SPECIFICATIONS AND CONTRACT DOCUMENTS
FOR THE CONSTRUCTION OF

CITY OF ALAMOGORDO
PARK RESTROOMS
CS2101

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CITY OF ALAMOGORDO, NEW MEXICO
PUBLIC WORKS BID No. 2021-005

October 2021

The technical material and data contained in these Specifications were prepared under the supervision and direction of the undersigned, whose seal, as a Professional Engineer/Architect licensed to practice in the State of New Mexico, is affixed below.

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GENERAL DOCUMENTS

SECTION 1 - ADVERTISEMENT FOR BIDS

Sealed Bids will be received by the City of Alamogordo at 1376 E. Ninth Street, Alamogordo, New Mexico, 88310, Attn: Engineering Department for the construction of the Project known as "**ALAMOGORDO PARK RESTROOMS", Public Works Bid No. 2021-005**, until **1:30 PM** on **November 8, 2021,** at which time the Bid Opening and reading of the Bids received will begin in the Commission Chambers at 1376 E. Ninth Street, Alamogordo, New Mexico. The tabulation of Bids will be considered by the City Commission of the City of Alamogordo at its next regular meeting, or at a later meeting if required.

The Work will consist of construction of new ADA-compliant restrooms at the Alameda Park Zoo and at the Balloon Fiesta Park.

Construction Industries Division (CID) Project Classification Determination is GB-98. In accordance with the provisions of the New Mexico Construction Industries Licensing Act, all project work must be performed by properly licensed contractors and subcontractors with active licenses in good standing as of the date and time specified for Bid Opening. The City has determined that the Contractor shall possess a valid license classification as specified above or other appropriate license classification under the Construction Industries Licensing Act at the time the contract is Bid. Any work outside the scope of the Prime Contractor's classification(s) must be subcontracted. Any work subcontracted by a Prime Contractor must be performed by an entity that is validly licensed in the classification(s) of the work that is to be subcontracted as of the date and time specified for Bid Opening. Bids that do not satisfy applicable licensing requirements will be considered non-responsive.

"Specifications and Drawings will be available to BIDDERS on the **City Website through Vendor Registration and Bid Notification System** or by emailed requests to either *bpyeatt@ci.alamogrodo.nm.us* or *cgebhardt@ci.alamogordo.nm.us.*

A Non-Mandatory Pre-Bid Meeting will be held at **1:30 pm October 19, 2021,** in the Commission Chambers, 1376 E. Ninth Street, Alamogordo, New Mexico.

Prospective BIDDERS are advised that a 10% Bid Evaluation Criterion for area businesses will not apply to this Project.

Each Bid shall be accompanied by a Bid Security in the amount of not less than five (5) percent of the total Bid amount.

The successful BIDDER will be required to furnish a Performance Bond and a Payment Bond in the amount of one hundred (100) percent of the Bid amount to assure performance of the Contract, and payment for all labor and materials of the Contract.

No Bids may be withdrawn after the scheduled closing time for receipt of Bids, and the City of Alamogordo reserves the right to reject any or all Bids and waive all technicalities and formalities.

No BIDDER may withdraw their Bid within sixty (60) days after the actual date of the Bid Opening thereof.

Attention of BIDDERS is particularly called to the requirements as to conditions of employment to be observed and minimum wage rates to be paid under the Contract.

Barbara Pyeatt
Chief Procurement Officer
City of Alamogordo

Advertised on **October 10, 2021 and October 17, 2021** in:

Alamogordo Daily News
Albuquerque Journal

SECTION 2 - INSTRUCTIONS TO BIDDERS

1.0 DEFINED TERMS

Terms used in these Instructions to BIDDERS which are defined in the General Conditions of the Construction Contract have the meanings assigned to them in the General Conditions. The term "BIDDER" means one who submits a Bid directly to OWNER, as distinct from a sub-bidder, who submits a Bid to a Bidder. The term "Successful BIDDER" means the lowest, qualified, responsible and responsive BIDDER to whom OWNER (on the basis of OWNER's evaluation as hereinafter provided) makes an Award. The term "Bidding Documents" includes the Advertisement or Invitation to Bid, Instructions to BIDDERS, the Bid Schedule, and the proposed Contract Documents (including all Addenda issued prior to receipt of Bids).

2.0 EXAMINATION OF CONTRACT DOCUMENTS AND PROJECT SITE

Before submitting a Bid, each BIDDER must:

A. Examine and study the Project Plans and Contract Documents thoroughly.

B. Visit the site to become familiar with local conditions that may in any manner affect performance of the Work.

Before submitting a Bid, each BIDDER may, at BIDDER's own expense, make or obtain any additional examinations, investigations, explorations, tests and studies and obtain any additional information and data which pertain to the physical conditions (surface, subsurface and underground facilities) at or contiguous to the site or otherwise which may affect cost, progress, performance or furnishing of the Work and which BIDDER deems necessary to determine its Bid for performing and furnishing the Work in accordance with the time, price and other terms and conditions of the Contract Documents.

Any explorations or tests that each BIDDER deems necessary for submission of the Bid shall be coordinated and performed with the prior approval of the City of Alamogordo. Any work of this nature will be done in strict compliance with all applicable permits, requirements and regulations.

C. Be familiar with federal, state and local laws, ordinances, rules and regulations, affecting performance of the work and employment of labor.

D. Carefully correlate any observations with the requirements of the Contract Documents.

E. Notify ENGINEER of all conflicts, errors or discrepancies in the Contract Documents.

F. Note that information and data reflected in the Contract Documents with respect to Underground Facilities at or contiguous to the site is based upon information and data furnished to OWNER and ENGINEER by owners of such Underground Facilities or others, and neither the ENGINEER nor the OWNER assumes responsibility for the accuracy or completeness thereof. It shall be the CONTRACTOR's sole responsibility to locate all utilities before any work commences.

The submission of a bid will constitute an incontrovertible representation by BIDDER that BIDDER has complied with all requirements contained herein, that without exception the Bid is premised upon performing and furnishing the Work required by the Contract Documents and such means, methods, techniques, sequences or procedures of construction as may be indicated in or required by the Contract Documents, and that the Contract Documents are sufficient in scope and detail to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

3.0 INTERPRETATIONS AND ADDENDA

All questions about the meaning or intent of the Contract Documents shall be submitted via fax (575) 439-4117 or e-mail bpyeatt@ci.alamogordo.nm.us **Questions received after 4:00 p.m. on October 22, 2021 will not be answered.** Submitted questions will be answered by formal written addenda and will be binding. Oral clarification will not be binding.

Each Addenda shall be made part of the Contract Documents to the same extent as though contained in the original documents and itemized listings thereof. On the Bid Proposal, each BIDDER shall acknowledge receipt of each Addenda.

4.0 CONTRACT TIME

The number of calendar days within which, or the dates by which, the Work is to be substantially completed and ready for Final Payment (the Contract Time) as set forth in the AGREEMENT, Section 8. This time may be defined as a specified fixed date or a given number of calendar days. The Contract Time may be amended by mutual written Agreement to include authorized time extensions as the performance of the Contract requires.

5.0 LIQUIDATED DAMAGES

Provisions for liquidated damages are set forth in the AGREEMENT, Section 8.

6.0 SUBSTITUTE OR "OR-EQUAL" ITEMS

The Contract, if Awarded, will be on the basis of materials and equipment described in the Drawings or specified in the Specifications without consideration of possible substitutes or "or-equal" items. Whenever it is indicated in the Drawings or in the Specifications that a substitute or an "or-equal" item of material or equipment may be furnished or used by the CONTRACTOR, if acceptable to ENGINEER, application for acceptance will not be considered by ENGINEER until after the Effective Date of the AGREEMENT. The procedure for the submission of any such application by the CONTRACTOR for consideration by the ENGINEER is set forth in the General Conditions.

7.0 SUBCONTRACTORS

BIDDERS will submit to OWNER a list of all Subcontractors and other persons and organizations proposed for those portions of the Work whose value in services is $5,000.00 or more. **SUCH LIST WILL BE COMPLETED AND SUBMITTED WITH THE BID AND SHALL INCLUDE THE NAME AND ADDRESS OF EACH SUBCONTRACTOR AND THE NATURE OF THE WORK TO BE PERFORMED**. If OWNER or ENGINEER, after due investigation, has reasonable objection to any proposed Subcontractor, other person, or organization, they may before giving the Notice of Award, request the Apparent Low BIDDER to submit an acceptable

substitute Subcontractor. The Contract Price shall be increased or decreased by the difference in cost occasioned by such substitution and an appropriate Change Order shall be issued. If the Apparent Low Bidder declines to make any such substitution, he will not thereby sacrifice his Bid Security. Any Subcontractor, other person, or organization so listed and to whom OWNER or ENGINEER does not make written objection prior to the giving of the Notice of Award will be deemed acceptable to OWNER and ENGINEER.

The CONTRACTOR shall not be required to employ any Subcontractor, other person, or organization against whom CONTRACTOR has reasonable objection.

The BIDDER is specifically advised that any person, firm, or other party to whom it is proposed to award a subcontract must be acceptable to the OWNER.

8.0 WAGE RATES

The BIDDER's attention is directed to the fact that the prevailing State Wage Rate Decision listed by the New Mexico Department of Workforce Solutions and contained in Section 12, herein, shall also be made a part of the Contract. It shall be the BIDDER'S responsibility to be thoroughly informed of all state, federal and local laws and statutes pertaining to the employment and shall strictly adhere to such laws and regulations.

9.0 COLLUSION - GENUINE BID

The BIDDER, by submitting a Bid, certifies that the Bid is genuine and is not a sham or collusive, or made in the interest, or in the behalf of any person not named as BIDDER, and that the BIDDER has not directly or indirectly induced or solicited any other BIDDER to put in a sham Bid, or any other person, firm or corporation to refrain from bidding, and that the BIDDER has not in any manner sought by collusion to secure himself an advantage over any other BIDDER.

10.0 QUANTITIES

The quantities set forth in the Bid Schedule are estimated quantities. Payment will be made at the unit price bid amounts for the Work actually performed. The City reserves the right to increase or decrease quantities. The CONTRACTOR shall not be paid for any portion of the Project built beyond plan dimensions and thickness. The OWNER has the right (and BIDDER by submission of a Bid, agrees OWNER has this right) to increase or reduce the quantities shown in the Bid Schedule up to twenty-five (25) percent before the CONTRACTOR can present a claim to adjust the unit bid prices.

11.0 EQUAL EMPLOYMENT OPPORTUNITY

During the performance of this contract, the CONTRACTOR agrees as follows:

The CONTRACTOR will not discriminate against any employee or applicant for employment because of race, creed, color, or national origin. The CONTRACTOR will take affirmative action to insure that applicants are employed, and that employees are treated during employment without regard to their race, creed, color, or national origin. Such action shall include, but not be limited to the following: employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training.

The CONTRACTOR agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the provisions of this nondiscrimination clause.

12.0 GROSS RECEIPTS SURETY BOND

Effective July 1, 1975, New Mexico House Bill 262 added Section 7-1-55, NMSA 1978 to the Tax Administration Act, Subsection A, provides for any person engaged in the construction business, as defined in Section 7-9-3, NMSA 1978, who does not have its principal place of business in New Mexico and enters into a prime construction contract to be performed in this state, at the time such contract is entered into, to furnish the Commissioner of Revenue or an authorized delegate with a surety bond, or other acceptable security, in a sum equivalent to the gross receipts to be paid under the contract, multiplied by the sum of the applicable rate of the gross receipts tax imposed by Section 7-9-4, NMSA 1978, plus the rate of tax imposed by the local option gross receipts tax. Upon receipt of a surety bond, or other acceptable security, the Commissioner, or the delegate, shall issue a certificate stating that the requirements of this section have been met.

13.0 SAFETY STANDARDS AND ACCIDENT PREVENTION

With respect to all Work performed under this Contract, the CONTRACTOR shall:

A. Comply with the safety standards provisions of applicable laws, building and construction codes, the "Manual of Accident Prevention in Construction" published by the Associated General Contractors of America, the requirements of the Occupational Safety and Health Act of 1970 (Public Law 91-596).

B. Exercise every precaution at all times for the prevention of accidents and the protection of persons (including employees) and property.

C. Maintain in the Project Office or other well known place at the job site, all articles necessary for giving first aid to the injured, and shall make standing arrangements for the immediate removal to a hospital or a doctor's care of persons (including employees), who may be injured on the job site. In no case shall employees be permitted to work at a job site before the employer has made a standing arrangement for removal of injured persons to a hospital or a doctor's care.

14.0 WORK ON OR ADJACENT TO PRIVATE PROPERTY

The CONTRACTOR shall be required to provide access for the residents and businesses along the construction route to the satisfaction of the ENGINEER. In addition, any private improvements that exist shall be preserved against damage from the CONTRACTOR's activities. The CONTRACTOR shall be required to remove and rebuild any improvements damaged during construction at his sole expense. These improvements include but are not limited to: buildings, fences, sidewalks, structures, walls, driveways, and landscaping. The CONTRACTOR shall not be allowed to make a claim for additional Time or expense due to rebuilding improvements damaged by construction activities.

Except as specified otherwise, in the execution of work on private property, the CONTRACTOR shall make all arrangements with the private property owners to the satisfaction of both the private owner and the ENGINEER before proceeding with the Work. Items removed on private

property to facilitate access to the Work shall be replaced to a condition satisfactory to both the private property owner and the ENGINEER at the cost of the CONTRACTOR.

15.0 TWELVE (12) HOUR CALL-OUT NOTICE

The CONTRACTOR shall be required to maintain a clean, safe work site as well as adequate, safe access for all residents and businesses along the construction routes, to the satisfaction of the ENGINEER. This Work shall include any measures necessary to keep the site clean and safe, and provide access, including but not limited to routine sweeping, treatment to prevent blowing soil, complete removal of mud, grading, temporary driveways, and import of dry suitable material to form temporary driving surfaces.

Upon verbal notification by the ENGINEER, the CONTRACTOR shall perform whatever measures necessary to provide the required cleanup for adequate and safe site conditions and access to adjacent property. The CONTRACTOR shall have twelve (12) hours to respond and begin the work required to clean up the work site or provide said access.

Failure by CONTRACTOR to respond and begin corrective Work within twelve (12) hours will cause OWNER to hire an independent CONTRACTOR to perform the Work required, as determined solely on the ENGINEER's opinion, and withhold all expenses incurred from the CONTRACTOR's Payment for the Project. The CONTRACTOR, by submission of a Bid, agrees to the above stated conditions and is required to sign the Call Out Notice Acknowledgment in Section 3 - Bid Schedule.

16.0 COPIES OF BIDDING DOCUMENTS

"Specifications and Drawings will be available to BIDDERS on the **City Website through Vendor Registration and Bid Notification System** or by emailed requests to either *bpyeatt@ci.alamogrodo.nm.us* or *cgebhardt@ci.alamogordo.nm.us.*

Complete sets of Bidding Documents must be used in preparing Bids. Neither OWNER nor the ENGINEER assumes any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.

OWNER and ENGINEER, in making copies of Bidding Documents available on the above terms, do so only for the purpose of obtaining Bids on the Work and do not confer a license or grant for any other use.

16.1 PLAN HOLDER LIST

Included at the end of this Section is a form for those vendors who wish to be placed on the Plan Holder List for this project. Those vendors must complete this form and forward it to the Purchasing Department. Only those vendors who elect to return this completed form will be placed on the Plan Holder List.

17.0 SUBMISSION OF BIDS

The following bid documents are to be submitted as your Bid:

Section 3 - Bid Schedule
Section 4 - Subcontractor's Fair Practice Act Compliance

Section 5 - Bid Bond
Section 6 - Statement of Bidders Qualifications
Section 7 - Campaign Contribution Disclosure Form,
Resident Veterans Preference Certification (if applicable)
- Copy of State of New Mexico, Regulation and Licensing Department, Construction Industries Division License(s)
- Copy of New Mexico Department Workforce Solutions, Certificate of Public Works Registration

and any other information that may be required.

Prices shall be filled in for all items on the Bid Schedule (Section 3). The Bid Schedule must be completed in ink or by typewriter.

Bids by corporations must be executed in the corporate name by the president or vice-president (or other corporate officer accompanied by evidence of authority to sign) and the corporate seal shall be affixed to the Bid and attested by the secretary or an assistant secretary. The corporate address and state of incorporation shall be shown below the signature. Bids by partnerships must be executed in the partnership name and signed by a partner, whose title must appear under the signature, and the official address of the partnership must be shown below the signature.

All names must be typed or printed below the signature.

The Bid shall contain an Acknowledgment of Receipt of all Addenda (the numbers of which shall be filled in on the Bid Schedule), and acknowledgment of the Twelve (12) Hour Call-Out Notice.

Bids shall be submitted before the time and place stated herein. Bids received after the Bid Opening time will be returned unopened. Faxed bids will not be accepted.

The address and telephone number for communications regarding the Bid must be shown.

Alterations to Bid amounts by erasures or by interlineations shall be initialed by the signer of the Bid. Any Bid not duly signed will not be considered. All Bids shall be submitted and received with the understanding that the BIDDER accepts the terms and conditions as set forth herein.

Each Bid, accompanied by the Bid Security and all other required documents shall be placed in a sealed opaque envelope marked with the words "Bid Proposal", the Project title, the Public Works Bid Number (shown on the title sheet of the Specification book), Attn: Engineering Department, and the name and address of the BIDDER.

18.0 QUALIFICATIONS OF BIDDERS

To demonstrate qualifications to perform the Work, each BIDDER must submit with their Bid, the "Statement of Bidder's Qualifications" contained in Section 6 herein. The City of Alamogordo reserves the right to require additional information and to reject any and all bids from BIDDERS that OWNER determines not to be qualified to carry out the obligations of the Contract and complete the Project.

19.0 BID SECURITY

Bid Security in the amount of five (5) percent of the amount of the Bid shall accompany the Bid documents. This Bid Security must be in the form of a certified or bank cashier's check, payable without condition or recourse, to the OWNER or it may be a Bid Bond issued by a surety licensed to conduct business in the State of New Mexico and be named in the current list of the Insurance Division, State Corporation Commission, Santa Fe, New Mexico.

The attached Bid Security is to become the property of the OWNER in the event the AGREEMENT and Bonds are not executed within the time specified in these Instructions to Bidders, as liquidated damages for the delay and additional expenses caused to the OWNER. The Bid Security is submitted as a guarantee that the BIDDER, if Awarded the Contract, will Execute such Contract in accordance with the Bid Schedule - Section 3, and in the manner and form required by the Contract Documents.

The Bid Security of the three (3) lowest Bidders will be retained until the Contract is Awarded or other disposition is made. Bid Proposals submitted without the required Bid Security will not be considered. Attorneys-in-fact who sign the Bid Security must file a certified and effective dated copy of their power of attorney.

The Bid Security of the successful BIDDER will be retained until such BIDDER has Executed the Agreement and furnished the required Contract security. If the successful BIDDER fails to Execute and deliver the Agreement and to furnish the required Contract Security within ten (10) days after the Notice of Award, OWNER may annul the Notice of Award and the Bid Security of that BIDDER will be forfeited. The Bid Security of other BIDDERS whom OWNER believes to have a reasonable chance of receiving the Award may be retained by OWNER until the earlier of the seventh (7th) day after the Effective Date of the Executed AGREEMENT or the sixty-first (61st) day after the Bid Opening.

20.0 GROSS RECEIPTS TAXES, PERMITS AND LICENSES

Prices stated in the Bid Schedule shall not include applicable State gross receipts or applicable local option taxes. Taxes shall be added to the subtotal Bid amount. The CONTRACTOR will be reimbursed for the actual gross receipts tax liability incurred during construction. The CONTRACTOR will be responsible for all permits and licenses required to perform the Work.

21.0 OPENING OF BIDS

BIDDERS are invited to be present at the Bid Opening. The person reading the Bids will utilize the following procedure prior to reading the amount of the Bid:

A. Read name of BIDDER and BIDDER's New Mexico contractor's license number and classification.

B. Check for list of Subcontractors to be utilized on the Project.

C. Verify that the proper Bid Security is enclosed.

D. Verify receipt of the Statement of Bidder’s Qualifications.

E. Verify Bidder's Acknowledgment of each Addendum issued, if any.

F. Verify Bidder's Acknowledgment of the Twelve (12) Hour Call-Out Notice.

G. Determine whether the Bid Schedule is signed.

H. Verify receipt of State of New Mexico, Regulation and Licensing Department, Construction Industries Division License.

I. Verify receipt of New Mexico Department Workforce Solutions, Certificate of Public Works Registration.

J. Verify receipt of Campaign Contribution Disclosure Form.

K. Verify receipt of Resident Veterans Preference Certification.

L. Verify any other information that may be required from other funding sources. (If this is a federally funded project, federal "pink sheets" must be completed and signed.)

M. Proceed with reading the Bid amounts.

If any of the requirements of the Contract Documents have not been met, the Bid shall be subject to rejection based solely on the OWNER'S discretion.

22.0 BIDS TO REMAIN SUBJECT TO ACCEPTANCE

The OWNER will require time to study and canvass each Bid to determine which Bid is in the best interest of the OWNER. In consideration thereof, no Bid Proposal may be withdrawn after the scheduled closing time for receipt of Bids, for a period of sixty (60) days. The OWNER may return any or all Bids along with the Bid Security prior to that date.

23.0 AWARD OF CONTRACT

The OWNER reserves the right to reject any and all Bids, to waive any and all formalities. Also, OWNER reserves the right to reject the Bid of any BIDDER if OWNER believes that it would not be in the best interest of the OWNER to make an Award to that BIDDER.

In evaluating Bids, the OWNER will consider the qualifications of the BIDDERs as well as other prescribed requirements, and such alternates, unit prices and other data, as may be requested in the Bid Schedule or by the OWNER prior to the Notice of Award.

The OWNER may consider the qualifications and experience of the CONTRACTOR, Subcontractors, suppliers, and other persons and organizations proposed in evaluating the Bids. The OWNER may also consider the operating costs, maintenance requirements, performance data and guarantees of major items of materials and equipment proposed for incorporation in the Work when such data is required to be submitted prior to the Notice of Award.

The OWNER may conduct such investigations as deemed necessary in the evaluation of any Bid and to establish the responsibility, qualifications and financial ability of each BIDDER, proposed Subcontractors, suppliers and other persons and organizations to perform and furnish

the Work. If requested by the OWNER, the BIDDER shall provide a certified statement of financial condition.

The Contract will be Awarded to the BIDDER whose evaluation by the OWNER indicates that said Award will be in the best interests of the City.

If the Contract is to be Awarded, OWNER will give the Successful BIDDER a Notice of Award within seventy-five (75) days after the day of the Bid Opening. BIDDERS are hereby notified that, if Awarded the Contract, they **MAY NOT** assign payments due under the Award without permission of the OWNER. Further, BIDDERS are notified that consent to such assignments will be rarely granted.

24.0 PERFORMANCE BOND, LABOR AND MATERIAL PAYMENT BOND, AND CERTIFICATE OF INSURANCE BOND

Upon receipt of Notice of Award, the BIDDER will Execute the formal Contract Documents within ten (10) days and deliver the Performance Bond, Labor and Material Bond and Certificate of Insurance as required herein, naming the OWNER as co-insured. Each Surety Bond shall be in the amount of one hundred (100) percent of the total Contract Price as security for the faithful performance of the Contract and for the payment of all labor and materials. The sureties on such bonds shall be duly authorized to conduct business in the State of New Mexico and acceptable to the OWNER and shall otherwise meet the requirements set forth in the Contract Documents. Attorneys-in-fact who sign Payment and Performance Bonds must file with each bond a certified and effective dated copy of their power of attorney. Sureties must also identify a service agent in the State of New Mexico.

OWNER reserves the right to require that any Bond furnished pursuant to the Contract Documents be in a form acceptable to OWNER. OWNER may reject any Bond which is not acceptable. CONTRACTOR'S inability to provide a Bond acceptable to OWNER may serve to render the Bid non-responsive.

25.0 EXECUTION OF CONTRACT

The Contract Agreement shall be Executed in three (3) counterparts, any one of which shall be deemed to be an original, and shall be distributed as follows:

CONTRACTOR	1 original
OWNER	1 original
FUNDING AGENCY	1 original

26.0 CONSTRUCTION SCHEDULE

The CONTRACTOR shall submit to the OWNER a proposed construction schedule in accordance with Article 2.8 of the General Conditions, Section 13. The CONTRACTOR is required to schedule the Work so as to minimize disturbance to the local residents and businesses. Allowable days for the contract are described in Section 8, Article 3, Contract Agreement.

27.0 MAJOR EQUIPMENT

Upon the Execution of the Contract Documents, the CONTRACTOR shall immediately place orders for all equipment and materials to be used on the Project. It is recommended that the CONTRACTOR place tentative orders, subject to cancellation for failure to complete the Contract Documents upon Notification of Award, for all equipment and materials with critical delivery dates.

28.0 SHOP DRAWINGS

Shop Drawings, descriptive literature and calculations as required covering all materials and equipment proposed for the job shall be submitted in three (3) copies by the CONTRACTOR to the ENGINEER for approval. The purpose of the Shop Drawings is to show the ENGINEER that the CONTRACTOR understands the design concept, demonstrating CONTRACTOR's understanding by indicating which equipment and material CONTRACTOR intends to furnish and install, and by detailing the fabrication and installation CONTRACTOR intends to use.

All data submitted shall be complete, including type, size, number required, etc., as called for in the Contract, Project Plans, and Specifications. If material or equipment other than that specified is submitted for approval, the submittal data shall clearly show and point out any differences with adequate information to determine its equality.

The approval of the Shop Drawings by the ENGINEER shall not be construed as a complete check, but will indicate that the general method of construction is satisfactory. Approval of the Shop Drawings will not relieve the CONTRACTOR of the responsibility for any errors or omissions which may exist. The CONTRACTOR will be responsible for the satisfactory construction of all Work covered under this Contract. If deviations, discrepancies or conflicts between Shop Drawings and Specifications are discovered either prior to, or after, Shop Drawing submittals are processed by the ENGINEER, the Design Drawings and Specifications shall control and shall be followed.

All data shall be submitted in strict accordance with the following procedures:

A. Submit to the ENGINEER within fifteen (15) days after the Notice of Award.

B. Submittals shall be made in groups of items which are related to facilitate cross checking and coordination.

C. Each submittal shall be accompanied by a letter giving the CONTRACTOR's name, the Project name and an itemized list of the submittal data.

Should this procedure not be followed, the CONTRACTOR shall make no claim for loss of time or money as a result of delay in receiving approved submittal data. Material fabricated or equipment delivered to the site before the approved submittals have been returned to the CONTRACTOR shall be subject to rejection by the ENGINEER.

OWNER shall review each submittal and provide written acceptance or rejection within ten (10) working days after receipt.

29.0 WORK GUARANTEE

The CONTRACTOR shall guarantee in writing all Work constructed under this Contract against defective materials and workmanship as follows:

All items of Work shall be guaranteed for a period of one (1) year, unless stated otherwise in these Specifications.

The Performance Bond shall guarantee claims for damages due to the workmanship for the same period as stated above. The Guarantee Period begins on the date of Substantial Completion of the Work as determined by the OWNER. All corrective work satisfying the Guarantee Periods shall be accomplished at no cost to the OWNER. Emergency repairs performed by forces of or on the behalf of the OWNER will be billed to the CONTRACTOR. The Labor and Materials Payment Bond shall guarantee payment for all equipment, equipment rental, labor and materials for a period of one (1) year after Substantial Completion of the Work.

30.0 BID EVALUATION CRITERION FOR AREA – NOT APPLICABLE TO THIS PROJECT

Effective March 15, 2015, the Alamogordo City Commission adopted Ordinance No. 1490 establishing Bid Evaluation Criterion for area businesses. Any business licensed in New Mexico, with a current business registration from the City of Alamogordo, with fixed offices or distribution points within fifteen (15) miles of the city limits of Alamogordo and able to furnish evidence of payment of New Mexico Gross Receipts tax shall qualify. If the Bid from the local business multiplied by 0.90 is less than or equal to the lowest responsible BIDDER, who does not qualify as a local business, the Contract will be offered to the local business at the same price as the lowest Bid. Acceptance of the offer is optional for the local business. If the area business rejects the offer, the Contract will be Awarded to the lowest responsible BIDDER.

Such acceptance by the area business must be in writing and signed by a principal officer of the firm. In addition, the acceptance package must include an affidavit that the area business meets the criterion set forth in the ordinance and an adjusted Bid Schedule such that the grand total is equal to the lowest BIDDER's Price.

31.0 PRE-BID MEETING

A Non-Mandatory Pre-Bid Meeting will be held at **1:30 pm, October 19, 2021,** in the Commission Chambers at 1376 E. Ninth Street, Alamogordo, New Mexico.

32.0 Construction Industries Division (CID) Project Classification Determination

Construction Industries Division (CID) Project Classification Determination is **GB-98** as regulated by Construction Industries Division, 2550 Cerrillos Road, Santa Fe, NM 87505. In accordance with the provisions of the New Mexico Construction Industries Licensing Act, all project work must be performed by properly licensed contractors and subcontractors with active licenses in good standing as of the date and time specified for Bid Opening. The City has determined that the Contractor shall possess a valid license classification as specified above or other appropriate license classification under the Construction Industries Licensing Act at the time the contract is Bid. Any work outside the scope of the Prime Contractor's classification(s) must be subcontracted. Any work subcontracted by a Prime Contractor must be performed by an entity that is validly licensed in the classification(s) of the work that is to be subcontracted as

of the date and time specified for Bid Opening. Bids that do not satisfy applicable licensing requirements will be considered non-responsive.

33.0 NEW MEXICO PREFERENCES

To ensure adequate consideration and application of §13-1-21, NMSA (as amended), BIDDERs **must** include a copy of their preference certificate with their BID. Certificates for preferences must be obtained through the New Mexico Department of Taxation and Revenue *http://www.tax.newmexico.gov/Business/in-state-veteran-preference-certification.aspx*

New Mexico Business Preference
A copy of the certification must accompany BID.

New Mexico Resident Veterans Business Preference
A copy of the certification must accompany BID.

New Mexico Business Preference and New Mexico Resident Veterans Business Preference cannot be cumulative. The BIDDER will only be credited one of the preferences, as applicable.

PLAN HOLDER LIST

PW BID 2021-005

ALAMOGORDO PARK RESTROOMS

Those vendors who wish to be placed on the Plan Holder list for this project, please complete this form and forward to the Purchasing Department. Only those vendors who elect to return this form completed will be placed on the Plan Holder List.

COMPANY: _____

REPRESENTED BY:_____

TITLE: _____PHONE NO.:_____

E-MAIL:_____ FAX NO.:_____

ADDRESS: _____

CITY: _____ STATE: _____ ZIP CODE: _____

SIGNATURE: _____ DATE: _____

Acknowledgements must be delivered to the Chief Procurement Officer at the following address:

Barbara Pyeatt
Chief Procurement Officer
Purchasing Department
2600 N Florida Ave
Alamogordo, New Mexico 88310
bpyeatt@ci.alamogordo.nm.us
Fax Number: (575) 439-4117

ALAMOGORDO PARK RESTROOMS
Public Works Bid No. 2021-005
November 9, 2021

BID LOT NO.	CONSTRUCTION ITEMS Items with unit or lump sum bid prices should be written in numerals on the blank lines.	AMOUNT OF BID
1	Lump Sum (LS) **ALTERNATE TO BID LOT 2 – BALLOON FIESTA PARK RESTROOM**, construction of restroom facility including site work, building construction and appurtenances, concrete and utility installation as identified in the plans and specifications, complete, in place and accepted by the City	$_____
2	Lump Sum (LS) **ALTERNATE TO BID LOT 1 – BALLOON FIESTA PARK RESTROOM: Unclassified Excavation**, construction of restroom facility including site work, building construction and appurtenances, concrete and utility installation as identified in the plans and specifications, complete, in place and accepted by the City	$_____
3	Lump Sum (LS) **ALAMEDA PARK ZOO RESTROOM**, construction of restroom facility including site work, building construction and appurtenances, concrete and utility installation as identified in the plans and specifications, complete, in place and accepted by the City	$_____

BID LOTS 1 AND 3 TOTAL $_____

BID LOTS 2 AND 3 TOTAL $_____

Based upon project budget, the City will Award either Bid Lot 1 or Bid Lot 2 with Bid Lot 3 or any one of the Bid Lots individually.

ALAMOGORDO PARK RESTROOMS
Public Works Bid No. 2021-005
November 9, 2021

NOTE: Gross receipts tax shall be paid with each pay request as it is submitted at the current tax rate for Alamogordo, New Mexico (Alamogordo – 8.125%)

To the City of Alamogordo, New Mexico (hereinafter called "OWNER"), the undersigned, (hereinafter called "BIDDER"), in compliance with your invitation for bids for the construction of **ALAMOGORDO PARK RESTROOMS - Public Works Bid No. 2021-005**, having carefully examined the Contract Documents and the site of the proposed Work, and being familiar with all of the conditions surrounding the construction of the proposed project including the availability of materials and labor, hereby proposes to furnish all labor, materials, and supplies, and to construct the Project in accordance with the Contract Documents, within the time set forth herein, and at the unit prices stated above. These prices are to cover all expenses incurred in performing the Work required under the Contract Documents of which this Bid Schedule is a part. Quantities shown in this Bid Schedule are estimated and actual payment will be made on the basis of the unit bid prices for confirmed quantities as constructed.
BIDDER acknowledges receipt of the following addenda:

_____

CALLOUT NOTICE ACKNOWLEDGMENT:

_____
Authorized Signature of Bidder

_____
Business Name of Bidder

_____
Authorized Signature of Bidder

_____
Printed Name and Title of Authorized Signature

_____
BIDDER'S New Mexico Contractor's License No. & Classification, Federal Employee ID#

_____
Address

_____ _____ _____
Telephone Fax Email

(SEAL) If Bid Proposal is submitted by a corporation.

SECTION 4 - SUBCONTRACTOR'S FAIR PRACTICE ACT COMPLIANCE

This Project is subject to the provisions of the State of New Mexico Subcontractor's Fair Practice Act.

Listing Threshold	$5,000.00 or one-half (1/2) of one percent (1%) of the engineer's or architect's estimate of the total Project cost, whichever is greater.

For each category of the Project list, all Subcontractors, sub-Subcontractors, other organizations, persons which the BIDDER will be subcontracting, **who will perform work or labor, or render service to the BIDDER**, for an amount exceeding the listing threshold indicated above, the BIDDER shall define the subcontracting categories and list only one Subcontractor, sub-Subcontractor, other organization, and/or person for each category. The listing shall be in the format indicated on the following page, and shall be completed and submitted with the Bid.

No CONTRACTOR whose Bid is accepted shall sublet or subcontract any portion of the Work of the Project in an amount exceeding the threshold amount given above, where the original Bid amount did not designate a subcontract, unless 1) the CONTRACTOR either received no bid for that category or one (1) bid was received (**note: the BIDDER must designate on the list of Subcontractors that either "no bid was received" or "one bid was received". The latter designation shall not occur more than one time on the subcontractor list**), or 2) the Work is pursuant to a change order that causes changes or deviations from the original Contract.

No CONTRACTOR whose Bid is accepted shall substitute any Subcontractor in place of the Subcontractor listed in the Bid except as provided for in the Subcontractor's Fair Practice Act.

Contractor and Subcontractors will register with the New Mexico Workforce Solutions on-line database exchange system at <*www.dws.state.nm.us/Public-Works*>

LIST OF PROJECT SUBCONTRACTORS FOR
AMOUNTS EXCEEDING THE LISTING THRESHOLD
(THIS FORM MUST BE FILLED OUT AND SUBMITTED WITH BID)

Subcontractor's Business Name _____
Principal Place of Business _____
Telephone No. _____
Business Email Address _____
NM Contractor's License No. _____
Type of Work _____
Amount $ _____
Federal Employer ID# _____

Subcontractor's Business Name _____
Principal Place of Business _____
Telephone No. _____
Business Email Address _____
NM Contractor's License No. _____
Type of Work _____
Amount $ _____
Federal Employer ID# _____

Subcontractor's Business Name _____
Principal Place of Business _____
Telephone No. _____
Business Email Address _____
NM Contractor's License No. _____
Type of Work _____
Amount $ _____
Federal Employer ID# _____

_____ _____
Signature of Authorized Representative for BIDDER Date

Duplicate, complete, and submit additional sheets as required.

SECTION 5 - BID BOND

KNOW ALL MEN BY THESE PRESENTS, that we the undersigned, _____, as PRINCIPAL, and _____, as SURETY are held and firmly bound unto The City of Alamogordo, New Mexico, hereinafter called the OWNER, in the penal sum of _____ dollars, ($_____) lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrator, successors, personal representatives, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the PRINCIPAL has submitted the accompanying Bid, dated _____, 20____, for _____

_____.

NOW, THEREFORE, if the PRINCIPAL shall not withdraw said Bid within the period therein specified after the Opening of the same or, if no period be specified, within sixty (60) days after the said Opening, and shall within the period specified therefore, or if no period be specified, within fifteen (15) days after the prescribed forms are presented to PRINCIPAL for signature, enter into a written Contract with the OWNER in accordance with the Bid as accepted, and give bond with good and sufficient surety or sureties, as may be required, for the faithful performance and proper fulfillment of such Contract, or in the event of the withdrawal of said Bid within the period specified, or the failure to enter into such Contract and give such bond within the time specified, the PRINCIPAL shall pay the OWNER the difference between the amount specified in said Bid and the amount for which the OWNER may procure the required Work or supplies or both, if the latter be in excess of the former, then the above obligation shall be void and of no effect, otherwise to remain in full force and virtue.

IN WITNESS WHEREOF, the above bounded parties have executed this instrument under their several seals this _____ day of _____, 20___, the name and corporate seal of each corporate party being hereto affixed and these presents signed by its undersigned representative, pursuant to authority of its governing body.

In presence of:

_____

[Individual PRINCIPAL] [SEAL]

_____

[Business Address]

_____ _____

[Partnership] [SEAL]

_____ _____

[Business Address]

Attest: _____ By: _____

[Corporate PRINCIPAL]

_____

[Business Address]

By: _____Affix Corporate Seal

_____ _____

Attest: _____ _____

[Corporate SURETY]

By: _____Affix Corporate Seal

Countersigned

By: _____

Attorney-in-Fact[1], State of _____

_____

[1]Power-of-attorney for person signing for Surety Company must be attached to bond and must indicate availability for service in the State of New Mexico and a current mailing address.

SECTION 6 - STATEMENT OF BIDDER'S QUALIFICATIONS
(TO BE SUBMITTED BY THE BIDDER AND INCLUDED WITH BID)

All questions must be answered and the data given must be clear and comprehensive. This statement must be notarized. If necessary, questions may be answered on separate attached sheets. The BIDDER may submit additional information.

1. Name of Bidder and N.M. Contractor's License Number.

2. Permanent main office address.

3. When organized.

4. If a corporation, where incorporated.

5. How many years have you been engaged in the contracting business under your present firm or trade name?

6. Contracts on hand. (Schedule these, showing amount of each contract and the approximate anticipated dates of completion.)

7. General character of work performed by your company.

8. Have you ever failed to complete any work awarded to you? If so, where and why?

9. Have you ever defaulted on a contract? If so, where and why?

10. List the more important projects recently completed by your company, stating the approximate cost for each and the month and year completed.

11. List your major equipment available for this Contract.

12. Experience in construction work similar in importance to this project.

13. Background and experience of the principal members of your organization, including the officers.

14. Credit available: $_____.

15. Give bank reference:

---

16. Will you, upon request, fill out a detailed financial statement and furnish any other information that may be required by the OWNER?

17. The undersigned hereby authorizes any person, firm, or corporation to furnish any information requested by the OWNER in verification of the recitals comprising this statement of BIDDER'S Qualifications. This _____ day of _____, 20_____, dated at _____.

_____
Name of BIDDER

By:_____

Title:_____

State of_____)
)ss.
County of _____)

_____, the _____ of
Name Position

_____ being duly sworn,
Company Name

deposes and says that the answers to the foregoing questions and all statements therein contained are true and correct.

Subscribed and sworn to before me this _____ day of _____, 20____.

_____
Notary Public

My Commission expires _____, 20___.

SECTION 7- CAMPAIGN CONTRIBUTION DISCLOSURE FORM

Pursuant to Chapter 81, Laws of 2006, any prospective contractor seeking to enter into a Contract with any state agency or local public body for professional services, a design and build project delivery system, or the design and installation of measures the primary purpose of which is to conserve natural resources must file this form with that state agency or local public body. This form must be filed even if the contract qualifies as a small purchase or a sole source contract. The prospective contractor must disclose whether they, a family member or a representative of the prospective contractor has made a campaign contribution to an applicable public official of the state or local public body during the two (2) years prior to the date on which the contractor submits a proposal or, in the case of a sole source or small purchase contract, the two (2) years prior to the date the contractor signs the contract, if the aggregate total of contributions given by the prospective contractor, a family member or a representative of the prospective contractor to the public official exceeds two hundred and fifty dollars ($250) over the two (2) year period.

Furthermore, the state agency or local public body shall void an executed contract or cancel a solicitation or proposed award for a proposed contract if: 1) a prospective contractor, a family member of the prospective contractor, or a representative of the prospective contractor gives a campaign contribution or other thing of value to an applicable public official or the applicable public official's employees during the pendency of the procurement process or 2) a prospective contractor fails to submit a fully completed disclosure statement pursuant to the law.

THIS FORM MUST BE FILED BY ANY PROSPECTIVE CONTRACTOR WHETHER OR NOT THEY, THEIR FAMILY MEMBER, OR THEIR REPRESENTATIVE HAS MADE ANY CONTRIBUTIONS SUBJECT TO DISCLOSURE.

The following definitions apply:

"**Applicable Public Official"** means a person elected to an office or a person appointed to complete a term of an elected office, who has the authority to award or influence the award of the contract for which the prospective contractor is submitting a competitive sealed proposal or who has the authority to negotiate a sole source or small purchase contract that may be awarded without submission of a sealed competitive proposal.

"Campaign Contribution" means a gift, subscription, loan, advance or deposit of money or other thing of value, including the estimated value of an in-kind contribution, that is made to or received by an applicable public official or any person authorized to raise, collect or expend contributions on that official's behalf for the purpose of electing the official to either statewide or local office. "Campaign Contribution" includes the payment of a debt incurred in an election campaign, but does not include the value of services provided without compensation or un-reimbursed travel or other personal expenses of individuals who volunteer a portion or all of their time on behalf of a candidate or political committee, nor does it include the administrative or solicitation expenses of a political committee that are paid by an organization that sponsors the committee.

"Contract" means any agreement for the procurement of items of tangible personal property, services, professional services, or construction.

"Family Member" means spouse, father, mother, child, father-in-law, mother-in-law, daughter-in-law or son-in-law.

"Pendency of the Procurement Process" means the time period commencing with the public notice of the Request for Proposals and ending with the award of the Contract or the cancellation of the Request for Proposals.

"Person" means any corporation, partnership, individual, joint venture, association or any other private legal entity.

"Prospective Contractor" means a person who is subject to the competitive sealed proposal process set forth in the Procurement Codes or is not required to submit a competitive sealed proposal because that person qualifies for a sole source or a small purchase contract.

"Representative of a Prospective Contractor" means an officer or director of a corporation, a member or manager of a limited liability corporation, a partner of a partnership or a trustee of a trust of the prospective contractor.

DISCLOSURE OF CONTRIBUTIONS:

Contribution Made By: _____

Relation to Prospective Contractor: _____

Name of Applicable Public Official: _____

Date Contribution(s) Made: _____

Amount(s) of Contribution(s): _____

Nature of Contribution(s): _____

Purpose of Contributions(s): _____

_____ _____
Signature Date

_____
Title (Position)

--OR—

NO CONTRIBUTIONS IN THE AGGREGATE TOTAL OVER TWO HUNDRED FIFTY DOLLARS ($250) WERE MADE to an applicable public official by me, a family member or representative.

_____ _____
Signature Date

_____
Title (Position)

SECTION 8 - CONTRACT AGREEMENT

This AGREEMENT is dated as of the _____ day of _____ in the year **2021** by and between the City of Alamogordo, a New Mexico municipal corporation ("OWNER") and _____**,** a New Mexico corporation ("CONTRACTOR").

OWNER and CONTRACTOR, in consideration of the mutual covenants hereinafter set forth, agree as follows:

ARTICLE 1 CONTRACT DOCUMENTS

The Contract Documents which comprise the entire AGREEMENT between OWNER and CONTRACTOR concerning the work consist of the following:

- This AGREEMENT.
- Exhibits to this AGREEMENT.
- All required Bonds.
- Notice of Award.
- Conditions of the Contract (General, Supplementary, and Other Conditions).
- Project Specifications.
- Drawings with each sheet bearing the following general title:

ALAMOGORDO PARK RESTROOMS
PUBLIC WORKS BID No. 2021-005

- Notice to Proceed.
- Bid Documents and CONTRACTOR'S ***Bid Schedule***
- Certificate of Insurance.
- All Addenda Issued Prior to, and all Modifications Issued after, Execution of this AGREEMENT.

These documents form the Contract, and all are as fully a part of the Contract, as if attached to this AGREEMENT, or repeated herein.

There are no Contract Documents other than those listed above in the Article 1. The Contract Documents may only be amended, modified or supplemented as provided in Section 13, General Conditions.

ARTICLE 2 WORK

CONTRACTOR shall complete all Work as specified or indicated in the Contract Documents. The Work is generally described as follows:

ALAMOGORDO PARK RESTROOMS
PUBLIC WORKS BID No. 2021-005

consisting of the following: See attached ***Exhibit A***.

ARTICLE 3 TIME OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

The date of commencement of the Work is the date established in the NOTICE TO PROCEED AS ISSUED BY THE OWNER. Substantial Completion shall be achieved within **ninety (90)** calendar days after the date of written "Notice to Proceed" for Bid Lot 1 or 2 and **ninety (90)** calendar days after the date of written "Notice to Proceed" for Bid Lot 3, except as hereafter extended by valid written Change Order, by the OWNER. Final Completion shall be achieved not later than **fifteen (15)** calendar days after the date of Substantial Completion. **Each restroom building will have its individual NTP and Substantial Completion Date.**

Should the CONTRACTOR neglect, refuse, or otherwise fail to complete the Work within the time specified in this article, the CONTRACTOR agrees, in partial consideration for the award of this Contract, to pay to the OWNER the amount of **Three Hundred Dollars** (**$300.00**) per consecutive calendar day, not as a penalty, but as liquidated damages for such breach of this Contract.

ARTICLE 4 CONTRACT PRICE

OWNER shall pay CONTRACTOR in current funds for performance of the Work, subject to additions and deductions by Change Order as provided in the Contract Documents, the Contract Price determined as follows:

See CONTRACTOR'S ***Bid Schedule***, attached hereto as ***Exhibit B*** and incorporated by reference. The Bid Lots awarded for this contract are Bid Lots 1 or 2 and 3.

ARTICLE 5 PROGRESS PAYMENTS

Based upon Applications for Payment submitted in accordance with Article 14 of the General Conditions, the OWNER shall make progress payments on account of the Contract Price to the CONTRACTOR as provided in the Contract Documents for the period ending the last day of the month as follows:

Not later than twenty-one (21) days following receipt by the OWNER, of the undisputed Application, for Payment, one hundred percent (100%) of the portion of the Contract Price properly allocable to labor, materials, and equipment incorporated in the Work, and one hundred percent (100%) of the portion of the Contract Price properly allocable to materials and equipment suitably stored at the site or some other location agreed upon in writing for the period covered by the Application for Payment, less the aggregate of previous payments made by the OWNER; and upon Substantial Completion of the entire Work, a sum sufficient to increase the total payments to one hundred percent (100%) of the Contract Price, less such amounts as the Engineer shall determine for all incomplete Work and unsettled claims as provided in the Contract Documents, which shall be paid in accordance in Article 6 of this Contract.

Valid, undisputed payments, due and unpaid, under the Contract Documents shall bear interest from the date payment is due, at the legal rate established by Laws of 2001, Chapter 68, Section 5. Section 13-4-28, NMSA 1978.

ARTICLE 6 FINAL PAYMENT

Final payment, constituting the entire undisputed, unpaid balance of the Contract Price, shall be paid by the OWNER to the CONTRACTOR within ten (10) days after notification of the OWNER, by the Architect/Engineer that all incomplete and unacceptable Work that was noted during the Substantial Completion Inspection, and listed on the attachment to the Certificate of Substantial Completion has been corrected, and provided the Contract has been fully performed, and a final Certificate for Payment has been issued by the Architect/Engineer. In addition, the CONTRACTOR shall provide to the OWNER a certified statement of Release of Liens (AIA Document G706A or approved form) and Consent of Surety.

ARTICLE 7 CONTRACTOR'S REPRESENTATIONS

CONTRACTOR makes the following representations:

CONTRACTOR has studied and become familiar with the nature and extent of the Contract Documents, Work, site, locality, and all local conditions and Laws and Regulations that in any manner may affect cost, progress, performance or furnishing of the Work.

CONTRACTOR has studied carefully all reports of explorations and tests of subsurface conditions and drawings of physical conditions as provided in Section 13, General Conditions, and accepts the determination of the extent of the technical data contained in such reports and drawings upon which CONTRACTOR is entitled to reply.

CONTRACTOR has obtained and carefully studied (or assumes responsibility for obtaining and carefully studying) all such examinations, investigations, explorations, tests, reports and studies (in addition to or to supplement those referred above) which pertain to the subsurface or physical conditions at or contiguous to the site or otherwise may affect the cost, progress, performance or furnishing of the Work as CONTRACTOR considers necessary for the performance or furnishing of the Work at the Contract Price, within the Contract Time and in accordance with the other terms and conditions of the Contract Documents, including specifically the provisions of Section 13, General Conditions; and no additional examinations, investigations, explorations, tests, reports, studies or similar information or data are or will be required by CONTRACTOR for such purposes.

CONTRACTOR has reviewed and checked all information and data shown or indicated on the Contract Documents with respect to existing Underground Facilities at or contiguous to the site and assumes responsibility for carefully locating said Underground Facilities. No additional examinations, investigations, explorations, tests, reports, studies or similar information or data with respect to said Underground Facilities are or will be required by CONTRACTOR in order to perform and furnish the Work at the Contract Price, within the Contract Time and in accordance with the other terms and conditions of the Contract Documents, including specifically the provisions of Section 13, General Conditions.

CONTRACTOR has correlated the results of all such observations, examinations, investigations, explorations, tests, reports and studies with the terms and conditions of the Contract Documents.

CONTRACTOR has given OWNER’s Representative all conflicts, errors or discrepancies that CONTRACTOR has discovered in the Contract Documents and the written resolution thereof by OWNER's Representative is acceptable to CONTRACTOR.

ARTICLE 8 GENERAL AND SPECIAL PROVISIONS

The OWNER's Representative is Nancy Beshaler, Project Manager for the City of Alamogordo, New Mexico, who is hereinafter called OWNER's Representative and who is to act as OWNER's Representative, assume all duties and responsibilities and have the rights and authority assigned to OWNER's Representative in the Contract Documents in connection with completion of the Work in accordance with the Contract Documents.

This AGREEMENT shall be governed exclusively by the provisions hereof, and by the laws of the State of New Mexico, as the same from time to time exist.

Terms used in this AGREEMENT, which are defined in the Conditions of the Contract, shall have the meanings designated in those Conditions.

As between the parties to this AGREEMENT: As to all acts or failures to act by either party to this AGREEMENT, any applicable statute of limitations shall commence to run and any alleged cause of action shall be deemed to have accrued in any and all events not later than the relevant Date of Substantial Completion of the Work; and as to any acts or failures to act occurring after the relevant

Date of Substantial Completion, not later than the date of the OWNER's approval of the Final Certificate of Payment.

The CONTRACTOR shall hold harmless and indemnify the OWNER against any and all injury, loss, or damage, including cost of defense - including but not limited to court costs and attorneys' fees - arising out of the negligent acts, errors, or omissions of the CONTRACTOR.

This AGREEMENT shall not become effective until it is signed by all parties which are required to sign this AGREEMENT.

The CONTRACTOR and his agents and employees are independent CONTRACTORs, and are not employees of the City of Alamogordo. The CONTRACTOR and his agents and employees shall not accrue leave, retirement, insurance, bonding, use of City vehicles, or any other benefits afforded to employees of the City of Alamogordo, as a result of this AGREEMENT.

The CONTRACTOR, upon final payment of the amounts due under this AGREEMENT, releases the OWNER, his officers and employees, and the City of Alamogordo from all liabilities and obligations arising from or under this AGREEMENT, including but not limited to all damages, losses, costs, liability, and expenses, including but not limited to attorneys' fees and costs of litigation that the CONTRACTOR may incur.

The CONTRACTOR agrees not to purport to bind the City of Alamogordo to any obligation not assumed herein by the City of Alamogordo unless the CONTRACTOR has express written authority to do so, and then only within the strict limits of that authority.

Notices
All notices herein provided to be given, or which may be given, by either party to the other shall be deemed to have been fully given when made in writing and deposited in the United States mail, postage prepaid - in the instance of notice of termination of work also by certified mail - and addressed as follows:

THE OWNER:

City of Alamogordo
Engineering Department
1376 E. Ninth Street
Alamogordo, NM 88310

THE CONTRACTOR:

Nothing herein contained shall preclude the giving of any such written notice by personal service. The address to which notices shall be mailed to either party may be changed by written notice given by such party to the other as here in above provided.

Gender, Singular/Plural. Words of any gender used in this AGREEMENT shall be held and construed to include any other gender, and words in the singular number shall be held to include the plural, unless the context requires otherwise.

Captions and Section Headings. The captions and section headings contained in this AGREEMENT are for convenience of reference only, and in no way limit, define, or enlarge the terms, scope, and conditions of this AGREEMENT.

Certificates and Documents Incorporated. All certificates and documentation required by the provisions of this AGREEMENT shall be attached to this AGREEMENT at the time of Execution and are hereby incorporated by reference as though set forth in full in this AGREEMENT to the extent they are consistent with its conditions and terms.

Severability. If any clause or provision of this AGREEMENT is illegal, invalid, or unenforceable under present or future laws effective during the term of this AGREEMENT, then and in that event it is the intention of the parties hereto that the remainder of this AGREEMENT shall not be affected thereby.

Waiver. No provision of this AGREEMENT shall be deemed to have been waived by either party unless such waiver be in writing signed by the party making the waiver and addressed to the other party; nor shall any custom or practice which may evolve between the parties in the administration of the terms hereof be accordance with the terms hereof. Further, the waiver by any party of a breach by the other party of any term, covenant, or condition hereof shall not operate as a waiver of any subsequent breach of the same or any other term, covenant, or condition thereof.

Entire AGREEMENT. This AGREEMENT represents the entire contract between the parties and, except as otherwise provided herein, may not be amended, changed, modified, or altered without the written consent of the parties hereto. This AGREEMENT incorporates all of the conditions, agreements, and understandings between the parties concerning the subject matter of this AGREEMENT, and all such conditions, understandings, and agreements have been merged into this written AGREEMENT. No prior condition, agreement, or understanding, verbal or otherwise, of the parties or their agents shall be valid or enforceable unless embodied in this written AGREEMENT.

Interchangeable Terms. For purposes of all provisions within this AGREEMENT and all attachments hereto, the terms "AGREEMENT" and "Contract" shall have the same meaning and shall be interchangeable.

Words and Phrases. Words, phrases, and abbreviations, which have well-known technical or trade meanings used in the Contract Documents shall be used according to such recognized meanings. In the event of a conflict, the more stringent meaning shall govern.

Relationship of Contract Documents. The Contract Documents are complementary, and any requirement of one contract document shall be as binding as if required by all.

Pursuant to Section 13-1-191, NMSA 1978, reference is hereby made to the Criminal Laws of New Mexico (including Sections 30-24-1 through 30-24-3, NMSA 1978, and 30-41-1 through 30-41-3, NMSA 1978), which prohibit bribes, kickbacks, and gratuities, violations of which constitutes a felony. Further, the Procurement Code (Sections 13-1-28 through 13-1-199, NMSA 1978) imposes civil and criminal penalties for its violation.

A potential CONTRACTOR, or the CONTRACTOR, agrees to comply with state laws and rules pertaining to worker’s compensation insurance coverage for its employees. If CONTRACTOR fails to comply with the Worker’s Compensation Act, and applicable rules when required to do so, the contract may be canceled effective immediately.

OWNER and CONTRACTOR each binds itself, its partners, successors, assigns and legal representatives to the other party hereto, its partners, successors, assigns and legal representatives in respect of all covenants, agreements and obligations contained in the Contract Documents.

IN WITNESS WHEREOF, OWNER and CONTRACTOR have Executed two (2) originals of this AGREEMENT. One counterpart each has been delivered to CONTRACTOR and OWNER's Representative. All portions of the Contract Documents have been signed or identified by OWNER and CONTRACTOR or by OWNER's Representative on their behalf.

CONTRACTOR

By: _____

NM Taxpayer Identification Number: _____

Federal Taxpayer Identification Number: _____

OWNER
CITY OF ALAMOGORDO, NEW MEXICO
a New Mexico municipal corporation

By:_____
Brian Cesar, City Manager

ATTEST:

_____
Rachel Hughs, City Clerk

APPROVED AS TO FORM:

_____
Petria Bengoechea, City Attorney

EXHIBIT A

The Work will consist of construction of new ADA-compliant restrooms at the Alameda Park Zoo and the Balloon Fiesta Park including site work, building construction, concrete work and utility installation, all within the city limits of Alamogordo, New Mexico.

SECTION 9 - PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS:

THAT, [*Insert the name or legal title of the CONTRACTOR]* _____as Principal, herein after called the CONTRACTOR, and *[Insert the legal title of the surety and address*]

_____

_____ a corporation organized and existing under and by virtue of the laws of the State of _____ and authorized to do business in the State of New Mexico, hereinafter called the Surety, are held and firmly bound unto *[Insert the name or legal title and address of the OWNER*)

_____

_____ as Obligee, hereinafter called the OWNER, in the amount of _____Dollars ($_____), for the payment whereof CONTRACTOR and Surety bind themselves, their heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

WHEREAS, CONTRACTOR has by written agreement dated _____, _____, entered into a contract described as follows:

_____

_____

_____

which contract is by reference made a part hereof and is hereinafter referred to as the Contract.

NOW, THEREFORE, the condition of this obligation is such that, if CONTRACTOR shall faithfully perform and complete said Contract according to its terms and comply with all requirements of law, then this obligation shall be null and void; otherwise it shall remain in full force and effect.

The Surety hereby waives notice of any alteration or extension of time made by the OWNER.

Whenever the CONTRACTOR shall be, and shall be declared by the OWNER to be, in default under the said Contract, the OWNER having performed its obligations hereunder, the Surety may promptly remedy the default or shall promptly:

1. Complete the Contract in accordance with its terms and conditions, or

2. At OWNER's option, obtain a bid or bids for submission to the OWNER for completing said Contract in accordance with its terms and conditions and, upon determination by the OWNER and Surety of the lowest responsible BIDDER, arrange for a contract between such

BIDDER and the OWNER and make available as Work progresses (even though there should be a default or a succession of defaults under the Contract or contracts of completion arranged under this paragraph) sufficient funds to pay the cost of completion less the balance of the Contract Price but not exceeding, including other costs and damages for which the Surety may be liable hereunder, the amount set forth in the first paragraph hereof. The term "balance of the Contract Price", as used in this paragraph shall mean the total amount payable by the OWNER to the CONTRACTOR under the Contract and any amendments thereto less the amount previously paid by the OWNER to the CONTRACTOR.

The Surety acknowledges that said Contract may contain express guarantees and agrees that said guarantees, if any, are covered by the Surety's obligation hereunder.

Right of action with respect to any express guarantees in the Contract shall accrue from the date of completion and formal acceptance of the Work under the Contract.

No right of action shall accrue on this bond to or for the use of any person or corporation other than the OWNER named herein or its successors or assigns.

SIGNED AND SEALED _____, _____.

_____
Contractor-Principal]

In presence of:

_____

By:_____

Title:_____[Surety]

Approved as to form:

_____

By:_____
Attorney for the OWNER

Title:_____

\
Countersigned:

_____
Surety's Authorized New Mexico Agent for Service

SECTION 10 - LABOR AND MATERIAL PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS:

THAT, [*Insert the name or legal title and address of the CONTRACTOR]*

_____

_____, as PRINCIPAL, hereinafter called the CONTRACTOR, and [*Insert the legal title of the surety and address*]

_____

_____, a corporation organized and existing under and by virtue of the laws of the State of _____ and authorized to do business in the State of New Mexico, hereinafter called the Surety, as held and firmly bound unto [*Insert the name or legal title and address of the OWNER]*

_____

_____as Obligee, hereinafter called the OWNER and supplier of labor, material or supplies as joint obligees, in the amount of _____dollars ($_____), for the payment whereof CONTRACTOR and Surety bind themselves, their heirs, executors, administrators, successors, and assigns, jointly and severally firmly by these presents.

WHEREAS, CONTRACTOR has by written agreement dated _____, 20_____ entered into a contract described as follows:

_____

_____

_____

_____

which contract is by reference made a part hereof and is hereinafter referred to as the Contract.

NOW, THEREFORE, the condition of this obligation is such that, if the CONTRACTOR shall pay as they become due all just claims for labor performed and materials and supplies furnished upon or for the Work under the Contract, whether said labor be performed and materials and supplies be furnished under the original Contract or any contract there-under, then this

obligation shall be null and void; otherwise it shall remain in full force and effect, subject, however, to the following conditions.

The right to sue on this bond accrues only to the OWNER and the parties to whom the right is granted pursuant to Section 13-4-1 et. seq., NMSA 1978 (1988 repl. pamp.) and New Mexico Law; and any such right shall be exercised only in accordance with the provisions and limitations of said statutes.

SIGNED AND SEALED ON _____, _____

_____
[CONTRACTOR - PRINCIPAL]

In presence of:

_____

By _____

Title:_____

_____
[Surety]

Approved as to form:

_____ By:_____
Attorney for the OWNER

Title:_____

Countersigned:

_____
Surety's Authorized New Mexico Agent for Service

This bond is issued simultaneously with performance bond in favor of OWNER and suppliers of labor, materials or supplies for the faithful performance of the Contract.

PLEASE ATTACH AN INSURANCE CERTIFICATE FROM A NEW MEXICO LICENSED INSURANCE AGENT PER THE GENERAL CONDITIONS, SECTION 13 ARTICLE 5

SECTION 12 - WAGE RATES

Wage Rates do not pertain to
Projects under $60,000.00

You are hereby advised that where differences exist between the minimum wage rates shown, the higher wage rates shall govern, if applicable.

LABOR RELATIONS DIVISION **WWW.DWS.STATE.NM.US**

401 Broadway NE
Albuquerque, NM 87102
Phone: 505-841-4400
Fax: 505-841-4424

226 South Alameda Blvd
Las Cruces, NM 88005
Phone: 575-524-6195
Fax: 575-524-6194

1596 Pacheco St, Suite 103
Santa Fe, NM 87505
Phone: 505-827-6817
Fax: 505-827-9676

Wage Decision Approval Summary

1) Project Title: Alamogordo Park Restrooms
Requested Date: 09/14/2021
Approved Date: 09/15/2021
Approved Wage Decision Number: OT-21-1815-B

Wage Decision Expiration Date for Bids: 01/13/2022

2) Physical Location of Jobsite for Project:
Job Site Address: 1321 N White Sands Blvd, LaVelle Road
Job Site City: Alamogordo
Job Site County: Otero

3) Contracting Agency Name (Department or Bureau): City of Alamogordo
Contracting Agency Contact's Name: Nancy Beshaler
Contracting Agency Contact's Phone: (575) 439-4235 Ext. 1

4) Estimated Contract Award Date: 11/30/2021

5) Estimated total project cost: $250,000.00
a. Are any federal funds involved?: No
b. Does this project involve a building?: Yes - 2 restroom buildings constructed with block exterior
c. Is this part of a larger plan for construction on or appurtenant to the property that is subject to this project?: No
d. Are there any other Public Works Wage Decisions related to this project?: No
e. What is the ultimate purpose or functional use of the construction once it is completed?: Public Restrooms

6) Classifications of Construction:

Classification Type and Cost Total	Description
General Building (B) **Cost:** $250,000.00	Construction of 2 ADA accessible public restrooms at Alameda Park Zoo and Balloon Fiesta Park

TYPE "B" – GENERAL BUILDING

Please refer to the base and fringe rate columns that pertain to the date your wage decision was approved. For instance, if your wage decision was approved on April 1, 2021, you will use the rates in the first two columns. If your wage decision was approved on May 10, 2021, use the third and fourth columns.

	Effective January 1, 2021 Through May 4, 2021		Effective May 5, 2021		Effective January 1, 2020 Through December 31, 2021
Trade Classification	**Base Rate**	**Fringe Rate**	**Base Rate**	**Fringe Rate**	**Apprenticeship**
Asbestos Workers/Heat and Frost insulators	33.01	12.06	32.26	12.06	0.60
Asbestos Workers/Heat and Frost insulators-Los Alamos County	35.44	12.06	34.69	12.06	0.60
Boilermaker/ blacksmith	34.97	28.85	34.97	28.85	0.60
Bricklayer/Block layer/Stonemason	24.97	9.50	24.46	8.81	0.60
Carpenter/Lather	25.63	11.74	24.63	11.24	0.60
Carpenter-Los Alamos County	28.37	13.44	27.80	13.19	0.60
Millwright/ pile driver	33.16	27.24	33.16	25.24	0.60
Cement Mason	21.07	10.33	21.07	10.33	0.60
Electricians-Outside Classifications-Zone 1					
Ground man	23.74	13.16	23.27	12.67	0.60
Equipment Operator	34.06	15.94	33.39	15.35	0.60
Lineman/Tech	40.07	17.57	39.28	16.91	0.60
Cable Splicer	44.08	18.65	43.21	17.95	0.60
Electricians-Outside Classification: Zone 2					
Ground man	23.74	13.16	23.27	12.67	0.60

Equipment Operator	34.06	15.94	33.39	15.35	0.60
Lineman/ technician	40.07	17.57	39.28	16.91	0.60
Cable Splicer	44.08	18.65	43.21	17.95	0.60
Electricians-Outside Classifications: Los Alamos					
Ground man	24.42	13.34	23.94	12.85	0.60
Equipment Operator	35.04	16.21	34.35	15.60	0.60
Lineman/ Technician	41.22	17.88	40.41	17.21	0.60
Cable Splicer	45.34	18.99	44.45	18.28	0.60
Electricians-Inside Classifications: Zone 1					
Wireman/ low voltage technician	33.65	12.01	32.70	11.18	0.60
Cable Splicer	37.02	12.11	35.97	11.28	0.60
Electricians-Inside Classification: Zone 2					
Wireman/ low voltage technician	36.68	12.10	35.64	11.27	0.60
Cable Splicer	40.04	12.20	38.91	11.37	0.60
Electricians-Inside Classification: Zone 3					
Wireman/ low voltage technician	38.70	12.16	37.61	11.33	0.60
Cable Splicer	42.06	12.26	40.88	11.43	0.60
Electricians-Inside Classification: Zone 4					
Wireman/ low voltage technician	42.40	12.27	41.20	11.44	0.60
Cable Splicer	45.75	12.37	44.47	11.53	0.60
Electricians-Inside Classification: Los Alamos					
Wireman/ low voltage technician	38.70	14.09	37.61	13.21	0.60
Cable Splicer	42.06	14.36	40.88	13.47	0.60
Elevator Constructor	43.25	36.37	43.80	35.25	0.60

Elevator Constructor Helper	36.19	36.37	35.04	35.25	0.60
Glazier					
Journeyman/ Fabricator	20.50	6.20	20.25	5.35	0.60
Delivery Driver	9.00	5.35	9.00	5.35	0.60
Ironworker	27.35	17.49	27.00	15.75	0.60
Painter (Brush/Roller/Spray)	17.25	7.75	17.00	6.88	0.60
Paper Hanger	17.25	7.75	17.00	6.88	0.60
Drywall- Light Commercial & Residential					
Ames tool operator	25.63	7.60	25.08	7.10	0.60
Hand finisher/machine texture	24.63	7.60	24.08	7.10	0.60
Plasterer	23.56	9.39	23.17	8.99	0.60
Plumber/Pipefitter	31.52	12.90	30.76	11.62	0.60
Roofer	25.74	7.97	25.23	7.97	0.60
Sheet metal worker					
Zone 1	33.38	17.64	31.03	17.26	.60
Zone 2 – Industrial	34.38	17.64	32.03	17.26	.60
Zone 3 – Los Alamos	35.38	17.64	33.03	17.26	.60
Soft Floor Layer	20.30	8.10	19.94	7.70	0.60
Sprinkler Fitter	31.57	23.46	30.90	22.29	0.60
Tile Setter	24.46	8.81	24.46	8.81	0.60
Tile Setter Helper/Finisher	16.53	8.81	16.53	8.81	0.60
Laborers					
Group I- Unskilled and semi-skilled	18.25	7.12	17.50	6.27	0.60
Group II- Skilled	19.25	7.12	18.50	6.27	0.60
Group III- Specialty	21.50	7.12	20.75	6.27	0.60
Masonry Laborers					
Group I- Unskilled and Semi-Skilled	18.75	7.34	18.00	6.27	0.60

Group II- Skilled	20.50	7.34	19.75	6.27	0.60
Group III- Specialty	21.00	7.34	20.25	6.27	0.60
Reinforcing iron workers and post tension	24.75	7.12	24.00	6.27	0.60
Operators					
Group I	21.96	7.47	20.95	7.27	0.60
Group II	24.12	7.47	23.11	7.27	0.60
Group III	24.58	7.47	23.57	7.27	0.60
Group IV	25.02	7.47	24.01	7.27	0.60
Group V	25.21	7.47	24.20	7.27	0.60
Group VI	25.42	7.47	24.41	7.27	0.60
Group VII	25.53	7.47	24.52	7.27	0.60
Group VIII	28.58	7.47	27.56	7.27	0.60
Group IX	30.96	7.47	29.95	7.27	0.60
Group X	34.36	7.47	33.35	7.27	0.60
Truck Drivers					
Group I-VII	16.65	8.27	16.45	7.87	0.60
Group VIII	16.71	8.27	16.51	7.87	0.60
Group IX	18.65	8.27	18.45	7.87	0.60

NOTE: All contractors are required to pay SUBSISTENCE, ZONE AND INCENTIVE according to the particular trade. Details are located in a PDF attachment at WWW.DWS.STATE.NM.US. Search Labor Relations/Labor Information/Public Works/Prevailing Wage Rates.

For more information about the Subsistence, Zone, and Incentive Pay rates, or to file a wage claim,
contact the Labor Relations Division at (505) 841-4400 or visit us online at www.dws.state.nm.us.

LABOR RELATIONS DIVISION
121 Tijeras Ave NE, Suite 3000
Albuquerque, NM 87102
Phone: 505-841-4400
Fax: 505-841-4424

PUBLIC WORKS PROJECT REQUIREMENTS

As a participant in a Public Works project valued at more than $60,000 in the state of New Mexico, the following list addresses many of the responsibilities that are defined by statute or regulation to each project stakeholder.

Contracting Agency

- Ensure that all contractors wishing to bid on a Public Works project when the project is $60,000 or more are actively registered with the Public Works and Apprenticeship Application (PWAA) website: http://www.dws.state.nm.us/pwaa (Contractor Registration) prior to bidding.
- Please submit Notice of Award (NOA) and Subcontractor List(s) to the PWAA website promptly after the project is awarded.
- Please update the Subcontractor List(s) on the PWAA website whenever changes occur.
- All sub-contractors and tiers (excluding professional services) regardless of contract amount must be listed on the Subcontractor List and must adhere to the Public Works Minimum Wage Act.
- Ninety days after project completion please go into the PWAA system and close the project. Only contracting agencies are allowed to close the project. Agents or contractors are not allowed to close projects.

General Contractor

- Provide a complete Subcontractor List and Statements of Intent (SOI) to Pay Prevailing Wages for all contractors, regardless of amount of work, to the contracting agency within 3 (three) days of award.
- Ensure that all subcontractors wishing to bid on a Public Works project have an active Contractor Registration with the Public Works and Apprenticeship Application (PWAA) website: http://www.dws.state.nm.us/pwaa prior to bidding when their bid will exceed $60,000.
- Make certain the Public Works Apprentice and Training Act contributions are paid either to an approved Apprenticeship Program or to the Public Works Apprentice and Training Fund.
- Confirm the Wage Rate poster, provided in PWAA, is displayed at the job site in an easily accessible place.
- When the project has been completed, make sure the Affidavits of Wages Paid (AWP) are sent to the contracting agency.
- All subcontractors and tiers (excluding professional services) regardless of contract amount must pay prevailing wages, be listed on the Subcontractor List, and adhere to the Public Works Minimum Wage Act.

Subcontractor

- Ensure that all subcontractors wishing to bid on a Public Works project have an active Contractor Registration with the Public Works and Apprenticeship Application (PWAA) website: http://www.dws.state.nm.us/pwaa prior to bidding when their bid will exceed $60,000.
- Make certain the Public Works Apprentice and Training Act contributions are paid either to an approved Apprenticeship Program or to the Public Works Apprentice and Training Fund.
- All subcontractors and tiers (excluding professional services) regardless of contract amount must pay prevailing wages, be listed on the Subcontractor List, and adhere to the Public Works Minimum Wage Act.

Additional Information

Reference material and forms may be found in the New Mexico Department of Workforce Solutions Public Works web pages at: https://www.dws.state.nm.us/Labor-Relations/Labor-Information/Public-Works.

CONTACT INFORMATION

Contact the Labor Relations Division for any questions relating to Public Works projects by email at public.works@state.nm.us or call (505) 841-4400.

SECTION 13 - GENERAL CONDITIONS

ARTICLE 1 DEFINITIONS AND TERMS

Wherever used in these General Conditions or in the other Contract Documents, the following terms have the meanings indicated which are applicable to both the singular and plural thereof:

AGREEMENT - The written agreement which constitutes a contract between OWNER and CONTRACTOR covering the Work to be performed; other Contract Documents are part of the AGREEMENT

Application for Payment - The form furnished by ENGINEER which is to be used by CONTRACTOR in requesting progress payments and a CONTRACTOR affidavit stating that progress payments theretofore received on account of the Work have been applied by CONTRACTOR to discharge in full all of CONTRACTOR's obligations reflected in prior Applications for Payment

ARCHITECT - The person or firm designated by OWNER, who may or may not be an employee, who is responsible for providing architectural services under this AGREEMENT

Bid - The offer or proposal of the BIDDER submitted on the prescribed form setting forth the prices for the Work to be performed

BIDDER - Any person, firm, or corporation submitting a responsive BID for the Work

Bonds - BID, performance and payment bonds, and other instruments of security furnished by CONTRACTOR or SUBCONTRACTOR and CONTRACTOR's or SUBCONTRACTOR's surety in accordance with the Contract Documents

Change Order - A written order to CONTRACTOR signed by OWNER authorizing an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Time issued after execution of the AGREEMENT

City Commission - The governing body of the City of Alamogordo

Contract Documents - The written AGREEMENT between the CONTRACTOR and the OWNER setting forth the obligations of the parties there under, including but not limited to the performance of the Work and the Basis of Payment. The Contract Documents include: the Advertisement for Bids, Addenda (whether issued prior to the opening of Bids or the execution of the Agreement), Instructions to BIDDERs, CONTRACTOR's Bid, the Performance Bonds and Labor and Payment Bond (for both CONTRACTOR and SUBCONTRACTOR, if applicable to SUBCONTRACTOR), the Certificate of Insurance, the Statement of BIDDER's Qualifications, the Campaign Contribution Disclosure Form, the Notice of Award, the Notice to Proceed, these General Conditions, the Contract Specifications, any Special Conditions, any referenced Specifications or Standards, Drawings and Plans, and all Modifications to the above, including Change Orders and extensions of Contract Time, all of which constitute one instrument

Contract Price - The total monies payable to CONTRACTOR under the Contract Documents

Contract Time - The time specified in the AGREEMENT for completion of the Project. This time may be defined as a specified fixed date or a given number of calendar days. The Contract

Time may be amended by mutual written Agreement to include authorized time extensions as the performance of the Contract requires.

CONTRACTOR - The person, firm, or corporation with whom OWNER has executed the Agreement

Day - A calendar day of twenty-four (24) hours measured from midnight to the next midnight

DESIGNER - The person or firm designated by OWNER, who may or may not be an employee, who is responsible for providing engineering services

Drawings or Plans - The drawings which show the character and scope of the WORK to be performed and which have been prepared or approved by ENGINEER and are referred to in the Contract Documents

ENGINEER – The City of Alamogordo's City Engineer or authorized representative.

Engineer of Record – Professional Engineer, licensed in the State of New Mexico, that stamps the design (plans). Can be either the City Engineer or a consultant

Field Order - A written order issued by ENGINEER which clarifies or interprets the Contract Documents in accordance with paragraph 9.3 or orders minor changes in the Work in accordance with paragraph 10.2

General Conditions - This document

Modification - (a) A written amendment to the Contract Documents signed by both parties; (b) a Change Order; (c) a written clarification or interpretation issued by ENGINEER in accordance with paragraph 9.3; or (d) a written order for a minor change or alteration in the Work issued by ENGINEER pursuant to paragraph 10.2. A Modification may only be issued after execution of the AGREEMENT

Notice of Award - The written notice by OWNER to the apparent successful BIDDER stating that, upon compliance with the conditions precedent to be fulfilled by CONTRACTOR within the time specified

Notice to Proceed - A written notice given by OWNER to CONTRACTOR fixing the date on which the Contract Time will commence to run and on which CONTRACTOR shall start to perform the obligations set forth in the Contract Documents

OWNER - The City of Alamogordo, New Mexico, a New Mexico municipal corporation. The term "City" may be used interchangeably with the term "OWNER"

Project - The entire construction to be performed as provided in the Contract Documents

Project Manager – The OWNER's representative who is delegated the responsibility for administration of the PROJECT and who is the primary point of contact for the CONTRACTOR

Project Close Out Documents - Project Close Out Documents consist of as-built drawings of the Project; waiver of lien certificates from all Subcontractors, material suppliers, or service

companies involved in the construction of the project; affidavit of release of liens that the lien releases or waivers attached include all parties above and any others who have lien rights; consent of surety for final payment prior to release of final payment; CONTRACTOR's certificate of completion that Project is complete in conformance with the Contract Drawings and specifications; written warranty (one year period) in accordance with Article 13.1 of these General Conditions.

