER MAIN

6"x6"x1/4" STEEL PLATE ANCHOR TO FLOOR WITH 3/8" MASONRY ANCHORS (4) PER PLATE

SUPPLY TO RISER

FLOW DETECTION METER INTEGRAL TO RPBP AS BYPASS ARRANGEMENT

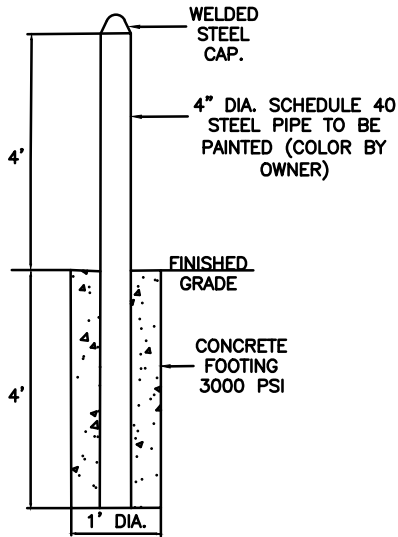
18"

WELD 2" Ø LEGS TO 1/4" STEEL SADDLE ABOVE AND 1/4" BASE PLATE BELOW

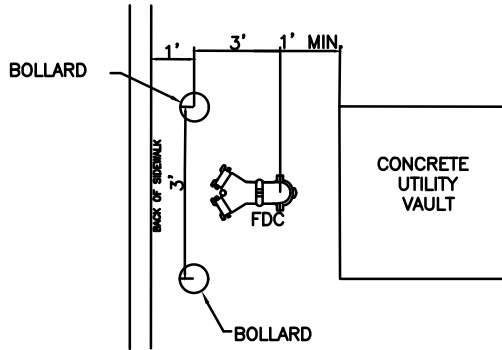
DRAIN OUTLET MIN. 2"x3"x4" LONG

LANDSCAPE

NOTES:
1. FOR MOST CURRENT DETAILS PLEASE CONTACT THE LAS CRUCES FIRE DEPARTMENT/PREVENTION (575) 528-3473 FD-Prevention@las-cruces.org

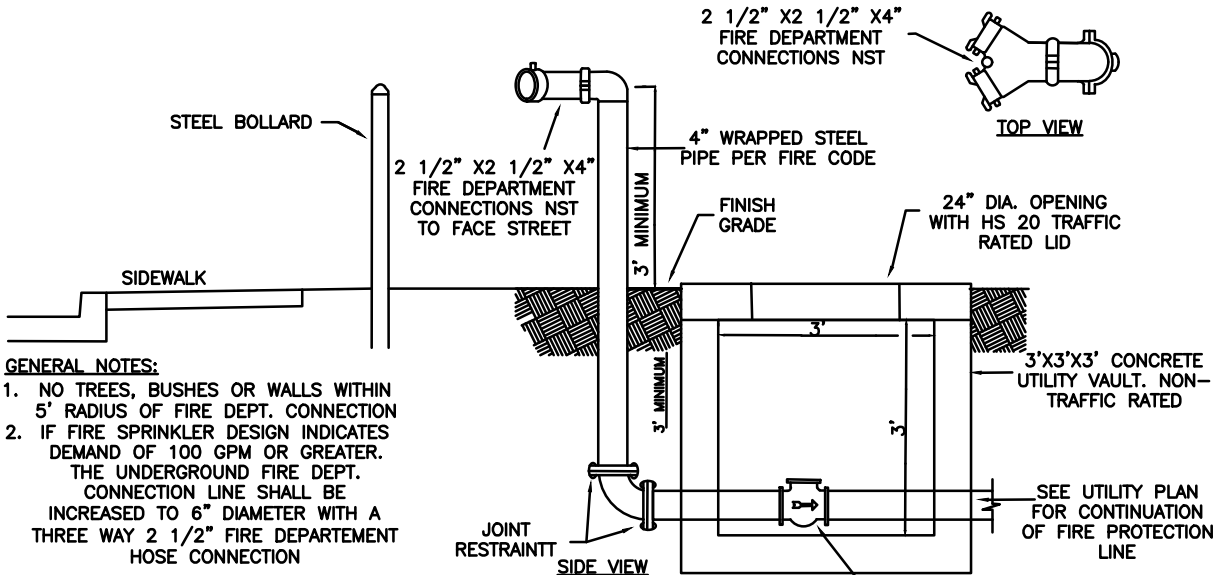


BOLLARD DETAIL
NOT TO SCALE



FIRE DEPARTMENT CONNECTION (FDC) - PLAN VIEW
NOT TO SCALE

NOTE: ALL FDC'S SHALL BE PROTECTED BY STEEL PIPE BOLLARDS AS DIRECTED BY LAS CRUCES FIRE DEPARTMENT

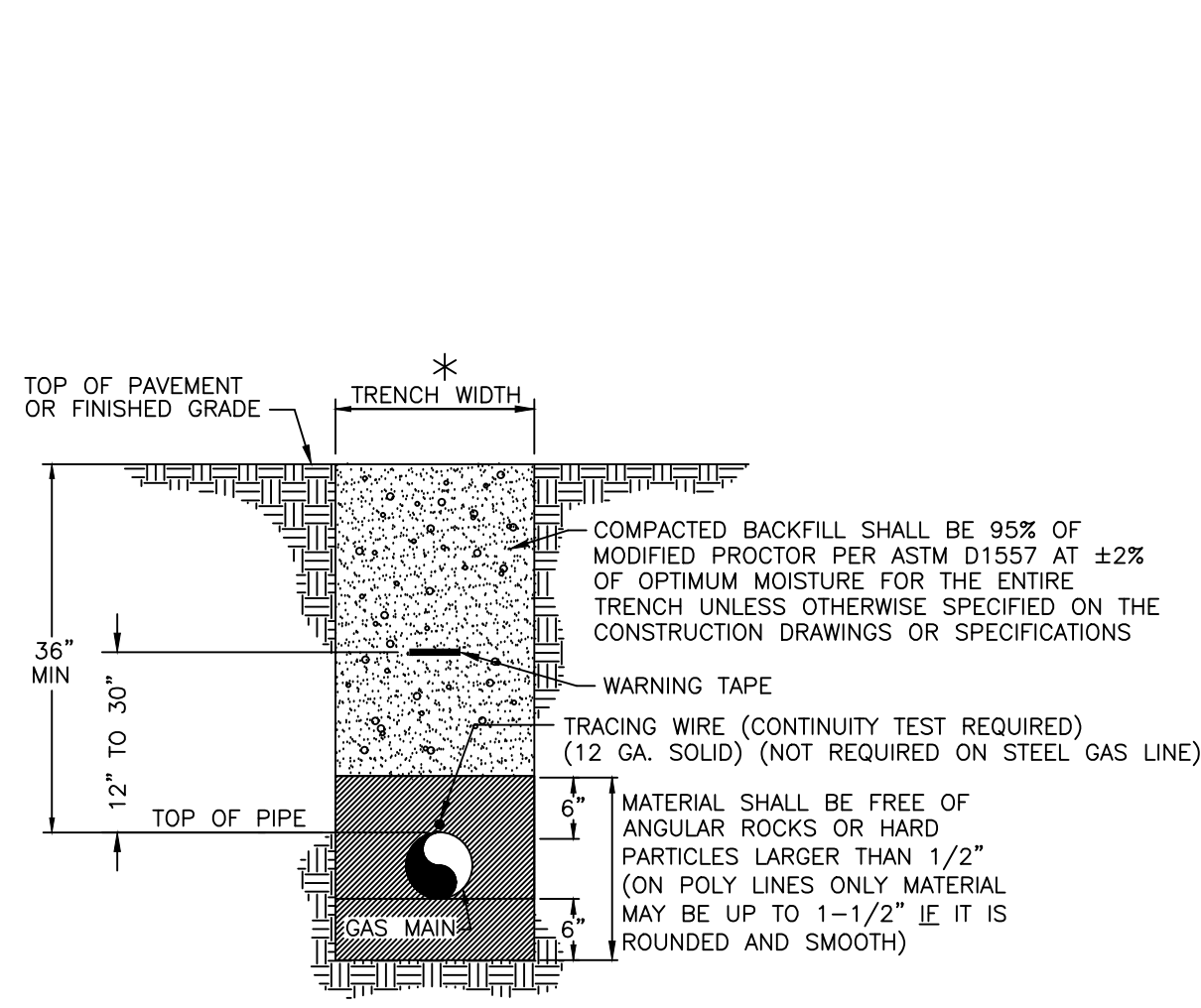


- GENERAL NOTES:**
1. NO TREES, BUSHES OR WALLS WITHIN 5' RADIUS OF FIRE DEPT. CONNECTION
 2. IF FIRE SPRINKLER DESIGN INDICATES DEMAND OF 100 GPM OR GREATER. THE UNDERGROUND FIRE DEPT. CONNECTION LINE SHALL BE INCREASED TO 6" DIAMETER WITH A THREE WAY 2 1/2" FIRE DEPARTMENT HOSE CONNECTION

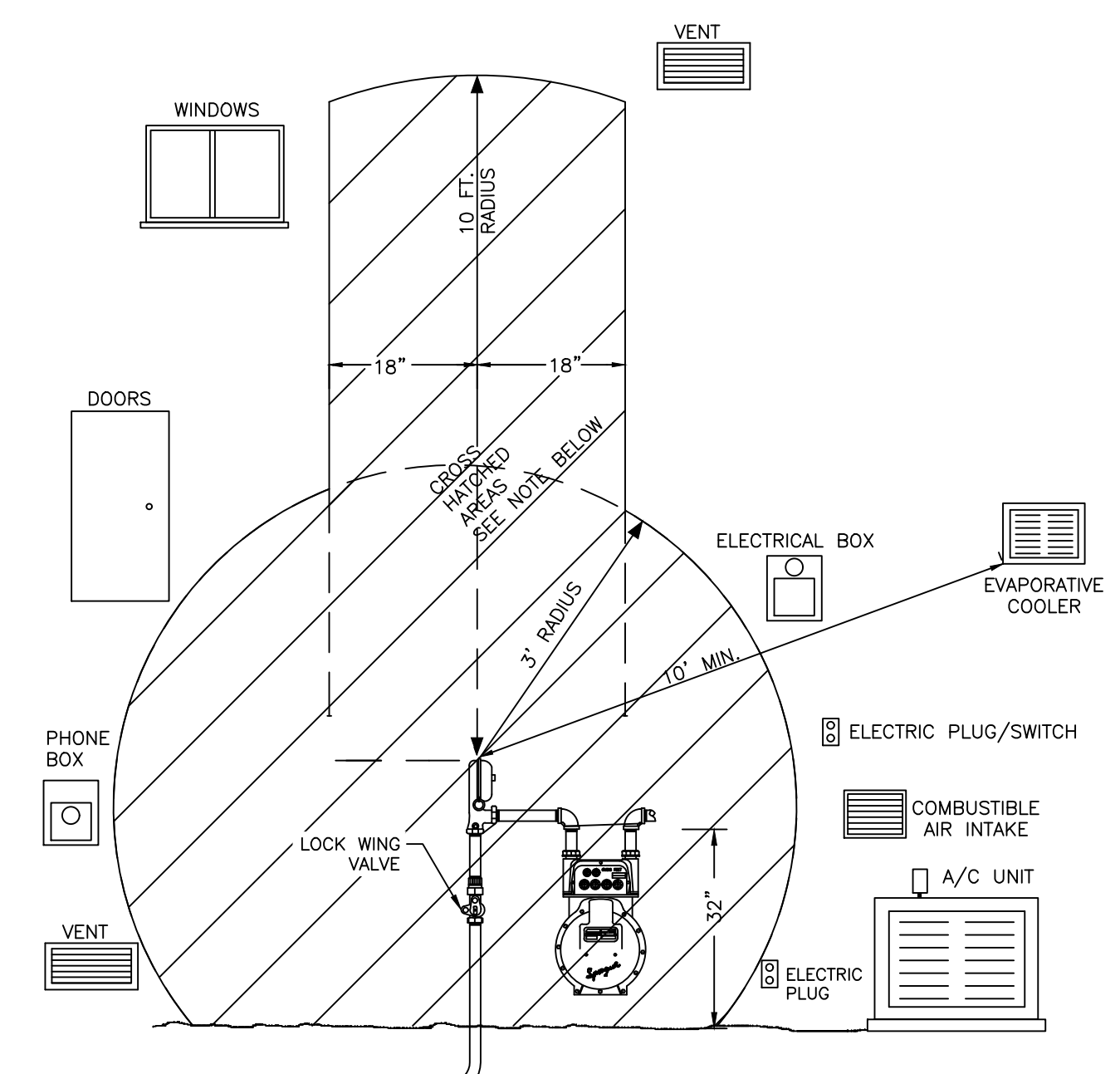
NOTE: ALL FDC'S SHALL BE PROTECTED BY STEEL PIPE BOLLARDS AS DIRECTED BY LAS CRUCES FIRE DEPARTMENT

FIRE DEPARTMENT CONNECTION (FDC)
NOT TO SCALE

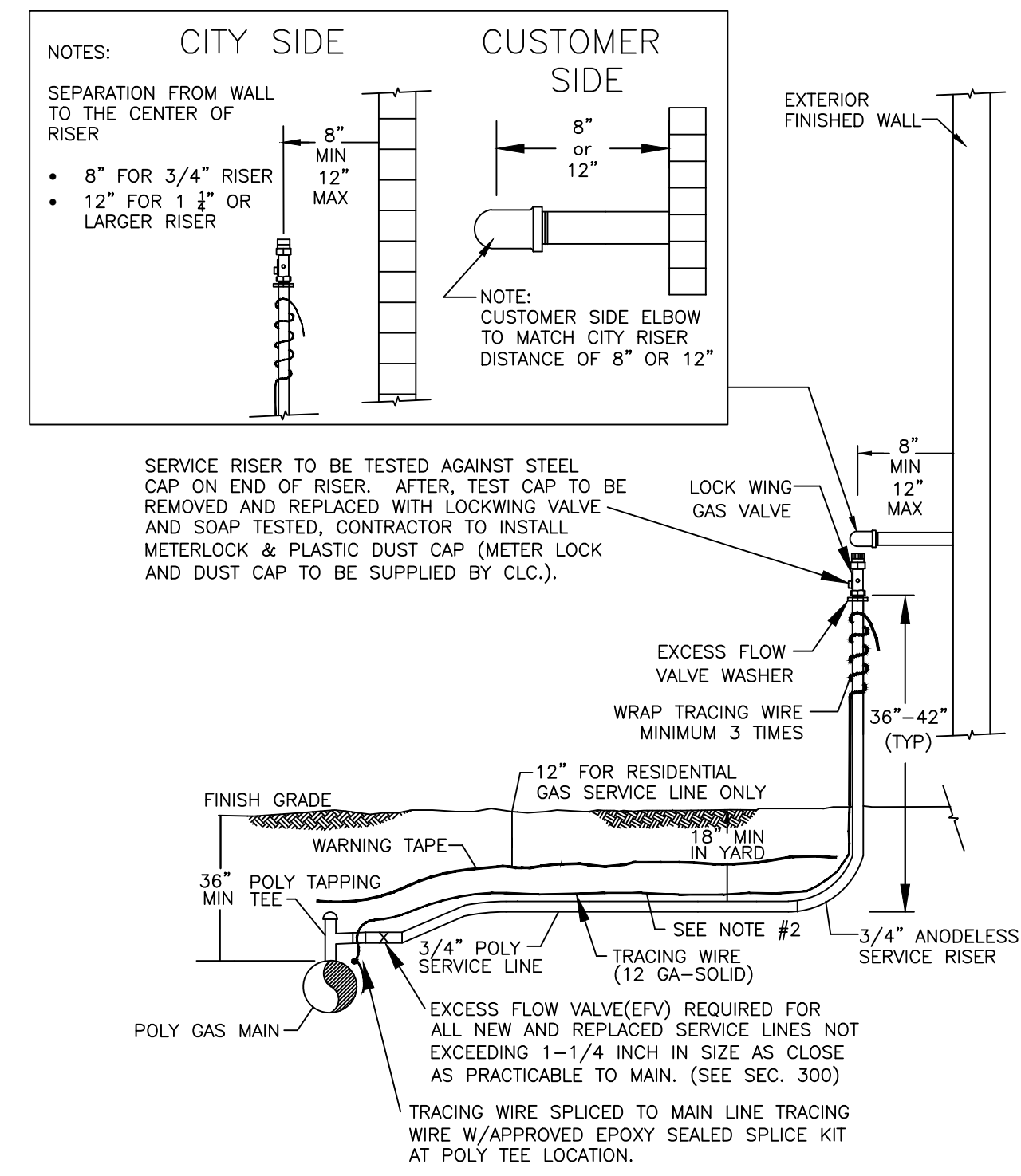
ALL GAS UTILITY DETAILS SHEET 1 OF 2



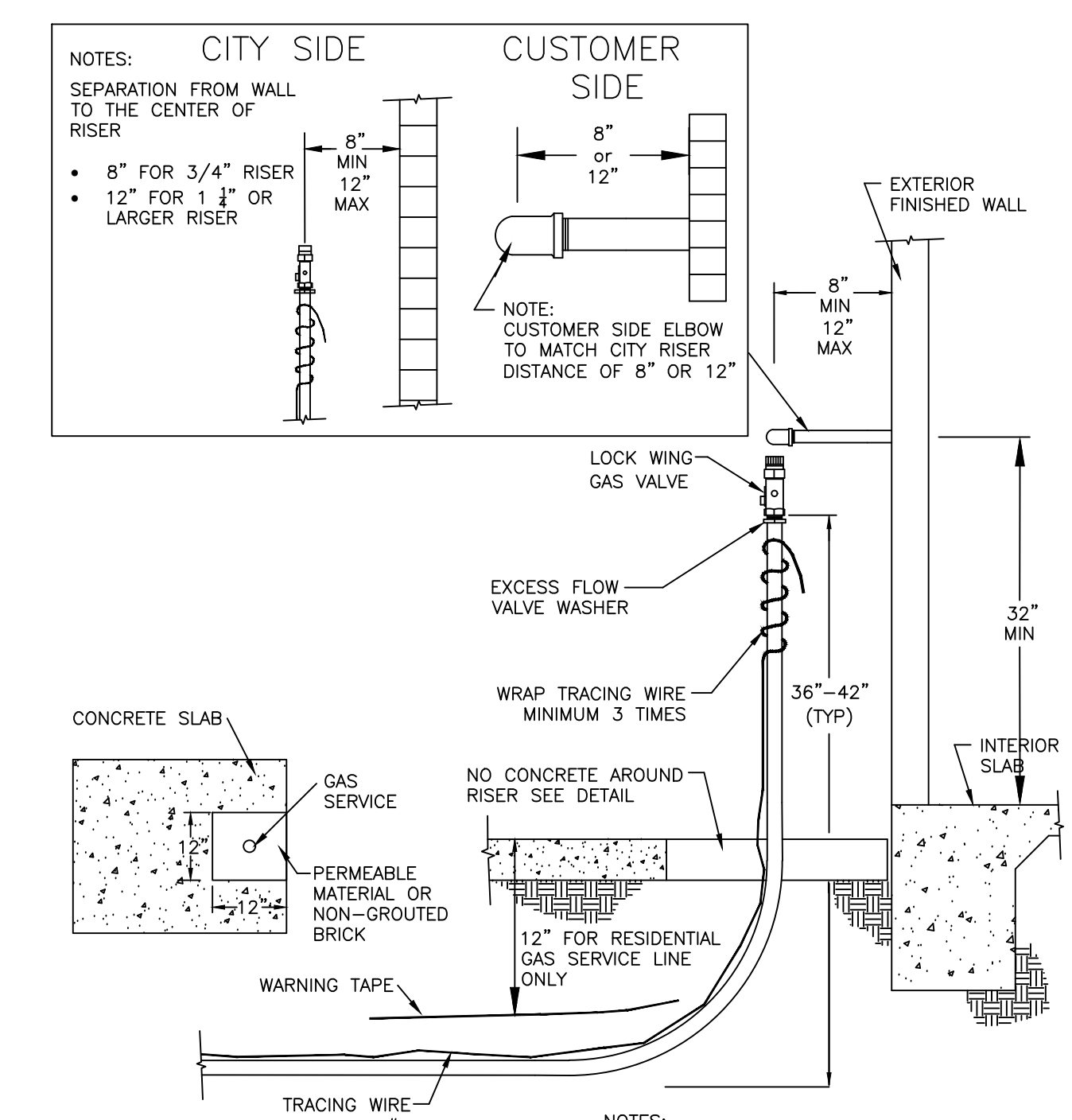
- * MAIN LINE TRENCH SHALL HAVE THE FOLLOWING MINIMUM WIDTHS:
- 3 PIPE DIAMETERS OR 12 INCHES, WHICHEVER IS GREATER FOR TRENCHES REQUIRING COMPACTION TESTS
 - 3 PIPE DIAMETERS FOR OTHER TRENCHES
 - TRENCH WIDTHS, CROSS SECTIONS, SHALL BE COMPLIANT TO ALL APPLICABLE SAFETY STANDARDS AND REGULATIONS
 - TRENCH WIDTH IS TYPICAL FOR POLY PIPE.
 - TRENCH WIDTHS SHALL BE DESIGNED ON A PER CASE BASIS FOR STEEL PIPE.
 - TRACING WIRE TO BE TAPED TO GAS LINE @ 5 FT. O.C.
 - TRACING WIRE TO BE ACCESSIBLE, WITHIN VALVE BOX, SERVICE POINT, OR WITHIN AN INSTALLED TWO POINT BOX, AT 500 FT. MAXIMUM ON CENTER.



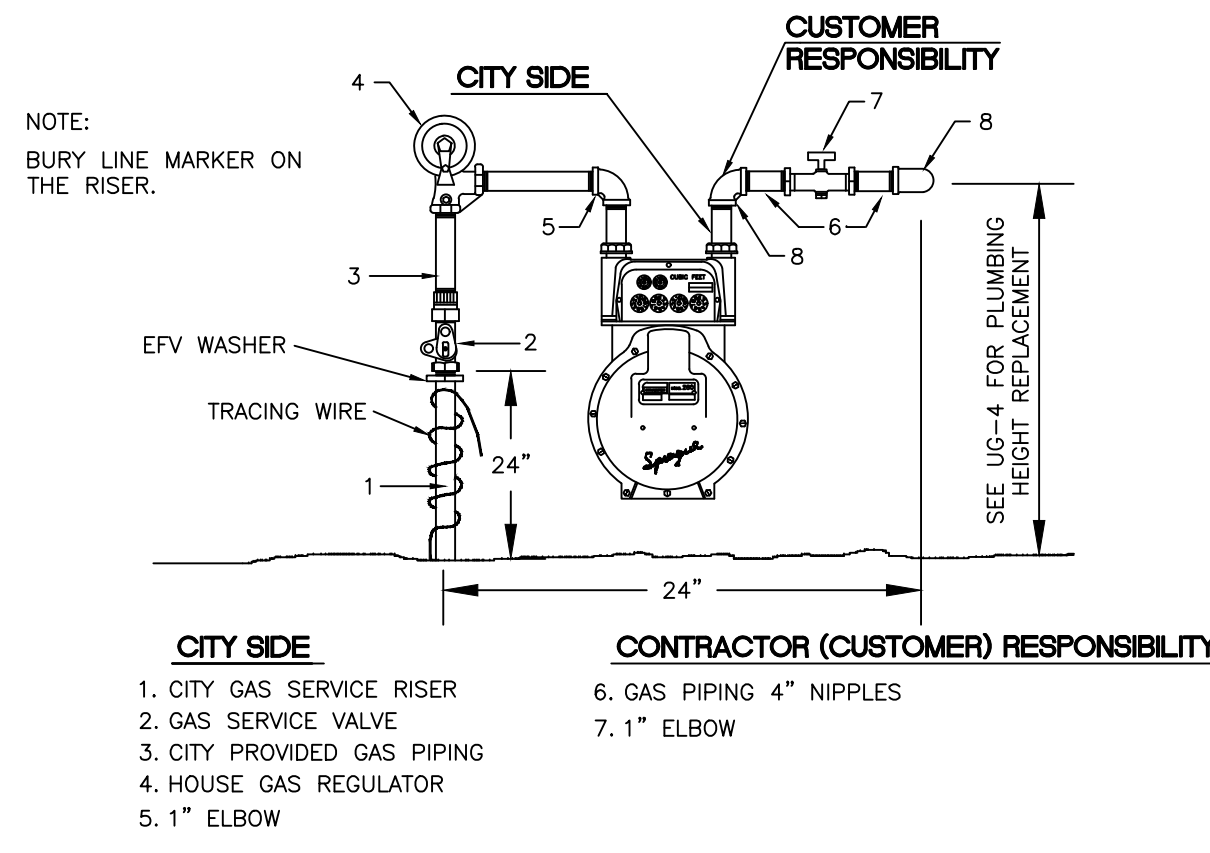
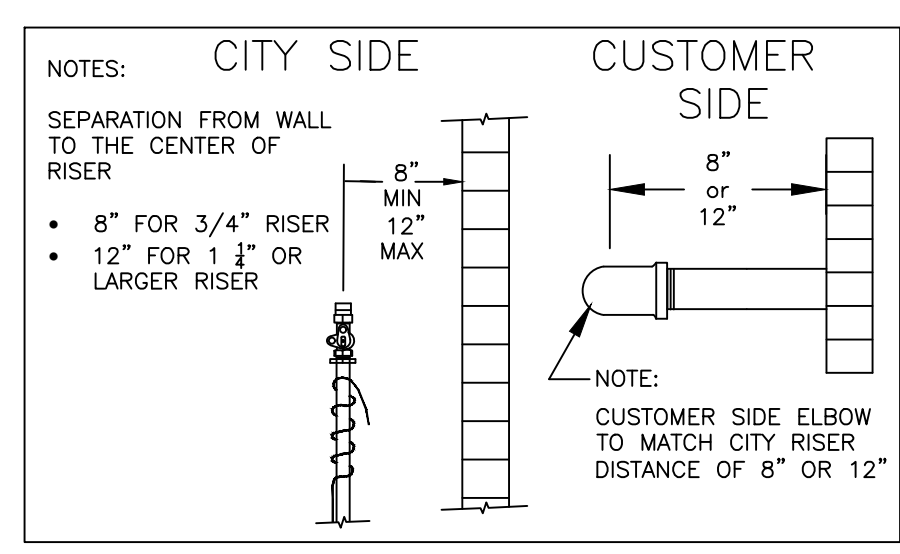
- NOTES:**
1. DIMENSIONS SHOWN ARE MINIMUMS.
 2. METERS ARE INSTALLED BY CITY.
 3. GAS METERS SHALL BE LOCATED AS PER CITY OF LAS CRUCES - DIVISION OF UTILITIES "STANDARD OPERATING PROCEDURES" LATEST EDITION.
 4. NO AIR INTAKES/SOURCES OF VENTILATION/SOURCES OF IGNITION WITHIN CROSS HATCHED AREAS SHOWN.(EXCEPT: EVAP. COOLER MIN. DISTANCE IS 10 FT.)



