

**SANTA FE COUNTY
PUBLIC WORKS DEPARTMENT**

INVITATION FOR BID



**VISTA AURORA SUBDIVISION SANITARY SEWER
LINE CONSTRUCTION PROJECT**

IFB# 2019-0140-PW/CW

Commodity Codes: 91345 and 91356

November 2018

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ADVERTISEMENT

**SANTA FE COUNTY
INVITATION FOR BID
IFB# 2019-0140-PW/CW**

N.M. State Commodity Codes: 91345, 91356

VISTA AURORA SUBDIVISION SANITARY SEWER LINE CONSTRUCTION PROJECT

The Santa Fe County Public Works Department is requesting bids for the purpose of procuring a licensed Contactor to provide construction services for the installation of the Vista Aurora Subdivision Sewer Line as per design drawings. The work consists of providing the designed installation of a sewer line in the area of the Vista Aurora Subdivision along Lopez Lane that will connect the existing sewer line to the Calle Atajo Sewer Line. Bids may be held for ninety (90) days subject to all action by the County. Santa Fe County reserves the right to reject any and all bids in part or in whole. A completed bid package must be submitted in a sealed container indicating the bid title and number along with the bidding firm's name and address clearly marked on the outside of the container.

All bids must be received by 2:00 PM (MST) on DECEMBER 19, 2018 at the Santa Fe County Purchasing Division, 142 W. Palace Avenue (Second Floor), Santa Fe, NM 87501. By submitting a bid for the requested materials and/or services each firm is certifying that their bid is in compliance with regulations and requirements stated within the IFB package.

A Pre-Bid Conference will be held on **November 29, 2018 at 1:30 PM (MST)** at the Project Delivery Division building at 901 W. Alameda, Suite 20C., Santa Fe, N.M. Attendance at the Pre-Proposal Conference is not mandatory but attendance is highly recommended.

EQUAL OPPORTUNITY EMPLOYMENT: All qualified bidders will receive consideration of contract(s) without regard to race, color, religion, sex, national origin, ancestry, age, physical and mental handicap, serious mental condition, disability, spousal affiliation, sexual orientation or gender identity. Bidders are required to comply with the President's Executive Order No. 11246 as amended.

An Invitation for Bid packages is available by contacting Coralie G. Whitmore, Santa Fe County, by telephone at (505) 986-6337, by email at cgwhitmore@santafecountynm.gov or by accessing the Santa Fe County website at http://www.santafecountynm.gov/asd/current_bid_solicitations

BIDS RECEIVED AFTER THE DATE AND TIME SPECIFIED ABOVE WILL NOT BE ACCEPTED.

Santa Fe County
Publish: November 18th and 19th, 2018

INSTRUCTIONS FOR BIDDERS

Santa Fe County Purchasing and Public Works Department are requesting Bids for the purpose of procuring a licensed contractor to construct the Vista Aurora Subdivision Sewer Line Construction Project to be completed in compliance with Engineered Design Drawings.

1. **LOCATION AND DESCRIPTION OF WORK:** The sewer line is in the area of the Vista Aurora Subdivision along Lopez Lane and will connect the existing sewer line on Calle Manuel Road to the Calle Atajo Sewer Line. Work is to be performed by a contractor licensed in the State of New Mexico.

The bid shall include all permits, fees, tie-in fees for all utilities, overhead and profit and incidental costs in the bid amounts. All applicable taxes shall **not** be included in the bid amounts.

All applicable laws and ordinances and the rules and regulations of all authorities having jurisdiction over the project shall apply to the contractor and all agreements between the contractor and the County.

2. **SCOPE OF WORK:**

To provide sewer line connection in the area of the Vista Aurora Subdivision along Lopez Lane and connect the existing sewer line on Calle Manuel Road to the Calle Atajo Sewer Line. Work will be performed and completed in compliance with Engineered Design Drawings: VISTA AURORA SUBDIVISION SANITARY SEWER UPGRADE PROJECT NUMBER: 2016-0171-PW/IC by Santa Fe Engineering Consultants.

3. **TIME AND PLACE OF RECEIVING AND OPENING BIDS:** This information will be found in the "Advertisement for Bids" form attached hereto. A bid received after the specified time will not be considered and will be returned to the bidder unopened.
4. **SPECIFICATIONS:** The construction of the project will be in accordance with the specification and drawings provided by the County, which are included in the bid package.
5. **CONTRACT TIME:** The number of days for the completion of work (the contract time) is 120 days. The number of days for the completion of work is weather working calendar days, where "calendar days" are defined as consecutive days.
6. **COPIES OF BIDDING DOCUMENTS:** The Invitation for Bid Documents will be available by contacting Coralie G. Whitmore, Santa Fe County Purchasing, by telephone at (505) 986-6337, email at cgwhitmore@santafecountynm.gov and on the Santa Fe County website at www.santafecountynm.gov/services/asd/current_bid_solicitations.

Bidders shall use complete sets of Bidding Documents in preparing bids; neither the owner nor engineer assumes responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.

No license or grant of use of the Bidding Documents is conferred by issuance of copies of the bidding documents.

7. **BIDDER'S REPRESENTATION:** By submitting a bid the bidder represents that: a) the bidder has read and understands the Bid Documents and Contract Documents; b) the bid is made in compliance with the Bid Documents and Contract Documents; c) The bidder has visited the site and has become familiar with local conditions under which the Work is to be performed, and has correlated the bidder's personal observations with the requirements of the proposed Contract Documents; d) the bidder has familiarized itself with federal, state and local laws, ordinances, rules, and regulations affecting performance of the Work; and e) the bid is based upon the materials, equipment and systems required by the Bid Documents without exception; and f) the County shall rely on these representations.
8. **THE COMPLETE CONTRACT DOCUMENTS CONTAIN THE FOLLOWING:** Everything that is bound herein, project plans and any specifications referenced herein.
9. **INTERPRETATIONS/ADDENDA:** All questions about the meaning or intent of the contract documents shall be submitted to the Procurement Manager in writing. Replies will be issued by written addenda posted to the County Web site and E-Mailed to all parties who attended the Pre-bid meeting and turn in, Appendix A "The Acknowledgement of Receipt Form. Questions received less than seven (7) calendar days prior to the date for opening of bids will not be answered. Only questions answered by formal written addenda will be binding. Oral and other interpretations or clarifications will be without legal effect. Written questions or inquiries in relation to this Invitation for Bid will be directed to:

Coralie G. Whitmore, Procurement Specialist Senior
Santa Fe County Purchasing Division
142 W. Palace Avenue (Second Floor)
Santa Fe, NM 87501
Ph. (505) 986-6337
Fax (505) 989-3243
Email: cgwhitmore@santafecountynm.gov

Addenda will be transmitted to all bidders that are listed on the Pre-Bid Sign in Sheet and turn in an Acknowledgement of Receipt Form.

Copies of addenda will be made available for inspection wherever Bid Documents are on file for that purpose. Each addendum shall be part of the contract documents as specified in the written contract, attached to these specifications (see Appendix F).

Addenda will be issued no later than five (5) working days prior to the date for receipt of bids except an addendum withdrawing the request for bids or one which includes postponement of the date for receipt of bids.

Each bidder shall ascertain prior to submitting a bid that the bidder has received all addenda and the bidder shall acknowledge receipt in the bid.

10. **RESIDENT PREFERENCE:** If a bidder wishes to be given preference in this procurement, it is required to submit its certificate or certificate number issued by the State Purchasing Agent with the bid prior to the bid submittal time and date deadline. Preference will not be given to a bidder who does not submit its certificate or certificate number that can be verified with the State Purchasing Office. The certificate must be under the bidder's business name as represented in its bid. The bidder's certificate must indicate whether the bidder is certified as a resident business, resident manufacturer, or New York State business enterprise. Application of preference by the County shall be provided as described at Section 13-1-21 (A)-(L) and Section 13-1-21.2 NMSA 1978, of the State Procurement Code.
11. **SUBCONTRACTORS, SUPPLIERS AND OTHERS:** The contractor shall be required to fully comply with the Subcontractors Fair Practices Act, NMSA 1978, 13-4-31 to 13-4-42.
 - A. The contractor, in the bid documents, must identify in writing to the County those portions of the work that it proposes to subcontract and after the Notice of Award, may only subcontract other portions of the work with the County's written consent.
 - B. Any subcontractor who will be providing more than \$5,000 or one-half of one percent of the architect's or engineer's estimate of the total project cost (not including alternates) whichever is greater for any service, must be listed on the Subcontractor Listing. All subcontractor's must adhere to the wage rates no matter the dollar amount of the work to be performed.
12. **SUBSTITUTIONS:** The materials, products, and equipment described in the Bid Documents establish a standard of required function, dimension, appearance and quality to be met by any proposed substitution. No substitution will be considered prior to receipt of bids.
13. **WAGE RATES/REGISTRATION WITH THE LABOR AND INDUSTRIAL DIVISION OF THE LABOR DEPARTMENT:** The contractor shall be required to fully comply with the Public Works Minimum Wage Act, NMSA 1978, 13-4-11 thru 13-4-17. If the minimum wage rate determination for the project is not included in the initial Bid Documents, it will be furnished in an addendum.

A contractor or subcontractors who submit a bid valued at more than sixty thousand dollars (\$60,000) for a public works project that is subject to the Public Works Minimum Wage Act must be registered with the New Mexico Workforce Solutions at the time of the bid opening. The registration number shall be provided in the bid submitted by the contractor in the space provided for subcontracts with work proposed. After the bid opening, the registration numbers will be verified by the County and the bid will be determined to be non-responsive and disqualified if the registration numbers are *"inactive"* and the contractor does not provide proof of the required registration for itself or its subcontractors for work proposed over sixty thousand dollars (\$60,000).

For a public works contract whose value is \$60,000 or more, the NM Public Works Minimum Wage Act 13-4-11 NMSA 1978, also requires all tiers of subcontractors to submit certified weekly payroll records to the general contractor to the general contractor and the County biweekly. If this provision applies, and shall require all tiers of subcontractors, to submit

certified weekly payroll records to the contractor and the County's Project manager for this project.

14. BID FORM:

- A. The bid forms are included in the bidding documents; additional copies may be obtained from the Santa Fe County Purchasing Division.
- B. Bid forms must be completed in either ink or typewritten. The bid price of each item on the form must be stated in numerals and written words; **in case of an error in extensions in the unit price schedule the unit price shown in written words shall govern.**
- C. Bids by corporations must be executed in the corporate name by the president or a vice president (or other corporate office accompanied by evidence of authority to sign) and the corporate seal shall be affixed and attested by the secretary or an assistant secretary. The corporate address and state of incorporation shall be shown below the signature.
- D. Bids by partnerships must be executed in the partnership name and signed by a partner, their title must appear under their signature and the official address of the partnership must be shown below the signature.
- E. All names must be typed or printed below the signature.
- F. The bid shall contain an acknowledgment of receipt of all addenda (the numbers of which shall be filled in on the bid form).

15. BID SECURITY: Each individual bid shall be accompanied by bid security equal to 5% of the amount of the bid. Such bid security shall be in the form of a certified or cashier's check made payable to the County or a surety bond issued by a surety authorized to conduct business in the State of New Mexico and who is approved in federal circular 570 as published by the U.S. Treasury Department.

By submitting the bid and providing the bid security, the bidder pledges to enter into a binding contract with the County and will furnish bonds covering the faithful performance of the contract and payment of all obligations arising hereunder. Should a bidder refuse to enter into such contract or fail to furnish such bonds, if required, the amount of the bid security shall be forfeited to the County as liquidated damages, not as penalty.

The County will have the right to retain the bid security of bidders to whom an award is being considered until either the contract has been executed and bonds, if required, have been furnished or the specified time has elapsed so that bids may be withdrawn or all bids have been rejected.

16. POWER OF ATTORNEY: Attorneys in fact who sign bonds must attach certified effective copies of their Power of Attorney to all bonds.
17. QUALIFICATION OF BIDS: All contractors and subcontractors must have a valid New Mexico license appropriate to the work herein specified at the time the bid is submitted.

18. **SUBMISSION OF BIDS:** Bids shall be submitted at the time and place indicated in the Advertisement for Bids and shall be enclosed in an sealed envelope, marked with the project title, name and address of the bidder, N.M. License Number, and accompanied by the list of subcontractors and other required documents. All blanks must be filled in. Conditional bids will not be considered. The envelope shall be addressed to:

Coralie G. Whitmore, Procurement Specialist, Senior
Santa Fe County Purchasing Division
142 W. Palace Avenue (Second Floor)
Santa Fe, NM 87501

19. **MODIFICATION AND WITHDRAWAL OF BIDS:** A bid may not be modified, withdrawn or canceled by the bidder following the time and date designated for the receipt of bids, and each bidder so agrees to these conditions by submitting a bid.

Prior to the time and date designated for receipt of bids, a bid submitted may be modified or withdrawn by notice to the County at the address designated for receipt of bids. Such notice shall be in writing and signed by the bidder.

Upon receipt such written confirmation shall be date and time stamped by the County on or before the date and time set for receipt of bids. A modification of a bid shall be worded as not to reveal the amount of the original bid.

20. **GROSS RECEIPTS TAXES:** The amount of the bid shall **exclude** applicable New Mexico Gross Receipts Taxes or applicable local option taxes. The applicable gross receipts tax or applicable local option taxes shall be computed and shown as a separate amount on each request for payment made under the contract.
21. **CONSIDERATION OF BIDS:** Bids received on time will be opened publicly and will be read aloud, and an abstract of the amounts of the base bids and alternates or bid items, if any, will be made available to the bidders. Each bid shall be open to public inspection.
22. **BID OPENING PROCEDURE:** The person or persons opening the bids shall verify that the requirements of the Instruction to Bidders have been fulfilled, and shall read aloud the name of each apparently responsive bidder and the bid amount(s). If any requirements have not been met, the bid shall be deemed non-responsive and disqualified. Each bid shall be reviewed for the following:
- A. Bid Proposal – Include name of bidder, type of organization, contractor's license number and DOL registration number and all required signatures.
 - B. Bid Form- Include acknowledgement of all addenda, if applicable, bidder's name, title, address, telephone number, contractor's license number and type, United States Treasury number, resident preference number, if applicable, and all required signatures.
 - C. Bid Sheet-Include best price offered, excluding GRT.
 - D. Non-Collusion Affidavit for Prime Bidder Form-Include all required notarized signatures.
 - E. Certification of Non-Segregated Facilities Form-Include all required notarized signatures.
 - F. Certification of Bidder Regarding Equal Employment Opportunity Form-Include all required signatures.

- G. Bid Bond-Include all required notarized signatures.
- H. Bid Security- Shall be in the form of a certified or cashier's check made payable to the County or a surety bond issued by a surety.
- I. Subcontractor's Listing Form-List of all subcontractors performing work over \$5,000.00, include name, address, telephone number, license number and **active** NM Department of Workforce Solutions Registration Number.
- J. Campaign Contribution Disclosure Form-Include all required signatures.
- K. Certificate of Resident Preference, if applicable.

IF ANY OF THESE REQUIREMENTS HAVE NOT BEEN MET, THE BID MAY BE DISQUALIFIED AND CONSIDERED NON-RESPONSIVE.

- 23. BIDS TO REMAIN OPEN: All bids shall remain open for ninety (90) days after the day of the bid opening.
- 24. AWARD OF CONTRACT:
 - A. The County reserves the right to reject any and all bids and waive any and all informalities or technicalities and the right to disregard all nonconforming or conditional bids or counter proposals.
 - B. If a contract is to be awarded, it will be awarded to the lowest responsible bidder submitting a bid that is either: (i) the lowest base bid; or (ii) the lowest bid including the base bid and the alternate(s); or (iii) the lowest bid including the base bid and any combination of the alternates.
 - C. If the lowest responsible bidder has otherwise qualified, the lowest bidder may negotiate with the County for a lower bid if the lowest bid is within **ten percent** over budgeted project funds in order to prevent all bids from being rejected. No change in the original scope and/or terms and conditions will be allowed. Negotiations may be permitted with product, materials, and equipment alternatives as determined to be in the best interest of the County.
 - D. Alternates may be accepted and awarded in any manner or order based on available budget. The County reserves the right not to award any particular alternate.
- 25. LIQUIDATED DAMAGES: Liquidated damages in the amount of two hundred fifty dollars (\$250.00) per each working day that expires after the date of substantial completion until substantial completion is achieved and a certificate of Substantial Completion is issued by the County.
- 26. PREFERENCES: In the construction of this project, the County has no preference for any process, type of equipment, or kind of material, but will consider all processes, types of equipment or kinds of material offered on a usual competitive basis if they are in fact equal to that specified and will accomplish the purpose intended. The County reserves the right to

be the sole judge as to whether or not a different process, type of equipment or kind of material offered is in fact equal to that specified.

27. **LICENSE OR ROYALTY FEES:** Licenses and/or royalty fees for products or for processes must be paid for directly by the contractor.
28. **PERMITS:** It is the responsibility of the contractor and each subcontractor to obtain permits and inspections required by the County and/or the State of New Mexico or any other entity that may have jurisdiction over the construction or scope of work.
29. **COLLUSION:** No bidder shall be interested in more than one bid. Collusion among bidders or the submission of more than one bid under different names by any firms or individual shall be cause for rejection of all bids in question without consideration.
30. **QUANTITIES:** The quantities set forth in the bid proposal are estimated quantities which bids will be compared and which will be the basis for award of contract. Payment will be made for work actually performed.
31. **PROTEST PROCEDURE:** Any bidder who is aggrieved in connection with procurement may protest to the County Purchasing Manager as set forth in Resolution No. 2006-60 by the Board of County Commissioners. A copy of Resolution No. 2006-60 is available upon request. The protest must be in writing and be submitted within fifteen (15) days after the facts or occurrences. The complete procedures and requirements regarding protests and resolution of protests are available from the Santa Fe County Purchasing Division upon request.
32. **CONTRACTOR'S QUALIFICATION STATEMENT:** Bidders to whom award of a contract is under consideration shall submit, upon request, information and data to prove that their financial resources, production or service facilities, personnel, and service reputation and experience are adequate to make satisfactory delivery of the services, construction, or items of personal property described in the Bidding Documents.
33. **BOND REQUIREMENTS – PERFORMANCE BOND AND PAYMENT BOND:** If awarded the contract, a bidder shall furnish bonds covering the faithful performance of the contract and payment of all obligations arising thereunder. The amount of the bonds, performance and payment, shall be equal to 100% of the contract sum. Bonds shall be issued by a surety authorized to conduct business in the State of New Mexico and who is approved in federal circular 570 as published by the U.S. Treasury Department. The cost of the bonds shall be included in the bid.
34. **TIME OF DELIVERY AND FORM OF BONDS.** The bidder shall deliver the required bonds to the County no later than seven (7) days following the date of execution of the contract. If the Work is to be commenced prior thereto in response to a letter of intent, the bidder shall, prior to commencement of the Work, submit evidence satisfactory to the County that such bonds will be furnished and delivered in accordance with this section.

The bidder shall require the attorney-in-fact who executes the required bonds on behalf of the surety to affix thereto a certified and current copy of the power of attorney.

35. **WARRANTY:** The contractor shall furnish a written warranty of workmanship to the Procurement Manager for a period of one (1) year following the completion date in addition to all other warranties required by the Contract Documents.
36. **NOTICE OF AWARD:** A written Notice of Award shall be issued by the County after review and approval of the bid and related documents.
37. **IDENTICAL BIDS:** If two or more identical low bids are received, the County will apply the process described at Section 13.1.110 NMSA 1978, of the State Procurement Code.
38. **CANCELLATION OF AWARD:** When in the best interest of the public, the County may cancel the award of any contract at any time before the execution of said contract by all parties without any liability against the County.
39. **NOTICE TO PROCEED:** The County will issue a written Notice to Proceed and a purchase order to the contractor stipulating the date from which contract time will be charged and the date contract time is to expire, subject to valid modifications in accordance with the Contract Documents.
40. **FAILURE TO EXECUTE CONTRACT:** Failure to return the signed contract with acceptable contract bonds and certificate of insurance within ten (10) calendar days after the date of the Notice of Award shall be just cause for the cancellation of the award. The award may then be made to the next lowest responsible bidder, or the work may be re-advertised and constructed under contract or otherwise, as the owner may decide.
41. **INSURANCE REQUIREMENTS:** At a minimum upon execution of the Agreement between the County and the Contractor, the Contractor shall furnish to the County, Certificates of Insurance naming Santa Fe County as an additional insured for the insurance coverage specified in the sample contract that is attached as an exhibit to this IFB.
42. **CLARIFICATION OF NON-COLLUSION AFFIDAVIT OF SUBCONTRACTOR, AND CERTIFICATION OF SUBCONTRACTOR REGARDING EQUAL EMPLOYMENT OPPORTUNITY:** The general contractor is not required to present completed “Non-Collusion Affidavit of Subcontractor” and “Certification of Subcontractor Regarding Equal Employment Opportunity” forms from their subcontractors at the time of bid submittal; however, once the contract is awarded, the general contractor is responsible for providing these forms along with the bonds and certificate of insurance.
43. **SUBCONTRACTOR PERFORMANCE AND PAYMENT BOND.** A subcontractor whose work to be performed on a public works building project is one hundred twenty five thousand dollars (\$125,000) or more shall submit a performance and payment bond in the amount of the work they are to perform on the project. These bonds will be submitted within the stated (10) calendar days after the date of the Notice to Award.

44. OPERATIONS AND MAINTENANCE MANUALS: At the completion of the project but prior to the Substantial Completion certificate will be approved by the architect/engineer, the contractor shall submit to the architect/engineer two (2) copies of a three ring binder with all maintenance and operations instructions for all systems and items within this phase of construction if applicable.
45. NOTICE: The Procurement Code, Sections 13-1-28 through 13-1-199 NMSA 1978, imposes civil and misdemeanor criminal penalties for its violation. In addition, the New Mexico criminal statutes impose felony penalties for bribes, gratuities, and kick-backs.
46. SUFFICIENT APPROPRIATION: Any contract awarded as a result of this IFB process may be terminated if sufficient appropriations or authorizations do not exist. Such termination will be effected by sending written notice to the contractor. The County's decision as to whether sufficient appropriations and authorizations are available will be accepted by the contractor as final.
47. NUMBER OF BIDS ACCEPTED. Bidders shall submit only one (1) bid in response to this IFB.
48. LIVING WAGE. Contractor shall comply with the requirements of the Santa Fe County Ordinance 2014-1 (Establishing a Living Wage) as amended by 2014-5.
49. DOUBLE-SIDED DOCUMENTS. All submitted bids/proposal documents shall be double-sided, pursuant to Santa Fe County Resolution 2013-7, Adopting Sustainable Resource Management Principles, Section 2. A. Waste Reduction and Reuse..."all documents are to be double-sided, including those that are generated by outside entities using County funds and by consultants and contractors doing business with the County".

BID PROPOSAL FORM
IFB# 2019-0140-PW/CW
VISTA AURORA SUBDIVISION SANITARY SEWER LINE CONSTRUCTION PROJECT

To Santa Fe County, State of New Mexico, Owner:

In compliance with the Information for Bidders and in strict conformance with the Contract Documents, _____, hereinafter called the Bidder, organized and existing under the laws of the State of New Mexico as a _____ (type of business or legal entity), hereby proposes to perform all the WORK required for the construction services to install a sewer line in the area of the Vista Aurora Subdivision along Lopez Lane to connect Calle Manuel Road to the Calle Atajo Sewer Line, located in Santa Fe County, New Mexico.

The undersigned declares that the only person or parties interested in the proposal as principals are those named herein; that the proposal is made without collusion with any person, firm or corporation; that it has carefully examined the specifications, including special provisions, if any, and that it has made a personal examination of the site of the work, that it is to furnish all the necessary machinery, tools, apparatus and other means of construction and do all the work and furnish all the materials specified in the manner and the time prescribed; that it understands that the quantities are approximate only and subject to increase or decrease, and that it is willing to perform any increased or decreased quantities of work at unit price bid.

The undersigned hereby agrees to execute and deliver the Construction Agreement within ten (10) days, or such further time as may be allowed in writing by Santa Fe County after receiving notification of the acceptance of this proposal, and it is hereby mutually understood and agreed that in case we do not, Santa Fe County may proceed to award the contract to others.

We hereby agree to commence the work within fifteen (15) days, or such further time as may be allowed in writing by Santa Fe County after notification to proceed.

The undersigned proposes to guarantee all work performed under these plans, specifications and contract for one year after acceptance by the County and repair and maintain same until the date of acceptance by Santa Fe County.

Signature-Title

(Corporate Seal)

Corporate Name

Address

City, State, Zip Code

Names of individual members of
firms or names and titles of all
officers of Corporation.

Corporation organized under
the Laws of the State of

New Mexico Contractor's License No.

NM Department of Workforce Solutions,
Public Works Labor Enforcement Fund
Registration Number:

**SANTA FE COUNTY
BID FORM**

FROM: _____

_____ hereinafter called "Bidder".

TO: Santa Fe County
142 West Palace Avenue
Santa Fe, New Mexico 87501

hereinafter called "CONTRACTING AGENCY",

BID FOR: **IFB# 2019-0140-PW/CW**
PROJECT: **Vista Aurora Subdivision Sanitary Sewer Line Construction Project**

Purchasing Division:

The bidder has familiarized itself with the existing conditions on the project area affecting the cost of the work and with the contract documents which includes:

- | | |
|---|---|
| A. Advertisement for Bids | L. Certification of Bidder Regarding |
| B. Instructions for Bidders | Equal Employment Opportunity |
| C. Bid Proposal | M. Certification of Subcontractor Regarding |
| D. Bid Form | Equal Employment Opportunity |
| E. Bid Sheets | N. Sub-Contractor Listing Form |
| F. Bid Bond | O. Acknowledgement of Receipt Form |
| G. Performance Bond | P. Campaign Contribution Disclosure Form |
| H. Labor and Material Payment Bond | Q. Resident Veterans Preference Certification |
| I. Non-Collusion Affidavit of Prim Bidder | R. N. M. Wage Determination |
| J. Non-Collusion Affidavit of subcontractor | S. Sample Construction Contract |
| K. Certificate of Non-Segregated Facility | T. Specifications and Plans |

Therefore, the Bidder hereby proposes to furnish all supervision, technical personnel, labor, materials, tools appurtenances, equipment, and services (including all utility and transportation services) required to complete the construction of the Sewer Line for the Vista Aurora Subdivision, in accordance with the above listed documents.

(Amounts are to be shown in both words and figures. In case of discrepancy, the amount shown in words will govern). Bidder has provided lump sum price for the scope of work.

In submitting this bid, the Bidder understands that the right is reserved by Santa Fe County to reject any irregular or all bids, waive any technicalities in the bids, and accept the bid deemed to be in the best interest of the public and that Santa Fe County intends to award one contract (if at all) for the items bid. If written notice of the acceptance of this bid is mailed, telegraphed or otherwise delivered to the undersigned within ninety (90) days after the opening thereof or at any time thereafter before this bid is withdrawn, the undersigned agrees to execute and deliver the agreement in the prescribed form within ten (10) days after the agreement is presented to him for signature.

All Addenda pertaining to this Project shall be acknowledged by the Bidder in the spaces provided below:

Addendum No. Date	Acknowledged by Bidder or Its Authorized Representative	Date Acknowledged
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Failure to acknowledge receipt, as provided above, may be considered sufficient grounds for disqualification of the bidder and rejection of his proposal. It shall be the bidder's responsibility to become fully advised of all Addenda prior to submitting his bid.

The Bidder agrees to commence work under this Contract within fifteen (15) days after, a date to be specified in a written "Notice to Proceed" from Santa Fe County or its authorized agents. Bidder further agrees to pay liquidated damages as provided in the Contract Documents.

This Bid Proposal contains the following:

- A. Bid Proposal
- B. Bid Form
- C. Bid Sheet
- D. Non-Collusion Affidavit for Prime Bidder
- E. Certification of Non-Segregated Facilities
- F. Certification of Bidder Regarding Equal Employment Opportunity
- G. Bid Bond
- H. Subcontractors Listing (as included in this packet)
- I. Campaign Contribution Disclosure Form
- J. Resident Preference Certificate, if applicable

Respectfully submitted:

Name of Bidder: _____

Official Address: _____

By: _____
(Signature)

Title: _____

Date: _____

Telephone No.: _____

Email address: _____

*New Mexico Contractor's License Number and Types: _____

Resident Preference Certificate Number: _____

BID FORM
IFB # 2019-0140-PW/CW

Please offer your best price for the work required for the Sanitary Line Construction Project for Vista Aurora Subdivision. The base bid must include pricing for materials, equipment, labor, travel and fees for any required permitting. Be advised that award may be made without discussion with bidders on offers received.

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	EXTENDED COST
1	8" SAS INSTALLED AT 0-7' DEPTH	L.F.	690		
2	8" SAS INSTALLED AT 7-14' DEPTH	L.F.	860		
3	8" SAS INSTALLED AT 14-21' DEPTH	L.F.	200		
4	TV INSPECT SEWER LINE	L.F.	2,690		
5	FLOWABLE FILL ENCASEMENT	C.Y.	8		
6	MANHOLE TYPE E <6'	EA.	5		
7	EXTRA DEPTH MANHOLES >6'	V.F.	20		
8	TIE TO EXISTING MANHOLE (DIVERT)	EA.	1		
9	TIE TO EXISTING MANHOLE (DROP)	EA.	1		
10	ROCK EXCAVATION < 6' DEPTH	L.F.	500		
11	GRAVITY SERVICE CONNECTIONS	EA.	8		
12	REBUILD WATER LINE	L.F.	655		
13	ASPHALT REMOVE & REPLACE	S.Y.	155		
14	CONCRETE DRIVEWAY REMOVE AND REPLACE	S.Y.	10		
15	2' CURB AND GUTTER REMOVE & REPLACE	L.F.	90		
16	GRAVEL DRIVEWAY REMOVE AND REPLACE	S.Y.	90		
17	REMOVE AND REBUILD 5' HIGH CMU WALL	S.F.	1,200		
18	SEWER ACCESS ROAD	S.Y.	965		
19	STANDARD GATE - 20'	EA.	1		
20	TEMP. CONC. WALL BARRIER	L.F.	160		

21	CLASS A SEEDING	ACRE	1.5		
22	DECOMMISSION LIFT STATION, PLUG FORCE MAIN	L.S.	1		
23	STORM WATER POLLUTION PREVENTION PLANS / BMP INSTALLATION	L.S.	1		
24	CONSTRUCTION TRAFFIC CONTROL & MANAGEMENT	L.S.	1		
25	MOBILIZATION	L.S.	1		
26	CONSTRUCTION STAKING	L.S.	1		
27	CONSTRUCTION TESTING	L.S.	1		
TOTAL BASE BID AMOUNT FOR ITEMS 1 - 27					
WRITTEN IN WORDS				WRITTEN IN NUMBERS	

Exclusive of NM GRT and other applicable taxes

NON-COLLUSION AFFIDAVIT OF PRIME BIDDER

STATE OF NEW MEXICO

COUNTY OF _____

_____ being first duly sworn, deposes and says that:

- (1) They are the _____ of _____ the Bidder that has submitted the attached Bid Proposal;
- (2) They are fully informed respecting the preparation and contents of the attached Bid Proposal and of all pertinent circumstances respecting such bid;
- (3) Such bid is genuine and is not a collusive or sham bid;
- (4) Neither the said bidder nor any of its officers, partners, owners, agents, representatives, employees or parties in interest, including this affiant, has in any way colluded, conspired, connived or agreed, directly or indirectly with any other bidder, firm or person to submit a collusive or sham bid in connection with the contract for which the attached bid has been submitted or to refrain from bidding in connection with such contract, or has in any manner, directly or indirectly, sought by agreement or collusion or communications or conference with any other bidder, or to secure through any collusion, conspiracy, connivance or unlawful agreement any advantage against the Contracting Agency or any person interested in the proposed contract; and
- (5) The price or prices quoted in the attached bid are fair and proper and are not tainted by any collusion, conspiracy, connivance or unlawful agreement on the part of the bidder or any of its agents, representatives, owners, employees, or parties in interest, including this affiant.

(SIGNED) _____

—

TITLE _____

SUBSCRIBED AND SWORN to before me this ____ day of _____ 2018.

NOTARY PUBLIC

My Commission Expires _____

NON-COLLUSION AFFIDAVIT OF SUBCONTRACTOR

STATE OF NEW MEXICO

COUNTY OF _____

_____ being first duly sworn, deposes and says that:

- (1) It is the _____ of _____, hereinafter referred to as the "Subcontractor".
- (2) It is fully informed respecting the preparation and contents of the Subcontractor's proposal submitted by the Subcontractor to _____, the Contractor, for certain work in connection with the _____ contract pertaining to the _____ project in _____.
- (3) Such Subcontractors proposal is genuine and is not a collusive or sham proposal.
- (4) Neither the Subcontractor nor any of its officers, partners, owners, agents, representatives, employees or parties in interest, including this affiant, has in any way colluded, conspired, connived or agreed, directly or indirectly with any other bidder, firm or person to submit a collusive or sham bid in connection with the contract for which the attached bid has been submitted or to refrain from bidding in connection with such contract, or has in any manner, directly or indirectly, sought by agreement or collusion or communications or conference with any other bidder, or to secure through any collusion, conspiracy, connivance or unlawful agreement any advantage against the Contracting Agency or any person interested in the proposed contract; and
- (5) The price or prices quoted in the Subcontractor's proposal are fair and proper and are not tainted by any collusion, conspiracy, connivance or unlawful agreement on the part of the bidder or any of its agents, representatives, owners, employees, or parties in interest, including this affiant.

(SIGNED) _____

TITLE _____

SUBSCRIBED AND SWORN to before me this _____ day of _____ 2018.

Notary Public

My Commission Expires: _____

SUBCONTRACTS

- A. The contractor shall not execute an agreement with any subcontractor or permit any subcontractor to perform any work included in this contract until it has submitted a Non-Collusion Affidavit from the subcontractor, is substantially the form shown below, and has received written approval of such subcontractor from Santa Fe County.

- B. No proposed subcontractor shall be disapproved by Santa Fe County except for cause.
- C. The contractor shall be as fully responsible to Santa Fe County for the acts and omissions of its subcontractors and of persons either directly or indirectly employed by them, as it is for the acts and omissions of persons directly employed by them.
- D. The contractor shall cause appropriate provision to be inserted in all subcontracts relative to the work to require compliance by each subcontractor with the applicable provisions of the contract for the improvements embraced.
- E. Nothing contained in the contract shall create any contractual relation between any subcontractor and Santa Fe County.

THIS SPACE INTENTIONALLY LEFT BLANK.

CERTIFICATION OF NON-SEGREGATED FACILITIES

(Applicable to construction contracts and related subcontracts exceeding \$10,000, which are not exempt from the Equal Opportunity Clause).

The construction contractor certifies that it does not maintain or provide for its employees any segregated facility at any of its establishments, and that it does not permit its employees to perform their services at any location, under its control, where segregated facilities are maintained. The construction contractor certifies further that it will not maintain or provide for its employees any segregated facilities at any of its establishments, and that it will not permit its employees to perform their services at any location, under its control, where segregated facilities are maintained. The construction contractor agrees that a breach of this certification is a violation of the Equal Opportunity Clause in this contract. As used in this certification, the term "segregated facilities" means any waiting room, work areas, rest rooms and wash rooms, restaurants and other eating areas, time clock, locker rooms and other storage or dressing areas, parking lots, drinking foundations, recreating or entertainment areas, transportation, and housing facilities provided for employees which are segregated by explicit directive or are in fact segregated on the basis of race, creed, color, or national origin, because of habit, local custom, or otherwise. The construction contractor agrees that (except where it has obtained identical certifications from proposed subcontractors for specific time periods) it will obtain identical certifications from proposed SUBCONTRACTORS prior to the award of subcontracts exceeding \$10,000 which are not exempt from the provisions of the Equal Opportunity Clause and that it will retain such certifications in its files.

SIGNED: _____

TITLE: _____

SUBSCRIBED AND SWORN to before me this ____ day of _____, 2018.

NOTARY PUBLIC

My Commission Expires: _____

CERTIFICATION OF BIDDER REGARDING EQUAL EMPLOYMENT OPPORTUNITY

INSTRUCTIONS

This certification is required pursuant to Executive Order 11246 (30 F. R. 12319-25). The implementing rules and regulations provide that any bidder or perspective contractor, or any of their proposed subcontractors, shall state as an initial part of the bid or negotiations of the contract or subcontract whether it has participated in any previous contract or subcontract subject to the equal opportunity clause; and, if so, whether it has filed all compliance reports due under applicable instructions.

Where the certification indicates that the bidder has not filed a compliance report due under applicable instructions, such bidder shall be required to submit a compliance report within seven calendar days after bid opening. No contract shall be awarded unless such report is submitted.

CERTIFICATION OF BIDDER

Bidder's Name: _____

Address: _____

1. Bidder has participated in a previous contract or subcontract subject to the Equal Opportunity Clause.

Yes ____ No ____

2. Compliance reports were required to be filed in connection with such contract or subcontract.

Yes ____ No ____

Certification -- The information above is true and complete to the best of my knowledge and belief.

NAME AND TITLE OF SIGNER (PLEASE TYPE)

SIGNATURE

DATE

CERTIFICATION OF SUBCONTRACTOR REGARDING EQUAL EMPLOYMENT OPPORTUNITY

INSTRUCTIONS

This certification is required pursuant to Executive Order 11246 (30 F. R. 12319-25). The implementing rules and regulations provide that any bidder or perspective contractor, or any of their proposed subcontractors, shall state as an initial part of the bid or negotiations of the contract or subcontract whether it has participated in any previous contract or subcontract subject to the equal opportunity clause; and, if so, whether it has filed all compliance reports due under applicable instructions.

Where the certification indicates that the bidder has not filed a compliance report due under applicable instructions, such bidder shall be required to submit a compliance report within seven calendar days after bid opening. No contract shall be awarded unless such report is submitted.

CERTIFICATION OF SUBCONTRACTOR

Subcontractor's Name: _____

Address: _____

1. Subcontractor has participated in a previous contract or subcontract subject to the Equal Opportunity Clause.

Yes ____ No ____

2. Compliance reports were required to be filed in connection with such contract or subcontract.

Yes ____ No ____

Certification -- The information above is true and complete to the best of my knowledge and belief.

NAME AND TITLE OF SIGNER (PLEASE TYPE)

SIGNATURE

DATE

BID BOND

A. KNOW ALL MEN BY THESE PRESENT, THAT WE _____ hereinafter called the PRINCIPAL, as PRINCIPAL and the _____, of _____ a Corporation duly organized under the laws of the State of _____, and authorized to do business in the State of New Mexico, hereinafter called the SURETY, as SURETY are held and firmly bound unto Santa Fe County, a Municipal Corporation, hereinafter called the OBLIGEE, in the sum of _____ DOLLARS (\$ _____) for the payment of which sum well and truly to be made, the said Principal and the said Surety, bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly be these presents.

WHEREAS, the Principal has submitted the accompanying bid, dated _____, 2018, for the construction services to install a sewer line in the area of the Vista Aurora Subdivision along Lopez Lane to connect Calle Manuel Road to the Calle Atajo Sewer Line in Santa Fe County, New Mexico.

B. NOW, THEREFORE, if the Obligee shall accept the bid of the Principal and the Principal shall enter into a contract with the Obligee in accordance with the terms of such bid, and give such bond of bonds as may be specified in the bidding of Contract Documents with good and sufficient surety for the faithful performance of such contract and for the prompt payment of labor and material furnished in the prosecution thereof of in the event of the failure of the Principal to enter such contract and give such bond or bonds, if the Principal shall pay to the Obligee the difference not to exceed the penalty hereof between the amount specified in said bid and such larger amount for which the Obligee may in good faith contract with another party of perform the work covered by said bid, then this obligation shall be null and void, otherwise to remain in full force and effect.

C. SIGNED AND SEALED THIS _____ DAY OF _____, 2018.

BIDDER

(SEAL)

By: _____
PRINCIPAL

WITNESS

By: _____
SURETY

WITNESS

Title: _____

PERFORMANCE BOND

A. KNOW ALL MEN BY THESE PRESENT, THAT WE _____, as PRINCIPAL hereinafter called the "CONTRACTOR" and _____, as SURETY hereinafter called the "SURETY", are held and firmly bound unto OBLIGEE Santa Fe County, a Political Subdivision of the State of New Mexico, hereinafter called the "COUNTY", in the sum 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.

B. WHEREAS, the CONTRACTOR has a written contract dated _____, 2018, with the COUNTY for the construction services to install a sewer line in the area of the Vista Aurora Subdivision along Lopez Lane to connect Calle Manuel Road to the Calle Atajo Sewer Line in Santa Fe County, New Mexico, in accordance with drawings and specifications which contract is referenced made part hereof, and is hereinafter referred to as the "Contract."

C. NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that, if CONTRACTOR shall promptly and faithfully perform said Contract (including any amendment thereto), then this obligation shall be null and void; otherwise it shall remain in full force and effect until the COUNTY shall by written instrument notify the SURETY that the obligation is discharged, except that the obligation shall continue for at least three (3) months following the expiration of the term of the Contract.

1. The SURETY hereby waives notice of any alteration or extension of the Contract time made by the COUNTY.
2. Whenever CONTRACTOR shall be, and is declared by the COUNTY to be in default under the Contract, the COUNTY having performed the COUNTY'S obligations thereunder, the SURETY must promptly remedy the default and shall promptly:

- (1) Complete the Contract in accordance with its terms and conditions, or
- (2) Obtain a bid or bids for submission to the COUNTY for completing the Contract in accordance with its terms and conditions, and upon determination by the COUNTY and SURETY of the lowest responsible bidder, arrange for a contract between such bidder and Santa Fe County, and make available as work progresses (even though there should be a default or a secession 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

COUNTY to CONTRACTOR under the Contract and any amendments thereto,
less the amount properly paid by the COUNTY to CONTRACTOR.

D. No right of action shall accrue on this Performance Bond to or for the use of any person or corporation other than Santa Fe County named herein or the heirs, executors, administrators, or successors of Santa Fe County.

E. This Bond shall be enforceable without the need to have recourse to any judicial or arbitral proceedings.

SIGNED AND SEALED THIS _____ DAY OF _____, 2018.

CONTRACTOR – PRINCIPAL (signature)

By: _____
(Printed name and title)

NOTARY PUBLIC (seal)

My Commission expires: _____

SURETY (signature)

(Printed name and title)

NOTARY PUBLIC (seal)

My Commission expires: _____

SURETY'S Authorized New Mexico Agent

LABOR AND MATERIAL PAYMENT BOND

KNOW ALL MEN BY THESE PRESENT, THAT WE _____
 _____ as PRINCIPAL hereinafter called the "PRINCIPAL" and
 _____ as SURETY hereinafter called the "SURETY", are held and
 firmly bound unto Santa Fe County, a Political Subdivision of the State of New Mexico as OBLIGEE
 hereinafter called the "COUNTY", for the use and benefit of any claimants as herein below defined,
 in the amount of _____ (\$.) dollars for the payment whereof
 PRINCIPAL and SURETY bind themselves, their heirs, executors, administrators, successors, and
 assigns, jointly and severally, firmly by these presents.

WHEREAS, the PRINCIPAL has a written contract dated _____, 2018, with the
 COUNTY for the construction services to install a sewer line in the area of the Vista Aurora
 Subdivision along Lopez Lane to connect Calle Manuel Road to the Calle Atajo Sewer Line in Santa
 Fe County, New Mexico, which must be constructed in accordance with drawings and specifications
 which contract is referenced and made a part hereof, and is hereinafter referred to as the "Contract."

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that, if PRINCIPAL shall
 promptly make payment to all claimants as hereinafter defined, for all labor and material used or
 reasonably required for use in the performance of the Contract, then this obligation shall be void;
 otherwise, it shall remain in full force and effect, subject to the following conditions:

1. A claimant is defined as one having a direct contract with the PRINCIPAL or with a
 subcontractor of the PRINCIPAL for labor, material, or both, used or reasonably required
 for use in the performance of the Contract, labor and material being construed to include
 but not be limited to that part of water, gas, power, light, heat, oil, gasoline, telephone
 services or rental of equipment directly applicable to the Contract.
2. The above named PRINCIPAL and SURETY hereby jointly and severally agree with the
 COUNTY that every claimant as herein defined, who has not been paid in full before the
 expiration of a period of ninety (90) days after the date on which the last of such claimant's
 work or labor was done or performed, or materials were furnished by such claimant,
 prosecute a suit to final judgment for such sum or sums as may be justly due claimant, and
 have execution thereof. The COUNTY shall not be liable for payment of any cost or
 expenses of any such suit.
3. No suit or action shall be commenced hereunder by any claimant:
 - a. Unless claimant, or other than one having a direct contract with the PRINCIPAL,
 shall have written notice in the form of a sworn statement to the COUNTY and any
 one or both of the following: the PRINCIPAL or SURETY above named, within
 ninety (90) days after such said claim is made or suit filed, stating with substantial
 accuracy the amount claimed and the name of the party to whom the materials were
 furnished, or for whom the work or labor was done or performed.

- b. Such notice shall be served by mailing the same by registered mail or certified mail, postage prepaid, in an envelope addressed to the COUNTY, PRINCIPAL or SURETY, at any place where an office is regularly maintained by said COUNTY, PRINCIPAL or SURETY for the transaction of business, or served in any manner in which legal process may be served in the State in which the aforesaid project is located, save that such service need not be made by a public officer.
4. Any suit under this Labor and Material Bond must be instituted in accordance with the statute of limitation under Section 37-1-3 NMSA 1978.
5. No right of action shall accrue on this Bond to or for the use of any person or corporation other than subcontractors or sub-subcontractors of the said Contract between PRINCIPAL and Santa Fe County named herein.

SIGNED AND SEALED THIS _____ DAY OF _____, 2018.

CONTRACTOR – PRINCIPAL (signature)

By: _____
(Printed name and title)

NOTARY PUBLIC (seal)

My Commission expires: _____

SURETY (signature)

(Printed name and title)

NOTARY PUBLIC (seal)

My Commission expires: _____

SURETY'S Authorized New Mexico Agent

SUBCONTRACTOR LISTING

1. To be fully executed and included with Bid as a condition of the Bid (13-4-31 through 13-4-42 NMSA 1978).
2. For the purposes of this Project all subcontractors, regardless of contract amount, must be listed on the subcontractor list.
3. The Bidder shall list the Subcontractor's Name, the City or County of the Place of Business and the Category of Work that will be done by each Subcontractor

Trade:	Name of Subcontractor:	
Address:		
Telephone No:	License No:	NM Dept of Workplace Solutions Registration No.
Signature of Subcontractor (To be obtained after award of contract):		
Trade:	Name of Subcontractor:	
Address:		
Telephone No:	License No:	NM Dept of Workplace Solutions Registration No.
Signature of Subcontractor (To be obtained after award of contract):		
Trade:	Name of Subcontractor:	
Address:		
Telephone No:	License No:	NM Dept of Workplace Solutions Registration No.
Signature of Subcontractor (To be obtained after award of contract):		
Trade:	Name of Subcontractor:	
Address:		
Telephone No:	License No:	NM Dept of Workplace Solutions Registration No.
Signature of Subcontractor (To be obtained after award of contract):		

Trade:	Name of Subcontractor:	
Address:		
Telephone No:	License No:	NM Dept of Workplace Solutions Registration No.
Signature of Subcontractor (To be obtained after award of contract):		
Trade:	Name of Subcontractor:	
Address:		
Telephone No:	License No:	NM Dept of Workplace Solutions Registration No.
Signature of Subcontractor (To be obtained after award of contract):		
Trade:	Name of Subcontractor:	
Address:		
Telephone No:	License No:	NM Dept of Workplace Solutions Registration No.
Signature of Subcontractor (To be obtained after award of contract):		
Trade:	Name of Subcontractor:	
Address:		
Telephone No:	License No:	NM Dept of Workplace Solutions Registration No.
Signature of Subcontractor (To be obtained after award of contract):		
Trade:	Name of Subcontractor:	
Address:		
Telephone No:	License No:	NM Dept of Workplace Solutions Registration No.
Signature of Subcontractor (To be obtained after award of contract):		

Trade:	Name of Subcontractor:	
Address:		
Telephone No:	License No:	NM Dept of Workplace Solutions Registration No.
Signature of Subcontractor (To be obtained after award of contract):		
Trade:	Name of Subcontractor:	
Address:		
Telephone No:	License No:	NM Dept of Workplace Solutions Registration No.
Signature of Subcontractor (To be obtained after award of contract):		
Trade:	Name of Subcontractor:	
Address:		
Telephone No:	License No:	NM Dept of Workplace Solutions Registration No.
Signature of Subcontractor (To be obtained after award of contract):		
Trade:	Name of Subcontractor:	
Address:		
Telephone No:	License No:	NM Dept of Workplace Solutions Registration No.
Signature of Subcontractor (To be obtained after award of contract):		
Trade:	Name of Subcontractor:	
Address:		
Telephone No:	License No:	NM Dept of Workplace Solutions Registration No.
Signature of Subcontractor (To be obtained after award of contract):		

APPENDIX A
ACKNOWLEDGEMENT OF RECEIPT
IFB# 2019-0140-PW/CW
Vista Aurora Subdivision Sanitary Sewer Line Construction Project

In acknowledgement of receipt of this Invitation for Bids, the undersigned agrees that he/she has received a complete copy, beginning with the title page, and ending with the contractual documents. Completed forms must be submitted to Coralie G. Whitmore no later than November 28 2018 to receive any addenda for this solicitation.

The acknowledgement of receipt should be signed and returned to Coralie G. Whitmore. Only Bidders that return this form in a timely manner will receive copies of addenda to this IFB. (Please Print Clearly)

FIRM: _____
 REPRESENTED BY: _____
 TITLE: _____
 PHONE NO.: _____
 FAX NO.: _____
 E-MAIL ADDRESS: _____
 MAILING ADDRESS: _____

 DELIVERY ADDRESS: _____

By: _____ Date: _____
 (Signature)
 Name: _____
 (Printed)
 Title: _____

This name and address will be used for all correspondence related to the Invitations for Bid.

Coralie G. Whitmore
 Santa Fe County
 Purchasing Division
 142 W. Palace Avenue
 Santa Fe, NM 87504
 Phone: (505) 986-6337 Fax: (505) 989-3243
 E-mail: cgwhitmore@santafecountynm.gov

APPENDIX B

CAMPAIGN CONTRIBUTION DISCLOSURE FORM

Pursuant to the Procurement Code, Sections 13-1-28, et seq., NMSA 1978 and NMSA 1978, § 13-1-191.1 (2006), as amended by Laws of 2007, Chapter 234, 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 a local public body during the two 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 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 year period.

Furthermore, the state agency or local public body may cancel a solicitation or proposed award for a proposed contract pursuant to Section 13-1-181 NMSA 1978 or a contract that is executed may be ratified or terminated pursuant to Section 13-1-182 NMSA 1978 of the Procurement Code 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.

The state agency or local public body that procures the services or items of tangible personal property shall indicate on the form the name or names of every applicable public official, if any, for which disclosure is required by a prospective contractor.

THIS FORM MUST BE INCLUDED IN THE REQUEST FOR PROPOSALS AND 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 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 unreimbursed 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.

"Family member" means spouse, father, mother, child, father-in-law, mother-in-law, daughter-in-law or son-in-law of (a) a prospective contractor, if the prospective contractor is a natural person; or (b) an owner of a prospective contractor.

"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.

"Prospective contractor" means a person or business that is subject to the competitive sealed proposal process set forth in the Procurement Code or is not required to submit a competitive sealed proposal because that person or business 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.

Name(s) of Applicable Public Official(s) if any: _____
(Completed by State Agency or Local Public Body)

DISCLOSURE OF CONTRIBUTIONS BY PROSPECTIVE CONTRACTOR:

Contribution Made By: _____

Relation to Prospective Contractor: _____

Date Contribution(s) Made: _____

Amount(s) of Contribution(s) _____

Nature of Contribution(s) _____

Purpose of Contribution(s)

(Attach extra pages if necessary)

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)

APPENDIX C**Resident Veterans Preference Certification**

_____ (NAME OF CONTRACTOR) hereby certifies the following in regard to application of the resident veterans' preference to this procurement.

Please check the box below:

☐ I declare under penalty of perjury that my business prior year revenue starting January 1 ending December 31 is up to \$3M allowing me the 10% preference discount on this solicitation. I understand that knowingly giving false or misleading information about this fact constitutes a crime.

"I agree to submit a report or reports to the State Purchasing Division of the General Services Department declaring under penalty of perjury that during the last calendar year starting January 1 and ending on December 31, the following to be true and accurate:

"In conjunction with this procurement and the requirements of this business application for a Resident Veteran Business Preference/Resident Veteran Contractor Preference under Sections 13-1-21 or 13-1-22 NMSA 1978, which awarded a contract which was on the basis of having such veterans preference, I agree to report to the State Purchasing Division of the General Services Department the awarded amount involved. I will indicate in the report the award amount as a purchase from a public body or as a public works contract from a public body as the case may be."

"I understand that knowingly giving false or misleading information on this report constitutes a crime".

I declare under penalty of perjury that this statement is true to the best of my knowledge. I understand that giving false or misleading statements about material fact regarding this matter constitutes a crime.

(Signature of Business Representative)*

(Date)

*Must be an authorized signatory of the Business.

The representations made in checking the box constitutes a material representation by the business that is subject to protest and may result in denial of an award or un-award of the procurement involved if the statements are proven to be incorrect.

SIGNED AND SEALED THIS _____ DAY OF _____, 2018.

NOTARY PUBLIC

My Commission Expires:

APPENDIX D

New Mexico Wage Determination



STATE OF NEW MEXICO
NEW MEXICO DEPARTMENT OF
WORKFORCE SOLUTIONS
Labor Relations Division
121 Tijeras Ave NE, Suite 3000
Albuquerque, NM 87102
www.dws.state.nm.us

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.
- Submit weekly certified payroll bi-weekly to the Contracting Agency.
- 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.
- Make sure, when a project has been completed, the Affidavits of Wages Paid (AWP) are sent to the Contracting Agency.



STATE OF NEW MEXICO
NEW MEXICO DEPARTMENT OF
WORKFORCE SOLUTIONS
Labor Relations Division
121 Tijeras Ave NE, Suite 3000
Albuquerque, NM 87102
www.dws.state.nm.us

- All Subcontractors 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.

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.
- Submit weekly certified payroll bi-weekly to the General Contractor(s).
- 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 be listed on the Subcontractor List and must adhere to the Public Works Minimum Wage Act.

Additional Information

Reference material and forms may be found at 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.

TYPE "A" - STREET, HIGHWAY, UTILITY & LIGHT ENGINEERING

Effective January 1, 2018

Trade Classification	Base Rate	Fringe Rate
Bricklayer/Blocklayer/Stonemason	23.52	8.84
Carpenter/Lather	24.00	9.97
Cement Mason	17.42	6.35
Ironworker	26.50	15.30
Painter (Brush/Roller/Spray)	16.75	6.28
Plumber/Pipefitter	28.95	12.23
Electricians (outside)		
Groundman	22.36	11.56
Equipment Operator	32.08	14.09
Lineman/Wireman or Tech	37.75	15.57
Cable Splicer	41.53	16.56
Laborers		
Group I	11.96	5.55
Group II	12.26	5.55
Group III	12.66	5.55
Operators		
Group I	16.94	6.33
Group II	17.69	6.33
Group III	17.80	6.33
Group IV	17.88	6.33
Group V	18.00	6.33
Group VI	18.14	6.33
Group VII	18.52	6.33
Group VIII	18.75	6.33
Group IX	25.70	6.33
Group X	28.60	6.33
Truck Drivers		
Group I	16.00	7.17
Group II	16.00	7.17
Group III	16.00	7.17
Group IV	16.00	7.17

NOTE: All contractors are required to pay **SUBSISTENCE, ZONE AND INCENTIVE PAY** 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.

APPENDIX E
Specifications and Plans



**SANTA FE COUNTY
VISTA AURORA SUBDIVISION SANITARY SEWER UPGRADE
PN#2016-0171-PW/IC**

DESIGN PROJECT SPECIFICATIONS – 100%

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STANDARD SPECIFICATIONS AND GENERAL PROVISIONS

The New Mexico Department of Transportation Standard Specifications for Highway and Bridge construction, 2014 Edition (SSHBC), the New Mexico Standard Specifications for Public Works Construction, 2006 Edition (NM APWA), Santa Fe County Design Specifications, and City of Santa Fe Engineering Design Guidelines are incorporated by reference to these project specifications.

References to “Department” shall be replaced with “Design Project Engineer or Owner”. Any conflicts between plans, specifications, and references shall be resolved using the more stringent requirement, at the direction of the Design Project Engineer.

-----END OF STANDARD SPECIFICATIONS AND GENERAL PROVISIONS-----

SPECIAL PROVISIONS

The following are special provisions modifying individual sections of the New Mexico Standard Specifications for Public Works Construction, 2006 Edition (NM APWA):

PUBLIC WORKS SPECIAL PROVISION SECTION 101 – PORTLAND CEMENT CONCRETE

Delete entire section and replace with “all concrete and flowable fill mixes need designed and approved in accordance with Section 509 Portland Cement Concrete Mix Designs of the NMDOT specifications”.

PUBLIC WORKS SPECIAL PROVISION SECTION 121 – PLASTIC PIPE

121.5.2.5.1: Sewer service line connections are permitted as shown on the plans.

PUBLIC WORKS SPECIAL PROVISION SECTION 701 – TRENCHING, EXCAVATION AND BACKFILL

701.8: REMOVAL OF EXISTING PAVEMENT, SIDEWALK, AND DRIVEWAY: The CONTRACTOR is responsible for obtaining any required pavement cutting permits.

701.13.3.4: Delete this Section and replace with “The CONTRACTOR shall utilize acceptable native material in the embedment zone in conformance with these specifications. Additional compensation for importing Class C bedding with select granular material for the embedment zone will be allowed for sewer lines flatter than 1%. The CONTRACTOR shall utilize acceptable native material in the compacted fill above the embedment zone in conformance with these specifications. Additional compensation for importing a different material for the compacted fill above the embedment zone will only be allowed if the native material is Class IV, Class V, or rock.”

701.15.4: Add the following to the end of this section: “For each lift of backfill, compaction tests will be taken as directed by the Project Manager. At a minimum, tests within road rights of way will be required 100 feet apart along pipe centerline at each 1 foot depth interval. At a minimum, tests not within road rights of way will be required 200 feet apart along pipe centerline at each 1 foot depth interval. Tests will be staggered horizontally from tests taken at lower lifts.

PUBLIC WORKS SPECIAL PROVISION SECTION 901 – SANITARY SEWER COLLECTOR
AND INTERCEPTOR FACILITIES

901.8.2.2: Replace “VHS videotape recordings” with “Digital Video Files”.

901.9.4.2: Delete entire section and replace with “Television inspection is defined in Subsection 901.8.2. Measurement and payment will be by the linear foot of television inspection and to include all items within Subsection 901.8.2”.

PUBLIC WORKS SPECIAL PROVISION SECTION 905 – SANITARY SEWER SERVICE
LINES

905.6.1: Replace “utilizing new saddles.” with “utilizing new saddles, tee connections, or core drill and grout in manhole as required.”

905.8.3: Add “or core drill and grout in manhole” to the list of items included in payment.

PUBLIC WORKS SPECIAL PROVISION SECTION 920 – SANITARY AND STORM SEWER
MANHOLES

920.8.1.1: Delete entire section and replace with “Type E manholes of 4-foot diameter with a depth of up to 6 feet shall be measured per each. Manholes which are greater in depth than 6 feet shall be measured per each, with any additional depth over 6 feet to be paid for as extra depth as shown in 920.8.1.2.”

920.8.1.2: Delete entire section and replace with “Extra depth at manholes over 6 feet shall be paid by the vertical foot of manhole in excess of 6 feet. For example, a manhole with depth of 8 feet will be paid for as each under 920.8.1.1 as well as 2 feet of extra depth under this section.”

-----END OF SPECIAL PROVISIONS-----

SUPPLEMENTAL SPECIFICATION
SECTION SS-1

ASPHALT REMOVAL AND REPLACEMENT

SS-1.1 GENERAL

The following specifications set forth the requirements for asphalt patching.

SS-1.2 NMDOT STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGE
CONSTRUCTION, 2014 EDITION (SSHBC)

SECTION 207	SUBGRADE PREPARATION
SECTION 303	BASE COURSE
SECTION 423	HOT MIX ASPHALT
SECTION 601	REMOVAL OF STRUCTURES AND OBSTRUCTIONS

SS-1.3 INSTALLATION

SS-1.3.1 Sawcut and remove existing pavement and base course per SECTION 601 of the SSHBC

SS-1.3.2 Complete subsurface work in accordance with plans and specification. Ensure all required testing is complete prior to replacing backfill.

SS-1.3.3 Once backfill is at proper elevations, prepare subgrade in accordance with SECTION 207 of the SSHBC.

SS-1.3.4 Place base course in accordance with SECTION 303 of the SSHBC. CONTRACTOR shall match existing thickness of base course.

SS-1.3.5 Place asphalt concrete pavement in accordance with SECTION 423 of the SSHBC. CONTRACTOR shall match existing thickness / type of asphalt concrete pavement.

SS-1.4 WORK INCLUDED

Sawcut, removal of existing asphalt and base course, and replacement of complete paving section as shown on the plans shall be included.

SS-1.5 MEASUREMENT AND PAYMENT

Removal and replacement of paving section will be included in the measurement per square yard.

----- END OF SUPPLEMENTAL SPECIFICATION SS-1 -----

SECTION 207: SUBGRADE PREPARATION

207.1 DESCRIPTION

This Work consists of compacting and finishing the Subgrade.

207.2 MATERIALS—Reserved

207.3 CONSTRUCTION REQUIREMENTS

Maximum dry density of all soil types encountered or used will be determined in accordance with AASHTO T 180 (Modified Proctor), Method D (TTCP Modified) and AASHTO T 224.

Ensure the top two (2) ft of the finished Subgrade contains material with the design R-value. For Subgrade material not meeting design R-value, perform subexcavation in accordance with section 203.3.6.

Compact the top six (6) inches of the Roadbed to 95% of maximum density.

Ensure the soil moisture content (at the time of compaction) is from optimum to optimum minus five percent (5%). For soils with a PI of 15 or greater, ensure the moisture content of the soil at the time of compaction is from optimum moisture to optimum moisture plus four percent (4%).

Conduct field density tests at locations according to Minimum Testing Requirements, in accordance with AASHTO T 310, or by other Department-approved methods.

207.3.1 Tolerances

Ensure the top surface of the finished Subgrade is within 0.10 ft of the Plan Subgrade elevation. The Department will measure tolerances on the finished surface at right angles to the centerline.

207.4 METHOD OF MEASUREMENT—Reserved

207.5 BASIS OF PAYMENT

Pay Item	Pay Unit
<i>Subgrade Preparation</i>	Square Yard

207.5.1 Work Included in Payment

No payment will be made for rehandling or reworking material to meet moisture and density requirements.

SECTION 303: BASE COURSE

303.1 DESCRIPTION

This Work consists of providing, hauling, and placing Base Course.

303.1.1 Stockpiling

This Work consists of providing, hauling, and stockpiling Base Course at specified locations.

303.1.2 Removing, Processing, and Placing Base Course

This Work consists of removing, hauling, processing, placing existing Base Course material.

303.2 MATERIALS

303.2.1 General

Base Course consists of one (1) or more of the following:

1. Crushed stone;
2. Crushed or screened gravel;
3. Caliche;
4. Sand;
5. Recycled Asphalt Pavement (RAP) not to exceed 50%; recycled concrete pavement (RC) not to exceed 75%; and the combined RAP and RC not to exceed 75% by weight.
6. Processed glass aggregate.

Base Course does not contain organic matter or other Deleterious Materials, including silt and clay balls.

The Department will allow a maximum of 10% (by weight) processed glass aggregate, uniformly distributed, in composite Base Course. Processed glass aggregate shall meet physical properties and deleterious substance requirements in accordance with AASHTO M 318.

303.2.2 Aggregate Acceptance

The Department will accept Base Course based on periodic random samples taken by the Department from the Roadway. Unless the Contract specifies otherwise, combine the aggregate Materials, including processed glass aggregate (if used), in proportions that produce a homogeneous composite blend in accordance with Table 303.2.1:1, "Type I Base Course Gradation Band."

Table 303.2.1:1
Type I Base Course Gradation Band

Sieve size	% passing
1.0 inch	100
¾ inch	80--100
No. 4	30-60
No. 10	20-45
No. 200	3.0-10.0

Table 303.2.1:2
Type II Base Course Gradation Band

Sieve size	% passing
1.0 inch	100
¾ inch	85-95
No. 4	40-70
No. 10	30-55
No. 200	6.0-15.0

Ensure that at least 50% of the Materials retained on or above the No. 4 sieve have at least two (2) Fractured Faces when evaluated in accordance with AASHTO T-335, "Determining the Percentage of Fracture in Coarse Aggregate". Provide Base Course from a material source with a maximum AI of 35 when calculated in accordance with Section 910, "Aggregate Index," a maximum LL of 25, and a maximum PI of 6. Determine the AI for the untreated natural aggregate source.

303.3 CONSTRUCTION REQUIREMENTS

303.3.1 Preparation of Subgrade

Clear the Subgrade of loose and Deleterious Material. Ensure that the top six (6) inches of the Roadbed meets the density requirements of Section 207, "Subgrade Preparation." Proof-roll the Subgrade with Equipment described in the Contractor's Quality Control Plan and approved by the Project Manager to expose and correct soft areas.

303.3.2 Mixing and Placing

Mix the Base Course Material to a homogenous mixture. Place maximum six (6) inches (compacted) lifts, unless specified otherwise. Do not place on frozen Subgrade. Compact Base Course to at least 96% of maximum density as determined by AASHTO T 180 (Modified Proctor), Method D (TTCP Modified). The Department will take field density tests and gradation samples at random locations. The Department will use nuclear testing methods to determine in-place densities in accordance with AASHTO T 310 and TTCP procedures.

303.3.3 Surface Tolerance

The Department will allow a surface tolerance of ½ inch within ten (10) feet. If the depth is deficient, the Project Manager can accept the Work and reduce the Contractor's payment, or reject the Work with subsequent replacement by the Contractor.

303.3.4 Plan Base Course and Sub-base Depths

Monitor and record Base Course depth during the placement in accordance with the Department's *Minimum Testing and Acceptance Requirements*. If the placed thickness deviates from the requirements by more than minus ½ inch, the Project Manager may:

1. Accept and approve the payment for the measured quantity only; or
2. Allow Contractor to add material and reprocess to correct the deficiency, to meet specification required in section 303.2.2.

303.3.5 Stockpiled Base Course

Stockpile material at locations shown on the Plans. Prevent segregation of Materials at each stockpile. Maintain each stockpile in accordance with Section 423.2.2.3, "Stockpiling."

303.3.6 Removing and Processing Base Course

Minimize contamination of Base Course Material when removing it from the Roadway.

303.3.7 Sampling and Testing

Sample and test the Base Course in accordance with Section 901, Quality Control/Quality Assurance (QC/QA), and the Department's "Minimum Testing Requirements for Base Course". Department personnel may test locations other than the random locations generated for statistical analysis. These tests will not be used for pay factor determination, but may be used to determine Acceptance or rejection of localized material.

303.3.7.1 Contractor Quality Control

Develop and administer a Quality Control plan that ensures the product meets the requirements of Section 901.2, "Contractor Quality Control." Ensure that the Quality Control plan addresses the following elements:

1. Contractor management and process control personnel,
2. Testing Equipment and lab facilities,
3. Aggregate production,
4. Aggregate quality
5. Stockpile management,
6. Proportioning,
7. Mixing and processing,
8. Transporting,
9. Placing and spreading,
10. Compaction,
11. Line and grade control, and
12. Criteria for the correction or rejection of unsatisfactory Materials.

Provide copies of TTCP wallet cards or certifications for personnel who are responsible for sampling and testing the Base Course. Update the list as required if personnel substitutions are made. Use test results, inspections, and other Quality Control practices to assure the quality of each material source and to control processes for crushing, mixing, proportioning, processing, transporting, placing, spreading, and compacting quality.

303.3.8 Acceptance

The Department will accept Base Course Materials based on samples taken in accordance with the Departments Minimum Testing Requirements after placement but before compaction. Acceptance will be in accordance with Section 303.3 Construction Requirements. If necessary, re-work the Base Course until all requirements are met.

303.4 METHOD OF MEASUREMENT

When calculating the square yardage the Department will use the average Base Course width and the station-to-station length along the centerline. The dimensions will show on the typical section of the Plans. When calculating the weight of the material, the Department will deduct the weight of moisture that exceeds the optimum moisture content plus two percent (2%). No additional payment shall be made for the stockpile pad.

303.5 BASIS OF PAYMENT

The Department will pay for the accepted quantities of *Base Course* as determined in Section 303.3.8, "Acceptance."

Pay Item	Pay Unit
<i>Base Course</i>	Cubic Yard or Ton
<i>Base Course _____inch Depth</i>	Square Yard
<i>Remove, Process and Place Base Course</i>	Square Yard or Ton

SECTION 423: HOT MIX ASPHALT — SUPERPAVE (QLA and Non-QLA)

423.1 DESCRIPTION

This Work consists of constructing one (1) or more courses of hot-mix asphalt (HMA) on a prepared base.

423.2 MATERIALS

423.2.1 General

HMA is a mixture of asphalt binder, aggregate, blending sand, mineral filler, and hydrated lime or anhydrite based material. Unless otherwise prohibited in the Contract, the Department will allow Recycled Asphalt Pavement (RAP) in HMA mixtures as long as the resulting mixture conforms to all specification requirements.

Size, uniformly grade, and combine aggregate fractions in accordance with the Contract. Test Materials in accordance with applicable AASHTO methods, as modified by the Department (if applicable) or other test procedures as directed by the Department. The State Materials Bureau will decide all questions pertaining to the interpretation of test procedures.

423.2.2 Aggregate

Ensure the aggregate gradation of the HMA mixture meets the requirements of Table 423.2.2.1:1, "HMA Aggregate Gradation Control Points." The Project Manager may require, at no additional cost to the Department, wet preparation, per AASHTO T 146, Method A, if the Project Manager determines there are Deleterious Materials present in the aggregate stockpiles before aggregate gradation testing. The Contract will specify the type of HMA the Contractor is to use. The Department will allow the Contractor to combine Materials from two (2) or more sources to produce aggregate only when each individual aggregate source meets all applicable quality requirements.

423.2.2.1 Gradation and Quality Requirements

Table 423.2.2.1:1

a. HMA Aggregate Gradation Control Points

Sieve size	% passing per HMA type					
	SP-II		SP-III		SP-IV	
	Min	Max	Min	Max	Min	Max
two (2) inch	—	—	—	—	—	—
1 1/2 inch	100	—	—	—	—	—
One (1) inch	90	100	100	—	—	—
3/4 inch	—	90	90	100	100	—
1/2 inch	—	—	—	90	90	100
3/8 inch	—	—	—	—	—	90
No. 8	19	45	23	49	28	58
No. 200	1.0	7.0	2.0	8.0	2.0	10.0

423.2.2.1.1 Aggregate Quality

For each Material source, ensure the HMA coarse aggregate has an AI of 25 or less when calculated in accordance with Section 910, "Aggregate Index."

Regulate the crushing of aggregate stockpiles so that the minimum Fractured Faces content of the plus No. 4 Material complies with the requirements of Table 423.2.2.1.2:1, "Fractured Faces, Sand Equivalent, and Fine Aggregate Angularity," and evaluation by NMDOT Method FF-1, "*Fractured Face Determination for Coarse Aggregate*." Ensure the plus 3/8 inch

material contains no more than 20% flat, elongated particles with a dimensional ratio of 3:1 or greater as determined by ASTM D 4791 (TTCP Modified). Ensure the combined material, excluding RAP, passing the No. 40 sieve is non-plastic. Ensure that before the addition of hydrated lime or anhydrite based material, the minimum sand equivalent value and the minimum fine aggregate angularity value of the combined aggregate, excluding RAP, complies with the requirements of Table 423.2.2.1.2:1, “Fractured Faces, Sand Equivalent, and Fine Aggregate Angularity.” Determine the sand equivalent value in accordance with AASHTO T 176, Alternate Method No. 1 and the fine aggregate angularity value in accordance with AASHTO T 304, Method A.

423.2.2.1.2 Fractured Faces

The Department will consider a face to be fractured when at least one-half of the projected particle area exhibits a rough, angular, or broken texture with well defined edges.

Table 423.2.2.1.2:1
Minimum Fractured Faces, Sand Equivalent, and Fine Aggregate Angularity for Virgin Aggregates

Design Traffic, ESALs^a x 10⁶	Fractured Faces^b	Sand Equivalent (%)	Fine Aggregate Angularity
< 3.0	75.0 / —	45.0	40.0
≥ 3.0 – < 10.0	85.0 / 80.0	45.0	45.0
≥ 10.0 – < 30.0	95.0 / 90.0	45.0	45.0
≥ 30.0	99.0 / 95.0	50.0	45.0

^aESALs are based on a 20-year design life for all scenarios.

^bUnder “Fractured Faces”, 85.0 / 80.0 denotes that 85.0% of the coarse aggregate has at least 1 Fractured Face and 80.0% has at least two (2) Fractured Faces.

Ensure RAP provided from sources outside the Project has at least 75% Fractured Faces (one (1) Fractured Face); however, Sand Equivalent and Fine Aggregate Angularity do not apply.

423.2.2.2 Production

When producing aggregates for HMA, remove natural fines by screening and stockpiling separately. Use a No. 4 screen, minimum, or a larger screen if needed to properly control the crushing and screening operation. Crush the aggregate retained on the scalping screen and separate the crushed Material into at least two (2) stockpiles of fine and coarse aggregates. Regulate crushing operations to produce Material within the specified gradation band.

423.2.2.3 Stockpiling

The following requirements apply to stockpiles:

1. Place stockpiles upon prepared sites;
2. Make stockpiles neat and regular to prevent segregation;
3. Provide enough storage space for each size of aggregate;
4. Separate the aggregate stockpiles far enough apart to prevent mixing, or with walls or partitions;
5. Prevent contamination (store stockpiles away from vehicular and Equipment traffic);
6. Keep the storage yard neat and orderly and keep the stockpiles accessible for sampling; and
7. Keep the aggregate sizes separated until delivered to the cold feed system that feeds the drier.

423.2.2.4 Combining

When combining crushed Materials from different stockpiles, including RAP (if in the mixture); ensure the product is in accordance with the mix design gradation requirements. Use controlled feeders from each stockpile to combine crushed Material.

423.2.3 Asphalt Binder

The Contract will specify the type and grade of asphalt binder. Provide asphalt binders in accordance with Section 402, "Asphalt Materials, Hydrated Lime, and Anhydrite Based Material." Do not change the asphalt source after approval of the mix design without written approval of the State Materials Bureau.

423.2.4 Hydrated Lime or Anhydrite Based Material

Provide hydrated lime or anhydrite based material in accordance with Section 402, "Asphalt Materials, Hydrated Lime, and Anhydrite Based Material."

423.2.5 Blending Sand

Blending sand consists of the following:

1. Natural fines from the scalping process;
2. Concrete sand;
3. Sandy Material; or
4. A combination of these, graded to the mix design requirements.

Determine the need for and percentage (a maximum of 20.0%) of blending sand using mix design tests on samples taken from stockpiles during crushing operations and submitted to an approved testing Laboratory.

423.2.6 Mineral Filler

Provide mineral filler in accordance with AASHTO M 17 and approved by the State Materials Bureau. The Department will not allow fly ash as mineral filler for HMA.

423.2.7 Reclaimed Asphalt Pavement

Unless otherwise specified in the Contract, the Contractor may use RAP removed under the Contract consisting of salvaged, milled, pulverized, broken, or crushed asphalt pavement. The Contractor may use RAP produced from outside sources provided evidence of ownership is supplied and the following is met: After the Contractor obtains sufficient quantities of RAP aggregate samples in accordance with AASHTO T 308, the Department will accept RAP for which each fraction of coarse aggregate has a percent wear of 40.0 or less, at 500 revolutions, when tested in accordance with AASHTO T 96. Provide plus No. 4 RAP Material with a minimum of 75% Fractured Faces content (one (1) face).

The Contractor may use a maximum of 15% RAP (by weight) in the production of HMA mixtures without changing the asphalt binder. For quantities greater than 15% to 25% RAP, either lower the asphalt binder's high and low temperature grades by one (1) grade (e.g. lower a PG 76-22 to a PG 70-28) or extract, recover, and combine the RAP's asphalt binder with a virgin asphalt binder per AASHTO M 323, Appendix A, ensuring the resultant binder meets the entire AASHTO M 320 required Project PG asphalt binder properties indicated on the approved mix design. For quantities greater than 25% to 35% RAP, extract, recover, and combine the RAP's asphalt binder with a virgin asphalt binder per AASHTO M 323, Appendix A. Ensure the resultant binder meets the entire AASHTO M 320 required Project PG asphalt binder properties indicated on the approved mix design. The Department will not allow the Contractor to use more than 35% RAP in the production of HMA mixtures. For Projects of entirely new construction, limit the RAP to 15% in the top mat or extract, recover and combine the RAP's asphalt binder with a virgin asphalt binder per AASHTO M323, Appendix A. Ensure the resultant binder meets the entire AASHTO M320 required Project PG asphalt binder properties indicated on the approved mix design.

Process RAP so that 100% passes a 1-1/2-inch sieve. For HMA mixtures containing greater than 15% RAP, maintain adequate stockpile management (i.e. sufficient quantities and shaping of the stockpiles) and fractionation (divide the RAP into a minimum of two (2) stockpiles), so they are uniform throughout the stockpiles. Address in the Quality Control Plan how RAP will be controlled, such as which screen will be used to split into two (2) stockpiles, or by what method the RAP will be controlled to keep the resultant mix within acceptable limits. Account for the weight of the binder in the RAP when batching aggregates. Provide RAP that is free of Deleterious Materials. If the Contractor decides to use RAP in the production of HMA mixtures, the Department will make no additional payment for the asphalt binder in the RAP or asphalt binder due to asphalt binder grade adjustment. As RAP is produced and prepared for inclusion in the HMA, perform Process Control testing in accordance with Section 901, "Quality Control/Quality Assurance," Table 901.7:3, Minimum Process Control Guidelines for Aggregates and Base Course.

If problems with HMA consistency or compliance with Project Specifications occur, additional efforts taken to achieve acceptable levels of consistency and compliance with Contract Specifications, at the Contractor's discretion (at no additional cost to the Department), include, but are not limited to:

- Reduce the top size of the RAP from 1-1/2" to 1";
- Fractionate the aggregates on a second screen, such as the 3/8" or 1/4" Screen so that the RAP is maintained in three (3) stockpiles, one being Rap larger than 1-1/2" to 2", Coarse RAP and the third being Fine RAP;
- Ensure that the RAP used in the HMA mix design is representative of the RAP available on the Project;
- Cover the RAP pile(s) so that ambient moisture is not absorbed; and
- Process and maintain the stockpiles so that the RAP material is equally and uniformly distributed throughout the entire stockpile(s) and is withdrawn such that uniform, non-segregated RAP is delivered to the hoppers.

423.2.8 Mix Design

Provide a mix design developed by a Department-approved testing Laboratory, reviewed and signed by a professional Engineer licensed by the New Mexico Board of Registration for Professional Engineers and Land Surveyors. A list of approved private testing laboratories is available from the State Materials Bureau. Develop the mix design at no additional cost to the Department. The Contractor may develop the mix design at any time prior to the Project Pre-Paving Conference. Submit at least five (5) independent aggregate gradation test results from each stockpile to the Project Manager.

Provide the Department with a copy of the request to the testing Laboratory to develop a mix design, along with supporting documents in accordance with AASHTO R 35, to the Project Manager and the State Asphalt Engineer. Include the proposed aggregate combination and copies of all stockpile test results. Summarize the mix design results from the Department-approved testing Laboratory in a format approved by the State Materials Bureau and submit them to the Project Manager and State Asphalt Engineer for review and concurrence by the State Asphalt Engineer. Include the results and design worksheets of testing calculations in accordance with AASHTO R 35, for the mix components as well as the mixture itself and in accordance with State Materials Bureau procedures. Department concurrence of a mix design will not relieve the Contractor of full responsibility for producing an acceptable mixture. The mix design may require adjustment in accordance with Section 423.2.8.1, "Mix Design Adjustment."

Create the JMF gradation in accordance with Table 423.2.2.1:1, "HMA Aggregate Gradation Control Points." The Department will require at least one percent (1.0%) hydrated lime or anhydrite based material in all mix designs. Include the hydrated lime or anhydrite based material in the gradation for developing the mix design. The mix design shall establish a single percentage of the aggregate passing each sieve size and a single percentage of asphalt binder the Contractor is to add to the aggregate. Develop the mix design using the

Strategic Highway Research Program (SHRP) gyratory compactor in accordance with AASHTO R 35. AASHTO TP 77 may be used in lieu of AASHTO T 84/T 85. The mix design shall be in accordance with Table 423.2.8:1, "HMA Superpave Design Requirements for Aggregates with Less Than three percent (3.0%) Absorption," or Table 423.2.8:2, "HMA Superpave Design Requirements for Aggregates with three percent (3.0%) or Greater Absorption."

Test the HMA with at least one percent (1.0%) hydrated lime or anhydrite based material in accordance with AASHTO T 283, as modified below:

- Use six (6) inch by 3.75 inch specimens for all prisms;
- Compact all test specimens in accordance with AASHTO T 312 to an air content of seven percent (7%) +/- 0.5%;
- On the AASHTO T283 Section 11.3 scale of 0-5, with 5 exhibiting the most damage from moisture, visually estimate the amount of damage caused by moisture on the interior surfaces of each broken prism.
- Use a minimum of one percent (1%) hydrated lime or anhydrite based material and ensure the design amount results in a tensile stress ratio of at least 85%, and that no visual rating is greater than one (1), as determined by AASHTO T283 Section 11.3. Provide a mixture that meets all applicable criteria. If tests indicate the need for additives or modifiers not specified in the Contract or a change in source of binder to satisfy mix design requirements, perform the required changes at no additional cost to the Department.

Table 423.2.8:1

**b. HMA Superpave Design
Requirements for Aggregates with
Less Than 3.0% Absorption**

(a) 20-year design ESALS	N initial	N design (b)	N max	Percent Voids in the Mineral Aggregate (VMA) per nominal maximum aggregate size			Voids Filled with Asphalt (VFA) Range, % (c)	Dust to Binder Ratio Range
				One (1) inch (SP-II)	3/4 inch (SP-III)	1/2 inch (SP-IV)		
< 0.3	<91.5			12.5	13.5	14.5	72.0–80.0	0.6 to 1.4
0.3– <3.0	<90.5	96.0	< 98.0	–	–	–	68.0–78.0	
≥3.0	<89.0			14.0	15.0	16.0	68.0–75.0	

^aIn Millions

^bDesign Air Void Content of four percent (4%)

^cFor one (1) inch nominal maximum size mixtures, the specified lower limit of the VFA shall be 70% for the design traffic level <0.3 million ESALS.

Table 423.2.8:2

**c. HMA Superpave Design
Requirements for Aggregates with
3.0% or Greater Absorption**

(a) 20-year design ESALs	N initial	N design (b)	N max	Percent Voids in the Aggregate (VMA) per maximum aggregate size			Mineral nominal (SP-IV) 1/2 inch	Voids Filled with Asphalt (VFA) Range, % (c)	Dust to Binder Ratio Range
				One(1) inch (SP-II)	3/4 inch (SP-III)				
<0.3	<91.5							70.0– 80.0	
0.3– <3.0	<90.5	96.5	< 98.0	12.0 – 14.0	13.0 – 15.0		14.0 – 16.0	65.0– 78.0	0.6 to 1.4
≥3.0	<89.0							65.0– 78.0	

^aIn Millions

^bDesign Air Void Content of 3.5%

^cFor one (1) inch nominal maximum size mixtures, the specified lower limit of the VFA will be 70% for the design traffic level <0.3 million ESALs.

When Department Reviewed Commercial Mix Designs are used on the Project, submit a copy of proposed commercial mix design to the State Materials Bureau with Project information to verify the proposed commercial mix design is appropriate to use and meets all the requirements for the specific Project. If the proposed commercial mix design meets all the requirements for the specific Project; the State Materials Bureau may re-issue the proposed commercial mix design for that specific Project.

The State Materials Bureau may allow the Contractor to use a mix design for one (1) year from the date of review by the State Materials Bureau. The Contractor may use or re-submit the design before the expiration of the one (1) year time frame. Do not use a Mix Design beyond one (1) year after the State Materials Bureau's review date. Submit acceptable evidence to the State Materials Bureau verifying that the component Materials have not changed. Submit a new mix design if changing the source of Materials. Obtain concurrence from the State Materials Bureau before using the new Materials.

423.2.9 Job Mix Formula

The Job Mix Formula (JMF) must be in accordance with all aggregate gradation requirements and result in a mix that meets all specified mix design requirements. The Department will refer to the result of the Laboratory Laboratory mix design developed in accordance with Section 423.2.8, "Mix Design," as JMF1.

Prepare the aggregate gradation of the calibration samples for analysis per AASHTO T 308. Individually calibrate each oven used to perform AASHTO T 308 in accordance with the State Materials Bureau's, *Ignition Oven Calibration Factors* procedure including a set for the Referee Lab. Provide a minimum of five (5) sets of calibration samples. Do not combine the elements of the calibration samples prepared for the Referee Lab, and provide them, with the Project Number, Contractor and Project Manager clearly identified to the Project Manager who will forward them to the State Asphalt Engineer. All Quality Control,

Quality Assurance and Independent Assurance ovens must be calibrated by this procedure prior to start of production of a JMF. New calibration samples may be required for new JMF's, as determined by the District Lab Supervisor or the State Asphalt Engineer. The Project Manager will suspend paving operations until calibration of the ovens has been completed. No additional time or compensation will be granted for completion of this requirement.

423.2.9.1 Job Mix Formula Adjustment

The Contractor may request a modification to the JMF based on field testing of Material produced through the plant. It is expected that minor adjustments will be necessary and the Project Manager (with the concurrence of the Department's District Laboratory Supervisor) may approve a new JMF if the adjustment results in a new TV that is within the tolerance from the design TV. (Example: If design TV for No. 4 sieve is 30%, then a new TV may be approved in the field from 23% - 37%). Test results and calculations that verify a proposed JMF adjustment complies with the Specifications will be required prior to being reviewed by the Project Manager and concurred by the State Materials Bureau. Review and concurrence of a JMF adjustment can only be made after:

- The Quality Control Plan (including checks on specific gravity) has been submitted and concurred by the Project Manager and the District Lab Supervisor for use on the Project;
- Confirmation by the Project Manager that the Quality Control Plan is being followed;
- Concurrence of the proposed changes from Project Manager and District Lab Supervisor,
- Submittal by the Testing Laboratory responsible for the original mix design to the Project Manager with a copy to the State Asphalt Engineer.

If the JMF is adjusted after the Shakedown Period, terminate the previous lot when the adjusted JMF has been reviewed and concurred with by the Project Manager, Assistant District Engineer for Construction and the State Materials Bureau. Terminated lot will be added to the previous lot for evaluation by QLA. Begin a new lot for the QLA with the adjusted JMF. During the Shakedown Period, make JMF adjustments in accordance with Section 423.3.5.7, Test Strip and Shakedown Period.

423.3 CONSTRUCTION REQUIREMENTS

423.3.1 General

Provide sufficient storage space for each size of aggregate and RAP. Keep the different sizes separate until delivery to the cold feed system feeding the drier. While storing and moving the coarse and fine aggregate, ensure that segregation, degradation, or combination of Materials of different grades does not occur. Re-screen or waste segregated or degraded Material. Provide separate storage and bin feeder for mineral filler if the Contract requires mineral filler. Stockpile aggregates and RAP that contain gravitational water and allow them to drain before mixing. After introducing the required amounts of aggregate, RAP (if used), and asphalt binder into the mixer, mix them until the aggregate particles are completely and uniformly coated with asphalt binder. If the Project Manager determines that uncoated aggregate exists, take corrective action. Ensure that the moisture content of the HMA at discharge from the mixer does not exceed 0.5%.

423.3.2 Mix Temperature Requirements

Do not allow the temperature of the HMA discharged from the mixer into the transport vehicle to be greater or less than the target mixing temperature specified in the mix design by more than ten percent (10%) F, not to exceed 350° F, unless written concurrence by the oil Supplier and design lab are provided to the Project Manager. HMA delivered to the Project with mix temperatures outside the acceptable range shall, at the sole discretion of the Project Manager, be removed and replaced at no cost to the Department.

423.3.3 Addition of Hydrated Lime or Anhydrite Based Material

Add the hydrated lime or anhydrite based material to the aggregate in an enclosed pug mill immediately after leaving the cold feed and just before introduction into the drier drum or aggregate drier. Minimize the loss of hydrated lime or anhydrite based material while adding to the aggregate. Use an enclosed conveyor belt to prevent blowing or loss of hydrated lime or anhydrite based material if necessary. During production, if necessary to counteract loss, increase the percentage of hydrated lime or anhydrite based material.

Equip the out feed of the hydrated lime or anhydrite based material silo with a vane feeder and install a flow sensor on the discharge from the vane feeder. Ensure that the sensor activates audible and visual signals at the control panel upon interruption of hydrated lime or anhydrite based material flow.

Equip the hydrated lime or anhydrite based material silo with an approved means of metering the addition of hydrated lime or anhydrite based material to the mix at typical discharge rates with an accuracy of $\pm 3.0\%$, by weight. Approved means of metering hydrated lime or anhydrite based material include load cell weighing devices placed beneath each leg of the silo, or a weigh belt feeder between the silo discharge and the pug mill. Obtain Project Manager's approval for other means of metering the addition of hydrated lime or anhydrite based material before use. Do not use external strain gauges affixed to the legs of the silo. If the Contractor uses load cell weighing devices for hydrated lime or anhydrite based material metering, use a foundation system to support the silo in accordance with the silo manufacturer's recommendations. Control the hydrated lime or anhydrite based material content such that at a minimum the amount added is equal to the Target Value on the Job Mix Formula.

When mixing the aggregate and hydrated lime or anhydrite based material, maintain the moisture content of the combined aggregate at the recommended saturated surface dry moisture content, plus an additional $1.5\% \pm 0.5\%$, by weight. The Project Manager may increase the moisture content of the coarse and fine aggregates to properly coat the aggregates with hydrated lime or anhydrite based material and to eliminate dust pollution. Provide a method to measure the amount of moisture added to the hydrated lime or anhydrite based material-aggregate mix. On a daily basis, record the average amount of added moisture to verify specification compliance. Supply the recorded moisture information to the Project Manager upon request.

423.3.4 Equipment

423.3.4.1 Mixing Plants

423.3.4.1.1 Plant Scales

Ensure that the scales are accurate to 0.5% of the maximum allowable load in accordance with the Federal Motor Carrier Safety Administration (FMCSA) publication. A licensed scale serviceman must certify the scales. Submit a copy of the certification to the Project Manager.

423.3.4.1.2 Equipment for Preparation of Asphalt Materials

Provide storage tanks for asphalt binder capable of heating and holding the asphalt at the required temperatures and measuring the temperature of the asphalt in the tank. Use approved heating methods that do not allow flames in contact with the tank. Design the circulating system for the asphalt binder to ensure proper and continuous circulation during the operating period. Allow measuring and sampling of asphalt binder from the delivery truck upon arrival.

423.3.4.1.3 Feeder for Drier

Equip the plant with an accurate feeding mechanism to deliver the aggregate into the drier and maintain uniform production and temperature.

423.3.4.1.4 Drier

Equip the plant with a system to continuously agitate the aggregate during the heating and drying process. Use a drier that can dry and heat the aggregate and prevent fuel oil or carbon from coating the aggregate. Take corrective action if the aggregate becomes coated with burner fuel.

423.3.4.1.5 Bins

Equip the plant with storage bins large enough to supply the mixer when it is operating at full capacity. Arrange the bins to ensure separate and adequate storage of the appropriate fractions of the mineral aggregates. When necessary, use separating boards. Provide separate dry storage for hydrated lime or anhydrite based material. Ensure that the gates on the bins do not leak. Equip the bins with warning devices that notify the control panel when the bins are low.

423.3.4.1.6 Asphalt Binder Control Unit

Equip the plant with the following:

1. A scale or meter to obtain the proper amount of asphalt binder in the mix, within the allowable tolerances; and
2. A meter for checking the quantity or rate of flow of asphalt binder put in the mixer.

423.3.4.1.7 Thermometers

Equip the asphalt feed line, near the charging valve at the mixer unit, with an approved recording thermometer with a range of from 100 °F to 400 °F. Equip the discharge chute of the drier with an approved recording thermometer to automatically register the temperature of the heated aggregates or mix, as necessary. Provide the Project Manager with a record of discharge temperatures at the end of each week's production and when requested by the Project Manager during the course of production.

423.3.4.1.8 Truck Scales

Weigh the HMA on approved scales (provided by the Contractor) or public scales in accordance with Section 109.1, "Measurement of Quantity."

423.3.4.1.9 Requirements for Batching Plants

423.3.4.1.9.1 Weigh Box or Hopper

Provide a batching plant that can accurately weigh aggregate in a weigh box or hopper suspended on scales. Use a weigh box or hopper that can hold a full batch. Ensure that the gate of the weigh box or hopper does not allow material to leak into the mixer while being weighed. Test the scales in accordance with Section 109.1, "Measurement of Quantity."

423.3.4.1.9.3 Mixer

Provide a batch mixer with a capacity of at least 2,000 lb, capable of producing a uniform mixture within specified tolerances.

423.3.4.1.9.4 Control of Mixing Time

Equip the mixer with an accurate timing device that signals the end of the mixing time.

423.3.4.1.10 Drum Mix Plants

Equip the drum mix plant with the following auxiliary Equipment and capabilities:

1. Separate cold feed controls for each Material.
2. An automatic interlocking device for cold feed, asphalt, and additive.
3. A means for determining moisture content of aggregate so the dry weight of cold feed can be determined for proper setting of asphalt and additive flow. Determine the moisture content of the aggregate at least twice daily and adjust the moisture correction Equipment accordingly.
4. A means for sampling individual cold feeds and provisions for sequential sampling of aggregate, RAP, asphalt binder, and additives while under full production.
5. Measure the temperature of the mix at the discharge and the automatic burner controls.
6. A surge storage system having a minimum capacity of 40 ton, designed and equipped to prevent segregation. Equip the surge storage system bins with mechanical or electrical devices that provide an audible or visual warning when the bins are less than 1/4 full.
7. Equip the bin containing fine aggregate and filler, if required, with a device that prevents material hang-up during plant operation.
8. A minimum of one (1) cold feed bin for each aggregate fraction in the mix.
9. Equip the cold feed with mechanical or electrical devices that indicate when the bins are empty or when the cold feed belt is not carrying the proper amount of Material. The device shall automatically lock the cold feed belt and provide an audible or visual warning.
10. A separate cold feed for RAP Material. Introduce RAP so that it does not come into direct contact with the burner flame.
11. Equip the feeding mechanism with an individual belt feeder with a variable speed feeder drive controlled by electronically operated actuators. Couple the asphalt feed control with the total-aggregate-weight measurement device to automatically vary the asphalt feed rate to maintain the required proportion.

423.3.4.2 Haul Equipment

Haul asphalt mixtures with trucks that have tight, clean, smooth metal beds and a thin coat (a minimal amount) of a Department-approved release agent to prevent the mixture from adhering to the bed. Do not use release agents derived from petroleum derivatives, including but not limited to diesel fuel that contaminate or alter the characteristics of the mix.

Be prepared to cover and insulate hauling beds. Equip each truck with a waterproof and windproof cover of suitable material and sufficient size to protect the mix from the weather. Securely fasten covers when necessary to maintain temperature. Ensure that covers do not allow water to enter the bed, paver or mix material transfer device during mix unlading. Use insulated truck beds when necessary to maintain temperature.

423.3.4.3 Pavers

Use self-contained, self-propelled pavers, with activated screeds or strike-off assemblies, heated if necessary, and capable of spreading and finishing courses of HMA in accordance with the Plans.

423.3.4.4 Compaction Equipment

Provide a sufficient number, weight, and type of rollers to obtain the required compaction and specified pavement density while the HMA is in a workable condition. All rollers must be capable of reversing direction without shoving or tearing the mixture.

423.3.5 Placement Operations

For cold milled surfaces, prepare the surface in accordance with Section 414, Cold Milling. Clean the existing surfaces and apply a tack coat in accordance with Section 407, "Tack Coat."

When placing HMA on Base Course, Proof Roll the Base Course with a 27 ton roller or other approved Equipment and correct any soft areas, as directed by the Project Manager. Correct deficient areas at the Contractor's expense. Place the HMA on the approved surface, then spread, and strike off to the specified grade and elevation. Spread and compact the HMA in layers in accordance with the Plans.

For new construction and reconstruction, prepare the Subgrade or Base Course as follows:

1. Clean of loose or Deleterious Materials;
2. Free of frozen material;
3. Meet the moisture and density requirements; and
4. Place prime coat, as required in the Plans unless otherwise approved by the Project Manager, in accordance with Section 408, Prime Coat.

Unless otherwise specified in the Plans, for construction on NMDOT Projects using State approved HMA designs utilizing greater than 25% RAP the use of a Materials Transfer Vehicle is required.

Materials Transfer Vehicle (MTV): Use a MTV with storage and remixing capabilities on all mainline construction when placing HMA State approved designs. The MTV will independently remix and deliver mixture from the hauling Equipment to the paving Equipment.

Furnish an MTV with the following capabilities:

1. An unloading system to receive mixtures from the hauling Equipment.
2. A minimum storage capacity of 13 tons with a remixing system in the MTV storage bin.
3. A discharge conveyor to deliver the mixture to the paver hopper.
4. The MTV system cannot exceed maximum legal loading on Structures.

Pick-up machines, hopper inserts and material transfer devices are not considered MTVs.

In the event the MTV malfunctions during paving operations, the Contractor can finish the Day without the MTV. Do not resume further mainline mix placement until the MTV is operational.

Consistently overloading the HMA mix into the paving machine is not acceptable. Coordinate the speed of the paving machine with the production of the plant and keep enough haul Equipment available to achieve continuous operation.