Public Works Inspector - An authorized representative of ENGINEER who is assigned to inspect the technical aspects of the Project or any part thereof

Reference Specifications, Test Methods, and Applicable Codes - All standard specifications and test methods of any society, association, or organization referred to herein are hereby made a part of these Contract Documents the same as if written in full. (Any reference to a paragraph or subparagraph within an article or section shall include all general provisions of the article or section to which reference is made.) References to such standards refer to the latest published issues as of the date of the Invitation to Bid, unless otherwise specified. References to local or state codes and laws shall mean the latest adopted and published codes as of the date of the Invitation to Bid, unless otherwise specified

Service Connections - Service Connections shall be construed to mean all or any portion of the pipe, conduit, cable, or duct which connects a utility main or distribution line to a building, home, residence, or property

Shop Drawings - All drawings, diagrams, illustrations, brochures, schedules, and other data which are prepared by CONTRACTOR, a SUBCONTRACTOR, manufacturer, supplier, or distributor which have been approved by ENGINEER and which illustrate the equipment, material, or some portion of the Work

Special Conditions - Conditions which modify any article or paragraph of these General Conditions

Specifications (also Technical Specifications) - Those portions of the Contract Documents consisting of written technical descriptions of materials, equipment, construction systems, standards and workmanship as applied to the Work

Subcontractor - An individual, firm or corporation having a direct contract with CONTRACTOR or with any other SUBCONTRACTOR for the performance of a part of the WORK

Substantial Completion - Date, as certified by ENGINEER, when construction of the Project or a specified part thereof is sufficiently completed, in accordance with the Contract Documents, so that the Project or a specified part thereof can be utilized for the purposes for which it was intended; or, if there be no such certification, the date when final payment is due in accordance with paragraph 14.13

Utility - Overhead or underground wires, pipes, conduits, ducts, or structures, operated and maintained in or across a public right-of-way or easement or private easement operated and maintained to supply such commodities as water, gas, power, telephone, cable television, or sewer.

A. Public Utility - Owned and operated by a municipality or another political subdivision of the State

B. Private Utility - Owned and operated by a private company or corporation

Work - Any and all obligations, duties, and responsibilities necessary to the successful completion of the Project assigned to or undertaken by CONTRACTOR under the CONTRACT DOCUMENTS, including all labor, materials, equipment, incidentals, and the furnishing and installation thereof

ARTICLE 2 PRELIMINARY MATTERS

Execution of AGREEMENT

2.1. At least two (2) counterparts of the Agreement and such other Contract Documents as are required to be executed will be executed and delivered by CONTRACTOR to OWNER within ten (10) days of the Notice of Award; and OWNER will execute and deliver one counterpart to CONTRACTOR within ten (10) days of receipt of the executed Agreement from CONTRACTOR.

Delivery of Bonds and Insurance

2.2. When CONTRACTOR delivers the executed Agreements to OWNER, CONTRACTOR shall also deliver to OWNER such Bonds and Certificates of Insurance as CONTRACTOR and SUBCONTRACTORS may be required to furnish in accordance with Article 5 of these General Conditions.

Copies of Documents

2.3. OWNER shall furnish to CONTRACTOR one (1) complete set of the Contract Documents

CONTRACTOR's Pre-Start Representations

2.4. CONTRACTOR represents that CONTRACTOR is familiar with and assumes full responsibility for becoming familiar with the nature and extent of the Contract Documents, Work and locality; and with all local conditions and federal, state, and local laws, ordinances, rules, and regulations that may in any manner affect performance of the Work. CONTRACTOR represents that CONTRACTOR has correlated CONTRACTOR's study and observations with the requirements of the Contract Documents. CONTRACTOR also represents that CONTRACTOR has studied all surveys and investigation reports of subsurface and latent physical conditions referred to in the Specifications, that CONTRACTOR has made such additional surveys and investigations as CONTRACTOR deems necessary for the performance of the Work at the Contract Price in accordance with the requirements of the Contract Documents, and that CONTRACTOR has correlated the results of all such data with the requirements of the Contract Documents.

Commencement of Contract Time; Notice to Proceed

2.5. The Contract Time will commence to run on the day indicated in a written Notice to Proceed is given, on the day indicated in the Notice to Proceed is issued by the OWNER. A Notice to Proceed may be given at any time within 30 days after the day on which OWNER delivers the executed Agreement to CONTRACTOR.

Starting the Project

2.6. CONTRACTOR may start to perform the WORK ONLY AFTER RECEIVING A WRITTEN Notice to Proceed.

Before Starting Construction

2.7. Before undertaking each part of the Work, CONTRACTOR shall carefully study and compare the Contract Documents, and check and verify pertinent figures shown thereon, and check and verify all applicable field measurements. CONTRACTOR shall at once report in writing to ENGINEER any conflict, error or discrepancy which CONTRACTOR may discover; however, CONTRACTOR shall not be liable to OWNER for failure to discover any conflict, error, or discrepancy in the Drawings or Specifications.

2.8. The CONTRACTOR, within twenty-one (21) calendar days after being Awarded the Contract unless agreed otherwise by the OWNER, shall prepare and submit for the ENGINEER's approval, a CONTRACTOR's construction schedule for the Work. The schedule shall not exceed time limits current under the Contract Documents, shall be approved by CONTRACTOR's sureties, if any, shall be related to the entire Project to the extent required by the Contract Documents, and shall provide for expeditious and practicable execution of the Work. The construction schedule may be significantly modified only upon prior written agreement of the CONTRACTOR and its sureties, if any, and the ENGINEER. CONTRACTOR shall conform to the most recently approved schedules and shall not be entitled to an extension of the Contract Time or an increase in the Contract Price for the time that may be required to obtain any Surety's approval.

2.9. Before starting the Work at the site, CONTRACTOR shall furnish OWNER certificates of insurance as required by Article 5 of these General Conditions. Within twenty (20) days after delivery of the executed Agreement by OWNER to CONTRACTOR, but before starting the Work at the site, a conference will be held to review the above schedules; to establish procedures for the handling of Shop Drawings and other submissions and the processing of Applications for Payment; and to establish a working understanding between the parties as to the Project. The conference will be attended by the OWNER, ENGINEER, and CONTRACTOR.

ARTICLE 3 CORRELATION, INTERPRETATION, AND INTENT OF CONTRACT DOCUMENTS

3.1. The parties intend that the Specifications and Drawings describe a complete Project to be constructed in accordance with the Contract Documents. The Contract Documents comprise the entire Agreement between OWNER and CONTRACTOR. They may be altered only by a Contract Modification.

3.2. The Contract Documents are complementary; what is called for by one is as binding as if called for by all. If CONTRACTOR finds a conflict, error, or discrepancy in the Contract Documents, CONTRACTOR shall call it to ENGINEER's attention in writing at once and before proceeding with the Work affected thereby; however, CONTRACTOR shall not be liable to OWNER for failure to discover any conflict, error, or discrepancy in the Specifications or Drawings. In resolving such conflicts, errors, and discrepancies, the documents shall be given precedence in the following order: Contract Modification(s), Agreement, Addenda, Special Conditions, Instructions to BIDDERs, General Conditions, Specifications, and Drawings. Figure dimensions on Drawings shall govern over scale dimensions, and Detailed Drawings shall govern over General Drawings. Any Work that may reasonably be inferred from the Contract Documents as being required to produce the intended result shall be supplied whether or not it is specifically called for. Work, materials or equipment described in words which so applied have a well-known technical or trade meaning shall be deemed to refer to such recognized standards.

Reference to Standard Specifications, manuals or codes of any technical society, organization or association, or to the laws or regulations of any governmental authority, whether such reference be specific or by implication, shall mean the most current Standard Specification, manual, code or laws or regulations in effect at the time of opening of Bids (or, on the Effective Date of the Agreement if there were no Bids), except as may be otherwise specifically stated.

ARTICLE 4 AVAILABILITY OF LANDS; PHYSICAL CONDITIONS; REFERENCE POINTS

Availability of Lands

4.1. OWNER shall furnish, as indicated in the Contract Documents and not later than the date when needed by CONTRACTOR, the lands upon which the Work is to be done, rights-of-way for access thereto, and any other lands designated for use by CONTRACTOR. Easements for permanent structures or permanent changes in existing facilities will be obtained and paid for by OWNER unless otherwise specified in the Contract Documents. If CONTRACTOR believes that any delay in OWNER furnishing these lands or easements entitles CONTRACTOR to an extension of the Contract Time, CONTRACTOR may make a claim therefor as provided in Article 12 of these General Conditions. CONTRACTOR shall provide for any additional lands and access that may be required for temporary construction facilities or storage of materials and equipment at their expense.

Physical Conditions-Surveys and Reports

4.2 The OWNER will, upon request, furnish to the CONTRACTOR copies of all relevant boundary surveys and other pertinent reports and material which are readily available in OWNER's office. OWNER has not made tests of subsurface conditions and makes no warranties or statements to CONTRACTOR as to the presence or absence of difficult excavation conditions.

Unforeseen Physical Conditions

4.3. CONTRACTOR shall promptly notify ENGINEER in writing of any subsurface or latent physical conditions at the site differing materially from those indicated in the Contract Documents.

ENGINEER will promptly investigate those conditions and determine if further surveys or subsurface tests are necessary. ENGINEER shall obtain any necessary additional surveys and tests and furnish copies to CONTRACTOR. If appropriate, a Change Order shall be issued incorporating the necessary revisions.

The CONTRACTOR is responsible for locating and protecting underground and aerial utilities and constructions.

Reference Points

4.4. ENGINEER shall provide engineering surveys for construction to establish reference points which, in OWNER's judgment, are necessary to enable CONTRACTOR to proceed with the Work. CONTRACTOR shall be responsible for surveying and laying out the Work (unless otherwise agreed) and shall protect and preserve the established reference points. CONTRACTOR shall make no changes or relocations without the prior written approval of OWNER. CONTRACTOR shall report to OWNER whenever any reference point is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points by professionally qualified personnel.

Physical Conditions - Underground Facilities

4.5. Shown or Indicated: The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities are based on information and data furnished to OWNER by the owners of such Underground Facilities or by others. Unless it is otherwise expressly agreed:

4.5.1. OWNER shall not be responsible for the accuracy or completeness of any such information or data; and,

4.5.2. CONTRACTOR shall have full responsibility for reviewing and checking all such information and data, for locating all Underground Facilities shown or indicated in the Contract Documents, for coordination of the Work with the owners of such Underground Facilities during construction, for the safety and protection thereof, for repairing any damage thereto resulting from the Work, and for the cost; all of which will be considered as having been included in the Contract Price.

4.6. Not Shown or Indicated: If an Underground Facility is uncovered or revealed which was not shown or indicated in the Contract Documents and of which CONTRACTOR could not reasonably have been expected to be aware, CONTRACTOR shall promptly identify the owner of such Underground Facility and give written notice thereof to OWNER. OWNER will promptly review the Underground Facility to determine the extent to which the Contract Documents should be modified to reflect the new condition, and the Contract Documents will be amended or supplemented to the extent necessary. During the interim, CONTRACTOR shall be responsible for the safety and protection of such Underground Facility. If the parties are unable to agree as to the amount or length of the appropriate adjustment, CONTRACTOR may make a claim therefor as provided in this Agreement.

ARTICLE 5 BONDS AND INSURANCE

Performance, Payment, and Other Bonds

5.1. CONTRACTOR and CONTRACTOR's SUBCONTRACTORS [if Subcontractors' contract for work to be performed on the Project is one hundred twenty-five thousand dollars ($125,000) or more] shall furnish performance and payment Bonds as security for the faithful performance of this Contract and for payment of all the CONTRACTOR's and CONTRACTOR's SUBCONTRACTORS' obligations under the Contract Documents. These Bonds shall be in amounts at least equal to the Contract Price and shall be in a form acceptable to OWNER and issued by sureties which are licensed to conduct business in the State of New Mexico and which are named in the current list of "Surety Companies Acceptable on Federal Bonds" as published in the Federal Register by the Audit Staff Bureau of Accounts, U. S. Treasury Department. The Performance Bond shall include coverage for the Guarantee Period. Notwithstanding the obligation of any other party, person or entity to notify CONTRACTOR's and CONTRACTOR's Subcontractors' sureties, CONTRACTOR and CONTRACTOR's Subcontractors shall give immediate written notice to its sureties of any change in the Contract Sum, Contract Time, Scope of Work or any other event for which failure to give said sureties notice would operate to discharge a surety's liability. The Surety on the performance bond shall furnish a waiver by which it consents to progress or partial payments to the CONTRACTOR in accordance with this Contract. Surety shall further agree that such payment shall not preclude or stop the OWNER from showing the true character and quantity of the materials furnished or from recovering from the CONTRACTOR or Subcontractor or CONTRACTOR'S or Subcontractors' sureties such damages as the OWNER may sustain by reason of any deficiency in quantity of the materials with respect to which a progress payment was made.

If the surety on any Bond furnished by CONTRACTOR or SUNCONTRACTOR is declared bankrupt or becomes insolvent, or if its right to do business is terminated in any state where any part of the Project is located, CONTRACTOR or SUBCONTRACTOR shall within five days thereafter substitute another Bond and surety, both of which shall be acceptable to OWNER.

Insurance Requirements

5.2. Until final acceptance by the OWNER of the Work, the CONTRACTOR shall procure and maintain at CONTRACTOR's own expense insurance of the kinds and in the amounts herein provided. This insurance shall be provided by insurance companies authorized to do business in New Mexico and shall cover all operations under the Contract, whether performed by the CONTRACTOR, CONTRACTOR's agents or employees or by Subcontractors. All insurance provided shall remain in full force and effect for the entire period of the Work, up to and including final acceptance, and the removal of all equipment and employees, agents and SUBCONTRACTORS there from.

I. Public Liability and Automobile Liability Insurance

A. **General Liability:** Bodily Injury Liability and Property Damage Liability insurance applicable in full to the subject project shall be provided in the following minimum amounts:

Bodily Injury Liability:
$500,000 each occurrence

$1,000,000 aggregate

Property Damage Liability:
$500,000 each occurrence
$1,000,000 aggregate

1. The policy to provide this insurance is to be written on a Comprehensive General Liability form which must include the following:

a. Coverage for liability arising out of the operation of independent Contractors.

b. Completed Operations Coverage.

c. Attachment of the Broad Form Comprehensive General Liability Endorsement.

2. In the event that any use of explosives is a required part of the Contract, the CONTRACTOR's insurance must include coverage for injury to or destruction of property arising out of blasting or explosion.

3. In the event that any form of work next to an existing building or structure is a required part of the Contract, the CONTRACTOR's insurance must include coverage for injury to or destruction of property arising out of:

The collapse of or structural injury to any building or structure due to excavation, including borrowing, filling or backfilling in connection therewith, or to tunneling, cofferdam work or caisson work or to moving, shoring, underpinning, raising or demolition of any building or structure or removal or rebuilding of any structural support thereof.

4. Coverage must be included for injury to or destruction of any property arising out of injury to or destruction of wires, conduits, pipes, mains, sewers or other similar property or any apparatus in connection therewith below the surface of the ground, if such injury or destruction is caused by or occurs during the use of mechanical equipment for the purpose of excavating, digging or drilling, or to injury to or destruction of property at any time resulting there from.

A. Automobile Liability Insurance coverage for the CONTRACTOR (whether included in the policy providing General Liability insurance or in a separate policy) must provide liability for the ownership, operation and maintenance of owned, non-owned and hired cars. The limits of liability for Automobile Liability insurance shall be provided in the following amounts:

Bodily Injury Liability:
$500,000 each person
$1,000,000 each occurrence

Property Damage Liability:
$1,000,000 each occurrence

II. Workers' Compensation Insurance

The CONTRACTOR shall also carry Workers' Compensation Insurance or otherwise fully comply with the provisions of the New Mexico Workmen's Compensation Act and Occupational Disease Disablement Law.

III. Owners' Protective Liability Insurance

The CONTRACTOR shall purchase Standard Form Owners' Protective Liability insurance naming the OWNER as the name insured, with limits of liability applicable in full to the subject project as follows:

Bodily Injury Liability:
$500,000 each occurrence

Property Damage Liability:
$100,000 each occurrence

Property Damage and Bodily Injury Combined:
$1,000,000 aggregate

IV. Certificate of Insurance

The CONTRACTOR being Awarded the Contract shall furnish evidence of CONTRACTOR's insurance coverage by a Certificate of Insurance executed on a form acceptable to the OWNER, to be made a part of the Contract and included with the Contract Documents prior to signing the Contract. Such certificate shall indicate compliance with these specifications and shall certify that the coverage shall not be changed, canceled or allowed to lapse without giving the OWNER thirty (30) days written notice. Also, a Certificate of Insurance shall be furnished to the OWNER on renewal of a policy or policies as necessary during the terms of the Contract. The OWNER shall not issue a Notice to Proceed until such time as the above requirements have been met.

V. Umbrella Coverage

The insurance limits cited in the above paragraphs are minimum limits. This specification is in no way intended to define what constitutes adequate insurance coverage for the individual CONTRACTOR. The OWNER will recognize excess coverage (Umbrella) as meeting the requirements of Subsection I of this Section should such insurance otherwise meet all the requirements of such Subsection.

VI. Optimal Insurance

The CONTRACTOR shall procure and maintain, when required by the OWNER, forms and types of Bailee insurance such as, but not limited to, Builder's Risk Insurance, which should include, but is not limited to, theft, vandalism, weather conditions and acts of God, CONTRACTOR's Equipment Insurance, Rigger's Liability Property Insurance, etc. in amounts necessary to protect the OWNER against claims, losses and expenses arising from the damage, disappearance or destruction of property of others in the care, custody or control of the

CONTRACTOR, including property of others being installed, erected or worked upon by the CONTRACTOR, CONTRACTOR's agents or Subcontractors.

VII. Railroad Insurance

In the event that railroad property is affected by the subject Contract, the CONTRACTOR is advised that, in addition to the above requirements, CONTRACTOR shall be required to furnish a Railroad Protective Liability policy in the name of the railroad company involved. In addition, on those rails that are used by the National Railroad Passenger Corporation (NRPC), the CONTRACTOR will also obtain a Railroad Protective Liability policy in the name of NRPC.

The limits of liability for the Railroad Protective Liability policy (or policies) must be negotiated with the railroad company on a hazard and risk basis. In no event will the limits exceed the following:

Bodily Injury Liability, Property Damage Liability:
$2,000,000 each occurrence

Liability and Physical Damage to Property:
$6,000,000 aggregate

The limits of liability stated above apply to the coverage as set forth in the Railroad Protective Liability Endorsement Form, subject to the terms, conditions and exclusions found in the Form.

The policy must afford coverage as provided for in the standard Railroad Protective Liability Endorsement (AASHTO Form).

Additional Bonds and Insurance

5.3. Prior to delivery of the executed Agreement by OWNER to CONTRACTOR, OWNER may require CONTRACTOR to furnish such other Bonds and such additional insurance, in such form and with such sureties or insurers, as OWNER may require. If such other Bonds or such other insurance are specified by written instructions given prior to opening of Bids, the premiums shall be paid by CONTRACTOR.

ARTICLE 6 CONTRACTOR'S RESPONSIBILITIES

Registration

6.1 CONTRACTOR must be registered with the Industrial Division of the Department of Labor.

Supervision and Superintendence

6.2. CONTRACTOR shall supervise and direct the Work efficiently and with CONTRACTOR's best skill and attention. CONTRACTOR shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction; but shall not be solely responsible for the negligence of others in the design or selection of a specific mean, method, technique, sequence, or procedure of construction which is indicated in and required by

the Contract Documents. CONTRACTOR shall be responsible to see that the finished Work complies accurately with the Contract Documents.

6.3. CONTRACTOR shall keep on the Work at all times during its progress a competent resident Superintendent, who shall not be replaced without written notice to ENGINEER (written notice only, NOT consent) except under extraordinary circumstances. The Superintendent will be CONTRACTOR's representative at the site and shall have authority to act on behalf of CONTRACTOR. All communications given to the Superintendent shall be as binding as if given to CONTRACTOR.

Labor, Materials, and Equipment

6.4. CONTRACTOR shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. CONTRACTOR shall at all times maintain good discipline and order at the site.

6.5. CONTRACTOR shall furnish all materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water and sanitary facilities, and all other facilities and incidentals necessary for the execution, testing, initial operation, and completion of the Work.

6.6. All materials and equipment shall be new, except as otherwise provided in the Contract Documents. If required by ENGINEER, CONTRACTOR shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

6.7. All materials and equipment shall be applied, installed, connected, erected, used, cleaned, and conditioned in accordance with the instructions of the applicable manufacturer, fabricator, or processors, except as otherwise provided in the Contract Documents or directed by the ENGINEER.

6.7.1. CONTRACTOR shall assign to OWNER all express and implied warranties and Contract rights for materials and equipment installed in the Project and for which OWNER has paid CONTRACTOR.

Substitute Materials or Equipment

6.8. If the Specifications, laws, ordinances, or applicable rules or regulations permit CONTRACTOR to furnish or use a substitute that is equal to any material or equipment specified, and if CONTRACTOR wishes to furnish or use a proposed substitute, CONTRACTOR shall, prior to the conference called for by paragraph 2.9, make written application to ENGINEER for approval of such a substitute, certifying in writing that the proposed substitute will perform adequately the functions called for by the general design, be similar and of equal substance to that specified, and be suited to the same use and capable of performing the same function as that specified; stating whether or not its incorporation in or use in connection with the Project is subject to the payment of any license fee or royalty; and identifying all variations of the proposed substitute from that specified and indicating available maintenance service. No substitute shall be ordered or installed without the written approval of ENGINEER, who will be the judge of equality and who may require CONTRACTOR to furnish such other data about the proposed substitute as ENGINEER considers pertinent. No substitute shall be ordered or installed without such performance guarantee and bonds as OWNER may require which shall be furnished at CONTRACTOR's expense.

Subcontractors

6.9. CONTRACTOR shall not employ any Subcontractor or other person or organization (including those who are to furnish the principal items of materials or equipment), whether initially or as a substitute, against whom OWNER or ENGINEER may have reasonable objection. A Subcontractor or other person or organization identified in writing to OWNER by CONTRACTOR prior to the Notice of Award and not objected to in writing by OWNER prior to the Notice of Award will be deemed acceptable to OWNER. Acceptance of any Subcontractor, other person, or organization by OWNER or ENGINEER shall not constitute a waiver of any right of OWNER to reject defective Work or Work not in conformance with the Contract Documents.

If OWNER, after due investigation, has reasonable objection to any Subcontractor, other person, or organization proposed by CONTRACTOR after the Notice of Award, CONTRACTOR shall submit an acceptable substitute and the Contract Price shall be increased or decreased by the difference in cost occasioned by such substitution and an appropriate Change Order shall be issued. CONTRACTOR shall not be required to employ any Subcontractor, other person, or organization against whom CONTRACTOR has reasonable objection. CONTRACTOR shall not, without the consent of OWNER, make any substitution for any Subcontractor, other person, or organization who has been accepted by OWNER unless OWNER determines that there is good cause for doing so.

6.10. CONTRACTOR shall be fully responsible for all acts and omissions of CONTRACTOR's Subcontractors and of persons and organizations directly or indirectly employed by them and of persons and organizations for whose acts any of them may be liable to the same extent that CONTRACTOR is responsible for the acts and omissions of persons directly employed by CONTRACTOR. Nothing in the Contract Documents shall create any contractual relationship between OWNER and any Subcontractor or other person or organization having a direct contract with CONTRACTOR, nor shall it create any obligation on the part of OWNER to pay or to see to the payment of any monies due any Subcontractor or other person or organization, except as may otherwise be required by law. OWNER may furnish to any Subcontractor or other person or organization, to the extent practicable, evidence of amounts paid to CONTRACTOR on account of specific Work done in accordance with the schedule of values.

6.11. The sections of the Specifications and the identifications of any Drawings shall not control CONTRACTOR in dividing the Work among Subcontractors or delineating the Work to be performed by any specific trade. All work shall be performed by persons licensed to perform such work by New Mexico Construction Industries Division.

6.12. CONTRACTOR agrees to bind specifically every Subcontractor to the applicable terms and conditions of the Contract Documents for the benefit of OWNER.

Patent Fees and Royalties

6.13. CONTRACTOR shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if, to the actual knowledge of OWNER, its use is subject to patent

rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by OWNER in the Contract Documents. CONTRACTOR shall indemnify and hold harmless OWNER and anyone directly or indirectly employed by either of them from and against all claims, damages, losses, and expenses, including attorneys' fees, arising out of any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents and shall defend all such claims in connection with any alleged infringement of such rights.

Permits

6.14. CONTRACTOR shall obtain and pay for all construction permits and licenses and shall pay all governmental charges and inspection fees necessary for the prosecution of the Work, which are applicable at the time of CONTRACTOR's Bid. OWNER shall assist CONTRACTOR, when necessary, in obtaining such permits and licenses. CONTRACTOR shall also pay all public utility charges.

Laws and Regulations

6.15. CONTRACTOR shall give all notices and comply with all laws, ordinances, rules, and regulations applicable to the Work. If CONTRACTOR observes that the Specifications or Drawings are at variance therewith, CONTRACTOR shall give ENGINEER prompt written notice thereof; and any necessary changes shall be adjusted by an appropriate Modification. If CONTRACTOR performs any Work knowing it to be contrary to such laws, ordinances, rules, and regulations and without such notice to ENGINEER, CONTRACTOR shall bear all costs arising there-from; however, it shall not be CONTRACTOR's primary responsibility to make certain that the Specifications and Drawings are in accordance with such laws, ordinances, rules, and regulations.

Taxes

6.16. CONTRACTOR shall pay all New Mexico gross receipts, sales, consumer, use, and other similar taxes required to be paid by CONTRACTOR in accordance with the law of the place where the Work is to be performed.

Use of Premises

6.17. CONTRACTOR shall confine CONTRACTOR's equipment, the storage of materials and equipment, and the operations of CONTRACTOR's workmen to areas permitted by law, ordinances, permits, or the requirements of the Contract Documents and shall not unreasonably encumber the premises with materials or equipment.

6.18. CONTRACTOR shall not load nor permit any part of any structure to be loaded with weights that will endanger the structure, nor shall CONTRACTOR subject any part of the Work to stresses or pressures that will endanger it.

Record Drawings

6.19. CONTRACTOR shall keep one record copy of all Specifications, Drawings, Addenda, Modifications and Shop Drawings at the site in good order and currently annotated to show all

changes made during the construction process. These shall be available to ENGINEER and shall be delivered in good condition to OWNER upon completion of the Project.

Safety and Protection

6.20. CONTRACTOR shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. CONTRACTOR shall take all necessary precautions for the safety of and shall provide the necessary protection to prevent damage, injury, or loss to:

6.20.1. All employees on the Work and other persons who may be affected thereby;

6.20.2. All the Work and materials or equipment to be incorporated therein, whether in storage on or off the site; and

6.20.3. Other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation, or replacement in the course of construction.

6.20.4. All personal property that may be affected by the work.

The CONTRACTOR shall conduct construction operations in a manner which will minimize interference with the normal use of property adjacent to the construction Work and shall give owners of such property at least twenty-four (24) hours notice of the commencement of Work in the area abutting their property. CONTRACTOR shall comply with all applicable laws, ordinances, rules, regulations and orders of any public body having jurisdiction for the safety of persons or property or to protect them from damage, injury, or loss. CONTRACTOR shall erect and maintain, as required by the conditions and progress of the Work, all necessary safeguards for its safety and protection. CONTRACTOR shall notify owners of adjacent utilities at least forty-eight (48) hours in advance when prosecution of the Work may affect them. All damage, injury, or loss to any property referred to in subparagraphs 18.4.1 and 18.4.2 caused, directly or indirectly, in whole or in part, by CONTRACTOR, any Subcontractor, or anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, shall be remedied by CONTRACTOR, except for damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of DESIGNER or anyone employed by OWNER or anyone for whose acts OWNER may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of CONTRACTOR. CONTRACTOR's duties and responsibilities for the safety and protection of the Work shall continue until such time as all the work is completed and ENGINEER has issued a notice to OWNER and CONTRACTOR in accordance with paragraph 14.13 that Work is acceptable.

6.21. CONTRACTOR shall designate a responsible member of CONTRACTOR’s organization at the site whose duty shall be the prevention of accidents. This person shall be CONTRACTOR's superintendent, unless otherwise designated in writing by CONTRACTOR to OWNER.

Emergencies

6.22. In emergencies affecting the safety of persons or the Work or property at the site or adjacent thereto, CONTRACTOR, without special instruction or authorization from ENGINEER

or OWNER, is obligated to act, on self discretion, to prevent threatened damage, injury, or loss. CONTRACTOR shall give ENGINEER prompt written notice of any significant changes in the Work or deviations from the Contract Documents caused thereby; and a Change Order shall thereupon be issued covering the changes and deviations involved. If CONTRACTOR believes that additional work done in an emergency which arose from causes beyond CONTRACTOR's control entitles an increase in the Contract Price or an extension of the Contract Time, CONTRACTOR may make a claim as provided in Articles 11 and 12 of these General Conditions.

Shop Drawings and Samples

6.23. After checking and verifying all field measurements, CONTRACTOR shall submit to ENGINEER for approval, in accordance with the accepted schedule of Shop Drawing submissions (see paragraph 2.9), three copies (or, at ENGINEER's option, one reproducible copy) of all Shop Drawings which shall have been checked by and stamped with the approval of CONTRACTOR and identified as ENGINEER may require. The data shown on the Shop Drawings will be complete with respect to dimensions, design criteria, materials of construction, and the like to enable ENGINEER to review the information as required.

6.24. CONTRACTOR shall also submit to ENGINEER for approval, with such promptness as to cause no delay in Work, all samples required by the Contract Documents. All samples will have been checked by and stamped with the approval of CONTRACTOR, identified clearly as to material, manufacturer, and pertinent catalog numbers and the use for which intended.

6.25. At the time of each submission, CONTRACTOR shall in writing call ENGINEER's attention to any deviations that the Shop Drawings or sample may have from the requirements of the Contract Documents.

6.26. ENGINEER will review and approve with reasonable promptness Shop Drawings and samples, but ENGINEER's review and approval shall be only for conformance with the design concept of the Project and for compliance with the information given in the Contract Documents. The approval of a separate item as such will not indicate approval of the assembly in which the item functions. CONTRACTOR shall make any corrections required by ENGINEER and shall return the required number of corrected copies of Shop Drawings and resubmit new samples until approved. CONTRACTOR shall direct specific attention in writing or on resubmitted Shop Drawings to revisions other than the corrections called for by ENGINEER on previous submissions. CONTRACTOR's stamp of approval on any Shop Drawing or sample shall constitute a representation to ENGINEER that CONTRACTOR has either determined and verified all quantities, dimensions, field construction criteria, materials, catalog numbers, and similar data or assumes full responsibility for doing so and that CONTRACTOR has reviewed or coordinated each Shop Drawing or sample with the requirements of the Work and the Contract Documents.

6.27. Where a Shop Drawing or sample submission is required by the Specifications, no related Work shall be commenced until the submission has been approved by ENGINEER. A copy of each approved Shop Drawing and each approved sample shall be kept in good order by CONTRACTOR at the site and shall be available to ENGINEER.

6.28. ENGINEER's approval of Shop Drawings or samples shall not relieve CONTRACTOR from CONTRACTOR's responsibility for any deviations from the requirements of the Contract

Documents unless CONTRACTOR has in writing called ENGINEER's attention to such deviation at the time of submission and ENGINEER has given written approval to the specific deviation, nor shall any approval by ENGINEER relieve CONTRACTOR from responsibility for errors or omissions in the Shop Drawings.

Cleanup

6.29. CONTRACTOR shall keep the premises free from accumulations of waste materials, rubbish, and other debris resulting from the Work; and at the completion of the Work, CONTRACTOR shall remove all waste materials, rubbish, and debris from and about the premises, as well as all tools, construction equipment and machinery, and surplus materials and shall leave the site clean and ready for occupancy by OWNER. CONTRACTOR shall restore to their original condition those portions of the site not designated for alteration by the Contract Documents.

Indemnification

6.30. CONTRACTOR shall indemnify and hold harmless OWNER and its agents and employees from and against all claims, damages, losses, and expenses including attorneys' fees arising out of or resulting from the performance of the Work by the CONTRACTOR, provided that any such claim, damage, loss, or expense (a) is attributable to bodily injury, sickness, disease, or death or to injury to or destruction of tangible property (other than the Work itself) including the loss of use resulting there from and (b) is caused in whole or in part by any negligent act or omission of CONTRACTOR, any Subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, regardless of whether or not it is caused in part by a party indemnified hereunder.

6.31. In any and all claims against OWNER or any of its agents or employees by any employees of CONTRACTOR, any Subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, the indemnification obligation under this Agreement shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for CONTRACTOR or any Subcontractor under workmen's compensation acts, disability benefit acts, or other employee benefit acts.

6.32. The obligations of CONTRACTOR under this Agreement shall not extend to the liability of OWNER, OWNER’s agents, or employees arising out of (a) the preparation or approval of maps, drawings, opinions, reports, surveys, Change Orders, designs, or Specifications or (b) the giving of or the failure to give directions or instructions by OWNER, OWNER’s agents, or employees provided such giving or failure to give is the primary cause of injury or damage.

Notice to Surety

6.33. In all cases involving changes in the Work, the CONTRACTOR shall be obligated to promptly notify its Sureties, if any, of any change in Contract Price, scope of the Work or Contract Time which might operate to discharge the Sureties if notice were not provided. No obligation to notify a Surety or actual notice to a Surety by any other person or party shall operate to relieve CONTRACTOR of its obligation to notify a Surety.

Documents, Records and Correspondence

6.34. The CONTRACTOR shall maintain the following documents and records and, upon request by the OWNER, shall promptly make the records or legible copies thereof available to OWNER: Bid estimates, site observation reports, material and equipment invoices, payment records, payroll records, approved shop drawings, job meeting minutes, daily reports, logs and diaries, and photographs pertaining to the Work. The CONTRACTOR shall furnish copies of all correspondence pertaining to the Work to the OWNER upon request.

ARTICLE 7 WORK BY OTHERS

7.1. OWNER may itself perform additional Work related to the Project or it may let other direct contracts therefore which shall contain General Conditions similar to these. CONTRACTOR shall afford the other contractors who are parties to such direct contracts (or OWNER, if performing the additional work directly) reasonable opportunity for the introduction and storage of materials and equipment and for the execution of work and shall properly connect and coordinate CONTRACTOR's Work with theirs.

7.2. If any part of CONTRACTOR's Work depends for proper execution or results upon the work of any such other contractor (or OWNER), CONTRACTOR shall inspect and promptly report to ENGINEER in writing any defects or deficiencies in such work that render it unsuitable for such proper execution and results. CONTRACTOR's failure to report shall constitute an acceptance of the work as fit and proper for the relationship of CONTRACTOR's Work except as to defects and deficiencies which may appear in the other work after the execution of CONTRACTOR's Work.

7.3. CONTRACTOR shall do all cutting, fitting and patching of the Work that may be required to make its several parts come together properly and fit it to receive or be received by such other work. CONTRACTOR shall not endanger any work of others by cutting, excavating or otherwise altering their work and will only cut or alter their work with the written consent of OWNER and of the other contractors whose work will be affected.

7.4. If the performance of additional work by other contractors or OWNER is not noted in the Contract Documents prior to the execution of the Contract, written notice thereof shall be given to CONTRACTOR prior to starting any such additional work. If CONTRACTOR believes that the performance of such additional work by OWNER or others involves additional expense or warrants an extension of the Contract Time, CONTRACTOR may make a claim therefor as provided in Articles 11 and 12 of these General Conditions.

7.5. Work by the CONTRACTOR and work by others shall be coordinated and expedited by the OWNER to prevent time delays and additional cost to the CONTRACTOR. Any extension of time and/or additional costs caused by other contractors may be claimed as provided in Articles 11 and 12 of these General Conditions.

ARTICLE 8 OWNER'S RESPONSIBILITIES

8.1. OWNER shall issue all official communications to CONTRACTOR through ENGINEER, in writing.

8.2. In case of termination of the employment of ENGINEER, OWNER shall appoint an engineer whose status under the Contract Documents shall be that of the former ENGINEER.

8.3. OWNER shall furnish the data required of OWNER under the Contract Documents promptly and shall make payments to CONTRACTOR promptly after they are due as provided in paragraphs 14.4 and 14.13.

8.4. OWNER's duties in respect of providing lands and easements and providing engineering surveys to establish reference points are set forth in paragraphs 4.1 and 4.4.

8.5. In connection with OWNER's rights to request changes in the Work in accordance with Article 10 of these General Conditions, OWNER (especially in certain instances as provided in paragraph 10.4) is obligated to execute Change Orders.

8.6. OWNER's responsibility in respect of certain inspections, tests and approvals is set forth in paragraph 13.2.

8.7. In connection with OWNER's right to stop Work or suspend Work, see paragraphs 13.11 and 15.1. Paragraph 15.2 deals with OWNER's right to terminate services of CONTRACTOR.

ARTICLE 9 ENGINEER'S STATUS DURING CONSTRUCTION

OWNER's Representative

9.1. ENGINEER will be OWNER's representative during the construction period for the purpose of inspecting and approving the WORK.

Visits to Site

9.2. ENGINEER will make visits to the site at intervals appropriate to the various stages of construction to observe the progress and quality of the executed Work and to determine, in general, if the Work is proceeding in accordance with the Contract Documents. ENGINEER will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. ENGINEER shall exercise reasonable skill and diligence to ensure that the completed Work will conform to the Contract Documents.

Clarifications and Interpretations

9.3. ENGINEER will issue with reasonable promptness such written clarifications or interpretations of the Contract Documents (in the form of Drawings or otherwise) as ENGINEER may determine necessary, which shall be consistent with or reasonably inferable from the overall intent of the Contract Documents. If CONTRACTOR believes that a written clarification or interpretation justifies an increase in the Contract Price or Contract Time, CONTRACTOR may make a claim therefor as provided in Article 11 or Article 12 of these General Conditions.

Rejecting Defective Work

9.4. ENGINEER will have authority to disapprove or reject Work which is defective and will also have authority to require special inspection or testing of the Work as provided in paragraph 13.7, whether or not the Work is fabricated, installed or completed.

Shop Drawings, Change Orders and Payments

9.5. In connection with ENGINEER's responsibility for Shop Drawings and samples, see paragraphs 6.23 through 6.28 inclusive.

9.6. In connection with ENGINEER's responsibilities as to Change Orders, see Articles 10, 11 and 12 of these General Conditions.

9.7. In connection with ENGINEER's responsibilities in respect of Applications for Payment, etc., see Article 14 of these General Conditions.

Project Representation

9.8. The ENGINEER may designate a Project Representative to assist ENGINEER in observing the performance of the Work. The duties, responsibilities and limitations of authority of any such Project Representative and assistants will be as delegated by the ENGINEER.

Decisions on Disagreements

9.9. ENGINEER will be the initial interpreter of the requirements of the Contract Documents and judge of the acceptability of the Work there-under. Claims, disputes and other matters relating to the acceptability of the Work or the interpretation of the requirements of the Contract Documents pertaining to the execution and progress of the Work shall be referred initially to ENGINEER in writing with a request for a formal decision in accordance with this paragraph, which ENGINEER will render in writing within a reasonable time, unless ENGINEER advises CONTRACTOR that additional time is needed in which to ascertain more accurate data.

9.10. The rendering of a decision by ENGINEER pursuant to paragraph 9.9 with respect to any claim, dispute or other matter will be a condition precedent to any exercise by OWNER or CONTRACTOR of such rights or remedies as either may otherwise have under the Contract Documents or at law in respect of that claim, dispute or other matter.

Limitations on ENGINEER's Responsibilities

9.11. Neither ENGINEER's authority to act under this Article 9 or elsewhere in the Contract Documents nor any decision made by ENGINEER in good faith either to exercise or not exercise such authority shall give rise to any duty or responsibility of ENGINEER to CONTRACTOR, any Subcontractor, any manufacturer, fabricator, supplier or distributor, or any of their agents or employees or any other person performing any of the Work.

9.12. Whenever in the Contract Documents the terms "as ordered," "as directed," "as required," "as allowed" or terms of like effect or import are used, or the adjectives "reasonable," "suitable," "acceptable," "proper" or "satisfactory" or adjectives of like effect or import are used, to describe requirement, direction, review or judgment of ENGINEER as to the Work, it is intended that such requirement, direction, review or judgment will be solely to evaluate the Work for compliance with the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective never indicates that ENGINEER shall have authority to supervise or direct performance of the Work or authority to undertake responsibility contrary to the provisions of paragraphs 9.13 or 9.14.

9.13. ENGINEER will not be responsible for CONTRACTOR's means, methods, techniques, sequences or procedures of construction, or the safety precautions and programs incident thereto, and ENGINEER will not be responsible for CONTRACTOR's failure to perform the Work in accordance with the Contract Documents.

9.14. ENGINEER will not be responsible for the acts or omissions of CONTRACTOR or of any Subcontractor, or of the agents or employees of any CONTRACTOR or Subcontractor, or of any other persons at the site or otherwise performing any of the Work.

ARTICLE 10 CHANGES IN THE WORK

Change Order:

10.1. Without invalidating the Agreement, OWNER may, at any time order additions, deletions or revisions in the Work; these will be authorized by written Change Orders. Upon receipt of a signed Change Order, CONTRACTOR shall proceed with the Work involved. All such Work shall be executed under the applicable conditions of the Contract Documents. If any Change Order causes an increase or decrease in the Contract Price or an extension or shortening of the Contract Time, an equitable adjustment may be made as provided in Article 11 or Article 12 of these General Conditions on the basis of a claim made by either party.

Field Order:

10.2. ENGINEER may authorize minor changes in the Work not involving an adjustment in the Contract Price or the Contract Time and which are consistent with the overall intent of the Contract Documents. These may be accomplished by a Field Order and shall be binding on OWNER and CONTRACTOR, who shall perform the change promptly. If CONTRACTOR believes that a Field Order justifies an increase in the Contract Price or Contract Time, CONTRACTOR may make a claim therefor as provided in Article 11 or Article 12 of these General Conditions.

10.3. Additional Work performed without authorization of a written and executed Change Order will not entitle CONTRACTOR to an increase in the Contract Price or to an extension of the Contract Time, except in the case of an emergency as provided in paragraph 6.22 and except as provided in paragraphs 10.2 and 13.10.

10.4. OWNER shall execute appropriate Change Orders prepared by ENGINEER covering changes in the Work which are required by OWNER or which are required because of emergencies or as provided in Article 7 of these General Conditions or because of any other valid claim of CONTRACTOR for a change in the Contract Time or the Contract Price which is recommended by ENGINEER and accepted by the OWNER.

10.5. If notice of any change affecting the general scope of the Work or change in the Contract Price is required by the provisions of any Bond to be given to the Surety, it will be CONTRACTOR's responsibility to so notify the Surety, and the amount of each applicable Bond shall be adjusted accordingly. CONTRACTOR shall furnish proof of such adjustment to OWNER.

10.6. CONTRACTOR shall not be entitled to receive damages or additional cost for delay reasonably caused by the OWNER, OWNER'S consultants, agents and employees. In such event, however, CONTRACTOR may be entitled to an extension of the Contract Time.

10.7. Changes in the Work which represent less than twenty-five percent (25%) of the value of the Work shall not be considered to change the scope of the Work provided that the operations and methods required to perform the change are not significantly different from those contemplated by the original Work.

ARTICLE 11 CHANGE OF CONTRACT PRICE

11.1. The Contract Price constitutes the total compensation payable to CONTRACTOR for performing the Work. All duties, responsibilities, and obligations assigned to or undertaken by CONTRACTOR shall be at CONTRACTOR's expense without change in the Contract Price.

11.2. The Contract Price may only be changed by a Change Order. Any claim for an increase in the Contract Price shall be based on written notice delivered to OWNER within fifteen (15) days of the occurrence of the event giving rise to the claim but before the CONTRACTOR has incurred additional expenses except in the case of emergencies, under paragraph 6.22. Notice of the amount of the claim with supporting data and written explanation of the basis for the claim shall be delivered within seven (7) days of such occurrence unless ENGINEER allows an additional period of time to ascertain accurate cost data. All claims for adjustments in the Contract Price shall be determined by OWNER. Any change in the Contract Price resulting from any such claim shall be incorporated in a Change Order. OWNER may grant CONTRACTOR an extension of the Contract Time for resolving a claim for adjustment but in no case shall CONTRACTOR be entitled to damages for delay.

11.3. The value of any Work covered by a Change Order or of any claim for an increase or decrease in the Contract Price shall be determined in one of the following ways:

11.3.1. Where the Work involved is covered by unit prices contained in the Contract Documents, by application of unit prices to the quantities of the items involved.

11.3.2. By mutual acceptance of a lump sum or unit prices.

11.3.3. On the basis of the Cost of the Work, plus a CONTRACTOR's Fee for supervision, overhead, bond, profit and any other general expenses, fee shall not exceed fifteen percent (15%) of the actual Cost of Work.

11.3.4. If the CONTRACTOR subcontracts all or part of the Work and the subcontract is to be paid on the basis of the Cost of Work plus a Fee, the Total Fee for the subcontracted Work and the CONTRACTOR's Fee shall not exceed fifteen percent (15%) of the actual cost of Work, as determined in accordance with paragraphs 11.4 and 11.5, unless otherwise as determined or agreed to by OWNER. The Cost of Work and Fee shall be identified individually in the Change Order back-up provided to the OWNER by the CONTRACTOR, in a format acceptable to the OWNER.

Cost of the Work

11.4. The term Cost of the Work means the sum of all costs necessarily incurred and paid by the CONTRACTOR in the proper performance of the Work. Except as otherwise may be agreed in writing by OWNER; such costs shall be in amounts no higher than those prevailing in the locality of the Project, shall include only the following items, and shall not include any of the costs itemized in paragraph 11.5:

11.4.1. Payroll costs for employees in the direct employ of CONTRACTOR in the performance of the Work under schedules of job classifications agreed upon by OWNER and CONTRACTOR. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include salaries and wages plus the cost of fringe benefits which shall include social security contributions, unemployment, excise and payroll taxes, workmen's compensation, health and retirement benefits, sick leave, vacation and holiday pay applicable thereto. Employees shall include superintendents and foremen at the site. The expenses of performing work after regular working hours, on Sunday or legal holidays shall be included in the above to the extent authorized by OWNER.

11.4.2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and manufacturers' field services required in connection therewith. All cash discounts shall accrue to CONTRACTOR unless OWNER deposits funds with CONTRACTOR with which to make payments, in which case the cash discounts shall accrue to OWNER. All trade discounts, rebates and refunds, and all returns from sale of surplus materials and equipment shall accrue to OWNER and CONTRACTOR shall make provisions so that they may be obtained.

11.4.3. Payments made by CONTRACTOR to the Subcontractors for Work performed by Subcontractors. If required by OWNER, CONTRACTOR shall obtain competitive Bids from Subcontractors acceptable to CONTRACTOR and shall deliver such Bids to OWNER who will then determine which Bids will be accepted. If a subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work Plus a Fee, the Cost of the Work shall be determined in accordance with paragraphs 11.4 and 11.5. The Total Fee for Subcontractor’s Fee and CONTRACTOR’s Fee combined shall not exceed fifteen percent (15%) of the actual Cost of Work, unless otherwise determined or agreed to by OWNER. Fee includes compensation for supervision, overhead, bond, profit and any other general expenses. All subcontracts shall be subject to the other conditions of the Contract Documents insofar as applicable.

11.4.4. Costs of special consultants (including, but not limited to, engineers, architects, testing laboratories, surveyors, lawyers, and accountants) employed for services specifically related to the Work to the extent authorized in advance by OWNER.

11.4.5. Supplemental costs including the following:

11.4.5.1. The proportion of necessary transportation, traveling, and subsistence expenses of CONTRACTOR's employees incurred in discharge of duties connected with the Work.

11.4.5.2. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office and temporary facilities at the site, and hand tools not owned by the workmen, which are consumed in the performance of the Work; and cost less market value of such items used but not consumed which remain the property of CONTRACTOR.

11.4.5.3. Rentals of all construction equipment and machinery and parts thereof, whether rented by CONTRACTOR or others in accordance with rental agreements approved by OWNER, and the costs of transportation, loading, unloading, installation, dismantling, and removal thereof -- all in accordance with terms of said rental agreements. The rental of any such equipment, machinery or parts shall cease when the use thereof is no longer necessary for the Work; if rental is not timely ceased, OWNER shall incur no cost beyond that absolutely required for the Work.

11.4.5.4. Sales, use, or similar taxes related to the Work and for which CONTRACTOR is liable, imposed by any governmental authority.

11.4.5.5. Deposits lost for causes other than CONTRACTOR's negligence, royalty payments, and fees for permits and licenses.

11.4.5.6. Losses, damages and expenses not compensated by insurance or otherwise, sustained by CONTRACTOR in connection with the execution of and to the Work, provided they have resulted from causes other than the negligence of CONTRACTOR, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of OWNER. No such losses, damages and expenses shall be included in the Cost of the Work for the purpose of determining CONTRACTOR's Fee. If, however, any such loss or damage requires reconstruction and CONTRACTOR is placed in charge thereof, CONTRACTOR shall be paid for the services a fee proportionate to that stated in paragraph 11.6.2.

11.4.5.7. The cost of utilities, fuel and sanitary facilities at the site.

11.4.5.8. Minor expenses such as telegrams, long distance telephone calls, telephone service at the site, expressage and similar petty cash items in connection with the Work.

11.5. The term Cost of the Work shall not include any of the following:

11.5.1. Payroll costs and other compensation of CONTRACTOR's officers, executives, principals (of partnership and sole proprietorships), general managers, engineers, architects, estimators, timekeepers, clerks and other personnel employed by CONTRACTOR whether at the site or in CONTRACTOR’s principal or a branch office for general administration of the Work and not specifically included in the schedule referred to in paragraph 11.4.1 -- all of which are to be considered administrative costs covered by the CONTRACTOR's Fee.

11.5.2. Expenses of CONTRACTOR's principal and branch offices other than CONTRACTOR’s office at the site.

11.5.3. Any part of CONTRACTOR's capital expenses, including interest on CONTRACTOR's capital employed for the Work and charges against CONTRACTOR for delinquent payment.

11.5.4. Cost of premiums for all bonds and for all insurance policies whether or not CONTRACTOR is required by the Contract Documents to purchase and maintain the same.

11.5.5. Costs due to the negligence of CONTRACTOR, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective work, disposal of materials or equipment wrongly supplied and making good any damage to property.

11.5.6. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in paragraph 11.4.

CONTRACTOR's Fee

11.6. The CONTRACTOR's Fee that is allowed to CONTRACTOR for overhead and profit shall be determined as follows:

11.6.1. A mutually acceptable fixed fee; or if none can be agreed upon,

11.6.2. An amount determined by the OWNER to be reasonable.

11.6.2.1. No fee shall be payable on the basis of costs itemized under paragraphs 11.4.4, 11.4.5, and 11.5.

11.6.3. If a subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a Fee, the Cost of the Work shall be determined in accordance with paragraphs 11.4 and 11.5. The Total Fee for Subcontractor’s Fee and Contractor’s Fee combined shall not exceed fifteen percent (15%) of the actual Cost of Work, unless otherwise determined or agreed to by OWNER. Fee includes compensation for supervision, overhead, bond, profit and any other general expenses

11.7. The amount of credit to be allowed by CONTRACTOR to OWNER for any change in contract price which results in a net decrease in cost will be the amount of the actual net decrease plus an allowance for overhead and administration. When both additions and credits are involved in any one change, the combined overhead and profit shall be figured on the basis of the net increase or decrease.

11.8. Whenever the cost of any Work is to be determined pursuant to paragraphs 11.4 and 11.5, CONTRACTOR will submit in the form prescribed by OWNER an itemized cost breakdown together with supporting data.

ARTICLE 12 CHANGE OF THE CONTRACT TIME

12.1. The Contract Time may only be changed by written approval from the OWNER. Any claim for an extension in the Contract Time shall be based on written notice delivered to OWNER within seven (7) days of the occurrence of the event giving rise to the claim for contract time extension and shall be accompanied by supporting data unless OWNER allows an additional period of time to ascertain more accurate data. All claims for adjustment in the Contract Time shall be determined by OWNER.

12.2. The Contract Time may be extended in an amount equal to time lost due to delays beyond the control of CONTRACTOR if CONTRACTOR makes a claim therefor as provided in paragraph 12.1. Such delays shall include, but not be restricted to, acts or neglect by any separate contractor employed by OWNER, fires, floods, labor disputes, epidemics, weather conditions, or acts of God. If the CONTRACTOR has worked less than four (4) hours in a day, and is forced to suspend work due to weather conditions, CONTRACTOR shall receive credit for one (1) day. The CONTRACTOR shall deliver to the OWNER, a written request within seven (7) days of each occurrence, regarding the credit day(s). The OWNER shall make the final determination as to the validity of each request.

12.3. All time limits stated in the Contract Documents are of the essence of the Agreement. The conditions of this Article 12 shall not exclude recovery for damages (including compensation for additional professional services) for delay by either party; except that CONTRACTOR shall be entitled only to an extension of the Contract Time, and not for other damages, resulting from OWNER's decision to delay the Work either prior to the time for commencement of the Work or during performance of the Work.

ARTICLE 13 WARRANTY AND GUARANTEE; TESTS AND INSPECTIONS; CORRECTION, REMOVAL, OR ACCEPTANCE OF DEFECTIVE WORK

Warranty and Guarantee

13.1. CONTRACTOR warrants and guarantees to OWNER that all materials and equipment will be new unless otherwise specified and that all Work will be of good quality, will be free from faults or defects, and will be in accordance with the requirements of the Contract Documents and of any inspections, tests, or approvals referred to in paragraph 13.2. All unsatisfactory Work, all faulty or defective Work, and all Work not conforming to the requirements of the Contract Documents or of such inspections, tests or approvals, shall be considered defective. Prompt notice of all defects shall be given to CONTRACTOR. All defective Work, equipment and materials whether or not in place, may be rejected, corrected or accepted as provided in this Article 13.

Tests and Inspections

13.2. If the Contract Documents, laws, ordinances, rules, regulations or orders of any public authority having jurisdiction require any Work to specifically be inspected, tested or approved by some public body, CONTRACTOR shall assume full responsibility therefore, shall pay all costs in connection therewith and shall furnish OWNER the required certificates of inspection, testing or approval.

Quality Assurance Materials Testing (Geotechnical)

13.3 A material testing laboratory shall be retained by the OWNER for Quality Assurance testing. The frequency of the Quality Assurance testing shall be as determined by the OWNER. The CONTRACTOR shall notify the testing laboratory, the OWNER and the ENGINEER when CONTRACTOR is ready for each Quality Assurance test and shall cooperate fully in making way for the laboratory technician to make the tests. If any Work fails to meet the standards specified, the CONTRACTOR shall correct such failures in a manner acceptable to the ENGINEER. The CONTRACTOR shall pay for the cost of all Quality Assurance retesting necessary due to failure to meet specification requirements on the initial Quality Assurance testing. If the CONTRACTOR requests the testing laboratory to obtain density tests and the area to be tested is not ready when the technician arrives at the job site, the CONTRACTOR shall pay for all trip charges or stand by time assessed. All cost for retesting, standby time and other charges associated with a failed QA test will be deducted from the amount due on the Contract.

13.4 CONTRACTOR shall be responsible for providing to the OWNER the Proctor, Gradation and Liquid Limits of the Sub-Grade material and Base Course material.

13.5 Material testing as referenced in this article is for the OWNER's Quality Assurance. The CONTRACTOR is responsible for Quality Control of material, process and method.

13.6. CONTRACTOR shall give OWNER, ENGINEER, INSPECTING AGENCY and GEOTECHNICAL TESTING LAB a minimum of twenty-four (24) hours notice of readiness of the Work for all inspections, tests or approvals. All requests for QA testing shall be made in writing or e-mail to the ENGINEER, OWNER AND Testing Laboratory and by phone to the testing laboratory. If any such Work required so to be inspected, tested or approved is covered without written approval of ENGINEER, it must, if requested by ENGINEER, be uncovered for observation; and such uncovering shall be at CONTRACTOR's expense unless CONTRACTOR has given ENGINEER timely notice of CONTRACTOR's intention to cover such Work and ENGINEER has not acted with reasonable promptness in response to such notice.

13.7. Neither observations by ENGINEER nor inspections, tests or approvals by persons other than CONTRACTOR shall relieve CONTRACTOR from CONTRACTOR's obligations to perform the Work in accordance with the requirements of the Contract Documents. Refer to Technical Specifications, Article 01-002.1, Section 4, Quality Assurance Materials Testing.

Access to Work

13.8. ENGINEER and ENGINEER'S representatives and other representatives of OWNER will have access to the Work at reasonable times. CONTRACTOR shall provide proper and safe facilities for such access and observation of the Work and also for any inspection or testing thereof by others.

Uncovering Work

13.9. If any Work is covered contrary to the request of ENGINEER, it must, if requested by ENGINEER, be uncovered for ENGINEER's observation and the cover replaced in compliance with the Contract Documents at CONTRACTOR's expense.

13.10. If any Work has been covered which ENGINEER has not specifically requested to observe prior to its being covered or if ENGINEER considers it necessary or advisable that covered Work be inspected or tested by others, CONTRACTOR, at ENGINEER's request, shall uncover or otherwise make available for observation, inspection or testing as ENGINEER may require that portion of the Work in question, furnishing all necessary labor, material and equipment. If it is found that such Work is defective, CONTRACTOR shall bear all the expenses of such uncovering, exposure, observation, inspection and testing and of satisfactory reconstruction, including compensation for additional professional services; and an appropriate deductive Change Order shall be issued. If, however, such Work is not found to be defective, CONTRACTOR shall be allowed an increase in the Contract Price or an extension of the Contract Time, or both, directly attributable to such uncovering, exposure, observation, inspection, testing and reconstruction if CONTRACTOR makes a claim therefor as provided in Articles 11 and 12 of these General Conditions.

OWNER May Stop the Work

13.11. If the Work is defective or CONTRACTOR fails to supply sufficient skilled workmen or suitable materials or equipment, when an imminent hazard condition is known to exist, when the CONTRACTOR either delays in correcting or permits repeated occurrences of a hazardous condition, or if CONTRACTOR fails to make prompt payments to Subcontractors or for labor, materials or equipment, OWNER may order CONTRACTOR to stop the Work or any portion thereof until the cause for such order has been eliminated; however, this right of OWNER to stop the Work shall not give rise to any duty on the part of OWNER to exercise this right for the benefit of CONTRACTOR or any other party. This authority to suspend Work does not relieve the CONTRACTOR of the legal responsibility for safety at the jobsite.

Correction or Removal of Defective Work

13.12. If required by ENGINEER prior to approval of final payment, CONTRACTOR shall promptly (as determined by ENGINEER), without cost to OWNER and as specified by ENGINEER, either correct any defective Work, whether or not fabricated, installed, or completed or, if the Work has been rejected by ENGINEER, remove it from the site and replace it with non-defective Work. If CONTRACTOR does not correct such defective Work or remove and replace such rejected Work within a reasonable time as determined by ENGINEER, all as specified in a written notice from ENGINEER, OWNER may have the deficiency corrected or the rejected Work removed and replaced. All direct or indirect costs of such correction or removal and replacement, including compensation for additional professional services, shall be paid by

CONTRACTOR and an appropriate deductive Change Order shall be issued. CONTRACTOR shall also bear the expenses of making good all Work of others destroyed or damaged by such correction, removal, or replacement of CONTRACTOR's defective Work.

One Year Correction Period

13.13. If, after the approval of final payment and prior to the expiration of one year after the date of FINAL ACCEPTANCE provided by letter by OWNER or such longer period of time as may be prescribed by law or by the terms of any applicable special guarantee required by the Contract Documents, any Work is found to be defective, CONTRACTOR shall promptly, without cost to OWNER and in accordance with OWNER's written instruction, either correct such defective Work or, if it has been rejected by OWNER, remove it from the site and replace it with non-defective Work. If CONTRACTOR does not promptly comply with the terms of such instructions, OWNER may have the defective Work corrected or the rejected Work removed and replaced and all direct and indirect cost of such removal and replacement, including compensation for additional professional services, shall be paid by CONTRACTOR.

Acceptance of Defective Work

13.14. The OWNER may elect to accept defective work instead of requiring correction or removal and replacement of the defective Work. In such case, if acceptance occurs prior to approval of final payment, a Change Order shall be issued incorporating the necessary revisions in the Contract Documents, including appropriate reduction in the Contract Price; or, if the acceptance occurs after approval of final payment, an appropriate amount shall be paid by CONTRACTOR to OWNER.

Neglected Work by CONTRACTOR

13.15. If CONTRACTOR shall fail to prosecute the Work in accordance with the Contract Documents, including any requirements of the progress schedule, OWNER, after seven (7) days written notice to CONTRACTOR may, without prejudice to any other remedy OWNER may have, make good any deficiencies and the cost thereof, including compensation for additional professional services, shall be charged against CONTRACTOR if ENGINEER approves such action, in which case a Change Order shall be issued incorporating the necessary revisions in the Contract Documents, including an appropriate reduction in the Contract Price. If the payments then or thereafter due CONTRACTOR are not sufficient to cover such amount, CONTRACTOR shall pay the difference to OWNER.

ARTICLE 14 PAYMENTS TO CONTRACTOR AND COMPLETION

Schedules

14.1. Prior to commencement of the Work, CONTRACTOR shall submit to OWNER a Project schedule and a final schedule of Shop Drawing submission. The schedule shall be approved in writing by CONTRACTOR's Sureties and shall be satisfactory in form and substance to OWNER.

Application for Progress Payment

14.2. No later than the first day of each month, CONTRACTOR shall submit to OWNER for review an Application for Payment filled out and signed by CONTRACTOR covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents and also as OWNER may reasonably require. If payment is requested on the basis of materials and equipment not incorporated in the Work, but delivered and suitably stored at the site or at another location agreed to in writing, the Application for Payment shall also be accompanied by such data, satisfactory to OWNER, as will establish OWNER's title to the material and equipment and protect OWNER's interest therein, including applicable insurance. **Each subsequent Application for Payment shall include an affidavit of CONTRACTOR stating that all previous progress payments received on account of the Work have been applied to discharge in full all of CONTRACTOR's obligations reflected in prior Applications for Payment**.

CONTRACTOR'S Warranty of Title

14.3. CONTRACTOR warrants and guarantees that title to all Work, materials and equipment covered by any Application for Payment, whether incorporated in the Project or not, will pass to OWNER at the time of payment free and clear of all liens, claims, security interests and encumbrances (hereafter in these General Conditions referred to as "Liens").

Review of Applications for Progress Payment

14.4. OWNER will, within seven (7) days after receipt of each Application for Payment, except as submitted the Application for Payment or return the Application to CONTRACTOR indicating in writing the reasons for refusing to recommend payment. In the latter case, CONTRACTOR may make the necessary corrections and resubmit the Application. OWNER shall pay CONTRACTOR the amount recommended by ENGINEER, within twenty-one (21) days of the Application for Payment.

14.5. ENGINEER's recommendation of any payment requested in an Application for Payment will constitute a representation by ENGINEER to OWNER, based on ENGINEER's on-site observations of the Work in progress as an experienced and qualified design professional and on ENGINEER's review of the Application for Payment and the accompanying data and schedules that the Work has progressed to the point indicated; that, to the best of ENGINEER's knowledge, information and belief, the quality of the Work is in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning Project upon Substantial Completion, to the results of any subsequent tests called for in the Contract Documents and any qualifications stated in the recommendation) and that CONTRACTOR is entitled to payment of the amount recommended. However, by recommending any such payment ENGINEER will not thereby be deemed to have represented that exhaustive or continuous on-site inspections have been made to check the quality or the quantity of the Work, or that the means, methods, techniques, sequences and procedures of construction have been reviewed or that any examination has been made to ascertain how or for what purpose CONTRACTOR has used the monies paid or to be paid to CONTRACTOR on account of the Contract Price, or that title to any Work, materials or equipment has passed to OWNER free and clear of any Liens.

14.6. ENGINEER's recommendation of final payment will constitute an additional representation by ENGINEER to OWNER that the conditions precedent to CONTRACTOR's being entitled to final payment as set forth in paragraph 14.13 have been fulfilled.

14.7. ENGINEER may refuse to recommend the whole or any part of any payment if, in ENGINEER's opinion, it would be incorrect to make such representations to OWNER. ENGINEER may also refuse to recommend any such payment, or, because of subsequently discovered evidence or the results of subsequent inspections or tests, nullify any such payment previously recommended to such extent as may be necessary in ENGINEER's opinion to protect OWNER from loss because:

14.7.1. The Work is defective, or completed Work has been damaged requiring correction or replacement,

14.7.2. Written claims have been made against OWNER in connection with the Work,

14.7.3. The Contract Price has been reduced because of Modifications,

14.7.4. OWNER has been required to correct defective Work,

14.7.5. Of CONTRACTOR's unsatisfactory prosecution of the Work in accordance with the Contract Documents, or

14.7.6. Of CONTRACTOR's failure to make payment to Subcontractors, or for labor, materials or equipment.

Substantial Completion

14.8. When CONTRACTOR considers the entire Work ready for its intended use CONTRACTOR shall, in writing to OWNER, certify that the entire Work is substantially complete and request that ENGINEER issue a certificate of Substantial Completion. Within a reasonable time thereafter, OWNER, CONTRACTOR and ENGINEER shall make an inspection of the Work to determine the status of completion. If ENGINEER does not consider the Work substantially complete, ENGINEER will notify CONTRACTOR in writing giving his reasons therefor. If ENGINEER considers the Work substantially complete, ENGINEER will prepare a tentative certificate of Substantial Completion which shall fix the date of Substantial Completion and acceptance. There shall be attached to the certificate a tentative list of items to be completed or corrected before final payment.

14.9. OWNER shall have the right to exclude CONTRACTOR from the Work after the date of Substantial Completion, but OWNER shall allow CONTRACTOR reasonable access to complete or correct items on the tentative list.

Partial Utilization

14.10. Use by OWNER of any completed portion of the Work may be accomplished prior to Substantial Completion of all Work subject to the following:

14.10.1. OWNER at any time may request CONTRACTOR in writing to permit OWNER to use any part of the Work which OWNER believes to be substantially

complete and which may be so used without significant interference with construction of the other parts of the Work. If CONTRACTOR agrees, CONTRACTOR will certify to OWNER that said part of the Work is substantially complete and request ENGINEER to issue a certificate of Substantial Completion for that part of the Work. Prior to the OWNER using that portion of work, OWNER, CONTRACTOR and ENGINEER shall make an inspection of that part of the Work to determine its status of completion. If ENGINEER does not consider that part of the Work to be substantially complete, ENGINEER will notify OWNER and CONTRACTOR in writing giving the reasons therefor. If ENGINEER considers that part of the Work to be substantially complete, ENGINEER will execute and deliver to OWNER and CONTRACTOR a certificate to that effect, fixing the date of Substantial Completion as to that part of the Work, attaching thereto a tentative list of items to be completed or corrected before final acceptance and payment. Prior to issuing a certificate of Substantial Completion as to part of the Work, ENGINEER will deliver to OWNER and CONTRACTOR a written recommendation as to the division of responsibilities pending final payment between OWNER and CONTRACTOR with respect to security, operation, safety, maintenance, utilities and insurance for that part of the Work, which shall become binding upon OWNER and CONTRACTOR at the time of issuing the definitive certificate of Substantial Completion as to that part of the Work unless OWNER and CONTRACTOR shall have otherwise agreed in writing and so informed ENGINEER. OWNER shall have the right to exclude CONTRACTOR from any part of the Work which ENGINEER has so certified to be substantially complete, but OWNER shall allow CONTRACTOR reasonable access to complete or correct items on the tentative list.

14.10.2. In lieu of the issuance of a certificate of Substantial Completion as to part of the Work, OWNER may take over operation of a facility constituting part of the Work whether or not it is substantially complete if such facility is functionally and separately usable; provided that prior to any such takeover, OWNER and CONTRACTOR have agreed as to the division of responsibilities between OWNER and CONTRACTOR for security, operation, safety, maintenance, correction period, heat, utilities and insurance with respect to such facility.

Final Inspection

14.11. Upon written notice from CONTRACTOR that the Work is complete, ENGINEER will make a final inspection with OWNER and CONTRACTOR and will notify CONTRACTOR in writing of all particulars in which this inspection reveals that the Work is incomplete or defective. CONTRACTOR shall immediately take such measures as are necessary to remedy such deficiencies.

Final Application for Payment

14.12. After CONTRACTOR has completed all deficiency corrections to the satisfaction of ENGINEER and delivered all maintenance and operating instructions, schedules, warranty assignments, guarantees, Bonds, certificates of inspection, marked-up record documents and other documents, all as required by the Contract Documents, and after ENGINEER has indicated that the Work is acceptable (subject to the provisions of paragraph 14.15), CONTRACTOR may make application for final payment following the procedure for progress payments. The final Application for Payment shall be accompanied by all documentation called for in the Contract Documents (to include all Project Close Out Documents as defined in Article

1 of these General Conditions), and such other data and schedules as ENGINEER may reasonably require. CONTRACTOR shall also furnish an affidavit of CONTRACTOR to the effect that the labor, services, material and equipment charges have been satisfied in full; and that all payrolls, material and equipment bills, and other indebtedness connected with the Work have been paid or otherwise satisfied; and consent of the Surety, if any, to final payment.

Final Payment and Acceptance

14.13. If, on the basis of ENGINEER's observation of the Work during construction and final inspection and ENGINEER's review of the final Application for Payment and accompanying documentation--all as required by the Contract Documents--ENGINEER is satisfied that the Work has been completed and CONTRACTOR has fulfilled all of CONTRACTOR's obligations under the Contract Documents (to include all Project Close Out Documents as defined in Article 1 of these General Conditions), ENGINEER will, within seven (7) days after receipt of the final Application for Payment, indicate in writing ENGINEER's recommendation of payment and present the Application to OWNER for payment. Thereupon ENGINEER will give written notice to OWNER and CONTRACTOR that the Work is acceptable subject to the provisions of paragraph 14.15. Otherwise, ENGINEER will return the Application to CONTRACTOR, indicating in writing the reasons for refusing to recommend final payment, in which case CONTRACTOR shall make the necessary corrections and resubmit the Application. If the Application and accompanying documentation are satisfactory and complete in form and substance, OWNER shall, within twenty-one (21) days after receipt thereof, pay CONTRACTOR the amount recommended by ENGINEER.

CONTRACTOR's Continuing Obligation

14.14. CONTRACTOR's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. Neither recommendation of any progress or final payment by ENGINEER, nor the existence of an unresolved claim, nor the issuance of a certificate of Substantial Completion, nor any payment by OWNER to CONTRACTOR under the Contract Documents, nor any use or occupancy of the Work or any part thereof by OWNER, nor any act of acceptance by OWNER nor any failure to do so, nor the issuance of a notice of acceptability by ENGINEER pursuant to paragraph 14.13, nor any correction of defective Work by OWNER shall constitute an acceptance of Work not in accordance with the Contract Documents or a release of CONTRACTOR's obligation to perform the Work in accordance with the Contract Documents.

Waiver of Claims

14.15. The making and acceptance of final payment shall constitute:

14.15.1. A waiver of all claims by OWNER against CONTRACTOR, except claims arising from defective Work appearing after final inspection pursuant to paragraph 14.11 or from any failure to comply with the Contract Documents or the terms of any special guarantees specified therein; however, it shall not constitute a waiver by OWNER of any rights in respect of CONTRACTOR's continuing obligations under the Contract Documents; and

14.15.2. A waiver of all claims by CONTRACTOR against OWNER other than those previously made in writing and still unsettled.

ARTICLE 15 SUSPENSION OF WORK AND TERMINATION

OWNER May Suspend Work

15.1. OWNER may, at any time and without cause, suspend the Work or any portion thereof for a period of not more than ninety (90) days by notice in writing to CONTRACTOR and fix the date on which Work shall be resumed. CONTRACTOR shall resume the Work on the date so fixed unless CONTRACTOR and OWNER agree otherwise. CONTRACTOR will be allowed an extension of the Contract Time directly attributable to any suspension if CONTRACTOR makes a claim therefor as provided in Article 12 of these General Conditions, but shall not be entitled to an increase in the Contract Price or to any sums in damages.

OWNER May Terminate

15.2. If CONTRACTOR is adjudged bankrupt or insolvent; makes a general assignment for the benefit of creditors; or if a trustee or receiver is appointed for CONTRACTOR or for any of CONTRACTOR's property; or if CONTRACTOR files a petition to take advantage of any debtor's act or to reorganize under the bankruptcy or similar laws; repeatedly fails to supply sufficient skilled workmen or suitable materials or equipment; repeatedly fails to make prompt payments to Subcontractors for labor, materials, or equipment; disregards laws, ordinances, rules, regulations, or orders of any public body having jurisdiction; disregards the authority of ENGINEER; or violates any provision of the Contract Documents, then OWNER may, without prejudice to any other right or remedy and after giving CONTRACTOR and CONTRACTOR's Surety seven days' written notice, terminate the services of CONTRACTOR and take possession of the Project and of all materials, equipment, tools, construction equipment and machinery thereon owned by CONTRACTOR and make demand upon CONTRACTOR's Surety to finish the Work. If Surety fails to make satisfactory arrangements within twenty-one days for completion of the Work, OWNER may finish the Work by whatever means it may deem expedient. In such case CONTRACTOR shall not be entitled to receive any further payment until the Work is finished. If the unpaid balance of the Contract Price exceeds the direct and indirect costs of completing the Project, including compensation for additional professional services, such excess shall be paid to CONTRACTOR. If such costs exceed such unpaid balance, CONTRACTOR shall pay the difference to OWNER. Such costs incurred by OWNER shall be determined by OWNER and incorporated in a Change Order.

15.3. Where CONTRACTOR's services have been so terminated by OWNER, said termination shall not affect any rights of OWNER against CONTRACTOR then existing or which may thereafter accrue. Any retention or payment of monies by OWNER due CONTRACTOR will not release CONTRACTOR from liability.

15.4. If the OWNER, which is a public entity, makes a good faith determination that such action is in the best interests of the entity, OWNER may terminate the Work or the Project upon seven days' written notice to CONTRACTOR for any reason which is within the legitimate purview of OWNER.

If OWNER terminates the Work under this provision, CONTRACTOR shall be entitled to payment for all portions of the Work completed and materials on hand at the date of termination and for expenses reasonably resulting from termination.

15.4.1. If, after notice of termination of the CONTRACTOR's right to proceed under the provisions of this clause, it is determined for any reason that the CONTRACTOR was not in default under the provisions of this clause, or that the delay was excusable under the provisions of this clause, the rights and obligations of the parties shall, if the Contract contains a clause providing for termination for convenience of the OWNER, be the same as if the notice of termination had been issued pursuant to such clause. If, in the foregoing circumstances, this Contract does contain a clause providing for termination for convenience of the OWNER, the Contract shall be equitably adjusted to compensate for such termination and the Contract modified accordingly.

CONTRACTOR May Stop Work or Terminate

15.5. If, through no act or fault of CONTRACTOR, the Work is suspended for a period of more than ninety (90) days by OWNER or under an order of court or other public authority, or if ENGINEER fails to act on any Application for Payment within thirty days after it is submitted, or if OWNER fails to pay CONTRACTOR any sum approved by ENGINEER within thirty (30) days of its approval and presentation, then CONTRACTOR may, upon seven (7) days written notice to OWNER, terminate the Agreement and recover from OWNER payment for all Work executed and any expense sustained. In addition, and in lieu of terminating the Agreement, if ENGINEER has failed to act on an Application for Payment or OWNER has failed to make any payment as aforesaid, CONTRACTOR may, upon seven (7) days notice to OWNER, stop the Work until payment is made.

ARTICLE 16 FORMAL DISPUTE

16.1. Prior to seeking judicial relief in a court of law, and in addition and prior to arbitration, the interested parties shall endeavor to settle disputes by mediation under the requirements of Sections 13-4C-1 through 13-4C-11 NMSA 1978. Mediation shall commence within the time limits stipulated in the Act. Such time limits shall then be extended for arbitration by ten days (Chapter 63, Laws of 1992.)

16.2. All persons or entities whose interests or responsibilities in the dispute are substantial may be joined, and claims and disputes may be consolidated, in accordance with the law.

16.3. CONTRACTOR will carry on the Work and maintain the progress schedule during any dispute resolution proceedings, unless otherwise agreed by CONTRACTOR and OWNER in writing.

ARTICLE 17 MISCELLANEOUS

Giving Notice

17.1. Whenever any provision of the Contract Documents requires the giving of written notice, it shall be deemed to have been validly given on the date delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended or three days after sent by certified mail, postage prepaid and return receipt requested, to the last business address known to the person who gives the notice.

Computation of Time

17.2. When any period of time is referred to in the Contract Documents by days, it shall be computed to include the first and the last day of such period.

General

17.3. All monies not paid when due hereunder shall bear interest at the maximum rate allowed by law at the place of the Project.

17.4. All Specifications, Drawings and copies thereof furnished by OWNER shall remain the property of OWNER. They shall not be used on another Project and, with the exception of those sets which have been signed in connection with the execution of the Agreement, shall be returned on request upon completion of the Project.

17.5. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder and, in particular but without limitation, the warranties, guarantees, and obligations imposed upon CONTRACTOR by paragraphs 6.29, 13.1, 13.10, and 14.3 and the rights and remedies available to OWNER there-under shall be in addition to and shall not be construed in any way as a limitation of any rights and remedies available to them which are otherwise imposed or available by law, by special guarantee or by other provisions of the Contract Documents.

17.6. Should OWNER or CONTRACTOR suffer injury or damage to person or property because of any error, omission or act of the other or of any of the other's employees or agents or others for whose acts the non-injured party is legally liable, claim shall be made in writing to the other party within a reasonable time of the first observance of such injury or damage.

17.7. The Contract Documents shall be governed by the laws of the State of New Mexico.

Minimum Wages

17.8. The CONTRACTOR and any Subcontractor performing Work under this Contract shall comply fully with the "Public Works Minimum Wage Act", Section 13-4-11 through 13-4-17 NMSA 1978 (1988 Repl.), and all amendments thereto, which provides in part that “the CONTRACTOR shall pay all mechanics and laborers employed on the site of the project unconditionally and not less often than once a week, and without subsequent unlawful deduction or rebate on any account, the full amounts accrued at time of payment, computed at wage rates not less than those stated in the advertised specifications.”

The minimum hourly rate of wage which may be paid to workmen in each trade or occupation required for the Work under the Contract employed in the performance of the Contract either by the CONTRACTOR or Subcontractor or by other persons doing or contracting to do the whole or part of the Work contemplated by the Contract shall be as set forth in the schedule of Minimum Wage Rates appearing in the State Wage Rates, and the workmen employed in the performance of the Contract shall be paid not less than the applicable specified minimum hourly rate of wage as such is set forth in said schedule.

The scale of wages to be paid shall be posted by the CONTRACTOR in a prominent and easily accessible place at the site of the work; and it is further provided that there may be withheld

from the CONTRACTOR so much of accrued payments as may be considered necessary by the OWNER to pay to laborers and mechanics employed by the CONTRACTOR or Subcontractor on the Work, the difference between the rates of wages required by the Contract to be paid laborers and mechanics on the Work and the rates of wages received by such laborers and mechanics and not refunded to the CONTRACTOR, Subcontractors, or their agents.

The attention of the CONTRACTOR and any Subcontractor performing work under this Contract is directed to Section 13-4-12 NMSA 1978 (1988 Repl.) which reads in part, as follows:

"A. As used in Section 13-4-11 NMSA 1978, 'wages', 'scale of wages', 'wage rates', 'minimum wages', and 'prevailing wages' include:

(1) The basic hourly rate of pay, and

(2) The amount of:

(a) The rate of contribution irrevocably made by a CONTRACTOR or Subcontractor to a trustee or a third person pursuant to a fund, plan, or program; and

(b) The rate of costs to a CONTRACTOR or Subcontractor which reasonably may be anticipated in providing benefits to laborers and mechanics pursuant to an enforceable commitment to carry out a financially responsible plan or program which was communicated in writing to the laborers and mechanics affected for: 1) medical or hospital care, 2) pensions on retirement or death, 3) compensation for injuries or illness resulting from occupational activity, or 4) insurance to provide for any of the foregoing, and for 5) employment benefits, 6) life insurance, 7) disability and sickness insurance, 8) accident insurance, 9) vacation and holiday pay, 10) costs of apprenticeship or other similar programs, or for 11) other bona fide fringe benefits, but only where the CONTRACTOR or Subcontractor is not required by other federal, state, or local law to provide any of the foregoing or similar benefits."