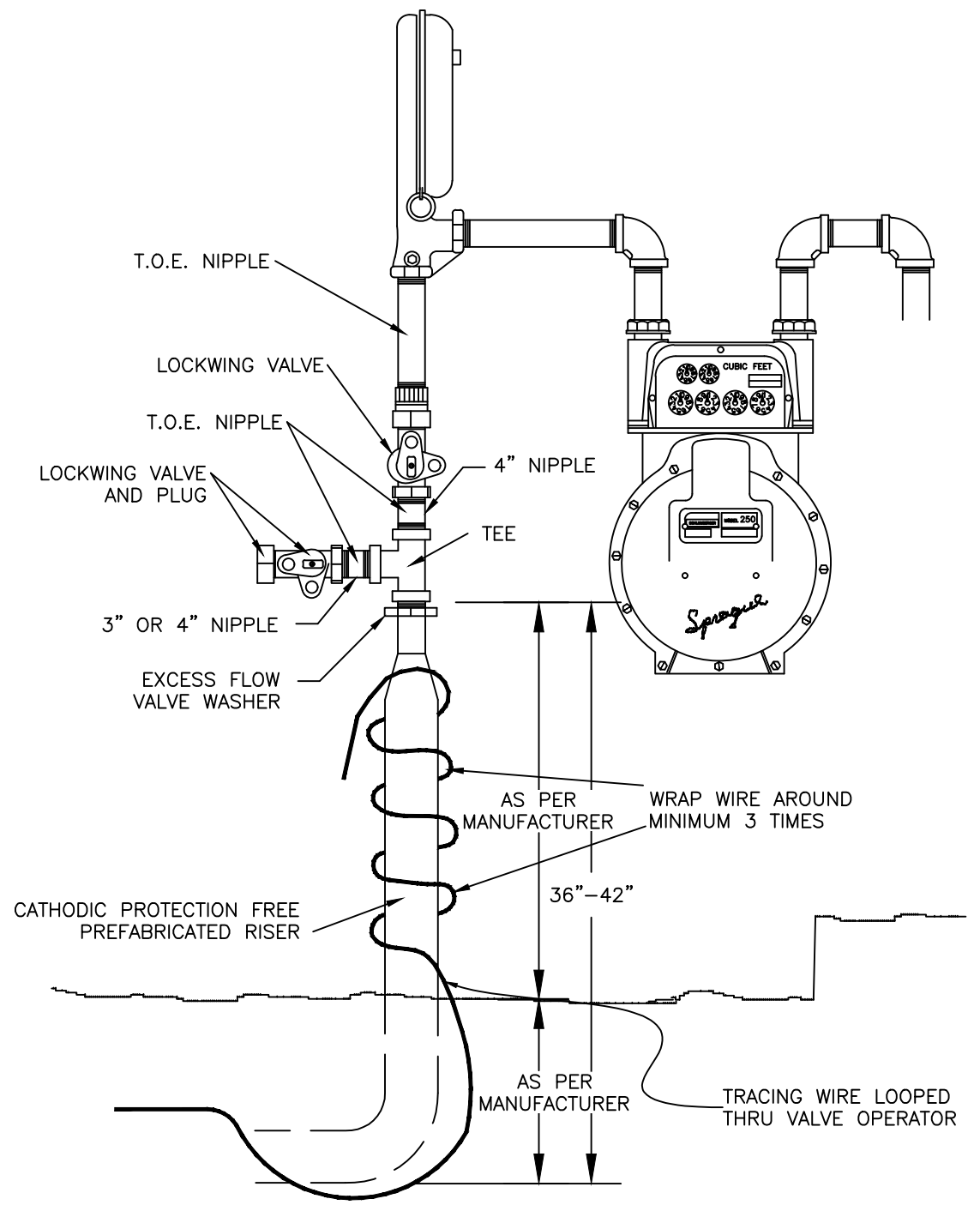
- NOTES:**
1. CONTINUITY TEST REQUIRED ON TRACING WIRE.
 2. TAPE TRACING WIRE TO CARRIER PIPE MAIN AND SERVICE @ 5 FT. O.C.



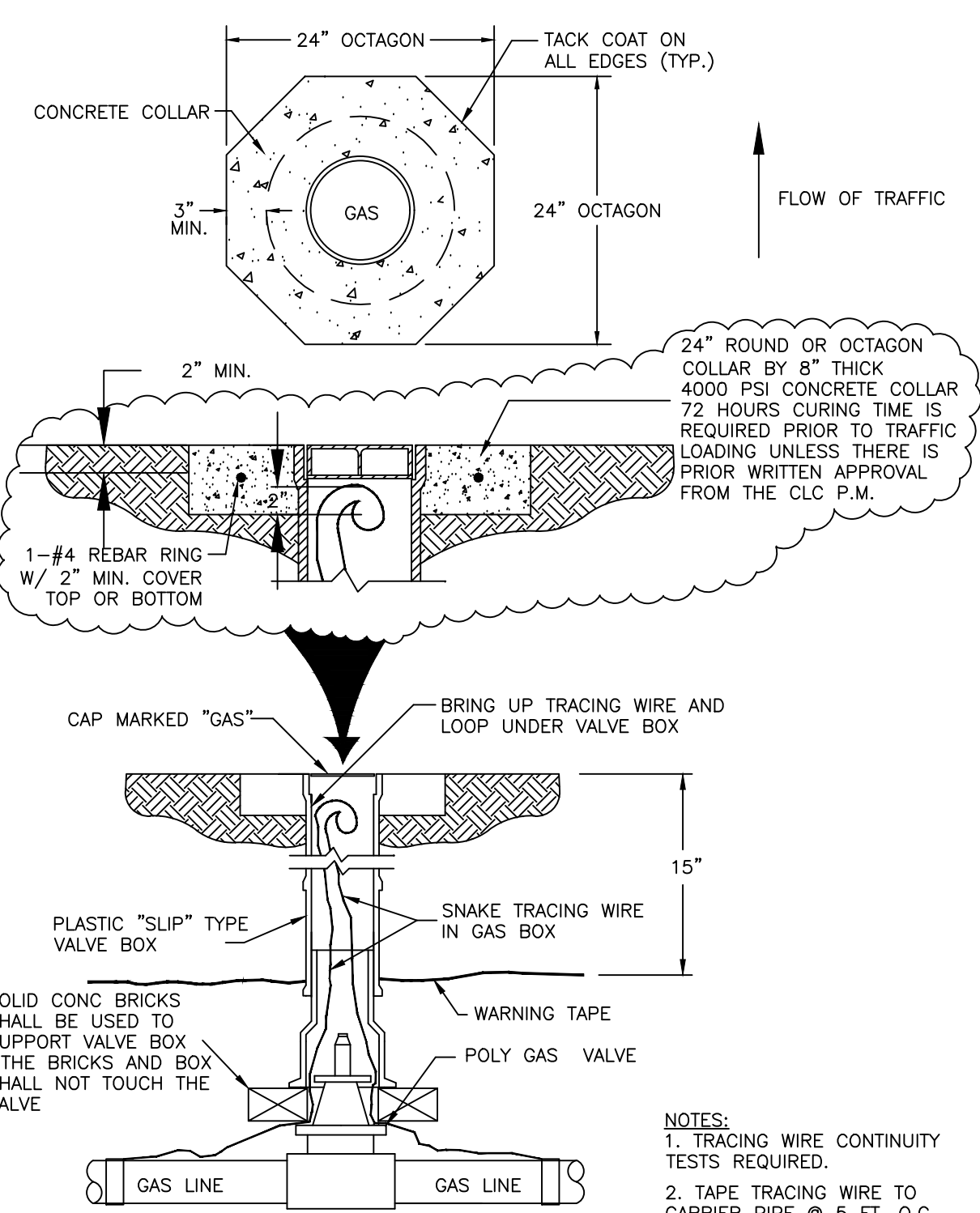
- NOTES:**
1. TYPICAL UNDER CONCRETE PAVING.
 2. TAPE TRACING WIRE TO CARRIER PIPE MAIN AND SERVICE @ 5 FT. O.C.
 3. CONTINUITY TEST REQUIRED ON TRACING WIRE.
 4. WRAP AND TIE TRACING WIRE TO RISER.
 5. BURY LINE MARKER ON THE RISER.



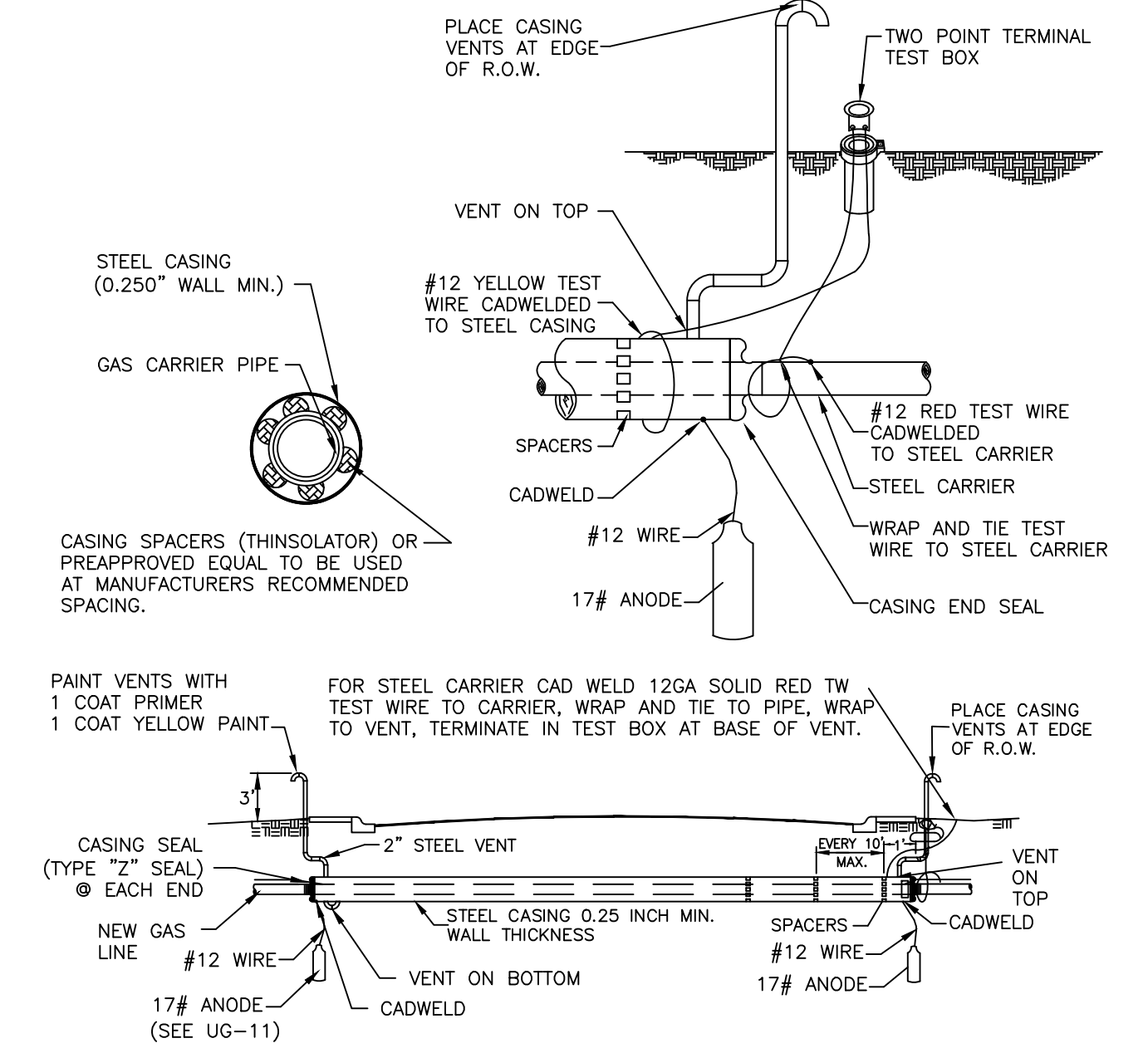
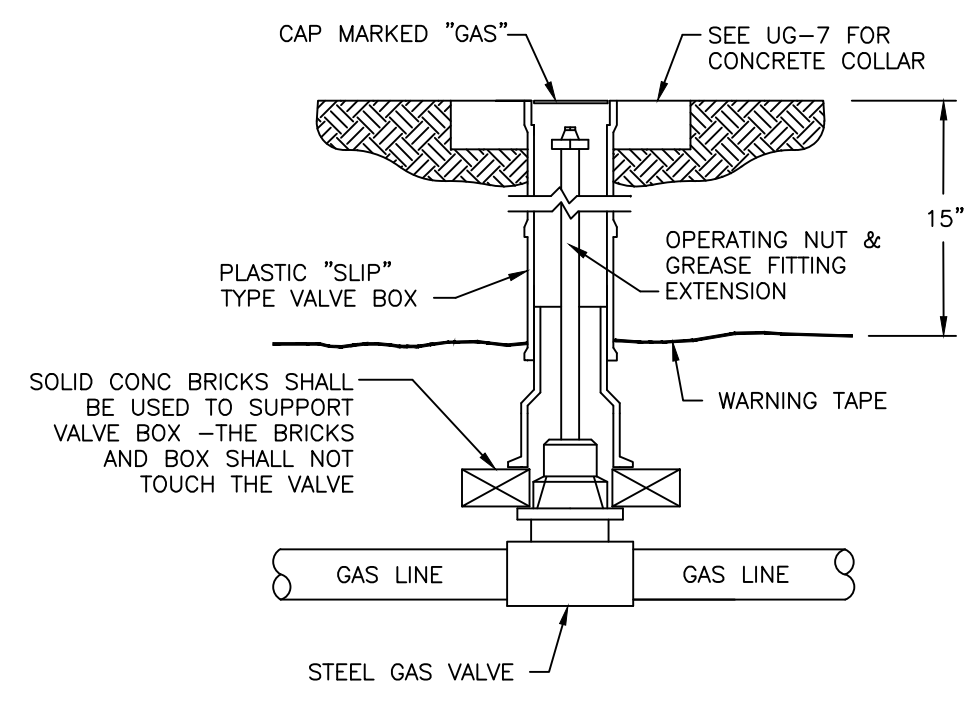
UG-5 SINGLE RESIDENTIAL METER INSTALLATION N.T.S.



- NOTE:**
1. TRACING WIRE CONTINUITY TESTS REQUIRED.
 2. BURY LINE MARKER ON THE RISER

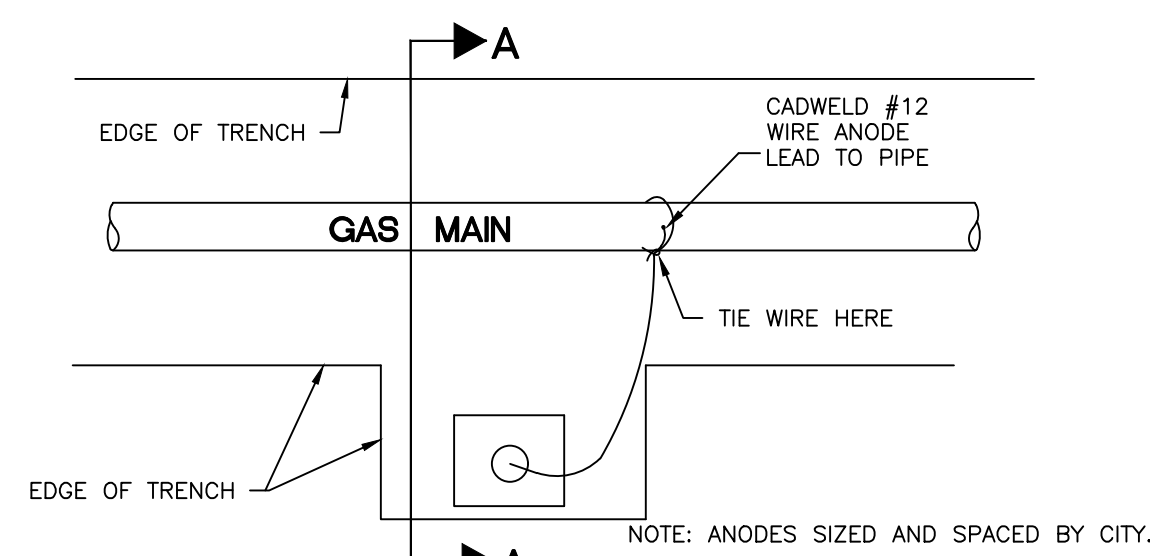


- NOTES:**
1. TRACING WIRE CONTINUITY TESTS REQUIRED.
 2. TAPE TRACING WIRE TO CARRIER PIPE @ 5 FT. O.C.

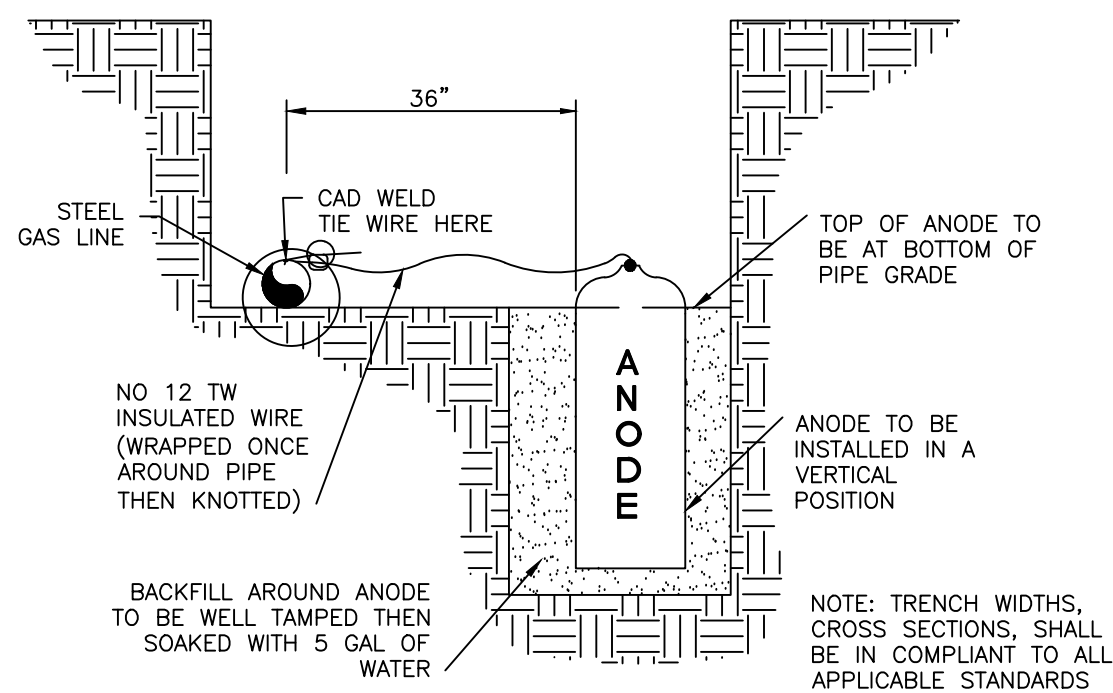


- NOTES:**
1. CASING SIZE TO BE SPECIFIED BY DESIGN ENGINEER (DEPENDENT ON LENGTH OF BORE, SERVICE LINE TYPE, ETC.)
 2. FOR STEEL CARRIER PIPE, SEE SPECIFICATIONS FOR REQUIRED TESTING PRIOR TO CONNECTION.
 3. TRACING WIRE IS PLACED THROUGH CASING WHEN CARRIER PIPE IS POLY.
 4. NO TESTWIRE REQUIRED WHEN CARRIER PIPE IS POLY.

ALL GAS UTILITY DETAILS SHEET 2 OF 2

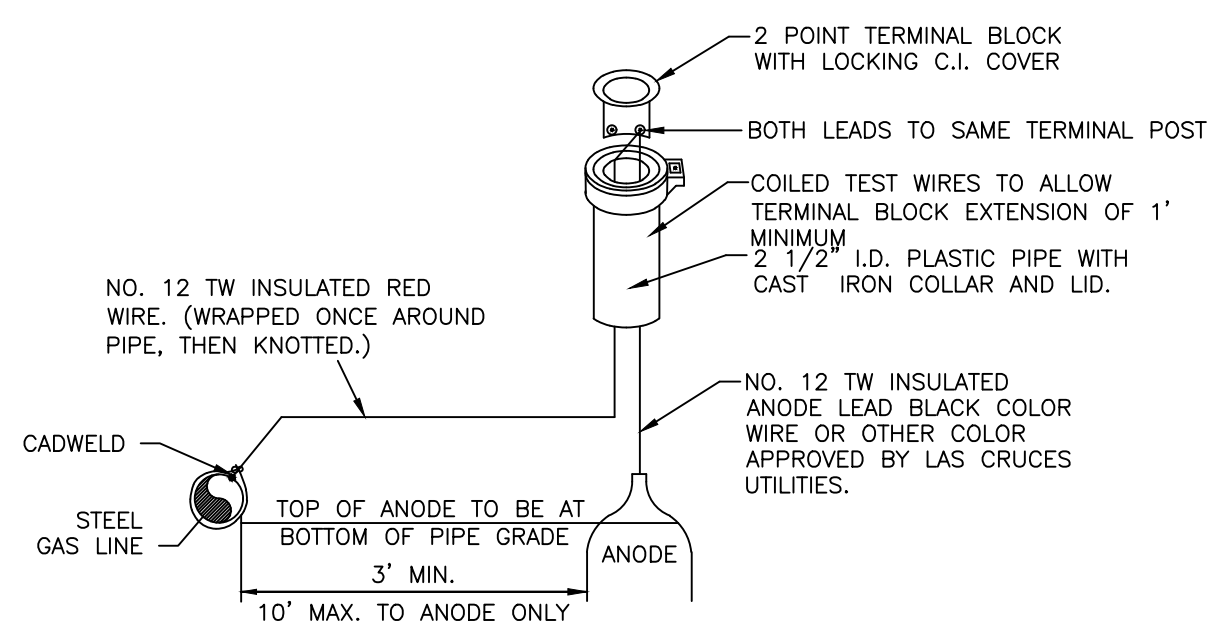


PLAN VIEW
N.T.S.



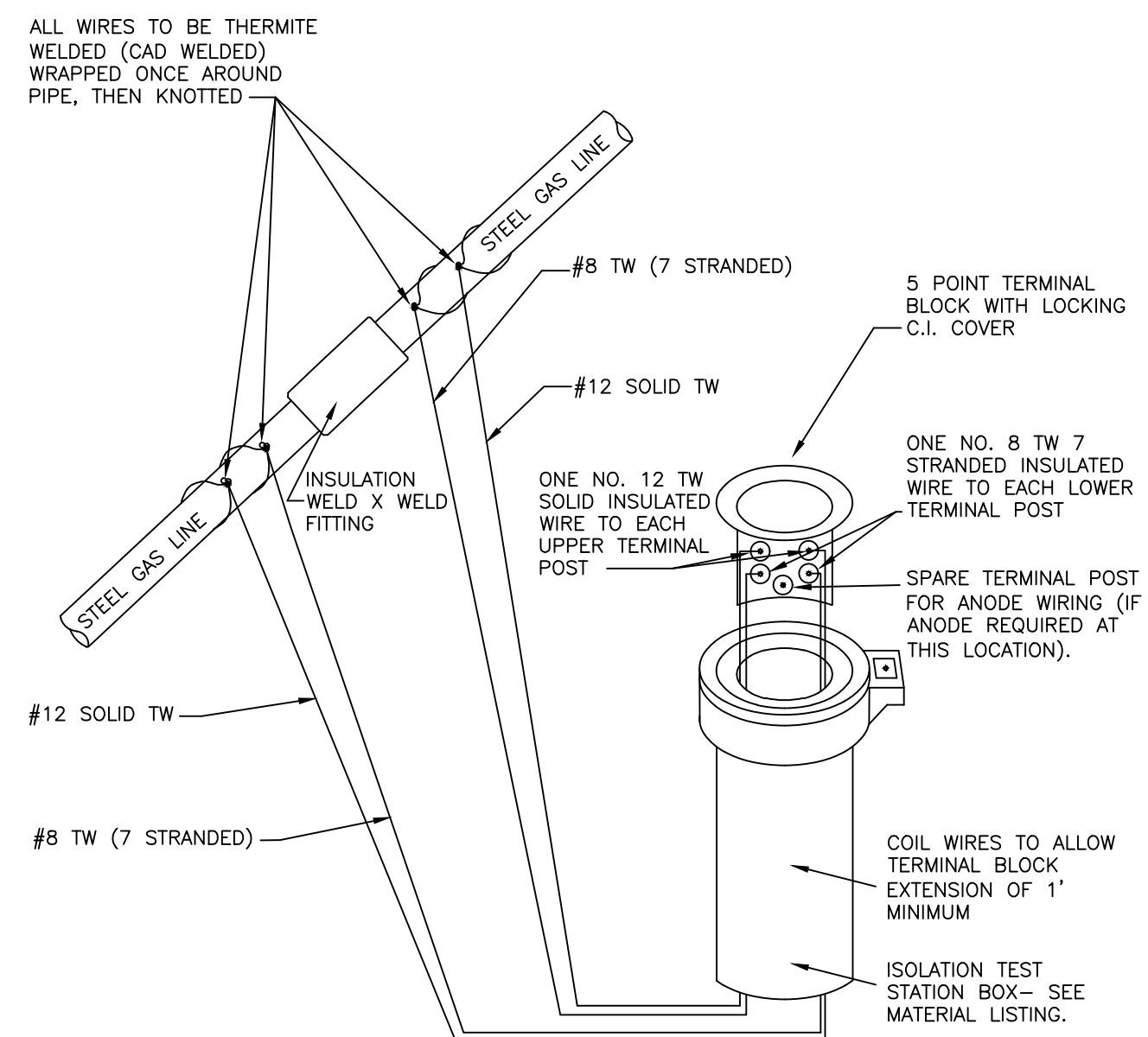
SECTION A-A
N.T.S.