Use the control system on the paving machine to control the grade and the transverse slope by either of the following methods:

1. One end directly and the other indirectly through controlling the transverse slope; or
2. Each end independently, including screed attachments.

Suspend operations if the control system does not achieve the typical section in accordance with the Plans. Place, spread, and finish the courses of HMA according to the following:

1. Without segregation or tearing ;
2. True to the line, grade, and crown in accordance with the Plans; and
3. With self-propelled pavers, except as otherwise directed.

On areas where irregularities or unavoidable obstacles make the use of mechanical spreading and finishing Equipment impracticable, dump, spread, and level the HMA by other methods to achieve the required compacted thickness.

423.3.5.1 Weather Limitations

Do not place HMA on wet or frozen surfaces or if weather conditions prevent proper handling, finishing, and compacting. Place HMA when the Chill Factor is at least 40 °F and rising. If the air temperature is 60 °F or warmer, do not consider the Chill Factor.

423.3.5.2 Compaction

Compact the HMA thoroughly and uniformly immediately after placement. Operate rollers at speeds slow enough to minimize displacement of the HMA, including the lines and grades of the asphalt edges. Remove marks from pneumatic rollers and immediately correct any displacement. The Department will not allow the use of Equipment that crushes the aggregate excessively.

Prevent the HMA from sticking to the roller wheels by keeping the wheels moistened with water; water mixed with very small quantities of detergent or other approved material. Do not use diesel fuel or other petroleum diluents. At locations inaccessible to the rollers, compact the HMA with hot hand tampers, smoothing irons, or mechanical tampers. The Contractor may use a trench roller or cleated compression strips under the roller to transmit compression to depressed areas.

Remove areas that become loose, broken, mixed with dirt, segregated or defective, replace with fresh HMA, and compact to match the surrounding area, at no additional cost to the Department. Immediately correct areas that have excessive or deficient asphalt binder.

423.3.5.3 Not Used

423.3.5.4 Joints

Place the HMA as continuously as possible. Do not pass rollers over the unprotected end of a freshly laid mixture. When placing open-graded friction course over HMA, stagger longitudinal joints at least six (6) inches relative to the longitudinal joints of the underlying course.

Unless otherwise specified, taper transverse and longitudinal joints as follows:

1. At least a three (3) ft taper for transverse joints, with a taper slope no steeper than 24:1.
2. At least a one (1) ft taper or a notched taper, for longitudinal joints, with a taper slope no steeper than 6:1 or a notched taper with a one (1) inch vertical edge at the top of the taper connected to a slope no steeper than 6:1.
3. Cut and square off transverse tapers before commencing new Work.
4. Clean and tack coat longitudinal joints from previous operations.
5. Avoid placing longitudinal joints in the wheel paths, unless approved by the Project Manager.

Completely bond joints. Smooth the surface of each course at the joints. The Department will not allow deviations greater than 3/16 inch when tested with a ten (10) ft straightedge in any direction. When paving under traffic, schedule the daily surfacing operations so that tapered longitudinal joints are not exposed for longer than seven (7) Days.

423.3.5.5 Surface Tolerances

Smooth the surface of each completed course and prevent deviations larger than 1/8 inch using a ten (10) ft straightedge in any direction. Immediately correct deviations exceeding this

tolerance. Provide a final HMA surfacing course that conforms to Section 401, "Pavement Smoothness Measurement".

423.3.5.6 Plan Surfacing Depths

Provide pavement at the depth specified in the Contract. Monitor depths by calculating continuous production yields using the formula found in the MT-1, as maintained by the State Construction Bureau. Calculate the required yield and the corresponding yields for 0.25 inch increase (upper limit) and decrease (lower limit). The Project Manager may adjust the required yield to fit field conditions. If adjusted, the new target yield will be communicated to the Contractor in writing. Control production to keep yield within the upper and lower limits. Correct deficiencies at no cost to the State. Correct deficient depths during placement. Address Plan Surfacing Depths in the Quality Control Plan.

423.3.5.7 Test Strip & Shakedown Period

Construct a maximum 1,000 ton test strip for each HMA mix design with a minimum of three (3) Contractor and three (3) agency samples to evaluate the JMF, process control, and placement operations. Construct test strip on Shoulder, low volume segments of the pavement, or area approved by the Project Manager. Correct and modify non-complying placement operations and produce necessary process control adjustments. Develop a revised JMF if necessary based on the results of the test strip. Production and placement operations prior to approval of the revised JMF and placement operations are at the Contractor's risk. For purposes of payment, the test strip will be evaluated in conformance with Section 416, Minor Paving. If accepted, the test strip will have a pay factor of 1.0. If rejected, said material shall be handled in accordance with Section 423.3.6.1.3 Adherence to Specifications and Rejection of Non-specification Material. Remove unaccepted test strip material placed within the Roadway Prism at no cost to the Department. If the Contractor disagrees with removing and replacing unacceptable material placed in test strips outside the Roadway Prism, the Assistant District Engineer for Construction, based on engineering judgment, will decide if the material can remain in place with a maximum pay factor of 50%, or shall be removed and replaced at no cost to the Department. If the test strip is rejected, construct a subsequent test strip. Do not proceed to full production until an accepted test strip is produced. After the test strip is placed, continue to evaluate the mix properties and the JMF during the placement of the first two (2) sublots in the first lot. Changes may be made to either the JMF or the mix proportions and/or properties with the concurrence of the Assistant District Engineer for Construction. For changes made prior to the completion of the first two (2) sublots, the adjustments will be applied to the entire lot for purposes of payment.

The Project Manager may waive test strip requirements for the Project, if requested by the Contractor based on prior experience with the JMF.

For QLA Projects, the Shakedown Period is defined as the first two (2) sublots produced in the first lot.

For Non-QLA Projects, the Shakedown Period is defined as the test strip. As the test strip is placed, evaluate the mix properties and the JMF. Changes may be made to either the JMF or the mix proportions and/or properties with the concurrence of the Project Manager, State Materials Bureau and the Assistant District Engineer for Construction.

423.3.6 Sampling and Testing

Sample and test the aggregate production and HMA mixture in accordance with Section 901, Quality Control /Quality Assurance (QC/QA), and the Department's "Minimum Testing Requirements." Department personnel may test locations other than the random locations generated for statistical analysis. These tests will not be used for pay factor determination, but may be used to determine Acceptance or rejection of localized material.

423.3.6.1 Contractor Quality Control

Administer a Quality Control Plan, referred to hereafter as “the Plan,” to provide a product in accordance with the Contract. Ensure the Plan conforms to Section 901.2, “Contractor Quality Control.” Submit the Plan a minimum of two (2) weeks prior to commencement of crushing operations and at a minimum comply with “Contractor Quality Control Plan Guidelines”. No HMA operations are allowed until the Plan has been approved by the Project Manager and the District Lab Supervisor. Address changes in the Job Mix Formula in conformance with Section 423.2.9.1, Job Mix Formula Adjustments.

The Plan shall do the following:

1. Address elements that affect the quality of the asphalt concrete including, but not limited to, the following:
 - 1.1. Mix design;
 - 1.2. Sampling and Testing;
 - 1.3. Aggregate production;
 - 1.3.1. Gradation,
 - 1.3.2. Minus 200 wash,
 - 1.3.3. Plasticity index,
 - 1.3.4. Sand equivalent,
 - 1.3.5. Fine aggregate angularity,
 - 1.3.6. Flat and elongated particles count, and
 - 1.3.7. Fractured Face count.
 - 1.4. RAP (if used);
 - 1.5. Quality of components;
 - 1.6. Stockpile management;
 - 1.7. Proportioning;
 - 1.7.1. Gradation,
 - 1.7.2. Minus 200 wash,
 - 1.7.3. Plasticity index,
 - 1.7.4. Sand equivalent,
 - 1.7.5. Fine aggregate angularity,
 - 1.7.6. Flat and elongated particles count, and
 - 1.7.7. Fractured Face count.
 - 1.8. Mixing, including addition of hydrated lime or anhydrite based material, and/or asphalt additive, if required;
 - 1.9. Transporting;
 - 1.10. Placing and finishing;
 - 1.11. Joints;
 - 1.12. Compaction;
 - 1.13. Smoothness;
 - 1.14. Plan Surfacing Depths;
 - 1.15. Shakedown period;
 - 1.16. Corrective Action Processes; and
 - 1.17. Proposed lot size and subplot size in accordance with Section 423.3.6.3 QLA.

For the properties listed in 1.3 above, specifically address the requirements of Table 423.2.2.1.2:1 in the Plan. Define planned corrective action if the requirements are not met.

- 1.3.1 and 1.3.2 are for informational purposes during aggregate production.

- 1.3.3 through 1.3.7, if three (3) consecutive tests fail, address what will change in production. Failure to adjust will result in ceasing operations until a corrective action plan is approved by the Project Manager.

For the properties listed in 1.7 above, specifically address the requirements of Table 423.2.2.1.2:1 in the Plan. Define planned corrective action if the requirements are not met.

- 1.7.1 and 1.7.2 are to be evaluated against the Job Mix Formula.
- For properties listed in 1.7.3 through 1.7.4, if any three (3) consecutive tests fail, the Contractor is to cease operations until a corrective plan is approved by the Project Manager and implemented.
- For properties listed in 1.7.5 through 1.7.7, any test failing by more than 5 percentage points, or if three (3) consecutive tests fail by an average of 0 to 5 percentage points, cease operations until a corrective plan is approved by the Project Manager and implemented.

2. Employ sampling and testing personnel who are either under the direct supervision of a TTCP certified technician or who are themselves currently certified to perform the required Quality Control testing. Provide the Project Manager with a listing of all testing personnel that summarizes their TTCP certifications or, if they are not TTCP certified to perform a particular test, which TTCP certified technician is supervising their testing. Keep the Project Manager notified, by providing an updated listing, of any changes.

Provide testing Equipment that meets all applicable ASTM and AASHTO requirements to accomplish required sampling and testing. Establish a Laboratory for the Project separate and distinct from the Department's Laboratory and Quality Assurance facilities. Submit verification that all Quality Control and assurance testing Equipment meets the applicable standards and has been calibrated per the requirements of AASHTO R-18. Remove any Equipment that does not meet the applicable standards or calibration requirements.

On Projects designated as QLA Projects, sample and test HMA in accordance with Section 901, "Quality Control/Quality Assurance (QC/QA)."

- 2.1. The Contractor is responsible for inspection performed at the crushing operations, hot mix plant and at the Contractor's field Laboratory; using the Laboratory test results and other Quality Control practices to ensure the quality of aggregate sources and other mix components. Adjust and control mix proportioning to meet the mix design. Be responsible for periodically inspecting all Equipment used in proportioning and mixing to ensure its proper operating condition and to ensure that proportioning and mixing is in conformance with the mix design and other requirements.
- 2.2. Be responsible for inspection, sampling, and testing performed at the paving site, ensuring that the delivered Materials meet Contract requirements and for periodically inspecting all Equipment used in transporting, placing, finishing, and compacting to ensure its proper operating condition. Ensure that placing, finishing, joint construction, compaction, and thickness, when required, are as specified.
3. Define and document the coordination of activities between the Contractor's management and all Contractor testing personnel including the frequency of each type of test, the criteria used by the Contractor's management and technicians to recognize deficiencies and reject or correct unacceptable Materials, and a description of proposed corrective actions.
4. In the Plan, describe, in detail, the proposed process control sampling and testing programs. Include the method by which random sampling locations are to be determined. Develop sample locations for process control tests so that the center of the sample is at least 12 inches from a joint or edge of the pavement layer.

423.3.6.1.1 Contractor Quality Control of Aggregate

Obtain samples in accordance with Section 901.2.4 Sampling.

Take representative samples as required, either at the stockpile or after the aggregate material is combined but before the addition of hydrated lime or anhydrite based material and mixing with asphalt binder. Test these samples for conformance with the approved Job Mix Formula and: (excluding RAP)

1. Gradation,
2. Minus 200 wash,
3. Plasticity index,
4. Sand equivalent,
5. Fine aggregate angularity,
6. Flat and elongated particles count, and
7. Fractured Face count.

The Project Manager may sample and test the aggregate at any time during production or stockpiling, or may request to split samples with the Contractor. If testing indicates corrections are necessary, make corrections in conformance with the Plan. The Department will base evaluation of RAP aggregate in accordance with Section 423.2.7, "Reclaimed Asphalt Pavement."

423.3.6.1.2 Contractor Quality Control for Compaction

Monitor the compaction process by determining the density of the HMA with a portable densometer in accordance with the Plan. Establish calibration of the portable densometer from cut pavement samples. Determine the density readings of the cut pavement samples in accordance with AASHTO T 166 (weight, volume method) and determine the density readings of the pavement with the portable densometer. Correlate these test results. Conduct Quality Control testing in accordance with Section 901, "Quality Control/Quality Assurance (QC/QA)," and provide test results to the Project Manager. Perform Quality Control density testing while the asphalt mixture is hot enough to permit further compaction. Do not roll for compaction when it becomes ineffective or damages the HMA. Do not use vibratory mode when the temperature of the mix is below 200 °F.

423.3.6.1.3 Adherence to Specifications and Rejection of Non-specification Material

Produce Material in compliance with all specification requirements. Evaluate test results for specification compliance and treatment of Material that does not meet Specifications in accordance with Section 423 in its entirety. All Material that is rejected shall, at the sole discretion of the Department, be removed and replaced with specification Material at the Contractor's expense.

423.3.6.2 Department Quality Assurance

423.3.6.2.1 Acceptance

The Department will evaluate Materials for Acceptance in accordance with this section. Sample and test the mixture and pavement on a statistically random basis in accordance with Table 901.7:6, "Minimum Acceptance Guidelines." The Project Manager may reject material that appears to be defective based on visual inspection.

Table 423.3.6.2.1:1
Acceptance Testing Tolerances^a

Characteristic	Specification limit, percentage points from TV
Air Voids, %	± 1.4

Table 423.3.6.2.1:1
Acceptance Testing Tolerances^a

Pavement Density % ^c	± 2.5
Hydrated Lime or Anhydrite Based Material % ^e	Minimum of JMF Target Value
Voids in the Mineral Aggregate (VMA), % ^{a,d}	± 1.6
Asphalt Content % ^{a,b}	± 0.50

^a All gradation, Asphalt Content, VMA, and VFA values shall be determined using the AASHTO T 308 testing results.

^b HMA will not be rejected based on Asphalt Content Determined by AASHTO T 308

^c Density payment will be adjusted in accordance with Section 901.5

^d If Gmm fluctuates more than ±0.03 on a consistent basis, it is recommended that the Specific Gravity of the aggregates be checked in order to verify VMA.

^e If Hydrated Lime or Anhydrite Based Material is below Design TV cease hot mix production, investigate and correct.

423.3.6.2.1.1 Non-QLA

The Department will evaluate (QA) test results from Projects with Bid quantities less than 15,000 tons for specification compliance in accordance with the following procedures: If the mean of the test results for each property is within the Acceptance Tolerances as listed in Table 423.3.6.2.1:1, "Acceptance Testing Tolerances," the Material will be accepted at full Contract price except that Roadway density will be adjusted in price in accordance with Section 901.5, Quality Level Analysis. If the mean of the test results for any of the listed properties is outside of the tolerances as listed in Table 423.3.6.2.1:1, "Acceptance Testing Tolerances," then the Department will determine Acceptance of the Material in accordance with 901.1.3, "Acceptance Sampling and Testing," and Section 901.5, "Quality Level Analysis." A composite pay factor of more than 1.00 is not allowed for Projects with Bid quantities less than 15,000 tons. Remove and replace rejected Material with specification Material at no additional cost to the Department.

423.3.6.2.1.1.1 Acceptance of Pavement Density

The target density for Acceptance of HMA will be 94.5% of the theoretical maximum density as determined from AASHTO T 209. For determination of maximum specific gravity, obtain and test a minimum of two (2) samples and ensure the Department obtains and tests a minimum of one (1) sample for each Day that the HMA is placed. Each individual density test value obtained must be from 92.0% to 97.0% of the theoretical maximum density.

To be prepared for dispute resolution, the Contractor is to provide one (1) additional core for each core tested by the Department for Acceptance of density. The additional core is to be from the same lot as the initial core and shall be generated from the random sample plan. If the Contractor believes the Department's cut pavement samples have been damaged they may invoke Section 423.3.7 Dispute Resolution. The Referee Lab results will replace the initial core in determining pay factor. The Assistant District Engineer for Construction will make the final decision on accepting or rejecting material, based on the Referee Laboratory's result(s) by:

1. Accepting the section or subplot if the density falls between 92.0% - 97.0%;
2. Determining that a portion, based on visual determination, or all of the Material in that section or subplot shall be removed or replaced at no additional cost to the Department;
3. Determining that a portion, based on visual determination, of the Material in that section or subplot will be paid for at a 50% pay factor.

For purposes of Acceptance and pay factor determination, determine the density from cut pavement sections (cores) with 6-inch diameters extending through the full thickness of the HMA. Determine the pay factor in accordance with Section 901.5, Quality Level Analysis.

Use a minimum of ten (10) cores to determine the pay factor, unless otherwise directed by the Assistant District Engineer for Construction. Determine the theoretical maximum density using an average of the maximum specific gravity values obtained by the Department and the Contractor the Day the core's Material was placed. If a composite pay factor of more than 1.00 is calculated, the composite pay factor will be a 1.00 for the purposes of payment.

For Projects consisting of single lift overlays or mill and inlay with a single lift of two and a half inches or less, the Project Manager may grant an exception to the mean density target requirement of at least 94.5% of the theoretical maximum density if the Contractor can demonstrate that a minimum of 92.0% cannot be reasonably obtained because of the existing conditions of the Pavement Structure or Subgrade Materials. The Contractor demonstrates this by providing density results obtained during paving operations witnessed by a State Inspector at the location in question. If the Project Manager grants this exemption, construct a Roadway test strip and develop an HMA compaction process to get the highest possible density based on an approved roller's density gain per pass, in accordance with Section 423.3.4.4, Compaction Equipment. The Project Manager will approve the process, establish a new target value for density and establish a new Acceptance lot only for the portion of the Project addressed herein (except for the Roadway test strip) before paving begins or continues. Density shall not fall below 91%. If a lot does not meet either of the revised density requirements, the Project Manager will, with the concurrence of the Assistant District Engineer for Construction, do the following:

1. Accept and pay for the lot of HMA at 50% of the Bid Item Unit Price; or
2. Reject the in-place material and require the Contractor to remove and replace.

423.3.6.3 QLA

On Projects with Bid quantities of 15,000 tons or more, the Department will determine Acceptance of the Materials in accordance with Section 901.5, "Quality Level Analysis," using the Acceptance limits in Table 423.3.6.2.1:1, "Acceptance Testing Tolerances". Acceptance lots shall be between 15,000 tons and 30,000 tons, as determined at the pre-paving conference. Table 423.3.6.2.1:2 indicates properties that will be tracked for purposes of Quality Assurance. For all QLA Projects, if a composite pay factor of more than 1.00 is calculated, the composite pay factor will be a 1.00 for the purposes of payment.

423.3.6.3.1 Acceptance of Pavement Density

The target density for Acceptance of HMA will be 94.50% of the theoretical maximum density as determined from AASHTO T 209. For determination of maximum specific gravity, obtain and test a minimum of two (2) samples and ensure the Department obtains and tests a minimum of one (1) sample for each Day that the HMA is placed, in accordance with the random sampling plan. Each individual density test value obtained must be from 92.0% to 97.0% of the theoretical maximum density.

For purposes of Acceptance and pay factor determination, determine the density from cut pavement sections (cores) with 6-inch diameters extending through the full thickness of the HMA. Determine the pay factor in accordance with Section 901.5, Quality Level Analysis. Use a minimum of ten (10) cores to determine the pay factor, unless otherwise directed by the Assistant District Engineer for Construction. To be prepared for dispute resolution, the Contractor is to provide one (1) additional core for each core tested by the Department for Acceptance of density. The additional core is to be from the same lot as the initial core and shall be generated from the random sample plan. If the Contractor or Department believes the Department's cut pavement samples have been damaged they may invoke Section 423.3.7 Dispute Resolution. The Referee Lab results will replace the initial core in determining pay factor. Determine the theoretical maximum density using an average of the maximum specific gravity values obtained by the Department and the Contractor the Day the core's Material was placed. If a composite pay factor of more than 1.00 is calculated, the composite pay factor will be a 1.00 for the purposes of payment.

For Projects consisting of single lift overlays or mill and inlay with a single lift of two and a half inches or less, the Project Manager may grant an exception to the mean density target

requirement of at least 94.5% of the theoretical maximum density if the Contractor can demonstrate that a minimum of 92.0% cannot be reasonably obtained because of the existing conditions of the Pavement Structure or Subgrade Materials. The Contractor demonstrates this by providing non-destructive density results obtained during paving operations witnessed by a State Inspector at the location in question. If the Project Manager grants this exemption, construct a Roadway test strip and develop an HMA compaction process to get the highest possible density based on an approved roller's density gain per pass, in accordance with Section 423.3.4.4, Compaction Equipment. The Project Manager will approve the process, establish a new target value for density and establish a new Acceptance lot only for the portion of the Project addressed herein (except for the Roadway test strip) before paving begins or continues. Lot density shall not fall below 91%. If a lot does not meet either of the revised density requirements, the Project Manager will, with the concurrence of the Assistant District Engineer for Construction do the following:

1. Accept and pay for the lot of HMA at 50% of the Bid Item Unit Price; or
2. Reject the in-place material and require the Contractor to remove and replace at no cost to the Department.

423.3.6.4 Independent Assurance Testing

The Department will perform Independent Assurance sampling and testing in accordance with Section 901.3, "Independent Assurance Testing."

423.3.7 Dispute Resolution

For any test incorporated into the pay factor, if a dispute exists the Project Manager and Contractor will investigate to determine why and make corrections if possible. If the discrepancy cannot be resolved, then either party may invoke a referee lab. The State Asphalt Engineer will maintain a list of labs that are willing and capable of performing referee testing. All referee labs shall be AASHTO Materials Reference Laboratory (AMRL) certified for the test(s) to be performed. Neither the Department's Project staff, nor the Contractor will know who is performing the referee testing. The State Asphalt Engineer will select a Laboratory, without disclosing the name of the lab to Department Project Personnel or Contractor personnel, from the following, not in priority order:

1. A District Laboratory not from the District in which the Project resides; or
2. A private Laboratory currently listed on the State Material's Bureau's list of approved private labs not involved in the subject Project in any manner, such as mix design submittal, preliminary testing for design, etc. Only laboratories that are in the routine business of providing testing and designs will be considered. Contractor owned laboratories will not be allowed.

When a referee lab is used, the referee lab's test results will be used in determining the pay factor. The referee lab must be invoked in writing within ten (10) Calendar Days of receiving the test results from the other party. If not invoked within ten (10) Calendar Days, the test results are deemed accepted. The results will be used to determine pay factors. The Department's prior test results or the Contractor's prior test results for the test in question will be discarded. If the composite pay factor decreases from applying the referee lab's results, the Contractor shall pay for the testing performed by the referee lab. If the composite pay factor increases from applying the referee lab's results, the Department will pay for the testing performed by the referee lab. If the composite pay factor remains unchanged, the cost shall be split with each party responsible for 50% of the total cost.

For all testing incorporated into the pay factor, each party shall generate an additional sample from the Department's Acceptance Samples and the Contractor's Quality Control Samples used in pay factor analysis. Failure to provide the referee samples prior to testing the initial sample will result in the Project Manager suspending the Project at no cost to the Department. Additional time will not be added to the Contract for Project suspension caused by failure to comply with Dispute Resolution Process. Work shall not resume until the Contractor provides the delayed sample(s) and satisfies the Project Manager, in writing, that future samples will be provided in compliance with this requirement. The extra sample(s) is

(are) to be retained by the Department. The Department will retain the samples at the Project location inside a locked cargo container, provided by the Contractor at no cost to the State. The State will provide the lock for the cargo container. Once the pay factor is determined dispose of the unused samples at no cost to the Department. In no case will the unused samples be disposed of prior to the ten (10) Calendar Day period in which the Dispute Resolution process may be invoked.

For Pavement Density, the Contractor shall provide an additional core only for each core provided to the Department for Acceptance. The additional core will be stored and retained in the provided container. Should the Contractor invoke the Dispute Resolution Process for Density, the second core will be provided to the Referee Lab. The density pay factor for the material in question will be based solely on the Referee Lab result, not including Department or Contractor results.

Failure to comply with the requirements contained herein will result in the pay factor being calculated in accordance with the applicable Sections of 423, Superpave (QLA and Non-QLA), and 901, Quality Control/Quality Assurance (QC/QA). No test results will be replaced by referee results.

423.4 METHOD OF MEASUREMENT

If the Department measures *HMA* by the square yard, the Department will use the average width of the HMA in place and the length from station to station along the centerline of the Roadway when calculating quantities.

423.5 BASIS OF PAYMENT

Pay Item

HMA Complete

HMA

Pay Unit

Ton or Square Yard

Ton or Square Yard

The Department will pay for accepted quantities at the Bid Item Unit Price, adjusted in accordance with Section 423.5.1, "Price Adjustments." Providing and transporting all cores, samples and storage containers shall be Incidental to the Pay Items above.

423.5.1 Price Adjustments

423.5.1.1 Projects with Bid Quantities of 15,000 Tons or Greater

The Department will pay for accepted quantities of *HMA* or *HMA Complete* at the Bid Item Unit Price, adjusted in accordance with Section 901.5, "Quality Level Analysis." The *HMA* will be evaluated on a lot-by-lot basis at a price determined by multiplying the Bid Item Unit Price by the weighting factor. The Department will use Table 423.5.1.1:1, "Weighting Factors," to calculate each lot's composite pay factor. The pay factor for the entire Project will be calculated by applying weighted averages, based on tonnage contained within each lot, to each lot's composite pay factor. If the composite pay factor for a lot is greater than 1.0, the pay factor will be set at 1.0.

**Table 423.5.1.1:1
Weighting Factors**

Characteristic	"f" Factor (%)
Mat Density	35
Air voids	35
Voids in the mineral aggregate (VMA)	20
Asphalt Content*	10

*If the individual pay factor for asphalt content is less than 0.75, it will be set at 0.75 for the purpose of calculating payment.

423.5.1.2 Projects with Bid Quantities Less than 15,000 Tons

The Department will pay for accepted quantities of *HMA* or *HMA Complete* at the Bid Item Unit Price if the mean of the test results for each property is within the testing tolerances as listed in Table 423.3.6.2.1:1, "Acceptance Testing Tolerances." If the mean of the test results for any of the listed properties is outside of the testing tolerances as listed in Table 423.3.6.2.1:1, "Acceptance Testing Tolerances," then the Department will determine the price adjustment for the Material in accordance with the Department's *Price Reduction Procedures* current at the time of the Project letting. In no case will the pay factor be greater than 1.00.

423.5.1.2.1 Price Adjustment for Pavement Density (Bid Quantities Less than 15,000 Tons)

The Department will also adjust the Bid Item Unit Price for the *HMA* or *HMA Complete* Pay Item, based on the Roadway density, in accordance with Section 901, Quality Control/Quality Assurance (QC/QA), specifically Section 901.5, Quality Level Analysis, steps one (1) through nine (9). If the density pay factor for a lot is greater than 1.0, the density pay factor will be set at 1.0 for purposes of payment. The Department will apply the price adjustments to the *HMA* Bid Item unit price for each lot.

SECTION 509: PORTLAND CEMENT CONCRETE MIX DESIGNS

509.1 DESCRIPTION

This Work consists of developing, submitting and getting approval to use PCC mix designs on Department Projects.

509.2 MATERIALS

Test Materials in accordance with AASHTO and ASTM methods or other test procedures designated by the Department. The State Materials Bureau will decide questions about test procedure interpretation. Correct or remove and dispose of improperly graded or segregated material that fails to meet the requirements as directed by the Project Manager and at no additional cost to the Department.

Use pre-approved Materials in accordance with the current Department's *Approved Products List*. The Department will not allow changes in the source or character of the Materials without notifying the State Materials Bureau and obtaining written approval.

509.2.1 Reserved

509.2.2 Portland Cement

Use Type II, low-alkali portland cement in accordance with ASTM C 150 unless otherwise specified. If the results of the alkali-silica reactivity (ASR) mitigation tests required in Section 509.2.4.5 "Alkali-Silica Reactivity" are less than 0.10% for each of the individual aggregates in the mixture, the Department will waive the low-alkali requirement.

509.2.2.1 Source Approval and Acceptance

The Department will accept portland cement based on certification of the approved sources and satisfactory test results from Project verification samples. The State Materials Bureau must approve cement from a particular source or Contractor before use. Include the following information in the request for source approval:

1. The Supplier or company;
2. Cement plant location;
3. Storage facility type and capacity;
4. Average and maximum production capabilities;
5. Production procedures;
6. Details regarding the in-house Quality Control program information:
 - 6.1. Routine sampling and testing frequency;
 - 6.2. Documentation that the Laboratory responsible for the certified ASTM C 150, ASTM C 595, and ASTM C 1157 test results is currently participating in the Cement and Concrete Reference Laboratory (CCRL) proficiency sample and the pozzolan inspection programs;
 - 6.3. A copy of the Laboratory letter authorizing CCRL to send copies of the CCRL inspection programs and proficiency result reports directly to the State Materials Bureau;
 - 6.4. Documentation of measures taken to ensure that the Supplier keeps unacceptable cement separated from acceptable cement;
7. Copies of Quality Control program test reports for the previous six (6) months, including at least one (1) comprehensive ASTM C 150 analysis for each month.

The Department will maintain a list of approved sources.

509.2.2.2 Sources on Approved List

Provide the following information from approved sources to the State Materials Bureau monthly:

1. Copies of routine Quality Control program test results; and
2. A certified ASTM C 150 or ASTM C 595 analysis for each lot tested. An average over a period of time or over several different test lots will not be acceptable.

509.2.2.3 Withdrawal of Source Approval

The State Materials Bureau may withdraw source approval for any of the following reasons:

1. A change in Equipment or production procedure from that on the original request for approval;
2. Project sample failure to comply with specification requirements;
3. Chemistry or physical properties that vary more than allowed;
4. A source becomes inactive for a period of 3 months; or
5. A source does not provide cement to the Department for a period of 1 year;
6. The appropriate mill certificates are not regularly received.

Manufacture cement at the same production facility unless otherwise approved by the State Materials Bureau. Obtain approval for changes in cement sources. Submit a written source change request to the Project Manager. The State Materials Bureau will issue a written decision within seven (7) Days of receipt.

Provide documentation that the proposed source will provide cement that produces concrete with hardened properties equal to or better than the original source. Compliance with ASTM C 150 is not sufficient documentation.

509.2.2.4 Blended Portland-Fly Ash Cement

Use blended portland-fly ash cement in accordance with ASTM C 595 or ASTM C 1157. Blend or inter-grind portland cement with fly ash. Provide proof that the blended portland-fly ash cement contains the appropriate percentage of the proper fly ash by weight of the cement only, to mitigate ASR concerns for the aggregates used.

509.2.2.4.1 Approval of Blended Portland-Fly Ash Cement Source

Provide test data showing that the proposed source can provide blended portland fly ash cement that produces concrete in accordance with Table 509.2.8.1:1 "Concrete Classes for Laboratory Design of Concrete Mixtures" and Section 509.2.8.4, "Concrete Mix Design Development."

509.2.2.5 Packaging

Mark portland cement and blended portland-fly ash cement packages with the name brand, the source manufacturing facility, and the cement type. Provide the same information on the shipping documents for bulk cement deliveries.

509.2.2.6 Storage

Protect cement from moisture. Store different brands or types of cement, or cement from different production facilities separately. Provide separate, identifiable blended portland-fly ash cement storage at the Project or plant site. Store portland cement and portland-fly ash cement separately.

509.2.2.7 Cement Rejection

The Department will reject cement if it:

1. Has come in contact with moisture, fly ash, or other cements; or

2. Has partially set or is lumpy.

509.2.3 Fly Ash

Use fly ash that complies with the physical and chemical requirements of ASTM C 618 and the optional requirements for available alkalis and reactivity with cement alkalis as modified by Table 509.2.3:1, "Fly Ash Requirements." Use Class F fly ash if either the coarse or the fine aggregate is reactive. If both the coarse and the fine aggregate are non-reactive, the Contractor may use a C/F blend fly ash or a Class C fly ash.

**Table 509.2.3:1
Fly Ash Requirements**

Characteristics	Class C	Class F
Sum of Al ₂ O ₃ , SiO ₂ , and Fe ₂ O ₃	—	>85%
Moisture content, maximum %	1.0	1.0
Loss on ignition, maximum %	3.0	3.0
Magnesium Oxide (MgO), maximum %	5.0	5.0
Available Alkalis, maximum %	1.5	1.5
Calcium Oxide (CaO), maximum % ^a	50.0	8.0

^aNMDOT will only consider a fly ash as Class F if the CaO is less than eight percent (8%). Fly ash meeting the requirements of ASTM C 618 and containing more than eight percent (8%) by weight of bulk CaO is considered as Class C fly ash and can only be used in concrete that is not exposed to sulfate environments or with "potentially reactive", or "reactive" aggregate.

Use waterproof and clearly labeled bags when supplying fly ash in bags. Label with the name brand, the manufacturer, type, and source. Provide an executed Certificate of Compliance with each fly ash shipment. Permission for blending Class C and Class F fly ash depends upon approval by the State Materials Bureau. Ensure the blended fly ash is in accordance with ASTM C 618 and is limited to concrete mixes in which the coarse and fine aggregates are non-reactive.

509.2.3.1 Source Approval and Acceptance

The Department will accept fly ash based on certification of approved sources and satisfactory test results on Project verification samples. Obtain approval from the State Materials Bureau before using fly ash from a particular source or Supplier in PCC. Include the following in source approval requests:

1. Supplier or company name;
2. Source power plant location;
3. Coal type and origin;
4. Combustion process;
5. Storage facilities and capacity;
6. Production procedures;
7. Details regarding the Supplier's Quality Control program including the following:
 - 7.1. Routine sampling and testing frequency;
 - 7.2. Documentation showing that the Laboratory responsible for the certified ASTM C 618 test results is currently participating in the CCRL proficiency sample and pozzolan inspection programs. Submit a letter authorizing CCRL to send the Laboratory's inspection and proficiency reports directly to the State Materials Bureau; and
 - 7.3. Measures taken to ensure that fly ash not meeting specification requirements are kept separate from Material meeting the requirements;
8. Copies of the Quality Control program test reports for each lot tested for the previous six (6) months including at least one (1) complete ASTM C 618 analysis for

each month.

The Department will maintain an approved products list. Do not substitute the approved Material source for a different source without prior Department approval. The Department will consider a fly ash source change only after receiving a written request. The State Materials Bureau will review the request and provide written approval once they have verification of the equivalency of the proposed Material. Compliance with ASTM C 618 is not sufficient documentation to permit a change of sources. Provide information that verifies the proposed source Material performs equally as Material from the original source.

509.2.3.2 Sources on Approved List

Sources on the approved list are required to provide the State Materials Bureau with the following information on a monthly basis:

1. Test results obtained in their routine Quality Control program; and
2. A certified ASTM C 618 analysis for each lot tested.

509.2.3.3 Withdrawal of Source Approval

The Department may withdraw source approval for any of the following reasons:

1. If there is a change in Equipment or production procedures from what was shown in the original request for approval;
2. If a Project sample fails to comply with specification requirements;
3. If a source becomes inactive for 3 consecutive months or more; or
4. If a source does not furnish fly ash to the Department for a period of 1 year.

509.2.3.4 Storage

Protect fly ash from moisture. Store different brands or types of fly ash, or fly ash from different production facilities separately. Provide separate, identifiable blended portland-fly ash cement storage at the Project or plant site. Store portland cement and portland-fly ash cement separately.

509.2.4 Aggregate

The Department will allow the Contractor to combine aggregates from two (2) or more approved sources based on the following criteria:

1. Each source complies with Material requirements other than gradation; and
2. The blended Material meets all requirements.

509.2.4.1 Aggregate Testing

Test coarse and fine aggregate in accordance with the methods shown in Table 509.2.4.1:1, "Aggregate Test Methods." Concrete mixture design approval involving a designated source will remain in effect as long as annual test results for specific gravity, absorption, gradation, and sand equivalent (for fine aggregate only) and annual tests for other requirements (except ASR) demonstrate Material compliance.

**Table 509.2.4.1:1
Aggregate Test Methods**

Aggregate test	Method
Sampling	AASHTO T 2
Clay lumps	AASHTO T 112
Amount of Material passing No. 200 sieve	AASHTO T 11
Absorption & Specific Gravity of Coarse Aggregate	AASHTO T-85 or TP 77

Table 509.2.4.1:1
Aggregate Test Methods

Aggregate test	Method
Absorption & Specific Gravity of Fine Aggregate	AASHTO T-84 or TP 77
Sieve analysis	AASHTO T 27
Soundness with magnesium sulfate	AASHTO T 104
Sand equivalent	AASHTO T 176
Soft fragments	AASHTO T 112
Flat and elongated pieces	ASTM D 4791
Alkali-Silica Reactivity	AASHTO T303 or ASTM C1293

509.2.4.2 Coarse Aggregate

Coarse aggregate is crushed stone, crushed gravel, or natural washed gravel. Unless otherwise specified, ensure that at least 50% of the aggregate by weight has a minimum of 1 Fractured Face. Ensure that Class G mixes are composed of at least 50% particles with no Fractured Faces. The Department may waive the Fractured Face requirement for mixes other than Class G mixes if less than 1.0% of the Material passes the No. 200 sieve.

509.2.4.2.1 Deleterious Materials

Do not exceed the deleterious substance tolerances in accordance with Table 509.2.4.2.1:1, "Deleterious Materials Tolerances for Coarse Aggregate." Perform tests in accordance with Table 510.2.4.1:1, "Aggregate Test Methods."

Table 509.2.4.2.1:1
Deleterious Materials Tolerances for Coarse Aggregate

Substance	Maximum % by weight
Soft fragments	2.0
Coal and lignite	0.25
Clay lumps	2.5
Materials passing No. 200 sieve	2.0
Flat and elongated pieces	^a

^aEnsure that Material larger than 3/8 inch contains no more than 15% flat or elongated particles with a 3:1 or greater dimensional ratio in accordance with TTCP. Add the percentage of flat pieces to the percentage of elongated pieces to determine specification compliance. Count pieces that are both flat and elongated only once.

Provide aggregate that is free of organic matter. The Department will reject contaminated aggregate.

509.2.4.2.2 Coarse Aggregate Quality Requirements

Provide coarse aggregate with an AI of 25 or less, calculated in accordance with Section 910, "Aggregate Index." The Department will reject aggregates with an AI greater than 25.

509.2.4.2.3 Coarse Aggregate Gradation Requirements

If the combined gradation procedure detailed in Section 509.2.8.3.1, "Combined Gradation" has been chosen by the Contractor, then the gradation requirements specified below do not apply. Comply with all other aggregate properties and characteristics, including the amount of Material passing the No. 200 sieve.

Use coarse aggregate that complies with Table 509.2.4.2.3:1, "Coarse Aggregate

Table 509.2.4.2.3:1
Coarse Aggregate Gradation Requirements

Sieve size	% of aggregate passing sieve				Class G
	1.5 in	1.0 in	0.75 in	0.5 in	
2.0 inch	100	—	—	—	—
1.5 inch	95–100	100	—	—	—
1.0 inch	—	95–100	100	—	100
3/4 inch	35–70	—	90–100	100	90–100
0.5 inch	—	25–60	—	90–100	—
3/8 inch	10–30	—	20–55	40–70	20–55
No. 4	0–5	0–10	0–10	0–15	0–10
No. 8	—	0–5	0–5	0–5	0–5
No. 200	0.0–2.0	0.0–2.0	0.0–2.0	0.0–2.0	0.0–2.0

Provide coarse aggregate that meets the following:

1. 50% of the Material has at least 1 Fractured Face; and
2. 2.0% or less (by weight) of the Material passes a No. 200 sieve.

The Department may accept coarse aggregate with more than the maximum percent passing the No. 200 sieve if the combined gradation of the coarse and fine aggregate percent passing the No. 200 sieve does not exceed 3.0%.

509.2.4.2.4 Portland Cement Concrete Pavement (PCCP) Gradations

Meet the coarse aggregate gradation requirements shown in Table 509.2.4.2.3:1, “Coarse Aggregate Gradation Requirements,” for PCCP, unless using the combined gradation procedure. Additionally, except when the gradation of the coarse and fine aggregate combined has less than one percent (1.0%) passing the No. 200 sieve, all of the particles retained on or above the 3/8 inch sieve must have at least one (1) Fractured Face. The Contractor may eliminate the Fractured Face requirement by washing the aggregate to produce a combined aggregate of which less than one percent (1.0%) passes a No. 200 sieve. Provide proof that the mix design meets performance and minimum specified hardened properties.

509.2.4.3 Fine Aggregate

Use fine aggregate that consists of natural sand, manufactured sand, or a combination of both.

509.2.4.3.1 Deleterious Materials

Provide fine aggregates in accordance with Table 509.2.4.3.1:1, “Deleterious Material Tolerances for Fine Aggregate.”

Table 509.2.4.3.1:1
Deleterious Material Tolerances for Fine Aggregate

Substance	Maximum % by weight
Soft fragments	2.0
Coal and lignite	1.0
Clay lumps	3.0
Materials passing No. 200 sieve	3.0

509.2.4.3.2 Fine Aggregate Quality Requirements

Provide fine aggregate with the following properties:

1. A soundness loss of 12 or less when tested in accordance with AASHTO T 104 using magnesium sulfate solution and a test duration of five (5) cycles; and
2. A sand equivalent of at least 75 when tested in accordance with AASHTO T 176.

509.2.4.3.3 Fine Aggregate Gradation Requirements

If the combined gradation procedure detailed in Section 509.2.8.3.1, "Combined Gradation" has been chosen by the Contractor, then the gradation requirements specified below do not apply. Comply with all other aggregate properties and characteristics, including the amount of Material passing the No. 200 sieve.

Use well-graded fine aggregate in accordance with Table 509.2.4.3.3:1, "Fine Aggregate Gradation Requirements." The gradation requirements represent the limits that the Department will use to determine source acceptability.

The Department will not approve fine aggregate that has more than 45% passing any sieve and retained on the next finer sieve shown in Table 509.2.4.3.3:1, "Fine Aggregate Gradation Requirements." Use a fineness modulus, calculated in accordance with AASHTO M 6, to determine the degree of uniformity between representative samples. If the combined gradation procedure has not been chosen, the Department may reject fine aggregate from designated sources with variation in fineness modulus greater than 0.20 above or below the fineness modulus shown on the approved concrete mix designs. Variations in excess of these tolerances may be cause for rejection. The Department may accept the aggregate once the Contractor assures the State Materials Bureau that the source maintains the designated production tolerances.

**Table 509.2.4.3.3:1
Fine Aggregate Gradation Requirements**

Sieve size	% Passing
3/8 inch	100
No. 4	90–100
No. 8	70–95
No. 16	45–80
No. 30	25–60
No. 50	5–30
No. 100	0–8
No. 200	0.0–3.0

The Department may accept fine aggregate with more than three percent (3%) percent passing the No. 200 sieve, but not more than five percent (5%) passing the No. 200 sieve if the combined fine and coarse aggregates passing the No. 200 sieve does not exceed three percent (3.0%).

509.2.4.4 Alkali-Silica Reactivity

Prevent damage from ASR in accordance with the following procedures.

Perform the initial proof-of-reactivity-potential test using standard Rio Grande Type I-II low alkali cement from the Rio Grande Cement plant located at Tijeras, New Mexico. Use cement with an alkali content of from 0.5% to 0.6%. The Department considers aggregates with mean mortar bar expansions of greater than 0.10% at 14 Days potentially reactive and those less than 0.10% as non-reactive. Expansions greater than 0.20% are considered "Reactive." If tested using ASTM C 1293, the Department will consider aggregate non-reactive if the average expansion at the end of one (1) year is less than 0.04%. Once the State Materials Bureau decides a particular aggregate source is non-reactive, it will not require the source to reevaluate for three (3) years unless concerns arise from possible aggregate source changes. Obtain a list of reactive, potentially reactive, and non-reactive aggregate sources tested to date from the State Materials Bureau.

If the results of the initial proof-of-potential-reactivity test show the aggregate to be “potentially reactive” or “reactive”, repeat the test procedure using the actual cement, fly ash and, if desired, any of the ASR inhibiting admixtures shown in Table 509.2.4.4:1 “ASR Inhibiting Admixtures.” Report the minimum amount of Class F fly ash, and the minimum amount of ASR inhibiting admixture required to provide a maximum expansion at 14 Days that is less than 0.10%. Report the Fly Ash required as a percentage of the cement weight.

**Table 509.2.4.4:1
ASR Inhibiting Admixtures**

Material	Requirement
Fly ash (Class F)	Section 510.2.9, “Fly Ash”
Blended cement (Only Class F Fly Ash may be used)	Section 510.2.4.4, “Blended Portland Fly-Ash Cement”
Ground granulated blast furnace slag (GGBFS), Grade 100 and 200	AASHTO M 302
Silica fume	AASHTO M 307
Lithium nitrate (LiNO ₃)	Section 510.2.11, “Lithium”

Use admixtures in accordance with Table 509.2.4.4:2, “ASR Mitigation Dosage Rate Requirements,” unless it is determined that larger dosages are required to control the expansion.

**Table 509.2.4.4:2
ASR Mitigation Dosage Rate Requirements**

Material	Dosage Rate
Fly ash (Class F)	As required to mitigate ASR expansion, but not less than 20% by weight of cement only for binary blends; not less than 12% by weight for ternary blends as long as the total pozzolan dosage is at least 20%
Blended cement	As required, but not less than 20% by weight of cement only
GGBFS	As required, but not less than 25% by weight of cement only
Silica fume	As required, but not less than ten percent (10%) by weight of cement only
Lithium nitrate	0.55 gal/yd ³ of solution for each pound of cement sodium equivalent

509.2.4.4.1 ASR Mitigation Evaluation Criteria

The Department will consider an admixture effective if the mean mortar bar expansion at 14 Days is less than or equal to 0.10%, when tested in accordance with Section 509.2.4.4 “Alkali-Silica Reactivity.” Retest aggregates classified as “potential reactive” or “reactive” for ASR mitigation each time the comprehensive mix evaluation is performed. If the test results from AASHTO T 303 or ASTM C 1293 indicate “potentially reactive” or “reactive” Material, but the Contractor believes that the aggregates are non-reactive, submit the following documentation as proof of non-reactivity:

1. A letter signed and sealed by an Engineer registered in New Mexico confirming direct knowledge of the fundamentals of ASR in concrete and stating that the subject aggregates have never caused ASR concrete deterioration; and
2. A report from an approved petrographer. The report will confirm that at least two (2) different concrete core samples obtained from different 15-year old exposed Structures that used the subject aggregates in a cement-only mixture were examined and that there is no evidence of ASR reactivity.

After receipt of a stamped letter from the registered professional Engineer indicating no

evidence of ASR gel found in either of the cores, the Department will consider the aggregate sources non-reactive.

509.2.5 Admixtures

Ensure the total admixture, or combinations of admixtures, of soluble and insoluble chloride content does not exceed 1,000 ppm. Use only admixtures on the Department's *Approved Products List*.

509.2.5.1 Air Entraining Admixtures

Use air-entraining admixtures that comply with AASHTO M 154.

509.2.5.2 Chemical Admixtures

Use water-reducing and set-controlling admixtures set retarding admixtures, and non-chloride set accelerating admixtures, that comply with Section 509.2.5, "Admixtures," and AASHTO M 194.

509.2.6 Water

Test non-potable water before use in accordance with AASHTO T 26. Use water for mixing and curing concrete or washing concrete aggregates that does not contain acid, oil, alkali, organic matter, or other Deleterious Material that will adversely affect the concrete. Use water with a pH value of from 6.0 to 8.5 in accordance with AASHTO T 26. Do not use water with a sulfate content or chloride content that exceeds 1,000 ppm. Prevent contamination from silt, clay, organic matter, or other Deleterious Material. Do not use residual water, wash water, or recycled water generated by Equipment, mixer trucks, or central mixers in concrete mixtures.

509.2.7 Fibrous Concrete Reinforcement

Use fibers in the concrete mix at a minimum dosage rate of 1.5 lb per cubic yard of concrete. Use only 100% virgin polypropylene fibrillated fibers, containing no reprocessed olefin Materials, and specifically manufactured for use in PCC.

509.2.8 PCC Mixture Design and Approval

509.2.8.1 Classifications

The classes of PCC are shown in Table 509.2.8.1:1, "Concrete Classes for Laboratory Design of Concrete Mixtures," and as specified:

Table 509.2.8.1:1 Concrete Classes for Laboratory Design of Concrete Mixtures				
Class	Use	Specified compressive strength at 28 Days, (psi)	Laboratory design slump^a (in)	Percent air content^b
A	Cast in-place structural	3,000	4.5 to 5.5	—
AA	Cast in-place structural	4,000	4.5 to 5.5	—
D	Non-structural	2,500	4.5 to 5.5	—
E	Slip form structural	2,500 ^c	2.0 to 2.5	—
F	Slip form structural	3,000 ^c	2.0 to 2.5	—
F-LS	PCCP Low Shrinkage	3,000	2.0 to 2.5	—

Table 509.2.8.1:1
Concrete Classes for Laboratory Design of Concrete Mixtures

Class	Use	Specified compressive strength at 28 Days, (psi)	Laboratory design slump ^a (in)	Percent air content ^b
G	Drilled shafts	3,000	—	No entrained air agent allowed
HPD	Bridge decks and other low shrinkage applications	4,000	4.5 to 5.5	—
Special	The <i>Contract Requirements</i> for the individual Project will address special mix requirements.			

^aAs determined by AASHTO T 119.

^bProject risk zone requirements apply; see Section 510.3.2, “Freeze-Thaw Risk Zones.”

^cThe specified age for Class E and Class F is 14 Days.

509.2.8.1.1 Details for Table 510.2.9.1:1, “Concrete Classes for Laboratory Design of Concrete Mixtures”

Use Table 509.2.8.1:1, “Concrete Classes for Laboratory Design of Concrete Mixtures,” only for designing concrete mixes. Do not use to evaluate concrete delivered to Department Projects.

Use the minimum air content shown below in the Laboratory mix:

1. High Risk Zones: 7.0%
2. Medium Risk Zones: 6.5%
3. Low Risk Zones: 6.0%

Use a minimum compressive strength over-design at least 1,200 psi greater than the specified compressive strength for new mixes if there is no additional information available. For existing mixes with at least 15 compressive strength tests, or for plants which can provide at least 15 consecutive compressive strength tests for a similar mix (same entrained air and same specified compressive strength), determine the minimum allowable average compressive strength using one (1) of the following equations. Use the equation that produces the largest value to determine the minimum allowable compressive strength.

$$f'_{cr} = f'_c + (1.34 \times k \times s) \quad (1)$$

$$f'_{cr} = f'_c + (2.33 \times k \times s) - 500 \quad (2)$$

Where,

f'_{cr} is the minimum Laboratory compressive strength at the specified age

f'_c is the specified compressive strength

k is the k-factor from Table 509.2.8.1.1:1, “k-factor for increasing standard deviation,” for standard deviation increase if the total number of tests is less than 30, but equal to or greater than 15

s is the standard deviation for the compressive strength tests submitted of the same specified strength

Table 509.2.8.1.1:1
k-Factor for Increasing Standard Deviation

Total number of tests	k-Factor
15	1.16

Table 509.2.8.1.1:1 k-Factor for Increasing Standard Deviation	
Total number of tests	k-Factor
20	1.08
25	1.03
≥30	1.00

The Department will allow linear interpolation for an intermediate number of tests. A mix that was developed from a history of 15 or more test results from the preceding 12-month period is considered an existing mix. A mix developed without historical test results is considered a new mix.

Class E and Class F concrete must attain minimum strength at 14 Days. The minimum Class F over-design is 800 psi at 14 Days unless a lower value is calculated using the greater value from either Equation (1) or Equation (2). The minimum Class E over-design is 600 psi at 14 Days, unless a lower number is calculated using the greater value from either Equation (1) or Equation (2).

Class G shall have the following characteristics:

1. A minimum cementitious content of at least 611 lb;
2. A maximum water/cementitious ratio no greater than 0.44;
3. A maximum sized aggregate no greater than 0.75 inch;
4. A sand/aggregate ratio between 40% and 42% by total aggregate volume;
5. A maximum air content no greater than three percent (3.0%);
6. No air entrainment agent;
7. A slump range of seven, 7.0 inch \pm one, 1.0 inch, except when placing under a drilling fluid;
8. A slump range of eight, 8.0 inch \pm one, 1.0 inch for placement under a drilling fluid; and
9. Adjust admixtures for the job site conditions encountered so that the concrete remains workable and plastic for the two (2) h placement limit.

509.2.8.2 Freeze-Thaw Risk Zones

Design the concrete mixture for use in the freeze-thaw zone in which the Project is located. One freeze/thaw cycle is defined as a Day in which the lowest recorded temperature is equal to or less than 25 °F as recorded on the Western Regional Climate Center database. The web address is www.wrcc.dri.edu. The risk levels are defined as follows:

1. **Low-Risk.** The annual average number of freeze/thaw cycles is equal to or less than 30 cycles per year;
2. **Medium-Risk.** The annual average number of freeze/thaw cycles is greater than 30 but less than or equal to 130 cycles per year;
3. **High-Risk.** The annual average number of freeze/thaw cycles is greater than 130 cycles per year.

Obtain the number of freeze/thaw cycles using the closest weather station to the Project with the most similar environmental conditions. Use Table 509.2.8.2:1, "Statewide Concrete Risk Zones," to determine the required risk zone.

Table 509.2.8.2:1 Statewide Concrete Risk Zones			
District no.	County name	Station name	Concrete risk zone
1	Dona Ana	(County wide)	Low
1	Grant	(County wide)	Low

**Table 509.2.8.2:1
Statewide Concrete Risk Zones**

District no.	County name	Station name	Concrete risk zone
1	Hidalgo	(County wide)	Low
1	Luna	(County wide)	Low
1	Sierra	(County wide)	Low
1	Socorro	(County wide)	Medium
2	Chaves	(County wide)	Low
2	Curry	(County wide)	Medium
2	De Baca	(County wide)	Medium
2	Eddy	(County wide)	Low
2	Lea	(County wide)	Low
2	Lincoln	(County wide) ^a	Medium
2	Lincoln	Ruidoso	High
2	Otero	(County wide)	Medium
2	Roosevelt	(County wide)	Medium
3	Bernalillo	(County wide) ^a	Medium
3	Bernalillo	Sandia Crest	High
3	Sandoval	(County wide)	Medium
3	Valencia	(County wide)	Medium
4	Colfax	(County wide)	High
4	Guadalupe	(County wide)	Medium
4	Harding	(County wide)	Medium
4	Mora	(County wide)	High
4	Quay	(County wide)	Medium
4	San Miguel	(County wide)	Medium
4	Union	(County wide)	Medium
5	Los Alamos	(County wide)	Medium
5	Rio Arriba	(County wide) ^a	Medium
5	Rio Arriba	Chama	High
5	Rio Arriba	Dulce	High
5	Rio Arriba	El Vado Dam	High
5	Rio Arriba	Gavilan	High
5	Rio Arriba	Lindrith	High
5	Rio Arriba	Tres Piedras	High
5	San Juan	(County wide)	Medium
5	Santa Fe	(County wide)	Medium
5	Taos	(County wide)	High
5	Torrance	(County wide)	Medium
6	Catron	(County wide)	High
6	Cibola	(County wide)	High
6	McKinley	(County wide) ^a	High
6	Sandoval	(County wide)	High

^aExcept as otherwise listed

The minimum allowable air content for mix design submittal purposes is:

1. 6.0% for low-risk zones;

2. 6.5% for medium-risk zones;
3. 7.0% for high-risk zones.

Confirm these contents by the pressure method and the volumetric method in accordance with Section 509.2.8.4.3, "Mix Design Submittal."

509.2.8.3 PCC Mixture Development

Submit representative samples of all proposed Materials to a PTL that is pre-approved to design PCC mixtures by the State Materials Bureau. Provide a professional civil Engineer licensed by the State of New Mexico with a minimum of three (3) years experience in proportioning and testing PCC mixes to directly supervise all testing.

509.2.8.3.1 Combined Gradation

The combined gradation procedure is optional for all concrete mixes except for Class F-LS and High Performance Deck (HPD) mixes. Class F-LS and HPD mixes must be prepared using the combined gradation procedure. Evaluate aggregates for concrete mixtures prepared for the combined gradation procedures in accordance with the following:

1. **Coarseness Factor.** Determine the Coarseness Factor in accordance with the following equation:

$$CF = \frac{Q}{Q+I} \times 100 \quad (3)$$

Where,

CF is the Coarseness Factor

Q is the weight of the aggregate retained on or above the 3/8-inch sieve

I is the weight of the aggregate passing the 3/8 inch sieve, but retained on the No. 8 sieve

2. **Workability Factor.** The weight of the aggregate passing the No. 8 sieve divided by the weight of the combined gradation, represented as a percent.
3. **Mortar Factor.** The volume of the cement, fly ash, water, air, other pozzolans, and aggregate passing the No. 8 sieve divided by the volume of the entire concrete mixture, represented as a percent.
4. **Paste Factor.** The volume of the cement, fly ash, water, air, and other pozzolans divided by the volume of the entire concrete mixture, represented as a percent.

Combine aggregates to produce a uniform gradation. Ensure that combined aggregates comply with the required individual physical and chemical properties. Individual gradation requirements will not apply. Use the .45 Power Curve to blend the aggregates to achieve the densest grading possible. Approximate targets for the Coarseness Factor and the Workability Factor are shown in Table 509.2.8.3.1:1, "Recommended Workability Factor and Coarseness Factor Targets," for concrete mixtures designed using combined gradation.

Table 509.2.8.3.1:1
Recommended Workability Factor and Coarseness Factor Targets

Nominal Maximum Aggregate Size	Workability Factor	Coarseness Factor
3/4 inch	32 - 36	65 - 75
1/2 inch	40-42	10-20

509.2.8.4 Concrete Mix Design Development

Use fly ash in all concrete mixtures. If fly ash is the only pozzolan used, add at a minimum of 20%, by weight of cement only. Only use Class C or C/F blended fly ash with non-reactive aggregate. When using Class C or C/F blended fly ash instead of the Class F fly

ash, use at a minimum dosage rate of 25%, by weight of cement. When using additional pozzolans, such as silica fume, metakaolin, or GGBFS, the minimum amount of fly ash required is 12% for mixtures using Class F fly ash and 15% for mixtures using Class C fly ash. When using multiple pozzolans, ensure that the total pozzolan content is at least 20% with Class F fly ash and 25% with Class C or C/F blend fly ash.

509.2.8.4.1 Concrete Mix Design Documentation

Submit documentation to the State Materials Bureau that verifies:

1. All Materials used comply with Section 510.2, "Materials;"
2. The PTL prepared and tested a proof mix using the designated Materials and batch weights;
3. A complete companion set of compressive strength test cylinders was delivered to the Department District Laboratory for comparison testing; and
4. The cylinders were cured for at least 48 h after casting, and the cylinders were transported upright in protected and cushioned containers to the Department District Laboratory.

509.2.8.4.2 Concrete Mix Design Designing & Proportion

Design and proportion the concrete mixtures to comply with the following performance requirements:

1. Except for concrete mixtures to be used exclusively in pre-stressed applications, all structural concrete mixtures must demonstrate strength gain characteristics as follows:
 - 1.1 28-Day strength of at least 130% of the seven (7)-Day strength;
 - 1.2 56-Day strength at least 108% of the 28Day test;
2. For Class F-LS Concrete mixtures, the minimum average flexural strength for three (3) beams cast in the Laboratory shall be 650 psi at 28 Days, when tested in accordance with AASHTO T-97
3. Structural concrete mixtures must achieve a minimum durability index:
 - 3.1 Greater than or equal to 85 for Low-Risk Zones;
 - 3.2 Greater than or equal to 90 for Medium-Risk Zones; and
 - 3.3 Greater than or equal to 95 for High-Risk Zones;
4. Determine the durability index from at least one (1) prism tested at 28 Days for 300 cycles, in accordance with ASTM C 666, Method A. Cure prisms tested for durability index by bathing in lime saturated water at a temperature of 73.3 °F ± 3.0 °F for the first seven (7) Days followed by 21 Days in lime saturated water at a temperature of 100.0 °F ± 3.0 °F.
5. If the specimen cannot be tested immediately after curing, place immediately in a freezer at a maximum temperature of 10.0 °F until testing;
6. Hardened air void system characteristics required of all structural concrete classes, when examined in accordance with the ASTM C 457 linear traverse method include:
 - 6.1 A minimum air content of five percent (5.0%);
 - 6.2 A specific surface greater than 600 in-1; and
 - 6.3 A spacing factor less than 0.008 inch;
7. Ensure that concrete complies with Section 509.2.4.4, "Alkali-Silica Reactivity," and Section 509.2.4.5.1, "ASR Mitigation Evaluation Criteria," as determined by the State Materials Bureau;
8. Provide chloride ion permeability at 28 Days for structural concrete tested in accordance with ASTM C 1202 that is:
 - 8.1 Less than or equal to 3,000 coulombs for Low-Risk Zones; or
 - 8.2 Less than 2,500 coulombs for Medium-Risk Zones; or

- 8.3 Less than 2,000 coulombs for High-Risk Zones;
9. Cure concrete for chloride ion permeability the same way as the durability index specimens in accordance with #2, above;
10. The maximum shrinkage value for Class F-LS concrete mixtures and for HPD concrete mixtures is 0.05% at 56 Days when tested with three (3) inch x four (4) inch x 16 inch prism or three (3) inch x three (3) inch x ten (10) inch prism and cured in a standard cure for the first seven (7) Days. Following the seven (7) Day initial cure, cure in a relative humidity of 50% and test in accordance with AASHTO T 160;
11. For Class G mixtures, provide trial mix and slump loss test results that verify compliance with the concrete slump requirements for Class G.

Only technicians who are currently certified by TTCP-Concrete or ACI Concrete Field Technician, Level I shall determine concrete fresh properties in accordance with the appropriate AASHTO procedures. Laboratories approved by the Department's State Materials Bureau shall determine hardened properties. Technicians performing tests on aggregates and aggregate gradations shall be certified by TTCP or ACI Concrete Laboratory Level I. Those technicians performing strength tests on hardened concrete must be certified as an ACI Level I Laboratory Technician or by TTCP for Compressive Strength Testing of Concrete.

Develop concrete mixtures with compressive strengths as close as possible to the over-design strengths calculated in accordance with Section 509.2.8.1.1, "Details for Table 509.2.8.1:1, 'Concrete Classes for Laboratory Design of Concrete Mixtures.'" Concrete with strengths substantially in excess of these over-design strengths will be rejected and returned to the submitting Laboratory for the appropriate adjustments.

509.2.8.4.3 Mixture Design Submittal

Submit a completed electronic copy of the NMDOT *Concrete Mix Design Submittal Form* to the Concrete Unit of the State Materials Bureau. Ensure that the following information is included:

1. Company name of the requestor;
2. Company address, telephone number and e-mail address;
3. PTL's name and signature; and
4. The New Mexico registration number of the professional Engineer who is responsible for the concrete mixture design Work;
 - 4.1. Ensure that the following information and the required documentation are provided electronically and through back-up documentation:
5. A comprehensive Materials list and the properties of each component, including:
 - 5.1. Aggregates:
 - 5.1.1. Source names;
 - 5.1.2. Specific source locations;
 - 5.1.3. For sources not on the Department approved list, provide a complete ASTM C 295 "Petrographic Examination of Aggregates for Concrete" and an ASTM C 294, *Constituents of Natural Mineral Aggregates* for both the coarse and fine aggregate Material after completing processing and manufacturing procedures and the aggregate is ready for use; include the geologic origin of the Material; perform and certify the analysis using a petrographer previously approved by the Department;
 - 5.1.4. Soundness loss with calculations;
 - 5.1.5. Percent of Fractured Faces for the coarse aggregate;
 - 5.1.6. Gradations, including AASHTO T 11;
 - 5.1.7. Bulk saturated surface dry specific gravities;
 - 5.1.8. Los Angeles wear abrasion;

- 5.1.9. Fineness modulus;
- 5.1.10. Aggregate absorption;
- 5.1.11. Aggregate correction factor;
- 5.1.12. Sand equivalent of fine aggregate;
- 5.1.13. Dry-rodded coarse aggregate unit weight;
- 5.1.14. Fine aggregate clay lumps content; and
- 5.1.15. Organic impurity content, including soft fragments, coal and lignite, flat or elongated pieces, and other deleterious substances.
- 5.2. Cement:
 - 5.2.1. ASTM C 150 Analysis;
 - 5.2.2. Chemical and physical cement properties, including the amount of C3S, C2S, C3A, the amount finer than the No. 325 sieve, and the Blaine Fineness; and
 - 5.2.3. Cube strengths;
- 5.3. Fly Ash:
 - 5.3.1. ASTM C 618 Analysis;
 - 5.3.2. Specific gravity;
 - 5.3.3. Material retained on a No. 325 sieve;
 - 5.3.4. Moisture content;
 - 5.3.5. Loss on ignition;
 - 5.3.6. Magnesium oxide content; and
 - 5.3.7. Calcium oxide content.
- 5.4. Blended Cement:
 - 5.4.1. ASTM C 595 and ASTM C 1157 analyses;
 - 5.4.2. Chemical and physical cement properties, including the percent of C3S, C2S, C3A, the amount finer than a No. 325 sieve, and the Blaine Fineness;
 - 5.4.3. Total alkalis;
 - 5.4.4. ASTM C 618 Analysis; and
 - 5.4.5. Percent of fly ash;
- 5.5. Admixtures:
 - 5.5.1. Documentation of compliance with appropriate ASTM requirements; and
 - 5.5.2. Verification of supply availability;
- 5.6. Water:
- 6. Concrete mixture proportions; state clearly if submitting request under the combined gradation provisions;
- 7. Water/cementitious ratios;
- 8. Type and amount of admixtures; use admixtures on the Department's *Approved Products List*;
- 9. Water source and location; include pH, available alkalis, and a full chemical analysis, if the water source is not a certified NMED public potable water supply;
- 10. Plastic Concrete Properties:
 - 10.1. Air temperature;
 - 10.2. Concrete temperature;
 - 10.3. Slump; when using super-plasticizer, document the slump before and after addition of the super-plasticizer;
 - 10.4. Unit weight; and
 - 10.5. Air content measured in accordance with AASHTO T 152 or AASHTO T 121;

- 10.6. When using super-plasticizer, document the measured air content before and after adding the super-plasticizer);
11. Hardened Concrete Properties:
 - 11.1. New Concrete Mixtures:
 - 11.1.1. Compressive strength tests (the average of three (3) cylinders tested at seven (7) Days, 28 Days, and 56 Days, except for Class E, Class F and Class F-LS mixes which shall have two (2) cylinders tested at 7, 14, 28 and 56 Days);
 - 11.1.2. Type of fracture of each cylinder;
 - 11.1.3. Flexural strength test results for Class F-LS (average of three (3) beams)
 - 11.1.4. Durability index (for structural mixes only);
 - 11.1.5. Hardened air void analysis (for structural mixes only);
 - 11.1.6. Rapid Chloride Permeability (for structural mixes only); and
 - 11.1.7. Expansion data from AASHTO T 303;
 - 11.2. Existing Concrete Mixtures:
 - 11.2.1. Consecutive compressive strength data with individual specimen test results from seven (7) Days, 28 Days, and 56 Days (at least 15 tests required); Present this data in chronological order;
 - 11.2.2. Durability index (for structural mixes only);
 - 11.2.3. Hardened air void analysis (for structural mixes only);
 - 11.2.4. Rapid Chloride Permeability (for structural mixes only); and
 - 11.2.5. Expansion data from AASHTO T 303;
 - 11.3. Incidental Concrete Mixtures (Only for specific Projects) Concrete mixes intended for Projects that anticipate less than 300 yd³ of each concrete class, but not more than 750 yd³ for concrete used on the Project:
 - 11.3.1. Compressive strength data (field performance data if using the mix within the previous 12 months, or Laboratory Laboratory mix performance data not using it in the field); and
 - 11.3.2. Air content, as measured by the pressure method or the volumetric method; when using superplasticizer, show the air content before and after adding superplasticizer.

509.2.8.5 Mixture Design Approval

The Department will require at least 14 Days to review the submittal packages after receipt by the State Materials Bureau of all required information. The Department will approve designs for a period of 1 year from the date of issuance if the documentation verifies compliance with all requirements. At least 30 Days before the 1-year approval expires, the Contractor may request that the mix design be reissued. The Contractor must provide test reports showing that the mix design met specification requirements during the issue period. Mix designs may be re-approved for no more than 4 additional years. The Department will grant each approval period if the documentation verifies the following:

1. Constituent Material sources and the Material's properties remain the same;
2. The compressive strength performance data verifies compliance with Section 510.3.5.3, "Acceptance of Concrete Based on Cylinders;"
3. Compliance with other fresh and hardened properties is verified where the mixture was used;
4. The coefficient of variation (CV), determined in accordance with ACI 214, is less than 12%; and
5. When field performance data shows the CV exceeds 12%, a "Comprehensive Operations QC/QA Manual" that shows how the Contractor will reduce the variability and improve the consistency of its production process will be required.

At the discretion of the State Concrete Engineer, a mixture can be adjusted without re-batching by using “cement efficiency” calculations to determine the amount of change to the cement and the total cementitious content that is necessary to achieve the desired level of performance. When this procedure is allowed, the ratio of pozzolan to cement ratio will remain unchanged, the water content will remain unchanged, and the aggregates will be adjusted without changing the overall gradation to accommodate the changes in volume from changes made to the cement. All changes made by this method must be approved by the State Concrete Engineer before being implemented in the field.

If the constituent Materials change, immediately provide documentation to the State Materials Bureau describing how to resolve the problem. Return the affected Material to an approved condition or submit a new concrete mixture design package. If the compressive strengths do not comply with Department requirements, describe the needed adjustments. Submit a written summary of the adjustments to achieve compressive strength to the State Materials Bureau for approval. Do not use the concrete mixture on Department Projects before receipt of written approval from the State Materials Bureau.

The Department will not consider the addition of more cement a sufficient explanation or resolution without additional documentation explaining why other measures are not appropriate.

509.3 CONSTRUCTION REQUIREMENTS – Reserved

509.4 METHOD OF MEASUREMENT – Reserved

509.5 BASIS OF PAYMENT

The Department will pay for concrete in accordance with the section of these Standard Specifications for which the concrete is used.

SECTION 516: FLOWABLE FILL

516.1 DESCRIPTION

This Work consists of providing and placing flowable fill.

516.2 MATERIALS

516.2.1 General

Flowable fill is a flowable mixture of portland cement, fly ash, aggregates, admixtures and water.

516.2.2 Mix Design

The State Materials Bureau is responsible for approving the mix design for flowable fill. Approval of a Flowable fill mix design by the State Materials Bureau will be valid for a period of 5 years unless revoked due to performance problems.

516.2.3 Cement

See Section 509, "Portland Cement Concrete Mix Designs."

516.2.4 AGGREGATE

Provide a uniform mixture of fine aggregate or coarse and fine aggregate. Provide coarse and fine aggregate with a gradation in accordance with Table 516.2.4:1, "Aggregate Mixture Gradation Requirements."

Table 516.2.4:1
Aggregate Mixture Gradation Requirements

Sieve size	% passing
One (1) inch	100
3/8 inch	95 – 100
No. 4	80 – 100
No. 8	60 – 95
No. 16	45 – 80
No. 30	25 – 60
No. 50	5 – 45
No. 100	5 – 35
No. 200	0 – 30

516.2.5 Water

Provide concrete mix water in accordance with Section 509, "Portland Cement Concrete Mix Designs."

516.2.6 Air-Entraining Admixture

The Contractor may use an air-entraining admixture to provide air entrainment no greater than 35% in the flowable fill.

516.2.7 Fly Ash

Provide approved Class F, Class C, or Class C/F blended fly ash in accordance with Section 509, "Portland Cement Concrete Mix Designs."

516.2.8 Water-Reducing Admixture

The Contractor may use a water-reducing admixture.

516.2.9 Proportioning and Physical Property Requirements in the Laboratory

Provide a flowable fill mix design in accordance with the following limits:

1. Cement, maximum 50 lbs/yd³.
2. Fly Ash, from 150 lbs/yd³ to 300 lbs/yd³.
3. Air Content, optional.
4. Slump, from eight (8) inch to 11 inch.
5. Water/cement ratio, proportioned by weight to produce a slump within the prescribed limits.
6. Consistent aggregate throughout the concrete mixture.
7. Compressive strength will not exceed 150 psi at 28 Days.
8. Cast the test specimens in four (4) inch × eight (8) inch test cylinders, perforated on the bottom with four (4) 1/4 inch diameter holes for free draining;
9. Keep the test cylinders in a moist environment, but do not cure in a curing tank.
10. Cast six (6) compressive strength test cylinders in the Laboratory. Test two (2) cylinders at seven (7) Days, two (2) at 28 Days, and two (2) at 56 Days.

516.3 CONSTRUCTION REQUIREMENTS

516.3.1 Batching, Mixing, and Transporting

Perform batching, mixing, and transporting in accordance with Section 510, "Portland Cement Concrete."

516.3.2 Testing Flowable Fill in the Field

Obtain the State Materials Bureau's approval of the flowable fill mix properties before using the mix in the field.

For field testing, use a standard (15 lb) T-post fence driver to drive a #6 reinforcing bar with a flat end into the flowable fill Material 24 h after placement. Lift the driver until the bottom of the driver is even with a mark located six (6) inches below the top of the rebar, and then allow it to fall under its own weight. Remove and replace the flowable fill if fewer than six (6) blows or more than 25 blows are required to drive the rebar exactly 12 inches into the fill. Do not use compressive strength test cylinders for field-testing purposes.

516.3.3 Pre-Placement Requirements

Before placing flowable fill, remove any loose or uncompacted soils from the area to be filled. Ensure that all areas in which soils or construction Materials have sloughed off or collected are completely cleared. **DO NOT PLACE FLOWABLE FILL AGAINST LOOSE OR UNCOMPACTED SURFACES/MATERIAL.**

Ensure that all pipes or other embedded items which would otherwise float to the top of the flowable fill are adequately secured to prevent their floating out of position.

516.3.4 Placing

Place flowable fill uniformly to prevent voids in or segregation of the bedding and filling Material. Secure the Culvert or pipe from movement.

Place the flowable fill by direct discharge from a ready mix truck, pumping, or other method approved by the Project Manager. Place the flowable fill in layers no more than 12 ft high. Place the flowable fill in layers no more than four (4) ft high for areas that require forming. Do not place the individual layers until flowable fill in a previously placed layer has

been in place at least two (2) h.

Submit a written request and obtain written approval from the District Construction Engineer before placing the flowable fill in a full depth layer.

Do not place the flowable fill on frozen ground or while it is raining. Protect flowable fill from flooding for at least 24 h after placement.

If necessary, place flowable fill in standing water that is positioned to keep the outside water from contaminating or mixing with the flowable fill.

If required, consolidate the flowable fill with internal vibrators in accordance with Section 511.3.4.5, "Vibrating/Consolidation."

Do not allow any imbedded items to float or otherwise dislodge. Secure pipe to compensate for buoyancy.

Fill the areas between the walls of the existing CBC and an inserted CMP thoroughly.

Do not disturb the flowable fill Material for at least 24 h after placement. The Contractor may reduce this 24-hour period, if the penetration resistance of the Material justifies, as tested in accordance with Section 516.2.10, "Sampling and Testing."

516.3.5 Application of Load

The Contractor may cover the flowable fill within 24 h after placement, if a person weighing at least 150 lb does not sink into the Material more than one (1) inch, if standing on a four (4) inch × four (4) inch wooden block.

516.3.6 Temperature and Weather Limitations

Do not place flowable fill when the air temperature is lower than 35 °F. The Contractor may begin placement only when weather conditions are favorable and the air temperature is at least 35 °F and rising. If the air temperature at the time of placement is less than 40 °F, place flowable fill that has a temperature of at least 50 °F.

516.4 METHOD OF MEASUREMENT

The Department will measure flowable fill using the dimensions shown in the Contract or as approved by the Project Manager. The Department will consider flowable fill used at the Contractor's option to be Incidental to the associated Bid Item.

516.5 BASIS OF PAYMENT

PAY ITEM	PAY UNIT
<i>Flowable Fill</i>	Cubic Yard

516.5.1 Work Included In Payment

The following Work will be considered as included in the payment for the main item and will not be measured or paid for separately: When called for in the Contract, or the Contractor proposes its use and is approved by the Project Manager, flowable fill can be used for backfill in Culvert installations. No measurement or payment will be made for Work and Materials associated with backfilling pipes with flowable fill. This will be included in the Contract unit price per linear foot of Culvert pipe.

SECTION 601: REMOVAL OF STRUCTURES AND OBSTRUCTIONS

601.1 DESCRIPTION

This Work consists of removing and salvaging, or disposing of buildings, fences, Structures, utility lines, pavement in its entirety or partially to neat cut or saw cut lines, and other obstructions.

This Work also includes salvaging specified Materials and backfilling the resulting trenches, holes, and pits.

The Contractor shall repair salvageable items that are damaged during removal, whether designated for removal in the Contract or by the Project Manager, at no additional cost to the Department.

601.2 MATERIALS—RESERVED

601.3 CONSTRUCTION REQUIREMENTS

601.3.1 General

If the Contract identifies material for salvage, remove the material and return to the Department in a transportable condition. Store this material in accordance with the Contract.

Notify the Project Manager in writing of disposal details for material not identified as salvage.

Destroy unusable, non-hazardous combustible material. Dispose of non-hazardous, non-combustible material. If the Contractor disposes of this material outside the Right of Way, provide the Project Manager with a copy of the written permission from the property owner.

Backfill holes created by Structure removal. If the hole is within the Roadway Prism, compact in accordance with Section 203.3.5, "Embankments," and Section 203.3.7, "Moisture and Density Control." Break up concrete aprons or surfacing before burying to allow water to drain.

Provide a list of removals to the Project Manager at the preconstruction conference, with the following information for each:

1. A percent of the pay item amount; and
2. A monetary value.

601.3.2 Removal of Bridges, Culverts, and Other Drainage Structures

Remove existing Structures in a streambed down to the stream bottom. Remove existing Structures outside the stream to one (1) ft below the ground surface. Remove more of the existing Structure if necessary to accommodate a new Structure.

If dismantling a steel or wood Bridge, minimize damage to the removed material if identified as salvageable, match-mark the steel members (unless otherwise approved by the Project Manager), and store salvaged material in accordance with Section 601.3.1, "Construction Requirements, General."

If removed concrete is specified for use as riprap in the Contract, crush and stockpile as directed by the Project Manager.

601.3.3 Removal of Pipe

Minimize damage while removing existing pipe. If the Project Manager identifies existing pipe as reusable, store the reusable pipe, minimizing loss or damage.

601.3.4 Removal of Pavement, Sidewalks, Curbs, and Gutters

Break concrete items including pavement, Sidewalks, curbs, and gutters, and dispose of them in accordance with Section 601.3.1, "Construction Requirements, General."

If approved by the Project Manager, recycle existing ballast, Base Course, gravel; asphalt Material, and other surfacing Materials in accordance with Section 107.14.7, "Disposal of Removed Asphalt Pavement Material." The Contractor is responsible for disposing of excess material in accordance with Section 601.3.1, "Construction Requirements, General."

601.3.4 Removal of Fence

Salvage fence Materials, unless otherwise specified in the Contract. Place barbed wire into single-strand rolls. Minimize damage when pulling posts.

601.3.5 Demolition

If the Contract requires demolition, remove the existing Structures and restore to the existing surface.

Before beginning demolition, coordinate disconnection of utility services with the appropriate utility owner.

Immediately repair broken or damaged utilities, at no additional cost to the Department.

601.3.6 Hauling and Stockpiling Salvageable Material

If the Contract requires the Contractor to haul and stockpile salvageable material, load, haul, unload, and stockpile the Materials in accordance with the Contract. Minimize damage to the material.

Place the salvageable material on blocks or other approved Materials and maintain the stockpile area, as directed by the Project Manager.

601.4 METHOD OF MEASUREMENT—RESERVED

601.5 BASIS OF PAYMENT

Pay Item	Pay Unit
<i>Removal of Structures and Obstructions</i>	Lump Sum
<i>Removal of Surfacing</i>	Lump Sum or Square Yard
<i>Demolition</i>	Lump Sum

The Department will make partial payments based on the percent complete of each item on the list of removals provided to the Project Manager at the preconstruction conference.

The Department will not make additional payment for minor removals not specified in the Contract.

601.5.1 Work Included in Payment

1. No direct payment will be made for filling cavities left by structure removal, and the Work shall be considered Incidental to the applicable items;
2. No direct payment will be made for loading, hauling, unloading, and satisfactorily stockpiling salvageable material and the Work shall be considered Incidental to the applicable items;

3. Saw cutting when designated on contract.

SECTION 603: TEMPORARY EROSION AND SEDIMENT CONTROL

603.1 DESCRIPTION

This Work consists of preparing a Storm Water Pollution Prevention Plan (SWPPP), and constructing, inspecting, and maintaining erosion, sediment control, and storm water pollution prevention facilities for the discharge of storm water associated with construction activity. This Work includes construction phase activities through final stabilization.

603.1.1 Storm Water Pollution Prevention Plan

The Storm Water Pollution Prevention Plan (SWPPP) must satisfy the requirements of the current Construction General Permit and must contain the following sections, forms, and information sheet:

SWPPP REQUIRED SECTIONS

1. Storm Water Team;
2. Nature of Construction Activities;
3. Emergency Related Projects (if applicable);
4. Identification of Other Site Operators;
5. Sequence and Estimated Dates of Construction Activities;
6. Site Map;
7. Construction Site Pollutants;
8. Non-Storm Water Discharges;
9. Buffer Documentation;
10. Temporary Erosion and Sediment Control Plan and Description of Storm Water Control Measures (Construction Phase & Final Stabilization);
11. Pollution Prevention Procedures;
12. Procedures for Inspection, Maintenance, and Corrective Action;
13. Staff Training;
14. Documentation of Compliance and Other Federal Requirements;
15. SWPPP Certification; and
16. Post-Authorization Additions to the SWPPP.

SWPPP REQUIRED FORMS

1. Notice of Intent (NOI);
2. Storm Water Program;
3. Storm Water Management;
4. NPDES *General Construction Storm Water Permit Checklist*; and
5. Contractor Certification for NPDES *General Permit for Storm Water Discharges from Construction Sites*.

An information sheet provided by the NMDOT provides the following:

1. A site description;
2. NOI inputs;

3. Drainage parameters;
4. Runoff, discharge, and volume calculations; and
5. General notes.

The information sheet is included in the Plans. For more information on SWPPP, see Section 603.1.1.2, "Department Responsibilities." The NPDES Construction General Permit, issued by the EPA, requires a SWPPP and submittal of the NOI for construction Projects with 1 acre or more of earth disturbance as defined in the NPDES Construction General Permit.

603.1.1.1 Temporary Erosion and Sediment Control Plan

The Final Stabilization Temporary Erosion and Sediment Control Plan (TESCP) prepared by the Department depicts the location, type, and length of temporary erosion control measures, off-site flows, discharge locations, and flow paths within the Right of Way on plan sheets at final placement prior to seeding operations. For more details on the Final Stabilization TESCP, see Section 603.1.1.2, "Department Responsibilities."

The Construction Phase Temporary Erosion and Sediment Control Plan (TESCP) prepared by the Contractor depicts the location, type, and length of temporary erosion control measures, off-site flows, discharge locations, and flow paths within the Work area of the Right of Way on construction phasing plan sheets. For more details on the Construction Phasing TESCP, see Section 603.1.1.3, "Contractor Responsibilities."

603.1.1.2 Department Responsibilities

The Department will prepare and include in the Plans a Final Stabilization TESCP, a Re-vegetation/Erosion Control Plan, and a SWPPP information sheet. The Final Stabilization TESCP sheets will include the following:

1. Site maps;
2. Drainage patterns;
3. Discharge locations;
4. Approximate slopes;
5. Areas of soil disturbance;
6. Major controls locations;
7. Structural practices;
8. Surface waters (including wetlands);
9. Conditions before and after construction;
10. Right of Way lines;
11. Easements;
12. Existing and new Structures;
13. Existing and proposed Roadway grades; and
14. Detours outside of the Right of Way.

The Re-vegetation/Erosion Control Plan sheet will provide a description and timing of final stabilization practices.

The SWPPP information sheet will include the following information:

1. Nature of the activity;

2. Total site area;
3. Total disturbed area;
4. Runoff coefficient for pre/post construction;
5. Receiving waters;
6. Latitude and longitude of the site;
7. Estimate of likelihood of discharge;
8. Endangered species or critical habitat;
9. Part 3 of the NPDES General Permit, Water Quality-Based Effluent Limitations;
10. Basic drainage and site information required for SWPPP development;
11. MS4 areas; and
12. 303d impaired list.

603.1.1.3 Contractor Responsibilities

Before disturbing any soil, the Contractor shall prepare and submit to the Project Manager a Contractor developed SWPPP based on the planned construction phasing and schedule. The Contractor shall prepare amendments to the SWPPP as Work progresses or as phasing or scheduling changes are made. Specifically, the Contractor shall prepare a Construction Phase TESC for each construction phase, complying with provisions of the NPDES Construction General Permit, and include at least the following items or activities:

1. Develop the SWPPP using a combination of structural, non-structural, and vegetative best management practices (BMPs) appropriate for the identified location to control erosion and sedimentation and manage storm water during construction activities.
2. Include proposed methods for minimizing or eliminating pollution of streams, lakes, reservoirs, canals, and other water impoundments from storm water discharge associated with construction activities.
3. Do not start earth—disturbing activities until the Contractor developed SWPPP has been submitted and the NOI is active.
4. Refer to the recommendations in the current version of the Department's National Pollutant Discharge Elimination System Manual: Storm Water Management Guidelines for Construction and Industrial Activities.
5. Provide a signed, certified statement that states the terms and conditions of the NPDES General Permit are fully understood. Include a statement of intent to fully implement the SWPPP as proposed or modified at the pre-construction meeting in the certification.
6. Maintain the SWPPP in accordance with the NPDES Construction General Permit until final grading, erosion control, and seeding operation completion.

603.1.2 Retention of Records

Retain and maintain SWPPP changes as required by the NPDES General Permit. Include copies of the permit language and inspection and maintenance reports in the SWPPP. Prepare inspection and maintenance reports from commencement of earthwork activities to Project completion. Deliver the SWPPP to the Project Manager at Project completion. Ensure that these records are available to the public at all times.

603.1.3 Notice of Intent (NOI)

Provide a copy of the electronic NOI (eNOI) to the Project Manager that meets the NPDES General Permit requirements for discharge of storm water associated with construction activities.

The Department and the Contractor will prepare and submit separate eNOIs to the EPA, designating the status of owner/operator. Do not begin earth-disturbing activities until the eNOIs are listed on the EPA website as “active.” The EPA will post eNOI approvals on their website. The Contractor shall submit a copy of the Contractor’s eNOI to the Project Manager.

603.1.4 Notice to Termination (NOT)

Prepare and submit a NOT to the EPA within 30 Days after Project completion, indicating that the operator of the Project has changed to the NMDOT. Provide a copy of the submittal to the Project Manager.

603.1.5 Off-Site Pollution Prevention Plan

Prepare and submit a SWPPP, eNOI, and NOT, if required, to appropriate agencies for Work performed outside the Project Right of Way. The Contractor is responsible for all associated NPDES requirements for the off-site locations. Comply with NPDES requirements for off-site locations. Provide a copy of each off-site submittal to the Project Manager.

603.1.6 Liquidated Damages

Failure to comply with the NPDES program may result in EPA citations.

If the Contractor does any of the following, the Department will assess liquidated damages in accordance with Table 603.1.6:1, “Liquidated Damages Schedule;”

1. Fails to maintain temporary erosion control measures in accordance with Section 603.3.6, “Erosion Control Inspection and Maintenance;”
2. Fails to document inspection and maintenance activities (as required by the General Permit); or
3. Fails to document, in a Corrective Action Report (as required by the General Permit), field changes of erosion control measures as directed in writing by the Project Manager.

**Table 603.1.6:1
Schedule of Liquidated Damages**

Total Original Contract Amount (\$)	Charge (\$) per Day
≤2,000,000	500
>2,000,000–5,000,000	1,000
>5,000,000–10,000,000	1,500
>10,000,000	2,000

The Project Manager will keep a schedule of noncompliance that the Department will use to calculate liquidated damages. The Department will assess liquidated damages until the Project Manager issues a written notice of compliance to the Contractor.

If the Contractor’s failure to adhere to the NPDES General Permit requirements results in a fine assessed against the Department, the Contractor shall reimburse the Department within ten (10) Days of the assessment. If the Contractor does not reimburse the Department within the ten (10) Days, the Department may pay the fine assessed and withhold the fine amount from the Contractor’s next partial payment.

603.2 MATERIALS

603.2.1 General

Provide Materials for erosion, sediment control, and storm water pollution prevention measures that consist of siltation fences, socks, rock, riprap, soil retention blankets, or other acceptable measures approved by the Project Manager.

603.2.2 Slope Drains

Provide Materials for slope drains that consist of pipe, flexible pipe, and riprap. The Project Manager may approve the use of other Materials.

603.2.2.1 Pipe

See Section 570, "Pipe Culverts" for approved types of pipe.

603.2.3 Geotextiles

603.2.3.1 Drainage Geotextiles

Provide drainage geotextiles (Class B drainage applications) for silt fence in accordance with Section 604, "Soil and Drainage Geotextiles," unless otherwise specified in the Contract.

603.2.3.2 Soil Retention Blanket

Provide a soil retention blanket from the Department's *Approved Products List*, or as specified in the Contract and approved by the Project Manager.

603.2.4 Riprap

Provide riprap and rock plating in accordance with Section 602, "Slope and Erosion Protection Structures."

603.2.5 Temporary Soil Stabilant

Provide a temporary soil stabilant from the Department's *Approved Products List*, or as specified in the Contract and approved by the Project Manager.

Ensure that the soil stabilant contains an anti-foaming agent and color additive to assist in its uniform application and disappears from the surface within 36 hours after application.

603.2.6 Mulch Socks or Composted Mulch Socks

Core Material (Mulch): See Section 632, "Revegetation" for mulch and composted mulch Specifications.

Core Material (woodchips): The Material must be 100% untreated wood chip and free of inorganic debris, such as plastic, glass, metal, etc. Manufacturer shall certify that the material is free of noxious weeds.

Woodchip size shall not be smaller than one (1) inch and shall not exceed three (3) inches in diameter; shavings shall not be more than five percent (5%) of the total mass.

Containment Mesh: Furnish containment mesh 100% biodegradable, photodegradable such as burlap, twine, UV photodegradable plastic, polyester, or other acceptable Material as directed by the Project Manager.

The mesh should not exceed 1/2 inch in diameter.

Furnish biodegradable or photodegradable containment mesh when the socks will remain in place as part of the permanent or temporary vegetative plan. The containment mesh shall be greater than nine (9) inches in height after being packed; the containment mesh shall be

densely packed so that the socks do not deform. The Project Manager will determine the maximum allowable height for containment mesh.

603.3 CONSTRUCTION REQUIREMENTS

603.3.1 General

Apply appropriate erosion and sediment control measures for construction activities per the accepted Contractor developed SWPPP.

Install temporary erosion and sediment control features and maintain until final grading, erosion control, and seeding operations completion.

Incorporate permanent erosion and sediment control measures, such as riprap pads or other forms of energy dissipaters at the outlets of Structures, into the Project at the earliest practical time, as directed by the Project Manager.

603.3.2 Contractor's Operations

Keep construction activity to a minimum within the Project Right of Way, adjacent to the Project, to prevent damage to vegetation. Repair damage or disturbance to areas, not necessary for construction of the Project, at no additional cost to the Department.

Keep construction areas in an orderly condition and promptly dispose of refuse and discarded Materials.

As directed by the Project Manager, provide erosion and sediment control measures necessary to correct negligent or improper installation, at no additional cost to the Department.

603.3.2.1 Sequence of Operations

Before Work begins, the Project Manager and the Contractor will conduct a site inspection to review the planned erosion control protections. Use the Contractor developed SWPPP for this review.

Coordinate the placement and maintenance of the temporary and permanent erosion and sediment control measures shown in the Contractor developed SWPPP.

The Department will assess liquidated damages, in accordance with Section 603.1.6, "Liquidated Damages," if the Contractor begins earth-disturbing Work before the following:

1. Submission of the eNOI and obtaining notification of permit coverage; or
2. Placing erosion control measures.

603.3.2.2 Watercourse Protection

Provide filtration or settling basins to treat water used to wash aggregate or water used for similar operations.

Locate and construct waste disposal areas and haul Roads to prevent sediment from entering streams and water impoundment areas, or leaving the Project.

Do not operate mechanized Equipment in perennial streams, unless otherwise specified in the Contract.

Use temporary Bridges or other crossing Structures constructed of non-erodable Material, where frequent stream crossings are necessary.

Clear false Work, piling, debris, and other obstructions placed during construction from streambeds, arroyos, and watercourses as soon as possible. Do not allow waste from haul

truck cleaning to drain into watercourses.

The Contractor shall provide the necessary buffer protection for adjacent surface waters as required by the General Permit.

603.3.3 Temporary Soil Stabilant Application

Apply temporary soil stabilant to exposed areas not being worked. Begin stabilization within 1 Work Day after Work ceases, unless construction resumes within 14 Days after Work ceases.

Follow the manufacturer's recommendations for storage and application of the soil stabilant. Maintain the rate of application recommended by the manufacturer. If the soil stabilant does not produce the required results, the Project Manager and the Department's Landscape Architect may modify the manufacturer's application rate.

Reapply stabilant to areas of continued erosion and Contractor activity within four (4) weeks after the initial application at no additional cost to the Department, as directed by the Project Manager.

603.3.4 Mulch Socks or Composted Mulch Socks

Install the socks near the downstream perimeter of the disturbed area as shown on the SWPPP to intercept sediment from sheet flow, in the ditch as check dams, or as inlet protection as directed by the Project Manager. Close contact between the earth and sock should be maintained by removing remaining vegetation, rocks, debris, and dirt clods. The socks will be interlocked or overlapped at the ends.

Anchoring should be adequate to prevent displacement during design rain events and to prevent flow under the socks. The anchors will be two (2) inch by two (2) inch wooden stakes or as approved by the Project Manager. Socks used as check dams or placed in areas where the flow is more concentrated will be staked.

603.3.5 Earthwork Operations

Protect slopes as excavation or Embankment construction progresses.

Maintain and protect the earthwork in Roadway sections through all construction stages to prevent sediment from leaving the construction limits.

Provide temporary slope drain facilities that can collect runoff and carry it to the slope bottoms. Use drain Materials capable of length change as earthwork operations progress.

603.3.6 SWPPP Inspection and Maintenance

Inspect and maintain the Project site for NPDES compliance during the Project. Inspect and maintain installations at the following frequencies, per the General Permit:

1. At least once every seven (7) Calendar Days; or
2. once every 14 Calendar Days and within 24 hours of a 0.25 inch or greater rainfall event; or
3. for Arid, Semi-Arid, or Drought-Stricken Areas. The Contractor may reduce the frequency of inspections to once per month and within 24 hours of the occurrence of a storm event of 0.25 inches or greater if your site is located in an arid, semi-arid, or drought-stricken area, as these terms are defined in Appendix A of the Construction General Permit, and construction is occurring during the seasonally dry period or during a period in which drought is predicted to occur. The Contractor must document that they are using this reduced schedule and the beginning and ending dates of the seasonally dry period in the SWPPP.

Maintenance Work includes, but is not limited to, repair of damaged installations, removal of trapped sediment, and cleaning of any silt fence. Remove accumulated silt when the control installation becomes 50% filled. Inspect disturbed areas, Material storage areas, discharge locations, and structural control measures. Inspect vehicle entrances and exits for material being tracked off-site. Document each inspection on the *SWPPP Inspection Form* provided by the Department. Submit the inspection report signed by a NPDES-trained and qualified person to the Project Manager within 24 hours after the inspection. Include copies in the Contractor's SWPPP.

Install a rain gauge at the Project site to track rainfall amounts for the inspection schedule.

Designate the person responsible for the SWPPP on the qualification form provided by the Department, and sign. Ensure that the person is familiar with the Project SWPPP and document the responsible person's experience and training on the qualification form. Include it with the SWPPP. The Project Manager will assign a qualified Department representative (with qualification form) experienced and trained in implementing BMPs.

Repair damaged erosion and sediment control installations within three (3) Days of an inspection or following notification by the Project Manager that repairs are required.

If a damaged erosion control installation could result in sediment discharge into a live stream, water impoundment, or other body of water, initiate repairs within 24 hours or sooner, as necessary or as directed by the Project Manager.

Maintain erosion and sediment control installations specified to remain following completion of the Work until the Project is completed.

Dispose of erosion and sediment control installations in accordance with the Contract or as directed by the Project Manager.

603.3.7 Removal of Control Installations

Remove temporary erosion and sediment control installations and features from the Project area when no longer required, unless otherwise specified in the Contract or directed by the Project Manager. After removing temporary erosion control installations, restore ground lines, cover, and features as closely as possible to original condition.

Removed sediment may be deposited at locations within the Right of Way, if approved by the Project Manager. Where removed sediment is deposited in previously undisturbed areas, the Contractor shall reseed those areas at no additional cost to the Department.

603.4 METHOD OF MEASUREMENT

The Department will measure check dams along the crest of the dam.

603.4.1 SWPPP Plan Preparation and Maintenance

The Department will reimburse the cost to prepare the SWPPP, prepare and install all BMPs for the Construction Phase TESC, and maintain the Construction Phase TESC BMPs under pay item SWPPP Plan Preparation and Maintenance.