However, the obligation of a CONTRACTOR or Subcontractor to make payment in accordance with the prevailing wage determinations of the State Labor Commissioner [Director of the Labor and Industrial Division of the Department of Labor], insofar as Section 13-4-11 NMSA 1978, or other sections or legislative acts incorporating Section 13-4-11 NMSA 1978 are concerned may be discharged by:

(1) The making of payments in cash;

(2) The making of contributions of a type referred to in (2a) above; or

(3) The assumption of an enforceable commitment to bear the costs of a plan or program of a type referred to in (2b) above or any combination thereof, where the aggregate of any payments or contributions and costs therefor is not less than the rate of pay described in Section 13-4-11 NMSA 1978, plus the amount referred to in this section."

In the event it is found by the State Labor Commissioner that any laborer or mechanic employed by the CONTRACTOR or Subcontractor on the site of the Project covered by the Contract has been or is being paid as a result of a willful violation of a rate of wages less than the rate of wages required by the Contract, the OWNER may, by written notice to the CONTRACTOR and CONTRACTOR's Subcontractor, if the violation involves the Subcontractor, terminate their right to proceed with the work or such part of the Work as to which there has been a willful failure to pay the required wages; and the OWNER may prosecute the Work to completion by Contract or otherwise, and the CONTRACTOR and CONTRACTOR's sureties shall be liable to the State of New Mexico for any excess costs occasioned thereby. Any party receiving notice of termination of a contract or subcontract under the provisions of this section may appeal the finding of the State Labor Commissioner as provided in the Public Works Minimum Wage Act.

There is no representation on the part of the OWNER that labor can be obtained at the hourly rates shown in the General Conditions. It is the responsibility of BIDDERs to inform themselves as to local labor conditions and prospective changes or adjustments of wage rates. No increase in the Contract Price shall be allowed or authorized on account of the payment of wage rates in excess of those listed. The CONTRACTOR and any Subcontractor performing work under this Contract shall submit one certified copy of weekly payrolls to the State Labor and Industrial Commission not later than five working days after close of any payroll period that occurs during the month of June. One certified copy of all payrolls shall be submitted to the ENGINEER not later than five (5) working days after the close of any payroll. The scale of wages must be posted by the CONTRACTOR at the project site. The weekly payrolls shall conform to the following:

(1) Form and Content: Any particular form may be used for CONTRACTOR or Subcontractor payrolls, provided all payrolls contain the following information:

(a) The employee's full name, address, and social security number.

(i) The employee's full name and social security number need only appear on the first payroll on which employee's name appears.

(ii) The employee's address need be shown only on the first submitted payroll on which employee's name appears, unless a change of address necessitates an additional submittal to reflect the new address.

(b) The employee's classification (or classifications).

(c) The employee's hourly wage rate (or rates); and, where applicable, employee's overtime hourly wage rate (or rates).

(d) The daily and weekly hours worked in each classification, including actual overtime hours worked (not adjusted).

(e) The itemized deductions made.

(f) The net wages paid.

(2) Numbering Payrolls: All payrolls shall be numbered starting with number one (1) for the first payroll at the beginning of the job and continuing in numerical order until the job is completed.

(3) Certification of Payrolls: The CONTRACTOR and each Subcontractor shall submit a weekly statement of compliance in the following form:

Date _____

I, _____, _____ do hereby state:

1. That I pay or supervise the payment of the persons employed by _____ on the _____ that during the payroll period commencing on the _____ day of _____, 20___, and ending the _____ day of _____, 20___, all persons employed on said project have been paid the full weekly wages earned, that no rebates have been or will be made either directly or indirectly to or on behalf of said _____ from the full weekly wages earned by any person and that no deductions have been made either directly or indirectly from the full wages earned by any person other than deductions permitted by law.

2. That any payrolls under this Contract required to be submitted for the above period are correct and complete; that the wage rates for laborers or mechanics contained therein are not less than the applicable wage rates incorporated into the Contract; that the classifications set forth therein for each laborer or mechanic conform with the work employee performed.

3. That any apprentices employed in the above period are duly registered in a bona fide apprenticeship program registered with a state apprenticeship agency recognized by the Bureau of Apprenticeship and Training, United States Department of Labor.

17.8.1. Minimum Wages (Federal) - In the event that any work under this Contract involved Federal Funds, then the prevailing area Wage Rate Decision listed by the U.S. Department of Labor shall be made a part of this Contract. Whenever a conflict exists between the State and Federal Minimum Hourly Wage Rates, the higher of the conflicting wages rates shall govern.

Archaeological Salvage and Reports

17.9. Where objects of historical, archaeological, and paleontological value, including ruins, sites, buildings, artifacts, fossils and other objects of antiquity are encountered within the areas on which the CONTRACTOR's operations are performed, the CONTRACTOR shall postpone operations in the area, shall preserve such objects from disturbance or damage, and shall immediately notify the ENGINEER of their existence and location.

Upon receipt of such notification, the ENGINEER will arrange for the disposition of the objects or for the recording of data relative thereto and will notify the CONTRACTOR when it is proper to proceed with the Work in the affected area. In this regard, the ENGINEER may consult the Museum of New Mexico or other appropriate agency as to the nature and disposition of such objects. If the CONTRACTOR is directed by the ENGINEER to perform any Work in salvaging

said objects, the CONTRACTOR shall do so in accordance with the "Changes in the Work" provision of Article 10.

Measurement

17.10. Measurement of Quantities for Unit Price Work: Unless otherwise specified, linear or area quantities of Work, such as grading, landscaping, paving, curb, gutter, sidewalk, drive apron, and other Work of a similar nature, shall be determined from measurements or dimensions of such Work and computed in horizontal planes. However, linear quantities of underground cable, fencing, piling, and timber shall be considered as being the true length measured along the longitudinal axis thereof. For pipe Work see related technical specifications; but if the method of measurement for pipe Work is not stated therein, it shall be measured along the longitudinal axis of the pipe in place from center of fitting to center of fitting. A station, when used as a definition or term of measurement, will be one hundred (100) linear feet.

Method of Measurement

17.11. Materials and items of Work which are to be paid for on the basis of measurement shall be measured in accordance with the methods stipulated in the particular articles herein covering materials or types of Work.
When material is to be paid for on a volume basis and it would be impracticable to determine a volume by the specified method of measurement or when requested by the CONTRACTOR and approved by the ENGINEER, the material will be weighed in accordance with the requirements specified for weight measurement and such weights will be converted to volume measurement for payment purposes. Factors for conversion from weight measurement to volume measurement will be determined by the ENGINEER. Unless otherwise provided, when mineral aggregate or roadway material is being paid for by weight, deductions from pay quantities will be made for the weight of water in excess of three percent (3%) if the material is to be treated with bitumen and six percent (6%) if the material is to be water bound.

Units of Measurement

17.12. Measurements shall be in accordance with U.S. Standard Measures. A pound shall be avoirdupois. A ton shall be two thousand (2,000) pounds. The unit of liquid measure shall be the U.S. gallon.

Certified Weights

17.13. All materials to be paid for at a Contract unit price per ton shall be weighed on platform scales furnished by the CONTRACTOR or the supplier of the material at the CONTRACTOR's expense, or such materials may be weighed on certified public scales at the CONTRACTOR's expense. All scales shall be of adequate size to permit the entire vehicle to rest on the scale platform while being weighed. Scales furnished by the CONTRACTOR shall be installed on beams, piers, or foundations of sufficient strength and bearing to prevent the weighing mechanism supporting the scale platform from settling. The weighing facilities shall include a weatherproof scale house with a minimum floor area of thirty-two (32) square feet and equipped with adequate heat and light.

ARTICLE 18 UTILITIES

Policy on the proximity of water and sewer lines

18.1. Whenever possible, it is desirable to lay parallel water and sewer lines at least ten (10) feet apart horizontally, and the water line should be a higher elevation than the sewer. If this is not possible, separate trenches will 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 three (3) feet above the sewer; otherwise the sewer shall be of cast iron pipe, or equivalent, for ten (10) feet on each side of the water line.

18.2. Existing House Sewer Lateral or Water Service Connections, and Replacement of Mains.

18.2.1. Where house service line connections to existing sewer mains and water mains are encountered, the CONTRACTOR shall insure that the service line will not be disturbed or damaged. Should any service line connection be broken during the construction of the new line, it shall be replaced by the CONTRACTOR with new pipe, appropriate for the application, as determined by the ENGINEER. No extra compensation will be allowed the CONTRACTOR for this item.

18.2.2. Where the horizontal alignment of the new sanitary sewer line coincides with the alignment of an existing sanitary sewer line and the grade of the new line is approximately at the same grade as the existing line or lower, then the existing line shall be removed or dealt with as ordered by the ENGINEER. The cost of this work when applicable shall be paid for under the appropriate item in the Bid Proposal. The ENGINEER shall determine if it is necessary to pump sewage around the replacement work, or if it is possible to temporarily plug the sewer line during the replacement operation. In the case of by-pass pumping, it will be paid for as indicated in the Bid Proposal.

18.3. Operation of the Existing Water System

18.3.1 All shutoffs shall be done by the OWNER. The CONTRACTOR shall notify the OWNER forty-eight (48) hours prior to the date of required shutoff. The OWNER shall make a "trial shutoff" of the system within the project limits prior to issuance of Notice to Proceed, in order to preclude delay of emergency and required shutoffs. If valves cannot be located or are not in operating condition, the OWNER shall notify the CONTRACTOR as soon as possible. The OWNER's personnel will locate the valves, make the necessary repairs, or determine an alternate method of making the shutoff.

18.3.2. The CONTRACTOR shall notify each household, office or other affected water user that a shutoff will be made, giving full details by personal contact if possible or by leaving a door knob hanger notification. CONTRACTOR shall also notify the media, i.e. radio stations and newspaper, the City Water Shop, (575) 439-4244, and the ENGINEER giving full details of the date, time and location of the shutoff. Notifications shall be given at least twenty-four (24) hours in advance of a shutoff.

18.3.3. The CONTRACTOR shall notify the Fire Department when fire hydrants are taken out of service and returned to service.

18.3.4. The OWNER shall be responsible for the actual operation of the valves.

18.3.5. EMERGENCY BREAKS: The Water Division, (575) 439-4244, shall be notified immediately so that it may perform the shutoff.

18.4. Protection and Restoration of Property

18.4.1. The CONTRACTOR shall never unnecessarily interfere with or interrupt the services of any public utility having property within or adjacent to the streets, alleys and easements involved in the Work and shall take all necessary precaution and effort to locate and protect all underground conduit, cables, pipes, water mains, sewers, structures, gas lines, trees, monuments, power lines, telephone and telegraph lines, traffic control devices and other structures, both below and above ground. CONTRACTOR shall give all Public Utility Companies a reasonable notice in writing, but in no event less than forty-eight (48) hours, for any work that CONTRACTOR contemplates which would interfere in any way whatsoever with the service of any existing public utility and City-owned facilities. If such public utility does not cooperate for the protection of its services, the CONTRACTOR shall notify the ENGINEER. Utility lines shall be located by the CONTRACTOR far enough in advance of construction work in order that the owner of such lines may raise, lower, realign or remove lines and structures, if necessary, and in order that the ENGINEER may make any line and grade changes necessary should the existing utility lines conflict with the Work under construction providing such adjustments do not materially affect the Work. The CONTRACTOR shall immediately report any damages to property or plant of public utility companies and City property to the company or owner involved, and to the ENGINEER.

18.4.2. The CONTRACTOR shall restore at CONTRACTOR’s own expense any public, City-owned, or private property damage for which CONTRACTOR is directly or indirectly responsible to a condition equal to that existing before damage. The CONTRACTOR shall promptly notify CONTRACTOR’s insurance carrier of the alleged damage, and if CONTRACTOR refuses to do so upon notice or if CONTRACTOR otherwise fails to make a restoration for which CONTRACTOR is responsible, the OWNER may cause such restoration and deduct cost from monies due, or which may become due, the CONTRACTOR.

18.4.3. The CONTRACTOR shall not remove, realign, or adjust any official City traffic control device. CONTRACTOR shall give the ENGINEER forty-eight (48) hours notice of any official City traffic control devices that need to be moved. The OWNER shall move all traffic control devices as soon as practical thereafter.

18.5. Abandoned Utilities

18.5.1. Unless otherwise specified, the CONTRACTOR shall remove all interfering portions of utilities which are shown on the drawings as "abandoned" or "to be abandoned in place" and which interfere with the construction of the project. All abandoned water mains shown on the drawings as "abandoned" or "abandoned in

place" or found during construction shall be removed or capped at a minimum, unless otherwise specified. All costs involved in said removals shall be included in the prices Bid for the various items of Work. All such abandoned utilities removed by the CONTRACTOR shall be stored on the site where directed and shall remain the property of the OWNER utility company or contracting agency as determined by the ENGINEER.

18.5.2. Where utilities are shown on the drawings as "abandoned" or "to be abandoned in place," it shall be the CONTRACTOR's responsibility to contact the utility company involved within forty-eight (48) hours prior to excavating around such utilities to ascertain that the abandonment of the utility has been completed.

18.6. Location of Existing Utilities

18.6.1. The public utilities shall be responsible to locate their utilities and provide information stating the horizontal and vertical alignments of same. If field verification excavations are required, the public utility will provide same in a timely manner.

18.6.2. Utilities which upon exploration are found to interfere with the permanent project Work, or which are within the trenching prism as defined by OSHA, will be relocated, altered or reconstructed by others or the ENGINEER may order changes in location, line or grade of structures being built in order to avoid the utilities. The cost of such changes will be paid for under applicable Bid Items.

18.7. Unknown Utilities Disclosed by the CONTRACTOR or by Others During the Contract Work.

18.7.1. In the event that a utility is disclosed subsequent to the award of the Contract, such utility not being indicated on the drawings, or in the event that an existing utility is found to be in a materially different location than shown on the drawings and thus requires additional work on the part of the CONTRACTOR for its maintenance, relocation or support, the necessary alteration, relocation, proper support and protection shall be done and paid for as follows:

When said utility is found to occupy the space within the trenching prism as defined by OSHA, or the permanent works to be constructed, it shall be relocated or the CONTRACTOR shall be paid extra for its support.

18.8. Responsibility of the CONTRACTOR

18.8.1. The CONTRACTOR shall be responsible for all costs for the repair of any and all damage to the Contract Work or to any utility (which is previously known and disclosed to CONTRACTOR by the utility) as may be caused by CONTRACTOR’s operations. Utilities which are relocated by others in order to avoid interference with structures and which cross the project Work shall be maintained in their relocated positions by the CONTRACTOR. All costs for such work shall be absorbed or included in the prices bid for the various items of Work.

18.9. Delays Caused by Failure to Relocate Utilities

18.9.1. Where parties other than the CONTRACTOR are responsible for the relocation of utilities and a delay in the CONTRACTOR's Work is caused by the failure on the part of said parties to remove or relocate such utilities in time to prevent such delay, or by any action or lack of action on the part of the Contracting Agency, the CONTRACTOR shall be entitled to an extension of the Contract Time as determined by the ENGINEER.

18.9.2. In order to minimize delays to the CONTRACTOR caused by the failure of other parties to relocate utilities which interfere with structures, the CONTRACTOR may upon request to the ENGINEER, be permitted to temporarily omit the portion of the Work affected by the utility. The portion thus omitted shall be constructed by the CONTRACTOR immediately following the relocation of the utility involved. The CONTRACTOR shall be paid mobilization and demobilization to construct the omitted portion.

ARTICLE 19 TRAFFIC CONTROL

19.1. CONTRACTOR shall perform all signing, barricading and channelization required for the project in accordance with current edition of the Manual on Uniform Traffic Control Devices, latest edition. All signs, barricades and channelizing devices used at night shall be reflectorized with retroreflective sheeting (both orange and white). All advance warning signs used at night shall be equipped with flashing warning lights; all channelizing devices used at night shall be equipped with steady burning warning lights.

19.2. Traffic control to be used on the Project shall be pre-approved by the OWNER.

ARTICLE 20 DIGITAL VIDEO RECORDING

20.1 Prior to initiating construction operations, CONTRACTOR, shall perform digital video recording of the entire project, its full length and width. The CONTRACTOR, shall also include or add as necessary, any areas to be disturbed for material storage, employee parking or equipment storage.

The video documentation shall be completed in digital format; it shall be a minimum resolution of 1920 x 1080 pixels, at 60 fps (frame per second) and in color. The video documentation shall be performed between 10:00 a.m. and 2:00 p.m. during periods of full sun exposure. The actual date of recording shall be date-stamped within each frame of the video. Approval of the video must be obtained from the ENGINEER prior to the commencement of any clearing and grubbing operations.

A DVD copy of the video recording shall be submitted to the ENGINEER, in the format compatible with standard DVD players.

All cost associated with the video recording specified in this article shall be considered incidental to other related items of work and no separate payment will be made unless specifically indicated elsewhere in the Special Provisions.

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CHAPTER 1 – GENERAL STANDARDS

Article 01-01-010 Acronyms and Definitions

Acronyms:

AASHTO	American Association of State Highway and Transportation Officials
AC	Asbestos-Cement
ACI	American Concrete Institute
ACNM	Associated Contractors of New Mexico
AGC	Associated General Contractors of America, Inc.
ANSI	American National Standards Institute
APWA	American Public Works Association
ASCE	American Society of Civil Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
ATSSA	American Traffic Safety Services Association
AWG	American Wire Gage
AWWA	American Water Works Association
BM	Benchmark
EPA	Environmental Protection Agency
FH	Fire Hydrant
FHWA	Federal Highway Association
G	Gas Line
GIS	Geographic Information System
ID	Inside Diameter
Inv	Invert
MH	Manhole
mg/l	Milligrams per Liter
MUTCD	Manual on Uniform Traffic Control Devices
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
NM811	New Mexico One-Call (https://www.nm811.org/)
NMAC	New Mexico Administrative Code
NMDOT	New Mexico Department of Transportation
NMPRC	New Mexico Public Regulation Commission
NMSA	New Mexico Statutes Annotated--1978 Compilation as Amended

NSF	National Sanitation Foundation
OD	Outside Diameter
OHP	Overhead Power
OHP&T	Overhead Power & Telephone
OHT	Overhead Telephone
OSHA	Occupational Safety and Health Association
PC	Point of Curvature
PMBP	Plant Mix Bituminous Pavement
Ppm	Parts per Million
POWTS	Publicly owned Wastewater Treatment System
PRC	Point of Reverse Curvature
Psf	Pounds per Square Foot
Psi	Pounds per Square Inch
PT	Point of Tangency
PVC	Polyvinyl Chloride Pipe
Pvmt	Pavement
Q	Rate of Flow
RCP	Reinforced Concrete Pipe
SCCP	Steel Cylinder Concrete Pipe
Sec	Section
Sta	Station
Std	Standard
TCT	Traffic Control Technician
UGT	Underground Telephone
UL	Underwriters' Laboratories, Inc.
V	Velocity

Definitions:

Alley – A public way, other than a street, intended for secondary access and service to the rear or side of the property.

Arterial Street – Is a roadway classification defined by higher traffic volumes, used for trips of moderate lengths, and offers connectivity to higher arterial systems (i.e., interstates). This

roadway classification is characterized by a high degree of mobility with limited abutting direct access points.

Asphalt Treated Base Course – Is a dense-graded hot mix asphalt with a wide gradation band and lower asphalt content intended for use as a stabilizing base course.

Backfill – Is suitable material used to refill an excavation.

Building Setback – Is the required separation between a lot line and a building or structure.

City - The City of Alamogordo and all assigned representatives.

City Engineer – The City of Alamogordo's Engineer.

Collector Street – Is a roadway classification which typically connects larger traffic generators to the Arterial network. Typically characterized by more connecting driveways, fewer travel lanes, lower speed limits, and are prevalent between Arterial routes.

Construction and Demolition Activities – Activities directly related to a public or private improvement project.

Contract Documents - The written agreement between the Contractor and the owner setting forth the obligations of the parties thereunder, including but not limited to the performance of the Work and the Basis of Payment. The Contract Documents are defined in the Agreement and may include: the Advertisement for Bids, Addenda (whether issued prior to the opening of Bids or the execution of the Agreement), Instructions to bidders, Contractor's Bid, the Performance Bonds and Labor and Payment Bond (for both Contractor and subcontractor, if applicable to subcontractor), the Certificate of Insurance, the Statement of Bidder's Qualifications, the Campaign Contribution Disclosure Form, the Notice of Award, the Notice to Proceed, these General Conditions, the Contract Specifications, any Special Conditions, any referenced Specifications or Standards, Drawings and Plans, and all Modifications to the above, including Change Orders and extensions of Contract Time, all of which constitute one instrument.

Contractor - The person, firm, or corporation with whom an owner has executed the agreement.

Crown – Is the side-to-side or cross-sectional shape of a roadway surface. Roadways may have center-crown, in-sloped crowns, or out-sloped crowns.

Cul-De-Sac – A local street with only one (1) outlet having an appropriate terminus for the safe and convenient reversal of traffic movement.

Curb Cut – Is an opening in an existing curb to allow for a driveway, right-of-way entry from the street, or a temporary cut for the installation of subsurface utility.

Curb Return – Is a curved section of a curb located at a corner of intersecting roadways, connection point of curbs on the main road to an intersecting road.

Detour – An alternate route necessary to avoid something (i.e., vehicle crash, construction activities, etc.) within the existing travel route.

Drawings or Plans - The drawings which show the character and scope of the Work to be performed and which have been prepared or approved by an engineer.

Driveway, Private – A vehicular way not serving more than one (1) lot or parcel of land.

Driveway, Common – A vehicular way serving more than one (1) lot or parcel of land.

Engineer - The person or firm designated by an Owner, who is responsible for providing engineering services.

Easement, Private – A right-of-use granted for the limited use of private landowners and where general use and maintenance of such area is governed by an agreement which runs with the land. This easement is serviceable only by mutual consent of all of the parties that benefit from the Easement.

Easement, Public – An easement dedicated for use by the public, which is included within the dimensions or areas of lots or parcels of land.

Embankment – Excavation, borrow, or imported material suitable for use in fill sections above prepared existing grades.

Federal Highway Administration (FHWA) – Is a division of the United States Department of Transportation that specializes in highway transportation.

Field Order - A written order issued by an engineer or Public Works Inspector which clarifies or interprets the Plans and Specifications, that does not affect the cost or time to complete the work stipulated by the Contract Documents.

Frontage Road – Used to relieve Major Arterial streets of side traffic.

Grade – The slope of any surface specified in percentage terms or in terms of elevation.

Grading – Any disturbance of the surface of the land with earth moving equipment.

Hot Mix Asphaltic Concrete – Is a combination of stone, sand, or gravel bound together by asphalt cement. After it is mixes at a high temperature, laid and compacted, the result is an improved driving surface.

Intersection – the location where two (2) or more streets cross at grade.

Local Street – Is a roadway classification which typically carry no through traffic movement and are used to provide access to adjacent lands and developments.

Lot – is defined as an individual parcel of land for a development. Secondarily, it is a particular batch or collection of materials (i.e., pipe or other material).

Median – A strip of land that separates the opposing flows of traffic on a street.

New Mexico One-Call (NM811) – Acts as a communication link between utility companies and individuals planning any digging activity.

OWNER – The City of Alamogordo's representatives.

Parkway – Is defined as a buffer between a roadway and roadside improvements (sidewalks, walking paths, developments, etc.). Typically consisting of beautification or landscaping.

Pedestrian Way – A specifically designated place, means, or way by which pedestrians shall be provided safe, adequate and usable circulation; normally provides access through the interior of a property or development. Does not include street, vehicular easement, right-of-way, or required sidewalk along a street or vehicular way.

Plans – Documents governing construction of improvements.

Plat – Is a map, drawn to scale, depicting how a parcel of land is divided. A plat includes a description of the different boundaries, land features, and adjacent amenities.

Property Line – The line(s) of record bounding a lot or other parcel of land.

Project - The entire construction to be performed as provided in the Contract Documents.

Project Manager – The owner's representative who is delegated the responsibility for administration of the Project and who is the primary point of contact for the Contractor.

Public Rights of Way – A general term denoting land, property, or interest therein which is acquired, dedicated, or reserved for use by state, county, or municipal transportation purposes.

Public Works Inspector – Inspector representing the City of Alamogordo responsible for inspection of all Work done and all materials furnished. He is authorized to call to the attention of the CONTRACTOR any failure of the Work or materials to conform to the City's Standards, Plans and Specifications. He shall have the authority to reject materials or suspend Work until any questions at issue can be resolved.

Reference Specifications, Test Methods, and Applicable Codes - All Standard Specifications and test methods of any society, association, or organization, referred to herein, are hereby made a part of these Technical Standards the same as if written in full (any reference to a paragraph or subparagraph within an article shall include all general provisions of the article to which reference is made). References to such Standards refer to the latest published issues as of the date of the development or Project is approved, unless otherwise specified. Reference to local or state codes and laws shall mean the latest adopted and published codes as of the date of the development or Project is approved, unless otherwise specified.

Roadway – A thoroughfare, including shoulders, for vehicular use.

Service Connections - Service Connections shall be construed to mean all or any portion of the pipe, conduit, cable, or duct which connects a utility main or distribution line to a building, home, residence, or property.

Shop Drawings - All drawings, diagrams, illustrations, brochures, schedules, and other data which are prepared by Contractor, a subcontractor, manufacturer, supplier, or distributor which have been approved by owner and/or the City Engineer and which illustrate the equipment, material, or some portion of the Work.

Shoulder – The portion of the roadway contiguous with the traveled way, outside of the edge of pavement (designated driving surface), for accommodation of stopped vehicles, emergency use, and lateral support of base and surface courses.

Sidewalk – A paved path (typically concrete pavement) paralleling roadways or parking lots.

Slope – The gradient or incline of the land. Typically expressed in percent (i.e., 2% slope) or in horizontal distance per vertical distance (i.e., 6:1 slope).

Special Conditions - Conditions which modify any article or paragraph of these Technical Standards.

Specifications (also Technical Specifications) - A written technical description of materials, equipment, construction systems, standards and workmanship as applied to the Work.

Street – A right-of-way dedicated to the use of the public by which vehicles and pedestrians shall have lawful and usable ingress and egress, which has been accepted for maintenance and control

by the City, County or State. See Streets and Roads Detail Drawings for street classifications and typical cross sections.

Street, Stub – A street that has been designed to allow for the future extension of the street through subsequent developments.

Subcontractor - An individual, firm or corporation having a direct contract with Contractor or with any other subcontractor for the performance of a part of the Work at the site, and who has a current City of Alamogordo Business Registration.

Subgrade – The prepared earth surface on which an asphalt road section, concrete section, or other proposed surface treatment or foundation is to be placed.

Traffic Control Supervisor – An individual trained on the concepts and techniques of temporary traffic control as well as the design of setups, their implementation, and recognizing, analyzing, and correcting deficiencies. Typically certified by the American Traffic Safety Services Association (ATSSA) or Associated Contractors of New Mexico (ACNM).

Traffic Control Technician – An individual trained in a basic knowledge of temporary traffic control with experience in installing traffic control devices, monitoring their performance, and recognizing their deficiencies. Typically certified by the American Traffic Safety Services Association (ATSSA) or Associated Contractors of New Mexico (ACNM).

Utility - Overhead or underground wires, pipes, conduits, ducts, or structures, operated and maintained in or across a public right-of-way or easement or private easement operated and maintained to supply such commodities as water, gas, power, telephone, cable television, or sewer.

(a) Public Utility - Owned and operated by a municipality or another political subdivision of the state.

(b) Private Utility - Owned and operated by a private company or corporation.

Work - Any and all obligations, duties, and responsibilities necessary to the successful completion of the Project assigned to or undertaken by Contractor, including all labor, materials, equipment, incidentals, and the furnishing and installation thereof.

Article 01-01-020 Purpose

The following general standards and their requirements have been prepared and adopted by the City of Alamogordo, New Mexico, to guide and assist developers, sub-dividers, owners of subdivisions, engineers and Contractors, in the preparation of plans, specifications, and for the construction of City utilities, streets, and improvements inside the public right-of-way in accordance with the Alamogordo Municipal Code. These Technical Standards shall be the minimum requirements for the design and construction of these improvements.

All the Technical Standards and requirements in the Subdivision Regulations of the Alamogordo Municipal Code are hereby made part of these requirements, even though they may not be specifically mentioned and described herein.

Article 01-01-030 General

(a) The Contractor is required to locate all existing utilities prior to commencing work on the Project. It shall be the Contractor's sole financial and legal responsibility to field verify locations and depths of all existing utilities and coordinate any relocation Work required. NMAC 18.60.5 provides guidance on the One-Call Notification System and utility locate requirements.

(b) The Contractor shall be required to maintain adequate temporary access for the private residences and the businesses and facilities within the construction area, to the satisfaction of the City.

(c) At the end of each workday, as required during each day, or as required due to weather conditions, the Contractor shall perform grading, shaping, and cleanup, to maintain an acceptable site condition, as determined by the engineer.

(d) Notices and/or requests made by Contractors or Owners to the City shall be made in writing. Each written request will receive a written response with further direction or detail.

Article 01-01-040 Workmanship and Materials

(a) These standards are prepared with the intention that only first-class workmanship and materials of the best quality will be provided. Materials and workmanship of less than best quality will not be acceptable. In the event that these Standards may not completely describe each and every part, item, and detail, it will not relieve the Contractor of the full responsibility for providing the necessary part, item or work necessary to complete the Project satisfactorily for proper operation, as intended.

(b) The materials and equipment specified are considered the minimum standard of quality necessary to produce a satisfactory Project. Substitutions for the materials and equipment that have been specified will not be permitted except on written approval of the City.

(c) Any materials that are found to be damaged either before or after installation shall be removed promptly and replaced with new materials. The City inspection of the materials before they are installed shall not relieve the Contractor from any responsibility to furnish and install good quality materials, totally undamaged.

Article 01-01-050 Water for Construction

(a) The Contractor will be responsible for purchasing all construction water (reclaimed water or potable water) needed for construction from the City. The cost will be determined in accordance with the current reclaimed or potable water rates. It shall be the Contractor's responsibility to transport and apply the construction water as specified or as ordered by the engineer.

Reclaimed Hydrant Locations

Purple Hydrants

(1) RS_HYD_01 – 3500 Airport Road (Airport use Only)
(2) RS_HYD_02 – 3500 Airport Road
(3) RS_HYD_03 – 2143 S. Walker Avenue
(4) RS_HYD_04 – 500 LaVelle Road
(5) RS_HYD_05 – 220 LaVelle Road
(6) RS_HYD_06 – 2150 US Highway 54 South
(7) RS_HYD_07 – 2518 Puerto Rico Avenue
(8) RS_FIL_01 – 800 E. First Street

(b) The Contractor shall meter the reclaimed water used at the fire hydrant from which the reclaimed water is taken. Construction water is the sole responsibility and expense of the Contractor that requires water. Water for construction purposes is available for a fee from the City reclaimed water system. An application may be made to the Customer Service Division for which the Contractor will place a deposit, to be refunded when the meter is returned in good working condition. In cases where potable water is to be used for construction purposes and the Contractor does not have an air-gap method of utilizing water, a reduced pressure backflow preventor must be installed and certified by the City prior to being used.

(c) Construction water is generally made available by means of a City furnished meter attached to a reclaimed, purple fire hydrant, potable fire hydrant, or through the used of the automated reclaimed fill stand. The charges for City furnished construction water consist of a monthly rental fee plus a cost based on the actual

water usage recorded at the meter. Since fees vary, the Contractor is encouraged to determine the current cost of the service prior to utilizing the service.

(d) The Contractor shall furnish and maintain the piping and/or equipment necessary to connect to the reclaimed water source and to convey the reclaimed water into the Contractor's reclaimed water tank. Contractor shall not allow reclaimed water to go to waste during the tank filling operations and shall not allow his piping and equipment to leak water.

(e) The water truck tank filling equipment shall be placed and maintained in such a way as to provide prevention against accidents of any nature to Contractor personnel or the public in general.

(f) The Contractor is required to connect the fill stand or fill equipment to the fire hydrant and leave the fire hydrant valve open. Contractor shall install a valve in the fill stand piping to control the water flow without leaks. The Contractor shall repair leaks from their respective plumbing immediately. The Contractor shall repair all asphalt/gravel driveways and turnouts that are damaged, during the utilization of locations to acquire water for construction, to pre-existing condition.

(g) The hydrant valve shall not be closed except when water will not be needed over a weekend or a period of two (2) or more days.

(h) If it is observed that water for construction is being used from a potable water source or a reclaimed water source that is not metered, the work will be shut down by the City and will not be allowed to resume until a source for metered construction water is provided.

Article 01-01-060 Quality Assurance Materials Testing

(a) An independent material testing laboratory shall be retained by the City for quality assurance testing. The frequency of the quality assurance testing shall be as determined by the City. The Contractor shall notify the City 24-hours prior to being ready for each quality assurance test and cooperate fully in making way for the laboratory technician to make the required tests. The Contractor shall notify the City if any of the work fails to meet the standards specified, the Contractor shall correct such failures in a manner acceptable to the City. The Contractor shall pay for the cost of all quality assurance re-testing necessary due to failure to meet Specification requirements on previous quality assurance testing. If the Contractor requests the testing laboratory to obtain density tests and the area to be tested is not ready when the technician arrives at the job site, the Contractor shall pay for all trip charges or stand-by time assessed. All costs for failed test and stand-by time will be deducted from the amount due on the Contract.

(b) Contractor shall notify the Geotechnical Testing Lab a minimum of twenty-four (24) hours in advance of readiness of the work for quality assurance tests.

(c) Contractor shall be responsible for providing to the City the Proctor, Gradation, and Liquid Limits of subgrade material and base course material.

(d) Material testing as referenced in this Article is for the City's, quality assurance. The Contractor is responsible for quality control of material, process, and method. Neither observations by the City nor inspections, tests, or approvals by persons other than Contractor shall relieve the obligations to perform the work in accordance with the requirements of the standards.

(e) Minimum quality assurance testing intervals are provided at the end of this chapter.

Article 01-01-070 Surveying and Staking

The Contractor shall be responsible for all horizontal and vertical control required to build the Project; the latest City benchmarks are provided at the end of Chapter 01. City benchmarks shall be used insomuch as possible unless unnecessarily constrained by distance from the project. Any field adjustments made will be accepted as if incorporated herein and shall not make any claims for additional surveying or surveying expenses resulting therefrom. All Public Works Surveying shall be completed by a State of New Mexico Licensed Surveyor.

Article 01-01-080 Sanitary Facilities

(a) The Contractor shall provide the necessary number of sanitary facilities for all the workers on the work site. The sanitation facilities shall be moved along the Project routes so that they will be convenient for the workers.

(b) Adequate potable drinking water shall be provided on the work site as well as drinking cups, for the benefit of all employees.

Article 01-01-090 Truck Bed Covers

All trucks or other conveyances hauling any loose materials, including hot-mix bituminous materials, on public streets, highways, and detours shall be covered in such a manner as to prevent such materials from dropping, sifting, leaking, or otherwise escaping therefrom. Coverings for trucks or other conveyances hauling loose materials shall be securely fastened so as to prevent said covering or load from becoming loose, detached, or in any manner a hazard to public traffic. The Contractor shall observe legal load restrictions when

hauling materials or equipment within or outside the Project. Any vehicles in violation of this provision will not be permitted to operate.

Article 01-01-100 Method of Bidding

The Bid Schedule has been prepared for a Unit Price Contract procedure. All the quantities shown in the Bid Schedule are estimated and are not purported to be exactly correct. Contractor shall be required to furnish more or less of each estimated quantity that may be required to satisfactorily complete all the Work. The Contractor will be paid on the unit basis for all the material that is actually furnished and installed in the construction of the Project to plan dimensions. In no case shall the Contractor claim extra compensation for building any portion of the Project beyond plan dimensions.

Article 01-01-110 Underground and Overhead Utilities

(a) Any interference with, or damage to, either underground or overhead utilities of any nature shall be the Contractor's legal and financial responsibility, saving the Owner harmless from any or all claims resulting from damage to these utilities by reasons of his operations.

(b) The Contractor shall contact New Mexico One-Call at 1-800-321-2537 or by cell phone at 811 to request field utility locates forty-eight (48) hours prior to digging. New Mexico One-Call Website: https://www.nm811.org/.

(c) Contractors shall reference NMAC – Public Regulation Commission Rules and Regulations, specifically Title 18 Chapter 60 found at http://164.64.110.134/nmac/T18C060.

Article 01-01-120 Contractor Communications

The Contractor shall contact the City to provide information related to traffic control impacts, as well as to obtain any new requirements or restrictions for traffic control procedures.

Article 01-01-130 Sequence of Works

(a) The Work shall be carried out with the intent of causing as little disruption as possible to the public. The Contractor shall perform cleanup operations on a continuous basis. Any area requested to be cleaned up by the City shall be cleaned immediately.

(b) Contractor shall be responsible for advising the businesses, residents, and occupants along each street as to when work will be done in that particular area.

Contractor will notify the businesses, residents, and occupants not less than two (2) days in advance of doing the Work.

(c) The Contractor shall notify, in writing, the City of anticipated disruptions for issuance of PSA by the City if necessary. Additionally, the Contractor shall provide door hangers to alert businesses, residents, and occupants of upcoming work.

(d) Contractor will request businesses, residents, and occupants to move their vehicles out of the way of construction if required. If occupant is unresponsive within 48-hours or uncooperative, the City will assist having the vehicles removed.

Article 01-01-140 Authority and Duties of Public Works Inspector(s)

(a) Inspectors representing the City of Alamogordo shall be authorized to inspect all work done and all materials furnished. Such inspection may extend to all or any part of the work and to the preparation, fabrication, or manufacture of the materials to be used. The inspector is not authorized to revoke, alter, or waive any requirements of the Project. The inspector is authorized to call to the attention of the Contractor any failure of the work or materials to conform to the Project. The inspector shall have the authority to suspend the work when an imminent hazard condition is known to exist, or when the Contractor either delays in correcting or permits repeated occurrences of a hazardous condition. This authority to suspend work does not relieve the Contractor of the legal responsibility for safety at the jobsite.

(b) The inspector shall have the authority to suspend work due to rejected materials or rejected work only at the direction of the City. Any questions at issue as to quality of materials and/or work installed may be referred to the City. If the Contractor refuses to suspend operations on verbal order, the inspector shall issue a written order giving the reason for suspending the work. After placing the order in the hands of the Contractor's person-in-charge, the inspector shall immediately leave the project. Work done during the absence of the inspector will not be accepted.

(c) The inspector shall in no case act as foreman or perform other duties for the Contractor, nor shall they interfere with the management of the work by the Contractor. Any advice which the inspector may give the Contractor shall not be construed as binding the City in any way or releasing the Contractor from fulfilling all required Contract terms.

(d) Contractor supplied photographic evidence will not replace physical observation and/or inspection by the City.

Article 01-01-150 Sanitary Landfill

All waste and recyclable materials shall be disposed of or stockpiled in approved locations per EPA regulations.

Article 01-01-160 Sign Removal and Replacement

The Contractor shall be responsible for removing and replacing all existing signs that are in the way of the Project construction. The existing sign location and height shall be indexed before removal. Removed signs shall be properly and adequately stored. When replaced, signs shall be in existing or better condition, in all respects, than before removal. The Contractor shall replace any signs that are damaged due to negligence, mishandling, or inadequate storage at their own expense.

Article 01-01-170 Protecting the Work

The Contractor shall be responsible for protecting all portions of the work against any and all damage including but not limited to vandalism, accidents, and weather conditions, until accepted. No additional payment will be allowed for rebuilding any portion of the Project caused by such damage.

Article 01-01-180 Fencing

(a) The Contractor shall be responsible for removing and rebuilding any and all existing fencing that is damaged or is in the way of the Project construction. This work shall be considered incidental to the Project and no payment will be allowed for this work.

(b) Facility Security Chain Link Fence

(1) Fabric: the chain link fabric shall be galvanized steel. The fabric shall be 9-gauge core wire, woven in a two-inch (2") bottom selvage mesh and be hot dipper galvanized all conforming to ASTM A641. The height of the fabric shall be 96-inches. Fabric shall be fastened to intermediate posts with No. 6 aluminum fabric wire spaced approximately 15-inches apart and to top rail with 9-gauge wires spaced at 24-inches apart. The fabric shall be secured to all terminal and gate posts with ¼-inch by 3/4-inch stretcher bars with No. 11 gauge pressed steel bands spaced approximately 12-inches apart.

(2) Posts, Rails, and Braces

A. Posts, rails, and braces shall be fabricated of Class I (round steel sections), Grade A (hot dipped galvanized), seamless steel pipe in accordance with ASTM F1083 (Schedule 40) and be of the following sizes:

1. Corner and Terminal Posts: 2.875-inch O.D.
2. Bracing: Terminal posts braced and trussed to nearest line post with 1.625-inch O.D. SS-40 pipe and 0.375-inch truss rod and truss rod tightener.
3. Line Posts: 2.375-inch O.D.
4. Gate Posts: 4.00-inch O.D.
5. Rails and Braces: 1.625-inch O.D.
6. Spacing of posts shall not exceed ten-feet (10').

(3) Accessories

A. Accessories shall be hot-dipped galvanized in accordance with ASTM A123 or A153. In addition to wire ties and clips, brace bands, tension bands and bars, tension wire and truss rods, accessories shall include the following:

1. Caps for all exposed ends of posts.
2. Top rail and brace ends.
3. Top rail sleeves to allow for expansion and contraction of the top rail.
4. Bottom tension wire shall be a 7-gauge galvanized steel wire. Fabric shall be attached to tension wire with 9-gauge galvanized steel hog rings spaced no more than 24-inches on center.
5. Barbed wire shall be three strands of 12.5-gauge with 14-gauge 4 point round barbs.
6. Barbed wire support arms shall be single arm, for three (3) strands of barbed wire, and be at an angle of 45 degrees.

(4) Execution: Set all line posts 24-inches deep in eight-inch (8") diameter footing and end posts to 36-inches deep in 12-inch diameter footing. After setting and plumbing posts, fill holes with 3,000 PSI truck-poured concrete. Crown top surface of concrete to shed water away from all posts. Brace all terminal posts horizontally with sections used for top rail. The top rail shall extend through all line posts to form a continuous brace from end to end of each stretch of fence, be securely fastened at the end of each run, and have joints made with expansion sleeve couplings not less than six-inches (6") long. Refer to Standard Detail W-33.

Article 01-01-190 Existing Water Valve Boxes

(a) The Contractor shall reference the location of all existing water valve boxes within the construction areas. Any valve boxes that are damaged during construction shall be replaced in accordance with the Standard Details with no additional payment. After the new paving has been installed and approved, the Contractor shall neatly saw-cut an opening in the new pavement, centered on the valve, and the Contractor shall install a new reinforced concrete collar, as provided in the Standard Details. Valve box grade adjustments shall be completed in accordance with Standard Detail W-6 and W-7.

(b) Existing valves scheduled for removal shall have the entire valve box and valve operating nut removed. Final valve position (open or closed) shall be provided by the City. Backfill requirements shall adhere to Chapter 08.

Article 01-01-200 Existing Manholes

(a) The Contractor shall reference the location and carefully remove and store manhole rings and lids within the construction areas. Any manhole rings and lids damaged shall be replaced by the Contractor at their own expense. Any manhole lids and covers that do not conform to the requirements of the Standard Details shall be replaced by the Contractor. The top portion of the manhole shall be removed to a depth below the limits of work, and a steel plate covering over the manhole shall be provided. After the new surface treatment has been installed and approved, the Contractor shall neatly saw cut an opening in the new pavement, centered on the manhole, in conformance with Standard Details S-4 and S-5.

(b) The Contractor shall provide concrete grade adjustment rings as required to reconstruct the top of the manhole to the proper elevation so that the manhole frame and lid are flush with the new surface treatment. A maximum of one foot of adjustment may be made utilizing grade adjustment rings. Each manhole shall receive a new reinforced concrete collar, as provided in the Standard Details.

Article 01-01-210 Water Shut-Offs

(a) All water shut offs shall be done by the City. The Contractor shall notify the City forty-eight (48) hours prior to the time of the required shut-off. The Contractor shall also notify, at least twenty-four (24) hours in advance, each household, office, business, and/or other affected water user that a shut-off will be made.

(b) The Contractor shall notify, in writing, the City of anticipated disruptions for issuance of PSA by the City if necessary. Additionally, the Contractor shall provide door hangers to alert businesses, residents, and occupants of upcoming work.

Article 01-01-220 Concrete Washout

Contractors shall designate, maintain, and remove concrete washout wastes in accordance with the EPA Best Management Practices. This shall include collection, retention, and recycling/disposal of washout water and solids to prevent caustic material exposure to soils and ground water. Measures shall include washout containment facilities, directional signage, and daily inspections for leak monitoring and capacity of containment facility.

Table 1: Testing Requirements & Minimum Frequency

Materials/Products	Test	Feature	Frequency	Minimum	Chapter
Subgrade and Base Course	Proctor ASTM D-1557	Determines the maximum density or compaction a soil sample can reach	At beginning of project, Contractor responsible to provide to City	1 Location per Soil Type	Chapter 5
Borrow, Embankment, Backfill	Compaction ASTM D-1557	Density of soil in-place	Every 500' each lift	1 Location	Chapter 5
Borrow, Embankment, Backfill	Moisture Content	Moisture content of soil in-place	Every 500' each lift	1 Location	Chapter 5
Borrow, Embankment, Backfill	Compaction	Lab moisture-density ASTM D-698	Every 500' each lift	1 Location	Chapter 5
Borrow, Embankment, Backfill	Compaction	Relative density of cohesionless soils ASTM D-4253/4254	Every 500' each lift	1 Location	Chapter 5
Backfill	Compaction ASTM D-1557	Density of soil	Every 500' each lift	1 Location	Chapter 5
Trench Bedding & Backfill for Pipes	Compaction ASTM D-1557	See Article 02-022.1 (all tests apply)	Every 200' each lift	1 Location	Chapter 6 Chapter 8 Chapter 9
Subgrade	Compaction & Density ASTM D-1557	Density of soil in -place	Every 200'	2 Locations	Chapter 5
Subgrade	½" Maximum Deviation	Surface Tolerances	---	---	Chapter 5
Subgrade, Subbase, or Base Course	Moisture Content	Moisture Content AASHTO T-99 AASHTO T-180	---	---	Chapter 5
Base Course	Compaction & Density ASTM D-1557	Density	Every 500' for Each Lift	2 Locations	Chapter 5
Base Course	3/8" Maximum Deviation	Surface Tolerance	---	---	Chapter 5
Plant Mix Bituminous Pavement (PMBP)	Compaction	Compaction ASTM D-2950	1 Test per 500 tons	1 per day of production	Chapter 5
Plant Mix Bituminous Pavement (PMBP)	3/16" Maximum Deviation	Surface Tolerance	---	---	Chapter 5

Table 1 Continued: Testing Requirements & Minimum Frequency					
Materials/Products	**Test**	**Feature**	**Frequency**	**Minimum**	**Specification**
Plant Mix Bituminous Pavement (PMBP)	Density (Cores)	Physical Properties: thickness, density, specific gravity, air voids, stability, flow	---	2 Cut Pavement Samples per Acceptance Section	Chapter 5
Aggregates	Plasticity Index, Sand Equivalent, Fine Aggregate Angularity, Flat & Elongated Particles Count, & Fractured Face Count	Plasticity Index, Sand Equivalent, Fine Aggregate Angularity, Flat & Elongated Particles Count, & Fractured Face Count	At the Start of Production and at every 500 Tons	One per Project	Chapter 5
Mineral Filler	Manufacturer Info.	Materials Content	---	---	Chapter 5
Aggregate Base Course – Pavement Patching	Gradation	Size of Aggregates	Every 200 SF	1 Minimum	Chapter 5
Aggregate Base Course – Pavement Patching	Percent Wear & Soundness Loss	Mix Composition	---	---	Chapter 5
Aggregate Base Course – Pavement Patching	Density & Moisture Content	Density and Moisture	---	1 Minimum	Chapter 5
Water Supply Pipes	Hydrostatic Pressure Test AWWA C-600	Tests for Leaking	All Water Lines	1 Minimum	Chapter 8 Chapter 9
Water Supply Pipes – Air Valves & Access Points	Disinfection AWWA C-651	Tests for Chlorine Residual	All Water Lines	---	Chapter 8
Water Supply Pipes – Air Relief Valves & Vacuum Relief Valves	Pressure Test	Test for Strength and Leakage	All Valves	---	Chapter 8 Chapter 9 Chapter 10
Sanitary Sewer	Low Pressure Air or Water Test	Tightness Uni-Bell PVC Pipe Assn UNI-B-6-98	All Pipe	---	Chapter 6
Sanitary Sewer	Ex-Filtration Test	Pressure & Leakage	All Pipe	---	Chapter 6
Sanitary Sewer	Deflection Test	Pipe Strength	All Pipe	---	Chapter 6
Sanitary Sewer - Manholes	Water Test	Leakage	All Manholes	---	Chapter 6
Concrete	Slump, Unit Weight, Air Content ASTM C-143 ASTM C-172 ASTM C-231	Materials, Consistency, Content, and Properties	1 Sample from each of the first 3 Concrete loads delivered, then 1 randomly selected load from each sub-lot of 6 trucks	---	Chapter 5
Concrete	Compressive Strength Test Cylinders	Concrete Compressive Strength	7 and 28 Days	1 Set Total from first 3 loads (random)	Chapter 5

Table 1 Continued: Testing Requirements & Minimum Frequency					
Materials/Products	**Test**	**Feature**	**Frequency**	**Minimum**	**Specification**
Concrete – Slip Form	Individual Strength Test	Concrete Compressive Strength ASTM C-39	7 Days, 14 Days for slip-form concrete, and 28 Days	4 Cylinders per Sample	Chapter 5
Concrete Curbs, Gutters, Walks, Driveways, Aprons, Curb Returns, Fillets, Valley Gutter & Slope Paving	Compressive Strength Test Cylinders	Concrete Compressive Strength	3 Cylinders for initial 10 yards placed, 3 cylinders for every 100 CY placed thereafter	1 Set of Three (3) Cylinders	Chapter 5

END OF CHAPTER 01

CHAPTER 02 - TRAFFIC CONTROL & MANAGEMENT

ARTICLE 02-01 - GENERAL
Article 02-01-010 Work Description

(a) The work shall consist of providing Traffic Control and Traffic Control Management in accordance with the Contract and the MUTCD, current edition, including supervision of personnel and the installation, inspection, and maintenance of all traffic control devices on the Project.

(b) Complex traffic control plans, as determined by the City, shall be developed and sealed by a State of New Mexico registered professional engineer prior to submittal to the City.

ARTICLE 02-02 – REQUIREMENTS
Article 02-02-010 Contractor Requirements

(a) The Contractor may assign more than one (1) traffic control supervisor (TCS) to provide traffic control management for the Project provided that a schedule is submitted to the City.

(b) If assigning more than one (1) TCS to provide traffic control management, submit to the City a weekly schedule identifying who shall be in charge of providing traffic control management each day.

(c) The TCS shall possess, at all times, a set of approved traffic control plans and a current copy of the MUTCD.

(d) Traffic control shall be required when any public street or alley requires work. Traffic control shall also be required to prevent through-traffic, where new development meets existing streets, until all utilities, new streets, and infrastructure have been completed.

(e) Where more than one Contractor is working in an area requiring traffic control, the Contractor shall coordinate all traffic control operations.

(f) If the Contractor is using a subcontractor to provide traffic control management, the Contractor shall ensure that the TCS is in accordance with the Contract.

(g) The Contractor may assign one (1) or more traffic control technicians (TCT) to assist the TCS in inspection and maintenance of traffic control devices.

Article 02-02-020 Certification

(a) Before commencing work that requires traffic control management, submit to the City a copy of the "Work Zone Safety Supervisor" certificate for the TCS (wallet size card) issued by the American Traffic Safety Services Association (ATSSA), the Associated Contractors of New Mexico (ACNM), or an agency or firm approved by the City.

(b) The City will accept the TCS certification by ATSSA, ACNM, or any agency or firm only if the following requirements are met:

(1) Successful completion of an approved work-zone traffic control course;
(2) Passing a written examination on a work-zone traffic control course;
(3) At least one (1) year of full-time field experience, verified by the agency or firm, in work zone traffic control; the City may verify the experience at its discretion.

The TCT must only satisfy requirements 1 and 2, above.

(c) Before commencing work that requires flagger traffic control, submit a copy of the "Flagger Training" certificate (wallet sized card) issued by ATSSA, ACNM, FHWA, or an agency or firm approved by the City.

Article 02-02-030 Re-Certification

(a) Renew the TCS's certification every four (4) years through the ATSSA, ACNM, or a City-approved agency or firm.

(b) Re-certify in the fourth year, before the expiration date of the current certification.

(c) Flaggers must obtain refresher training which meets the requirements of ATSSA, ACNM, FHWA, or agency or firm approved by the City prior to the fourth anniversary date shown on the current certificate.

Article 02-02-040 Duties

(a) The TCS's only responsibility is traffic control management. The City may allow exceptions to this rule if the Project is small and requires limited traffic control. The City will determine approval of the exception at the preconstruction conference.

(b) The TCS's primary duties include the following:

(1) Providing management and supervision services at the Project site.

(2) Preparing revisions requested by the Contractor to the traffic control plan in the Contract and submitting the new traffic control plan, in hard copy format, to the City.

(3) Coordinating the flagging and signing personnel training.

(4) Supervising the flagging and signing personnel.

(5) Coordinating traffic control operations for the duration of the Contract, including those of subcontractors, utility companies, and suppliers, to ensure that traffic control is in place and fully operational before the commencement of work. When dealing with utility companies, the TCS shall coordinate concurrent utility traffic control with other construction traffic control to avoid conflicts.

(6) Coordinating, in writing, Project activities with the appropriate individual traffic control, law enforcement, emergency services, and fire control agencies.

(7) Preparing and submitting statements concerning road closures, delays, and other project activities to the City for distribution, as necessary.

(8) Notifying the City of accidents related to the project traffic control.

(9) Recording time and date of accident notification in accordance with Article 02-02-040, "Traffic Control Diary".

(10) Attending the preconstruction conference.

(11) Maintaining, cleaning, and replacing traffic control devices in use per the current traffic control plan during working and non-working hours.

Article 02-02-050 Traffic Control Diary

(a) The TCS shall maintain a project traffic control diary in a bound book. Obtain the diary from the ACNM.

(b) The TCS shall keep the traffic control diary current each day and sign each daily entry.

(c) The TCS shall make entries in ink, in a format approved by the City, without erasures or white-outs. The TCS shall strike out unacceptable entries and replace with acceptable ones. The TCS may use photographs to supplement the written text.

(d) Ensure that the traffic control diary is always available for inspection by the City and submit a copy of the diary to the City at the end of each week. The traffic control diary shall be kept on site during construction activities.

(e) The traffic control diary will become the property of the City at the completion of the Project. If the Contractor fails to submit the diary, the City may withhold final payment until it is submitted.

Article 02-02-060 Inspection of Traffic Control

(a) The TCS shall inspect traffic control devices every day that traffic control devices are in use at least once a week during nighttime periods and at an interval not to exceed 12 hours not during standard working hours. The TCS shall provide for the immediate cleaning, repair, or replacement of traffic control devices that are not functioning as required to ensure the safety of the motorists, pedestrians, and construction personnel.

(b) The TCS shall conduct inspections of the traffic control devices at the beginning and end of each day that traffic control devices are in use, and as scheduled or directed by the City during working hours.

(c) The TCS shall inspect the traffic control devices during non-working hours on a schedule approved in writing by the City.

(d) The TCS shall inspect traffic control devices and shall provide for the immediate repair, cleaning, or replacement of traffic control devices not functioning as required or not meeting MUTCD Standards to ensure the safety of the public and construction personnel.

Article 02-02-070 Availability of TCS

(a) Provide traffic control management under the supervision and direction of the TCS on a 24-hour-per-day basis throughout the duration of the Project.

(b) The TCS shall be on the Project whenever work is in progress, and available by telephone to be on the Project within 1 hour at all other times.

(c) The provisions for availability of the TCS will also apply during times of partial or full project suspension.

(d) Contact information for the TCS shall be provided prior to construction, including a cell phone number for contact during non-working hours.

(e) An alternate contract who is a manager of TCS shall also be provided.

ARTICLE 02-03 - COMPLIANCE

Article 02-03-010 Failure to Comply

(a) If the Contractor fails to comply with the approved traffic control plan or fails to immediately correct unsafe traffic conditions after written notification of the problem, the City may suspend all or part of the Contractor's operations.

(b) In the event that the Contractor does not take appropriate action to bring the deficient traffic control into compliance with the approved Traffic Control Plan – or to correct the unsafe traffic conditions – the City may proceed with the corrective action and charge the Contractor for the additional cost incurred.

(c) If the City suspends the Contractor's operations, the City will include the period necessary to correct these unsafe conditions and traffic control deficiencies in the normal assessment of contract time.

(d) The City will not relieve the Contractor of the responsibility to provide traffic control safety to the traveling public if the City fully or partially suspends the Project.

(e) If the City suspends the Project due to the Contractor's failure to comply with this Article, or the contract is in liquidated damages, the Contractor shall continue to provide traffic control management, at no additional cost to the City.

(f) If the Contractor requests full or partial suspensions, the Contractor shall perform the additional traffic control management at no additional cost to the City.

Article 02-03-020 City Modification

The provisions included in the Contract Documents and Specifications for handling and controlling traffic during construction may be changed by the City due to actual field conditions encountered. Contract should only be changed by Field Order or Change Order.

END OF CHAPTER 02

CHAPTER 03 - CLEANUP

ARTICLE 03-01 – GENERAL

The work shall consist of cleanup, in accordance with this Article, the Contract Documents, and all applicable specification items in these documents. Contractor shall furnish all the labor, equipment, and materials necessary to perform all work required.

ARTICLE 03-02 – PROJECT CLEANUP

(a) Cleanup of debris, trash, and waste materials shall be performed on a continuous basis by the Contractor in such a way that will always keep the work site(s) clean and neat.

(b) The Contractor shall be responsible for cleaning up the Project. All areas disturbed shall be left in excellent condition, free of any debris, trash, and the like. All trees that were limbed during construction shall be neatly and properly coated so as to protect the cut face, in accordance with good tree surgery practices.

(c) All areas disturbed shall be graded smooth and shall be free of ruts and uneven places.

(d) All excess materials, trash, dirt, and rocks shall be disposed of at an approved site or at a place approved by the New Mexico Environment Department.

ARTICLE 03-03 – FINAL INSPECTION CLEANUP

Immediately before the final inspection tour is to be conducted, the Contractor shall cleanup the Project site in its entirety, removing all debris, waste, trash, excess materials, and equipment. Contractor shall review the entire Project before the final inspection and shall have it neat and clean in appearance.

END OF CHAPTER 03

CHAPTER 04 - PRODUCT OPTIONS

ARTICLE 04-01 - GENERAL

This section includes requirements for product options and substitution procedures.

ARTICLE 04-02 - PRODUCT OPTIONS

(a) For products specified by reference standards or by description only, provide products meeting those standards or description as approved by the City.

(b) For products specified by naming one or more manufacturers with the designation that no substitutions are allowed, provide only named products.

(c) For products specified by naming one or more manufacturers, provide named products or approved substitute products.

(d) Requests to use unspecified products shall be made in accordance with the "Substitution Request Procedures" as specified herein.

ARTICLE 04-03 – SUBSTITUTION REQUESTS

(a) Where products are specified by naming specific products of one or more manufacturers, these products shall establish a minimum acceptable level of quality and performance.

(b) Prior Approval: The City will consider requests made during bidding to use unspecified products only when indicated in individual standard sections.

(1) When substitution requests are allowed during bidding by individual standard sections, requests shall be made in accordance with the "Substitution Request Procedures" as specified herein.

(2) If product is acceptable, City will provide approval by addendum issued to known recipients of Bidding Documents.

(c) After signing of Agreement between City and Contractor, City will consider written requests for substitutions.

(1) Requests shall be made in accordance with "Substitution Request Procedures" as specified herein.

(2) City will determine acceptability of proposed substitutions and notify Contractor of decision in writing.

(3) Substitutions will not be considered when indicated or implied on shop drawings and product data submittals.

(d) Request for substitution and use of approved substitution shall constitute representation that Contractor.

(1) Has investigated product and determined it meets or exceeds quality level of specified product.

(2) Will provide same warranty for substitution as for specified product.

(3) Will coordinate installation and make changes to other work required to accommodate accepted substitution and complete work.

(4) Waives claims for additional costs or time extensions related to substitutions which later become apparent.

ARTICLE 04-04 – SUBSTITUTION REQUEST PROCEDURES

(a) Submit separate request for each substitution with "Substitution Request Form".

Copy of form follows this Section.

(b) Submit 3 copies of request for substitution and include the following:

(1) Complete data substantiating compliance of proposed substitution with Contract Documents.

(2) For products:

A. Product identification, including manufacturer's name and address.

B. Manufacturer's literature containing product description, performance and test data, and reference standards.

C. Samples as required.

D. For construction methods:

1. Detailed description of proposed method.

2. Drawings illustrating methods.

E. Itemized comparison of proposed substitution with product specified.

F. Data relating to changes in construction schedule.

G. Give cost data comparing proposed substitution with specified product.

H. For substitution requests made after signing Agreement, include proposed changes to Contract Amount and Time if substitution is accepted.

END OF CHAPTER 04

Read **CHAPTER 04 - PRODUCT OPTIONS** prior to submission of this form.

The undersigned requests that the following product be accepted for use in the Project.

Product: _____

Model No: _____

Manufacturer: _____

Address: _____

The above product would be used in lieu of:

Product: _____

Specified in: Section: _____ Paragraph: _____

Reason for substitution request: _____

_____

Attached are the following items:

Product description including specifications, performance and test data, and applicable reference standards.

- ☐ Drawings
- ☐ Photographs
- ☐ Samples
- ☐ Tabulated comparison with specified product
- ☐ For items requiring color selections, full range of manufacturer's color samples
- ☐ Documentation of reason for request.
- ☐ Cost data for comparing proposed substitution with specified product
- ☐ Other: _____

The undersigned certifies that the following statements are correct. Explanations for all items which are **not** true are attached.

1. Proposed substitution has been thoroughly investigated and function, appearance, and quality meet or exceed that of specified product. True □ False□
2. Same warranty will be provided for substitution as for specified product. True □ False□

3.	No aspect of Project will require re-design.	True □	False□
4.	Use of substitution will **not** adversely affect:		
	a. Dimensions shown on Drawings.	True □	False□
	b. Construction schedule and date of completion.	True □	False□
	c. Work of other trades.	True □	False□
5.	Maintenance service and replacement parts for proposed substitution will be readily available in the New Mexico area.	True □	False□
6.	Proposed substitution does **not** contain asbestos in any form.	True □	False□
7.	All changes to Contract Sum related to use of proposed substitution are included in price listed below. Contractor waives claims for additional costs related to acceptance of substitution which may subsequently become apparent.	True □	False□
8.	Costs of modifying project design caused by use of proposed substitution which subsequently become apparent will be paid for by Contractor.	True □	False□

If substitution requested after signing of Agreement between Owner and Contractor is accepted:

Contract Sum will be [decreased] [increased] by $ _____

Contract Time will be [decreased] [increased] by _____ calendar days.

Submitted By: _____

Company: _____

Address: _____

Telephone Number: _____

Name: _____ Date: _____

Signature: _____

CHAPTER 06 - SANITARY SEWER SYSTEM

ARTICLE 06-01 – GENERAL

Article 06-01-010 Sanitary Sewer Materials

Item Description	Size or Drawing	Reference Standard	Manufacturer
Schedule 40 PVC Pipe (Sanitary Service Line)	4" & 6"	ASTM D1785 – PVC Standard for Schedule 40, 80, and 120 ASTM D2564 – Solvent Weld PVC ASTM D2235 – Solvent Weld for Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe	
SDR 35 PVC Pipe (PS 46 PSI)	8" – 15"	ASTM D3034 – Pipe Standard ASTM D1784 – Pipe Compound ASTM F477 – Gasket Standard ASTM D2321 - Installation	
SDR 26 PVC Pipe (PS 115 PSI)	8"-15"	ASTM D3034 – Pipe Standard ASTM D1784 – Pipe Compound ASTM F477 – Gasket Standard ASTM D2321 - Installation	
PS46 PVC Pipe	18"-36"	ASTM F679 – Pipe Standard ASTM D1784 – Pipe Compound ASTM F477 – Gasket Standard ASTM D2321 - Installation	
PS115 PVC Pipe	18"-36"	ASTM F679 – Pipe Standard ASTM D1784 – Pipe Compound ASTM F477 – Gasket Standard ASTM D2321 - Installation	
Manhole Frames and Covers (H-20 Load Rated)	S-2 S-3	AASHTO Designation M306 ASTM A48 – Cl 30 or Stronger	
Precast Manholes	S-6 S-10	ASTM C478 AASHTO M199 NMDOT Section 517 and 662	Western Precast Concrete, Inc.
Mastic Gasket for Precast Sections	S-6 S-10	AASHTO M198 ASTM C990	Ram-Nek Hamilton Kent
Concrete Coating	S-6 S-10	ASTM D7234	Raven 175 Raven 405
Glass Fiber Reinforced Polyester (FRP) Manholes	S-16	ASTM D3753	LFM Fiberglass Structures
Detectable Warning Tape	S-1	ASTM D2103	

Tracing Wire Open Trench Installation	#12 AWG	ASTM B1010 ASTM D1248	Copperhead Industries
Tracing Wire Directional Drilling	#12 AWG	ASTM B1010 ASTM D1248	Copperhead Industries
Tracing Wire Slip Lining/Bursting	7x7 Strand	ASTM B1010 ASTM D1248	Copperhead Industries
Tracing Wire Termination/Access Boxes	S-4 S-6	Per Manufacturer Instructions	Copperhead Industries
Tracing Wire Connectors	S-17	Per Manufacturer Instructions	Copperhead Industries
Tracing Wire Grounding	S-6	Per Manufacturer Instructions	Copperhead Industries
Inserta Tee	S-13		Inserta Tee
Repair Couplings			Fernco
Inflow Protectors	S-12		LFM Fiberglass Structures
Casing Pipe	S-15	ASTM A139 Grade B Cooper E-80	
Casing End Seals	S-15		T.D. Williamson, Inc Z-Seals
Casing Spacers	S-15		Advance Products & Systems

Article 06-01-020 Work Description

(a) The Work covered by this specification consists of furnishing and installing all of the sanitary sewer pipe, fittings, and appurtenances required to tie into the existing sanitary sewer system.

(b) The Contractor shall have the responsibility for furnishing the exact lengths of pipe, fittings, adapters, and couplings for proper "make-up" and connections of the pipes.

Article 06-01-030 Location

Sanitary sewer lines may be placed either in the streets or alleys. In either case the sanitary sewer line shall be located on the south side of East-West streets or alleys, and on the east side of North-South streets or alleys, at approximately five-feet (5’) from the centerline of the street or alley.

Article 06-01-040 Depth of Sanitary Sewer Lines

Sanitary sewer lines shall be a minimum of three-feet (3') below the finish surface of the street or alley. The depth shall be measured from the top of the pipe to the finish surface of the street or alley.

Article 06-01-050 Sanitary Sewer Line Sizes

(a) Gravity sanitary sewer mains shall be eight inches (8") in diameter minimum. The City should be consulted for area flow conditions and volumes for final determination of required main sizes.

(b) Sanitary sewer service lines shall be four inches (4") in diameter minimum. Actual sewer line size shall be based on actual flow conditions.

Article 06-01-060 Manholes

(a) Manholes shall be required as follows:

(1) At a maximum horizontal spacing of five-hundred feet (500').

(2) Where two or more sanitary sewer mains converge.

(3) Minimum inner diameter of four feet (4').

(b) Grade differentials of more than twenty-four inches (24") between the highest incoming and outgoing sanitary sewer lines require construction of a drop manhole; Standard Detail S-10.

(c) Where a sanitary sewer line passes through a manhole in a straight line, a drop between incoming and outgoing inverts will not be required. If a horizontal deflection in the sanitary sewer alignment is proposed at the manhole, a minimum of one-tenth of a foot (0.10') between inverts will be required when the angle is between 0 and 45-degree (0° - 45°). If the angle of deflection is greater than 45-degree (45°) a minimum of two-tenths of a foot (0.20') shall be held between incoming and outgoing inverts, such as a 90-degree (90°) bend. Where more than two pipes enter a common manhole, all incoming lines shall be a minimum of two-tenths of a foot (0.20') above the outgoing lines.

(d) All manholes, regardless of type, shall have inflow protectors, LFM Fiberglass Structures or City approved equivalent complete with lift strap and gas relief valve.

Article 06-01-070 Water and Sanitary Sewer

Lines shall be laid parallel to each other and parallel to the street or alley centerline when both are installed in the same street or alley. Sanitary sewer lines may be placed in alleys instead of streets. If both are laid in the street, a minimum distance between the lines shall be ten-feet (10') horizontally, and the water line shall be at least two-feet (2') higher than the sanitary sewer line. Where the water and sanitary sewer lines cross each other, the water line shall be a minimum of two-feet (2') higher than the sanitary sewer line or the sanitary sewer line shall be concrete encased a minimum of ten-feet (10') on each side of the water line, per the detail W-11. If the water line crossing occurs below the sanitary/storm drain sewer the sewer line shall be encased per detail W-11.

ARTICLE 06-02 – SANITARY SEWER PIPE

Article 06-02-010 Materials

(a) PVC sewer pipe and fittings shall be gravity sewer pipe, ASTM D 3034, SDR 35. All elastomeric gaskets for PVC pipe shall comply with ASTM F 477. PVC sewer pipe and fittings shall meet the requirements of ASTM 3034, ASTM D 3212, and Uni-Bell UNI-B-4.

(b) A certification from the manufacturer shall be furnished to the City attesting compliance with appropriate ASTM Standards.

(c) All PVC pipes shall be coded to eliminate future confusion and prevent accidental damage to or interruption of the water and sanitary sewer facilities. Detectable marking tape shall be installed as prescribed in these standards.

(d) All pipes shall have a home mark on the spigot end to indicate proper penetration when joint is completed. The sockets and/or spigot configurations for the fittings and couplings shall be compatible to the pipe.

(e) Pipe with gasketed joints shall be manufactured with a socket configuration that will prevent improper installation of the gasket and will ensure that the gasket remains in place during joining operations. The gasket shall be manufactured from a synthetic elastomer material and shall conform to the requirements of ASTM F 477.

(f) Solvent cement joints shall be limited to four (4) inch diameter or six (6) inch diameter plastic pipe, which will be used exclusively for sanitary sewer service lines. The solvent cement shall be compatible to the pipe manufacturer's product and shall conform to the requirements of ASTM D 2564 for PVC pipe and ASTM D 2235 for ABS pipe.

(g) When PVC pipe is stored outside and exposed to prolonged periods of sunlight, an obvious discoloration of the pipe can occur. This is an indication of reduced pipe impact strength, and any particular length of pipe that is discolored will be rejected. All pipe rejected by the City will be removed from the job site.

(h) The materials in plastic pipe shall comply with ASTM D 1784.

(i) All plastic pipes shall be push-on, flexible elastomeric gasketed, except plastic pipe used for sanitary sewer service lines, which will be joined per manufacturer's recommendations.

(j) Polyvinyl chloride (PVC) pipe shall meet the requirements of ASTM D 3034 for pipe sizes eight (8) inch in diameter through fifteen (15) inches in diameter. Minimum wall classification shall be SDR 35 or SDR 26, as required. Only solid wall pipe will be acceptable.

(k) PVC pipe used for sanitary sewer service lines shall conform to ASTM D 2665 for Schedule 40 pipe, or ASTM 3034 for SDR 35 or SDR 26.

(l) Pipe for this purpose shall be solvent welded joined, per manufacturer's recommendations, or gasketed joints conforming to ASTM F 477.

ARTICLE 06-03 – SANITARY SEWER APPURTENANCES

Article 06-03-010 Manhole Bases

Manhole Bases: Manhole bases poured-in-place shall be Class A concrete, 3,000 psi, and reinforced per the Standard Detail S-6.

Article 06-03-020 Precast Manholes

(a) Manhole Sections: Manhole riser sections shall be precast concrete sections, precast concentric cone sections and precast concrete grade rings, in conformance with ASTM Designation C 478, latest revision. All joints of the manhole sections shall be sealed with Ram-Nek or approved equal. See Standard Detail: S-6.

(b) The entirety of manholes exposed surfaces shall be coated, prior to placement into service, to aide in corrosion and impact resistance. Manholes shall be coated with Raven 175 (prime coat) and Raven 405 (2^{nd} coat) to 100 mil total dry thickness; alternate coating systems shall be pre-approved by the City.

(c) Manhole Covers: Manhole covers shall be cast iron frame and solid lid, ASTM Designation A 48, Class 30 or stronger. The frames and lids shall be machined to provide a non-rocking bearing surface and uniform clearance around the edge of

the lid. The lids shall have the word "SEWER" embossed on them, and each lid shall have two (2) lifting lugs or pick holes. See Standard Details: S-2 and S-3.

(d) Manhole Collars: Manhole collars shall be poured-in-place with Class A concrete, 3,000 psi, and reinforced per the detail S-4. Tracing wire test stations shall be placed integral with manhole collars. See Standard Detail S-4.

Article 06-03-030 Glass Fiber Reinforced Polyester (FRP) Manholes

(a) Fiberglass reinforced manholes used for sanitary sewer systems shall consist of commercial grade polyester resin and meet or exceed the requirements of ASTM D3753. Manholes shall be manufactured by LFM Fiberglass Structures or City approved equivalent. The inner surface shall consist of a resin layer capable of resisting corrosive conditions, such as exposure to hydrogen sulfides. Each manhole shall be designed for an H-2) load rating, being water-tight and including a solid FRP anti-flotation bottom and fully enclosed fiberglass bench and invert area.

(b) Concrete bench and invert shall be coated, prior to placement into service, to aide in corrosion and impact resistance. The coating shall consist of Raven 175 (prime coat) and Raven 405 (2^{nd} coat) to 100 mil total dry thickness; alternate coating systems shall be pre-approved by the City.

(c) Manhole Covers: Manhole covers shall be cast iron frame and solid lid, ASTM Designation A 48, Class 30 or stronger. The frames and lids shall be machined to provide a non-rocking bearing surface and uniform clearance around the edge of the lid. The lids shall have the word "SEWER" embossed on them, and each lid shall have two (2) lifting lugs or pick holes. See Standard Details: S-2 and S-3.

(d) Manhole Collars: Manhole collars shall be poured-in-place with Class A concrete, 3,000 psi, and reinforced per the detail S-4. Tracing wire test stations shall be placed integral with manhole collars. See Standard Detail S-4.

Article 06-03-040 Cleanouts

(a) Cleanouts shall consist of a cast-iron frame and cover and boot. After installation of the boot, a square concrete block twenty-four by twenty-four inches (24"x24") by six-inches (6") thick shall be placed level with the top of the boot, reinforced with #3 bars on ten-inches (10") center each way and 3,000 PSI concrete. Cleanouts shall be located so that two hundred fifty (250) feet of sanitary sewer rod can reach any point in the line. Dead end mail lines shall be terminated with a manhole.

(b) A cleanout should be placed on all sanitary sewer lines where they leave public right-of-way or easement. The tracing wire on sanitary sewer service lines shall be terminated above ground at this cleanout.

Article 06-03-050 Flexible Markers

Where sanitary sewer lines travel across open country and not under pavement, marking posts shall be placed at two hundred- and fifty-foot (250') intervals, including every change in alignment direction. Marking posts shall be a minimum of four inches (4") wide by sixty inches (60") high, APWA green in color. Each marking post shall read "Warning Sewer Pipeline".

Article 06-03-060 Fats, Oils, Grease (FOG) Prevention Program

In accordance with City Ordinance Number 1619: The purpose of this article is to protect the health, safety, and welfare of the Citizens of Alamogordo through setting forth uniform requirements of the Publicly owned Wastewater Treatment System to capture and dispose of (FOG) and enables the City to comply with all applicable State and Federal Laws, including the Clean Water Act, 33 U.S.C. & 1251, et seq.; and General Pretreatment Regulations, Title 40 C.F.R. Part 403.

(a) Applicability: All Commercial Businesses in the City of Alamogordo, whose business involves preparation and sale of any product that has the potential to introduce FOG into the City's Publicly owned Wastewater Treatment System (POWTS).

(1) Shall apply to all non-domestic users of the POWTS.

(2) Grease interceptors shall not be required for residential users.

(3) Shall apply to both new and existing facilities generating fats, oils, and grease as a result of food manufacturing, processing, preparation, or food service shall install, use, and maintain appropriate grease interceptors as required. These facilities include, but are not limited to, restaurants, food manufacturers, food processors, hospitals, hotels and motels, nursing homes, and any other facility preparing, serving, or otherwise making any food available for consumption.

(4) No user may intentionally or unintentionally allow the direct or indirect discharge of fats, oils, or greases of animal or vegetable origin into the POWTS in such amounts as to cause interference with the collection and treatment system, or as to cause pollutants to pass through the treatment works into the environment.

(5) All Commercial Businesses shall be registered on the City Registry for tracking FOG areas and pumping companies.

(b) Sizing, Installation, and Maintenance Requirements

(1) All grease interceptors shall be properly sized. Hydromechanical grease interceptors shall be sized in accordance with Standard PDI-G 101 *Testing and Rating Procedure for Hydromechanical Grease Interceptors with Appendix of Installation and Maintenance* (Latest Edition) as developed by the Plumbing and Drainage Institute (PDI). Gravity interceptors shall be sized by a professional engineer licensed in the State of New Mexico to allow the minimum retention time of 30 minutes. In new businesses that will have a minimum impact on the City's sewer infrastructure a minimum of a 50-gallon grease interceptor shall be required.

(2) Installation, maintenance, monitoring, and recording shall meet the requirements outlined in City Ordinance Number 1619.

ARTICLE 06-04 – CONSTRUCTION REQUIREMENTS

Article 06-04-010 Trench Excavation

(a) Pipe trenches shall be excavated along straight lines to the dimensions as required in the Contract Documents.

(b) All trenching work shall be done in a safe manner, trenches shall be rendered safe for the workmen by complying with the applicable safety standards, and by practicing safety measures consistent with current OSHA Trenching and Excavation Safety Standards and good construction methods.

(c) All excavations shall be adequately barricaded and secured in accordance with the current New Mexico Department of Transportation Standard Specifications. Flashing lights and barricades shall be employed along open excavations and trenches to protect the public from potential hazards; barricades and advance warning devices shall comply with MUTCD Standards as well as any special direction required by the City.

(d) Unless trench banks are cut back on a stable slope, the trenches shall be braced as necessary to prevent caving or sliding, to provide protection for the workmen and the pipe. All trenching shall comply with OSHA Trenching and Excavation Safety Standards.