UG-10
TYPICAL ANODE INSTALLATION
N.T.S.



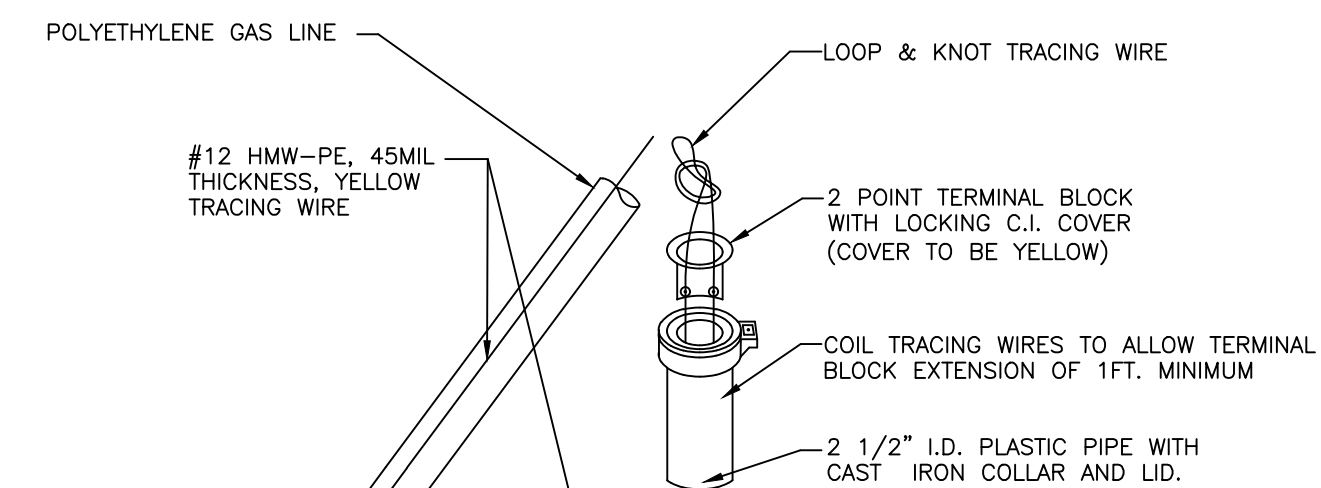
NOTE:
1. SPACING AND LOCATION DETERMINED BY THE CITY.
2. 24" OCTAGON CONCRETE COLLAR TO BE INSTALLED.

UG-11
ANODE TEST STATION
N.T.S.



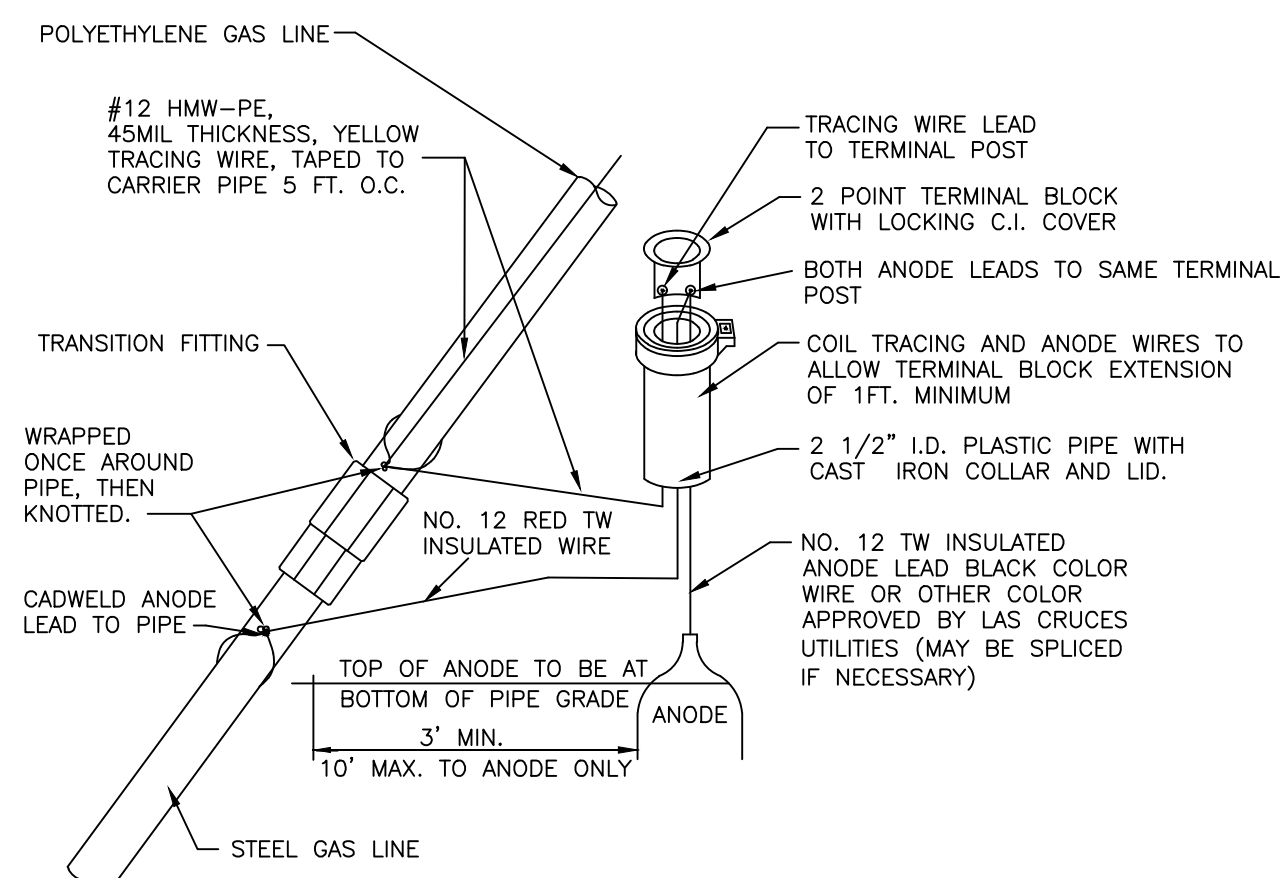
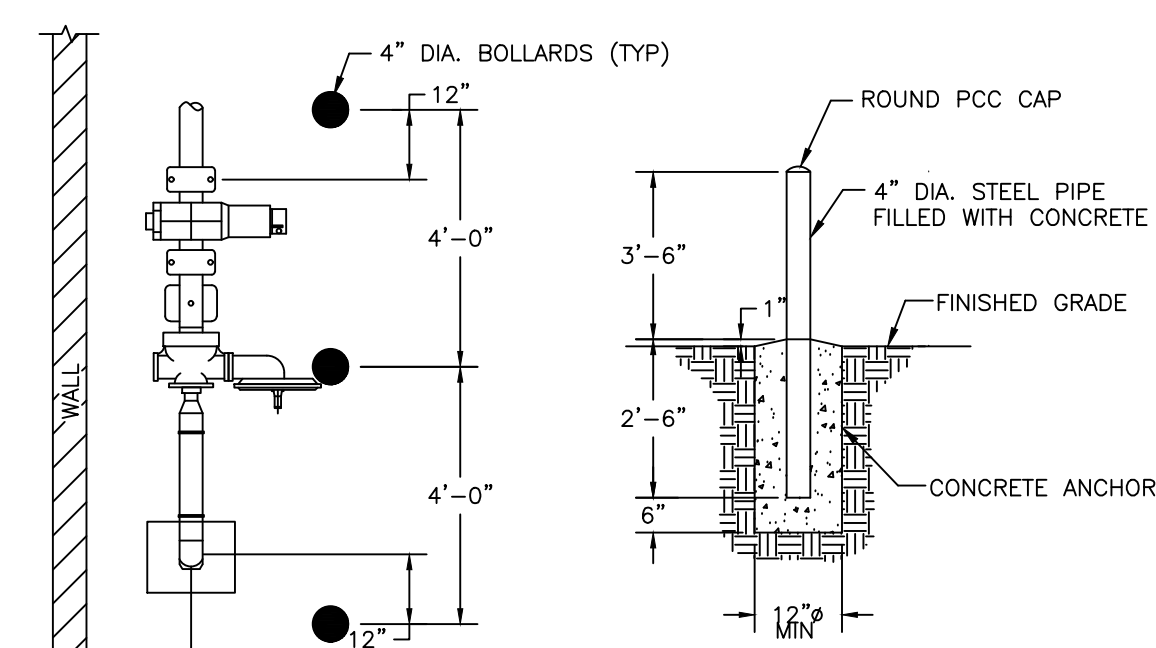
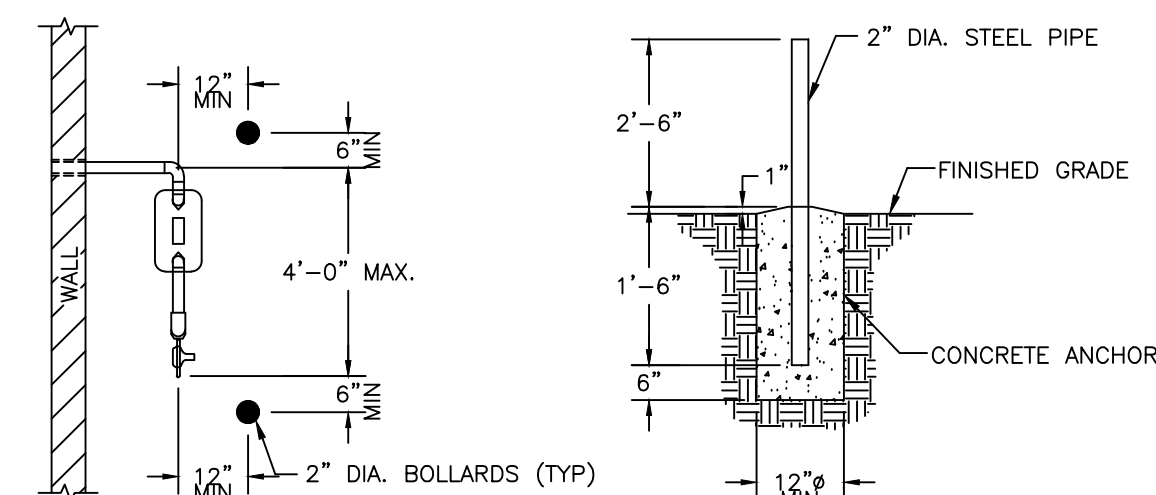
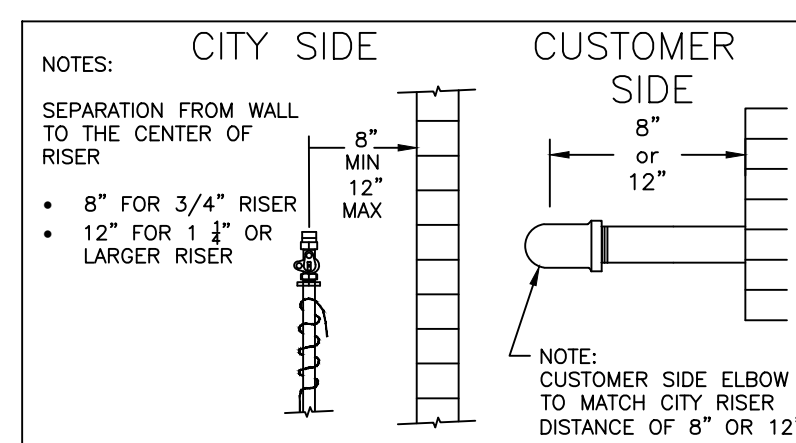
NOTES:
1. LOCATION OF TEST BOX TO BE DETERMINED BY THE CITY OF LAS CRUCES UTILITY DIVISION. THIS LOCATION MAY VARY UP TO 50 FT. FROM GAS LINE.
2. NO SPLICES ALLOWED IN ISOLATION TEST STATION WIRING.
3. REFER TO STANDARDS AND MATERIALS LISTS FOR CADWELD PROCEDURES AND MATERIALS.
4. 24" OCTAGON CONCRETE COLLAR TO BE INSTALLED.

UG-12
ISOLATION (INSULATION) TEST STATION
N.T.S.

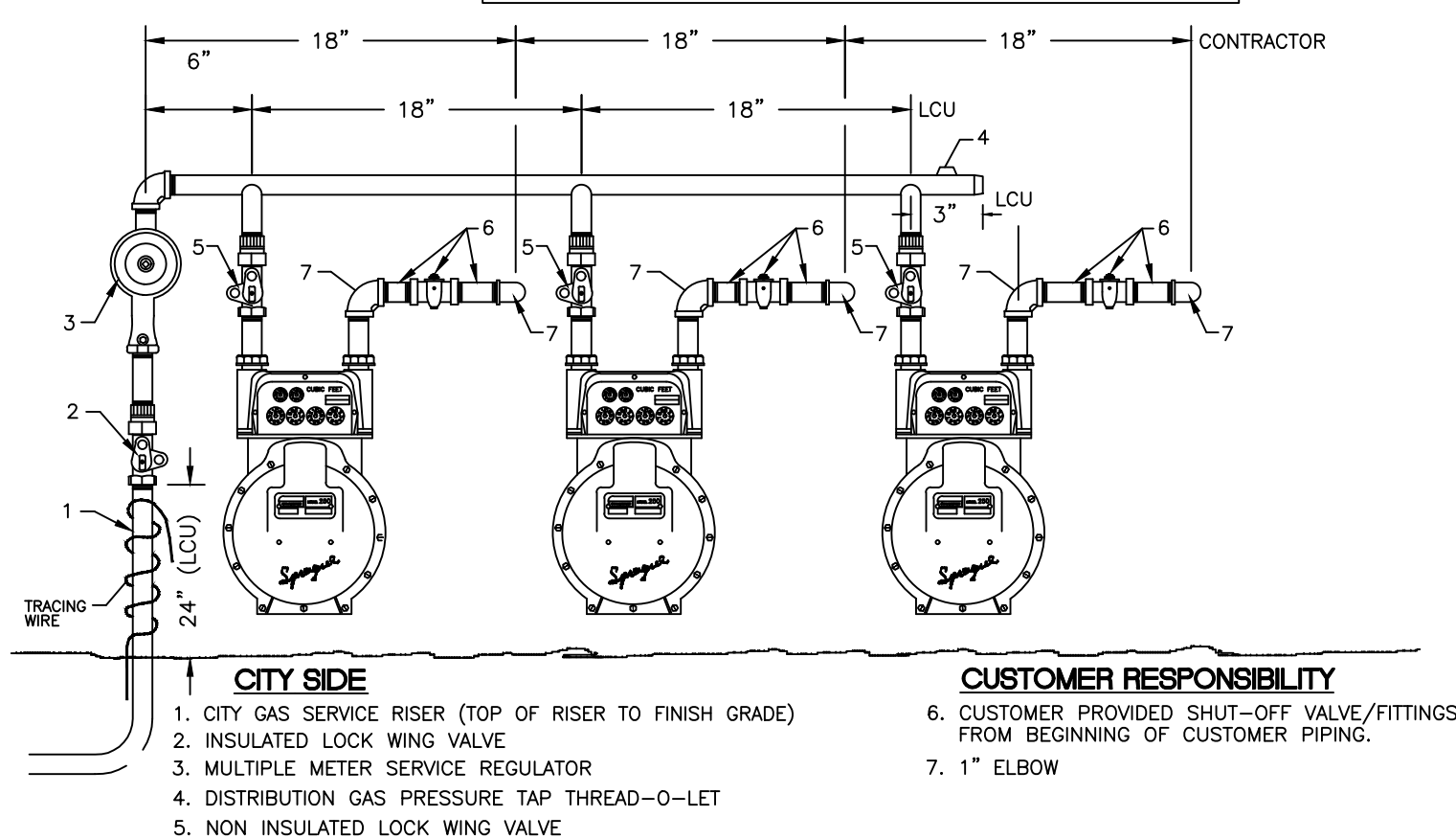


NOTES:
1. SPACING AND LOCATION OF TEST BOXES TO BE DETERMINED BY THE CITY UTILITIES DIVISION.
2. TEST BOX LOCATION MAY VARY, UP TO 50 FT. FROM GAS LINE.
3. REFER TO STANDARDS AND MATERIALS LISTS FOR MATERIALS.
4. TRACING WIRE SHALL EXTEND A MINIMUM OF 12" ABOVE TEST STATION.
5. 24" OCTAGON CONCRETE COLLAR TO BE INSTALLED.

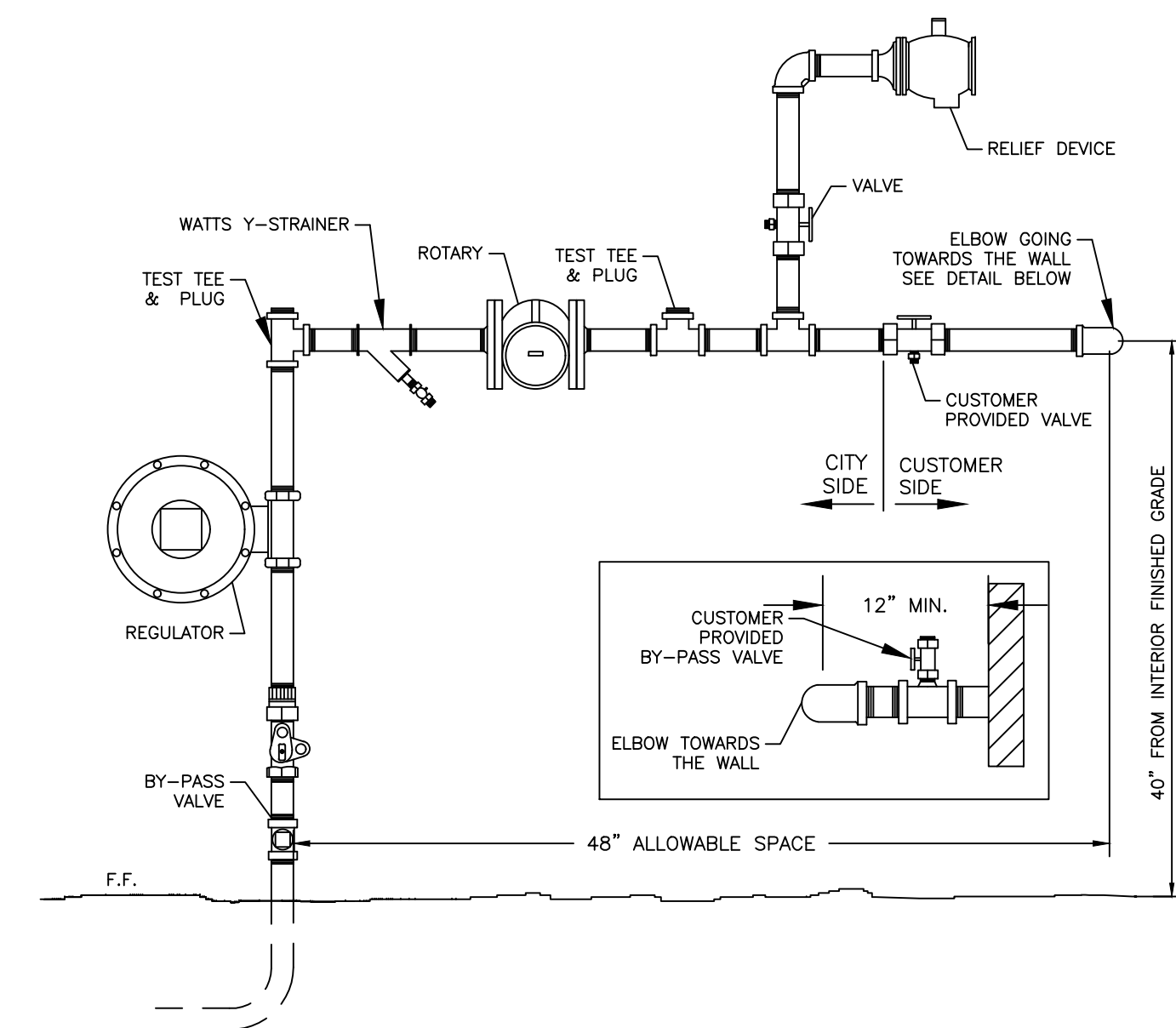
UG-13
TRACING WIRE TEST BOX
N.T.S.



NOTES:
1. SPACING AND LOCATION OF ANODES AND TEST BOXES TO BE DETERMINED BY THE CITY UTILITIES DEPARTMENT.
2. ANODES TO BE INSTALLED VERTICALLY.
3. TEST BOX LOCATION MAY VARY, UP TO 50 FT. FROM GAS LINE.
4. ANODE LEAD WIRE (TO TEST BOX AND TO CADWELD) IS THE ONLY WIRE WHICH MAY BE SPLICED. IF SPLICE IS NEEDED, SPLICE KITS (SEE MATERIAL LIST) WILL BE USED.
5. REFER TO STANDARDS AND MATERIALS LISTS FOR CADWELD PROCEDURES AND MATERIALS.
6. 24" OCTAGON CONCRETE COLLAR TO BE INSTALLED.



UG-15
GAS METER MANIFOLD
N.T.S.

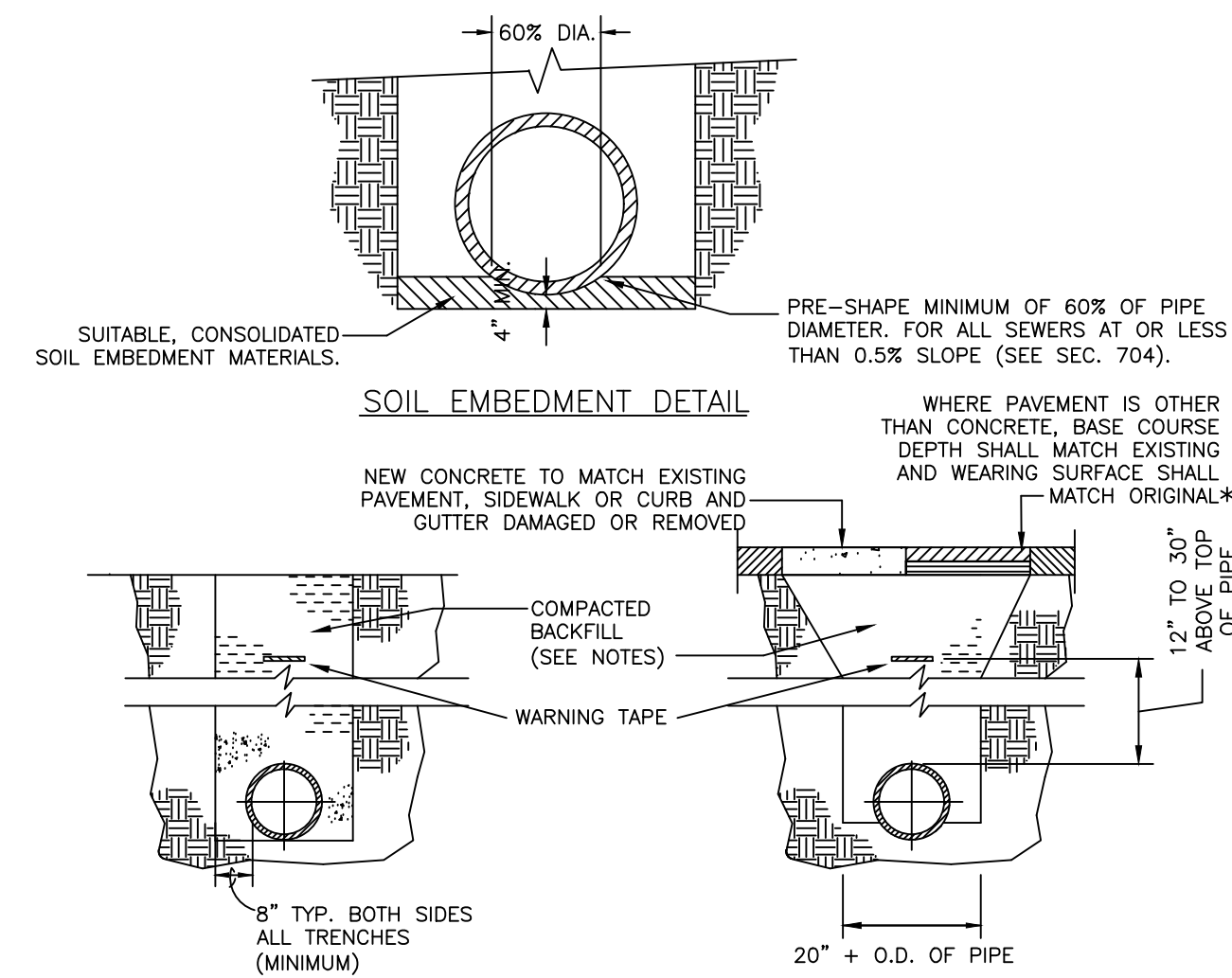


UG-17
SINGLE COMMERCIAL GAS METER
N.T.S.