603.5 BASIS OF PAYMENT

Pay Item	Pay Unit
<i>Silt Fence</i>	Linear Foot
<i>Check Dam Type _____</i>	Linear Foot
<i>Earth Dike</i>	Linear Foot

<i>Pipe Slope Drain</i>	Linear Foot
<i>Sediment Trap</i>	Cubic Yard
<i>Soil Retention Blanket</i>	Square Yard
<i>Temporary Soil Stabilant</i>	Acre
<i>Culvert Protection</i>	Square Yard
<i>Drop Inlet Protection Type _____</i>	Each
<i>SWPPP Plan Preparation and Maintenance</i>	Lump Sum
<i>Mulch Socks</i>	Linear Foot
<i>Composted Mulch Socks</i>	Linear Foot

SWPPP Plan Preparation and Maintenance includes SWPPP preparation, BMPs, installation of BMPs, inspection, and maintenance of erosion and sediment control measures, preparation of inspection reports, updating and/or modifying, maintaining, and retaining the SWPPP and other related records.

603.5.1 Work Included in Payment

The following Work and items will be considered as included in the payment for the above item(s) and will not be measured or paid for separately:

- A. Cleaning and maintenance of the temporary erosion and sediment control measures;
- B. Posts, hardware, and appurtenances of the temporary erosion and sediment control measures;
- C. Riprap for pipe slope drains and sediment traps;
- D. Excavation and disposal of sediment deposits;
- E. Removal and disposal of temporary erosion and sediment control measures, if required;
- F. Subsequent applications of temporary soil stabilant due to unsatisfactory results;
- G. Removal and replacement of the measure at the same location due to construction; and
- H. Relocation of BMPs during phasing and final placement.

603.5.2 Partial Payments

The Department will make an initial partial payment for *SWPPP Plan Preparation and Maintenance* upon receipt and Acceptance of the Contractor SWPPP based on the following equation:

$$P_1 = L \times 0.20 \quad (1)$$

Where,

P_1 is the initial partial payment upon receipt and approval of Contractor SWPPP.

The Department will make monthly partial payments for *SWPPP Plan Preparation and Maintenance* based on the rate of progress of the Project, less previous partial payments for this item. The Department will calculate partial payments in accordance with the following equation:

$$P_2 = [(A \times L)/B] - C \quad (2)$$

Where,

- P_2 is the partial payment during the progress of the Project
- L is the Total Bid Amount for *SWPPP Plan Preparation and Maintenance*
- A is the number of Days charged the Contractor toward completion of the Project
- B is the Contract Time
- C is the total amount of previous partial payments for this item.

SECTION 607: FENCE

607.1 DESCRIPTION

This Work consists of constructing fence and gates.

607.2 MATERIALS

607.2.1 Certification

Submit independent testing Laboratory certification to the Project Manager that indicates the fencing Materials meet these Specifications. The Department may inspect the manufacturing methods at manufacturing plants and may obtain Material samples for testing and may base Acceptance on the quality of manufacturing lots.

607.2.2 Barbed Wire and Woven Wire Fence

607.2.2.1 Wire

Provide wire and wire components with at least a Class 1 zinc coating in accordance with ASTM A 121 or ASTM A 116, unless otherwise specified in the Contract. Instead of Class 1 coating, the Contractor may coat the wire with aluminum alloy covering at least 0.3 oz per square foot of wire surface.

607.2.2.1.1 Barbed Wire

Provide barbed wire and barbs in accordance with ASTM A 121. Provide composite barbed wire strands that consist of two (2) coated wires with diameters of 0.099 inch. Provide round barbs that have a coated diameter of 0.08 inch, with either two-point barbs spaced four (4) inches apart or four-point barbs spaced five (5) inches apart. Provide stays for barbed wire fences in accordance with ASTM A 116, with a coated diameter of at least 0.142 inch and with lengths and spacing in accordance with the Contract.

607.2.2.1.2 Woven Wire

Provide woven wire in accordance with ASTM A 116, Design Number 832-6-11, unless otherwise specified in the Contract.

607.2.2.1.3 Post Fasteners

Provide coated staples with a diameter of at least 0.148 inch and a length of at least 1 1/2 inch; use for fastening fence wire to wood posts.

607.2.2.1.4 Brace Wire

Provide coated brace wire with a diameter of at least 0.148 inch; use for constructing braces and intermediate braces with wood posts.

607.2.2.1.5 Tie Wire

Provide coated tie wire for fastening barbed or woven wire to steel posts with a diameter of at least 0.099 inch. The Contractor may use wire fasteners or metal clamps with thicknesses of 0.12 inch or greater instead of tie wires, if approved by the Project Manager.

607.2.2.2 Posts

Provide metal or wood corner, brace, intermediate brace gate, and line posts of the specified type, size, and length in accordance with the Contract.

607.2.2.2.1 Metal Posts

Provide metal posts and braces of rail, billet, or commercial-grade steel in accordance with ASTM A 702 or ASTM F 1083 for galvanized, standard weight pipe. Provide C-section posts in accordance with ASTM A 1011.

Galvanize steel posts in accordance with AASHTO M 181 for Grade 1 steel and provide a top coating specified for Grade 2 steel, or an equivalent or better coating, from the Department's *Approved Products List*. Coat edges and damaged areas of posts in accordance with ASTM A 780. Use posts of the same coating and color.

Provide posts that weigh no less than 95% of the specified weight; and are of the specified length +2 inch, -1 inch.

Provide line posts with a minimum weight of 1.33 lb per foot, not including anchor plates. The Contractor may provide I-beam, T-beam, U-beam, Y-bar, or C-section line posts. Provide line posts with corrugations, lugs, ribs, or notches spaced one (1) inch on centers to attach fence wire. The Department will not accept posts with punched tabs used for crimping around the wire.

Provide anchor plates with an area of at least 18 inch² and that weigh at least 0.67 lb. Clamp, weld, or rivet anchor plates to the post section to prevent displacement when driving the posts.

607.2.2.2.2 Wood Posts

Provide wood posts cut from live southern yellow pine, lodge pole pine, or ponderosa pine trees. Provide straight posts that are free of decay and other defects, bark-free, trimmed smooth of knots and projections, and with both ends sawed off perpendicular to the centerline.

Provide an average nominal diameter at the top of each post of at least six (6) inches. Ensure the circumference of corner, brace, intermediate brace, and gate posts is at least 19 inches, measured six (6) inches below the top of the post.

The Contractor may provide line posts with a slight crook in one (1) direction, but the post may not vary more than 1 1/2 inch from a straight line connecting both ends of the post. Ensure the average nominal diameter of the top of each line post is at least three (3) inches. Ensure the circumference of line posts is at least nine (9) inches, measured six (6) inches below the top of the post.

Provide coast region douglas fir or New Mexico red spruce or fir braces for wood posts.

607.2.2.2.2.1 Preservative Treatment of Wood Posts

Provide wood posts pressure treated with pentachlorophenol in accordance with Section 550.2.2, "Preservatives and Treatment Methods," with a minimum retention of 0.3 lb per cubic foot.

607.2.2.3 Gates

For fence constructed with woven wire and barbed wire, the Contractor shall provide tubular steel or steel panel frame gates. Provide gates with woven wire or chain link fabric filler, if specified in the Contract or directed by the Project Manager.

If providing barbed wire gates, use the same Materials as for the barbed wire fence. Provide frame tube and panel Materials for gates in accordance with AASHTO M 181, unless otherwise specified in the Contract.

Galvanize gates in accordance with Section 607.2.2.2.1, "Metal Posts," or coat in accordance with Section 545, "Protective Coating of Miscellaneous Structural Steel." Use "Interstate Green" as the finished color coating, except for galvanized gates and unless

otherwise specified in the Contract.

607.2.2.4 Fittings

Provide fittings, hardware, and appurtenances for fences and gates that are of commercial-quality steel, malleable iron, or wrought iron, and galvanized in accordance with ASTM A 153.

607.2.3 Chain Link Fence

607.2.3.1 Posts

Provide posts that are tubular steel, H-column, or C-section (for line posts). Provide either Grade 1 or Grade 2 steel posts in accordance with AASHTO M 181. Provide Grade 1 tubular posts, braces, and top rails in accordance with ASTM F 1083 for galvanized, standard weight pipe. Provide Grade 2 steel posts in accordance with ASTM A 1011 or ASTM A 653.

Provide C-section line posts in accordance with ASTM A 1011. Provide H-column posts in accordance with ASTM A 36.

Provide pipe with minimum wall thickness as specified in the Contract. Ensure that the product of the yield strength and section modulus of the pipe is in accordance with ASTM F 1083.

Provide posts that securely hold tension wires in position without vertical movement.

607.2.3.2 Fittings

Provide fittings in accordance with Section 607.2.2.4, "Fittings."

Provide stainless steel straps and seals in accordance with ASTM A 176.

Provide coated tension wires that are galvanized coil spring steel wire of commercial quality with a diameter of 0.148 inch. Provide galvanized ferrules for tension take-up in accordance with ASTM A 1011.

Provide pull cable and tension truss rods with diameters of at least 3/8 inch, with drop forged turnbuckles or other approved tension devices.

Provide pull cable and tension wires with a minimum zinc coating of 0.8 oz per square foot of uncoated individual wire surface, tested in accordance with ASTM A 90.

The Project Manager will determine the uniformity of the coating by visual inspection. The Project Manager may reject coating with excessive roughness, blisters, discoloration spots, bruises, and flaking. The Department may make other inspections and tests at the manufacture's plant, before shipment.

607.2.3.3 Tie Wires and Fasteners

Provide galvanized, coated tie wires for fastening chain link fabric to posts and rails with a diameter of at least 0.148 inch. The Contractor may provide galvanized steel or non-corrosive metal bands or fasteners instead of tie wires, as recommended by the manufacturer.

607.2.3.4 Compression Braces

Provide compression braces that meet the same requirements as top rails in accordance with Section 607.2.3.1, "Posts."

607.2.3.5 Chain Link Fabric

Provide chain link fabric in accordance with AASHTO M 181, with a Class C coating or better. Provide chain link fabric full height. Provide galvanized, coated wire with a diameter of 0.148 inch. Provide two (2) inch mesh fabric. Measure the mesh size as the distance between the wires forming parallel sides of the mesh.

607.2.3.6 Gates

Provide double drive, single drive, or single walk gates. Provide galvanized steel pipe gate frames in accordance with ASTM F 1083 and ASTM A 123.

607.2.3.7 Vinyl-Coated Chain Link Fence

Provide vinyl-coated chain link fences in accordance with Section 607.2.3, "Chain Link Fence," except as modified in this subsection.

If providing PVC coated chain link fabric, use vinyl-coated fabric, posts, and hardware in accordance with AASHTO M 181 for Class A PVC coating. Continuously bond the vinyl coating (do not spray or dip) over the galvanized steel wire by the extrusion bonding process under pressure.

Ensure the vinyl coating resists damage from prolonged exposure to dilute solutions of common mineral acids, sea water, and dilute solutions of salts and alkali.

Galvanize using the electrolytic process before coating with PVC.

Provide wire that was vinyl-coated before weaving and is free and flexible at the joints.

607.2.4 Post and Cable Access Fence

607.2.4.1 Cable

Provide wire cable in accordance with AASHTO M 30. Provide cable of Type I, Class A, 0.75 in diameter rope, unless otherwise specified in the Contract.

607.2.4.2 Hardware and Fittings

Provide galvanized or cadmium plated parts, hardware, and fittings. Galvanize in accordance with AASHTO M 232. Provide cadmium plating in accordance with ASTM B 766, for Class 12, Type III. Provide bolts in accordance with ASTM A 307 and nuts in accordance with ASTM A 563.

Provide externally threaded fittings such as end tie rods, anchor rods, and splicing rods that transmit direct tensile stress, having a minimum tensile strength of 75,000 psi.

Provide internally threaded fittings such as turnbuckles, cable sockets, and nuts capable of withstanding a proof load that is 85% of the proof load requirements for nuts, as specified in accordance with ASTM A 563, Table 3.

Provide cable splices and connections that withstand a proof load equal to the tensile strength required of the attached wire rope cable.

Provide steel rectangular plate washers and cable clamps with a minimum tensile strength of 60,000 psi. Provide plain washers of ferrous metal in accordance with ANSI B 18.22.1, Type A.

607.2.4.3 Wood Posts

Provide wood posts from one (1) of the following species:

1. Northern White Cedar;

2. White Pine;
3. Jack Pine;
4. Red (Norway) Pine;
5. Southern Yellow Pine;
6. Ponderosa Pine.

Provide posts from live trees that are stacked and properly seasoned. Peel the entire length of each post, closely trim knots, saw both ends square, and shave the entire length of the post to the white.

Provide posts with a top diameter after shaving of four (4) inches -1/2 inch, +1 1/4 inch.

Ensure posts are free of sap rot, woodpecker holes, plugged holes, ant-eaten areas, and hollow knots extending to center of the post. Do not allow butt rot to exceed five percent (5%) of the butt area. Provide posts with sound tops, however, the Department will allow one (1) pipe rot not exceeding a diameter of 3/8 inch on a cedar post. Provide posts that do not have excessive checking. Ensure that the posts do not have short kinks or more than one (1) one-way sweep exceeding two (2) inches, however, the post may have a winding twist.

The Department will not allow posts exhibiting both the maximum crook and maximum butt rot, and will not allow more than ten percent (10%) of the posts specified in the Contract to contain the maximum crook or butt rot.

The Department may reject posts with other defects that give the post an unsightly appearance or impair its durability or strength. Complete debarking, trimming, and sizing operations before treatment.

607.2.4.4 Preservative Treatment of Posts for Post and Cable Barrier

Provide pressure treated wood posts with pentachlorophenol in accordance with Section 550.2.2, "Preservatives and Treatment Methods," with a minimum retention of 0.4 lb per cubic foot.

607.2.5 Snow Fence

Provide snow fence of 1/2 inch × 1 1/2 inch wooden pickets spaced 3 1/2 inch on center and woven between five (5) cables. Each cable will consist of at least two (2) strands of galvanized steel wire with diameters of 0.099 in or larger.

Provide wooden pickets that are at least 48 inches long and treated or painted in accordance with the manufacturer's recommendations.

Provide wire, braces, attachments, and fittings in accordance with ASTM A 116 and applicable requirements of Section 607.2.2, "Barbed Wire and Woven Wire Fence."

607.2.6 Concrete

Provide Class A concrete bearing blocks and anchors in accordance with Section 510, "Portland Cement Concrete." The Contractor may provide a prepackaged, pre-blended cementitious Material to which the Contractor only adds water at the site.

607.3 CONSTRUCTION REQUIREMENTS

607.3.1 General

Clear the fence lines of trees, bush, stumps, logs, weeds, existing fences, and other obstructions that may interfere with fence construction, unless the Project Manager requires

certain trees to remain in place. Dispose of removed material in accordance with Section 601, "Removal of Structures and Obstructions."

If the Contractor is to embed posts, braces, or anchors in concrete, the Contractor shall install temporary guys or bracing to hold the posts in position until the concrete sets. Unless otherwise specified, do not install Materials on posts and do not strain posts, braces, or anchors set in concrete until seven (7) Days after concrete placement, or until the concrete has reached a compressive strength of 2,500 psi, whichever occurs first. Crown the concrete at the top of the foundation to shed water.

Only cut the tops of posts as approved by the Project Manager. Apply protective coating to cut posts in accordance with Section 607.3.8, "Repair of Damaged Coating on Pull Cables and Tension Wires."

Firmly attach wire and fencing to the posts and braces. Tightly stretch wire and install it at the required elevations. Place fence wire on the field side of the posts, except on the inside of curves.

At each location where an electric transmission, distribution, or secondary line crosses new fence, provide and install a ground connection in accordance with the NEC®.

Build new fences adjacent to existing fence before removing existing fences. When removing and rebuilding fences, maintain the security of livestock and protect adjacent properties and the traveling public. Remove the existing fence or unused Materials and neatly roll it up in single strand rolls. Remove the fence posts without damaging them and place the posts with the rolls of wire within the Right of Way for property owners to salvage, unless otherwise directed by the Project Manager. If the property owners do not pick the fence up within the allotted time, dispose of the fence as directed by the Project Manager.

607.3.2 Barbed Wire and Woven Wire Fence

Set posts plumb and in accordance with the Plans. The Contractor may drive metal line posts. Excavate for footings and anchors in accordance with the Plans or as directed by the Project Manager. Place post hole backfill in thin layers and compact each layer.

Attach Right of Way fences to Roadway Structures, in accordance with the Plans.

607.3.2.1 Fence Tensioning

Stretch fence wire with a mechanical stretcher or other similar device. Do not allow the length between pull posts to exceed 990 ft for barbed wire, and 660 ft for woven wire.

607.3.2.2 Braces and Corner Posts

Place intermediate braces at intervals of 990 ft or less and at every fence grade-change, such as edges of arroyos, bottoms and tops of hills, and as directed by the Project Manager. Maintain the required distance between the bottom wire and the ground. Space intermediate braces evenly between corner and gateposts or cattle guards. Place a corner post and brace at the intersection of cross fences and the Right of Way fence. Stretch the wires and firmly attach them to the corner posts.

607.3.3 Chain Link Fence

Install braces, tension rods, cables, hardware, and appurtenances in accordance with the manufacturer's recommendations and the Contract.

Do not attach chain link fabric to posts until the concrete footings have reached a compressive strength of 2,500 psi, or until 3 Days after concrete placement, whichever occurs first.

After permanently positioning posts, setting anchorages firmly, and drawing tension wires and pull cables tight with turnbuckles or other approved tension devices, secure the tension wires to the posts with tension bands and tie wires. Secure the chain link fabric at one end and stretch away from the secured end. Stretch the fabric with a mechanical stretcher or other device approved by the Project Manager.

607.3.3.1 Chain Link Fence Post Placement

Set posts plumb in concrete footings. Space chain link fence posts at intervals of ten (10) feet or less. Measure the intervals from center to center of posts. Pull posts are line posts braced to adjacent line posts. Position pull posts at intervals of 500 ft or less. Provide end posts with an outside diameter of at least 2.875 inch. Brace end posts in the same way as corner posts.

607.3.3.2 Chain Link Security Fence

Use chain link security fence in accordance with Section 607.3.3, "Chain Link Fence." Supply security appurtenances on gates for access.

607.3.4 Post and Cable Access Fence

607.3.4.1 Post Placement

The Department will allow a depth of post embedment that is greater than specified in the Contract if the finished top of the post meets the required elevation. Compact the bottom of the holes to provide a stable foundation. Set the posts plumb with the front faces in a neat uniform line and with full contact on the foundation surface. Backfill holes with granular Material and compact in layers so the posts maintain the specified position and alignment.

Instead of setting posts in previously dug holes and backfilling, the Contractor may drive the posts, except if the Contract specifies bearing blocks. Only drive if there is adequate lateral stability and as long as the Shoulders and adjacent slopes are not damaged from the driving operations.

Remove posts that do not meet the requirements or are damaged below cutoff during driving, and replace with sound posts. If upward vertical adjustment of posts is necessary, remove and reinstall them.

The Contractor may cut off the tops of posts to the elevation specified in the Contract. Round the tops of round posts to an approximate domed hemispherical shape centered on the axis of the post. After cutting off treated posts, apply two (2) coats of pentachlorophenol preservative to the cut surfaces.

607.3.4.2 Setting of Anchors, Cable, and Fittings for Post and Cable Access Fence

If a bolt projects more than one (1) inch from the nut, cut off 1/2 inch and burr. Paint the ends of cut-off bolts with aluminum paint. Bore holes for cable supports after the posts are set. Place end and intermediate anchorages and bearing blocks in accordance with the Contract.

Excavate trenches for anchor blocks to their neat lines. Perform excavation for anchor rod installation without excessively disturbing the earth between the block and the anchored posts. Excavate holes for bearing blocks to their neat lines, then place and level the block with anchor rods in place on undisturbed soil. Place backfill Material and compact in layers. Do not apply final tension to the anchor assembly until after completing the backfilling.

After completing the anchor assemblies, properly adjust and securely fasten the cables, draw the cables tight, then loosen them to meet Contract requirements for the applicable temperature range.

Use three (3) inch wide reflective sheeting in accordance with Section 701.2.2.1, "Retroreflective Sheeting," Silver White No. 2. Mount the sheeting on flexible aluminum alloy. Fix the sheeting to each end post and at maximum intervals of 100 ft on intermediate posts, with a minimum of three (3) strips per installation. Completely wrap the reflective strips around each post before installing the post plate washers.

607.3.5 Snow Fence

Construct snow fence in accordance with the manufacturer's recommendations and the Contract.

607.3.6 Pedestrian/Bicycle Railing

Construct pedestrian and bicycle railing in accordance with the Contract or as directed by the Project Manager.

607.3.7 Removing and Rebuilding Fence

Remove and rebuild existing fences in accordance with the Contract or as directed by the Project Manager. Construct new fences in the same or better condition than the original fence.

Salvage Materials from removed fences and incorporate into the rebuilt fences. If the Project Manager determines that some Materials are not reusable, replace those Materials as necessary and in accordance with Section 109.5, "Payment for Changes, Differing Site Conditions, and Extra Work."

Firmly reset posts to the staked alignment. Use the same spacing of the posts and the same number of wires strung and stapled to the posts as the original fence. Use new staples to fasten the wires to the posts.

607.3.8 Repair of Damaged Coating on Pull Cables and Tension Wires

The Contractor may repair pull cables and tension wires that exhibit minor damage to the zinc coating by wire-brushing the damaged area and removing loose, cracked, or weld-burned zinc coating. Paint the cleaned area with two (2) coats of zinc oxide-zinc dust paint in accordance with Federal Specification TT-P-641 or Military Specification MIL-P-21035 or with an equivalent coating approved by the Project Manager. Make repairs and provide repair Materials at no additional cost to the Department.

607.3.9 Gates

Fabricate and construct gates, and stile and post wire traps in accordance with the Contract.

607.3.9.1 Remove and Reset Gate

Remove and reset existing gates in accordance with the Contract or as directed by the Project Manager.

607.4 METHOD OF MEASUREMENT

The Department will measure fences and watergap gates along the top from outside to outside of end posts for each continuous run of fence or watergap gate.

607.5 BASIS OF PAYMENT

Pay Item

Barbed Wire Fence ____ft

Game Fence ____ft

Pay Unit

Linear Foot

Linear Foot

<i>Woven Wire Fence ____ft</i>	Linear Foot
<i>Chain Link Fence ____ft</i>	Linear Foot
<i>Chain Link Security Fence ____ft</i>	Linear Foot
<i>Vinyl-Coated Chain Link Fence ____ft</i>	Linear Foot
<i>Snow Fence ____ft</i>	Linear Foot
<i>Pedestrian/Bicycle Railing ____ft</i>	Linear Foot
<i>Pedestrian Screening Fence Type _____ft</i>	Linear Foot
<i>Post and Cable Access Fence ____ft</i>	Linear Foot
<i>Remove and Rebuild (type) Fence</i>	Linear Foot
<i>Standard Gate ____ft</i>	Each
<i>Barbed Wire Gate, ____ft</i>	Each
<i>Chain Link Gate, ____ft Span</i>	<i>Each</i>
<i>Chain Link Gate, ____ft Span by ____ft Rise</i>	<i>Each</i>
<i>Pipe Gate ____ft</i>	Each
<i>Water Gap Gate</i>	Linear Foot
<i>Turnstile Gate ____ft</i>	Each
<i>Remove and Reset Gate</i>	Each
<i>Stile and Post Wire Trap</i>	<i>Each</i>

607.5.1 Work Included in Payment

The following Work and items will be considered as included in the payment for the main item(s) and will not be measured or paid for separately:

- Clearing and grubbing, grading, excavation, backfill, disposal of surplus material, concrete, fasteners, galvanizing, coating repairs and all additional bracing required for grade changes.

SECTION 618: TRAFFIC CONTROL MANAGEMENT

618.1 DESCRIPTION

This Work consists of providing traffic control management in accordance with the Contract and the *MUTCD, current edition*, including supervision of personnel and the installation, inspection, and maintenance of traffic control devices on the Project.

618.2 REQUIREMENTS

The Contractor may assign more than one (1) traffic control supervisor (TCS) to provide traffic control management for the Project.

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

Provide the TCS with a set of traffic control Plans and a current copy of the *MUTCD*. The TCS shall possess these at all times.

If using a Subcontractor to provide traffic control management, ensure that the TCS is in accordance with the Contract.

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

618.2.1 Certification

Before commencing Work that requires traffic control management, submit to the Project Manager 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 Department.

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

1. Successful completion of a Department-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 Department may verify the experience at its discretion.

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

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 Department.

618.2.1.1 Re-certification

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

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

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

618.2.2 Duties

The TCS's only responsibility is traffic control management. The Department may allow exceptions to this rule if the Project is small and requires limited traffic control. The Project Manager and the District Traffic Engineer will determine approval of the exception at the preconstruction conference.

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 CAD format or hand drafted on a 12 inch × 18 inch piece of 20-pound paper using current drafting standards, to the Project Manager for approval by the District Traffic Engineer. Complex traffic control Plans require development by a registered professional Engineer prior to submittal to the Project Manager;
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, and fire control agencies;
7. Preparing and submitting statements concerning Road closures, Delays, and other Project activities to the news media, as necessary. Before submittal to the news media, the Contractor shall submit news releases to the Project Manager for review and approval;
8. Notifying the Project Manager of accidents related to the Project traffic control;
9. Recording time and date of accident notification in accordance with Section 618.2.2.1, "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.

618.2.2.1 Traffic Control Diary

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

The TCS shall keep the traffic control diary current each Day and sign each daily entry.

The TCS shall make entries in ink, in a format approved by the Project Manager, 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.

Ensure that the traffic control diary is available for inspection by the Project Manager at all times and submit a copy of the diary to the Project Manager at the end of each week.

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

618.2.2.2 Inspection of Traffic Control

The TCS shall inspect traffic control devices every Day that traffic control devices are in use. 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 and construction personnel.

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 Project Manager during the Work Day.

The TCS shall inspect the traffic control devices during working and non-working hours on a schedule approved in writing by the Project Manager.

The TCS shall inspect traffic control devices that are in use for longer than seven (7) Days at least once a week during nighttime periods.

618.2.3 Availability of TCS

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.

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.

The provisions for availability of the TCS will also apply during times of Partial or full Project Suspension.

618.3 COMPLIANCE

618.3.1 Failure to Comply

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 Project Manager may suspend all or part of the Contractor's operations.

If the Contractor does not take appropriate action to correct the problem, the Department may proceed with the corrective action and charge the Contractor for the additional cost incurred by the Department.

If the Department suspends the Contractor's operations, the Department will include the period necessary to correct these unsafe conditions and traffic control deficiencies in the normal assessment of Contract Time.

The Department will not relieve the Contractor of the responsibility to provide traffic control safety to the traveling public, if the Department fully or Partially Suspends the Project.

If the Department suspends the Project due to the Contractor's failure to comply with this Section, or the Contract is in liquidated damages, the Contractor shall continue to provide traffic control management, at no additional cost to the Department.

If the Contractor requests full or Partial Suspensions, the Contractor shall perform the additional traffic control management at no additional cost to the Department.

618.3.2 Project Manager Modifications

The Project Manager may change requirements for handling and controlling traffic during construction, with the approval of the District Traffic Engineer, due to actual field conditions. The Project Manager will make these changes and provide written notice to the Contractor.

618.4 METHOD OF MEASUREMENT—Reserved

618.5 BASIS OF PAYMENT

Pay Item

Traffic Control Management

Traffic Control Management

Pay Unit

Lump Sum

Calendar Day

618.5.1 Partial Payments

If the Department pays for *Traffic Control Management* by the Lump sum, the Department will make monthly partial payments for *Traffic Control Management* based on the rate of progress of the Project, less previous partial payments for this item. The Department will calculate partial payments in accordance with the following equation:

$$P = \left(\frac{A \times L}{B} \right) - C \quad (1)$$

Where,

P is the partial payment

L is the Total Bid Amount for *Traffic Control Management*

A is the number of Days charged the Contractor toward completion of the Project

B is the Contract Time

C is the total amount of previous partial payments for this item

The Department will negotiate payment for additional traffic control management resulting from an increase in Work beyond the scope of the Project. Do not start Work until agreement on payment for additional *Traffic Control Management*.

For normal increases in Contract Items resulting in extensions of the Contract Time, the Department will increase the original Lump sum amount based on the ratio of actual additional Days used to the original Contract Time.

SECTION 632: REVEGETATION

632.1 DESCRIPTION

This Work consists of preparing the soil and seeding areas stripped of vegetation during construction operations and required to be revegetated as per the Clean Water Act.

632.2 MATERIALS

Provide certifications for all Materials to the Project Manager before Work commences.

632.2.1 Seed

The revegetation/erosion control Plans will specify the species, varieties or origins, and rates of seeding. The Contract will specify varieties of certified weed-free seed in accordance with New Mexico Seed Law (NMSA 1978, § 76-10-11 et seq.).

The revegetation/erosion control Plan will specify the minimum standards for each species. Provide certified seed of named varieties in accordance with the minimum standards of the appropriate seed certification agency.

632.2.1.1 Labeling and Certification

Seal and label each bag of seed in accordance with the Federal Seed Act (7 U.S.C. § 1551 et seq.) and NMDA seed labeling requirements (NMSA 1978, § 76-10-13). Provide the following information on each bag tag for each species:

1. Variety (specify if certified);
2. Kind of seed;
3. Lot number;
4. Purity;
5. Germination;
6. Percentage crop seed, percentage inert, percentage noxious weeds, in accordance with New Mexico Seed Law (NMSA 1978, § 76-10-11 et seq.);
7. Origin;
8. Test date; and
9. Weight (in pounds) of this species or percentage of total lot.

Provide seed analysis results that are not older than 12 months.

Provide to the Project Manager documentation of seed origin and pure live seed content from a certified testing Laboratory. Seed must arrive in the original sealed containers from the Certified Supplier and the Revegetation Contractor must provide all tags and certifications to the Project Manager. Certification must be provided that the seed has been stored in appropriate conditions in the 12 months before arriving at the Project. Any seed substitutions require letters from three (3) sources confirming that the originally specified seed is not available at the time of installation. Each seed bad shall have a unique identification number, and the certified seed Supplier shall maintain records of seed bad identification numbers for a period of three (3) years.

Calculate the pure live seed using the following equation:

$$PLS = \frac{P \times G}{100} \quad (1)$$

Where,

PLS is the pure live seed

P is the percent purity

G is the percent germination (including dormant seed)

The Contractor may provide premixed seeds. Provide documentation as if the Supplier sold or bagged the seeds separately.

632.2.2 Amendments

Provide amendments (specified type and formulation) and Supplier's certification in accordance with the Contract.

632.2.3 Wood Chip Mulch

Provide certified weed-free core material (woodchips). The material must be 100% untreated wood chips and free of inorganic debris, such as plastic, glass, metal, etc. Manufacturer shall certify that the material is free of noxious weeds. Woodchip size shall not be smaller than one (1) inch and shall not exceed three (3) inches in diameter; shavings shall not be more than five percent (5%) of the total mass.

632.2.3.1 Hay Mulch

Use perennial native or introduced grasses of fine-stemmed varieties, unless otherwise specified in the Contract.

Provide bales of hay containing at least 65% (by weight) ten (10) inch herbage or longer.

The Department will not accept rotten, brittle, or moldy hay, or hay containing noxious seed or plants. The Contractor may provide marsh grass or prairie hay composed of native grass of specified species. The Department will accept tall wheat grass, intermediate wheat grass, switch grass, or orchard hay, if the Contractor cuts it before seed formation.

Use marsh grass hay composed of mid and tall native, usually tough and wiry grass, and grass-like plants found in the lowland areas of the Rocky Mountain region.

Cure and harvest hay at least 60 Days before use.

All hay mulch is to be free of noxious weeds as certified by an industry recognized forage certification authority.

632.2.3.2 Straw Mulch

Do not use rotten or moldy straw. All straw mulch is to be free of noxious weeds as certified by an industry recognized forage certification authority.

632.2.3.3 Wood Cellulose Mulch

Provide wood cellulose mulch that consists of a specially prepared virgin wood fiber processed to contain no growth-inhibiting or germination-inhibiting factors. Manufacture and process mulch so the wood cellulose fibers remain in uniform suspension in water under agitation and will blend with grass seed, fertilizer, and other additives to form a homogenous slurry.

Provide processed mulch Materials with the following characteristics:

1. Can form a blotter-like ground cover on application;
2. Has moisture and percolation properties; and
3. Can cover and hold grass seed in contact with the soil.

632.2.4 Bonded Fiber Matrix (BFM)

Bonded Fiber Matrix (BFM) is a hydraulically applied blanket that controls soil erosion and accelerates seed germination. BFM is a three-dimensional composite of wood or paper fibers bonded by polymer tackifiers that provides high performance erosion prevention on slopes. A submittal shall be provided to the Project Manager providing core-drill photographs indicating the depth of completed BFM on the "A" soil horizon. The submittal shall reflect the tonnage of BFM required per acre on the Project. The Project Manager shall use this to confirm correct coverage of BFM on the Project.

632.2.5 Composted Mulch

Furnish and place composted mulch as shown on the Plans and in accordance with the criteria as described below. Composted mulch provider must be registered with or permitted by the New Mexico Environment Department Solid Waste Bureau and must be in compliance with 20 NMAC 9.1. The standard specified one (1) inch of compost mulch tilled into the top four (4) inches of soil for Class A Seeding equals 134 cubic yards of mulch per acre.

Composted mulch is defined as the product of a controlled aerobic thermophilic biological decomposition process that meets the quality requirements in Table 632.2.5:1, "Quality Requirements for Composted Mulch." Raw Materials used in producing composted mulch may include green waste, animal manure, animal bedding, paper waste, food waste, biosolids or other non-toxic organic matter, but shall not include animal mortalities.

Table 632.3.2:1
Material and Operations for Classes of Seeding

Material	Measure	Method	Criterion
All Composted Mulches	Moisture Content*	Evaporative loss at 105°C	No more than 60%
	Particle Size	Sieve	40% to 70% of material passes ¾ inch screen; 100% of pieces smaller than 4 inches in length and 2 inches in diameter
	Electrical Conductivity*	1:5 slurry (mass basis)	<10 mmho/cm
	pH*	1:5 slurry (mass basis)	pH 5.0 – pH 8.0
	Organic Matter*	Loss on ignition at 550°C	25% - 70% of dry weight
	Maturity	Minimum 50% germination to second set of leaves for marigold seeds in 50:50 (volume basis) mixture of ¾ inch screened composted mulch and twice-rinsed nursery sand.	
	Stability	Maximum core temperature of 110°F after 48 hours in 5 foot tall conical pile, with moisture adjusted to between 40% and 60%.	
	Debris	Less than one percent (1%) inorganic debris by volume, including, but not limited to, glass, plastic, stones and metal.	
Composted Mulches with Wastewater Biosolids	Trace Metals*	HNO ₃ digestion	Complies with Table 3 of 40CFR503.13
	Fecal Coliforms*	MPN with A-1 broth	<1000 MPN/dry gram

*Tests marked with asterisks must be performed by a suitable analytical Laboratory; other tests may be performed by the composted mulch producer.

632.2.5.1 Acceptance

Before delivering composted mulch, provider shall furnish documentation that includes the following:

1. The raw Materials, by percentage, used in the production of the delivered composted mulch;
2. Daily temperature records for at least 20% of the piles or batches used to produce the delivered composted mulch, illustrating attainment of at least 130°F for at least 7 consecutive Days;
3. A LaboratoryLaboratory analysis for criteria shown in Table 1, performed on composted mulch no more than 180 Days prior to composted mulch delivery; and
4. An affidavit, signed by a responsible company representative, confirming that the composted mulch meets each requirement shown in Table 632.2.5:1, "Quality Requirements for Composted Mulch."

The Project Manager or Landscape Architect may inspect and approve the composted mulch application during installation and upon completion of the Project.

Certification of compost weight shall be required. The weight shall account for moisture content at the time of sale. Certification must indicate date and time of sale, source of compost, and delivery location.

632.2.6 Rock Mulch

Rock mulch shall be $\frac{3}{4}$ inch to one (1) inch diameter Fractured Face material installed over hydroseeded areas to a depth of one (1) inch thick to aid in erosion control and water harvesting. The finished rock mulch surface must be smooth and uniform maintaining the original flow lines, slope gradients, and contours of the job. Certification of quantities must be provided to the Project Manager. A sample of the proposed rock mulch must be provided to the Project Manager and Landscape Architect for approval before application. A submittal shall be provided from a rock mulch Supplier confirming the tonnage required per acre for one (1) inch thickness of coverage depending on the chosen rock type size.

632.3 CONSTRUCTION REQUIREMENTS

632.3.1 Sampling

The Department may sample and test shipments of seed and fertilizer for compliance with the regulations and requirements of the NMDA. The Department may reject seed or fertilizer not in accordance with the Contract.

632.3.2 Seeding Classes

Provide the various classes and the Material and operations for each class in accordance with Table 632.3.2:1, "Material and Operations for Classes of Seeding."

Table 632.3.2:1
Material and Operations for Classes of Seeding

Operation	Seeding class			
	A	C	D	SS
Seed bed preparation	X	—	X	X
Amendments	X	X	X	X
Seeding	X	X	X	X
Chain harrowing or hand raking	—	X	X	X
Compost Mulch	X	X	—	—
Hay or Straw anchoring, crimping	X ^a	—	—	—
Hay or Straw anchoring, tack	X ^a	—	—	X

Soil Retention Blanket	—	—	X	—
BFM	—	X	—	X

^aAnchoring method is based on the specified mulch type.

Key:

X = required

— = not required

The Department defines the seeding classes as follows:

1. Class A = seeding with a drill (slopes flatter than 3:1)
2. Class C = seeding with hydroseeder; soil preparation, BFM (slopes flatter than 3:1)
3. Class D = seeding with soil retention blanket
4. Class SS = steep slope or inaccessible area seeding with a hydroseeder, BFM

632.3.3 Seedbed Preparation

Till the seedbed with a disc, harrow, or chiseling tools to at least four (4) inches deep. Uproot competitive vegetation during seedbed preparation, and uniformly Work the soil to a surface free of clods, large stones, or other Deleterious Material that would interfere with seeding Equipment.

Add any soil amendments as specified by disc, harrow, or chisel to a depth of four (4) inches.

Till across the slope, if practical. Do not till the seedbed if the moisture content of the soil is outside the limits recommended by the seed Supplier for planting, or the ground is in a non-tillable condition.

Do not prepare more seedbed area on which the entire seeding operation can be applied before the surface crusts or loses seed and fertilizer to erosion. If erosion or crusting occurs, perform seedbed preparation again.

632.3.4 Amendments

Apply the specified amendment uniformly to the prepared seedbed.

632.3.5 Seeding Season Limitations

There are no restrictions on time of seeding other than that the ground may not be frozen. Cool season grasses have been added to all seeding recommendations.

632.3.6 Seeding Operations

Uniformly apply the seed mix at a rate in accordance with the Contract. If practical, perform the seeding operations across the slope by drilling. Do not drive vehicles or other Equipment on seeded areas.

If rainfall or some other factor prevents the Contractor from seeding to the specified depth on prepared surfaces, the Contractor shall prepare the seedbed and apply seed again, at no additional cost to the Department.

632.3.6.1 Drill Seeding

Plant seed approximately 1/2 inch deep, with a maximum depth of one (1) inch, unless otherwise specified in the Contract. Ensure that the distance between the drilled furrows is no more than eight (8) inches. If the furrow openers on the drill exceed eight (8) inches, re-drill

the area.

Perform seeding with grass seeding Equipment in good working order. Ensure that the Equipment has the following:

1. Double disc openers;
2. Depth bands;
3. Drop tubes;
4. Packer wheels or drag chains;
5. Rate control attachments;
6. Seed boxers with agitators for trashy seed.

632.3.6.2 Contractor's Responsibility for Seeded Areas

Protect and care for seeded areas until final Acceptance of the Work. Repair any damage to seeded areas caused by pedestrian or vehicular traffic at no additional cost to the Department.

632.3.6.3 Contractors Warranty of Work

A 45 Day inspection of mulch following completion of application of mulch with mechanical crimping and tackifier must indicate a minimum of 90% of the original mulch still in place. Areas not meeting this criterion must be re-mulched and tackifier applied to meet the 90% standard. Allowance will be made for exceptional wind or water events which may have occurred during the 45 Day time period.

632.3.7 Mulching

Do not perform mulching when wind velocity exceeds 15 mph.

Ensure that hay and straw mulch have at least 50% of fibers exceeding ten (10) inches long on the ground after application.

Spread the mulch uniformly over the area either by hand or with a mechanical mulch spreader. If spreading by hand, tear apart the bales of mulch and fluff it before spreading.

Spread mulch for seeding with a mechanical mulch spreader. Anchor or tack the mulch with an approved tackifier. Use the Materials and rate of application recommended by the manufacturer. The tackifier shall be Incidental to the seeding.

Perform mechanical mulch anchoring with a tackifier when the mechanical method is impractical due to steep slopes or rocky areas and when approved by the Project Manager.

632.3.7.1 Hay Mulch

Ensure that the rate of application of hay mulch is at least two (2) tons per acre of air-dry hay.

Anchor hay mulch using a crimper with flat serrated discs at least one (1) inch thick with dull edges, spaced no more than nine (9) inches apart. Ensure that the disc diameter is large enough to prevent the frame of the Equipment from dragging in mulch.

Ensure that hay mulch anchoring is at least two (2) inches deep and do not cover it with excessive amounts of soil. Perform hay mulch anchoring across the slope where practical, with no more than two (2) passes of the anchoring Equipment.

632.3.7.2 Straw Mulch

Ensure that the straw mulch rate of application is at least two (2) tons per acre of air-dry straw.

Anchor straw mulch with an approved tackifier at the rate of application recommended by the manufacturer.

632.3.7.3 Wood Cellulose Mulch

Apply wood cellulose mulch uniformly at the approved rate.

632.4 METHOD OF MEASUREMENT

The Department will measure parallel to slopes.

632.5 BASIS OF PAYMENT

The Department will make partial payments for seeding in accordance with Section 632.3.5, "Seeding Season Limitations."

The Department considers seeding and fertilizing of the following areas occupied by the Contractor as Incidental to this Work, for which the Department will not pay for separately:

1. Campsites;
2. Office;
3. Plant sites;
4. Equipment parking;
5. Service areas; and
6. Areas stripped of native vegetation through unnecessary or improper construction practices by the Contractor.

Pay Item	Pay Unit
<i>Class ____ Seeding</i>	Acre
<i>Steep Slope Seeding</i>	Acre

632.5.1 Work Included in Payment

The following Work items will be considered as included in payment for the main items and will not be measured or paid for separately:

- A. Tackifier for mulch;
- B. All compost Materials and related Work;
- C. Seeding of the areas occupied by the Contractor for campsites, office, plant sites, Equipment parking, service; areas, areas stripped of native vegetation through unnecessary or improper construction practices by the Contractor, and any fertilizing.

701.1 DESCRIPTION

This Work consists of providing and installing traffic signs and sign Structures in accordance with the *MUTCD, current edition*.

701.2 MATERIALS

701.2.1 Concrete

Use Class G concrete for overhead sign structure foundations in accordance with Section 502, "Drilled Shafts."

Use Class A concrete for extruded panel sign foundations in accordance with Section 510, "Portland Cement Concrete."

701.2.2 Steel Reinforcement

Use steel reinforcement in accordance with Section 540, "Steel Reinforcement."

701.2.3 General

Provide Materials manufactured in accordance with the requirements of ASTM D 4956, current version.

701.2.3.1 Sign Manufacturer's Quality Control

Manufacture permanent signs in accordance with a Quality Control (QC) program approved and certified by the Traffic Services Engineer before fabrication.

Ensure the QC program includes the following:

1. Basis of raw Material Acceptance:
 - 1.1 Sign manufacturer Certificates of Compliance for sign Materials; or
 - 1.2 Random lot testing and certification of sign Materials by an independent testing Laboratory (ITL); and
 - 1.3 Traffic Services Engineer's approval of methods of manufacture.
2. Type, method, and frequency of control tests;
3. A record of QC program data for each sign component as follows:
 - 3.1 Maintain a logbook or other approved form of documentation that cross-references sign certifications. Include certifications for each sign component Material lot used to make each sign. Maintain these records for at least three (3) years;
 - 3.2 File and cross-reference any special instructions on how to use sign Materials, such as substrate preparation before applying sign sheeting or use of special inks;
4. Final inspection:
 - 4.1 Provide a manufacturing checklist for signs. Identify all sign component Material lot numbers and cross-reference those with the manufacturer's or ITL's Certificates of Compliance;
 - 4.2 Provide a completed checklist to the Project Manager with each sign shipment;
5. Name and position of the Quality Control person.

701.2.3.2 De-certification of Quality Control Program

The Department may withdraw approval of a sign manufacturer's QC program, if the manufacturer fails to follow the certified written QC program or fabricates signs that do not

conform to Department Specifications. The Traffic Services Engineer or designee will determine the de-certification period based on the severity and nature of infractions.

The Department may prohibit the use of sign manufacturers that do not have a certified QC program. However, the Traffic Services Engineer may allow the sign manufacturer to supply signs under the following conditions when the QC program certification has been withdrawn:

1. The sign manufacturer shall hire an ITL to inspect the manufacture of signs to be used on Department Projects, as approved by the Department; and
2. The ITL shall have a certified Quality Control program. The ITL shall provide a checklist in accordance with the certified QC program to the Project Manager indicating the signs were inspected and in accordance with the Specifications.

The Traffic Services Engineer or designee may recertify sign manufacturers, if they meet Department requirements.

701.2.3.3 Verification of Manufacturer's Certification

Submit the name of the proposed sign manufacturer and Project number in writing. The Traffic Services Section will verify that the proposed sign manufacturer is eligible to supply signs to the Project.

701.2.3.4 Sign Identification

Ensure that signs have identification labels as follows:

1. Display the following Information on the manufacturer's identification label:
 - 1.1 The wording, "Manufactured By," followed by the sign Fabricator's initials;
 - 1.2 Month and year fabricated;
 - 1.3 Reflective sheeting type and manufacturer's initials;
 - 1.4 The statement, "Property of the State of New Mexico, Defacing or Theft is a Crime;" and
 - 1.5 Whether sign is laminated with anti-graffiti sheeting.
2. Display the following Information on the Contractor's identification label:
 - 2.1 Contractor's name; and
 - 2.2 Date installed (month and year).

The labels may be dye stamped in 3/8 inch letters and numerals, or 1/2 inch letters and numerals made with high-tack adhesive reflective or non-reflective sign sheeting, prepared with screened ink. Place labels on the lower backside of the sign, where not hidden by any post or frame member. Provide labels with weather resistance characteristics having a service life at least equal to that of the sign. Do not damage signs during die stamping.

701.2.3.5 Special Coded Signs

Submit requests for significant deviations from Plan drawing sign sizes for special coded signs to the Project Manager for approval at the Preconstruction meeting. . Provide drawings showing the complete legend, arrangement of letters and numerals, letter and numeral height, letter series, symbols, borders, and dimensions. Provide an I-beam post submittal and obtain approval, before installing posts and before submitting overhead sign Structure shop drawings for review.

701.2.4 Sign Components

701.2.4.1 Retroreflective Sheeting

Use retroreflective sheeting included in the Department's *Approved Products List*. Provide certification that sheeting is in accordance with ASTM D 4956, current version.

Provide sheeting that has a smooth, flat exterior film with retroreflective elements homogeneous in appearance, weather resistant, and with a protected, pre-coated adhesive backing.

701.2.4.1.1 Colors

Provide the diffuse Day color of the retroreflective sheeting in accordance with ASTM D 4956, current version, Table 13.

701.2.4.1.2 Coefficient of Retroreflection

Provide sign sheeting with a coefficient of retroreflection, expressed as Specific Intensity per unit area, or average candlepower per foot-candle per square foot. Ensure the intensity values meet at least the minimum values at 0.2° and 0.5° observation (divergence) angles, and, when specified in the Contract, at least the minimum values at 0.1° and/or 1.0° Observation Angles. Ensure intensity values are in accordance with Table 701.2.4.1.2:1, "Type IV Sheeting—Unmetallized Microprismatic Element," Table 701.2.4.1.2:2, "Type VIII F Sheeting—Fluorescent Microprismatic Lens," Table 701.2.4.1.2:3, "Type IX Sheeting—Microprismatic Lens," Table 701.2.4.1.2:4, "Type IX F Sheeting—Fluorescent Microprismatic Element," and Table 701.2.4.1.2:5, "Type XI Retroreflective Sheeting." Conduct testing methods in accordance with ASTM E 810.

Table 701.2.4.1.2:1
Type IV Sheeting—Unmetallized Microprismatic Element

OA	EA	White	Yellow	Orange	Red	Green	Blue	Brown
0.2	-4	360	270	145	65	50	30	18
0.2	+30	170	135	68	30	25	14	8.5
0.5	-4	150	110	60	27	21	13	7.5
0.5	+30	72	54	28	13	10	6	3.5

Table 701.2.4.1.2:2
Type VIII F Sheeting—Fluorescent Microprismatic Lens

Minimum reflectivity for fluorescent sheeting (average candle power per foot candle per square foot)		
OA	EA	Orange
0.1	-4	300
0.1	+30	135
0.2	-4	210
0.2	+30	95
0.5	-4	75
0.5	+30	35

Table 701.2.4.1.2:3
Type IX Sheeting—Microprismatic Lens

Minimum reflectivity (average candlepower per foot candle per square foot)							
OA	EA	White	Orange	Yellow	Red	Green	Blue
0.2	-4	380	145	285	76	38	17
0.2	+30	215	82	162	43	22	10
0.5	-4	240	90	180	48	24	11
0.5	+30	135	50	100	27	14	6.0

Table 701.2.4.1.2:3
Type IX Sheeting—Microprismatic Lens

OA	EA	Minimum reflectivity (average candlepower per foot candle per square foot)					
		White	Orange	Yellow	Red	Green	Blue
1.0	-4	80	30	60	16	8.0	3.6
1.0	+30	45	17	34	9.0	4.5	2.0

Table 701.2.4.1.2:4
Type IX F Sheeting—Fluorescent Microprismatic Element

OA	EA	Minimum reflectivity (average candle power per foot candle per square foot)	
		Yellow	Yellow/Green
0.2	-4	230	300
0.2	+30	130	170
0.5	-4	145	190
0.5	+30	81	110
1.0	-4	48	64
1.0	+30	27	36

Table 701.2.4.1.2:5
Type XI Retroreflective Sheeting

Minimum reflectivity (average candle power per foot candle per square foot)											
OA	EA	White	Yellow	Orange	Green	Red	Blue	Brown	Fluorescent Yellow-Green	Fluorescent Yellow	Fluorescent Orange
0.1	-4	830	620	290	83	125	37	25	660	500	250
0.1	+30	325	245	115	33	50	15	10	260	200	100
0.2	-4	580	435	200	58	87	26	17	460	350	175
0.2	+30	220	165	77	22	33	10	7.0	180	130	66
0.5	-4	420	315	150	42	63	19	13	340	250	125
0.5	+30	150	110	53	15	23	7.0	5.0	120	90	45
1.0	-4	120	90	42	12	18	5.0	4.0	96	72	36
1.0	+30	45	34	16	5.0	7.0	2.0	1.0	36	27	14

701.2.4.1.3 Retroreflective Sheeting Backing

Provide backing for sheeting Types IV through XI in accordance with ASTM D 4956, current version.

701.2.4.1.4 Retroreflective Sheeting Durability and Workmanship

Use retroreflective sheeting Material in accordance with ASTM D 4956, current version. Provide sheeting Material sufficiently strong and flexible enough for handling, processing, and application in accordance with the manufacturer's recommendations without stretching.

When processed and applied in accordance with recommended procedures, sheeting Material must be weather resistant and, following cleaning, must show no discoloration, cracking, blistering, or dimensional change.

When exposed to normal traffic and weather, sheeting Material must not support fungus growth or accumulate dirt that reduce brightness before cleaning to less than 75% of the brightness after cleaning, measured at 0.2° divergence and -4° incidence.

Use a sheeting surface that can be refurbished by cleaning and clear protective overcoating in accordance with manufacturer's recommendations.

Apply retroreflective sheeting to a treated substrate, as recommended by the manufacturer. Ensure finished signs have a smooth and uniform surface and that letters and numbers are clean-cut and sharp.

Ensure the sheeting surface is solvent resistant and can be cleaned with a soft, clean cloth dampened with VM & P naphtha or mineral spirits.

701.2.4.1.5 Retroreflective Sheeting Delivery and Handling

If the Contractor provides retroreflective sheeting in continuous rolls, the Contractor shall ensure splices are smooth with no discernible lines and that sheeting is suitable for continuous application.

Use sheeting within the manufacturer's recommended time frame.

701.2.4.1.6 Multiple Pieces of Sign Sheeting

Ensure that sign faces from two (2) or more pieces of retroreflective sheeting match in color and provide uniform appearance and brilliance by Day and night.

Cover sign panels less than 48 inches tall with one (1) unspliced sheet of retroreflective sheeting. The Department will allow a horizontal splice, only if the substrate panel is 48 inches or taller. Ensure sheet colors match.

Sheeting shall be butt spliced when more than one (1) piece of sheeting is used on one (1) piece of substrate per manufacturer's recommendations. The sheeting pieces should not touch each other.

701.2.4.1.7 Screening Inks

The Department will allow use of screening inks, or acrylic film overlays recommended by the retroreflective sheeting manufacturer, instead of manufactured colors to produce the legend and background. Submit the manufacturer's recommendations, in writing, to the Department. File a copy of the recommendations in accordance with Section 701.2.3.1, "Sign Manufacturer's Quality Control."

Use ultraviolet (UV) resistant inks requiring no additional clear coating or UV protection. Use inks that are one (1) part non-isocyanate Material, easily removed from sign screens with citrus-based environmentally friendly screen cleaning solvents.

701.2.4.1.7.1 Outdoor Weatherability

Use screening inks, or acrylic film overlays with weather-resistant properties equal to retroreflective sheeting.

701.2.4.1.7.2 Adherence

To test for screening ink, process paste, or film overlay adherence, apply cellophane tape to a cured color processed area, and remove the tape with one (1) quick motion; no ink, paste, or film overlay should come off. Use 3/4 inch wide Cellophane Tape for this test.

701.2.4.1.7.3 Solvent Resistance

After curing, ensure sign faces resist manufacturer recommended cleaning solvents.

701.2.4.1.7.4 Vandal Resistance

Ensure that sign faces resist manufacturer recommended aromatic solvents used to remove paint or other oil based matter sprayed or painted on signs.

701.2.4.1.7.5 Color

Use a sign face color in accordance with ASTM D 4956, current version.

701.2.4.1.7.6 Retroreflective Intensity (Transparent Colors)

Process and apply transparent colored inks or transparent colored acrylic film overlays in accordance with the sheeting manufacturer's recommendations.

Ensure that the transparent color area processed on white sheeting provides a minimum retroreflective intensity value of at least 70% of the values specified in Table 701.2.4.1.2:1, "Type IV Sheeting—Unmetallized Microprismatic Element," Table 701.2.4.1.2:2, "Type VIII F Sheeting—Fluorescent Microprismatic Lens," Table 701.2.4.1.2:3, "Type IX Sheeting—Microprismatic Lens," Table 701.2.4.1.2:4, "Type IX F Sheeting—Fluorescent Microprismatic Element," and Table 701.2.4.1.2:5, "Type XI Retroreflective Sheeting," for each color at 0.2° OA and -4° EA (or 0.1° and/or 1.0° Observation Angles if, specified in the Contract).

701.2.4.1.7.7 Process Colors on Sheeting

Ensure the retroreflective intensity values are 70% of the retroreflective values specified in Section 701.2.4.1.2. Corresponding values at 0.2° OA and -4° EA are included in Table 701.2.4.1.7.8:1, "Retroreflective Intensity per Process Color."

701.2.4.1.7.8 Process Inks

Ensure that process inks equal 70% of the coefficient of retroreflection of new sheeting and 70% at the end of the warranty period.

Table 701.2.4.1.7.8:1
Retroreflective Intensity per Process Color

Type of sheeting	Intensity Value (average candelas per foot candle per square foot)		
	Red	Blue	Green
Type IV Unmetallized Microprismatic Element	24.5	14.0	24.5
Type IX Microprismatic Element	53.2	11.9	26.6
Type XI Retroreflective Sheeting	60.9	18.2	40.6

701.2.4.2 Sign Legends and Sheeting

A sign legend shall contain such letters, numerals, symbols, arrows, borders, and other accessories that convey the sign's message.

Sign legend and background shall be of the same type in accordance with Section 701.2.4.1, "Retroreflective Sheeting."

Provide legends in accordance with *MUTCD, current edition*. The legend may be:

1. 0.005 in minimum thickness integral, semi-rigid;
2. Self-adhering, machine cut sheeting; or
3. Reverse screened using weatherproof screen process inks compatible with the background that provides the designated sign colors and retroreflectorization; or a reverse film overlaid with an approved acrylic film overlay.

Provide extruded panel signs with borders as follows:

1. 1 1/8 inch wide with six (6) inch corner radii for signs under six (6) feet tall;
2. Two (2) inch wide with nine (9) inch corner radii for signs from six (6) feet to 7.5 feet tall; or
3. Three (3) inch wide with 12 inch corner radii for signs over 7.5 feet tall.

701.2.4.3 Sign Backgrounds

Provide a sign face with a plane surface free from defects. The Department may reject the entire sign face because of a defect or because of a dirty, marred, or defective background or legend. The Department will inspect in place signs at night for compliance.

701.2.4.4 Aluminum Panel Signs

Use 0.08 inch minimum thickness 6061-T6 or 5052-H38 aluminum alloy for signs 24 inch wide or less. Use 1/8 inch minimum thickness 6061-T6 or 5052-H38 aluminum alloy for signs wider than 24 inch.

Provide aluminum alloys in accordance with ASTM B 209. Supply as flat stock Material. Provide aluminum panel signs with smooth edges and corners.

701.2.4.4.1 Corners

Cut corner radii in accordance with the FHWA Standard Highway Signs manual.

701.2.4.4.2 Aluminum Sign Substrate

Prepare aluminum sign substrate for retroreflective sheeting as specified by the sheeting Material manufacturer. Apply sheeting, legend, and clear coat in accordance with the manufacturer's recommendations. Keep a copy of the manufacturer's recommendations on file as specified in Section 701.2.3.1, "Sign Manufacturer's Quality Control."

Punch or drill a hole in the aluminum sign panel to receive tamper proof hardware.

701.2.4.5 Extruded Panel Signs

Use extrusion-type signs, if mounted on steel I-Beam posts or on overhead sign Structures.

701.2.4.5.1 Aluminum Extrusions

Use 6063-T6 aluminum alloy in accordance with ASTM B 221, provided in 12 inch or six (6) inch sections in accordance with the Contract.

701.2.4.5.2 Sign Fabrication for Extruded Panel Signs

Sign legend and background for Extruded Panel Signs shall be fabricated on a metal facing panel unless a digital printing process is used.

701.2.4.5.3 Metal Panel Fabrication

Cover extrusion-type signs with a metal facing panel of the same metal as the extrusions. The flatness tolerance for an installed panel is 1/32 inch per foot of length and 0.004 inch per inch of width.

For metal facing panels, use panel units two (2) feet to four (4) feet wide, installed vertically. Do not horizontally splice metal facing sign panels eight (8) ft tall or less.

For horizontal splices on signs taller than eight (8) feet, offset the metal facing splices from the corresponding extrusion joint by 1/2 inch to one (1) inch.

For aluminum facing panels, use a sheet of aluminum 6061-T6 or 5052-H38 alloy in accordance with ASTM B 209, supplied as flat stock Material with a minimum thickness of 0.060 inch.

701.2.4.5.4 Digitally Printed Signs

Signs manufactured using digital printing process with a protective overlay film to produce all or part of the image shall conform to all other requirements of Section 701 with the exception that signs may be comprised of extruded panels only or by using metal panel fabrication over the extruded panel.

For extruded panel signs without metal panels, all or part of the image shall be printed on the required sheeting which then shall be laminated to the aluminum extrusion. After lamination of the sheeting to the extrusions, the extrusions may be assembled and bolted together to finish the sign.

For metal panel signs, all or part of the image may be printed before or after the sheeting is laminated to the metal panel.

701.2.4.5.4.1 Outdoor Weathering of Digitally Printed Signs

Inks applied using digital printing processes with a protective overlay film shall produce standard traffic colors (green, yellow, red, blue, brown, black) and have outdoor weathering properties equal to that of the base reflective sheeting.

701.2.4.5.4.2 Standard Traffic Colors Digitally Printed

Standard traffic colors (green, yellow, red, blue, brown, and black) printed with digital printing technology with a protective overlay film must provide the diffuse daytime color of the retroreflective sheeting in accordance with ASTM D4956-09, current version, Table 11.

701.2.4.5.4.3 Retroreflective Intensity of Digitally Printed Standard Traffic Colors

The coefficient of retro reflection of the standard traffic colors (green, yellow, red, blue, brown, and black) digitally produced on white sheeting shall provide an initial minimum retroreflective intensity as specified in Section 701.2.4.1.7.6.

701.2.4.5.5 Extrusion Hardware

Use 2025-T4 aluminum alloy extrusions for hardware with an alumilite or alodine finish, in accordance with ASTM B 221.

701.2.4.6 Inspection

The Department may inspect Material and finished signs before and after installation at the Project site.

Ensure that the Department has free entry to plant areas involved in sign manufacture and production during Work hours. Provide adequate facilities for the Department to inspect signs and verify the manufacturer's QC program.

On request, provide 12 inch × 12 inch test panels representing each production stage to the Inspector. Produce the test panels during regular production in the presence of the Inspector. If the Inspector cannot validate that the test panel came from regular production, provide a complete sign, upon request.

701.2.4.7 Packaging and Shipping

Package and protect signs and hardware for shipment and storage.

701.2.5 Field Overlay Panels for Existing Extruded Signs

Provide retroreflective sheeting overlay panels that consist of a retroreflectorized face sheet fastened over an existing extruded sign.

For the face sheet use:

1. 6061-T6 or 5052-H38 aluminum sheet alloy, in accordance with ASTM B 209, a minimum of 0.060 in thick with Type IX minimum sheeting backgrounds applied; or
2. Type IX minimum sheeting with an integral, semi-rigid, aluminum alloy backing, a minimum of 0.005 in thick. Use Type IX minimum for legends.

Install retroreflective sheeting field overlays in accordance with Section 701.2.4.2, "Sign Legends and Sheeting." Remove and repair the existing legend, as directed by the Project Manager.

701.2.6 Sign Structures and Hardware

Select aluminum panel sign and base posts from the Department's *Approved Products List*. Install posts in accordance with NCHRP *Report 350* criteria for single and multiple-post installations, and with the post manufacturer's wind load chart. Supply Certificates of Compliance to the Project Manager.

Use one (1) of the following finishes:

1. Hot dipped galvanizing in accordance with ASTM A 653 or ASTM A 123; or
2. Hot dip galvanized zinc coating, in accordance with AASHTO M 120, followed by a chromate conversion coating and a cross-linked polyurethane acrylic exterior coating; or
3. Color No. 17038 black paint or Color No. 14109 green paint for U-channel posts. Provide paint in accordance with Federal Standard 595a, a minimum of one (1) mil thick.

701.2.6.1 Post Assembly Hardware

Use post assembly hardware that is:

1. Hot dipped galvanized or cadmium plated in accordance with ASTM B766-86;
2. Stainless steel; or
3. Mechanically galvanized in accordance with ASTM B545 (Class Fe/Sn 20).

701.2.6.2 Fasteners

Use size M8 tamper-proof carriage bolts to attach signs that are:

1. Hot dipped galvanized, or cadmium plated in accordance with ASTM B766-86;
2. Stainless steel; or
3. Mechanically galvanized in accordance with ASTM B 545 (Class Fe/Sn 20).

The Contractor may use rivets to attach signs. Follow manufacturer's recommendations for installation procedures.

Use size M8 tamper-proof nuts fabricated from C 1008 hot rolled steel, case hardened to R55-60, and plated with zinc yellow dichromate, from 0.002 inch to 0.005 inch thick.

701.2.6.3 I-Beam Posts

Fabricate I-beam posts for extruded panel signs from standard Structural Steel shapes in accordance with ASTM A 36. Use one (1) of the following finishes:

1. Hot dipped galvanizing in accordance with the requirements of ASTM A 123;
2. Cold galvanizing in accordance with the fabrication method approved by the Traffic

Services Engineer; or

3. Coating in accordance with Section 545, "Protective Coating of Miscellaneous Structural Steel."

Use I-beam posts with fuse plate mechanisms.

701.2.6.4 Overhead Sign Structures

Fabricate overhead sign Structures as specified in the Contract.

701.2.6.5 Breakaway Base Systems

Use Type I Breakaway base systems that include slip-type connection, hardware, and stub post as specified in the Contract.

701.2.6.6 Fabrication

701.2.6.6.1 Shop Drawing Submittals & Review

Submit detailed overhead sign Structure shop drawings for approval before fabrication.

The Department will review overhead sign Structure shop drawings. Do not erect the signs until obtaining approval.

701.2.6.6.2 General Fabrication Requirements

Ensure arrangement, letter spacing and height, letter series, symbols, and borders for each sign face are in accordance with the *FHWA Standard Highway Signs* manual.

Shear, blank, saw, or mill Material 1/2 inch thick or less. Saw or mill Material over 1/2 inch thick.

Ensure that cut edges are true, smooth, and free from excessive burrs or ragged breaks. Fillet re-entrant cuts by drilling before cutting. Flame cutting is prohibited.

Drill bolt holes to finish sizes.

Shop assemble metal extrusions, facing panels, and legend items. Ensure that facing panels are tightly butted together.

Use additional fasteners, as needed, to achieve flatness, but do not exceed eight (8) fasteners per facing panel. Do not field assemble these items.

The Contractor may deliver assembled signs more than eight (8) ft high in two (2) parts.

701.2.6.6.3 Fabrication Requirements for Contact Surfaces

Use galvanized or stainless steel for surfaces in contact with aluminum.

Coat aluminum surfaces in contact with concrete or earth with an alkali resistant asphalt paint in accordance with manufacturers recommendation.

701.3 CONSTRUCTION REQUIREMENTS

701.3.1 General

Deliver removed, existing traffic control signs to locations specified in the Contract, or as directed by the Project Manager. Document removals and deliveries in the Traffic Control Diary in accordance with Section 618, "Traffic Control Management."

701.3.1.1 Installation of Breakaway Sign Posts

Ensure that slope and other Material does not interfere with the proper functioning of installed sign Breakaway systems.

701.3.1.2 Manufacturer Certification Verification

Supply signs with identification on the back as specified in Section 701.2.3.4, "Sign Identification," that matches the approved sign manufacturer identified by the documentation letter.

Do not install permanent signs until the Project Manager has:

1. Verified that the sign shipment has a manufacturer's checklist; and
2. Given authorization to begin sign installations.

Use the manufacturer for which certification was requested.

701.3.2 Site Storage Requirements

Elevate stored Materials from the ground and surface runoff water. Store signs posts and hardware away from pavement or Shoulder.

701.3.3 Installation Requirements

Compact sign Structure footing foundations and backfill to 95% of maximum density as determined by AASHTO T 180 (Modified Proctor), Method D (TTCP Modified).

Set posts plumb. Ensure that the mounting faces of multiple sign posts lie in the same plane.

701.3.4 Electrical Components

Provide and install electrical components such as light fixtures, lamps, ballasts, wires, conduit, junction boxes, and other items necessary to mount and operate the electrical system, in accordance with Section 716.2.4, "Sign Luminaire."

701.3.5 Removing and Resetting Traffic Signs

Remove existing traffic signs, posts, and associated appurtenances from specified locations and reset on new posts with new hardware redesigned for existing conditions, in accordance with Section 618, "Traffic Control Management."

Before removing existing signs, submit a sign removal and resetting schedule to the Project Manager for approval.

701.3.5.1 Removing and Resetting Extruded Panel Signs

Remove specified existing extruded panel signs, I-beam posts, and footing, and dispose of the Materials in an environmentally acceptable manner. Stockpile removed I-beam posts at locations specified in the Contract. Reset removed extruded panel signs on new I-beam posts and Breakaway base systems using new hardware in accordance with Section 701.2.6.3, "I-Beam Posts," and Section 701.2.6.5, "Breakaway Base Systems." Design new I-beam posts, new Breakaway base systems, and new hardware for existing conditions in accordance with the manufacturer's recommendations and as specified in the Contract.

Backfill holes left by the removal of I-beam post footings and compact in accordance with Section 203, "Excavation, Borrow, and Embankment."

701.3.6 Mileposts Installation

Notify the Project Manager two (2) weeks before placing mileposts; the District Traffic

Engineer will mark the milepost locations.

701.4 METHOD OF MEASUREMENT

The Department will not measure that portion of *Steel I-Beam Posts* extending below ground level.

The Department will not include stub post lengths in the measurement of *Steel I-Beam Post* lengths.

701.5 BASIS OF PAYMENT

Pay Item	Pay Unit
<i>Extruded Panel Signs</i>	Square Foot
<i>Panel Signs</i>	Square Foot
<i>Overhead Sign Structure, _____ Type, _____ Size</i>	Each
<i>Steel I-Beam Posts</i>	Foot
<i>Breakaway Base System for Steel I Beam Post</i>	Each
<i>Steel Posts & Base Posts for Aluminum Panel Signs</i>	Foot
<i>Multi-Directional Slip Base Posts for Aluminum Panel Signs</i>	Each
<i>Retroreflective Sheeting Field Overlay Panels</i>	Foot
<i>Remove and Reset Traffic Sign</i>	Each
<i>Remove and Reset Panel Sign</i>	Each
<i>Remove and Reset Extruded Panel Sign</i>	Each

The Department will pay for overhead sign structure foundation installations in accordance with Section 502, "Drilled Shafts."

The Department will pay for steel reinforcement used for overhead sign structure foundations in accordance with Section 540, "Steel Reinforcement."

701.5.1 Work Included in Payment

The following Work and items will be considered as included in the payment for the main items and will not be measured or paid for separately:

- A. Hardware;
- B. Excavation, backfill, and compaction for sign installation and/or removal;
- C. Reinforcing steel for extruded panel sign foundations;
- D. Class A Concrete for extruded panel sign foundations and multi-directional slip base posts;
- E. Hauling of removals; and
- F. Protective coatings.

Any other items installed by the Contractor for the installation of items covered by this specification shall be considered Incidental to the items listed in Section 701.5 BASIS OF PAYMENT and 701.5.1 WORK INCLUDED IN PAYMENT.

SECTION 702: CONSTRUCTION TRAFFIC CONTROL DEVICES

702.1 DESCRIPTION

This Work consists of providing and installing construction traffic control devices.

702.2 MATERIALS

702.2.1 Construction Signing

Provide sign substrate sufficiently durable to last the Project duration and rigid enough to hold the sheeting flat.

Provide Materials in accordance with Section 701.2.4.1, "Retroreflective Sheeting," Section 701.2.4.2, "Sign Legends and Sheeting," and Section 701.2.4.3, "Sign Backgrounds."

Provide Type VIII or greater intensity retroreflective sheeting for legends and sign backgrounds, unless otherwise specified in the Contract.

Use black letters on a reflective fluorescent orange background for construction signing, unless otherwise specified in the Contract.

Provide Type IV or greater intensity retroreflective sheeting for background of regulatory signs.

702.2.1.1 Steel Posts and Base Posts for Construction Signing

Provide steel post and base post Material in accordance with Section 701.2.6, "Sign Structures and Hardware."

702.2.1.2 Portable Sign Supports

Provide portable sign supports in accordance with the *MUTCD, current edition* and the Department's *Approved Products List*.

702.2.2 Barricades and Channelization Devices

Provide traffic control devices in accordance with the Department's *Approved Products List* for barricades and channelization devices, available from the State Maintenance Bureau.

Suppliers proposing traffic control devices for inclusion on the Department's *Approved Products List* must submit product certifications for approval. The Department will review and approve or deny the proposed certifications within 30 Days.

Unless stated otherwise, submit, to the Project Manager, certification from the manufacturer stating that the traffic control devices proposed for use are in accordance with NCHRP *Report 350*. Submit certification showing that the proposed traffic control devices are listed on the Department's *Approved Products List*.

Use traffic control devices from the following categories:

1. Category I Traffic Control Devices. Low mass, single piece traffic cones; tubular markers; single-piece drums; delineators; or similar devices without lights or signs.
2. Category II Traffic Control Devices. Vertical panels; Type I, II, and III barricades; moveable skid mounted sign stands; or similar devices.

702.2.2.1 Barricades

Use reflectorized barricades with orange and white retroreflective sheeting or tape in accordance with the *MUTCD, current edition* and Table 701.2.4.1.2:1, "Type IV Sheeting—Unmetallized Microprismatic Element," and Table 701.2.4.1.2:2, "Type VIII F Sheeting—

702.2.2.2 Vertical Panels

Use reflectorized vertical panels with orange and white retroreflective sheeting or tape in accordance with the *MUTCD, current edition* and Table 701.2.4.1.2:1, “Type IV Sheeting—Unmetallized Microprismatic Element,” and Table 701.2.4.1.2:2, “Type VIII F Sheeting—Fluorescent Microprismatic Lens.”

702.2.2.3 Traffic Markers

Provide traffic marker Materials in accordance with Section 703, “Traffic Markers.”

702.2.2.4 Drums

Provide non-metal drums in accordance with the *MUTCD, current edition* and as approved by the Project Manager. Use only one (1) size drum on the Project.

Use reflectorized drums with fluorescent orange and white high-performance retroreflective sheeting or tape. Use horizontal, circumferential, fluorescent orange and white reflectorized stripes from four (4) inches to six (6) inches wide for drum marking. Ensure the number of alternating fluorescent orange and white reflectorized stripes and the amount of non-reflective drum surface space is in accordance with the *MUTCD, current edition*.

Provide drums that are a minimum 36 inches high and 18 inches diameter with a closed top, and either a sand-ballasted, preformed rubberized, or tire sidewall-collared base, in accordance with the manufacturer’s recommendations.

702.2.2.4.1 Warning Lights

Provide either Type “A” low intensity, Type “B” high intensity, or Type “C” steady-burn warning lights in accordance with the *MUTCD, current edition*.

702.2.2.4.2 Flexible High-Performance Reflective Sheeting

Provide retroreflective sheeting and adhesive Materials in accordance with Section 701, “Traffic Signs and Sign Structures,” except provide Type VIII or greater intensity retroreflective sheeting.

Provide sheeting with a pre-coated adhesive protected by a removable liner. Apply to channelization devices in accordance with manufacturer’s recommendations.

702.2.2.4.2.1 Sheeting Flexibility

Use sheeting that does not exhibit cracking when bent around a 1/8 inch mandrel in one (1) second, after conditioning for 24 h at 32 °F with the liner removed. Test by spreading talcum powder on adhesive and bending with the adhesive side contacting the mandrel.

702.2.2.4.2.2 Adhesive

Provide pressure sensitive adhesives for use on substrates, other than plasticized PVC, in accordance with Section 701.2.4.1, “Retroreflective Sheeting.”

702.2.2.4.2.3 Adhesive Backing Testing

Test pressure sensitive adhesive backing on flexible high performance sheeting in accordance with FHWA Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects (FP-96), Section 718. Backing adhesive must support a 1 3/4 lb weight for five (5) min without peeling away more than one (1) inch if applied to a smooth aluminum surface.

702.2.2.4.2.4 Reflectivity

Provide flexible high-performance sheeting that meets or exceeds the minimum reflectivity requirements in Table 701.2.4.1.2:1, "Type IV Sheeting – Unmetallized Microprismatic Element," and Table 701.2.4.1.2:2, "Type VIII F Sheeting—Fluorescent Microprismatic Lens."

702.2.2.5 Traffic Cones

Provide traffic cones in accordance with the MUTCD, current edition and having a flexible cone (above the base) with an outer section made of a highly pigmented fluorescent orange polyvinyl compound.

Provide cones at least 28 inches tall weighing at least ten (10) lb with a base alone weighing seven (7) lb, with a distribution of cone weight effectively holding the traffic cones upright under traffic conditions.

If approved by the Project Manager, use tubular traffic markers manufactured, installed, and maintained in accordance with Section 703, "Traffic Markers," instead of traffic cones.

702.2.3 Sequential Arrow Displays

Use a sequential arrow display consisting of a sign panel assembly and a power source. Mount the display on a two-wheeled trailer or on a vehicle for mobile operations. Provide a sequential arrow display in accordance with the *MUTCD, current edition* Specifications for arrow displays. Use Type B panels for mobile operations and Type C panels for stationary traffic control. Provide a trailer in accordance with Section 702.2.4.5, "Trailer." Provide a display powered by diesel or solar power or one that connects to an external power supply. Ensure electrical connections meet or exceed the applicable electrical code requirements. Provide solar-powered systems with a battery-backup power supply capable of maintaining operation for a minimum of 12 consecutive 24-hour Days.

702.2.3.1 Operating Modes

Ensure that displays are capable of the following operating modes (see the *MUTCD, current edition* Specifications for advance warning arrow display):

1. Pass Left—Three (3) chevrons of five (5) lamps each sequencing right-to-left;
2. Pass Right—Three (3) chevrons of five (5) lamps each sequencing left-to-right;
3. Pass Either Side—Two (2) outermost chevrons on each end of the panel pointing outward forming arrowheads with crossing lamp rows burning continuously. Do not burn the first lamp directly behind the point of each arrow, to define the arrow points;
4. Caution—Four (4) lamps, one (1) at each corner of the panel.

702.2.4 Portable Changeable Message Signs

Portable changeable message signs will consist of a sign panel assembly, controller, power supply, and structural support system mounted on a two-wheeled trailer. Supply new portable changeable message signs if the Contract specifies that the Department will retain the message signs upon final Acceptance.

702.2.4.1 Sign Panel Assembly

Provide a sign panel consisting of a three-line panel assembly. Ensure that each line contains eight (8) matrices capable of producing at least eight (8) individually changeable characters. Ensure that each character module uses, as a minimum, a five-wide pixel by seven-high pixel matrix, with each matrix measuring at least 18 inches high and nine (9) inches wide.

Ensure a clearly displayed message on the sign panel that is legible from a distance of 800 ft during daytime and nighttime operation at angles in accordance with the *MUTCD*,

702.2.4.2 Controller

Provide a compact controller located to allow easy access to sign and message functions from a control cabinet on the trailer.

Provide a solid-state unit controller capable of generating and storing sign messages.

Provide a controller keyboard that allows the user to recall and use messages from permanent memory storage containing a library of standard messages. The controller will also have the capacity to store, recall, and use at least 50 additional messages generated by the operator.

Use a controller with a protective device that requires an entry code to access the memory and display messages to prevent unauthorized programming.

702.2.4.3 Power Supply

Provide a power unit capable of powering the message sign continuously for at least 21 consecutive 24-hour Days, with a fail-safe backup power supply system, and capable of being powered directly by a 120 V AC external power supply.

702.2.4.4 Structural Support Systems

Provide a structural support system with a mechanism capable of raising and lowering the sign panel at sustained wind speeds of 55 mph, and capable of operation by one (1) person without use of heavy Equipment. Ensure a clearance of at least seven (7) ft between the sign panel bottom and the pavement surface, when fully raised.

702.2.4.5 Trailer

Use a two-wheel single-axle system trailer with a suspension rated at no less than 2,000 lb.

Provide a trailer equipped with the following:

1. Four (4) non-removable leveling jacks, one (1) at each corner of the trailer,
2. A tongue and either a towing eye, for use with the pintle hook, or a ball receptacle, for a ball-type trailer hitch. Fabricate a 2 1/2 inches inside diameter towing eye from one (1) inch round, solid steel. Size the ball receptacle to accept a standard two (2) inch ball;
3. Two (2) safety chains with 1/4 inch diameter links. Install one (1) chain on each side of the draw bar and extend 24 inches beyond the towing eye. Install a safety hook on the outer end of each chain;
4. Two (2) combination tail, turn, and stop lights;
5. A license plate bracket and illumination lamp;
6. A standard SAE seven-way trailer light wire connector on a cable extending 24 inches beyond the towing eye;
7. A means of securing a receptacle on the trailer tongue.

702.2.5 Temporary Signal Span

Provide poles and associated electrical items for temporary signal spans in accordance with Section 715, "Beacons and Temporary Signal Equipment."

702.3 CONSTRUCTION REQUIREMENTS

702.3.1 General

Provide construction traffic control devices in accordance with *MUTCD, current edition* and *NCHRP Report 350*. Construction traffic control devices shall remain the property of the Contractor, unless otherwise specified in the Contract.

Install signs, steel posts, and base posts in accordance with the requirements of Section 701, "Traffic Signs and Sign Structures." Provide drums equipped with Type "C" steady-burn warning lights on channelization tapers, if in night operation.

Install traffic markers in accordance with the requirements of Section 703, "Traffic Markers."

Use Type A or Type B flashing warning lights and flags to call attention to advance warning construction signing.

Use Traffic Cones only during daylight hours.

702.3.1.1 Portable Sign Support System

Provide portable sign support systems from the Department's *Approved Products List*.

702.3.1.2 Temporary Signal Spans

Use temporary signal spans consisting of poles and associated electrical items in accordance with Section 715, "Beacons and Temporary Signal Equipment."

Remove temporary signal spans after Project Detours are removed, or as directed by the Project Manager.

702.3.2 Maintenance

Maintain the traffic control plan and devices in accordance with Section 618, "Traffic Control Management."

Keep construction traffic control devices clean so that the intended visibility is not diminished. The condition of construction traffic control devices is subject to Department approval.

The Department will assess liquidated damages at a rate of \$500 a Day for each Day or portion of a Day that a portable changeable message sign does not function.

702.4 METHOD OF MEASUREMENT—Reserved

702.5 BASIS OF PAYMENT

Pay Item	Pay Unit
<i>Construction Signing</i>	Square Foot
<i>Steel Posts and Base Posts for Construction Signing</i>	Foot
<i>Barricade, Type_____</i>	Each
<i>Vertical Panel, Type_____</i>	Each
<i>Construction Traffic Marker</i>	Each
<i>Portable Sign Support</i>	Each
<i>Channelization Device, Type_____</i>	Each
<i>Sequential Arrow Display</i>	Each
<i>Portable Changeable Message Sign</i>	Each
<i>Traffic Cone</i>	Each
<i>Temporary Signal Span</i>	Lump Sum

702.5.1 Work Included in Payment

The following Work and items will be considered as included in the payment for the main items and will not be measured or paid for separately:

- A. Supports required for vertical panels and poles, and all associated electrical and mechanical items for temporary signal span;
- B. Moving of construction traffic control devices from one (1) location to another, maintenance, and repair or replacement of damaged or destroyed traffic control devices;
- C. Additional traffic control device quantities approved and implemented solely for the Contractor's convenience;
- D. Type "A" low-intensity warning lights, Type "B" high-intensity warning lights, or Type "C" steady-burn warning lights and signing which are attached to barricades, drums and construction signs.

Any other items installed by the Contractor for the installation of items covered by this specification shall be consider Incidental to the items listed in section 702.5 BASIS OF PAYMENT and 702.5.1 Work Included in Payment.

SECTION 801: CONSTRUCTION STAKING BY THE CONTRACTOR

801.1 Description

801.1.1 General

This Work consists of construction staking, essential for the control and completion of the Project.

801.1.2 Department-Supplied Documents and Services

The Department will provide the Contractor with survey data sufficient to layout, control, and complete the Project. Survey data includes, but is not limited to, the following:

1. Location notes;
2. Design grades;
3. Elevations;
4. Slopes;
5. Projected locations of slope stake catch points; and
6. Lines and grades.

The Department will supply the data as printout sheets, field books, electronic files (when available, and at the discretion of the Department), Right of Way maps, or Plans. Contractor will locate and verify all data points.

801.1.3 Contractor-Supplied Personnel & Services

Provide qualified personnel who are experienced in Highway construction staking to perform the staking. Per NMSA 61-23-26, Public Work, a New Mexico licensed professional surveyor is required to be in responsible charge of construction staking surveys for engineering and architectural public Works projects with a construction cost of \$100,000.00 or greater.

Locate and establish control points with the data given in the Plans.

Verify Department-provided survey data, and submit changes or adjustments (including recorded data) to the Project Manager for approval at no cost to the Department.

801.2 CONSTRUCTION REQUIREMENTS

801.2.1 General

Do not disturb, cover, or remove reference marks without providing written documentation of the disturbed, covered, or removed reference mark to the Project Manager for approval. Reference marks include the following:

1. Triangulation stations;
2. Benchmarks;
3. Corners;
4. Monuments;
5. Stake;
6. Witness marks; or
7. Other reference marks located within the construction limits (including the limits of Temporary Construction Permits) or on the Right of Way line of this Project.

Coordinate the reestablishment of removed or destroyed markers with the Department. When directed, reset destroyed reference markers, at no additional cost to the Department, in accordance with 61-23-28 NMSA, Reference marks; removal or obliteration; replacement, and

Submit notes regarding the referencing of monuments to the Project Manager.

The Department will charge the Contractor \$1,000 for each monument the Contractor improperly referenced before disturbing, covering, or removing.

801.3.2 Construction-Staking Documentation

Complete construction-staking field notes and other documentation in accordance with the Department's current *NMDOT Survey Handbook* and accepted industry methods achieving required accuracy.

Keep field notes in a standard field notebook in a clear, orderly, and neat manner, consistent with professional surveying practices, unless stated otherwise in the Contract.

Construction-staking documentation will become the property of the Department when the Work is complete. Provide construction-staking documentation to the Project Manager. Submit earthwork quantities, slope staking, surface extracted cross sections, and earthwork calculations to the Project Manager for review before completing that phase of the Work. Ensure a New Mexico licensed professional surveyor or professional Engineer stamps and certifies the quantities and all submittals. The Department will not accept earthwork quantities until the Project Manager reviews and approves these quantities.

Submit earthwork quantity information in hard copy using double-end area or prismatic computations, or using Department-approved computer software.

801.3.3 Control Points

The Contractor shall use the reference control points provided by the Department or set by the Contractor's personnel to establish construction-staking points and to layout and control the Work.

Notify the Project Manager of errors and omissions discovered in the control points before beginning affected Work.

Move and re-establish benchmarks, control points, or monuments belonging to agencies of the United States, State, or local governments in accordance with the accepted procedures of the respective agency. If the Project Manager directs the Contractor to perform this Work, the Department will, unless due to Contractor operations or if detailed in the Contract, pay in accordance with Section 104.4, "Extra Work."

Contractor will make every effort to preserve and reference the provided survey control points in such a manner, that their location can be reestablished by the contractor in cases of weather related disturbances or vandalism.

Contractor will perform necessary transformation/calibration utilizing the referenced control points provided by the Department so that all survey Work is in the coordinate system provided by the DOT.

801.3.4 Accuracy Requirements

Meet accuracy requirements dictated by the individual elements of the Work.

801.3.5 Accuracy Verification

The Project Manager will spot check the accuracy of the construction stakes, lines, grades, and layouts but will assume no responsibility for the accuracy or the final result. The Project Manager will inform the Contractor of discrepancies immediately.

801.3.6 Non-Specified Re-staking and Re-establishment of Control

The Contractor shall perform re-staking due to the following conditions, at no additional cost to the Department:

1. Errors or omissions by Contractor personnel, or
2. The Contractor's negligence.

The Department will review re-staking in accordance with Section 104.2, "Significant Changes in the Character of Work," Section 104.3, "Differing Site Conditions," and Section 104.4, "Extra Work" when due to the following conditions:

1. Resulting from errors or omissions by the Department;
2. At the Department's request, or
3. Circumstances beyond the Contractor's control.

801.3.7 Construction Staking

801.3.7.1 Locations and Elevations

Verify locations and elevations of control points and benchmarks provided. Establish as necessary.

801.3.7.2 Centerline

Establish necessary construction centerline Project stationing and reference stakes for use in setting the grade and finishing stakes, and re-establishing the construction centerline. Establish necessary Right of Way centerline Project stationing and reference stakes for use in determining the location of the Right of Way for construction staking purposes, and re-establishing the Right of Way centerline.

801.3.7.3 Slope Stakes, Initial Ground Topographic Survey, and Clearing Stakes

Set slope stakes, and stationing at intervals no greater than 100 ft. Perform initial ground topographic survey before beginning construction.

801.3.7.4 Grade Finishing Stakes

Set grade finishing stakes (blue tops) to establish grade elevations and horizontal alignment at the top of Subgrade, top of Base Course, and top of Subbase. Set the finish stakes at intervals no more than 50 ft. If the Contractor uses automatic grade Equipment, the Contractor shall provide Equipment Specifications that will allow interval adjustments as per manufactures recommendation.

801.3.7.5 Drainage Structures

Survey and plot drainage Structure locations and prepare Structure drawings to verify the accuracy of the Structure sections shown on the Plans. Submit the plotted drainage Structure profiles, along with a revised Structure list, to the Project Manager for review and Acceptance prior to drainage Structure construction.

801.3.7.6 Bridges

Perform all Bridge staking using the vertical and horizontal control points provided by the Department. Stake, plot, and submit a Profile Grade for the Roadway approaches, departures, approach slabs, and Bridges. Identify any necessary adjustments before submitting to the Project Manager.

801.3.7.7 Sign Structures

Stake all new sign locations. Stake and plot locations for extruded and overhead sign Structures. Submit the plotted profile to the Project Manager for Acceptance before submitting shop drawings for extruded and overhead sign Structures, and before ordering the Materials.

801.3.7.8 Slope Stake Changes

Perform routine slope stake changes as needed to blend slopes into the existing terrain as approved by the Project Manager.

Perform slope stake changes required to blend slopes into the existing terrain as approved by the Project Manager for additional Work as defined per Section 104.2, "Significant Changes in the Character of Work," Section 104.3, "Differing Site Conditions," and Section 104.4, "Extra Work."

801.3.7.9 Curbs and Gutters

Perform staking using vertical and horizontal control points provided by the Department.

801.3.7.10 Miscellaneous Staking

The Contractor shall perform miscellaneous staking using vertical and horizontal control points provided by the Department. Miscellaneous staking includes staking for the following:

1. Material and Borrow Pits required for contract payment;
2. Guardrails;
3. Riprap,
4. Construction signs;
5. Delineators;
6. Pavement markings;
7. Cattle guards;
8. Turnouts;
9. Ditches;
10. Fences;
11. Traffic control devices;
12. Permanent and major signs; and
13. Other miscellaneous Work the Project Manager deems necessary to properly control the Work.

801.3.7.11 Other Staking Changes

Perform unexpected Work and construction staking changes as directed by the Project Manager necessary for the completion of the Work.

801.3.7.12 Fence Station Markers

Provide a shop-made station marker every fifth station. The marker shall be one (1) inch × five (5) inch × 14 inch black on white with three (3) inch stenciled numbers. Mount the markers on the fence or on an appropriate shop-made post four (4) feet above the ground.

801.3.8 Removal and Disposal of Stakes

After Project completion and before final Acceptance, remove and dispose of stakes and markers.

801.4 METHOD OF MEASUREMENT

Submit a construction-staking schedule of values as part of CPM or monthly progress

schedule to the Project Manager for approval.

801.5 BASIS OF PAYMENT

Pay Item

Construction Staking by the Contractor

Pay Unit

Lump Sum

The Department will make partial payments in accordance with the approved construction-staking schedule of values. The Department considers slope stake changes and other staking changes as Incidental to the completion of the Work and will not measure or pay for it separately.

SECTION 802: POST CONSTRUCTION PLANS

802.1 DESCRIPTION

802.1.1 General

This Work consists of providing Post Construction Plans to show in detail increases or decreases in quantities and alterations in the details of the Plans, including but not limited to alterations in the grade or alignment of the Road, structures, or both. Post Construction Plans shall be kept current and readily available at all times for the Project Manager to review.

The Post Construction Plans, including any revised plan sheets, shall be neat, legible and of the size let. All revisions to the original Plans shall be delineated in black ink, located properly on the drawing, legible and true to scale. Every Post Construction Plan, Profile, and Cross Section Sheet shall be designated as such by note or stamp "As-Built" in the upper right area in black.

802.1.1.1 Contractor-Supplied Documents and Services

Provide qualified personnel to perform Post Construction Plan updates and submittal in a professional, timely and accurate manner. Ensure the personnel supervising the operation are knowledgeable and experienced in surveying and mapping of Post Construction Plans.

If the Contractor has been given electronic data for surveying/construction staking the submittal will be required to be both electronic & paper copy. If there is no electronic data submitted for survey, the Post Construction Plans will be paper copy submittals. All paper copy submittals shall be 24" x 36" in size unless otherwise specified by the Project Manager.

802.2 CONSTRUCTION REQUIREMENTS

802.2.1 General

The Post Construction Plan submittal shall include but not be limited to the following:

1. Changes to the length of Project in miles;
2. Changes to the B.O.P. and E.O.P. in stationing and milepost location;
3. Changes to the station equations; all equations shall be listed;
4. All Structures, as built, and changes to Major Structures with Structure Number and span length, shall be shown on the plan and profile sheets and Structure sheets;
5. Typical section changes and station to station locations, including subexcavation limits, cut and fill limits, with the in place depth of each type of surfacing (subexcavation, Subbase, Base Course, HMA, etc.) on each plan and profile sheet;
6. Final quantities in appropriate columns on the plan set;
7. Changes to widths and locations of turnouts and Median openings, with radii indicated and changes to Structures, on Plan and Profile sheets;
8. All line, grade, and super elevation rate changes on plan and profile sheets, and Structure location sheets;
9. All fencing, gates, and cattle guards remaining and built, on the *Structure Quantity Sheets*. Specify types of fencing and width of gate(s) and cattle guard(s);
10. Relocation and clearance of utility lines on utility sheets including casings, offsets, depths, or elevations. Service lines to private property are not required;
11. Bridges: All changes shall be shown on Structure location sheets and detail sheets. Show the top elevation of the longest and shortest pile in each pier and abutment on the Structure location sheet. Also show changes in Bridge decks thickness;
12. All build notes shall be edited identifying changes made. Build notes not requiring edit shall be check marked;
13. Verify all Change Order information, excluding Gross Receipt Tax Change Orders,

has been transferred to the Post Construction PlansPlans and the proper sheets have been inserted and indexed and refer to the Change Order number;

14. Post Construction Plans should not use destructive binding & should be bound in a manner acceptable by the Project Manager; and
15. General Notes/Call Out sheets shall be edited changing the tense of each item to indicate what was done; strike-through of items not required or completed on the Project shall be done retaining legibility.

802.3 BASIS OF PAYMENT

Pay Item	Pay Unit
<i>Post Construction Plans</i>	Lump Sum

SECTION 901: QUALITY CONTROL/QUALITY ASSURANCE (QC/QA)

DEFINITIONS:

Direct Supervision. The required supervision of a TTCP trainee by a certified TTCP technician who is on a Project with the trainee and who is both signing off and is personally responsible for all of that trainee's sampling and testing procedures, results and reports.

Qualified Sampling and Testing Technician. A technician who has been certified under TTCP to independently perform inspections, sampling, and testing in specified Materials testing area(s) for either Quality Control or Acceptance testing. The term "qualified" and "certified" have the same meaning.

TTCP Trainee. A technician who has attended the appropriate TTCP training class and has a certificate of completion, and is receiving required "on-the-job-training" under the direct supervision of a TTCP certified technician, as such is eligible to take a particular TTCP certification exam.

Validation. A procedure using statistical methods to compare the Contractor's and the Department's test results, specifically, the *F-test* to compare variances and *T-test* to compare means.

901.1 INSPECTIONS AND TESTING OF MATERIALS

901.1.1 General

Materials are subject to inspection, sampling, and testing before Acceptance of the Work. References in the Contract to test methods or Specifications are to the latest versions as of the Bid Advertisement date, unless otherwise noted. Test methods may be subject to modification at the discretion of the State Materials Bureau. The Department's current *TTCP Manual* contains AASHTO and ASTM test method modifications. Testing frequency must be equal to or greater than the Minimum Testing Requirements, available here: <http://dot.state.nm.us>

The Department will sample and test Materials for Acceptance unless otherwise specified in the Contract. The Department will provide Acceptance test results to the Contractor within 2 Working Days after sampling, but only after Contractor QC tests have been received for the same subplot, and will provide other test results to the Contractor upon request. Department testing is not intended for Quality Control.

901.1.2 Technician Certification

Ensure that testing is performed under the direct supervision of an individual certified by the State Materials Bureau's TTCP. Certification is based on demonstration of abilities for test methods and procedures, and a written test. The TTCP Board of Directors, in conjunction with the State Materials Bureau and the State Construction Bureau, will establish term and expiration date of certification and requirements for renewal of certification. If the competence of a certified individual is questioned, the question of competence must be documented in accordance with the *TTCP Manual*. The *TTCP Manual* requires a written complaint be addressed to the TTCP Administrator or the State Materials Engineer. The State Materials Bureau will investigate the concern through the TTCP. If this investigation substantiates the concern, disciplinary action such as probation, revocation, or suspension of certification will be implemented in accordance with procedures established by the TTCP Board of Directors.

901.1.3 Acceptance Sampling and Testing

The Department will sample and test in accordance with Table 901.7:6, "Minimum Acceptance Guidelines," or at a lesser subplot size for Acceptance purposes as determined by the Project Manager before production of material begins. If Material appears defective, or if the Project Manager determines that a change in the process or product has occurred, additional sampling and testing may occur. When additional informational sampling and

testing is performed, the results will be used only to determine if corrective actions need to be taken by the Contractor and will not be incorporated into the quality level analysis.

The Department will conduct Acceptance testing independently from the Contractor's Quality Control testing. If the Department's Acceptance testing validates in method and property to the Contractor's Quality Control testing, the Department will use both for Acceptance and pay factor determination. Use of the Contractor's test results is dependent on the following conditions:

1. The Contractor uses Quality Control procedures as described in Section 901.2, "Contractor Quality Control."
2. The Department validates the Contractor's test results against the Department's test results using the *F-test* and *T-test*, conducted at a level of significance of 0.01.
3. The Contractor shall use all test results from the Contractor's random sampling plan as detailed in the Quality Control plan per Section 901.2.1, "Quality Control Plan." Do not include informational test data obtained by test results beyond the Contractor's random sampling plan locations. If a split sample is taken to determine deviations between Contractor and Department process, only data obtained from a random sampling plan location can be utilized in the quality level analysis. If a split sample is tested by the Contractor and Department for informational purposes and the location does not represent either the Contractor's or Department's random sampling plan locations, neither test data results are to be included in the quality level analysis.

If the Department cannot validate the Contractor's test data at any time during the Project, the Project Manager and Quality Control technician will investigate to determine why and make corrections if possible. If the discrepancy cannot be resolved, then, unless otherwise approved by the Assistant District Engineer for Construction, the Department will determine the pay factor using the Department's test values only for all characteristics.