(e) When over-excavation occurs beyond the limits indicated by the trench details, the over-excavated area shall be refilled with suitable material at optimum moisture and compacted to ninety-five (95) percent density per ASTM D 1557.

(f) The maximum amount of open trench permitted in any one location shall be 100-feet, or the length necessary to accommodate the amount of pipe installed in a single day, whichever is greater, unless otherwise approved by the City. A trench shall be considered open until backfilled to the top of subgrade.

(g) Excavation of pipe trenches for flexible and rigid pipe is as required in the table below. In all cases, the trench shall be wide enough to allow for the compaction equipment.

Table 2: Minimum Trench Widths

Flexible Pipe	Minimum shall be not less than 1.5 times the pipe outer diameter plus twelve inches (12”)
Rigid Pipe	Minimum shall be not less than the outside pipe diameter times 0.33

(h) When trench is to be backfilled with flowable fill, the minimum trench width may be reduced to the pipe diameter plus twelve inches (12”) and enough room needed to allow for the proper placement of the flowable fill using tools to “spade” the material under the pipe haunches.

(i) Maximum Trench Width: the maximum width of the trench shall be determined by the Contractor based on the method and means for the installation. However, trench width shall not exceed the width of a ride-along compactor plus two feet (2’) when working alongside the pipe or culvert.

(j) Street Crossings

(1) Trenches crossing streets shall be completely backfilled immediately after pipe, wire, or conduit installation and a temporary or permanent asphalt patch or flowable fill cap shall be installed as directed by the City to protect the integrity of the trenches within the roadway limits from excessive moisture.

(2) Substantial bridging, properly anchored, capable of carrying the vehicle loading, in addition to adequate trench bracing, shall be used to bridge across trenches at street crossings where trench backfill, and temporary patches have not been completed during regular working hours as directed and approved by the City. Safe and convenient passage for pedestrians and access to all properties shall be provided.

(k) Disposal of Unsuitable Excavated Materials

(1) Excess material and excavated material unsuitable for backfill shall be removed from the Project by the end of each working day unless otherwise approved by the City and disposed of by the Contractor in an environmentally responsible manner at no cost to the Project.

(2) When unsuitable material is encountered that is not shown in the Contract Documents, the City shall order the removal of the material by the Contractor and issue a field order to change the contract price due to the Contractor for removal of the materials.

(l) Portable trench shields or boxes that provide a movable safe working area for installing pipe may be used for the installation of the pipe. After placing the pipe in the trench, backfill material shall be placed in lifts and the shield shall be lifted to allow for the backfill material to be placed for each lift, trench wall to trench wall.

(m) Transition Installations: When differential conditions of pipe support might occur, such as transitions from manholes to trench, a transition support region shall be provided to ensure uniform pipe support and preclude the development of shear, or other concentrated loading on the pipe.

Article 06-04-020 Bedding

(a) The bottom of the trenches shall be smooth, and hand graded uniformly throughout. If rock or other unyielding material is encountered or if the trench is over-excavated, pipe bedding material shall be added, compacted, and graded to a smooth uniform surface. The compacted bedding shall support the pipe throughout its entire length, except at bells or couplings which shall not rest on the bedding.

(b) After the bell or coupling holes are excavated and after the pipe pieces are connected and properly aligned and graded, successive layers of select material shall be placed and compacted, until the pipe is covered, as required in the Contract Documents. The Contractor shall maintain proper alignment and grade during the bedding process. Any bent, cracked, chipped, or damaged pieces of pipe shall be removed and replaced at Contractor's expense.

Article 06-04-030 Pipe Laying

(a) The pipe shall be laid true to the line(s) and grade(s) indicated in the Contract Documents or as established by the City. Pipe shall be laid such that pipe size markings are facing up within the trench.

(b) The pipe shall be protected during handling against impact shocks and free fall. Do not permit hooks, chains, cables, or handling equipment to come in contact with the pre-molded or pre-formed end surfaces.

(c) Handle the pipe having pre-molded end surfaces or pre-formed end surfaces so that no weight, including the weight of the pipe itself, will bear on or be supported by the jointing material or surfaces. Do not drag the end of the pipe on the ground or allow pipes to be damaged by contact with gravel, crushed stone, or any other hard objects. No damaged or deformed pipe will be incorporated into the Project.

(d) The interior of the pipelines shall be kept free from dirt and other foreign material as the work progresses and shall be clean upon completion of the pipe installation. Tight stoppers or bulkheads shall be securely placed in the ends of all pipelines when the work is stopped temporarily, or at the end of a workday.

(e) Immediately prior to jointing, both pipe ends shall be thoroughly cleaned, and a lubricant shall be applied according to the manufacturer's recommendations. For push-on type joints, sufficient pressure shall be applied in making up joints to insure proper seating of the joints.

(f) All pipe shall be laid straight between ends, fittings or bends, and on uniform grade. Excavate bell holes for each pipe joint. After the pipe is jointed in the trench, the pipeline shall form a true line and consistent grade.

(g) The City may select to check the pipe for line and grade by any method after the pipe is laid and before backfilling begins. The City shall also have the privilege of checking each pipe joint with a gauge or by any means necessary in order to be assured that the gaskets are in place and properly seated. Any run of pipe that is found to be appreciably offline or grade shall be removed from the trench, the trench bedding shall be re-graded and compacted, and the pipe shall then be laid accurately online and grade. Any joint that is found to be improperly gasketed and/or seated shall be un-jointed and correctly reassembled. If any gasket is found to be damaged, the entire pipe section containing the damaged gasket shall be replaced with a new section of pipe.

(h) Contractor shall furnish any tools, gauges, and all items required for the checking of the gaskets and joints and shall check every joint to be sure that the gaskets are seated and located in the correct place to avoid leakage at the joints.

(i) Pipe and appurtenances shall be new and unused. The type of pipe to be installed shall be as approved by these Technical Standards. Pipe and appurtenances shall be handled to insure delivery to the trench in sound, undamaged condition. Particular care shall be taken to prevent damage to any pipe coating.

(j) The interior of pipe shall be thoroughly cleaned of foreign material before being lowered into the trench and shall be kept clean during construction operations. When work is not in progress, the open ends of pipe shall be securely closed so that no foreign materials will enter the pipe. Any section of pipe found to be defective before or after laying shall be replaced with sound pipe or repaired in a manner satisfactory to the City without additional expense.

(k) The Contractor shall install a plug in the new sewer at any point of connection to an existing system. The plug shall remain in place until the Project has been completed and all work approved. The Contractor shall not flush or otherwise discharge any flow into an existing system unless approved in writing by the City.

(l) Pipe shall be laid to line and grade as shown on the plans and as staked in the field. The bedding of the trench shall be graded and prepared to provide a firm and uniform bearing throughout the entire length of the pipe barrel. Suitable excavation shall be made to receive the bell of the pipe and the joint shall not bear upon the bottom of the trench. All adjustments to the line and grade shall be made by scraping away or filling in with pipe zone material under the body of the pipe, and not by wedging or blocking. When connections are to be made to any existing manhole, pipe, or other improvement, the actual elevation or position of which cannot be determined without excavation, the Contractor shall excavate for and expose the existing improvement before laying the connecting pipe or conduit. When existing underground improvements may reasonably be expected to conflict with the line or grade established for the new sewer line, the Contractor shall excavate as necessary to expose and locate such potentially conflicting underground improvements prior to laying the new pipe. Any adjustment in line or grade which may be necessary to accomplish the intent of the plans will be made.

(m) Trenches shall be kept free from water during pipe installation until suitable backfill has been placed and compacted to prevent pipe flotation. Any standing water within the trench shall be evacuated and the trench bottom or bedding be restored per the standards contained herein.

(n) Field cuts shall be completed with a hacksaw, handsaw, or a power saw with a steel blade or an abrasive disc. Field cuts shall be square to the pipe's flow area. The newly cut pipe end shall be beveled to the factory pipe chamfer. Completed field cuts shall be smooth and blunt free from shavings and rough edges.

(n) Connections to existing manholes shall be made by core drilling through the manhole wall using concrete saw or other cutting device approved by the City. Sledgehammers are not acceptable. The Contractor shall take care to avoid unnecessary damage to the existing manhole. Manholes broken by the Contractor shall be replaced by the Contractor without additional expense to the City.

(p) Pipe shall be laid up-grade in a continuous operation from structure to structure, with the socket or collar ends of the pipe up-grade, unless otherwise permitted by the City.

(q) Sanitary sewer mains shall not be constructed under walkways, sidewalks, curbs and gutters, drivepads, or similar concrete structures by tunneling underneath. The Contractor will cut these concrete structures by using a concrete saw. At the Contractor's option, he may remove the section of the concrete structure to the nearest full expansion joint or edge without addition expense to City.

(r) Plastic sewer pipe shall be connected and placed in the trench in accordance with the manufacturer's recommendations.

(s) The reference mark (a distinct circumferential line) is placed on the pipe's spigot end by the manufacturer to indicate the correct depth of spigot penetration into the pipe gasket joint. If the pipe is seated too deep or too shallow the pipe may buckle or separate due to thermal expansion/contraction. Spigot penetration shall be within one quarter (1/4) inch of the manufacturer's recommended mark.

(t) For plastic pipe connection to manholes, the Contractor shall install an appropriately sized press seal gasket, such as PS-10 by Press Seal Gasket Corporation, Large Diameter Waterstops for Concrete Manhole Adapters by Fernco, or approved equal. The gasket shall be installed per manufacturer's directions. See Standard Detail: S-1.

Article 06-04-040 Sewer Service Taps

(a) Sewer service line taps shall be completed by qualified and appropriately licensed Utility Contractors.

(b) All private service lines must be connected by a tap into the sewer main; no private service connection will be allowed to connect directly into a manhole.

(c) The City will evaluate the condition of the existing sanitary sewer line to be connected to; if the pipe is determined to be in good condition the pipe may be tapped. If the existing pipe is not in ample condition to facilitate tapping, the Contractor shall remove a minimum five-foot (5') pipe segment and install SDR-35 PVC pipe of appropriate diameter coupled to existing sanitary sewer line, on either side, with leak-proof couplings (Fernco or approved equal). The sewer service line tap can be completed upon the PVC main line segment. The completed segment and tap shall be inspected by the City.

Article 06-04-050 Existing Manholes

(a) Where the Contractor is required to connect to the existing manholes, the manholes shall be handled to avoid damage. Any damage to the existing manholes resulting from the Contractor's activities shall be corrected to the satisfaction of the City, at the Contractor's expense.

(b) Each manhole penetration shall be sawcut along pre-marked lines to form a uniform opening. The existing manhole invert shall be removed as required to build the new sewer line through the manhole at the alignment and grade called for in the Contract Documents.

(c) Prior to grouting the openings and manhole invert, the walls and floor of the manhole shall be clean and free of all foreign matter or other condition that would affect the bonding of the new grout. Additionally, a rubber manhole gasket shall be installed around the new sewer line where it will be in contact with the new grout. All voids shall be filled, and the invert shall be grouted to form a smooth sloping surface toward the opening in the new pipe.

(d) Existing sanitary sewer manholes designated for removal shall be demolished and disposed of at an appropriate site. The resulting excavation shall be properly refilled with compacted backfill.

Article 06-04-060 Temporary Bypasses

(a) The Contractor will be required to control the sewage in the existing sewer lines and service lines.

(b) The sewage shall be pumped, diverted, or otherwise accommodated to facilitate construction of the new sewer line.

(c) The Contractor shall conduct sewer line construction so that fittings, couplings, and all required materials are on hand to quickly complete each section of sewer line, minimizing the timeframe that the bypass is in place. The Contractor shall present to the City a bypass proposal that accurately details operations, for approval by the City prior to beginning work on the sewer line.

(d) Refer to Chapter 07 Temporary Bypass Pumping System for additional detail.

Article 06-04-070 Backfilling Trenches

(a) Definitions

(1) Foundation: Over-excavation and backfill of the foundation only when the native trench bottom does not provide a firm-working platform for placement of the pipe bedding material.

(2) Bedding: In addition to bringing the trench bottom to required grade, the bedding levels out any irregularities and ensures uniform support along the length of the pipe.

(3) Haunch Zone: The backfill under the lower half of the pipe (haunches) distributes superimposed loadings.

(4) Initial Zone: The backfill from the pipe midline to the top of the pipe zone provides the primary support against lateral pipe deformation for flexible pipe.

(5) Final Zone: Backfill above the pipe zone to the top of the subgrade.

(b) Materials for trench backfill may include flowable fill, Type I aggregate base course, Type II aggregate base course, and native materials. Individual pipe zone backfill requirements are presented below. The Contractor shall submit the material types to the City for approval prior to construction.

Native backfill shall only be utilized within the Final backfill zone. Native materials shall be free from sod, frozen earth, organic materials, rubbish, and debris. The material should be free of large stones (maximum clod size shall be < 3") that may cause damage to the pipe, such as concentrated pipe loading.

Table 3: Type I Aggregate Base Course Gradation and Requirements

Sieve Size	Percentage of Dry Weight Passing Sieve
2-Inch	100
1-1/2-Inch	90-100
1-Inch	70-90
No. 4	30-65
No. 10	30-10
No. 16	15-20
No. 200	10-20
Plastic Index	12 Maximum
Liquid Limit	35 Maximum
Fractured Faces	70% Minimum
Total Available Water-Soluble Sulfates	Less than 0.3% by dry weight of soil

Table 4: Type II Aggregate Base Course Gradation and Requirements

Sieve Size	Percentage of Dry Weight Passing Sieve
1-Inch	100
¾-Inch	85-95
No. 4	40-70
No. 10	35-45
No. 16	25-35
No. 200	6-18
Plastic Index	12 Maximum
Liquid Limit	35 Maximum
Fractured Faces	70% Minimum
Total Available Water-Soluble Sulfates	Less than 0.3% by dry weight of soil

Table 5: Native Backfill Requirements

Percentage by Weight Passing No. 200 Sieve	Plasticity Index Maximum
0-20.0	12
20.1 – 50.0	10
50.1 – 80.0	8
80.1 – 100	6
Liquid Limit	50 Maximum

(1) Foundation: Trench foundations shall be stable prior to placing bedding material. If the City determines that unsuitable materials exist at the trench foundations, the Contractor shall remove and replace the material as directed by the City.

(2) Pipe Bedding: The trench shall be excavated to a depth of four- to six-inches (4”-6”) below the bottom of the pipe barrel and to a depth that will be sufficient to provide two- to four-inches (2”-4”) of clearance under the pipe bell (where applicable).

Uniform and stable bedding shall be provided for the pipe and any protruding features of its joints and/or fittings. The middle of the bedding equal to one-third (1/3) the pipe outside diameter may be loosely placed to allow for the pipe bell and other protruding features. Alternatively, the compacted bedding material may be excavated slightly to allow for continuous lines and grades of the pipe structure.

Pipe bedding shall consist of Type II aggregate base course or flowable fill. Bedding shall be backfilled to the required grade of the bottom of the pipe. The compaction shall provide a density, at minimum, equal to 95 percent of

the maximum dry density in accordance with ASTM D 1557 with the exception of the middle-uncompacted area.

(3) Haunch Zone Backfill: After the pipe or conduit is laid, the haunch areas shall be backfilled with Type II aggregate base course or flowable fill.

Compaction of the haunching material can be best accomplished by hand with tampers or suitable power compactors for maximum compacted lift thickness of six inches (6”). The Contractor shall take care to not disturb the pipe from its line and grade while compacting the backfill. Material suitably distant from the pipe shall be compacted to 95 percent of the maximum dry density in accordance with ASTM D 1557.

While compacting the embedment near the pipe with impact-type tampers, caution shall be taken to not allow direct contact of the equipment with the pipe.

(4) Initial Backfill Zone: After the pipe or conduit is laid, the initial backfill area shall be backfilled with Type II aggregate base course or flowable fill. Avoid usage of impact tampers directly above the pipe until the full loose layer backfill depth above the pipe is obtained.

Table 6: Initial Backfill Zone Material Depths

Pipe or Conduit	Initial Zone
2-Inch or less diameter	6-Inches above the top of pipe
Greater than 2-Inch diameter	12-Inches above the top of pipe

(5) Final Backfill Zone: The remaining backfill, to the top of subgrade, shall consist of Type I or Type II aggregate basecourse, native material, or floable fill. The material shall be compacted to a minimum of 95 percent of the maximum dry density in accordance with ASTM D 1557.

A. If flowable fill is used, flowable fill shall be placed from the top of the initial backfill zone to the bottom of the flexible pavement (replaces aggregate road base in the pavement section over the trench).

B. Flowable fille cap may be required in the upper portion of the Final Backfill Zone for all non-residential roadways with a minimum thickness of twelve inches (12”) for minor collectors and eighteen inches (18”) for all major collectors and arterials.

(d) Compaction

(1) Compaction shall be performed by mechanical means except in the haunch zone where compaction may be required by hand tamping. Mechanically compacted backfill shall be placed in layers of thickness compatible with the characteristics of the backfill and the type of equipment being used and shall have a maximum lift thickness as shown in the table below. The lifts shall be placed on both sides of the pipe at the same time to reduce pipe movement.

Table 7: Backfill Lift Thickness

Location	Maximum Compacted Lift Thickness (inches)	Maximum Loose Lift Thickness (inches)
Bedding, Haunch, and Initial Zones	6	8
Final Zone	8	12

(2) Each layer shall be evenly spread, moistened, and tamped or rolled until the specified relative compaction has been attained.

(3) Compaction minimum shall be 95 percent of the maximum dry density in accordance with ASTM D 1557 for trenches within the roadway prism. Compaction requirements for the final zone of trenches outside the roadway may be reduced to 90 percent of maximum dry density in accordance with ASTM D 1557.

(4) Density testing shall be completed every 200-feet on mains or any part thereof per day, one per every three services or any part thereof per day.

(5) Density testing per depth: Less than or equal to four-feet (4') shall require one at depth and one at subgrade per horizontal length above. Greater than four-feet (4') depths shall require one per six-inch (6") or larger pipe, then one every three (3) vertical feet, and one at subgrade per horizontal length above.

(6) Where test results reveal non-compliance with the requirements of the Contract, the Contractor shall bear the costs of subsequent rework and retesting until the required specification compliance is obtained to the satisfaction of the City.

(e) Minimum Pipe Spacing: If the pipe space between parallel pipes in a single trench is not conducive to mechanical backfill, then flowable fill shall be used.

Article 06-04-080 Manhole Construction

(a) Manholes shall be pre-cast reinforced concrete units or glass fiber reinforced polyester (FRP) in accordance with the detail drawings and as shown on the Contract Documents.

(b) Soil foundations for manhole base shall be compacted to a density of ninety-five (95%) percent of the maximum density per ASTM D 1557.

(c) Invert elevation of the pipes entering or exiting the manhole and interior inverts shall not vary more than 0.05 foot from the elevations indicated in the Contract Documents.

(d) All cement used for poured foundations, mortar, fillets, grout, and concrete shelf construction shall be Type II or approved equal.

(e) All concrete for formed-in-place foundations or bases shall be 3,000 psi compressive strength concrete.

(f) Concrete, used for precast bases, vertical sections, and eccentric cones, shall be 4,000 psi compressive strength concrete.

(g) Manhole risers should be constructed using the tallest barrels possible from the pre-cast manufacturer. The base barrel shall be a minimum of four (4) feet, but not less than two (2) times the size of the sewer pipe penetrating the manhole.

(h) All precast sections of the manholes shall conform to the requirements of ASTM C 478, latest revision.

(i) Circular pre-cast manhole sections shall be provided with mastic gasket to seal joints between sections, such as Ram-Nek, Kent Seal, or approved equal.

(j) Precast concrete manhole bases may be used; however, the Contractor shall be responsible for placing the bases at the specified elevation, location, and alignment.

(k) All lifting holes and gaps at joints shall be filled with a nonshrink grout.

(l) Removable inflow protectors shall be required in all new sanitary sewer manholes.

Article 06-04-090 Pavement Patching

After all trenching and backfilling is complete, the pavement shall be marked and sawcut to form a smooth, uniform edge. The resulting cut face shall be coated with tack coat and

new plant mix bituminous pavement shall be placed and densified as specified. The resulting pavement patch shall have a smooth riding surface in any direction. The patch section shall at minimum match the existing section.

Article 06-04-100 Cased Sewer Lines

(a) Where encasements or carrier pipe is required to be installed under railroad embankments or under highways, streets, or other facilities by jacking or boring methods, construction shall be made in a manner that will not interfere with the operation of the railroad, highway, or other facility, and will not weaken or damage any embankment or structure. During construction operations, barricades and lights to safeguard traffic and pedestrians shall be furnished and maintained, as directed by the City.

(b) Entry and exit pits shall be excavated for the purpose of conducting the boring/jacking operations and for placing end joints of the pipe. This excavation shall not be carried to a greater depth than is required for placing of the guide and boring/jacking machine. All open trenches and pits shall be braced and shored in such a manner as will adequately prevent caving or sliding of the walls into the open trench or pit.

(c) Minimum casing specifications can be found on Standard Drawing S-15. Facility operator beneath which the casing is being installed to determine if more stringent requirements shall govern the installation.

(d) Lateral or vertical variation in the final position of the pipe from the line and grade established by the Contract Documents will be permitted only to the extent of one-sixteenth inch (1/16”) per ten feet (10’), however, final approval will be required by the City.

(e) Entry and exit pits shall be backfilled, in compliance with the Contract Documents, immediately upon installation of the carrier pipe and approval by the City.

Article 06-04-110 Testing

(a) Testing for Tightness: After the pipe has been laid and backfilled, the line shall be tested between manholes by a low-pressure air or water test at five (5) psi for two (2) hours, unless otherwise approved by the City. Low-pressure air testing shall be conducted in accordance with the Uni-Bell PVC Pipe Association recommended practices.

(b) Exfiltration Test: The maximum water exfiltration for a given pipe shall be at a rate of fifty (50) gallons per inch of internal pipe diameter per mile per day. During the

ex-filtration testing, the maximum internal pressure at the lowest end may not exceed twenty-five (25) feet or 10.8 psi. The internal water head must be a minimum of two (2) feet higher than the top of the pipe.

(c) Deflection Testing: Long term pipe deflection shall not exceed seven and a half (7½) percent. When required, the Contractor shall perform deflection test(s) between successive manholes using appropriate instruments. The City will designate when the test is to be performed. If it is determined that the pipe has exceeded deflection requirements, the pipe shall be removed and replaced at the Contractor's expense.

(d) Manhole Testing: Manholes shall be filled with water to a minimum of one (1) section above the highest pipe penetration. Water level shall remain for a minimum of six (6) hours.

Article 06-04-120 Flushing Sewer lines

All completed sewer lines shall be flushed with water to remove any dirt or foreign matter from the line. The flushing shall be done in the presence of the City.

Article 06-04-130 Detectable (Underground) Warning Tape

(a) Detectable warning tape shall be 6" wide, 5 mil overall thickness, with a .35 mil solid foil coil. APWA color coded with imprint of underground utility installed.

(b) Detectable warning tape shall be laid in continuous manner and be placed above all sewer mains, sewer force mains, sewer service lines, and other sewer appurtenances. The detectable warning tape shall be placed eighteen inches (18") below the final surface elevation.

Article 06-04-140 Tracing Wire

(a) All tracing wire shall have HDPE insultation intended for direct bury service. HDPE insulation shall be color coated per APWA Standard for respective utility being installed.

(b) Tracing wire shall be taped to the top of all sewer mains, sewer force mains, and sewer service lines at maximum 10-foot interval. Tracing wire along sanitary sewer service lines entering private property shall be terminated above ground at the cleanout adjacent to the developed structure.

(c) Tracing wire shall be as following based on installation method:

(1) Open Trench Installation: #12 AWG copper clad steel, high strength with minimum 450-pound break load and minimum 30 mil HDPE insulation thickness. Copperhead Industries High Strength – 1230 CCS Tracer Wire or City approved equal.

(2) Directional Drilling/Boring: #12 AWG copper clad steel, high strength with minimum 1,150-pound break load and minimum 30 mil HDPE insulation thickness. Copperhead Industries Extra-High Strength – 1245 CCS Tracer Wire or City approved equal.

(3) Pipe Bursting/Slip Lining: 7 x 7 stranded copper clad steel, extreme strength with minimum 4,700-pound break load and minimum 50 mil HDPE insulation thickness. Copperhead Industries SoloShot Xtreme – PBX-50 CCS Tracer Wire or Engineer Approved Equal.

(4) When a new trace wire is to be tied to an existing trace wire the connection shall be made with an approved splice connector and shall be properly grounded at the splice connection.

(d) Connectors

(1) All main line tracing wires shall be interconnected at intersections (tees and crosses). Connectors shall be lockable and manufactured specifically for use in underground trace wire installation. Connectors shall be dielectric silicon filled to seal out moisture and corrosion and shall be installed in a manner as to prevent any uninsulated wire exposure.

(2) Tee Connectors (service lines, main line tees, and fire hydrants) shall include a 3-way lockable connector main line to lateral lug connector. Copperhead Industries Mainline-to-Service Connector Part Number 3WB-01 or City approved equal.

(3) Cross Connectors (main line crosses) shall include two (2) 3-way lockable main line to lateral lug connectors. Copperhead Industries Mainline-to-Service Connector Part Number 3WB-01 or City approved equal.

(4) Main line tracing wire splices shall be completed utilizing twist-lock connectors. Copperhead Industries Locking Connector Part Number LSC1230C or City approved equal.

(5) Do not cut and splice main line trace wire.

(6) Non-locking friction fit, twist on, or taped connectors shall not be used.

(e) Termination/Access Boxes

(1) All trace wire termination points must utilize an approved trace wire access box, specifically manufactured for this purpose. Except as noted previously for termination on the upstream end of sewer service lines.

(2) All access boxes shall be identified with “sewer” or “water” cast into the cap and be APWA color coded according to the utility.

(3) A minimum of two-feet (2’) of slack is required in all trace wire boxes upon installation at final grade.

(4) All trace wire access boxes must include a manually interruptible conductive/connective link between the terminals for the trace wire connection and the terminal for the ground anode wire connection.

(5) Ground anode wire shall be connected to the identified terminal on all access boxes.

(6) Manholes must terminate at an in-ground tracing wire access box positioned within the manhole concrete collar. Copperhead Industries SnakePit Roadway with Two-Terminal Switchable Lid Access Point Part Number RB14*2T-SW or City approved equal.

(f) Grounding

(1) Trace wire must be properly grounded at all dead ends and stubouts.

(2) Grounding of trace wire shall be accomplished through the use of a drive-in magnesium grounding anode rod with a minimum of 20-feet of #12 AWG red HDPE insulated copper clad steel wire connected to the anode (minimum of 1.5-pound) specifically manufactured for the intended purposed. The ground anode shall be landed at the same elevation as the utility. Ground anode shall be Copperhead Industries Ground Rod with Twist-On Connector Part Number ANO-12 or City approved equal.

(3) When grounding the trace wire at dead ends or stubouts, the grounding anode shall be installed perpendicular to the trace wire at a maximum possible distance.

(4) When grounding the trace wire in long continuous runs, the grounding anode shall be installed directly beneath and in-line with trace wire. The

grounding anode wire shall be trimmed to an appropriate length before connecting to trace wire with a mainline to lateral lug connector.

(g) Testing

(1) All new trace wire installations shall be located using typical low frequency line tracing equipment. The test trace shall be witnessed by the City prior to final acceptance.

(2) Continuity testing in lieu of actual line tracing will not be accepted.

END OF CHAPTER 06

CHAPTER 07 – TEMPORARY BYPASS PUMPING SYSTEM

ARTICLE 07-01 - GENERAL

Article 07-01-010 Description

This section includes requirements for implementing a temporary pumping system for the purpose of diverting existing sewage flow around work area for the duration of the Project.

Article 07-01-020 Quality Assurance

(a) Follow national standards and as specified herein.

(b) Perform leakage and pressure tests on discharge piping using clean water, before operation. Notify City 24 hours prior to testing.

(c) Maintain and inspect temporary pumping system every two hours. Maintain a log of flows every two hours for each system. Responsible operator on site at all times when pumps are operating.

(d) Keep and maintain spare parts for pumps and piping on site, as required.

(e) Maintain adequate hoisting equipment and accessories on site for each pump, as necessary.

(f) Bypassing Contractor (subcontractor) shall have no less than 2 years' experience in bypassing a system of similar characteristics. City may request a list of similar projects with references to be delivered to the City at the preconstruction conference.

Article 07-01-030 Submittals

Submit the following at Pre-Construction Conference:

(a) Detailed plan and description of proposed pumping system at each location. Indicate the number, size, material, location, and method of installation of suction and discharge piping, size of pipeline or conveyance system to be bypassed, staging area for pumps, site access point, and expected flow. The plan shall, at a minimum, indicate the following information:

(1) Size and location of manhole or access points for suction and discharge hose or piping.

(2) Sections showing suction and discharge pipe depth, embedment, select fill, and special backfill for existing vehicular accesses or roadways.

(3) Temporary pipe supports, and anchoring required.

(4) Thrust restraint block sizes and locations.

(5) Sewer plugging methods and types or plugs.

(6) Bypass pump sizes, capacity, number of each size to be on site, and power requirements.

(7) Back up pump, power and piping equipment for each setup as indicated on plans.

(8) Calculations on static lift, friction losses, and flow velocity. Pump curves showing pump operating range.

(9) Design plans and computation for access to bypass pumping locations indicated on plans.

(10) Calculations for selection of bypass pumping pipe size.

(11) Method of noise control for each pump and /or generator.

(12) Method for protecting discharge manholes or structures from erosion or damage.

(13) Schedule for installation and maintenance of bypass pumping lines.

(14) Procedures to monitor upstream mains for backup impacts.

(15) Procedures for setup and breakdown of pumping operations.

(16) Emergency plan detailing procedures to be followed in event of pump failures, power failures, generator failures, sewer overflows, rain events, service backups, and sewage spillage. A copy of this plan must be kept on site for the duration of the project.

(17) Odor Control abatement measures at suction and discharge locations.

Article 07-01-040 Contractor's Responsibility for Overflows and Spills

(a) Schedule and perform work in a manner that does not cause or contribute to incidence of overflows, release of spills of sewage from sanitary sewer system or bypass operation.

(b) The Contractor shall be responsible for any damage to property, private or public, caused from bypass operations.

(c) The Contractor shall be responsible for cleaning and disinfecting any spills caused by the bypass operations.

(d) The Contractor shall be responsible for any fines from regulatory agencies for spills caused by the bypass operations.

(e) The Contractor shall not surcharge any existing sewer mains. The water surface elevation shall not exceed the top of pipe at any suction location.

Article 07-01-050 Delivery and Storage

(a) Transport, deliver, handle, and store pipe, fittings, pumps, ancillary equipment, and materials to prevent damage and following manufacturer's recommendations. Inspect all material and equipment for proper operation before initiating work.

(b) Material found to be defective or damaged due to manufacturer or shipment.

(1) When City deems repairable: Repair as recommended by manufacturer.

(2) When City deems not repairable: Replace as directed before initiating work.

(3) Repair or replacement of defective or damaged material and equipment shall be at no additional cost to the City.

ARTICLE 07-02 - PRODUCTS

Article 07-02-010 Materials

(a) Discharge and Suction Pipes: Approved by the City

(1) Discharge piping: Determined according to flow calculations and system operating calculations.

(2) Suction piping: Determined according to pump size, flow calculations, and manhole depth following manufacturer's specifications and recommendations.

(b) Polyethylene Plastic Pipe:

(1) High density solid wall and following ASTM F714 Polyethylene (PE) Plastic Pipe (SDR DR) based on outside diameter, ASTM D1248 and ASTM D3550.

(2) Homogeneous throughout, free of visible cracks, discoloration, pitting, varying wall thickness, holes, foreign material, blisters, or other deleterious faults.

(c) High-Density Polyethylene (HDPE)

(1) Homogeneous throughout, free of visible cracks, discoloration, pitting, varying wall thickness, holes, foreign material, blisters, or other deleterious faults.

(2) Assembled and joined at site using couplings, flanges, or butt-fusion method to provide leak proof joint. Follow manufacturer's instructions and ASTM D 2657. Threaded or solvent joints and connections are not permitted.

(3) Fusing: By personnel certified as fusion technicians by manufacturer of HDPE pipe and/or fusing equipment.

(4) Butt fused joint: True alignment and uniform roll-back beads resulting from use of proper temperature and pressure.

A. Allow adequate cooling time before removal of pressure.
B. Watertight and have tensile strength equal to that of pipe.
C. Acceptance by City before insertion.

(d) Flexible Hoses and Associated Couplings and Connectors

(1) Abrasion resistant.

(2) Suitable for intended service.

(3) Rated for external and internal loads anticipated, including test pressure.

(4) External Loading Design: Incorporate anticipated traffic loadings, including traffic impact loading.

(5) When subject to traffic loading, compose system, such as traffic ramps or covers.

(6) Install system and maintain H-20 loading requirements while in use or as directed by the City.

(e) Valves and fittings: Determined according to flow calculations, pump sizes previously determined, and system operating pressures.

(f) Plugs: Selected and installed according to size of line plugged, pipe and manhole configurations, and based on specific site.

(1) Additional plugs: One available for each phase in the event a plug fails. Plugs will be inspected before use for defects which may lead to failure.

(g) Aluminum "irrigation type" piping or glued PVC piping will not be permitted.

(h) Discharge hose will only be allowed in short sections when approved by the City.

Article 07-02-020 Equipment

(a) Pumps

(1) Fully automatic self-priming units that do not require the use of foot valves or vacuum pumps in priming system.

(2) Electric or diesel powered. Contractor shall provide necessary power.

(3) Constructed to allow dry running for long periods of time to accommodate cyclical nature of effluent flows.

(b) Provide

(1) Necessary stop/start controls for each pump.

(2) Two pumps for each bypass location (primary and backup) for all bypass locations with average flow greater than 500 gpm.

(3) Each pump to be capable of estimated peak flow.

(4) Primary and backup pumps shall be capable of running simultaneously for wet flow conditions.

Article 07-02-030 Design Requirements

(a) Bypass pumping systems:

(1) Wet flow conditions are estimated at twice the average flow. The online back pump may be used during wet flow conditions.

(2) No surcharging of existing incoming lines at bypass locations.

(3) In the event of a pump failure, the Contractor shall immediately replace primary or backup pump to avoid surcharging of manholes, overflowing of manholes, spills, and damage to property.

(4) Operate 24 hours per day for the duration of each phase.

(5) Bypass pumping systems shall have sufficient capacity to pump peak flows included with the plans.

ARTICLE 07-03 – EQUIPMENT

Article 07-03-010 Preparation

(a) Determining location of bypass pipelines.

(1) Minimal disturbance to existing utilities. Field locate existing utilities in proposed bypass area.

(2) Obtain approvals for placement within public or private property.

(3) Obtain City's approval of location.

(4) Costs associated with relocation of utilities and obtaining approvals at no additional cost to the City.

Article 07-03-020 Installation and Removal

(a) Provisions and requirements must be reviewed by the City before starting construction.

(b) Remove manhole sections or make connections to existing sewer and construct temporary bypass pumping structures at access locations indicated on Contract Documents and as required to provide adequate suction conduit.

(c) Plugging or blocking of sewage flows shall incorporate a primary and secondary plugging device for each bypass location. When plugging or blocking is no longer needed for performance and acceptance of work, remove in a manner that permits the sewage flow to slowly return to normal without surge, to prevent surcharging or causing other major disturbances downstream.

(d) When working inside manhole or junction box, exercise caution. Follow OSHA, Local, State and Federal requirements. Take required measures to protect workforce against sewer gases and/or combustible or oxygen-deficient atmosphere.

(e) Installation of Bypass Pipelines:

(1) Pipeline may be placed along gutter of streets. Do not place in sidewalks.

(2) When bypass pipeline crosses streets and private driveways, place in roadway ramps. When roadway ramps cannot be used, place bypass in trenches and cover with temporary pavement as approved by the City.

(3) Include provisions for Traffic Control including signs and barricades as applicable. The Contractor shall submit a traffic control plan for review prior to commencing this work.

(f) During bypass operation, protect sewer lines from damage inflicted by equipment.

(g) Upon completion of bypass pumping operations, and after the receipt of written permission from the City, remove piping, restore property to preconstruction condition, and restore pavement.

END OF CHAPTER 07

CHAPTER 08 – WATER SUPPLY SYSTEM

ARTICLE 08-01 - GENERAL

Article 08-01-010 Water System Materials

Item Description	Size or Reference	Specification	Manufacturer
Water Meter	¾" to 4" (W-1, W-2, W-26 & W-27)	AWWA C700 ANSI/NSF 61 AWWA C707	Zenner Stealth Reader System
PVC Pipe DR18	4" to 12"	AWWA C900-16 ASTM D1784 - Pipe Compound ASTM F477 - Gasket	
PVC Pipe DR25	14" to 36"	AWWA C900-16 ASTM D1784 – Pipe Compound ASTM F477 - Gasket	
PVC Fittings	6" to 12"	AWWA C153	
Ductile Iron Pipe	12" to 36"	ANSI/AWWA C151/A21.51	
High Density Polyethylene Pipe DR11 min.		AWWA C901 or AWWA C906	
Fittings for HDPE		AWWA C906	
Fiberglass Flexible Markers	W-30	APWA Color Code	
Couplings Mechanical and/or Flexible	W-16 thru W-18	AWWA C111	Romac or approved equal
Casing Pipe End Seals	W-22	See Manufacturer's Specifications	T.D. Williamson Z-Seal Casing Seals or approved Engineer Equal
Casing Spacer Band	W-22	See Manufacturer's Specifications	Advance Products & Systems, LLC Model SSIM or approved Engineer Equal
Gate Valves	4" and larger W-13	AWWA C515 NSF/ANSI 61 & 372	Waterous Company or approved equal
Valve Boxes	Series 6850 W-5 & W-6	ASTM A-48	Tyler Pipe, Tyler Corporation or approved equal
Valve Box Lockable Debris Cap	W-5	See Manufacturer's Specifications	SW Services LLC

Fire Hydrant	W-9	AWWA C502	Clow "Medallion" American Darling Model B-84, Mueller Super Centurion Model A-423
Post Type Flush Hydrant	W-29	ANSI/AWWA C502	Mueller Model A-411 or approved equal
Sampling Station	W-14	NSF/ANSI 372	Eclipse #88WC
Reduced Pressure Backflow Prevention Devices	2 -1/2" to 10"	AWWA C511-92	Watts Series LF909 or approved equal
Reduced Pressure Backflow Prevention Enclosure	W-31 and W-32		USC Approved
Polyethylene Service Lines	W-1 & W-2	ASTM D 2737	
Service Tapping Saddles	W-1 & W-2	ASTM A-536 – Body ASTM A-240 – Straps ASTM D-2000 - Gasket	
Corporation Stops	W-1 & W-2	AWWA C800 NSF 61	Mueller Insta-Tite or Approved Equal
Curb Stop	W-1 & W-2	AWWA C800 NSF 61	Mueller 300 ball curb valve or Pre-approved equal
Copper Meter Resetters	W-1 & W-2	NSF/ANSI/CAN 61 NSF/ANSI/CAN 372	A.Y. McDonald Mfg. Co. Model 76102 or Approved Equal
Water Meter Can	W-1, W-2, & W-12	ASTM C857-16	DFW Plastics Inc
Stainless Steel Tapping Sleeve	W-1 & W-2	AWWA C207 ASTM D2000	
Detectable Warning Tape	APWA Standard	ASTM D2103	
Tracing Wire	#12 AWG Copper Clad Steel W-20	ASTM B1010 – Wire ASTM B910/B910M – Wire ASTM D1248 -Insulation	Copperhead Industries or Approved Equal
Tracing Wire Connectors		See Manufacturer's Specifications	Copperhead Industries Connector Part Number 3WB-01 or Approved Equal

Tracing Wire Access Boxes	W-20	ASTM D1788, Type 1 – Base Material APWA Standard	Copperhead Industries CD14*2T-SW or approved equal
Tracing Wire Access Box Lid	W-20	ASTM D1788, Type 1 – Base Material APWA Standard	Copperhead Industries RB14*2T-SW or LD14*2T-SW or approved equal
Tracing Wire Grounding (Ground Anode)	W-29	See Manufacturer's Specifications	Copperhead Industries Ground Rod with ANO-12 or approved equal
Mechanical Joint Restraint	W-16 thru W-19	AWWA C600, C605 or ASTM D2774 ASTM A536 - Material	EBBA Iron Inc.
Repair coupling	2" to 12"	ANSI/AWWA C230 ASTM D2000 - Gasket	Romac or approved equal
Air-Release and Vacuum-Relief Valves	W-15	AWWA C512 ASTM A 48 ANSI B1.20.1	Val-Matic Model 201C.2 or equivalent
Air-Release and Vacuum-Relief Enclosure	Precast Manhole W-15 & W-26	ASTM C478 AASHTO M199 NMDOT Section 517 and 662	Western Precast Concrete Inc
Non Traffic Bearing Manhole ring and Cover	W-26		East Jordan
Manhole gap filler	W-26 & W-27	ASTM C990-09	RAM-NEK Joint sealant or Approved Equal
Air-Release and Vacuum-Relief Enclosure Lid	W-15	H20 traffic rated ASTM C478-93	

Article 08-01-020 Work Description

(a) This Work consists of furnishing all of equipment, materials, and labor to perform all operations in connection with the installation of potable water lines and appurtenances. This section defines required characteristics and properties of Polyvinyl Chloride (PVC), High Density Polyethylene (HDPE), and Ductile Iron Pipe (DIP), valves, valve boxes, adapters, couplings, fire hydrants, materials, fittings, appurtenances, and construction practices.

(b) Contractor shall provide, in place, all valves, adapters, couplings, and appurtenances necessary to meet the requirements of this Project, whether shown in the Contract Documents or not.

(c) At all times, the new main shall be isolated from the active distribution system by physical separation until disinfecting water has been flushed out and satisfactory bacteriological testing has been completed in accordance with AWWA Standard C651. Water needed to fill the new main for testing and flushing purposes shall only be potable City water supplied through a temporary connection protected by a backflow device.

(d) The backflow device must be tested and certified after installation on-site. A copy of the Certification shall be given to the City and a copy shall be kept on-site with the device. Testing must be completed by a certified testing facility on the City's approved listing.

Article 08-01-030 Location

Waterline shall be located in the streets and shall be approximately ten-feet (10') north of the street centerline on East-West bound streets, and ten-feet (10') west of the street centerline on the North-South bound streets. All water mains shall be laid with a minimum cover of three-feet (3'). The minimum pipe coverage shall apply to new construction only.

Water meters shall be located at the back of sidewalk or in landscape area between the curb and sidewalk (where parkways of ample width are present) within the right-of-way. Water meters cans shall not be located in driveways or vehicular traffic flows unless location(s) and meter can type(s) have been pre-approved by the City.

Article 08-01-040 Minimum Waterline Size

The minimum size of water mains shall be six-inches (6") in diameter.

ARTICLE 08-02 – MATERIALS

Article 08-02-010 General

(a) Pipe and accessories shall be new and unused. Pipe shall be color-coded (blue for potable water, green for sanitary sewer, purple for reclaimed water). Detectable Marking Tape shall be installed as provided in the Contract Documents.

(b) When PVC pipe is stored outside and exposed to prolonged periods of sunlight, an obvious discoloration of the pipe can occur. This is an indication of reduced pipe impact strength, and any length of pipe that is discolored will be rejected. The City will make the determination for rejection of pipe; all pipe rejected will be removed from the job site.

Article 08-02-020 PVC Pipe

(a) PVC pipe four inches (4"-for existing tie-in locations only) through twelve inches (12") shall be not less than DR18, Class 235 and in conformance with AWWA C900, latest revision. Pressure class of PVC pipe shall be as required by Appendix A of AWWA C900. PVC pipe over twelve inches (12") shall be no less than DR25, Class 165 and in conformance with AWWA C900, latest revision.

(b) All PVC pipes shall be approved for use in potable water systems by an agency such as NSF Testing Laboratory.

(c) Joints: For pipe six inches (6") through twelve inches (12"), elastomeric gasket bell push-on type ends shall be used in accordance with ASTM F 477.

(d) Specials and Fittings: For pipe six inches (6") through twelve inches (12"), specials and fittings for PVC pipe shall conform to the requirements of AWWA C153 and shall be cement mortar lined in accordance with AWWA C104. Fitting types shall include restrained mechanical joints and concrete thrust block where required. Restraining, standard mechanical joints, and fittings shall be submitted for City approval.

Article 08-02-030 Ductile Iron Pipe

(a) Ductile iron pipe shall be in accordance with ANSI/AWWA C151/A21.51 and Federal Specification WW-P-421d, latest revision. All ductile iron pipe shall be minimum class 150, unless otherwise indicated in the Contract Documents. Ductile iron pipe fittings shall be pressure rated at three hundred fifty (350) psi and be in accordance with ANSI/AWWA C153/A21.53 and ANSI/AWWA C111/A21.11.

(b) All ductile iron pipe and fittings shall be internally mortar lined in accordance with ANSI A21.4, latest revision, and shall have an exterior coating in accordance with ANSI A21.6, A21.8, or A21.51.

(c) All ductile iron pipe and ductile iron fittings shall have a polyethylene encasement in accordance with ANSI/AWWA C105/A21.5, latest revision.

(d) The ductile iron pipe shall be push-on type joints, unless indicated otherwise on the plans, and the fittings shall conform to the requirements of AWWA C153 and shall be cement mortar lined in accordance with AWWA C104. Fitting types shall include standard flange fittings and mechanical joints.

Article 08-02-040 High Density Polyethylene Pipe (HDPE)

(a) HDPE pipe shall not be less than DR11.0, Class 160 and in conformance with AWWA C901 or AWWA C906.

(b) Joints: Pipe shall be joined by heat fusion method and shall be performed as per manufacturer's safety instructions.

(c) Specials and Fittings: Specials and Fittings for HDPE shall conform to the requirements of AWWA C906 and used in accordance with ASTM D 3350, and F 714. Fitting types shall include restrained mechanical joints where required. Transition gaskets for HDPE pipe shall be used when mechanical joints are used. Restraining, standard mechanical joints, and fittings shall be submitted for City approval.

Article 08-02-050 Adapters and Couplings

(a) All adapters, pipe couplings, tap and sleeves, or mechanical type couplings required for any of the piping systems shall be of the type manufactured for the specific purpose of the use intended, and shall be installed in strict compliance with the manufacturer's specifications, and to the satisfaction of the City. Factory-made adapters shall be furnished for connecting transition material to the mechanical joint fittings and valves, where required, including plastic to steel and plastic to DIP.

(b) Mechanical and/or flexible couplings shall be manufactured by Romac, or approved equal, and shall be sized and styled in accordance with the requirement for the particular coupling and used in accordance with the manufacturer's recommendations for the diameter, thickness and type of pipe to be connected. The mechanical and/or flexible couplings shall be provided with an acceptable joint harness to prevent separation of the joint where required due to pressure or change in direction of fittings. Couplings shall be polyethylene wrapped.

Article 08-02-060 Gate Valves: Four (4) Inch and Larger

All gate valves shall be resilient seated gate valves conforming to AWWA C515 rated for one hundred fifty (150) psi working pressure. Valves shall have a standard two (2) inch operating nut that opens counterclockwise. The wedge shall be constructed of ductile iron and shall be fully encapsulated in synthetic rubber except for the guide and wedge nut areas. The wedge shall seat against seating surfaces that are inclined to the vertical at a minimum angle of thirty-two (32) degrees when stem is in vertical position to eliminate abrasive wear. The non-rising stem shall be sealed by at least two (2) O-rings. The waterway shall be smooth and shall have no depressions or cavities. The valve body and bonnet shall be epoxy coated, inside and out, and wrapped with polyethylene sheet

encasement. Joints shall be restrained mechanical joint ends. Valve shall be as manufactured by Waterous Company or approved equal.

Article 08-02-070 Valve Boxes

(a) Valve boxes shall be deep skirted, adjustable cast iron two (2) piece screw type, Series 6850 as manufactured by Tyler Pipe, Tyler Corporation, or approved equal. The valve boxes shall be five and one-quarter (5-1/4) inch diameter and the two (2) pieces shall overlap at least six (6) inches. The drop lid shall have a depth of two (2) inches, shall weigh thirteen (13) pounds, and shall have the word "WATER" embossed on top. Refer to Standard Details: W-5, W-6, and W-7.

(b) Valve boxes shall have debris caps installed to aid in the prevention of dirt and debris accumulation within the valve box. Lockable debris caps shall be as manufactured by SW Services, LLC or City approved equal.

Article 08-02-080 Fire Hydrants

(a) Fire hydrants and extensions shall be in accordance with AWWA C502, traffic type, fire hydrants shall have two (2) two and one-half (2-1/2) inch hose nozzle connections, and one (1) four and one-half (4-1/2) inch steamer nozzle. All nozzle connections shall be National Standard Fire Hose Coupling screw threads. Fire hydrants shall have a bronze or cast-iron pentagon operating nut. The main inlet shall be six (6) inch restricted mechanical joint type. All fire hydrants shall be rated for two hundred fifty (250) psi working pressure. Any marks or scratches on new fire hydrants shall be corrected to the satisfaction of the City. Extensions will be used, when required, to bring the bottom of the break-off flange three (3) to six (6) inches above the top of the surrounding finished grade. All fire hydrants shall be Clow Medallion (preferred), Mueller Super Centurion A-423 (second choice), or American Darling B-84. All fire hydrants shall be fire engine red. Refer to Standard Details: W-9 and W-10.

(b) Post type flush hydrants shall be installed on dead end lines. The feed line for the flushing shall be four inches (4”) in diameter. Post hydrant shall be Mueller Model A-411 or Engineer Approved Equal. Refer to Standard Detail: W-29.

Article 08-02-090 Cross Connection, Prevention, and Control

(a) The need, responsibilities, requirements, inspections, and maintenance of backflow prevention devices shall adhere to Article 8.08 of the City’s General Ordinances.

(b) All water lines supplying water-based fire protection systems outside of public utility easements and public rights-of-way shall require a Reduced Pressure

Backflow Preventer, which must be sized accordingly by a New Mexico licensed engineer. The fire line, water-based fire protection, system, and double check backflow preventer shall meet the requirements of the adopted City fire code and be approved by the fire code official.

(c) Reduced pressure backflow prevention devices shall be Watts Series LF909 or City Approved Equal. All backflow prevention devices utilized within the City shall be USC Approved.

(d) All approved containment and isolation backflow prevention assemblies which are classified as testable devices shall be tested at least one per year. Testing shall be completed by a certified tester (or technician) who is registered with the City. For complete testing and maintenance requirements refer to Article 8.08 of the City's General Ordinances.

Article 08-02-100 Water Services

(a) All service lines to individual customers shall be three-quarter inch (3/4") minimum diameter. Larger diameters may be required based on available pressures and demands.

(b) Polyethylene Service Lines: Polyethylene water service line tubing shall be fabricated from new polyethylene, PE 3406, SDR-9, 200 psi, manufactured in accordance with ASTM D 2737, latest revision, and be the size called for in the Contract Documents. The service line shall contain embedded tracing wire with connections to the water main.

(c) All single-family residences shall be served by an individual service line and water meter. No service line splitting is allowed. Multiple dwelling units (duplexes, apartments, etc.) shall have a single service and master water meter; submetering units shall be installed downstream of the master meter.

(d) Identification of Water Services at Top Back of Curbs: The location of each water service shall be stamped or scribed (marked as "W") into the top of the curb. The marking shall be located directly above each respective service.

(e) Location of Water Services: Water service lines shall be tapped into the water main at 90-degrees and shall continue as a straight run (perpendicular to the main) to the water meter.

(f) Domestic meters two inches and smaller (≤2") are to be sized as per the International Plumbing Code (IPC). All other meters shall be sized in accordance

with the American Water Works Association standards. Intermittent use shall not exceed three (3) hours per day. All water meters are supplied by the City.

(g) Water Meter: Water meter shall be positive displacement (compound), reading in cubic feet (cf) and acceptable for use with **ZENNER STEALTH READER SYSTEM (NO SUBSTITUTIONS)**. It is the sole responsibility of the Contractor to verify compatibility of the water meters with the **ZENNER STEALTH READER SYSTEM**.

(1) Prior approval is a part of these specifications and any bidder or manufacturer wishing to obtain approval to use unspecified products shall submit a written request. The request shall be received, by the City, not later than seven (7) days prior to the bid opening date.

(2) Request shall clearly describe the product for which approval is asked, including all data necessary to demonstrate acceptability. If the product is acceptable, the ENGINEER will approve it in an Addendum issued to all plan holders. Otherwise, the specified product or item shall be used. The burden of proof is the sole responsibility of the Contractor.

(3) Meters shall comply with AWWA C700 Standard for Cold-Water Meters, Displacement Type, Bronze Main Case, of the latest revision. Meters shall also comply with the Safe Drinking Water Act and ANSI/NSF 61 requirements.

(4) Meter Register housing and lid shall be plastic and the main case, bottom, shall be non-breakable plastic.

(5) The size, model, and direction of flow through the meter shall be cast permanently into the outer case of the meter. The manufacturer's meter serial number shall be imprinted on the outer case and lid.

(6) The meter connections shall be: 5/8" x 3/4" or the size called for in the Project Plans or Contract Documents and shall have standard male meter thread. Meter connections 1-1/2" and larger shall have flanged ends. Developments requiring a three-inch (3") service and meter shall be upsized to four inches (4").

(7) Registers shall be an Encoder-Type register for use in AMR, drive-by or fixed network systems. They shall meet the requirements of the AWWA C707 Standard, for Encoder-Type remote registers, of the latest revision. The encoded register shall be preassembled to the meter and supplied with a wire assembly, at least 16-inches in length. The wire assembly

connections to the register will be sealed to prevent any water/moisture damage. The pigtail supplied must have enough leads to interface with ZENNER STEALTH READER SYSTEM unit. Each encoded register must have its own unique identification number, either external or internal.

(8) All encoded registers will have a 6-wheel odometer.

(9) A letter of certification from the meter manufacturer, certifying that the product supplied will work properly with the ZENNER STEALTH READER SYSTEM units.

(10) Existing water meters will be salvaged to OWNER.

(h) Service (Tapping) Saddles: Service (tapping) saddles shall be pre-approved by City. Acceptable saddles shall have two (2) double straps, or one (1) large, wide, single strap secured by four (4) bolts and shall be the size called for in the Contract Documents.

(i) Corporation Stops: Corporation stops shall be ball valve type, rated for 150 psi. (minimum) working pressure. Corporation stops shall be per the size called for in the Project Plans or Contract Documents, CC or IP threaded inlet with compression fitting or Mueller Insta-Tite connection, or pre-approved equal.

(j) Curb stop: Curb stop shall be ball valve type, rated for 150 psi (minimum) working pressure. Curb stops shall be per the size called for in the Project Plans or Contract Documents. If the Contractor crimps the service line in order to install a curb stop, a moody should be installed over the crimp. The crimped service shall be inspected by the City prior to acceptance.

(k) Copper meter resetters (meter yoke): Copper meter resetters (meter yoke) shall be pre-approved by City. Acceptable coppersetters shall be 5/8" x 3/4" copper or the size called for in the Project Plans or Contract Documents, with a lock wing and angle dual check backflow preventers/device. Existing copper meter resetters (meter yoke) will be salvaged to City.

(l) Water Meter Cans: All water meter cans for this Project shall be the size called for in the Project Plans or Contract Documents. The diameter and height for each installation shall be as shown in the Project Plans. Cutouts for the water service lines shall be neatly cut and trimmed to allow one (1) inch clearance on all sides of the water service line.

(1) Specification is based on use of "DFW PLASTICS, INC." by DFW Plastics, Inc., 901 E Industrial Avenue, Saginaw TX 76131, with attributes as

described below. Equal products of other water meter can manufacturers may be acceptable when pre-approved by City.

(2) This product is designed to withstand loading in non-deliberate and incidental traffic. Not to be installed in roadway. Meter pit lid shall be black and constructed out of modified polyethylene material for maximum durability and corrosion resistance. The black material is for maximum UV protection. The black material shall be uniform throughout the meter pit lid for maximum longevity and not have a foaming agent that creates air pockets within the polymer lid. New installations shall be completed with lockable meter can lids and customer-maintained ball shutoff valve outside the meter can.

A. Vertical and Lateral Load Rating:

- Compliant with AASHTO, Design Load of H-10; ASTM C857-16, Design Load of A-8, 8,000 lbs. transferred through a 10" x 10" steel plate centered in the cover and body.

- Compliant with AASHTO, Design Load of H-20; ASTM C857-16, Design Load of A-16, 16,000 lbs. transferred through a 10" x 20" steel plate centered on the cover and body.

- This product is designed to withstand H-10 and H-20 loading in non-deliberate or incidental traffic areas.

NOT INTENDED TO BE INSTALLED IN ROADWAYS.

B. Polymer Lid

- The polymer lid shall have a molded keyhole and Plastic Lock underneath lid - *as illustrated.*

- The polymer lid shall have one (1) molded slide mount for placement of AMR/AMI device - *as illustrated.*

- The polymer lid shall seat securely and evenly inside the meter pit and shall not overlap the top edge of the meter pit.

- The polymer lid shall have molded tread-pattern for skid resistance - tread dimensions shall be 0.188" x 0.938" x 0.150" deep.

- The polymer lid shall have "WATER METER" molded into the lid - Font shall be Std Fadal CNC Font with 1" characters x 0.150" deep.

- The polymer lid shall be black and have a molded recycled emblem

with a minimum of 50% Post-Consumer Recycled and 50% Post Industrial/ Pre-Consumer Recycled Content- Verified with a Leed Product Documentation.

C. Polymer Body

- The polymer body shall be BLACK and have a minimum of 3/8" wall thickness - *as illustrated.*
- The polymer body shall have minimum inside working room of (23-1/4") - *as illustrated.*
- The polymer body shall have crush resistant ribbing along the outside of the box with 1-5/8" base footing located at the bottom of the meter pit to help eliminate sinking or floating once installed.
- The polymer body shall have a straight wall design and not be flared as to allow for adjustment to grade after installation.
- The polymer body shall have one pipe slot molded on each end of the body that measures (3" x 5-3/4").
- The polymer body shall have a molded recycled emblem with a minimum of 35% Post Industrial/ Pre-Consumer Recycled Content - Verified with a Leed Product Documentation**.**

Whenever in the specifications, any particular materials, process and/or equipment is indicated or specified by patent, proprietary, or brand name, or by name of manufacturer, such wording shall be deemed to be used for the purpose of facilitating description of the material, process, and/or equipment desired, and shall be deemed to be followed by the words "or equal". The lists of acceptable material are not intended to be comprehensive lists, or in any order of preference. The bidder may offer any material, process, and/or equipment which comply with the governing specifications which the bidder considers to be equivalent to that which is indicated or specified.

(m) Temporary Service: Contractor shall maintain service to all connections during construction to minimize time water will be unavailable. Contractor shall complete work on new services and testing and disinfecting of new waterlines prior to removing service from existing waterline. Contractor shall submit a plan for temporary service for City approval prior to construction of new waterline. Refer to Standard Details: W-1 and W-2.

(n) A customer shut-off ball valve shall be installed on the customer side of the meter outside of the meter box. The valve shall be completed to the finished ground surface with a capped pipe sleeve. The customer shut-off valve will allow service shutdown by the resident and minimize the potential damage to the water meter. The City is responsible for water service maintenance up to and including the water meter, and the individual customer is responsible for the water service from outside the meter can toward their property or dwelling.

Article 08-02-110 Stainless Steel Tapping Sleeve

(a) Body: 18-8 Type 304 Stainless Steel. All welds shall be fully passivated to restore stainless characteristics.

(b) Bolts: 18-8 Type 304 Stainless Steel. Heavy hex nuts and washer are coated to prevent galling.

(c) Flange:18-8 Type 304 Stainless Steel Flange with recess per MSS-SP60 to accept standard tapping valve. Flange conforms to AWWA C207 Class D ANSI 150 lb. drilling.

(d) Outlet: 18-8 Type 304 Stainless Steel. Scheduled 10 for 3" and 4" outlets. Scheduled 5 for all outlets larger than 4".

(e) Test Plug: 18-8 Type 304 Stainless Steel in test outlet.

(f) Gasket: Sleeve shall have a full wide gasket of Nitrile Butadiene Rubber (NBR, Buna-N) per ASTM D2000 with hydromechanical activated lip, captured in a recessed groove around the outlet. Gasket shall be suitable for water, salt solutions, mild acids, bases, and sewage.

(g) Service Rating: 2"-12" outlets: 175 psi.

(h) Only qualified and appropriately licensed Utility Contractors shall complete potable water taps on new installations not connected to the City's potable water system at the time of the tap. The City shall observe all tapping activities. Taps on the City's active potable water system shall be completed by the City.

Article 08-02-120 Detectable (Underground) Warning Tape

Detectable warning tape shall be 6" wide, 5 mil overall thickness, with a .35 mil solid foil coil. APWA Color coded with imprint of underground utility installed.

Article 08-02-130 Tracing Wire

(a) All trace wire shall have HDPE insultation intended for direct bury service. HDPE insulation shall be color coated per APWA Standard for respective utility being installed.

(b) Tracing wire shall be taped to the top of all water mains and fire hydrant/lines at a maximum 10-foot (10') interval. Tracing wire integral to water services shall be connected to the water main tracing wire.

(c) Trace wire shall be as following based on installation method:

(1) Open Trench Installation: #12 AWG copper clad steel, high strength with minimum 450-pound break load and minimum 30 mil HDPE insulation thickness. Copperhead Industries High Strength – 1230 CCS Tracer Wire or City approved equal.

(2) Directional Drilling/Boring: #12 AWG copper clad steel, high strength with minimum 1,150-pound break load and minimum 30 mil HDPE insulation thickness. Copperhead Industries Extra-High Strength – 1245 CCS Tracer Wire or City approved equal.

(3) Pipe Bursting/Slip Lining: 7 x 7 stranded copper clad steel, extreme strength with minimum 4,700-pound break load and minimum 50 mil HDPE insulation thickness. Copperhead Industries SoloShot Xtreme – PBX-50 CCS Tracer Wire or City approved equal.

(4) When a new trace wire is to be tied to an existing trace wire the connection shall be made with an approved splice connector and shall be properly grounded at the splice connection.

(d) Connectors

(1) All main line trace wires shall be interconnected at intersections (tees and crosses). Connectors shall be lockable and manufactured specifically for use in underground trace wire installation. Connectors shall be dielectric silicon filled to seal out moisture and corrosion and shall be installed in a manner as to prevent any uninsulated wire exposure.

(2) Tee Connectors (service lines, main line tees, and fire hydrants) shall include a 3-way lockable connector main line to lateral lug connector. Copperhead Industries Mainline-to-Service Connector Part Number 3WB-01 or City approved equal.

(3) Cross Connectors (main line crosses) shall include two (2) 3-way lockable main line to lateral lug connectors. Copperhead Industries Mainline-to-Service Connector Part Number 3WB-01 or City approved equal.

(4) Main line tracing wire splices shall be completed utilizing twist-lock connectors. Copperhead Industries Locking Connector Part Number LSC1230C or City approved equal.

(5) Do not cut and splice main line trace wire.

(6) Non-locking friction fit, twist on, or taped connectors shall not be used.

(e) Termination/Access Boxes

(1) All trace wire termination points must utilize an approved trace wire access box, specifically manufactured for this purpose.

(2) All access boxes shall be identified with “sewer” or “water” cast into the cap and be APWA color coded according to the utility.

(3) A minimum of two-feet (2’) of slack is required in all trace wire boxes upon installation at final grade.

(4) All trace wire access boxes must include a manually interruptible conductive/connective link between the terminals for the trace wire connection and the terminal for the ground anode wire connection.

(5) Ground anode wire shall be connected to the identified terminal on all access boxes.

(6) Fire hydrants must terminate at an in-ground trace wire access box positioned within the fire hydrant concrete collar. Copperhead Industries SnakePit Concrete/Driveway with Two-Terminal Switchable Lid Access Point Part Number CD14*2T-SW or City approved equal.

(7) Main Line access boxes shall be placed at intervals not exceeding 500-feet in locations where fire hydrants are not present. Trace wire access boxes may be placed outside the roadway driving surface or may be placed integral with valve box collars if pre-approved by the City.

A. Trace wire access box placed integrally in concrete valve box shall be Copperhead Industries SnakePit Roadway with Two-Terminal Switchable Lid Access Point Part Number RB14*2T-SW or City approved equal.

B. Trace wire access box outside the roadway prism shall be Copperhead Industries SnakePit Lite Duty with Two-Terminal Switchable Lid Access Point Part Number LD14*2T-SW or Engineer Approved Equal. Access boxes placed outside of the roadway shall be identified with flexible marker per Standard Detail W-20.

(f) Grounding

(1) Trace wire must be properly grounded at all dead ends and stubouts.

(2) Grounding of trace wire shall be accomplished using a drive-in magnesium grounding anode rod with a minimum of 20-feet of #12 AWG red HDPE insulated copper clad steel wire connected to the anode (minimum of 1.5-pound) specifically manufactured for the intended purposed. The ground anode shall be landed at the same elevation as the utility. Ground anode shall be Copperhead Industries Ground Rod with Twist-On Connector Part Number ANO-12 or City approved equal.

(3) When grounding the trace wire at dead ends or stubouts, the grounding anode shall be installed perpendicular to the trace wire at a maximum possible distance.

(4) When grounding the trace wire in long continuous runs, the grounding anode shall be installed directly beneath and in-line with trace wire. The grounding anode wire shall be trimmed to an appropriate length before connecting to trace wire with a mainline to lateral lug connector.

(g) Testing

(1) All new trace wire installations shall be located using typical low frequency line tracing equipment. The test trace shall be witnessed by the City prior to final acceptance.

(2) Continuity testing in lieu of actual line tracing will not be accepted.

Article 08-02-140 Sampling Stations

(a) All new developments proposing to tie to the City's Public Water System shall be completed with a minimum of one (1) sampling station. Based on the number of full buildout connections being served the, City will provide the Owner with the total number of required sampling stations to be installed.

(b) Sampling stations shall be designed specifically for collecting bacteriological and other water samples at a designated point directly from the water main. The sampling station shall be NSF/ANSI 372 certified and shall be manufactured by Kupferle Foundry Eclipse #88 Sampling Station or City approved equal.

Article 08-02-150 Cathodic Protection

Cathodic protection, if required, shall be designed by a licensed engineer in the State of New Mexico.

ARTICLE 08-03 – CONSTRUCTION REQUIREMENTS

Article 08-03-010 Trench Excavation

(a) Pipe trenches shall be excavated along straight lines to the dimensions as required in the Contract Documents.

(b) All trenching work shall be done in a safe manner, trenches shall be rendered safe for the workmen by complying with the applicable safety standards, and by practicing safety measures consistent with current OSHA Trenching and Excavation Safety Standards and good construction methods.

(c) All excavations shall be adequately barricaded and secured in accordance with the current New Mexico Department of Transportation Standard Specifications. Flashing lights and barricades shall be employed along open excavations and trenches to protect the public from potential hazards; barricades and advance warning devices shall comply with MUTCD Standards as well as any special direction required by the City.

(d) Unless trench banks are cut back on a stable slope, the trenches shall be braced as necessary to prevent caving or sliding, to provide protection for the workmen and the pipe. All trenching shall comply with OSHA Trenching and Excavation Safety Standards.

(e) When over-excavation occurs beyond the limits indicated by the trench details, the over-excavated area shall be refilled with suitable material at optimum moisture and compacted to ninety-five (95) percent density per ASTM D 1557.

(f) The maximum amount of open trench permitted in any one location shall be 100-feet, or the length necessary to accommodate the amount of pipe installed in a single day, whichever is greater, unless otherwise approved by the City. A trench shall be considered open until backfilled to the top of subgrade.

(g) Excavation of pipe trenches for flexible and rigid pipe is as required in the table below. In all cases, the trench shall be wide enough to allow for the compaction equipment.

Table 8: Minimum Trench Widths

Flexible Pipe	Minimum shall be not less than 1.5 times the pipe outer diameter plus twelve inches (12”)
Rigid Pipe	Minimum shall be not less than the outside pipe diameter times 0.33

(h) When trench is to be backfilled with flowable fill, the minimum trench width may be reduced to the pipe diameter plus twelve inches (12”) and enough room needed to allow for the proper placement of the flowable fill using tools to “spade” the material under the pipe haunches.

(i) Maximum Trench Width: the maximum width of the trench shall be determined by the Contractor based on the method and means for the installation. However, trench width shall not exceed the width of a ride-along compactor plus two feet (2’) when working alongside the pipe or culvert.

(j) Street Crossings

(1) Trenches crossing streets shall be completely backfilled immediately after pipe, wire, or conduit installation and a temporary or permanent asphalt patch or flowable fill cap shall be installed as directed by the City to protect the integrity of the trenches within the roadway limits from excessive moisture.

(2) Substantial bridging, properly anchored, capable of carrying the vehicle loading, in addition to adequate trench bracing, shall be used to bridge across trenches at street crossings where trench backfill, and temporary patches have not been completed during regular working hours as directed and approved by the City. Safe and convenient passage for pedestrians and access to all properties shall be provided.

(k) Disposal of Unsuitable Excavated Materials

(1) Excess material and excavated material unsuitable for backfill shall be removed from the Project by the end of each working day unless otherwise approved by the City and disposed of by the Contractor in an environmentally responsible manner at no cost to the Project.

(2) When unsuitable material is encountered that is not shown in the Contract Documents, the City shall order the removal of the material by the Contractor and issue a field order to change the contract price due to the Contractor for removal of the materials.

(l) Portable trench shields or boxes that provide a movable safe working area for installing pipe may be used for the installation of the pipe. After placing the pipe in the trench, backfill material shall be placed in lifts and the shield shall be lifted to allow for the backfill material to be placed for each lift, trench wall to trench wall.

(m) Transition Installations: When differential conditions of pipe support might occur, such as transitions from manholes to trench, a transition support region shall be provided to ensure uniform pipe support and preclude the development of shear, or other concentrated loading on the pipe.

Article 08-03-020 Bedding

(a) The bottom of the trenches shall be smooth, and hand graded uniformly throughout. If rock or other unyielding material is encountered or if the trench is over-excavated, pipe bedding material shall be added, compacted, and graded to a smooth uniform surface. The compacted bedding shall support the pipe throughout its entire length, except at bells or couplings which shall not rest on the bedding.

(b) After the bell or coupling holes are excavated and after the pipe pieces are connected and properly aligned and graded, successive layers of select material shall be placed and compacted, until the pipe is covered, as required in the Contract Documents. The Contractor shall maintain proper alignment and grade during the bedding process. Any bent, cracked, chipped, or damaged pieces of pipe shall be removed and replaced at Contractor's expense.

Article 08-03-030 Pipe Laying

(a) Pipe shall be laid true to the line and grade indicated in the Contract Documents or as established by the City.

(b) The pipe shall be protected during handling against impact shocks and free fall. Do not permit hooks, chains, cables, or handling equipment to come in contact with the pre-molded or pre-formed end surfaces.

(c) Handle the pipe having pre-molded end surfaces or pre-formed end surfaces so that no weight, including the weight of the pipe itself, will bear on or be supported by the jointing material or surfaces. Do not drag the end of the pipe on the ground or

allow them to be damaged by contact with gravel, crushed stone, or any other hard objects.

(d) No damaged or deformed pipe will be incorporated in the work.

(e) The interior of the pipelines shall be kept free from dirt and other foreign material as the work progresses and shall be clean upon its completion. Tight stoppers or bulkheads shall be securely placed in the ends of all pipelines when the work is stopped temporarily, or at the end of the workday.

(f) Immediately prior to joining, both pipe ends shall be thoroughly cleaned, and a lubricant shall be applied according to the manufacturer's recommendations. For push-on type joints, sufficient pressure shall be applied in making up joints to insure proper seating of the joints.

(g) The full length of each section of pipe shall rest solidly upon the bed, with recesses excavated to accommodate bells and joints. Any 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 City. Minimum depth of cover over top of pipe shall be three feet, unless otherwise approved by the City.

(h) All nuts, and bolts utilized in underground pipe connections shall be stainless steel, high strength cast iron or high strength wrought iron. Carbon steel nuts and bolts may be used except that they shall be protected by “cocoon” type protective coating of coal-tar and felt in accordance with AWWA Standard C 203.

(i) Where connections are made between new work and existing lines, the connections shall be made using specials and fittings as recommended by pipe manufacturer and approved by the City. Couplings may be either cast iron or steel with bolts as stated above. If steel couplings are used, they will be cocoon wrapped as specified herein.

(j) Water lines shall not be laid closer, along horizontal dimensions, than ten feet (10’) from sewer lines, and with the water line at a higher elevation than the sewer. If this is not possible, and if concurrence from the City is obtained by the Contractor, separate trenches will be required, and the water line shall be at least two (2) feet above the sewer or concrete encased. When water and sewer lines cross each other, the water line shall be at least two (2) feet above the sewer or concrete encased, per Standard Detail W-11. If the water line crossing occurs below the sewer line the sewer line shall be encased per Standard Detail W-11.

(k) Water main lines shall not be constructed under walkways, sidewalks, curbs and gutters, drive pads, or similar concrete structures by tunneling underneath. The Contractor will cut these concrete structures by using a concrete saw to the closest control joint or, at his option, may remove the section of the concrete structure to the nearest full expansion joint or edge.

(l) Encasement shall be performed as shown in the Contract Documents at shallow crossings or other instances in which piping may be exposed or susceptible to excessive surface loading. DIP shall be used for these crossings with push-on or M.J. type connections, blocked with curved / conforming cinder blocks underneath, installed in prepared trench of adequate width to house pipe diameter and encasement. Trench excavation shall have ninety-five (95) percent relative compaction or shall be in freshly excavated native material, and as approved by the City may suffice with adequate dimensions to omit use of formwork for encasement concrete placement. Encasement concrete shall be aggregate and Type II cement meeting or exceeding 3,000 psi compressive strength. Rebar shall be placed as shown in the Contract Documents, shall be new and unused, and tied with minimum six-inch (6") lap distances, with minimum two inches (2") of concrete cover on outside dimensions.

(m) All valves shall be set true, level, vertical and plumb. All valves shall have and be supported by a concrete thrust block, have retainer rods, and shall comply with the details shown in the Contract Documents. Backfill shall be compacted to ninety-five (95) percent density under pavement, ninety (90) percent in unpaved areas, ASTM D 1557.

(n) The Contractor shall remove the valve box and operating nut from all existing valves that are to be abandoned. The resulting excavation shall be backfilled and compacted to ninety-five (95) percent density, ASTM D 1557. The top six inches (6") of the excavation shall receive new base course placed to the above stated density. The pavement shall be sawcut to form a square opening. The cut faces of the existing asphalt shall be thoroughly coated with tack coat and new asphalt pavement shall be placed and densified to ninety-five (95) percent density, ASTM D 1557.

(o) Cast iron valve boxes shall be set vertical and plumb centered over the operating nut. All valve boxes shall be adjusted to proper elevation, providing the minimum overlap of six inches (6") of the two (2) pieces, and a concrete collar shall be built around the top of each valve box. The concrete collar shall be of the size, shape, and dimensions shown in the Detail Drawings. The concrete shall be 3,000 psi at twenty-eight (28) days with one (1) inch aggregate and finished with a light broom finish. All concrete shall be removed from the top of the valve box and lid while it is still wet, and they shall be left clean. Backfill shall be compacted to ninety-five

(95) percent density under pavement, ninety (90) percent in unpaved areas, ASTM D 1557. Valve stem extensions shall be required and installed on all valves for which the valve operator is more than four feet (4') below the finished surface.

(p) Adapters and couplings shall be installed in strict compliance with the manufacturer's recommendations. Contractor shall provide, in place, all additional straps, rods, and harness required to make a secure water-tight connection.

(q) The City shall have the privilege of checking the pipe for line and grade by any method that he wants to use after the pipe is laid, and before backfilling begins. The City shall also have the privilege of checking each pipe joint with a gauge or by any means that he deems necessary in order to be assured that the gaskets are in place and properly seated. Any run of pipe that is found to be appreciably off of line or grade shall be removed from the trench, the trench bedding shall be re-graded and compacted, and the pipe shall then be laid accurately online and grade. Any joint that is found to be improperly gasketed and/or seated shall be un-jointed and correctly reassembled. If any gasket is found to be damaged, the entire pipe section containing the damaged gasket shall be replaced with a new one.

(r) Contractor shall furnish any tools, gauges, and all items required for the checking of the gaskets and joints, and he shall check every joint to be sure that the gaskets are seated and located in the correct place to avoid leakage at the joints.

(s) Trenches shall be kept free from water during pipe installation until suitable backfill has been placed and compacted to prevent pipe flotation. Any standing water within the trench shall be evacuated and the trench bottom or bedding be restored per the standards contained herein.

(t) Field cuts shall be completed with a hacksaw, handsaw, or a power saw with a steel blade or an abrasive disc. Field cuts shall be square to the pipe's flow area. The newly cut pipe end shall be beveled to the factory pipe chamfer. Completed field cuts shall be smooth and blunt free from shavings and rough edges.

(u) Plastic sewer pipe shall be connected and placed in the trench in accordance with the manufacturer's recommendations.

(v) The reference mark (a distinct circumferential line) is placed on the pipe's spigot end by the manufacturer to indicate the correct depth of spigot penetration into the pipe gasket joint. If the pipe is seated too deep or too shallow the pipe may buckle or separate due to thermal expansion/contraction. Spigot penetration shall be within one quarter (1/4) inch of the manufacturer's recommended mark.

Article 08-03-040 Utility Restraint Systems

(a) Utility system piping thrust is to be restrained through the use of restrained joint fittings. Refer to Standard Details W-16 through W-18.

(b) Bell joint restraints shall be utilized.

(c) Where site conditions preclude the use of pipe restraints concrete thrust blocks may be utilized as follows. Thrust blocks shall be poured at all bends, valves, tees, reducers, and fittings, where changes in pipe diameter, alignment or grade occur, and as indicated in the Contract Documents or as required by City. Thrust blocks are only necessary where mechanical restraint joints are not being utilized. The minimum size of concrete thrust blocks shall be as shown in the Contract Documents or as directed by the City. The material of thrust blocks shall be concrete composed of concrete aggregates and shall have a compressive strength of no less than two thousand five hundred (2,500) psi in twenty eight (28) days for standard cement Type II and shall be placed between solid, undisturbed ground and the fitting to be anchored. The area of bearing on the fitting and on the ground shall in each instance be that required by the City. Unless otherwise directed by the City the thrust blocks shall be placed so that the pipe and fitting joints will be accessible for repair. Metal harness or tie rods, of the size and type shown in the Contract Documents, shall be used. Refer to Standard Details: W-3 and W-4.

Article 08-03-050 Backfilling Trenches

(a) Definitions

(1) Foundation: Over-excavation and backfill of the foundation only when the native trench bottom does not provide a firm-working platform for placement of the pipe bedding material.

(2) Bedding: In addition to bringing the trench bottom to required grade, the bedding levels out any irregularities and ensures uniform support along the length of the pipe.

(3) Haunch Zone: The backfill under the lower half of the pipe (haunches) distributes superimposed loadings.

(4) Initial Zone: The backfill from the pipe midline to the top of the pipe zone provides the primary support against lateral pipe deformation for flexible pipe.

(5) Final Zone: Backfill above the pipe zone to the top of the subgrade.