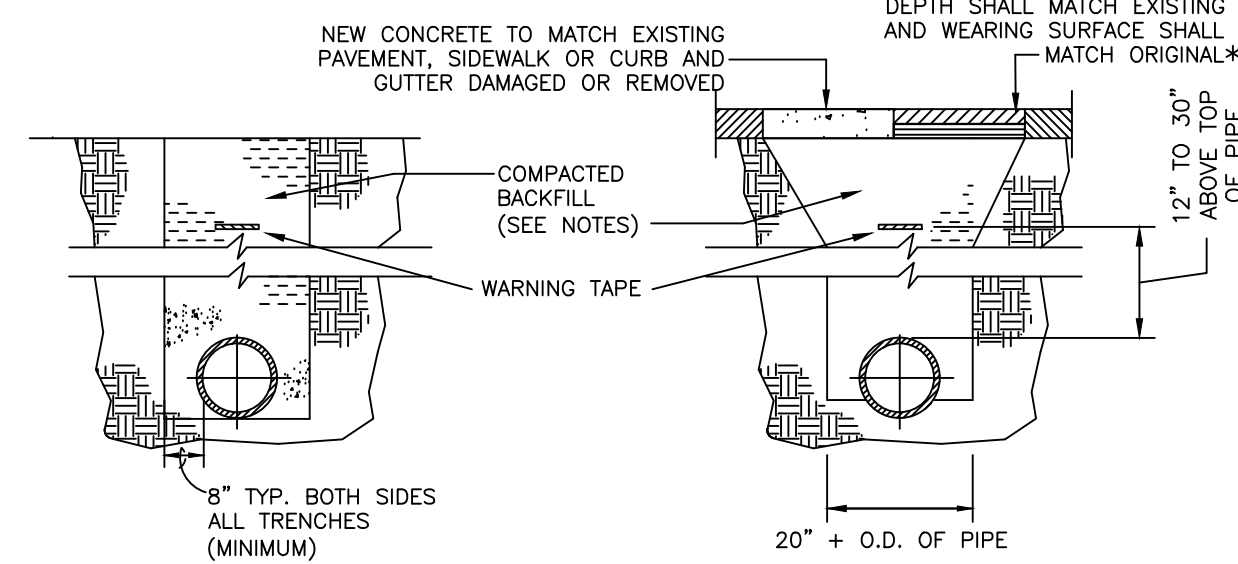
CHANGE TRACING WIRE TAPE REQUIREMENT

UG-14
STEEL TO POLYETHYLENE
N.T.S.

ALL SEWER UTILITY DETAILS SHEET 1 OF 2



SOIL EMBEDMENT DETAIL



UNPAVED ROAD TRENCH

UNDER PAVEMENT

BACKFILL IN UNPAVED STREETS, ALLEYS, AND DRIVEWAYS SHALL BE COMPACTED TO 90% COMPACTION AS DETERMINED BY AASHTO T-180 (ASTM D1557) UNLESS OTHERWISE NOTED

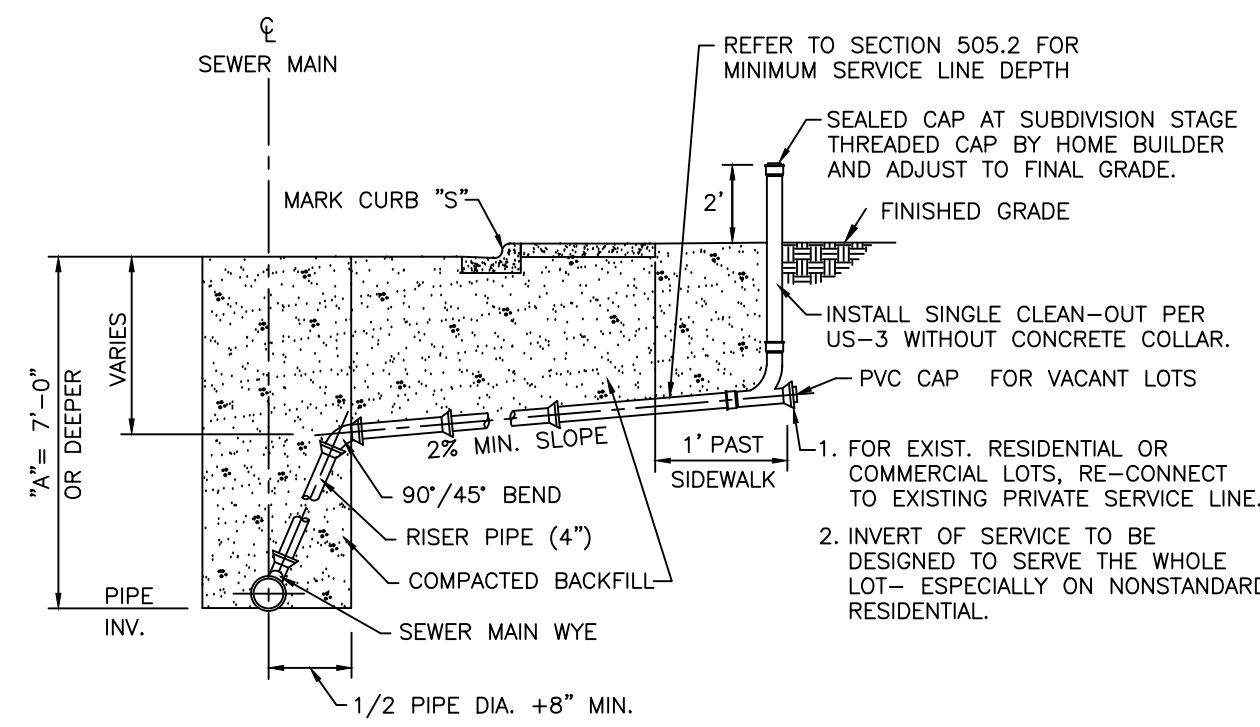
BACKFILL SHALL BE COMPACTED TO 95% COMPACTION AS DETERMINED BY AASHTO T-180 (ASTM D1557)

GENERAL NOTES:

1. TRENCH WIDTHS, CROSS SECTIONS, SHALL BE IN COMPLIANT TO ALL APPLICABLE SAFETY STANDARDS AND REGULATIONS.
2. TESTING REQUIREMENTS (SEC. 706) INCLUDE VISUAL TESTING OF ALL MAIN LINES LAID AT OR FLATTER THAN MINIMUM SLOPES (PG 700-11).
3. TRACING WIRE REQUIRED TO BE PLACED ABOVE ALL FORCE MAINS.
4. TRACING WIRE IF REQUIRED TO BE TAPED TO MAIN TO FT. O.C.
5. TRACING WIRE TO BE ACCESSIBLE, WITHIN VALVE BOX, SERVICE POINT, OR WITHIN AN INSTALLED TWO POINT TEST BOX, @ 500 FT. O.C. MAXIMUM.

* THE THICKNESS OF THE PAVEMENT PATCH SHALL MATCH THE DEPTH OF THE ADJACENT PAVEMENT SURFACES PLUS ONE INCH AND SHALL BE A MINIMUM 3" THICK.

US-1
TYPICAL SEWER TRENCHING DETAILS
N.T.S.

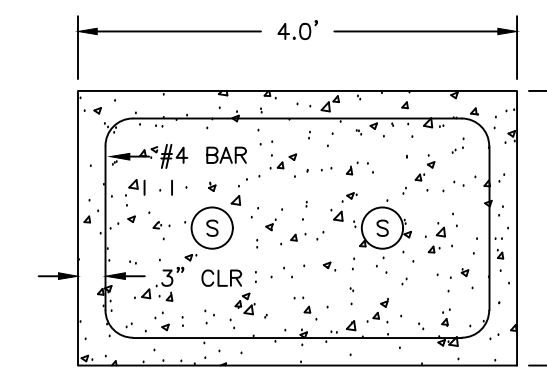


NOTES:
WHEN "A" IS LESS THAN 7'-0", DELETE RISER PIPE. USE 45° ELL IN PLACE OF 90° ELL. TURN SEWER MAIN TEE OR WYE TOWARD SERVICE SIDE AT A 45° ANGLE.

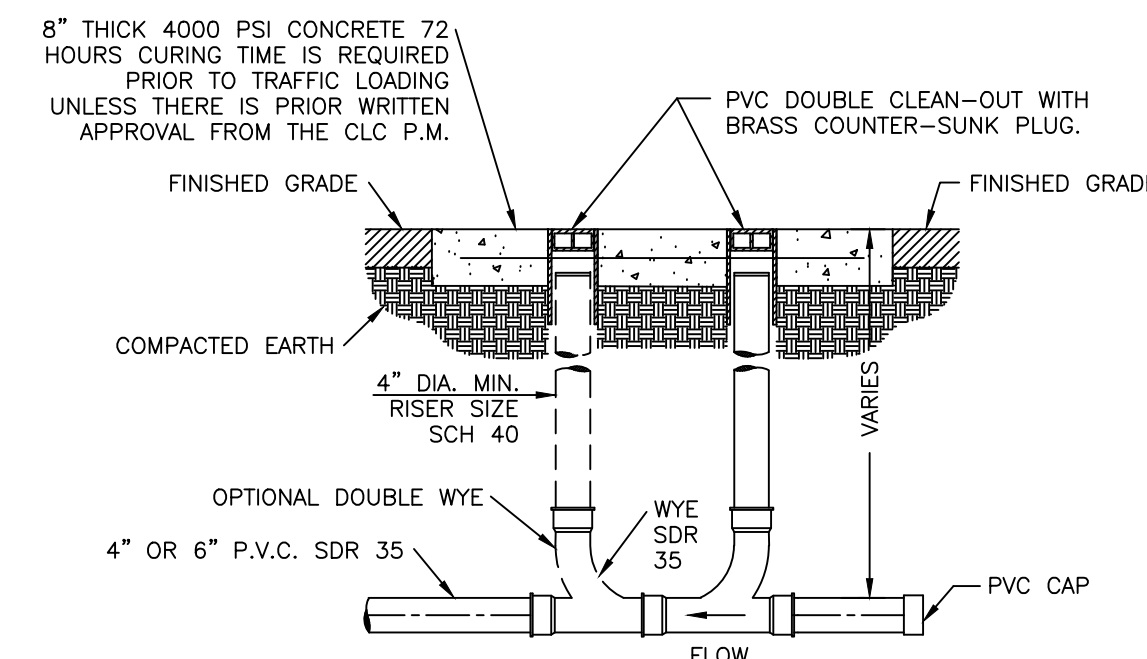
CLEAN-OUT TO BE INSTALLED AT SUBDIVISION STAGE (REFERENCE SECTION 504.2).

TRENCH WIDTHS, CROSS SECTIONS, SHALL BE IN COMPLIANCE WITH ALL APPLICABLE SAFETY STANDARDS AND REGULATIONS.

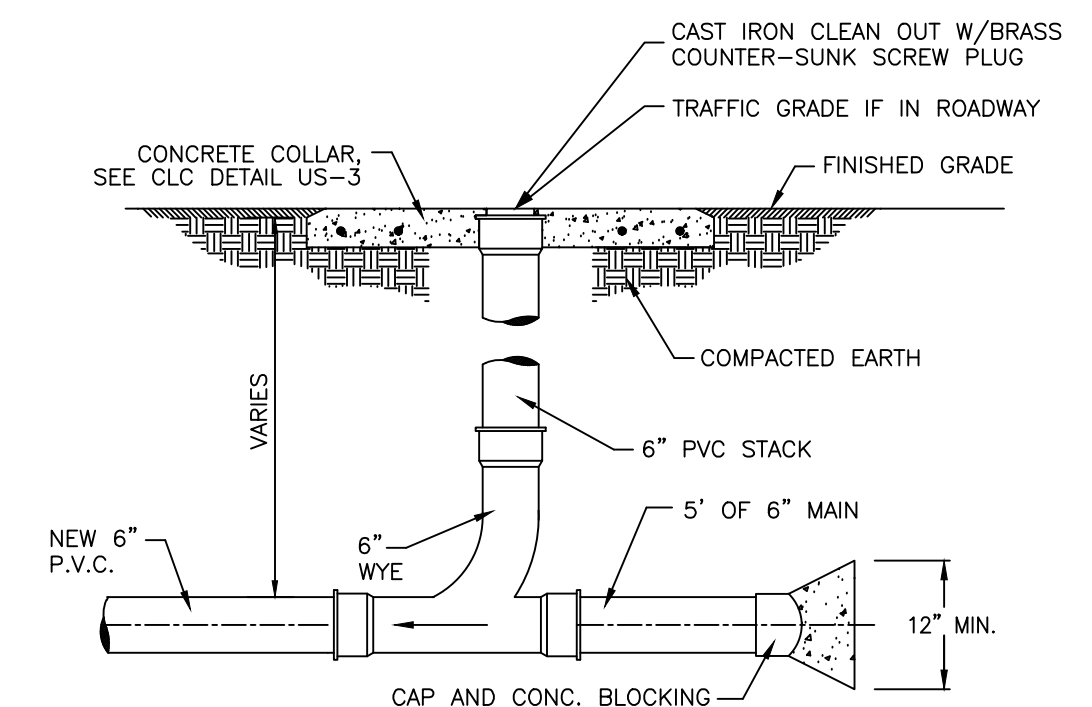
US-2
TYPICAL SEWER SERVICE
N.T.S.



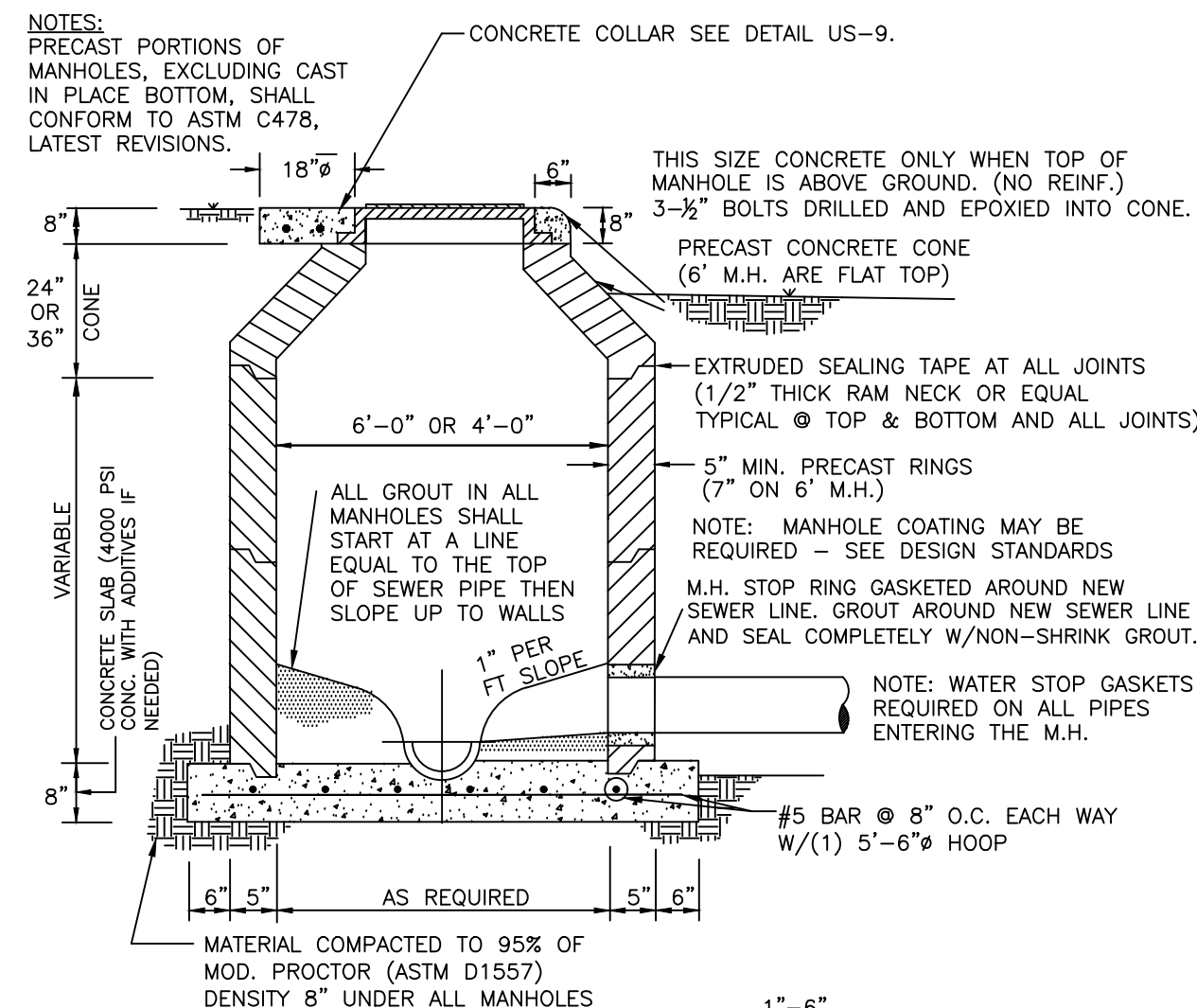
DOUBLE CLEAN-OUT PLAN VIEW



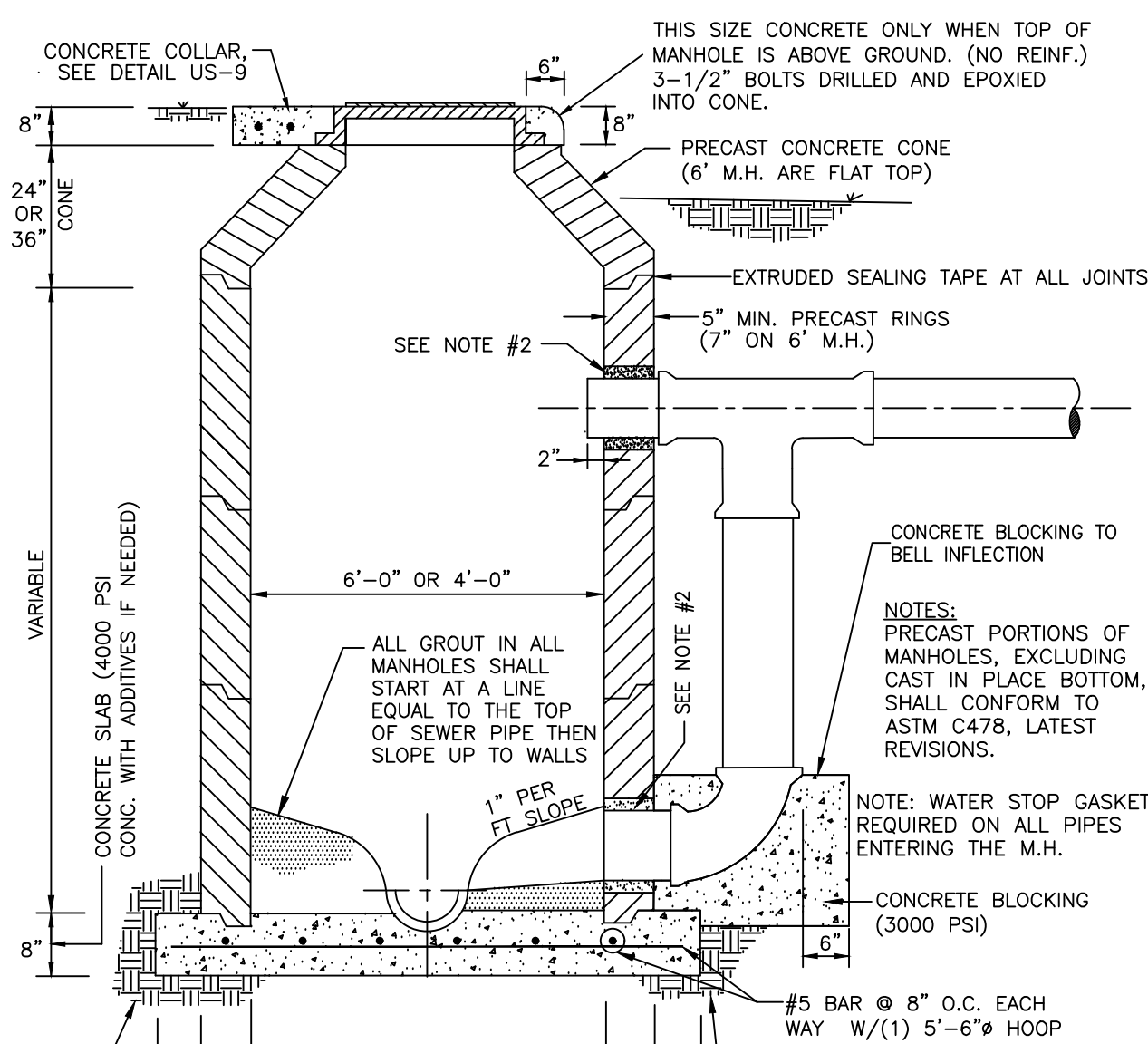
US-3
SERVICE CLEAN-OUT DETAIL
N.T.S.



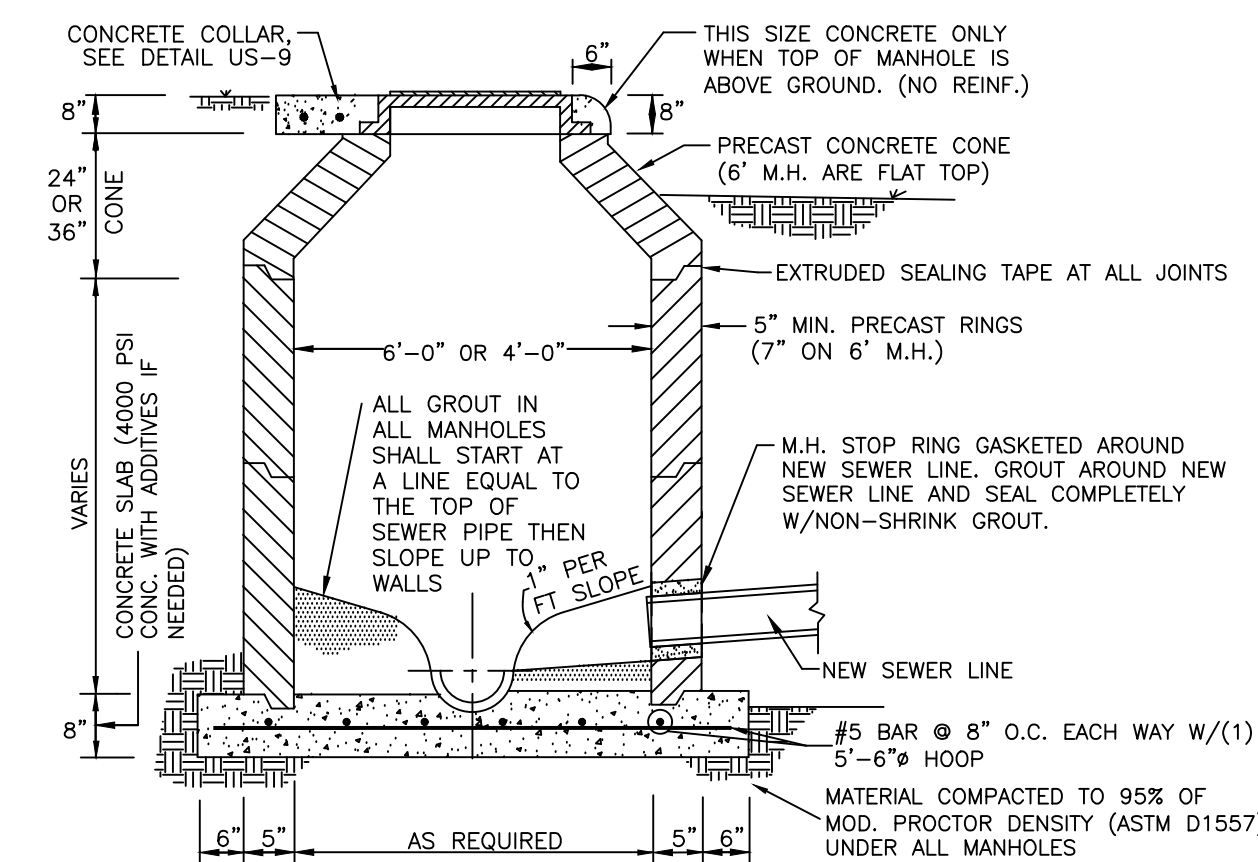
US-4
MAIN LINE CLEANOUT
N.T.S.



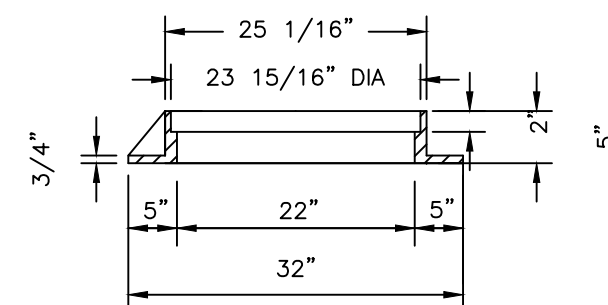
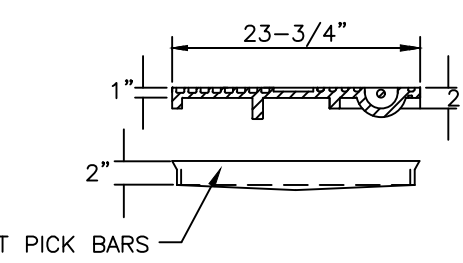
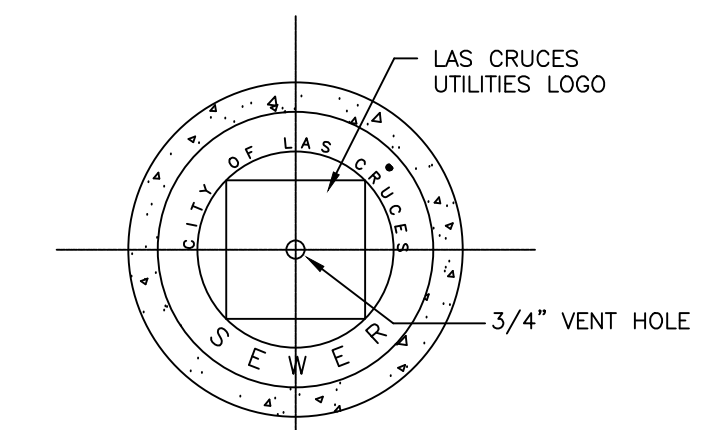
US-5
TYPICAL MANHOLE DETAIL
N.T.S.



US-6
TYPICAL MANHOLE DETAIL W/DROP
N.T.S.



US-7
TAPPING INTO AN EXISTING
STANDARD MANHOLE
N.T.S.