901.2 CONTRACTOR QUALITY CONTROL

Perform Quality Control sampling, testing, and inspection in accordance with Table 901.7:3, "Minimum Process Control Guidelines for Aggregates and Base Course," Table 901.7:4, "Minimum Process Control Guidelines for Hot Mix Asphalt," and Table 901.7:5, "Minimum Process Control Guidelines for Portland Cement Concrete Pavement."

901.2.1 Quality Control Plan

Provide a Quality Control plan to control the quality of the product. At the Pre-Construction Conference, be prepared to discuss Quality Control responsibilities for specific Contract Items. Submit the Quality Control plan to the Project Manager at least two (2) weeks before starting Work. Itemize inspections, testing procedures, sampling and testing frequencies, and corrective action strategies that the Contractor will use to control the Work. Develop the Quality Control plan using the Department's *Contractor Process Quality Control Plan Guidelines* available from the Project Manager or State Construction Bureau. Do not begin Work that requires Quality Control testing for Acceptance without a Quality Control plan that has been reviewed and approved by the Project Manager and the District Laboratory Supervisor. Provide written certification that testing Equipment is calibrated and meets the applicable Specifications.

901.2.2 Quality Control Laboratory

Perform the Quality Control testing using a private testing Laboratory or a Contractor provided Laboratory. Use a portable or permanent Quality Control Type II Laboratory in accordance with Section 622.3.2.2, "Field Office Equipment." Calibrate or check testing Equipment in accordance with AASHTO R 18 and any time the Equipment is moved. Maintain calibration documentation at the Laboratory and provide this to the Project Manager upon request. The Project Manager in conjunction with the District Lab Supervisor will determine acceptability of the Quality Control Laboratory. Allow the Department unrestricted access to

the Laboratory. The Department will conduct independent inspection of the Contractor's field Laboratory. The Project Manager will provide the Contractor a written accounting of Laboratory deficiencies.

901.2.3 Plan Administration and Technician Qualification

Identify the individual who will administer the plan. The individual shall have full authority to take actions necessary for the successful operation of the plan. Quality Control Technicians (QCT's) performing the actual sampling, testing, or inspection shall be TTCP certified as described in Section 901.1.2, "Technician Certification." Cease production if certified personnel are unavailable on the Project.

901.2.4 Sampling

The sampling plan shall contain a random sampling selection technique in accordance with specified Department, AASHTO, or ASTM procedures, as modified by the State Materials Bureau. Allow the Project Manager to witness all sampling and testing. Take additional samples if directed by the Project Manager. The sampling plan shall be submitted as a component of the Quality Control Plan.

901.2.5 Testing

The Department will use test results from the random sampling plan only in the quality level analysis for pay factor determination. Additional informational test results will not be used in the quality level analysis. The Contractor shall provide original Quality Control test results (on approved forms including all original supporting handwritten worksheets and notes) to the Project Manager within 1 Working Days of sampling. The Technician performing the testing shall sign and certify the results as "true and accurate to the best of my belief and knowledge" prior to providing the results to the Department. Failure to provide the results within 1 Working Day of sampling may result in the Project Manager ordering the Contractor to cease HMA operations until said results are provided to the Project Manager.

901.2.6 Records

Maintain copies of the complete set of original Quality Control test records (including supporting documents (calculations, scratch sheets, internal forms etc.) and, upon request, make them available to the Project Manager within 24 hours. No hard copy Laboratory testing documentation shall be destroyed for any reason, even after the data is entered into the computer spreadsheet for analysis. If complete records are not provided as requested, the Department may determine the pay factor using the Department's test values only for all testing characteristics. Maintain copies of test documentation for a minimum of three (3) years after the Physical Completion Date of the Project.

901.2.7 Control Charts

Update Department-approved test control charts daily on all tests in accordance with Table 901.7:3, "Minimum Process Control Guidelines for Aggregates and Base Course," Table 901.7.4, "Minimum Process Control Guidelines for Hot-Mix Asphalt," and Table 901.7:5, "Minimum Process Control Guidelines for Portland Cement Concrete Pavement." Keep at a location approved by the Project Manager. Provide at least the following information on the charts:

1. Project number;
2. Contract Item number;
3. Test number;
4. Each test parameter;
5. Upper and lower specification limit applicable to each test parameter; and
6. The Contractor's test results.

Use the charts for identifying product and Equipment problems, and potential pay factor reductions. Notify the Project Manager of any identified problems within 4 hours.

901.3 INDEPENDENT ASSURANCE TESTING

TTCP certified independent personnel will perform Independent Assurance testing on split samples from Quality Control and Acceptance programs to ensure that the Contractor and Department field personnel are using correct and accurate procedures and the proper Equipment. These personnel will not have direct responsibility for Quality Control or Acceptance testing.

901.4 EVALUATION OF MATERIALS FOR ACCEPTANCE

The Department will analyze lot Acceptance test results collectively and statistically using the Quality Level Analysis method. Quality Level Analysis is a statistical procedure for estimating the percent compliance with a specification; it is affected by shifts in the arithmetic mean, and by the sample standard deviations. The Department will use this analysis to estimate the total percent of the lot that is within specification limits. The maximum pay factor per lot is 1.0.

The Department may accept a lot containing Material below a pay factor of 1.00 at a reduced price, in accordance with the following criteria:

1. The composite pay factor is at least 0.75;
2. There are no rejectable individual criteria (Agency, Contractor or Combined); and
3. The Project Manager does not identify isolated defects (i.e., segregation, or other construction related material defects).

The Department will consider a written request to accept a Material lot below the Target Value (TV) that does not meet the above criteria, but at a composite pay factor not to exceed 0.50. The Contractor shall include an engineering analysis showing expected Material performance. The Assistant District Engineer for Construction will decide if the Material may remain in place and determine the final pay factor for the material in question. If less than three (3) samples are obtained at the time a lot is terminated, they shall be incorporated in the prior lot. If no prior lot exists, the disposition of the material shall be decided by the Assistant District Engineer for Construction after evaluating with Non-QLA criteria in accordance with Section 423.3.6.2.1.1.

The Project Manager may reject Material that appears to be defective based on visual inspection.

901.5 QUALITY LEVEL ANALYSIS (QLA)

Use the following steps to calculate the standard deviation:

1. Do not include test results for Material not used in the Work;
2. Calculate the arithmetic mean of the test results using the following equation:

$$\bar{x} = \frac{\sum x}{n} \quad (\text{Equation 1})$$

Where,

\bar{x} is the arithmetic mean

\sum is the summation of

x is the individual test value

n is the number of test values

3. Calculate the sample standard deviations using the following equation:

$$s = \sqrt{\frac{\sum (x - \bar{x})^2}{(n-1)}} \quad (\text{Equation 2})$$

Where,

s is the sample standard deviation

\sum is the summation of

x is the individual test value

\bar{x} is the arithmetic mean

n is the number of test values

4. Calculate the upper quality index using the following equation:

$$Q_U = \frac{USL - \bar{x}}{s} \quad (\text{Equation 3})$$

Where,

Q_U is the upper quality index

USL is the upper specification limit, or TV plus allowable deviation above TV

\bar{x} is the arithmetic mean

s is the sample standard deviation

TV is the Target Value

5. Calculate the lower quality index using the following equation:

$$Q_L = \frac{\bar{x} - LSL}{s} \quad (\text{Equation 4})$$

Where,

Q_L is the lower quality index

\bar{x} is the arithmetic mean

LSL is the lower specification limit or TV minus allowable deviation below TV

s is the sample standard deviation

6. Determine P_U (the percent of test values below the upper specification limit, which corresponds to a given Q_U) from Table 901.7:1, "Quality Level Analysis by the Standard Deviation Method Upper Quality Index Q_U or Lower Quality Index Q_L ." If a USL is not specified, P_U is 100.
7. Determine P_L (the percent of test values above the lower specification limit, which corresponds to a given Q_L) from Table 901.7:1, "Quality Level Analysis by the Standard Deviation Method Upper Quality Index Q_U or Lower Quality Index Q_L ." If an LSL is not specified, P_L is 100.
8. Calculate the quality level (the total percent within specification limits) using the following equation:

$$Q = (P_U + P_L) - 100 \quad (\text{Equation 5})$$

Where,

Q is the quality level

P_U is the percent of test values below the upper specification limit which corresponds to a given upper quality index (Q_U)

P_L is the percent of test values above the lower specification limit which corresponds to a given lower quality index (Q_L)

9. Using the quality level, determine the lot pay factor from Table 901.7:2, "Pay Factors."
10. Calculate the composite pay factor for each lot, using the following equation:

$$CPF = \frac{[f_1(PF_1) + f_2(PF_2) \dots f_j(PF_j)]}{[f_1 + f_2 \dots f_j]} \quad (\text{Equation 6})$$

Where,

CPF is the composite pay factor

f is the price adjustment factor specified for the applicable Material

j is the number of evaluated components

PF is the individual pay factor determined for each component

Carry the numbers in the above calculations to significant figures and round them in accordance with AASHTO R 11.

901.6 METHOD OF MEASUREMENT—Reserved

901.7 BASIS OF PAYMENT

The Department will pay for *Contractor Process Quality Control* on QLA Projects as follows:

1. 25% of the Lump sum pay item or 0.5% of the Total Original Contract Amount, whichever is less upon approval of the Quality Control plan; and
2. The remaining Lump sum prorated based on total job progress.

The Department will withhold payment if the Contractor does not provide test result documentation in accordance with the Contract.

Pay Item

Contractor Process Quality Control

Pay Unit

Lump Sum

Table 901.7:1
QUALITY LEVEL ANALYSIS BY THE STANDARD DEVIATION METHOD
UPPER QUALITY INDEX QU OR LOWER QUALITY INDEX QL

Pu or PI	n=														
	3	4	5	6	7	8	9	10 to 11	12 to 14	15 to 17	18 to 22	23 to 29	30 to 42	43 to 66	67 to ∞
100	1.16	1.49	1.72	1.88	1.99	2.07	2.13	2.20	2.28	2.34	2.39	2.44	2.48	2.51	2.56
99	—	1.46	1.64	1.75	1.82	1.88	1.91	1.96	2.01	2.04	2.07	2.09	2.12	2.14	2.16
98	1.15	1.43	1.58	1.66	1.72	1.75	1.78	1.81	1.84	1.87	1.89	1.91	1.93	1.94	1.95
97	—	1.40	1.52	1.59	1.63	1.66	1.68	1.71	1.73	1.75	1.76	1.78	1.79	1.80	1.81
96	—	1.37	1.47	1.52	1.56	1.58	1.60	1.62	1.64	1.65	1.66	1.67	1.68	1.69	1.70
95	1.14	1.34	1.42	1.47	1.49	1.51	1.52	1.54	1.55	1.56	1.57	1.58	1.59	1.59	1.60
94	—	1.31	1.38	1.41	1.43	1.45	1.46	1.47	1.48	1.49	1.50	1.50	1.51	1.51	1.52
93	1.13	1.28	1.33	1.36	1.38	1.39	1.40	1.41	1.41	1.42	1.43	1.43	1.44	1.44	1.44
92	1.12	1.25	1.29	1.31	1.33	1.33	1.34	1.35	1.35	1.36	1.36	1.37	1.37	1.37	1.38
91	1.11	1.22	1.25	1.27	1.28	1.28	1.29	1.29	1.30	1.30	1.30	1.31	1.31	1.31	1.31
90	1.10	1.19	1.21	1.23	1.23	1.24	1.24	1.24	1.25	1.25	1.25	1.25	1.25	1.26	1.26
89	1.09	1.16	1.18	1.18	1.19	1.19	1.19	1.19	1.20	1.20	1.20	1.20	1.20	1.20	1.20
88	1.07	1.13	1.14	1.14	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15
87	1.06	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.11	1.11	1.11	1.11	1.11	1.11	1.11
86	1.04	1.07	1.07	1.07	1.07	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
85	1.03	1.04	1.03	1.03	1.03	1.03	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
84	1.01	1.01	1.00	0.99	0.99	0.99	0.99	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
83	0.99	0.98	0.97	0.96	0.95	0.95	0.95	0.95	0.94	0.94	0.94	0.94	0.94	0.94	0.94
82	0.97	0.95	0.93	0.92	0.92	0.92	0.91	0.91	0.91	0.91	0.90	0.90	0.90	0.90	0.90
81	0.95	0.92	0.90	0.89	0.88	0.88	0.88	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
80	0.93	0.89	0.87	0.86	0.85	0.85	0.84	0.84	0.84	0.83	0.83	0.83	0.83	0.83	0.83
79	0.91	0.86	0.84	0.82	0.82	0.81	0.81	0.81	0.80	0.80	0.80	0.80	0.80	0.80	0.79
78	0.88	0.83	0.81	0.79	0.79	0.78	0.78	0.77	0.77	0.77	0.76	0.76	0.76	0.76	0.76
77	0.86	0.80	0.77	0.76	0.75	0.75	0.74	0.74	0.74	0.73	0.73	0.73	0.73	0.73	0.73
76	0.83	0.77	0.74	0.73	0.72	0.72	0.71	0.71	0.70	0.70	0.70	0.70	0.70	0.70	0.70
75	0.81	0.74	0.71	0.70	0.69	0.69	0.68	0.68	0.67	0.67	0.67	0.67	0.67	0.67	0.66
74	0.78	0.71	0.68	0.67	0.67	0.65	0.65	0.65	0.64	0.64	0.64	0.64	0.64	0.64	0.63
73	0.75	0.68	0.65	0.64	0.63	0.62	0.62	0.62	0.61	0.61	0.61	0.61	0.61	0.61	0.60
72	0.73	0.65	0.62	0.61	0.60	0.59	0.59	0.59	0.58	0.58	0.58	0.58	0.58	0.58	0.57
71	0.70	0.62	0.59	0.58	0.57	0.57	0.56	0.56	0.55	0.55	0.55	0.55	0.55	0.55	0.54
70	0.67	0.59	0.56	0.55	0.54	0.54	0.53	0.53	0.52	0.52	0.52	0.52	0.52	0.52	0.52
69	0.64	0.56	0.53	0.52	0.51	0.51	0.50	0.50	0.50	0.49	0.49	0.49	0.49	0.49	0.49

Table 901.7:1 QUALITY LEVEL ANALYSIS BY THE STANDARD DEVIATION METHOD UPPER QUALITY INDEX QU OR LOWER QUALITY INDEX QL															
Pu or Pl	n=														
	3	4	5	6	7	8	9	10 to 11	12 to 14	15 to 17	18 to 22	23 to 29	30 to 42	43 to 66	67 to ∞
68	0.61	0.53	0.50	0.49	0.48	0.48	0.48	0.47	0.47	0.47	0.46	0.46	0.46	0.46	0.46
67	0.58	0.50	0.47	0.46	0.45	0.45	0.45	0.44	0.44	0.44	0.44	0.43	0.43	0.43	0.43
66	0.55	0.47	0.45	0.43	0.43	0.42	0.42	0.42	0.41	0.41	0.41	0.41	0.41	0.41	0.40
65	0.51	0.44	0.42	0.40	0.40	0.39	0.39	0.39	0.38	0.38	0.38	0.38	0.38	0.38	0.38
64	0.48	0.41	0.39	0.38	0.37	0.37	0.36	0.36	0.36	0.36	0.35	0.35	0.35	0.35	0.35
63	0.45	0.38	0.36	0.35	0.34	0.34	0.34	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.32
62	0.41	0.35	0.33	0.32	0.32	0.31	0.31	0.31	0.30	0.30	0.30	0.30	0.30	0.30	0.30
61	0.38	0.30	0.30	0.30	0.29	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28
60	0.34	0.28	0.28	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
59	0.31	0.27	0.25	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23
58	0.30	0.25	0.23	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
57	0.25	0.20	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18
56	0.20	0.18	0.16	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
55	0.18	0.15	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
54	0.15	0.13	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
53	0.10	0.10	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
52	0.08	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
51	0.05	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Note: For negative values of Qu or Ql, Pu or Pl is equal to 100 minus the table value for Pu or Pl. If the value of Qu or Ql does not correspond exactly to a figure in the table, use the next lower figure.															

Table 901.7:2 Pay Factors															
Pay factor	Minimum Required Percent of Work Within Specifications Limits for a Given Pay Factor (Pu+PL) – 100														
	n=														
	3	4	5	6	7	8	9	10 to 11	12 to 14	15 to 17	18 to 22	23 to 29	30 to 42	43 to 66	67 to ∞
1.05	—	—	—	—	—	100	100	100	100	100	100	100	100	100	100
1.04	—	—	—	—	100	99	97	95	96	96	96	97	97	97	97
1.03	—	—	—	100	98	96	94	92	93	93	94	95	95	96	96
1.02	—	—	—	99	97	94	91	89	90	91	92	93	93	94	94
1.01	100	100	100	98	95	92	89	87	88	89	90	91	92	92	93

Table 901.7:2 Pay Factors															
Pay factor	<i>Minimum</i> Required Percent of Work Within Specifications Limits for a Given Pay Factor (Pu+PL) – 100														
	n=														
	3	4	5	6	7	8	9	10 to 11	12 to 14	15 to 17	18 to 22	23 to 29	30 to 42	43 to 66	67 to ∞
1.00	69	75	78	80	82	83	84	85	86	87	88	89	90	91	92
0.99	66	72	76	78	80	81	82	83	84	85	86	87	89	90	91
0.98	64	70	74	76	78	79	80	81	82	84	85	86	87	88	90
0.97	63	68	72	74	76	77	78	79	81	82	83	84	86	87	88
0.96	61	67	70	72	74	75	76	78	79	81	82	83	84	86	87
0.95	59	65	68	71	72	74	75	76	78	79	80	82	83	84	86
0.94	58	63	67	69	71	72	73	75	76	78	79	80	82	83	85
0.93	57	62	65	67	69	71	72	73	75	76	78	79	80	82	84
0.92	55	60	63	66	68	69	70	72	73	75	76	78	79	81	82
0.91	54	59	62	64	66	68	69	70	72	74	75	76	78	79	81
0.90	53	57	61	63	65	66	67	69	71	72	74	75	77	78	80
0.89	51	56	59	62	63	65	66	68	69	71	72	74	75	77	79
0.88	50	55	58	60	62	64	65	66	68	70	71	73	74	76	78
0.87	49	53	57	59	61	62	63	65	67	68	70	71	73	75	77
0.86	48	52	55	58	59	61	62	64	66	67	69	70	72	74	76
0.85	46	51	54	56	58	60	61	62	64	66	67	69	71	72	75
0.84	45	49	53	55	57	58	60	61	63	65	66	68	70	71	73
0.83	44	48	51	54	56	57	58	60	62	64	65	67	69	70	72
0.82	43	47	50	53	54	56	57	59	61	62	64	66	67	69	71
0.81	41	46	49	51	53	55	56	58	59	61	63	64	66	68	70
0.80	40	44	48	50	52	54	55	56	58	60	62	63	65	67	69
0.79	39	43	46	49	51	52	54	55	57	59	61	62	64	66	68
0.78	38	42	45	48	50	51	52	54	56	58	59	61	63	65	67
0.77	36	41	44	46	48	50	51	53	55	57	58	60	62	64	66
0.76	35	39	43	45	47	49	50	52	54	56	57	59	61	63	65
0.75	33	38	42	44	46	48	49	51	53	54	56	58	60	62	64
Reject	Values less than those shown above														
Note: If the value of (Pu+PL) – 100 does not correspond to a (Pu+PL) – 100 value in this table, use the next lower (Pu+PL) – 100 value															

Table 901.7:3
Minimum Process Control Guidelines for Aggregates, Base Course and RAP (QC)

Item	Property	Testing frequency	Test method
Aggregate for Base Course, Hot Mix Asphalt, Warm Mix Asphalt, PCCP, and Open Graded Friction Course	Sampling	As specified	AASHTO T 2, 248
	Gradation	1 per 1,000 ton	AASHTO T 11, 27, 146 ^a
	Fractured Faces		NMDOT Method FF 1
	Sand Equivalent		AASHTO T 176 ^c
	Plasticity Index		AASHTO T 89, 90
RAP (Recycled Asphalt Pavement) used in HMA, WMA and Base Course	Moisture Content	As needed to control operations	AASHTO T 255
	Sampling	As specified	AASHTO T2, 248
	Gradation	2 per Day (on RAP that is prepared for inclusion in the Base Course or HMA)	AASHTO T30, 164, 308
Aggregates for HMA & WMA	Asphalt Content		AASHTO T308
	Los Angeles Wear	As needed to confirm quality	AASHTO T 96
	Soundness Loss	Based on AASHTO TP 58	AASHTO T 104 AASHTO T 85
	Absorption	Testing results	
Aggregate for PCCP	Sampling	As specified	AASHTO T 2, 248
	Gradation	1 per 1,000 ton	AASHTO T 11, 27
	Sand Equivalent		AASHTO T 176
	Moisture Content	As needed to control operations	AASHTO T 255
Aggregates for Base Course	Sampling	As specified	AASHTO T 2, 248
	Moisture Content	1 per 1,000 ton	AASHTO T 255
	Density		AASHTO T 180
	Gradation		AASHTO T 11, 27
	Thickness		^b

^aFor gradations to control crushing operations, the Contractor may, at its own risk, modify AASHTO T 146 to improve the test result timelines. Modified method tests will not be considered in Acceptance determinations by the Project Manager.

^bTake measurements at a randomly selected location. Determine thickness by removing all of the in-place compacted Material, placing a straight edge tool (i.e. a survey lath) across the hole, measuring the thickness to the nearest 1/4 inch using a measuring tape, and then replacing and recompacting the removed material.

^cThis test will not be done for Base Course.

Table 901.7:4 Minimum Process Control Guidelines for Hot Mix Asphalt and Warm Mix Asphalt (QC)			
Item	Property	Testing frequency	Test method
HMA & WMA	Sampling	As specified	AASHTO T 168 / Agency Method AS-1
	Hydrated Lime or Anhydrite Based Material Content	Daily	Totalizing Weighing Device
	Flat/Elongated Particles	Daily	ASTM D 4791
	Fine Aggregate Angularity	Daily	AASHTO T 304
	Asphalt Content	1 per 1,000 ton ^c	AASHTO T 308
	Gradation		AASHTO T 30, 164, 308
	Air Voids		AASHTO T 166, 209, 269
	Voids in Mineral Aggregate (VMA)		AASHTO R 35
	Voids Filled with Asphalt (VFA)		AASHTO R 35
	Dust to Binder Ratio		AASHTO R 35
	Gyratory Tests		AASHTO T 312
	Thickness ^a		
	Mat Density, Cores ^b		AASHTO T 166, 209
	Density (Nuclear)	As needed to control operations	AASHTO T 310
	Temperature	As needed to control operations	—

^aTake measurement at a randomly selected location. Determine thickness by coring the in-place compacted Material and measuring the thickness to the nearest 1/4 inch using a measuring tape.

^bDensity calculation will use the daily average of Contractor and Department maximum specific gravity as validated by *F-test* and *T-test* in the daily calculation.

^cMinimum of one (1) test per Day and three (3) tests per subplot except for maximum specific gravity. Obtain a minimum of two (2) tests per Day for maximum specific gravity. If subplot size is reduced to 3,000 tons or less, perform testing at a rate of 1 per 1,000 tons with a minimum of one (1) per Day.

Table 901.7:5 Minimum Process Control Guidelines for Portland Cement Concrete Pavement (QC)			
Item	Property	Testing frequency	Test method
Fresh Concrete for PCCP	Unit Weight	1 per 125 yd ³	AASHTO T 121
	Air Entrainment	1 per 125 yd ³	AASHTO T 152
	Slump	1 per 125 yd ³	AASHTO T 119
	Compressive Strength	1 per 125 yd ³	AASHTO T 22, 23, 231
PCCP in Place	Thickness ^a	2 per 2,500 yd ^{2 b}	—
^a Complete corrective Work specified in Section 450.3.5.2, "Surfacing Smoothness Requirements," before determining pavement thickness			
^b Determine thickness by actual survey conducted before and after the construction of the PCCP at fixed, randomly selected locations.			

Table 901.7:6 Minimum Acceptance Guidelines (QA)					
Item	Property	Point of Acceptance	Sublot size	Lot size	Test method
Base Course	Sampling	As specified	—	—	AASHTO T 2, 248
	Gradation	Processed Windrow	1 per 2,000 ton	20,000 tons	AASHTO T 11, 27
	Thickness	After compaction			^c
	Density				AASHTO T 180, 238, 239
HMA & WMA	Sampling	As specified	—	—	AASHTO T 168
	Asphalt Content	Behind Laydown Machine, Before compaction	One tenth of the lot size, ^f	15,000 to 30,000 tons	AASHTO T 308
	Gyratory Tests				AASHTO T 312
	Gradation				AASHTO T 30, 308
	Air Voids				AASHTO T 166, 209, 269
	Voids in Mineral Aggregate (VMA)				AASHTO R 35
	Dust to Binder Ratio				AASHTO R 35
	Thickness	After compaction			^d
	Mat Density Cores ^a				AASHTO T 166, 209

Table 901.7:6 Minimum Acceptance Guidelines (QA)					
Item	Property	Point of Acceptance	Sublot size	Lot size	Test method
Fresh Concrete for PCCP	Air Content	Deliver to grade	1 per 500 yd ³	5,000 yd ³	AASHTO T 152
	Compressive Strength				AASHTO T 22, 23, 231
In-Place PCCP	Thickness ^b	—	2 per 10,000 yd ²	30,000 yd ²	^e
^a Density calculation will utilize daily average of Contractor and Department maximum specific gravity as validated by <i>F-test</i> and <i>T-test</i> . The Department will obtain a minimum of one (1) maximum specific gravity sample per Day. ^b Complete corrective Work specified in Section 450.3.5.2, “Surfacing Smoothness Requirements,” before determining pavement thickness ^c Take measurement at a randomly selected location. Determine the thickness by removing all of the in-place compacted Material, placing a straight edge tool (i.e. a survey lath) across the hole and measuring the thickness to the nearest 1/4 inch using a measuring tape. ^d Take measurements at a randomly selected location. At that location, the thickness shall be determined by coring the in-place compacted Material and measuring the thickness to the nearest 1/4 inch using a measuring tape. ^e Determine thickness by actual survey conducted before and after the construction of the PCCP at fixed, randomly selected locations. ^f A lesser sublot size for Acceptance purposes as determined by the Project Manager before production of material begins can be established.					

SECTION 106

CEMENT MORTAR AND GROUT

106.1 GENERAL

Cement mortar prepared under this specification shall consist of a mixture of cementitious materials, aggregate, and water.

106.2 REFERENCES

106.2.1 ASTM

C 5	C 207
C 91	C 266
C144	C 270

106.2.2 This publication

SECTION 101

106.3 DESIGNATIONS

106.3.1 The designation of cement mortar according to type listed in the following tabulation indicates the proportions of materials to be used in the preparation thereof; the proportions indicated are on a volume basis. The type of mortar to be used shall be as specified in Tables 106.3.1.1, 106.3.1.2, as shown on the plans, or as approved by the ENGINEER

106.3.2 Grout shall be Type M mortar, unless otherwise approved by the ENGINEER. Neat cement grout shall consist of cement mixed with water as necessary to obtain a fluid and workable mix.

106.4 CEMENT AND LIME

Cement to be used shall conform with the requirements in Section 101. Masonry cement shall conform to ASTM C 91. Quicklime shall conform to ASTM C 5. Hydrated lime shall conform to ASTM C 207.

106.5 AGGREGATES

Aggregates to be used shall conform with ASTM C 144.

106.6 WATER

Water shall be clean and free of deleterious amounts of acids, alkalis, or organic materials.

106.7 ADMIXTURES OR MORTAR COLORS

Admixtures or mortar colors shall not be added to the mortar at the time of mixing unless approved by

the ENGINEER and, after the materials are so added, the mortar shall conform to the requirements of this specification.

106.8 ANTIFREEZE COMPOUNDS

No antifreeze liquid, salts, or other substances shall be used in mortar to lower the freezing point.

106.9 MORTAR FOR REPAIRING SPALLED AREAS AND FOR NOSING GROUT.

Mortar shall have a fast setting Portland cement base, no metallic additives, and shall mix, place and finish similar to regular concrete. It shall develop minimum compressive strengths (psi) of 3200 @ 24 hr. and 4500 @ 7 days. The mortar shall meet the resistance to the action of freeze-thaw cycles as ascertained using the rapid method outlined in ASTM C-266 and shall show no excessive spalling after 300 cycles of rapid freezing and thawing in water.

106.10 MEASURING AND MIXING OF MATERIALS

106.10.1 The method of measuring materials for the mortar used in construction shall be such that the specified portions of the mortar materials can be controlled and accurately maintained.

106.10.2 All cementitious materials and aggregate shall be mixed for a least 3 minutes with the maximum amount of water to produce a workable consistency in a mechanical batch mixer.

106.10.3 Mortars that have stiffened because of evaporation of water from the mortar shall be retempered by adding water as frequently as needed to restore the required consistency. Mortars shall be used and placed in final position within 2 1/2 hours after initial mixing.

106.11 TESTS

The mortar shall be designed and the laboratory mix tested in accordance with ASTM C 270.

106.12 MEASUREMENT AND PAYMENT

106.12.1 Measurement and payment for mortar and grout used in repair of spalled areas and for joint nosing material in drainage channels shall be by the square foot and shall include all chipping, sawing, sandblasting, and materials and work required for the completion of the repair.

106.12.2 No separate measurement and payment will be made for mortar and grout in other applications unless designated by the ENGINEER.

106.12.3 Grout shall be Type M mortar, unless otherwise approved by the ENGINEER. Neat cement grout shall consist of cement mixed with water as necessary to obtain a fluid and workable mix.

106.14 CEMENT AND LIME

Cement to be used shall conform with the requirements in Section 101. Masonry cement shall conform to ASTM C 91. Quicklime shall conform to ASTM C 5. Hydrated lime shall conform to ASTM C 207.

106.15 AGGREGATES

Aggregates to be used shall conform with ASTM C 144.

106.16 WATER

Water shall be clean and free of deleterious amounts of acids, alkalis, or organic materials.

106.17 ADMIXTURES OR MORTAR COLORS

Admixtures or mortar colors shall not be added to the mortar at the time of mixing unless approved by the ENGINEER and, after the materials are so added, the mortar shall conform to the requirements of this specification.

106.18 ANTIFREEZE COMPOUNDS

No antifreeze liquid, salts, or other substances shall be used in mortar to lower the freezing point.

106.19 MORTAR FOR REPAIRING SPALLED AREAS AND FOR NOSING GROUT.

Mortar shall have a fast setting Portland cement base, no metallic additives, and shall mix, place and finish similar to regular concrete. It shall develop minimum compressive strengths (psi) of 3200 @ 24 hr. and 4500 @ 7 days. The mortar shall meet the resistance to the action of freeze-thaw cycles as ascertained using the rapid method outlined in ASTM C-266 and shall show no excessive spalling after 300 cycles of rapid freezing and thawing in water.

106.20 MEASURING AND MIXING OF MATERIALS

106.20.1 The method of measuring materials for the mortar used in construction shall be such that

the specified portions of the mortar materials can be controlled and accurately maintained.

106.20.2 All cementitious materials and aggregate shall be mixed for a least 3 minutes with the maximum amount of water to produce a workable consistency in a mechanical batch mixer.

106.20.3 Mortars that have stiffened because of evaporation of water from the mortar shall be retempered by adding water as frequently as needed to restore the required consistency. Mortars shall be used and placed in final position within 2 1/2 hours after initial mixing.

106.21 TESTS

The mortar shall be designed and the laboratory mix tested in accordance with ASTM C 270.

106.22 MEASUREMENT AND PAYMENT

106.22.1 Measurement and payment for mortar and grout used in repair of spalled areas and for joint nosing material in drainage channels shall be by the square foot and shall include all chipping, sawing, sandblasting, and materials and work required for the completion of the repair.

106.22.2 No separate measurement and payment will be made for mortar and grout in other applications unless designated by the ENGINEER.

TABLE 106.3.1.1
MORTAR TYPES

Mortar Type	Portland Cement	Masonry Cement	Hydrated Lime or Lime Putty	Aggregate, Measured In A Damp, Loose, Condition
M	1	1 (type II)	0	Not less than 2 1/4 and not more than 3 times the sum of the volumes of the cement and lime used.
M	1	0	1/4	
S	1/2	1 (type II)	0	
S	1	0	Over 1/4 to 1/2	
N	0	1 (type II)	0	
N	1	0	Over 1/2 to 1 1/4	
O	0	1 (type I or II)	0	
O	1	0	Over 1 1/4 to 2 1/2	
K	1	0	Over 2 1/2 to 4	

TABLE 106.3.1.2
MORTAR TYPE VS STRENGTH

<u>Mortar Type</u>	<u>Average Compressive Strength</u> <u>at 28 days. psi</u>
M	2,500
S	1,800
N	750
O	350
K	75

SECTION 121

PLASTIC PIPE

121.1 GENERAL: Plastic pipe for pressure and non-pressure uses shall be manufactured from polyvinyl chloride (PVC), high-density polyethylene (HDPE) or ultra-high molecular weight materials.

121.2 REFERENCES.

121.2.1 American Society for Testing and Materials (Latest Editions) (ASTM):

- D1248 Specification for Polyethylene Plastics Molding and Extrusion Materials
- D1598 Test Method for Time-to-Failure of Plastic Pipe Under Constant Internal Pressure
- D1599 Test Method for Short-Time Hydraulic Failure Pressure of Plastic Pipe, Tubing and Fittings
- D1601 Test Method for Dilute Solution Viscosity of Ethylene Polymers
- D1693 Test Method for Environmental Stress -Cracking of Ethylene Plastics
- D1784 Specifications for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds
- D2239 Specifications for Polyethylene (PE) Plastic Pipe(SIDR-PR) Based on Controlled Inside Diameter
- D2412 Test Method for Determination of External Loading Characteristics of Plastic Pipe by Parallel-Plate Loading
- D2657 Heat-Joining Polyolefin Pipe and Fittings
- D2737 Specification for Polyethylene (PE) Plastic Tubing
- D3034 Specification for type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings
- F477 Specification for Elastomeric Seals (Gaskets) for joining Plastic Pipe
- F679 Specification for Poly (Vinyl Chloride) (PVC) Large-Diameter Plastic Gravity Sewer Pipe and Fittings
- F794 Specification for Poly (Vinyl Chloride) (PVC) Large Diameter Ribbed Gravity Sewer Pipe and Fittings Based on Controlled Inside Diameter
- F894 Specification for Polyethylene (PE) Large Diameter Profile Wall Sewer and Drain Pipe

121.2.2 American Water Works Association (Latest Edition (AWWA):

- C900 AWWA Standards for Polyvinyl Chloride (PVC) Pressure Pipe, 4 in. through 12 in. for Water.
- C905 AWWA Standard for Polyvinyl Chloride (PVC) Water Transmission Pipe, Nominal Diameter 14 in through 36 in.
- C909 Molecular Oriented Polyvinyl Chloride (PVCO)

Pressure Pipe 4 in. through 12 in. for Water Distribution

121.2.3 THIS PUBLICATION:

SECTION 800 WATER TRANSMISSION, COLLECTOR DISTRIBUTION AND SERVICE LINES

SECTION 900 SANITARY AND STORM SEWER FACILITIES.

SECTION 1502 SUBMITTALS

121.3 CERTIFICATION: The CONTRACTOR shall submit certification from the manufacturer of the pipe as specified in Section 1502 as to the pipe material and that the pipe meets or exceeds the required testing. Only pipe manufactured in the United States of America will be acceptable.

121.4 GENERAL PLASTIC PIPE REQUIREMENTS

121.4.1 POSITIVE IDENTIFICATION: All plastic pipe shall be coded in accordance with the applicable material standard to eliminate future confusion and prevention accidental damage and service interruption of the facilities.

121.4.2 LINE LOCATOR: Metallic tape shall be used as a locator for all plastic pipe which is installed less than 10 feet deep. The tape should be installed 3 ft. to 6 ft. below top of ground and centered over the pipe. When feasible, the tape shall be fastened to metallic appurtenances associated with the installation (i.e. valves, fittings, manhole rings, etc.) in an effort to enhance its detectability.

121.4.3 PIPE STORAGE: All types of plastic pipe shall be stored in a manner that the pipe will not be deformed as recommended by the manufacturer. PVC or PVCO pipe is subject to potential degradation when exposed to prolonged periods of sunlight. Material degradation is generally indicated by a discoloration of the pipe. PVC or PVCO pipe shall be stored inside a building, under a cover or covered up totally. All discolored pipe shall not be installed and shall be immediately removed from the project.

121.4.4 JOINING SYSTEMS

121.4.4.1 All plastic pipe which is connected to a manhole, junction box, inlet or similar structure shall be installed with an approved manhole connection adapter

or water-stop such that each connection is leak-free and that there is no detrimental affect resulting from the material property characteristic differences between the plastic pipe and the structure.

121.4.4.2 Bell and Spigot Joints: Pipe with gasket joints shall be manufactured with a socket configuration, which 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 with the requirements of ASTM F 477. The spigot end of each joint of pipe shall be marked circumferentially to indicate the proper home mark. Pipe, which is field-cut, shall be chamfered and the home mark identified in accordance with the applicable criteria.

121.4.4.3 Heat-Welded Joints: HDPE pipe, which is manufactured without the standard bell and spigot joint configuration shall be joined by a heated fusion process in accordance with ASTM D 2657.

121.5 MATERIALS AND UTILIZATION.

121.5.1 Polyvinyl Chloride (PVC) and Molecular Oriented Polyvinyl Chloride (PVCO) Pressure Pipe:

121.5.1.1 The material in PVC and PVCO pipe shall be in accordance with ASTM D 1784. Also, the material in PVCO pipe shall be in accordance with Molecular Oriented and Polyvinyl Chloride.

121.5.1.2 Pipe shall be suitable for use in the conveyance of water for human consumption. The pipe shall be marked with two seals of the testing agency that certified the pipe material is suitable for potable water use.

121.5.1.3 PVC and PVCO pipe shall be approved by the Underwriters Laboratories (UL) and be furnished in cast iron pipe-equivalent outside diameters. Joints shall be push-on flexible elastomeric gasketed.

121.5.1.4 Pressure pipe shall have a minimum working pressure of 150 psi (DR 18) or as specified on the plans or in the Supplemental Technical Specifications.

121.5.1.5 Pipe lengths shall contain one bell-end or couple with an elastomeric gasket. Gasket shall meet the requirements of ASTM F 477. The bell shall be an integral part of the pipe length and have the same strength and DR as the pipe. The spigot pipe end shall be beveled.

121.5.1.6 PVC pressure pipe in sizes 4-inch through 12-inch shall meet the requirements of AWWA C 900. PVCO pressure pipe in sizes 4-inch through 12 inch shall meet the requirements of AWWA C 909.

121.5.1.7 PVC pressure pipe in sizes 14-inch through 24-inch shall meet the requirements of AWWA C 905.

121.5.2 Polyvinyl Chloride (PVC) Gravity Flow Pipe:

121.5.2.1 The material in PVC pipe shall be in accordance with ASTM D 1784.

121.5.2.2 PVC gravity flow pipe may be used for sanitary sewer and storm drainage applications for sizes 8-inch and greater, except for installation resulting in a depth of cover (to subgrade elevation) less than 3.1 feet or when the Contract documents specifically prohibit its use.

121.5.2.3 Lateral line connections shall be made at manholes or at factory manufactured saddles or tees only, unless specifically authorized by the ENGINEER.

121.5.2.4 PVC gravity flow pipe in sizes 8-inches through 15-inches shall meet the requirements of ASTM D 3034. Only solid wall pipe shall be used. Minimum wall classification shall be SDR 35.

121.5.2.5 PVC gravity flow pipe in sizes 18-inch and larger shall meet the requirements of ASTM F 679 or ASTM F 794. Minimum pipe stiffness shall be 46 psi.

121.5.2.5.1 Sewer service line connections to this pipe will not be permitted, unless specifically authorized in the plans and/or Supplemental Technical Specifications and/or by the ENGINEER.

121.5.3 Polyethylene (PE) Pipe:

121.5.3.1 The material in PE pipe shall be in accordance with ASTM D 1248.

121.5.3.2 High Density Polyethylene (HDPE) Profile Wall Gravity Flow Pipe:

121.5.3.2.1 High-density polyethylene (HDPE), large diameter, profile wall, gravity flow pipe shall meet all general requirements for plastic pipe and shall conform to requirements in ASTM F 894 for diameters of 30-inch and larger.

121.5.3.2.2 Minimum wall thickness in pipe waterway shall be RSC 63. When using ASTM D 2412 for determining the strength value of pipe, the E' number (E = modulus of soil reaction) shall not exceed 1500 psi. The pipe manufacturer shall provide certification to the CONTRACTOR and ENGINEER that the class of pipe used is adequate for the specific pipe laying conditions, including, but not limited to, depth of bury, soil characteristics and groundwater conditions.

121.5.3.2.3 Sewer service line connections to this pipe will not be permitted, unless specifically authorized in the

plans and/or Supplemental Technical Specifications and/or by the ENGINEER.

121.5.3.2.4 Lateral line connections shall be made at manholes or at factory manufactured tees or saddles only, unless specifically authorized by the Engineer.

121.5.3.3 All water service lines shall be copper per these specifications.

121.6 MEASUREMENT AND PAYMENT: Plastic pipe used for both pressure and gravity flow shall be measured and paid for at the contract unit pipe as specified in Section 800 and 900 and/or as defined in the Bid Proposal.

SECTION 701

TRENCHING, EXCAVATION AND BACKFILL

701.1 GENERAL

Trench excavation and backfill for underground utilities, sanitary sewer, storm sewer, water lines, and appurtenances shall conform to these specifications or as specified in the Supplemental Technical Specifications or as authorized, in writing, by the ENGINEER.

701.2 REFERENCES

701.2.1 ASTM:

701.2.2 This Publication:

- Section 207
- Section 301
- Section 302
- Section 336
- Section 337
- Section 340

701.3 TERMINOLOGY

701.3.1 For the purpose of these specifications in this Section, the descriptive terms "flexible," "plastic" and "non-rigid" are similarly interchangeable as utilized in these specifications and appurtenant reference material.

701.3.2 Rigid pipe: shall be reinforced concrete, concrete cylinder, and vitrified clay pipes.

701.3.3 Flexible pipe shall be polyvinyl chloride, polyethylene, ductile iron, and corrugated metal pipes.

701.3.4 Standard Detail Drawings show the trench cross-sections which identify the meaning and limits of terminology used in these specifications for the terms "foundation, bedding, haunching, initial backfill, final backfill, embedment, pipe zone, cover, springline, and pipe width."

701.3.5 The Unified Soil Classification System in ASTM D2487 Shall be utilized for the purpose of

material classifications. See Table 701.3.A for a listing of referenced soil classes.

701.4 NOTIFICATION OF FORTHCOMING WORK

701.4.1 To assure that the construction work progresses in a timely manner and that good public relations are maintained with the property owners, the following actions are considered essential:

701.4.1.1 Prior to the start of construction the CONTRACTOR shall assist the ENGINEER in notifying the adjacent property owners as to when construction will start, the estimated completion date, anticipated access blockages.

D-422	D-698
D-1557	D-2321
D-2487	D-2922
D-3017	D-4318

TABLE 701.3.A
EMBEDMENT SOILS CLASSIFICATIONS

SOILS CLASS	SOIL TYPE	DESCRIPTION
CLASS I SOILS*		Manufactured angular, granular material, ¼ to 1-1/2 inches (6 to 40 mm) size, including materials having regional significance such as crushed stone or rock, broken coral, crushed slag, cinders, or crushed shells, complying to the requirements of Class II soils.
CLASS II SOILS**	GW	Well-graded gravels and gravel-sand mixtures, little or no fines. 50% or more of coarse fraction retained on No. 4 sieve. More than 95% retained on No. 200 sieve. Clean.
CLASS II SOILS**	GP	Poorly graded gravels and gravel-sand mixtures, little or no fines. 50% or more of coarse fraction retained on No. 4 sieve. More than 95% retained on No. 200 sieve. Clean.
CLASS II SOILS**	SW	Well-graded sands and gravelly sands, little or no fines. More than 50% of coarse fraction passes No. 4 sieve. More than 95% retained on No. 200 sieve. Clean.
CLASS II SOILS**	SP	Poorly graded sands and gravelly sands, little or no fines. More than 50% of coarse fraction passes No. 4 sieve. More than 95% retained on No. 200 sieve. Clean.
CLASS III SOILS***	GM	Silty gravels, gravel-sand-silt mixtures. 50% or more of coarse fraction retained on No. 4 sieve. More than 50% retained on No. 200 sieve.
CLASS III SOILS***	GC	Clayey gravels, gravel-sand-clay mixtures. 50% or more of coarse fraction retained on No. 4 sieve. More than 50% retained on No. 200 sieve.
CLASS III SOILS***	SM	Silty sands, sand-silt mixtures. More than 50% of coarse fraction passes No. 4 sieve. More than 50% retained on No. 200 sieve.
CLASS III SOILS***	SC	Clayey sands, sand-clay mixtures. More than 50% of coarse fraction passes No. 4 sieve. More than 50% retained on No. 200 sieve.
CLASS IV SOILS	ML	Inorganic silts, very fine sands, rock flour, silty or clayey fine sands. Liquid limit 50% or less. 50% or more passes No. 200 sieve.
CLASS IV SOILS	CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays, Liquid limit 50% or less. 50% or more passes No. 200 sieve.
CLASS IV SOILS	MH	Inorganic silts, micaceous or diatomaceous fine sands or silts, elastic silts. Liquid limit greater than 50%. 50% or more passes No. 200 sieve.
CLASS IV SOILS	CH	Inorganic clays of high plasticity, fat clays. Liquid limit greater than 50%. 50% or more passes No. 200 sieve.
CLASS V SOILS	OL	Organic silts and organic silty clays or low plasticity. Liquid limit 50% or less. 50% or more passes No. 200 sieve.
CLASS V SOILS	OH	Organic clays of medium to high plasticity. Liquid limit greater than 50%. 50% or more passes No. 200 sieve.
CLASS V SOILS	PT	Peat, muck and other highly organic soils.

SECTION 801

INSTALLATION OF WATER TRANSMISSION, COLLECTOR AND DISTRIBUTION LINES

801.1 GENERAL

The water facilities and materials, specified herein, are associated with water transmission, collector and distribution lines.

801.2 REFERENCES

801.2.1 American Water Works Association
(Latest Edition) (AWWA):

C110 American National Standard for Ductile-Iron and Gray-Iron Fittings, 3 in. through 48 in., for Water and Other Liquids

C203 Coal-Tar Protective Coatings and Linings for Steel Water Pipelines -Enamel and Tape-Hot-Applied

C206 Field Welding of Steel Water Pipe

C207 Steel Pipe Flanges for Waterworks Service-Sizes 4 in. through 144 in.

C502 Dry Barrel Fire Hydrants

C504 Rubber-Seated Butterfly Valves

C509 Resilient-Seated Gate Valves for Water and Sewerage Systems

C600 Installation of Ductile-Iron Water Mains and Their Appurtenances

C651 Disinfecting Water Mains

C900 Polyvinyl Chloride (PVC) Pressure Pipe, 4 in. Through 12 in., for Water Distribution

C905 Polyvinyl Chloride (PVC) Water Transmission Pipe Nominal Diameter 14 in. through 36 in.

C909 Molecular Oriented Polyvinyl Chloride (PVCO), Pressure Pipe 4" - 12" for water distribution.

M9 Concrete Pressure Pipe

M23 PVC Pipe-Design and Installation

801.2.2 This Publication:

SECTION 121 PLASTIC PIPE

SECTION 127 STEEL WATER PIPE

SECTION 128 CONCRETE CYLINDER PIPE

SECTION 129 DUCTILE IRON PIPE

SECTION 130 GRAY IRON AND DUCTILE IRON FITTINGS

SECTION 340 PORTLAND CEMENT CONCRETE CURBS, GUTTERS, WALKS, DRIVEWAYS, ALLEY INTERSECTIONS, SLOPE PAVING, AND MEDIAN PAVING

SECTION 343 REMOVAL AND DISPOSAL OF EXISTING PAVEMENT, CURBS, GUTTERS, SIDEWALKS & DRIVEPADS

SECTION 701 TRENCHING, EXCAVATION AND

BACKFILL

SECTION 1502 SUBMITTALS

801.3 MATERIALS:

801.3.1 GENERAL:

801.3.1.1 The CONTRACTOR shall submit certification from the manufacturer of the pipe as specified in Section 1502 as to the pipe material and that the pipe meets or exceeds the required testing. Only pipe manufactured in the United States of America will be acceptable.

801.3.1.2 Main line pipe and fittings shall be as specified in the Reference Section in this publication as listed above or as specified in the Supplemental Technical Specifications and/or as authorized by the ENGINEER.

801.3.2 PIPE:

801.3.2.2 Limitations of pipe materials versus pipe sizes will be as follows, unless otherwise specified on the plans or Supplemental Technical Specifications:

<u>Pipe Type</u>	<u>Sizes</u>
Ductile Iron	3" thru 64"
Concrete Cylinder(AWWA C303)	16" and larger
Plastic (PVC)	4" thru 20"
Welded Steel Pipe (AWWA 200)	16" and larger

801.3.2.3 The type of pipe used shall be approved by the ENGINEER. Steel pipe will be used only where specified on the drawings. All pipe shall be of domestic manufacture and origin. Unless otherwise approved by the ENGINEER, all pipe installed shall be identical from valve to valve.

801.3.3 GATE VALVES:

801.3.3.1 Gate valves shall only be used for pipe sizes of 12 inches and smaller, unless otherwise noted on the plans or in the Supplemental Technical Specifications.

801.3.3.2 Resilient seat gate valve shall be used and shall conform to AWWA C 509. The gate valve shall be a non-rising stem type with inside screw and "O" ring seals. The valve shall have a standard hub which opens counter-clockwise. Type valve ends shall be mechanical joints, unless otherwise specified on the plans. "O" ring retainer shall be

secured with nuts and bolts.

801.3.3.3 The resilient seat shall be mechanically retained or bonded on the valve gate (wedge disc).

801.3.3.4 All brass or bronze parts used on gate valves shall comply with AWWA C 509.

801.3.3.5 The outside of the valve body shall be painted with coal tar enamel or corrosion-resistant coating. The inside shall be protected with corrosion resistant coating, approved for potable water.

801.3.3.6 The valve stem shall comply with AWWA C 509. The material for the valve stem shall be brass or bronze, and shall have a minimum yield strength of 20,000 psi and minimum tensile strength of 60,000 psi.

801.3.3.7 Gate valves shall have a 2 inch square operating hub nut. Gate valves in vaults with valve covers at ground level shall have a handwheel with the 2" nut welded to the center.

801.3.3.8 Maximum input torque to open and/or close the valve shall be 200 foot pounds for a 4-inch valve and 300 foot pounds for 6-inch under a working pressure of 200 psi.

801.3.3.9 No Project will be accepted by the OWNER until all valves are operational and accessible.

801.3.3.10 Before the Work will be accepted, the CONTRACTOR shall provide the ENGINEER with a completed "Water Valve Data Card", as shown on Pages 801-5 and 801-6. The ENGINEER shall forward the card to OWNER.

801.3.4 RUBBER SEATED BUTTERFLY VALVES:

801.3.4.1 Butterfly valves will be used for sizes of 14 inches and larger, and shall comply to AWWA C 504.

801.3.4.2 Only short body, Class 150B valves are acceptable. Wafer type valves are not acceptable. Valve ends may be either mechanical joint or flanged.

801.3.4.3 The rubber seat shall be field replaceable on valve sizes 24 inches and larger. The rubber seat may be mechanically retained or bonded on the disc or valve body.

801.3.4.4 Butterfly valves shall have a 3 inch square operating hub nut. Butterfly valves in vaults with valve covers at ground level shall have a handwheel with the 3" nut welded to the center.

801.3.4.5 The valve shaft and disc shall be installed horizontally. The valve disc shall pivot and rotate on the horizontal axis.

801.3.4.6 The maximum input torque to open and/or close the valve shall not exceed 150 foot pounds under a minimum working pressure of 150 psi, and the butterfly operator shall be compatible with this pressure. Maximum operating torques shall be in accordance with AWWA C 504, Table 1, Class 150B. The manufacturer of the valve shall be responsible for the operator.

801.3.4.7 No project will be accepted by the OWNER until all valves are operational and accessible.

801.3.4.8 Before the Work will be accepted, the CONTRACTOR shall provide the ENGINEER with a completed "Water Valve Data Card," as shown on pages 801-5 and 801-6. The ENGINEER shall forward the card to the OWNER.

801.3.5 VALVE BOXES: Valve boxes shall consist of Polyvinyl Chloride (PVC) C-900, or High Density Polyethylene Pipe, (HDPE), with corrugated exterior and smooth interior pipe cut to accommodate the required depth. No joints shall be allowed. Pipe diameter shall be 10 inches for valves in paved areas to accommodate the cover and lid specified here-in. The pipe shall be centered and placed true to vertical around the axis of the operating nut. Valve covers and lids for re-use water shall be different than those used for potable water, and shall be as shown on re-use project construction plans.

801.3.6 COMBINATION AIR AND VACUUM VALVES: Air and vacuum valves shall be the type and size shown on the plans.

801.3.7 FIRE HYDRANTS:

801.3.7.1 Fire hydrants and their extensions shall be in accordance with AWWA C 502, traffic type. Fire hydrants shall have one 5 1/4 inch diameter valve opening; 6 inch mechanical joint inlet connection; two 2 1/2 inch hose nozzle connections; and one 4 1/2 inch steamer nozzle with National Standard Fire Hose Coupling Screw Threads. Fire hydrants shall have a bronze or cast iron, pentagon, operating nut, be designed for 150 psi. working pressure service, and have a normal bury of 4 to 4 1/2 feet unless field conditions require a deeper bury, in which case extensions will be used so as to bring the bottom of the break-off flange 2 to 8 inches above the top of finish grade.

801.3.7.2 The pipe fittings and fire hydrants starting at the street main and ending at the fire hydrant itself shall be lying in a line perpendicular to the street's centerline or radially on a curvilinear installation. Fire hydrants shall have no more than 1/2 inch variation from a vertical line between the breakaway flange and the top of the fire hydrant.

801.3.7.4 Hydrants shall be dry barrel, post-type with compression main valve closing with pressure. They shall have a field lubrication capability. Hydrants shall have a bronze seat ring threaded into a bronze drain ring or bronze or cast iron bushing.

801.3.7.5 Exterior of hydrant, below the ground line, shall be coated with asphalt varnish, and the exterior painted from the top to a point one foot below the ground level flange, consisting of one coat rust inhibitive primer and one coat "chrome yellow" enamel. The bonnet shall then be painted with a reflectorized paint using a color as close to "chrome-yellow" as possible.

801.3.7.6 The bottom plate of the main valve shall be epoxy coated. The shoe of the fire hydrant shall have a 6-inch mechanical joint connection and the inside shall be epoxy coated to prevent corrosion. The nozzle shall be threaded in place and retained by stainless steel locks. Hydrant body shall be threaded to receive the threaded nozzle. Nozzle shall be secured by a stainless steel locking device.

801.3.7.7 Fire hydrant shall contain two drain outlets. The drain outlets shall be constructed of bronze. Hydrant shall be provided with a pentagon operating nut to open counter clockwise and shall have an anti-friction washer between the hold-down nut and the operating nut.

801.3.7.8 To prevent loss of brass operating nuts due to theft or vandalism, the following shall be included in or on the fire hydrant:

801.3.7.8.1 Attach OWNER approved anti-theft device to the hydrant; or

801.3.7.8.2 The bonnet must be removed in order to remove the operating nut; or

801.3.7.8.3 Use a cast iron operating nut.

801.3.7.9 Fire hydrants shall be installed at locations as shown on construction plans and in accordance with Standard Detail Drawings.

801.3.7.10 Fire hydrants shall be properly restrained in accordance with Section 130. If mechanical restraint is used, each joint on the hydrant leg shall also be restrained.

801.3.8 PRESSURE REDUCING VALVE (PRV): Pressure reducing valve shall be a globe pattern, flanged end, pressure Class 125. Submittals for approval shall be made to the ENGINEER and approval must be received before installation. The following items are required in the PRV:

801.3.8.1 Materials:

801.3.8.1.1 Main valve-cast iron with brass trim.

801.3.8.2 Pilot Control System:

801.3.8.2.1 Adjustment from 15 psi to 75 psi.

801.3.8.2.2 Shut-off cock on all pilot control system lines.

801.3.8.2.3 Inlet flow strainer.

801.3.8.2.4 Closing speed control.

801.3.8.2.5 Opening speed control.

801.3.8.2.6 Flow stabilizer.

801.3.8.2.7 Tubing shall be copper.

801.3.8.3 Installation shall be as per the construction plans. ENGINEER shall determine final settings on PRV.

801.3.8.4 Before the Work will be accepted, the CONTRACTOR shall provide the ENGINEER with a "Water Valve Data Card". The ENGINEER will forward the card to the OWNER.

801.3.9 TAPPING SLEEVES: (For other than Concrete Cylinder Pipe) For either taps greater than 2/3 line size, or size on size taps 12 inches or less, only approved, long body, fully gasketed tapping sleeves shall be allowed. During installation of the tapping sleeve, the pipe shall be fully supported to support the weight of the tapping sleeve and tapping machine.

801.3.9.1 Tapping sleeves of heavy welded steel bodies shall meet the following requirements:

801.3.9.1.1 Epoxy coated.

801.3.9.1.2 Bolts and nuts to be stainless steel.

801.3.9.1.3 Gaskets to be Buna-N rubber.

801.3.9.1.4 Flange to be flat face steel and comply with AWWA C-207.

801.3.9.1.5 Class D-ANSI 150 lbs. drilling.

801.3.9.1.6 Designed to sustain an operating pressure of 150 psi.

801.3.9.1.7 May be used on all water mains, 4" and larger.

801.3.9.2 Tapping sleeves of cast iron bodies shall meet the following requirements:

801.3.9.2.1 Mechanical joint type with a working pressure of 200 psi .

801.3.9.2.2 Outlet flange to be Class 125, ANSI B16.1.

801.3.9.2.3 Sleeves to include side and end gaskets of Buna-N rubber.

801.3.9.2.4 Eight high strength steel bolts and nuts to secure the halves of the sleeve to the pipe.

801.3.9.2.5 May be used on all water mains, 4" and larger.

801.3.9.3 Tapping sleeves of short sleeve cast iron shall meet the following requirements:

801.3.9.3.1 Working pressure of 150 psi.

801.3.9.3.2 Outlet flange to be Class 125, ANSI B16.1.

801.3.9.3.3 Outlet half to have an enclosed gasket in a groove for a pressure seal.

801.3.9.3.4 Four high strength steel bolts to secure halves of tapping sleeve to the pipe.

801.3.9.3.5 May be used on all water mains, 4" and larger.

801.4 WATER VALVE DATA CARD: Water Valve Data Card, as shown on pages 801-5 and 801-6 shall be prepared for all types of valves (Gate Valves, Butterfly Valves, Pressure Reducing Valves, Air Release Valves, etc.) according to the following instructions.

801.4.1 A Water Valve Data Card will be prepared for each valve installed.

801.4.2 The Valve Number will be assigned by the OWNER at a later date.

801.4.3 Valve Size is the nominal diameter of the valve, i.e., 6-inch, 14-inch or 48-inch. In the case of

compound valves give size of main valve and bypass valve, i.e., 24-inch and 4-inch, or 36-inch and 6-inch.

801.4.4 Valve Type is the general description of the valve, such as: Resilient-Seal Gate Valve, Butterfly Valve, Globe Valve, Check Valve, etc.

801.4.5 Make and Model refers to the manufacturer, make and model number to identify the valve for replacement parts. This information should be available from the shop drawings.

801.4.6 Number of Turns and Direction to Open is the number of revolutions of the operating nut to make the valve travel from fully closed to fully open, and the direction is either clockwise or counterclockwise, i.e., 54 turns counterclockwise. All standard valves shall open counterclockwise. Operation, turn count, and direction to open will be verified by the ENGINEER prior to installation.

801.4.7 Under Project Name is the assigned work order number.

801.4.8 Date Warranty Expires is the expiration date, under the contract, for requiring warranty repairs.

801.4.9 Street Location: Give both Block number and street name. For valves in intersections give both streets, i.e., 5200 San Mateo Blvd. NE and 3000 Candelaria NE.

801.4.10 The section on coordinate location shall be completed with information furnished by the ENGINEER.

801.4.11 All applicable items on the "Water Valve Data Card" should be filled in. However, accuracy is more unknown and cannot be determined, leave the space blank.


801.4.12 Depth to "Operator" is vertical distance from the top of actual valve operating nut to top of valve box cover.

801.5 FIRE HYDRANT DATA CARD
Fire Hydrant Data Card, as shown on page 801-8 shall be prepared for all installations of fire hydrants, according to the following instructions.

MAP NO.	VALVE NO.	SIZE	TYPE <input type="checkbox"/> -B.F.V. <input type="checkbox"/> -B.V. <input type="checkbox"/> -R.S.G.V.	MAKE	MODEL	PROJECT	EMD -YES <input type="checkbox"/> -NO <input type="checkbox"/>
CHECKED							
DATE							
CREW							
<p>"CHECKED" CODE:</p> <div style="display: flex; justify-content: space-between;"> O - OK L - LOST E - EXTENSION NEEDED C - NEEDS CLEANING </div> <div style="display: flex; justify-content: space-between;"> B - BROKEN M - LID MISSING R - RAISE TO GRADE </div>							
WARRANTY EXPIRES _____				DEPTH TO OPER. _____			
				LOCATION _____			
CONTRACTOR _____				EXTENSION LENGTH _____			
				SKETCH EXACT LOCATION BELOW			

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CARD NO. 801.4
WATER VALVE DATA CARD
(Reverse Side)

 <p>INDICATE NORTH BY ARROW</p>		REFERENCE SYMBOLS
		<p>- SUBJECT VALVE</p> <p>- OTHER VALVE (S)</p> <p>- PRESSURE REDUCING VALVE</p> <p>- AIR RELIEF VALVE</p> <p>- FIRE HYDRANT</p> <p>- LINE VALVE IS FOR</p> <p>- OTHER WATER LINES</p>
<p>COORDINATES OF LID</p> <p>X -</p> <p>Y -</p> <p>Z -</p>		

801.5.1 Fire hydrant number will be assigned by the OWNER at a later date.

801.5.2 Fire hydrant type refers to the manufacturer's make and model.

801.5.3 Location. Indicate both block number and street name. At intersections indicate both street names.

801.5.4 Date installed. Indicate actual date the hydrant was installed.

801.5.5 Depth. Indicate the actual depth in feet of the lower barrel of the fire hydrant. This depth is measured from the shoe to the break-away flanges of the hydrant.

801.5.6 On the reverse side of the card indicate the location of fire hydrant on the sketch.

801.6 WATER LINE CONNECTIONS

801.6.1 GENERAL : All new water line tie-ins to the existing water system shall be directly inspected and approved by the ENGINEER. This includes non-pressurized or pressurized connections that will result in extension of the existing system.

801.7 LOCATIONS OF WATER MAINS AND SEWER LINES

801.7.1 Unless otherwise authorized by the ENGINEER, parallel water and sewer lines shall be installed at least 10 feet apart horizontally, and the water line shall be at a higher elevation than the sewer. 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 18 inches above the sewer; when water and sewer lines cross each other, the water line shall be at least 18 inches above the sewer; otherwise the sewer shall be of pressure class pipe extending between manholes, or concrete encased for 10 feet on each side of the water line as shown in the Standard Detail Drawings. The crossings shall be arranged so that the sewer joints will be equidistant and as far as possible from the water main joints.

801.7.2 Water mains shall not be constructed under walkways, sidewalks, curbs and gutters, driveways, or similar concrete structures by tunneling underneath them. Trenchless technologies may be allowed with prior approval by the OWNER. The CONTRACTOR will cut these structures by using a concrete saw or, at his option, he may remove and replace the section of the concrete

structure to the nearest full expansion joint or edge.

801.8 TRENCHING AND BACKFILLING

801.8.1 All trenching and backfilling shall be in full accordance with Section 701. The minimum cover over distribution lines shall be 3 feet, and 4 feet of cover over transmission and collector lines.

801.9 GENERAL INSTALLATION ITEMS

801.9.1 Trenching, bedding, and backfilling shall comply with the requirements set forth in Section 701.

801.9.2 Pipe and accessories shall be new and unused and shall be handled in such a manner as to insure delivery to the trench in sound, undamaged condition. Particular care shall be taken not to injure the pipe coating. No other pipe or material of any kind shall be placed inside of a pipe or fitting after the coating has been applied.

801.9.3 The interior of the pipe shall be thoroughly cleaned of foreign matter before being lowered into the trench and shall be kept clean during operations by plugging or other approved methods. When work is not in progress, open ends of pipes and fittings shall be securely closed so that no other substances will enter the pipes or fittings. Any section of the pipe found to be defective before or after laying shall be replaced with sound pipe without additional expense to the OWNER.

801.9.4 All nuts and bolts utilized in underground pipe connections shall be stainless steel, high strength cast iron or high grade, high strength steel. 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 relaid. Pipes shall not be laid in water or when trench or weather conditions are unsuitable for the work except by as authorized by the ENGINEER. All unconnected ends of pipes shall have a valve, plug, or cap installed on it.

801.9.5 Pipe shall be laid to line and/or grade shown on the plans or as staked in the field. Changes in horizontal or vertical alignment of the pipe at a joint shall not exceed the manufacturer's recommended deflection for the type and size pipe being laid. When the change required is more than the recommended deflection, a fitting or several short joints of pipe shall be used. PVC pipe may not be deflected at the joints.

CARD NO. 801.5
FIRE HYDRANT DATA CARD

FIRE HYDRANT NUMBER														
INSP.														
REP.														
CREW														
DATE														

TYPE

LOCATION

DATE INSTALLED

VALVES TO CLOSE FOR REPAIRS

DEPTH

REMARKS

FRONT SIDE

REVERSE SIDE

801.9.6 When new pipe is to be connected to an existing pipe or when crossing an existing pipe line, the CONTRACTOR shall excavate the existing lines well in advance of the laying of the new pipe line to enable the ENGINEER to verify their elevation and placement and to make any changes in grade and/or alignment of the new pipe line that may be required.

801.9.7 On all push-on-joints (bell and spigot, fluid-tite, and ring-tite) the rubber gasket shall be removed, cleaned, the groove cleaned, the gasket replaced, and the bell or plain end cleaned before jointing. The gasket and the bell or plain end of the pipe to be jointed shall both be lubricated with a suitable soft vegetable soap compound to facilitate jointing. Care shall be taken to insure that neither the bell or collar, or the pipe being jointed is damaged as it is being pushed home.

801.9.8 Flanged and mechanical joints shall be made with machine bolts and nuts of the proper size only. All components of these types of joints shall be cleaned before jointing. Only one (1) gasket will be permitted in a flange joint. In a mechanical joint the plain end pipe shall be fully seated before the gasket and gland is slipped up to the bell. Nuts on both types of joints shall be tightened by alternating nuts 180 degrees apart. The CONTRACTOR shall be responsible for assuring that proper torque is achieved and shall have a torque wrench available for verification by the ENGINEER.

801.9.9 When laying PVC pipe, a metalized detectable warning tape shall be installed a minimum of 1 foot above the top of pipe and 3 to 6 feet below the final surface. The tape shall be detectable with a standard metal pipe locator. The color of tape shall be safety precaution blue and will be inscribed at 10-foot intervals with the words, "CAUTION BURIED WATER LINE BELOW." Tape shall be 2 inches wide. The tape shall be constructed of material that is impervious to alkalis, acids, chemical reagents, and solvents found in the soils.

801.9.10 When laying pipe, Electronic Marker Disks (EMDs) shall be installed in accordance with Section 170.

801.10 SPECIFIC PIPE LAYING REQUIREMENTS

801.10.1 Ductile iron pipe shall be installed in accordance with AWWA C 600 and as herein specified.

801.10.2 Steel pipe shall be installed in accordance with AWWA C 206 for welded joint and as herein specified. All field welded joints shall have one coat of coal-tar enamel of 3/32 inch thickness.

801.10.3 Plastic pressure pipe shall be installed in accordance with AWWA M 23 and C 900 and/or manufacturer's printed recommendations, whichever is applicable. Where a conflict arises with this Specification, this Specification shall control. Trenching, embedment and backfill shall be specified in Section 701. A reference mark (a distinct circumferential line) is placed on the pipes spigot by the manufacturer to indicate the correct depth of the spigot penetration into the pipes gasket joint. If the pipe is seated too deep or too shallow, the pipe may buckle or separate due to thermal expansion/contraction, therefore particular attention must be exercised when jointing pipe. The reference mark must be showing and not farther than 1/2" from the leading edge of the bell. The CONTRACTOR shall verify that the manufacturer's reference mark is correct per manufacturer's literature.

801.10.4 All welded steel and concrete cylinder pipe shall have two small bond wires of low resistance, or other approved method, welded across the joint to make the joint electrically continuous. Where rigid joints are specified they shall be provided as specified herein. The outside joint recess shall be completely filled with a rich low shrinkage cement grout. The concrete surface in contact with the joint mortar shall be moistened with water just prior to pouring the joint recess. The mortar shall be poured into the joint recess against a waterproof paper or cloth diaper laid around and lapping the outside field joint. The diaper shall completely and snugly enclose the joint recess, being held in place by metal box strapping or wire. The mortar shall be poured into an opening slightly to one side on the top of the pipe and rodded by a flexible wire rod into place until it appears on the opposite side completely. After the joint recess has been filled with mortar, adjoining pipe sections shall not be disturbed. After the joint has been made, the concrete lining surfaces of the joint shall be moistened and the interior recess tightly jointed and troweled flush and smooth with the inside pipe surface. Grout for painting the interior joints shall be of a stiff consistency and shall have low shrinkage characteristics. In sizes of pipe smaller than 24", the mortar shall be buttered all around the shoulder inside the bell before the spigot is entered. A backing-up tool, such as an inflated rubber ball wrapped with burlap, shall be pulled through the joint to compact the mortar, completely fill the inside annular space and wipe off the excess mortar. Each joint will be inspected by the ENGINEER for proper and complete closure prior to final acceptance. Flanges shall be protected by "cocoon" type protection coating of coal-tar and felt in accordance with AWWA C 203. When moving individual pipe sections, the pipe shall be lifted using two web or belt type slings which support the pipe between the third and outside quarter points.

801.10.5 All fittings and valves shall be installed as per the type of joint as stated herein and/or as shown on the plans.

801.10.6 All couplings, clamps, sleeves, etc shall be installed as per the manufacturer's printed recommendations and as approved by the ENGINEER. The CONTRACTOR shall properly restrain all appurtenances as necessary.

801.10.7 All waterlines installed as part of a re-use system or other non-potable use shall be purple in color or shall be encased in purple PVC wrap.

801.11 CUTTING: The cutting of any type of pipe shall be done as per the manufacturer's printed recommendations, as approved by the ENGINEER. Care shall be taken in cutting any pipe that has an internal and/or external lining or coating.

801.12 BLOCKING AND RESTRAINED JOINTS

801.12.1 All restrained joints shall be by mechanical means unless directed or approved otherwise by the ENGINEER.

801.12.2 All tees, bends shall be restrained by mechanical means. Valves in runs need not be restrained, except that butterfly valves shall be flanged. Where rigid joints are called for on concrete cylinder pipe, the joints shall be flanged or field welded bell and spigot joints in accordance with the manufacturer's recommendation.

801.12.3 All caps and plugs on dead end lines will be mechanically restrained when feasible. Blocking may also be required when adequate restrain length is not available.

801.12.4 Where restrained joints on ductile iron pipe, or PVC pipe are called for on the plan, the mechanical restraining system employed shall conform to the recommendations of the pipe manufacturer. The restrained joint will be subject to the hydrostatic test specified herein.

801.13 RESTRAINING JOINTS FOR WELDED STEEL AND CONCRETE CYLINDER PIPE

801.13.1 Restrained joints in welded steel and concrete cylinder pipe for thrust restraint shall be produced by continuous welding the pipe joints and as shown on the plans.

801.13.2 Unless otherwise stated in the supplemental specifications the working pressure (operating plus transient) shall be 150 psi. The value for weight of overburden and the coefficient of friction

shall be stated in the supplemental specifications.

801.14 TAPS INTO EXISTING CONCRETE CYLINDER PIPE

801.14.1 OBJECTIVE: The intent of this Subsection is to establish procedural and design criteria for making taps into existing concrete cylinder pipe for water distribution line extensions, and will be applicable to 4-inch and larger size water taps.

801.14.2 NEW WATER LINES: No non-factory taps will be allowed on newly-installed concrete cylinder pipes.

801.14.3 EXISTING WATER LINES:

801.14.3.1 Taps to existing concrete cylinder pipe must be approved in writing by the OWNER. The requester shall provide the following information:

801.14.3.1.1 Justification for the tap,

801.14.3.1.2 Project name and number, if applicable,

801.14.3.1.3 Date tap required,

801.14.3.1.4 Name of the CONTRACTOR who will be making the tap.

801.14.3.2 The CONTRACTOR shall coordinate the work with the OWNER before commencing work. The OWNER shall inspect and approve the entire installation of the tap.

801.14.4 INSTALLATION OF FIELD TAP:

801.14.4.1 Installation of field taps on concrete cylinder pipe shall be no smaller than 4 in. and no larger than 2/3 diameter of pipe to be tapped. No "weld neck" or weld on outlets will be used.

801.14.4.2 For field taps larger than 2/3 of pipe diameter, a tee will be inserted into the line.

801.14.4.3 For field taps greater than 4 in. and less than 2/3 diameter of pipe to be tapped an approved tapping saddle will be used. Tapping saddles shall be approved by the ENGINEER

801.15 SALVAGED MATERIALS

All salvaged materials (pipe, fittings, valves and other water line appurtenances) shall be stockpiled on-site in a neat manner by the CONTRACTOR. The ENGINEER and a representative of OWNER will inspect the stockpiled materials for salvage fitness and direct the following disposition:

801.15.1 If the material is considered salvageable, the CONTRACTOR will be directed to deliver the material to the OWNER. The CONTRACTOR will be responsible for the loading, transportation and off-loading of the salvageable materials. When the materials are delivered, the CONTRACTOR shall obtain a signed receipt from the OWNER. Before final acceptance of the project, all signed receipts will be submitted to the ENGINEER for accounting purposes.

801.15.2 Materials that do not have salvageable value will be disposed of by the CONTRACTOR at no additional cost to the OWNER.

801.16 HYDROSTATIC TESTS:

801.16.1 The CONTRACTOR shall be required to perform hydrostatic tests in all water mains, laterals, dead ends, and service lines in accordance with AWWA C 600. The test shall be conducted in the presence of the ENGINEER or his authorized representative. The testing of the lines shall be done without being connected to existing lines unless approved by the ENGINEER. The CONTRACTOR shall provide all temporary plugs required. If connections to the existing lines are allowed by the ENGINEER, it is with the understanding that the CONTRACTOR assumes any and all responsibility in case of damage or failure of the existing system. Water used for disinfecting may be used for hydrostatic testing. Leakage through connections to the existing system, leaks in the existing lines, or leaking existing valves under the test pressure will invalidate the test. The lines shall be tested at 150 pounds, or 1.5 times the normal working pressure of the line, whichever is greater, for not less than two hours. All taps, gauges and necessary equipment shall be provided by the CONTRACTOR as approved by the ENGINEER, however, the ENGINEER may utilize gauges provided by himself if he so elects. Each section of the new line, between valves shall be tested to demonstrate that each valve will hold the test pressure. No installed pipe will be accepted if the leakage is greater than that determined by hydrostatic test sheet calculations in which L is the allowable leakage, in gallons per hour; S is the length of pipeline tested; D is the nominal diameter of the pipe in inches; and P is the test pressure in pounds per square inch gauge. During the test the test pressure should not lose more than 10 psig without being pumped back up to test pressure. The totals of the gallons of water required to hold the test pressure during the two hours and the amount of water required to return the line to the test pressure at the end of the test period is the total leakage. If the total leakage is less than the allowable, the line can be accepted. All visible leaks will be repaired regardless of the amount of leakage.

801.16.2 CONTRACTOR shall submit a testing plan to the ENGINEER for approval. In cases where a new main is being connected to an existing main without the installation of a new valve, the end of the new main shall be temporarily capped and blocked and a hydro-static test performed. Hydro-static tests should not be made such that an existing valve or existing main is included in the test section. Test Sheet on page 801-12 is the standard form which must be completed at the time of the test, signed by the ENGINEER and delivered to the OWNER prior to acceptance of the Project

801.17 DISINFECTING, FLUSHING, AND BACTERIA TESTING OF WATER LINES: New water lines shall be installed in such a manner as to not require cleaning by flushing. This shall require capping of stockpiled line, capping of lines at night and any other time work is not in progress, visual inspection of interior of lines, and cleaning as necessary, prior to placing in the trench. Every effort shall be made to prevent the entry of dirt and debris into pipelines under construction.

801.17.1 Mains shall be disinfected in accordance with AWWA C 651 or as required below with chlorine liquid solution, which is added by an approved method at one end of the lines as water is drawn through the lines and service connections. The chlorine solution shall remain in the line for at least 24 hours. The lines shall then be flushed until the chlorine residual is equal to the normal residual in the existing system or at 0.5 parts per million for unchlorinated water. Dry chlorine will not be used for disinfection of water lines. The flushed water will be disposed of by the CONTRACTOR appropriately.

801.17.2. Prior to the line being placed into service, bacteria samples shall be taken by the OWNER. Should results of the bacteriological analysis be unsatisfactory, the disinfection procedure shall be repeated.

801.17.3 The CONTRACTOR will be granted two free volumes of water for testing, disinfecting and flushing the new installation. All water used for testing, disinfecting and flushing shall be metered. If additional water is needed for these purposes, the water will be paid for by the CONTRACTOR at the current water rates. An approved backflow preventor system shall be used when withdrawing water from any waterlines and hydrants. Direct connection to the water system shall not be used for providing water for disinfecting, testing or flushing.

801.17.4 OWNER or the ENGINEER will collect the water sample to test the water in the existing lines at

TEST SHEET 801.16.2
HYDROSTATIC TEST

Test No.: _____

PROJECT NAME: _____
DATE: _____

PROJECT _____ NUMBER: _____
CONTRACTOR: _____

LOCATION: _____

PIPE MATERIAL: _____ DIP _____ PVC _____ CCP _____ Fabricated Steel

Test: Length (S) = _____ ft.
Size (D) = _____ inches
Pressure (P) = _____ psi - gauge (average test pressure during the hydrostatic test)
Leakage Allowed (L_{ALL}) - _____ gal / hr ($L_{ALL} = SD \sqrt{P} / 133,200$ per AWWA C600-99)

Basis: Only resilient seated gate valves and/or rubber seated butterfly valves are used. No metal seated valves are allowed.

Total Leakage Allowed for 2 hour Test Period: $L_{ALL} * 2 \text{ hours} =$ _____ gallons

Actual Amount of Water ADDED to maintain 150 psi \pm 5 psi for 2 hours = _____ gallons

If actual amount of water added is LESS THAN total leakage allowed, test PASSED

If actual amount of water added is GREATER THAN total leakage allowed, test FAILED

_____ Test Passed _____ Test Failed

Contractor _____ Date _____ Inspector _____ Date _____

Project Manager _____ Date _____

COMMENTS:

Note: See Section 801.16 for the Specification for test procedure. A0224B/D2376B
the point of delivery for assurance of clean and

potable water. The water in the existing lines will be used for testing and flushing.

801.18 INTERFERENCE WITH SERVICE AND SCHEDULE OR WORK

801.18.1 The CONTRACTOR shall obtain the permission of the ENGINEER before making any connections with existing mains. The required operation of existing valves will be performed by the OWNER as per Section 18.

801.18.2 Work shall be started after authorization of the ENGINEER and shall be completed in a prompt efficient manner in coordination and cooperation with other utilities concerned. 801.18.3 The CONTRACTOR will be required to arrange his construction program with a view of maintaining continuous service to water users, from existing facilities, to the fullest extent possible. He shall, at all times, withhold construction work, where any conflict in the service requirements occur.

801.19 NOTIFICATION OF COMPLETION

The CONTRACTOR shall notify the ENGINEER, in writing, when the CONTRACTOR has completed construction of a water line. This notification should be submitted immediately upon completion; the water line will not be placed in service by the OWNER before the sewer service and the street are in place and until the OWNER has received and accepted all adequate documentation submittals. OWNER shall consider, on a case by case basis, exceptions for fire protection purposes.

801.20 VALVE CAN REHABILITATION

801.20.1 The rehabilitation of existing valve cans as shown on the plans or as authorized by the ENGINEER shall include the following:

801.20.1.1 Removing the existing valve can and ring and cover and installing the new type can and cover.

801.20.1.2 Install a new concrete collar in paved and unpaved areas. Size and direction of the line should be noted on the collar.

801.20.1.3 The existing ring and cover shall be considered salvaged materials.

801.20.1.4 Removal and replacement of the pavement.

801.20.1.5 Excavation, backfill, and compaction.

801.20.1.6 All materials, labor, and equipment

necessary to do the work.

801.20.2 The work under this item shall be constructed per the Standard Detail Drawings.

801.21 DOCUMENTATION SUBMITTALS

801.21.1 At the time of the final inspection the following documentation will be submitted to the ENGINEER and OWNER:

801.21.1.1 Hydrostatic test data of the new water line system.

801.21.1.2 Microbiological test reports which were taken at representative locations along the system.

801.21.1.3 Fire hydrant and valve cards. All valves at that time shall be in the open position, unless otherwise authorized by the ENGINEER and OWNER.

801.21.1.4 A marked-up set of construction drawings reflecting as-built conditions. This does not supplant the requirements for record or as-built drawings.

801.22 MEASUREMENT AND PAYMENT

801.22.1 PIPE: Payment for all sizes and types of pipe shall be made on the basis of measurement per linear foot, including the length of fittings, valves, etc. The contract unit price of pipe shall include all jointing and coupling materials necessary for its installation and connections to other sections of pipe, except for fittings, valves or other appurtenances. The cost of hydrostatic testing, flushing and disinfecting of new water lines shall be included in the contract unit price for the item in place. Pipe locator tape for pipe shall be included in the contract unit price of the pipe.

801.22.2 DEPTH OF TRENCH:

801.22.2.1 The contract unit price for pipe and appurtenances in all cases shall include the trenching, installation, and compacted backfilling for trench cuts as specified in Section 701.

801.22.2.2 Payment for additional depth, below the specified limits shall be made on the contract unit price per vertical foot per linear foot, and shall include trenching, installation of pipe and appurtenances, and compacted backfilling in the deeper trench.

801.22.3 REMOVAL AND RELAY, RETURN, OR DISPOSAL OF PIPE:

801.22.3.1 The contract unit price for removal and relaying pipe shall include all labor and new gasket material necessary to remove and reinstall pipe in another location.

801.22.3.2 The payment for removing and the delivery 2-1/4 inch to 14 inch pipe to the Water Utility Division in the City Yard as salvage materials shall be made on the unit price per linear foot. Only cast iron or ductile iron pipe that is undamaged will be considered for salvage.

801.22.3.3 Where there is no salvage value of the pipe, the pipe shall be removed and disposed of by the CONTRACTOR. The payment for removal shall be made on a unit price per linear foot; there will be no additional cost to the OWNER for disposal.

801.22.3.4 The payments for removal and relaying, removal and return, or removal and disposal shall include trenching and compacted backfilling.

801.22.4 CAST IRON AND DUCTILE IRON FITTINGS:

801.22.4.1 All cast iron and ductile iron fittings shall be measured and paid for at the contract unit price per pound based on weights of an all mechanical joint ends fitting for the type and size of fitting used as specified in AWWA C 110, regardless of the type of ends on the fitting installed. The contract unit price per pound of fittings shall include all gaskets, glands, bolts and nuts required, no separate payment will be made for these items.

801.22.4.2 When the CONTRACTOR installs a OWNER-furnished fitting and replaces that fitting in the OWNER's inventory, the CONTRACTOR shall be paid the full contract unit price of that fitting as outlined above. If the CONTRACTOR does not replace the fitting in the OWNER's inventory the payment to the CONTRACTOR will be at the contract unit price of the fitting less the cost of the fitting itself.

801.22.4.3 Fitting insertion: The insertion of a fitting into an existing pipe line shall be measured and paid for at the contract unit price per pound based on weights of an all mechanical joint end fitting and if required an all mechanical joint connecting piece (coupling) of the type fitting and size used, as specified in AWWA C 110, regardless of the type of ends on the fitting and coupling installed. This payment shall include all compensation for the excavation, cutting and removal of the existing pipe, installation of the fitting and coupling, if required, the recutting of the existing pipe or new pipe installed between the fitting and coupling, and backfill and compaction complete in place. In addition to the

payment for the fitting insertion, the CONTRACTOR shall be paid for one each non-pressurized (wet) connection and if pavement, curb and gutter, sidewalk, drivepad, etc., are removed, these items will be paid for as part of the appropriate item.

801.22.5 REMOVAL AND RELAY, RETURN OR DISPOSAL OF PIPE APPURTENANCES:

801.22.5.1 The contract unit price for removal and relaying the appurtenances shall include all labor and new gasket material necessary to remove and reinstall the item in another location.

801.22.5.2 The payment for removing and returning 2 1/4 inch to 36 inch appurtenance to the OWNER as salvaged material shall be made on the contract unit price per each or unit price per pound. Only undamaged material will be considered for salvage.

801.22.5.3 Where there is no salvage value of the appurtenance, the item shall be removed and disposed of by the CONTRACTOR. The payment for removal shall be made on the contract unit price per each or contract unit price per pound; there will be no additional cost to the OWNER for disposal.

801.22.5.4 The payment for removal and relaying, removal and return, or removal and disposal shall include trenching and compacted backfilling.

801.22.5.5 Only cast iron or ductile iron appurtenances will be removed and relaid or removed and returned for salvage.

801.22.5.6 Fire hydrant relocation payment shall be the contract unit price per each for removal and reinstallation and shall include excavation, blocking, aggregate and compacted backfilling, as shown in the Standard Detail Drawings.

801.22.6 CONCRETE CYLINDER OR WELDED STEEL PIPE FITTINGS:

Concrete cylinder or welded steel pipe fittings, such as flanged outlets, bends, reducers, etc., shall be considered as incidental to the contract unit price for installation of the pipe, as shown on the construction plans.

801.22.7 COUPLINGS: The measurement for steel or cast iron couplings shall include payment for all gaskets, bolts, and incidental materials as may be needed for its complete installation. Payment shall be made on the contract unit price per each size of coupling required.

801.22.8 STEEL FITTINGS: Steel fittings shall only be used when authorized by the ENGINEER and

when needed to connect to an existing steel water line. Measurement and payment for steel fittings, when authorized, shall be made at the contract unit per pound based on weights of an all mechanical joint ends fitting of the type fitting and size used, as specified in AWWA C 110. This payment shall include all fabrication and welding required on the fitting.

801.22.9 VALVE AND VALVE CANS:

801.22.9.1 Valves shall be measured and paid for at the contract unit price per each size of valve. The contract unit price for valves 24-inch and larger shall include the bypass valve, fittings and piping, complete in place.

801.22.9.2 Valve boxes shall be measured and paid for at the contract unit price per each per type of valve boxes, which payment shall include the concrete pad with stem extension when required, complete in place.

801.22.10 FIRE HYDRANTS: Fire hydrants shall be measured and paid for at the contract unit price per each per depth of bury, which payment shall include excavation, gravel drain pocket, mechanical restraining system or blocking, backfilling, and compaction complete in place.

801.22.11 VALVE BOX ADJUSTMENTS:

801.22.11.1 Valve box adjustment using the adjustment collar and insert shall be measured and paid for per each complete in place including the concrete pad.

801.22.11.2 When the adjustment height required on a valve box exceeds the height of the adjustment collar or the valve box has been previously adjusted, the valve box will have to be rehabilitated. Measurement and payment shall be made as specified under Valve Box Rehabilitation.

801.22.12 WATER LINE CONNECTIONS:

801.22.12.1 Nonpressurized Connections: Nonpressurized connections shall be measured and paid for at the contract unit price per each for any size or type of pipe, complete in place, which shall include any extra excavation required, shut-off coordination, the removal of any caps or plugs or the cutting of the existing pipe any number of times required to make the connection, drainage plan (if required), pumping or handling of the water, backfilling and compaction. Fittings shall be measured and paid for per pound as specified herein, including all types of couplings.

801.22.12.2 Pressurized Connection: Pressurized connections shall be measured and paid for at the contract unit price per each per location shown on the plans, complete in place, which shall include excavation, the cleaning or removal of existing pipe coatings and coverings, air testing, the tapping, any grouting required, backfilling and compaction. The installation of the tapping sleeve and gate valve is to be paid under separate item or as indicated on the plans.

801.22.12.3 Connection to Steel Water Lines: All connections to existing steel water lines shall be made by using a transition coupling. The measurement and payment for this type of connection shall be made per pound of fitting for a Mechanical-Joint Connecting Piece of the size used based on the weights specified in AWWA C 110.

801.22.13 THRUST RESTRAINTS:

801.22.13.1 CONCRETE BLOCKING: When concrete blocking is used as a substitute for a mechanically restrained joint as authorized by the ENGINEER, the blocking shall be measured and paid for at the contract unit price per cubic yard placed to the neat lines shown on the plans or per the Standard Detail Drawings.

801.22.13.2 RESTRAINING JOINTS FOR WELDED STEEL OR CONCRETE CYLINDER PIPE: Measurement and payment for this item shall be at the contract unit price per linear inch of circumferential weld, complete in place, including protective coating of the weld.

801.22.13.3 MECHANICALLY RESTRAINED JOINTS: Mechanically restrained joint assemblies shall be measured and paid for at the contract unit price per each assembly per size of the pipe per each type (pipe to pipe, pipe to mechanical joint, pipe to fitting, etc.) complete in place.

801.22.13.4 VALVE ANCHORAGE: No separate measurement nor payment shall be made for valve anchorage as per Standard Detail Drawing. The cost of this work shall be included with the cost of the valve.

801.22.14 PRESSURE REDUCING VALVE (PRV): Measurement and payment for furnishing and installing a PRV shall be made at the contract unit price per each per size, complete in place as shown on the plans or in the Standard Detail Drawings. The payment shall include all labor, equipment and material required for the excavation, the PRV, all bypass piping, fittings and valves both inside and outside the structure, the structure, backfilling and compaction.

801.22.15 AIR RELEASE VALVE (ARV): Measurement and payment for furnishing and installing an ARV shall be made at the contract unit price per each per size of ARV, complete in place as shown on the plans or in the Standard Detail Drawings. The payment shall include all labor, equipment and materials required for the excavation, ARV, piping, fittings, gate valve, can or structure, backfilling, and compaction.

801.22.16 VALVE BOX REHABILITATION: Valve box rehabilitation shall be measured and paid for at the contract unit price per each, complete in place which shall include the removal of the existing valve box, excavation, the new valve box installed, backfilling, compaction and the installation of the concrete collar.

801.22.17 CONCRETE STRUCTURES: The removal and replacement of concrete structures such as sidewalks, drive pads, and curb and gutters etc., required for the installation of water lines shall be measured and paid for as specified in Section 340 and 343.

801.22.18 BEDDING MATERIAL: No separate measurement nor payment shall be made for bedding material required when shown on the plans or when required due to the type of pipe supplied by the CONTRACTOR. The cost of the bedding material shall be included in the unit price of the pipe. If bedding material is not required by the conditions above but is required due to the conditions encountered during construction then the bedding material shall be measured and paid for as specified in Section 701.

801.22.19 SURPLUS MATERIALS: No separate measure nor payment will be made for the removal and disposal of surplus material generated by the pipe, bedding material or the use of lean fill.

SECTION 802

INSTALLATION OF WATER SERVICE LINES

802.1 GENERAL: This section pertains to the water service line which extends from the distribution line to the water meter.

802.2 REFERENCES

802.2.1 American Society for Testing and Materials (Latest Editions) (ASTM)

- A-48 Specification for Gray Iron Castings
- B-62 Specification for Composition Bronze or Ounce Metal Castings
- B-88 Specification for Seamless Copper Water Tube
- D-2000 Classification System for Rubber Products in Automotive Applications

802.2.2 American Water Works Association (Latest Editions) (AWWA)

C-800 Underground Service Line Valves and Fittings

802.3 MATERIALS

802.3.1 SERVICE LINE FITTINGS: All service line fittings shall be in full compliance with the latest revision of AWWA Standard C 800, except as modified herein. Service line fittings will be of brass which has a composition of 85 percent copper, 5 percent tin, 5 percent lead, and 5 percent zinc. Fittings will be of the type required for the type of service line being installed. All stops shall be of the round, full opening type with no restriction in the opening less than the nominal size. Fittings incorporating a threaded plastic gripper and "O" ring seal may be utilized in lieu of the flared configuration. All service pipe and fittings shall be designed to sustain and operating pressure of 150 psi.

802.3.2 COPPER SERVICE PIPE: The 3/4" to 2" copper service pipe shall conform to ASTM B 88 and shall be Type K, unless otherwise specified. Copper tubing shall be bent with approved tube benders without any kinks or sharp bends. Cutting of tubing will be performed with cutters designed for that purpose.

802.3.3 TAPPING SADDLES:

802.3.3.1 Service saddle bodies shall be of cast iron, ductile iron or bronze; straps, nuts, bolts, and washers shall be of stainless steel or bronze; gaskets shall be vulcanized elastomeric rubber or

synthetic rubber compound.

802.3.3.2 The saddles shall be tapped for the type of thread being used on the corporation stop.

802.3.3.3 Tapping saddles for PVC C900 pipe shall have bronze straps and shall be installed as per the manufacturer's printed recommendations.

802.3.4 METERS: Meters are furnished and installed by OWNER for new service line installations. For replacement and relocation work the meters will be furnished by the OWNER and installed by the CONTRACTOR.

802.3.5 METER

802.3.5.1 METER BOXES FOR 3/4"-1" Meters:

802.3.5.1.1 Meter boxes with two meters shall be centered on adjacent property lines.

802.3.5.1.2 The meter box is to be part of an underground enclosure for water meters and will have a cast iron cover plate or lid.

802.3.5.1.3 Meter box will be cast in one piece to form a hollow rectangle and new material or recycled materials shall be used in its manufacture.

802.3.5.1.4 The box material shall have the following minimum mechanical properties at variable ambient temperatures of -20°F to 120°F: compressive strength = 10,000 psi, tensile strength = 1,500 psi and flexural strength = 7,500 psi.

802.3.5.1.5 During testing of the materials at the above ambient temperatures no visual cracking, crazing, checking, blistering, surface pitting or deformation will be noted.

802.3.5.1.6 The finished meter box shall have the following physical properties:

802.3.5.1.6.1 Maximum wall deflection shall not exceed 1/8" at any one point when subjected to earth pressures or forces created during backfilling.

802.3.5.1.6.2 Material used for making the box shall be non-biodegradable when buried and/or exposed to water. Life expectancy of the box shall be at least 20 years.

802.3.5.1.6.3 Overall weight of the box component shall not exceed 80 pounds.

802.3.5.1.6.4 Inside dimensions of the box shall be: width = 16 ½ inches, length = 22 ½ inches, and depth = 24 inches. See Standard Detail Drawings for further dimensions and configurations. This meter box is for one and two meter installations.

802.3.5.1.6.5 Inside and outside surfaces of walls shall be reasonable smooth and free of burrs.

802.3.5.1.6.6 All materials used for box construction shall be approved for use in domestic water supply system.

802.3.5.2 METER COVER AND LID:

802.3.5.2.1 Lightweight and heavyweight meter box covers and lids shall be of Gray Iron casting materials. The light weight type is for use in sidewalk and unpaved areas not subject to traffic loads. The heavyweight type is for use in driveways and along streets having mountable curbs. The size, dimensions and details of the castings are as shown in the Standard Detail Drawings.

802.3.5.2.2 The casting shall conform to ASTM A 48, Class 30. The castings shall be true to pattern in form and dimensions and be free from pouring faults, sponginess, cracks, blowholes or other defects. Castings shall be filleted boldly at angles and arises shall be sharp and true. Edges shall be rounded or chamfered. The castings shall be thoroughly cleaned and the parting lines, grates, and risers ground flush. The lid shall seat firmly in the cover without rocking. The lid top surface shall be flush with the top surface of the cover. The lid shall be easily removed from the cover.

802.3.5.2.3 The cover and lid shall have, integrated in the casting top, a corrugated design to provide a nonslip surface. The lid shall have, integrated in the top of the casting, the words "WATER METER." The cover and lid shall be asphalt painted with coal tar paint. The paint thickness shall not exceed 30 mils.

802.3.5.3 METER BOX FOR 1 ½" AND 2" METERS:

802.3.5.3.1 The meter box is to be part of an underground enclosure for water meters.

802.3.5.3.2 The material used for manufacturing the box, cover and lid shall be new or recycled materials and shall have the following minimum mechanical properties at ambient temperatures from -20°F to 120°F: compressive strength = 11,000 psi, tensile strength = 1,700 psi and flexural strength = 7,500 psi.

802.3.5.3.3 During testing of the materials at the above ambient temperatures no visual cracking, crazing, checking, blistering, surface pitting or

deformation will be noted.

802.3.5.3.4 The finished meter box shall have the following physical properties:

802.3.5.3.4.1 Box, cover and lid shall be rated for a load capacity of 1,000 lbs over a 4" x 4" area.

802.3.5.3.4.2 The overall weight of the box, cover and lid and extension shall not exceed 80 lbs.

802.3.5.3.4.3 Maximum wall deflection shall not exceed 1/8" at any one point when subjected to earth pressures or forces created during backfilling.

802.3.5.3.4.4 The material used for making the box shall be non-biodegradable when buried underground and exposed to water.

802.3.5.3.4.5 The minimum dimensions of the box, cover and lid shall conform to the Standard Detail Drawings.

802.3.5.3.4.6 The walls inside and outside of the box shall be reasonably smooth and free of burrs.

802.3.5.3.4.7 Cover of the meter box must have a non-skid surface and have "WATER METER" inscribed on the top. The cover shall be secured to the box by bolts.

802.3.5.3.4.8 All materials used for constructing the box, cover and lid shall be approved for use in domestic water supply systems.