(b) Materials for trench backfill may include flowable fill, Type I aggregate base course, Type II aggregate base course, and native materials. Individual pipe zone backfill requirements are presented below. The Contractor shall submit the material types to the City for approval prior to construction.

Native backfill shall only be utilized within the Final backfill zone. Native materials shall be free from sod, frozen earth, organic materials, rubbish, and debris. The material should be free of large stones (maximum clod size shall be < 3") that may cause damage to the pipe, such as concentrated pipe loading.

Table 9: Type I Aggregate Base Course Gradation and Requirements

Sieve Size	Percentage of Dry Weight Passing Sieve
2-Inch	100
1-1/2-Inch	90-100
1-Inch	70-90
No. 4	30-65
No. 10	30-10
No. 16	15-20
No. 200	10-20
Plastic Index	12 Maximum
Liquid Limit	35 Maximum
Fractured Faces	70% Minimum
Total Available Water-Soluble Sulfates	Less than 0.3% by dry weight of soil

Table 10: Type II Aggregate Base Course Gradation and Requirements

Sieve Size	Percentage of Dry Weight Passing Sieve
1-Inch	100
¾-Inch	85-95
No. 4	40-70
No. 10	35-45
No. 16	25-35
No. 200	6-18
Plastic Index	12 Maximum
Liquid Limit	35 Maximum
Fractured Faces	70% Minimum
Total Available Water-Soluble Sulfates	Less than 0.3% by dry weight of soil

Table 11: Native Backfill Requirements

Percentage by Weight Passing No. 200 Sieve	Plasticity Index Maximum
0-20.0	12
20.1 – 50.0	10
50.1 – 80.0	8
80.1 – 100	6
Liquid Limit	50 Maximum

(1) Foundation: Trench foundations shall be stable prior to placing bedding material. If the City determines that unsuitable materials exist at the trench foundations, the Contractor shall remove and replace the material as directed by the City.

(2) Pipe Bedding: The trench shall be excavated to a depth of four- to six-inches (4”-6”) below the bottom of the pipe barrel and to a depth that will be sufficient to provide two- to four-inches (2”-4”) of clearance under the pipe bell (where applicable).

Uniform and stable bedding shall be provided for the pipe and any protruding features of its joints and/or fittings. The middle of the bedding equal to one-third (1/3) the pipe outside diameter may be loosely placed to allow for the pipe bell and other protruding features. Alternatively, the compacted bedding material may be excavated slightly to allow for continuous lines and grades of the pipe structure.

Pipe bedding shall consist of Type II aggregate base course or flowable fill. Bedding shall be backfilled to the required grade of the bottom of the pipe. The compaction shall provide a density, at minimum, equal to 95 percent of the maximum dry density in accordance with ASTM D 1557 with the exception of the middle-uncompacted area.

(3) Haunch Zone Backfill: After the pipe or conduit is laid, the haunch areas shall be backfilled with Type II aggregate base course or flowable fill.

Compaction of the haunching material can be best accomplished by hand with tampers or suitable power compactors for maximum compacted lift thickness of six inches (6”). The Contractor shall take care to not disturb the pipe from its line and grade while compacting the backfill. Material suitably distant from the pipe shall be compacted to 95 percent of the maximum dry density in accordance with ASTM D 1557.

While compacting the embedment near the pipe with impact-type tampers, caution shall be taken to not allow direct contact of the equipment with the pipe.

(4) Initial Backfill Zone: After the pipe or conduit is laid, the initial backfill area shall be backfilled with Type II aggregate base course or flowable fill. Avoid usage of impact tampers directly above the pipe until the full loose layer backfill depth above the pipe is obtained.

Table 12: Initial Backfill Zone Material Depths

Pipe or Conduit	Initial Zone
2-Inch or less diameter	6-Inches above the top of pipe
Greater than 2-Inch diameter	12-Inches above the top of pipe

(5) Final Backfill Zone: The remaining backfill, to the top of subgrade, shall consist of Type I or Type II aggregate basecourse, native material, or floable fill. The material shall be compacted to a minimum of 95 percent of the maximum dry density in accordance with ASTM D 1557.

A. If flowable fill is used, flowable fill shall be placed from the top of the initial backfill zone to the bottom of the flexible pavement (replaces aggregate road base in the pavement section over the trench).

B. Flowable fille cap may be required in the upper portion of the Final Backfill Zone for all non-residential roadways with a minimum thickness of twelve inches (12”) for minor collectors and eighteen inches (18”) for all major collectors and arterials.

(d) Compaction

(1) Compaction shall be performed by mechanical means except in the haunch zone where compaction may be required by hand tamping. Mechanically compacted backfill shall be placed in layers of thickness compatible with the characteristics of the backfill and the type of equipment being used and shall have a maximum lift thickness as shown in the table below. The lifts shall be placed on both sides of the pipe at the same time to reduce pipe movement.

Table 13: Backfill Lift Thickness

Location	Maximum Compacted Lift Thickness (inches)	Maximum Loose Lift Thickness (inches)
Bedding, Haunch, and Initial Zones	6	8
Final Zone	8	12

(2) Each layer shall be evenly spread, moistened, and tamped or rolled until the specified relative compaction has been attained.

(3) Compaction minimum shall be 95 percent of the maximum dry density in accordance with ASTM D 1557 for trenches within the roadway prism. Compaction requirements for the final zone of trenches outside the roadway may be reduced to 90 percent of maximum dry density in accordance with ASTM D 1557.

(4) Density testing shall be completed every 200-feet on mains or any part thereof per day, one per every three services or any part thereof per day.

(5) Density testing per depth: Less than or equal to four-feet (4') shall require one at depth and one at subgrade per horizontal length above. Greater than four-feet (4') depths shall require one per six-inch (6") or larger pipe, then one every three (3) vertical feet, and one at subgrade per horizontal length above.

(6) Where test results reveal non-compliance with the requirements of the Contract, the Contractor shall bear the costs of subsequent rework and retesting until the required specification compliance is obtained to the satisfaction of the City.

(e) Minimum Pipe Spacing: If the pipe space between parallel pipes in a single trench is not conducive to mechanical backfill, then flowable fill shall be used.

ARTICLE 08-04 – FLUSHING AND DISINFECTION

Article 08-04-010 Work Description

(a) This work includes materials and procedures for flushing and disinfection of water mains by the continuous feed method and by the slug method. The tablet method to disinfect pipelines shall not be used. Disinfect piping in accordance with AWWA C651 as modified below.

(b) At all times, the new main shall be isolated from the active distribution system by physical separation until disinfecting water has been flushed out and satisfactory bacteriological testing has been completed in accordance with AWWA Standard C651. Water needed to fill the new main for testing and flushing purposes shall only be potable City water supplied through a temporary connection protected by a backflow device.

(c) The backflow device must be tested and certified after installation on-site. A copy of the certification shall be given to the City and a copy shall be kept on-site with the device. Testing must be completed by a certified testing facility and be on the City's approved tester list.

Article 08-04-020 Job Conditions

(a) Disposal of the chlorinated disinfection water and the flushing water is the Contractor's responsibility. The chlorinated disinfection water shall be properly disposed of by either pumping the water into a tank truck or through de-chlorination using a neutralizing chemical applied to the wasted water in accordance with AWWA C655 "Field Dechlorination" prior to directing the dechlorinated water into the environment or the sewer system.

(b) An air gap of two (2) times the hose diameter must be provided to prevent cross contamination. The Contractor shall notify City (24) hours prior to disposal into the sewer system. Schedule the rate of flow and locations of discharges in advance to permit review and coordination with the City. Use potable water for chlorination. Submit request for use of water from waterline of the City forty-eight (48) hours in advance. All notifications to the City shall be completed in writing and acknowledged in writing prior to commencement of activities by the Contractor.

Article 08-04-030 Materials

(a) Liquid Chlorine: Inject with a solution feed chlorinator and a water booster pump. Use an experienced operator and follow the instructions of the chlorinator manufacturer.

(b) Calcium Hypochlorite (Dry): Dissolve in water to a known concentration in a drum and pump into the pipeline at a metered rate.

(c) Sodium Hypochlorite (Solution): Further dilute in water to desired concentration and pump into the pipeline at a metered rate.

(d) Chlorine Residual Test Kit: For measuring chlorine concentration, supply and use a medium range, drop count, titration kit or an orthotolidine indicator comparator with wide range color discs. Products: Hach Chemical or Helliege. Maintain kits in good working order available for immediate test of residuals at point of sampling. The use of expired DPD compound is prohibited.

Article 08-04-040 Execution

(a) Continuous Feed Method for Pipelines: The continuous-feed method consists of completely filling the main with potable water, removing air pockets, then flushing the completed main to remove particulates, and refilling the main with potable water that has been chlorinated to a minimum of 50 mg/L. After a 24-hour holding period in the main there shall be a free chlorine residual of not less than 25 mg/L. Table 16 below provides the amount of chlorine required for each 100-feet of pipe across various diameters. A complete step-by-step procedure can be found in AWWA C651.

Table 14: Chlorine required to produce an initial 50-mg/L concentration in 100ft of pipe by diameter.

Pipe Diameter	100% Chlorine	1% Chlorine Solution
(inches)	(lb)	(gal)
4	0.027	0.33
6	0.061	0.73
8	0.108	1.30
10	0.170	2.04
12	0.240	2.88

(b) Slug Method for Pipelines: Introduce the water in the pipeline at a constant measured rate. At the start of the test section, feed the chlorine solution into the pipeline at a measured rate so that the chlorine concentration created in the pipeline is three hundred (300) mg/L. Feed the chlorine for a sufficient period to develop a solid column or "slug" of chlorinated water that will, as it passes along the line, expose all interior surfaces to a concentration of at least three hundred (300) mg/1 for at least three (3) hours.

(c) Disinfection of Valves and Appurtenances: During the period that the chlorine solution or slug is in the section of pipeline, pen and close valves to obtain a chlorine residual at hydrants and other pipeline appurtenances.

(d) Disinfection of Connections to Existing Pipelines: Disinfect per AWWA C651. Flush with potable water until discolored water, mud, and debris are eliminated. Swab interior of pipe and fittings with a one (1) percent sodium hypochlorite solution. After disinfection, flush with potable water again until water is free of chlorine odor.

(e) After the chlorine solution applied by the continuous feed method has been retained in the pipeline for twenty-four (24) hours. Confirm that a chlorine residual of fifty (50) mg/1 minimum exists along the pipeline by sampling at air valves and other points of access.

(f) With the slug method, confirm by sampling as the slug passes each access point and as it leaves the pipeline. After confirming the chlorine residual, flush the excess chlorine solution from the pipeline until the chlorine concentration in the water leaving the pipe is within 0.5 mg/1 of the existing potable water system.

(g) Pipeline Flushing: After confirming the chlorine residual, dechlorinate the excess chlorine solution from the pipeline until the chlorine concentration in the water leaving the pipe is within 0.5 mg/l of the replacement water. Replacement water sample shall be verified by the City.

(h) Bacteriologic Tests: Collect two (2) samples, deliver to a certified laboratory within six (6) hours of obtaining the samples, and obtain a bacteriologic quality test to demonstrate the absence of coliform organisms in each separate section of the pipeline after chlorination and refilling. The City shall observe while samples are taken; written notification shall be received 24-hours prior to desired sampling. Water testing bottles for transportation to the lab must be sealed in the presence of the City. Sampling shall only occur between 8:30 AM and 3:00 Monday through Thursday, excluding holidays, unless preapproved by the City. Hydrants shall not be utilized as sampling points.

(1) New Mains: An initial set of samples shall be completed and then resampled 24-hours later. In order to place the line into service both sets of samples must show the absence of coliform bacteria and acceptable aesthetic quality (e.g. chlorine residual, pH, alkalinity, specific conductance, turbidity). At the option of the City a heterotropic plate count (HPC) may be required.

A. For new mains, sets of samples shall be collected every 1,200 feet of the new water main, plus one set from the end of the line and at least one from each branch greater than one pipe length.

B. If trench water has entered the new main during construction or if, in the opinion of the City, excessive quantities of dirt or debris have entered the new main, bacteriologic samples shall be taken at intervals of approximately 200 feet. Samples shall be taken of water that has stood in the new main for at least 16 hours after final flushing is completed.

(2) Repaired Mains: For repaired mains that were depressurized and/or wholly or partially dewatered, one set of samples will be required. Samples shall be collected downstream of the repair site and at intervals of approximately 200 feet within the length of pipe that was shut down. If the direction of flow is not known, or known to flow both directions, samples shall be collected on either side of the repair site.

(i) Repetition of Procedure: If the initial chlorination fails to produce required residuals and bacteriologic tests, repeat the chlorination and retesting until satisfactory results are obtained.

(j) Test Facility Removal: After satisfactory disinfection, replace air valves, restore the pipe coating, and complete the pipeline where temporary disinfection or test facilities were installed.

Article 08-04-050 Hydrostatic Tests

(a) The Contractor shall be required to test all piping and other lines and appurtenances in the presence of the City. Test reports shall be required for each test and submitted to the City. Testing of lines shall be done without being connected to existing lines. If such connections are allowed it is with the understanding that the Contractor assumes any and all responsibility in case of damage, failure and/or contamination to the existing system. The new water pipe will be tested before the backfilling is done. After the pipe is laid, earth cover shall be placed over the middle of the pipe joints, leaving the corp. stops, valves, service taps and laterals uncovered. The pipe will be filled with water, and the pressure in the pipeline shall be raised by means of a motor-driven water pump to a hydrostatic pressure of one hundred fifty (150) psi or one and one-half (1.5) times the normal working pressure, whichever is greater, at the lower end of the pipe section. Applicable AWWA C-600 standards and procedures shall be adhered to for determination of losses on pipes up to thirty-inches (30") in diameter. If any leaks appear in the pipe, they shall be repaired to the satisfaction of the City, and the test shall be performed until the pipe holds the prescribed pressure. As an alternative, the Contract may opt to test the pipeline in sections between mainline valves or as approved by the City.

(b) All testing shall be conducted in accordance with AWWA Standard C600 for ductile iron mains and AWWA Standard C605 for PVC mains and those portions of the above standard related to hydrostatic tests shall apply to any type of water main construction. Test pressure shall be one hundred fifty (150) psi or one and one-half (1.5) times the normal working pressure, whichever is greater. Waterline shall be placed in its final position for hydrostatic testing. If the waterline is moved, all testing shall be performed again.

(c) All taps, gauges and necessary equipment shall be provided by the Contractor; however, the City may utilize gauges provided by the City at their discretion.

(d) Leakage Defined: Leakage shall be defined as the quantity of water that must be supplied into the newly laid pipe, or any valved section thereof, to maintain pressure within five (5) psi of the specified test pressure after the air in the pipeline has been expelled and the pipe has been filled with water. If the pressure drops more than five (5) pounds in thirty (30) minutes, the pipe has failed to pass the test. If the pressure drop is less than five (5) pounds in thirty (30) minutes, water shall be added to the pipe section to maintain the one hundred fifty (150) psi test pressure and the volume of water added shall be duly recorded. This procedure shall be repeated at each thirty (30) minute intervals for the test period. The total volume of water added to the pipe section to maintain the one hundred fifty (150) psi test pressure shall represent the total leakage during the test.

(e) Allowable leakage: No pipe installation will be accepted if the leakage is greater than that determined by the following formula:

$$\underline{\text{DIP}} \qquad \underline{\text{PVC}}$$
$$L = \frac{SD\sqrt{P}}{133{,}200} \quad \text{or} \quad L = \frac{ND\sqrt{P}}{7{,}400}$$

where L is the allowable leakage, in gallons per hour, S is the length of pipe tested, in feet; N is the number of joints in the length of pipeline tested, D is the nominal diameter of the pipe, in inches, and P is the average test pressure during the leakage test, in pounds per square inch gauge.

The tables below present the allowable leakage per various pipe diameters per 1,000 feet of pipeline.

Table 15: Allowable Leakage (GPH) per 1,000 Feet of Pipeline (DIP)

Avg. Test Pressure	6	8	10	12	14	16	18	24	30
PSI	In.	In.	In.	In.	In.	In.	In.	In.	In.
350	0.84	1.12	1.40	1.69	1.97	2.25	2.53	3.37	4.21
300	0.78	1.04	1.30	1.56	1.82	2.08	2.34	3.12	3.90
275	0.75	1.00	1.24	1.49	1.74	1.99	2.24	2.99	3.73
250	0.71	0.95	1.19	1.42	1.66	1.90	2.14	2.85	3.56
225	0.68	0.90	1.13	1.35	1.58	1.80	2.03	2.70	3.38
200	0.64	0.85	1.06	1.27	1.49	1.70	1.91	2.55	3.19
175	0.60	0.79	0.99	1.19	1.39	1.59	1.79	2.38	2.98
150	0.55	0.74	0.92	1.10	1.29	1.47	1.66	2.21	2.76

Table 16: Allowable Leakage (GPH) per 1,000 Feet of Pipeline (PVC)

Avg. Test Pressure	6	8	10	12	14	16	18	24	30
PSI	In.	In.	In.	In.	In.	In.	In.	In.	In.
300	0.70	0.94	1.17	1.40	1.64	1.87	2.11	2.81	3.51
275	0.67	0.90	1.12	1.34	1.57	1.79	2.02	2.69	3.36
250	0.64	0.85	1.07	1.28	1.50	1.71	1.92	2.56	3.21
225	0.61	0.81	1.01	1.22	1.42	1.62	1.82	2.43	3.04
200	0.57	0.76	0.96	1.15	1.34	1.53	1.72	2.29	2.87
175	0.54	0.72	0.89	1.07	1.25	1.43	1.61	2.15	2.68
150	0.50	0.66	0.83	0.99	1.16	1.32	1.49	1.99	2.48

(f) When testing against closed metal-seated valves, an additional leakage per closed valve of 0.0078 gal/h/in. (0.0012 L/h/mm) of nominal valve size shall be allowed.

(g) When hydrants are in the test section, the test shall be made against the closed hydrant.

(h) Acceptance of Installations: Acceptance shall be determined on the basis of allowable leakage. If any test of pipe laid disclosed leakage greater than specified the Contractor shall, at the Contractor's expense, locate and make repairs as necessary until the leakage is within the specified allowance.

(i) All visible leaks are to be repaired regardless of the amount of leakage.

(j) The Contractor shall be notified of any leaks that may occur during the one (1) year warranty period and shall make immediate arrangements after he is notified to return to the job site and repair any leaks that may develop in the pipeline.

Article 08-04-060 Asbestos Containing Materials

It is the Contractor's responsibility to follow all EPA, OSHA, New Mexico Solid Waste Management Regulations, and all other regulations when working with asbestos-cement (AC) pipe. Cutting of AC pipe will not be permitted. At the point of tie-in connection to an existing AC line, the Contractor shall excavate to the nearest joint and remove the section of pipe in a single piece. The AC pipe must remain wet and encapsulated with 6 mil or thicker plastic bag per NM Solid Waste Management Regulations until the pipe is delivered to the Special Waste Facility. Existing AC pipe shall remain abandoned in place whenever possible.

END OF ARTICLE CHAPTER 08

CHAPTER 09 – RECLAIMED WATER SUPPLY SYSTEM

ARTICLE 09-01 - GENERAL

Article 09-01-010 Reclaimed Water System Materials

Item Description	Size or Reference	Specification	Manufacturer
Water Meter			
PVC Pipe DR18	4” to 30”	AWWA C900-16 ASTM D1784 - Pipe Compound ASTM F477 - Gasket	
PVC Pipe DR25	4” to 36”	AWWA C900-16 ASTM D1784 – Pipe Compound ASTM F477 - Gasket	
PVC Fittings	6” to 12”	AWWA C153	
Ductile Iron Pipe	12” to 36”	ANSI/AWWA C151/A21.51	
Fiberglass Flexible Markers	W-30	APWA Color Code	
Couplings Mechanical and/or Flexible		AWWA C111	Romac or approved equal
Casing Pipe End Seals	W-22	See Manufacturer’s Specifications	T.D. Williamson Z-Seal Casing Seals or approved Engineer Equal
Casing Spacer Band	W-22	See Manufacturer’s Specifications	Advance Products & Systems, LLC Model SSIM or approved Engineer Equal
Gate Valves	4” and larger W-13	AWWA C515 NSF/ANSI 61 & 372	Waterous Company or approved equal
Valve Boxes	Series 6850 W-5 & W-6	ASTM A-48	Tyler Pipe, Tyler Corporation or approved equal
Valve Box Lockable Debris Cap	W-5	See Manufacturer’s Specifications	SW Services LLC
Fire Hydrant	W-9	AWWA C502	Clow “Medallion” American Darling Model B-62 or B-84, Mueller Super Centurion Model A-423

Reduced Pressure Backflow Prevention Devices	2 -1/2" to 10"	AWWA C511-92	Watts Series LF909 or approved equal
Stainless Steel Tapping Sleeve		AWWA C207 ASTM D2000	
Detectable Warning Tape	APWA Standard	ASTM D2103	
Tracing Wire	#12 AWG Copper Clad Steel W-20	ASTM B1010 – Wire ASTM B910/B910M – Wire ASTM D1248 -Insulation	Copperhead Industries or Approved Equal
Tracing Wire Connectors		See Manufacturer's Specifications	Copperhead Industries Connector Part Number 3WB-01 or Approved Equal
Tracing Wire Access Boxes	W-20	ASTM D1788, Type 1 – Base Material APWA Standard	Copperhead Industries CD14*2T-SW or approved equal
Tracing Wire Access Box Lid	W-20	ASTM D1788, Type 1 – Base Material APWA Standard	Copperhead Industries RB14*2T-SW or LD14*2T-SW or approved equal
Tracing Wire Grounding (Ground Anode)	W-29	See Manufacturer's Specifications	Copperhead Industries Ground Rod with ANO-12 or approved equal
Mechanical Joint Restraint	W-16 thru W-19	AWWA C600, C605 or ASTM D2774 ASTM A536 - Material	EBBA Iron Inc.
Air-Release and Vacuum-Relief Valves	W-15	AWWA C512 ASTM A 48 ANSI B1.20.1	Val-Matic Model 201C.2 or equivalent
Air-Release and Vacuum-Relief Enclosure	Precast Manhole W-15 & W-26	ASTM C478 AASHTO M199 NMDOT Section 517 and 662	Western Precast Concrete Inc
Traffic Bearing Manhole ring and Cover	W-26		East Jordan
Manhole gap filler	W-26 & W-27	ASTM C990-09	RAM-NEK Joint sealant or Approved Equal

Air-Release and Vacuum-Relief Enclosure Lid	W-15	H20 traffic rated ASTM C478-93	

Article 09-01-020 Work Description

(a) This Work consists of furnishing all of equipment, materials, and labor to perform all operations in connection with the installation of potable water lines and appurtenances. This section defines required characteristics and properties of Polyvinyl Chloride (PVC) and Ductile Iron Pipe (DIP), valves, valve boxes, adapters, couplings, fire hydrants, materials, fittings, appurtenances, and construction practices.

(b) Contractor shall provide, in place, all valves, adapters, couplings, and appurtenances necessary to meet the requirements of this Project, whether shown in the Contract Documents or not.

(c) At all times, the new main shall be isolated from the active distribution system by physical separation until disinfecting water has been flushed out and satisfactory bacteriological testing has been completed in accordance with AWWA Standard C651. Water needed to fill the new main for testing and flushing purposes shall only be potable City water supplied through a temporary connection protected by a backflow device.

(d) The backflow device must be tested and certified after installation on-site. A copy of the Certification shall be given to the City and a copy shall be kept on-site with the device. Testing must be completed by a certified testing facility on the City's approved listing.

Article 09-01-030 Location

Reclaimed waterline shall be located as directed by the City. All reclaimed water mains shall be laid with a minimum cover of three-feet (3'). The minimum pipe coverage shall apply to new construction only.

Article 09-01-040 Minimum Reclaimed Waterline Size

The minimum size of reclaimed water mains shall be six-inches (6") in diameter.

ARTICLE 09-02 – MATERIALS

Article 09-02-010 General

(a) Pipe and accessories shall be new and unused. Pipe shall be color-coded (purple for reclaimed water). Detectable Marking Tape shall be installed as provided in the Contract Documents.

(b) When PVC pipe is stored outside and exposed to prolonged periods of sunlight, an obvious discoloration of the pipe can occur. This is an indication of reduced pipe impact strength, and any length of pipe that is discolored will be rejected. All pipe rejected will be removed from the job site.

Article 09-02-020 PVC Pipe

(a) PVC pipe four inches (4"-for existing tie-in locations only) through twelve inches (12") shall be not less than DR18, Class 235 and in conformance with AWWA C900, latest revision. Pressure class of PVC pipe shall be as required by Appendix A of AWWA C900. PVC pipe over twelve inches (12") shall be no less than DR25, Class 165 and in conformance with AWWA C900, latest revision.

(b) All PVC pipes shall be approved for use in potable water systems by an agency such as NSF Testing Laboratory.

(c) Joints: For pipe six inches (6") through twelve inches (12"), elastomeric gasket bell push-on type ends shall be used in accordance with ASTM F 477.

(d) Specials and Fittings: For pipe six inches (6") through twelve inches (12"), specials and fittings for PVC pipe shall conform to the requirements of AWWA C153 and shall be cement mortar lined in accordance with AWWA C104. Fitting types shall include restrained mechanical joints and concrete thrust block where required. Restraining, standard mechanical joints, and fittings shall be submitted for City approval.

Article 09-02-030 Ductile Iron Pipe

(a) Ductile iron pipe shall be in accordance with ANSI/AWWA C151/A21.51 and Federal Specification WW-P-421d, latest revision. All ductile iron pipe shall be minimum class 150, unless otherwise indicated in the Contract Documents. Ductile iron pipe fittings shall be pressure rated at three hundred fifty (350) psi and be in accordance with ANSI/AWWA C153/A21.53 and ANSI/AWWA C111/A21.11.

(b) All ductile iron pipe and fittings shall be internally mortar lined in accordance with ANSI A21.4, latest revision, and shall have an exterior coating in accordance with ANSI A21.6, A21.8, or A21.51.

(c) All ductile iron pipe and ductile iron fittings shall have a polyethylene encasement in accordance with ANSI/AWWA C105/A21.5, latest revision.

(d) The ductile iron pipe shall be push-on type joints, unless indicated otherwise on the plans, and the fittings shall conform to the requirements of AWWA C153 and shall be cement mortar lined in accordance with AWWA C104. Fitting types shall include standard flange fittings and mechanical joints.

Article 09-02-040 Adapters and Couplings

(a) All adapters, pipe couplings, tap and sleeves, or mechanical type couplings required for any of the piping systems shall be of the type manufactured for the specific purpose of the use intended, and shall be installed in strict compliance with the manufacturer's specifications, and to the satisfaction of the City. Factory-made adapters shall be furnished for connecting transition material to the mechanical joint fittings and valves, where required, including plastic to steel and plastic to DIP.

(b) Mechanical and/or flexible couplings shall be manufactured by Romac, or approved equal, and shall be sized and styled in accordance with the requirement for the particular coupling and used in accordance with the manufacturer's recommendations for the diameter, thickness and type of pipe to be connected. The mechanical and/or flexible couplings shall be provided with an acceptable joint harness to prevent separation of the joint where required due to pressure or change in direction of fittings. Couplings shall be polyethylene wrapped.

Article 09-02-050 Gate Valves: Four (4) Inch and Larger

All gate valves shall be resilient seated gate valves conforming to AWWA C515 rated for one hundred fifty (150) psi working pressure. Valves shall have a standard two (2) inch operating nut that opens counterclockwise. The wedge shall be constructed of ductile iron and shall be fully encapsulated in synthetic rubber except for the guide and wedge nut areas. The wedge shall seat against seating surfaces that are inclined to the vertical at a minimum angle of thirty-two (32) degrees when stem is in vertical position to eliminate abrasive wear. The non-rising stem shall be sealed by at least two (2) O-rings. The waterway shall be smooth and shall have no depressions or cavities. The valve body and bonnet shall be epoxy coated, inside and out, and wrapped with polyethylene sheet encasement. Joints shall be restrained mechanical joint ends. Valve shall be as manufactured by Waterous Company or approved equal.

Article 09-02-060 Valve Boxes

(a) Valve boxes shall be deep skirted, adjustable cast iron two (2) piece screw type, Series 6850 as manufactured by Tyler Pipe, Tyler Corporation, or approved equal. The valve boxes shall be five and one-quarter (5-1/4) inch diameter and the two (2) pieces shall overlap at least six (6) inches. The drop lid shall have a depth of two (2) inches, shall weigh thirteen (13) pounds, and shall have the word "WATER" embossed on top. Refer to Standard Details: W-5, W-6, and W-7.

(b) Valve boxes shall have debris caps installed to aid in the prevention of dirt and debris accumulation within the valve box. Lockable debris caps shall be as manufactured by SW Services, LLC or City approved equal.

Article 09-02-070 Fire Hydrants

(a) Fire hydrants and extensions shall be in accordance with AWWA C502, traffic type, fire hydrants shall have two (2) two and one-half (2-1/2) inch hose nozzle connections, and one (1) four and one-half (4-1/2) inch steamer nozzle. All nozzle connections shall be National Standard Fire Hose Coupling screw threads. Fire hydrants shall have a bronze or cast-iron pentagon operating nut. The main inlet shall be six (6) inch restricted mechanical joint type. All fire hydrants shall be rated for one hundred fifty (150) psi working pressure. Any marks or scratches on new fire hydrants shall be corrected to the satisfaction of the City. Extensions will be used, when required, to bring the bottom of the break-off flange three (3) to six (6) inches above the top of the surrounding finished grade. All fire hydrants shall be Clow Medallion (preferred), American Darling B-62, American Darling B-84, Mueller Super Centurion A-423. All fire hydrants shall be painted purple. Refer to Standard Details: W-9 and W-10.

Article 09-02-080 Cross Connection, Prevention, and Control

(a) The need, responsibilities, requirements, inspections, and maintenance of backflow prevention devices shall adhere to Article 8.08 of the City's General Ordinances.

(b) All water lines supplying water-based fire protection systems outside of public utility easements and public rights-of-way shall require a Double Check Backflow Preventer, which must be sized accordingly by a New Mexico licensed engineer. The fire line, water-based fire protection, system, and double check backflow preventer shall meet the requirements of the adopted City fire code and be approved by the fire code official.

(c) Reduced pressure backflow prevention devices shall be Watts Series LF909 or Engineer Approved Equal.

(d) All approved containment and isolation backflow prevention assemblies which are classified as testable devices shall be tested at least one per year. For completer testing and maintenance requirements refer to Article 8.08 of the City's General Ordinances. Refer to Standard Details: W-31 and W-32.

Article 09-02-090 Reclaimed Water Services

(a) All new reclaimed water services shall be accompanied by an approved New Mexico Environment Department (NMED) Ground Water Discharge Permit.

(b) Approved connections to the City's Reclaimed Water System shall be metered. The meter location and manufacture shall be coordinated with the City.

Article 09-02-100 Stainless Steel Tapping Sleeve

(a) Body: 18-8 Type 304 Stainless Steel. All welds shall be fully passivated to restore stainless characteristics.

(b) Bolts: 18-8 Type 304 Stainless Steel. Heavy hex nuts and washer are coated to prevent galling.

(c) Flange:18-8 Type 304 Stainless Steel Flange with recess per MSS-SP60 to accept standard tapping valve. Flange conforms to AWWA C207 Class D ANSI 150 lb. drilling.

(d) Outlet: 18-8 Type 304 Stainless Steel. Scheduled 10 for 3" and 4" outlets. Scheduled 5 for all outlets larger than 4".

(e) Test Plug: 18-8 Type 304 Stainless Steel in test outlet.

(f) Gasket: Sleeve shall have a full wide gasket of Nitrile Butadiene Rubber (NBR, Buna-N) per ASTM D2000 with hydromechanical activated lip, captured in a recessed groove around the outlet. Gasket shall be suitable for water, salt solutions, mild acids, bases, and sewage.

(g) Service Rating: 2"-12" outlets: 175 psi.

(h) Only qualified and appropriately licensed Utility Contractors shall complete reclaimed water taps on new installations not connected to the City's reclaimed water system at the time of the tap. The City shall observe all tapping activities. Taps on the City's active reclaimed water system shall be completed by the City.

Article 09-02-110 Detectable (Underground) Warning Tape

Detectable warning tape shall be 6" wide, 5 mil overall thickness, with a .35 mil solid foil coil. APWA Color coded with imprint of underground utility installed.

Article 09-02-120 Tracing Wire

(a) All trace wire shall have HDPE insultation intended for direct bury service. HDPE insulation shall be color coated per APWA Standard for respective utility being installed.

(b) Tracing wire shall be taped to the top of all water mains and fire hydrant/lines at a maximum 10-foot (10') interval. Tracing wire integral to water services shall be connected to the water main tracing wire.

(c) Trace wire shall be as following based on installation method:

(1) Open Trench Installation: #12 AWG copper clad steel, high strength with minimum 450-pound break load and minimum 30 mil HDPE insulation thickness. Copperhead Industries High Strength – 1230 CCS Tracer Wire or City approved equal.

(2) Directional Drilling/Boring: #12 AWG coper clad steel, high strength with minimum 1,150-pound break load and minimum 30 mil HDPE insulation thickness. Copperhead Industries Extra-High Strength – 1245 CCS Tracer Wire or City approved equal.

(3) Pipe Bursting/Slip Lining: 7 x 7 stranded copper clad steel, extreme strength with minimum 4,700-pound break load and minimum 50 mil HDPE insulation thickness. Copperhead Industries SoloShot Xtreme – PBX-50 CCS Tracer Wire or City approved equal.

(4) When a new trace wire is to be tied to an existing trace wire the connection shall be made with an approved splice connector and shall be properly grounded at the splice connection.

(d) Connectors

(1) All main line trace wires shall be interconnected at intersections (tees and crosses). Connectors shall be lockable and manufactured specifically for use in underground trace wire installation. Connectors shall be dielectric silicon filled to seal out moisture and corrosion and shall be installed in a manner as to prevent any uninsulated wire exposure.

(2) Tee Connectors (service lines, main line tees, and fire hydrants) shall include a 3-way lockable connector main line to lateral lug connector. Copperhead Industries Mainline-to-Service Connector Part Number 3WB-01 or City approved equal.

(3) Cross Connectors (main line crosses) shall include two (2) 3-way lockable main line to lateral lug connectors. Copperhead Industries Mainline-to-Service Connector Part Number 3WB-01 or City approved equal.

(4) Main line tracing wire splices shall be completed utilizing twist-lock connectors. Copperhead Industries Locking Connector Part Number LSC1230C or City approved equal.

(5) Do not cut and splice main line trace wire.

(6) Non-locking friction fit, twist on, or taped connectors shall not be used.

(e) Termination/Access Boxes

(1) All trace wire termination points must utilize an approved trace wire access box, specifically manufactured for this purpose.

(2) All access boxes shall be identified with “sewer” or “water” cast into the cap and be APWA color coded according to the utility.

(3) A minimum of two-feet (2’) of slack is required in all trace wire boxes upon installation at final grade.

(4) All trace wire access boxes must include a manually interruptible conductive/connective link between the terminals for the trace wire connection and the terminal for the ground anode wire connection.

(5) Ground anode wire shall be connected to the identified terminal on all access boxes.

(6) Fire hydrants must terminate at an in-ground trace wire access box positioned within the fire hydrant concrete collar. Copperhead Industries SnakePit Concrete/Driveway with Two-Terminal Switchable Lid Access Point Part Number CD14*2T-SW or City approved equal.

(7) Main Line access boxes shall be placed at intervals not exceeding 500-feet in locations where fire hydrants are not present. Trace wire access boxes may be placed outside the roadway driving surface or may be placed integral with valve box collars if pre-approved by the City.

A. Trace wire access box placed integrally in concrete valve box shall be Copperhead Industries SnakePit Roadway with Two-Terminal Switchable Lid Access Point Part Number RB14*2T-SW or City approved equal.

B. Trace wire access box outside the roadway prism shall be Copperhead Industries SnakePit Lite Duty with Two-Terminal Switchable Lid Access Point Part Number LD14*2T-SW or Engineer Approved Equal. Access boxes placed outside of the roadway shall be identified with flexible marker per Standard Detail W-20.

(f) Grounding

(1) Trace wire must be properly grounded at all dead ends and stubouts.

(2) Grounding of trace wire shall be accomplished using a drive-in magnesium grounding anode rod with a minimum of 20-feet of #12 AWG red HDPE insulated copper clad steel wire connected to the anode (minimum of 1.5-pound) specifically manufactured for the intended purposed. The ground anode shall be landed at the same elevation as the utility. Ground anode shall be Copperhead Industries Ground Rod with Twist-On Connector Part Number ANO-12 or City approved equal.

(3) When grounding the trace wire at dead ends or stubouts, the grounding anode shall be installed perpendicular to the trace wire at a maximum possible distance.

(4) When grounding the trace wire in long continuous runs, the grounding anode shall be installed directly beneath and in-line with trace wire. The grounding anode wire shall be trimmed to an appropriate length before connecting to trace wire with a mainline to lateral lug connector.

(g) Testing

(1) All new trace wire installations shall be located using typical low frequency line tracing equipment. The test trace shall be witnessed by the City prior to final acceptance.

(2) Continuity testing in lieu of actual line tracing will not be accepted.

Article 09-02-130 Cathodic Protection

Cathodic protection, if required, shall be designed by a licensed engineer in the State of New Mexico.

ARTICLE 09-03 – CONSTRUCTION REQUIREMENTS

Article 09-03-010 Trench Excavation

(a) Pipe trenches shall be excavated along straight lines to the dimensions as required in the Contract Documents.

(b) All trenching work shall be done in a safe manner, trenches shall be rendered safe for the workmen by complying with the applicable safety standards, and by practicing safety measures consistent with current OSHA Trenching and Excavation Safety Standards and good construction methods.

(c) All excavations shall be adequately barricaded and secured in accordance with the current New Mexico Department of Transportation Standard Specifications. Flashing lights and barricades shall be employed along open excavations and trenches to protect the public from potential hazards; barricades and advance warning devices shall comply with MUTCD Standards as well as any special direction required by the City.

(d) Unless trench banks are cut back on a stable slope, the trenches shall be braced as necessary to prevent caving or sliding, to provide protection for the workmen and the pipe. All trenching shall comply with OSHA Trenching and Excavation Safety Standards.

(e) When over-excavation occurs beyond the limits indicated by the trench details, the over-excavated area shall be refilled with suitable material at optimum moisture and compacted to ninety-five (95) percent density per ASTM D 1557.

(f) The maximum amount of open trench permitted in any one location shall be 100-feet, or the length necessary to accommodate the amount of pipe installed in a single day, whichever is greater, unless otherwise approved by the City. A trench shall be considered open until backfilled to the top of subgrade.

(g) Excavation of pipe trenches for flexible and rigid pipe is as required in the table below. In all cases, the trench shall be wide enough to allow for the compaction equipment.

Table 17: Minimum Trench Widths

Flexible Pipe	Minimum shall be not less than 1.5 times the pipe outer diameter plus twelve inches (12”)
Rigid Pipe	Minimum shall be not less than the outside pipe diameter times 0.33

(h) When trench is to be backfilled with flowable fill, the minimum trench width may be reduced to the pipe diameter plus twelve inches (12”) and enough room needed to allow for the proper placement of the flowable fill using tools to “spade” the material under the pipe haunches.

(i) Maximum Trench Width: the maximum width of the trench shall be determined by the Contractor based on the method and means for the installation. However, trench width shall not exceed the width of a ride-along compactor plus two feet (2’) when working alongside the pipe or culvert.

(j) Street Crossings

(1) Trenches crossing streets shall be completely backfilled immediately after pipe, wire, or conduit installation and a temporary or permanent asphalt patch or flowable fill cap shall be installed as directed by the City to protect the integrity of the trenches within the roadway limits from excessive moisture.

(2) Substantial bridging, properly anchored, capable of carrying the vehicle loading, in addition to adequate trench bracing, shall be used to bridge across trenches at street crossings where trench backfill, and temporary patches have not been completed during regular working hours as directed and approved by the City. Safe and convenient passage for pedestrians and access to all properties shall be provided.

(k) Disposal of Unsuitable Excavated Materials

(1) Excess material and excavated material unsuitable for backfill shall be removed from the Project by the end of each working day unless otherwise approved by the City and disposed of by the Contractor in an environmentally responsible manner at no cost to the Project.

(2) When unsuitable material is encountered that is not shown in the Contract Documents, the City shall order the removal of the material by the Contractor and issue a field order to change the contract price due to the Contractor for removal of the materials.

(l) Portable trench shields or boxes that provide a movable safe working area for installing pipe may be used for the installation of the pipe. After placing the pipe in the trench, backfill material shall be placed in lifts and the shield shall be lifted to allow for the backfill material to be placed for each lift, trench wall to trench wall.

(m) Transition Installations: When differential conditions of pipe support might occur, such as transitions from manholes to trench, a transition support region shall be provided to ensure uniform pipe support and preclude the development of shear, or other concentrated loading on the pipe.

Article 09-03-020 Bedding

(a) The bottom of the trenches shall be smooth, and hand graded uniformly throughout. If rock or other unyielding material is encountered or if the trench is over-excavated, pipe bedding material shall be added, compacted, and graded to a smooth uniform surface. The compacted bedding shall support the pipe throughout its entire length, except at bells or couplings which shall not rest on the bedding.

(b) After the bell or coupling holes are excavated and after the pipe pieces are connected and properly aligned and graded, successive layers of select material shall be placed and compacted, until the pipe is covered, as required in the Contract Documents. The Contractor shall maintain proper alignment and grade during the bedding process. Any bent, cracked, chipped, or damaged pieces of pipe shall be removed and replaced at Contractor's expense.

Article 09-03-030 Pipe Laying

(a) Pipe shall be laid true to the line and grade indicated in the Contract Documents or as established by the City.

(b) The pipe shall be protected during handling against impact shocks and free fall. Do not permit hooks, chains, cables, or handling equipment to come in contact with the pre-molded or pre-formed end surfaces.

(c) Handle the pipe having pre-molded end surfaces or pre-formed end surfaces so that no weight, including the weight of the pipe itself, will bear on or be supported by the jointing material or surfaces. Do not drag the end of the pipe on the ground or allow them to be damaged by contact with gravel, crushed stone, or any other hard objects.

(d) No damaged or deformed pipe will be incorporated in the work.

(e) The interior of the pipelines shall be kept free from dirt and other foreign material as the work progresses and shall be clean upon its completion. Tight stoppers or bulkheads shall be securely placed in the ends of all pipelines when the work is stopped temporarily, or at the end of the workday.

(f) Immediately prior to joining, both pipe ends shall be thoroughly cleaned, and a lubricant shall be applied according to the manufacturer's recommendations. For push-on type joints, sufficient pressure shall be applied in making up joints to insure proper seating of the joints.

(g) The full length of each section of pipe shall rest solidly upon the bed, with recesses excavated to accommodate bells and joints. Any 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 City. Minimum depth of cover over top of pipe shall be three feet, unless otherwise approved by the City.

(h) All nuts, and bolts utilized in underground pipe connections shall be stainless steel, high strength cast iron or high strength wrought iron. Carbon steel nuts and bolts may be used except that they shall be protected by “cocoon” type protective coating of coal-tar and felt in accordance with AWWA Standard C 203.

(i) Where connections are made between new work and existing lines, the connections shall be made using specials and fittings as recommended by pipe manufacturer and approved by the City. Couplings may be either cast iron or steel with bolts as stated above. If steel couplings are used, they will be cocoon wrapped as specified herein.

(j) Water lines shall not be laid closer, along horizontal dimensions, than ten feet (10’) from sewer lines, and with the water line at a higher elevation than the sewer. If this is not possible, and if concurrence from the City is obtained by the Contractor, separate trenches will be required, and the water line shall be at least two (2) feet above the sewer or concrete encased. When water and sewer lines cross each other, the water line shall be at least two (2) feet above the sewer or concrete encased, per Standard Detail W-11. If the water line crossing occurs below the sewer line the sewer line shall be encased per Standard Detail W-11.

(k) Water main lines shall not be constructed under walkways, sidewalks, curbs and gutters, drive pads, or similar concrete structures by tunneling underneath. The Contractor will cut these concrete structures by using a concrete saw to the closest control joint or, at his option, may remove the section of the concrete structure to the nearest full expansion joint or edge.

(l) Encasement shall be performed as shown in the Contract Documents at shallow crossings or other instances in which piping may be exposed or susceptible to excessive surface loading. DIP shall be used for these crossings with push-on or M.J. type connections, blocked with curved / conforming cinder blocks underneath, installed in prepared trench of adequate width to house pipe diameter and encasement. Trench excavation shall have ninety-five (95) percent relative compaction or shall be in freshly excavated native material, and as approved by the City may suffice with adequate dimensions to omit use of formwork for encasement concrete placement. Encasement concrete shall be aggregate and Type II cement meeting or exceeding 3,000 psi compressive strength. Rebar shall be placed as shown in the Contract Documents, shall be new and unused, and tied with minimum six-inch (6") lap distances, with minimum two inches (2") of concrete cover on outside dimensions.

(m) All valves shall be set true, level, vertical and plumb. All valves shall have and be supported by a concrete thrust block, have retainer rods, and shall comply with the details shown in the Contract Documents. Backfill shall be compacted to ninety-five (95) percent density under pavement, ninety (90) percent in unpaved areas, ASTM D 1557.

(n) The Contractor shall remove the valve box and operating nut from all existing valves that are to be abandoned. The resulting excavation shall be backfilled and compacted to ninety-five (95) percent density, ASTM D 1557. The top six inches (6") of the excavation shall receive new base course placed to the above stated density. The pavement shall be sawcut to form a square opening. The cut faces of the existing asphalt shall be thoroughly coated with tack coat and new asphalt pavement shall be placed and densified to ninety-five (95) percent density, ASTM D 1557.

(o) Cast iron valve boxes shall be set vertical and plumb centered over the operating nut. All valve boxes shall be adjusted to proper elevation, providing the minimum overlap of six inches (6") of the two (2) pieces, and a concrete collar shall be built around the top of each valve box. The concrete collar shall be of the size, shape, and dimensions shown in the Detail Drawings. The concrete shall be 3,000 psi at twenty-eight (28) days with one (1) inch aggregate and finished with a light broom finish. All concrete shall be removed from the top of the valve box and lid while it is still wet, and they shall be left clean. Backfill shall be compacted to ninety-five (95) percent density under pavement, ninety (90) percent in unpaved areas, ASTM D 1557. Valve stem extensions shall be required and installed on all valves for which the valve operator is more than four feet (4') below the finished surface.

(p) Adapters and couplings shall be installed in strict compliance with the manufacturer's recommendations. Contractor shall provide, in place, all additional straps, rods, and harness required to make a secure water-tight connection.

(q) The City shall have the privilege of checking the pipe for line and grade by any method that he wants to use after the pipe is laid, and before backfilling begins. The City shall also have the privilege of checking each pipe joint with a gauge or by any means that he deems necessary in order to be assured that the gaskets are in place and properly seated. Any run of pipe that is found to be appreciably off of line or grade shall be removed from the trench, the trench bedding shall be re-graded and compacted, and the pipe shall then be laid accurately online and grade. Any joint that is found to be improperly gasketed and/or seated shall be un-jointed and correctly reassembled. If any gasket is found to be damaged, the entire pipe section containing the damaged gasket shall be replaced with a new one.

(r) Contractor shall furnish any tools, gauges, and all items required for the checking of the gaskets and joints, and he shall check every joint to be sure that the gaskets are seated and located in the correct place to avoid leakage at the joints.

(s) Trenches shall be kept free from water during pipe installation until suitable backfill has been placed and compacted to prevent pipe flotation. Any standing water within the trench shall be evacuated and the trench bottom or bedding be restored per the standards contained herein.

(t) Field cuts shall be completed with a hacksaw, handsaw, or a power saw with a steel blade or an abrasive disc. Field cuts shall be square to the pipe's flow area. The newly cut pipe end shall be beveled to the factory pipe chamfer. Completed field cuts shall be smooth and blunt free from shavings and rough edges.

(u) Plastic sewer pipe shall be connected and placed in the trench in accordance with the manufacturer's recommendations.

(v) The reference mark (a distinct circumferential line) is placed on the pipe's spigot end by the manufacturer to indicate the correct depth of spigot penetration into the pipe gasket joint. If the pipe is seated too deep or too shallow the pipe may buckle or separate due to thermal expansion/contraction. Spigot penetration shall be within one quarter (1/4) inch of the manufacturer's recommended mark.

Article 09-03-040 Utility Restraint Systems

(a) Utility system piping thrust is to be restrained through the use of restrained joint fittings. Refer to Standard Details W-16 through W-18.

(b) Bell joint restraints shall be utilized.

(c) Where site conditions preclude the use of pipe restraints concrete thrust blocks may be utilized as follows. Thrust blocks shall be poured at all bends, valves, tees, reducers, and fittings, where changes in pipe diameter, alignment or grade occur, and as indicated in the Contract Documents or as required by City. Thrust blocks are only necessary where mechanical restraint joints are not being utilized. The minimum size of concrete thrust blocks shall be as shown in the Contract Documents or as directed by the City. The material of thrust blocks shall be concrete composed of concrete aggregates and shall have a compressive strength of no less than two thousand five hundred (2,500) psi in twenty eight (28) days for standard cement Type II and shall be placed between solid, undisturbed ground and the fitting to be anchored. The area of bearing on the fitting and on the ground shall in each instance be that required by the City. Unless otherwise directed by the City the thrust blocks shall be placed so that the pipe and fitting joints will be accessible for repair. Metal harness or tie rods, of the size and type shown in the Contract Documents, shall be used. Refer to Standard Details: W-3 and W-4.

Article 09-03-050 Backfilling Trenches

(a) Definitions

(1) Foundation: Over-excavation and backfill of the foundation only when the native trench bottom does not provide a firm-working platform for placement of the pipe bedding material.

(2) Bedding: In addition to bringing the trench bottom to required grade, the bedding levels out any irregularities and ensures uniform support along the length of the pipe.

(3) Haunch Zone: The backfill under the lower half of the pipe (haunches) distributes superimposed loadings.

(4) Initial Zone: The backfill from the pipe midline to the top of the pipe zone provides the primary support against lateral pipe deformation for flexible pipe.

(5) Final Zone: Backfill above the pipe zone to the top of the subgrade.

(b) Materials for trench backfill may include flowable fill, Type I aggregate base course, Type II aggregate base course, and native materials. Individual pipe zone backfill requirements are presented below. The Contractor shall submit the material types to the City for approval prior to construction.

Native backfill shall only be utilized within the Final backfill zone. Native materials shall be free from sod, frozen earth, organic materials, rubbish, and debris. The material should be free of large stones (maximum clod size shall be < 3") that may cause damage to the pipe, such as concentrated pipe loading.

Table 18: Type I Aggregate Base Course Gradation and Requirements

Sieve Size	Percentage of Dry Weight Passing Sieve
2-Inch	100
1-1/2-Inch	90-100
1-Inch	70-90
No. 4	30-65
No. 10	30-10
No. 16	15-20
No. 200	10-20
Plastic Index	12 Maximum
Liquid Limit	35 Maximum
Fractured Faces	70% Minimum
Total Available Water-Soluble Sulfates	Less than 0.3% by dry weight of soil

Table 19: Type II Aggregate Base Course Gradation and Requirements

Sieve Size	Percentage of Dry Weight Passing Sieve
1-Inch	100
¾-Inch	85-95
No. 4	40-70
No. 10	35-45
No. 16	25-35
No. 200	6-18
Plastic Index	12 Maximum
Liquid Limit	35 Maximum
Fractured Faces	70% Minimum
Total Available Water-Soluble Sulfates	Less than 0.3% by dry weight of soil

Table 20: Native Backfill Requirements

Percentage by Weight Passing No. 200 Sieve	Plasticity Index Maximum
0-20.0	12
20.1 – 50.0	10
50.1 – 80.0	8
80.1 – 100	6
Liquid Limit	50 Maximum

(1) Foundation: Trench foundations shall be stable prior to placing bedding material. If the City determines that unsuitable materials exist at the trench foundations, the Contractor shall remove and replace the material as directed by the City.

(2) Pipe Bedding: The trench shall be excavated to a depth of four- to six-inches (4”-6”) below the bottom of the pipe barrel and to a depth that will be sufficient to provide two- to four-inches (2”-4”) of clearance under the pipe bell (where applicable).

Uniform and stable bedding shall be provided for the pipe and any protruding features of its joints and/or fittings. The middle of the bedding equal to one-third (1/3) the pipe outside diameter may be loosely placed to allow for the pipe bell and other protruding features. Alternatively, the compacted bedding material may be excavated slightly to allow for continuous lines and grades of the pipe structure.

Pipe bedding shall consist of Type II aggregate base course or flowable fill. Bedding shall be backfilled to the required grade of the bottom of the pipe. The compaction shall provide a density, at minimum, equal to 95 percent of the maximum dry density in accordance with ASTM D 1557 with the exception of the middle-uncompacted area.

(3) Haunch Zone Backfill: After the pipe or conduit is laid, the haunch areas shall be backfilled with Type II aggregate base course or flowable fill.

Compaction of the haunching material can be best accomplished by hand with tampers or suitable power compactors for maximum compacted lift thickness of six inches (6”). The Contractor shall take care to not disturb the pipe from its line and grade while compacting the backfill. Material suitably distant from the pipe shall be compacted to 95 percent of the maximum dry density in accordance with ASTM D 1557.

While compacting the embedment near the pipe with impact-type tampers, caution shall be taken to not allow direct contact of the equipment with the pipe.

(4) Initial Backfill Zone: After the pipe or conduit is laid, the initial backfill area shall be backfilled with Type II aggregate base course or flowable fill. Avoid usage of impact tampers directly above the pipe until the full loose layer backfill depth above the pipe is obtained.

Table 21: Initial Backfill Zone Material Depths

Pipe or Conduit	Initial Zone
2-Inch or less diameter	6-Inches above the top of pipe
Greater than 2-Inch diameter	12-Inches above the top of pipe

(5) Final Backfill Zone: The remaining backfill, to the top of subgrade, shall consist of Type I or Type II aggregate basecourse, native material, or flowable fill. The material shall be compacted to a minimum of 95 percent of the maximum dry density in accordance with ASTM D 1557.

A. If flowable fill is used, flowable fill shall be placed from the top of the initial backfill zone to the bottom of the flexible pavement (replaces aggregate road base in the pavement section over the trench).

B. Flowable fille cap may be required in the upper portion of the Final Backfill Zone for all non-residential roadways with a minimum thickness of twelve inches (12") for minor collectors and eighteen inches (18") for all major collectors and arterials.

(d) Compaction

(1) Compaction shall be performed by mechanical means except in the haunch zone where compaction may be required by hand tamping. Mechanically compacted backfill shall be placed in layers of thickness compatible with the characteristics of the backfill and the type of equipment being used and shall have a maximum lift thickness as shown in the table below. The lifts shall be placed on both sides of the pipe at the same time to reduce pipe movement.

Table 22: Backfill Lift Thickness

Location	Maximum Compacted Lift Thickness (inches)	Maximum Loose Lift Thickness (inches)
Bedding, Haunch, and Initial Zones	6	8
Final Zone	8	12

(2) Each layer shall be evenly spread, moistened, and tamped or rolled until the specified relative compaction has been attained.

(3) Compaction minimum shall be 95 percent of the maximum dry density in accordance with ASTM D 1557 for trenches within the roadway prism. Compaction requirements for the final zone of trenches outside the roadway

may be reduced to 90 percent of maximum dry density in accordance with ASTM D 1557.

(4) Density testing shall be completed every 200-feet on mains or any part thereof per day, one per every three services or any part thereof per day.

(5) Density testing per depth: Less than or equal to four-feet (4') shall require one at depth and one at subgrade per horizontal length above. Greater than four-feet (4') depths shall require one per six-inch (6") or larger pipe, then one every three (3) vertical feet, and one at subgrade per horizontal length above.

(6) Where test results reveal non-compliance with the requirements of the Contract, the Contractor shall bear the costs of subsequent rework and retesting until the required specification compliance is obtained to the satisfaction of the City.

(e) Minimum Pipe Spacing: If the pipe space between parallel pipes in a single trench is not conducive to mechanical backfill, then flowable fill shall be used.

ARTICLE 09-04 – FLUSHING AND DISINFECTION

Article 09-04-010 Work Description

(a) This work includes materials and procedures for flushing and disinfection of water mains by the continuous feed method and by the slug method. The tablet method to disinfect pipelines shall not be used. Disinfect piping in accordance with AWWA C651 as modified below.

(b) At all times, the new main shall be isolated from the active distribution system by physical separation until disinfecting water has been flushed out and satisfactory bacteriological testing has been completed in accordance with AWWA Standard C651. Water needed to fill the new main for testing and flushing purposes shall only be potable City water supplied through a temporary connection protected by a backflow device.

(c) The backflow device must be tested and certified after installation on-site. A copy of the certification shall be given to the City and a copy shall be kept on-site with the device. Testing must be completed by a certified testing facility and be on the City's approved tester list.

Article 09-04-020 Job Conditions

(a) Disposal of the chlorinated disinfection water and the flushing water is the Contractor's responsibility. The chlorinated disinfection water shall be properly disposed of by either pumping the water into a tank truck or through de-chlorination using a neutralizing chemical applied to the wasted water in accordance with AWWA C655 "Field Dechlorination" prior to directing the dechlorinated water into the environment or the sewer system.

(b) An air gap of two (2) times the hose diameter must be provided to prevent cross contamination. The Contractor shall notify City (24) hours prior to disposal into the sewer system. Schedule the rate of flow and locations of discharges in advance to permit review and coordination with the City. Use potable water for chlorination. Submit request for use of water from waterline of the City forty-eight (48) hours in advance. All notifications to the City shall be completed in writing and acknowledged in writing prior to commencement of activities by the Contractor.

Article 09-04-030 Materials

(a) Liquid Chlorine: Inject with a solution feed chlorinator and a water booster pump. Use an experienced operator and follow the instructions of the chlorinator manufacturer.

(b) Calcium Hypochlorite (Dry): Dissolve in water to a known concentration in a drum and pump into the pipeline at a metered rate.

(c) Sodium Hypochlorite (Solution): Further dilute in water to desired concentration and pump into the pipeline at a metered rate.

(d) Chlorine Residual Test Kit: For measuring chlorine concentration, supply and use a medium range, drop count, titration kit or an orthotolidine indicator comparator with wide range color discs. Products: Hach Chemical or Helliege. Maintain kits in good working order available for immediate test of residuals at point of sampling. The use of expired DPD compound is prohibited.

Article 09-04-040 Execution

(a) Continuous Feed Method for Pipelines: The continuous-feed method consists of completely filling the main with potable water, removing air pockets, then flushing the completed main to remove particulates, and refilling the main with potable water that has been chlorinated to a minimum of 50 mg/L. After a 24-hour holding period in the main there shall be a free chlorine residual of not less than 25 mg/L.

Table 7 below provides the amount of chlorine required for each 100-feet of pipe across various diameters. A complete step-by-step procedure can be found in AWWA C651.

Table 23: Chlorine required to produce an initial 50-mg/L concentration in 100ft of pipe by diameter.

Pipe Diameter (inches)	100% Chlorine (lb)	1% Chlorine Solution (gal)
4	0.027	0.33
6	0.061	0.73
8	0.108	1.30
10	0.170	2.04
12	0.240	2.88

(b) Slug Method for Pipelines: Introduce the water in the pipeline at a constant measured rate. At the start of the test section, feed the chlorine solution into the pipeline at a measured rate so that the chlorine concentration created in the pipeline is three hundred (300) mg/L. Feed the chlorine for a sufficient period to develop a solid column or "slug" of chlorinated water that will, as it passes along the line, expose all interior surfaces to a concentration of at least three hundred (300) mg/1 for at least three (3) hours.

(c) Disinfection of Valves and Appurtenances: During the period that the chlorine solution or slug is in the section of pipeline, pen and close valves to obtain a chlorine residual at hydrants and other pipeline appurtenances.

(d) Disinfection of Connections to Existing Pipelines: Disinfect per AWWA C651. Flush with potable water until discolored water, mud, and debris are eliminated. Swab interior of pipe and fittings with a one (1) percent sodium hypochlorite solution. After disinfection, flush with potable water again until water is free of chlorine odor.

(e) After the chlorine solution applied by the continuous feed method has been retained in the pipeline for twenty-four (24) hours. Confirm that a chlorine residual of fifty (50) mg/1 minimum exists along the pipeline by sampling at air valves and other points of access.

(f) With the slug method, confirm by sampling as the slug passes each access point and as it leaves the pipeline. After confirming the chlorine residual, flush the excess chlorine solution from the pipeline until the chlorine concentration in the water leaving the pipe is within 0.5 mg/1 of the existing potable water system.

(g) Pipeline Flushing: After confirming the chlorine residual, dechlorinate the excess chlorine solution from the pipeline until the chlorine concentration in the water leaving the pipe is within 0.5 mg/l of the replacement water. Replacement water sample shall be verified by the City.

(h) Bacteriologic Tests: Collect two (2) samples, deliver to a certified laboratory within six (6) hours of obtaining the samples, and obtain a bacteriologic quality test to demonstrate the absence of coliform organisms in each separate section of the pipeline after chlorination and refilling. The City shall observe while samples are taken; written notification shall be received 24-hours prior to desired sampling. Sampling shall only occur between 8:30 AM and 3:00 Monday through Thursday, excluding holidays, unless preapproved by the City. Hydrants shall not be utilized as sampling points.

(1) New Mains: An initial set of samples shall be completed and then resampled 24-hours later. In order to place the line into service both sets of samples must show the absence of coliform bacteria and acceptable aesthetic quality (e.g. chlorine residual, pH, alkalinity, specific conductance, turbidity). At the option of the City a heterotropic plate count (HPC) may be required.

A. For new mains, sets of samples shall be collected every 1,200 feet of the new water main, plus one set from the end of the line and at least one from each branch greater than one pipe length.

B. If trench water has entered the new main during construction or if, in the opinion of the City, excessive quantities of dirt or debris have entered the new main, bacteriologic samples shall be taken at intervals of approximately 200 feet. Samples shall be taken of water that has stood in the new main for at least 16 hours after final flushing is completed.

(2) Repaired Mains: For repaired mains that were depressurized and/or wholly or partially dewatered, one set of samples will be required. Samples shall be collected downstream of the repair site and at intervals of approximately 200 feet within the length of pipe that was shut down. If the direction of flow is not known, or known to flow both directions, samples shall be collected on either side of the repair site.

(i) Repetition of Procedure: If the initial chlorination fails to produce required residuals and bacteriologic tests, repeat the chlorination and retesting until satisfactory results are obtained.

(j) Test Facility Removal: After satisfactory disinfection, replace air valves, restore the pipe coating, and complete the pipeline where temporary disinfection or test facilities were installed.

Article 09-04-050 Hydrostatic Tests

(a) The Contractor shall be required to test all piping and other lines and appurtenances in the presence of the City. Test reports shall be required for each test and submitted to the City. Testing of lines shall be done without being connected to existing lines. If such connections are allowed it is with the understanding that the Contractor assumes any and all responsibility in case of damage, failure and/or contamination to the existing system. The new water pipe will be tested before the backfilling is done. After the pipe is laid, earth cover shall be placed over the middle of the pipe joints, leaving the corp. stops, valves, service taps and laterals uncovered. The pipe will be filled with water, and the pressure in the pipeline shall be raised by means of a motor-driven water pump to a hydrostatic pressure of one hundred fifty (150) psi or one and one-half (1.5) times the normal working pressure, whichever is greater, at the lower end of the pipe section. Applicable AWWA C-600 standards and procedures shall be adhered to for determination of losses on pipes up to thirty-inches (30") in diameter. If any leaks appear in the pipe, they shall be repaired to the satisfaction of the City, and the test shall be performed until the pipe holds the prescribed pressure. As an alternative, the Contract may opt to test the pipeline in sections between mainline valves or as approved by the City.

(b) All testing shall be conducted in accordance with AWWA Standard C600 for ductile iron mains and AWWA Standard C605 for PVC mains and those portions of the above standard related to hydrostatic tests shall apply to any type of water main construction. Test pressure shall be one hundred fifty (150) psi or one and one-half (1.5) times the normal working pressure, whichever is greater.

(c) All taps, gauges and necessary equipment shall be provided by the Contractor; however, the City may utilize gauges provided by the City at their discretion.

(d) Leakage Defined: Leakage shall be defined as the quantity of water that must be supplied into the newly laid pipe, or any valved section thereof, to maintain pressure within five (5) psi of the specified test pressure after the air in the pipeline has been expelled and the pipe has been filled with water. If the pressure drops more than five (5) pounds in thirty (30) minutes, the pipe has failed to pass the test. If the pressure drop is less than five (5) pounds in thirty (30) minutes, water shall be added to the pipe section to maintain the one hundred fifty (150) psi test pressure and the volume of water added shall be duly recorded. This procedure shall be repeated at each thirty (30) minute intervals for the test period. The total volume of water added

to the pipe section to maintain the one hundred fifty (150) psi test pressure shall represent the total leakage during the test.

(e) Allowable leakage: No pipe installation will be accepted if the leakage is greater than that determined by the following formula:

$$\underline{\text{DIP}} \qquad\qquad \underline{\text{PVC}}$$
$$L = \frac{SD\sqrt{P}}{133{,}200} \quad \text{or} \quad L = \frac{ND\sqrt{P}}{7{,}400}$$

where L is the allowable leakage, in gallons per hour, S is the length of pipe tested, in feet; N is the number of joints in the length of pipeline tested, D is the nominal diameter of the pipe, in inches, and P is the average test pressure during the leakage test, in pounds per square inch gauge.

The tables below present the allowable leakage per various pipe diameters per 1,000 feet of pipeline.

Table 24: Allowable Leakage (GPH) per 1,000 Feet of Pipeline (DIP)

Avg. Test Pressure	6	8	10	12	14	16	18	24	30
PSI	In.	In.	In.	In.	In.	In.	In.	In.	In.
350	0.84	1.12	1.40	1.69	1.97	2.25	2.53	3.37	4.21
300	0.78	1.04	1.30	1.56	1.82	2.08	2.34	3.12	3.90
275	0.75	1.00	1.24	1.49	1.74	1.99	2.24	2.99	3.73
250	0.71	0.95	1.19	1.42	1.66	1.90	2.14	2.85	3.56
225	0.68	0.90	1.13	1.35	1.58	1.80	2.03	2.70	3.38
200	0.64	0.85	1.06	1.27	1.49	1.70	1.91	2.55	3.19
175	0.60	0.79	0.99	1.19	1.39	1.59	1.79	2.38	2.98
150	0.55	0.74	0.92	1.10	1.29	1.47	1.66	2.21	2.76

Table 25: Allowable Leakage (GPH) per 1,000 Feet of Pipeline (PVC)

Avg. Test Pressure	6	8	10	12	14	16	18	24	30
PSI	In.	In.	In.	In.	In.	In.	In.	In.	In.
300	0.70	0.94	1.17	1.40	1.64	1.87	2.11	2.81	3.51
275	0.67	0.90	1.12	1.34	1.57	1.79	2.02	2.69	3.36
250	0.64	0.85	1.07	1.28	1.50	1.71	1.92	2.56	3.21
225	0.61	0.81	1.01	1.22	1.42	1.62	1.82	2.43	3.04
200	0.57	0.76	0.96	1.15	1.34	1.53	1.72	2.29	2.87
175	0.54	0.72	0.89	1.07	1.25	1.43	1.61	2.15	2.68
150	0.50	0.66	0.83	0.99	1.16	1.32	1.49	1.99	2.48

(f) When testing against closed metal-seated valves, an additional leakage per closed valve of 0.0078 gal/h/in. (0.0012 L/h/mm) of nominal valve size shall be allowed.

(g) When hydrants are in the test section, the test shall be made against the closed hydrant.

(h) Acceptance of Installations: Acceptance shall be determined on the basis of allowable leakage. If any test of pipe laid disclosed leakage greater than specified the Contractor shall, at the Contractor's expense, locate and make repairs as necessary until the leakage is within the specified allowance.

(i) All visible leaks are to be repaired regardless of the amount of leakage.

(j) The Contractor shall be notified of any leaks that may occur during the two (2) year warranty period and shall make immediate arrangements after he is notified to return to the job site and repair any leaks that may develop in the pipeline.

END OF CHAPTER 09

CHAPTER 10 – AIR-RELEASE AND VACUUM-RELIEF VALVES
ARTICLE 10-01 - GENERAL

Article 10-01-010 Work Description

This work includes materials and installation of combination air-release and vacuum-relief valves.

ARTICLE 10-02 – VALVE COMPONENTS

Article 10-02-010 Materials

Materials of construction for air and vacuum valves for water service shall be as follows:

Item	Material	Specification
Body and cover	Cast iron or brass	ASTM A 48, Class 30; or ASTM A 126, Class B
Float, guide rod, guide bushings	Stainless steel	AISI Type 316, ASTM A 240 or A 276
Seat	Buna-N	--

Article 10-02-020 Seating

Valves shall be seated drip-tight at a pressure of one (1) psi.

Article 10-02-030 Valves End Connections

Valves shall have threaded ends and comply with ANSI B1.20.1.

Article 10-02-040 Combination Air-Release and Vacuum Valves

Valves shall have a float with lever arm to actuate a poppet valve. A needle shall be attached to the float arm. The poppet valve shall serve to admit large quantities of air when the pipeline drains. The needle shall serve to release small quantities of air as the pipeline fills or as air accumulates in the pipeline. Valves shall have an operating pressure of three hundred (300) psi. Body and cover shall be cast iron (ASTM A 48, Class 30). Float, lever, and poppet shall be Type 316 stainless steel (ASTM A 240 or A 276). Seat shall be Buna-N. Valves shall be Val-Matic Model 202C, as scheduled on plans or equivalent.

Article 10-02-050 Service Saddles

Service saddles shall be sized as called out for in the Project Plans and shall be pre-approved.

Article 10-02-060 Gate Valves

Gate valves shall be sized as called out for in the Contract Documentss; shall be non-rising stem, solid wedge, threaded ends; and shall be pre-approved.

Article 10-02-070 Enclosures

(a) Precast Manhole

(1) Risers and adjustment rings shall be standard precast manhole sections of 4,000 psi reinforced concrete.

(2) Manhole frame and lid shall be ductile iron; H20 traffic rated, marked "Water" and shall have three (3) half-inch (1/2") diameter vent holes.

(b) Galvanized meter box shall be sized as called out for in the Contract Documents.

(c) Steel frame and lid shall be sized as called out for in the Contract Documents and shall be vehicle traffic rated.

Article 10-02-080 Piping

Piping shall be brass, standard strength, highest quality, seamless, threaded, reamed and chamfered.

Article 10-02-090 Drainage Media

Drainage media shall be clean crushed rock, three-quarter inch (3/4") size.

ARTICLE 10-03 – EXECUTION

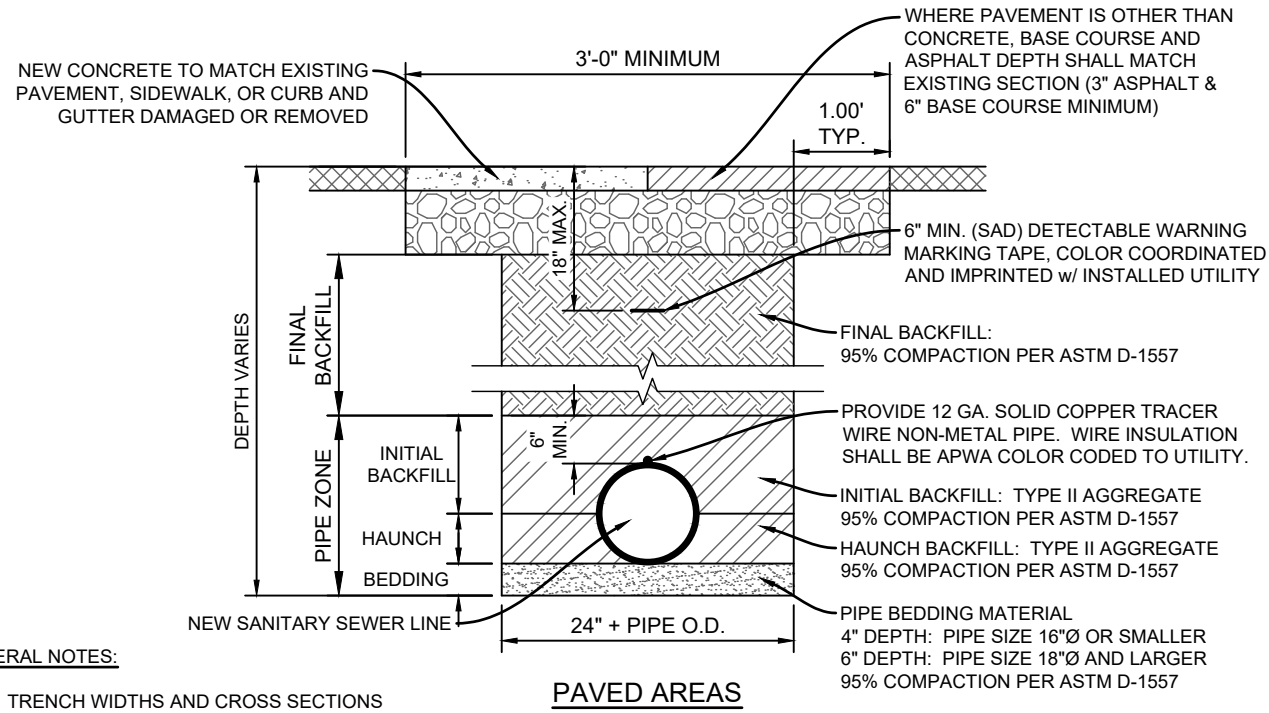
Article 10-03-010 Installation

Locate combination, air-release and vacuum-relief valves at high points ("peaks") of the pipeline. Holes in the pipe shall be the same size as the service saddle outlet. Position enclosure and manhole frame and lid to allow personnel entry. Valve and enclosure shall be set vertical. Clean threaded joints by wire-brushing or swabbing. Apply Teflon joint compound or Teflon tape to pipe threads prior to installation of threaded valves. All joints shall be watertight. Refer to Standard Detail W-15.

Article 10-03-020 Valve Pressure Testing

Test valves at the same time that the connecting pipelines are pressure tested. See Chapter 8 Water Supply System, for pressure testing requirements. Protect or isolate any parts of valves, operators, or control and instrumentation systems whose pressure rating is less than the test pressure.

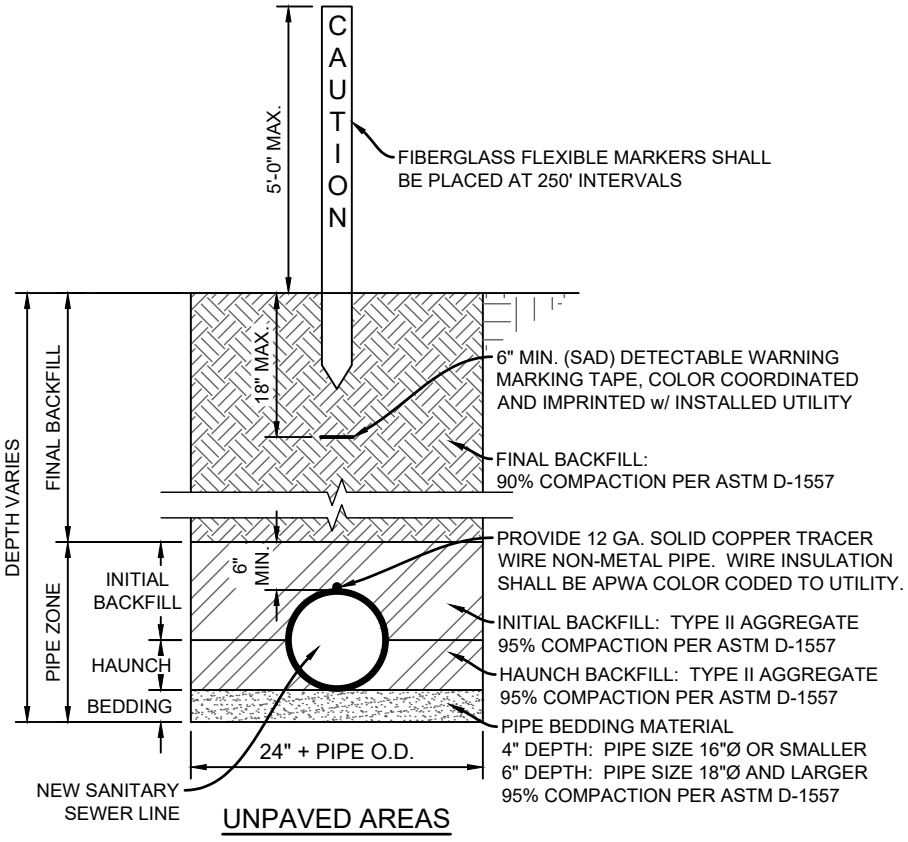
END OF CHAPTER 10



PAVED AREAS

GENERAL NOTES:

1. TRENCH WIDTHS AND CROSS SECTIONS SHALL BE IN COMPLIANCE WITH APPLICABLE SAFETY STANDARDS AND REGULATIONS.
2. TESTING REQUIREMENTS INCLUDE VISUAL TESTING OF ALL MAIN LINES LAID AT OR FLATTER THAN MINIMUM SLOPES.
3. MECHANICAL TAMPERS SHALL NOT BE USED IN THE INITIAL BACKFILL SECTION FOR FLEXIBLE PIPE.
4. HAND PREPARED PIPE BED, PROVIDE A SMOOTH UNIFORM SURFACE, EXCAVATE FOR PIPE BELL.
5. TRACING WIRE REQUIRED TO BE PLACED ABOVE ALL FORCE MAINS.
6. TRACING WIRE SHALL BE TAPED TO MAIN AT 10-FEET ON CENTER.
7. TRACING WIRE TO BE ACCESSIBLE, WITHIN VALVE BOX, SERVICE POINT, OR WITHIN AN INSTALLED TWO POINT TEST BOX, AT 500-FEET ON CENTER MAXIMUM.
8. NATIVE SOIL MAY BE USED AS FINAL BACKFILL IF FREE OF ORGANIC MATTER/DEBRIS, MAXIMUM PARTICLE SIZE OF TWO-INCH (2"), LIQUID LIMIT OF <35, AND PLASTICITY INDEX OF <15. COMPACTION REQUIREMENTS FOR NATIVE MATERIAL SHALL REMAIN THE SAME AS IMPORT MATERIALS AND PLACEMENT SHALL OCCUR WITHIN ±2% OF OPTIMUM MOISTURE CONTEXT.