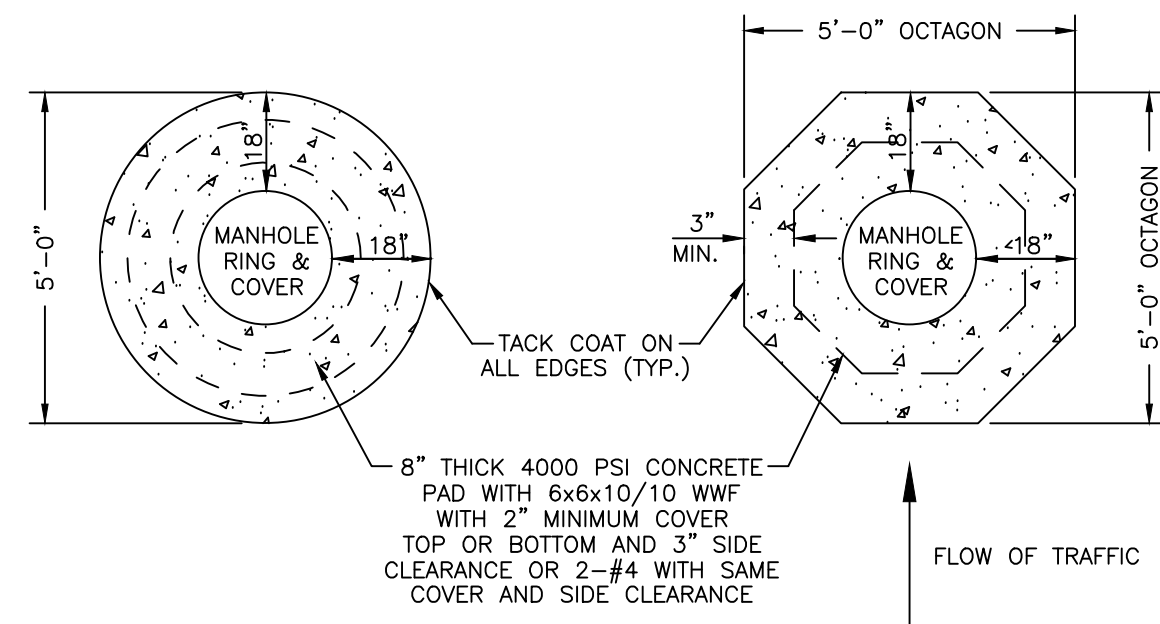
NOTES:

- | | |
|--|---|
| CAST IRON
MIN TOTAL WT. - 300 LBS.
MIN COVER WT. - 134 LBS.
MIN RING WT. - 165 LBS. | DUCTILE IRON
MIN TOTAL WT. - 266 LBS.
MIN COVER WT. - 141 LBS.
MIN RING WT. - 125 LBS. |
|--|---|

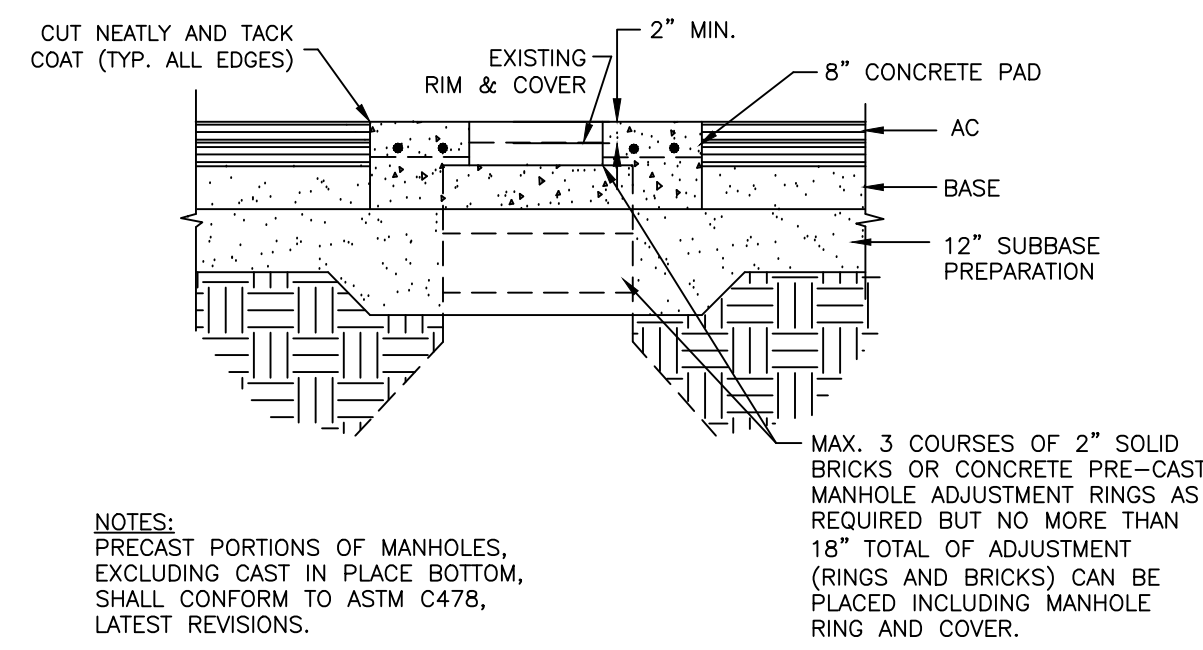
MANHOLE SHALL MEET AASHTO M 306-05 (OR LATEST PUBLICATION) H-20 LOADING AND BE THE FOLLOWING: EAST JORDAN IRON WORKS 2023 MANHOLE LID AND RING (OR APPROVED EQUAL) WITH "CITY OF LAS CRUCES" AND "SEWER" OR "SANITARY SEWER" LETTERING AND LAS CRUCES UTILITY LOGO.

US-8
MANHOLE AND COVER
N.T.S.

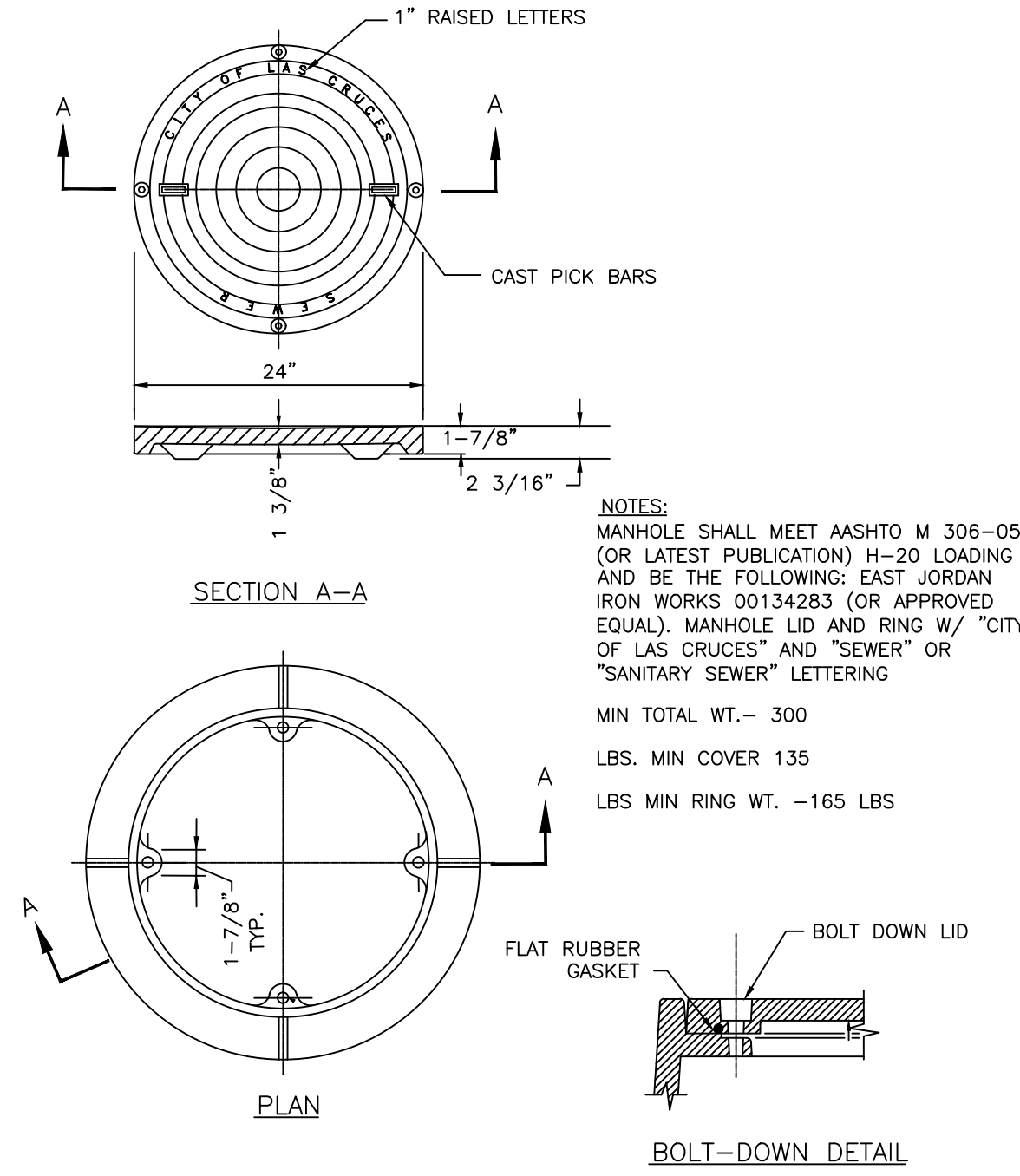
ALL SEWER UTILITY DETAILS SHEET 2 OF 2



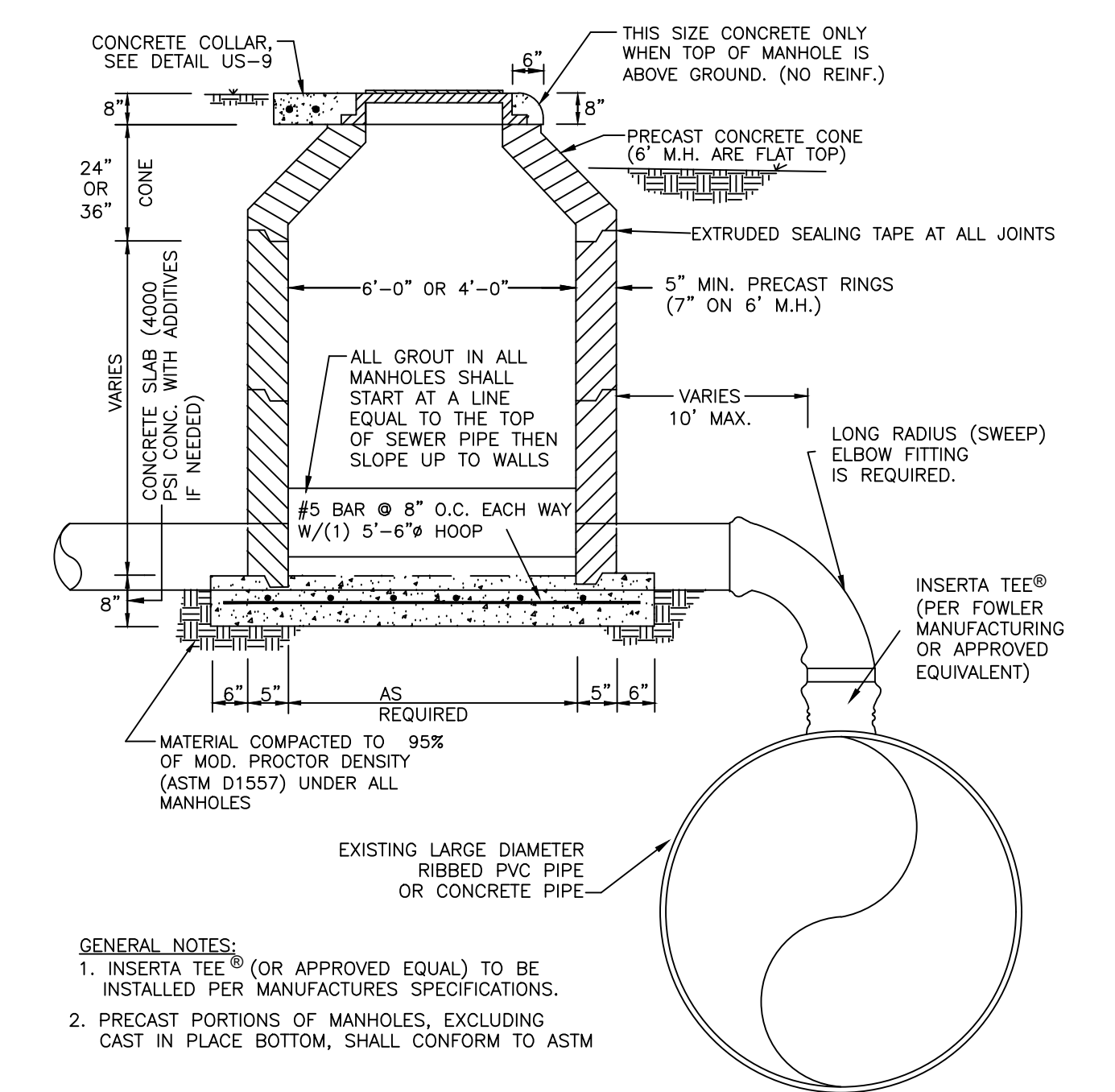
US-9
MANHOLE ADJUSTMENT DETAIL
N.T.S.



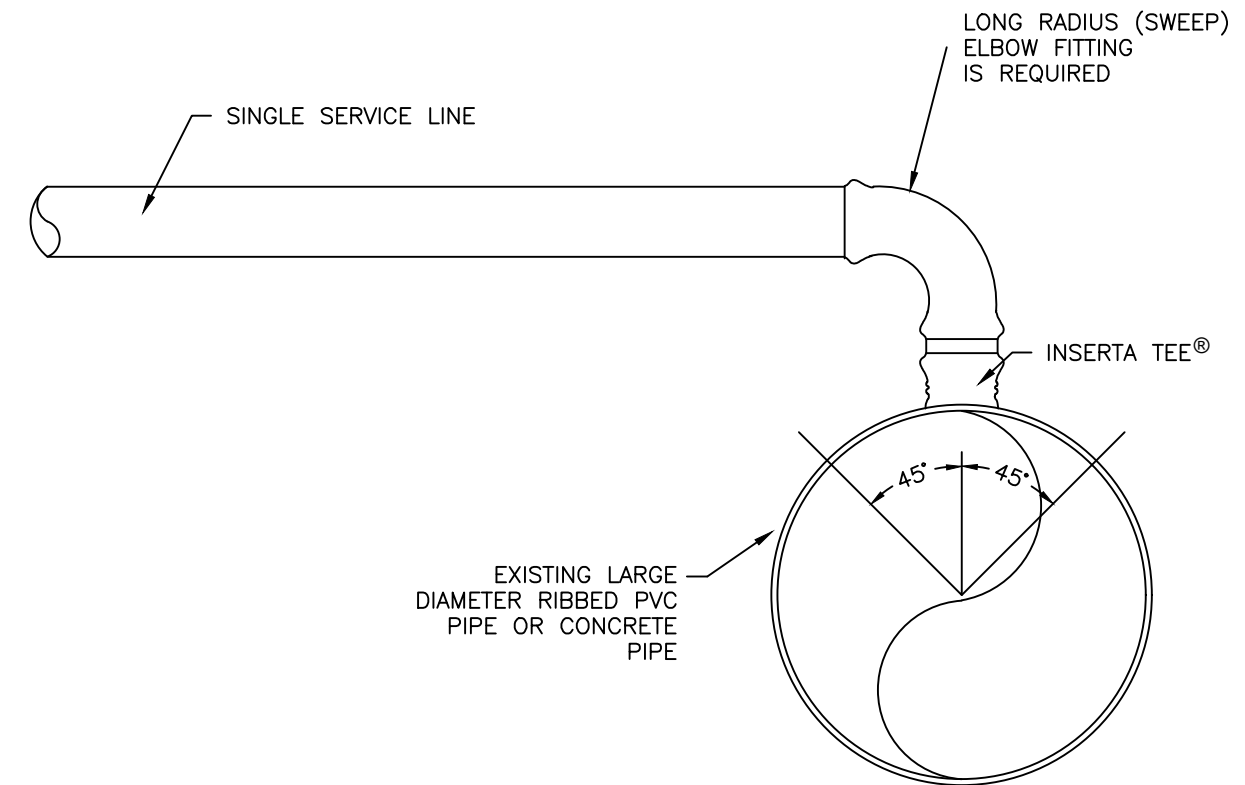
US-10
WATER TIGHT MANHOLE RING AND COVER
N.T.S.



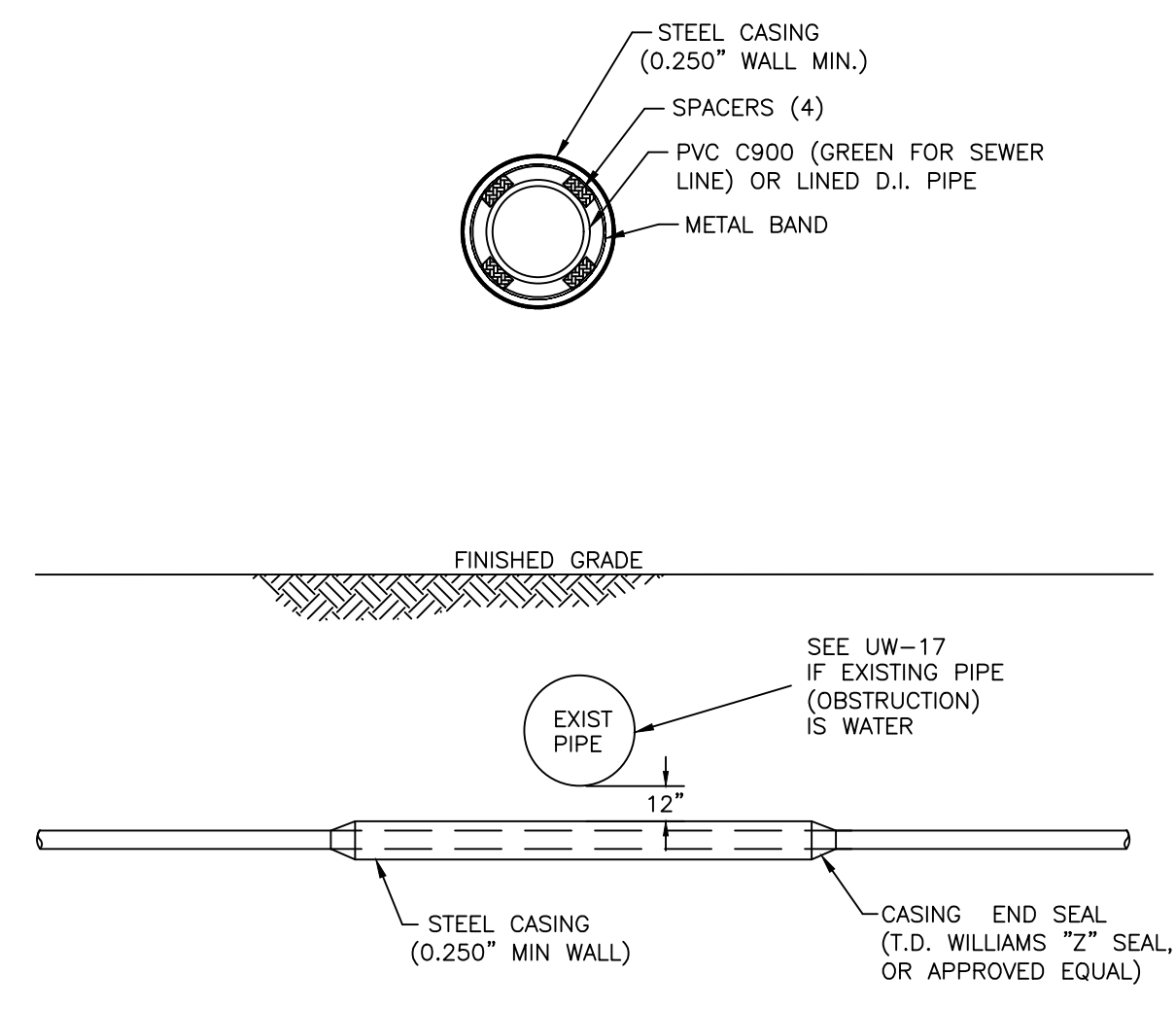
US-11
WATERTIGHT VENTED MANHOLE
N.T.S.



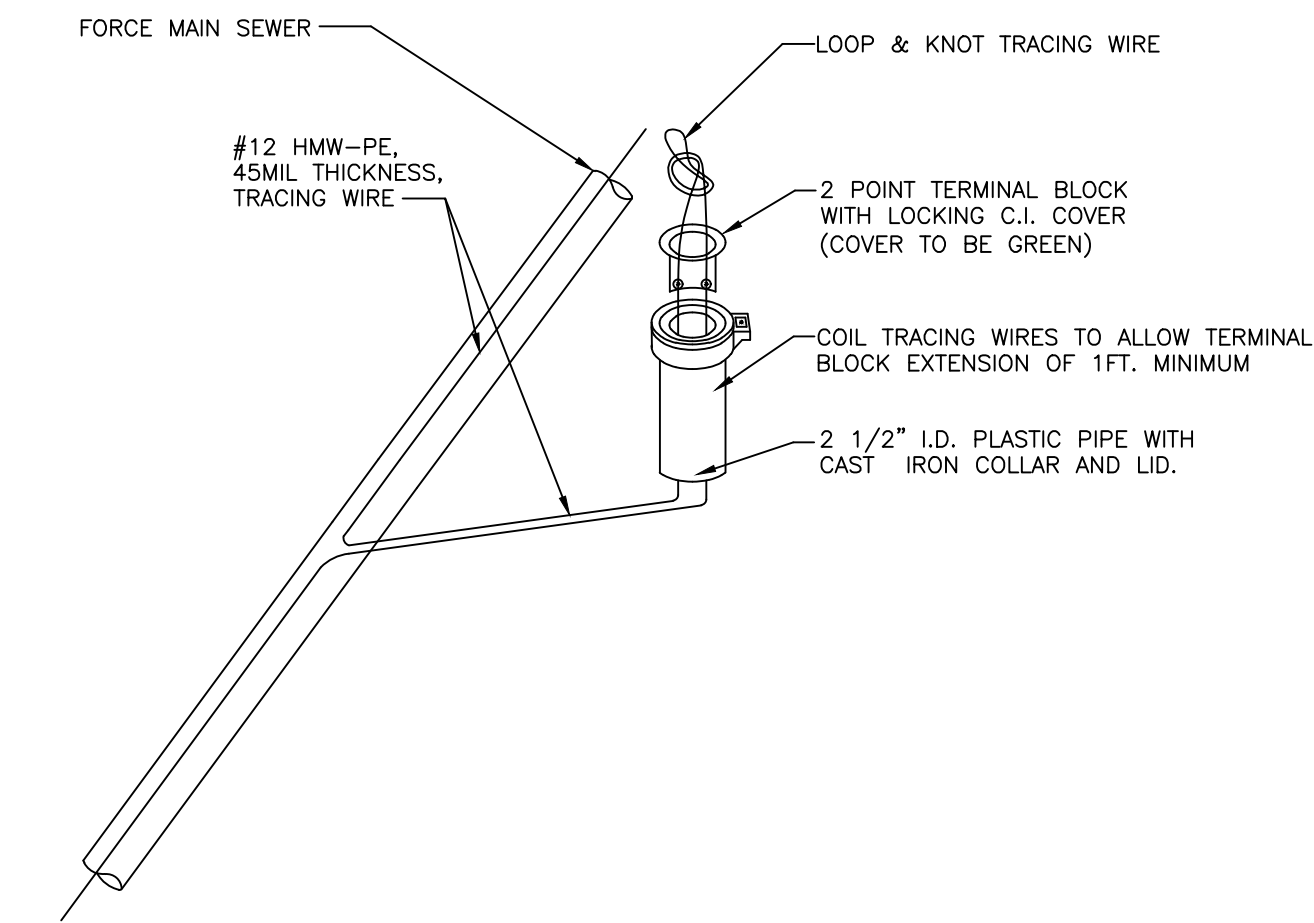
US-12
MAIN LINE INSERTA TEE CONNECTION
N.T.S.



US-13
SERVICE LINE INSERTA TEE CONNECTION
N.T.S.



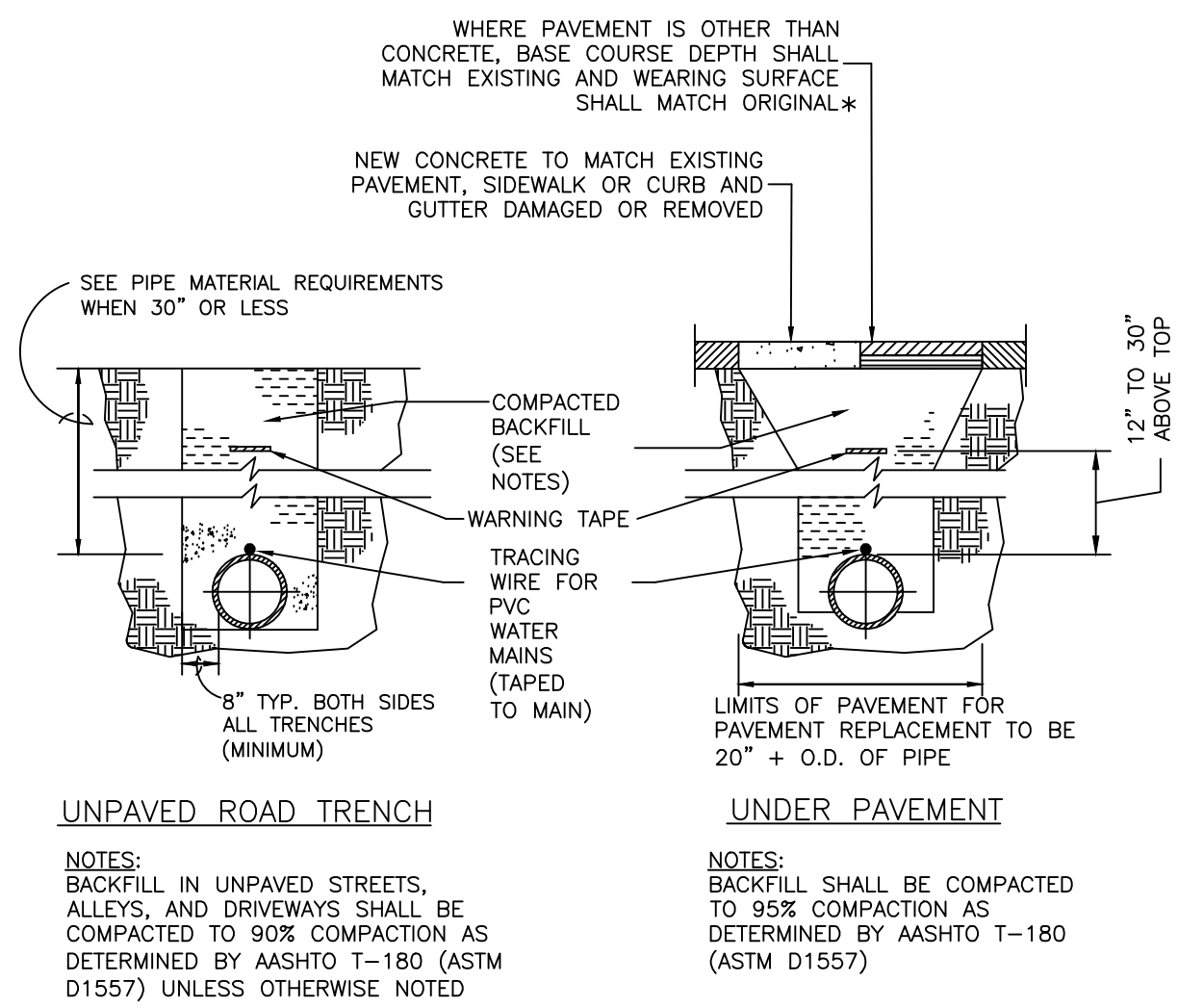
US-14
SEWER LINE BORE AND CASE
N.T.S.