802.3.5.4 LOCATIONS OF METER BOXES: Meter Boxes shall be located within the right-of-way as shown on Standard Detail Drawings.

802.3.6 CORPORATION STOP: Corporation stop shall be AWWA thread inlet by compression-type outlet or Pack Joint to fit 3/4", 1", 1 ½" and 2" copper tubing. The socket-housing or the rotating ball shall be PTFE coated to avoid metal to metal contact, ensure adequate seal and provide smooth turning operation. Outlet shall have a nominal size Standard AWWA C-800 copper service thread to fit existing OWNER drilling and tapping machine equipment. All casting shall be ASTM B-62 and outlet seals shall be Buna-N

802.3.7 TAILPIECE: The service will be placed in the meter box with a copper tubing tailpiece for 3/4" to 2", protruding from the standard concrete pad into the owner's property with a Pack Joint capped fitting to which the plumber can connect.

802.3.8 COPPERSETTERS: Coppersettters shall have pipe connections for Type K Copper Tubing. The coppersetter shall be an assembly of brass and

copper tubing with a bottom bar, shall have a bronze ball valve on the inlet side of the meter, and shall be furnished with coupling gaskets. Coppersetter shall have temporary threaded plugs in the meter connections and shall be furnished free of excess grease. A stabilizer bar of 12 inches by ½ inch galvanized pipe shall be inserted in the yoke assembly as shown on the Standard Detail Drawings. A coppersetter with dual check valve shall be installed as per the Cross Connection Control section.

802.3.9 CROSS CONNECTION CONTROL: Approved dual check valves shall be installed on all services as indicated on the plans. For water customers having private wells located that connect to the municipal water system shall: agree to completely sever the private well from the premises existing plumbing system and install an approved dual check valve at the water meter. The owner of the premises shall also sign a covenant that runs with the land that the private well shall not be re-connected to the premises previous plumbing.

802.4 SERVICE LINE INSTALLATIONS

802.4.1 NEW 3/4" TO 2" SERVICE LINES:

802.4.1.1 New Service lines are complete new services in accordance with Standard detail Drawings and shall include the following:

802.4.1.1.1 Furnish and install tapping saddle, corporation stop, tubing, coppersetter, meter box, cover and lid and tailpiece, complete in place, including excavation and backfill and flushing.

802.4.1.2 Meters will not be installed as part of this work. However, construction of the meter box and placement of the yoke shall be such that at a later date the meter may be installed properly and easily.

802.4.1.3 The CONTRACTOR shall be responsible for proper vertical and horizontal location of the box over the meter yoke.

802.4.2 REPLACEMENT 3/4"-2" SERVICE LINES:

802.4.2.1 Replacement service lines are essentially new services installed in conjunction with the replacement of the water main. Unless otherwise specified in the Contract Documents, all existing services shall be replaced with new material between the water main and the meter yoke.

802.4.2.2 Replacement service line work does not include any relocation or rehabilitation of the meter. The work shall consist of the following:

802.4.2.2.1 Furnish and install tapping saddle, corporation stop, coppersetter and tubing, complete in place, including flushing.

802.4.2.2.2 Re-connection to the meter.

802.4.2.2.3 All necessary excavation and backfill and concrete removal and replacement.

802.4.3 3/4" thru 2" METER RELOCATION:

802.4.3.1 A meter relocation is the relocation of an existing meter to a position closer to or further away from the centerline of the street. The meter relocation item is to be used when the service line is not replaced.

802.4.3.2 A new meter box and cover shall be furnished and installed.

802.4.3.3 A coppersetter shall be used in the reinstallation of the meter, for services sized 3/4" thru 2", and shall be of a height to properly position the meter, vertically, within the box, as shown in the Standard Detail Drawings.

802.4.3.4 When moving the meter toward the property line, new tubing shall be installed, from the inlet connection point of the meter to be relocated, to the coppersetter, and a tailpiece shall be installed on the outlet side of the coppersetter to the property line. When the existing meter is moved toward the street, the gap in the service line shall be filled with new tubing, including connectors.

802.4.3.5 When determined by the OWNER, the existing meter shall be replaced by the CONTRACTOR with a meter furnished by the OWNER. 1" meters will be substituted for 1-1/4" meters.

802.4.3.6 The work and materials shall include the coppersetter, connector pieces, excavation, tubing, backfill, removal of old meter and meter box, installation of new meter, meter box, and concrete pad, necessary disconnections, and connections of the house and meter box service lines, complete restoration of the affected site (including landscaping) and adjustment of the meter to the level shown in the Standard Detail Drawings.

802.6 3/4" thru 2" METER REHABILITATION AND REPLACEMENT

802.6.1 3/4" THRU 2" METER REHABILITATION:

802.6.1.1 Meter rehabilitation is applicable where the meter box deficiency exists. Deficiencies include obsolete, broken above or below grade, improperly sized, or existing location does not allow access to

the meter, curb stop or connector pieces (does not meet new installation standards). When any of these conditions exists, the meter box and meter installation shall be rehabilitated, as authorized by the ENGINEER.

802.6.1.2 The work and materials shall include:

802.6.1.2.1 Furnish and install a new coppersetter, meter box, cover and lid and concrete pad.

802.6.1.2.2 Furnish and install any reconnection pieces necessary for a complete service restoration.

802.6.1.2.3 Flushing out of the service line.

802.6.1.2.4 Site restoration (including any necessary landscaping) and cleanup.

802.6.2 3/4" thru 2" METER REPLACEMENT: Meters to be replaced under "Service Line Replacement" and "Meter Relocation" work shall be performed in accordance with the following procedure:

802.6.2.1 All existing meters involved with "Service Line Replacement" and "Meter Relocation" work shall be replaced by the CONTRACTOR with a meter provided by the OWNER as determined by the OWNER.

802.6.2.2 The replacement meter shall be requested, in writing by the CONTRACTOR from the OWNER with documentation of address and size meter for each meter to be replaced, project name and number, and CONTRACTOR's name.

802.6.2.3 The request shall be received at least seven days prior to issuance of meters.

802.6.2.4 The CONTRACTOR will be issued a directive with each meter issued. The CONTRACTOR shall return the directive along with the replaced meter, within five days of replacement of the meter to the OWNER.

802.6.2.5 The work order must be turned in with the specific meter for which the meter replacement was issued. The replaced meter shall have a tag affixed to the meter, by the CONTRACTOR, showing the CONTRACTOR's name, and project name and address from which the meter was removed.

802.6.2.6 The CONTRACTOR shall handle all meters so as not to damage them and shall be responsible for the meters from the time of receipt to turn in. Stolen or lost meters shall be replaced at the CONTRACTOR's expense.

802.7 METER PIT FOR SERVICES 3" AND LARGER: Meter pit construction details and the

installation of the pipe, valves and meter details will be shown on the construction plans.

802.8 MEASUREMENT AND PAYMENT

802.8.1 METERED SERVICE LINE INSTALLATIONS: For 3/4 inch thru 2 inches, new service lines, service line replacements and transfers, meter relocations, and meter replacements, and meter rehabilitation shall be measured and paid for as a completed unit of installation in accordance with the applicable items contained in the Bid Proposal, which payment shall include all materials, labor and equipment required to install, flush and place into service the applicable item.

802.8.2 SERVICE LINE TUBING: Unless otherwise authorized in the Contract Documents or by the ENGINEER, service line tubing shall be considered incidental to the applicable pay item established in the Bid Proposal.

802.8.3 PAVEMENT REMOVAL AND REPLACEMENT: Unless otherwise authorized in the Contract Documents or by the ENGINEER, pavement removal and replacement shall be considered incidental to the applicable pay item established in the Bid Proposal.

SECTION 901

SANITARY SEWER COLLECTOR AND INTERCEPTOR FACILITIES

901.1 GENERAL

The construction items, specified in this section, are common to sanitary sewer collector and interceptor facilities.

901.2 REFERENCES

901.2.1 ASTM

C 43	D 2321
C 425	D 3034
C 443	F 679
C 478	F 794

901.2.2 AWWA

C 603

901.2.3 This publication per SECTIONS:

101	123
102	124
105	125
106	129
108	701
121	

901.3 MATERIALS

901.3.1 PIPE: Sewer line pipe and fittings shall be as specified in other sections, as follows:

Plastic Pipe	Section 121
Reinforced Concrete Pipe	Section 123
Reinforced Concrete Pressure Pipe	Section 124
Vitrified Clay Pipe	Section 125
Ductile Iron Pipe	Section 129

901.4 CERTIFICATION

The OWNER/ENGINEER will be supplied with a certification on each item or type of material required in the sewer line, as to that item meeting the specifications and/or the reference specifications before that item is installed.

901.5 INSTALLATION

901.5.1 GENERAL:

901.5.1.1 Pipe and appurtenances shall be new and unused. The type of pipe to be installed shall be as approved by these specifications or unless otherwise shown on the drawings. Pipe and appurtenances

shall be handled in such a manner as to insure delivery to the trench in sound, undamaged condition. Particular care shall be taken to prevent damage to any pipe coating.

901.5.1.2 The interior of the 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 ENGINEER, without additional expense to the OWNER.

901.5.1.3 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 ENGINEER authorizes its removal in writing. The CONTRACTOR shall not flush or otherwise discharge any flow into an existing system unless approved in writing by the ENGINEER.

901.5.1.4 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 adjustment 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 ENGINEER shall request the CONTRACTOR to 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, and the CONTRACTOR will be paid for any additional work resulting from such change in line or grade in the manner provided for in the General Conditions.

901.5.1.5 Connections to existing manholes shall be made by core drilling through the manhole wall. The CONTRACTOR shall take care to avoid unnecessary damage to the existing manhole.

901.5.1.6 Pipe shall be laid upgrade in a continuous operation from structure to structure, with the socket or collar ends of the pipe upgrade unless otherwise permitted by the ENGINEER.

901.5.1.7 Sanitary sewer mains shall not be constructed under walkways, sidewalks, curbs and gutters, driveways, or similar concrete structures by tunneling underneath them. The CONTRACTOR will cut these concrete structures by using a concrete saw or, at his option, he may remove the section of the concrete structure to the nearest full expansion joint or edge.

901.5.2 PLASTIC PIPE INSTALLATION:

901.5.2.1 Plastic sewer pipe shall be connected and placed in the trench in accordance with the manufacturer's recommendations. Where a conflict arises with this Specification, this Specification shall control. Trenching, embedment, and backfill shall be as specified in Section 701.

901.5.2.2 The reference mark (a distinct circumferential line) is placed on the pipes 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 1/4" of the manufacturer's recommended mark.

901.5.2.3 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. No direct payment shall be made for this item; this cost shall be included in the pipe bid item price.

901.5.2.4 Not less than thirty (30) days after the installation and backfilling of plastic sewer pipe, including any service connections, the CONTRACTOR shall, in the presence of the ENGINEER, test deflection with a mandrel (GO - NO GO device). The mandrel shall be hand pulled. All pipe with deflections in excess of five percent of the base internal diameter, as determined by ASTM D 3034, ASTM F 679, or ASTM F 794, shall be excavated, pipe removed, new pipe installed,

backfilled, compacted and retested after an additional period of at least thirty days. Mandrels shall have 9 ribs and be only hand pulled through the test section. The CONTRACTOR shall furnish the mandrels. The length of the minimum radius portion of the mandrel shall not be less than the one-third of the nominal diameter of the pipe tested. The pipe shall be flushed and cleaned by the CONTRACTOR prior to testing. No flow will be permitted in the pipe while testing for deflections.

901.5.2.5 All expenses for trenching, removal of pipe, furnishing new pipe, installation of new pipe, compacted backfill, paving, and other related work that is required because of failure to meet deflection test requirements shall be borne by the CONTRACTOR.

901.5.2.6 Acceptance of plastic pipe sewers will be made only after these deflection test requirements have been met.

901.5.2.7 Minimum Diameters of Mandrels

901.5.2.7.1

<u>Nominal Pipe Size</u>	<u>Min. Mandrel Diam.</u>
8 in.	7.28 in.
10 in.	9.08 in.
12 in.	10.80 in.
15 in.	13.20 in.
18 in.	16.13 in.
21 in.	19.00 in.
24 in.	21.36 in.
27 in.	24.07 in.

901.6 JOINTS FOR PIPE

901.6.1 JOINTS FOR CLAY PIPE (FACTORY FABRICATED AND INSTALLED COMPRESSION-TYPE JOINTS FOR VITRIFIED CLAY PIPE):

901.6.1.1 Joint material shall be any one of the types specified in ASTM C 425 and shall meet all requirements of that specification and Section 125.

901.6.1.2 The CONTRACTOR shall furnish the ENGINEER complete information concerning the type and make of all joint material which he intends to use under the contract including certification that the joint material meets the requirements of these specifications.

901.6.1.3 In addition to all other tests required, the ENGINEER may select at random and perform the test on 2 joints for each 250 feet of pipe or fraction of each size of any lot of pipe to be tested.

901.6.1.4 The pipe joints shall not leak when subjected to the shear loading and hydrostatic tests as per ASTM C 425.

901.6.2 JOINT FOR CONCRETE PIPE:

901.6.2.1 The type of joint to be used shall be as shown on the drawings or as specified in the Supplementary Specifications.

901.6.2.2 Gasketed type of joints for circular reinforced concrete pipe shall be used (See Section 123).

901.6.2.3 Rubber gaskets for making compression type joints for circular concrete pipe shall be factory fabricated in accordance with ASTM C 443 and C 361; for circular pipes 12 inches in diameter and larger shall be rubber gasket and shall be handled, primed, installed, etc. in strict accordance with the manufacturer's recommendations.

901.6.2.4 The CONTRACTOR's attention is particularly called to ASTM C 443, regarding storage of gaskets.

901.6.2.5 The sealing of the plastic liner at the pipe joints shall be in strict accordance with Section 122.

901.6.2.6 The ends of the pipe shall be so formed that when the pipes are laid together and joined, they shall make a continuous and uniform line of pipe with a smooth and regular surface.

901.6.2.7 For elliptical or arch reinforced concrete pipe, the joints shall be tongue and groove. Mastic material, such as: RAMNEK, KENT SEAL, or approved equal, will be used to seal joints.

901.6.2.8 The CONTRACTOR shall furnish the ENGINEER complete information concerning the type and make of all joint material which he intends to use under the contract, including certification that the joint material meets the requirements of these specifications.

901.6.3 JOINT FOR PLASTIC SEWER PIPE (PVC):

901.6.3.1 Refer to ASTM D 2321 and ASTM F 794 for pipe laying and joining of pipe guidelines.

901.6.3.2 Prior to the laying of pipe, each pipe component shall be inspected for damage and

cleaned. Damaged components shall be rejected or repaired.

901.6.3.3 All joints will be assembled in accordance with manufacturer's published recommendations. If a lubricant is required to facilitate assembly, it shall have no detrimental effect on the gasket or on the pipe when subjected to prolonged exposure. Proper jointing may be verified by rotation of the spigot by hand or with a strap wrench. If unusual joining resistance is encountered or if the insertion mark does not reach the flush position, disassemble the joint components and repeat the assembly steps. Note that fitting bells may permit less insertion depth than pipe bells. When mechanical equipment is used to assemble joints, care should be taken to prevent over insertion.

901.7 TESTING FOR LEAKAGE

901.7.1 GENERAL:

901.7.1.1 Unless otherwise shown on the drawings or specifically deleted by the ENGINEER, in writing, all sanitary sewers shall be tested for leakage.

901.7.1.2 The CONTRACTOR may, at his option, Air Test the sanitary sewer line before backfilling the trench to aid the CONTRACTOR in checking the installation for any defects. Such testing is at the option of the CONTRACTOR and shall not constitute an acceptance test under these specifications.

901.7.1.3 The test for acceptance and compliance with these specifications shall be performed after the pipe zone backfilling has been completed. In the case of new sanitary sewer lines with house laterals included as an integral part of the project, the test for acceptance and compliance with these specifications shall be performed after the house laterals or stubs have been completed and backfilled. The CONTRACTOR has the option to leave the end of the service line exposed.

901.7.1.4 If the leakage, as shown by the test, is greater than allowed by these specifications, the pipe shall be overhauled by the CONTRACTOR at his expense and, if necessary, relaid until the pipe will satisfactorily pass the test.

901.7.1.5 The CONTRACTOR shall, at his own expense, furnish all water, material, tools and labor for making the test required. All tests shall be made under observation of the ENGINEER.

901.7.2 INFILTRATION TEST:

901.7.2.1 An Infiltration Test shall be used only when excessive ground water prevents satisfactory testing by either the Exfiltration Test or the Air Test. In addition, the Infiltration Test must be performed after backfilling, before any service connections are functioning and at a time when the ground water is over the entire section of pipe and at or near its maximum level.

901.7.2.2 The procedure for conducting an Infiltration Test shall be as follows:

901.7.2.2.1 The pipe section shall be cleaned.

901.7.2.2.2 Determine the groundwater table. The groundwater table shall be determined for each section of sanitary sewer tested.

901.7.2.2.3 Plug the upstream pipe outlet from upstream manhole of the sections being tested with a plug which will assure a tight seal against flow from the upstream portion of the sewer system. Also plug all house laterals and any other connections to the section being tested.

901.7.2.2.4 Install a 90 degree V-notch weir in the downstream manhole of the section being tested. Weir must be installed plumb and sealed to the pipe wall surface.

901.7.2.2.5 A sufficient period of time must be allowed to permit the infiltrated waters to collect and flow over the weir. Water shall flow over the weir for at least thirty minutes prior to taking measurements.

901.7.2.2.6 The head (H) of water flowing over the weir must be measured accurately and the measurement taken at least 18 inches upstream from the crest of the weir.

901.7.2.2.7 Discharge over the 90 degree V-notch weir shall be calculated according to:

$$Q = 3240 H^{2.5}$$

H = Head in inches

Q = Discharge in gallons per day

901.7.2.3 The allowable infiltration shall be 200 gallons per inch of pipe diameter per mile of pipe per day. When there is significantly more than two feet of groundwater above the top of the pipe at the highest point of the section being tested, ten percent additional infiltration above the permitted 200 gal/in.-dia/mi/day limit will be allowed for every 2 foot of additional head.

901.7.3 EXFILTRATION TEST

901.7.3.1 An Exfiltration Test may be conducted wherever the groundwater level is below the crown of the pipe at the highest elevation of the section of sanitary sewer being tested. If the groundwater level is above the crown of the pipe either the Air Test, properly adjusted, or Infiltration Test should be used.

901.7.3.2 The procedure for conducting an Exfiltration Test shall be as follows:

901.7.3.2.1 The pipe section shall be cleaned.

901.7.3.2.2 Plug the downstream pipe outlet to the manhole with a plug which will assure a tight seal against water leakage. Also plug all house laterals and any other connections to the section being tested.

901.7.3.2.3 If the upstream manhole is to be used as a reservoir for maintaining the pressure head on the sewer pipe, the inlet sewer pipe or pipes must be plugged. If a standpipe is to be used as a reservoir for maintaining the pressure head on the sewer pipe, the standpipe must be connected to the sewer pipe in the upstream manhole by a tightly sealed connection.

901.7.3.2.4 The amount of water (volume required to fill the section of sewer under test plus the manhole or standpipe) shall be calculated.

901.7.3.2.5 Water shall then be introduced through the manhole or standpipe. The amount of water introduced shall be metered. The amount of water introduced to fill the sewer should be approximately equal to the calculated amount. If the amount of water required to fill the sewer pipe is significantly greater than the calculated amount, it is an indication of a leak or leaks and consequent saturation of the backfill around the sewer pipe. Saturation of the backfill will invalidate the test.

901.7.3.2.6 The level of water in the manhole or standpipe shall be at least two feet above the crown of the pipe at the highest section of the section of sanitary sewer being tested.

901.7.3.2.7 After filling the pipe at least one hour shall be allowed for water absorption in the pipe. For some materials, up to six hours may be required. After the absorption period, the manhole or standpipe shall be refilled to the established measuring mark and the test begun.

901.7.3.2.8 If the upstream manhole is used as a reservoir for maintaining the pressure head on the sewer pipe, the difference in water surface elevation

from original to final level in a two hour period shall be used to calculate the water lost. The water lost in the two hour period shall be converted into gallons per day. If a standpipe is used as a reservoir for maintaining the pressure head on the sewer pipe, the stand-pipe shall be refilled periodically during the two hour test period to maintain an essentially constant head on the test section of pipe. The amount of water added shall be measured and shall be used to calculate the loss in gallons per day.

901.7.3.2.9 The allowable exfiltration shall be computed based upon the average pressure head above the crown of the pipe for the section tested as follows:

$$\text{Allowable leakage} = \frac{\sqrt{h}}{\sqrt{3}} 1 \times 200$$

Allowable leakage in gallons per inch of pipe diameter per mile of pipe per day.

h = average pressure head above the crown of the pipe, in feet (elevation of water at center of run)

901.7.3.2.10 When the upstream manhole is used as a reservoir for maintaining the pressure head, the allowable leakage from the manhole shall be added to the allowable leakage calculated for the sewer pipe.

901.7.3.2.11 If the sanitary sewer line fails to pass the Exfiltration Test, a re-test shall be permitted only after the groundwater conditions surrounding the pipe return to a condition similar to those existent at the beginning of the test period. The groundwater elevation shall be determined prior to initiation of the second test.

901.7.4 AIR TEST:

901.7.4.1 An Air Test may be conducted under all conditions of groundwater levels surrounding the sanitary sewer pipe. If the groundwater is above the crown of the pipe, the air pressure shall be increased by an increment equal to the pressure exerted by the groundwater over the pipe.

901.7.4.2 The procedure for conducting an Air Test shall be as follows:

901.7.4.2.1 Clean the pipe section (manhole to manhole reach of sewer) being tested by propelling a snug-fitting inflated ball, or other adequate method, through the pipe with water. It is important that the pipe be thoroughly wetted if consistent results are to be expected.

901.7.4.2.2 Plug all pipe outlets with pneumatic plugs. The pneumatic plugs shall be able to resist internal testing pressures without requiring external bracing. Give special attention to house laterals.

901.7.4.2.3 Determine the groundwater level surrounding the section of sewer under test. If the groundwater level is above the crown of the pipe, the test pressures shall be increased by 0.43 psig for each foot of water above the average elevation of the crown of the pipe. Test pressures shall not exceed 10 psig.

901.7.4.2.4 Introduce air slowly to the section of pipe under evaluation until the internal air pressure is raised to 4.0 psig plus any increase required by a high groundwater level.

901.7.4.2.5 Allow the air pressure to stabilize. Air may be added slowly to maintain a pressure in the 3.5 to 4.0 psig (plus groundwater allowance) for two minutes.

901.7.4.2.6 After the stabilization period, when the pressure reaches exactly 3.5 psig (plus groundwater allowance) the stopwatch is started and when the pressure reaches exactly 2.5 psig (plus groundwater allowance) the stopwatch is stopped.

901.7.4.2.7 If the time required for a one pound pressure drop is not less than the allowable time for the pipe section under test to lose air, the section shall pass the leakage test.

901.7.4.2.8 In all cases where an Air Test is conducted, the manholes shall be tested separately as previously specified.

901.7.4.2.9 All persons conducting an Air Test must be made aware of the fact that an Air Test may be dangerous if improperly conducted.

901.7.5 AIR TESTING TABLES: Tables 901.7.5.1 and 901.7.5.2 will be used to determine the required test duration for the section of line being tested.

TABLE 901.7.5.1

SPECIFICATION TIME REQUIRED FOR 1.0 PSIG PRESSURE
DROP FOR SIZE AND LENGTH OF PIPE
INDICATED FOR Q=0.0015

(A) Pipe Diameter (in.)	(B) Minimum Time (min:sec)	(C) Length for Minimum Time (ft)	(D) Time for length (sec)	(E) Specification Time for Length (L) Shown (min:sec)							
				100 ft	150 ft	200 ft	250 ft	300 ft	350 ft	400 ft	450 ft
4	3:46	597	.380 L	3:46	3:46	3:46	3:46	3:46	3:46	3:46	3:46
6	5:40	398	.854 L	5:40	5:40	5:40	5:40	5:40	5:40	5:42	6:24
8	7:34	298	1.520 L	7:34	7:34	7:34	7:34	7:36	8:52	10:08	11:24
10	9:26	239	2.374 L	9:26	9:26	9:26	9:53	11:52	13:51	15:49	17:48
12	11:20	199	3.418 L	11:20	11:20	11:24	14:15	17:05	19:56	22:47	25:38
15	14:10	159	5.342 L	14:10	14:10	17:48	22:15	26:42	31:09	35:36	40:04
18	17:00	133	7.692 L	17:00	19:13	25:38	32:03	38:27	44:52	51:16	57:41
21	19:50	114	10.470 L	19:50	26:10	34:54	43:37	52:21	61:00	69:48	78:31
24	22:40	99	13.674 L	22:47	34:11	45:34	56:58	68:22	79:46	91:10	102:33
27	25:30	88	17.306 L	28:51	43:16	57:41	72:07	86:32	100:57	115:22	129:48
30	28:20	80	21.366 L	35:37	53:25	71:13	89:02	106:50	124:38	142:26	160:15
33	31:10	72	25.852 L	43:05	64:38	86:10	107:43	129:16	150:43	172:21	193:53
36	34:00	66	30.768 L	51:17	76:55	102:34	128:12	153:50	179:29	205:07	230:46

Table from: UNI-B-6-79, "Recommended Practice for Low-Pressure Air Testing of Installed Sewer Pipe"; Uni-Bell Plastic Pipe Assoc.

TABLE 901.7.5.2

SPECIFICATION TIME REQUIRED FOR LOSS OF PRESSURE
FROM 3.5 PSIG TO 2.5 FOR SIZE AND
LENGTH OF PIPE INDICATED FOR Q=0.003

(A) Pipe Diameter (in.)	(B) Minimum Time (min:sec)	(C) Length for Minimum Time (ft)	(D) Time for length (sec)	(E) Specification Time for Length (L) Shown (min:sec)							
				100 ft	150 ft	200 ft	250 ft	300 ft	350 ft	400 ft	450 ft
4	1:53	597	.190 L	1:53	1:53	1:53	1:53	1:53	1:53	1:53	1:53
6	2:50	398	.427 L	2:50	2:50	2:50	2:50	2:50	2:50	2:51	3:12
8	3:47	298	.760 L	3:47	3:47	3:47	3:47	3:48	4:26	5:04	5:42
10	4:43	239	1.187 L	4:43	4:43	4:43	4:57	5:56	6:55	7:54	8:54
12	5:40	199	1.709 L	5:40	5:40	5:42	7:08	8:33	9:48	11:24	12:49
15	7:05	159	2.671 L	7:05	7:05	8:54	11:08	13:21	15:35	17:48	20:02
18	8:30	133	3.846 L	8:30	9:37	12:49	16:01	19:14	22:26	23:38	28:51
21	9:55	114	5.235 L	9:55	13:05	17:27	21:49	26:11	30:32	34:54	39:16
24	11:20	99	6.837 L	11:24	17:57	22:48	28:30	34:11	39:53	45:35	51:17
27	12:45	88	8.653 L	14:25	21:38	28:51	36:04	43:16	50:30	57:42	64:54
30	14:10	80	10.683 L	17:48	26:43	35:37	44:31	53:25	62:19	71:13	80:07
33	15:35	72	12.926 L	21:33	32:19	43:56	53:52	64:38	75:24	86:10	96:57
36	17:00	66	15.384 L	25:39	38:28	51:17	64:06	76:55	89:44	102:3	115:23
39	18:25	61	18.054 L	30:57	45:09	60:11	75:14	90:16	105:1	120:2	135:24
42	19:50	57	20.039 L	34:54	52:21	69:48	87:15	104:4	122:0	139:3	157:05
								2	9	6	

Table from: WPCF Journal, Vol. 44, No. 4, April 1972; Ramseyer, "Testing New Sewer Pipe Installations", pp. 557-564.

901.7.5.3 EXPLANATION AND USE OF TABLES

Explanation of Tables

Column A	Nominal diameter of pipe (any pipe material).
Column B	Minimum duration of air test regardless of length of line segment being tested. (e.g., 250' of 8" PVC: test duration 3 min. 47 sec.)
Column C	Length of Line associated with minimum duration of air test (Column B).
Column D	L = length of line in feet; product of computation yields duration of air test (e.g., 250' of 12" PVC where ground water is not present ([Table 901.7.5.1]: test duration-- $1.709 (250) = 427.25 \text{ sec.} = 7 \text{ min. } 8 \text{ sec.}$)
Column E	Duration of air test for given incremental lengths of line.

Use of Tables

Table 901.7.5.1 is based on an air loss rate of 0.003 cfm/sf of internal surface area. Use for line installations where ground water (and subsequent infiltration) is not present.

Table 901.7.5.2 is based on an air loss rate of 0.0015 cfm/sf of internal surface area. Use for line installations where ground water (and subsequent infiltration) is present

901.8 CLEANING AND INSPECTION

901.8.1 CLEANING: No pipe spalls, rocks, dirt, joint compounds, cement mortar and other trash or obstructions shall be left in a sewer pipe of any size or type. During the flushing operations the manhole outlet shall be bagged or plugged so that this debris will not be carried into or contaminate an existing or active line.

901.8.2 TELEVISION:

901.8.2.1 All completed sewer lines shall be inspected by a television camera before lines become operational or final acceptance of the installation.

901.8.2.2 After the CONTRACTOR has cleaned flushed and retrieved all debris in the line, the CONTRACTOR will notify the project engineer that the line is ready for television inspection. The CONTRACTOR in the presence of the ENGINEER or the engineer's representative shall televise the line with televising equipment specifically designed and constructed for sewerline visual inspection.

The television camera shall be of color and equipped with a rotating lens capable of 360-degree rotation with zoom focus and a wide-angle optical lens permitting spontaneous focal

adjustments, allowing viewing of service lateral connections, joints, pipe walls, etc.

A television report log, completed on the OWNER'S log form, shall be maintained during the television inspection. This log shall be completed to the OWNER'S satisfaction noting the location, project title, name of OWNER, date, type of pipe material, line size, location of services (live or stubouts), manhole or station numbers, and any abnormal or line defects within the line segment. The CONTRACTOR shall be responsible for subsequent televising when line repairs are required or when the previous televising is not satisfactory to the OWNER.

When the televising is complete, the CONTRACTOR shall turn over to the OWNER complete television report logs and the VHS videotape recordings.

901.9 MEASUREMENT AND PAYMENT

901.9.1 SANITARY SEWER PIPE: Installed pipe shall be measured and paid for as follows:

901.9.1.1 For straight lines the pipe length shall be the intervening distance between the centers of manholes along a line parallel to the pipe invert.

901.9.1.2 For curvilinear lines the pipe length shall be the intervening arc distance between the

centers of manholes along a line parallel to the pipe invert.

901.9.1.3 For lateral lines, such as from main or manhole to a storm inlet, the pipe length shall be the distance between the center of a manhole or centerline of the main to the interior wall face of the storm inlet along a line parallel to the pipe invert.

901.9.1.4 Payment for pipe will be in accordance with the unit price per linear foot per size and material as defined in the Bid Proposal, and shall include: pipe installed in the trench, jointing and coupling materials, and other materials necessary to connect to other sections of pipe, manholes, and other appurtenances.

901.9.2 CONNECTIONS: Connections, tying new sewer lines into existing manholes, shall be measured and paid for on a unit price per each within the size increments as specified in the Bid Proposal. Connections to the shelf section of the floor will not be considered for payment under this bid item.

901.9.3 VERTICAL DROPS: Vertical drops at manholes shall be measured by the linear foot of pipe from the invert of the sewer line to be dropped to the spring line of the receiving main. Payment will be made on the unit price per linear foot per size and type of pipe as specified in the Bid Proposal.

901.9.4 TESTING:

901.9.4.1 Infiltration, ex filtration, and air tests of sewer mains shall include sewer service lines to the property lines or right-of-way lines as installed per the construction plans. No payment will be made for the initial test or subsequent tests.

901.9.4.2 Television inspection is defined in Subsection 801.8.2.

901.9.4.3 There will be no payment for required testing of sanitary sewer manholes.

901.9.4.4 No payment will be made for deflection tests after the required waiting period for PVC sewer pipe installations.

901.9.5 REMOVAL AND DISPOSAL OF SEWER PIPE: Removal and disposal of sanitary or storm sewer lines shall be measured by the linear foot within the specified pipe size increments. Payment will be made on the unit price per linear foot of specified pipe size in the Bid Proposal. No payment will be made until delivery of salvageable materials is verified by Liquid Waste Division.

Trenching, backfilling, and pavement removal and replacement will be paid for based on the unit prices for each appropriate bid item in the Bid Proposal. If new pipe is to be installed in the same trench as the removed pipe, only one payment will be made for trenching, backfilling, and pavement removal and replacement.

SECTION 905

SANITARY SEWER SERVICE LINES

905.1 GENERAL

905.1.1 The requirements of this section apply only to sanitary sewer service lines installed or reconnected within the public right-of-way or easement. The CONTRACTOR shall be responsible for the integrity of the installation or reconnection of all sanitary sewer service lines during the warranty period.

905.1.2 Sanitary sewer service lines shall be installed at all locations shown on the plans. The CONTRACTOR shall be aware of the importance of accurately recording the horizontal and vertical location of sanitary sewer service lines.

905.2 REFERENCES

905.2.1 ASTM:

D 1557
D 2661
D 2665

905.2.2 This publication:

SECTION 701

905.3 MATERIALS

905.3.1 The materials listed herein are considered pre-approved. The CONTRACTOR shall submit to the ENGINEER a certified list of all sanitary sewer service materials which will be utilized on the project. All materials not listed must be submitted to the ENGINEER for approval no less than thirty (30) calendar days prior to the proposed date of use.

905.3.2 The following saddles have been pre-approved for use in the connection of sanitary sewer service lines to collection lines. The CONTRACTOR shall be responsible for assuring that the supplied saddle is compatible with the size and type of both the collection line and service line. Saddles shall be so constructed to have a positive stop to prevent service line from protruding into the main.

905.3.2.1 "Pioneer Sewer Branch Connector" (Hersey) 90 degree (tee) type only, with alignment ring and elastomeric gasket.

905.3.2.2 "Sealtite Sewer Pipe Saddle" (Geneco), Type "S", Type "D" Model "DD", Type "E" Models

"EO" and "EBG" and Type "C" Model "CO" (if 4" service is required a 4" x 6" reducer must be used).

905.3.2.3 For all saddles with a 2 1/2" wide strap will be required when saddle is attached to plastic pipe.

905.3.3 The following saddles have been pre-approved for use in the connection of sanitary sewer services to manholes. Manhole connections shall only be allowed if shown on the plans or approved by the ENGINEER.

905.3.3.1 "Fowler Quick-Way Sewer Tap" Models 4-41, 4-42, 6-41, and 6-42.

905.3.4 Service risers, if required, shall be PVC Schedule 40 pipe conforming to ASTM D 2665 cast iron soil pipe (service weight), or ABS Schedule 40 sewer pipe conforming to ASTM D 2661. Only PVC or ABS shall be used when connecting to flexible pipe.

905.3.5 Fittings shall be compatible with the service line material. PVC or ABS fittings shall be schedule 40 injection molded only.

905.3.6 Service line laterals shall be cast iron soil pipe (service weight), PVC Schedule 40, or ABS Schedule 40.

905.4 INSTALLATION (NEW CONSTRUCTION STUB-OUTS)

905.4.1 Service lines shall be installed to the right-of-way line or 5 feet beyond any existing or proposed improvements (i.e., pavement, curb and gutter, sidewalk, etc.).

905.4.2 Saddle connections shall be installed at a 45 degree angle (upward) above the springline of the main sewer and shall be spaced a minimum of 3 feet apart (centerline to centerline).

905.4.3 Service lines shall be installed at a minimum slope of 2 percent with a minimum bury at the terminus of 4 feet, unless otherwise authorized by the ENGINEER. The pipe shall be placed on suitable bedding having a density of not less than 90 percent of maximum density, as determined by ASTM D 1557. The pipe shall be uniformly supported by the bedding. Backfill of the service line shall be carefully placed and compacted per the requirements of Section 701.

905.4.4 The terminus of the service line shall be plugged with an end cap compatible with the pipe size and material. An electronic marker disk shall be placed over the end of the service line and an "S" (3 inches high and 1/4 inch depth) shall be stamped or saw-cut into top of the curb surface directly over the service.

905.5 RISERS

905.5.1 Risers shall be utilized where the sewer main is 15 feet or greater in depth. The riser shall extend to an elevation such that the service line can be installed as specified in Subsection 905.4.3.

905.5.2 The riser shall be installed in accordance with the Standard Detail Drawings. The riser shall be one length of pipe cut to the appropriate length as necessary, unless otherwise approved by the ENGINEER.

905.6 SERVICE RECONNECTIONS

905.6.1 On replacement/rehabilitation type projects, all existing services shall be reconnected to the new sewer main utilizing new saddles and service line pipe. The length of removed existing service line shall be as necessary to accommodate the trench excavation and backfill conditions.

905.6.2 The CONTRACTOR shall visually observe the condition of the existing service line and notify the ENGINEER of any obviously deteriorated or defective conditions. The ENGINEER or CONTRACTOR shall notify the property owner of the situation and the property owner shall be afforded the opportunity to visually observe the service within a reasonable amount of time as dictated by normal construction activity.

905.6.3 The CONTRACTOR shall connect the new service line pipe to the existing pipe at the same slope and alignment as the existing service. Particular care shall be taken to assure a sound connection. The service line shall be uniformly supported on suitable bedding compacted to a density of not less than 90 percent of maximum density, as determined by ASTM D 1557. If service lines are reconnected such that the pipe is not fully supported, hand tampers shall be used to properly compact under the pipe.

905.6.4 The CONTRACTOR shall stamp or saw-cut an "S" (3 inches high and 1/4 inch depth) into top of curb surface directly over the service line.

905.7 RECORD INFORMATION: The CONTRACTOR shall provide accurate record information to the ENGINEER regarding both the horizontal and vertical location of the service. The horizontal location shall be by the distance to the nearest foot from both the upstream and downstream manhole lid center. Elevations to the nearest 0.10 foot shall be provided for the saddle, top of riser and invert of the service stub-out, as applicable.

905.8 MEASUREMENT AND PAYMENT

905.8.1 Sanitary sewer service lines installed on new construction shall be measured by the linear foot horizontally from the center of the sewer main, or top of riser, if applicable, to the end of the service line. Payment shall be made at the unit price per linear foot and shall include the saddle connection, pipe, trenching, compaction and backfill, electronic marker disk, testing, and all incidental work necessary to complete the installation.

905.8.2 Sanitary sewer service risers shall be measured by the vertical foot from the top of the sewer main to the top of the riser. Payment shall be made at the unit price per vertical foot, and shall include the pipe and casing (if required).

905.8.3 Sanitary sewer service reconnections shall be measured per each. Payment shall be made at the unit price per each reconnection shall include the saddle connection, new service pipe, connection to the existing service line, and all incidental work necessary for a complete reconnection.

SECTION 920

SANITARY AND STORM SEWER MANHOLES

920.1 GENERAL

This section contains items which are relative to the installation of sanitary and storm sewer manholes.

920.2 REFERENCES

920.2.1 ASTM

C 43	C 497
C 139	C 1557
C 478	

920.2.2 This publication

SECTION 101	SECTION 106
SECTION 102	SECTION 161
SECTION 105	

920.3 MANHOLE MATERIALS

Sewer manhole materials shall be as specified in other sections, as follows:

Portland Cement Concrete	Section 101
Steel Reinforcing	Section 102
Concrete Curing Compound	Section 105
Cement Mortar and Grout	Section 106
Gray Iron Castings	Section 161

920.4 MANHOLE CONSTRUCTION

920.4.1 GENERAL:

920.4.1.1 Soil Foundations for manhole base shall be compacted to a density of 95 percent of the maximum density per ASTM D 1557. Compaction limits shall be one foot beyond the perimeter of the concrete base and shall be a minimum of one foot in depth.

920.4.1.2 Manholes shall be constructed in accordance with the Standard Detail Drawings and as shown on the construction plans. Precast reinforced concrete units, concrete blocks or formed in-place, reinforced concrete may be used to construct the manhole.

920.4.1.3 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 on the construction plans.

920.4.1.4 All cement used for poured foundations. Mortar, fillets, grout, and concrete shelf construction shall be Type II or approved equal.

920.4.1.5 All concrete for formed in place foundations or bases, concrete shelves, and pipe supports shall be 3000 psi compressive strength concrete.

920.4.1.6 Depending on the size of the pipe, connections to existing and new manholes shall be made by either core drilling through the manhole wall, per-formed for new precast units, or for large-size pipe the manhole wall may be removed by carefully chipping the wall segment which will permit entry of the pipe. In the latter operation, exposed manhole reinforcement should be bent and tied to the reinforcement of the pipe collar. If core drilling is not practical, the CONTRACTOR shall request the ENGINEER to authorize the chipping operation. During either operation the CONTRACTOR shall take care to avoid unnecessary damage to the manhole surfaces or walls.

920.4.2 PRECAST CONCRETE MANHOLES:

920.4.2.1 The vertical sections of the manhole may be of different dimensions in order that manholes of various depths can be readily assembled.

920.4.2.2 Concrete, used for precast bases, vertical sections, and eccentric cones, shall be 4000 psi compressive strength concrete.

920.4.2.3 Vertical sections of the manhole shall conform to the requirements of ASTM C 478.

920.4.2.4 The CONTRACTOR shall submit shop drawings of the precast base and eccentric cone to the ENGINEER for review and approval.

920.4.2.5 Circular precast manhole sections shall be provided with mastic gasket to seal joints between sections, such as RAM-NEK, KENT SEAL, or approved equal.

920.4.2.6 All lifting holes, except Type "C" manhole covers, and gaps at joints shall be filled with a nonshrink grout.

920.4.2.7 Precast concrete manhole bases may be used when approved by the ENGINEER. If approved, it shall be with the understanding that the CONTRACTOR shall be responsible for placing the bases at the specified elevation, location, and alignment.

920.4.3 FORMED INPLACE REINFORCED CONCRETE MANHOLE:

920.4.3.1 The CONTRACTOR shall submit preconstruction drawings of the proposed manholes to the ENGINEER for review and approval.

920.4.3.2 Concrete used for this type of manhole construction shall be 4000 psi compressive strength concrete.

920.4.3.3 If desired, a precast eccentric cone or a flat cover can be used.

920.4.4 CONCRETE BLOCK MANHOLE:

920.4.4.1 The CONTRACTOR shall submit preconstruction drawings of the proposed manhole to the ENGINEER for review and approval.

920.4.4.2 Concrete masonry units for the construction of this type of manhole shall conform to ASTM C 139 and the Standard Detail Drawings. All blocks shall be mortared into place.

920.4.4.3 Eccentric cone or flat-type cover shall be used.

920.4.5 TEE PIPE MANHOLE:

920.4.5.1 Tee pipe manholes will be used for all 4-foot-diameter mainline pipes and larger. Horizontal section of the tee pipe shall be the same class of pipe as the adjacent sections. The vertical sections shall comply with the requirements set forth in ASTM C 478.

920.4.5.2 Top of the vertical portion of tee pipe unit will extend a minimum of 18 inches above the outside diameter of the horizontal pipe. The 4-foot-diameter vertical section of the tee pipe shall be connected at the longitudinal center point of the horizontal pipe section. The minimum length of horizontal pipe section shall be 8 feet.

920.4.5.3 The CONTRACTOR shall submit to the ENGINEER for review and approval preconstruction shop drawings on the fabrication of the tee pipe section as developed by a precast reinforced concrete pipe manufacturer. Field fabrication of this eccentric pipe unit will not be accepted. Shop drawings for the eccentric cone will also be submitted for review and approval.

920.4.5.4 RAM-NEK, Kent Seal, or OWNER - approved equal sealants shall be used to seal the joints in the vertical portion of this manhole.

920.4.5.5 All lifting holes, except for Type "C" manhole covers, and gaps at joints shall be filled with a nonshrink grout.

920.4.5.6 Standard Detail Drawings show some of the components of the tee-type pipe manhole.

920.4.6 COATING OF MANHOLES:

920.4.6.1 Exterior of Manholes: Exterior coating of manholes shall be required in areas where ground water is present. The coating shall be a water-proofing type of bitumastic or asphaltic material, as approved by the ENGINEER. Application shall be in accordance with the manufacturer's published recommendations.

920.4.6.2 Interior of Manholes: Interior coating of manholes shall be required only when specified on the construction plans. The coating shall be an epoxy resin-type material, be an epoxy resin-type material such as: "Zebron," "Plastite 7122," or approved equal, and shall be capable of protecting the concrete from deterioration due to a gaseous environment. Application shall be in accordance with the manufacturer's published recommendations.

920.4.6.3 Plastering of Manholes: The work shall include the coating of the surface of existing block manholes with plaster as required on the plans.

920.4.7 MANHOLE STEPS:

920.4.7.1 Manhole steps shall be 1/2" diameter, grade 60, reinforcing rod completely encapsulated in copolymer polypropylene or corrosion resistant rubber compound. Steps shall be designed to be cast in place or hammered into holes in manhole walls.

920.4.7.2 Approved manhole steps of only one manufacturer model shall be used on any specific project and shall not be intermixed with other approved steps. Approved steps must bear the manufacturer name and model on the exposed surface of the step and shall be one of the following products or approved equals: M.A. Industries, Inc. -Model PS-2-PFS H. Bowen Co.-Bowco, Model 81213 or 93813 Delta Pipe Products -WEDG-LOK, Model W-II

920.4.7.3 The minimum width of step tread shall be 11 inches. Steps will be spaced uniformly in each manhole. Spacing may be between 12 inches to 16 inches on center. Lower step will be 12 inches above manhole shelf or top of main. The upper step shall be 6 inches below the top portion of the eccentric cone or 6 inches below the bottom

of the flat cover. Also the steps shall be aligned vertically with the opening of the cone or cover.

920.4.7.4 Steps shall be embedded in the manhole wall a minimum of 3" inches and protrude from the manhole interior surface a minimum of 4 3/4 inches.

920.4.7.5 Holes for step installation shall be drilled or precast per manufacturer's recommended size. or of sufficient size to allow for step insertion into the wall. Cast-in-place sockets or tapered holes recommended by the step manufacturer may be used with prior approval of ENGINEER. If the hole has been drilled too large, then the step shall be secured in place by using epoxy grout for the full depth of the drilled hole.

920.4.6 Acceptable manhole step installations must be capable of withstanding a 400 pound. horizontal, pull out load applied in accordance with ASTM C-497.

920.4.8 ADJUSTMENT BRICKS:

920.4.8.1 Manhole adjustment bricks shall conform to the requirements for manhole bricks. per ASTM C 32 for Grade MS.

920.4.8.2 Mortar shall be used to lay the bricks. as well as coating the interior and exterior surfaces of the laid brick. Thickness of the mortar coating shall be 1/2 inch.

920.4. 9 MANHOLE FRAME AND COVER:

The manhole frame and cover for either the sanitary or storm sewer manholes shall conform to the specifications contained in Section 161.

920.5 TESTING OF SEWER MANHOLES:

920.5.1 All sanitary sewer manholes shall be tested for leakage by either a water exfiltration test or a vacuum test. Whichever test is utilized it is recommended that the test be performed prior to backfilling around the manhole and prior to placement of the manhole frame and cover. All inlet and outlet lines shall be properly plugged and the lift holes and barrel joints filled and sealed as specified. The CONTRACTOR shall be responsible for all materials and equipment necessary to perform the test and shall conduct the test in the presence of the ENGINEER or his representative. The CONTRACTOR has the option of performing a manhole test in increments appropriate to the depth of the manhole.

920.5.2 The water exfiltration test shall consist of filling the entire manhole with water to the bottom of the frame elevation. A stabilization period of one hour will be allowed for absorption. After which the manhole shall be refilled as necessary before starting the test. The test period shall be two (2) hours. After which the manhole shall be refilled, measuring the necessary quantity of water. The allowable leakage shall be 0.25 gallons per foot diameter per vertical foot per day, and is represented by the following formula:

$$V = 0.25 \text{ DHT}/24$$

where; V = Allowable loss in gallons

D = Manhole diameter in feet

H = Initial depth of water to invert in feet

T = Duration of test in hours

920.5.3 The vacuum test shall consist of utilizing an inflatable compression band, vacuum pump, gauges and appurtenances specifically designed for vacuum testing. Test procedures shall be in accordance with the manufacturer's printed recommendations. The ENGINEER shall be the sole judge as to the adequacy of the equipment.

920.5.3.1 A vacuum of 10" Hg shall be placed in the manhole and the time measured for a drop to 8.5" Hg. The test shall be considered to be successful if the measured time exceeds the test period. Should the test fail, the man- hole shall be repaired as necessary and the test rerun. The test periods are:

920.5.3.2 Sixty (60) seconds for four (4) foot diameter manholes.

920.5.3.3 Seventy-five (75) seconds for five (5) foot diameter manholes.

920.5.3.4 Ninety (90) seconds for six (6) foot diameter manholes.

920.5.3.5 One hundred and Twenty (120) seconds for eight (8) foot diameter manholes.

920.5.4 Normally storm sewer manholes need not be tested unless specifically required by the project plans or supplemental technical specifications. However, if in the opinion of the ENGINEER, the workmanship or materials do not appear to be satisfactory, the ENGINEER may require that any storm sewer manhole be tested in a similar manner as that for a sanitary sewer manhole.

920.6 ABANDONMENT OF MANHOLES

920.6.1 Abandonment of manhole, which is part of a sewer line being abandoned, shall entail the following work and materials:

920.6.2 Manhole will not be removed but will be abandoned in place.

920.6.3 All manhole inlet and outlet lines shall be plugged with a 12-inch- thick concrete or concrete mortar plug.

920.6.4 Salvageable material shall be stockpiled on the job site. The CONTRACTOR shall contact the OWNER to arrange for a representative to inspect the materials for usability. Salvageable materials shall be transported by the CONTRACTOR as directed by the OWNER. CONTRACTOR will receive a receipt for the turned-in materials. Receipts will be submitted to the ENGINEER prior to final acceptance of the Project. Unusable materials will be disposed of by the CONTRACTOR.

920.6.5 Manhole bottom will be pulverized.

920.6.6 The manhole shall be filled with cement treated base (CTB) material to the bottom elevation of the asphalt base course of the pavement or to the ground surface level.

920.6.7 All labor, materials, and equipment necessary to complete this work shall be furnished by the CONTRACTOR.

920.6.8 For historical information the ENGINEER shall have a survey performed which will locate the abandoned manhole, relative to permanent survey markers.

920.7 SEWER MANHOLE REHABILITATION IN REPLACEMENT WORK

920.7.1 The work under this item shall be to replace the existing manhole frame and cover and to place a concrete pad around the existing manhole as required per the construction plans. This work will be done only when an existing manhole is encountered in the normal course of the replacement work that has a light- weight, vented, multi-holed manhole cover.

920.7.2 The work and materials shall include the following:

920.7.2.1 Remove any and all existing brick under frame and replace with new Grade MS brick as necessary to bring new frame and cover up to street grade.

920.7.2.2 Remove and replace existing concrete pad, or construct a new pad.

920.7.2.3 Remove existing steps and replace with new steps or, if steps are nonexistent, install new steps. Steps will be installed as per Subsection 815.4.7.

920.7.2.4 Remove and replace pavement.

920.7.2.5 Excavation and compaction of backfill as necessary.

920.7.2.6 All materials, labor, and equipment necessary to do the work under this item shall be furnished by the CONTRACTOR.

920.7.2.7 The work and materials under this item shall be done according to the manner set forth in the Standard Detail Drawings and other sections of these specifications.

920.7.3 Salvageable material shall be stockpiled on the job site. The CONTRACTOR shall contact the OWNER to arrange for a representative to inspect the materials for usability. Salvageable materials shall be transported by the CONTRACTOR as directed by OWNER. CONTRACTOR will receive a receipt for the turned-in materials. Receipts will be submitted to the ENGINEER prior to final acceptance of the Project. Unusable materials will be disposed of by the CONTRACTOR.

920.8 MEASUREMENT AND PAYMENT

920.8.1 NEW MANHOLES:

920.8.1.1 Type "C," "E," "F," or "G" manholes of 4-foot or 6-foot diameters shall be measured per each within the following increments of depth: 3 to 6 feet, 6 to 10 feet, and 10 to 14 feet. Manholes which are greater in depth than 1 foot shall be measured by the vertical foot. Measurements will be made to the nearest foot and will be from the manhole rim elevation to the manhole invert elevation.

920.8.1.2 Payment for manholes 14 feet deep or less will be made on the unit price per manhole diameter per depth increment as specified in the Bid Proposal. Payment for manhole depths which exceed 14 feet will be made on the unit price per manhole diameter per vertical foot. This payment is in addition to the manhole unit price for the portion above the 14 foot depth.

920.8.1.3 Type "A" or Tee-type manholes shall be measured and paid for by the methods described

in 920.8.1.1 and 920.8.1.2. Measurement will be from the invert of the main line to the manhole rim. Payment under this item will include the normal manhole costs described below, as well as any additional pipe costs for the precast tee and for the concrete cradle under the tee.

920.8.1.4 Payment for any type diameter or depth of manhole will include excavation, compacted backfilling, shelving, cover or cone, leveling bricks, frame and cover, and concrete pad or collar.

920.8.2 ELEVATION ADJUSTMENTS:

920.8.2.1 When a new manhole is installed, no measurement or payment will be made for rim elevation adjustments to conform to street surface grades.

920.8.2.2 The following measurements and payments for rim elevation adjustments on existing manholes will be made for indicated conditions:

920.8.2.2.1 Unit price per inch of adjustment ring for adjustment to manhole frame by the addition of adjustment ring.

920.8.2.2.2 Unit price per inch of leveling brick adjustment.

920.8.2.2.3 Unit price per manhole diameter per vertical foot of adjustment to cone and/or barrel.

920.8.2.3 As required, the following items will be included in the unit price per appropriate adjustment: pavement removal and replacement, excavation, compacted backfilling, concrete collar or pad, leveling bricks, adjusting rings, and/or frame and cover.

920.8.3 COATING OF MANHOLE: Plastering or epoxy coating for manholes shall be measured and paid for on the unit price per square foot of surface area covered.

920.8.4 MANHOLE STEPS: Unless otherwise shown on the Bid Proposal, the cost of manhole steps shall be incidental to the unit prices for construction of manholes of various types and depths.

920.8.5 ABANDONMENT OF MANHOLES: Measurement and payment for abandonment of a manhole shall be the unit price per manhole for defined work in Subsection 920.6.

920.8.6 MANHOLE REHABILITATION IN REPLACEMENT WORK: Work under this item shall be measured and paid for by the unit price per manhole for work specified in the Bid Proposal.

920.8.7 TESTING: There will be no payment for required testing of sewer manholes.

**GEOTECHNICAL
ENGINEERING SERVICES
JOB NO. 1-71212
POWERLINE ROAD MANHOLES
SANTA FE, NEW MEXICO**

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**PREPARED FOR

SANTA FE COUNTY
PUBLIC WORKS PROJECT DIVISION**

January 23, 2018
Job No.1-71212

Santa Fe County
Public Works Projects Division
901 West Alameda, Suite 276
Santa Fe, New Mexico 87501

ATTN: David L. Madrid, Project Manager III

RE: Geotechnical Engineering Services
Powerline Road Manholes
Santa Fe, New Mexico

Dear Mr. Madrid:

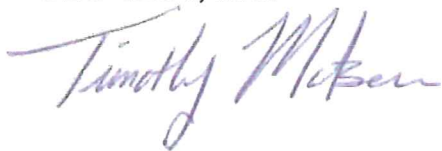
Submitted herein is the Geotechnical Engineering Services Report for the above referenced project. The report contains the results of our field investigation, laboratory testing, and recommendations to aid in the design for manhole construction, as well as criteria for site grading.

It has been a pleasure to serve you on this project. If you should have any questions, please contact this office.

Respectfully submitted:

Reviewed by:

GEO-TEST, INC.



Timothy Matson, Staff Engineer



Patrick J. Byres, PE



cc: Addressee

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INTRODUCTION

This report presents the results of the geotechnical investigation performed by this firm for the proposed Type E manholes to be located in Santa Fe, New Mexico.

The objectives of this investigation were to:

- 1) Evaluate the nature and engineering properties of the subsurface soils underlying the site.
- 2) Provide recommendations to aid in foundation design as well as criteria for site grading.

The investigation includes subsurface exploration, selected soil sampling, laboratory testing of the samples, performing an engineering analysis and preparation of this report.

PROPOSED CONSTRUCTION

It is understood that the project consists of the construction of two Type E manholes. The manholes will be about 10 feet below existing site grade for MH-2 and about 15 deep for MH-3. The manholes will be founded on an 8-inch thick reinforced concrete mat foundation. If the manhole is cast in-place the foundation will bear on densified native soils and if the manhole is pre-cast the mat foundation will bear on pea gravel. Unit loading at the base of the manhole is unknown at this time, but is expected to be relatively light.

Should structural loads or other project details vary significantly from those outlined above, this firm should be notified for review and possible revision of recommendations contained herein.

FIELD EXPLORATION

Two exploratory boring were drilled to depths ranging from approximately 20½ to feet below existing site grade. The location of the borings are shown on the attached Boring Location Map, Figure 1. The soils encountered in the boring were continuously examined, visually classified and logged during the drilling operation. The boring logs are presented in a following section of this report. Drilling was accomplished using a truck mounted drill rig equipped with 5.5-inch diameter continuous flight hollow stem auger. Subsurface materials were sampled at five-foot intervals or less utilizing an open tube split barrel sampler driven by a standard penetration test hammer.

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LABORATORY TESTING

Selected samples were tested in the laboratory to determine certain engineering properties of the soils. Moisture contents were determined to evaluate the various soil deposits with depth. The results of these tests are shown on the boring log.

Sieve analysis and Atterberg limits tests were performed to aid in soil classification. The results of these tests are presented in the Summary of Laboratory Results and on the individual test reports presented in a following section of this report.

SITE CONDITIONS

A brief surface reconnaissance was performed during our site exploration. The site is located on a relatively flat parcel of land west of Lopez Lane and east of Powerline Road, southeast of Vista Aurora Subdivision. The site slopes gently to the west, southwest with about 6 vertical feet of relief between manholes.

SUBSURFACE SOIL CONDITIONS

As indicated by the exploratory boring, the soils underlying the site consist of a surface layer consisting of about 3 to 5½ feet of silty, clayey sand. These soils are non-plastic to low in plasticity and range medium dense to dense. Directly below the silty, clayey sands, gravels with various amounts of silt, clay, sand and lesser amounts of cobbles were encountered. These soils were generally non-plastic to low in plasticity, very dense and extended to depths ranging from about 13 to 16 feet below existing site grades. Very difficult drilling was experience in these soils. Below the gravels, low plasticity, very dense silty, clayey sands with various amounts of gravel were encountered and extended to full depth explored. Although the silty, clayey sands were logged as very dense soils, some of these materials, particularly below about 13 to 16 feet below existing site grades, are believed to consist of weathered bedrock of the Santa Fe Formation. The Santa Fe Formation is a sedimentary rock deposited approximately 1 to 5 million years ago, and has the engineering properties of a very dense soil or weak rock.

Free groundwater was not encountered and soil moisture contents were relatively low throughout the extent of the borings.

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CONCLUSIONS AND RECOMMENDATIONS

The soils encountered at the elevations of the proposed manholes are very dense and thus, are considered suitable to provide reliable support of the manholes.

The structure should be supported on a rigid reinforced mat foundation as planned, bearing directly on the densified native soils or on structural fill. Detailed recommendations concerning site preparation and foundation design are presented in the following sections of this report.

FOUNDATIONS

The manholes can be supported on reinforced concrete mat foundations bearing on densified native soils or on structural fill. An allowable bearing pressure of 4,000 pounds per square foot should not be exceeded in design. This bearing pressure applies to full dead plus realistic live loads and can be safely increased by one-third for total loads including wind and seismic forces.

Settlement of foundations designed and constructed as recommended herein are estimated not to exceed 1.0 inch while differential movements should be less than 3/4 inch.

LATERAL LOADS

Resistance to lateral forces will be provided by soil friction between the base of the mat foundation and passive earth resistance. A coefficient of friction of 0.40 should be used for computing the lateral resistance between bases of mat foundation with the soil. With backfill placed as recommended in the site grading section of this report, a passive soil resistance equivalent to a fluid weighing 325 pounds per cubic foot should be used for analysis.

Lateral earth pressure against manhole walls on the project will depend upon their degree of restraint. Walls which are restrained so as to limit movement at the top to less than 0.001 times the height of the wall should be designed for an "at rest" earth pressure of 55 pounds per square foot per foot of depth. Walls free to move at the top should be designed of an "active" earth pressure equal to 35 pounds per square foot per foot of depth. These pressures assume horizontal backfill and no build-up of hydrostatic pressures behind the walls.

During backfilling, the contractor should be limited to the use of hand operated compaction equipment within a zone of about 3 feet horizontally

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from the back of the manhole walls. The use of heavier equipment could apply lateral pressures well in excess of the recommended design earth pressure, particularly over the upper portions of the walls.

CONSTRUCTION EXCAVATIONS

The results of this investigation indicate that the surficial soils encountered in the borings can be readily excavated using normal earth moving and excavation equipment. In addition, most of the excavated soils will be suitable for use as backfill above pipe embedment materials.

Excavated slopes for utility construction should be designed and constructed in accordance with 29 CFR 1926, Subpart P, and any applicable state or local regulations. Temporary cut slopes should not exceed 2:1 (horizontal to vertical). Shoring, bracing or benching should be performed by the contractor for in accordance with the strictest governing safety standards.

SITE-GRADING

The following general guidelines should be included in the project construction specifications to provide a basis for quality control during site grading. It is recommended that all structural fill and backfill be placed and compacted under engineering observation and in accordance with the following:

- 1) After site stripping and the making the required excavations for construction of the manholes, the exposed native soils should be densified. Densification of the cut surface should consist of moisture conditioning to near the optimum moisture content, and compacting the subgrade to a minimum of 95 percent of maximum dry density as determined in accordance with ASTM D-1557, prior to construction or placement of structural fill.
- 2) Densification of the exposed native soils should consist of scarifying to a depth of 8 inches, moisture conditioning to the optimum moisture content and compacting the area to a minimum of 90 percent of maximum dry density as determined in accordance with ASTM D-1557.
- 3) The results of this investigation indicate that most of the on-site soils will be suitable for reuse as structural fill; however, blending of materials and/or removal of oversized material may be required to meet the specifications for structural fill. All structural fill and backfill material should be free of vegetation and debris and contain no rocks

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larger than 3 inches. The gradation of the material, as determined in accordance with ASTM D-422, should be as follows:

Size	Percent Passing
3-inch	100
No. 4	60 - 100
No. 200	5 - 35

- 4) The plasticity index should be no greater than 15 when tested in accordance with ASTM D-4318.
- 5) Fill or backfill, consisting of soil approved by the geotechnical engineer, shall be placed in 8-inch loose lifts and compacted with approved compaction equipment. Loose lifts should be reduced to 4-inches if hand held compaction equipment is used. All compaction of fill or backfill below the bottom of the pedestal footing and vault shall be accomplished to a minimum of 95 percent of the maximum dry density as determined in accordance with ASTM D-1557. The moisture content of the fill or backfill, during compaction, should be within 2 percent of the optimum moisture content. Backfill above the base of the vault shall be compacted to a minimum of 90 percent of the maximum dry density.
- 6) Tests for degree of compaction should be determined by the ASTM D-1556 method or ASTM D-2922. Observation and field tests should be conducted during fill and backfill placement by the geotechnical engineer to assist the contractor in evaluating the required degree of compaction. If less than 95 percent is indicated, additional compaction effort should be made with adjustment of the moisture content as necessary until 95 percent compaction is obtained.

FOUNDATION REVIEW AND INSPECTION

This report has been prepared to aid in the evaluation of this site and to assist in the design of this project. It is recommended that the geotechnical engineer be provided the opportunity to review the final design drawings and specifications in order to evaluate whether the recommendations in this report are applicable to the final design. Review of the final design drawings and specifications should be noted in writing by the geotechnical engineer.

Variations from soil conditions presented herein may be encountered during

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construction of this project. In order to permit correlation between the conditions encountered during construction and to confirm recommendations presented herein, it is recommended that the geotechnical engineer be retained to perform sufficient review during construction of this project. Observation and testing should be performed during construction to confirm that suitable fill soils are placed upon competent materials and properly compacted and foundation elements penetrate the recommended soils.

CLOSURE

Our conclusions, recommendations and opinions presented herein are:

- 1) Based upon our evaluation and interpretation of the findings of the field and laboratory program.
- 2) Based upon an interpolation of soil conditions between and beyond the explorations.
- 3) Subject to confirmation of the conditions encountered during construction.
- 4) Based upon the assumption that sufficient observation will be provided during construction.
- 5) Prepared in accordance with generally accepted professional geotechnical engineering principles and practice.

This report has been prepared for the sole use of Santa Fe County, specifically for the design of Type E Manholes to be constructed in Santa Fe, New Mexico, and not for the use by any third parties.

We make no other warranty, either express or implied. Any person using this report for bidding or construction purposes should perform such independent investigation as he deems necessary to satisfy himself as to the surface and subsurface conditions to be encountered and the procedures to be used in the performance of work on this project. If conditions are encountered during construction that appears to be different than indicated by this report, this office should be notified.

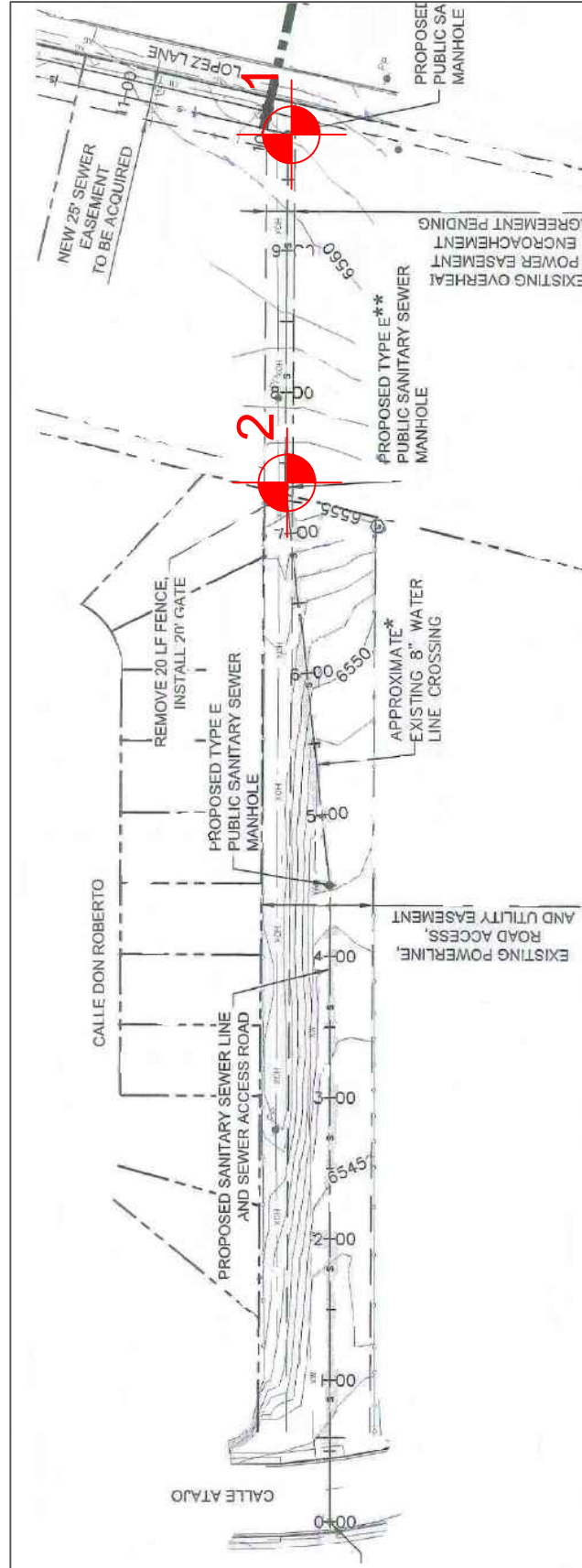
All soil samples will be discarded 60 days after the date of this report unless we receive a specific request to retain the samples for a longer period of time.

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BORING LOCATION MAP

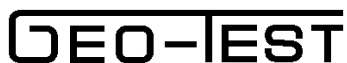


Powerline Road Sewer Manholes
 Santa Fe, New Mexico
 Job No. 1-71212

Figure 1



GEO-TEST
 GEOTECHNICAL ENGINEERING
 AND MATERIAL TESTING



Project: Powerline Road Manholes

Date: 01/09/2018

Elevation:

Project No: 1-71212

Type: 5.5" OD HSA

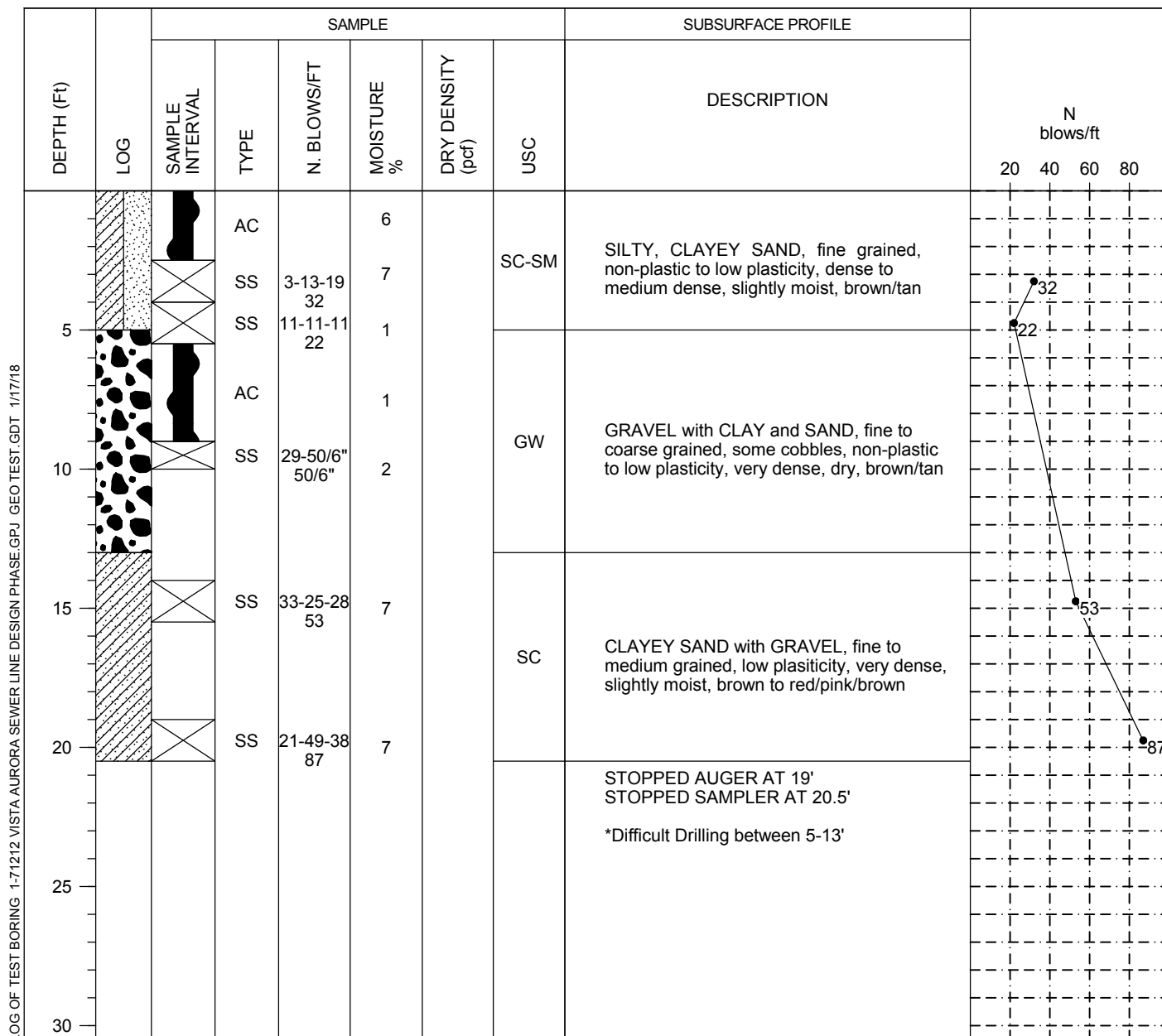
LOG OF TEST BORINGS

GROUNDWATER DEPTH

NO: 01

During Drilling: None

After 24 Hours:

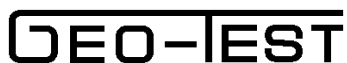


LEGEND

SS - Split Spoon
AC - Auger Cuttings
UD/SL - Undisturbed Sleeve

AMSL - Above Mean Sea Level
CS - Continuous Sampler
UD - Undisturbed
ST - Shelby Tube

Stratification lines represent approximate boundaries between soil types. Transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.



Project: Powerline Road Manholes

Date: 01/09/2018

Elevation:

Project No: 1-71212

Type: 5.5" OD HSA

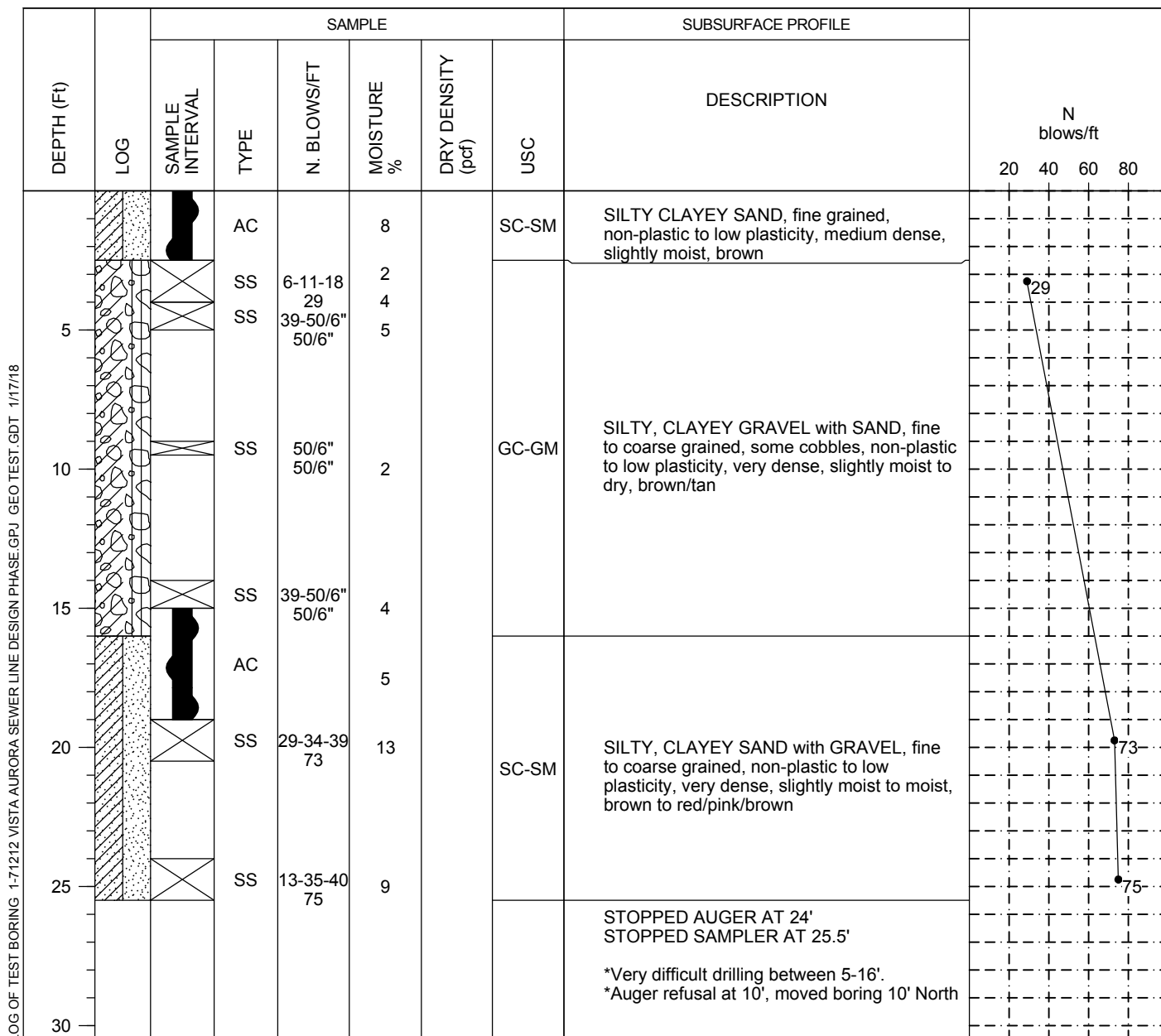
LOG OF TEST BORINGS

GROUNDWATER DEPTH

NO: 02

During Drilling: None

After 24 Hours:

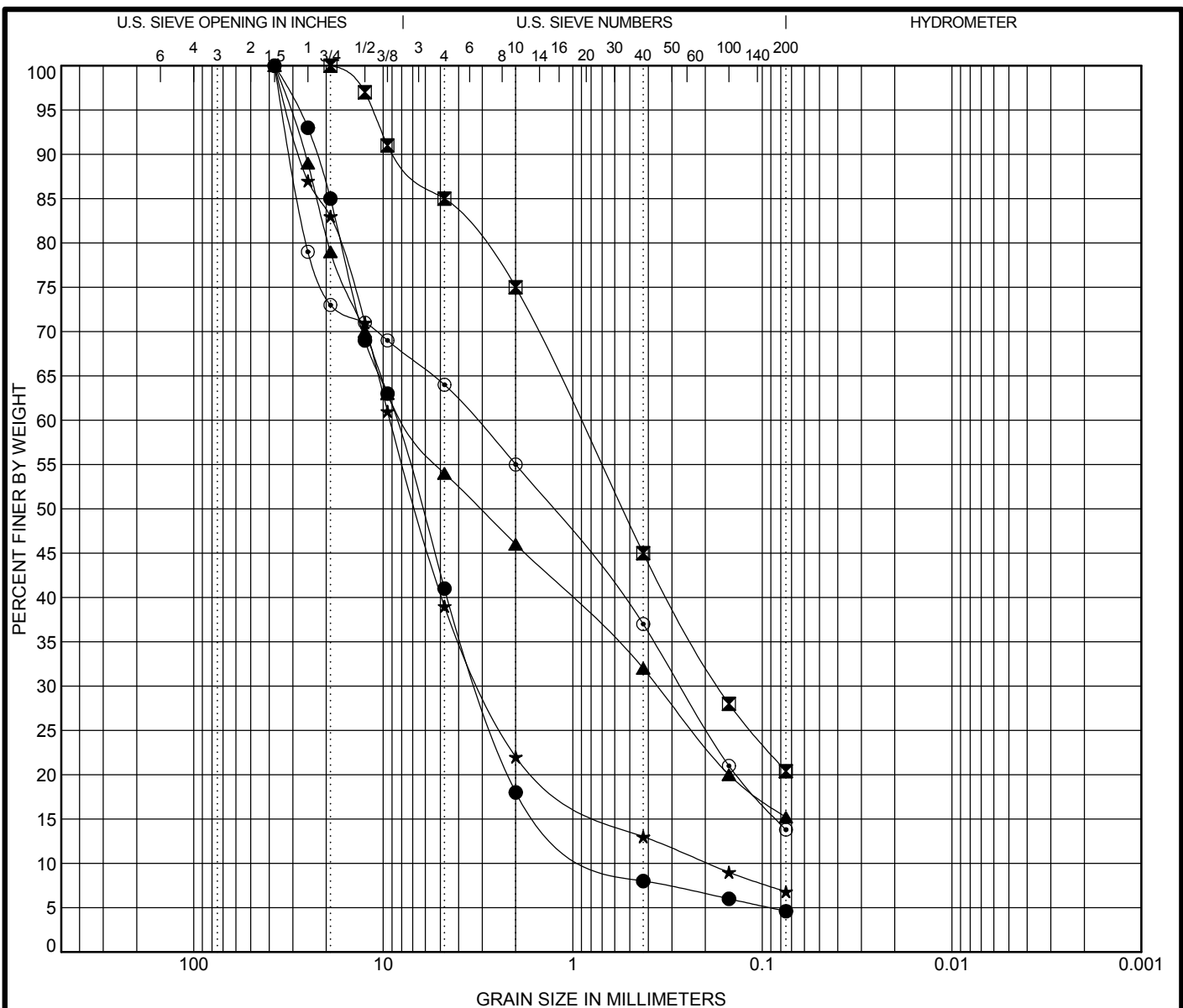


LEGEND

SS - Split Spoon
AC - Auger Cuttings
UD/SL - Undisturbed Sleeve

AMSL - Above Mean Sea Level
CS - Continuous Sampler
UD - Undisturbed
ST - Shelby Tube

Stratification lines represent approximate boundaries between soil types. Transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification			Classification			LL	PL	PI	Cc	Cu
●	01	5.0 - 10.0	WELL-GRADED GRAVEL with SAND(GW)			22	16	6	1.97	14.92
⊠	01	15.0	CLAYEY SAND with GRAVEL(SC)			33	21	12		
▲	02	2.5 - 5.0	SILTY, CLAYEY GRAVEL with SAND(GC-GM)			23	18	5		
★	02	10.0	POORLY GRADED GRAVEL with SILTY CLAY and SAND(GP-GC)			22	18	4	5.04	47.30
⊙	02	15.0	SILTY SAND with GRAVEL(SM)			NP	NP	NP		
Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	01	5.0 - 10.0	37.5	8.643	3.141	0.579	59.0	36.4	4.6	
⊠	01	15.0	19	0.922	0.17		15.0	64.6	20.4	
▲	02	2.5 - 5.0	37.5	7.54	0.357		46.0	38.8	15.2	
★	02	10.0	37.5	9.205	3.005	0.195	61.0	32.2	6.8	
⊙	02	15.0	37.5	3.234	0.269		36.0	50.2	13.8	

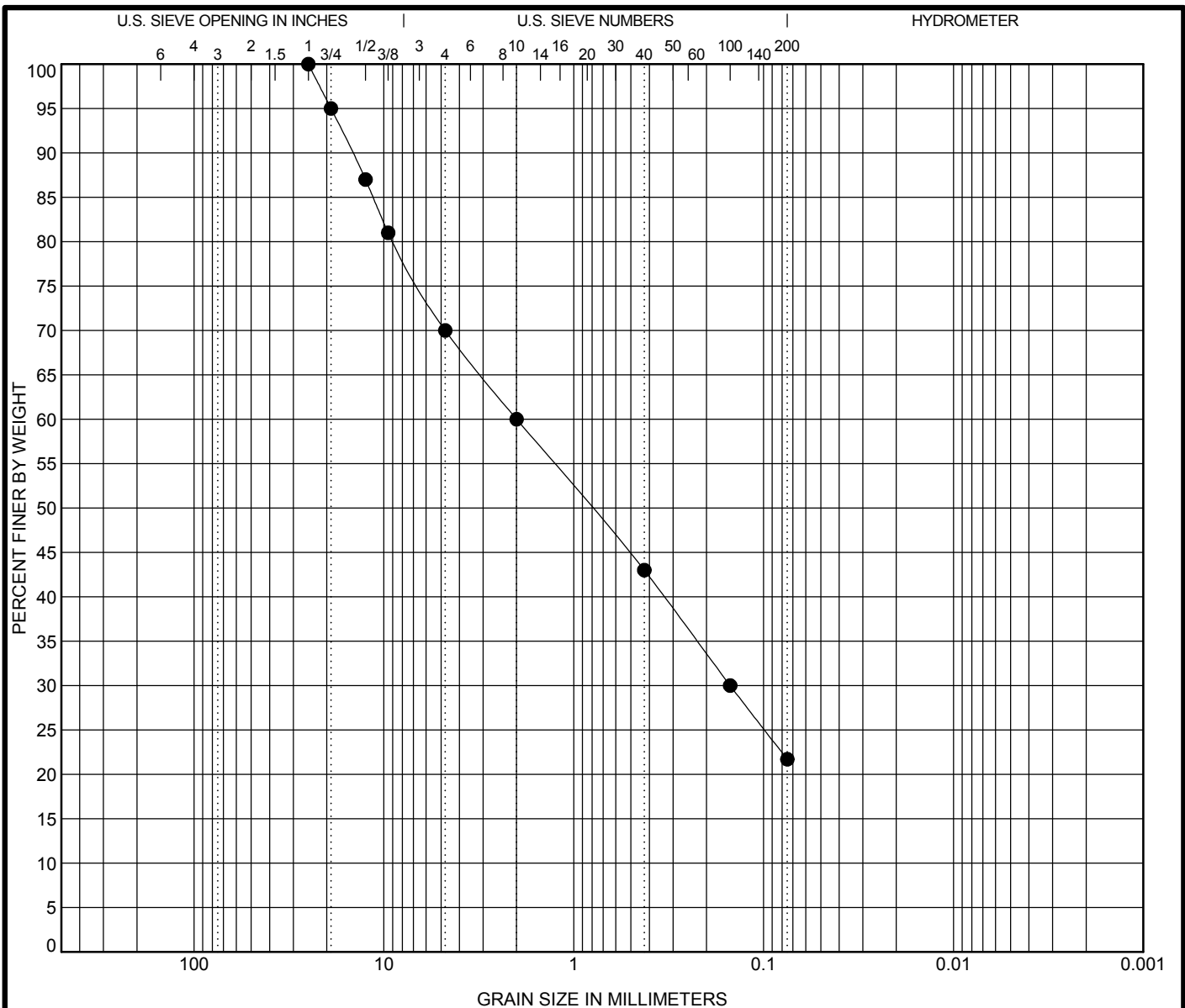
GEO-TEST

GRAIN SIZE DISTRIBUTION

Project: Powerline Road Manholes

Location: Santa Fe, New Mexico

Number: 1-71212



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Classification					LL	PL	PI	Cc	Cu
● 02 15.0 - 20.0	SILTY, CLAYEY SAND with GRAVEL(SC-SM)					26	19	7		

Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● 02 15.0 - 20.0	25	2	0.15		30.0	48.3	21.7	

GEO-TEST

GRAIN SIZE DISTRIBUTION

Project: Powerline Road Manholes

Location: Santa Fe, New Mexico

Number: 1-71212

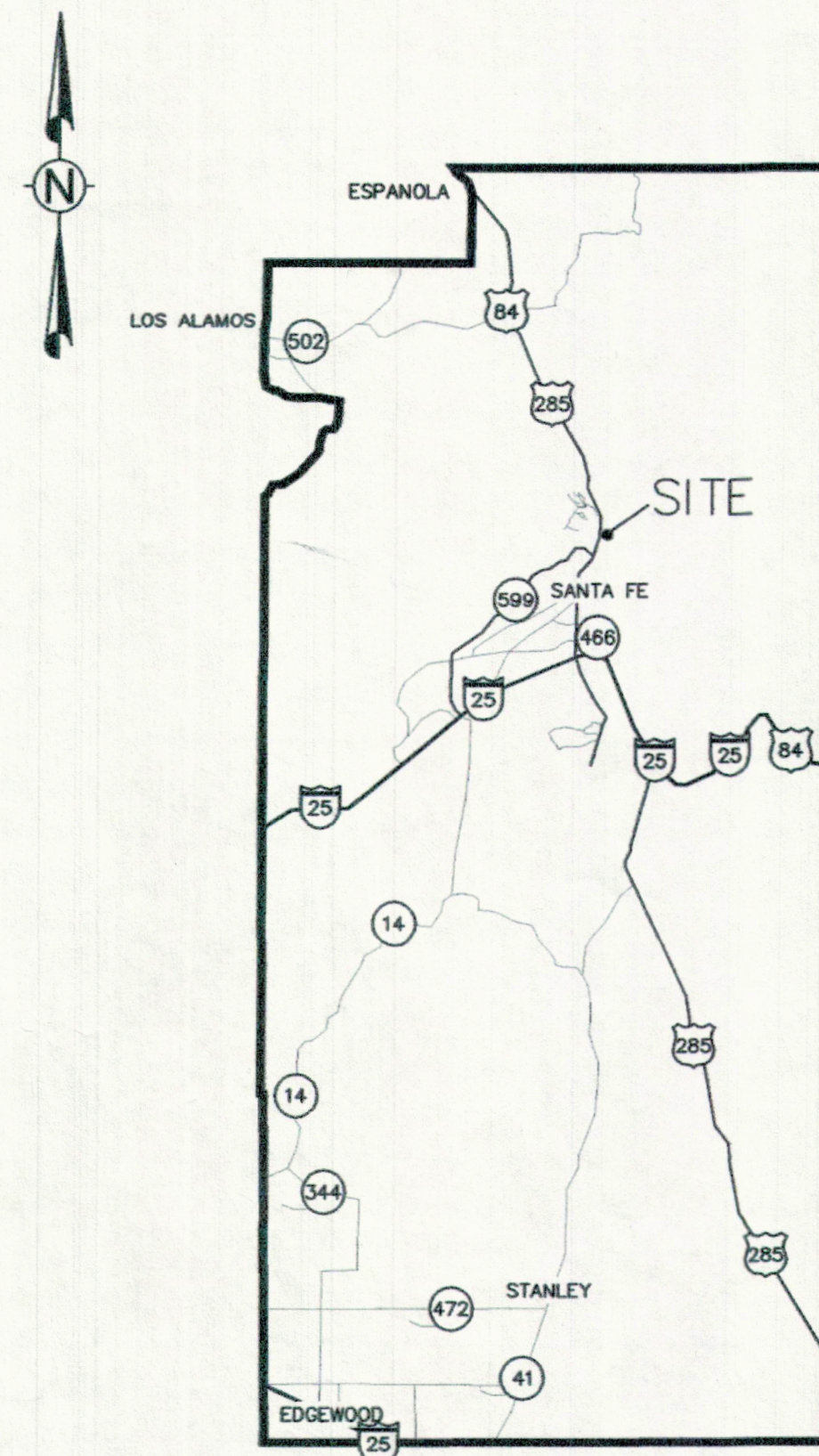
SANTA FE COUNTY, NEW MEXICO

VISTA AURORA SUBDIVISION

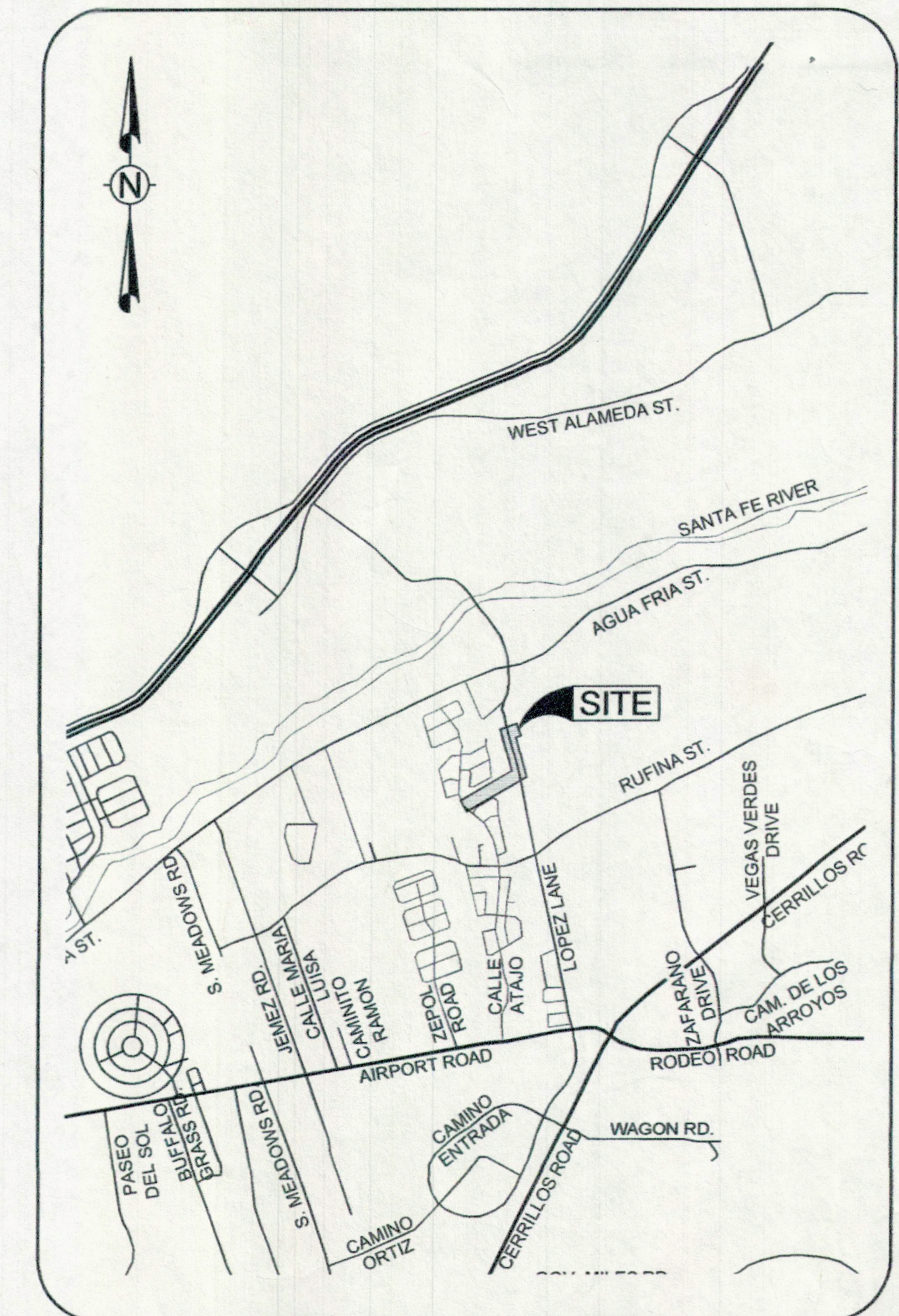
SANITARY SEWER UPGRADE

PROJECT NUMBER: 2016-0171 PW/IC

FINAL DESIGN - JUNE 2018



PROJECT VICINITY



PROJECT AREA

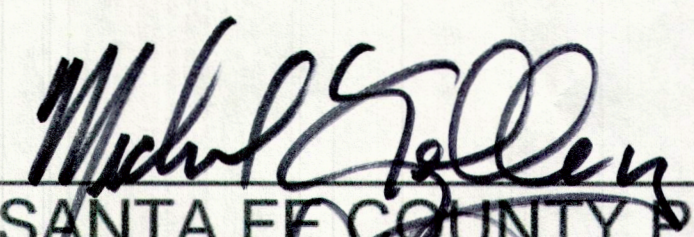


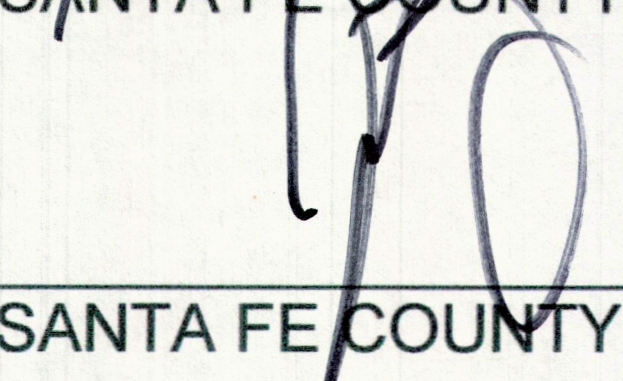
INDEX OF SHEETS


1-1	COVER SHEET AND INDEX OF SHEETS
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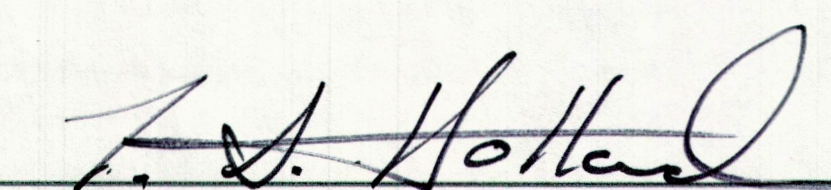
PREPARED FOR:

SANTA FE COUNTY PUBLIC WORKS DEPARTMENT
424 NEW MEXICO 599 FRONTAGE ROAD
SANTA FE, NEW MEXICO 87507


SANTA FE COUNTY PUBLIC WORKS DIRECTOR 7/5/18 DATE


SANTA FE COUNTY UTILITIES DIVISION DIRECTOR 7/5/18 DATE


SANTA FE COUNTY LAND USE ADMINISTRATOR 7-6-18 DATE

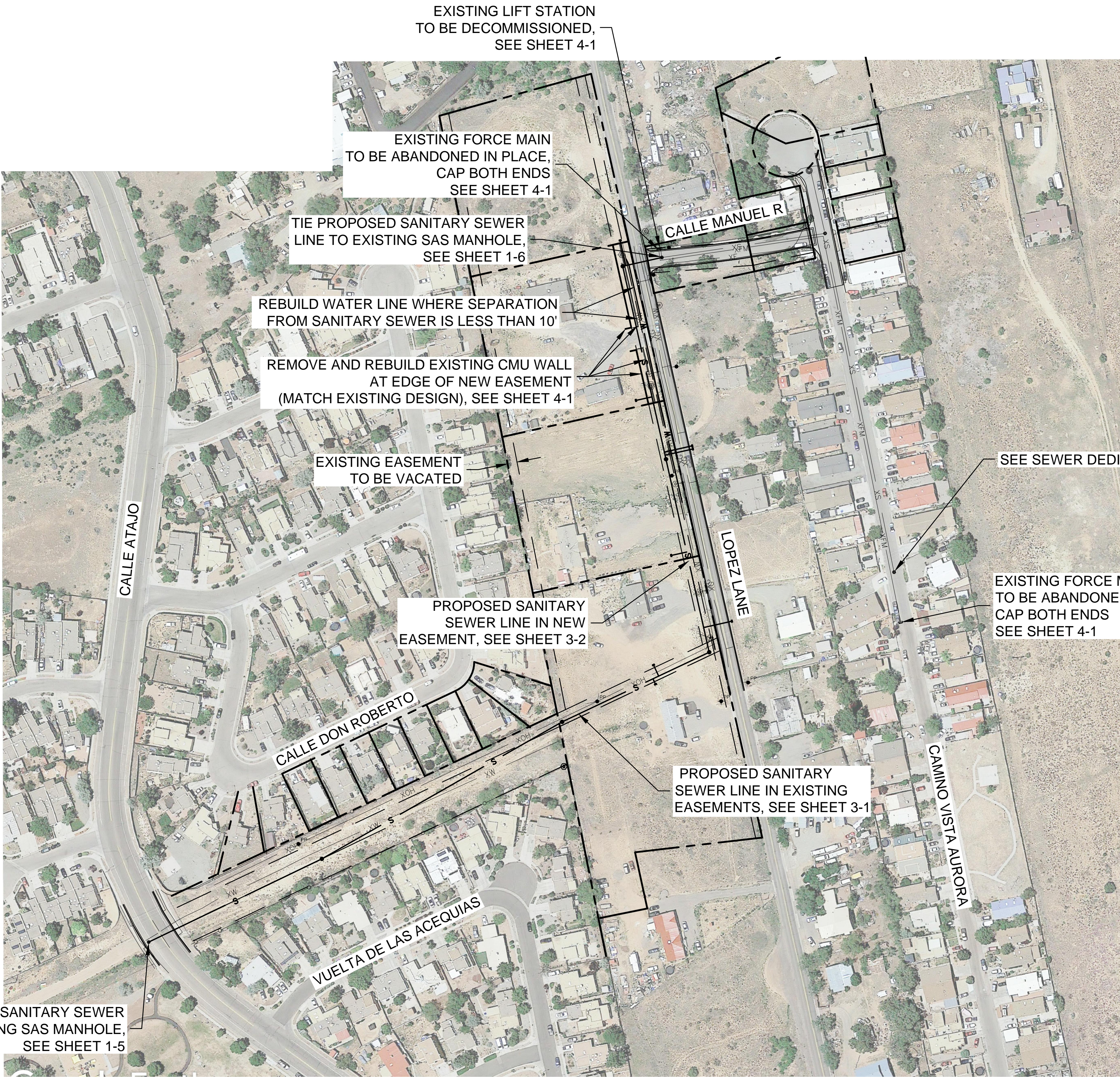

CITY OF SANTA FE WASTEWATER MANAGEMENT 6-28-18 DATE
DIVISION ENGINEER



DESIGN PROJECT ENGINEER

DATE

S F E C Santa Fe Engineering
Consultants, LLC
1599 St. Francis Drive, Suite B
Santa Fe, NM 87505
(505) 982-2845 - Phone
(505) 982-2641 - Fax
<http://www.SFENGR.com>



LEGEND:

XW	EXISTING WATER LINE
XOH	EXISTING OVERHEAD UTILITY
XG	EXISTING GAS LINE
XE	EXISTING UNDERGROUND ELECTRIC LINE
XS	EXISTING SEWER LINE
XFM	EXISTING FORCE MAIN
UP	EXISTING UTILITY POLE
	EXISTING UTILITY METER
S	PROPOSED SEWER
	PROPOSED SEWER SERVICE
W	PROPOSED WATER

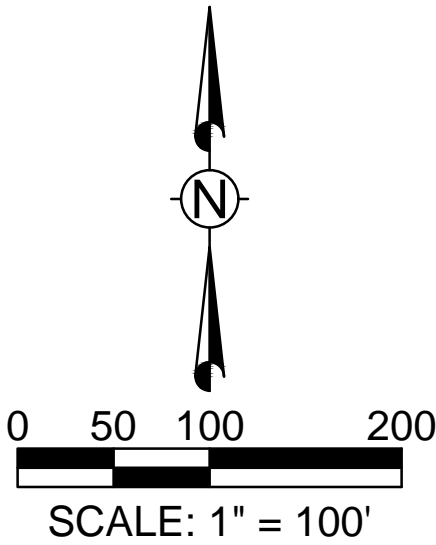
SEWER DEDICATION NOTE:

EXISTING GRAVITY SEWER FROM THIS MANHOLE NORTH ALONG CAMINO VISTA AURORA AND ALONG CALLE MANUEL R TO BE DEDICATED TO THE CITY OF SANTA FE. UPON PROJECT COMPLETION, CONTRACTOR TO FLUSH, TV INSPECT, AND PROVIDE AS-BUILT DRAWINGS FOR THIS PORTION OF SEWER LINE. FLUSHING AND TV INSPECTION TO BE PAID UNDER THE CONTRACT PRICE FOR "TV INSPECTION" BY THE LINEAL FOOT, PAYMENT FOR AS-BUILT DRAWINGS IS INCLUDED IN THE CONTRACT PRICE FOR CONSTRUCTION STAKING. AS-BUILT DRAWINGS SHALL BE SUBMITTED TO THE DESIGN PROJECT ENGINEER AND SHALL BEAR THE SIGNED SEAL AND CERTIFICATION OF THE CONTRACTOR'S SURVEYOR. AS-BUILT DRAWINGS TO INCLUDE RIM AND INVERT ELEVATIONS OF EXISTING MANHOLES AND PIPE LENGTH, SIZE, MATERIAL, AND SLOPE OF EXISTING SEWER LINES BETWEEN MANHOLES.