UNPAVED AREAS

SCALE: NOT TO SCALE

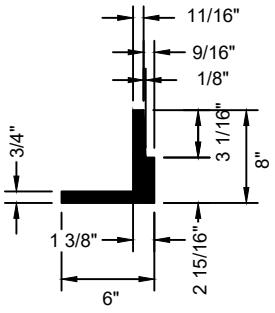
CITY OF ALAMOGORDO
TECHNICAL STANDARD DRAWINGS

SANITARY SEWER TRENCH DETAIL

ISSUE DATE: JUNE 2021

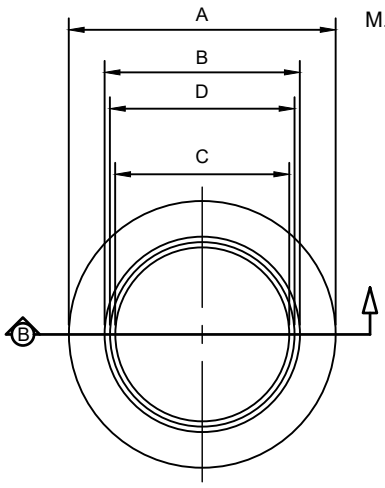
REVISION DATE: ----

SHEET NO: S-1

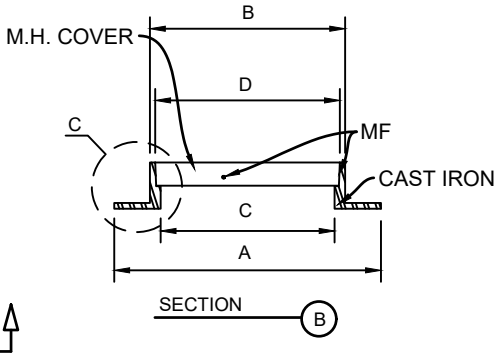


DETAIL C

MANHOLE RING	48" MANHOLE	72" MANHOLE
WEIGHT	155 LBS.	225 LBS.
A	2'-10 1/2"	3'-6"
B	2'-1 1/4"	2'-8 3/4"
C	1'-10 1/2"	2'-6"
D	1'-11 7/8"	2'-7 3/8"



TOP VIEW



NOTE:

1. MATCHING SURFACES MARKED "MF" TO BE MACHINE FINISHED OF ANY IRREGULARITIES THAT WOULD PREVENT A SNUG FIT.
2. CASTING TO BE SMOOTH AND FREE OF AIR VOIDS.

TYPICAL MANHOLE RING DETAIL

GENERAL NOTES:

1. MATCHING SURFACES MARKED "MF" TO BE MACHINE FINISHED AND BE FREE OF ANY IRREGULARITIES THAT WOULD PREVENT A SNUG FIT.
2. CASTING TO BE SMOOTH AND FREE OF AIR VOIDS.
3. MANHOLE RING AND LID SHALL BE DESIGNED FOR H-20 WHEEL LOADING.
4. MINIMUM TOTAL WEIGHT (RING AND LID) SHALL BE 300 LBS.
5. TOP OF LID MAY VARY FROM DETAIL SHOWN. LID SHALL BE MARKED FOR APPROPRIATE UTILITY.

SCALE: NOT TO SCALE

CITY OF ALAMOGORDO
TECHNICAL STANDARD DRAWINGS

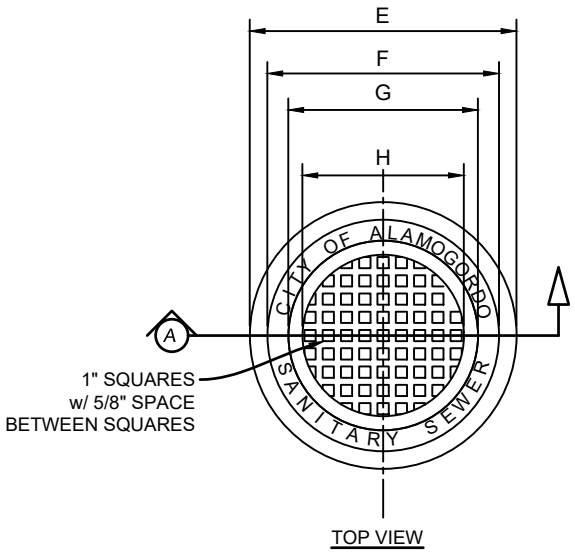
MANHOLE RING DETAIL

ISSUE DATE: JUNE 2021

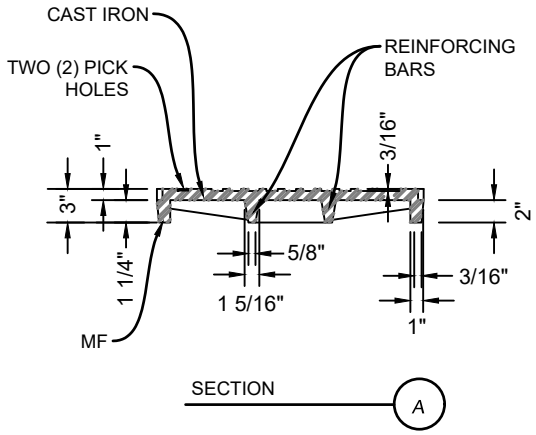
REVISION DATE: ----

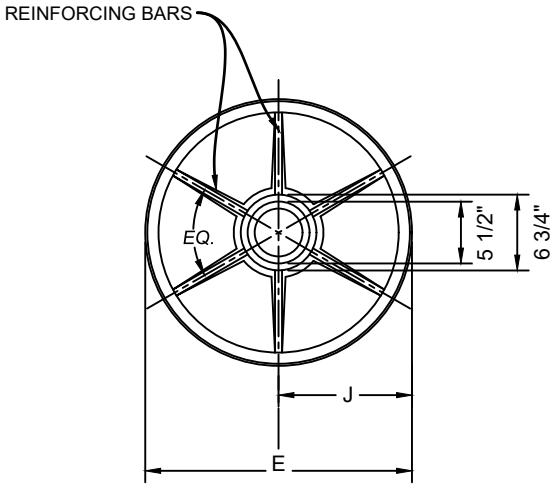
SHEET NO: S-2

MANHOLE RING	48" MANHOLE	72" MANHOLE
WEIGHT	175 LBS.	310 LBS.
E	23 3/4"	31 1/4"
F	20 5/8"	28 1/8"
G	16 7/8"	24 3/8"
H	14 3/8"	21 7/8"
J	11 7/8"	15 5/8"



TOP VIEW





BOTTOM VIEW

NOTE:

1. MATCHING SURFACES MARKED "MF" TO BE MACHINE FINISHED OF ANY IRREGULARITIES THAT WOULD PREVENT A SNUG FIT.

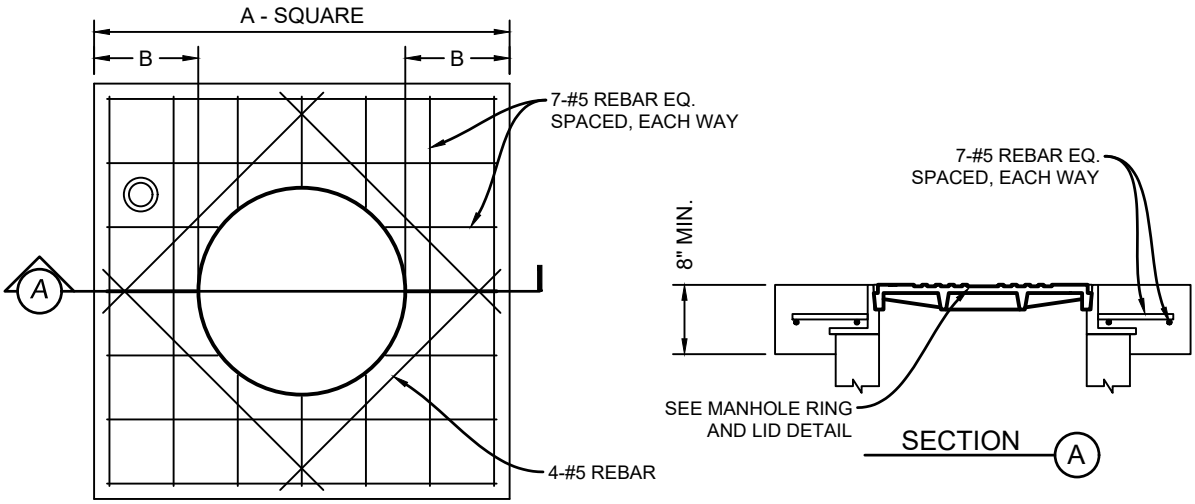
2. CASTING TO BE SMOOTH AND FREE OF AIR VOIDS.

TYPICAL MANHOLE LID DETAIL

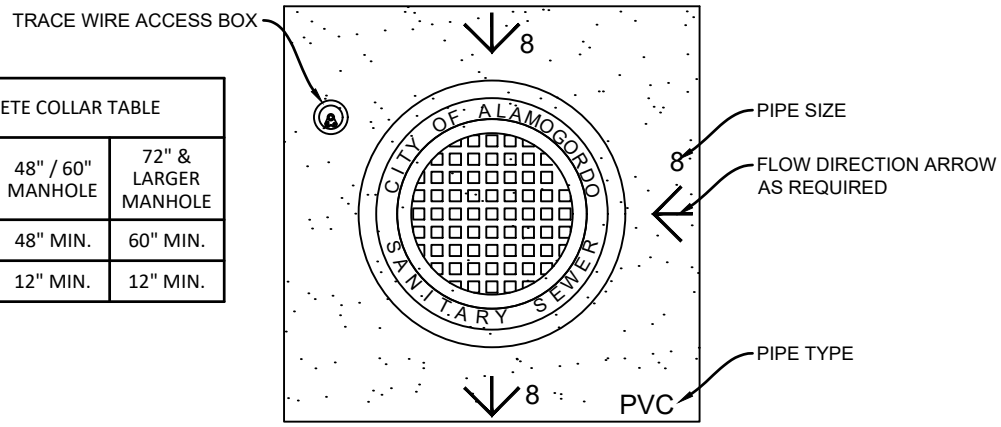
GENERAL NOTES:

1. MATCHING SURFACES MARKED "MF" TO BE MACHINE FINISHED AND BE FREE OF ANY IRREGULARITIES THAT WOULD PREVENT A SNUG FIT.
2. CASTING TO BE SMOOTH AND FREE OF AIR VOIDS.
3. MANHOLE RING AND LID SHALL BE DESIGNED FOR H-20 WHEEL LOADING.
4. MINIMUM TOTAL WEIGHT (RING AND LID) SHALL BE 300 LBS.
5. TOP OF LID MAY VARY FROM DETAIL SHOWN. LID SHALL BE MARKED FOR APPROPRIATE UTILITY.

SCALE: NOT TO SCALE



MANHOLE CONCRETE COLLAR DETAIL



CONCRETE COLLAR TABLE		
TYPE	48" / 60" MANHOLE	72" & LARGER MANHOLE
A	48" MIN.	60" MIN.
B	12" MIN.	12" MIN.

MANHOLE COLLAR MARKING DETAIL

GENERAL NOTES:

1. SIDES OF CONCRETE COLLAR TOP SHALL BE PARALLEL AND PERPENDICULAR TO THE NORMAL STREET TRAFFIC FLOW.
2. USE 3,000 P.S.I. CONCRETE FOR CONCRETE COLLAR.
3. SCRIBE CONCRETE WITH LINE DIRECTIONAL ARROWS, PIPE SIZE AND PIPE TYPE.
4. TEXT SIZE SHALL BE 4-INCHES TALL AND SCORED 3/8" DEEP IN A NEAT AND CONSISTENT MANNER, TYPICAL.

SCALE: NOT TO SCALE

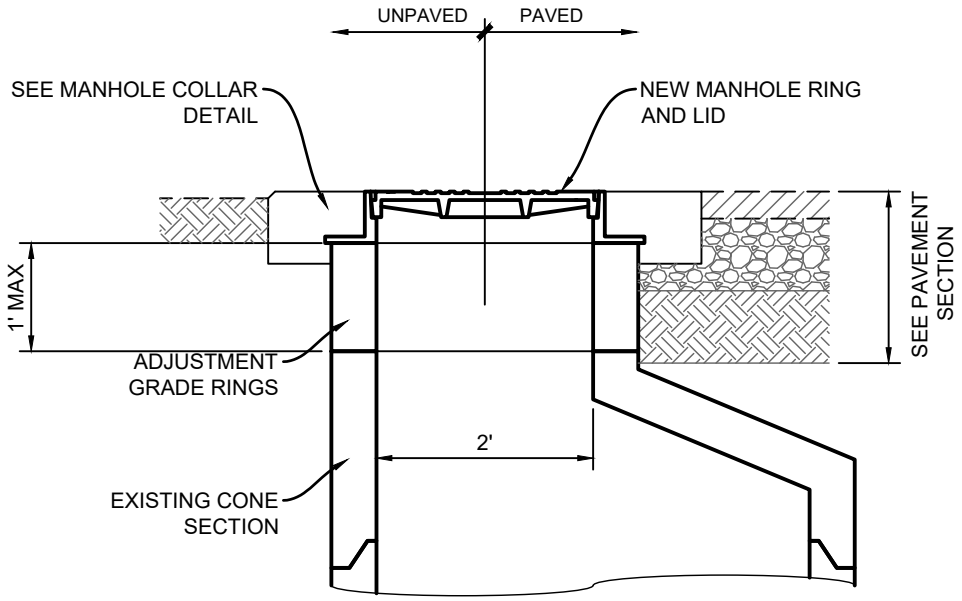
CITY OF ALAMOGORDO
TECHNICAL STANDARD DRAWINGS

MANHOLE COLLAR DETAIL

ISSUE DATE: JUNE 2021

REVISION DATE: ----

SHEET NO: S-4



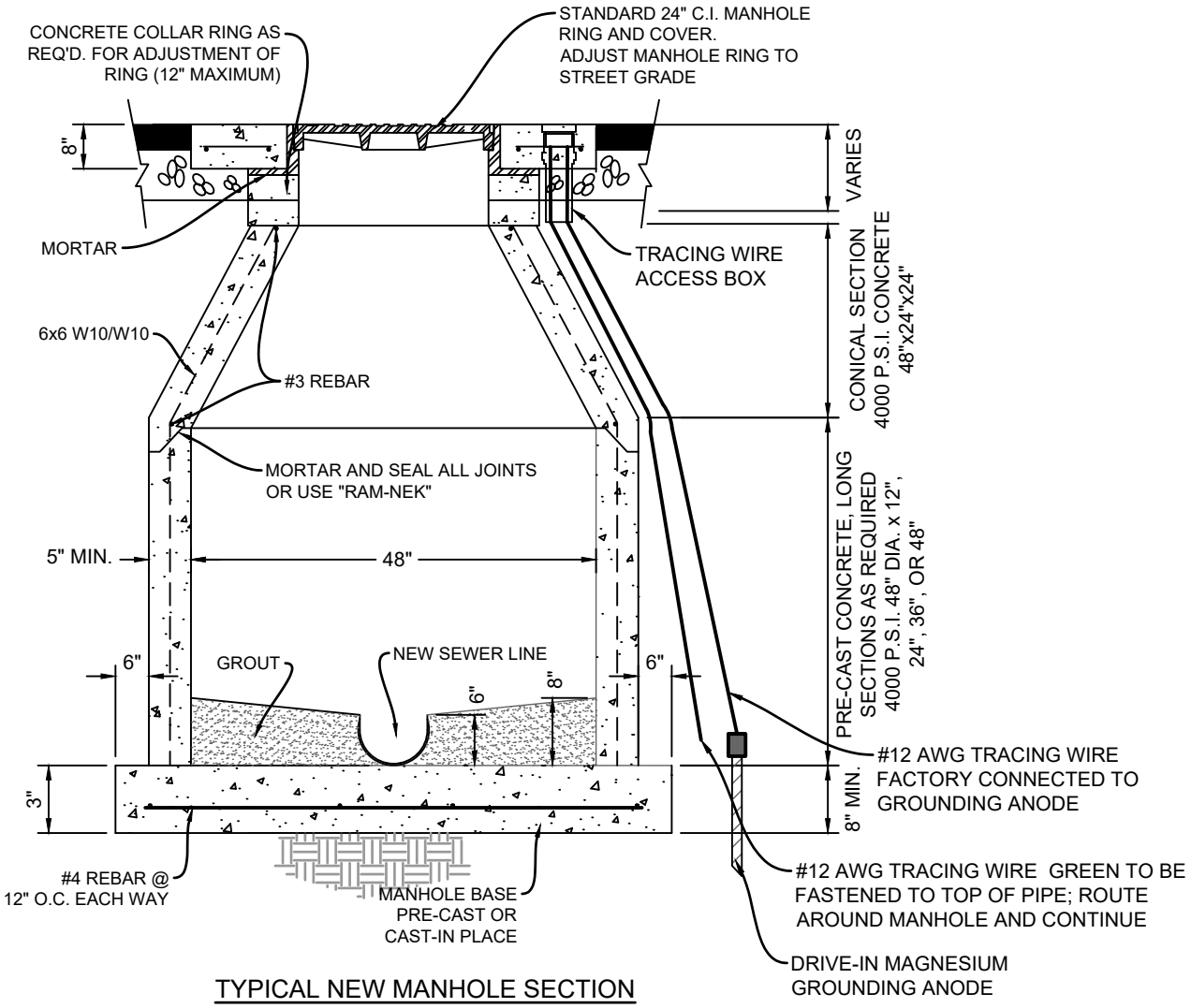
MANHOLE RING AND LID ADJUSTMENT DETAIL

GENERAL NOTES:

1. SIDES OF CONCRETE COLLAR TOP SHALL BE PARALLEL AND PERPENDICULAR TO THE NORMAL STREET TRAFFIC FLOW.
2. USE 3,000 P.S.I. CONCRETE FOR CONCRETE COLLARS.
3. SCRIBE CONCRETE WITH LINE DIRECTIONAL ARROWS, PIPE SIZE AND PIPE TYPE.
4. TEXT SIZE SHALL BE 4-INCHES TALL AND SCORED 3/8" DEEP IN A NEAT AND CONSISTENT MANNER, TYPICAL.

SCALE: NOT TO SCALE

	CITY OF ALAMOGORDO TECHNICAL STANDARD DRAWINGS	ISSUE DATE: JUNE 2021
		REVISION DATE: ----
	MANHOLE RING AND LID ADJUSTMENT DETAIL	SHEET NO: S-5



TYPICAL NEW MANHOLE SECTION

GENERAL NOTES:

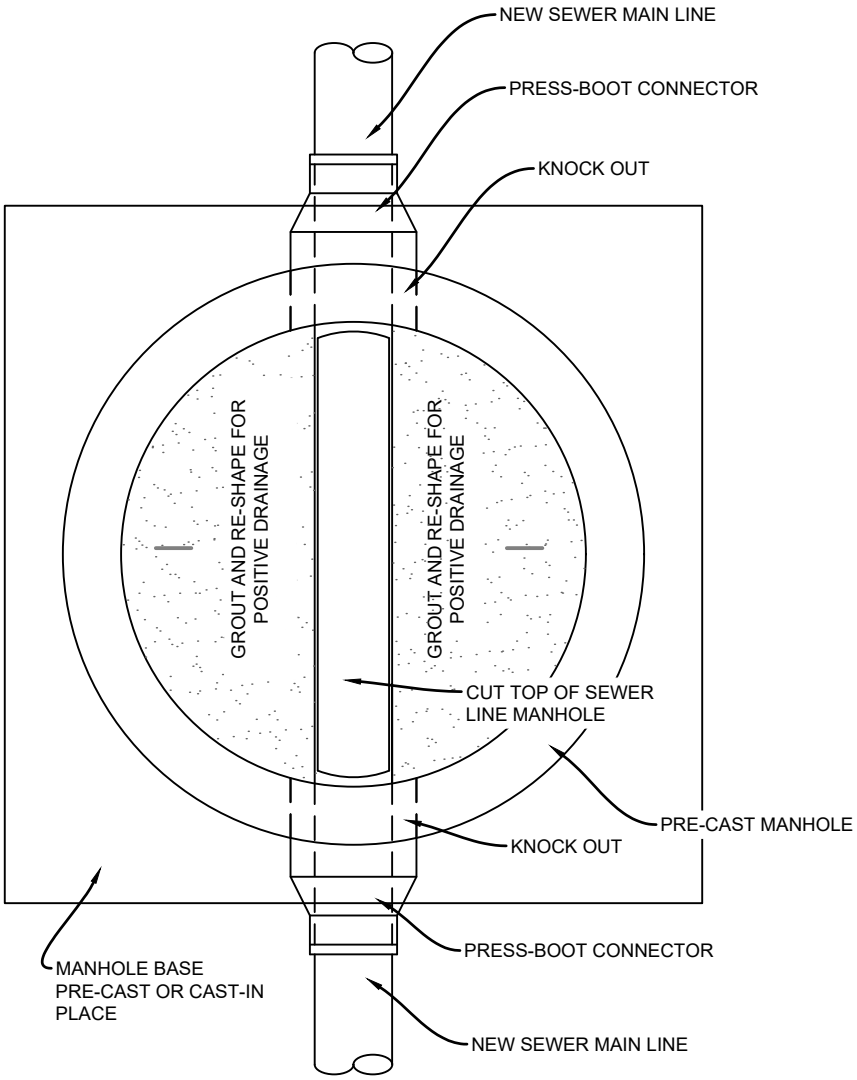
1. KNOCK OUT AND PRESS-BOOT CONNECTOR AS REQUIRED. PRECAST AS PART OF MANHOLE SECTION.

2. SEE PLAN AND PROFILE FOR INVERT ELEVATIONS.

3. THE ENTIRETY OF MANHOLES EXPOSED SURFACE SHALL BE COATED, PRIOR TO PLACEMENT INTO SERVICE, TO AIDE IN CORROSION AND IMPACT RESISTANCE. MANHOLE SHALL BE COATED WITH RAVEN 175 (PRIME COAT) AND RAVEN 405 (2ND COAT) TO 100 MIL TOTAL DRY THICKNESS; ALTERNATE COATING SYSTEMS SHALL BE PRE-APPROVED BY THE CITY.

SCALE: NOT TO SCALE

	CITY OF ALAMOGORDO TECHNICAL STANDARD DRAWINGS	ISSUE DATE: JUNE 2021
		REVISION DATE: ----
	PRECAST CONCRETE MANHOLE DETAIL	SHEET NO: S-6



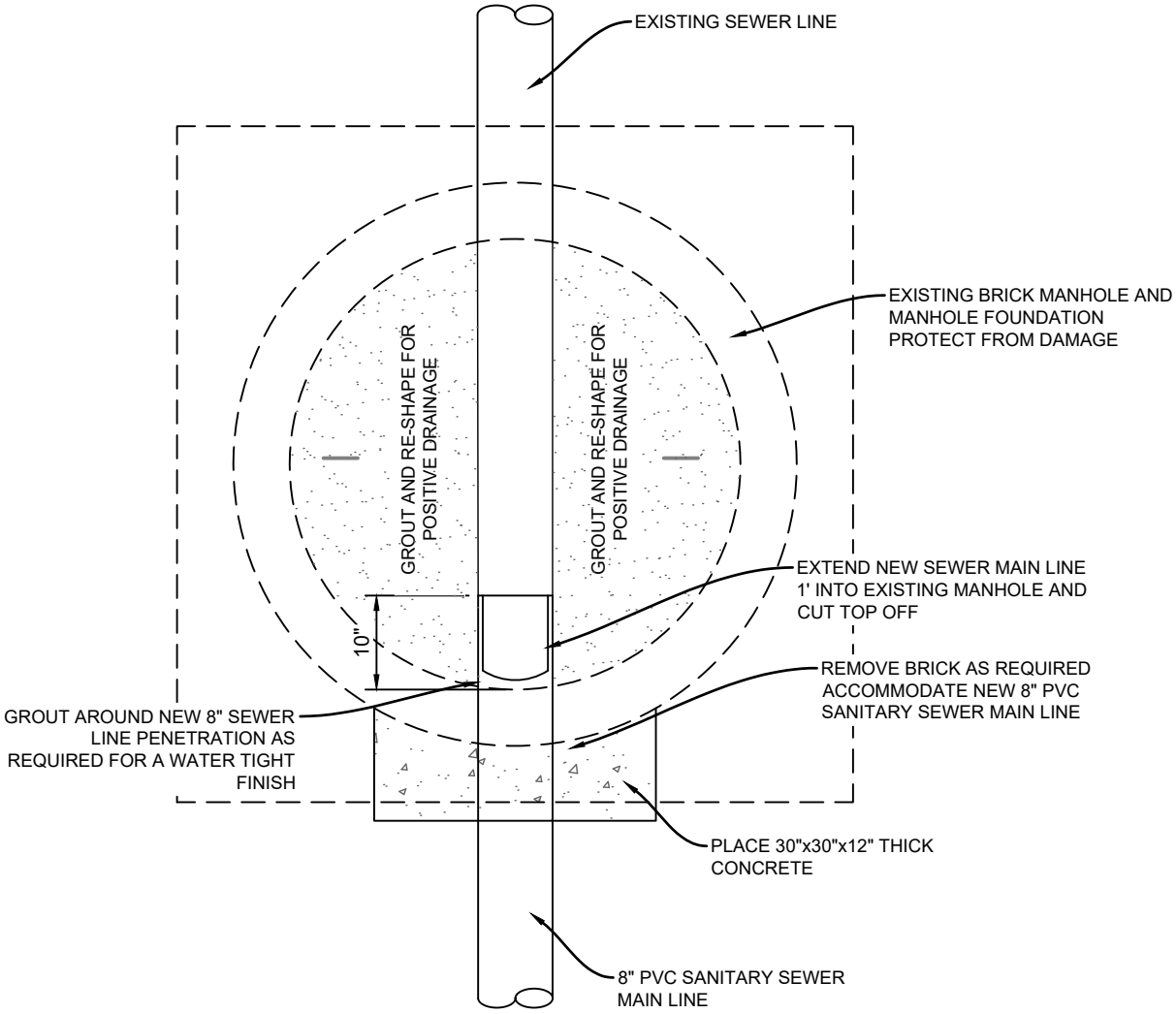
NEW MANHOLE SEWER MAIN CONNECTION

GENERAL NOTES:

1. AFTER MANHOLE HAS BEEN SET AND THE CONNECTIONS MADE CONTRACTOR SHALL CUT TOP OF SEWER LINE IN MANHOLE.

SCALE: NOT TO SCALE

	CITY OF ALAMOGORDO TECHNICAL STANDARD DRAWINGS	ISSUE DATE: JUNE 2021
		REVISION DATE: ----
	NEW MANHOLE SEWER CONNECTION DETAIL	SHEET NO: S-7



EXISTING MANHOLE SEWER MAIN CONNECTION

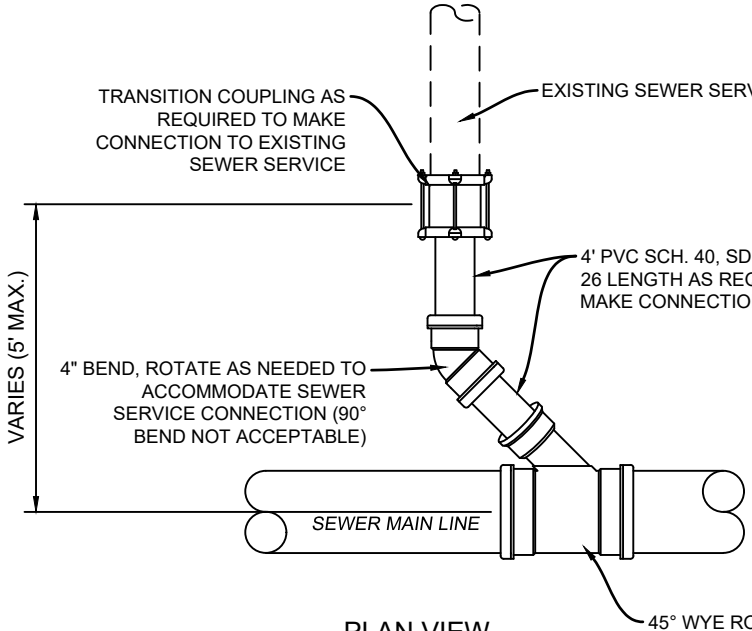
GENERAL NOTES:

1. AFTER MANHOLE HAS BEEN SET AND THE CONNECTIONS MADE CONTRACTOR SHALL CUT TOP OF SEWER LINE IN MANHOLE.

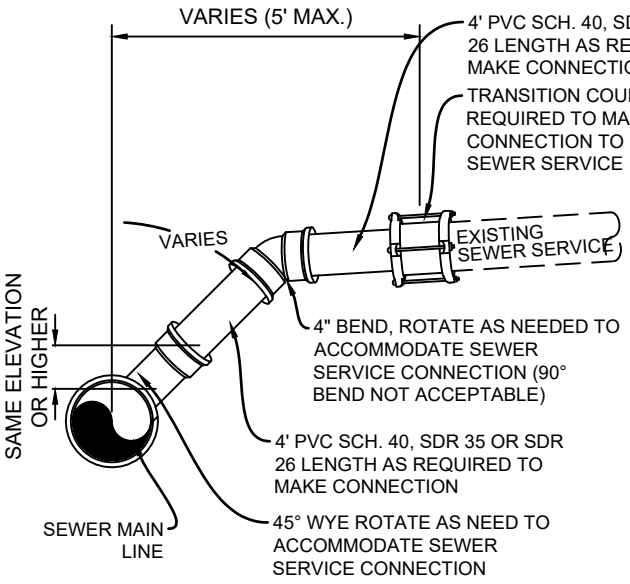
2. PER CITY ORDINANCE 28-02-080.(a) PUBLIC BUILDINGS-CONNECTIONS: NO PUBLIC SERVICE BUILDING, HOTEL, SCHOOL, PUBLIC SCHOOL, LAUNDRY OR OTHER KIND OF PUBLIC SERVICE ESTABLISHMENT SHALL BE PERMITTED TO CONNECT WITH THE PUBLIC SEWERS EXCEPT AT A MANHOLE.

SCALE: NOT TO SCALE

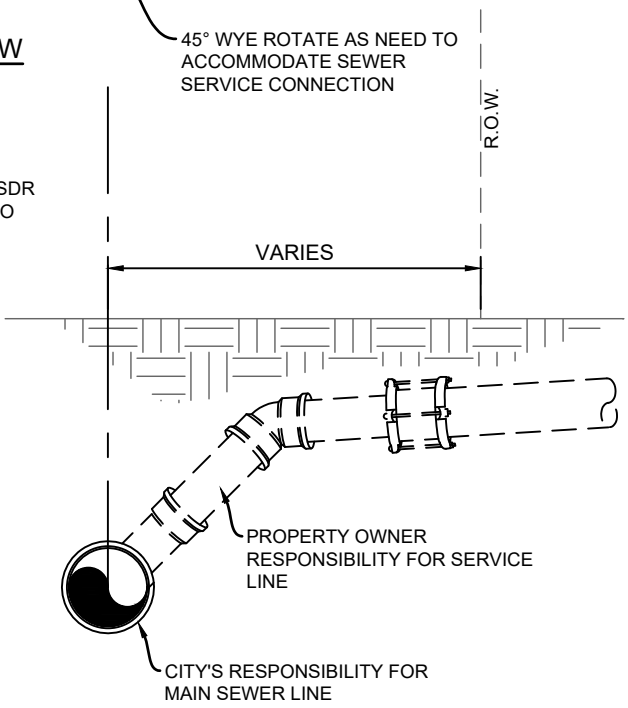
	CITY OF ALAMOGORDO TECHNICAL STANDARD DRAWINGS	ISSUE DATE: JUNE 2021
		REVISION DATE: ----
	EXISTING MANHOLE SEWER CONNECTION DETAIL	SHEET NO: S-8



PLAN VIEW



CROSS SECTION



SERVICE RESPONSIBILITY

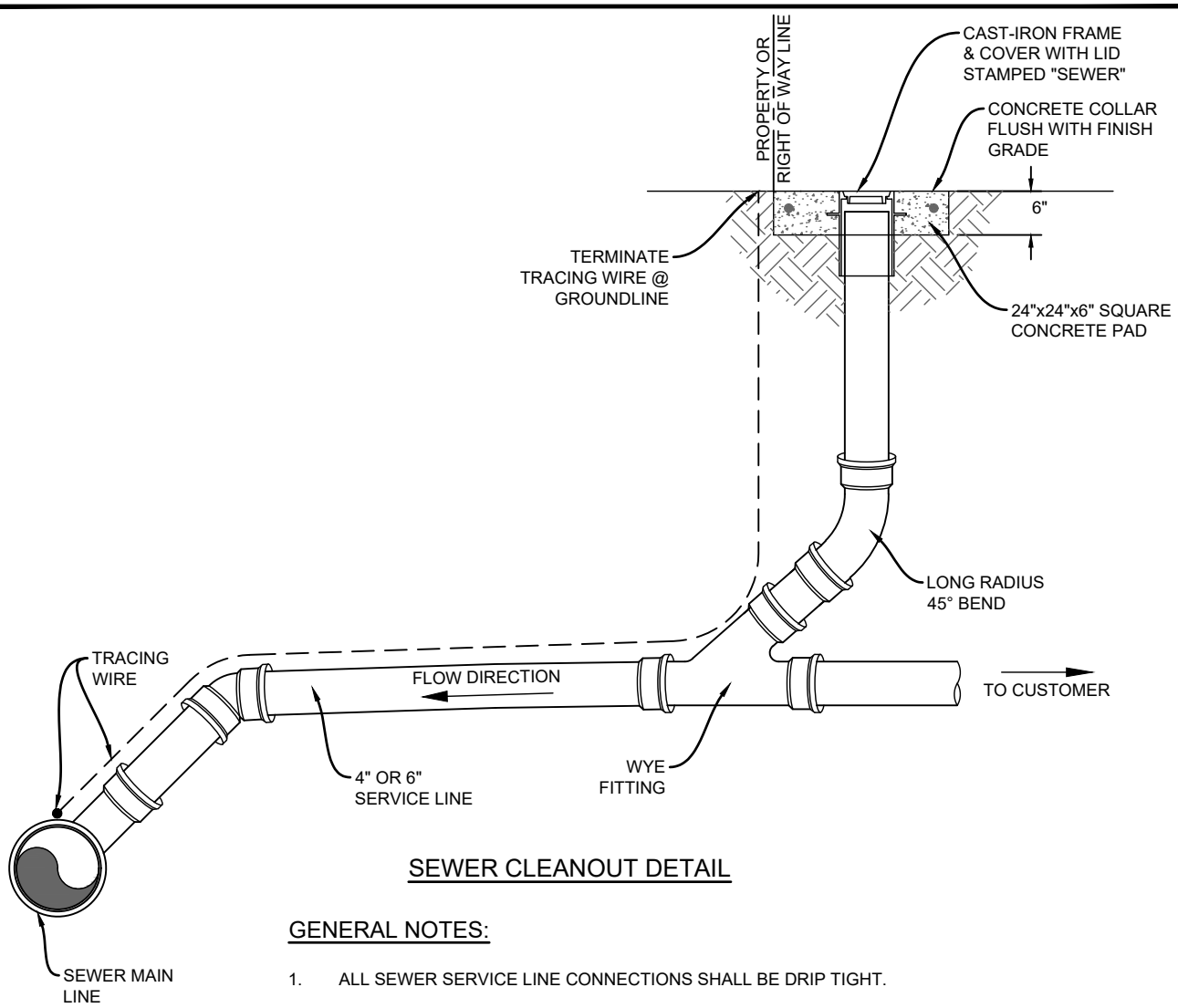
SEWER SERVICE LINE DETAIL

GENERAL NOTES:

1. ALL SEWER SERVICE LINE CONNECTIONS SHALL BE DRIP TIGHT.

SCALE: NOT TO SCALE

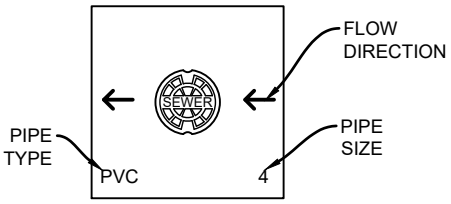
	CITY OF ALAMOGORDO TECHNICAL STANDARD DRAWINGS	ISSUE DATE: JUNE 2021
		REVISION DATE: ----
	SEWER SERVICE LINE DETAIL	SHEET NO: S-9



SEWER CLEANOUT DETAIL

GENERAL NOTES:

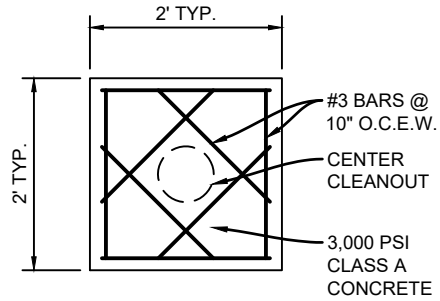
1. ALL SEWER SERVICE LINE CONNECTIONS SHALL BE DRIP TIGHT.



COLLAR CALLOUTS

GENERAL NOTES:

1. SCRIBE CONCRETE WITH LINE DIRECTIONAL ARROWS, PIPE SIZE AND PIPE TYPE.
2. TEXT SIZE SHALL BE 4-INCHES TALL AND SCORED 3/8" DEEP IN A NEAT AND CONSISTENT MANNER, TYPICAL.



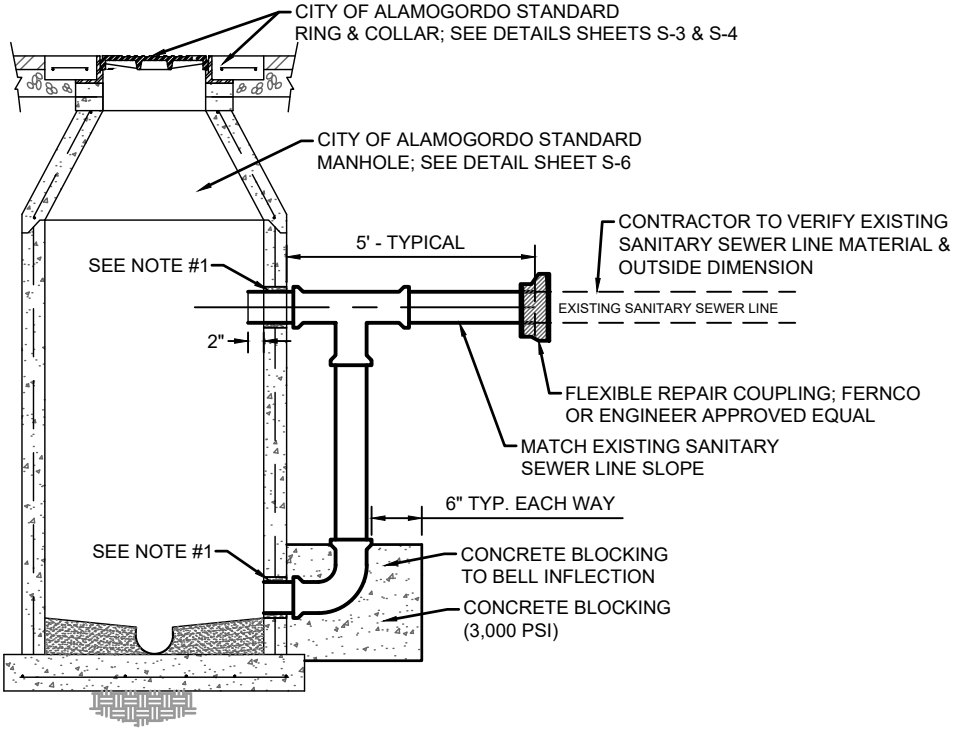
COLLAR DETAIL

GENERAL NOTES:

1. SEWER CLEANOUT SHALL BE CENTERED IN CONCRETE COLLAR.
2. REBAR SHALL BE 1-1/2" CLEAR FROM CONCRETE EDGE TYPICAL.

SCALE: NOT TO SCALE

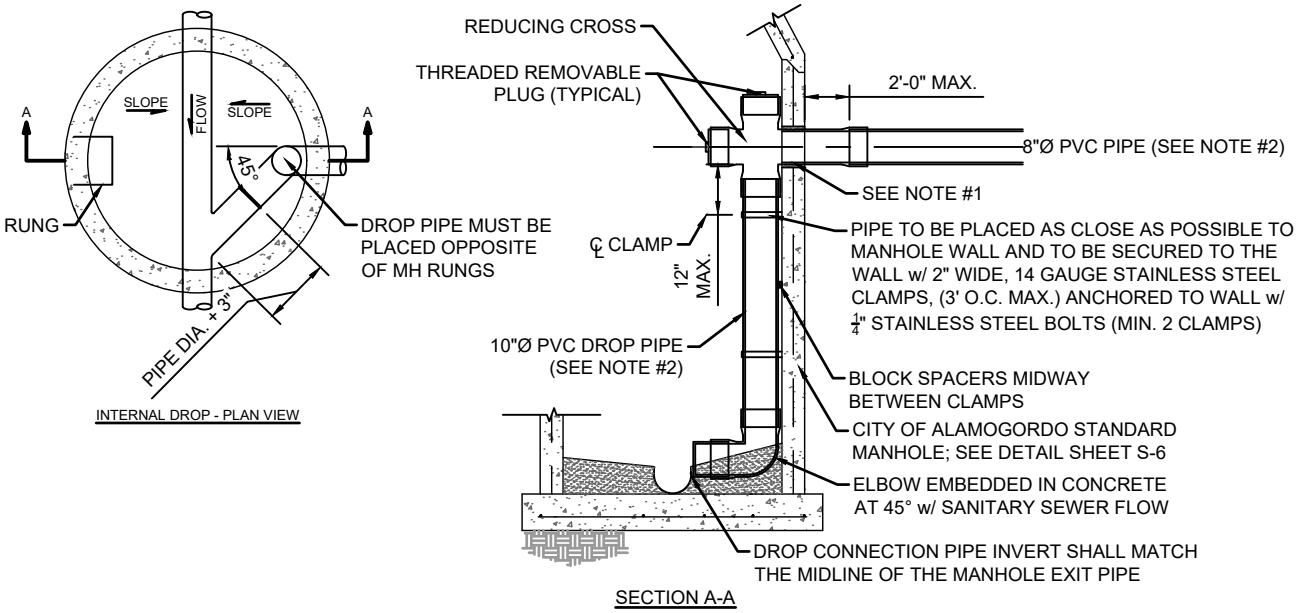
	CITY OF ALAMOGORDO TECHNICAL STANDARD DRAWINGS	ISSUE DATE: JUNE 2021
		REVISION DATE: ----
	SEWER CLEANOUT DETAIL	SHEET NO: S-10



EXTERNAL DROP MANHOLE

NOTES:

1. MANHOLE STOP RING GASKETED AROUND NEW SEWER LINE AND SEAL COMPLETELY w/ NON-SHRINK GROUT.



INTERNAL DROP MANHOLE

NOTES:

1. MANHOLE STOP RING GASKETED AROUND NEW SEWER LINE AND SEAL COMPLETELY w/ NON-SHRINK GROUT.
2. FOR 8"Ø PVC PIPE PROVIDE 10"Ø PVC INTERNAL DROP PIPING.
   FOR 10"Ø PVC PIPE PROVIDE 12"Ø PVC INTERNAL DROP PIPING.

SCALE: NOT TO SCALE

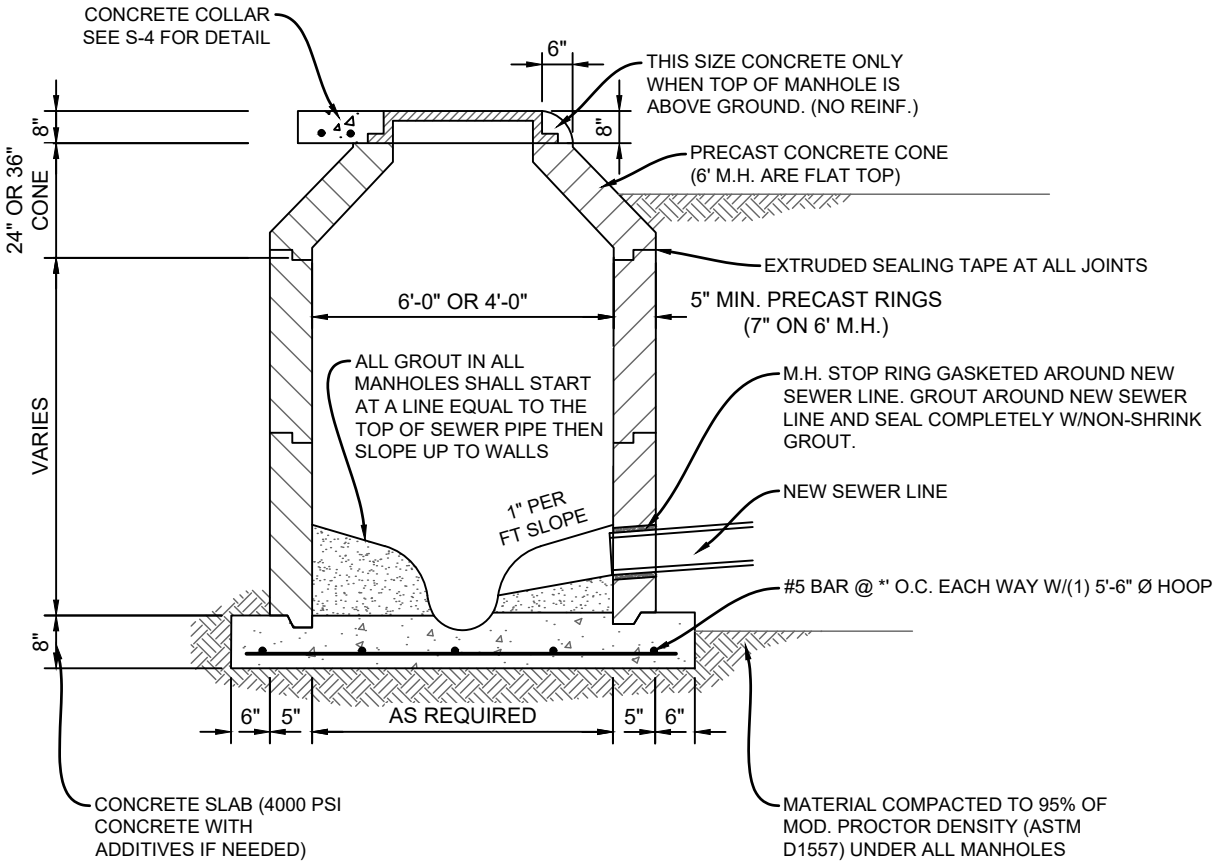
CITY OF ALAMOGORDO
TECHNICAL STANDARD DRAWINGS

DROP MANHOLE DETAILS

ISSUE DATE: JUNE 2021

REVISION DATE: ----

SHEET NO: S-11



CONTRACTOR NOTES:

1. IF NEW PIPE INVERT IS BELOW EXISTING GROUTED SHELF, SHELF IS TO BE CUT OUT AS NEEDED AND RE-GROUTED.

2. PRECAST PORTION OF MANHOLES, EXCLUDING CAST IN PLACE BOTTOM, SHALL CONFORM TO ASTM C478 LATEST REVISIONS.

SCALE: NOT TO SCALE

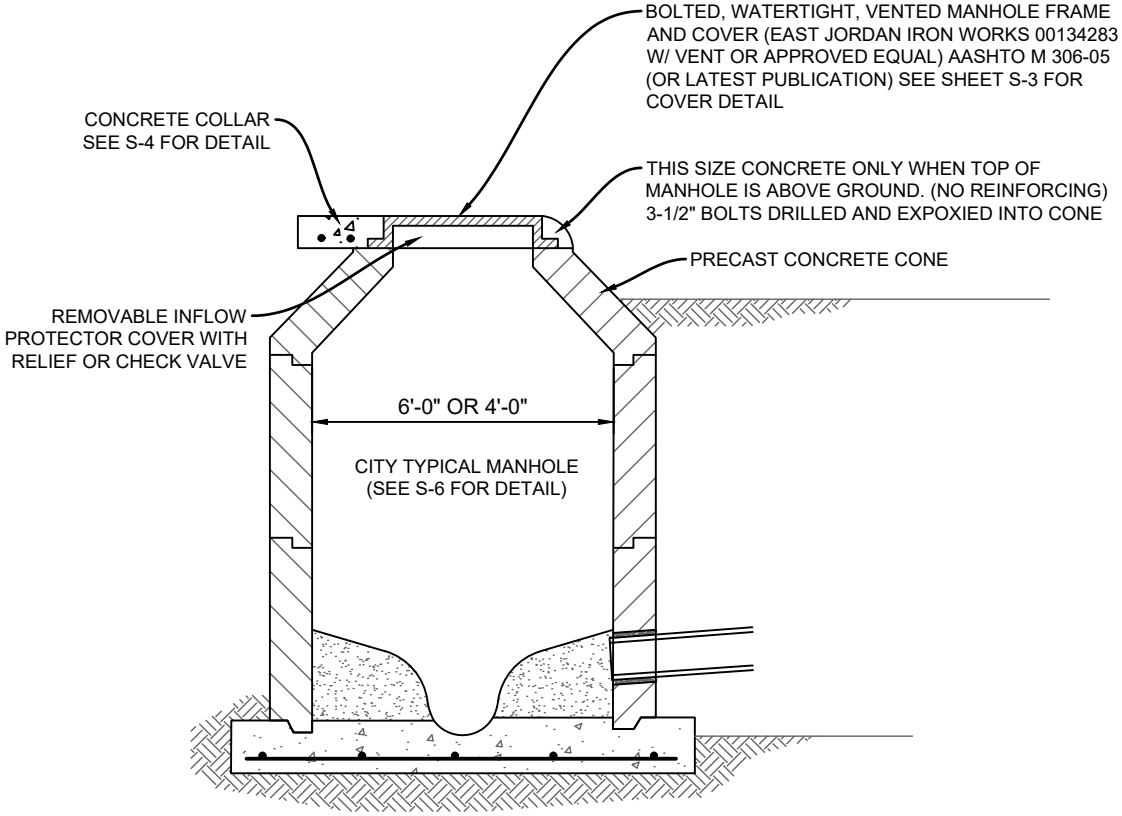
CITY OF ALAMOGORDO
TECHNICAL STANDARD DRAWINGS

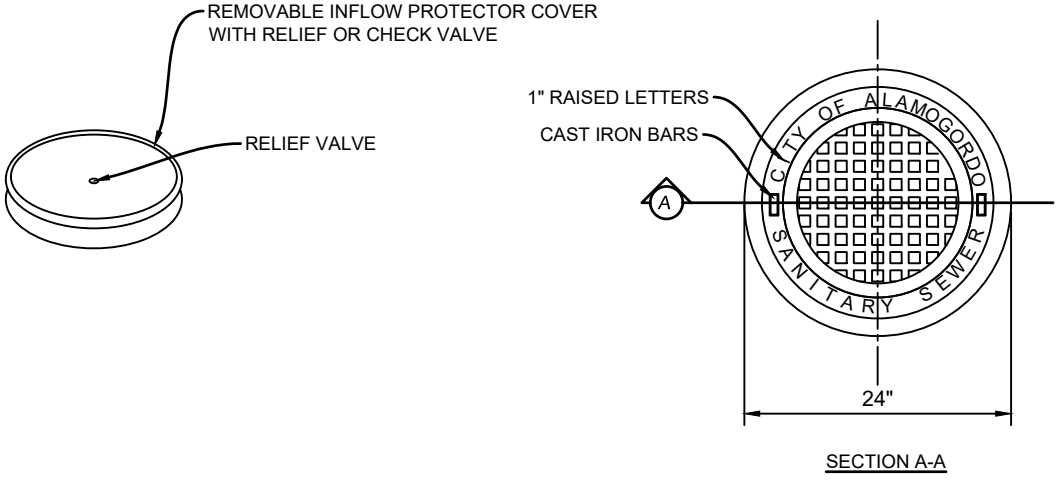
TAPPING INTO EXISTING STANDARD MANHOLE DETAIL

ISSUE DATE:
JUNE 2021

REVISION DATE:

SHEET NO:
S-12





SECTION A-A

SCALE: NOT TO SCALE

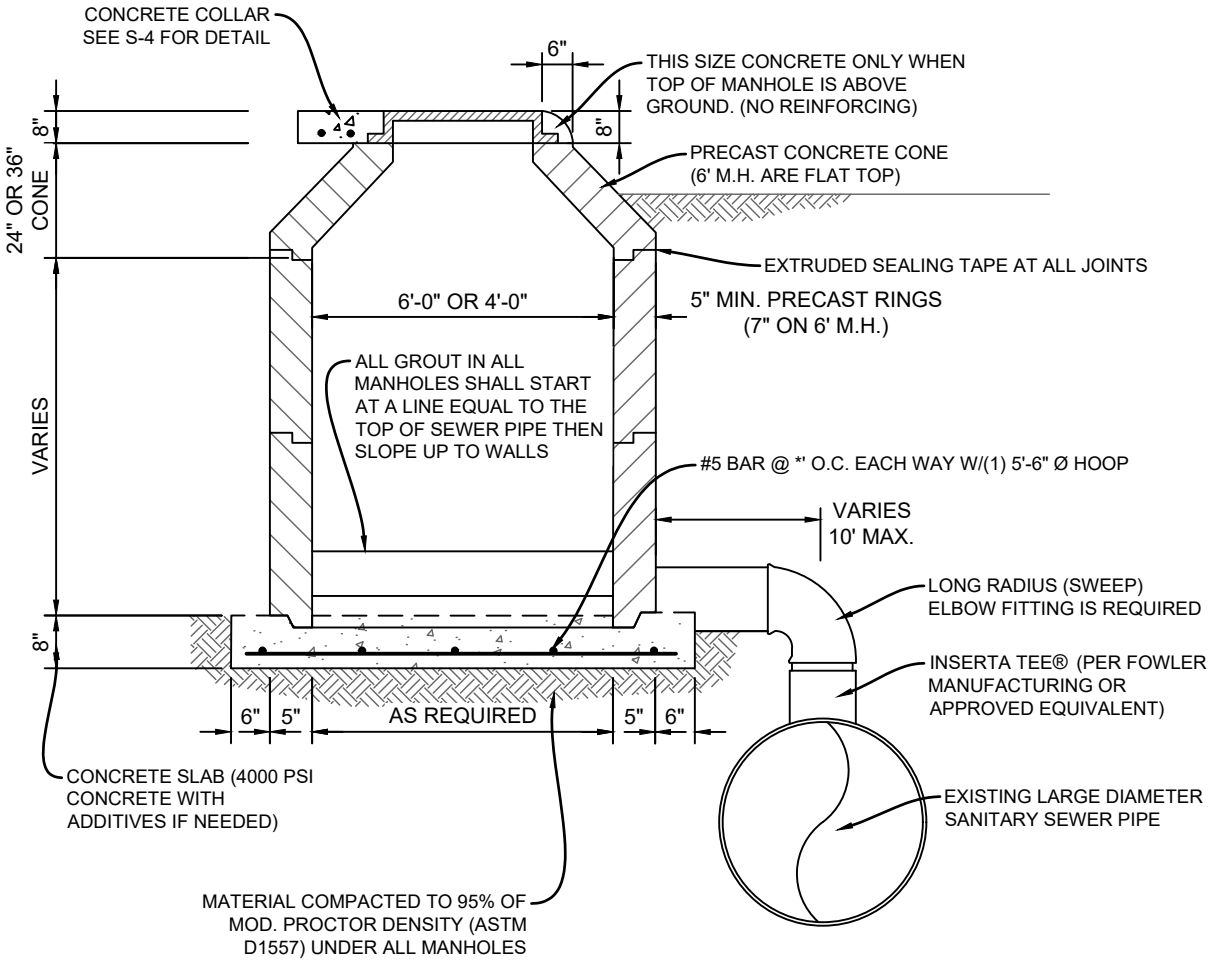
CITY OF ALAMOGORDO
TECHNICAL STANDARD DRAWINGS

WATERTIGHT VENTED MANHOLE DETAIL

ISSUE DATE: JUNE 2021

REVISION DATE: ----

SHEET NO: S-13



CONTRACTOR NOTES:

1. INSTERTA TEE® (OR APPROVED EQUAL) TO BE INSTALLED PER MANUFACTURES SPECIFICATIONS..

2. PRECAST PORTIONS OF MANHOLES, EXCLUDING CAST IN PLACE BOTTOM, SHALL CONFORM TO ASTM C-478.

SCALE: NOT TO SCALE

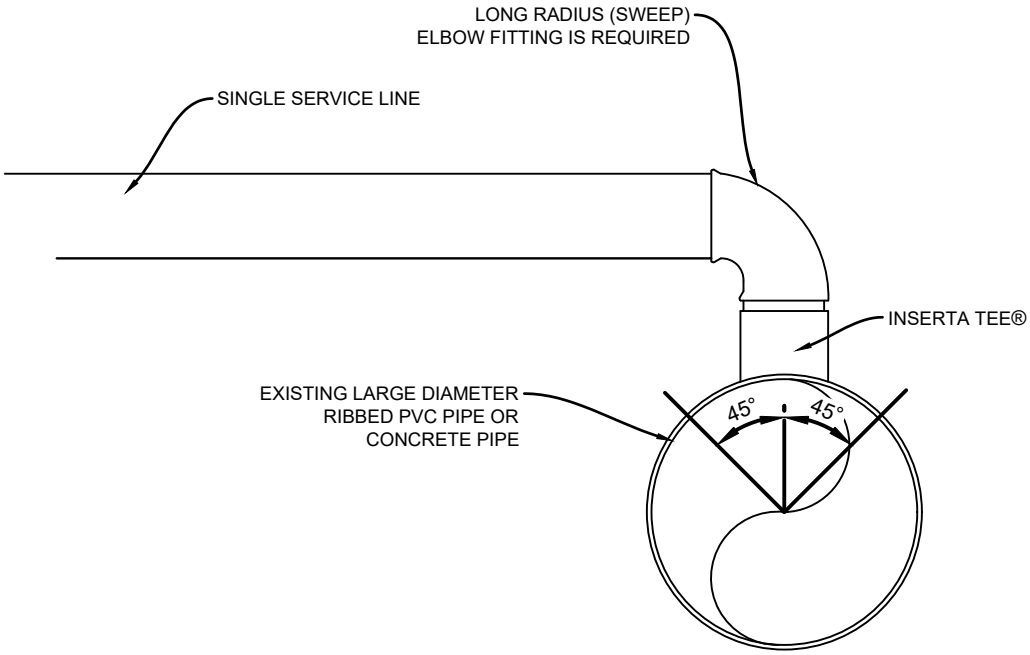
CITY OF ALAMOGORDO
TECHNICAL STANDARD DRAWINGS

MAIN LINE INSERTA TEE CONNECTION DETAIL

ISSUE DATE:
JUNE 2021

REVISION DATE:

SHEET NO:
S-14

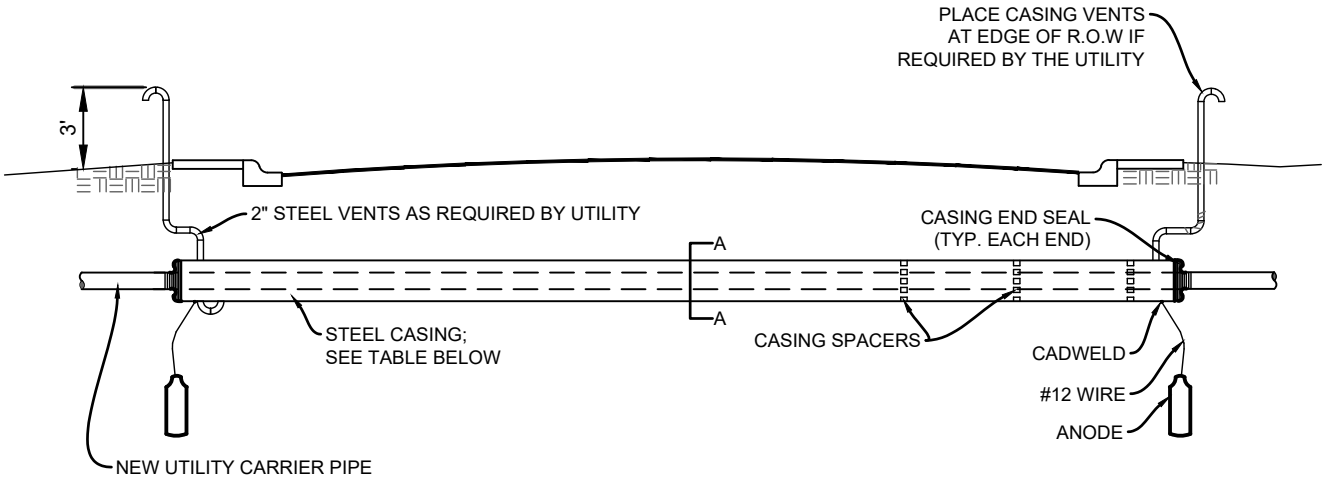


NOTES:

1. INSTERTA TEE® (OR APPROVED EQUAL) TO BE INSTALLED PER MANUFACTURES SPECIFICATIONS.
2. TEE CONNECTION SHALL BE IN THE TOP OR WITHIN 45° OF THE TOP.

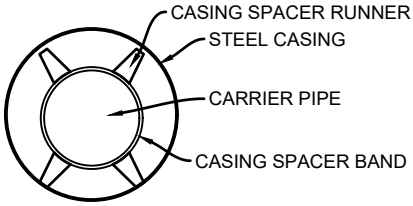
SCALE: NOT TO SCALE

	CITY OF ALAMOGORDO TECHNICAL STANDARD DRAWINGS	ISSUE DATE: JUNE 2021
		REVISION DATE: ----
	SERVICE LINE INSERTA TEE CONNECTION DETAIL	SHEET NO: S-15



GENERAL NOTES:

1. CASING END SEALS SHALL BE T.D. WILLIAMSON, INC Z-SEALS OR ENGINEER APPROVED EQUAL.
2. CASING SPACERS SHALL BE ADVANCE PRODUCTS & SYSTEMS, LLC MODEL SSIM OR ENGINEER APPROVED EQUAL.
3. STEEL CASING PIPE SHALL BE SIZED TO ADEQUATELY ACCOMMODATE CARRIER PIPE AND ADHERE TO THE REQUIREMENTS PROVIDED IN THE TABLE BELOW.
4. PIPE JOINT(S) INSIDE CASING SHALL BE JOINT RESTRAINED.
5. CASING VENTS TO BE PAINTED WITH AN OIL BASE ALKYD PRIMER AND AN OIL BASE ALKYD ENAMEL TOP COAT. COLOR SHALL BE PER APWA UNIFORM COLOR CODE FOR RESPECTIVE UTILITY.



SECTION A-A

STEEL CASING MINIMUM WALL THICKNESS		
NOMINAL DIAMETER (INCHES)	MIN. WALL THICKNESS FOR COATED (INCHES)	MIN. WALL THICKNESS NON-COATED (INCHES)
14 AND UNDER	0.1880	0.1880
16	0.2190	0.2810
18	0.2500	0.3120
20 AND 22	0.2810	0.3440
24	0.3120	0.3750
26	0.3440	0.4060
28	0.3750	0.4380
30	0.4060	0.4690
32	0.4380	0.5000
34 AND 36	0.4690	0.5310
42	0.5000	0.5630
48	0.5630	0.6250

1. WALL THICKNESS DESIGNATIONS FOR STEEL CASING PIPE FOR E-80.
2. STEEL PIPE SHALL HAVE A MINIMUM YIELD STRENGTH OF 35,000 PSI.
3. CORROSION CONTROL MEASURES MUST INCLUDE CATHODIC PROTECTION.

SCALE: NOT TO SCALE

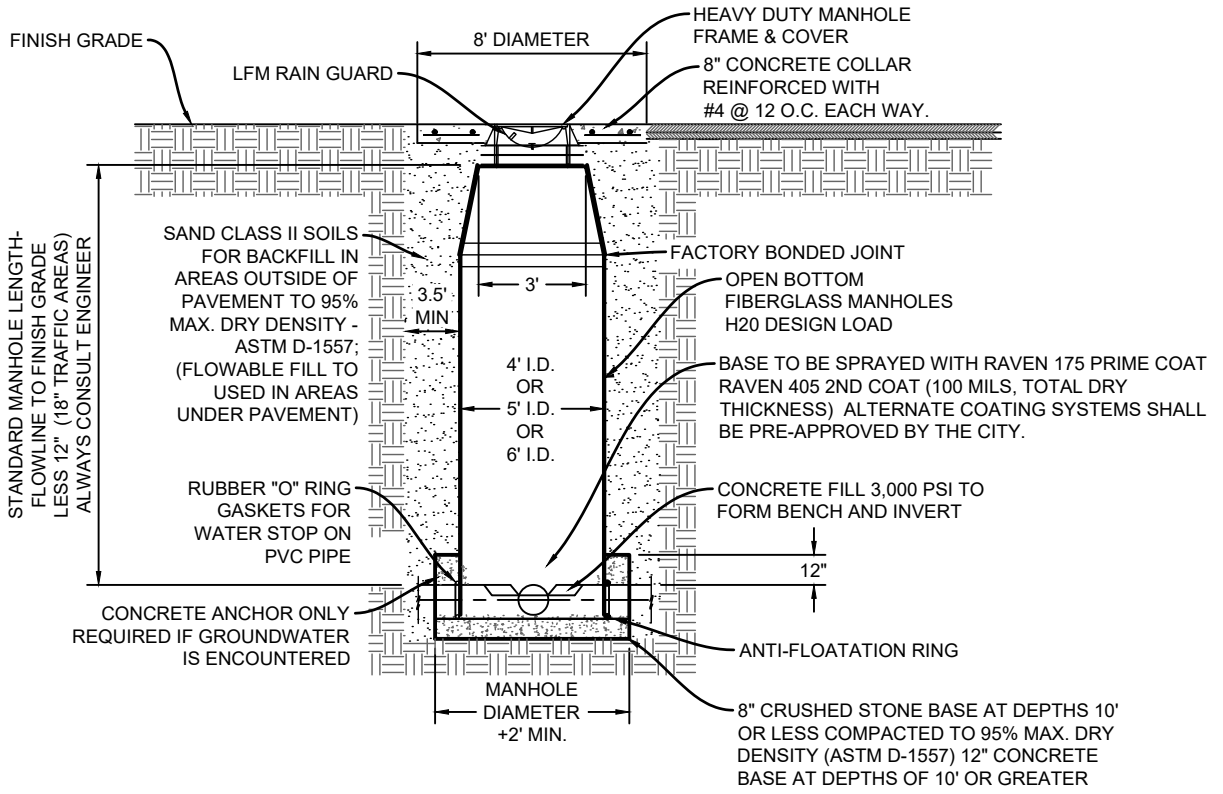
CITY OF ALAMOGORDO
TECHNICAL STANDARD DRAWINGS

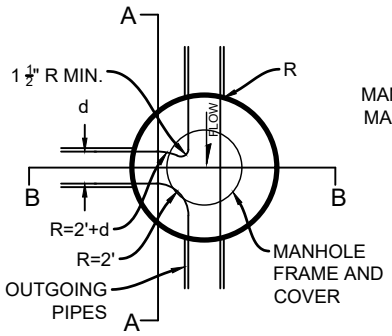
SEWER LINE BORE AND CASE DETAIL

ISSUE DATE: JUNE 2021

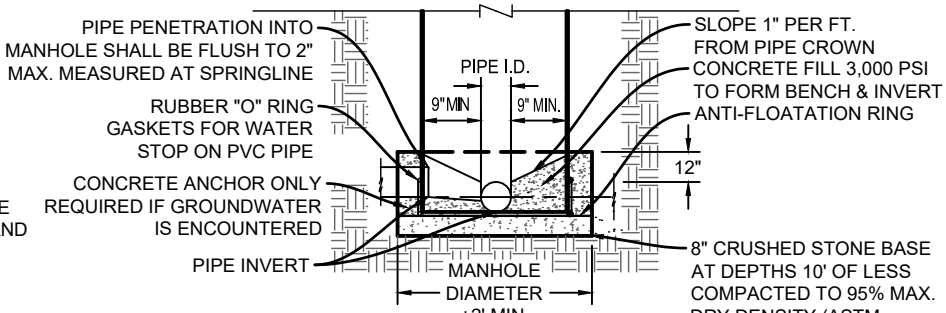
REVISION DATE: ----

SHEET NO: S-16





FIBERGLASS MANHOLE DETAIL
PLAN VIEW



SECTION B-B
BENCH AND INVERT DETAIL
FOR MULTIPLE PIPES

GENERAL NOTES:

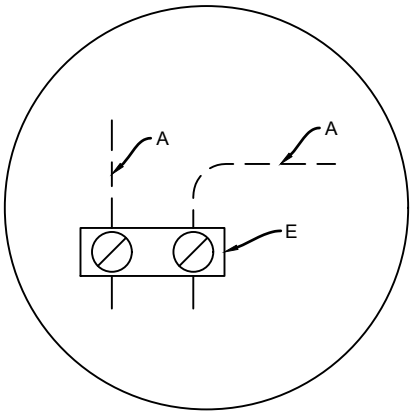
1. CONCRETE ANCHOR WILL ONLY BE REQUIRED IF GROUNDWATER IS ENCOUNTERED.

2. WHERE A SANITARY SEWER LINE ENTERS AND EXITS A MANHOLE IN A STRAIGHT LINE, A DROP BETWEEN THE INCOMING NAND OUTGOING INVERTS WILL NOT BE REQUIRED. IF A DEFLECTION IN THE SANITARY SEWER ALIGNMENT IS PROPOSED AT THE MANHOLE, A MINIMUM OF ONE-TENTH (0.10) OF A FOOT BETWEEN INVERTS WILL BE REQUIRED WHEN THE ANGLE IF BETWEEN 0 AND 45, A MINIMUM OF TWO-TENTHS (0.20) OF A FOOT SHALL BE HELD BETWEEN INCOMING AND OUTGOING INVERTS, SUCH AS 90° BENDS. TEE INTERSECTIONS WILL REQUIRE ALL INCOMING LINES TO BE A MINIMUM OF TWO-TENTHS (0.20) OF A FOOT ABOVE OUTGOING LINES.

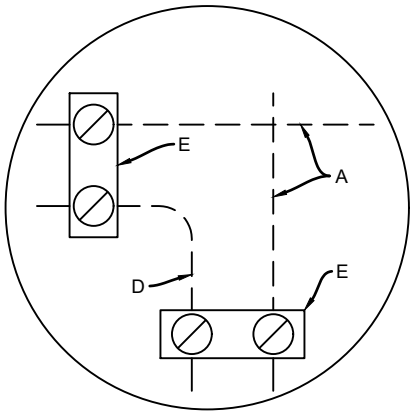
3. WATER TIGHT FIBERGLASS (CLOSED BOTTOM) MANHOLES ARE MANUFACTURED WITH A PRE-BUILT FIBERGLASS BENCH AND INVERT. THE DESIGN ENGINEER WILL NEED TO CONFIRM PROJECT REQUIREMENTS PRIOR TO MANUFACTURING OF MANHOLES.

SCALE: NOT TO SCALE

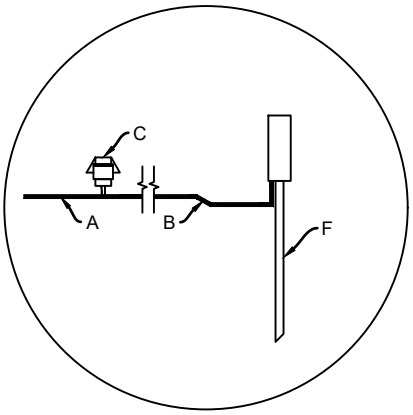
	CITY OF ALAMOGORDO TECHNICAL STANDARD DRAWINGS	ISSUE DATE: JUNE 2021
		REVISION DATE: ----
	FIBERGLASS MANHOLE DETAIL	SHEET NO: S-17



Tee Connection Detail



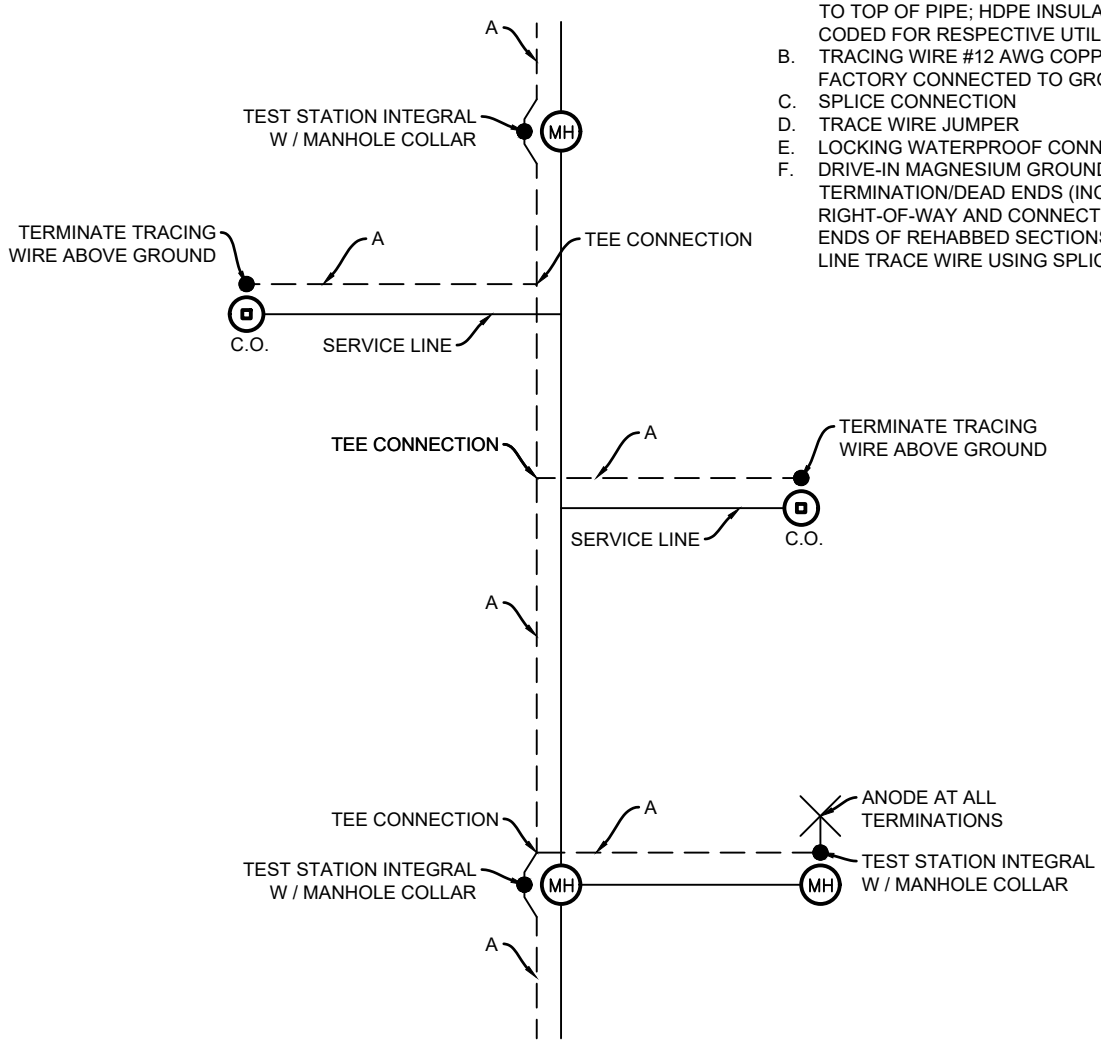
Cross Connection Detail



Anode Detail

CONSTRUCTION NOTES:

A. TRACING WIRE #12 AWG COPPER CLAD STEEL, TAPED TO TOP OF PIPE; HDPE INSULATION APWA COLOR CODED FOR RESPECTIVE UTILITY
B. TRACING WIRE #12 AWG COPPER CLAD STEEL - RED FACTORY CONNECTED TO GROUND ANODE
C. SPLICE CONNECTION
D. TRACE WIRE JUMPER
E. LOCKING WATERPROOF CONNECTOR
F. DRIVE-IN MAGNESIUM GROUNDING ANODE AT ALL TERMINATION/DEAD ENDS (INCLUDING EDGE OF RIGHT-OF-WAY AND CONNECTION POINTS/TERMINAL ENDS OF REHABBED SECTIONS). CONNECT TO MAIN LINE TRACE WIRE USING SPLICE CONNECTIONS.



SCALE: NOT TO SCALE

CITY OF ALAMOGORDO
TECHNICAL STANDARD DRAWINGS

SANITARY SEWER TRACING WIRE DETAILS

ISSUE DATE: JUNE 2021

REVISION DATE: ----

SHEET NO: S-18

CONTRACTOR NOTE:

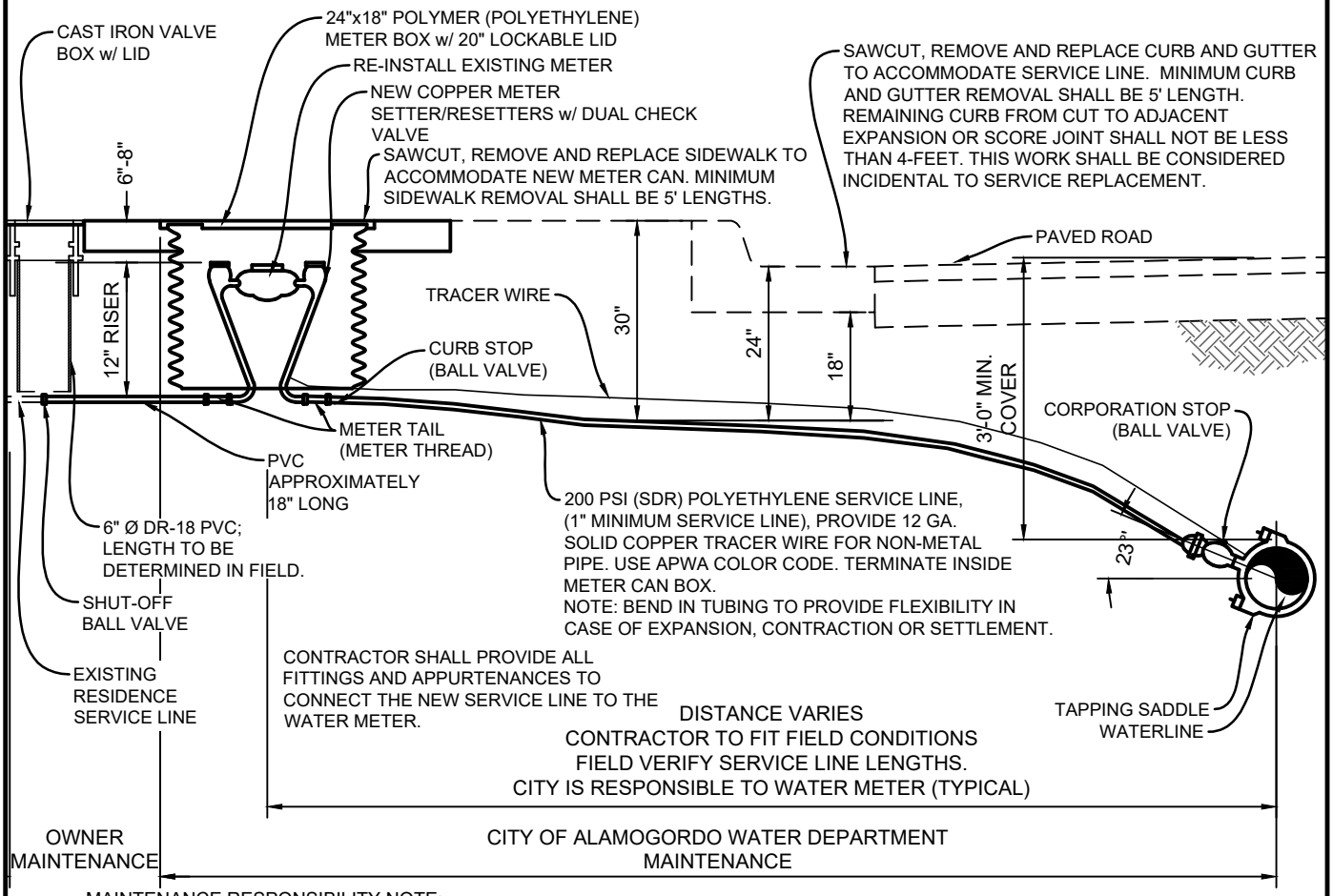
METER CAN SHALL NOT BE INSTALLED IN ACCESSIBLE (ADA) RAMP PAN, SLOPE OR LANDINGS.