- NOTES:
1. SPACING AND LOCATION OF TEST BOXES TO BE DETERMINED BY THE CITY UTILITIES DIVISION.
 2. TEST BOX LOCATION MAY VARY, UP TO 50 FT. FROM GAS LINE.
 3. REFER TO STANDARDS AND MATERIALS LISTS FOR MATERIALS.
 4. TRACING WIRE SHALL EXTEND A MINIMUM OF 12" ABOVE TEST STATION.
 5. 24" OCTAGON CONCRETE COLLAR TO BE INSTALLED.

US-15
TRACING WIRE TEST BOX
N.T.S.

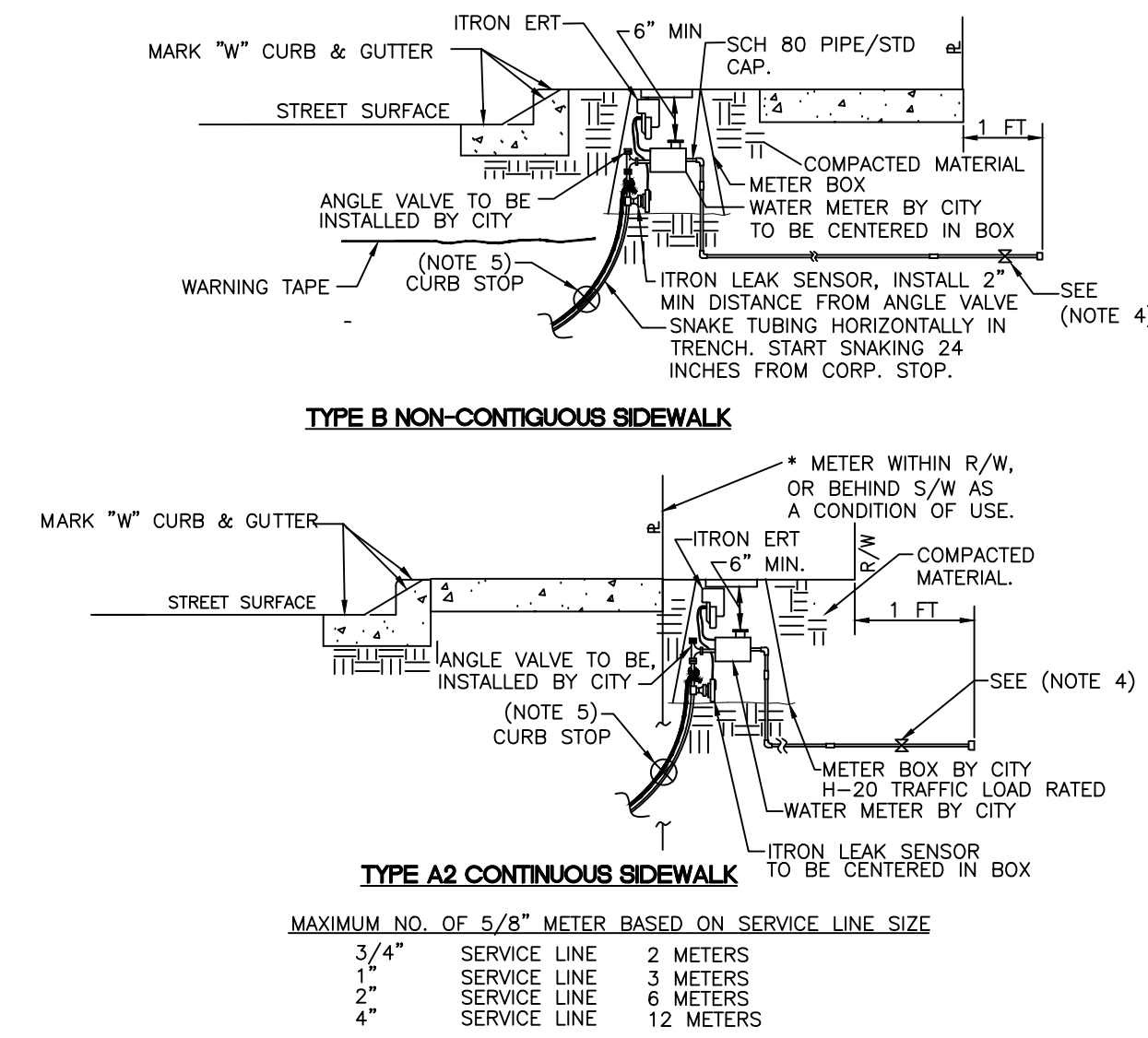
ALL WATER UTILITY DETAILS SHEET 1 OF 3



- NOTES:
- TRACING WIRE REQUIRED TO BE PLACED ABOVE ALL MAINS AND TRANSMISSION LINES.
 - TEST BOXES, CONNECTED INTO TRACING WIRE SYSTEM, SHALL BE REQUIRED WHERE HYDRANTS ARE NOT USED OR WHERE HYDRANT SPACING EXCEEDS 500 FEET.
 - TRENCH WIDTHS, CROSS SECTIONS, SHALL BE IN COMPLIANT TO ALL APPLICABLE SAFETY STANDARDS AND REGULATIONS.

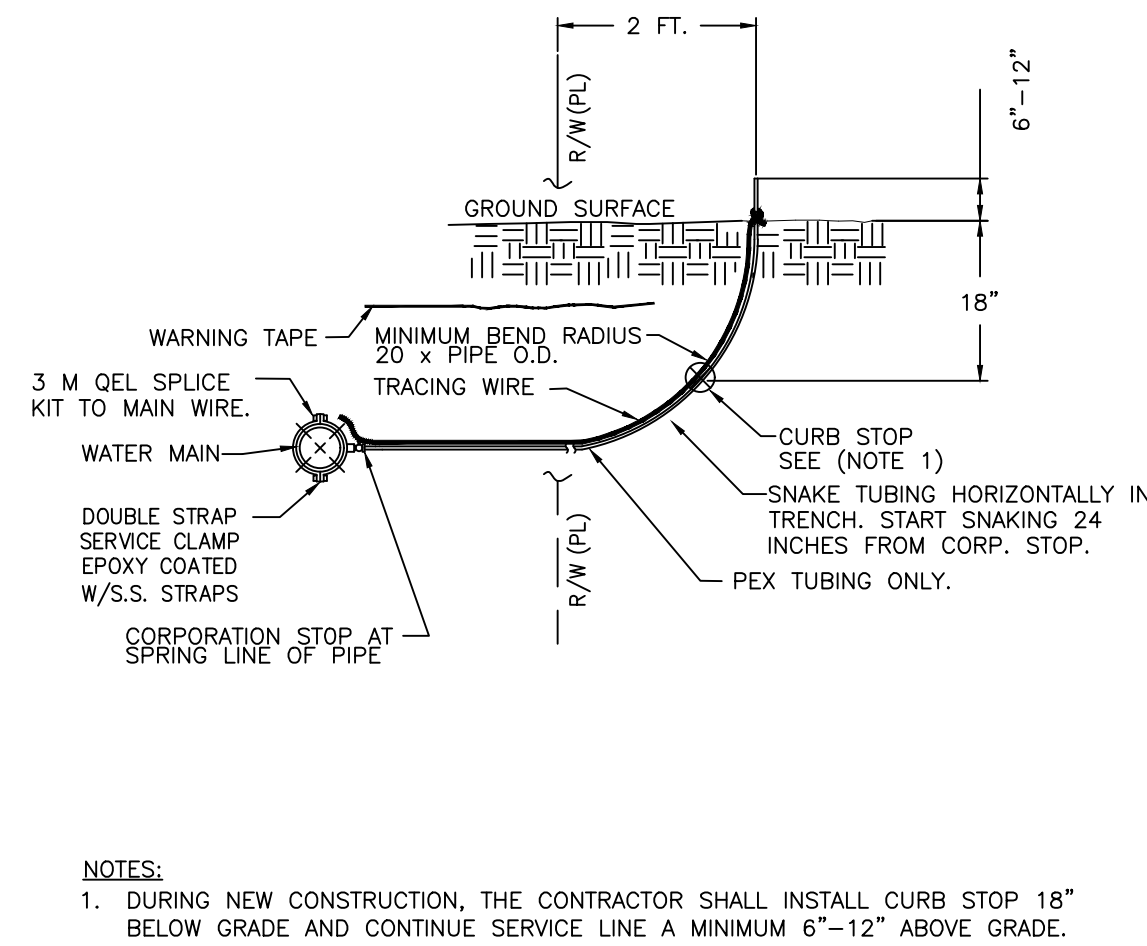
* THE THICKNESS OF THE PAVEMENT PATCH SHALL MATCH THE DEPTH OF THE ADJACENT PAVEMENT SURFACES PLUS ONE INCH AND SHALL BE A MINIMUM 3" THICK.

UW-1
TYPICAL WATER TRENCHING DETAILS
N.T.S.

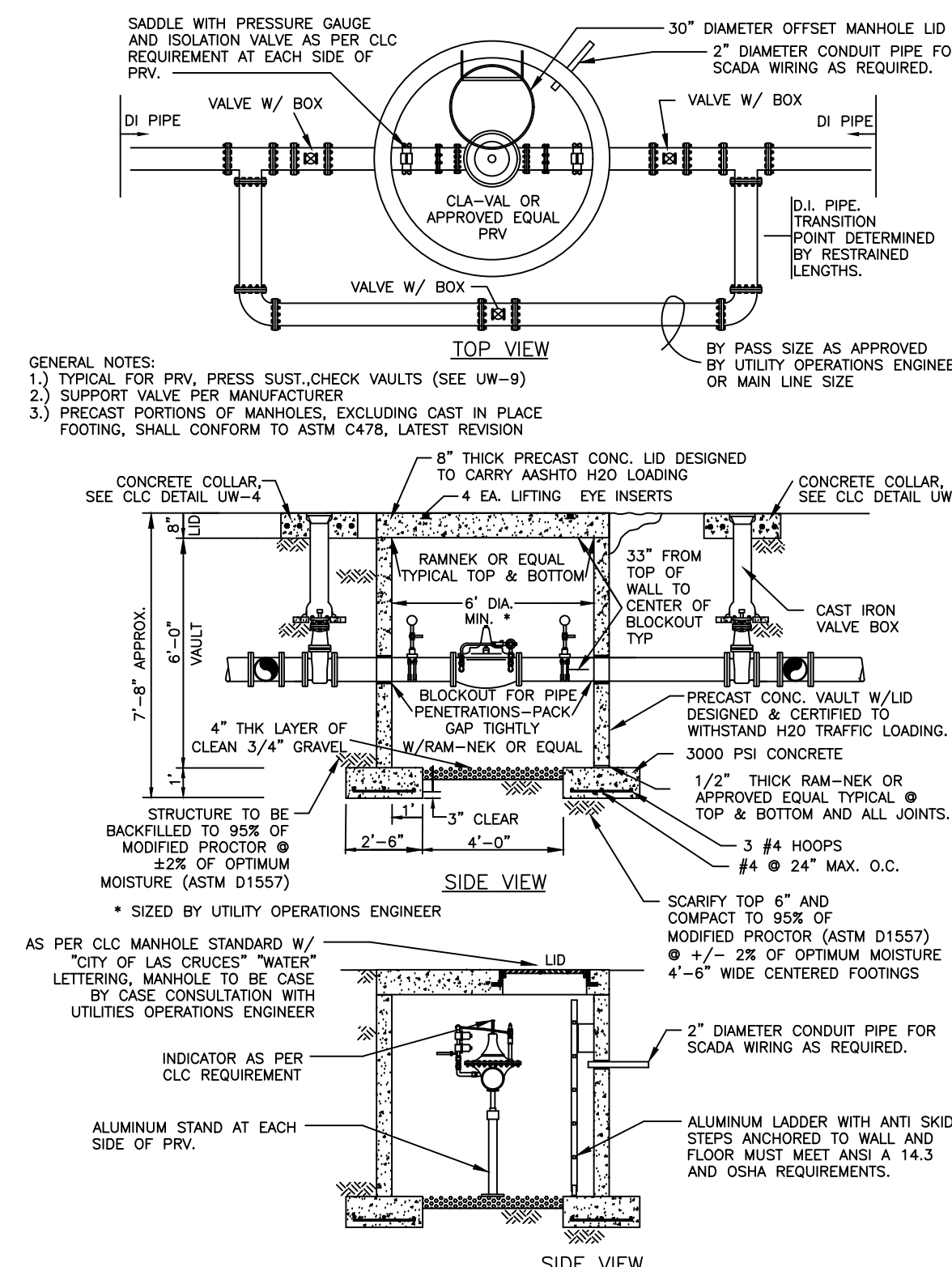
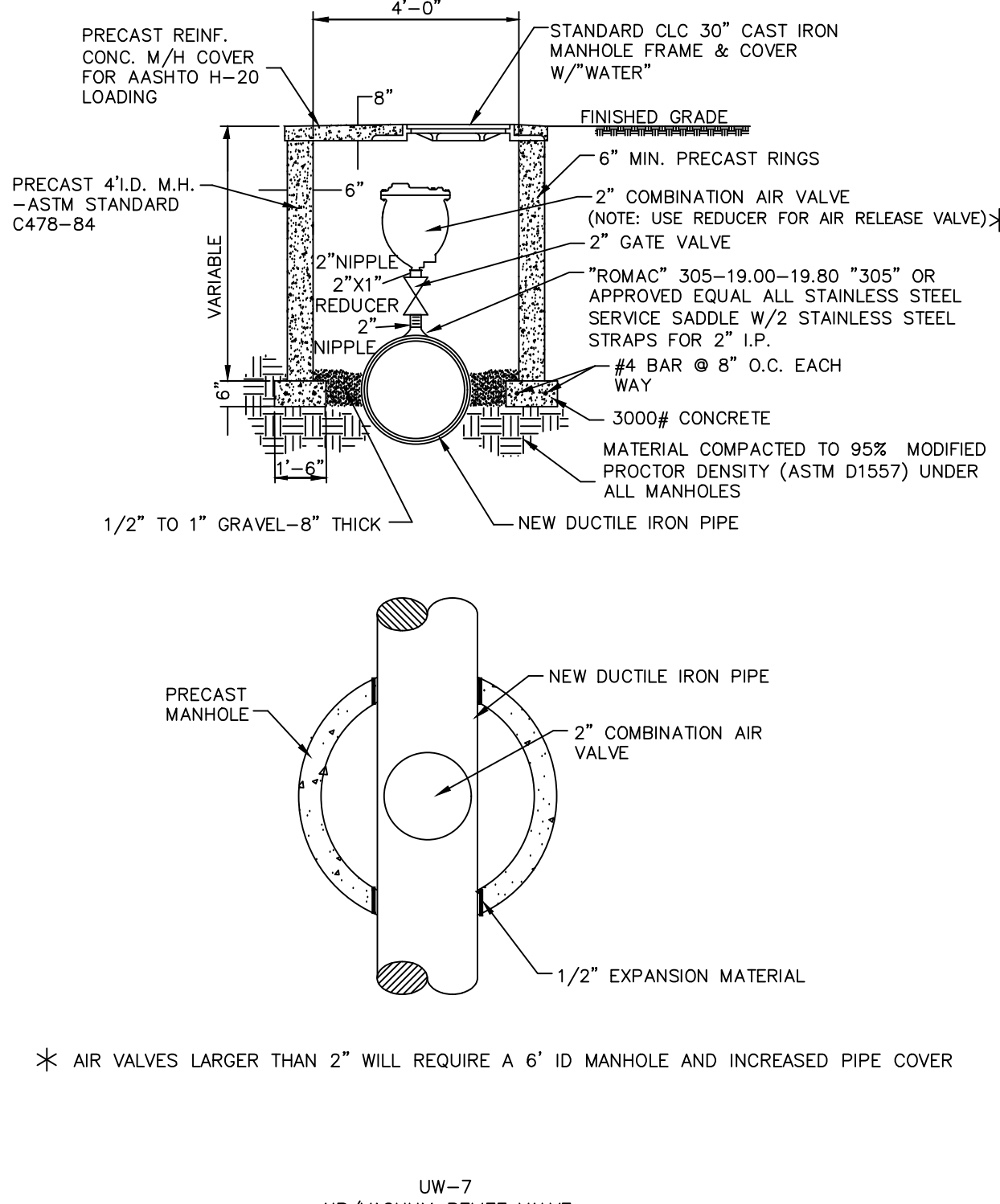
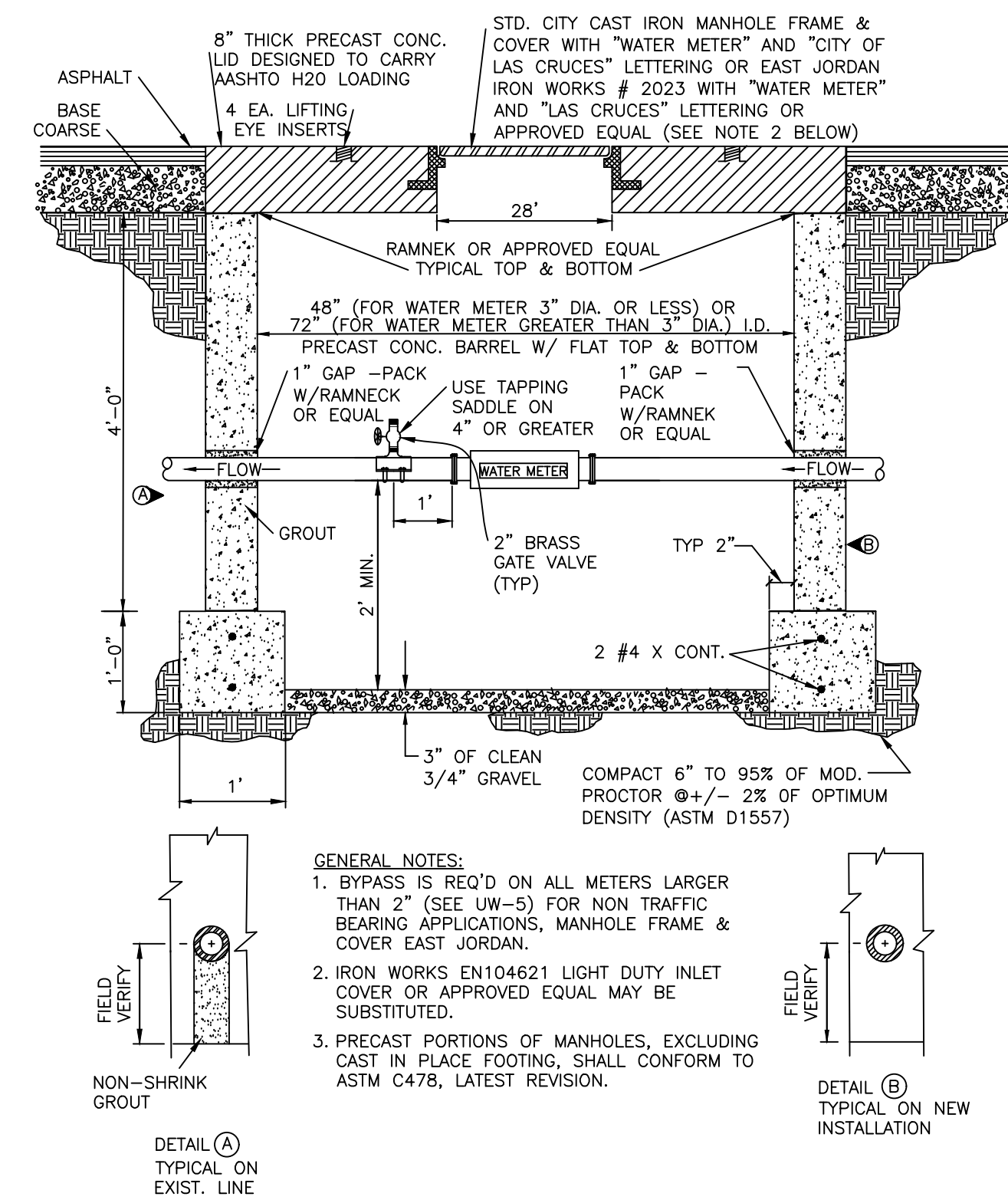
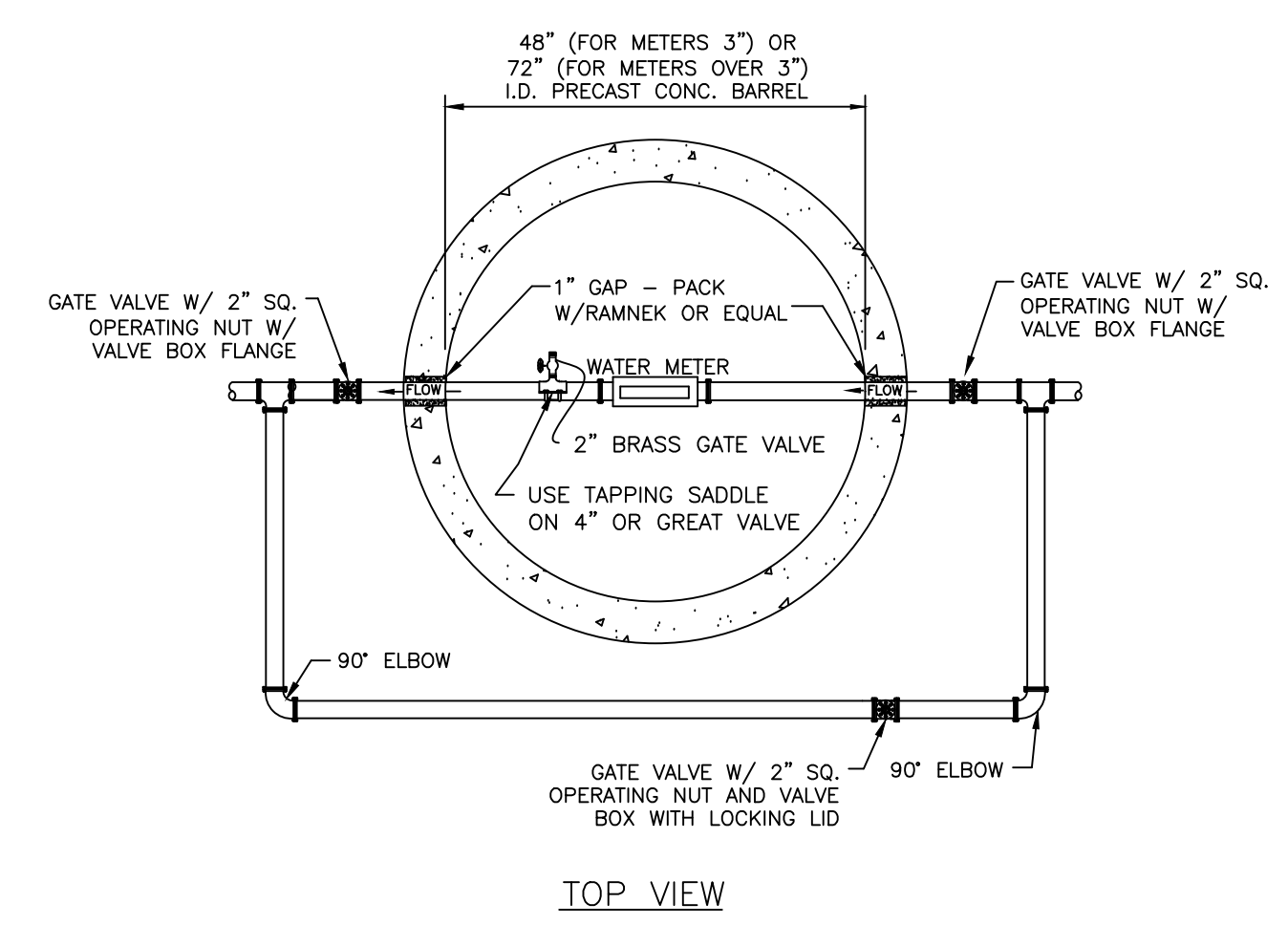
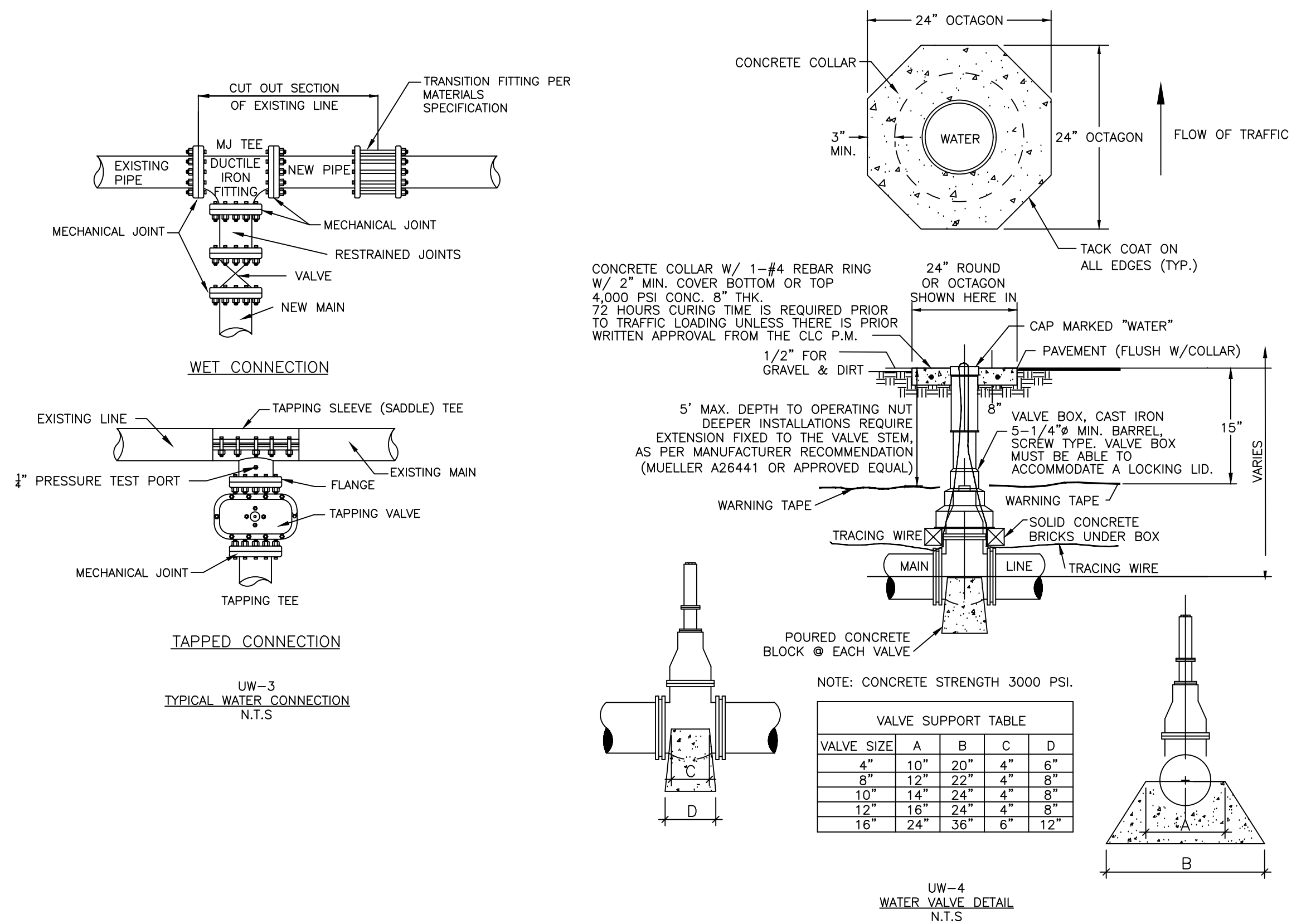


- NOTES:
- TUBING MUST BE BEDDED THROUGHOUT ITS LENGTH TO ENSURE THE SERVICE LINE IS NOT STRESSED DURING BACKFILLING, BEDDING MATERIAL MUST EXTEND 4" IN ALL DIRECTIONS FROM TUBING. TAPE TRACING WIRE TO SERVICE LINE EVERY 5FT AND EXTEND TRACING WIRE TO ANGLE VALVE/CURB STOP.
 - IRON EQUIPMENT (IRON ERT & LEAK SENSOR) IS SUPPLIED BY CITY WITHIN THE METER BOX.
 - TRACING WIRE SHOULD BE SPLICED (3M OEL SPLICE KIT) TO EXISTING MAIN TRACING WIRE, WHEN THERE IS NOT A MAIN TRACING WIRE, THE WIRE END REQUIRES WIRE CAP.
 - CUSTOMER VALVE INSTALLED BY CITY ARE TIED DURING NEW SERVICE CONNECTION, TO BE MAINTAINED BY CUSTOMER.
 - DURING NEW CONSTRUCTION, THE CONTRACTOR SHALL INSTALL CURB STOP 18" BELOW GRADE AND CONTINUE SERVICE LINE A MINIMUM 6"-12" ABOVE GRADE.