PROJECT DESCRIPTION

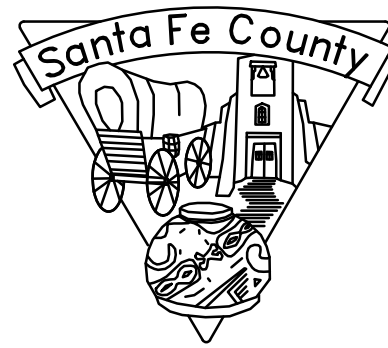
- INSTALL NEW SEWER LINE FROM EXISTING MANHOLE ON CALLE ATAJO TO EXISTING MANHOLE ON CALLE MANUEL R.
- EXISTING LIFT STATION ON CALLE MANUEL R TO BE DECOMMISSIONED.
- EXISTING FORCE MAIN FROM LIFT STATION TO EXISTING MANHOLE ON CAMINO VISTA AURORA TO BE ABANDONED.

REFERENCE PLAN
SCALE: 1" = 100'



5			
4			
3			
2			
1			
NO.	DESCRIPTION	DATE	BY

REVISIONS (OR CHANGE NOTICES)



VISTA AURORA SUBDIVISION
SANITARY SEWER UPGRADE
PROJECT NUMBER: 2016-0171 PW/IC
100% DESIGN

REFERENCE PLAN

DATE: JUNE 2018	SCALE: 1" = 100'	SHEET: 1-2
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1. ALL CONSTRUCTION SHALL CONFORM TO THE REQUIREMENTS OF SANTA FE COUNTY SUSTAINABLE LAND DEVELOPMENT CODE (SLDC) AND STANDARDS, AS APPLICABLE.
2. ALL CONSTRUCTION SHALL CONFORM TO APPLICABLE SECTIONS OF THE NEW MEXICO DEPARTMENT OF TRANSPORTATION'S "STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGE CONSTRUCTION, 2014 EDITION, INCLUDING LATEST PUBLISHED AMENDMENTS (SSHBC) AND SHALL CONFORM TO APPLICABLE SECTIONS OF THE APWA'S "NEW MEXICO STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, 2006 EDITION, INCLUDING LATEST PUBLISHED AMENDMENTS (APWA) AS SHOWN IN THE DESIGN PROJECT SPECIFICATIONS.
3. THE ORDER OF PRECEDENCE SHALL BE, LISTED IN ORDER OF HIGHEST PRECEDENCE: PLANS, DESIGN PROJECT SPECIFICATIONS, AND SLDC.
4. IN THE CASE OF CONFLICTS BETWEEN PLANS AND SPECIFICATIONS, RESOLUTION SHALL BE MADE BY USING THE MORE RESTRICTIVE REQUIREMENTS AS DETERMINED BY THE DESIGN PROJECT ENGINEER AND APPROVED BY SANTA FE COUNTY. THE CONTRACTOR IS ENCOURAGED TO SUBMIT WRITTEN REQUESTS FOR INFORMATION (RFIs) TO THE DESIGN PROJECT ENGINEER TO RESOLVE THESE CONFLICTS.
5. BASECOURSE SHALL BE COMPACTED TO 96% OF MAXIMUM DENSITY IN ACCORDANCE WITH AASHTO T180. SUBGRADE PREPARATION SHALL BE COMPACTED TO 95% OF MAXIMUM DENSITY IN ACCORDANCE WITH ASTM D-1557. SOME SOILS AT THE SITE MAY HAVE A PI OF 15 OR GREATER. THESE SOILS REQUIRE COMPACTION OF AT LEAST 95% OF MAXIMUM DENSITY. CONTROL OF MOISTURE, BLENDING OF MATERIAL, AND REWORKING OF MATERIAL MAY BE REQUIRED. THIS WORK SHALL BE CONSIDERED INCLUDED IN THE CONTRACT PRICE FOR "ASPHALT REMOVAL AND REPLACEMENT" AND NO SEPARATE MEASUREMENT OR PAYMENT WILL BE MADE FOR REHANDLING OR REWORKING MATERIAL TO MEET MOISTURE AND DENSITY REQUIREMENTS.
6. WARPING OF SLOPES. THE CONTRACTOR SHALL WARP SLOPES WHERE NECESSARY TO STAY WITHIN THE RIGHT OF WAY OR CONSTRUCTION EASEMENT LIMITS. THIS SHALL BE CONSIDERED INCIDENTAL TO PROJECT COMPLETION AND NO SEPARATE MEASUREMENT OR PAYMENT WILL BE MADE.
7. THE CONSTRUCTION CLEAR ZONE FOR THIS PROJECT IS WITHIN 12' OF THE LOPEZ LANE TRAVEL WAY. THE CONTRACTOR SHALL NOT STORE EQUIPMENT OR MATERIAL WITHIN THE CONSTRUCTION CLEAR ZONE, UNLESS THE EQUIPMENT OR MATERIAL IS PROPERLY SHIELDED UTILIZING CURRENT SAFETY DESIGN AND INSTALLATION METHODS. THE DESIGN FOR SHIELDING SHALL BE PROVIDED BY THE CONTRACTOR AND MUST BE APPROVED BY THE DESIGN PROJECT ENGINEER BEFORE IMPLEMENTING. THIS WORK SHALL BE CONSIDERED INCIDENTAL TO THE COMPLETION OF THE PROJECT AND NO SEPARATE MEASUREMENT OR PAYMENT WILL BE MADE.
8. THE CONTRACTOR SHALL TAKE PRECAUTIONS TO PROTECT HORIZONTAL AND VERTICAL CONTROL SURVEY MONUMENTS (MARK) FROM DAMAGE PRIOR TO INITIATING CONSTRUCTION. IF DURING THE COURSE OF CONSTRUCTION OPERATIONS, THE CONTRACTOR DISTURBS OR DESTROYS A MARK, THE CONTRACTOR SHALL ESTABLISH A NEW MARK IN COMPLIANCE WITH THE STANDARDS AND PROCEDURES SET FORTH IN THE GEODETIC MARK PRESERVATION GUIDEBOOK, NATIONAL GEODETIC SURVEY, MARCH 1990. CONSTRUCTION STAKING DOCUMENTATION WILL BECOME THE PROPERTY OF THE COUNTY WHEN THE WORK IS COMPLETE. PROVIDE CONSTRUCTION-STAKING DOCUMENTATION TO THE DESIGN PROJECT ENGINEER. SUBMIT EARTHWORK QUANTITIES, SLOPE STAKING, SURFACE EXTRACTED CROSS SECTIONS AND EARTHWORK CALCULATIONS TO THE DESIGN PROJECT ENGINEER FOR REVIEW BEFORE COMPLETING THAT PHASE OF WORK. ENSURE A NEW MEXICO LICENSED PROFESSIONAL SURVEYOR OR PROFESSIONAL ENGINEER STAMPS AND CERTIFIES THE QUANTITIES AND ALL SUBMITTALS. THE COUNTY WILL NOT ACCEPT EARTHWORK QUANTITIES UNTIL THE DESIGN PROJECT ENGINEER REVIEWS AND APPROVES THESE QUANTITIES. THIS WORK SHALL BE CONSIDERED INCLUDED IN THE CONTRACT PRICE FOR "CONSTRUCTION STAKING" AND NO SEPARATE MEASUREMENT OR PAYMENT WILL BE MADE.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL, DISPOSAL AND HAUL OF MATERIALS REQUIRED TO COMPLETE THE PROJECT. THIS WORK SHALL BE CONSIDERED INCIDENTAL TO COMPLETION OF THE PROJECT.
10. SALVAGEABLE MATERIALS FROM THIS PROJECT ARE TO BE HAULED AND STOCKPILED AT A LOCATION AS DESIGNATED BY THE DESIGN PROJECT ENGINEER. HAUL OF SUCH MATERIAL SHALL BE PERFORMED DURING NORMAL WORKING HOURS AS DIRECTED BY THE DESIGN PROJECT ENGINEER. THIS WORK SHALL BE CONSIDERED INCIDENTAL TO COMPLETION OF THE PROJECT.
11. TRAFFIC CONTROL DEVICES, AS PER APPROVED PLAN, SHALL BE INSTALLED, MAINTAINED, AND REMOVED BY THE CONTRACTOR. SAID DEVICES SHALL CONFORM TO THE LATEST PUBLISHED EDITION OF THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) AND SHALL BE SUBMITTED FOR APPROVAL BY THE SANTA FE COUNTY TRAFFIC MANAGER FOR WORK OUTSIDE THE SANTA FE CITY LIMITS, AND SUBMITTED TO THE CITY OF SANTA FE TRAFFIC ENGINEER FOR WORK WITHIN THE SANTA FE CITY LIMITS. CONTACT JOHNNY BACA, SANTA FE COUNTY TRAFFIC MANAGER AT 505-992-3020 AND JOHN ROMERO, CITY OF SANTA FE TRAFFIC ENGINEER AT 505-955-6638. THE CONTRACTOR'S CONSTRUCTION TRAFFIC CONTROL PLAN MUST BE STAMPED BY A LICENSED PROFESSIONAL ENGINEER. THIS WORK SHALL BE CONSIDERED INCLUDED IN THE CONTRACT PRICE FOR "CONSTRUCTION TRAFFIC CONTROL AND MANAGEMENT" AND NO SEPARATE MEASUREMENT OR PAYMENT WILL BE MADE.
12. THE CONTRACTOR MAY ASSIGN MORE THAN ONE TRAFFIC CONTROL SUPERVISOR (TCS) TO PROVIDE TRAFFIC CONTROL MANAGEMENT FOR THE PROJECT. IF ASSIGNING MORE THAN ONE TCS TO PROVIDE TRAFFIC CONTROL MANAGEMENT, SUBMIT TO THE DESIGN PROJECT ENGINEER A WEEKLY SCHEDULE IDENTIFYING WHO SHALL BE IN CHARGE OF PROVIDING TRAFFIC CONTROL MANAGEMENT EACH DAY. PROVIDE THE TCS WITH A SET OF TRAFFIC CONTROL PLANS AND A CURRENT COPY OF THE MUTCD. THE TCS SHALL POSSESS THESE AT ALL TIMES. IF USING A SUBCONTRACTOR TO PROVIDE TRAFFIC CONTROL MANAGEMENT, ENSURE THAT THE TCS IS IN ACCORDANCE WITH THE CONTRACT. THE CONTRACTOR MAY ASSIGN ONE OR MORE TRAFFIC CONTROL TECHNICIAN (TCT) TO ASSIST THE TCS IN INSPECTION AND MAINTENANCE OF TRAFFIC CONTROL DEVICES.
13. UPON PROJECT COMPLETION, THE CONTRACTOR SHALL SEED AREAS DISTURBED BY CONSTRUCTION ACTIVITY. SEE SHEET 6-1. REVEGETATION SHALL BE CONSIDERED INCLUDED IN THE CONTRACT PRICE FOR "CLASS A SEEDING" AND NO SEPARATE MEASUREMENT OR PAYMENT WILL BE MADE.
14. MAINTENANCE OF AS-BUILT PLANS. THE CONTRACTOR SHALL MAINTAIN AN UP TO DATE SET OF RED-LINED DRAWINGS FOR THE PROJECT. THESE DRAWINGS SHALL SERVE AS A BASIS FOR FINAL AS-BUILT DRAWINGS. THESE DRAWINGS SHALL BE KEPT CURRENT (WITHIN TWO WEEKS) AT ALL TIMES AND SHALL BE SUBJECT TO REVIEW BY THE DESIGN PROJECT ENGINEER THROUGHOUT THE PROJECT AND WILL BE REVIEWED BY THE DESIGN PROJECT ENGINEER FOR ACCURACY AND COMPLETENESS AT LEAST ONCE EVERY 30 DAYS. UPON 50% COMPLETION OF THE PROJECT, THE CONTRACTOR SHALL SUBMIT PROGRESS AS-BUILT PLANS TO THE DESIGN PROJECT ENGINEER FOR REVIEW. THE CONTRACTOR'S FINAL AS-BUILT PLANS BEARING THE SIGNED SEAL AND CERTIFICATION OF THE CONTRACTOR'S SURVEYOR SHALL BE SUBMITTED TO THE DESIGN PROJECT ENGINEER PRIOR TO ANY FINAL PAYMENT. CONTRACTOR'S AS-BUILT PLANS ARE CONSIDERED CONSTRUCTION RECORDS AND WILL BE USED FOR FINAL AS-BUILT CERTIFICATION OF THE PROJECT BY THE DESIGN PROJECT ENGINEER, THIS WORK IS CONSIDERED INCIDENTAL TO COMPLETION OF THE PROJECT AND NO MEASUREMENT OR PAYMENT SHALL BE MADE.

31. PER SANTA FE COUNTY ORDINANCE 2003-1, THE CONTRACTOR MUST SUBMIT THE FOLLOWING DOCUMENTS TO THE TRAFFIC MANAGER (JOHNNY BACA) AT THE PRE-CON:
 - COPY OF THEIR CONTRACTORS LICENSE
 - COPY OF THEIR LIABILITY INSURANCE
 - \$15,000.00 PERFORMANCE BOND
 - COMPLETED PERMIT APPLICATION (AND ASSOCIATED FEES IF REQUIRED)
 - TRAFFIC CONTROL PLAN STAMPED BY A PROFESSIONAL ENGINEER
 - PRE PROJECT VIDEO DOCUMENTATION (MAY BE SUBMITTED AFTER PRE-CON)
 - PROJECT SCHEDULE
 - SAFETY PLAN
32. SANTA FE ENGINEERING CONSULTANTS WAIVES ANY AND ALL RESPONSIBILITY AND IS NOT LIABLE FOR PROBLEMS WHICH ARISE FROM THE CONTRACTOR'S FAILURE TO FOLLOW THESE PLANS, SPECIFICATIONS AND THE DESIGN INTENT THEY CONVEY OR FOR PROBLEMS WHICH ARISE FROM THE CONTRACTOR'S FAILURE TO OBTAIN AND/OR FOLLOW SFEC GUIDANCE WITH RESPECT TO ANY INCONSISTENCIES, AMBIGUITIES OR CONFLICTS.
33. DEWATERING IS NOT ANTICIPATED, BUT MAY BE REQUIRED. ANY DEWATERING SHALL BE CONSIDERED INCIDENTAL TO THE COMPLETION OF THE PROJECT.
34. INSTALLATION OF NEW CONCRETE COLLARS ON EXISTING WATER VALVES PER CITY OF SANTA FE SANGRE DE CRISTO WATER COMPANY STANDARDS IS CONSIDERED INCIDENTAL TO THE COMPLETION OF THE PROJECT.
35. STORM WATER POLLUTION PREVENTION PLANS (SWPPP) SHALL BE SUBMITTED FOR APPROVAL BY SANTA FE COUNTY TWO WEEKS PRIOR TO THE PRE-CON. AFTER COMPLETION OF THE PROJECT, THE CONTRACTOR IS REQUIRED TO MAINTAIN SWPPP CONTROLS THROUGHOUT THE WARRANTY PERIOD. THIS WORK SHALL BE CONSIDERED INCLUDED IN THE CONTRACT PRICE FOR "STORM WATER POLLUTION PREVENTION PLANS / BMP INSTALLATION" AND NO SEPARATE MEASUREMENT OR PAYMENT WILL BE MADE. EPA NOTICE OF INTENT (NOI) IS REQUIRED 7 DAYS PRIOR TO PRE-CON, AND PROVIDED TO SANTA FE COUNTY.
36. THE CONTRACTOR SHALL CREATE AN OPERATIONAL TIE-IN PLAN TO COVER THE CONSTRUCTION AT CALLE MANUEL AND CALLE ATAJO THAT WILL PREVENT A DISRUPTION IN SERVICE TO THE CUSTOMERS SERVED BY THIS EXISTING MANHOLE. THIS PLAN SHALL BE SUBMITTED TO THE DESIGN PROJECT ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION.
37. MANHOLE STEPS ARE REQUIRED. SEE SECTION 920.4.7 OF THE DESIGN PROJECT SPECIFICATIONS AND NOTE CM.2.B ON SHEET 7-1.
38. FLUSH, TEST, AND TV INSPECT NEW LINE PRIOR TO DIVERSION. SEE APWA PROJECT SPECIFICATION 901.8 "CLEANING AND INSPECTION" FOR ADDITIONAL INFORMATION.
39. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO MEET OSHA REQUIREMENTS AND MAINTAIN A SAFE WORKING CONDITION. THE CONTRACTOR SHALL TAKE THE APPROPRIATE MEASURES IN REGARD TO TRENCH SAFETY, WORK ZONE FENCING, AND CLEAR ZONE SHIELDING.
40. THE CONTRACTOR SHALL BE REQUIRED TO SUBMIT A SAFETY PLAN SHOWING EXPECTED CONSTRUCTION LIMITS BASED ON HIS METHOD AND MEANS OF CONSTRUCTION. THIS PLAN SHALL BE SUBMITTED TO THE DESIGN PROJECT ENGINEER AT THE PRECONSTRUCTION CONFERENCE. THIS WORK SHALL BE CONSIDERED INCIDENTAL TO THE COMPLETION OF THE PROJECT.
41. IF ANY SHEET FROM THIS PLAN SET IS NOT 24"x36", IT HAS BEEN REPRODUCED AT A SCALE OTHER THAN WHAT IS SHOWN ON THAT SHEET'S GRAPHIC SCALE(S). GRAPHIC SCALE SIZES SHALL BE VERIFIED USING AN ENGINEER'S SCALE PRIOR TO TAKING ANY MEASUREMENTS.

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SANTA FE COUNTY	SHEET NO.
PROJECT NUMBER: 2016-0171 PW/IC	1-4

CITY OF SANTA FE WASTE WATER DIVISION GENERAL CONSTRUCTION NOTES

1. PRIOR TO THE WASTEWATER MANAGEMENT DIVISION APPROVAL OF THE PLAN SET, A LETTER WILL BE REQUIRED FROM THE PROJECT ENGINEER INDICATING THEY ARE PROVIDING THE INSPECTION AND RECORD DRAWING SERVICES FOR THE PROJECT.

2. THE CONTRACTOR MUST OBTAIN ALL SEWER HOOKUP PERMITS FROM THE CITY'S BUILDING PERMITS SECTION (SEWER LINES) PRIOR TO COMMENCING ANY SEWER LINE CONSTRUCTION. A COPY OF THE PERMIT MUST BE KEPT AT THE CONSTRUCTION SITE.

3. ALL MANHOLES SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE "STANDARD MANHOLE DETAIL SHEET" SHOWN ON THE CITY STANDARD DRAWINGS.

4. A COPY OF THE APPROVED PLANS SHALL BE AVAILABLE AT THE CONSTRUCTION SITE AT ALL TIMES DURING WORKING HOURS.

5. ALL MODIFICATIONS TO THE SANITARY SEWER PLANS MUST BE REVIEWED AND APPROVED BY THE CITY'S WASTEWATER MANAGEMENT DIVISION PRIOR TO CONSTRUCTION.

6. ADDITIONAL GENERAL NOTES ARE CONTAINED IN THE STANDARD CITY DETAIL SHEETS FOR SANITARY SEWER CONSTRUCTION.

7. ALL PUBLIC GRAVITY SEWER LINES SHALL BE A MINIMUM 8 INCH DIAMETER WITH A MINIMUM CLASS C BEDDING (2006 NEW MEXICO AMERICAN PUBLIC WORKS ASSOCIATION).

8. ALL 4 INCH AND 6 INCH DIAMETER GRAVITY SEWER PIPE SHALL BE PRIVATE. NO PRIVATE SEWER SYSTEM SHALL USE LARGER THAN A 6 INCH DIAMETER PIPE. NO PUBLIC GRAVITY SEWER LINE TO BE ACCEPTED BY THE CITY OF SANTA FE FOR PERMANENT MAINTENANCE SHALL BE LESS THAN 8 INCHES DIAMETER.

9. NO CONCRETE ENCASEMENT OF NEW OR EXISTING PUBLIC SEWER PIPE WILL BE ALLOWED UNLESS APPROVED BY THE CITY OF SANTA FE WASTEWATER MANAGEMENT DIVISION.

10. CORE DRILLING IS REQUIRED FOR ALL NEW CONNECTIONS TO AN EXISTING MANHOLE.

11. NO PUBLIC SEWER MAIN LINE OR MANHOLE WILL BE ALLOWED UNDER OR WITHIN A STORM WATER DETENTION/RETENTION POND.

12. PRIOR TO PAVING OVER ANY SANITARY SEWER LINES, SUBMIT T.V.TAPES AND LOGS, PRESSURE TESTS, AND THE ENGINEER'S CERTIFICATION TO THE CITY'S WASTEWATER MANAGEMENT DIVISION. AFTER THE WASTEWATER MANAGEMENT DIVISION REVIEWS THE ABOVE LISTED INFORMATION, A PRELIMINARY MANHOLE INSPECTION WILL BE CONDUCTED. WHEN ALL THE ITEMS LISTED ABOVE ARE COMPLETED TO MEET THE STANDARDS OF THE WASTEWATER MANAGEMENT DIVISION, A LETTER APPROVING PAVING WILL BE ISSUED IN RELATION TO THE SANITARY SEWER. NOTE: A FINAL MANHOLE INSPECTION WILL BE CONDUCTED AFTER THE FINAL PAVING IS COMPLETED.

13. ALL SEWER MANHOLES WITH SEWER LINES 12 INCHES IN DIAMETER AND LARGER ARE REQUIRED TO HAVE APPROVED VENTED AND LOCKING MANHOLE COVERS.

14. LOCATE WIRES SHALL BE INSTALLED FOR ALL SANITARY SEWERS (GRAVITY/FORCE MAINS). THE LOCATE WIRE MUST BE VISIBLE IN THE MANHOLE OR ACCESS STRUCTURE. THIS WILL BE VERIFIED DURING THE PRELIMINARY MANHOLE INSPECTION PRIOR TO PAVING. THE LOCATE WIRE IS TO BE A CONTINUOUS, 12 GAUGE, SOLID STRAND INSULATED COPPER WIRE.

15. OFF-ROAD PUBLIC SEWER ACCESS WILL BE PROVIDED FOR ALL PUBLIC SEWER LINES AND MANHOLES. ACCESS ROADS ARE TO BE A MINIMUM 12 FEET WIDE WITH A DRIVING SURFACE OF 6 INCHES OF COMPACTED BASE COURSE. NO ACCESS ROAD SHALL HAVE A GRADE GREATER THAN 15%. MANHOLES ARE TO BE ALIGNED WITH THE CENTER LINE OF THE ACCESS ROAD. SEWER EASEMENTS ARE TO BE A MINIMUM OF 20 FEET IN WIDTH.

16. OFF ROAD SANITARY SEWER - CALL THE WASTEWATER MANAGEMENT DIVISION AT 955-4651 FOR A FIELD REVIEW OF THE GRADING OF ALL OFF ROAD SANITARY SEWER TO ENSURE THAT THE CITY'S MAINTENANCE VEHICLES CAN ACCESS ALL MANHOLES. THE GRADES MAY BE REQUIRED TO BE ADJUSTED BASED UPON THIS INSPECTION. ADDITIONAL BANK PROTECTION MAY BE REQUIRED BASED UPON A FINAL INSPECTION BY THE WASTEWATER MANAGEMENT DIVISION AND THE PROJECT ENGINEER.
17. FOR RECORD DRAWINGS, TIE MANHOLE TO A CITY OF SANTA FE SURVEY MONUMENT AS PART OF THE FINAL RECORD DRAWINGS. SHOW CORRECTED AS-BUILT BEARING AND DISTANCES, SLOPES, RIM AND INVERT ELEVATIONS AND SEWER SERVICES ALONG THE HORIZONTAL ALIGNMENT OF THE SANITARY SEWER. FOR RECORDS DRAWINGS, A SEPARATE SUMMARY TABLE ADDED TO THE EXISTING PLAN SHEETS OR AS AN ADDITIONAL SHEET SHALL BE REQUIRED. THE SUMMARY SHEET SHALL LIST DATA FOR THE SEWER LINE SEGMENTS BETWEEN MANHOLES SHOWING THE UPSTREAM AND DOWNSTREAM MANHOLE WITH THE DESIGN SEGMENT LENGTHS, SLOPES AND BEARINGS AND THE AS-BUILT SEGMENT LENGTHS, SLOPES AND BEARINGS. THE SUMMARY SHEET SHALL INDICATE THE TOTAL NUMBER OF NEW PUBLIC MANHOLES CONSTRUCTED, THE TOTAL NUMBER OF CONNECTIONS TO EXISTING PUBLIC MANHOLES, THE TIE TO A CITY CONTROL MONUMENT AND THE TOTAL LENGTH OF AS-BUILT PUBLIC SEWER LINE CONSTRUCTED BY SIZE.

18. THE OWNER/DEVELOPER WILL BE RESPONSIBLE FOR MAINTAINING, REPAIRING AND LOCATING THE SEWER SYSTEM UNTIL CITY ACCEPTANCE FOR MAINTENANCE. DAMAGES RESULTING FROM A STOPPAGE IN ANY GRAVITY AND/OR PRESSURE SEWER SYSTEM WILL BE THE SOLE RESPONSIBILITY OF THE OWNER/DEVELOPER UNTIL A FINAL ACCEPTANCE LETTER FOR PERMANENT MAINTENANCE HAS BEEN ISSUED BY THE WASTEWATER MANAGEMENT DIVISION.

~~19. WATER METERS WILL NOT BE PLACED UNTIL A FINAL ACCEPTANCE LETTER HAS BEEN ISSUED BY THE WASTEWATER DIVISION FOR ALL ON-SITE SANITARY SEWER NEEDED IN ORDER FOR THE PROJECT TO CONNECT TO THE SANITARY SEWER SYSTEM.~~

20. 20 FOOT WIDE ACCESS GATES SHALL BE PROVIDED AT ALL FENCES, WALLS OR OTHER OBSTRUCTIONS THAT CROSS A PUBLIC SEWER LINE. ACCESS GATES TO BE LOCATED WITHIN THE SANITARY SEWER EASEMENT.

21. THE OWNER/DEVELOPER WILL BE RESPONSIBLE FOR LOCATING EACH SEWER SERVICE AT THE TIME EACH LOT IS READY TO CONNECT TO THE SEWER. IT IS SUGGESTED THAT THE OWNER/ DEVELOPER RETAIN A COPY OF THE TELEVISION INSPECTION VIDEO ALONG WITH THE VIDEO LOGS. EACH SERVICE SHALL BE CLEARLY MARKED FOR EACH LOT AT POINT OF CONNECTION. ALL CALLS RECEIVED BY THIS DIVISION REGARDING THE LOCATION OF SERVICE WILL BE FORWARDED TO THE OWNER/DEVELOPER.

22. THE CONTRACTOR SHALL CALL THE WASTEWATER MANAGEMENT DIVISION (DOUGLAS FLORES WASTEWATER MANAGEMENT FIELD TECHNICIAN AT TELEPHONE # 955-4613) FOR A FINAL MANHOLE INSPECTION. THIS INSPECTION WILL BE ISOLATED TO THE MANHOLES. THE CITY'S PLUMBING AND MECHANICAL INSPECTORS WILL CONDUCT ALL OTHER NECESSARY PLUMBING INSPECTIONS. NOTE: THE CITY'S PLUMBING AND MECHANICAL INSPECTORS WILL INSPECT THE INDIVIDUAL SEWER SERVICE TAPS AND LATERALS, WHICH CONNECT TO THE PUBLIC SANITARY SEWER.

23. THE EXISTING SANITARY SEWER LINE MUST BE T.V. TAPED PRIOR TO A NEW SERVICE CONNECTION BEING PLACED AS WELL AS TAPED AFTER THE SERVICES HAVE BEEN COMPLETED. THIS IS TO ENSURE THAT THE EXISTING SANITARY SEWER LINE IS NOT DAMAGED AND THE NEW SERVICE IS INSTALLED CORRECTLY.

~~24. ALL COSTS ASSOCIATED WITH THE OPERATION, MAINTENANCE AND REPLACEMENT OF GRINDER PUMPS FOR INDIVIDUAL LOTS SHALL BE THE RESPONSIBILITY OF THE LOT OWNER AND/OR OWNERS ASSOCIATION. FOR GRINDER PUMPS THAT CONNECT TO A PRESSURE SEWER MAIN, THE GRINDER PUMP WILL BE A MODEL MANUFACTURED BY ENVIRONMENT ONE OR A TYPE APPROVED BY THE CITY OF SANTA FE WASTEWATER MANAGEMENT DIVISION. FOR GRINDER PUMPS THAT CONNECT TO A GRAVITY MAIN, THE GRINDER PUMP SHALL BE OF A TYPE APPROVED BY THE CITY OF SANTA FE PLUMBING CODE.~~

25. A MINIMUM 12 INCHES OF VERTICAL CLEARANCE SHALL BE PROVIDED BETWEEN THE SEWER LINE AND ANY STORM DRAIN PIPING.

~~26. ALL PRESSURE SEWER SYSTEMS SHALL BE AIR OR HYDROSTATICALLY PRESSURE TESTED @ 120 PSI FOR 2 HOURS MINIMUM. THE TEST IS TO BE WITNESSED AND CERTIFIED BY THE PROJECT ENGINEER PRIOR TO BEING PUT INTO SERVICE AND ACCEPTANCE BY THE CITY OF SANTA FE. ALL PRESSURE SEWER SYSTEM MAIN LINES WILL BE FILLED WITH WATER.~~
27. NO PUBLIC PRESSURE SEWER SYSTEM PIPING MAY BE INSTALLED IN A COMMON TRENCH WITH OTHER UTILITIES.

28. SEWER BACKFLOW CHECK VALVES WILL BE REQUIRED FOR ALL SEWER SERVICE LATERAL CONNECTIONS TO SEWER MAINS 12 INCHES OR GREATER IN DIAMETER. THE SEWER SERVICE CONNECTION MUST BE MADE AT AN EXISTING OR NEW MANHOLE. SEWER SERVICE CONNECTIONS TO SEWER MAINS WITH PIPE SIZE DIAMETER OF 12 INCHES AND GREATER WILL NOT BE MADE WITHOUT APPROVAL FROM THE WASTEWATER MANAGEMENT DIVISION.

29. SEWER BACKWATER CHECK VALVES SHALL BE REQUIRED ON PRIVATE SEWER SERVICE LATERALS PER THE CITY OF SANTA FE PLUMBING CODE.

30. ALL PVC SEWER PIPES THAT ARE INSTALLED AT A DEPTH OF TEN (10) FEET OR GREATER OR AT A SLOPE OF ONE PERCENT (1%) OR LESS SHALL BE SDR 26 PVC PIPE.

31. ALL AS-BUILT SEWER LINE AND MANHOLE DATA SHALL BE OBTAINED AND CERTIFIED BY A LICENSED SURVEYOR OR ENGINEER. AS-BUILT DATA SUPPLIED BY OTHER THAN A LICENSED SURVEYOR OR ENGINEER SHALL NOT BE VALID FOR FINAL AS-BUILTS.

32. ALL EXISTING AND NEW PUBLIC MANHOLES WITHIN A PROJECT SHALL HAVE ACCESS FOR CITY SEWER MAINTENANCE EQUIPMENT. ALL ACCESS IS SUBJECT TO FIELD VERIFICATION AND MODIFICATION AS REQUIRED BY THE WASTEWATER DIVISION PRIOR TO FINAL PROJECT CLOSE OUT WITH THE CITY OF SANTA FE.

33. ALL SEWER LINE CROSSINGS OF RIVERS, STREAMS, ARROYOS, DRAINAGE CHANNELS, ETC. SHALL REQUIRE A BASIS OF DESIGN ANALYSIS PREPARED BY A LICENSED ENGINEER.

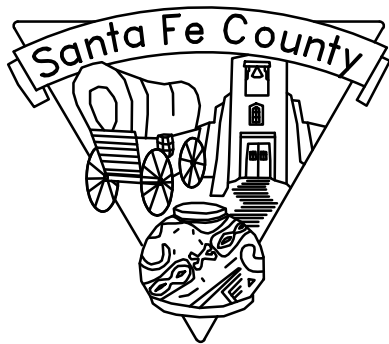
34. AN APPROVED BACKFLOW VALVE AND ISOLATION VALVE ARE REQUIRED ON ALL LOW PRESSURE SEWER SERVICE LINES AS PER THE CITY OF SANTA FE STANDARD SEWER SPECIFICATIONS.

35. TERMINAL FLUSHING CONNECTIONS AND IN-LINE FLUSHING CONNECTIONS ARE REQUIRED ON ALL LOW PRESSURE SEWER SYSTEMS. THE MAXIMUM SPACING BETWEEN IN-LINE FLUSHING CONNECTIONS SHALL BE 500 FEET. DISTANCES GREATER THE 500 FEET BETWEEN LOW PRESSURE SEWER IN-LINE FLUSHING CONNECTIONS SHALL BE APPROVED BY THE WASTEWATER DIVISION.

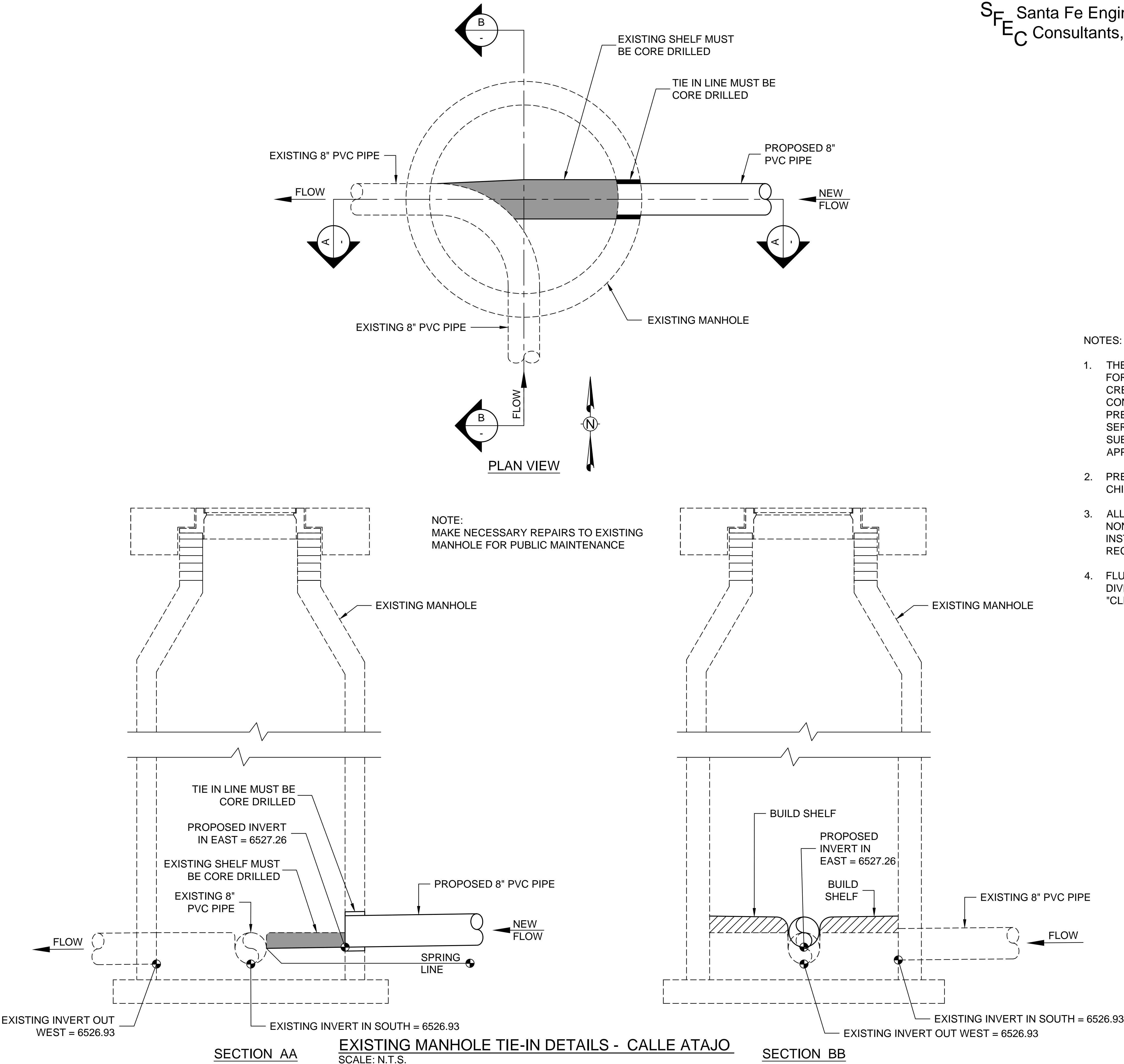
36. ALL SANITARY SEWER MANHOLES FIFTEEN (15) FEET IN DEPTH OR GREATER SHALL BE SIX (6) FOOT DIAMETER.

37. PVC SEWER PIPE SHALL BE RUN CONTINUOUS THROUGH MANHOLES WHEN PIPE OF APPROXIMATE EQUAL SLOPES ARE ENTERING AND LEAVING THE MANHOLES.

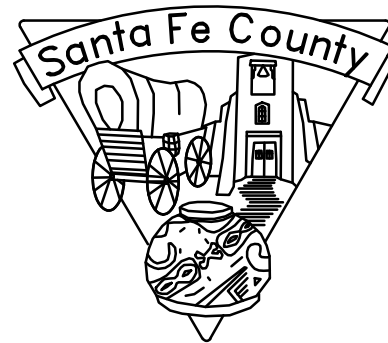
38. ALL NEW CONNECTIONS TO AN EXISTING SANITARY SEWER MANHOLE SHALL INCLUDE THE REHABILITATION REQUIRED TO MEET CITY OF SANTA FE WASTEWATER DIVISION STANDARD CONSTRUCTION DETAILS.

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NO.	DESCRIPTION	DATE	BY
REVISIONS (OR CHANGE NOTICES)			
<div><p>VISTA AURORA SUBDIVISION SANITARY SEWER UPGRADE PROJECT NUMBER: 2016-0171 PW/IC 100% DESIGN</p><p>CITY OF SANTA FE WASTE WATER DIVISION NOTES</p></div>			
DATE: JUNE 2018		SCALE: N.T.S.	SHEET: 1-4

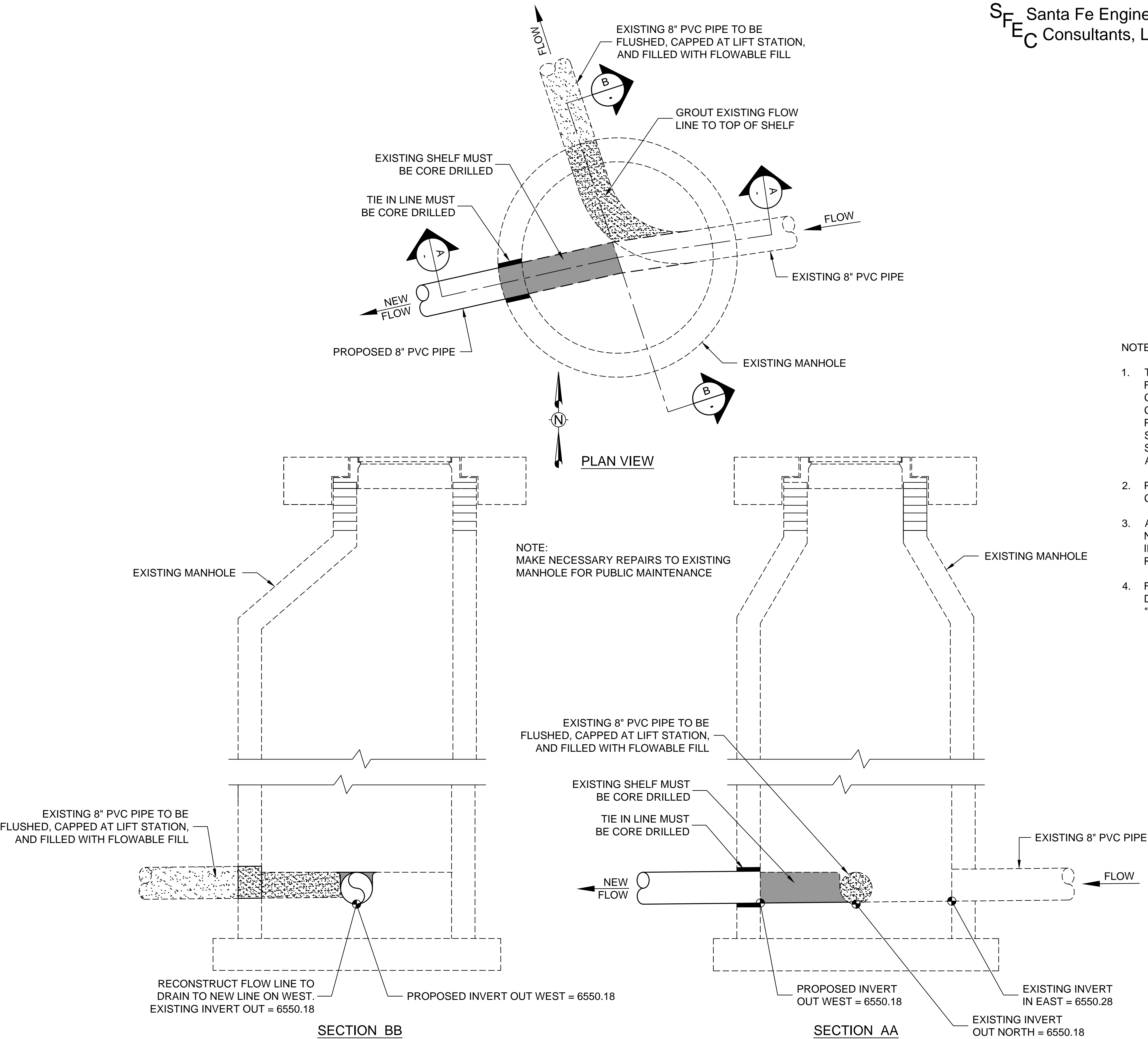
SANTA FE COUNTY	SHEET NO.
PROJECT NUMBER: 2016-0171 PW/IC	1-5



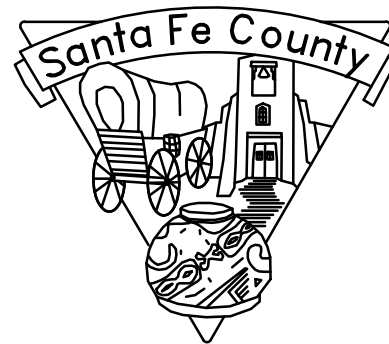
- NOTES:
1. THE TIE-IN DETAILS SHOWN ON THIS SHEET ARE PROVIDED FOR GUIDANCE PURPOSES ONLY. THE CONTRACTOR SHALL CREATE AN OPERATIONAL TIE-IN PLAN TO COVER THE CONSTRUCTION AT THE CALLE ATAJO MANHOLE THAT WILL PREVENT A DISRUPTION IN SERVICE TO THE CUSTOMERS SERVED BY THIS EXISTING MANHOLE. THIS PLAN SHALL BE SUBMITTED TO THE DESIGN PROJECT ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION.
 2. PREVENT DEBRIS FROM ENTERING SEWER LINE DURING CHIPPING / GROUT REMOVAL.
 3. ALL PENETRATIONS TO BE SEALED WITH HIGH STRENGTH, NON-SHRINK GROUT (GP GROUT OR APPROVED EQUAL). INSTALL AND CURE PER APWA AND MANUFACTURER'S RECOMMENDATIONS.
 4. FLUSH, TEST, AND TV INSPECT NEW LINE PRIOR TO DIVERSION. SEE APWA PROJECT SPECIFICATION 901.8 "CLEANING AND INSPECTION" FOR ADDITIONAL INFORMATION.

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NO.	DESCRIPTION	DATE	BY
REVISIONS (OR CHANGE NOTICES)			
 VISTA AURORA SUBDIVISION SANITARY SEWER UPGRADE PROJECT NUMBER: 2016-0171 PW/IC 100% DESIGN TYPICAL SECTIONS AND DETAILS			
DATE: JUNE 2018		SCALE: N.T.S.	SHEET: 1-5

SANTA FE COUNTY	SHEET NO.
PROJECT NUMBER: 2016-0171 PW/IC	1-6



- NOTES:
1. THE TIE-IN DETAILS SHOWN ON THIS SHEET ARE PROVIDED FOR GUIDANCE PURPOSES ONLY. THE CONTRACTOR SHALL CREATE AN OPERATIONAL TIE-IN PLAN TO COVER THE CONSTRUCTION AT THE CALLE MANUEL MANHOLE THAT WILL PREVENT A DISRUPTION IN SERVICE TO THE CUSTOMERS SERVED BY THIS EXISTING MANHOLE. THIS PLAN SHALL BE SUBMITTED TO THE DESIGN PROJECT ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION.
 2. PREVENT DEBRIS FROM ENTERING SEWER LINE DURING CHIPPING / GROUT REMOVAL.
 3. ALL PENETRATIONS TO BE SEALED WITH HIGH STRENGTH, NON-SHRINK GROUT (GP GROUT OR APPROVED EQUAL). INSTALL AND CURE PER APWA AND MANUFACTURER'S RECOMMENDATIONS.
 4. FLUSH, TEST, AND TV INSPECT NEW LINE PRIOR TO DIVERSION. SEE APWA PROJECT SPECIFICATION 901.8 "CLEANING AND INSPECTION" FOR ADDITIONAL INFORMATION.

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NO.	DESCRIPTION	DATE	BY
REVISIONS (OR CHANGE NOTICES)			
			
VISTA AURORA SUBDIVISION SANITARY SEWER UPGRADE PROJECT NUMBER: 2016-0171 PW/IC 100% DESIGN			
TYPICAL SECTIONS AND DETAILS			
DATE: JUNE 2018	SCALE: N.T.S.	SHEET: 1-6	

SANTA FE COUNTY	SHEET NO.
PROJECT NUMBER: 2016-0171 PW/IC	1-8

SUMMARY OF QUANTITIES

ITEM NO.	DESCRIPTION	UNIT	APPROX. QUANTITY	FINAL QUANTITY
1	8" SAS INSTALLED AT 0-7' DEPTH	L.F.	385	
2	8" SAS INSTALLED AT 7-14' DEPTH	L.F.	1145	
3	8" SAS INSTALLED AT 14-21' DEPTH	L.F.	220	
4	TV INSPECT SEWER LINE	L.F.	2690	
5	FLOWABLE FILL ENCASEMENT	C.Y.	6	
6	MANHOLE TYPE E <6'	EA.	5	
7	EXTRA DEPTH MANHOLES >6'	V.F.	20	
8	TIE TO EXISTING MANHOLE	EA.	2	
9	ROCK EXCA VATION < 6' DEPTH	L.F.	500	
10	GRA VITY SERVICE CONNECTIONS	EA.	8	
11	REBUILD WATER LINE	L.F.	655	
12	ASPHALT REMOVE & REPLACE	S.Y.	155	
13	CONCRETE DRIVEWAY REMOVE AND REPLACE	S.Y.	10	
14	2' CURB AND GUTTER REMOVE & REPLACE	L.F.	90	
15	GRAVEL DRIVEWAY REMOVE AND REPLACE	S.Y.	90	
16	REMOVE AND REBUILD 5' HIGH CMU WALL	S.F.	1200	
17	SEWER ACCESS ROAD	S.Y.	1310	
18	STANDARD GATE - 20'	EA.	1	
19	CLASS A SEEDING	ACRE	1.5	
20	DECOMMISSION LIFT STATION, PLUG FORCE MAIN	L.S.	1	
21	STORM WATER POLLUTION PREVENTION PLANS / BMP INSTALLATION	L.S.	1	
22	CONSTRUCTION TRAFFIC CONTROL & MANAGEMENT	L.S.	1	
23	MOBILIZATION	L.S.	1	
24	CONSTRUCTION STAKING	L.S.	1	
25	CONSTRUCTION TESTING	L.S.	1	

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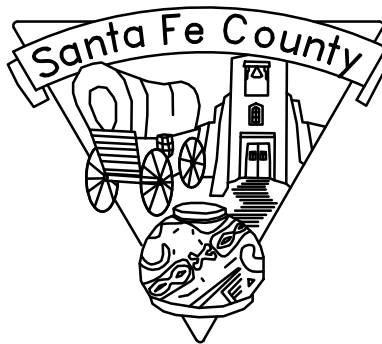
NO.

DESCRIPTION

DATE

BY

REVISIONS (OR CHANGE NOTICES)



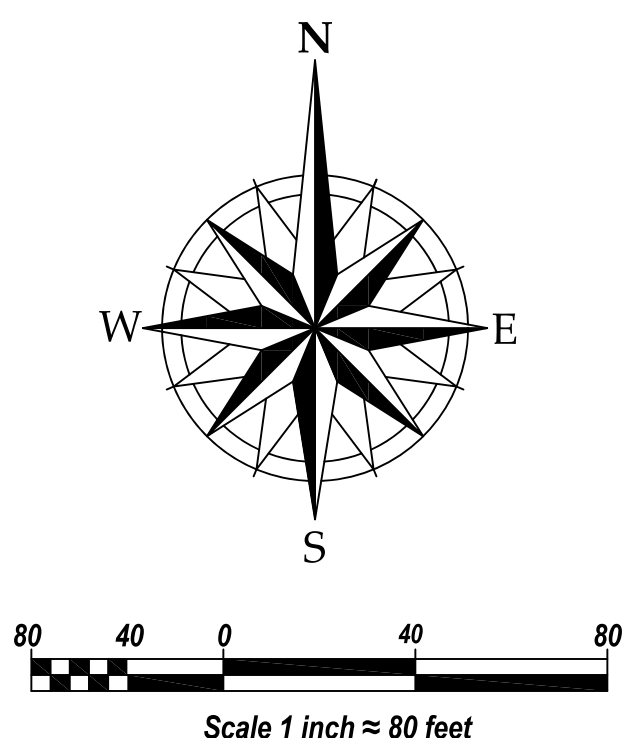
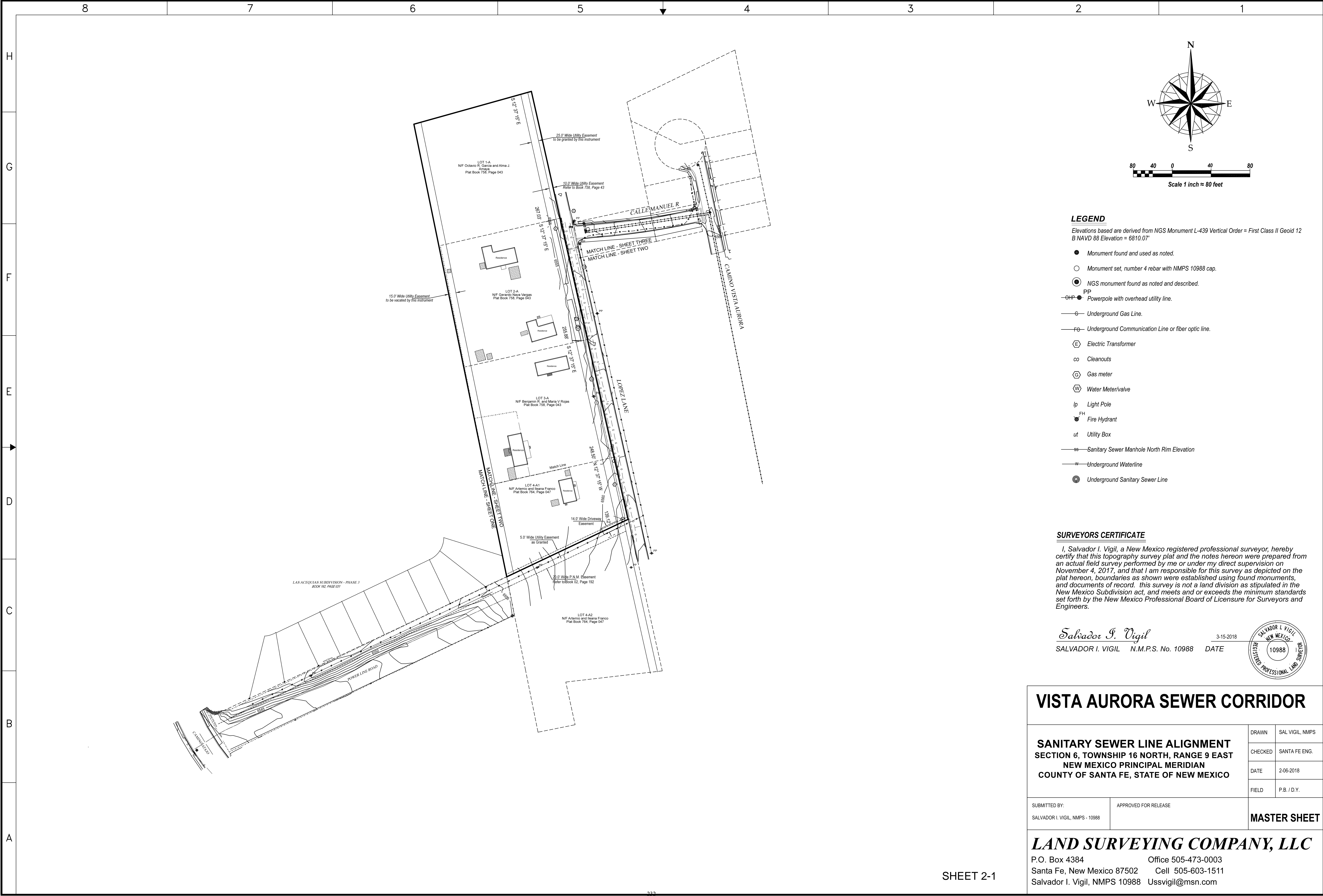
VISTA AURORA SUBDIVISION
SANITARY SEWER UPGRADE
PROJECT NUMBER: 2016-0171 PW/IC
100% DESIGN

SUMMARY OF QUANTITIES

DATE:
JUNE 2018

SCALE:
N.T.S.

SHEET:
1-8



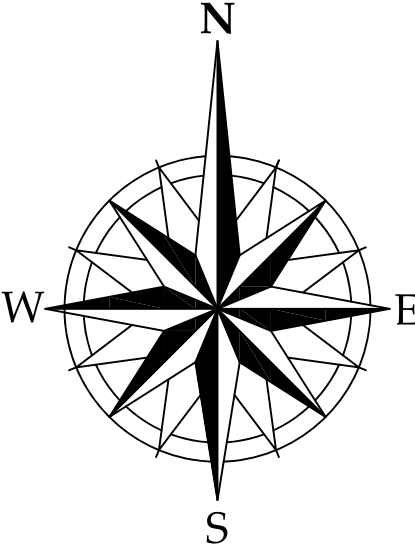
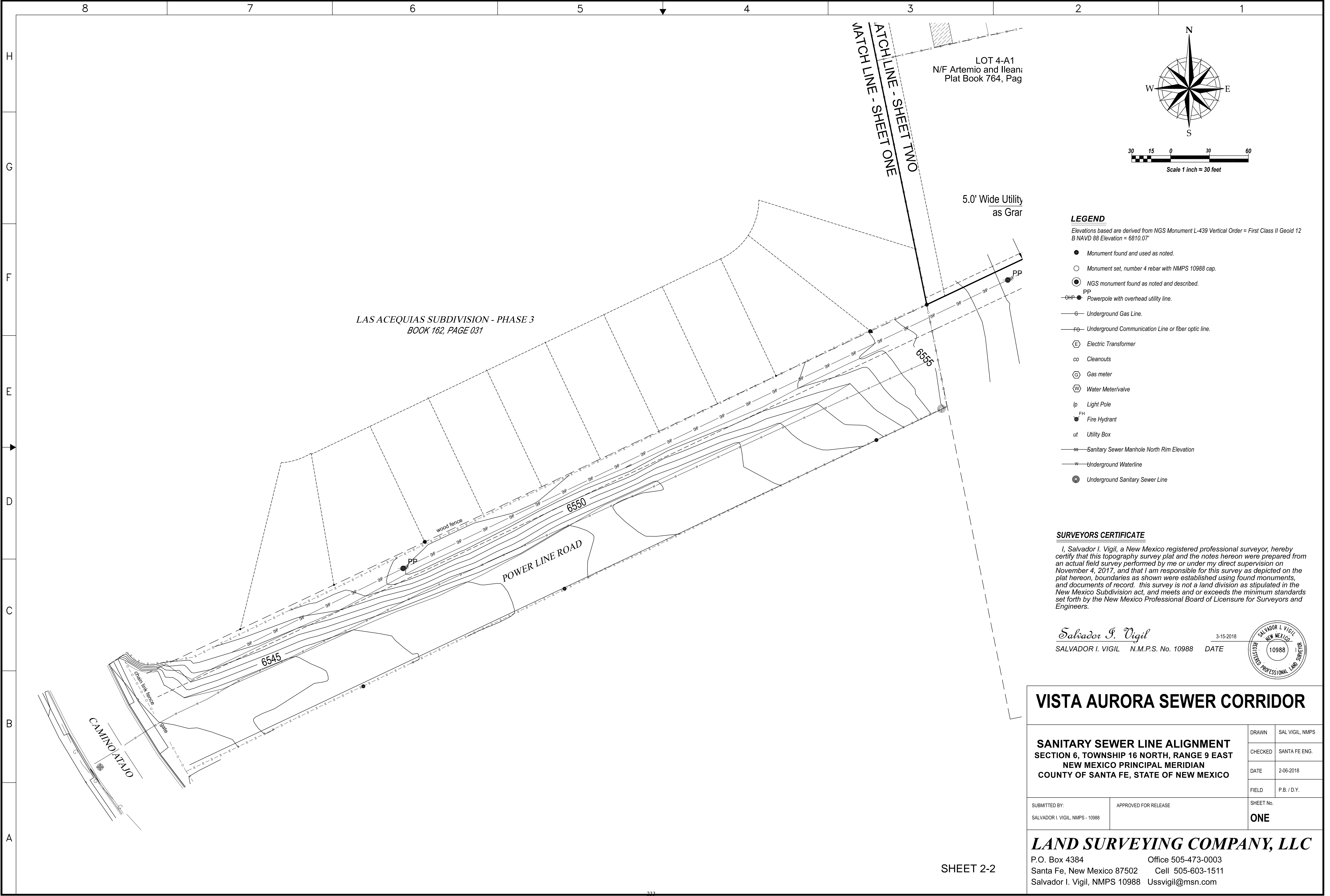
- LEGEND**
- Elevations based are derived from NGS Monument L-439 Vertical Order = First Class II Geoid 12 B NAVD 88 Elevation = 6810.07'
- Monument found and used as noted.
 - Monument set, number 4 rebar with NMPS 10988 cap.
 - ⦿ NGS monument found as noted and described.
 - PP Powerpole with overhead utility line.
 - G— Underground Gas Line.
 - FC— Underground Communication Line or fiber optic line.
 - ⓔ Electric Transformer
 - co Cleanouts
 - ⓖ Gas meter
 - Ⓦ Water Meter/valve
 - lp Light Pole
 - ⦿ Fire Hydrant
 - ut Utility Box
 - ss— Sanitary Sewer Manhole North Rim Elevation
 - w— Underground Waterline
 - ⦿ Underground Sanitary Sewer Line

SURVEYORS CERTIFICATE

I, Salvador I. Vigil, a New Mexico registered professional surveyor, hereby certify that this topography survey plat and the notes hereon were prepared from an actual field survey performed by me or under my direct supervision on November 4, 2017, and that I am responsible for this survey as depicted on the plat hereon, boundaries as shown were established using found monuments, and documents of record. this survey is not a land division as stipulated in the New Mexico Subdivision act, and meets and or exceeds the minimum standards set forth by the New Mexico Professional Board of Licensure for Surveyors and Engineers.

Salvador I. Vigil
SALVADOR I. VIGIL N.M.P.S. No. 10988 DATE 3-15-2018

VISTA AURORA SEWER CORRIDOR		
SANITARY SEWER LINE ALIGNMENT SECTION 6, TOWNSHIP 16 NORTH, RANGE 9 EAST NEW MEXICO PRINCIPAL MERIDIAN COUNTY OF SANTA FE, STATE OF NEW MEXICO	DRAWN	SAL VIGIL, NMPS
	CHECKED	SANTA FE ENG.
	DATE	2-06-2018
	FIELD	P.B. / D.Y.
SUBMITTED BY: SALVADOR I. VIGIL, NMPS - 10988	APPROVED FOR RELEASE	MASTER SHEET
LAND SURVEYING COMPANY, LLC P.O. Box 4384 Office 505-473-0003 Santa Fe, New Mexico 87502 Cell 505-603-1511 Salvador I. Vigil, NMPS 10988 Ussvigil@msn.com		



30 15 0 30 60
Scale 1 inch ≈ 30 feet

LEGEND

Elevations based are derived from NGS Monument L-439 Vertical Order = First Class II Geoid 12
B NAVD 88 Elevation = 6810.07'

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Salvador I. Vigil

SALVADOR I. VIGIL N.M.P.S. No. 10988

3-15-2018

DATE



VISTA AURORA SEWER CORRIDOR

SANITARY SEWER LINE ALIGNMENT
SECTION 6, TOWNSHIP 16 NORTH, RANGE 9 EAST
NEW MEXICO PRINCIPAL MERIDIAN
COUNTY OF SANTA FE, STATE OF NEW MEXICO

DRAWN	SAL VIGIL, NMPS
CHECKED	SANTA FE ENG.
DATE	2-06-2018
FIELD	P.B. / D.Y.

SUBMITTED BY:
SALVADOR I. VIGIL, NMPS - 10988

APPROVED FOR RELEASE

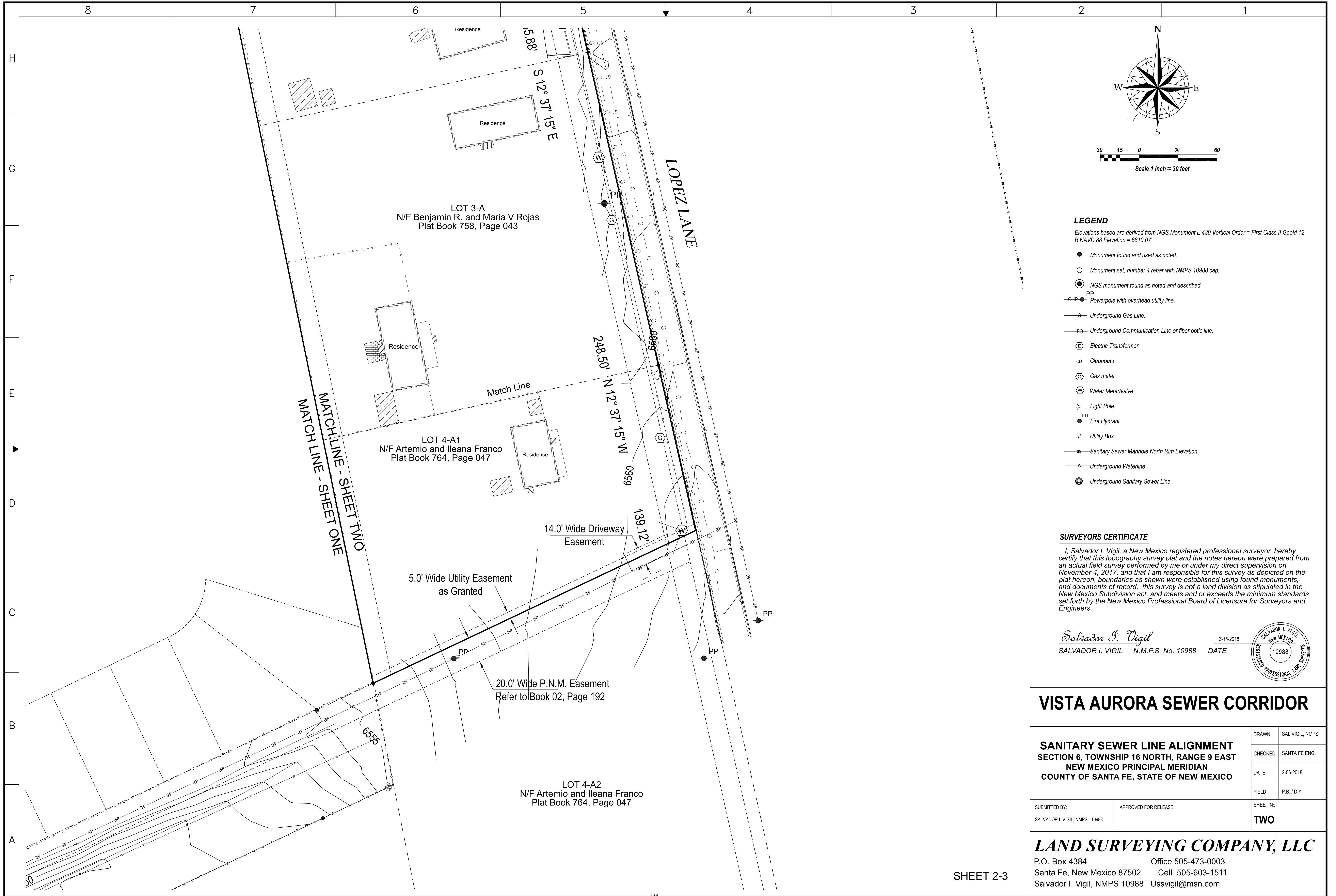
SHEET No.

ONE

LAND SURVEYING COMPANY, LLC

P.O. Box 4384 Office 505-473-0003
Santa Fe, New Mexico 87502 Cell 505-603-1511
Salvador I. Vigil, NMPS 10988 Ussvigil@msn.com

SHEET 2-2



LEGEND

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B NAVD 88 Elevation = 6810.07'

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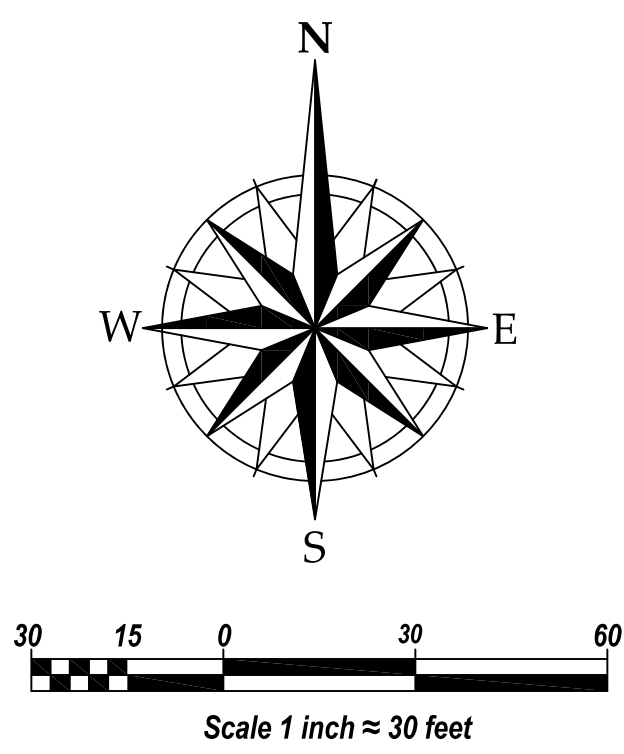
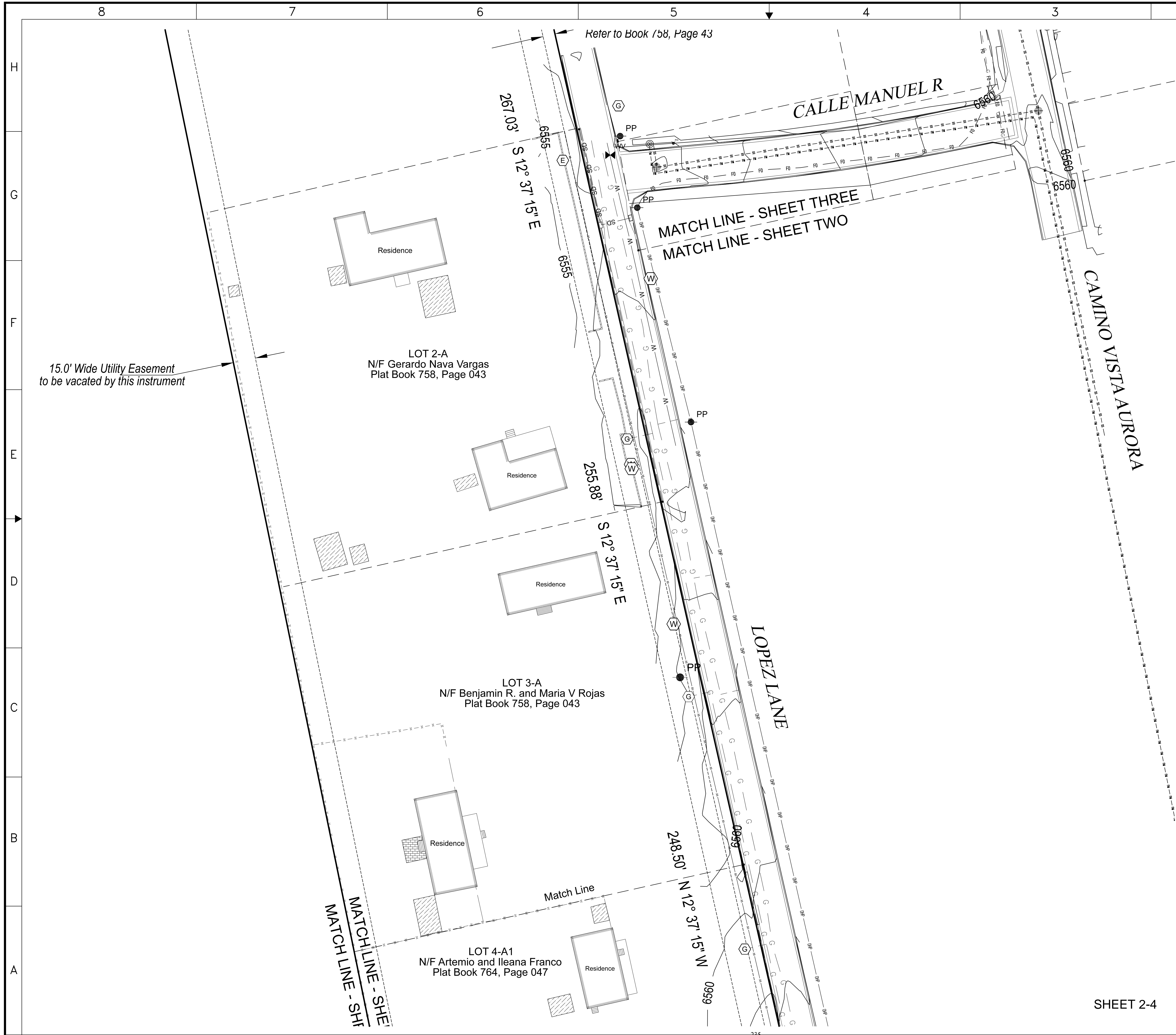
Salvador I. Vigil
SALVADOR I. VIGIL N.M.P.S. No. 10988 DATE 3-15-2018

VISTA AURORA SEWER CORRIDOR

SANITARY SEWER LINE ALIGNMENT
SECTION 6, TOWNSHIP 16 NORTH, RANGE 9 EAST
NEW MEXICO PRINCIPAL MERIDIAN
COUNTY OF SANTA FE, STATE OF NEW MEXICO

SUBMITTED BY: SALVADOR I. VIGIL, NMPS - 10988	APPROVED FOR RELEASE	SHEET No. TWO
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LAND SURVEYING COMPANY, LLC
P.O. Box 4384 Office 505-473-0003
Santa Fe, New Mexico 87502 Cell 505-603-1511
Salvador I. Vigil, NMPS 10988 Ussvigil@msn.com



LEGEND

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- Monument set, number 4 rebar with NMPS 10988 cap.
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- Underground Communication Line or fiber optic line.
- Electric Transformer
- Cleanouts
- Gas meter
- Water Meter/valve
- Light Pole
- Fire Hydrant
- Utility Box
- Sanitary Sewer Manhole North Rim Elevation
- Underground Waterline
- Underground Sanitary Sewer Line

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Salvador I. Vigil

3-15-2018

SALVADOR I. VIGIL

N.M.P.S. No. 10988

DATE



VISTA AURORA SEWER CORRIDOR

SANITARY SEWER LINE ALIGNMENT
SECTION 6, TOWNSHIP 16 NORTH, RANGE 9 EAST
NEW MEXICO PRINCIPAL MERIDIAN
COUNTY OF SANTA FE, STATE OF NEW MEXICO

DRAWN	SAL VIGIL, NMPS
CHECKED	SANTA FE ENG.
DATE	2-06-2018
FIELD	P.B. / D.Y.

SUBMITTED BY:
SALVADOR I. VIGIL, NMPS - 10988

APPROVED FOR RELEASE

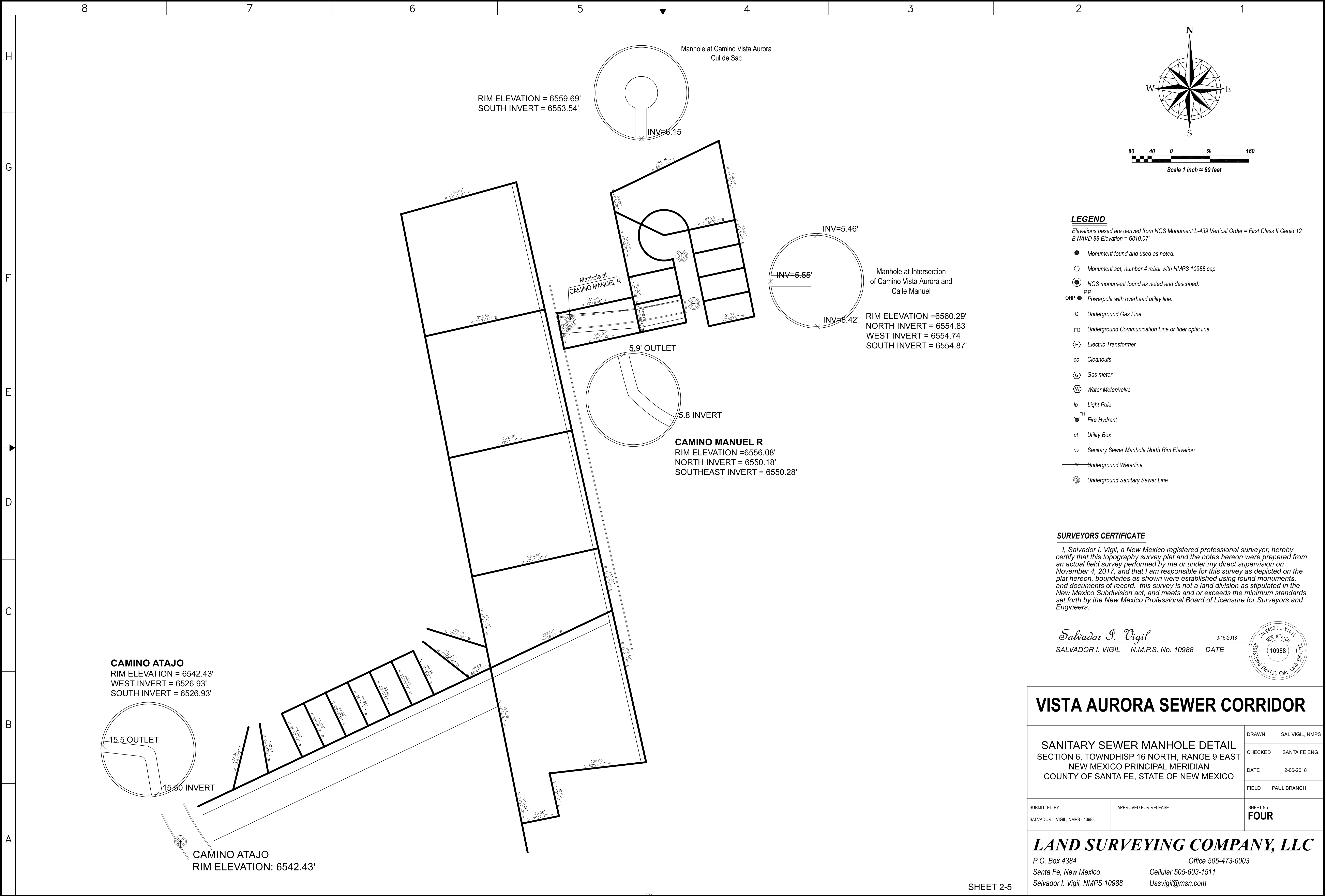
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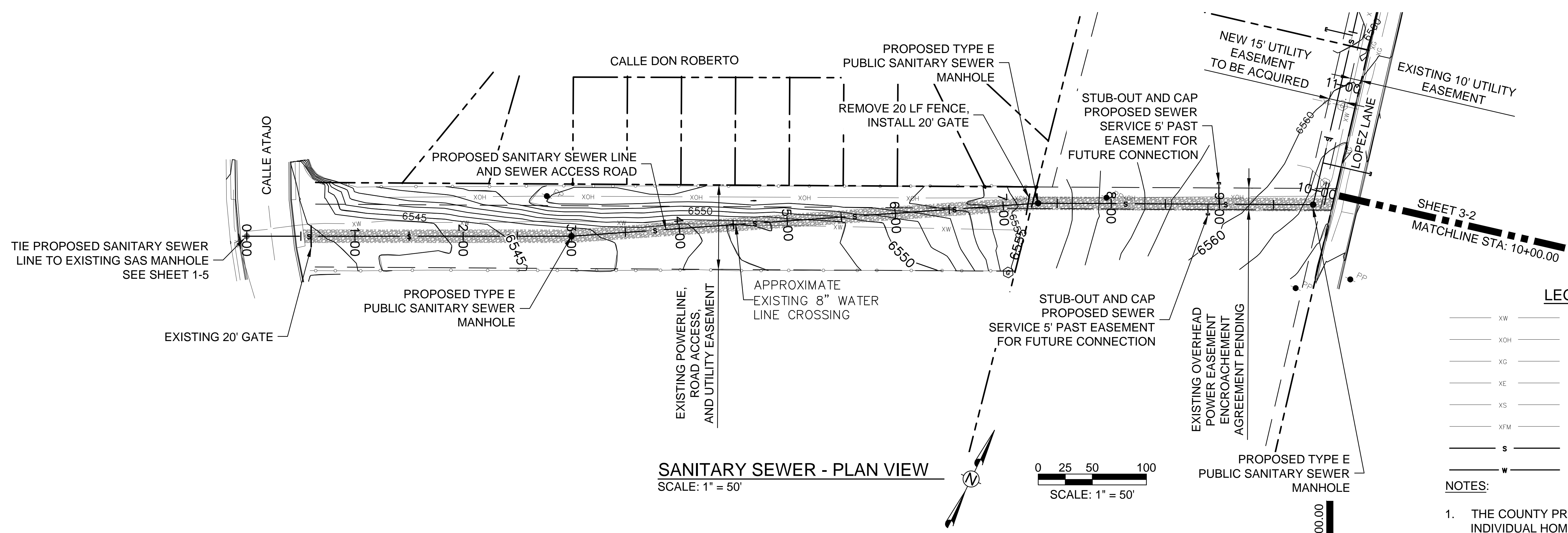
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LAND SURVEYING COMPANY, LLC

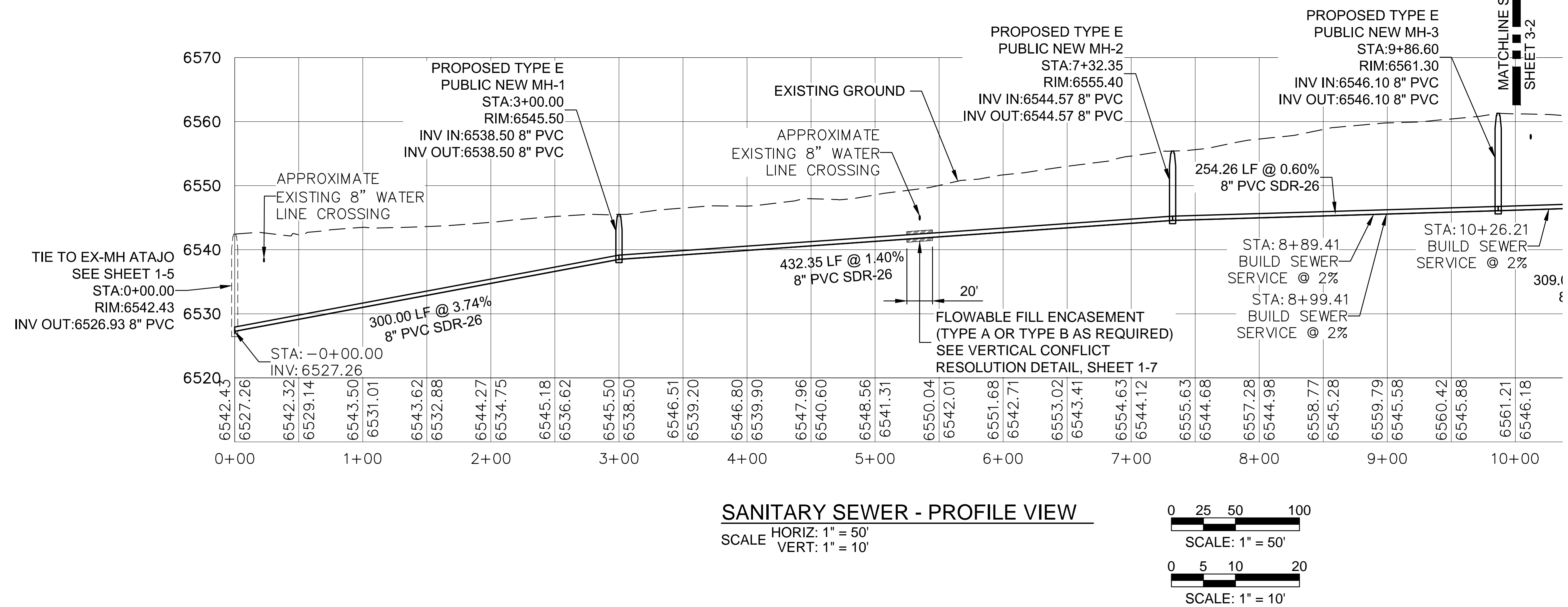
P.O. Box 4384 Office 505-473-0003
Santa Fe, New Mexico 87502 Cell 505-603-1511
Salvador I. Vigil, NMPS 10988 Ussvigil@msn.com

SHEET 2-4





- LEGEND:**
- | | |
|---------|------------------------------------|
| — XW — | EXISTING WATER LINE |
| — XOH — | EXISTING OVERHEAD UTILITY |
| — XG — | EXISTING GAS LINE |
| — XE — | EXISTING UNDERGROUND ELECTRIC LINE |
| — XS — | EXISTING SEWER LINE |
| — XFM — | EXISTING FORCE MAIN |
| — s — | PROPOSED SEWER |
| — w — | PROPOSED WATER |
- NOTES:**
1. THE COUNTY PROJECT MANAGER WILL MEET WITH INDIVIDUAL HOME OWNERS AND VERIFY OR REVISE THE LOCATION OF EACH SEWER SERVICE STUB-OUT.
 2. CONTRACTOR TO VERIFY DEPTHS OF EXISTING UTILITIES TO DETERMINE VERTICAL CONFLICT RESOLUTION TYPE TO USE. SEE DETAILS, SHEET 1-7.
 3. CONTRACTOR IS DIRECTED TO THE GEOTECHNICAL REPORT INCLUDED IN THE PROJECT SPECIFICATIONS FOR INFORMATION REGARDING MANHOLE FOUNDATIONS AND SUBSURFACE SOIL CONDITIONS. ANY DEVIATIONS IN SUBSURFACE SOIL CONDITIONS SHALL BE REPORTED TO THE DESIGN PROJECT ENGINEER IMMEDIATELY.



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NO.	DESCRIPTION	DATE	BY

REVISIONS (OR CHANGE NOTICES)

VISTA AURORA SUBDIVISION
SANITARY SEWER UPGRADE
PROJECT NUMBER: 2016-0171 PW/IC
100% DESIGN

SANITARY SEWER PLAN AND
PROFILE

DATE: JUNE 2018	SCALE: 1" = 50'	SHEET: 3-1
--------------------	--------------------	---------------

LEGEND:

XW EXISTING WATER LINE
XOH EXISTING OVERHEAD UTILITY
XG EXISTING GAS LINE
XE EXISTING UNDERGROUND ELECTRIC LINE
XS EXISTING SEWER LINE
XFM EXISTING FORCE MAIN
S PROPOSED SEWER
W PROPOSED WATER

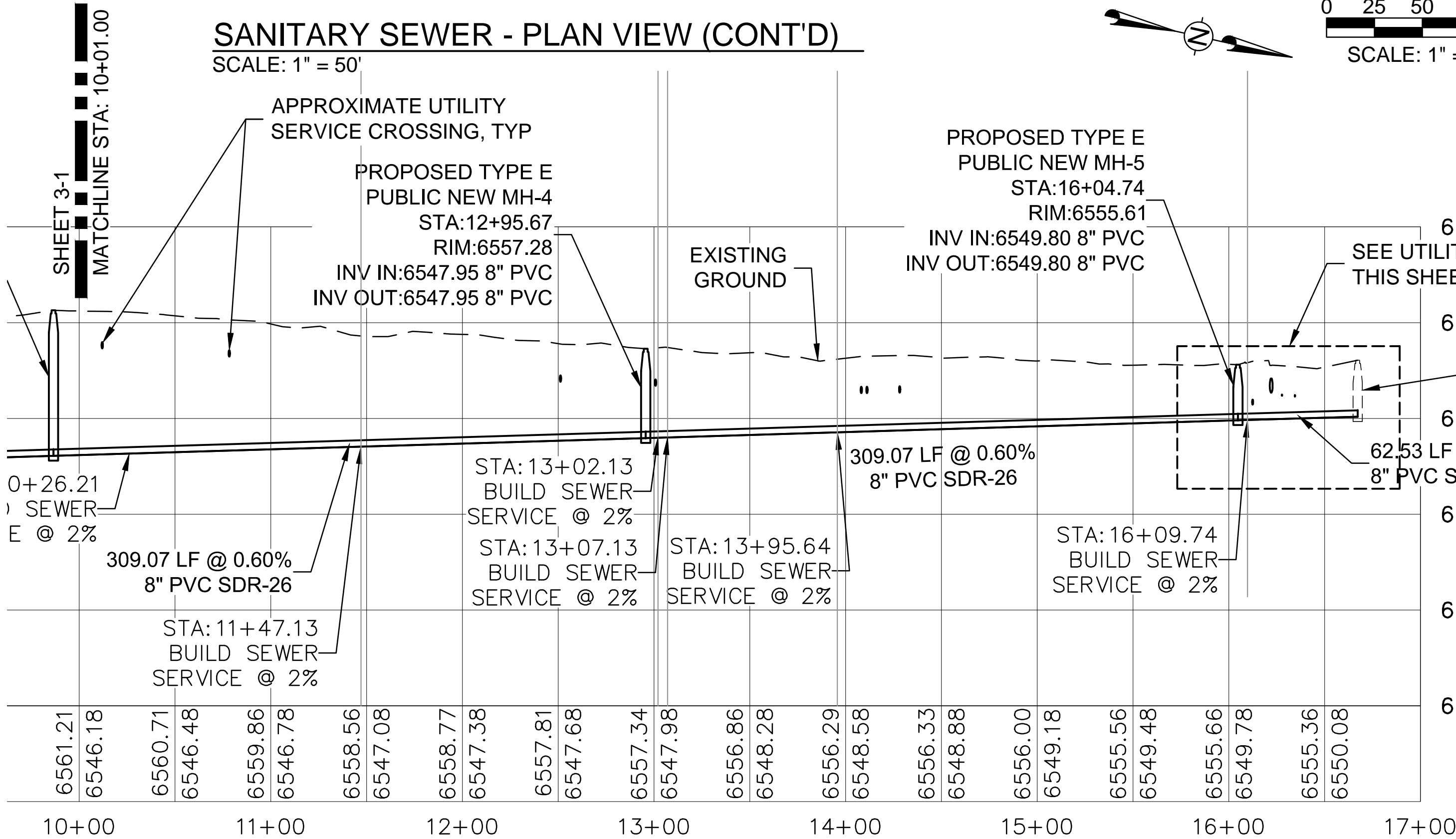
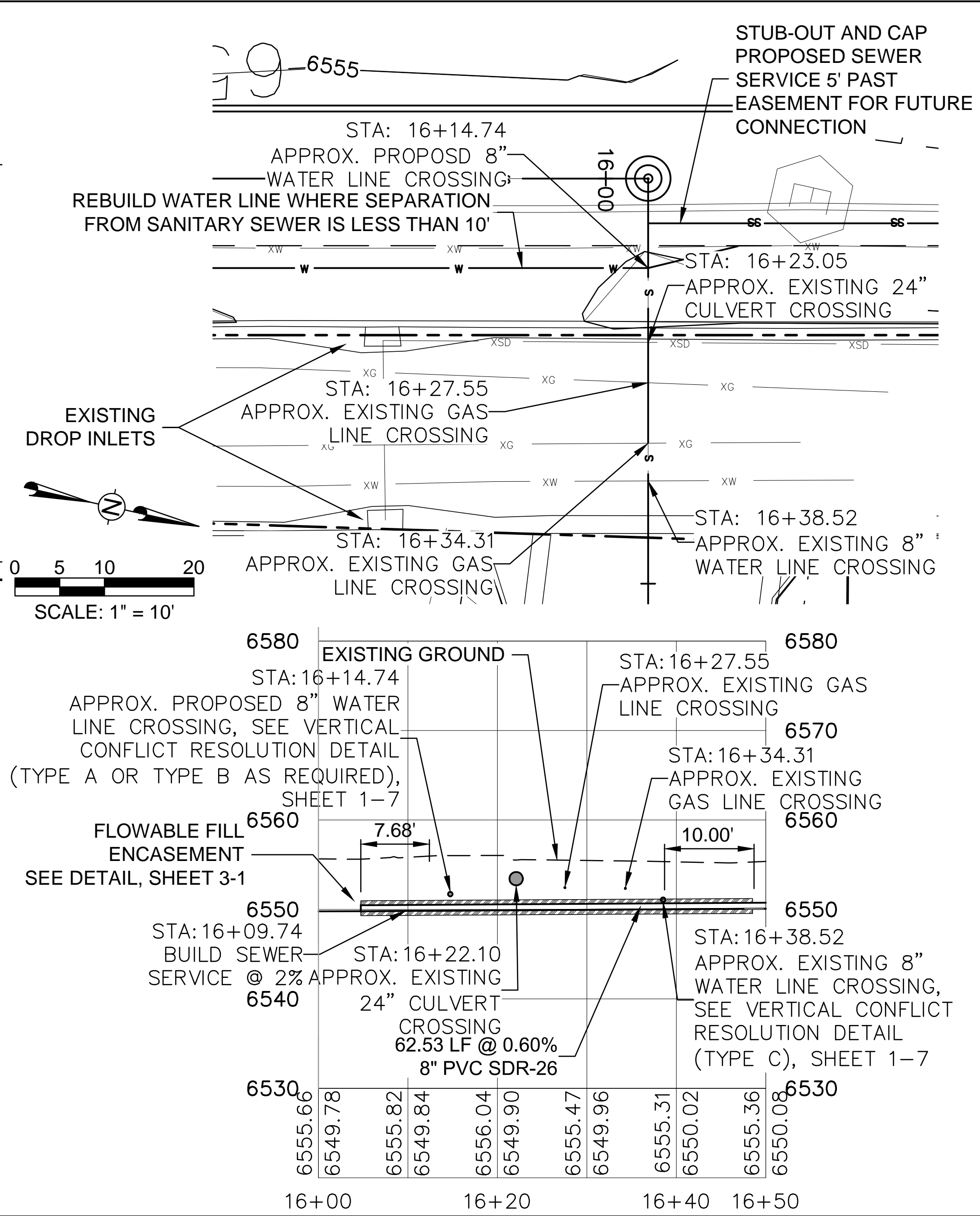
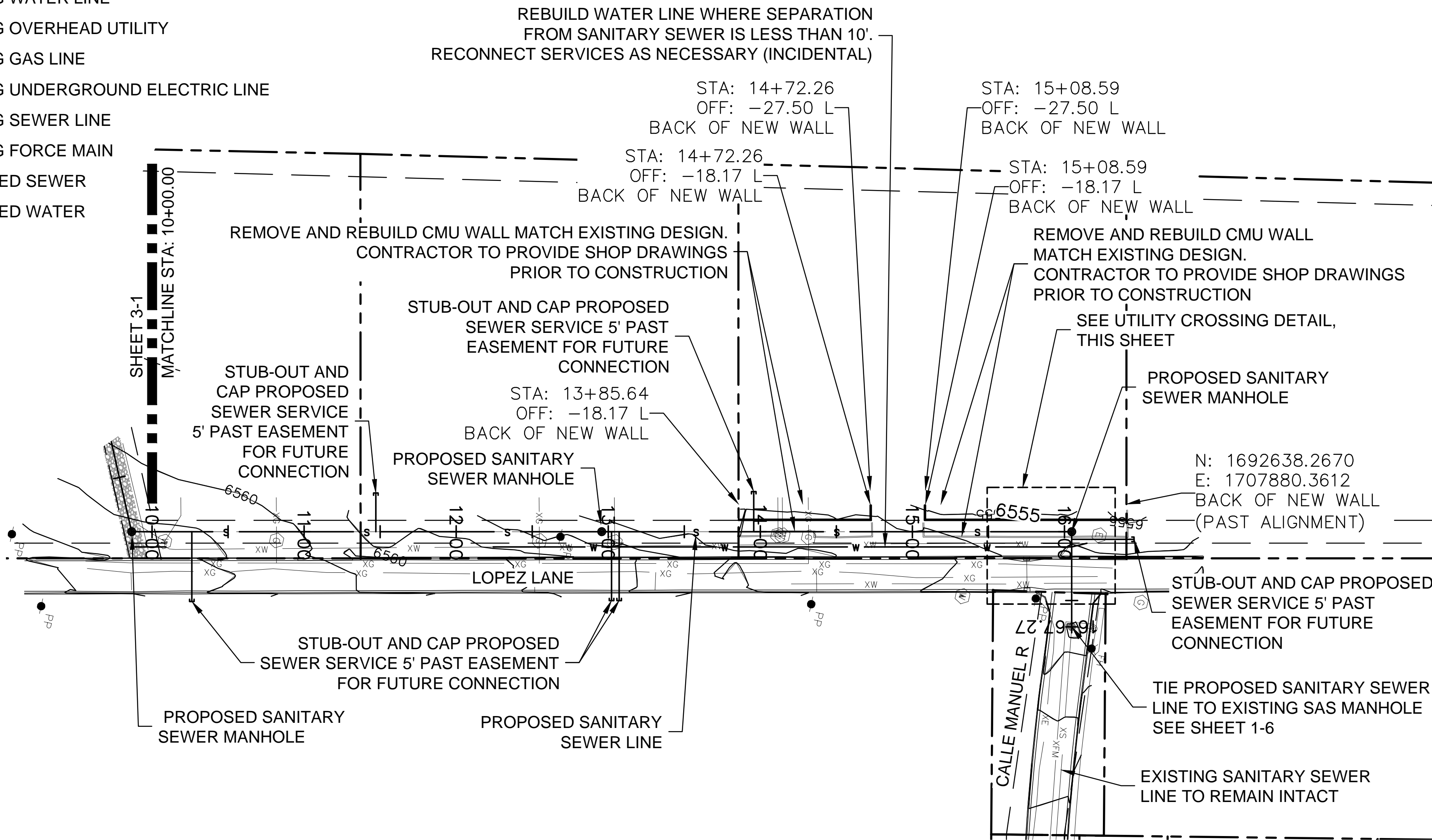
Santa Fe Engineering
Consultants, LLC

SANTA FE COUNTY

SHEET
NO.