IN SOME CASES THE EXISTING WATER METER IS SURROUNDED BY CONCRETE, ANY DAMAGE BY THE CONTRACTOR TO THE ADJACENT CONCRETE SHALL BE REPLACED AT CONTRACTOR'S EXPENSE.

CONTRACTOR SHALL INSCRIBE A 'W' ON TOP OF CONCRETE CURB (IN-LINE W/ NEW WATER SERVICE) TO INDICATE THE LOCATION OF THE NEW WATER SERVICE LINE. CONTRACTOR TO RE-INSCRIBE "W" INTO NEW CONCRETE IF EXISTING CONCRETE IS REMOVED AND REPLACED.

THE WATER SERVICE LINE MAY BE PUNCHED UNDERNEATH THE EXISTING CURB AND GUTTER AS LONG AS THE RESULTING HOLE IS LESS THAN 6-INCHES IN THE HORIZONTAL DIRECTION.

METER CAN SHALL BE INSTALLED IN SIDEWALKS OR LANDSCAPE AREA (BETWEEN SIDEWALK AND BACK OF CURB) WITHIN RIGHT OF WAY. METER CANS SHALL NOT BE INSTALLED IN DRIVEWAYS OR VEHICULAR TRAFFIC FLOWS UNLESS LOCATION(S) AND METER CAN TYPE(S) HAVE BEEN PRE-APPROVED IN WRITING BY THE PUBLIC WORKS DEPARTMENT AND THE ENGINEERING DEPARTMENT PRIOR TO INSTALLATION.



MAINTENANCE RESPONSIBILITY NOTE:
THE CITY OF ALAMOGORDO WATER DEPARTMENT WILL BE RESPONSIBLE FOR MAINTENANCE OF THE WATER LINE FROM THE WATER MAIN TO THE WATER METER. THE OWNER WILL BE RESPONSIBLE FOR MAINTENANCE OF THE WATER LINE FROM THE WATER METER TO THE BUILDING.

NOTE:

1. THE CITY OF ALAMOGORDO RESERVES THE RIGHT TO CHANGE AND/OR MODIFY ANY ITEM(S) EITHER DETAILED OR SPECIFIED ON THIS DRAWING.
2. WATER SERVICE DETAIL AND WATER SERVICE INSTALLATION MATERIAL LISTING ARE TYPICAL FOR 3/4" WATER SERVICE. ADJUSTMENTS SHALL BE MADE TO FITTINGS, CONNECTIONS, SERVICE LINE, ECT. SIZE AS REQUIRED FOR WATER SERVICES LARGER THAN 3/4".
3. ALL FITTING, CONNECTIONS, SERVICE LINE, ETC. SHALL BE RATED FOR 200 P.S.I. (MINIMUM) WORKING PRESSURE.
4. METER RISERS SHALL BE SET PLUMB AND VERTICAL WITHIN THE METER CAN.

SCALE: NOT TO SCALE

CITY OF ALAMOGORDO
TECHNICAL STANDARD DRAWINGS

WATER SERVICE DETAIL

ISSUE DATE: JUNE 2021

REVISION DATE: ----

SHEET NO: W-1

TYPICAL WATER SERVICE INSTALLATION MATERIAL LISTING:

COLD WATER METER: WATER METERS SHALL BE MULTIJET, READING IN CUBIC FEET AND ACCEPTABLE FOR USE WITH ZENNER STEALTH READER MIU SYSTEM. NO SUBSTITUTIONS. REFER TO ARTICLE 02-026.1 WATER SUPPLY SYSTEM FOR THE LIST OF COMPATIBLE WATER METERS. WATER METERS LARGER THAN 2-INCHES SHALL BE POSITIVE DISPLACEMENT (COMPOUND) METERS AND ACCEPTABLE FOR USE WITH ZENNER STEALTH READER MIU SYSTEM.

SERVICE (TAPPING) SADDLE: TAPPING SADDLES REQUIRE THE PRE-APPROVAL IN WRITING BY PUBLIC WORKS DEPARTMENT AND ENGINEERING DEPARTMENT PRIOR TO INSTALLATION. ACCEPTABLE SADDLES SHALL HAVE DOUBLE STRAPS STRAP SECURED BY FOUR BOLTS. SADDLES SHALL ALSO HAVE 1" IP THREADED OUTLET AND BE MADE OF THE FOLLOWING ACCEPTED MATERIALS:

BODY - DUCTILE IRON BODY, CONFORMING TO ASTM A-536, WITH 10-12 MIL FUSION EPOXY COATING OR NYLON COATED.

STRAPS - TYPE 304 (18-8) HEAVY GRADE STAINLESS STEEL, CONFORMING TO ASTM A-240.

NUTS & WASHERS - UNC ROLL THREAD TYPE 304 (18-8) STAINLESS STEEL BOLTS WITH HEAVY HEX NUTS. ROD FOR BOLTS, CONFORMING TO ASTM A-240, AND NUTS, CONFORMING TO ASTM A-194. ALL WELDS FULLY PASSIVATED FOR ENHANCED CORROSION RESISTANCE. NUTS COATED TO PREVENT GALLING. INSTALLATION SHALL CONFORM TO MANUFACTURER'S TORQUE SPECIFICATIONS.

GASKET - NITRILE BUTADIENE RUBBER (NBR), ASTM D-2000 MBC-610 OR HD EDPM O-RING.

NOTE: SADDLE WITH SLENDER SINGLE STRAPS SECURED BY TWO BOLTS, CAST IRON BODY AND STEEL STRAPS ARE NOT ACCEPTABLE.

CORPORATION STOP: CORPORATION STOP SHALL BE BALL VALVE TYPE AND RATED FOR 150 P.S.I. (MINIMUM) WORKING PRESSURE. CORPORATION STOP SHALL HAVE A 1" IP THREADED INLET WITH A PACK JOINT CONNECTION FITTING OR MUELLER INSTA-TITE CONNECTION FOR 1" PVC SERVICE LINE.

SERVICE LINE: SERVICE LINE SHALL BE 1" BLUE SDR POLYETHYLENE, 200 PSI, CONFORMING TO ASTM D2737 AND SPECIFIED FOR POTABLE WATER.

CURB STOP: CURB STOP SHALL BE BALL VALVE TYPE AND RATED FOR 150 P.S.I. (MINIMUM) WORKING PRESSURE.

COPPER METER RESETTER: COPPER METER RESETTER (METER YOKE) SHALL BE HORIZONTAL STYLE, 5/8"x3/4" (METER YOKE) BRASS/COPPER WITH LOCK WING STYLE ANGLE METER VALVE ON INLET AND TOP ENTRY ANGLE DUAL CHECK VALVE ON OUTLET WITH BRASS SUPPORT BAR. THE CONNECTIONS FOR METER SHALL BE BRASS SWIVEL NUT WITH WIRE SEAL HOLE AND METER SUPPORT LIP. INLET AND OUTLET THREADS SHALL BE METER THREAD. THE CONNECTION TO THE 1" SERVICE LINE SHALL BE MADE WITH AN AY McDONALD 76102 O.A.E. CTS MAC-PAC JOINTxFNPT CURB STOP AND A 3/4"x1" BRASS METER BUSHING. IF A THERMAL-COIL BOX IS UTILIZED THE FOLLOWING MATERIALS SHALL BE USED VERSUS THE METER YOKE:

-POLYBUTYLENE TUBING
-A LOCK WING METER STOP (INLET 3/4")
-A DUAL CHECK VALVE (OUTLET 3/4")
-A 3/4" OUTSIDE METER THREADED INLET
-A 3/4" OUTSIDE METER THREADED OUTLET

METER BOXES: SPECIFICATION IS BASED ON USE OF “DFW PLASTICS, INC.” BY DFW PLASTICS, INC., 901 E INDUSTRIAL AVENUE, SAGINAW TX 76131, WITH ATTRIBUTES AS DESCRIBED BELOW. EQUAL PRODUCTS OF OTHER WATER METER CAN MANUFACTURES MAY BE ACCEPTABLE WHEN PRE-APPROVED BY PUBLIC WORK DEPARTMENT AND ENGINEERING DEPARTMENT. PRE-APPROVED EQUAL, SUBSTITUTIONS UNDER ARTICLE 01-002.4. SHALL ONLY BE USED FOR CITY WATER METER INSTALLATIONS.

THIS PRODUCT IS DESIGNED TO WITHSTAND LOADING IN NON-DELIBERATE AND INCIDENTAL TRAFFIC. NOT TO BE INSTALLED IN ROADWAYS, DRIVEWAYS, PARKING LOTS, OR ALLEYS. METER PIT LID SHALL BE BLACK AND CONSTRUCTED OUT OF MODIFIED POLYETHYLENE MATERIAL FOR MAXIMUM DURABILITY AND CORROSION RESISTANCE. THE BLACK MATERIAL IS FOR MAXIMUM UV PROTECTION. THE BLACK MATERIAL SHALL BE UNIFORM THROUGHOUT THE METER PIT LID FOR MAXIMUM LONGEVITY AND NOT HAVE A FOAMING AGENT THAT CREATES AIR POCKETS WITHIN THE POLYMER LID.

VERTICAL AND LATERAL LOAD RATING:

- COMPLIANT WITH AASHTO, DESIGN LOAD OF H-10; ASTM C857-16, DESIGN LOAD OF A-8, 8,000 LBS. TRANSFERRED THROUGH A 10" X 10" STEEL PLATE CENTERED IN THE COVER AND BODY.
- COMPLIANT WITH AASHTO, DESIGN LOAD OF H-20; ASTM C857-16, DESIGN LOAD OF A-16, 16,000 LBS. TRANSFERRED THROUGH A 10" X 20" STEEL PLATE CENTERED ON THE COVER AND BODY.
- THIS PRODUCT IS DESIGNED TO WITHSTAND H-10 AND H-20 LOADING IN NON-DELIBERATE OR INCIDENTAL TRAFFIC AREAS.

NOT INTENDED TO BE INSTALLED IN ROADWAYS.

POLYMER LID

- THE POLYMER LID SHALL HAVE A MOLDED KEY HOLE AND PLASTIC LOCK UNDERNEATH LID - AS ILLUSTRATED.
- THE POLYMER LID SHALL HAVE ONE (1) MOLDED SLIDE MOUNT FOR PLACEMENT OF AMR/AMI DEVICE - AS ILLUSTRATED.
- THE POLYMER LID SHALL SEAT SECURELY AND EVENLY INSIDE THE METER PIT AND SHALL NOT OVERLAP THE TOP EDGE OF THE METER PIT.
- THE POLYMER LID SHALL HAVE MOLDED TREAD-PATTERN FOR SKID RESISTANCE - TREAD DIMENSIONS SHALL BE 0.188" X 0.938" X 0.150" DEEP.
- THE POLYMER LID SHALL HAVE "WATER METER" MOLDED INTO THE LID - FONT SHALL BE STD FADAL CNC FONT WITH 1" CHARACTERS X 0.150" DEEP.
- THE POLYMER LID SHALL BE BLACK AND HAVE A MOLDED RECYCLED EMBLEM WITH A MINIMUM OF 50% POST CONSUMER RECYCLED AND 50% POST INDUSTRIAL/ PRE CONSUMER RECYCLED CONTENT- VERIFIED WITH A LEED PRODUCT DOCUMENTATION.

POLYMER BODY

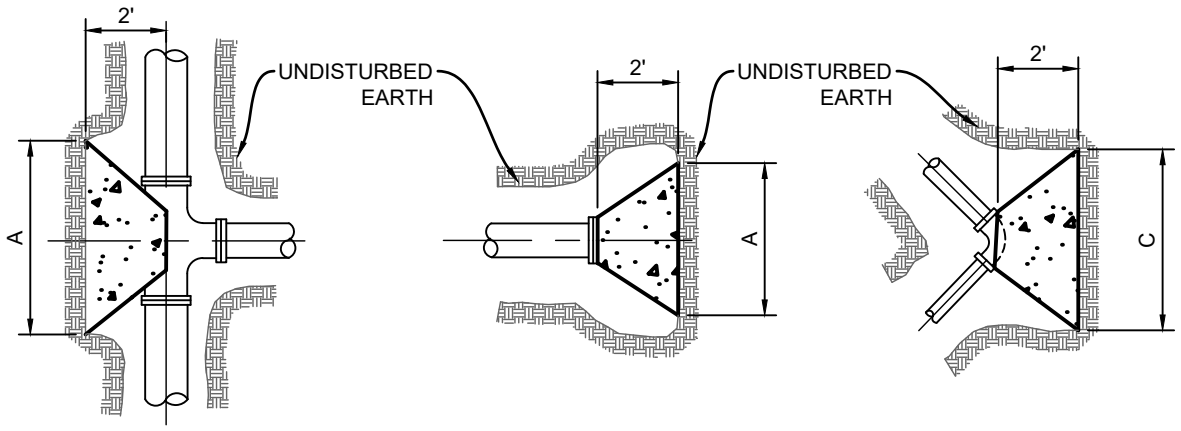
- THE POLYMER BODY SHALL BE BLACK AND HAVE A MINIMUM OF 3/8" WALL THICKNESS - AS ILLUSTRATED.
- THE POLYMER BODY SHALL HAVE MINIMUM INSIDE WORKING ROOM OF (23-1/4") - AS ILLUSTRATED.
- THE POLYMER BODY SHALL HAVE CRUSH RESISTANT RIBBING ALONG THE OUTSIDE OF THE BOX WITH 1-5/8" BASE FOOTING LOCATED AT THE BOTTOM OF THE METER PIT TO HELP ELIMINATE SINKING OR FLOATING ONCE INSTALLED.
- THE POLYMER BODY SHALL HAVE A STRAIGHT WALL DESIGN AND NOT BE FLARED AS TO ALLOW FOR ADJUSTMENT TO GRADE AFTER INSTALLATION.
- THE POLYMER BODY SHALL HAVE ONE PIPE SLOT MOLDED ON EACH END OF THE BODY THAT MEASURES (3" X 5-3/4").
- THE POLYMER BODY SHALL HAVE A MOLDED RECYCLED EMBLEM WITH A MINIMUM OF 35% POST INDUSTRIAL/ PRE CONSUMER RECYCLED CONTENT - VERIFIED WITH A LEED PRODUCT DOCUMENTATION.

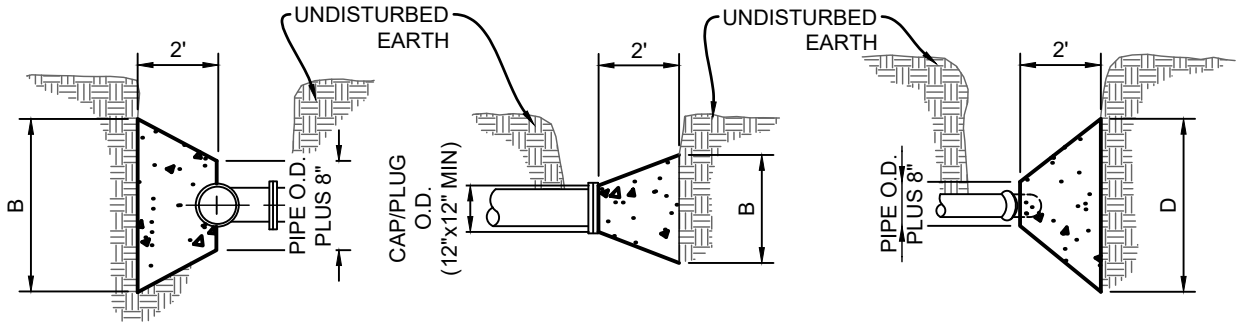
WHENEVER IN THE SPECIFICATIONS, ANY PARTICULAR MATERIALS, PROCESS AND/OR EQUIPMENT IS INDICATED OR SPECIFIED BY PATENT, PROPRIETARY, OR BRAND NAME, OR BY NAME OF MANUFACTURER, SUCH WORDING SHALL BE DEEMED TO BE USED FOR THE PURPOSE OF FACILITATING DESCRIPTION OF THE MATERIAL, PROCESS, AND/OR EQUIPMENT DESIRED, AND SHALL BE DEEMED TO BE FOLLOWED BY THE WORDS "OR EQUAL". THE LISTS OF ACCEPTABLE MATERIAL ARE NOT INTENDED TO BE COMPREHENSIVE LISTS, OR IN ANY ORDER OF PREFERENCE. THE BIDDER MAY OFFER ANY MATERIAL, PROCESS, AND/OR EQUIPMENT WHICH COMPLY WITH THE GOVERNING SPECIFICATIONS WHICH THE BIDDER CONSIDERS TO BE EQUIVALENT TO THAT WHICH IS INDICATED OR SPECIFIED.

THE NOTED METER BOX SIZE IS FOR A TYPICAL FOR 3/4" AND 1" WATER SERVICES. METER BOXES FOR WATER SERVICES LARGER THAN 1 1/2" SHALL BE PRE-APPROVED IN WRITING BY THE PUBLIC WORKS DEPARTMENT AND ENGINEERING DEPARTMENT.

SCALE: NOT TO SCALE

	CITY OF ALAMOGORDO TECHNICAL STANDARD DRAWINGS	ISSUE DATE: JUNE 2021
		REVISION DATE: ----
	TYPICAL WATER SERVICE INSTALLATION MATERIAL LISTING	SHEET NO: W-2





PIPE SIZE	TEE, CAP, PLUG, ELBOW ANGLE	A	B	C	D
4"	TEE OR CAP/PLUG	2'-0"	1'-0"	-	-
4"	90° 45°	-	-	2'-0"	2'-0"
4"	22 1/2" 11 1/4"	-	-	2'-0"	2'-0"
6"	TEE OR CAP/PLUG	2'-0"	2'-0"	-	-
6"	90° 45°	-	-	2'-0"	2'-0"
6"	22 1/2" 11 1/4"	-	-	2'-0"	2'-0"
8"	TEE OR CAP/PLUG	3'-0"	3'-0"	-	-
8"	90°	-	-	3'-0"	3'-0"
8"	45°	-	-	2'-0"	2'-0"
8"	22 1/2" 11 1/4"	-	-	2'-0"	2'-0"

PIPE SIZE	TEE, CAP, PLUG, ELBOW ANGLE	A	B	C	D
10"	TEE OR CAP/PLUG	3'-0"	3'-0"	-	-
10"	90°	-	-	3'-6"	3'-6"
10"	45°	-	-	3'-0"	3'-0"
10"	22 1/2" 11 1/4"	-	-	2'-0"	2'-0"
12"	TEE OR CAP/PLUG	3'-6"	3'-6"	-	-
12"	90°	-	-	4'-0"	4'-0"
12"	45°	-	-	3'-6"	3'-6"
12"	22 1/2" 11 1/4"	-	-	2'-0"	2'-0"
14"	TEE OR CAP/PLUG	4'-0"	4'-0"	-	-
14"	90°	-	-	5'-0"	5'-0"
14"	45°	-	-	3'-6"	3'-6"
14"	22 1/2" 11 1/4"	-	-	3'-0"	3'-0"

GENERAL NOTES:

1. ALL FITTINGS AND BURIED DUCTILE IRON PIPE SHALL BE ENCASED IN POLYETHYLENE.
2. ALL VERTICAL BENDS SHALL BE RESTRAINED JOINTS.
3. PIPE SIZES GREATER THAN 14-INCHES REQUIRES DESIGN AND CERTIFICATION BY ENGINEER.

SCALE: NOT TO SCALE

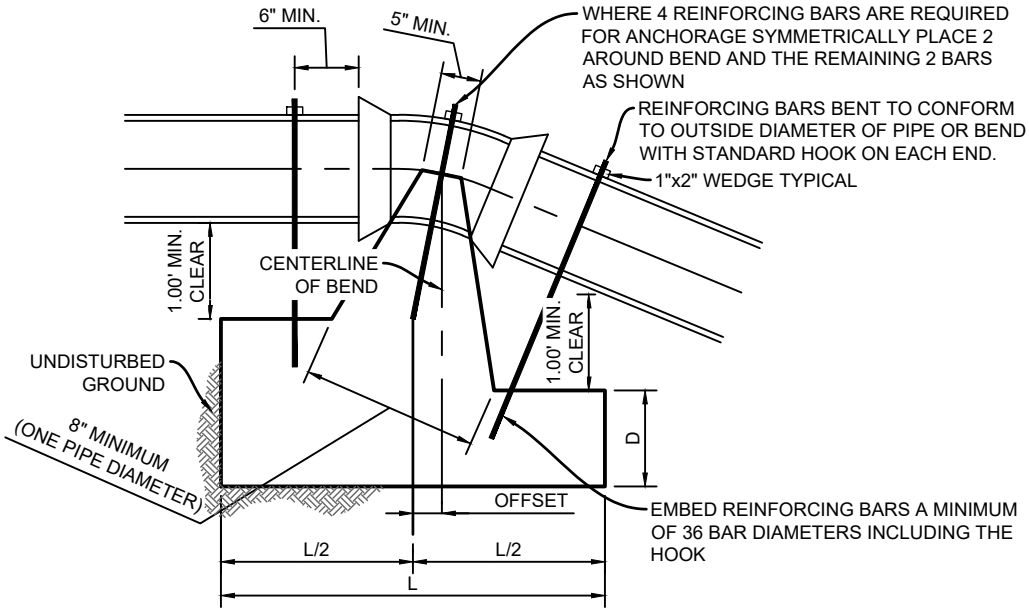
CITY OF ALAMOGORDO
TECHNICAL STANDARD DRAWINGS

THRUST BLOCK DETAILS

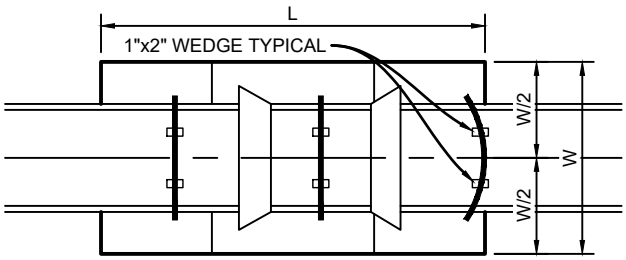
ISSUE DATE: JUNE 2021

REVISION DATE: ----

SHEET NO: W-3



ELEVATION VIEW



PLAN VIEW

GENERAL NOTES:

1. DESIGN TEST PRESSURE IS 150 PSI.
2. ALL REINFORCING BARS AND WEDGES SHALL BE FACTORY ZINC COATED. REPAIR DAMAGED COATING PER MANUFACTURER'S RECOMMENDATIONS.
3. PIPE SIZES GREATER THAN 14-INCHES REQUIRES DESIGN AND CERTIFICATION BY ENGINEER.

ANCHORAGE BLOCK DIMENSIONS							
BEND		SIZE					
		4"	6"	8"	10"	12"	14"
11.25° BEND	D	2'-0"	2'-6"	3'-0"	3'-6"	3'-9"	4'-0"
	L	2'-0"	2'-6"	3'-0"	3'-6"	3'-9"	4'-0"
	W	1'-9"	2'-3"	2'-6"	3'-0"	3'-6"	4'-0"
	OFFSET	0'-6"	0'-6"	0'-6"	0'-6"	0'-6"	0'-6"
	REBAR	3 - #3	3 - #3	3 - #3	3 - #3	3 - #3	3 - #3
22.5° BEND	D	2'-6"	3'-0"	3'-9"	4'-3"	4'-9"	5'-0"
	L	2'-6"	3'-0"	3'-9"	4'-3"	4'-9"	5'-0"
	W	2'-0"	2'-9"	3'-3"	4'-0"	4'-6"	5'-0"
	OFFSET	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"
	REBAR	3 - #3	3 - #3	3 - #3	3 - #3	3 - #3	3 - #4
45° BEND	D	3'-0"	3'-9"	4'-6"	5'-3"	5'-9"	6'-6"
	L	3'-0"	3'-9"	4'-6"	5'-3"	5'-9"	6'-6"
	W	2'-9"	3'-6"	4'-3"	5'-0"	5'-6"	6'-0"
	OFFSET	1'-0"	1'-3"	1'-6"	1'-9"	2'-0"	2'-3"
	REBAR	3 - #3	3 - #3	3 - #3	3 - #4	3 - #4	3 - #5

SCALE: NOT TO SCALE

CITY OF ALAMOGORDO
TECHNICAL STANDARD DRAWINGS

ANCHORAGE VERTICAL BEND DETAIL

ISSUE DATE: JUNE 2021

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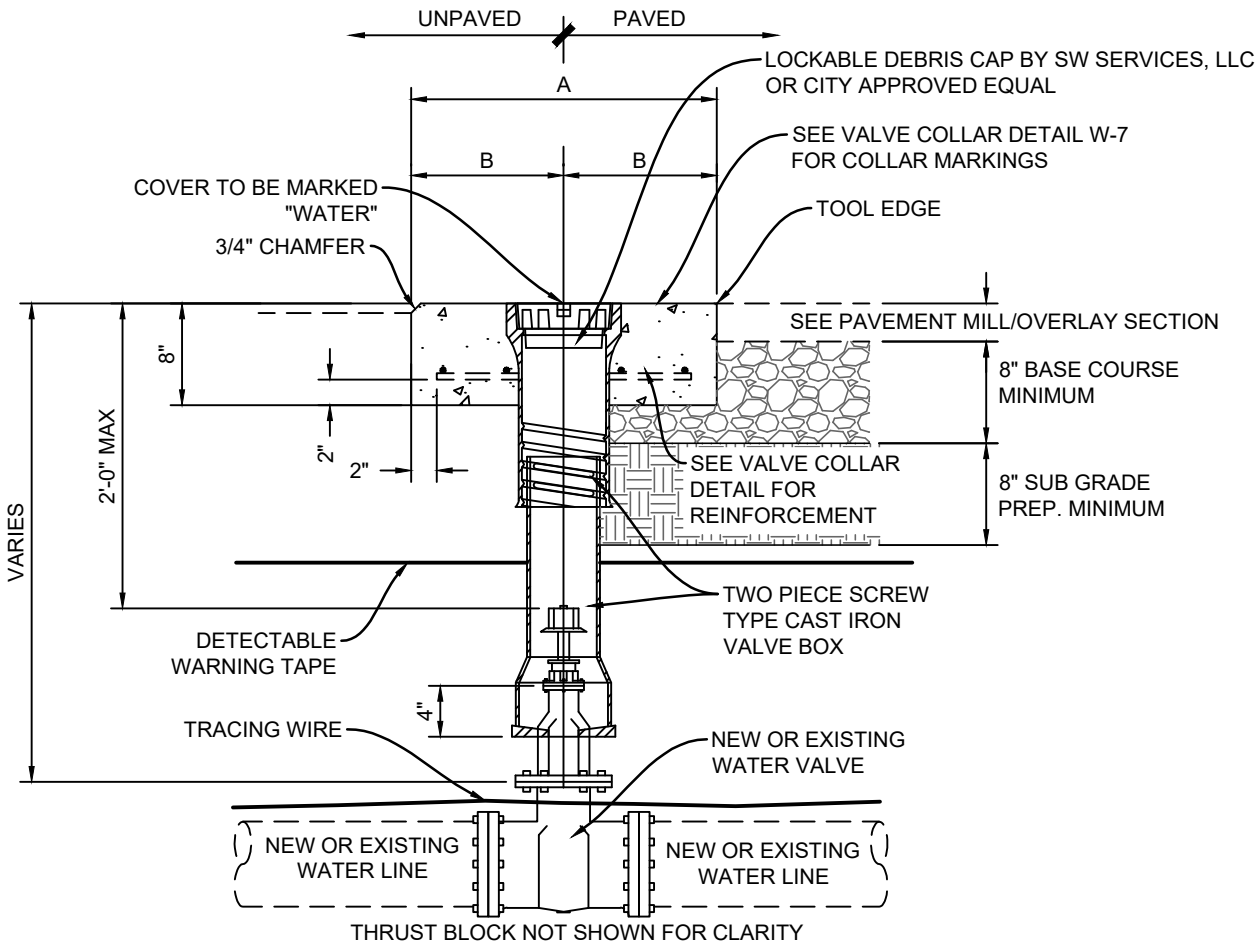
SHEET NO: W-4



CONCRETE COLLAR TABLE		
DIMENSION	PAVED	UNPAVED
A	2'-0"	4'-0"
B	1'-0"	2'-0"

WATER VALVE NOTES:

1. VALVE EXTENSIONS ARE REQUIRED ON ANY VALVE NUT OVER 36-INCHES IN DEPTH. THE EXTENSION SHALL BE WITHIN 18-INCHES OF THE SURFACE.

2. INTERSECTING WATER MAINS SHALL BE EQUIPPED WITH 3 AND/OR 4 ISOLATION CONTROL VALVES.

3. VALVE BOX SHALL BE CENTERED ABOUT OPERATING NUT AND BE PLACED TRUE AND VERTICAL.

SCALE: NOT TO SCALE

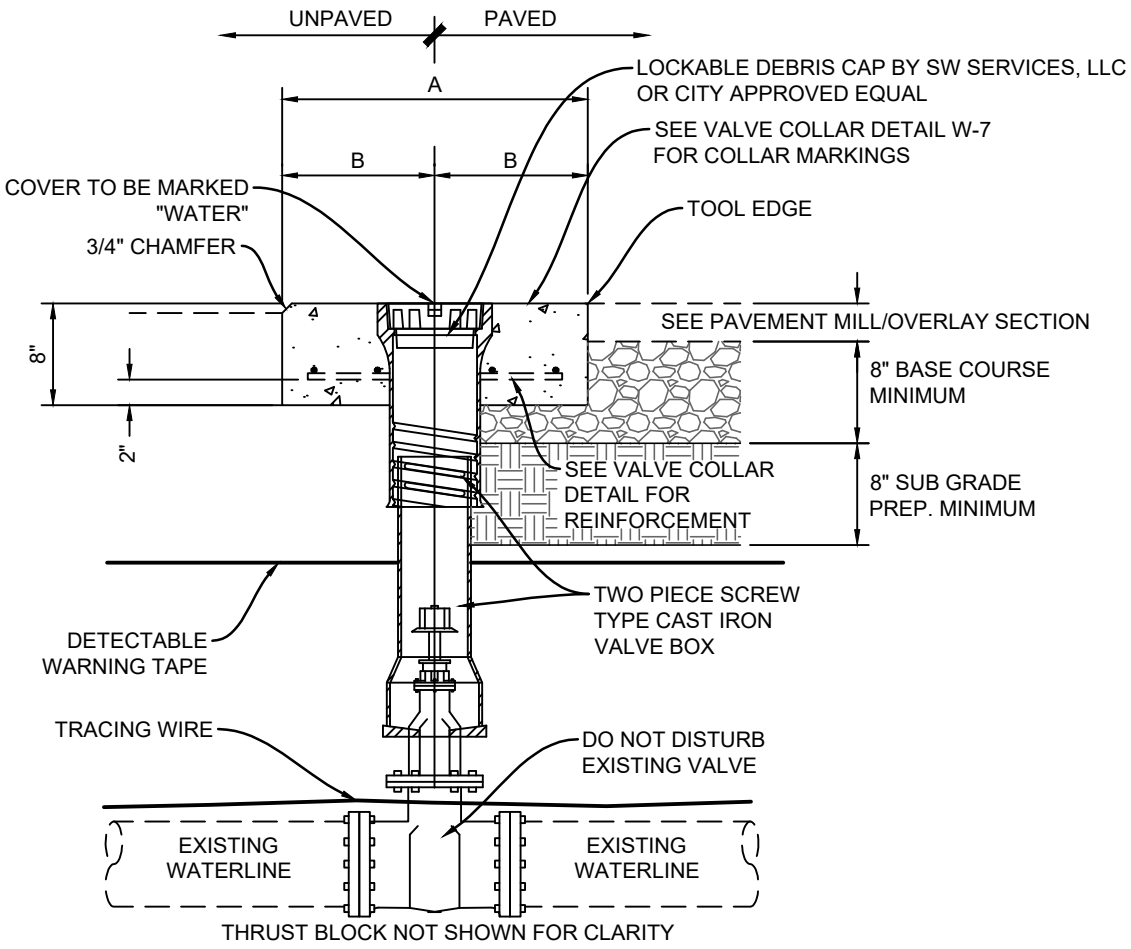
CITY OF ALAMOGORDO
TECHNICAL STANDARD DRAWINGS

VALVE BOX DETAIL

ISSUE DATE: JUNE 2021

REVISION DATE: ----

SHEET NO: W-5



CONCRETE COLLAR TABLE		
DIMENSION	PAVED	UNPAVED
A	2'-0"	4'-0"
B	1'-0"	2'-0"

GENERAL NOTES:

1. SEE TECHNICAL SPECIFICATION FOR BACKFILL MATERIAL SPECIFICATIONS AND COMPACTION REQUIREMENTS.

2. SEE CHAPTER 5, STREET STANDARDS FOR PAVEMENT, BASE COURSE COURSE AND SUB-GRADE PREP. REQUIREMENTS.

3. SIDES OF CONCRETE COLLAR TOP SHALL BE PARALLEL AND PERPENDICULAR TO THE NORMAL STREET TRAFFIC FLOW.

4. VALVE BOX SHALL BE CENTERED ABOUT OPERATING NUT AND BE PLACED TRUE AND VERTICAL.

SCALE: NOT TO SCALE

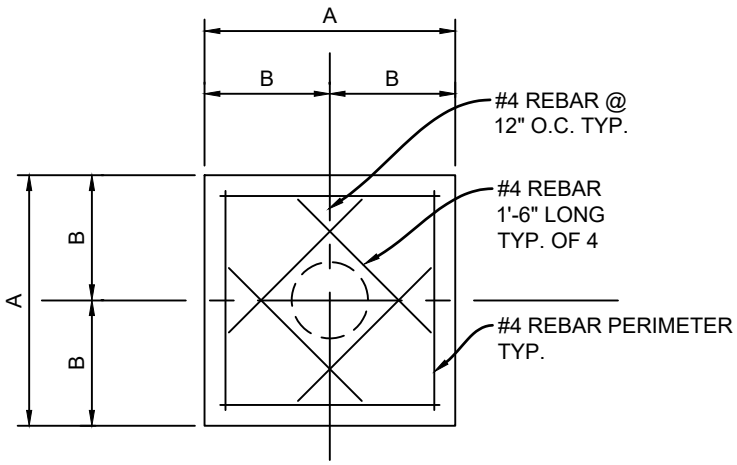
CITY OF ALAMOGORDO
TECHNICAL STANDARD DRAWINGS

ADJUST VALVE BOX DETAIL

ISSUE DATE: JUNE 2021

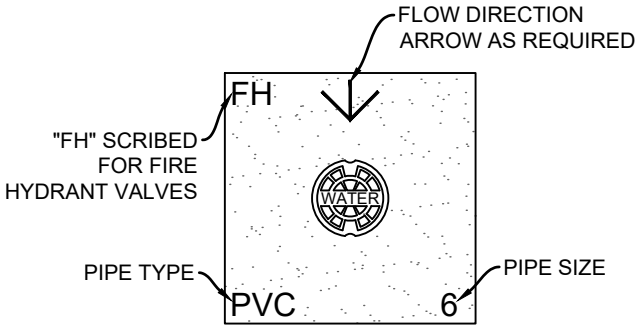
REVISION DATE: ----

SHEET NO: W-6

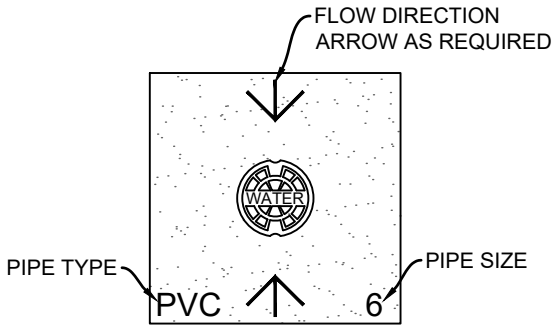


Valve Box Concrete Collar Detail

CONCRETE COLLAR TABLE		
DIMENSION	PAVED	UNPAVED
A	2'-0"	4'-0"
B	1'-0"	2'-0"



Valve Box Collar Marking
Fire Hydrant Valve Detail



Valve Box Collar
Marking Detail

GENERAL NOTES:

1. SIDES OF CONCRETE COLLAR TOP SHALL BE PARALLEL AND PERPENDICULAR TO THE NORMAL STREET TRAFFIC FLOW.

2. SCRIBE CONCRETE WITH LINE DIRECTIONAL ARROWS, PIPE SIZE AND PIPE TYPE. FIRE HYDRANT VALVES SHALL BE SCRIBED WITH "FH" FOR FIELD IDENTIFICATION.

3. TEXT SIZE SHALL BE 4-INCHES TALL AND SCORED 3/8" DEEP IN A NEAT AND CONSISTENT MANNER, TYPICAL.

SCALE: NOT TO SCALE

CITY OF ALAMOGORDO
TECHNICAL STANDARD DRAWINGS

VALVE BOX CONCRETE COLLAR DETAIL

ISSUE DATE:
JUNE 2021

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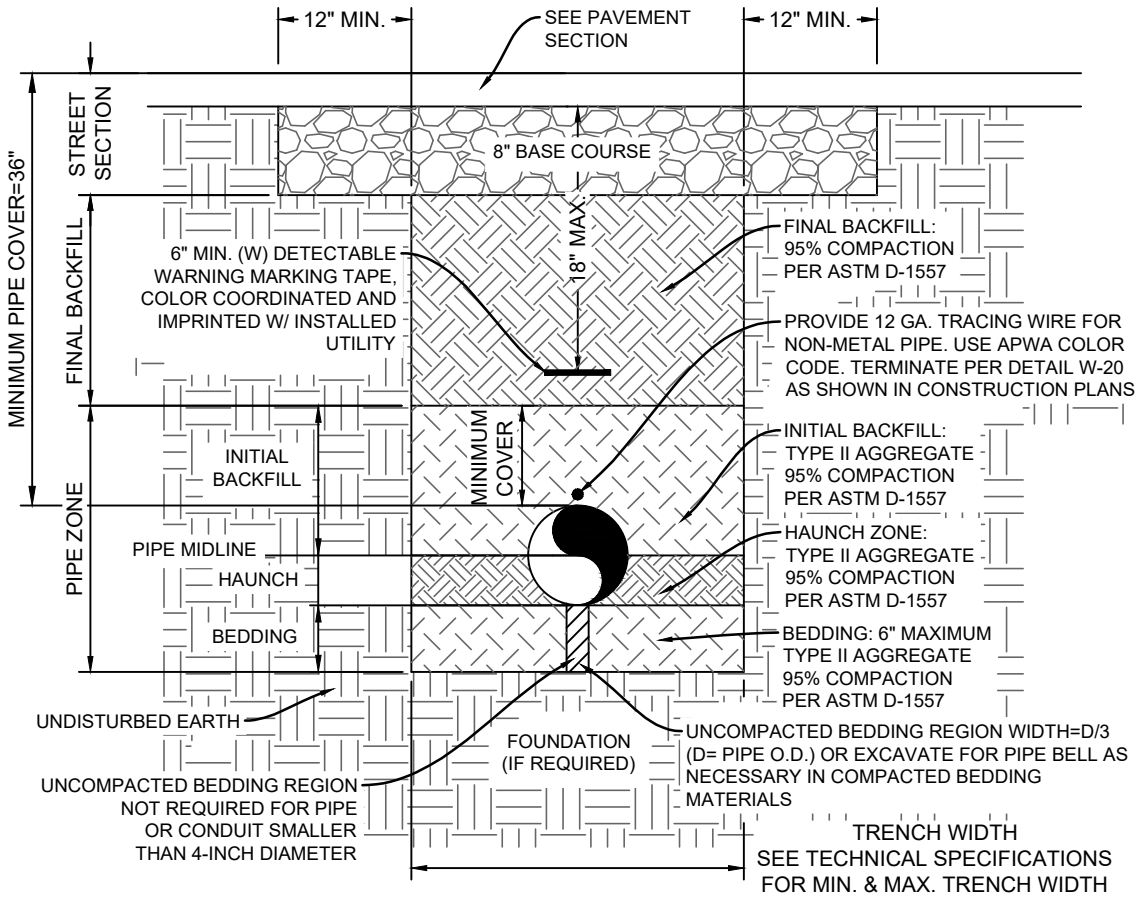
W-7



TYPE II AGGREGATE BASE BACKFILL GRADATION AND REQUIREMENTS	
SIEVE SIZE	PERCENT OF DRY WEIGHT PASSING SIEVE
1-INCH	100
3/4 - INCH	85 - 95
NO. 4	40 - 70
NO. 10	35 - 45
NO. 16	25 - 35
NO. 200	06 - 18
PLASTIC INDEX	12 MAXIMUM
LIQUID LIMITS	35 MAXIMUM
FRACTURED FACES	70% MINIMUM
TOTAL AVAILABLE WATER SOLUBLE SULFATES	35 MAXIMUM

GENERAL NOTES:

1. SEE TECHNICAL SPECIFICATIONS FOR BACKFILL MATERIAL SPECIFICATIONS AND COMPACTION REQUIREMENTS.

2. NATIVE SOIL MAY BE USED AS FINAL BACKFILL IF FREE OF ORGANIC MATTER/DEBRIS, MAXIMUM PARTICLE SIZE OF TWO-INCH (2"), LIQUID LIMIT OF <35, AND PLASTICITY INDEX OF <15. COMPACTION REQUIREMENTS FOR NATIVE MATERIAL SHALL REMAIN THE SAME AS IMPORTED MATERIALS AND PLACEMENT SHALL OCCUR WITHIN ±2% OF OPTIMUM MOISTURE CONTENT.

3. COMPACTION OF THE PIPE BEDDING MAY BE ACCOMPLISHED USING MECHANICAL TAMPING DEVICES PRIOR TO PLACEMENT OF THE PIPE OR CONDUIT. MINIMUM EXCAVATION FOR PIPE BELLS MAY BE ACCOMPLISHED AS NECESSARY TO ALLOW PROPER ALIGNMENT AND ELEVATION OF THE PIPE OR CONDUIT.

4. COMPACTION IN THE HAUNCH ZONE SHALL BE COMPLETED BY HAND WITH TAMPERS OR SUITABLE POWER COMPACTORS IN MAXIMUM LIFTS OF SIX-INCHES (6"). TAMPERS SHALL NOT CONTACT PIPE OR CONDUITS DURING THE TAMPING PROCESS.

5. THE CONTRACTOR SHALL NOT EMPLOY THE USE OF IMPACT TAMPERS DIRECTLY ABOVE THE PIPE OR CONDUIT UNTIL THE FULL LOOSE LAYER BACKFILL DEPTH ABOVE THE PIPE IS OBTAINED.

6. TRENCHING AND EXCAVATION OPERATIONS SHALL CONFORM TO THE CURRENT FEDERAL, STATE, AND LOCAL SAFETY ORDINANCES; INCLUDING OSHA REGULATIONS.

SCALE: NOT TO SCALE

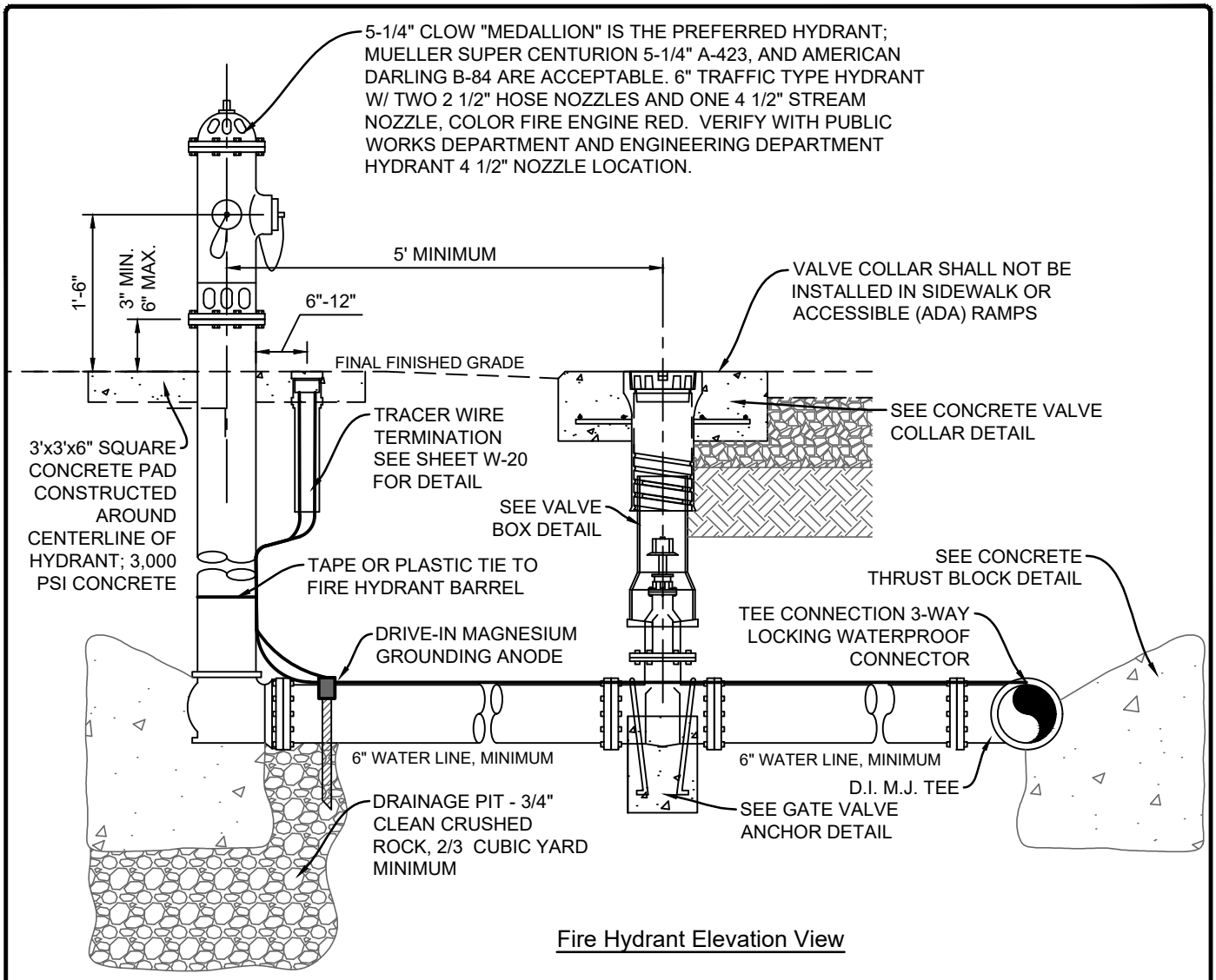
CITY OF ALAMOGORDO
TECHNICAL STANDARD DRAWINGS

UTILITY TRENCH CROSS-SECTION DETAIL

ISSUE DATE: JUNE 2021

REVISION DATE: ----

SHEET NO: W-8



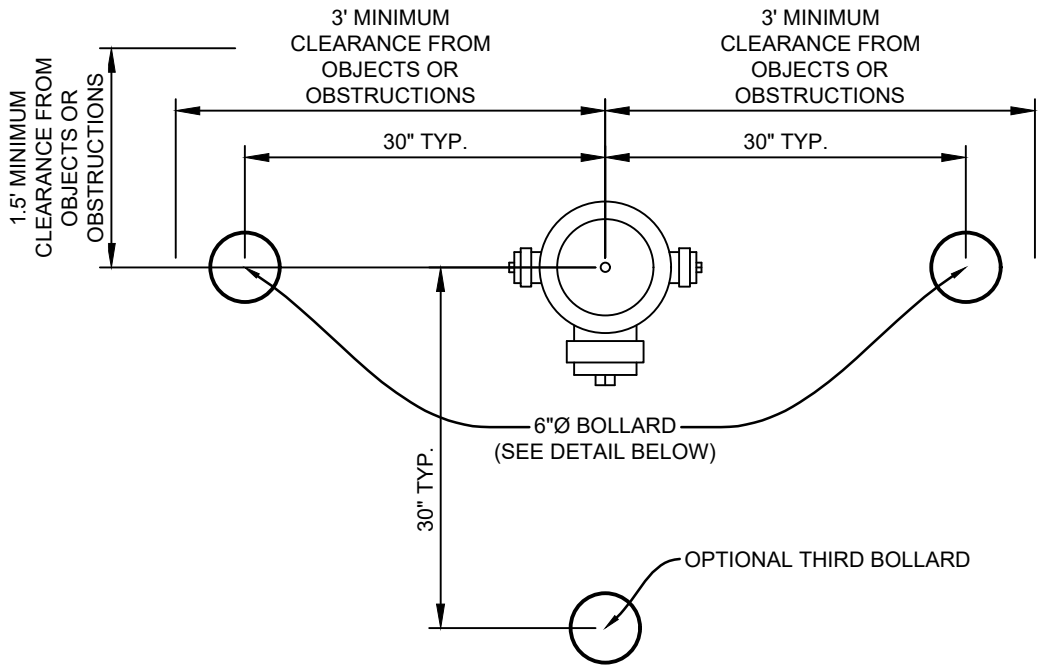
Fire Hydrant Elevation View

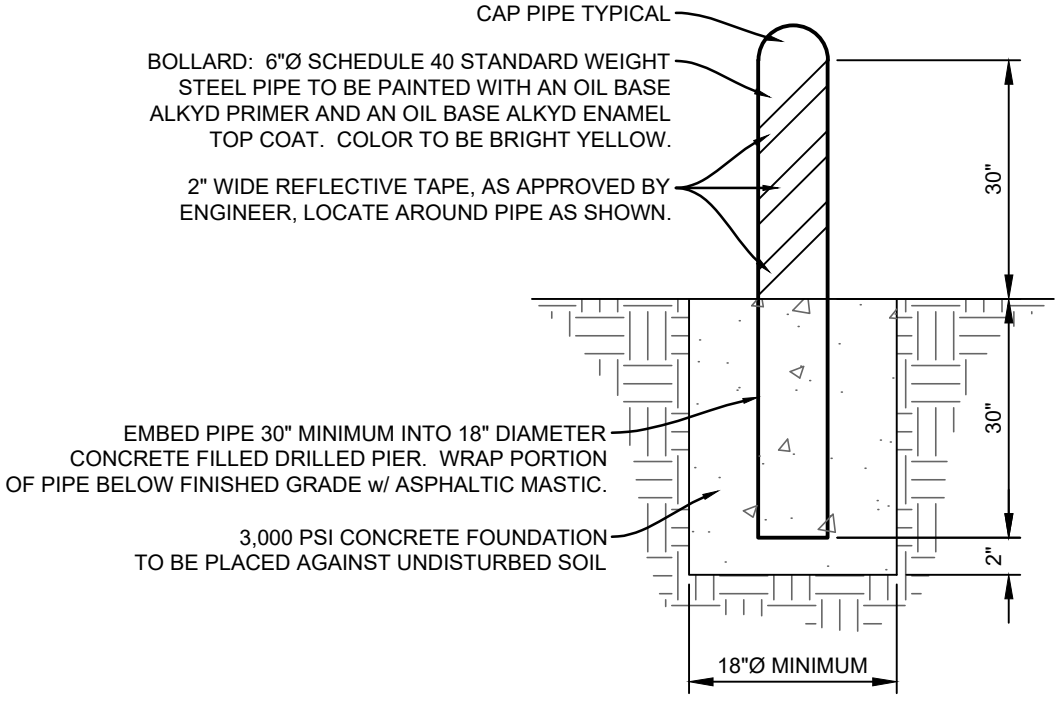
GENERAL NOTE:

1. FIRE HYDRANT SHALL BE INSTALLED 6-FEET FROM BACK OF CURB TO CENTER OF HYDRANT OR AS SPECIFIED BY THE PUBLIC WORKS DEPARTMENT AND ENGINEERING DEPARTMENT.
2. ALL FITTINGS FROM WATER MAIN LINE TO FIRE HYDRANT SHALL BE M.J. FITTINGS.
3. GRIP RING PIPE RESTRAINED, OR PRE-APPROVED EQUAL, SHALL BE INSTALLED ON PIPE FROM HYDRANT VALVE TO HYDRANT BOOT WHEN VALVE IS LOCATED WITH-IN THE 5-FEET MINIMUM SEPARATION, THIS INSTALLATION MUST BE PRE-APPROVED BY PUBLIC WORKS DEPARTMENT AND ENGINEERING DEPARTMENT.
4. FIRE HYDRANT VALVE SHALL NOT BE LOCATED IN THE CURB OR THE GUTTER; CONSULT WITH PUBLIC WORKS DEPARTMENT AND ENGINEERING DEPARTMENT FOR APPROPRIATE LOCATION.

SCALE: NOT TO SCALE

	CITY OF ALAMOGORDO TECHNICAL STANDARD DRAWINGS	ISSUE DATE: JUNE 2021
		REVISION DATE: ----
	FIRE HYDRANT DETAIL	SHEET NO: W-9





SCALE: NOT TO SCALE

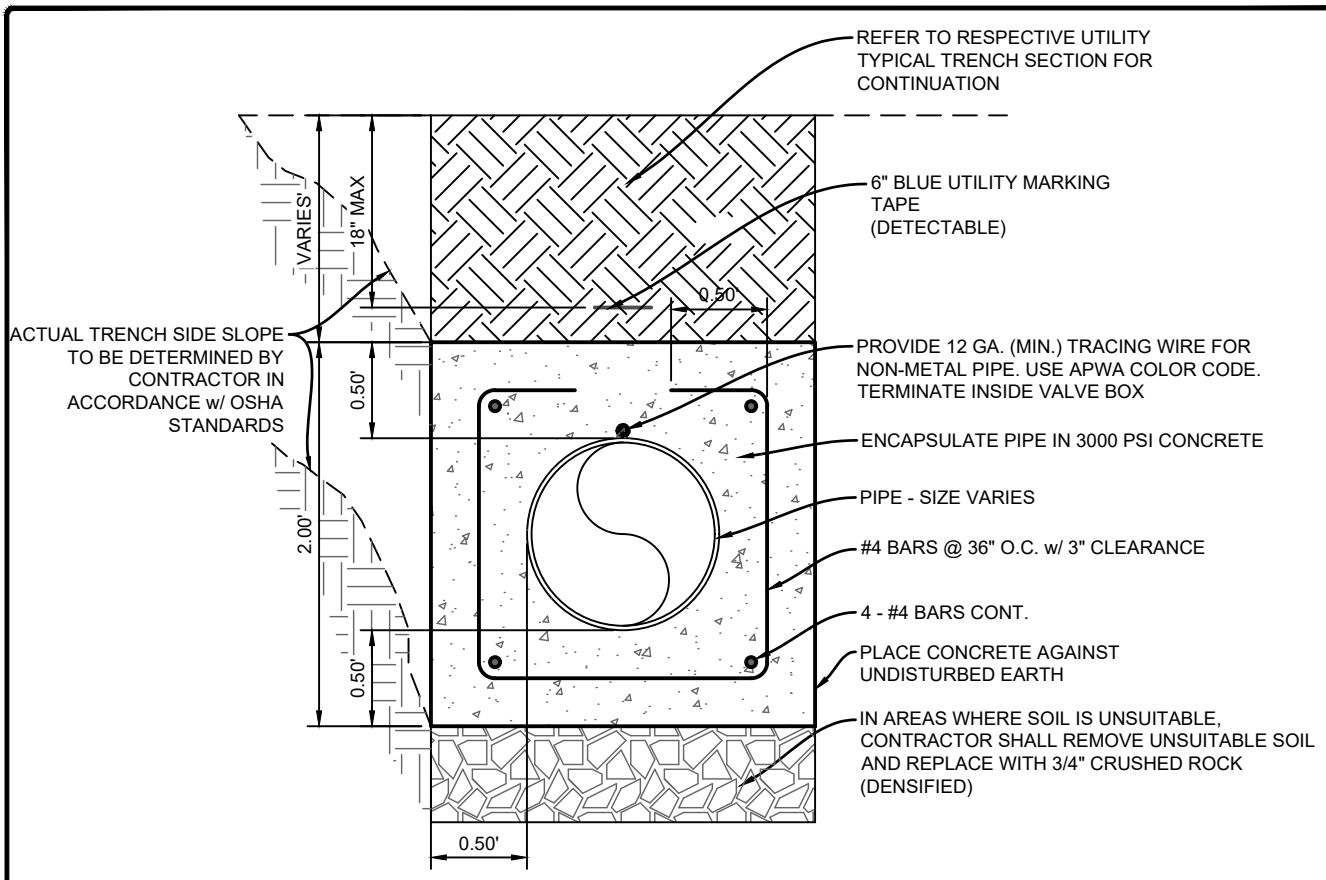
CITY OF ALAMOGORDO
TECHNICAL STANDARD DRAWINGS

FIRE HYDRANT BOLLARD DETAIL

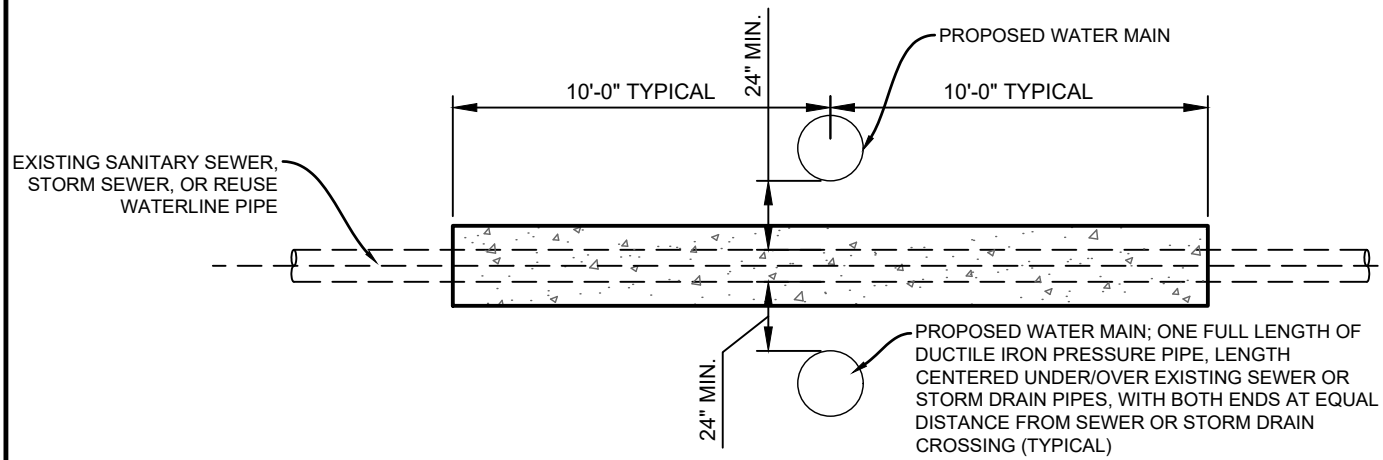
ISSUE DATE: JUNE 2021

REVISION DATE: ----

SHEET NO: W-10



CONCRETE ENCASEMENT SECTION



CONCRETE ENCASEMENT ELEVATION VIEW

GENERAL NOTES:

1. PROVIDE AT LOCATIONS WHERE WATERLINE CROSSES SANITARY SEWER LINE, STORM DRAIN LINE, AND/OR REUSE WATERLINE WITH A CLEARANCE LESS THAN 24-INCHES; ENCASE PIPE FOR A MINIMUM OF 10'-0" ON EACH SIDE OF THE CROSSING AND CROSSINGS TO BE ARRANGED SO THAT THE JOINTS WILL BE EQUIDISTANT AND AS FAR AS POSSIBLE FROM THE SANITARY SEWER LINE, STORM DRAIN LINE, AND/OR REUSE WATERLINE JOINTS.
2. WHERE 36-INCH MINIMUM COVER CANNOT BE MAINTAINED CONSULT WITH PUBLIC WORKS DEPARTMENT AND ENGINEERING DEPARTMENT ON LOWERING OF UTILITY.

SCALE: NOT TO SCALE

CITY OF ALAMOGORDO
TECHNICAL STANDARD DRAWINGS

PIPE CONCRETE ENCASEMENT DETAIL

ISSUE DATE: JUNE 2021

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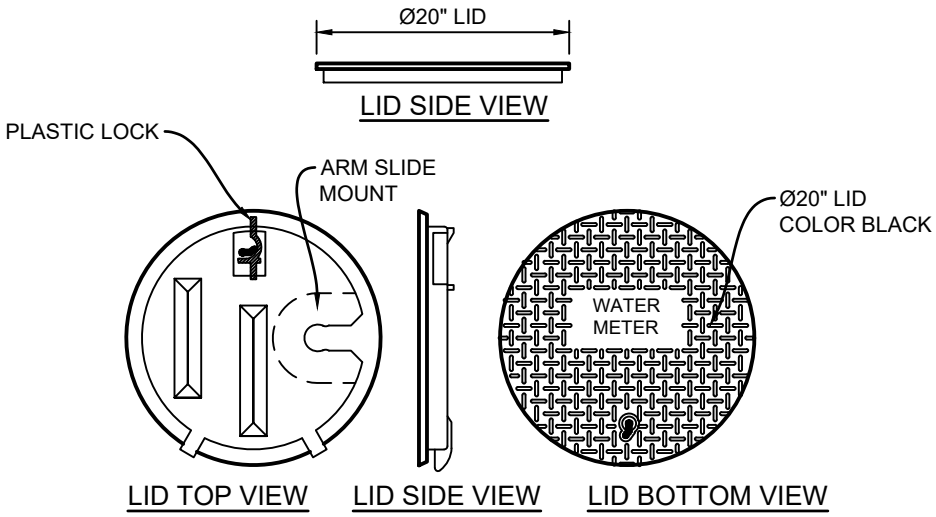
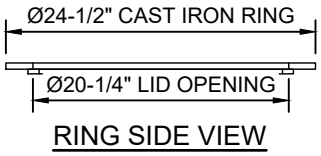
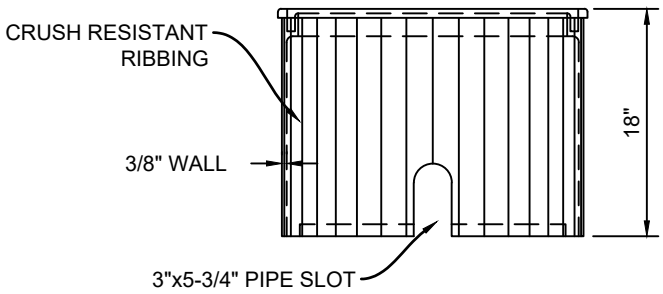
SHEET NO: W-11







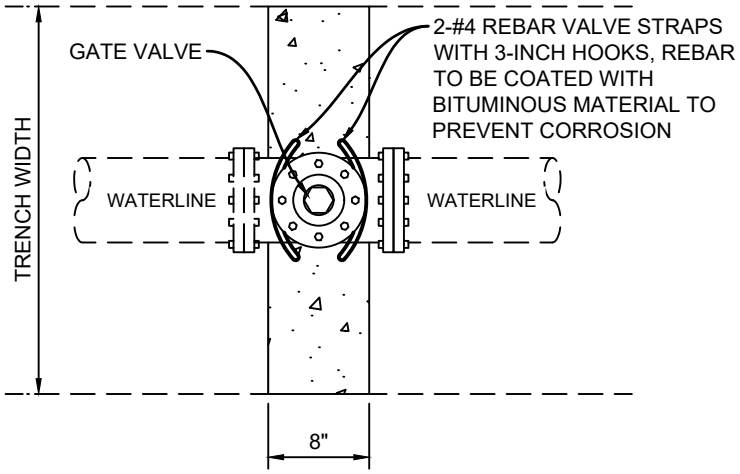
METER CAN SIDE VIEW

GENERAL NOTES:

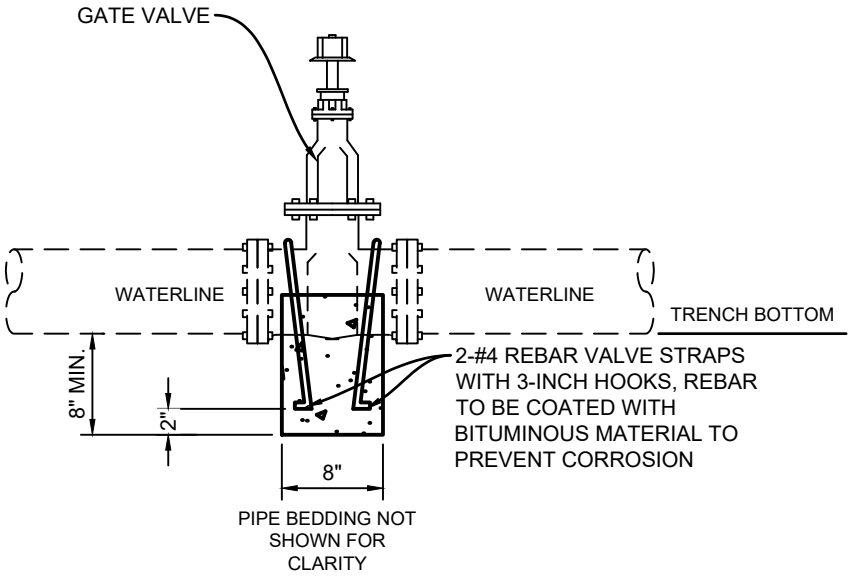
1. DIMENSION'S ±1/8" U.N.O.
2. LID MATERIAL: HDPE
3. BODY MATERIAL: LLDPE
4. WALL THICKNESS: 3/8"± MINIMUM
5. I.W.A. = INSIDE WORK AREA
6. SNAP LOCK POCKET WILL RECEIVE AMR/AMI DEVICE ENDPOINT. SNAP LOCK SLOT IS 1.80"± .015" TO ALLOW FOR A FINGER FORCE INSTALL. POCKET HEIGHT IS 15/16" FOR A MINIMUM 1/8" AIR GAP.

SCALE: NOT TO SCALE

	CITY OF ALAMOGORDO TECHNICAL STANDARD DRAWINGS	ISSUE DATE: JUNE 2021
		REVISION DATE: ----
	WATER METER CAN DETAIL	SHEET NO: W-12



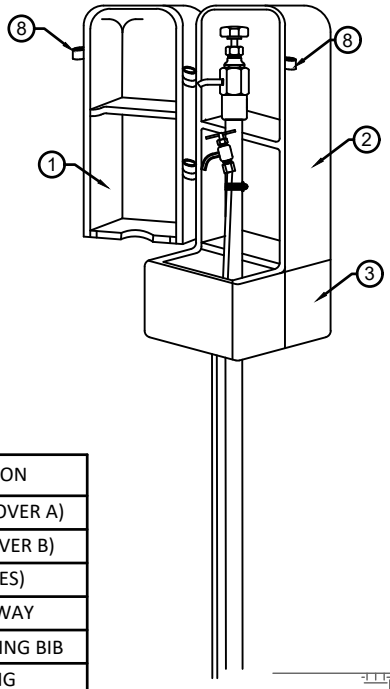
PLAN VIEW



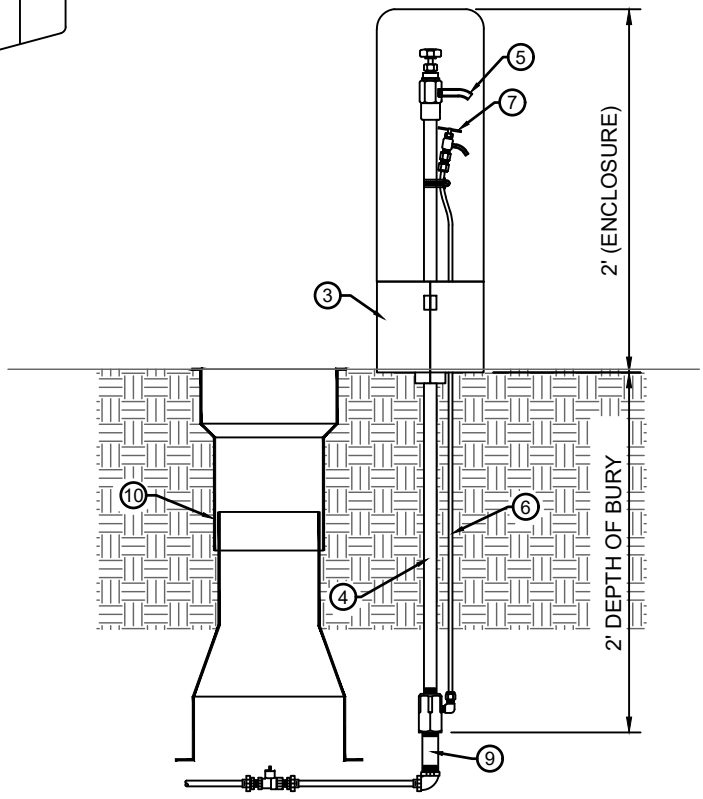
GATE VALVE ANCHOR DETAIL

SCALE: NOT TO SCALE

	CITY OF ALAMOGORDO TECHNICAL STANDARD DRAWINGS	ISSUE DATE: JUNE 2021
		REVISION DATE: ----
	GATE VALVE ANCHOR DETAIL	SHEET NO: W-13



ITEM	ITEM/DESCRIPTION
1	88 FRONT DOOR (COVER A)
2	88 REAR DOOR (COVER B)
3	88 BASE (2-PIECES)
4	1/2" S.S. WATERWAY
5	BLOW OFF & SAMPLING BIB
6	1/4" S.S. TUBING
7	PET COCK
8	LOCKING HOLE
9	3/4" S.S. NIPPLE
10	VALVE BOX



SAMPLING STATION NOTES:

1. ALL NEW SUBDIVISIONS SHALL INCLUDE A MINIMUM OF ONE SAMPLING STATION. TOTAL NUMBER OF SAMPLE STATIONS REQUIRED SHALL BE COORDINATED WITH THE CITY WATER DEPARTMENT AND ENGINEERING DEPARTMENT.

SCALE: NOT TO SCALE

CITY OF ALAMOGORDO
TECHNICAL STANDARD DRAWINGS

SAMPLING STATION DETAIL

ISSUE DATE: JUNE 2021

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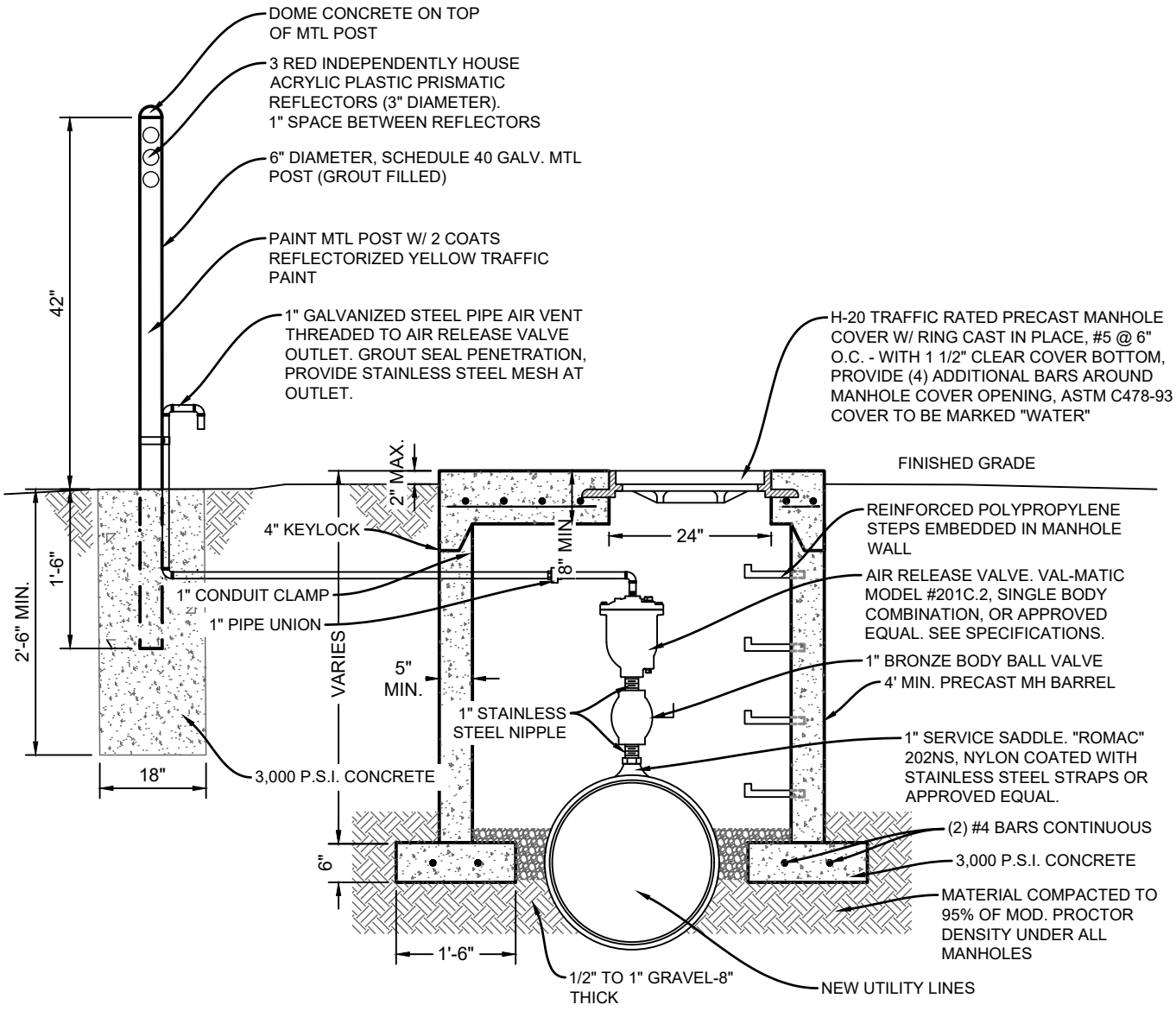

AIR RELEASE VALVE

SCALE: NOT TO SCALE

CITY OF ALAMOGORDO
TECHNICAL STANDARD DRAWINGS

COMBINATION AIR & VACUUM RELEASE VALVE DETAIL

ISSUE DATE: JUNE 2021

REVISION DATE: ----

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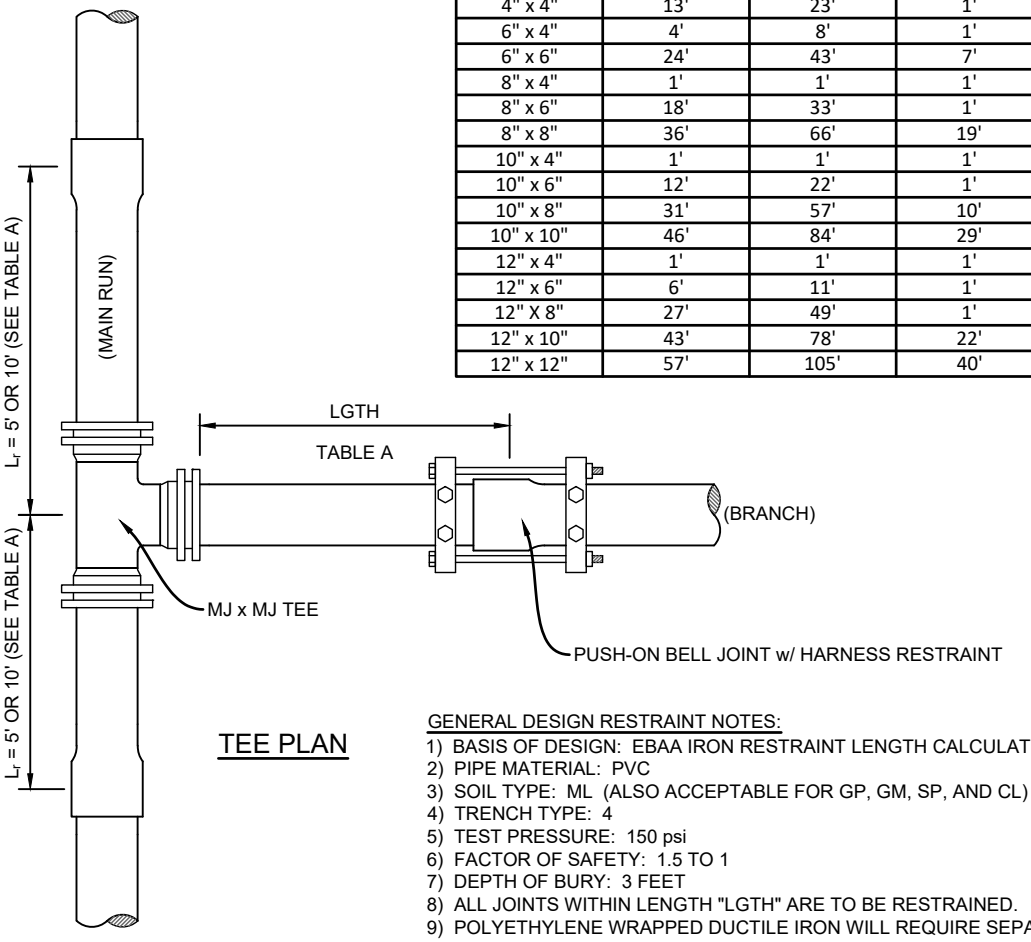
TABLE A				
PIPE SIZE	L_r = 5' MINIMUM		L_r = 10' MINIMUM	
	LGTH (D.I.)	LGTH (PVC)	LGTH (D.I.)	LGTH (PVC)
4" x 4"	13'	23'	1'	1'
6" x 4"	4'	8'	1'	1'
6" x 6"	24'	43'	7'	13'
8" x 4"	1'	1'	1'	1'
8" x 6"	18'	33'	1'	1'
8" x 8"	36'	66'	19'	35'
10" x 4"	1'	1'	1'	1'
10" x 6"	12'	22'	1'	1'
10" x 8"	31'	57'	10'	18'
10" x 10"	46'	84'	29'	53'
12" x 4"	1'	1'	1'	1'
12" x 6"	6'	11'	1'	1'
12" X 8"	27'	49'	1'	1'
12" x 10"	43'	78'	22'	40'
12" x 12"	57'	105'	40'	73'



TEE PLAN

GENERAL DESIGN RESTRAINT NOTES:

1) BASIS OF DESIGN: EBAA IRON RESTRAINT LENGTH CALCULATOR
2) PIPE MATERIAL: PVC
3) SOIL TYPE: ML (ALSO ACCEPTABLE FOR GP, GM, SP, AND CL)
4) TRENCH TYPE: 4
5) TEST PRESSURE: 150 psi
6) FACTOR OF SAFETY: 1.5 TO 1
7) DEPTH OF BURY: 3 FEET
8) ALL JOINTS WITHIN LENGTH "LGTH" ARE TO BE RESTRAINED.
9) POLYETHYLENE WRAPPED DUCTILE IRON WILL REQUIRE SEPARATE CALCULATIONS.
10) PIPE SIZES LARGER THAN 12" DIAMETER WILL REQUIRE A SEPARATE DESIGN.