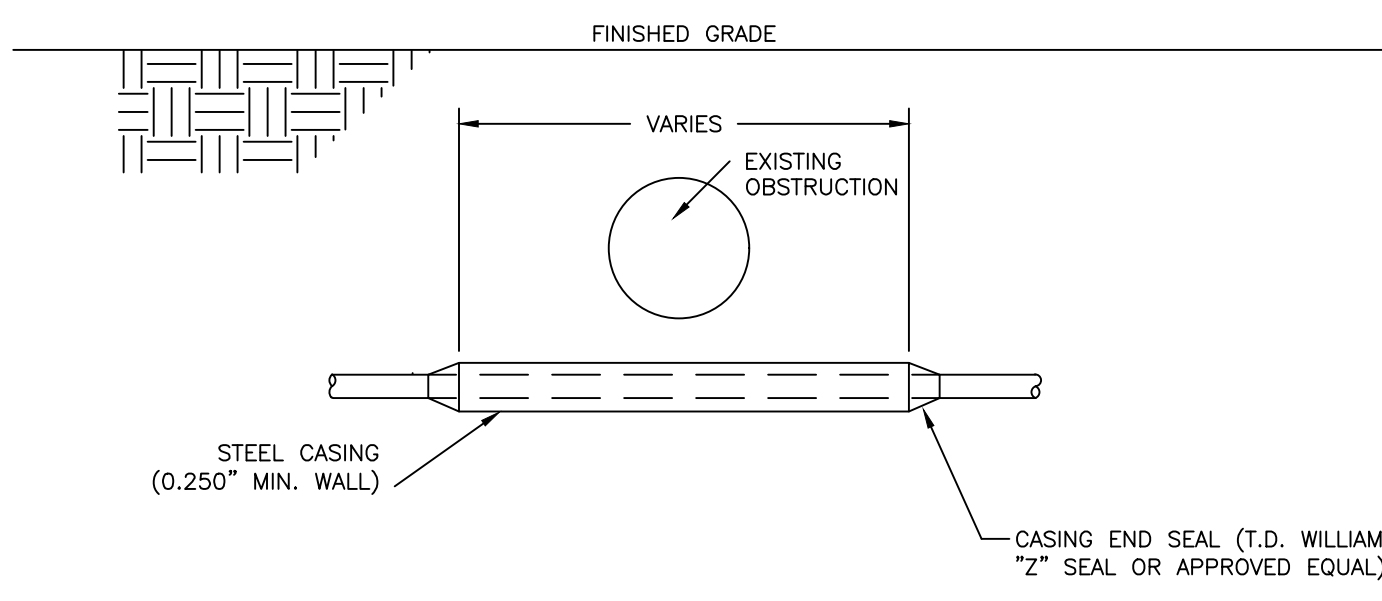
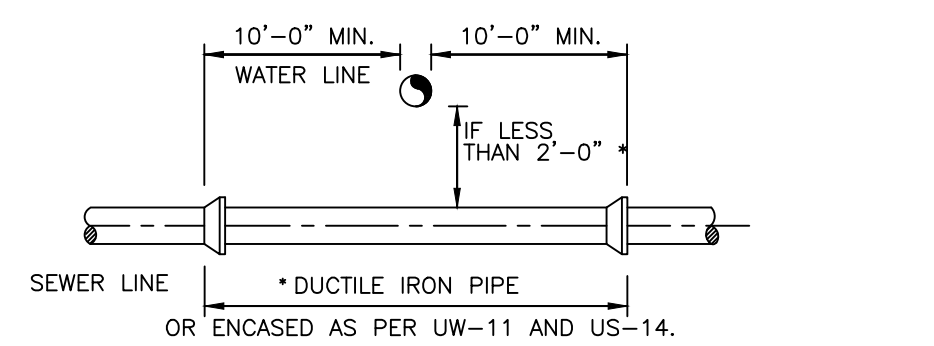
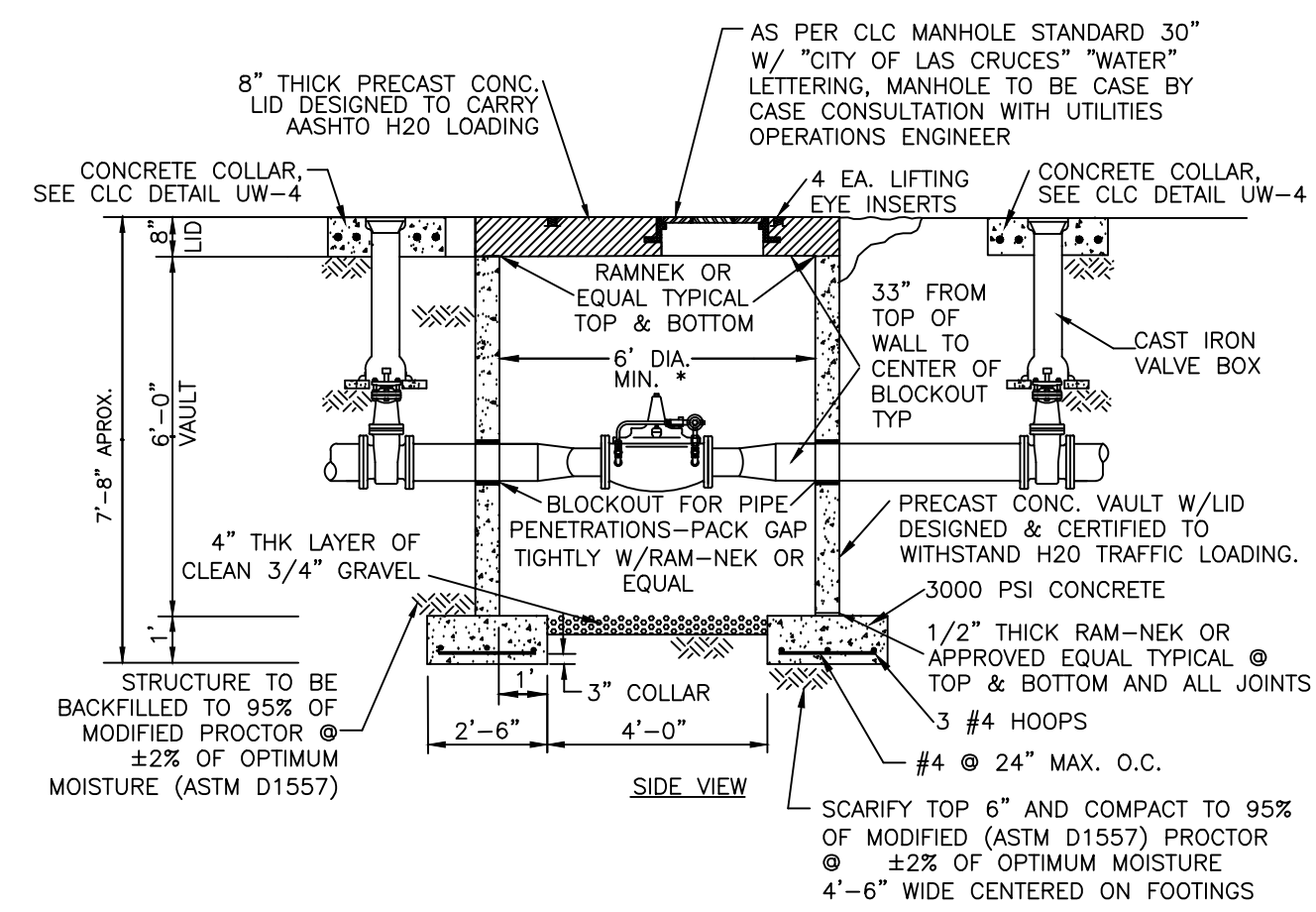
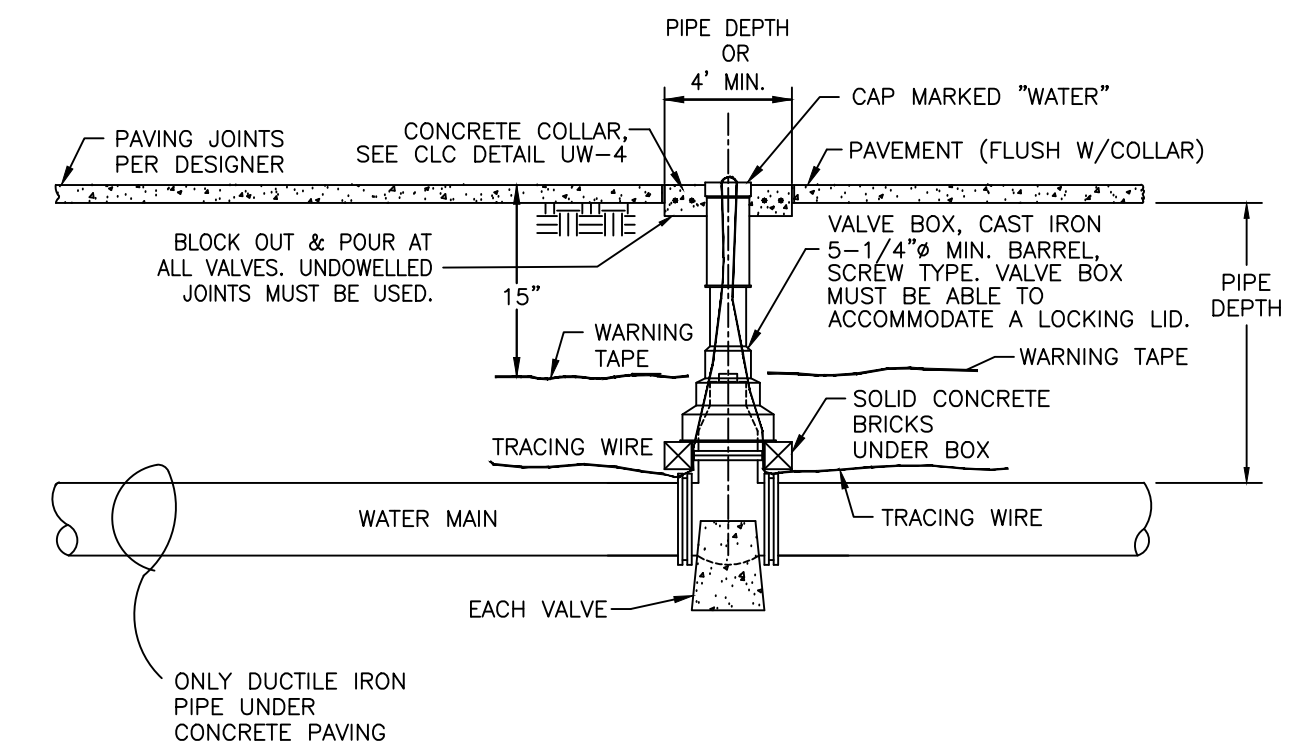
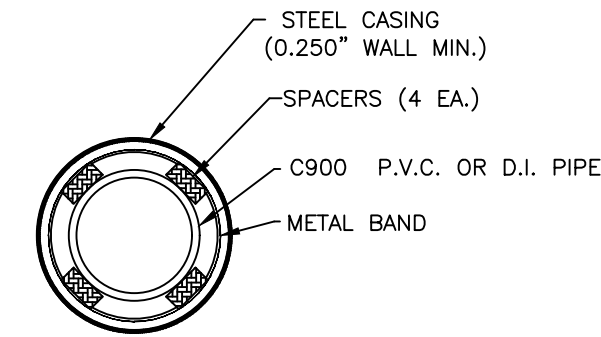
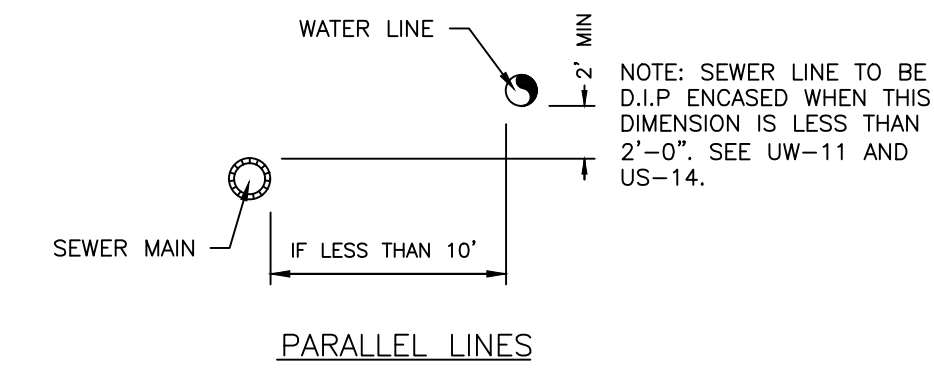
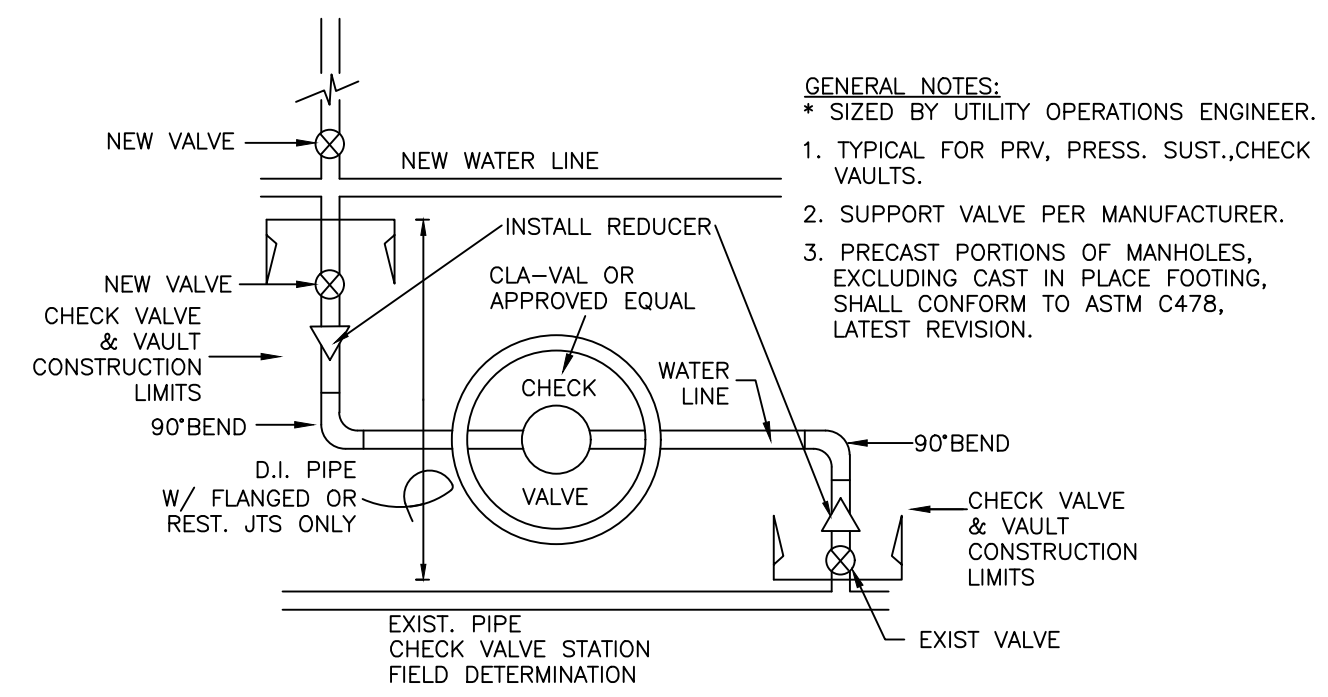
UW-2
TYPICAL RESIDENTIAL WATER SERVICE
FOR 3/4" THRU 2" METERS
N.T.S.



UW-2-1
TYPICAL RESIDENTIAL WATER SERVICE LINE
N.T.S.



ALL WATER UTILITY DETAILS SHEET 2 OF 3



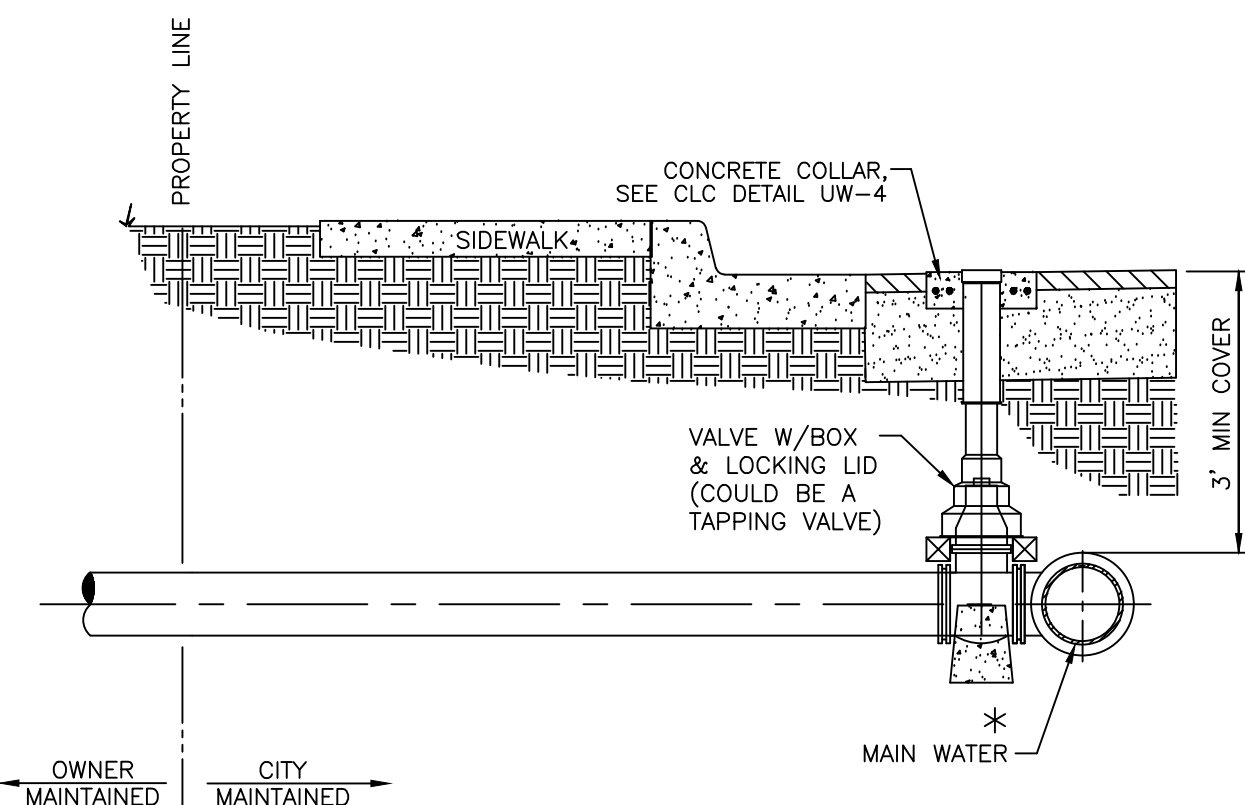
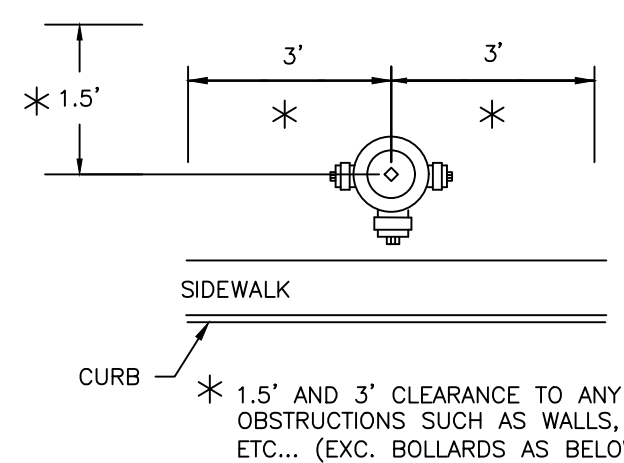
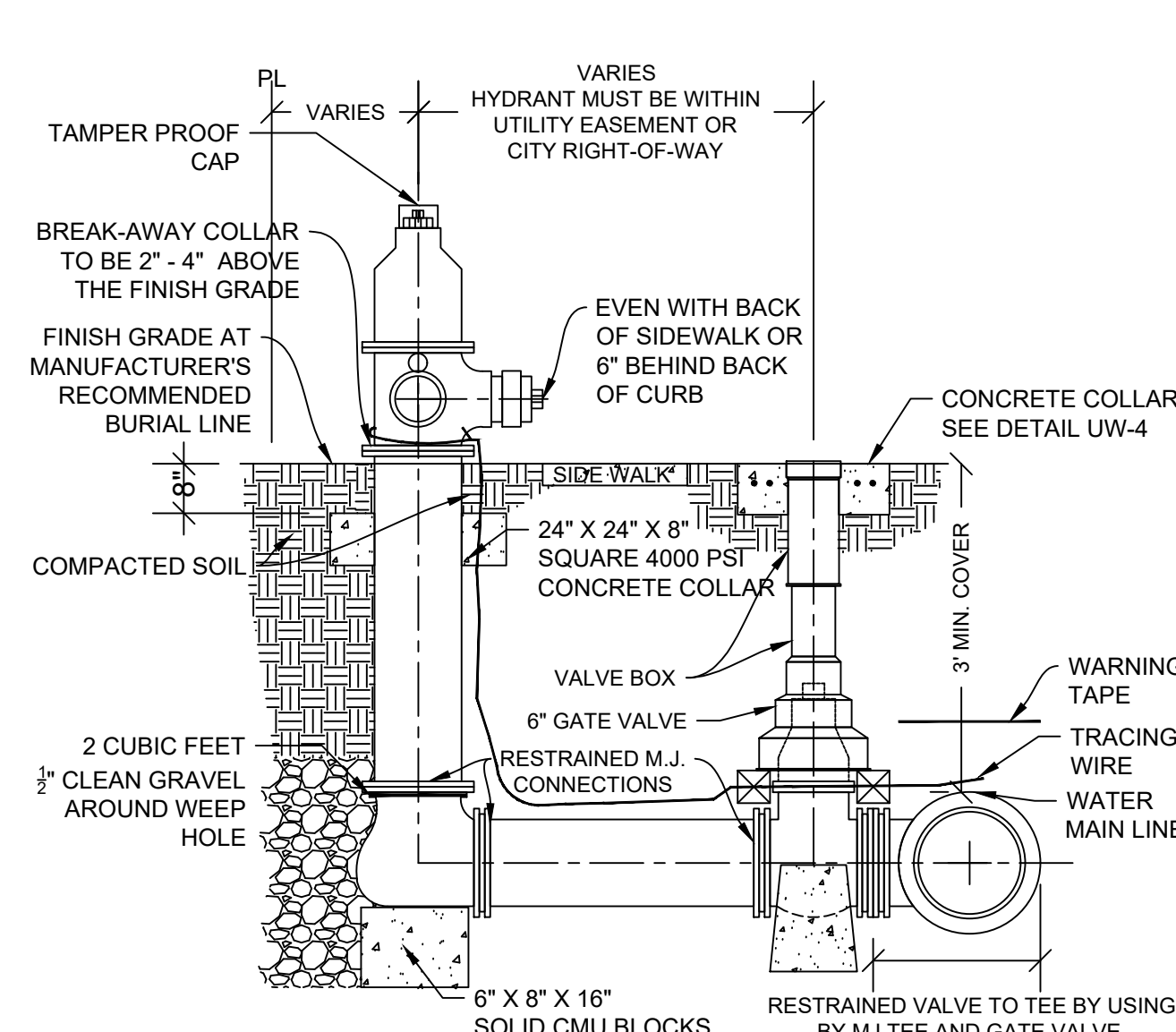
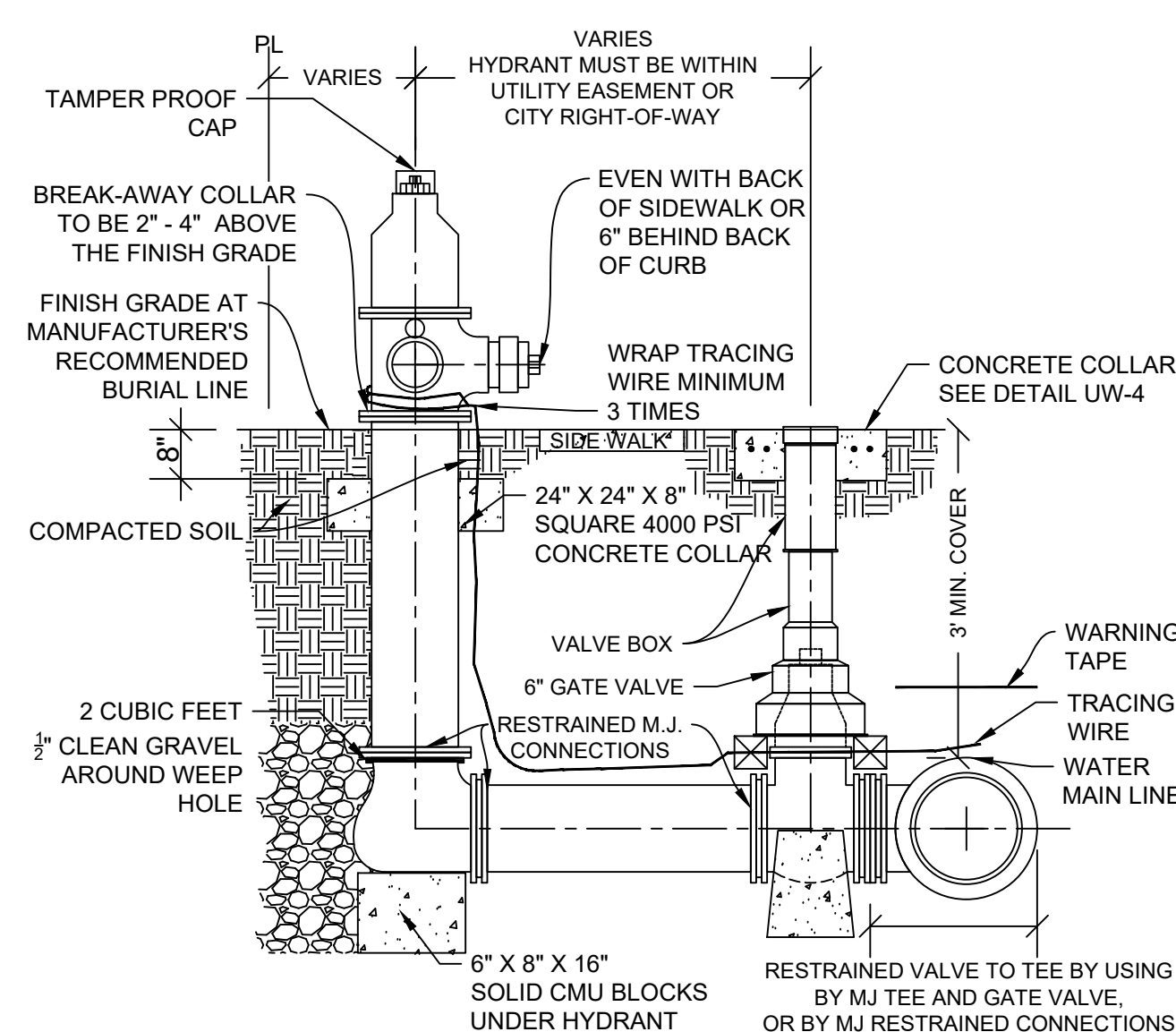
NOTES:
 1. PUBLIC WORKS MARKETING, INC. (P.W.M.) "RACI" SPACERS OR APPROVED EQUAL MAY BE SUBSTITUTED AT MANUFACTURER'S RECOMMENDED SPACING.
 2. PIPE JOINT INSIDE CASING SHALL BE JOINT RESTRAINED.