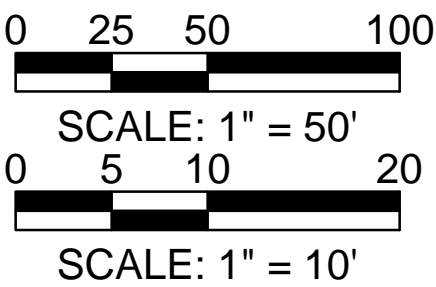
PROJECT NUMBER: 2016-0171 PW/IC

3-2



SANITARY SEWER - PROFILE VIEW (CONT'D)

SCALE
HORIZ: 1" = 50'
VERT: 1" = 10'



NOTES:

1. THE COUNTY PROJECT MANAGER WILL MEET WITH INDIVIDUAL HOME OWNERS AND VERIFY OR REVISE THE LOCATION OF EACH SEWER SERVICE STUB-OUT.
2. CONTRACTOR TO VERIFY DEPTHS OF EXISTING UTILITIES TO DETERMINE VERTICAL CONFLICT RESOLUTION TYPE TO USE. SEE DETAILS, SHEET 1-7.
3. CONTRACTOR IS DIRECTED TO THE GEOTECHNICAL REPORT INCLUDED IN THE PROJECT SPECIFICATIONS FOR INFORMATION REGARDING MANHOLE FOUNDATIONS AND SUBSURFACE SOIL CONDITIONS. ANY DEVIATIONS IN SUBSURFACE SOIL CONDITIONS SHALL BE REPORTED TO THE DESIGN PROJECT ENGINEER IMMEDIATELY.

UTILITY CROSSING DETAIL

SCALE
HORIZ: 1" = 10'
VERT: 1" = 10'

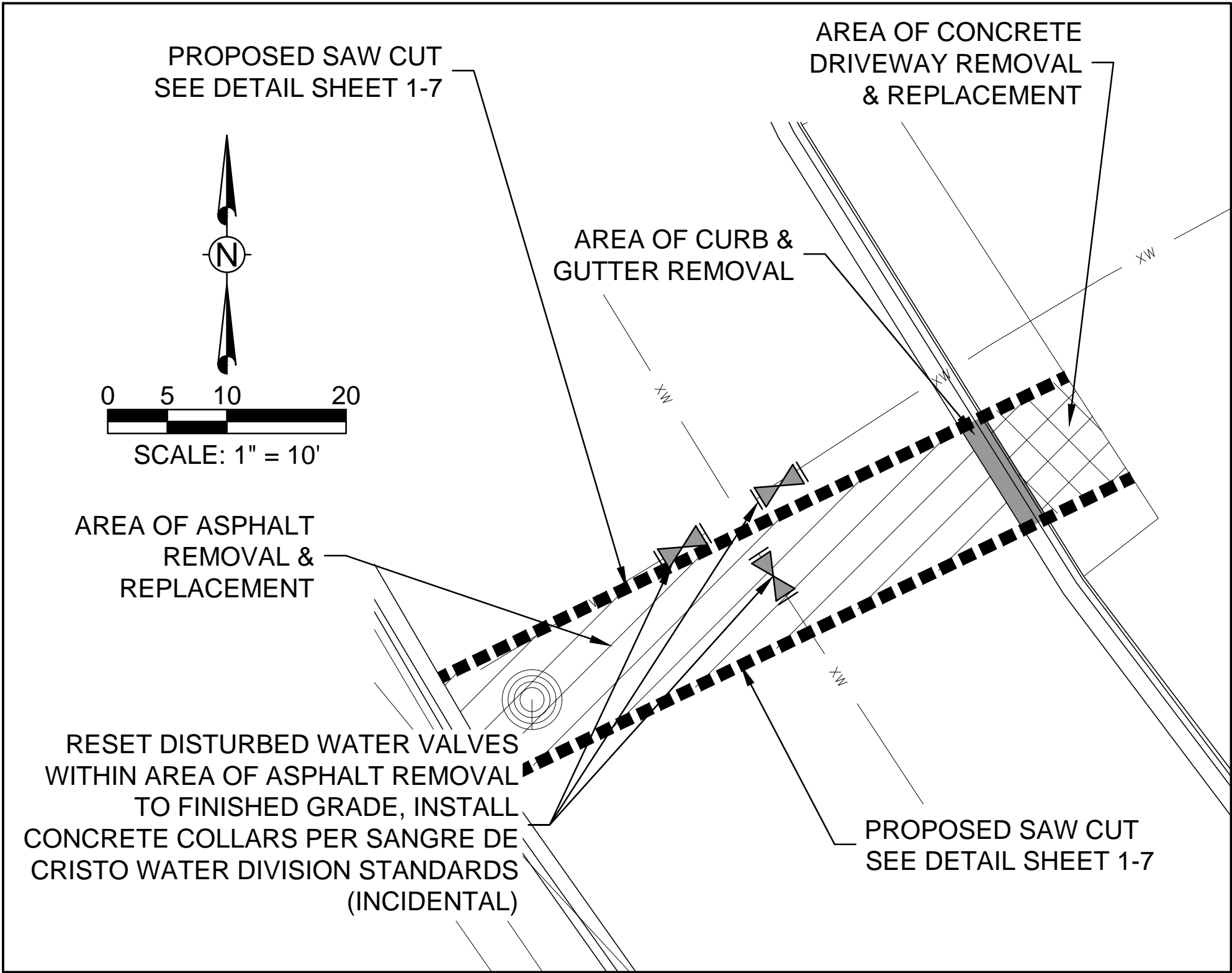
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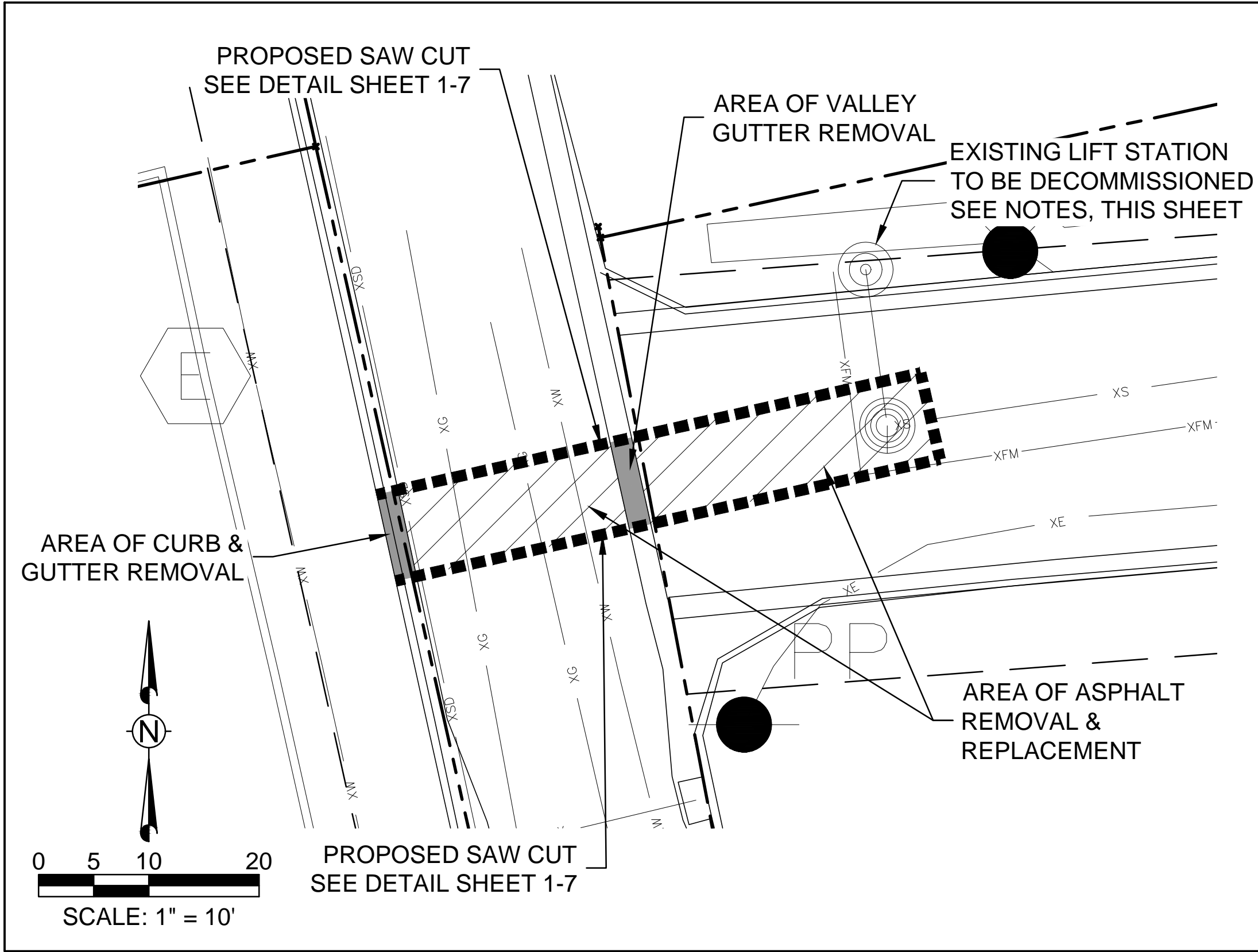
VISTA AURORA SUBDIVISION
SANITARY SEWER UPGRADE
PROJECT NUMBER: 2016-0171 PW/IC
100% DESIGN

SANITARY SEWER PLAN AND
PROFILE (CONT'D)

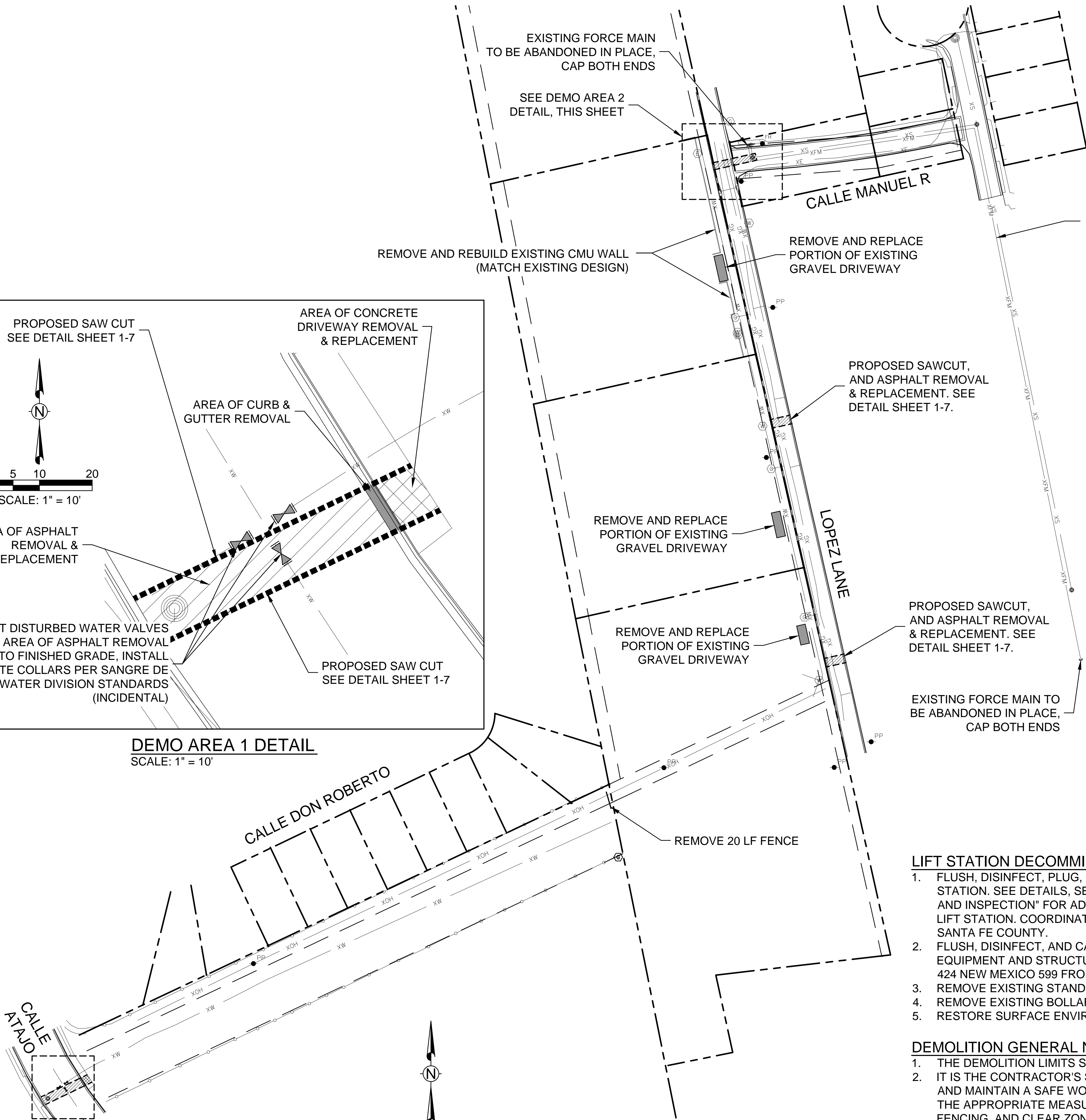
DATE: JUNE 2018
SCALE: AS NOTED
SHEET: 3-2



DEMO AREA 1 DETAIL
SCALE: 1" = 10'



DEMO AREA 2 DETAIL
SCALE: 1" = 10'



DEMOLITION PLAN
SCALE: 1" = 60'

LIFT STATION DECOMMISSION NOTES

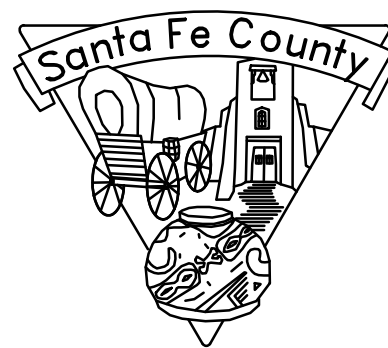
1. FLUSH, DISINFECT, PLUG, CUT AND CAP EXISTING GRAVITY LINE ENTERING LIFT STATION. SEE DETAILS, SEE APWA PROJECT SPECIFICATION 901.8 "CLEANING AND INSPECTION" FOR ADDITIONAL INFORMATION. DISCONNECT POWER FROM LIFT STATION. COORDINATE REMOVAL WITH DESIGN PROJECT ENGINEER AND SANTA FE COUNTY.
2. FLUSH, DISINFECT, AND CAREFULLY REMOVE ENTIRE EXISTING LIFT STATION EQUIPMENT AND STRUCTURE. DELIVER TO SANTA FE COUNTY PUBLIC WORKS, 424 NEW MEXICO 599 FRONTAGE ROAD, SANTA FE, NEW MEXICO 87507.
3. REMOVE EXISTING STAND PIPE AND BACKFILL OVER LIFT STATION EXCAVATION.
4. REMOVE EXISTING BOLLARDS.
5. RESTORE SURFACE ENVIRONMENT TO ORIGINAL CONDITION.

DEMOLITION GENERAL NOTES

1. THE DEMOLITION LIMITS SHOWN ON THIS DRAWING ARE APPROXIMATE ONLY.
2. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO MEET OSHA REQUIREMENTS AND MAINTAIN A SAFE WORKING CONDITION. THE CONTRACTOR SHALL TAKE THE APPROPRIATE MEASURES IN REGARD TO TRENCH SAFETY, WORK ZONE FENCING, AND CLEAR ZONE SHIELDING.
3. THE CONTRACTOR SHALL BE REQUIRED TO SUBMIT A SAFETY PLAN SHOWING EXPECTED CONSTRUCTION LIMITS BASED ON HIS METHOD AND MEANS OF CONSTRUCTION. THIS PLAN SHALL BE SUBMITTED TO THE DESIGN PROJECT ENGINEER AT THE PRECONSTRUCTION CONFERENCE. THIS WORK SHALL BE CONSIDERED INCIDENTAL TO THE COMPLETION OF THE PROJECT.

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REVISIONS (OR CHANGE NOTICES)



VISTA AURORA SUBDIVISION
SANITARY SEWER UPGRADE
PROJECT NUMBER: 2016-0171 PW/IC
100% DESIGN

DEMOLITION PLAN

NOTES:

1. THE EXISTING UTILITY LOCATIONS SHOWN ON THESE PLANS HAVE BEEN COMPILED FROM MULTIPLE SOURCES, INCLUDING UTILITY LOCATES, FIELD SURVEYS (AS COMPILED BY LAND SURVEYING COMPANY, AND DATA PROVIDED BY THE UTILITY COMPANIES.
2. SOME AREAS OF POTENTIAL UTILITY CONFLICT HAVE BEEN SHOWN ON THESE PLANS. IF REQUIRED, THE CONFLICTING UTILITIES AND SERVICES WITHIN THE RIGHT OF WAY WILL BE RELOCATED BY THE RESPECTIVE UTILITY COMPANY PRIOR TO CONSTRUCTION AS PER SANTA FE COUNTY ORDINANCE 2003-1.
3. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY AND POTHOLE ANY POTENTIAL UTILITY CONFLICTS. THE CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGE CAUSED BY CONSTRUCTION ACTIVITIES TO PUBLIC OR PRIVATE PROPERTY, INCLUDING UTILITIES.
4. ANY GRADING ACTIVITIES EXTENDING INTO UTILITY EASEMENTS WILL REQUIRE POTHOLING BY THE CONTRACTOR TO VERIFY ADEQUATE DEPTHS OF COVER ARE MAINTAINED.
5. ANY SCHEDULED OUTAGES OR MODIFICATIONS TO UTILITIES REQUIRE COORDINATION WITH THE RESPECTIVE UTILITY COMPANY.
6. SEE SHEET 3-1 AND 3-2 FOR APPROXIMATE UTILITY DEPTHS.

UTILITY CONTACT INFORMATION		
COMPANY	CONTACT	PHONE NUMBER
PNM	DON FERRIS	(505) 473-3279
CENTURY LINK	LORENZO LUJAN	(505) 425-9345
COMCAST	DAVID AIKIN	(505) 474-7886
NM GAS COMPANY	FRANK ARAGON	(505) 470-0668
SANGRE DE CRISTO WATER COMPANY	DEE BEINGESSNER	(505) 955 4231
CITY OF SANTA FE WASTE WATER DIVISION	STAN HOLLAND	(505) 955 4637
SANTA FE COUNTY	LEROY ALVARADO	(505) 490 0038
SANTA FE ENGINEERING	BERNADETTE SCARGALL	(505) 982 2845
AGUA FRIA COMMUNITY WATER SYSTEM	RAMON ROMERO	(505) 204 2394

LEGEND:

- | | |
|---------|------------------------------------|
| — XW — | EXISTING WATER LINE |
| — XOH — | EXISTING OVERHEAD UTILITY |
| — XG — | EXISTING GAS LINE |
| — XE — | EXISTING UNDERGROUND ELECTRIC LINE |
| — XS — | EXISTING SEWER LINE |
| — XFM — | EXISTING FORCE MAIN |
| • UP | EXISTING UTILITY POLE |
| ○ | EXISTING UTILITY METER |
| — S — | PROPOSED SEWER |
| — | PROPOSED SEWER SERVICE |
| — W — | PROPOSED WATER |

EXISTING OVERHEAD POWER LINE TO REMAIN UNDISTURBED, USE EXTREME CAUTION WHEN WORKING NEAR POWER LINE.

EXISTING 20' OVERHEAD UTILITY EASEMENT TO REMAIN. ENCROACHMENT AGREEMENT REQUIRED.

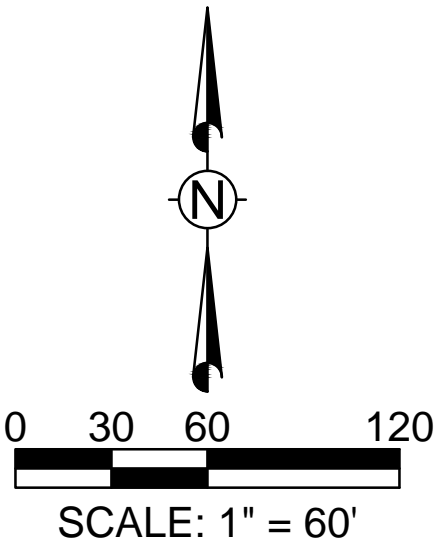
EXISTING UTILITY POLE, APPROXIMATE LOCATION.

EXISTING POWERLINE ROAD ACCESS UTILITY EASEMENT TO REMAIN.

EXISTING WATER LINE TO REMAIN UNDISTURBED, MAINTAIN 10' MINIMUM SEPARATION WITH PROPOSED SAS LINE.

EXISTING WATER LINE, SEE SHEET 3-1

UTILITY INFORMATION SHEET
SCALE: 1" = 60'



THIS SHEET IS SHOWN
FOR REFERENCE ONLY
UTILITY RELOCATIONS ARE THE
RESPONSIBILITY OF THE INDIVIDUAL
UTILITY COMPANIES

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REVISIONS (OR CHANGE NOTICES)

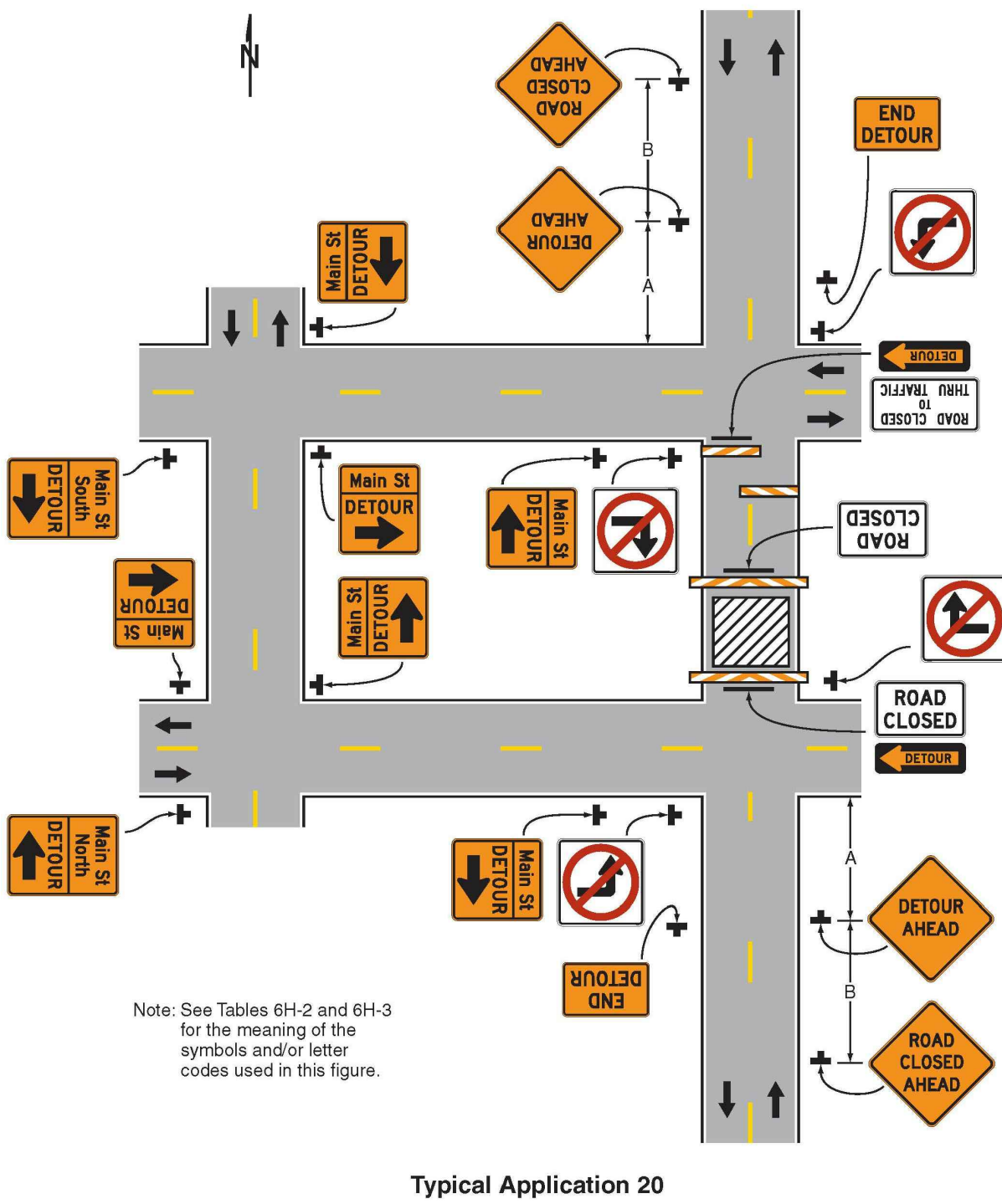
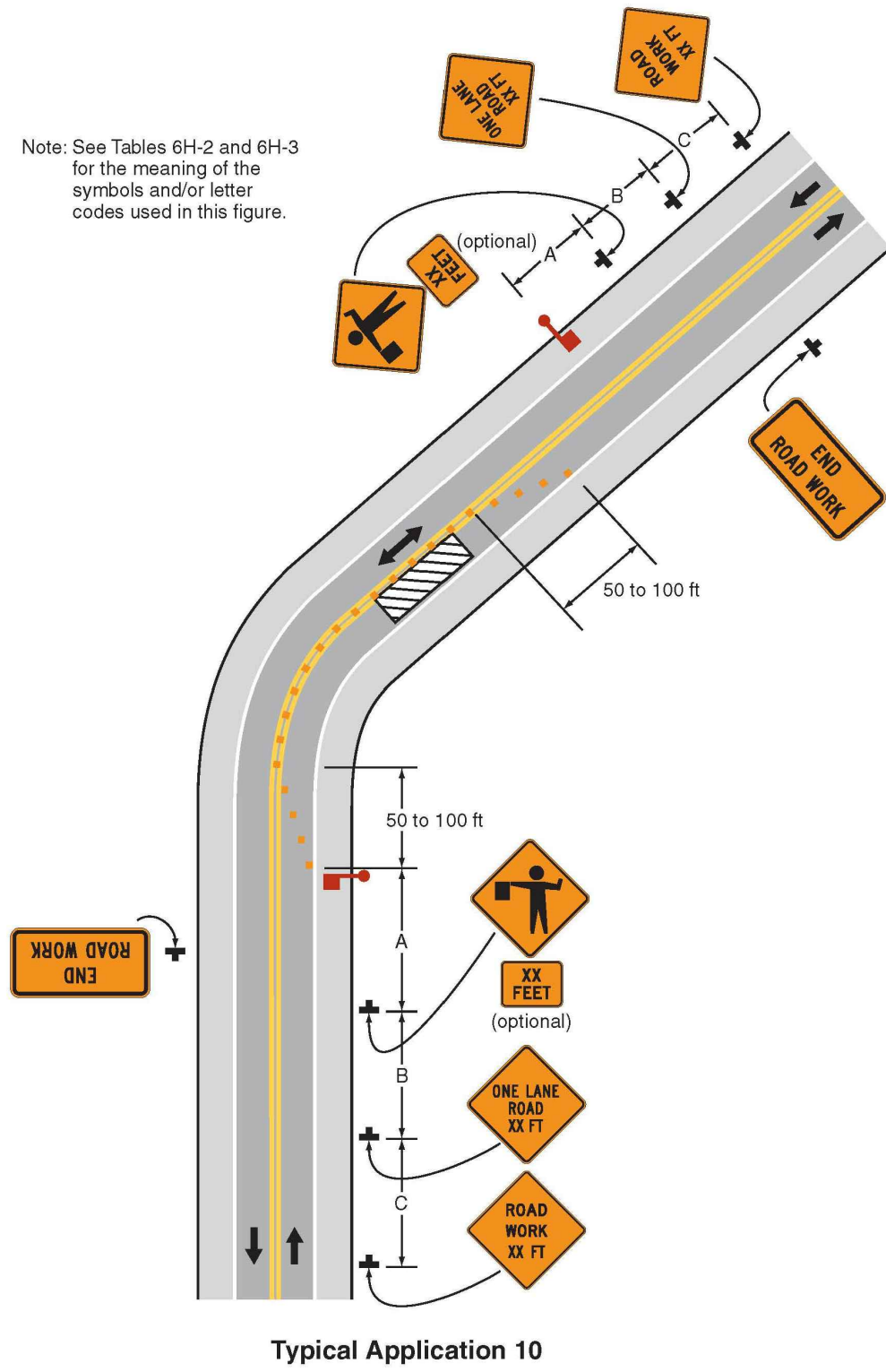


VISTA AURORA SUBDIVISION
SANITARY SEWER UPGRADE
PROJECT NUMBER: 2016-0171 PW/IC
100% DESIGN

UTILITY INFORMATION PLAN

DATE: JUNE 2018	SCALE: 1" = 60'	SHEET: 5-1
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Note: See Tables 6H-2 and 6H-3 for the meaning of the symbols and/or letter codes used in this figure.



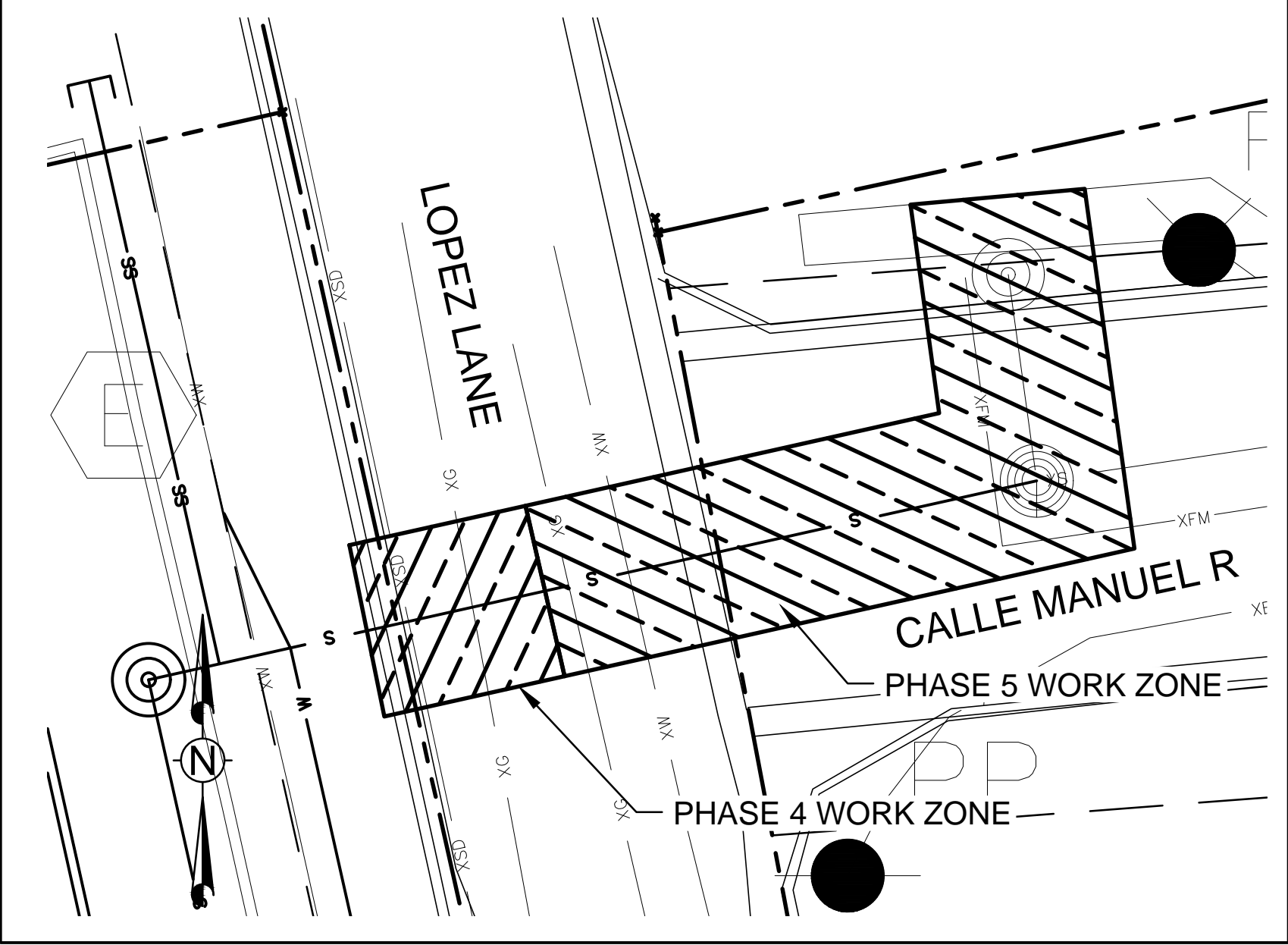
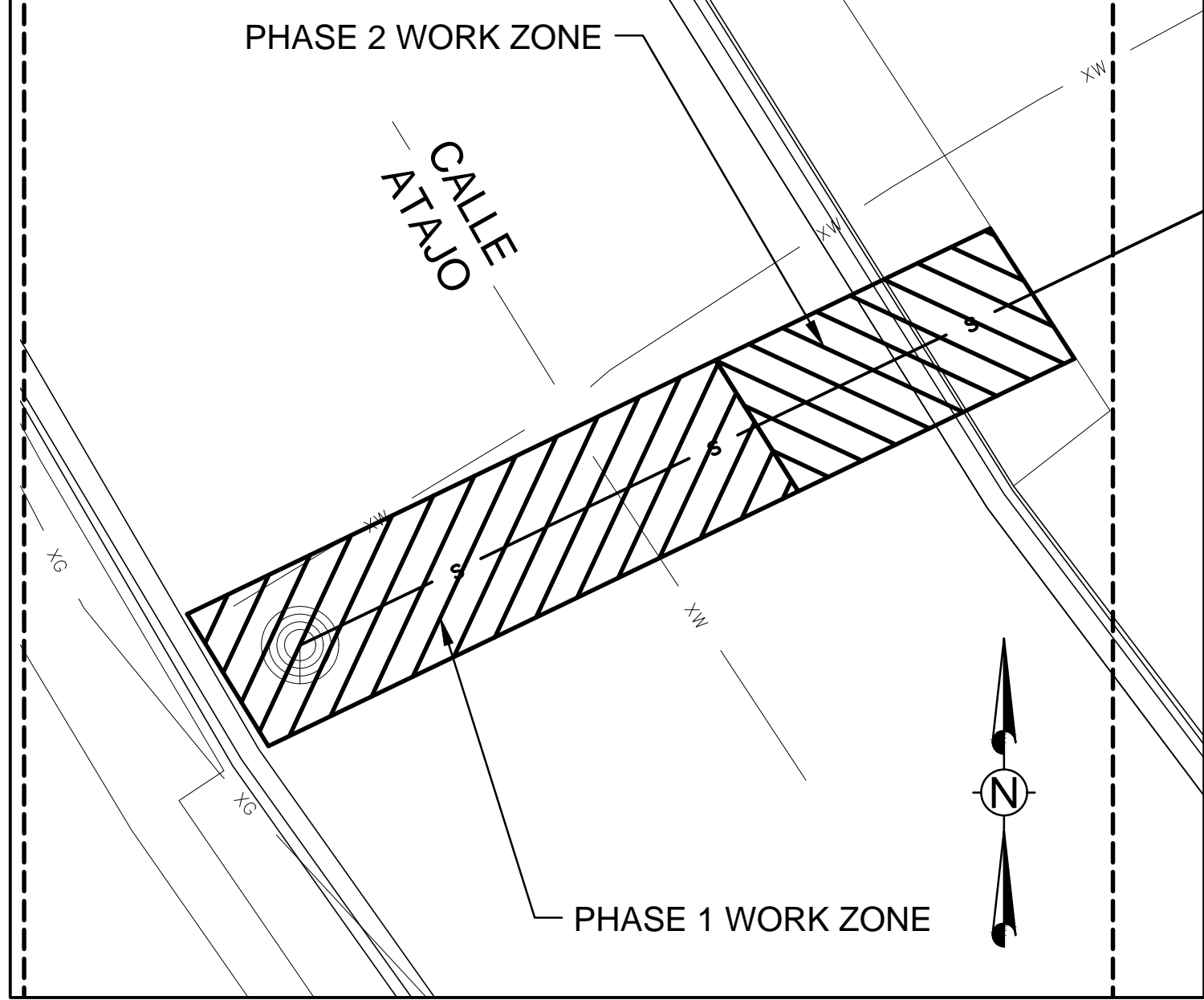
Note: See Tables 6H-2 and 6H-3 for the meaning of the symbols and/or letter codes used in this figure.

SEE DETAIL AREA 2 THIS SHEET

CALLE MANUEL R

LOPEZ LANE

PHASE 4 WORK ZONE
PHASE 5 WORK ZONE



PHASE 4 WORK ZONE
PHASE 5 WORK ZONE

DETAIL AREA 1
SCALE: 1" = 10'

0 5 10 20
SCALE: 1" = 10'

DETAIL AREA 2
SCALE: 1" = 10'

0 5 10 20
SCALE: 1" = 10'

Table 6H-2. Meaning of Symbols on Typical Application Diagrams

	Arrow board		Shadow vehicle
	Arrow board support or trailer (shown facing down)		Sign (shown facing left)
	Changeable message sign or support trailer		Surveyor
	Channelizing device		Temporary barrier
	Crash cushion		Temporary barrier with warning light
	Direction of temporary traffic detour		Traffic or pedestrian signal
	Direction of traffic		Truck-mounted attenuator
	Flagger		Type 3 barricade
	High-level warning device (Flag tree)		Warning light
	Longitudinal channelizing device		Work space
	Luminaire		Work vehicle
	Pavement markings that should be removed for a long-term project		

Table 6H-3. Meaning of Letter Codes on Typical Application Diagrams

Road Type	Distance Between Signs**		
	A	B	C
Urban (low speed)*	100 feet	100 feet	100 feet
Urban (high speed)*	350 feet	350 feet	350 feet
Rural	500 feet	500 feet	500 feet
Expressway / Freeway	1,000 feet	1,500 feet	2,640 feet

* Speed category to be determined by highway agency
** The column headings A, B, and C are the dimensions shown in Figures 6H-1 through 6H-46. The A dimension is the distance from the transition or point of restriction to the first sign. The B dimension is the distance between the first and second signs. The C dimension is the distance between the second and third signs. (The "first sign" is the sign in a three-sign series that is closest to the TTC zone. The "third sign" is the sign that is furthest upstream from the TTC zone.)

Table 6H-4. Formulas for Determining Taper Length

Speed (S)	Taper Length (L) in feet
40 mph or less	$L = \frac{WS^2}{60}$
45 mph or more	$L = WS$

Where: L = taper length in feet
W = width of offset in feet
S = posted speed limit, or off-peak 85th-percentile speed prior to work starting, or the anticipated operating speed in mph

SUGGESTED SEQUENCE OF CONSTRUCTION TABLE

PHASE	WORK ZONE DESCRIPTION	TRAFFIC CONTROL	MUTCD TYPICAL APPLICATIONS
PHASE 1	CALLE ATAJO (WEST SIDE)	ONE LANE CLOSURE WITH FLAGGER	TA-10
PHASE 2	CALLE ATAJO (EAST SIDE)	ONE LANE CLOSURE WITH FLAGGER	TA-10
PHASE 3	WORK OUTSIDE ROADWAYS	N/A, TRUCKS TURNING	N/A
PHASE 4	LOPEZ LANE (WEST SIDE)	ONE LANE CLOSURE WITH FLAGGER	TA-10
PHASE 5	LOPEZ LANE (EAST SIDE) AND CALLE MANUEL	ONE LANE CLOSURE WITH FLAGGER AND ROAD CLOSURE WITH DETOUR	TA-10 TA-20

TRAFFIC CONTROL NOTES

- ALL TRAFFIC CONTROL DEVICES AND THEIR PLACEMENT SHALL CONFORM TO CURRENT M.U.T.C.D. SPECIFICATIONS.
- THE CONTRACTOR SHALL SUBMIT HIS OWN CONSTRUCTION TRAFFIC CONTROL PLAN TO BE APPROVED BY THE CITY OF SANTA FE TRAFFIC ENGINEER FOR WORK WITHIN THE CITY LIMITS AND THE SANTA FE COUNTY TRAFFIC MANAGER FOR WORK OUTSIDE THE CITY LIMITS. THE CONTRACTOR'S CONSTRUCTION TRAFFIC CONTROL PLAN MUST BE STAMPED BY A LICENSED PROFESSIONAL ENGINEER.
- HOURS OF OPERATIONS SHALL BE LIMITED TO MONDAY THROUGH FRIDAY, 8:00 AM TO 5:00 PM.
- THIS IS AN URBAN LOW SPEED AREA. POSTED SPEED LIMIT IS 25 MPH. SIGN SPACING PER MUTCD IS 100 FEET.
- 10' MINIMUM WIDTH DRIVING LANES TO BE MAINTAINED AT ALL TIMES.

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VISTA AURORA SUBDIVISION
SANITARY SEWER UPGRADE
PROJECT NUMBER: 2016-0171 PW/IC
100% DESIGN

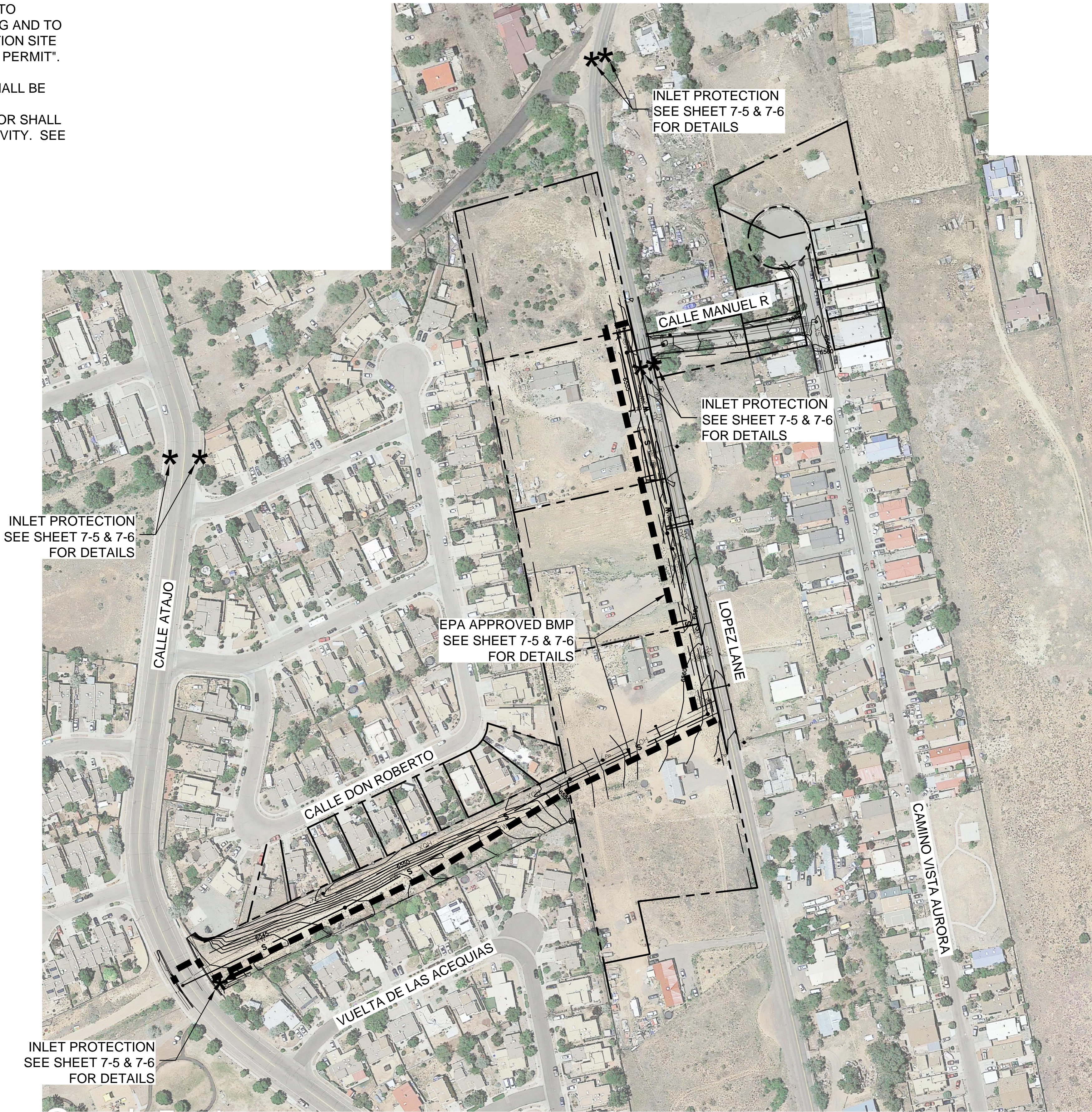
SUGGESTED CONSTRUCTION
SEQUENCE AND TRAFFIC
CONTROL

DATE: JUNE 2018	SCALE: AS NOTED	SHEET: 5-2
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SUGGESTED CONSTRUCTION SEQUENCE AND TRAFFIC CONTROL
SCALE: 1" = 60'

- NOTE:
1. THIS PLAN SHOWS TEMPORARY BMPs (BEST MANAGEMENT PRACTICES) IN THEIR LOCATIONS AFTER ALL FINAL GRADING IS COMPLETE AND BEFORE RESEEDING. ANY PLACEMENT OF TEMPORARY EROSION CONTROL BMPs DURING CONSTRUCTION SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO FACILITATE CONSTRUCTION OPERATIONS AND PHASING AND TO ELIMINATE SEDIMENT FROM LEAVING THE CONSTRUCTION SITE IN ACCORDANCE WITH THE "CONSTRUCTION GENERAL PERMIT". BMP QUANTITIES ARE BASED ON THIS SHEETS.
 2. PRIOR TO REMOVING ANY BMPs, SANTA FE COUNTY SHALL BE NOTIFIED FOR APPROVAL.
 3. UPON COMPLETION OF THE PROJECT, THE CONTRACTOR SHALL SEED ANY AREAS DISTURBED BY CONSTRUCTION ACTIVITY. SEE SEED MIX SPECIFICATION, THIS SHEET.

SANTA FE COUNTY	SHEET NO.
PROJECT NUMBER: 2016-0171 PW/IC	6-1



LEGEND

----- EPA APPROVED BMP (SILT FENCE OR MULCH SOCKS)

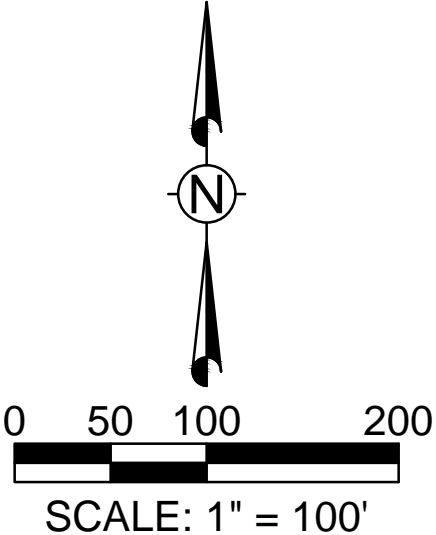
* INLET PROTECTION

CLASS A SEEDING SPECIFICATION

SEED	PERCENTAGE OF SEED MIX
BLUE GRAMA	30%
SIDEOATS GRAMA	20%
LITTLE BLUESTEM	15%
INDIAN RICEGRASS	10%
GALLETA	10%
ALKALI SACATON	5%
SHEEP FESCUE	10%

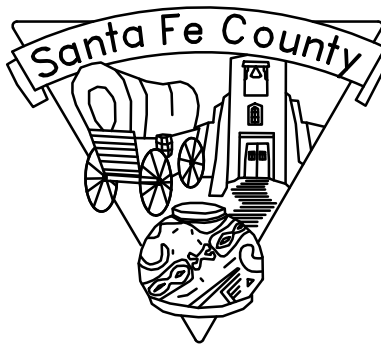
DRILL SEED AT A RATE OF 30 LBS. PER ACRE. SOW ANYTIME EXCEPT 2 MONTHS BEFORE FIRST FALL FROST.

T.E.S.C.M. PLAN
SCALE: 1" = 100'



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REVISIONS (OR CHANGE NOTICES)



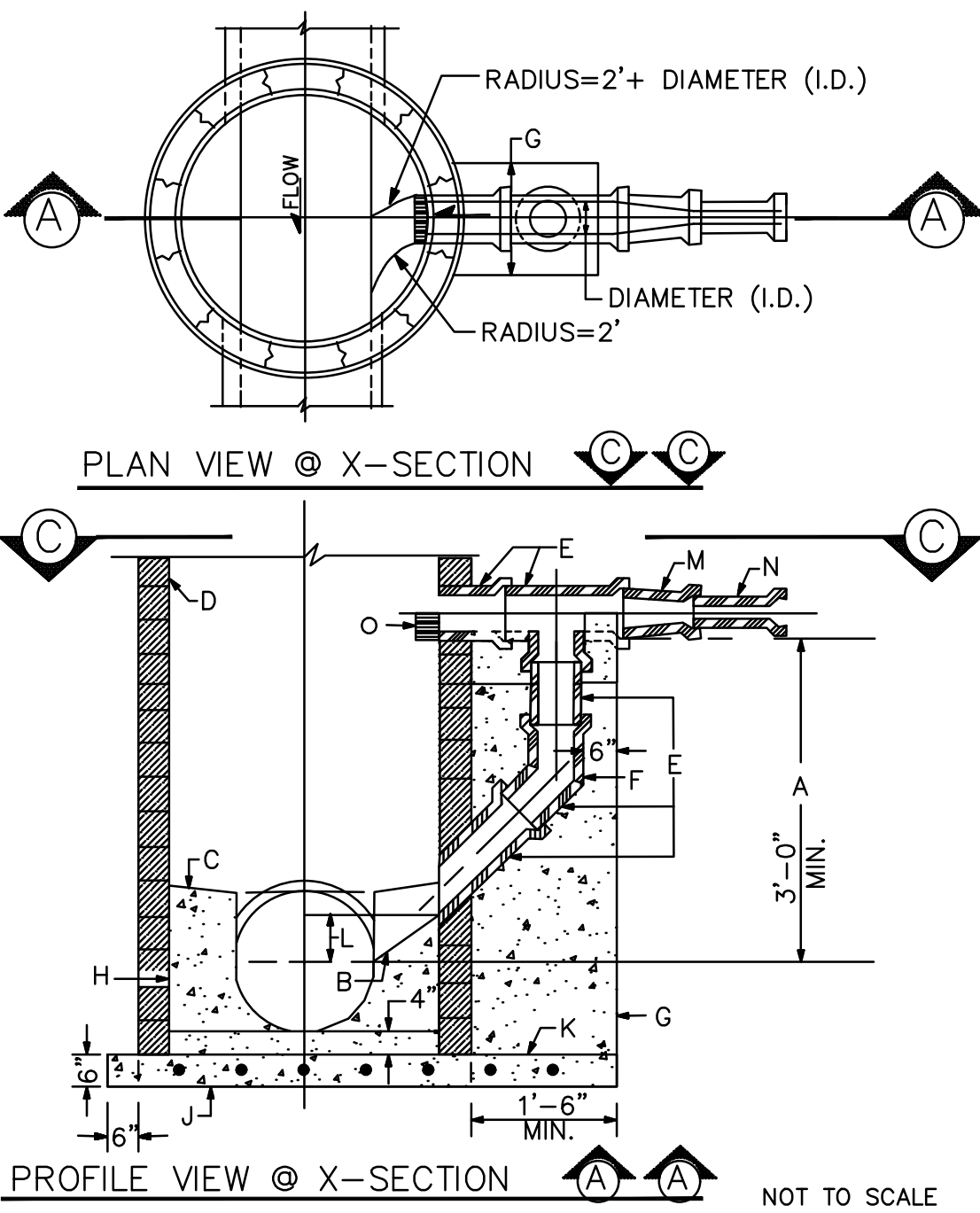
VISTA AURORA SUBDIVISION
SANITARY SEWER UPGRADE
PROJECT NUMBER: 2016-0171 PW/IC
100% DESIGN

TEMPORARY EROSION AND SEDIMENT
CONTROL MEASURES PLAN

DATE: JUNE 2018	SCALE: 1" = 100'	SHEET: 6-1
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LEGEND

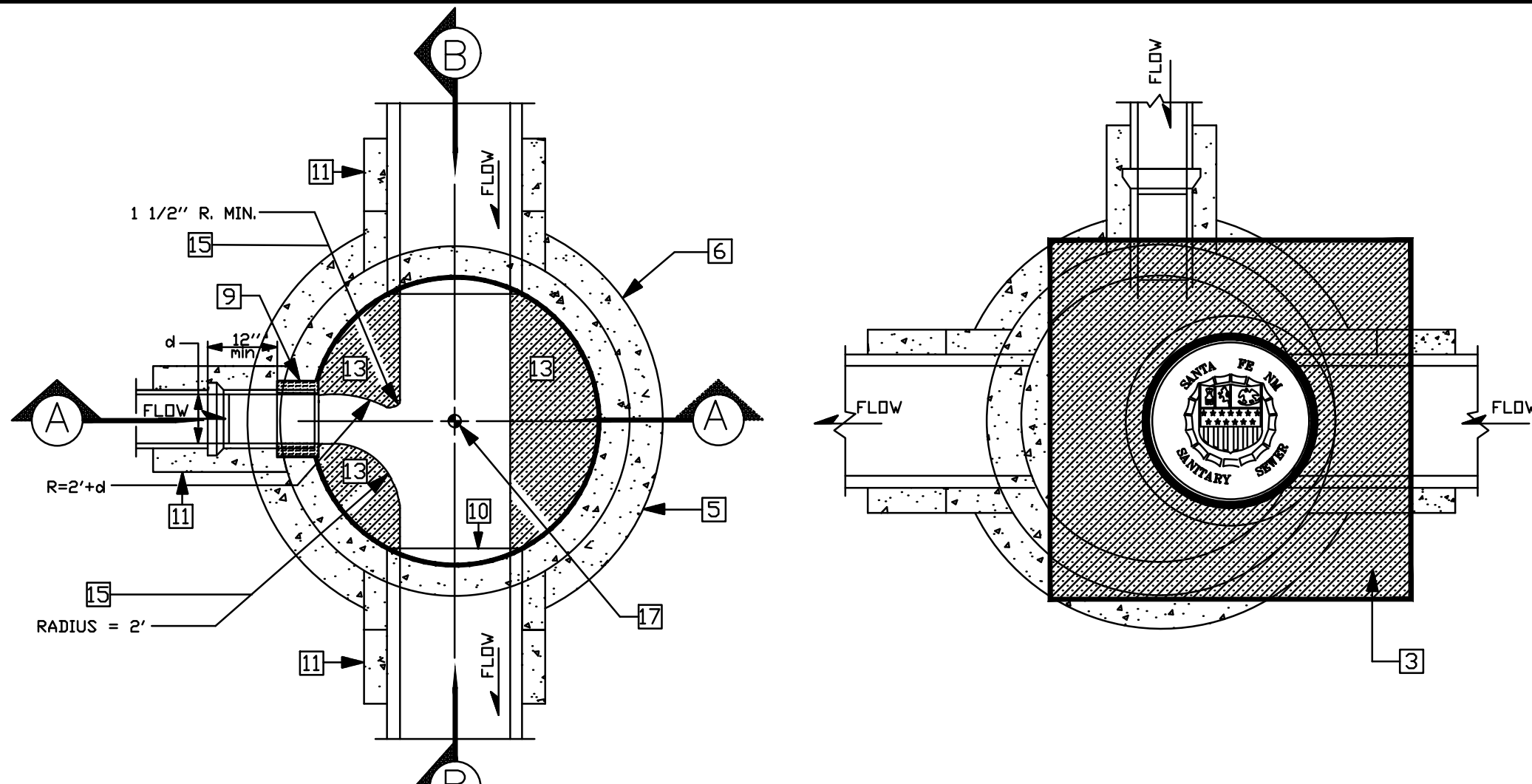
ITEM	DESCRIPTION
1	MANHOLE FRAME & COVER, refer to manhole frame and cover detail Dwg. No. SAS-4
2	CONCRETE ADJUSTMENT RINGS or CONCRETE BRICK, refer to concrete adjustment detail Dwg. No. SAS-5
3	CONCRETE COLLAR, refer to concrete collar detail Dwg. No. SAS-6
4	PRECAST REINFORCED CONCRETE RISER, CONE or FLAT TOP, with 5"(in) wall thickness, refer to general note CM-2
5	PRECAST REINFORCED CONCRETE BASE RISER, with suitable sized openings, refer to general note CM-2A
6	CONCRETE BASE, refer to concrete base detail Dwg. No. SAS-7
7	SEWER PIPE, refer to general note CM-1
8	6"(in) GROUT FILLET, on upper half of pipe and around base
9	ADAPTER, MANHOLE, refer to manhole adapter detail Dwg. No. SAS-8
10	PIPE PENETRATION INTO MANHOLE, refer to manhole adapter detail Dwg. No. SAS-8
11	PIPE SUPPORT, CONCRETE, shall extend out-side of manhole a maximum of 18"(in) to bell of first joint and shall cradle pipe half pipe
12	CONCRETE FILL, 3000 p.s.i., refer to general note CR-6
13	SHELF, to be 9"(in) minimum width with 1"(in) per 1'-0" slope, from crown of pipe
14	CUT UPPER HALF OF PIPE, after manhole has been completed and inspected by engineer
15	HAND FORMED CHANNELS, shall be on a uniform radius and shall not hold water
16	INVERT ELEVATIONS OF LATERAL LINES, shall be the same as the springline elevation of the sewer main, where possible
17	CHANGE SLOPE OF PIPE, at center of manhole
18	APPROVED WATER STOP, to be with type of pipe



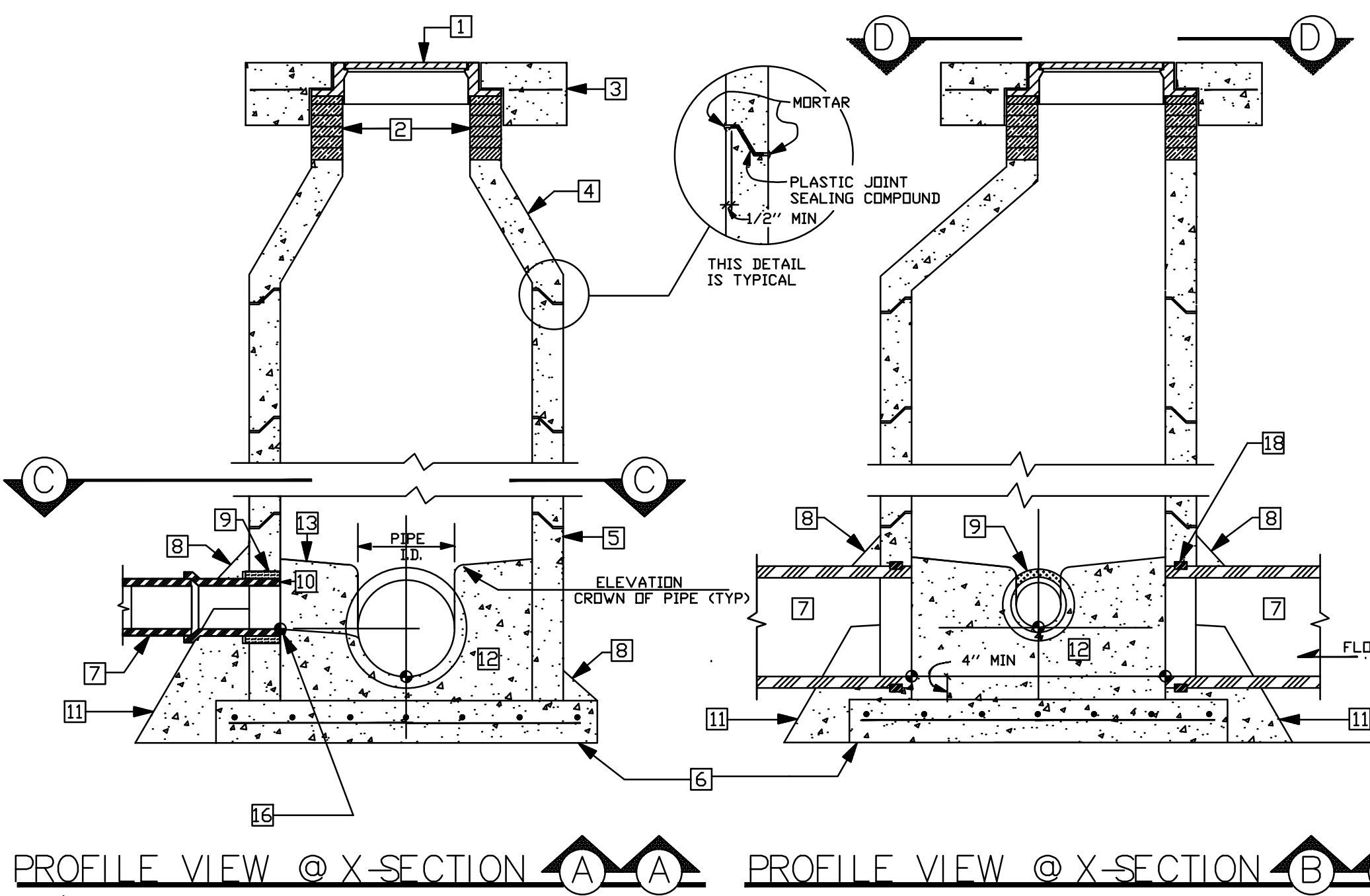
CONSTRUCTION NOTES

- 3' (FT) MINIMUM DISTANCE OF VERTICAL DROP. LESS THAN 3'(FT) DISALLOWS DROP MANHOLE.
- FORM PIPE INVERT IN SHELF. INVERT TO SPRINGLINE.
- SHELF SLOPE, 1"(IN) PER FT.
- MANHOLE TYPE FOR UPPER PORTION IS SPECIFIED IN MANHOLE TYPE "E" DETAIL DWG NO. SAS-2.
- USE D.I. OR P.V.C.(SDR 35) PIPE THROUGHOUT DROP. ALL PIPING IN DROP STRUCTURE FROM THE TEE IS INCREASED ONE PIPE SIZE FROM THE SERVICE LINE (SERVICE=8" DROP=10").
- USE BELL AND SPIGOT 45° LONG RADIUS BEND.
- CONCRETE SUPPORT WIDTH EQUALS PIPE O.D. PLUS 6"(IN) MINIMUM EACH SIDE.
- CONCRETE FILL.
- CAST IN PLACE REINFORCED CONCRETE BASE REQUIRED. CONCRETE BASE TO BE POURED IN PLACE USING NO.4 BARS AT 6"(IN) O.C. EACH WAY FOR MANHOLE DEPTH OF 16'(FT) OR GREATER. NO.4 BARS AT 12"(IN) O.C. EACH WAY FOR MANHOLE DEPTH LESS THAN 16'(FT) IN DEPTH.
- FOR NEW DROP ON EXISTING MANHOLE CONSTRUCT 3/4" REINFORCED CONCRETE BASE BEFORE CONSTRUCTING DROP SUPPORT.
- MINIMUM 2"(IN) ABOVE SPRINGLINE OR AS SHOWN ON PLAN.
- REDUCER.
- SERVICE LINE.
- EXTEND PIPE 3"(IN) MINIMUM 6"(IN) MAXIMUM INTO MANHOLE TOP. 1/2 PIPE REMOVED.

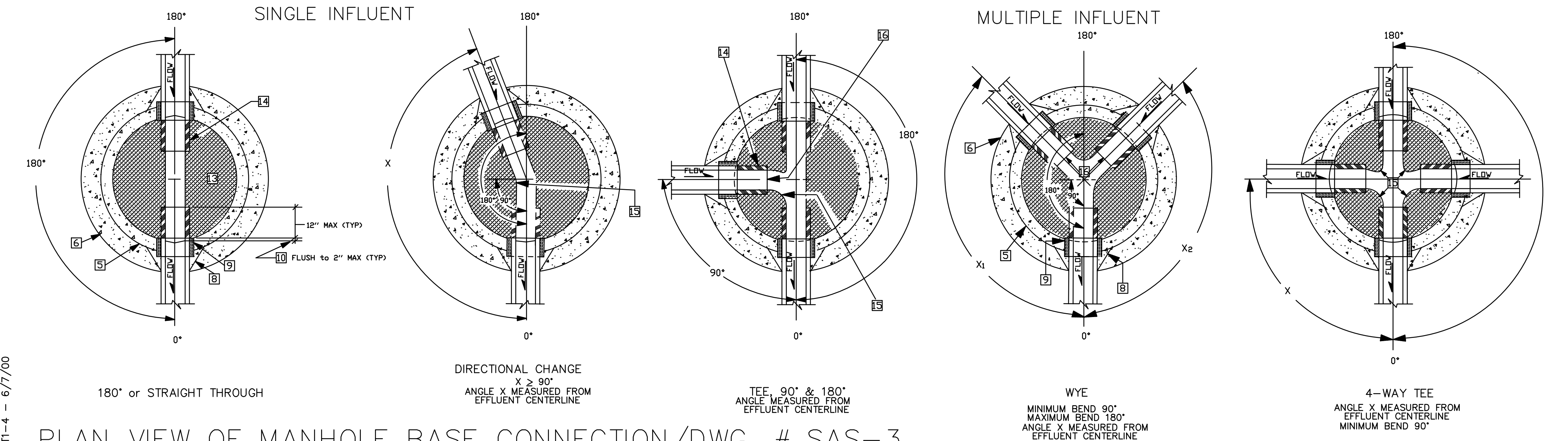
DROP MANHOLE DETAIL
DWG. #: SAS-1



MANHOLE TYPE "E" DETAIL/DWG # SAS-2 (See Dwg. # SAS-14 for Type "C" Flat Top)



MANHOLE TYPE "E" DETAIL/DWG # SAS-2 (See Dwg. # SAS-14 for Type "C" Flat Top)



PLAN VIEW OF MANHOLE BASE CONNECTION/DWG. # SAS-3

GENERAL NOTES

CONSTRUCTION REQUIREMENTS	INSTALLATION
<p>CR-1 MATERIALS AND WORK: CURRENT NEW MEXICO STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (referred to as NM APWA) WITH MODIFICATIONS NOTED BY THE CITY OF SANTA FE.</p> <p>CR-2 APPROVED PLANS: USE PLANS BEARING THE OFFICIAL STAMP OF THE DESIGN ENGINEER AND BEARING THE APPROVAL SIGNATURE OF THE CITY WATER QUALITY DIVISION OR APPROVED REPRESENTATIVE. CONSTRUCTION PERFORMED WITHOUT APPROVED PLANS WILL BE REJECTED.</p> <p>CR-3 SEWER HOOK-UP PERMIT: OBTAIN PERMITS FOR THE PROJECT BEFORE COMMENCING ANY SEWER CONSTRUCTION. CONSTRUCTION PERFORMED WITHOUT OBTAINING PERMITS SHALL BE REJECTED.</p> <p>A. CONSTRUCTION PLANS SHALL INDICATE THE CLASS OF BEDDING TO BE USED. CHANGE OF BEDDING MAY REQUIRE A CHANGE IN PIPE CLASSIFICATION OR WALL THICKNESS.</p> <p>CR-4 SUBSTITUTIONS OR CHANGES: ALL SUBSTITUTIONS OR CHANGES MUST BE APPROVED BY THE CITY WATER QUALITY DIVISION OR CITY APPROVED REPRESENTATIVE PRIOR TO CONSTRUCTION. ALL SUBSTITUTIONS OR CHANGES MUST BE SUBMITTED BY THE DESIGN ENGINEER TO THE CITY WATER QUALITY DIVISION OR APPROVED REPRESENTATIVE. WHERE APPROPRIATE, SUBMITTAL MUST INCLUDE FABRICATION DRAWINGS, WORKING DRAWINGS AND MATERIAL SPECIFICATIONS OR TEST DATA TO JUSTIFY SUBSTITUTIONS OR CHANGES. DESIGN ENGINEER SHALL AUTHORIZE ANY DRAWINGS FOR SUBSTITUTIONS AND CHANGES AND SUBMIT THEM TO THE CITY WATER QUALITY DIVISION FOR APPROVAL. UNAUTHORIZED SUBMITTALS WILL BE REJECTED.</p> <p>CR-5 MANUFACTURER'S CERTIFICATES: WHEN CERTIFICATES OF COMPLIANCE AND TEST REPORTS ARE REQUIRED FOR MATERIALS, DOCUMENTS SHALL BE SUBMITTED TO THE CITY WATER QUALITY DIVISION OR APPROVED REPRESENTATIVE AT THE TIME OF MATERIALS DELIVERY TO THE JOBSITE.</p> <p>CR-6 CONTRACTOR REQUIREMENTS: CONTRACTOR PERFORMING WORK ON PUBLIC SEWER LINES SHALL BE A LICENSED UTILITY CONTRACTOR.</p>	<p>I-1 LAYING PIPE: AS PER SECTION 900, NM APWA; PIPE SHALL BE PLACED AND BEDDED IN A FROST FREE TRENCH; GASKET SHALL BE FULLY SEATED AND NOT SLIPPED; PIPE SHALL BE LAID THROUGH MANHOLE LOCATIONS ON STRAIGHT AND UP TO 22 1/2 DEGREE DEFLECTIONS.</p> <p>A. IF PIPE TRENCH INSTALLATION CONFIGURATION EXCEEDS THE LIMITS OF NM APWA STANDARDS, SECTION 700, OR AS DEFINED ON THE CONSTRUCTION PLANS, THE DESIGN ENGINEER WILL SPECIFY THE NEW PIPE CLASSIFICATION OR WALL THICKNESS.</p> <p>B. TYPE I TRENCH CONFIGURATION IS NORMALLY USED WHEN TRENCH DEPTHS ARE 8'(FT.) OR LESS. TYPE II TRENCH CONFIGURATION IS NORMALLY USED WHEN TRENCH DEPTHS ARE 9'(FT.) AND OVER, DEPENDING ON SOIL CONDITIONS. REFER TO NM APWA STANDARDS SECTION 700.</p> <p>I-2 MANHOLE CONSTRUCTION: A. BASE: 1. CAST IN PLACE: ON UNDISTURBED FROST FREE SUBGRADE 2. PRECAST UNIT: ON PEA GRAVEL WITH COMPLETE EVEN BEARING</p> <p>B. PRECAST BARREL: 1. JOINTS: FILL COMPLETELY WITH NON-SHRINK GROUT AND TROWEL 2. MANHOLE ADAPTOR: INSTALL OVER PVC PIPE AND FILL IN PENETRATION WITH NON-SHRINK GROUT. 3. CAST IN PLACE BASES: SHALL ACHIEVE A MINIMUM OF 2500 PSI COMPRESSIVE STRENGTH BEFORE SETTING PRECAST BARREL SECTIONS.</p> <p>I-3 EXCAVATION AND BACKFILL: AS PER SECTION 700, NM APWA; SATURATION BY FLOODING OR JETTING METHODS IS NOT PERMITTED WITHOUT A SOILS ENGINEERING REPORT RECOMMENDING THESE METHODS. MECHANICAL OR VIBRATORY COMPACTORS SHALL NOT BE USED ON THE BEDDING AND 12"(IN.) OF INITIAL BACKFILL. COMPACTION SHALL BE DETERMINED PER AASHTO T-180.</p>

CONSTRUCTION MATERIALS	FIELD QUALITY CONTROL
<p>CM-1 SEWER PIPE: (CERTIFICATES REQUIRED)</p> <p>A. VITRIFIED CLAY: REFER TO SECTION 125, NM APWA FOR EXTRA STRENGTH VCP.</p> <p>B. PLASTIC (PVC): REFER TO SECTION 121, NM APWA, AS MODIFIED BY THE CITY.</p> <p>1. 4" THRU 15" (INCH) DIAMETER, ASTM D-3034 OR STATEM F-789 PIPE, MINIMUM PS-46 STRENGTH, SDR-35 OR EQUAL</p> <p>2. LARGER THAN 15" (IN.) DIAMETER: ASTM F 678 VOL. 08.04</p> <p>C. HDPE PIPE PER ASTM D-1248 CLASS III WHEN APPROVED BY WATER QUALITY DIVISION ENGINEER.</p> <p>D. PVC RESTRAINED JOINTS: SERIES 1350 OR SERIES 1380 FOR COUPLINGS PRODUCED BY UNI-FLANGE CORPORATION, LOCKING COUPLINGS WITH NYLON SPLINE, MARKETED AS "TELLONLINE" AND PRODUCED BY CERTAINTED CORPORATION, OR APPROVED EQUAL.</p> <p>E. MANHOLE ADAPTERS: ASBESTOS CEMENT (AC) MANHOLE ADAPTERS, OR AC/PVC ADAPTER COUPLINGS.</p> <p>F. SERVICE STUBS: CAST IRON DWV, PVC SCH. 40 DWV.</p> <p>G. SERVICE CONNECTIONS:</p> <p>1. VCP PIPE: FACTORY TEE FITTINGS; SECTION 125 NM APWA.</p> <p>2. PVC PIPE: CAST IRON BODIES TAPPING SADDLE OR STAINLESS STEEL TENSION STRAP AND FITTINGS; FOWLER "QUICKWAY", GENCO, HERSEY "PHONE" OR APPROVED EQUAL.</p> <p>H. SOIL CLASSIFICATION: THE UNIFIED SOIL CLASSIFICATION SYSTEM PER ASTM D 2487 TABLE 701.3.5 NM APWA.</p> <p>CM-2 MANHOLES:</p> <p>A. CONCRETE MANHOLES: PRECAST REINFORCED CONCRETE RISERS, REDUCING CONES, AND ADJUSTMENT RINGS PER ASTM C 478 VOL. 04.05. BASES MAY BE FIELD PLACED CONCRETE OR PRECAST CONCRETE PER ASTM C 478 VOL. 04.05 (CERTIFICATES REQUIRED). CRACKED OR VISIBLY DEFECTIVE UNITS WILL BE REJECTED.</p> <p>B. PIPE PENETRATIONS: PRECAST UNITS SHALL HAVE SUITABLE SIZED OPENINGS CAST INTO BARREL AT PROPER ANGLES FOR PIPE AND MANHOLE ADAPTERS.</p> <p>C. MANHOLE STEPS: REFER TO SECTION 920.4.7 NM APWA POLYPROPYLENE ENCASED GRADE 60 STEEL BY M.A. INC. OR APPROVED EQUAL: 14"(IN.) WIDE, 16"(IN.) MAXIMUM SPACING.</p> <p>D. FRAMES AND COVERS:</p> <p>1. CASTING: SHALL CONFORM TO SECTION 160, 161 & 162, NM, APWA CLASS 30B. (CERTIFICATES AND SHOP DRAWINGS REQUIRED)</p> <p>2. MINIMUM COVER WEIGHT: 165 POUNDS</p> <p>3. MINIMUM COMBINED WEIGHT: 365 POUNDS</p> <p>4. BEARING SURFACES: SHALL BE MATCHED FOR A FIRM NON ROCKING SEAT BETWEEN FRAME AND COVER. MINIMUM SEATING WIDTH: 7/8"(IN.)</p> <p>5. COATING: NONE</p> <p>6. COVER LETTERINGS: SANTA FE, N.M. SANITARY SEWER</p> <p>7. CASTINGS: CAST MANUFACTURER AND MODEL NUMBER ON FRAME AND COVER</p> <p>8. CASTINGS TOLERANCE: +/- 1/16"(IN.) PER FOOT OF OVERALL DIMENSION. OUT OF ROUND CASTINGS AND LOOSE FITTING UNITS WILL BE REJECTED IN THE FIELD.</p>	<p>FQC-1 TESTING AND INSPECTION: A. SUPERVISION: CONDUCTED BY DESIGN ENGINEER. B. CERTIFICATION: DESIGN ENGINEER SHALL CERTIFY THAT THE PROJECT HAS BEEN COMPLETED IN ACCORDANCE TO PLANS & SPECIFICATIONS AND SHALL SUBMIT A CERTIFICATION OF COMPLIANCE STATEMENT WITH STAMP AND SIGNATURE. C. EQUIPMENT AND ASSISTANCE: PROVIDED BY CONTRACTOR.</p> <p>FQC-2 LINE AND GRADE: ALLOWABLE TOLERANCE BETWEEN STRUCTURES FROM DESIGN: A. LINE: 0.20 FOOT B. GRADE: 0.02 FOOT; PIPE SHALL NOT HOLD BACK ANY WATER.</p> <p>FQC-3 LEAKAGE TEST: AIR TEST REQUIRED; REFER TO SECTION 901.7 NM APWA.</p> <p>FQC-4 TELEVISION INSPECTION: CONTRACTOR SHALL PROVIDE A CERTIFIED CCTV SEWERLINE INSPECTION AND RECORD TAPES AT HIS OWN EXPENSE.</p> <p>FQC-5 ALL CONNECTIONS TO EXISTING MANHOLES INCLUDES REHABILITATING THE TIE IN MANHOLE TO MEET THESE STANDARD CONSTRUCTION DETAILS.</p>

<p>CM-3 CONCRETE ENGAGEMENT:</p> <p>A. REQUIREMENTS:</p> <p>1. WHEN THE PIPE COVER IS 36" (IN.) OR LESS.</p> <p>2. WHEN VITRIFIED CLAY CROSSES AN ARROYO.</p> <p>3. WHEN A WATER LINE PASSES BELOW OR LESS THAN 18" (IN.) ABOVE THE EXISTING SEWER LINE.</p> <p>4. WHEN A PARALLEL WATER LINE IS LESS THAN 10'(FT.) HORIZONTALLY AND LESS THAN 2'(FT.) ABOVE THE SEWER LINE.</p> <p>5. THE SEWER LINE SHALL BE ENCASED IN CONCRETE 6"(IN.) THICK AS DETAILED AND EXTEND AT LEAST 10'(FT.) ON EACH SIDE OF THE WATER LINE.</p>	<p>NOTE: REVISIONS TO THIS SHEET SHALL BE MADE UNDER THE AUTHORITY OF THE CITY OF SANTA FE ONLY.</p>
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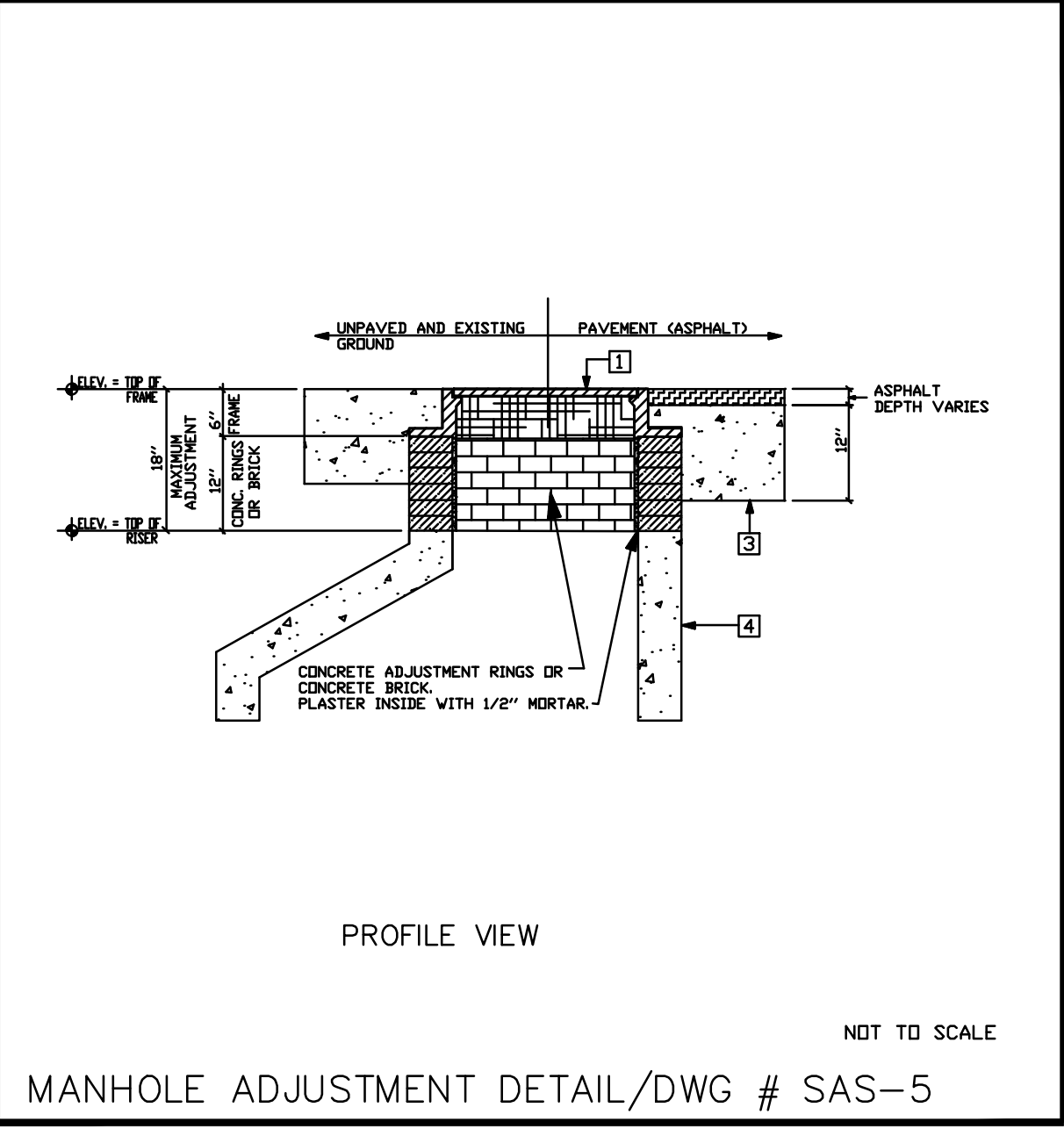
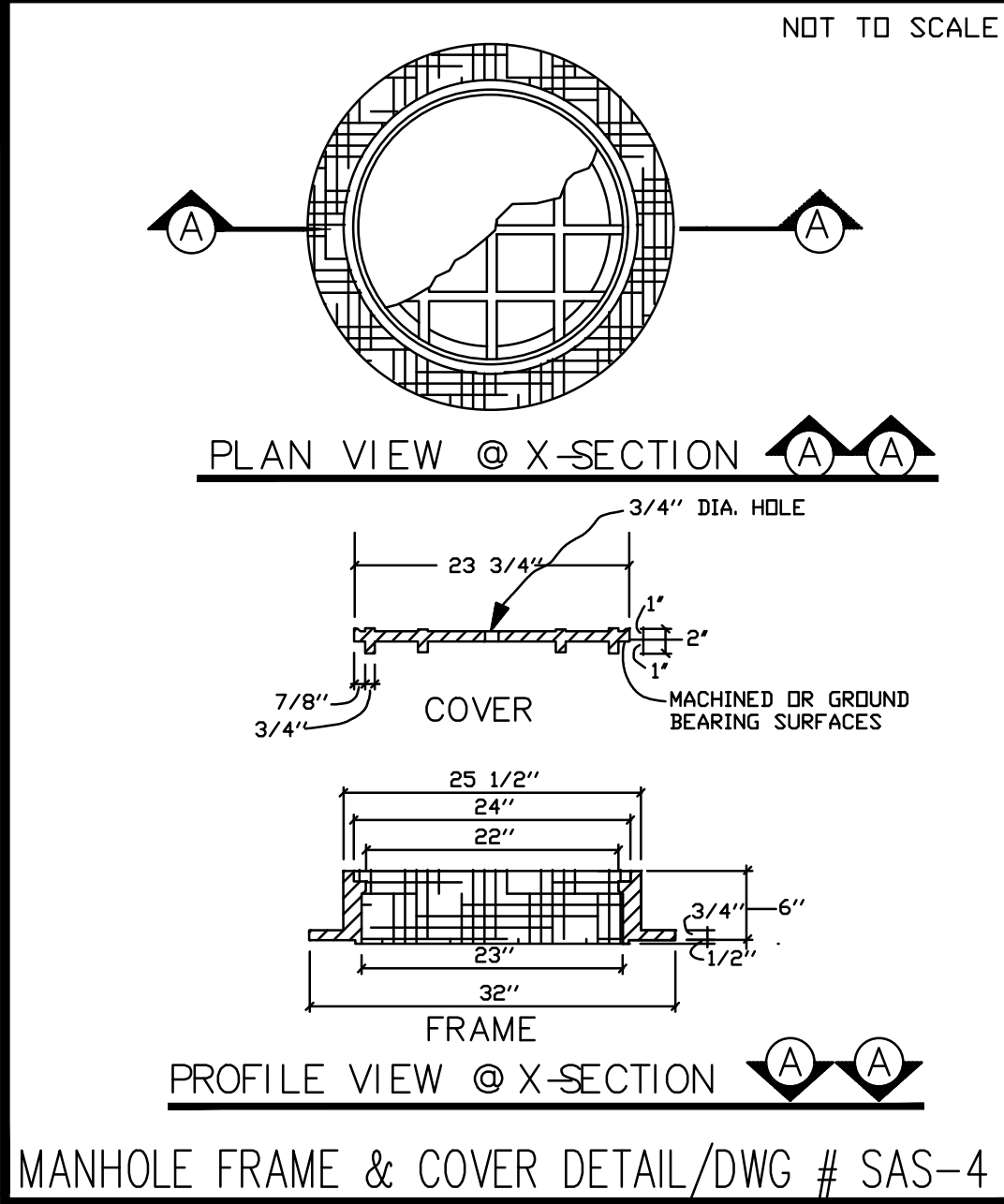


CITY OF SANTA FE
WATER QUALITY DIVISION

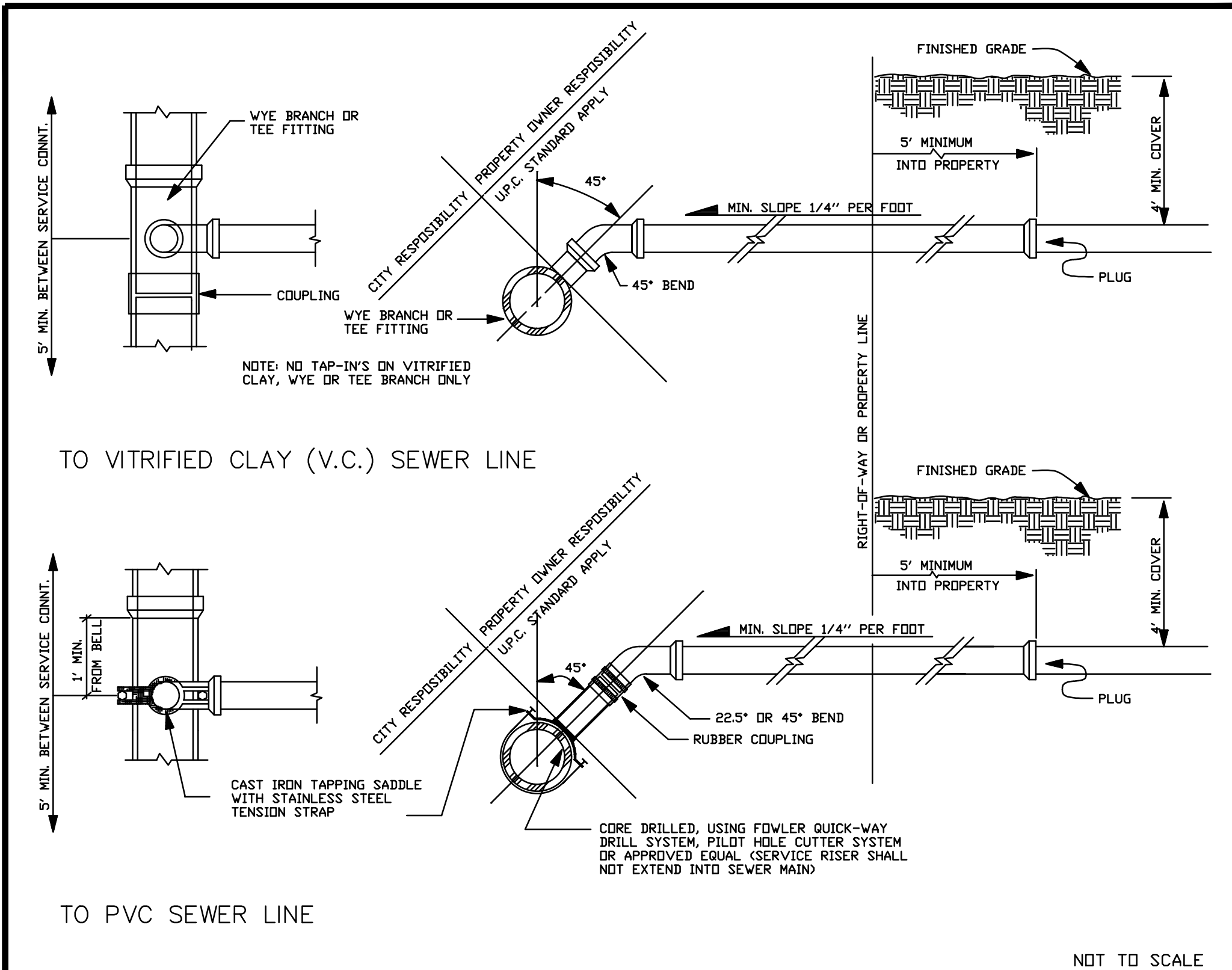
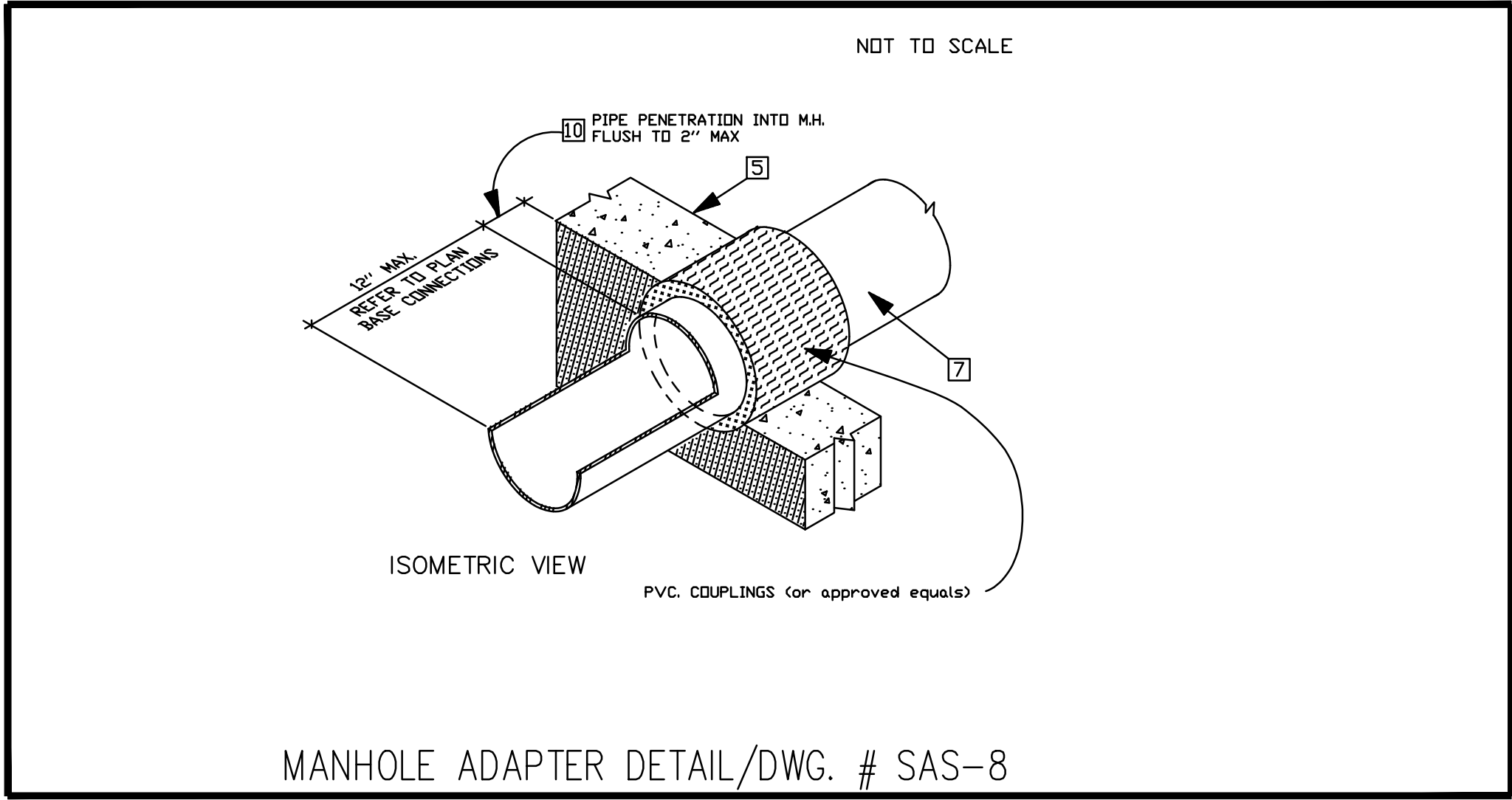
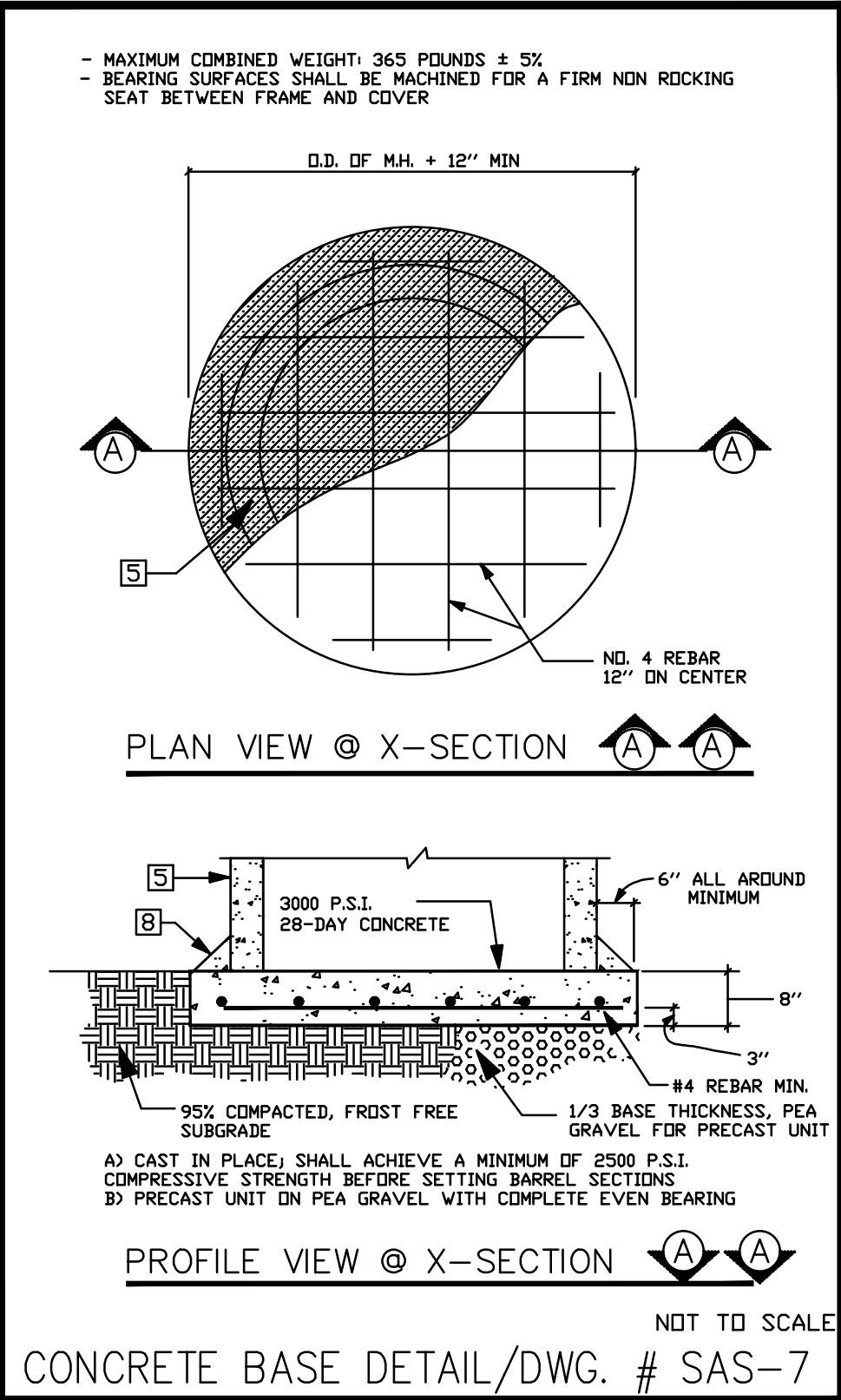
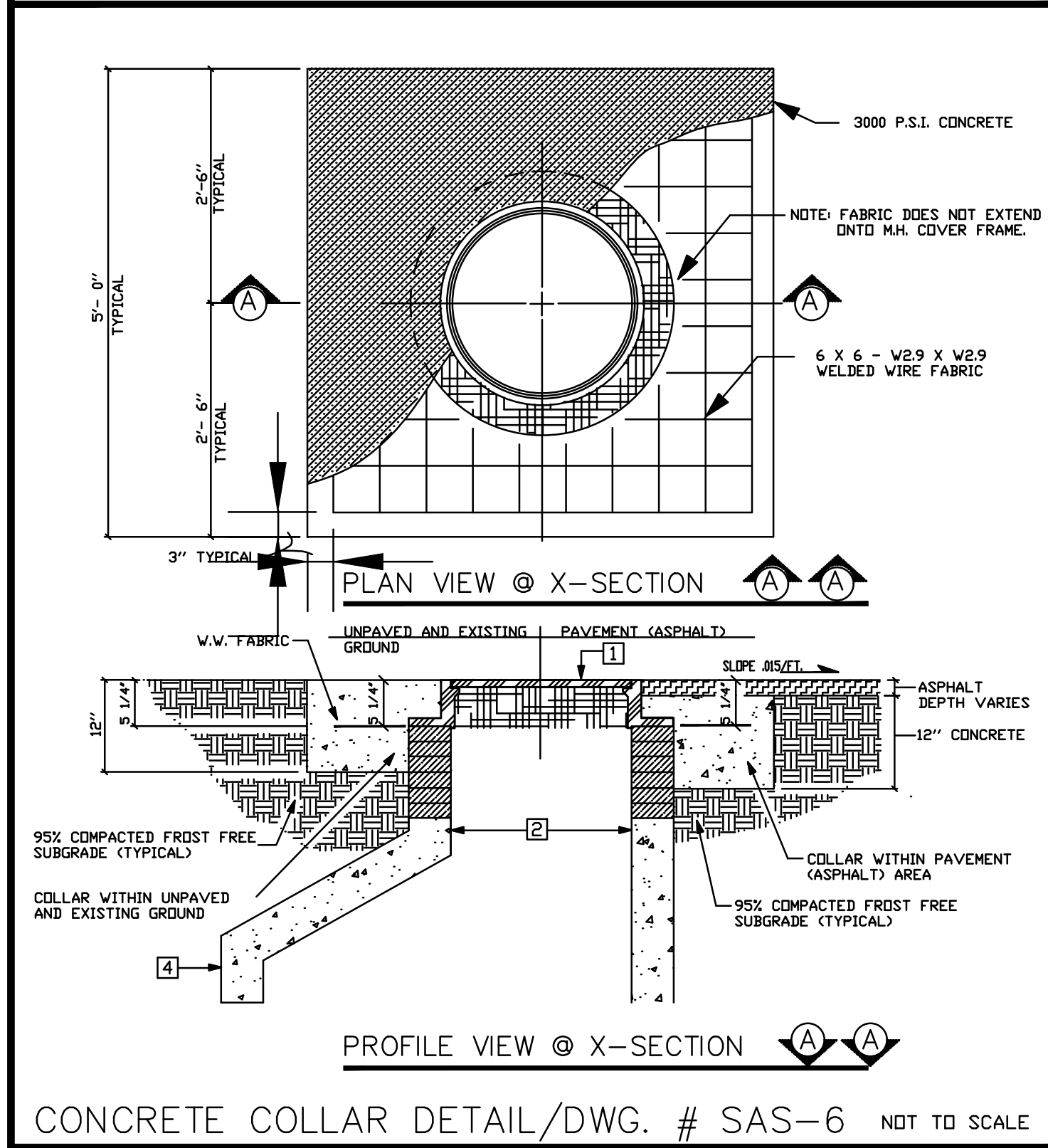
TITLE: SANITARY SEWER
STANDARD CONSTRUCTION DETAILS