SCALE: NOT TO SCALE

CITY OF ALAMOGORDO
TECHNICAL STANDARD DRAWINGS

RESTRAINED TEE DETAIL

ISSUE DATE: JUNE 2021

REVISION DATE: ----

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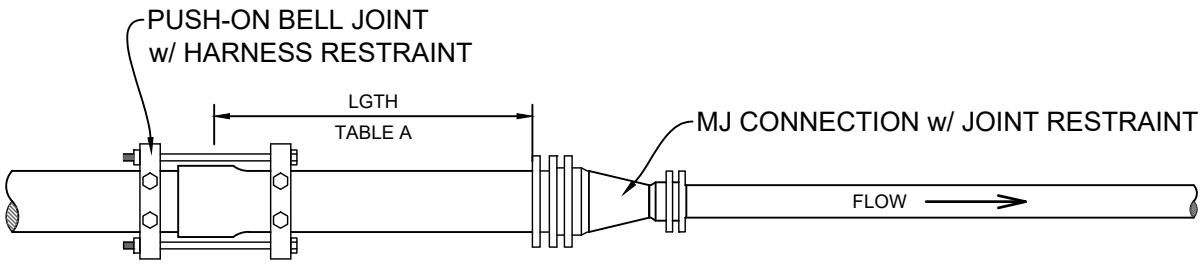
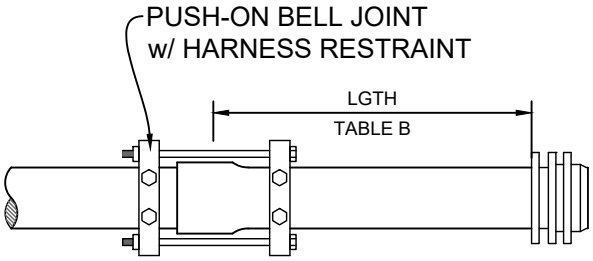


REDUCER PLAN

TABLE A		
PIPE SIZE	D.I.	PVC
6" x 4"	21'	38'
8" x 4"	38'	70'
8" x 6"	22'	41'
10" x 4"	52'	94'
10" x 6"	39'	71'
10" x 8"	22'	39'
12" x 4"	65'	118'
12" x 6"	54'	99'
12" x 8"	40'	73'
12" x 10"	22'	40'

GENERAL DESIGN RESTRAINT NOTES:

1) BASIS OF DESIGN: EBAA IRON RESTRAINT LENGTH CALCULATOR
2) PIPE MATERIAL: PVC
3) SOIL TYPE: ML (ALSO ACCEPTABLE FOR GP, GM, SP, AND CL)
4) TRENCH TYPE: 4
5) TEST PRESSURE: 150 psi
6) FACTOR OF SAFETY: 1.5 TO 1
7) DEPTH OF BURY: 3 FEET
8) ALL JOINTS WITHIN LENGTH "LGTH" ARE TO BE RESTRAINED.
9) POLYETHYLENE WRAPPED DUCTILE IRON WILL REQUIRE SEPARATE CALCULATIONS.
10) PIPE SIZES LARGER THAN 12" DIAMETER WILL REQUIRE A SEPARATE DESIGN.



DEAD END PLAN

TABLE B		
PIPE SIZE	D.I.	PVC
4"	29'	53'
6"	41'	74'
8"	53'	97'
10"	63'	116'
12"	74'	136'

SCALE: NOT TO SCALE

CITY OF ALAMOGORDO
TECHNICAL STANDARD DRAWINGS

RESTRAINED DEAD END & REDUCER DETAILS

ISSUE DATE:
JUNE 2021

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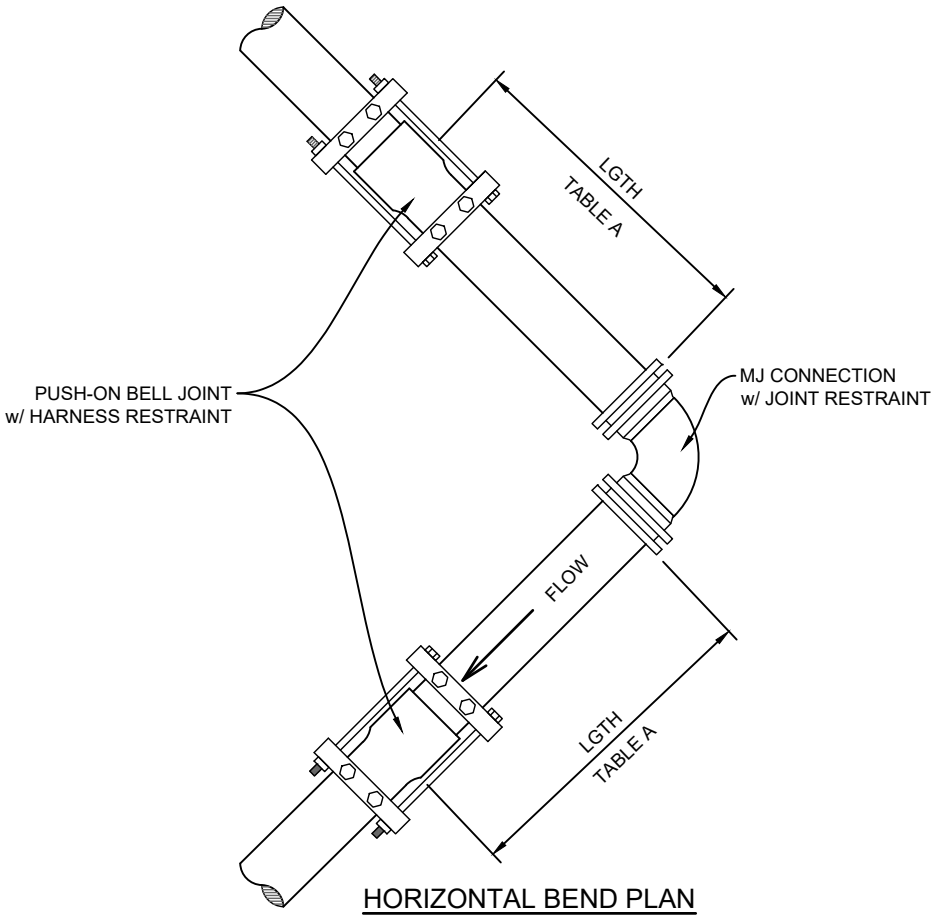


HORIZONTAL BEND PLAN

TABLE A (RESTRAINED LENGTH [FT] FOR PVC)				
PIPE SIZE	11.25° BEND	22.5° BEND	45° BEND	90° BEND
4"	2'	4'	8'	18'
6"	3'	5'	11'	25'
8"	4'	7'	14'	32'
10"	4'	8'	16'	38'
12"	5'	9'	19'	44'

TABLE A (RESTRAINED LENGTH [FT] FOR DI)				
PIPE SIZE	11.25° BEND	22.5° BEND	45° BEND	90° BEND
4"	2'	3'	6'	14'
6"	2'	4'	8'	19'
8"	3'	5'	11'	25'
10"	3'	6'	13'	30'
12"	4'	7'	15'	35'

GENERAL DESIGN RESTRAINT NOTES:

1) BASIS OF DESIGN: EBAA IRON RESTRAINT LENGTH CALCULATOR
2) PIPE MATERIAL: PVC
3) SOIL TYPE: ML (ALSO ACCEPTABLE FOR GP, GM, SP, AND CL)
4) TRENCH TYPE: 4
5) TEST PRESSURE: 150 psi
6) FACTOR OF SAFETY: 1.5 TO 1
7) DEPTH OF BURY: 3 FEET
8) ALL JOINTS WITHIN LENGTH "LGTH" ARE TO BE RESTRAINED.
9) POLYETHYLENE WRAPPED DUCTILE IRON WILL REQUIRE SEPARATE CALCULATIONS.
10) PIPE SIZES LARGER THAN 12" DIAMETER WILL REQUIRE A SEPARATE DESIGN.

SCALE: NOT TO SCALE

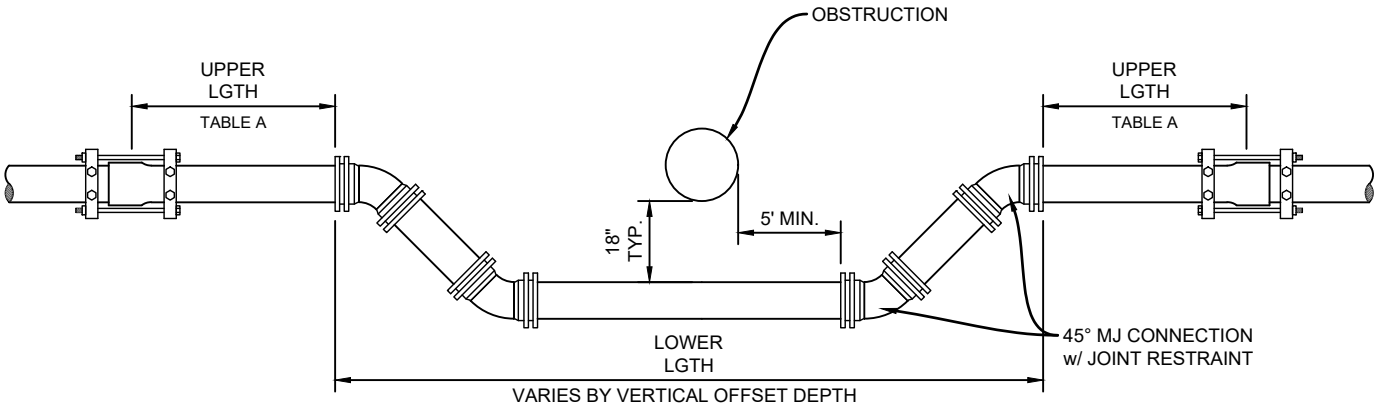
CITY OF ALAMOGORDO
TECHNICAL STANDARD DRAWINGS

RESTRAINED HORIZONTAL BEND DETAILS

ISSUE DATE: JUNE 2021

REVISION DATE: ----

SHEET NO: W-18



VERTICAL OFFSET PROFILE

TABLE A		
PIPE SIZE	D.I.	PVC
4"	12'	22'
6"	17'	31'
8"	22'	40'
10"	27'	48'
12"	31'	57'

GENERAL DESIGN RESTRAINT NOTES:

1) BASIS OF DESIGN: EBAA IRON RESTRAINT LENGTH CALCULATOR
2) PIPE MATERIAL: PVC
3) SOIL TYPE: ML (ALSO ACCEPTABLE FOR GP, GM, SP, AND CL)
4) TRENCH TYPE: 4
5) TEST PRESSURE: 150 psi
6) FACTOR OF SAFETY: 1.5 TO 1
7) DEPTH OF BURY: 3 FEET
8) ALL JOINTS WITHIN LENGTH "LGTH" ARE TO BE RESTRAINED.
9) POLYETHYLENE WRAPPED DUCTILE IRON WILL REQUIRE SEPARATE CALCULATIONS.
10) PIPE SIZES LARGER THAN 12" DIAMETER WILL REQUIRE A SEPARATE DESIGN.

SCALE: NOT TO SCALE

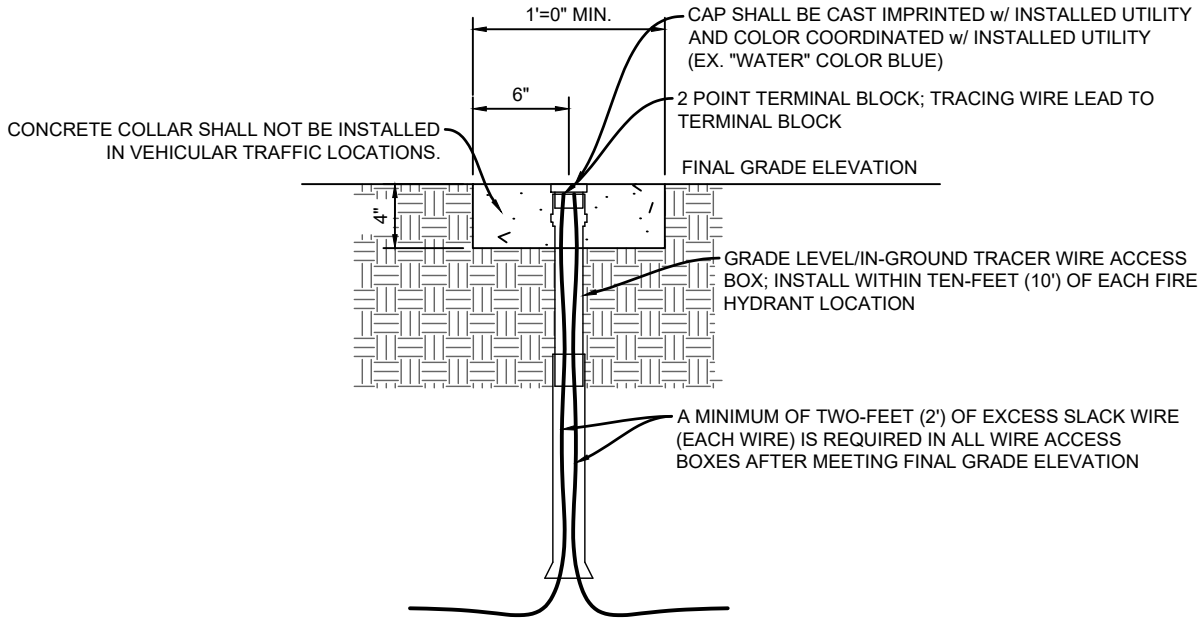
CITY OF ALAMOGORDO
TECHNICAL STANDARD DRAWINGS

WATER LINE LOWERING DETAIL

ISSUE DATE:
JUNE 2021

REVISION DATE:

SHEET NO:
W-19



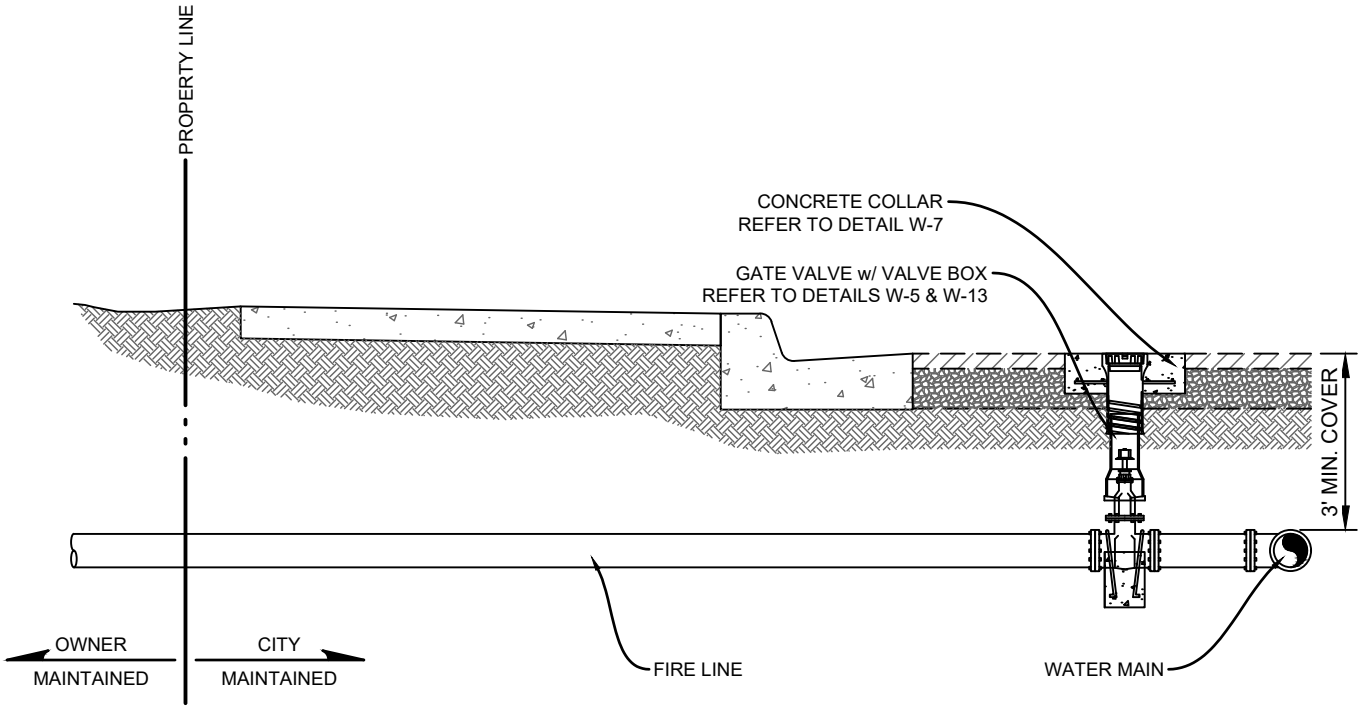
Tracer Wire Termination Detail

CONTRACTOR NOTES:

1. TRACER WIRE ACCESS BOXES SHALL BE LOCATED AT ALL FIRE HYDRANT LOCATIONS.
2. TRACER WIRE ACCESS BOXES SPACING SHALL NOT EXCEED 500 LINEAR FEET.
3. COORDINATE WITH PUBLIC WORKS DEPARTMENT AND ENGINEERING DEPARTMENT FOR TRACER WIRE ACCESS BOXES FINAL LOCATION(S).

SCALE: NOT TO SCALE

	CITY OF ALAMOGORDO TECHNICAL STANDARD DRAWINGS	ISSUE DATE: JUNE 2021
		REVISION DATE: ----
	TRACING WIRE TERMINATION DETAIL	SHEET NO: W-20



MAINTENANCE RESPONSIBILITY NOTE:
THE CITY OF ALAMOGORDO WATER DEPARTMENT WILL BE RESPONSIBLE FOR MAINTENANCE OF THE FIRE LINE FROM THE WATER MAIN TO THE PROPERTY LINE. THE OWNER WILL BE RESPONSIBLE FOR MAINTENANCE OF THE FIRE LINE FROM THE PROPERTY LINE TO THE BUILDING.

SCALE: NOT TO SCALE

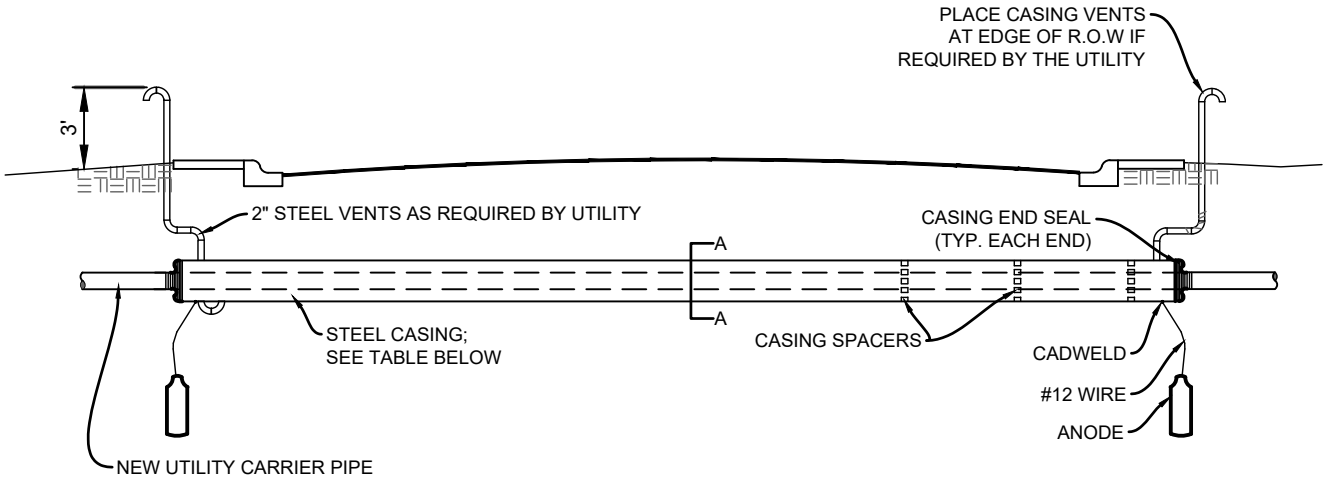
CITY OF ALAMOGORDO
TECHNICAL STANDARD DRAWINGS

FIRE LINE DETAIL

ISSUE DATE:
JUNE 2021

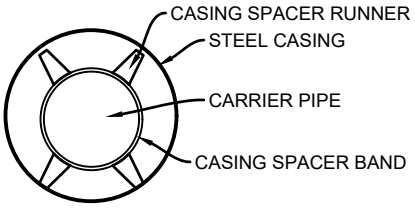
REVISION DATE:

SHEET NO:
W-21



GENERAL NOTES:

1. CASING END SEALS SHALL BE T.D. WILLIAMSON, INC Z-SEALS OR ENGINEER APPROVED EQUAL.
2. CASING SPACERS SHALL BE ADVANCE PRODUCTS & SYSTEMS, LLC MODEL SSIM OR ENGINEER APPROVED EQUAL.
3. STEEL CASING PIPE SHALL BE SIZED TO ADEQUATELY ACCOMMODATE CARRIER PIPE AND ADHERE TO THE REQUIREMENTS PROVIDED IN THE TABLE BELOW.
4. PIPE JOINT(S) INSIDE CASING SHALL BE JOINT RESTRAINED.
5. CASING VENTS TO BE PAINTED WITH AN OIL BASE ALKYD PRIMER AND AN OIL BASE ALKYD ENAMEL TOP COAT. COLOR SHALL BE PER APWA UNIFORM COLOR CODE FOR RESPECTIVE UTILITY.



SECTION A-A

STEEL CASING MINIMUM WALL THICKNESS		
NOMINAL DIAMETER (INCHES)	MIN. WALL THICKNESS FOR COATED (INCHES)	MIN. WALL THICKNESS NON-COATED (INCHES)
14 AND UNDER	0.1880	0.1880
16	0.2190	0.2810
18	0.2500	0.3120
20 AND 22	0.2810	0.3440
24	0.3120	0.3750
26	0.3440	0.4060
28	0.3750	0.4380
30	0.4060	0.4690
32	0.4380	0.5000
34 AND 36	0.4690	0.5310
42	0.5000	0.5630
48	0.5630	0.6250

1. WALL THICKNESS DESIGNATIONS FOR STEEL CASING PIPE FOR E-80.
2. STEEL PIPE SHALL HAVE A MINIMUM YIELD STRENGTH OF 35,000 PSI.
3. CORROSION CONTROL MEASURES MUST INCLUDE CATHODIC PROTECTION.

SCALE: NOT TO SCALE

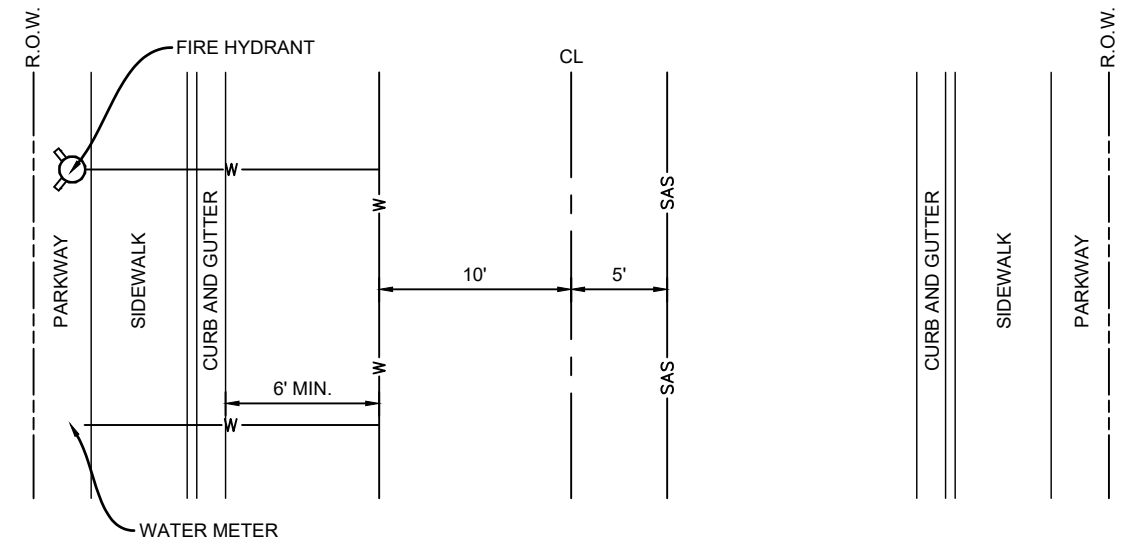
CITY OF ALAMOGORDO
TECHNICAL STANDARD DRAWINGS

WATER LINE BORE & CASE DETAIL

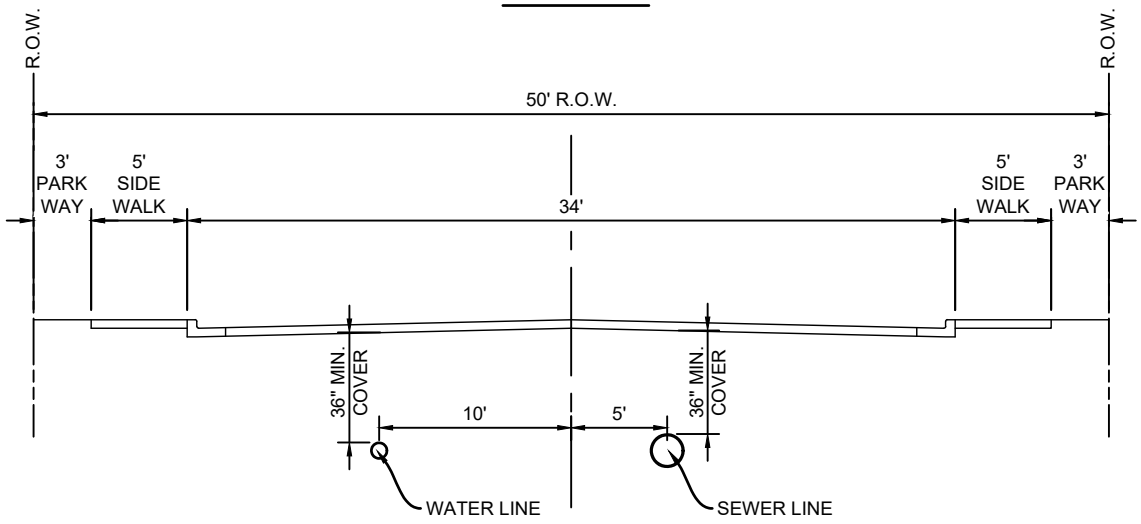
ISSUE DATE: JUNE 2021

REVISION DATE: ----

SHEET NO: W-22



PLAN VIEW



SECTION VIEW

CONTRACTOR NOTES:

1. WATER LINE WILL BE LOCATED 10' NORTH OF STREET CENTERLINE ON EAST TO WEST STREETS AND 10' WEST OF STREET CENTERLINE ON NORTH AND SOUTH STREETS.
2. WATER LINE MINIMUM COVER SHALL BE 36".
3. SANITARY SEWER MINIMUM COVER SHALL BE 36".
4. SANITARY SEWER WILL BE LOCATED 5' SOUTH OF STREET CENTERLINE ON EAST AND WEST STREETS AND 5' EAST OF STREET CENTERLINE ON NORTH AND SOUTH STREETS.
5. NONSTANDARD LOCATIONS REQUIRE WRITTEN APPROVAL OF THE CITY OF ALAMOGORDO .
6. UTILITY EASEMENT WILL BE AT THE DISCRETION OF THE CITY OF ALAMOGORDO.

SCALE: NOT TO SCALE

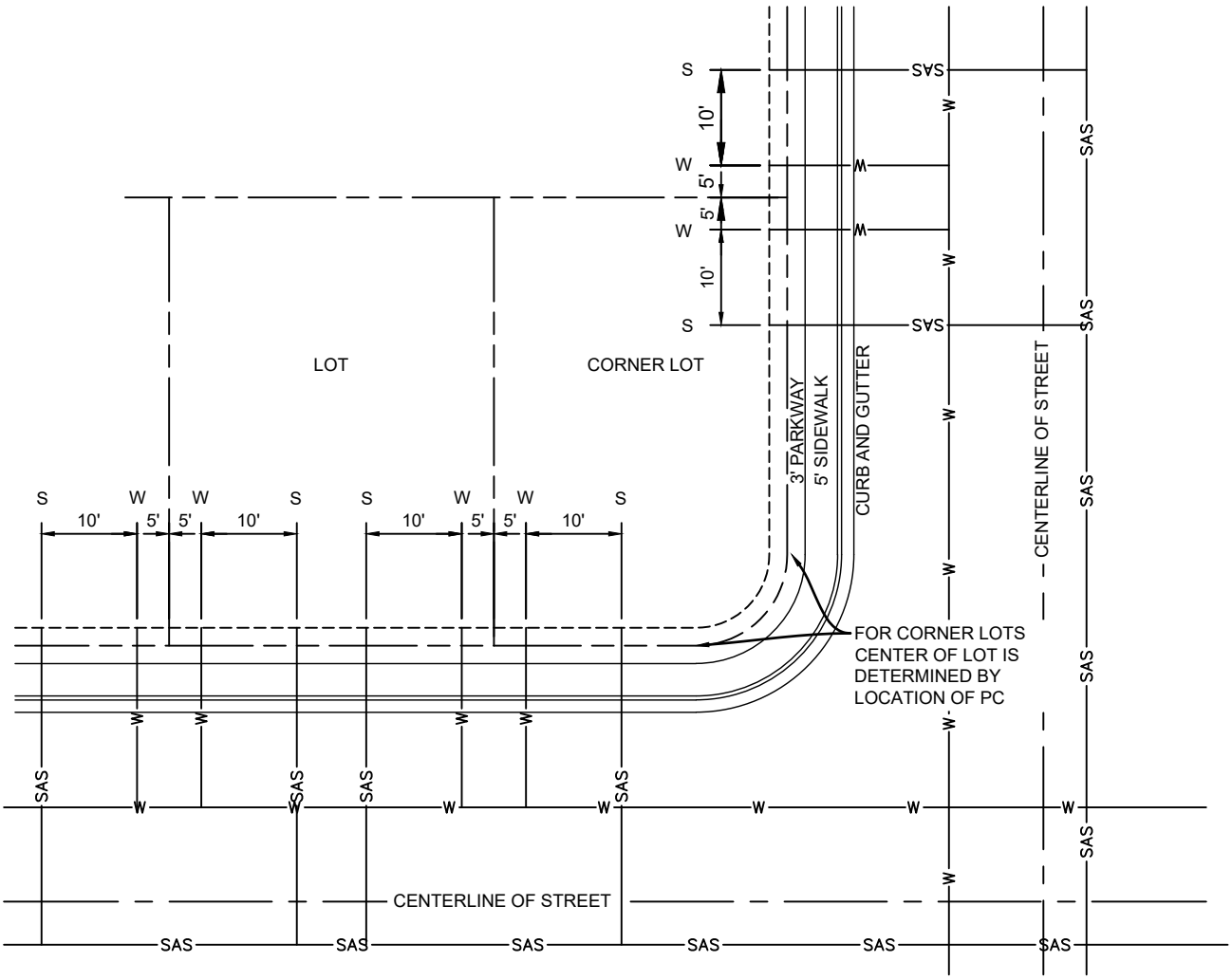
CITY OF ALAMOGORDO
TECHNICAL STANDARD DRAWINGS

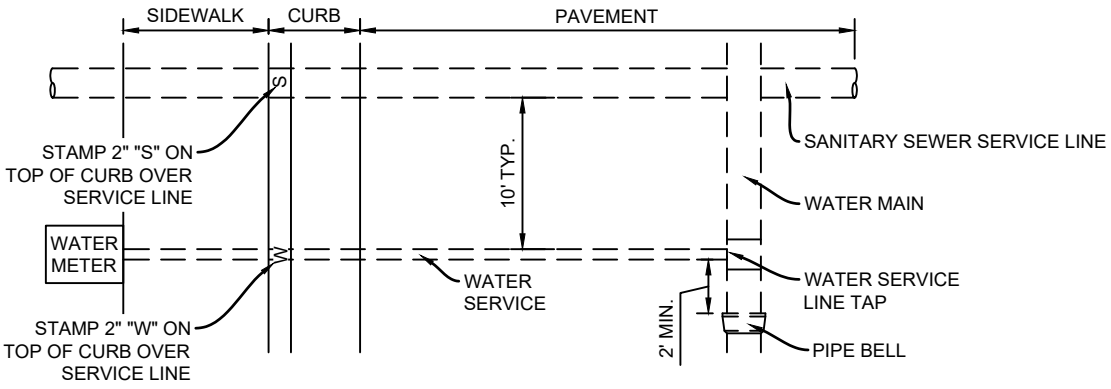
TYPICAL UTILITY LOCATIONS

ISSUE DATE: JUNE 2021

REVISION DATE: ----

SHEET NO: W-23





CONTRACTOR NOTES:

1. THE WATER SERVICE WILL ENTER 5' FROM THE PROPERTY LINE AS SHOWN. THE SEWER SERVICE WILL ENTER 10' FROM THE WATER SERVICE AS SHOWN.
2. FOR CORNER LOTS UTILITY STANDARD LOCATIONS AS SHOWN.
3. UTILITY EASEMENTS WILL BE AT THE DISCRETION OF THE CITY OF ALAMOGORDO.

SCALE: NOT TO SCALE

CITY OF ALAMOGORDO
TECHNICAL STANDARD DRAWINGS

TYPICAL LOT UTILITY LOCATIONS

ISSUE DATE: JUNE 2021

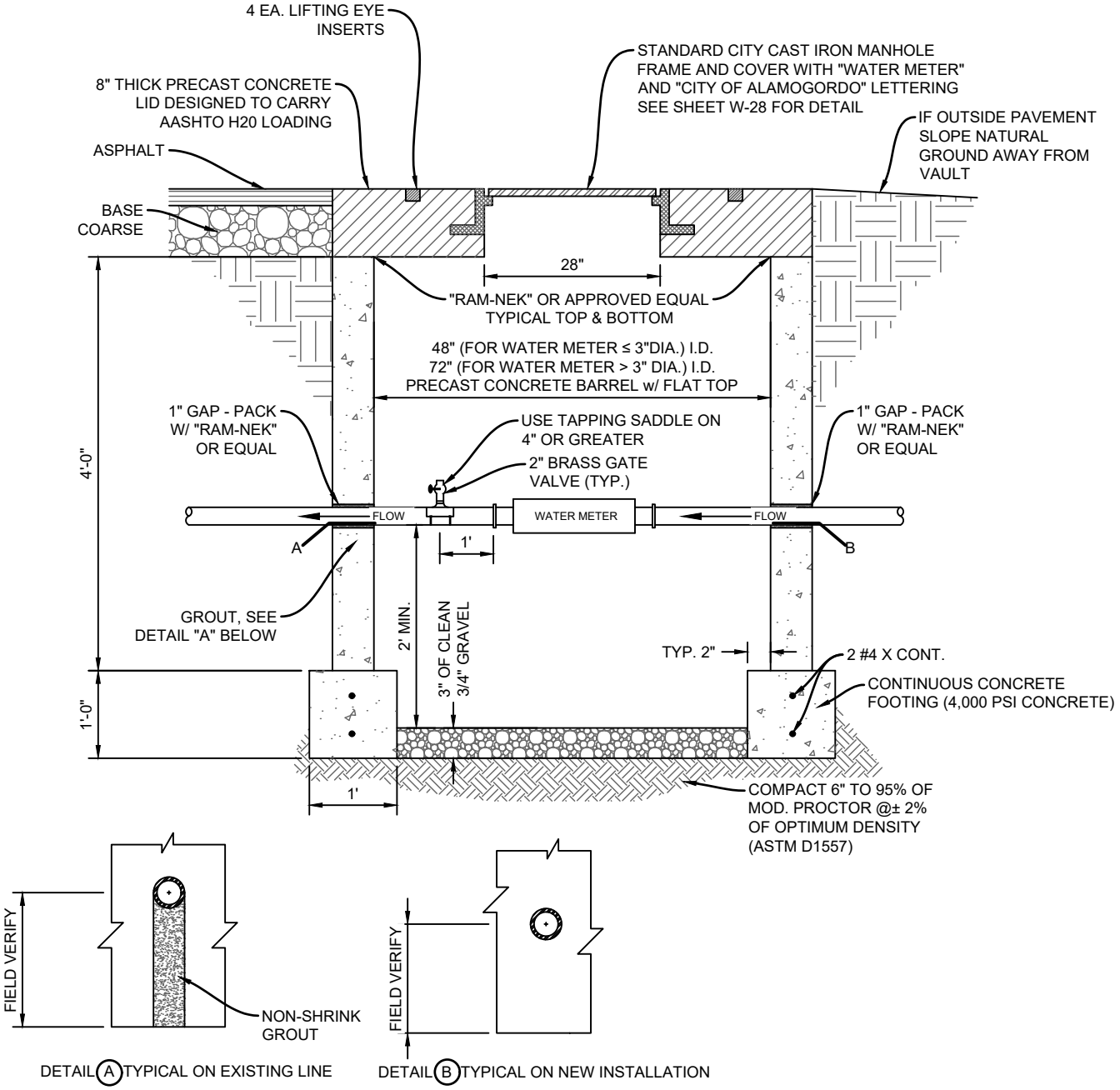
REVISION DATE: ----

SHEET NO: W-24

TYPICAL MINIMUM HORIZONTAL UTILITY SEPARATION						
	GAS MAIN	GAS SERVICE	SEWER MAIN	SEWER SERVICE	WATER MAIN	WATER SERVICE
GAS MAIN	5 FEET	5 FEET	10 FEET	5 FEET	10 FEET	5 FEET
GAS SERVICE	5 FEET	5 FEET	5 FEET	5 FEET	5 FEET	5 FEET
SEWER MAIN	10 FEET	5 FEET	10 FEET	5 FEET	10 FEET	5 FEET
SEWER SERVICE	5 FEET	5 FEET	5 FEET	5 FEET	5 FEET	5 FEET
WATER MAIN	10 FEET	5 FEET	10 FEET	5 FEET	5 FEET	5 FEET
WATER SERVICE	5 FEET	5 FEET	5 FEET	5 FEET	5 FEET	5 FEET
STORM SEWER	10 FEET	5 FEET	10 FEET	5 FEET	5 FEET	5 FEET
WIRE UTILITY	5 FEET	5FEET	5 FEET	5 FEET	5 FEET	5 FEET
MANHOLE	10 FEET	5 FEET	N/A	N/A	10 FEET	5 FEET
SEPARATION TYPICALLY MEASURED FROM CENTER OF UTILITY						
10 FOOT SEPARATION BETWEEN WATER AND SEWER MAINS SHALL BE MEASURED FROM OUTSIDE OF PIPE TO OUTSIDE OF PIPE						
SEPARATION MAY VARY WITH FIELD CONDITIONS AND WITH SUBSEQUENT CITY APPROVAL						

TYPICAL MINIMUM VERTICAL UTILITY SEPARATION						
	GAS MAIN	GAS SERVICE	SEWER MAIN	SEWER SERVICE	WATER MAIN	WATER SERVICE
GAS MAIN	NMGCO	NMGCO	NMGCO	NMGCO	NMGCO	NMGCO
GAS SERVICE	NMGCO	NMGCO	NMGCO	NMGCO	NMGCO	NMGCO
SEWER MAIN	12 INCHES	6 INCHES	12 INCHES	6 INCHES	24 INCHES	6 INCHES
SEWER SERVICE	6 INCHES	6 INCHES	6 INCHES	6 INCHES	6 INCHES	6 INCHES
WATER MAIN	12 INCHES	12 INCHES	24 INCHES	6 INCHES	12 INCHES	6 INCHES
WATER SERVICE	12 INCHES	12 INCHES	6 INCHES	6 INCHES	6 INCHES	6 INCHES
STORM SEWER	12 INCHES	6 INCHES	12 INCHES	6 INCHES	12 INCHES	6 INCHES
WIRE UTILITY	PNM/CITY	PNM/CITY	PNM/CITY	PNM/CITY	PNM/CITY	PNM/CITY
NMGCO - VERTICAL SEPARATION OF GAS MAINS AND GAS SERVICES SHALL BE PER REQUIREMENTS OF NEW MEXICO GAS COMPANY.						
PNM/CITY - VERTICAL SEPARATION OF WIRE UTILITIES SHALL BE DISCUSSED AND APPROVED WITH THE WIRE UTILITY PROVIDER.						
VERTICAL SEPARATION FROM GAS MAINS MAY VARY DEPENDING ON OPERATIONAL PRESSURES AND MAIN LINE MATERIAL (STEEL OR POLY); REQUIRED SEPARATION SHALL BE DISCUSSED WITH GAS PROVIDER.						
SEPARATION MAY VARY WITH FIELD CONDITIONS AND WITH SUBSEQUENT CITY APPROVAL						
WHEN REQUIRED VERTICAL SEPARATION OF SEWER MAINS AND WATER/REUSE MAINS CANNOT BE OBTAINED REFER TO DETAIL W-11 FOR ADDITIONAL GUIDANCE.						
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.						

SCALE: NOT TO SCALE



GENERAL NOTES:

1. BYPASS IS REQUIRED ON ALL METERS LARGER THAN 2" (SEE W-27) FOR NON TRAFFIC BEARING APPLICATIONS, MANHOLE FRAME & COVER EAST JORDAN.

2. PRECAST PORTIONS OF MANHOLE, EXCLUDING CAST IN PLACE FOOTING, SHALL CONFORM TO ASTM C478, LATEST REVISION.

SCALE: NOT TO SCALE

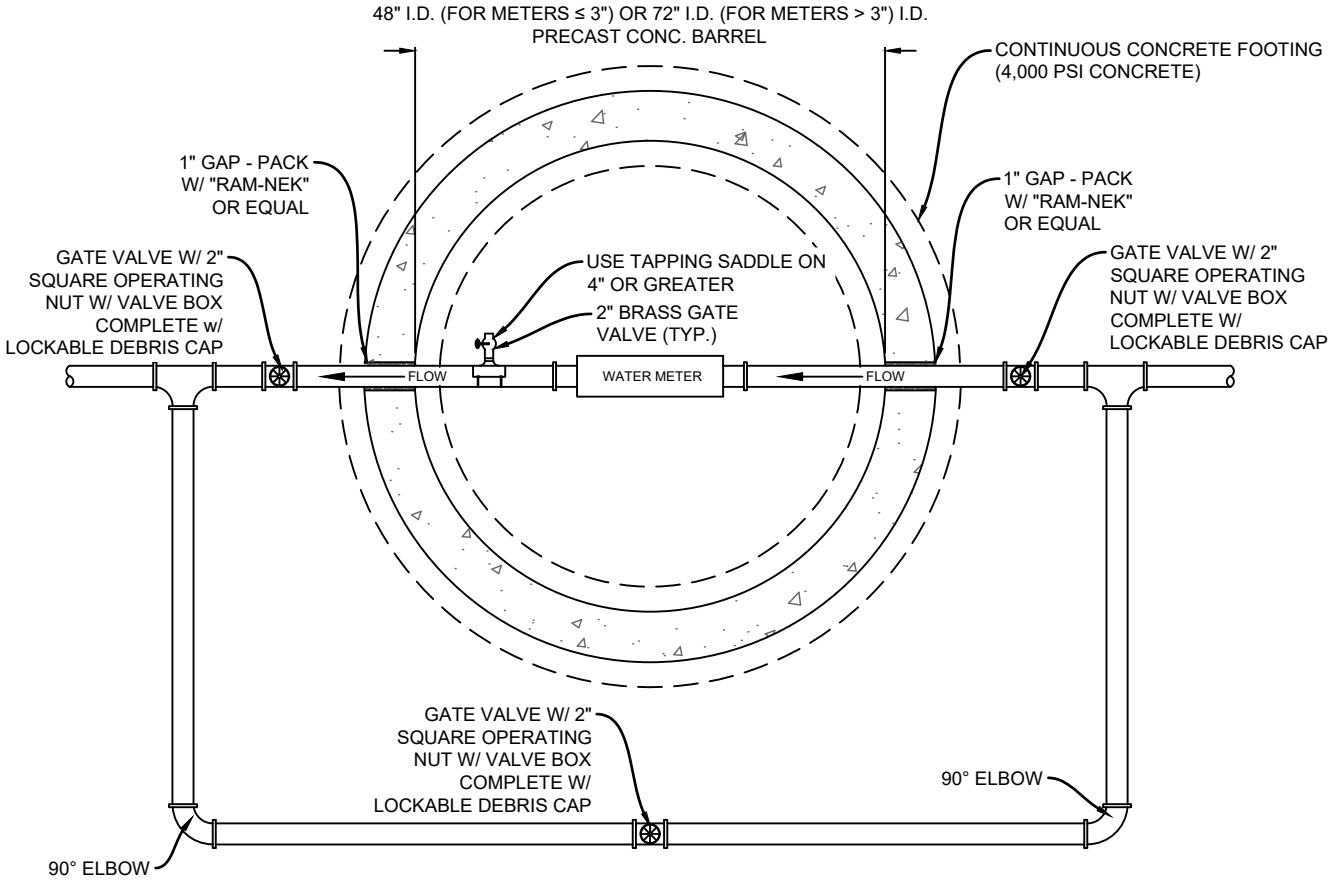
CITY OF ALAMOGORDO
TECHNICAL STANDARD DRAWINGS

2-INCH & LARGER TRAFFIC RATED WATER METER

ISSUE DATE: JUNE 2021

REVISION DATE: ----

SHEET NO: W-26



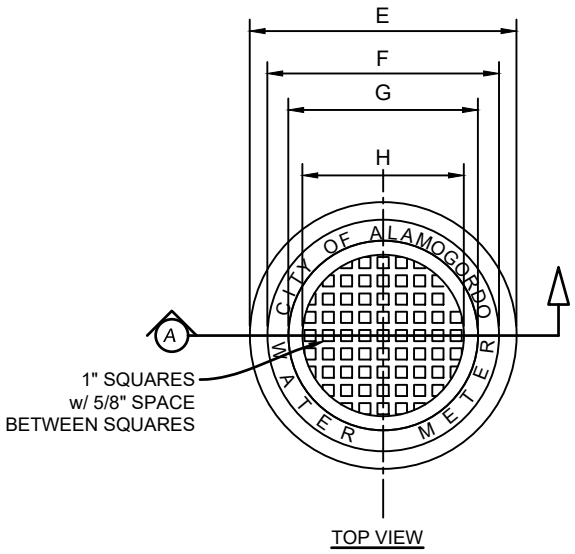
CONTRACTOR NOTES:

1. C-900 PVC PIPE OR DUCTILE IRON PIPE ON 3" OR GREATER.
2. MAINTENANCE BY CITY OF ALAMOGORDO UP TO AND INCLUDING THE METER, BPASS PIPING, AND THE BYPASS VALVES.
3. ALL CITY OF ALAMOGORDO MAINTAINED WATER PIPING SHALL BE EVEN PIPE SIZES WITH MINIMUM DIAMETER OF 4-INCHES.
4. DEBRIS CAP SHALL BE MANUFACTURED BY SW SERVICES, LLC OR CITY APPROVED EQUAL. LOCKS SHALL BE SUPPLIED BY THE CITY.

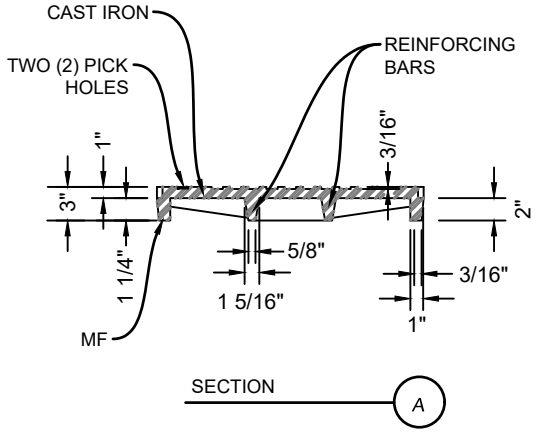
SCALE: NOT TO SCALE

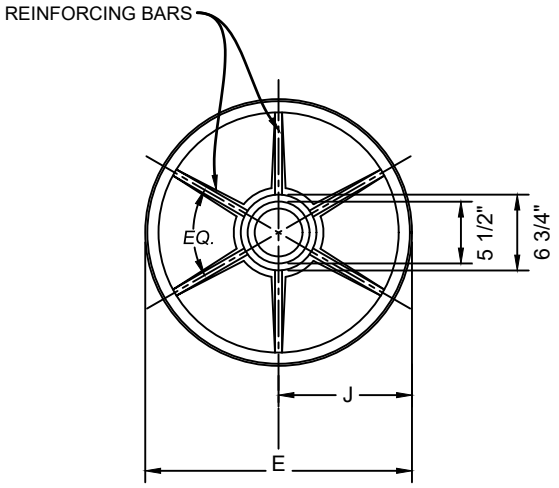
	CITY OF ALAMOGORDO TECHNICAL STANDARD DRAWINGS	ISSUE DATE: JUNE 2021
		REVISION DATE: ----
	TYPICAL TRAFFIC WATER METER VAULT & BYPASS LINE	SHEET NO: W-27

MANHOLE RING	48" MANHOLE	72" MANHOLE
WEIGHT	175 LBS.	310 LBS.
E	23 3/4"	31 1/4"
F	20 5/8"	28 1/8"
G	16 7/8"	24 3/8"
H	14 3/8"	21 7/8"
J	11 7/8"	15 5/8"



TOP VIEW





BOTTOM VIEW

TYPICAL LID DETAIL

GENERAL NOTES:

1. MATCHING SURFACES MARKED "MF" TO BE MACHINE FINISHED AND BE FREE OF ANY IRREGULARITIES THAT WOULD PREVENT A SNUG FIT.
2. CASTING TO BE SMOOTH AND FREE OF AIR VOIDS.
3. MANHOLE RING AND LID SHALL BE DESIGNED FOR H-20 WHEEL LOADING.
4. MINIMUM TOTAL WEIGHT (RING AND LID) SHALL BE 300 LBS.
5. TOP OF LID MAY VARY FROM DETAIL SHOWN. LID SHALL BE MARKED FOR APPROPRIATE UTILITY.

SCALE: NOT TO SCALE

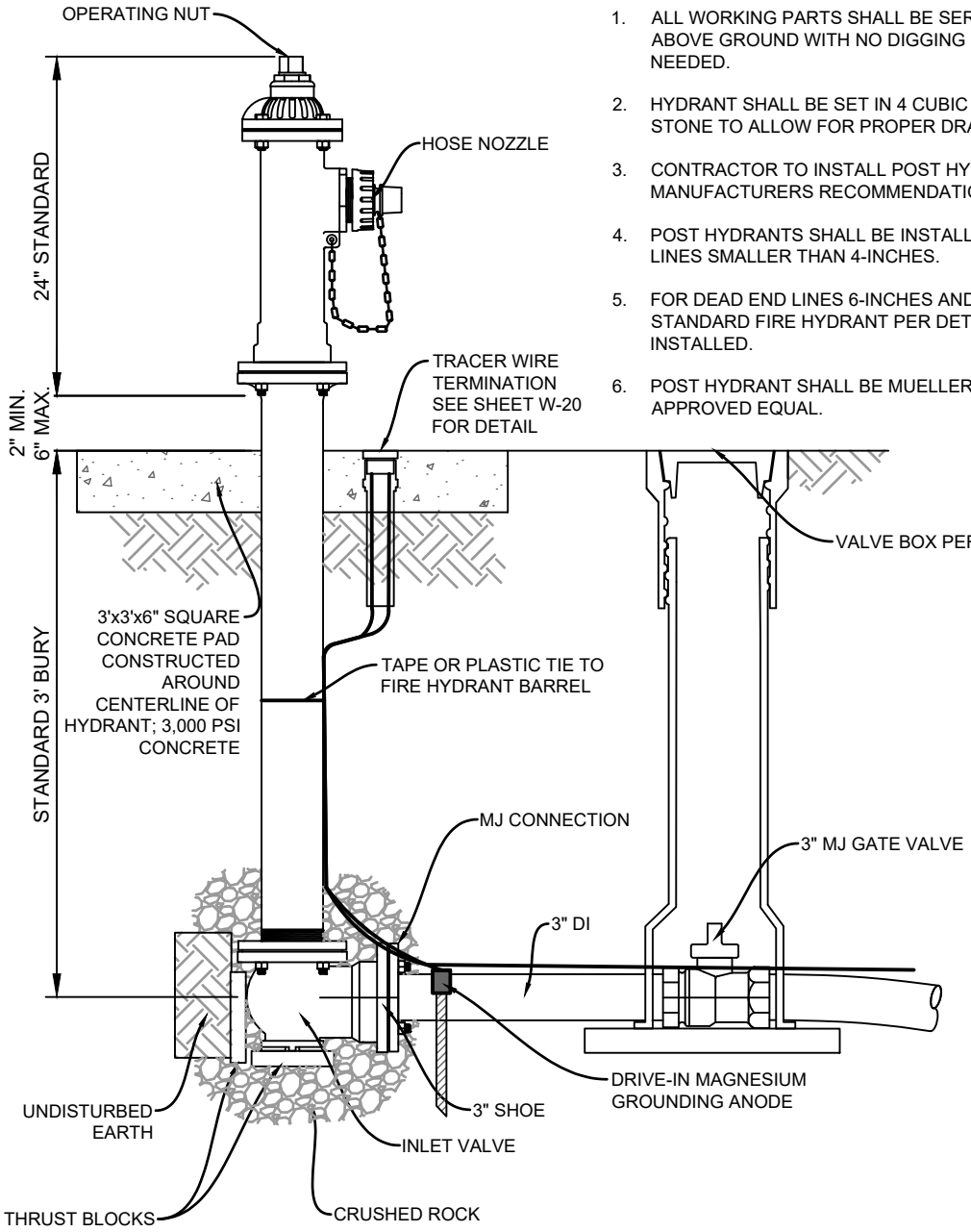
CITY OF ALAMOGORDO
TECHNICAL STANDARD DRAWINGS

WATER METER LID DETAIL

ISSUE DATE: JUNE 2021

REVISION DATE: ----

SHEET NO: W-28



NOTES:

1. ALL WORKING PARTS SHALL BE SERVICEABLE FROM ABOVE GROUND WITH NO DIGGING OR REPLACEMENT NEEDED.
2. HYDRANT SHALL BE SET IN 4 CUBIC FEET OF CRUSHED STONE TO ALLOW FOR PROPER DRAINAGE.
3. CONTRACTOR TO INSTALL POST HYDRANT PER MANUFACTURERS RECOMMENDATIONS.
4. POST HYDRANTS SHALL BE INSTALLED ON DEAD END LINES SMALLER THAN 4-INCHES.
5. FOR DEAD END LINES 6-INCHES AND LARGER STANDARD FIRE HYDRANT PER DETAIL W-9 SHALL BE INSTALLED.
6. POST HYDRANT SHALL BE MUELLER MODEL A-411 OR APPROVED EQUAL.

SCALE: NOT TO SCALE

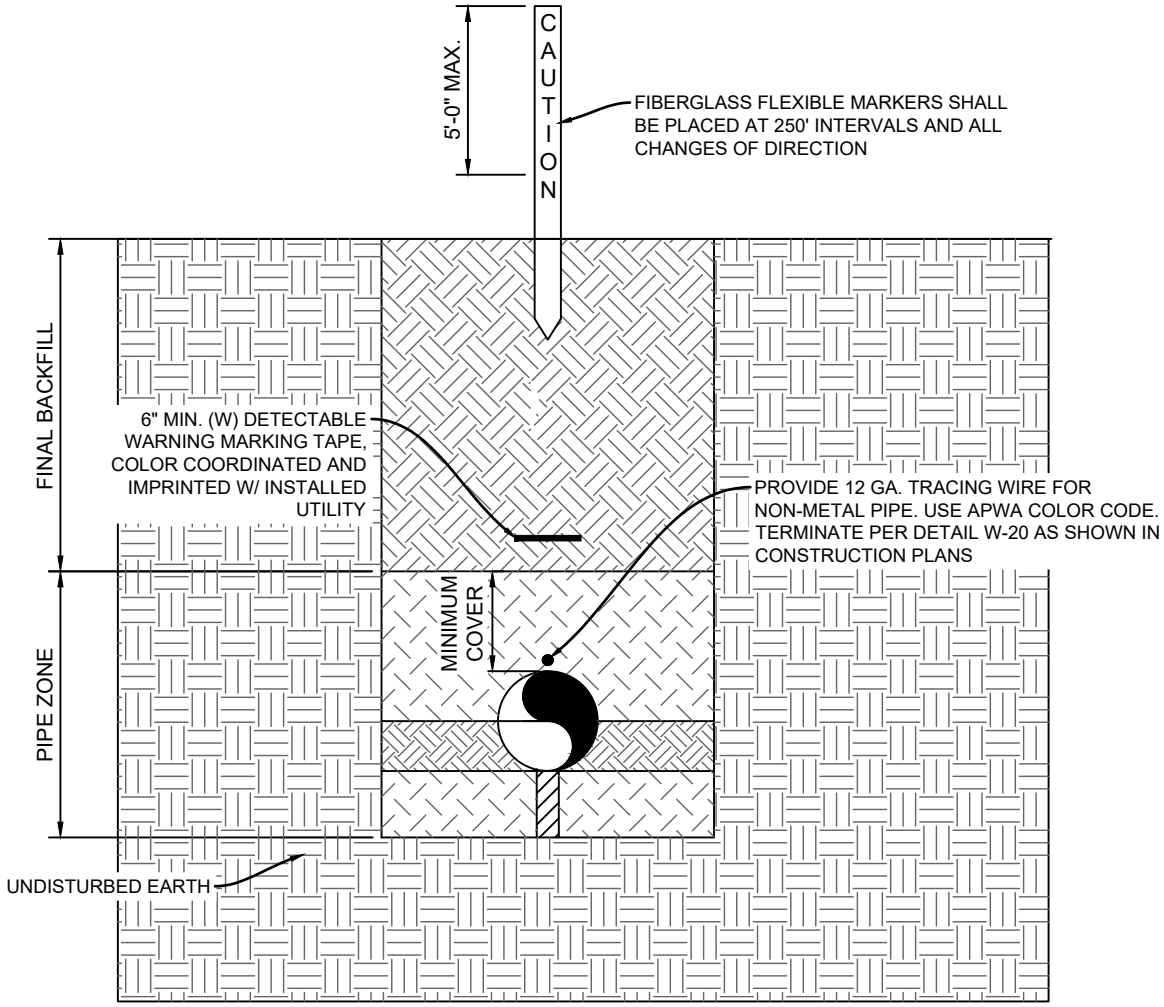
CITY OF ALAMOGORDO
TECHNICAL STANDARD DRAWINGS

POST TYPE FLUSH HYDRANT DETAIL

ISSUE DATE: JUNE 2021

REVISION DATE: ----

SHEET NO: W-29



UNPAVED AREAS

SCALE: NOT TO SCALE

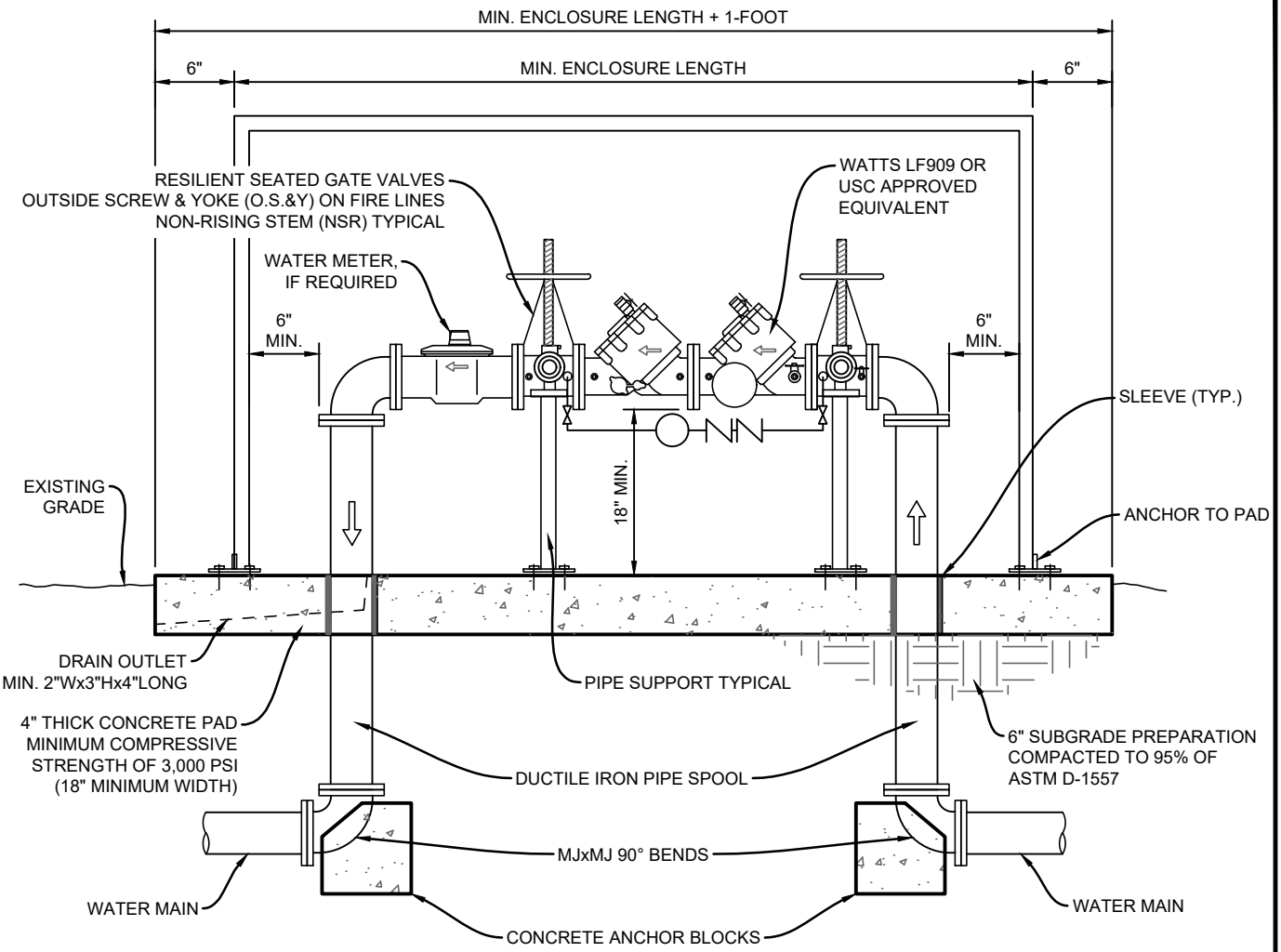
CITY OF ALAMOGORDO
TECHNICAL STANDARD DRAWINGS

WATER LINE FLEXIBLE MARKER DETAIL

ISSUE DATE: JUNE 2021

REVISION DATE: ----

SHEET NO: W-30

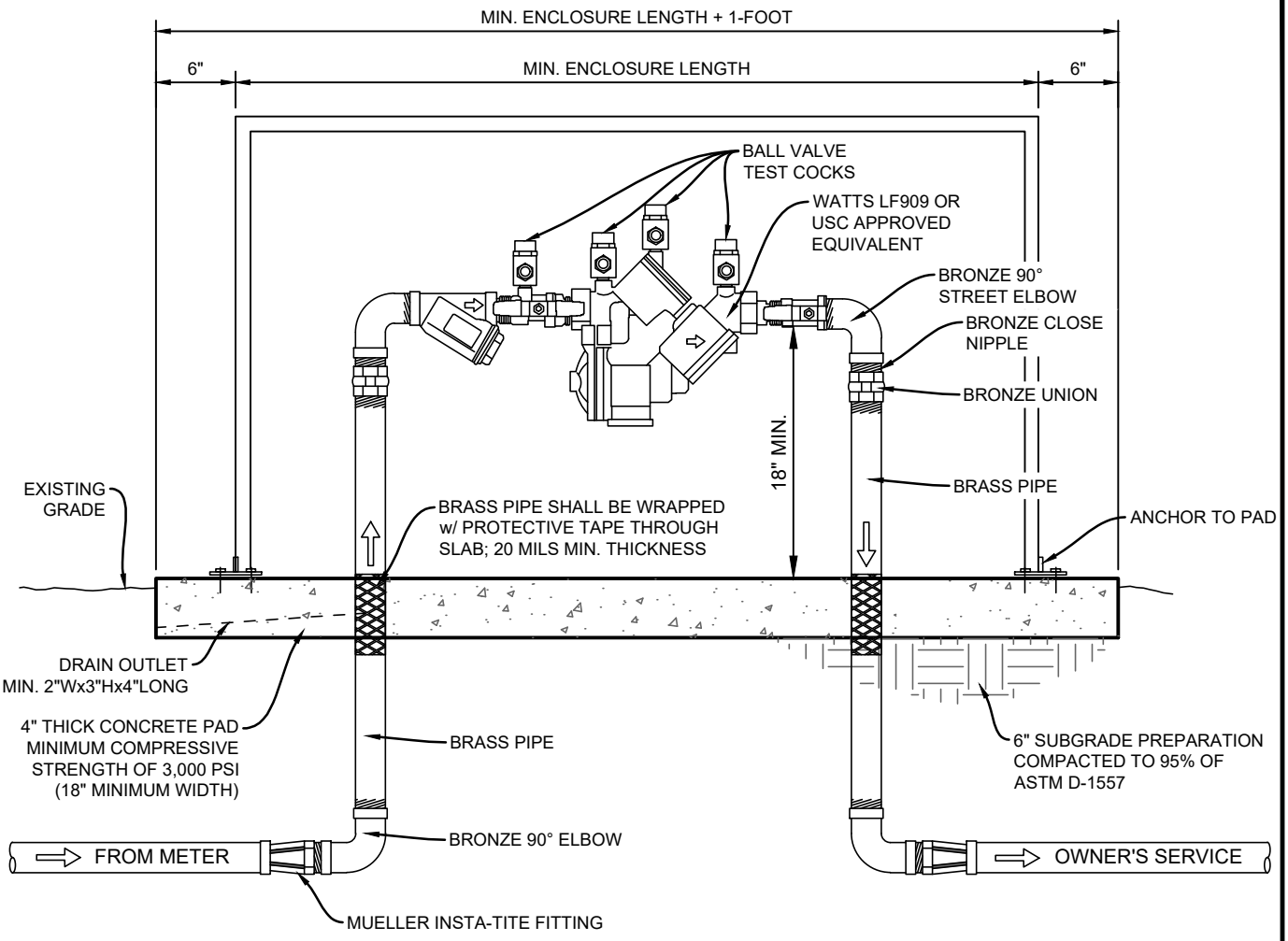


NOTES:

1. ALL ABOVE GROUND FITTINGS, VALVES, WATER METERS, BACKFLOW ASSEMBLY SHALL BE FLANGE-BY-FLANGE (FLxFL) CONSTRUCTION.
2. BOLLARDS MAY BE REQUIRED BY THE CITY FOR ADDITIONAL PROTECTION.
3. THE BACKFLOW PREVENTION DEVICE SHALL BE LOCATED ON PRIVATE PROPERTY AND A MAXIMUM OF FIVE-FEET (5') FROM THE METER VAULT OR AS DIRECTED BY THE CITY WATER AND ENGINEERING DEPARTMENT.
4. BACKFLOW ASSEMBLIES INSTALLED ON POTABLE WATER SERVICES SHALL BE LEAD FREE.
5. BACKFLOW ASSEMBLIES SHALL BE THE SAME SIZE AS THE WATER METER.
6. BACKFLOW ASSEMBLIES SHALL BE EQUIPPED WITH FOUR (4) TEST COCKS.
7. BACKFLOW ASSEMBLIES MUST BE TESTED ANNUALLY PER CITY OF ALAMOGORDO ORDINANCE NO. 1604.
8. ENCLOSURES OR SCREENING MEASURES FOR BACKFLOW ASSEMBLIES SHALL BE PRE-APPROVED BY THE CITY WATER AND ENGINEERING DEPARTMENT.

SCALE: NOT TO SCALE

	CITY OF ALAMOGORDO TECHNICAL STANDARD DRAWINGS	ISSUE DATE: JUNE 2021
		REVISION DATE: ----
	REDUCED PRESSURE BACKFLOW PREVENTION - 3IN AND OVER DETAIL	SHEET NO: W-31

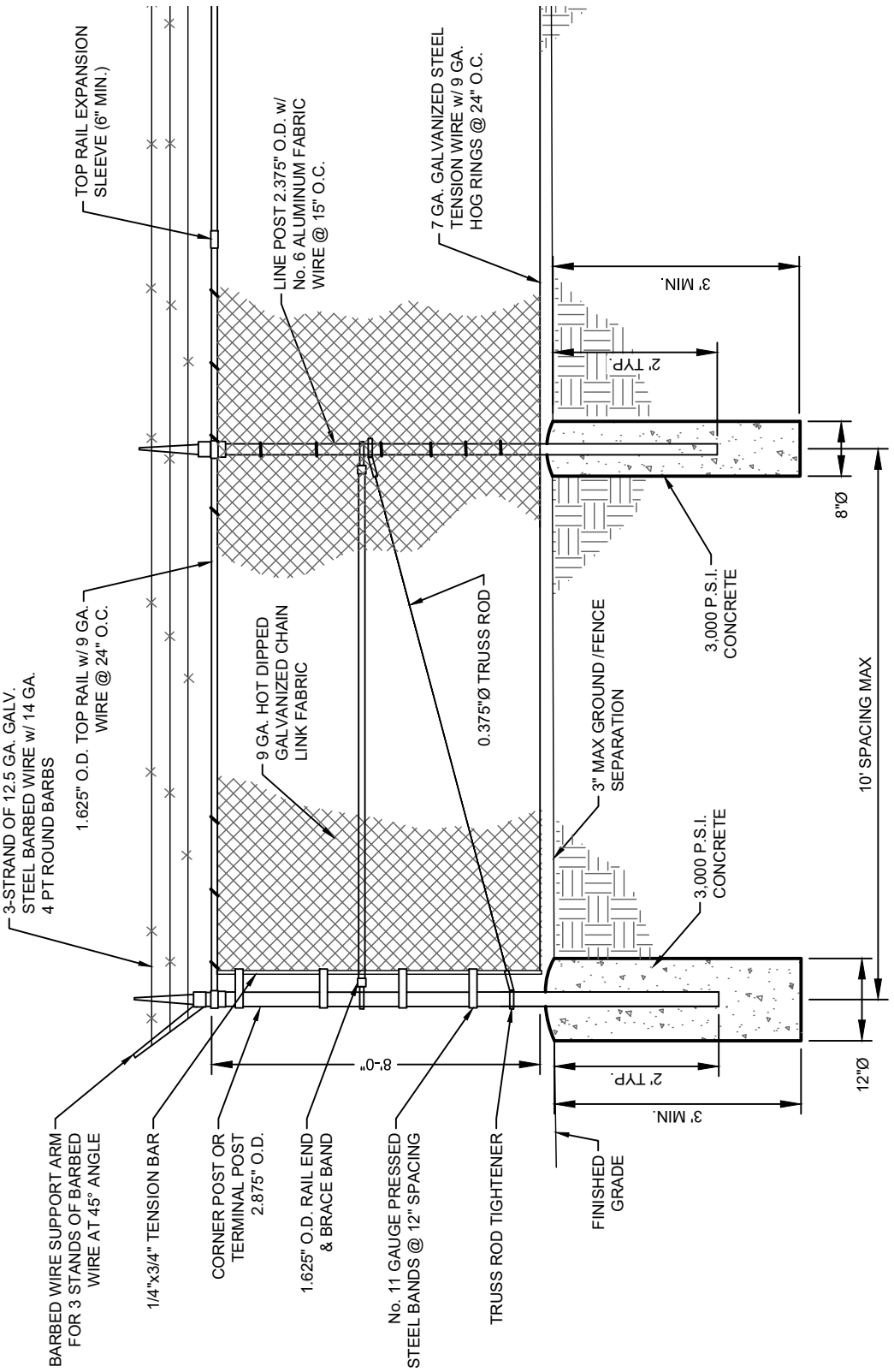


NOTES:

1. BOLLARDS MAY BE REQUIRED BY THE CITY FOR ADDITIONAL PROTECTION.
2. THE BACKFLOW PREVENTION DEVICE SHALL BE LOCATED ON PRIVATE PROPERTY AND A MAXIMUM OF FIVE-FEET (5') FROM THE WATER METER OR AS DIRECTED BY THE CITY WATER AND ENGINEERING DEPARTMENT.
3. BACKFLOW ASSEMBLIES INSTALLED ON POTABLE WATER SERVICES SHALL BE LEAD FREE.
4. BACKFLOW ASSEMBLIES SHALL BE THE SAME SIZE AS THE WATER METER.
5. BACKFLOW ASSEMBLIES SHALL BE EQUIPPED WITH FOUR (4) TEST COCKS.
6. BACKFLOW ASSEMBLIES MUST BE TESTED ANNUALLY PER CITY OF ALAMOGORDO ORDINANCE NO. 1604.
7. ENCLOSURES OR SCREENING MEASURES FOR BACKFLOW ASSEMBLIES SHALL BE PRE-APPROVED BY THE CITY WATER AND ENGINEERING DEPARTMENT.

SCALE: NOT TO SCALE

	CITY OF ALAMOGORDO TECHNICAL STANDARD DRAWINGS	ISSUE DATE: JUNE 2021
		REVISION DATE: ----
	REDUCED PRESSURE BACKFLOW PREVENTION - 2IN AND UNDER DETAIL	SHEET NO: W-32



CHAIN LINK FENCE DETAIL

SCALE: NOT TO SCALE

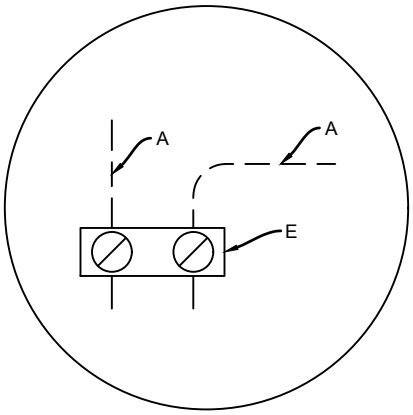
CITY OF ALAMOGORDO
TECHNICAL STANDARD DRAWINGS

FACILITY SECURITY CHAIN LINK FENCE DETAIL

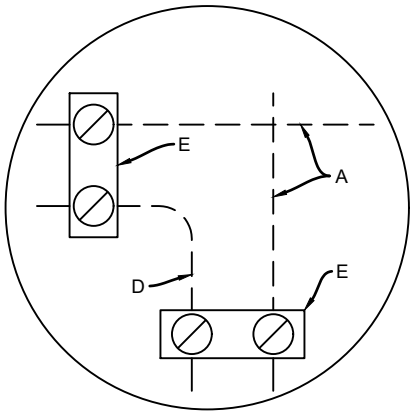
ISSUE DATE: JUNE 2021

REVISION DATE: ----

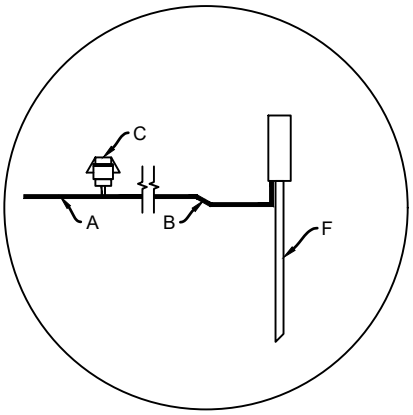
SHEET NO: W-33



Tee Connection Detail



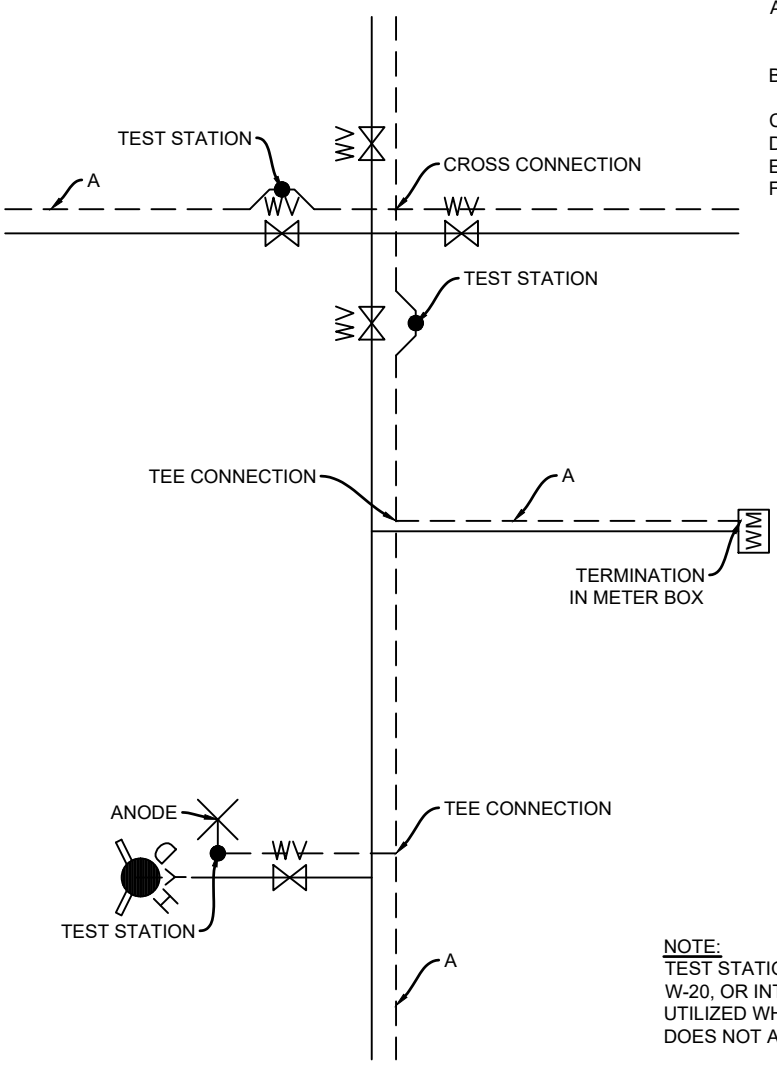
Cross Connection Detail



Anode Detail

CONSTRUCTION NOTES:

A. TRACING WIRE #12 AWG COPPER CLAD STEEL, TAPED TO TOP OF PIPE; HDPE INSULATION APWA COLOR CODED FOR RESPECTIVE UTILITY
B. TRACING WIRE #12 AWG COPPER CLAD STEEL - RED FACTORY CONNECTED TO GROUND ANODE
C. SPLICE CONNECTION
D. TRACE WIRE JUMPER
E. LOCKING WATERPROOF CONNECTOR
F. DRIVE-IN MAGNESIUM GROUNDING ANODE AT ALL TERMINATION/DEAD ENDS (INCLUDING EDGE OF RIGHT-OF-WAY AND CONNECTION POINTS/TERMINAL ENDS OF REHABBED SECTIONS). CONNECT TO MAIN LINE TRACE WIRE USING SPLICE CONNECTIONS



NOTE:
TEST STATIONS OUTSIDE THE ROADWAY SECTION, DETAIL W-20, OR INTEGRAL WITH VALVE BOX COLLAR SHALL ONLY BE UTILIZED WHERE FIRE HYDRANT SPACING w/ TEST STATION DOES NOT ALLOW FOR CONTINUITY OF TRACING WIRE.

SCALE: NOT TO SCALE

CITY OF ALAMOGORDO
TECHNICAL STANDARD DRAWINGS

WATERLINE OR RECLAIMED WATER TRACING WIRE DETAILS

ISSUE DATE: JUNE 2021

REVISION DATE: ----

SHEET NO: W-34