UW-9
 CHECK VALVE AND VAULT GENERAL DETAIL
 N.T.S.

UW-10
 PARALLEL AND CROSSED LINE
 N.T.S.

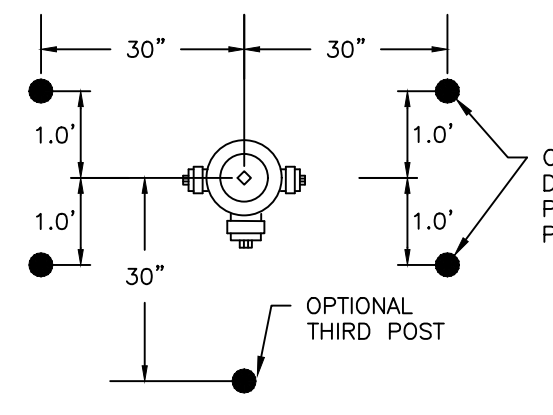
UW-11
 WATER LINE BORE AND CASE
 N.T.S.

UW-12
 WATER MAIN UNDER RIGID PAVING
 N.T.S.



* THE LAS CRUCES UTILITIES WILL BE RESPONSIBLE TO THE PROPERTY LINE AND THE OWNER WILL BE RESPONSIBLE FOR MAINTENANCE FROM THE PROPERTY LINE TO THE BUILDING.

UW-15
 FIRE LINE
 N.T.S.



NOTES:
 1. LOCATE FIRE HYDRANT IN PARKWAY BEHIND CURB & GUTTER IF AVAILABLE, OTHERWISE PLACE FIRE HYDRANT AT DIRECTION OF UTILITY INSPECTOR.
 2. FOR FIRE HYDRANTS ON LONG DEAD-END LINES OUTSIDE THE R.O.W., A SECOND VALVE MAY BE REQUIRED APPROXIMATELY 10 FEET FROM THE HYDRANT.
 3. TEST BOXES, CONNECTED INTO TRACING WIRE SYSTEM, SHALL BE REQUIRED WHERE HYDRANTS ARE NOT USED OR WHERE HYDRANT SPACING EXCEEDS 500 FEET.

NOTES:
 1. LOCATE FIRE HYDRANT IN PARKWAY BEHIND CURB & GUTTER IF AVAILABLE, OTHERWISE PLACE FIRE HYDRANT AT DIRECTION OF UTILITY INSPECTOR.
 2. FOR FIRE HYDRANTS ON LONG DEAD-END LINES OUTSIDE THE R.O.W., A SECOND VALVE MAY BE REQUIRED APPROXIMATELY 10 FEET FROM THE HYDRANT.
 3. TEST BOXES, CONNECTED INTO TRACING WIRE SYSTEM, SHALL BE REQUIRED WHERE HYDRANTS ARE NOT USED OR WHERE HYDRANT SPACING EXCEEDS 500 FEET.

UW-13
 FIRE HYDRANT DETAIL
 N.T.S.

UW-13-1
 FIRE HYDRANT DETAIL
 N.T.S.

ALL WATER UTILITY DETAILS SHEET 3 OF 3

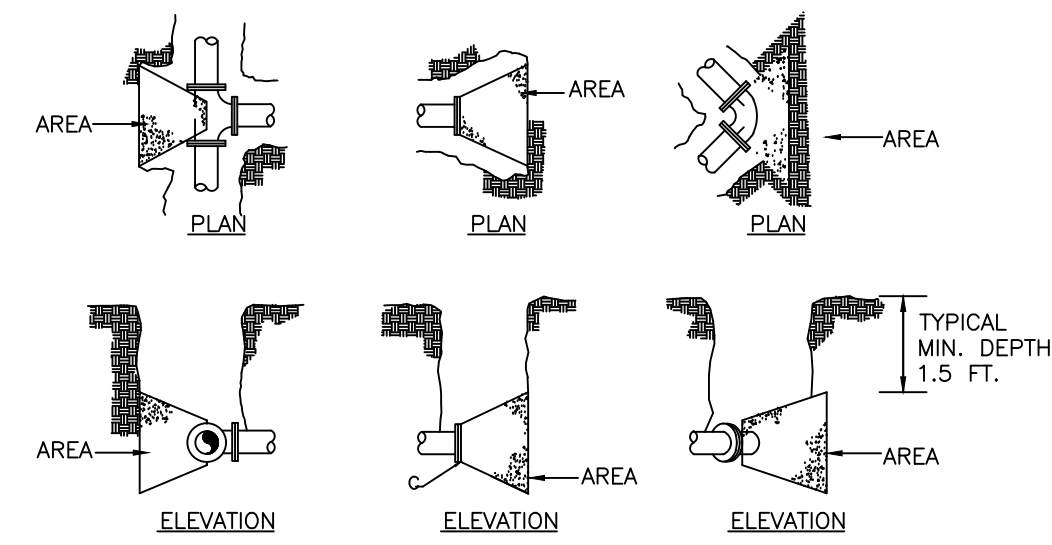


TABLE I

MINIMUM BEARING SURFACE AREA (IN SQUARE FEET)

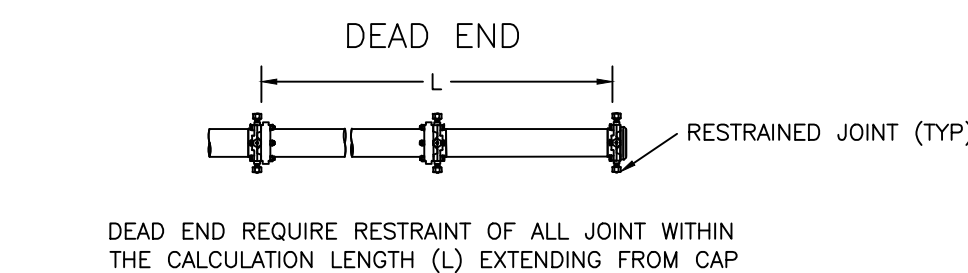
PIPE SIZE	BENDS				TEE OR DEAD END
	1 1/4"	2 1/2"	4 5/8"	90"	
4"	1	1	1	2	1.5
6"	1	1.5	2.5	4.5	3.5
8"	1.5	2.5	4.5	8	6
10"	2	3.5	7	12.5	9
12"	2.5	5	10	18	13.0

TABLE II

SOIL TYPE	MAX. ALLOWABLE SOIL BEARING VALUES	FACTOR FOR INCREASING AREAS IN TABLE I
LOOSE SAND	500 PSF	4
SOFT SANDY CLAY	1000 PSF	2
ADOBE	1000 PSF	2
COMPACT FINE SAND	2000 PSF	1
COMPACT COARSE SAND	2000 PSF	1
MEDIUM STIFF CLAY	2000 PSF	1

- NOTES:**
- BEARING VALUES SHOWN IN TABLE I ARE BASED ON 150 P.S.I. TEST PRESSURE, AT 1.5 TO 1 SAFETY FACTOR AND 2000 P.S.F. SOIL BEARING VALUE.
 - THE DESIGN ENGINEER SHALL DETERMINE THE SAFE BEARING VALUES FOR EACH PROJECT AND THE FACTORS AS SHOWN IN TABLE II FOR INCREASING AREAS IN TABLE I SHALL BE UTILIZED BY THE CONTRACTOR WHERE APPLICABLE.
 - BEARING SURFACE AREAS ARE TO BE ON UNDISTURBED SOIL.
 - UTILITY SYSTEM PIPING THRUST IS TO BE RESTRAINED BY THE USE OF RESTRAINED JOINT FITTINGS, SEE SECTION 802.3.1.

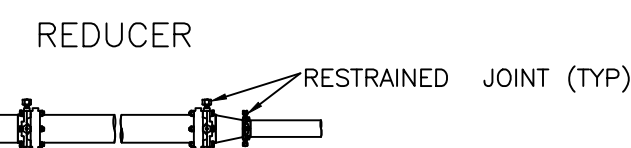
UW-16
CONCRETE BLOCKING DETAILS
N.T.S.



DEAD END RESTRAINED LENGTH (L) IN FEET

PIPE SIZE	D.I.	PVC
4"	28'	52'
6"	40'	74'
8"	52'	98'
10"	62'	115'
12"	73'	136'

- NOTES:**
- RESTRAINT LENGTH CALCULATION BASED ON COMPACTED TYPE 4 TRENCH WITH 3' OF COVER. A TEST PRESSURE OF 150 PSI & A 1.5 TO 1 SAFETY FACTOR.
 - THIS TABLE OF RESTRAINED LENGTHS IS PROVIDED BASED ON ML (UNIFIED CLASSIFICATION) SOIL TYPES. THESE LENGTHS MAY ALSO BE USED FOR GP, GM, SM, SP, AND CL SOIL TYPES. THE USE OF OTHER RESTRAINED LENGTHS BASED ON OTHER SOIL CONDITIONS OR OTHER DESIGN PARAMETERS OF PIPE SIZES LARGER THAN 12 INCH SHALL BE DESIGNED AND SUBMITTED FOR APPROVAL. POLYETHYLENE WRAPPED D.I. PIPE WILL REQUIRE SEPARATE CALCULATIONS.



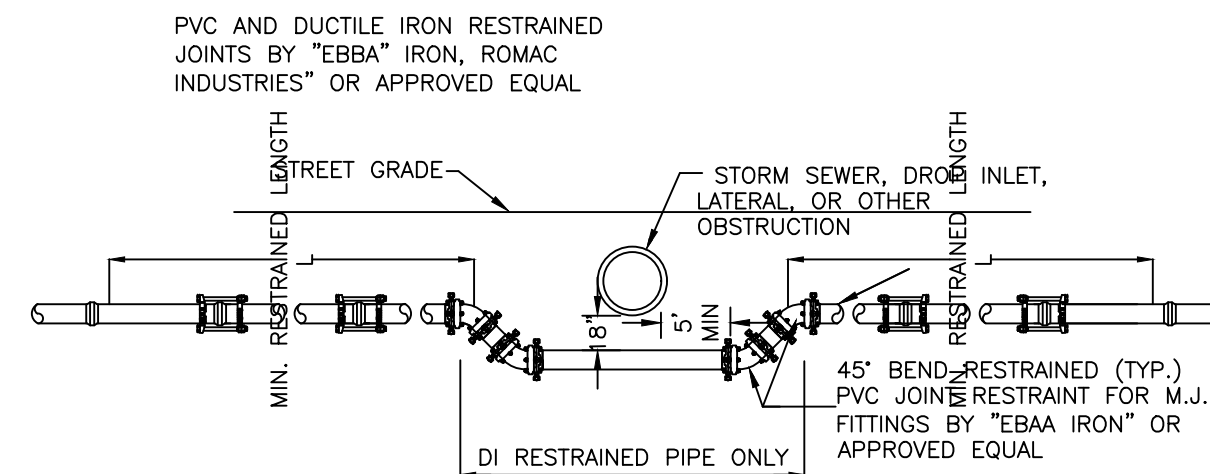
REDUCERS REQUIRE RESTRAINT OF ALL JOINT WITHIN THE CALCULATION LENGTH (L) EXTENDING FROM THE FITTING ON THE SIDE OF THE LARGER PIPE, RESTRAINING THE SMALL SIDE OF THE FITTING IS OPTIONAL

REDUCER RESTRAINED LENGTH (L) IN FEET

PIPE SIZE	D.I.	PVC
12"x4"	64'	118'
12"x6"	53'	99'
12"x8"	39'	72'
12"x10"	36'	67'
10"x4"	51'	94'
10"x6"	38'	71'
10"x8"	21'	39'
8"x4"	38'	69'
8"x6"	22'	40'
6"x4"	21'	38'

LENGTHS BASED ON: EBAA IRON RESTRAINT DESIGN SOFTWARE

UW-19
RESTRAINED DEAD END AND REDUCER
N.T.S.



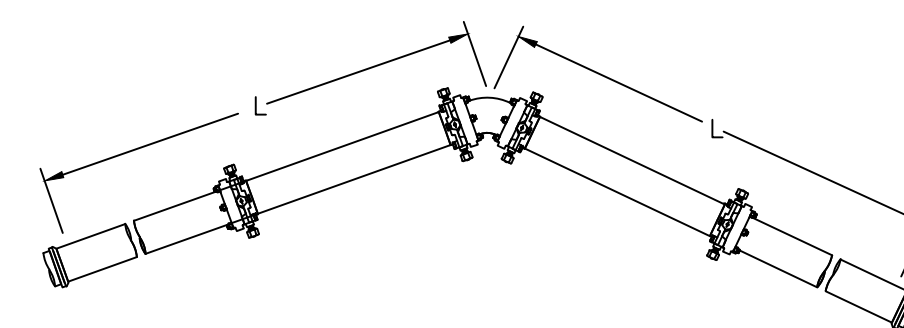
RESTRAINED LENGTH (L) IN FEET

PIPE SIZE	D.I.	PVC
4"	12'	22'
6"	17'	30'
8"	22'	40'
10"	28'	48'
12"	30'	56'

LENGTHS BASED ON: EBAA IRON RESTRAINT DESIGN SOFTWARE

- NOTES:**
- THIS TABLE OF RESTRAINED LENGTHS IS PROVIDED BASED ON ML (UNIFIED CLASSIFICATION) SOIL TYPES. THESE LENGTHS MAY ALSO BE USED FOR GP, GM, SM, SP, AND CL SOIL TYPES. THE USE OF OTHER RESTRAINED LENGTHS BASED ON OTHER SOIL CONDITIONS OR OTHER DESIGN PARAMETERS OR PIPE SIZES LARGER THAN 12 INCH SHALL BE DESIGNED AND SUBMITTED FOR APPROVAL.
 - RESTRAINT LENGTH CALCULATION BASED ON COMPACTED TYPE 4 TRENCH WITH 3' OF COVER. A TEST PRESSURE OF 150 PSI & A 1.5 TO 1 SAFETY FACTOR
 - POLYETHYLENE WRAPPED D.I. PIPE WILL REQUIRE SEPARATE CALCULATIONS

UW-17
WATER LINE LOWERING
N.T.S.



RESTRAINED LENGTH (FT) FOR DUCTILE IRON PIPE

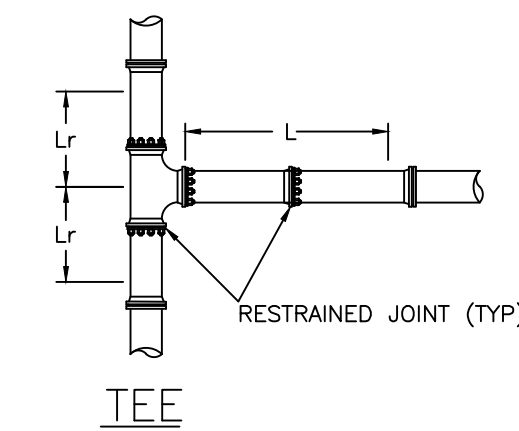
PIPE SIZE	11 1/2" BEND	22 1/2" BEND	45° BEND	90° BEND
4"	1	3	6	14
6"	2	4	8	19
8"	2	5	10	25
10"	3	6	12	29
12"	3	7	14	34

RESTRAINED LENGTH (FT) FOR P.V.C. PIPE

PIPE SIZE	11 1/2" BEND	22 1/2" BEND	45° BEND	90° BEND
4"	2	3	7	17
6"	2	5	10	24
8"	3	6	13	31
10"	4	7	15	37
12"	4	9	18	44

- NOTES:**
- THIS TABLE OF RESTRAINED LENGTHS IS PROVIDED BASED ON ML (UNIFIED CLASSIFICATION) SOIL TYPES. THESE LENGTHS MAY ALSO BE USED FOR GP, GM, SM, SP, AND CL SOIL TYPES. THE USE OF OTHER RESTRAINED LENGTHS BASED ON OTHER SOIL CONDITIONS OR OTHER DESIGN PARAMETERS OR PIPE SIZES LARGER THAN 12 INCH SHALL BE DESIGNED AND SUBMITTED FOR APPROVAL.
 - RESTRAINT LENGTH CALCULATION BASED ON COMPACTED TYPE 4 TRENCH WITH 3' OF COVER. A TEST PRESSURE OF 150 PSI & A 1.5 TO 1 SAFETY FACTOR.
 - POLYETHYLENE WRAPPED D.I. PIPE WILL REQUIRE SEPARATE CALCULATIONS.
 - LENGTH BASED ON EBAA IRON RESTRAINT SOFTWARE.

UW-20
RESTRAINED HORIZONTAL BEND
N.T.S.

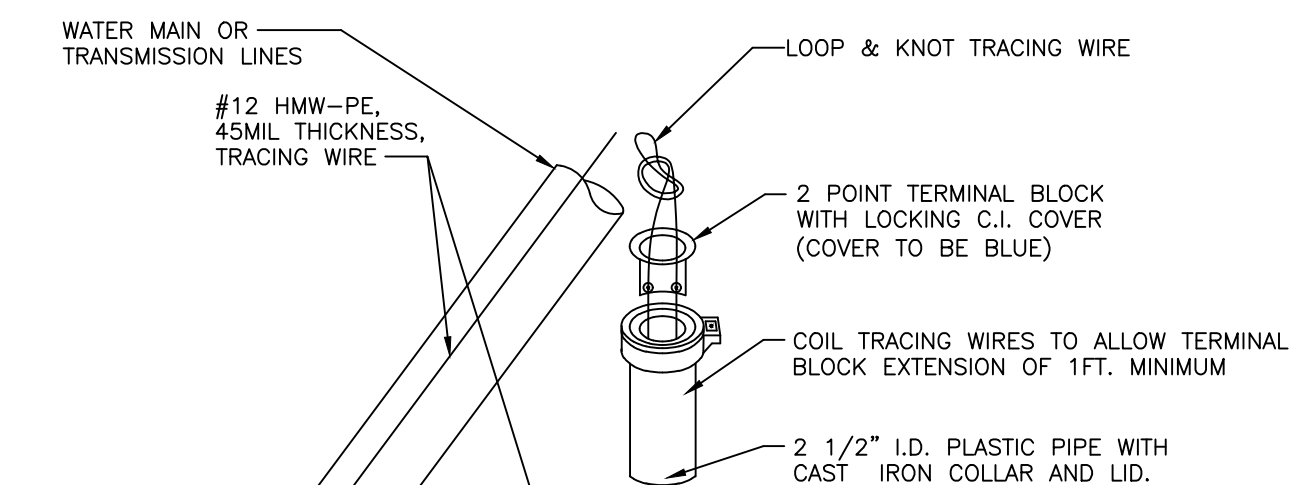


- NOTES:**
- RESTRAINED LENGTH CALCULATION BASED ON COMPACTED TYPE 4 TRENCH WITH 3' OF COVER. A TEST PRESSURE OF 150 PSI & A 1.5 TO 1 SAFETY FACTOR.
 - THIS TABLE OF RESTRAINED LENGTHS IS PROVIDED BASED ON ML (UNIFIED CLASSIFICATION) SOIL TYPES. THESE LENGTHS MAY ALSO BE USED FOR GP, GM, SP, AND CL SOIL TYPES. THE USE OF OTHER RESTRAINED LENGTHS BASED ON OTHER SOIL CONDITIONS OR OTHER DESIGN PARAMETERS OR PIPE SIZES LARGER THAN 12 INCH SHALL BE DESIGNED AND SUBMITTED FOR APPROVAL.
 - POLYETHYLENE WRAPPED D.I. PIPE WILL REQUIRE SEPARATE CALCULATIONS.
 - TEE FITTINGS REQUIRE THE RESTRAINT OF ALL JOINTS WITHIN A CALCULATED LENGTH ALONG THE BRANCH PIPE. THE RESTRAINED DESIGN ALSO REQUIRES THE SELECTION OF A LENGTH OF PIPE ALONG THE RUN (L_r) TO BE FREE OF JOINTS.

PIPE SIZE	LR= 5' MIN.		LR= 10' MIN.	
	D.I.	L(PVC)	D.I.	L(PVC)
12"x4"	1'	1'	1'	1'
12"x6"	6'	10'	11'	11'
12"x8"	27'	48'	1'	2'
12"x10"	42'	74'	21'	38'
12"x12"	56'	100'	39'	69'
10"x4"	1'	1'	1'	1'
10"x6"	12'	21'	1'	1'
10"x8"	32'	56'	10'	18'
10"x10"	45'	80'	28'	50'
8"x4"	1'	1'	1'	1'
8"x6"	18'	32'	1'	1'
8"x8"	36'	64'	19'	34'
6"x4"	4'	7'	1'	1'
6"x6"	23'	41'	7'	12'
4"x4"	12'	21'	1'	1'

LENGTHS BASED ON: EBAA IRON RESTRAINT DESIGN SOFTWARE

UW-18
RESTRAINED TEE
N.T.S.



- NOTES:**
- TEST BOXES, CONNECTED INTO TRACING WIRE SYSTEM, SHALL BE REQUIRED WHERE HYDRANTS ARE NOT USED OR WHERE HYDRANT SPACING EXCEEDS 500 FEET.
 - SPACING AND LOCATION OF TEST BOXES TO BE DETERMINED BY THE CITY UTILITIES DIVISION. TEST BOX LOCATION MAY VARY, UP TO 50 FT. FROM WATER MAIN LINE.
 - REFER TO STANDARDS AND MATERIALS LISTS FOR MATERIALS.
 - TRACING WIRE SHALL EXTEND A MINIMUM OF 12" ABOVE TEST STATION.
 - 24" OCTAGON CONCRETE COLLAR TO BE INSTALLED.

UW-21
TRACING WIRE TEST BOX
N.T.S.