DATE	REVISIONS	FILE #
DATE: JULY 1992		E:\AUTO\DWG\SCDT-4
DRAWN BY: G. CHAVEZ	8-3-92	
CADD REVISION BY: G. CHAVEZ	12-14-92	
APPROVED BY: E. BROWN	11-16-94	

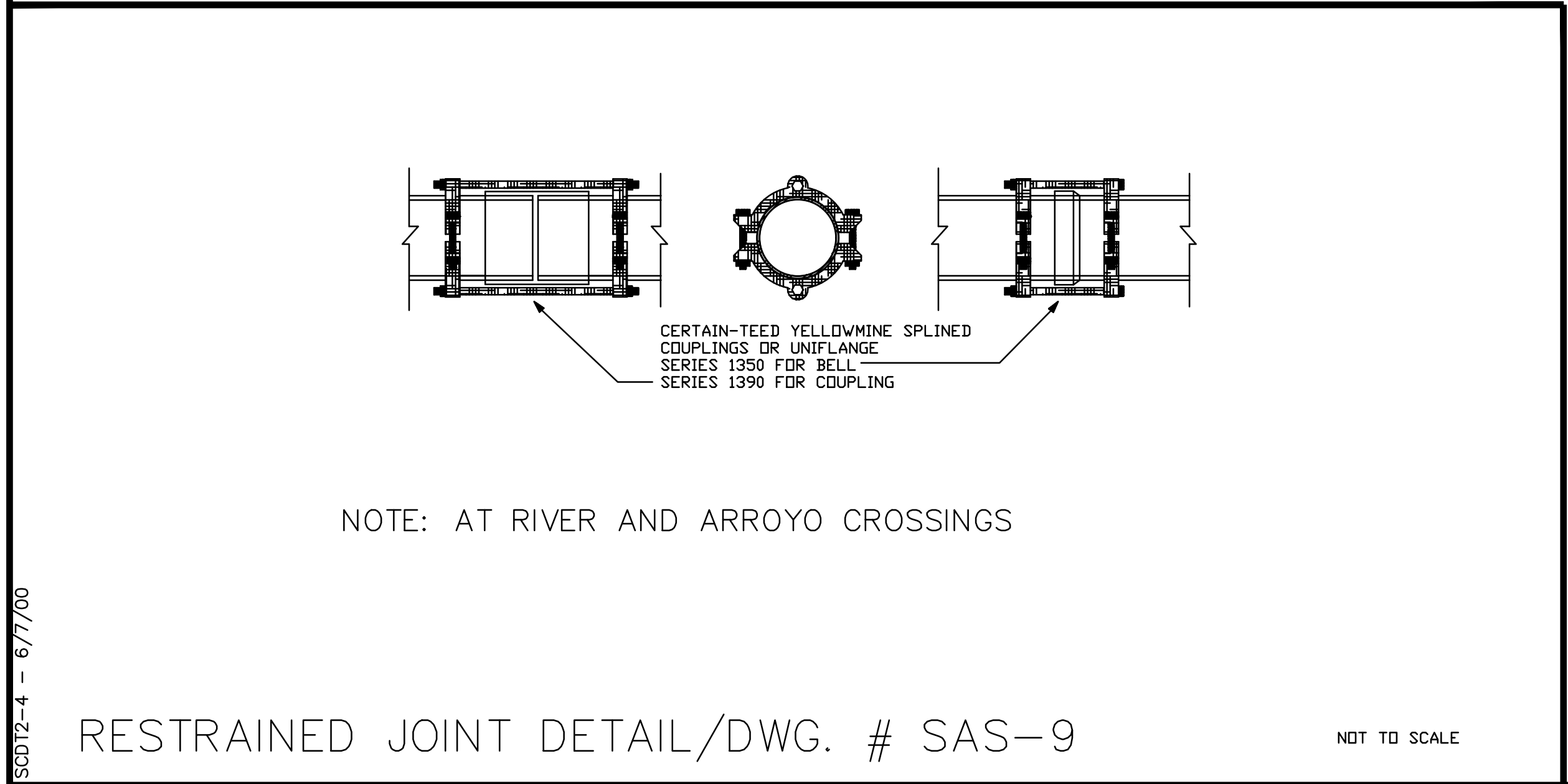
LEGEND	
ITEM	DESCRIPTION
1	MANHOLE FRAME & COVER, refer to manhole frame and cover detail Dwg. No. SAS-4
2	CONCRETE ADJUSTMENT RINGS or CONCRETE BRICK, refer to concrete adjustment detail Dwg. No. SAS-5
3	CONCRETE COLLAR, refer to concrete collar detail Dwg. No. SAS-6
4	PRECAST REINFORCED CONCRETE RISER, CONE or FLAT TOP, with 5"(in) wall thickness, refer to general note CM-2
5	PRECAST REINFORCED CONCRETE BASE RISER, with suitable sized openings, refer to general note CM-2A
6	CONCRETE BASE, refer to concrete base detail Dwg. No. SAS-7
7	SEWER PIPE, refer to general note CM-1
8	6"(in) GROUT FILLET, on upper half of pipe and around base
9	ADAPTER, MANHOLE, refer to manhole adapter detail Dwg. No. SAS-8
10	PIPE PENETRATION INTO MANHOLE, refer to manhole adapter detail Dwg. No. SAS-8
11	PIPE SUPPORT, CONCRETE, shall extend out-side of manhole a maximum of 18"(in) to bell of first joint and shall cradle pipe half pipe
12	CONCRETE FILL, 3000 p.s.i., refer to general note CR-6
13	SHELF, to be 9"(in) minimum width with 1"(in) per 1'-0" slope, from crown of pipe
14	CUT UPPER HALF OF PIPE, after manhole has been completed and inspected by engineer
15	HAND FORMED CHANNELS, shall be on a uniform radius and shall not hold water
16	INVERT ELEVATIONS OF LATERAL LINES, shall be the same as the springline elevation of the sewer main, where possible
17	CHANGE SLOPE OF PIPE, at center of manhole
18	APPROVED WATER STOP, to be with type of pipe



GENERAL NOTES	
CONSTRUCTION REQUIREMENTS	INSTALLATION
<p>CR-1 MATERIALS AND WORK: CURRENT NEW MEXICO STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (referred to as NM APWA) WITH MODIFICATIONS NOTED BY THE CITY OF SANTA FE.</p> <p>CR-2 APPROVED PLANS: USE PLANS BEARING THE OFFICIAL STAMP OF THE DESIGN ENGINEER AND BEARING THE APPROVAL SIGNATURE OF THE CITY WATER QUALITY DIVISION OR APPROVED REPRESENTATIVE. CONSTRUCTION PERFORMED WITHOUT APPROVED PLANS WILL BE REJECTED.</p> <p>CR-3 SEWER HOOK-UP PERMIT: OBTAIN PERMITS FOR THE PROJECT BEFORE COMMENCING ANY SEWER CONSTRUCTION. CONSTRUCTION PERFORMED WITHOUT OBTAINING PERMITS SHALL BE REJECTED.</p> <p>A. CONSTRUCTION PLANS SHALL INDICATE THE CLASS OF BEDDING TO BE USED. CHANGE OF BEDDING MAY REQUIRE A CHANGE IN PIPE CLASSIFICATION OR WALL THICKNESS.</p> <p>CR-4 SUBSTITUTIONS OR CHANGES: ALL SUBSTITUTIONS OR CHANGES MUST BE APPROVED BY THE CITY WATER QUALITY DIVISION OR CITY APPROVED REPRESENTATIVE PRIOR TO CONSTRUCTION. ALL SUBSTITUTIONS OR CHANGES MUST BE SUBMITTED BY THE DESIGN ENGINEER TO THE CITY WATER QUALITY DIVISION OR APPROVED REPRESENTATIVE. WHERE APPROPRIATE, SUBMITTAL MUST INCLUDE FABRICATION DRAWINGS, WORKING DRAWINGS AND MATERIAL SPECIFICATIONS OR TEST DATA TO JUSTIFY SUBSTITUTIONS OR CHANGES. DESIGN ENGINEER SHALL AUTHORIZE ANY DRAWINGS FOR SUBSTITUTIONS AND CHANGES AND SUBMIT THEM TO THE CITY WATER QUALITY DIVISION FOR APPROVAL. UNAUTHORIZED SUBMITTALS WILL BE REJECTED.</p> <p>CR-5 MANUFACTURER'S CERTIFICATES: WHEN CERTIFICATES OF COMPLIANCE AND TEST REPORTS ARE REQUIRED FOR MATERIALS, DOCUMENTS SHALL BE SUBMITTED TO THE CITY WATER QUALITY DIVISION OR APPROVED REPRESENTATIVE AT THE TIME OF MATERIALS DELIVERY TO THE JOBSITE.</p> <p>CR-6 CONTRACTOR REQUIREMENTS: CONTRACTOR PERFORMING WORK ON PUBLIC SEWER LINES SHALL BE A LICENSED UTILITY CONTRACTOR.</p>	<p>I-1 LAYING PIPE: AS PER SECTION 900, NM APWA; PIPE SHALL BE PLACED AND BEDDED IN A FROST FREE TRENCH; GASKET SHALL BE FULLY SEATED AND NOT SLIPPED; PIPE SHALL BE LAID THROUGH MANHOLE LOCATIONS ON STRAIGHT AND UP TO 22 1/2 DEGREE DEFLECTIONS.</p> <p>A. IF PIPE TRENCH INSTALLATION CONFIGURATION EXCEEDS THE LIMITS OF NM APWA STANDARDS, SECTION 700, OR AS DEFINED ON THE CONSTRUCTION PLANS, THE DESIGN ENGINEER WILL SPECIFY THE NEW PIPE CLASSIFICATION OR WALL THICKNESS.</p> <p>B. TYPE I TRENCH CONFIGURATION IS NORMALLY USED WHEN TRENCH DEPTHS ARE 8'(FT.) OR LESS. TYPE II TRENCH CONFIGURATION IS NORMALLY USED WHEN TRENCH DEPTHS ARE 9'(FT.) AND OVER, DEPENDING ON SOIL CONDITIONS. REFER TO NM APWA STANDARDS SECTION 700.</p> <p>I-2 MANHOLE CONSTRUCTION:</p> <p>A. BASE:</p> <ol style="list-style-type: none">CAST IN PLACE: ON UNDISTURBED FROST FREE SUBGRADEPRECAST UNIT: ON PEA GRAVEL WITH COMPLETE EVEN BEARING <p>B. PRECAST BARREL:</p> <ol style="list-style-type: none">JOINTS: FILL COMPLETELY WITH NON-SHRINK GROUT AND TROWELMANHOLE ADAPTOR: INSTALL OVER PVC PIPE AND FILL IN PENETRATION WITH NON-SHRINK GROUT.CAST IN PLACE BASES: SHALL ACHIEVE A MINIMUM OF 2500 PSI COMPRESSIVE STRENGTH BEFORE SETTING PRECAST BARREL SECTIONS. <p>I-3 EXCAVATION AND BACKFILL: AS PER SECTION 700, NM APWA; SATURATION BY FLOODING OR JETTING METHODS IS NOT PERMITTED WITHOUT A SOILS ENGINEERING REPORT RECOMMENDING THESE METHODS. MECHANICAL OR VIBRATORY COMPACTORS SHALL NOT BE USED ON THE BEDDING AND 12"(IN.) OF INITIAL BACKFILL. COMPACTION SHALL BE DETERMINED PER AASHTO T-180.</p>



CONSTRUCTION MATERIALS	
<p>CM-1 SEWER PIPE: (CERTIFICATES REQUIRED)</p> <p>A. VITRIFIED CLAY: REFER TO SECTION 125, NM APWA FOR EXTRA STRENGTH VCP.</p> <p>B. PLASTIC (PVC): REFER TO SECTION 121, NM APWA, AS MODIFIED BY THE CITY:</p> <ol style="list-style-type: none">4" THRU 15" (inch) DIAMETER, ASTM D-3034 OR ASTM F-798 PIPE, MINIMUM PS-46 STRENGTH, SDR-35 OR EQUALLARGER THAN 15" (IN.) DIAMETER: ASTM F 678 VOL. 08.04. <p>C. HDPE PIPE PER ASTM D-1248 CLASS III WHEN APPROVED BY WATER QUALITY DIVISION ENGINEER.</p> <p>D. PVC RESTRAINED JOINTS: SERIES 1350 OR SERIES 1390 FOR COUPLINGS PRODUCED BY UNI-FLANGE CORPORATION, LOCKING COUPLINGS WITH NYLON SPLINE, MARKED AS "YELLOWLINE" AND PRODUCED BY CERTAINTED CORPORATION, OR APPROVED EQUAL.</p> <p>E. MANHOLE ADAPTERS: ASBESTOS CEMENT (AC) MANHOLE ADAPTERS, OR AC/PVC ADAPTER COUPLINGS.</p> <p>F. BUILDING SERVICE STUBS: CAST IRON DWV, PVC SCH. 40 DWV.</p> <p>G. SERVICE CONNECTIONS:</p> <ol style="list-style-type: none">VCP PIPE: FACTORY TEE FITTINGS; SECTION 125 NM APWA.PVC PIPE: CAST IRON BODIES TAPPING SADDLE WITH STAINLESS STEEL TENSION STRAP AND FITTINGS; FOWLER "QUICKWAY" GENCO, HERSEY "PIONEER", OR APPROVED EQUAL. <p>H. SOIL CLASSIFICATION: THE UNIFIED SOIL CLASSIFICATION SYSTEM PER ASTM D 2487 TABLE 701-3.5 NM APWA.</p> <p>CM-2 MANHOLES:</p> <p>A. CONCRETE MANHOLES: PRECAST REINFORCED CONCRETE RISERS, REDUCING CONES, AND ADJUSTMENT RINGS PER ASTM C 478 VOL. 04.05. BASES MAY BE FIELD PLACED CONCRETE OR PRECAST CONCRETE PER ASTM C 478 VOL. 04.05 (CERTIFICATES REQUIRED). CRACKED OR VISIBLY DEFECTIVE UNITS WILL BE REJECTED.</p> <p>B. PIPE PENETRATIONS: PRECAST UNITS SHALL HAVE SUITABLE SIZED OPENINGS CAST INTO BARREL AT PROPER ANGLES FOR PIPE AND MANHOLE ADAPTERS.</p> <p>C. MANHOLE STEPS: REFER TO SECTION 920.4.7 NM APWA POLYPROPYLENE ENCASED GRADE 60 STEEL BY M.A. INC. OR APPROVED EQUAL: 14"(IN.) WIDE, 16"(IN.) MAXIMUM SPACING.</p> <p>D. FRAMES AND COVERS:</p> <ol style="list-style-type: none">CASTING: SHALL CONFORM TO SECTION 160, 161 & 162, NM APWA CLASS 308. (CERTIFICATES AND SHOP DRAWINGS REQUIRED)MINIMUM COVER WEIGHT: 165 POUNDSMINIMUM COMBINED WEIGHT: 365 POUNDS +/- 5%BEARING SURFACES: SHALL BE MATCHED FOR A FIRM NON ROCKING SEAT BETWEEN FRAME AND COVER. MINIMUM SEATING WIDTH: 7/8"(IN.)COATING: NONECOVER LETTERINGS: SANTA FE, N.M. SANITARY SEWERCASTINGS: CAST MANUFACTURER AND MODEL NUMBER ON FRAME AND COVER.CASTINGS TOLERANCE: +/- 1/16"(IN.) PER FOOT OF OVERALL DIMENSION. OUT OF ROUND CASTINGS AND LOOSE FITTING UNITS WILL BE REJECTED IN THE FIELD. <p>CM-3 CONCRETE ENCASEMENT:</p> <p>A. REQUIREMENTS:</p> <ol style="list-style-type: none">WHEN THE PIPE COVER IS 36" (IN.) OR LESS.WHEN VITRIFIED CLAY CROSSES AN ARROYO.WHEN A WATER LINE PASSES BELOW OR LESS THAN 18" (IN.) ABOVE THE EXISTING SEWER LINE.WHEN A PARALLEL WATER LINE IS LESS THAN 10'(FT.) HORIZONTALLY AND LESS THAN 2'(FT.) ABOVE THE SEWER LINE.THE SEWER LINE SHALL BE ENCASED IN CONCRETE 6"(IN.) THICK AS DETAILED, AND EXTEND AT LEAST 10'(FT.) ON EACH SIDE OF THE WATER LINE.	<p>FIELD QUALITY CONTROL</p> <p>FOC-1 TESTING AND INSPECTION:</p> <p>A. SUPERVISION: CONDUCTED BY DESIGN ENGINEER.</p> <p>B. CERTIFICATION: DESIGN ENGINEER SHALL CERTIFY THAT THE PROJECT HAS BEEN COMPLETED IN ACCORDANCE TO PLANS & SPECIFICATIONS AND SHALL SUBMIT A CERTIFICATION OF COMPLIANCE STATEMENT WITH STAMP AND SIGNATURE.</p> <p>C. EQUIPMENT AND ASSISTANCE: PROVIDED BY CONTRACTOR.</p> <p>FOC-2 LINE AND GRADE: ALLOWABLE TOLERANCE BETWEEN STRUCTURES FROM DESIGN:</p> <p>A. LINE: 0.20 FOOT</p> <p>B. GRADE: 0.02 FOOT; PIPE SHALL NOT HOLD BACK ANY WATER.</p> <p>FOC-3 LEAKAGE TEST: AIR TEST REQUIRED; REFER TO SECTION 901.7 NM APWA.</p> <p>FOC-4 TELEVISION INSPECTION: CONTRACTOR SHALL PROVIDE A CERTIFIED CCTV SEWERLINE INSPECTION AND RECORD TAPES AT HIS OWN EXPENSE.</p> <p>FOC-5 ALL CONNECTIONS TO EXISTING MANHOLES INCLUDES REHABILITATING THE TIE IN MANHOLE TO MEET THESE STANDARD CONSTRUCTION DETAILS.</p> <p>NOTE: REVISIONS TO THIS SHEET SHALL BE MADE UNDER THE AUTHORITY OF THE CITY OF SANTA FE ONLY.</p>



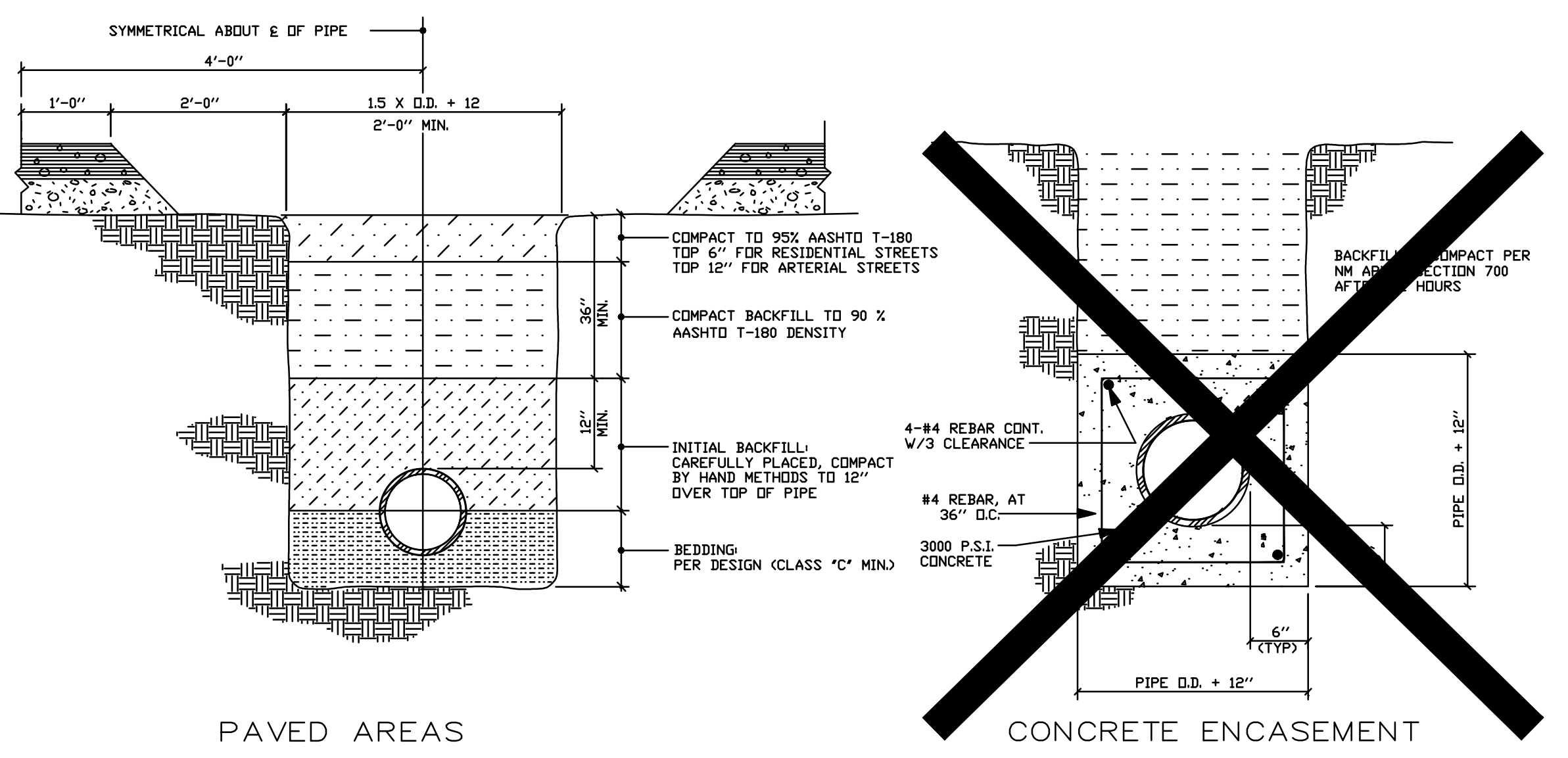
CITY OF SANTA FE
WATER QUALITY DIVISION

TITLE: SANITARY SEWER
STANDARD CONSTRUCTION DETAILS

DATE: JULY 1992	REVISIONS	FILE #
DRAWN BY: G. CHAVEZ	A 8-3-92	E:\AUTO\DWG\SCD12-4
CADD REVISION BY: G. CHAVEZ	A 12-10-92	
APPROVED BY: E. BROWN	A 11-16-94	
SHEET		7-2

Diagram 1: SHAPED SUBGRADE. The diagram shows a cross-section of a foundation where the pile is embedded into a shaped subgrade. The diameter of the subgrade opening is labeled as 0.5 D.D. The material above the subgrade is labeled as COMPACTED FILL PER NM APWA SECTION 700.

Diagram 2: GRANULAR FOUNDATION. The diagram shows a cross-section of a foundation where the pile is embedded into a layer of compacted granular material. The thickness of this layer is labeled as 6" (4" MIN.). The material above the granular layer is labeled as COMPACTED FILL PER NM APWA SECTION 700. A dimension of 1/6 D.D. is also indicated for the granular layer.

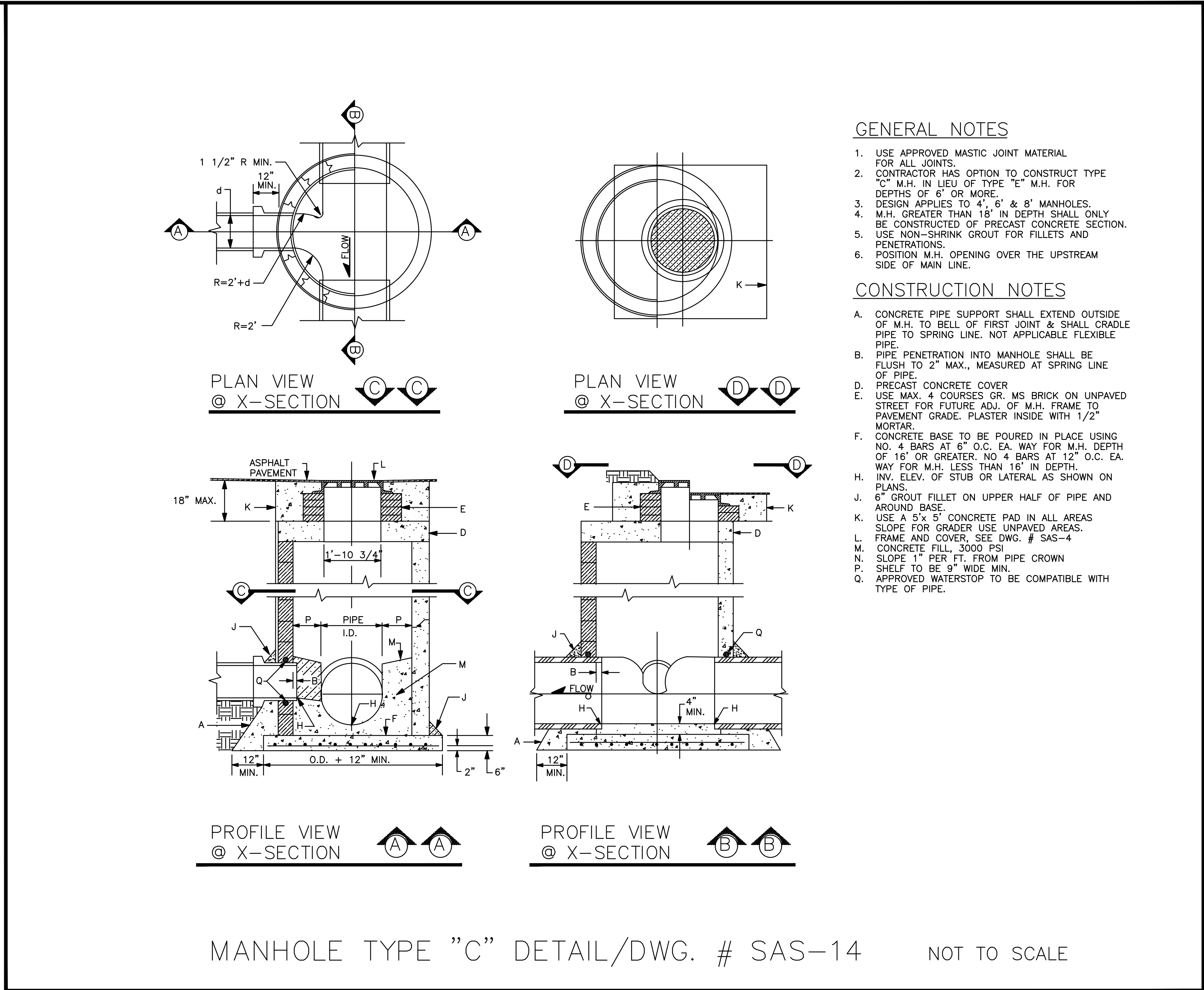
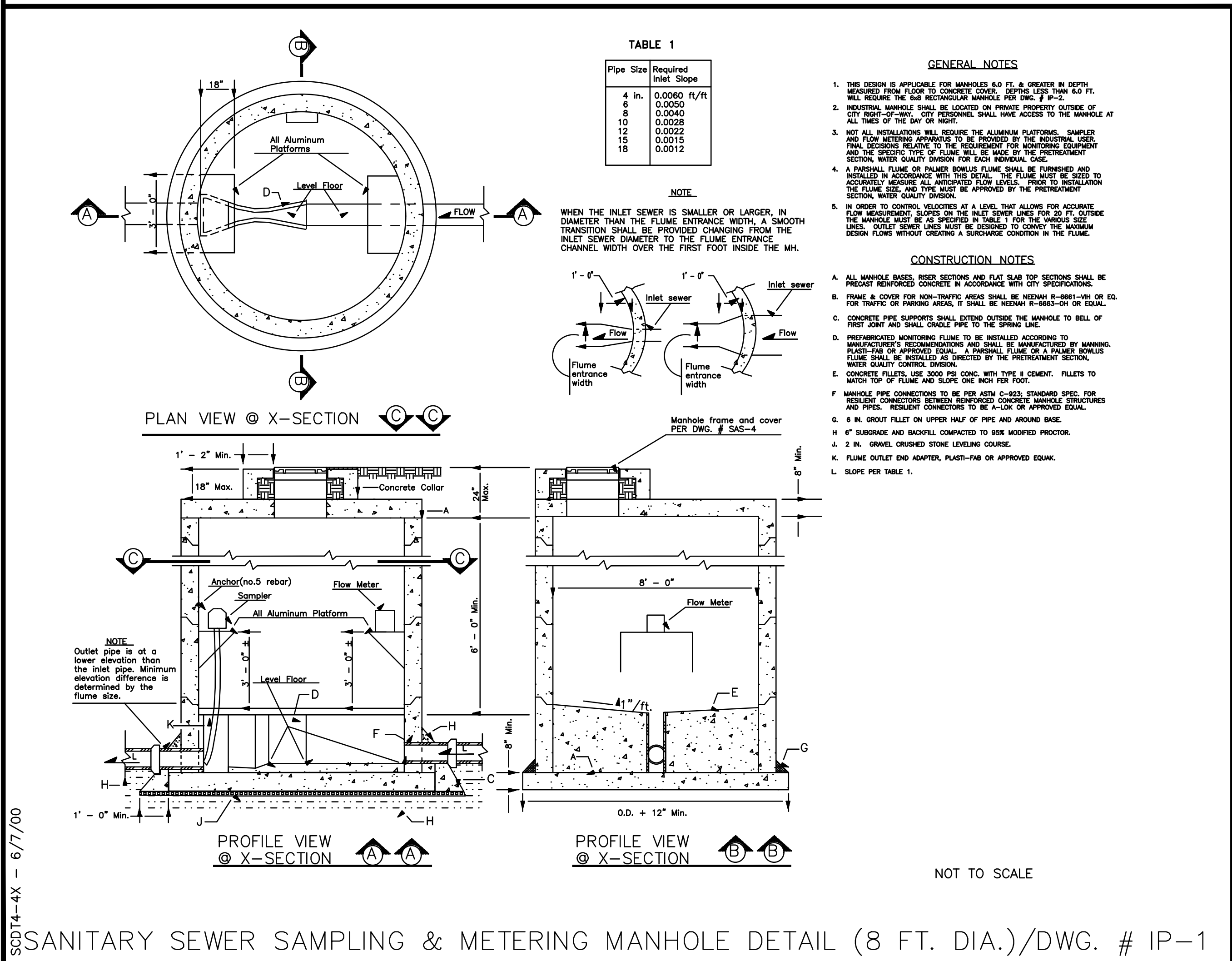
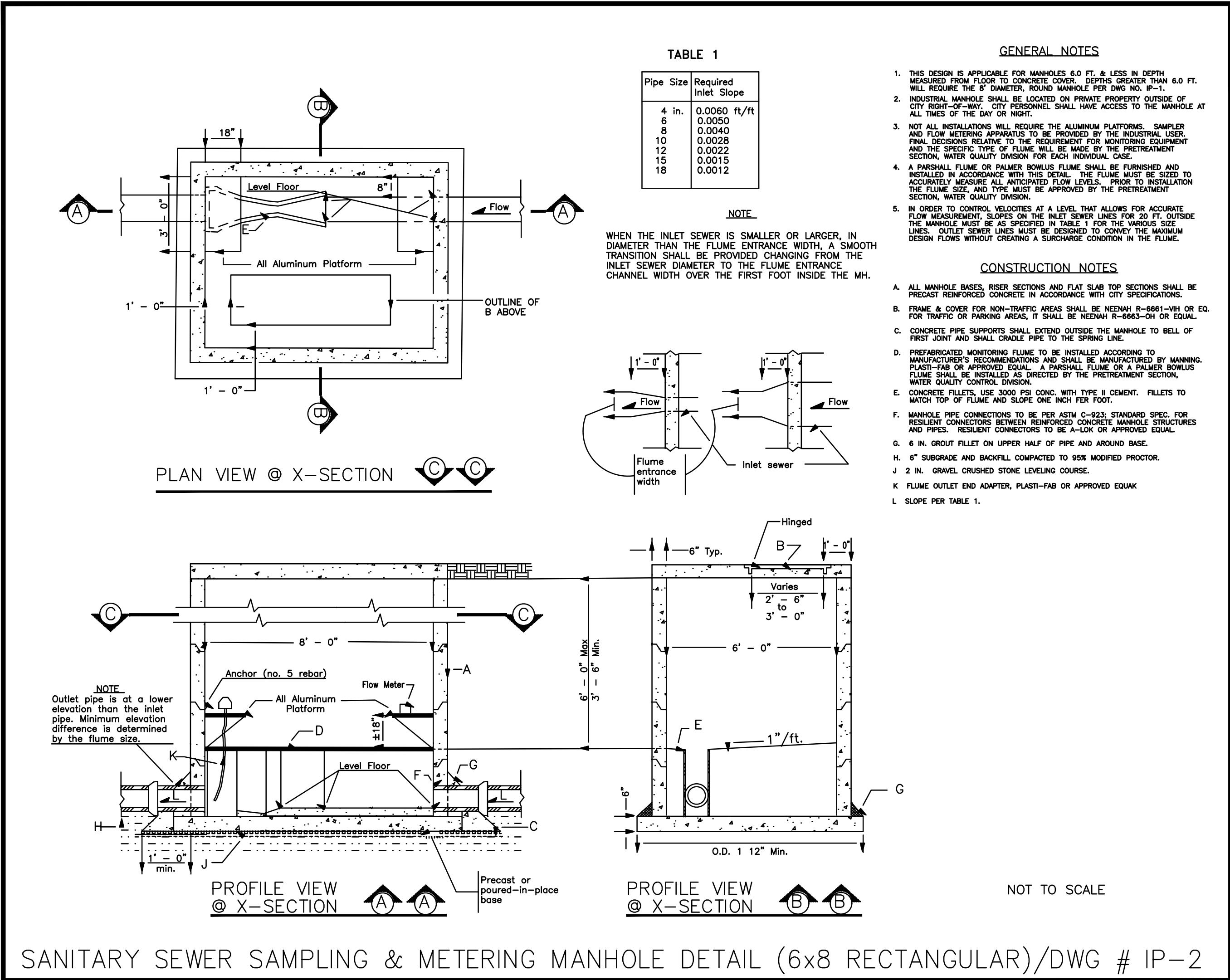


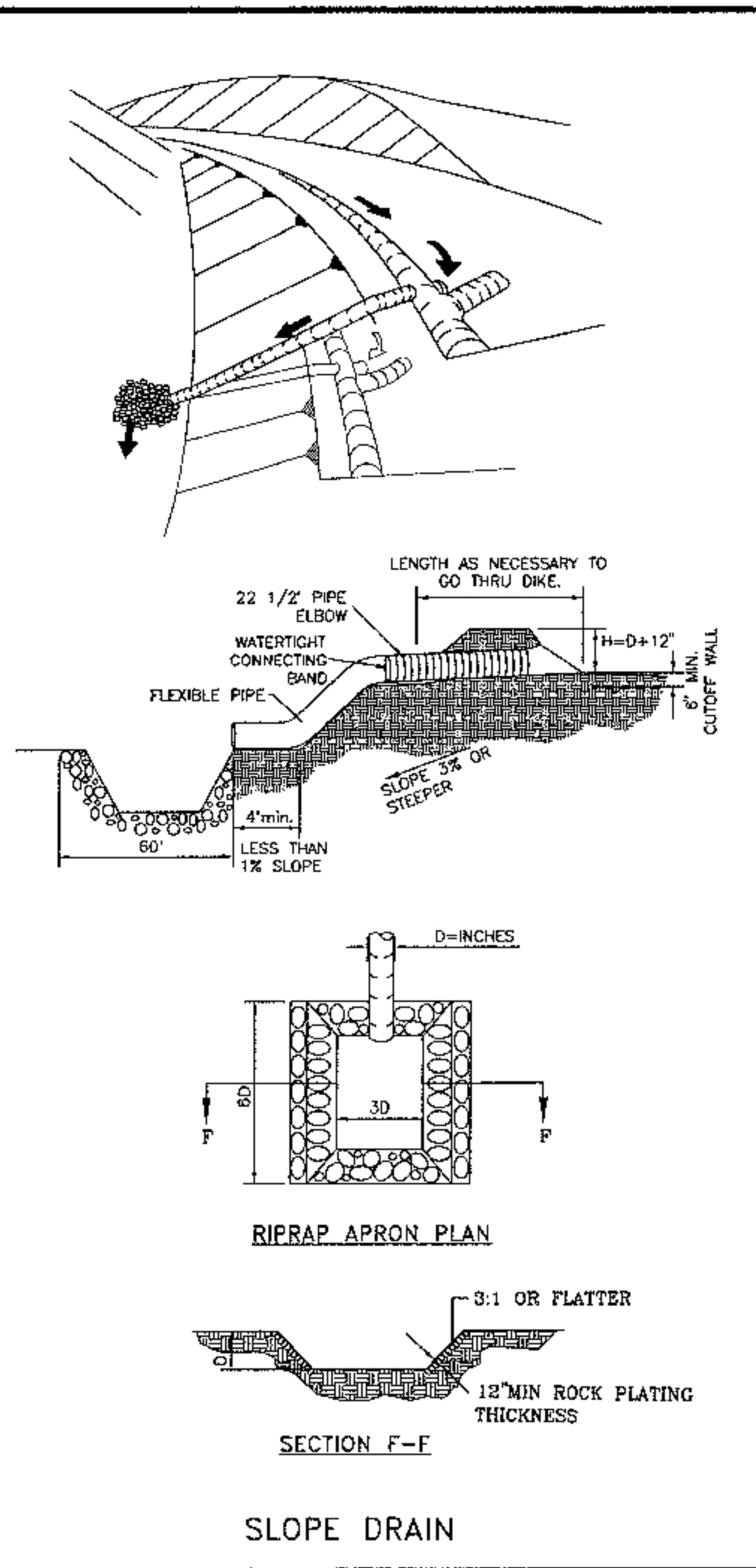
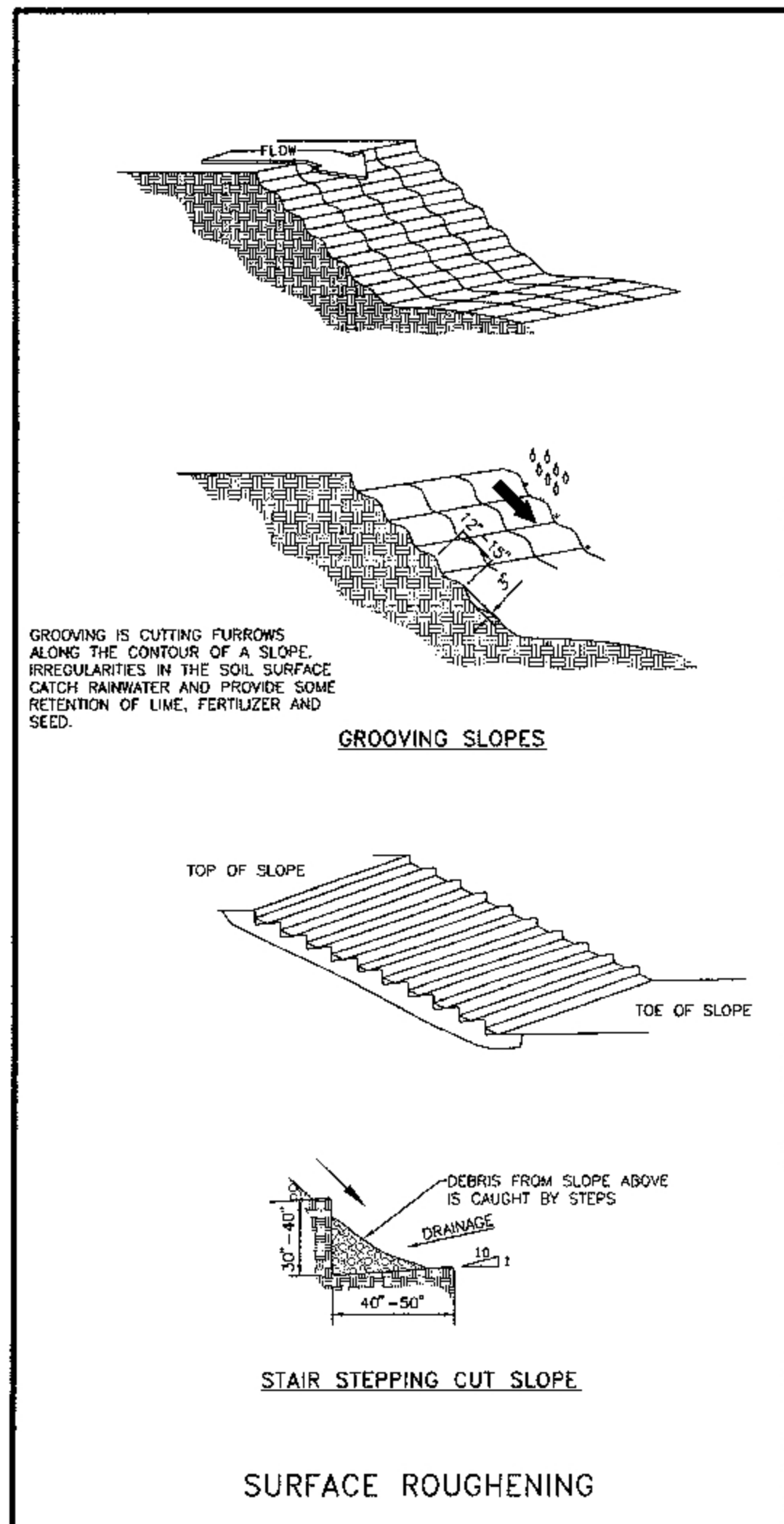
CONSTRUCTION REQUIREMENTS	INSTALLATION
<p>CR-1 MATERIALS AND WORK: CURRENT NEW MEXICO STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (referred to as NM APWA) with MODIFICATIONS NOTED BY THE CITY OF SANTA FE.</p>	<p>I-1 LAYING PIPE: AS PER SECTION 900, NM APWA; PIPE SHALL BE PLACED AND BEDDED IN A FROST FREE TRENCH; GASKET SHALL BE FULLY SEATED AND SUPPLIED; PIPE SHALL BE LAID THROUGH MANHOLE LOCATIONS ON STRAIGHT AND TO 22 1/2 DEGREE DEFLECTIONS.</p>
<p>CR-2 APPROVED PLANS: USE PLANS BEARING THE OFFICIAL STAMP OF THE DESIGN ENGINEER AND BEARING THE APPROVAL SIGNATURE OF THE CITY WATER QUALITY DIVISION OR APPROVED REPRESENTATIVE. CONSTRUCTION PERFORMED WITHOUT APPROVED PLANS WILL BE REJECTED.</p>	<p>A. TYPE 1 TRENCH INSTALLATION CONFIGURATION EXCEEDS THE LIMITS OF NM APWA STANDARDS, SECTION 700, OR AS DEFINED ON THE CONSTRUCTION PLANS, THE DESIGN ENGINEER WILL SPECIFY THE NEW PIPE CLASSIFICATION OR WALL THICKNESS.</p>
<p>CR-3 SEWER HOOK-UP PERMIT: OBTAIN PERMITS FOR THE PROJECT BEFORE COMMENCING SENER CONSTRUCTION. CONSTRUCTION PERFORMED WITHOUT OBTAINING PERMITS SHALL BE REJECTED. A. CONSTRUCTION PLANS SHALL INDICATE THE CLASS OF BEDDING TO BE USED. A CHANGE OF BEDDING MAY REQUIRE A CHANGE IN PIPE CLASSIFICATION OR WALL THICKNESS.</p>	<p>B. TYPE 1 TRENCH INSTALLATION IS NORMALLY USED WHEN TRENCH DEPTHS ARE 8'(FT.) OR LESS. TYPE II TRENCH CONFIGURATION IS NORMALLY USED WHEN TRENCH DEPTHS ARE 8'(FT.) AND OVER, DEPENDING ON SOIL CONDITIONS. REFER TO NM APWA STANDARDS SECTION 700.</p>
<p>CR-4 SUBSTITUTIONS OR CHANGES: ALL SUBSTITUTIONS OR CHANGES MUST BE APPROVED BY THE CITY WATER QUALITY DIVISION OR CITY APPROVED REPRESENTATIVE PRIOR TO CONSTRUCTION. ALL SUBSTITUTIONS OR CHANGES MUST BE SUBMITTED BY THE DESIGN ENGINEER TO THE CITY WATER QUALITY DIVISION OR APPROVED REPRESENTATIVE. WHERE APPROPRIATE, SUBMITTAL MUST INCLUDE FABRICATION DRAWINGS, WORKING DRAWINGS AND MATERIAL SPECIFICATIONS OR TEST DATA TO JUSTIFY SUBSTITUTIONS OR CHANGES. DESIGN ENGINEER SHALL AUTHORIZE ANY DRAWINGS FOR SUBSTITUTIONS AND CHANGES AND SUBMIT THEM TO THE CITY WATER QUALITY DIVISION FOR APPROVAL. UNAUTHORIZED SUBMITTALS WILL BE REJECTED.</p>	<p>I-2 MANHOLE CONSTRUCTION: A. BASE: 1. CAST IN PLACE; ON UNDISTURBED FROST FREE SUBGRADE 2. PRECAST UNIT- ON PEA GRAVEL WITH COMPLETE EVEN BEARING B. PRECAST BARREL: 1. JOINTS: FILL COMPLETELY WITH NON-SHRINK GROUT AND TROWEL 2. MANHOLE ADAPTOR: INSTALL OVER PVC PIPE AND FILL IN PENETRATION WITH NON-SHRINK GROUT 3. CAST IN PLACE BASES: SHALL ACHIEVE A MINIMUM OF 2500 PSI COMPRESSIVE STRENGTH BEFORE SETTING PRECAST BARREL SECTIONS.</p>
<p>CR-5 MANUFACTURER'S CERTIFICATES: WHEN CERTIFICATES OF COMPLIANCE AND TEST REPORTS ARE REQUIRED FOR MATERIALS, DOCUMENTS SHALL BE SUBMITTED TO THE CITY WATER QUALITY DIVISION OR APPROVED REPRESENTATIVE AT THE TIME OF MATERIALS DELIVERY TO THE JOBSITE.</p>	<p>I-3 EXCAVATION AND BACKFILL: AS PER SECTION 700, NM APWA; SATURATION BY FLOODING OR JETTING METHODS IS NOT PERMITTED WITHOUT A SOILS ENGINEERING REPORT. USING THESE METHODS, MECHANICAL OR VIBRATORY COMPACTORS SHALL NOT BE USED ON THE BEDDING AND 12"(N). OF INITIAL BACKFILL. COMPACTION SHALL BE DETERMINED PER AASHTO T-180.</p>
<p>CR-6 CONTRACTOR REQUIREMENTS: CONTRACTOR PERFORMING WORK ON PUBLIC SEWER LINES SHALL BE A LICENSED UTILITY CONTRACTOR.</p>	

<p>CM-1 SEWER PIPE: (CERTIFICATES REQUIRED)</p> <ol style="list-style-type: none"> A. VITRIFIED CLAY: REFER TO SECTION 125, NM APWA FOR EXTRA STRENGTH VCP. B. PLASTIC (PVC): REFER TO SECTION 121, NM APWA, AS MODIFIED BY THE CITY. <ol style="list-style-type: none"> 1. 4" THRU 15" (inch) DIAMETER, ASTM D-3034 OR ASTM F-769 PIPE, MINIMUM PS-46 STRENGTH, SDR-35 OR EQUAL. 2. LARGER THAN 15" (N.) DIAMETER: ASTM F 879 VOL. 08.04. C. HDPE PIPE PER ASTM D-1748 CLASS III WHEN APPROVED BY WATER QUALITY DIVISION ENGINEER. D. PVC RESTRAINED JOINTS: SERIES 1350 OR SERIES 1590 FOR COUPLERS PROVIDED BY UNITE-FLANGE CORPORATION, LOCKING COUPLINGS WITH NYLON SPLINE, MARKED AS "YELLOWMINE" AND PRODUCED BY CERTAINTED CORPORATION, OR APPROVED EQUAL. E. MANHOLE ADAPTERS: ASBESTOS CEMENT (AC) MANHOLE ADAPTERS, OR AC/PVC ADAPTER COUPLINGS. F. BUILDING SERVICE STUBS: CAST IRON DWV, PVC SCH. 40 DWV. G. SERVICE CONNECTIONS: <ol style="list-style-type: none"> 1. VCP PIPE: FACTORY TIE FITTINGS; SECTION 125 NM APWA. 2. PVC PIPE: CAST IRON BODIES TAPPING SADDLE WITH STAINLESS STEEL TENSION STRAP AND FITTINGS; FOWLER "QUICKWAKY" GENECO, HERSEY "PRONER", OR APPROVED EQUAL. H. SOIL CLASSIFICATION: THE UNIFIED SOIL CLASSIFICATION SYSTEM PER ASTM D 2487 TABLE 701.3.5 NM APWA. <p>CM-2 MANHOLES:</p> <ol style="list-style-type: none"> A. CONCRETE MANHOLES: PRECAST REINFORCED CONCRETE RISERS, REDUCING CONES, AND ADJUSTMENT RINGS PER ASTM C 478 VOL. 04.05. BASES MAY BE FIELD PLACED CONCRETE OR PRECAST CONCRETE PER ASTM C 478 VOL. 04.05 (CERTIFICATES REQUIRED). CRACKED OR VISIBLY DEFECTIVE UNITS WILL BE REJECTED. B. PIPE PENETRATIONS: PRECAST UNITS SHALL HAVE SUITABLE SIZED OPENINGS CAST INTO BARREL AT PROPER ANGLES FOR PIPE AND MANHOLE ADAPTERS. C. MANHOLE STEPS: REFER TO SECTION 920.4.7 NM APWA POLYPROPYLENE ENCASED GRADE 60 STEEL BY M.A. INC. OR APPROVED EQUAL: 14"(N.) WIDE, 16"(N.) MAXIMUM SPACING. D. FRAMES AND COVERS: <ol style="list-style-type: none"> 1. CASTING: SHALL CONFORM TO SECTION 160, 161 & 162, NM. APWA CLASS 308. (CERTIFICATES AND SHOP DRAWINGS REQUIRED) 2. MINIMUM COVER WEIGHT: 165 POUNDS 3. MINIMUM COMBINED WEIGHT: 365 POUNDS +/- 5% 4. BEARING SURFACES: SHALL BE MATCHED FOR A FIRM NON ROCKING SEAT BETWEEN FRAME AND COVER. MINIMUM SEATING WIDTH: 7/8"(N.) 5. COATING: NONE 6. COVER LETTERINGS: SANTA FE, N.M. SANITARY SEWER 7. CASTINGS: CAST MANUFACTURER AND MODEL NUMBER ON FRAME AND COVER. 8. CASTINGS TOLERANCE: +/- 1/16"(N.) PER FOOT OF OVERALL DIMENSION. OUT OF ROUND CASTINGS AND LOOSE FITTING UNITS WILL BE REJECTED IN THE FIELD. <p>CM-3 CONCRETE ENCASUREMENT:</p> <ol style="list-style-type: none"> A. REQUIREMENTS: <ol style="list-style-type: none"> 1. WHEN THE PIPE COVER IS 36" (N.) OR LESS. 2. WHEN VITRIFIED CLAY CROSSES AN ARROYO. 3. WHEN A WATER LINE PASSES BELOW OR LESS THAN 18" (IN.) ABOVE THE EXISTING SEWER LINE. 4. WHEN A PARALLEL WATER LINE IS LESS THAN 10'(FT.) HORIZONTALLY AND LESS THAN 2'(FT.) ABOVE THE SEWER LINE. 5. THE SEWER LINE SHALL BE ENCASED IN CONCRETE 6" THICK AS ORDERED, AND EXTEND AT LEAST 10'(FT.) ON EACH SIDE OF THE WATER LINE. 	<p>FQC-1 TESTING AND INSPECTION:</p> <ol style="list-style-type: none"> A. SUPERVISION: CONDUCTED BY DESIGN ENGINEER. B. CERTIFICATION: DESIGN ENGINEER SHALL CERTIFY THAT THE PROJECT HAS BEEN COMPLETED IN ACCORDANCE TO PLANS & SPECIFICATIONS AND SHALL SUBMIT A CERTIFICATION OF COMPLIANCE STATEMENT WITH STAMP AND SIGNATURE. C. EQUIPMENT AND ASSISTANCE: PROVIDED BY CONTRACTOR. <p>FQC-2 LINE AND GRADE: ALLOWABLE TOLERANCE BETWEEN STRUCTURES FROM DESIGN:</p> <ol style="list-style-type: none"> A. LINE: 0.20 FOOT B. GRADE: 0.02 FOOT; PIPE SHALL NOT HOLD BACK ANY WATER. <p>FQC-3 LEAKAGE TEST:</p> <p>AIR TEST REQUIRED; REFER TO SECTION 901.7 NM APWA.</p> <p>FQC-4 TELEVISION INSPECTION:</p> <p>CONTRACTOR SHALL PROVIDE A CERTIFIED CCTV SEWERLINE INSPECTION AND RECORD TAPES AT HIS OWN EXPENSE.</p> <p>FQC-5 ALL CONNECTIONS TO EXISTING MANHOLES INCLUDES REHABILITATING THE TIE IN MANHOLE TO MEET THESE STANDARD CONSTRUCTION DETAILS.</p> <p>NOTE: REVISIONS TO THIS SHEET SHALL BE MADE UNDER THE AUTHORITY OF THE CITY OF SANTA FE ONLY.</p>
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NOT TO SCALE

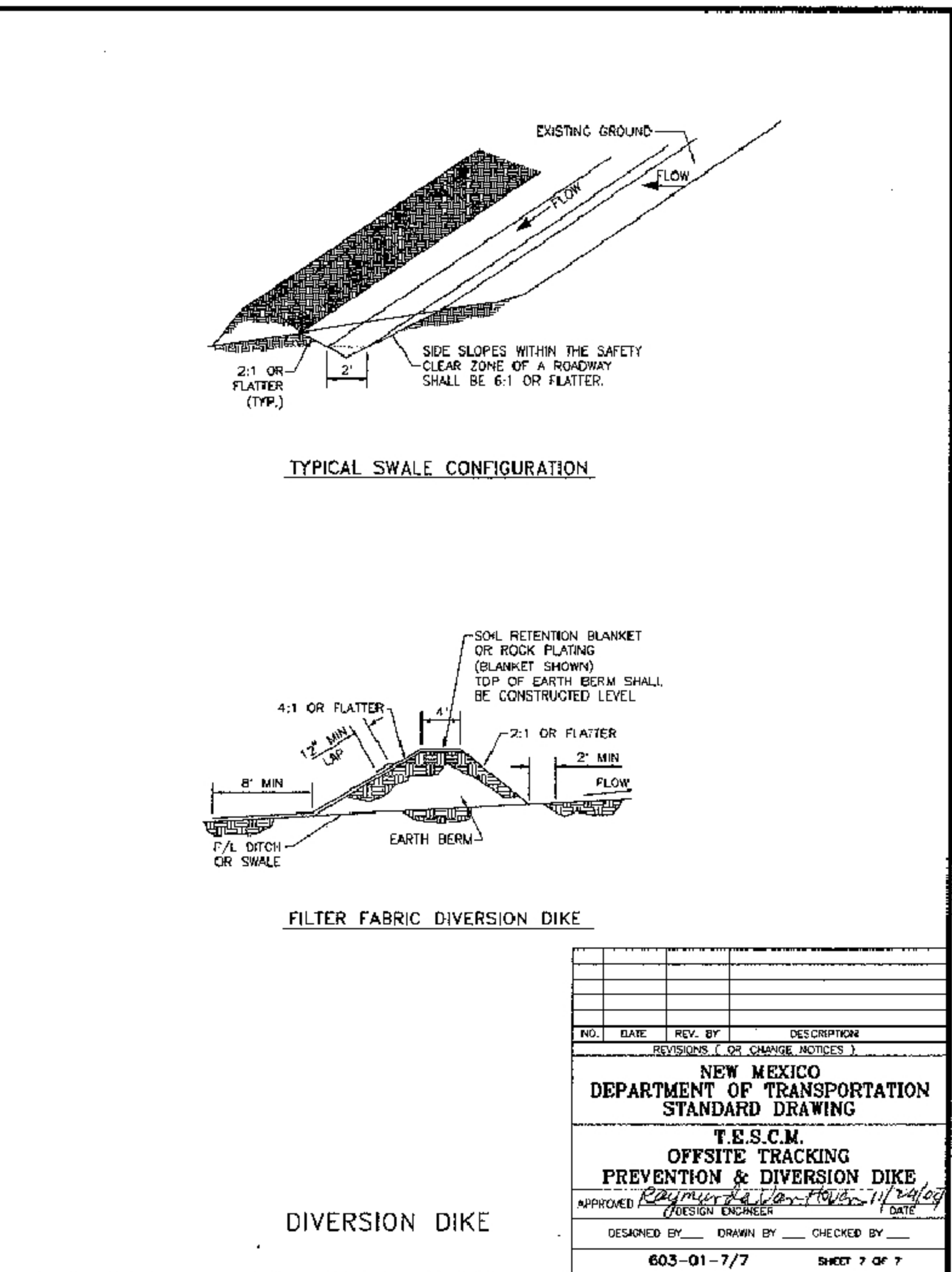
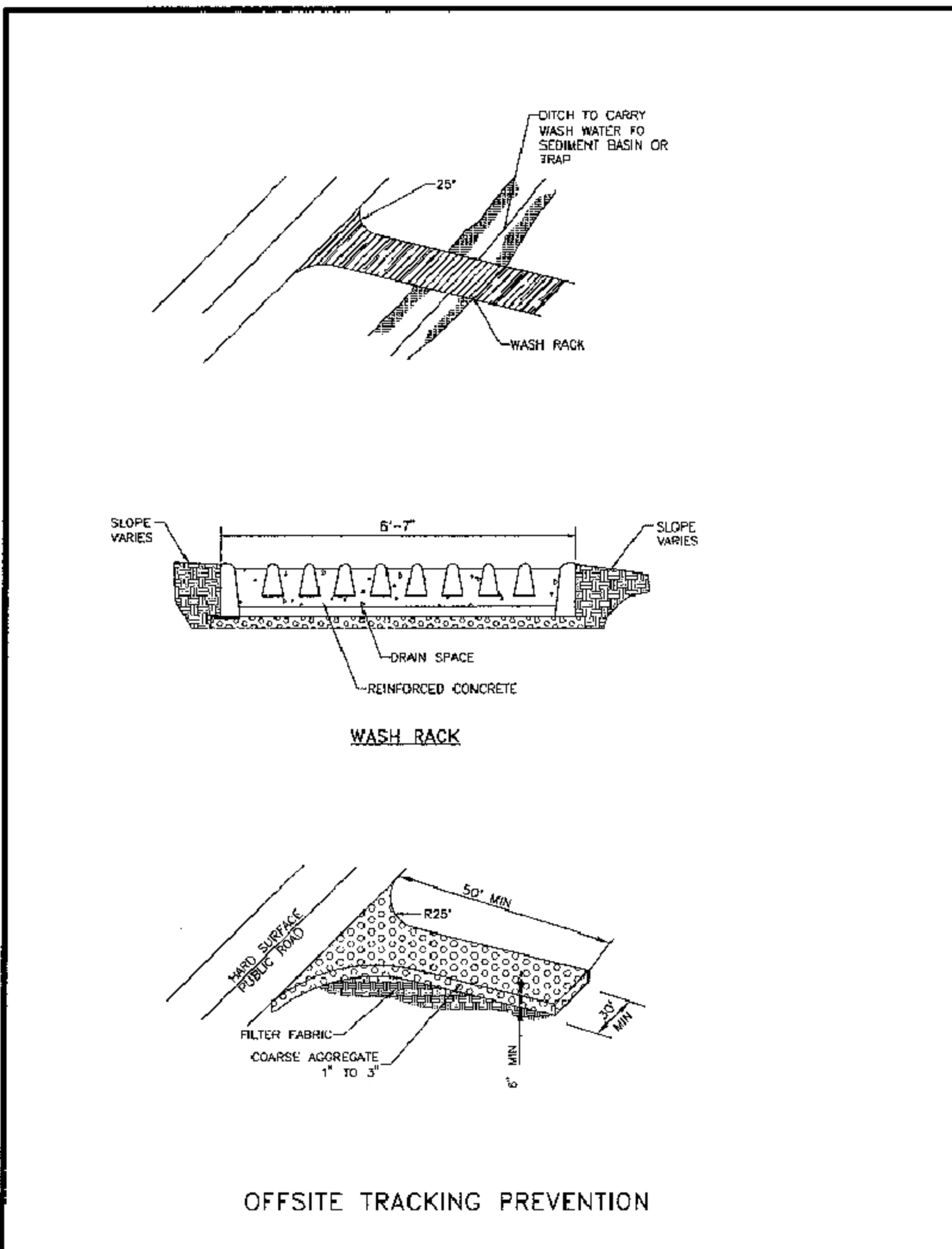




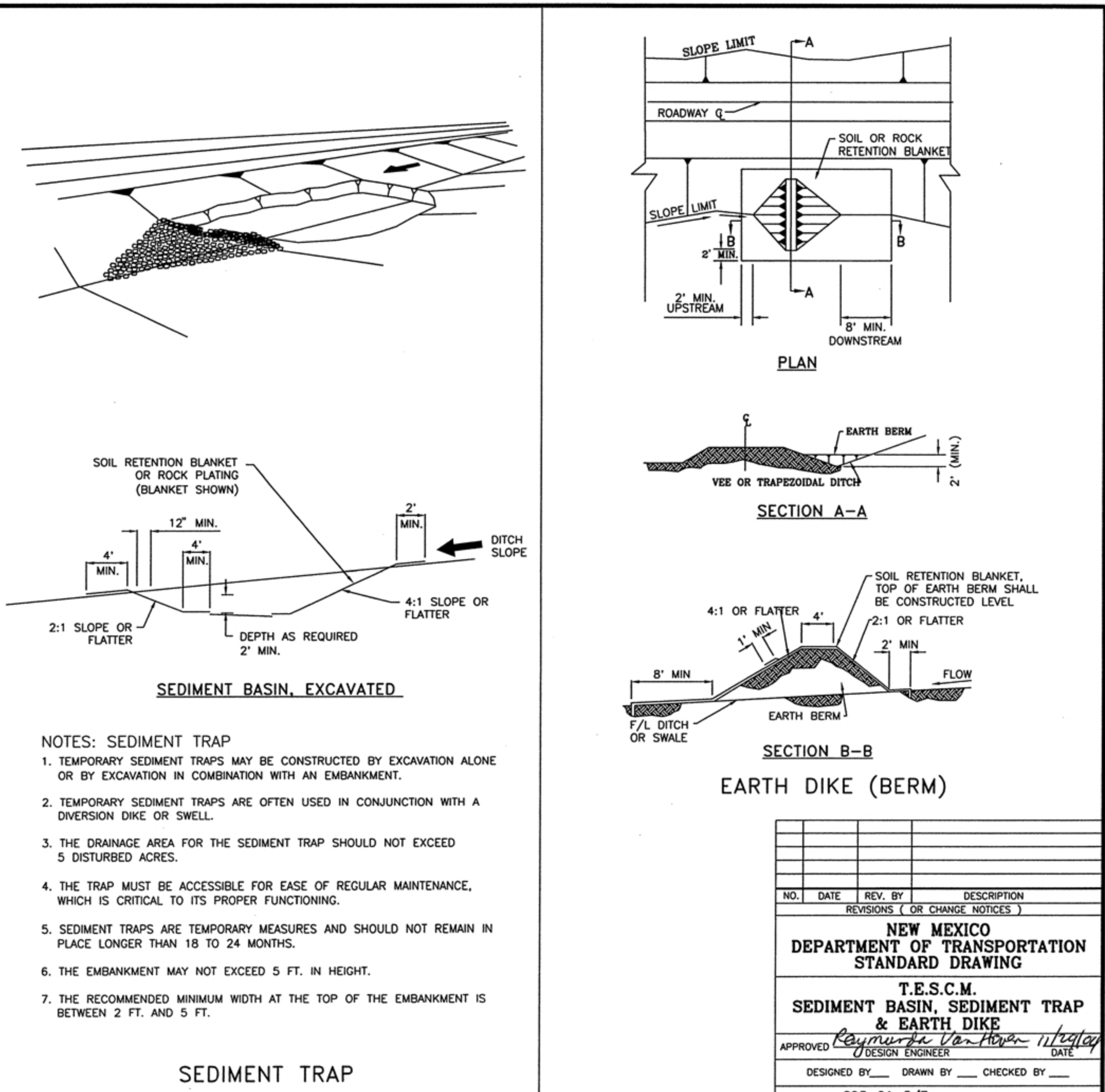
- NOTES: PIPE SLOPE DRAIN
1. THE FLEXIBLE PIPE SHALL BE THE SAME DIAMETER AS THE INLET PIPE AND SHALL BE CONSTRUCTED OF A DURABLE MATERIAL WITH HOLD-DOWN CROWMEYS SPACED AT 10 FT. ON CENTER.
 2. THE FLEXIBLE PIPE SHALL BE SECURELY FASTENED TO THE CORRUGATED METAL OR HIGH DENSITY POLYETHYLENE PIPE WITH METAL STRAPPING OR WATERTIGHT CONNECTING COLLARS.
 3. THE FLEXIBLE PIPE SHALL BE STAKED AT 10 FT. CENTERS ALONG THE SLOPE USING MINIMUM 4 INCH SQUARE WOOD POSTS OR STANDARD STEEL POSTS DRIVEN 2 FT. MINIMUM INTO THE GROUND.
 4. RIGID PIPE SHALL BE ANCHORED AT BENDS. ANCHORAGE SHALL CONSIST OF A MINIMUM 4 INCH SQUARE WOOD POSTS OR STANDARD STEEL POSTS DRIVEN 2 FT. MINIMUM INTO GROUND, OR EARTHEN THRUST BLOCK.
 5. PAYMENT OF BASIN ITEMS ARE INCIDENTAL TO THE COST OF FLEXIBLE STORM DRAIN PIPE.
 6. FOR PIPE DIAMETER ON TEMPORARY SLOPE DRAIN SEE TABLE BELOW

TEMPORARY SLOPE DRAIN PIPES	
Runoff Flow Rate (cfs)	Pipe Diameter Required (inches)
0 - 6.0	18
6.0 - 9.0	21
9.0 - 12.0	24
12.0 - 20.0	30

NO.	DATE	REV. BY	DESCRIPTION
REVISIONS (OR CHANGE NOTICES)			
NEW MEXICO DEPARTMENT OF TRANSPORTATION STANDARD DRAWING			
TEMPORARY EROSION & SEDIMENT CONTROL MEASURES PIPE SLOPE DRAIN & SURFACE ROUGHENING			
APPROVED	DESIGNED BY		
DESIGNED BY	DRAWN BY	CHECKED BY	DATE
603-01-6/7 SHEET 6 OF 7			



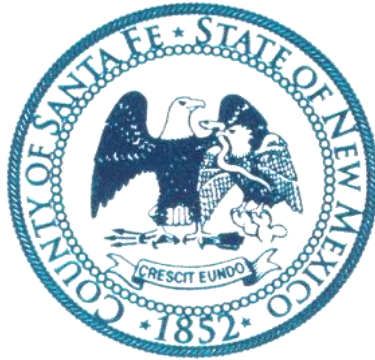
NO.	DATE	REV. BY	DESCRIPTION
REVISIONS (OR CHANGE NOTICES)			
NEW MEXICO DEPARTMENT OF TRANSPORTATION STANDARD DRAWING			
T.E.S.C.M. OFFSITE TRACKING PREVENTION & DIVERSION DIKE			
APPROVED	DESIGNED BY		
DESIGNED BY	DRAWN BY	CHECKED BY	DATE
603-01-7/7 SHEET 7 OF 7			



APPENDIX F

SAMPLE CONTRACT

**AGREEMENT BETWEEN SANTA FE COUNTY AND CONTRACTOR
FOR CONSTRUCTION SERVICES**



**SANTA FE COUNTY
ADMINISTRATIVE SERVICES DEPARTMENT
PURCHASING DIVISION
2014 EDITION**

[Changes, additions, deletions and/or any modifications other than those agreed upon by the parties upon execution of this contract, without the written consent of Santa Fe County shall render this document null and void.]

Hereafter "County":

Katherine Miller, County Manager
Santa Fe County
PO Box 276
Santa Fe, New Mexico 87504-0276
TELEPHONE: 505-986-6200
FAX: 505-995-2740

Hereafter "Contractor":

TELEPHONE: _____
E-MAIL ADDRESS: _____

ARCHITECT [or ENGINEER]

NAME: _____
ADDRESS: _____

TELEPHONE: _____
E-MAIL ADDRESS: _____

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RECITALS

WHEREAS, in accordance with Section 13-1-103 through Section 13-1-110 NMSA 1978, the County issued Invitation for Bid (IFB) No. _____ for construction services for _____; and

WHEREAS, the Contractor submitted its bid, dated _____ in response to IFB No. _____; and

WHEREAS, the County is authorized to enter into a construction contract for the Project pursuant to Sections 13-1-100, NMSA 1978; and

WHEREAS, the Contractor hereby represents that it is a licensed contractor of the State of New Mexico pursuant to Chapter 60, Article 13 NMSA 1978; and

WHEREAS, the Owner agrees to hire the Contractor, and the Contractor agrees to provide Construction Services as required herein for the Project in accordance with the terms and conditions set forth in this Agreement; and

WHEREAS, the County requires the services of the Contractor, and the Contractor is willing to provide these services and both parties wish to enter into this Agreement.

ARTICLE 1 THE CONTRACT DOCUMENTS

1.1 DOCUMENTS

The contract documents consist of the following:

- | | |
|--|--------------|
| -Agreement between County and Contractor | |
| -General Conditions of the Construction Contract | |
| -Conditions of the Work of the Construction Contract | |
| -Bid Sheet | Attachment A |
| -Addenda and Modifications issued | Attachment B |
| before and after execution of this Contract | |

1.2 CERTIFICATES AND DOCUMENTATION

The following certificates and documentation are hereby attached as exhibits as follows:

- | | |
|--|-----------|
| Project Manual | Exhibit A |
| Technical Specifications as listed in Plan Set | Exhibit B |
| Labor and Material Payment Bond | Exhibit C |
| Performance Bond | Exhibit D |
| Assignment of Antitrust Claims | Exhibit E |
| Certificate of Insurance | Exhibit F |

Notice of Award
Notice to Proceed
Change Order
Certificate of Substantial Completion

Exhibit G
Exhibit H
Exhibit I
Exhibit J

ARTICLE 2 THE WORK

2.1 THE WORK

The Contractor shall perform all the Work required by the Contract Documents for the following:

Insert description of work

ARTICLE 3 EFFECTIVE DATE, TIME OF COMMENCEMENT, SUBSTANTIAL COMPLETION AND AMENDMENTS

3.1 EFFECTIVE DATE

The Effective Date of this Agreement is the date of signature by the County.

3.2 TIME OF COMMENCEMENT

The work to be performed under this Contract shall be commenced no later than ten (10) consecutive calendar days after the date of written Notice to Proceed issued by the County, hereto attached as Exhibit H.

3.3 SUBSTANTIAL COMPLETION

The Contractor shall achieve Substantial Completion of the entire work no later than _____ () calendar days from the date of the Notice to Proceed, except as hereafter extended by valid written Change Order. A Certificate of Substantial Completion, attached hereto as Exhibit J, will be issued by the County to the Contractor, as adjusted by any Change Order, attached hereto as Exhibit I.

3.4 TIME FOR COMPLETION AND LIQUIDATED DAMAGES

Should the Contractor neglect, refuse, or otherwise fail to complete the Work within the time specified in this Article, the Contractor agrees that Liquidated Damages in the amount of _____ dollars (\$) shall be assessed per each calendar day that expires after the date of substantial completion, as adjusted by any change order, and until issuance by the County of a certificate of Substantial Completion in accordance with Paragraph 7 (Effective Date and Term) of the General Conditions.

- A. It is hereby understood and mutually agreed, by and between the Contractor and the County, that the date of beginning and the time for completion as specified in the contract of the work to be done hereunder are *essential conditions* of this contract and it is further

mutually understood and agreed that the work outlined in this contract shall be commenced on a date to be specified in the "Notice to Proceed."

- B. The Contractor agrees that work shall be prosecuted regularly, diligently and uninterruptedly at such rate of progress as will insure full completion thereof within the time specified. It is expressly understood and agreed, by and between the Contractor and the County, that the time for the completion of the work described herein is a reasonable time for the completion of the same, taking into consideration the average climatic range and usual industrial conditions prevailing in this locality.
- C. If the Contractor shall neglect, fail or refuse to complete the work within the time herein specified or any proper extension thereof granted by the County, then the Contractor does hereby agree, as a part consideration for the awarding of this contract, to pay to the County the amount specified in the contract, not as a penalty but as liquidated damages for such breach of contract as herein set forth, for each and every calendar day that the contract shall be in default after the time stipulated in the contract for completing the work.
- D. The amount is fixed and agreed upon by and between the Contractor and the County because of the impracticability and extreme difficulty of fixing and ascertaining the actual damages the County would in such event sustain, and the amount is agreed to be the amount of damages which the County would sustain and the amount shall be retained from time to time by the County from current periodical estimates.
- E. It is agreed that time is of the essence of each and every portion of this contract and of the specifications wherein a definite and certain length of time is fixed for the performance of any act whatsoever and where under the contract an additional time is allowed for the completion of any work, the new time limit fixed by such extension shall be of the essence of this contract. Provided that the Contractor shall not be charged with liquidated damages or any excess cost when the County determines that the Contractor is without fault and the Contractor's reasons for the time extension are acceptable to the County. Provided that the Contractor shall not be charged with liquidated damages or any excess cost when the delay in completion of the work is due:
 - 1. To any preference, priority or allocation order duly issued by the County;
 - 2. To unforeseeable cause beyond the control and without the fault or negligence of the Contractor, including but not restricted to, acts of God, or of the public enemy, acts of the County, acts of another contractor in the performance of a contract with the County, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, and severe weather;
 - 3. To any delays of subcontractors or suppliers occasioned by any of the causes specified in subsections above.
- F. Provided further, that the Contractor shall, within ten days from the beginning of such delay, unless the County shall grant a further period of time prior to the date of final settlement of the contract, notify the County in writing of the causes of the delay, who shall ascertain the facts and extent of the delay and notify the Contractor within a reasonable time of its decision in the matter.

3.5 AMENDMENTS

This Agreement may be amended by mutual agreement by both parties upon issuance of a Change Order by the County to the Contractor. Any such amendment shall be in accordance with Paragraph 10 (Amendments – Change Orders) of the General Conditions. Unless otherwise agreed to by the parties, an amendment shall not affect any outstanding Purchase Order(s) issued by the County prior to the effective date of the amendment.

**ARTICLE 4
CONTRACT SUM**

4.1 LUMP SUM

The County shall pay the Contractor in current funds for the performance of the Work, subject to additions and deductions by Change Order as provided in the Contract Documents, an agreed upon Lump Sum of (enter dollar amount in words) Dollars (\$0.00 enter dollar amount), exclusive of New Mexico gross receipts tax.

4.2 CONTRACT AMOUNT

The Contract sum is determined as follows: (insert data from bid form concerning base bid, alternates, etc.)

Base Bid	\$	
List Alternates, if applicable	\$	
	\$	
	\$	
Total Contract Amount	\$, exclusive of NM grt

**ARTICLE 5
PROGRESS PAYMENTS**

5.1 PROGRESS PAYMENTS

Based upon an Application for Payment submitted to the County by the Contractor and Certificates for Payment issued by the County, the County shall make progress payments on account of the Contract sum to the Contractor as provided in the Contract documents for the period ending the last day of the month as follows:

- A. No later than 21 working days following receipt by the County of an undisputed Application for Payment, one hundred percent (100%) of the portion of the Contract Sum properly allocable to labor, materials, and equipment incorporated in the Work and one

- hundred percent (100%) of the portion of the Contract Sum 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 County; less such amounts as the Architect/ Engineer shall determine for all incomplete Work and unsettled claims as provided in the Contract Documents (Section 57-28-5, NMSA 1978).
- B. When making payments, the County, Contractor or subcontractor shall not retain, withhold, hold back or in any other manner not pay amounts owed for work performed. For additional information regarding retainage and the Prompt Payment Act (refer to Section 57-28-5, NMSA 1978).
 - C. Contractors and subcontractors shall make prompt payment to their subcontractors and suppliers for amounts owed for work performed on the construction project within 21 days after receipt of payment from the County, contractor or subcontractor. If the contractor or subcontractor fails to pay its subcontractor and suppliers by first-class mail or hand delivery within twenty-one days after receipt of an undisputed request for payment, the contractor or subcontractor shall pay interest to its subcontractors and suppliers beginning on the 22nd day after payment was due, computed at one and one-half percent of the undisputed amount per month or fraction of a month until payment is issued. These payment provisions apply to all tiers of contractors, subcontractors and suppliers (Section 57-28-1 et. seq. NMSA 1978).
 - D. In preparing estimates the material delivered on the site and preparatory work done may be taken into consideration.
 - E. All material and work covered by partial payments made shall thereupon become the sole property of the County, but this provision shall not be construed as relieving the Contractor from the sole responsibility for the care and protection of materials and work upon which payments have been made or the restoration of any damaged work, or as a waiver of the right of the County to require the fulfillment of all of the terms of the contract.
 - F. County's right to withhold certain amounts and make application thereof. The Contractor agrees that it will indemnify and hold the County harmless from all claims growing out of the lawful demands of subcontractors, laborers, workmen, mechanics, material men, and furnisher of machinery and parts thereof, equipment, power tools, and all supplies, including commissary, incurred in the furtherance of the performance of this contract. The Contractor shall, at the County's request, furnish satisfactory evidence that all obligations of the nature hereinabove designated have been paid, discharged, or waived. If the Contractor fails so to do, then the County may, after having served written notice on the said Contractor, either pay unpaid bills, of which the County has written notice, direct, or withhold from the Contractor's unpaid compensation a sum of money deemed reasonably sufficient to pay any and all such lawful claims until satisfactory evidence is furnished that all liabilities have been fully discharged whereupon payment to the Contractor shall be resumed, in accordance with the terms of this contract, but in no event shall the provisions of this sentence be construed to impose any obligations upon the County to either the

Contractor or its Surety. In paying any unpaid bills of the Contractor, the County shall be deemed the agent of the Contractor, and any payment so made by the County shall be considered as a payment made under the contract by the County to the Contractor and the County shall not be liable to the Contractor for any such payments made in good faith.

ARTICLE 6 FINAL PAYMENT

6.1 FINAL PAYMENT

The entire unpaid balance of the Contract Sum, shall be paid by the County to the Contractor within 30 calendar days after notification of the County 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 County a certified statement of Release of Liens and Consent of Surety.

6.2 ACCEPTANCE OF FINAL PAYMENT CONTITUTES RELEASE

The acceptance by the Contractor of final payment shall be and shall operate as a release to the County of all claims and all liability to the Contractor for all things done or furnished in connection with this work and for every act and neglect of the County and others relating to or arising out of this work. No payment, however, final or otherwise, shall operate to release the Contractor or its sureties from any obligations under this contract or the Performance and Payment Bond.

IN WITNESS WHEREOF, the parties have duly executed this Agreement as of the date first written above.

SANTA FE COUNTY

Anna Hansen, Chair
Santa Fe County Board of County Commissioners

ATTESTATION

Geraldine Salazar
Santa Fe County Clerk

Approved as to form:

R. Bruce Frederick
Santa Fe County Attorney

Date

Finance Department:

Stephanie Schardin Clarke
Finance Director

Date

CONTRACTOR:

Signature

Date

Print Name

Print Title

**GENERAL CONDITIONS
TO AGREEMENT BETWEEN SANTA FE COUNTY
AND CONTRACTOR
FOR CONSTRUCTION SERVICES**

1.0 DEFINITIONS

The following terms as used in this contract are respectively defined as follows:

- 1.1 *Application for Payment*** Contractor's written request for payment for completed portions of the work and, for materials delivered or stored and properly labeled for the respective project.
- 1.2 *Change Order*** A written document between the County and the Contractor signed by the County and the Contractor authorizing a change in the work or an adjustment in the contract sum or the contract time. A change order may be signed by the Architect/Engineer, provided they have written authority from the County for such procedure and that a copy of such written authority is furnished to the Contractor upon request. The contract sum and the contract time may be changed only by change order. A change order may be in the form of additional compensation or time; or less compensation or time known as a Deduction (from the contract) the amount deducted from the contract sum by change order.
- 1.3 *Calendar Day*** Each and every Day shown on the calendar, beginning and ending at midnight.
- 1.4 *Contract Period*** The elapsed number of working days or calendar days from the specified date of commencing work to the specified date of completion, as specified in the contract.
- 1.5 *Contractor*** is a person, firm or corporation with whom the contract is entered into with the County.
- 1.6 *Construction Documents*** All drawings, specifications and addenda associated with a specific construction project.
- 1.7 *Construction Schedule*** A schedule in form satisfactory to the County, showing the proposed dates of commencement and completion of each of the various subdivisions of work required under the contract documents and the anticipated amount of each monthly payment that will become due the Contractor in accordance with the progress schedule.
- 1.8 *Day*** The word “day” means a calendar day of 24 hours measured from midnight to the next midnight.
- 1.9 *Labor and Material Payment Bond*** A written form of security from a surety (bonding) company to the County, on behalf of an acceptable prime Contractor or subcontractor, guaranteeing payment to the County in the event the Contractor fails to pay for all labor, materials, equipment, or services in accordance with the contract. (see Performance Bond and Surety Bond).

- 1.10 *Lump Sum Agreement (See Stipulated Sum Agreement)***
- 1.11 *Lump Sum Bid*** A single entry amount to cover all labor, equipment, materials, services, and overhead and profit for completing the construction of a variety of unspecified items of work without the benefit of a cost breakdown.
- 1.12 *Lump Sum Contract*** A written contract between the County and Contractor wherein the County agrees to pay the contractor a specified sum of money for completing a scope of work consisting of a variety of unspecified items or work.
- 1.13 *Payment Bond*** A written form of security from a surety company to the County, on behalf of an acceptable prime contractor or subcontractor, guaranteeing payment to all persons providing labor, materials, equipment, or services in accordance with the contract.
- 1.14 *Performance Bond*** A written form of security from a surety company to the County, on behalf of an acceptable prime contractor or subcontractor, guaranteeing the completion of the work in accordance with the terms of the contract.
- 1.15 *Progress Payment*** A payment from the County to the Contractor determined by calculating the difference between the completed work and materials stored and a predetermined schedule of values or unit costs. (see Schedule of Values, Unit Costs).
- 1.16 *Progress Schedule*** A pictorial or written schedule (including a graph or diagram) that shows proposed and actual start and completion dates of the various work elements.
- 1.17 *Punch list*** a list of items to be completed or corrected, prepared by the Architect/Engineer, checked and augmented as required by the Contractor or Construction Manager is appended hereto as Exhibit J. Note: The failure to include any item on such list does not relieve the Contractor of the responsibility to complete all work in accordance with the contract documents.
- 1.18 *Schedule of Values*** A statement furnished by the Contractor to the Architect or Engineer and the County reflecting the portions of the contract sum allotted for the various parts of the work and used as the basis for reviewing the Contractor's Applications for Payment.
- 1.19 *Services*** Includes services performed, workmanship, and material furnished or utilized in the performance of services.
- 1.20 *Stipulated Sum Agreement*** A written agreement in which a specific amount is set forth as the total payment for completing the contract (See Lump Sum Contract).
- 1.21 *Subcontractor*** is a person, firm or corporation supplying labor and materials or only labor for work at the site of the project for, and under separate contract or agreement with, the Contractor.
- 1.22 *Unit Price Contract*** A written contract wherein the County agrees to pay the Contractor a

specified amount of money for each unit of work successfully completed as set forth in the contract.

1.23 Unit Prices A predetermined price for a measurement or quantity of work to be performed within a specific contract. The designated unit price would include all labor materials, equipment or services associated with the measurement or quantity established.

1.24 Working Day means every day except Saturday, Sunday and holidays recognized by Santa Fe County. Based on a review of weather that may adversely affect the Contractor's ability to effectively prosecute the Work, and the actual Work performed by the Contractor, the Architect or Engineer will determine (between the end of the day and noon of the next day) if the County will charge a Working Day. If the Contractor was able to effectively prosecute Work on a critical path item for six (6) or more hours on a Saturday, Sunday or County-recognized Holiday, the Architect or Engineer may charge a Working Day.

1.25 Work on (at) the project is work to be performed at the location of the project, including the transportation of materials and supplies to or from the location of the project by employees of the Contractor and any subcontractor.

2. CONTRACT AND CONTRACT DOCUMENTS

2.1 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 incorporated in this written Agreement.

2.2 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.

2.3 Conflicting Conditions. Any provisions in any of the Contract Documents which may be in conflict or inconsistent with any of the paragraphs in these General Conditions shall be void to the extent of such conflict or inconsistency.

3. PLANS, SPECIFICATIONS AND ADDENDA

3.1 The plans, specifications and addenda, hereinafter enumerated in Article 1 of the Agreement Between County and Contractor for Construction shall form part of this Contract and the provisions thereof shall be as binding upon the parties hereto as if they were herein fully set forth. The table of contents, titles, headings, running headlines and marginal notes contained herein and in said documents are solely to facilitate reference to various provisions of the Contract Documents and in no way affect or limit the interpretation of the provisions to which they refer.

3.2 Certificates and Documents Incorporated. All certificates and documentation required by the

provisions of the 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.

4. CONTRACT SECURITY – BONDS

- 4.1** Performance Bond. The Contractor shall furnish a performance bond in an amount at least equal to one hundred percent (100%) of the contract sum as security for the faithful performance of this contract. The performance bond and the payment bond may be in one or in separate instruments in accordance with local law.
- 4.2** Payment Bond. The Contractor shall provide payment bond in an amount not less than one hundred percent (100%) of the contract price or in a penal sum not less than that prescribed by state, territorial or local law, as security for the payment of all persons performing labor on the project under this contract, furnishing materials in connection with this contract and all of Contractor's requirements as specified in the contract documents. The Payment Bond shall remain in effect until one year after the date when final payment becomes due.
- 4.3** Additional or Substitute Bond. If at any time the County for justifiable cause shall be or become dissatisfied with any surety or sureties, then upon the Performance or Payment Bonds, the Contractor shall within five days after notice from the County so to do, substitute an acceptable bond (or bonds) in such form and sum and signed by such other surety or sureties as may be satisfactory to the County. The premiums on such bond shall be paid by the Contractor. No further payments shall be deemed due nor shall be made until the new surety or sureties shall have furnished such an acceptable bond to the County.
- 4.4** Labor and Material Bond. The Contractor shall provide to the County Labor and Material Bond in an amount equal to the required payments by the Contractor to pay specified subcontractors, laborers, and materials suppliers associated with the project.

5. TERMS AND MEANINGS

Terms used in this Agreement that are defined in the Conditions of the Contract shall have the meanings designated in those Conditions.

- 5.1** 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.
- 5.2** 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 otherwise requires.
- 5.3** 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.

- 5.4 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.

6. COMPLIANCE WITH APPLICABLE LAW, CHOICE OF LAW

- 6.1** This Agreement shall be governed exclusively by the provisions hereof and by the laws of the State of New Mexico and applicable ordinances of Santa Fe County.
- 6.2** In performing its obligations hereunder, the Contractor shall comply with all applicable laws, ordinances, and regulations, including Santa Fe County Ordinance 2014-1 (Establishing a Living Wage).
- 6.3** Minimum Wage Rates. The Contractor, all subcontractors and sub-subcontractors warrants and agree to will comply with all applicable provisions of the New Mexico Public Works Minimum Wage Act as outlined in the Bid Documents. Wage rates are not applicable to projects costing less than \$60,000.
- 6.4** This Agreement shall be construed in accordance with the substantive laws of the State of New Mexico, without regard to its choice of law rules. Contractor and the County agree that the exclusive forum for any litigation between them arising out of or related to this Agreement shall be federal and state district courts of New Mexico.
- 6.5** Pursuant to 13-1-191, NMSA 1978, reference is hereby made to the criminal laws of New Mexico, including §30-14-1, §30-24-2, and §30-41-1 through 3 NMSA 1978, which prohibit bribes, kickbacks, and gratuities, violation of which constitutes a felony. Further, the Procurement Code, 13-1-28 through 13-1-199 NMSA 1978, imposes civil and criminal penalties for its violation.
- 6.6** New Mexico Tort Claims Act. By entering into this Agreement, neither party shall be responsible for liability incurred as a result of the other party’s acts or omissions in connection with this Agreement. Any liability incurred in connection with this Agreement is subject to the immunities and limitations of the New Mexico Tort Claims Act, Sections 41-4-1, et Seq. NMSA 1978, as amended. The County and its “public employees” as defined in the New Mexico Tort Claims Act, do not waive sovereign immunity, do not waive any defense and do not waive any limitation of liability pursuant to law. No provision in this Agreement modifies or waives any provision of the New Mexico Tort Claims Act.
- 6.7** Provision Required by Law Deemed Inserted. Each and every provision of law and clause required by law to be inserted in this contract shall be deemed to be inserted herein and the contract shall be read and enforced as though it were included herein, and if through mistake or otherwise any such provision is not inserted, or is not correctly inserted, then upon the application of either party the contract shall forthwith be physically amended to make such insertion or correction.

7. EFFECTIVE DATE AND TERM

- 7.1** This Agreement shall, upon due execution by all parties, become effective in accordance with the Agreement Between County and Contractor for Construction, Article 3 - Effective Date, Time of Commencement and Substantial Completion. This Agreement shall not become effective until: (1) approved by the Santa Fe County Commissioners and/or the County Manager or their designee; and (2) signed by all parties required to sign this Agreement.
- 7.2** This Contract shall achieve Substantial Completion in accordance with the Agreement Between County and Contractor, Article 3 - Effective Date, Time of Commencement and Substantial Completion, unless earlier terminated pursuant to Section 8 (Termination) or 9, (Appropriations and Authorizations) of these General Conditions.

8. TERMINATION

- 8.1** Termination of Agreement for Cause. Either party may terminate the Agreement based upon any material breach of this Agreement by the other party. The non-breaching party shall give the breaching party written notice of termination specifying the grounds for the termination. The termination shall be effective 30 days from the breaching party's receipt of the notice of termination, during which time the breaching party shall have the right to cure the breach. If, however, the breach cannot with due diligence be cured within 30 days, the breaching party shall have a reasonable time to cure the breach, provided that, within 30 days of its receipt of the written notice of termination, the breaching party began to cure the breach and advised the non-breaching party in writing that it intended to cure.
- 8.2** Termination for Convenience of the County. The County may, in its discretion, terminate this Agreement at any time for any reason by giving the Contractor written notice of termination. The notice shall specify the effective date of termination, which shall not be less than 15 days from the Contractor's receipt of the notice. The County shall pay the Contractor for acceptable work, determined in accordance with the specifications and standards set forth in this Agreement, performed before the effective date of termination but shall not be liable for any work performed after the effective date of termination.
- 8.3** Right of the County to Terminate Contract In the event that any of the provisions of this contract are violated by the Contractor, or by any of its subcontractors, the County may serve written notice upon the Contractor and the Surety of its intention to terminate the contract, such notices to contain the reasons for such intention to terminate the contract, and unless within ten days after the serving of such notice upon the Contractor, such violation or delay shall cease and satisfactory arrangement of correction be made, the contract shall, upon the expiration of said ten days, cease and terminate. In the event of any such termination, the County shall immediately serve notice thereof upon the Surety and the Contractor and the Surety shall have the right to take over and perform the contract. Provided, however, that if the Surety does not commence performance thereof within ten days from the date of the mailing to such Surety of notice of termination, the County may take over the work and prosecute the same to completion by contract or by force account and at the expense of the Contractor and the Contractor and its Surety shall be liable to the County for any excess cost occasioned the County thereby, and in such event the County may take possession of and utilize in completing the work, such materials,

appliances, and plant as may be on the site of the work and necessary therefore.

9. APPROPRIATIONS AND AUTHORIZATIONS

This Agreement is contingent upon sufficient appropriations and authorizations being made for performance of this Agreement by the Santa Fe County Board of County Commissioners and/or, if state funds are involved, the New Mexico State Legislature. If sufficient appropriations and authorizations are not made in this or future fiscal years, this Agreement shall terminate upon written notice by the County to the Contractor. Such termination shall be without penalty to the County, and the County shall have no duty to reimburse the Contractor for expenditures made in the performance of this Agreement. The County is expressly not committed to expenditure of any funds until such time as they are programmed, budgeted, encumbered and approved for expenditure by the County. The County's decision as to whether sufficient appropriations and authorizations have been made for the fulfillment of this Agreement shall be final and not subject to challenge by the Contractor in any way or forum, including a lawsuit.

10. AMENDMENTS – CHANGE ORDERS

Contract Documents may be amended by a Change Order, hereto attached as Exhibit I to allow for additions, deletions, and revision as specified in Article 2 “The Work” of the Agreement between Santa Fe County and the Contractor or to amend the terms and conditions by a Change Order.

11. INDEMNIFICATION

- 11.1** The Contractor shall defend, indemnify, and hold harmless the County and its elected officials, agents, and employees from any losses, liabilities, damages, demands, suits, causes of action, judgments, costs or expenses (including but not limited to court costs and attorneys' fees) resulting from or directly or indirectly arising out of the Contractor's performance or non-performance of its obligations under this Agreement, including but not limited to the Contractor's breach of any representation or warranty made herein.
- 11.2** The Contractor agrees that the County shall have the right to control and participate in the defense of any such demand, suit, or cause of action concerning matters that relate to the County and that such suit will not be settled without the County's consent, such consent can not to be unreasonably withheld. If a conflict exists between the interests of the County and the Contractor in such demand, suit, or cause of action, the County may retain its own counsel to represent the County's interest.
- 11.3** The Contractor's obligations under this section shall not be limited by the provisions of any insurance policy the Contractor is required to maintain under this Agreement.

12. AGGRIEVEMENT PROCEDURE DURING CONTRACT ADMINISTRATION

- 12.1** Any claims, disputes, or other matters in question between the Contractor and the County, except those which have been waived by the making or acceptance of final payment as provided in Paragraph 6.2 of the Agreement Between Santa Fe County and Contractor for Construction, shall be presented in the form of a written request accompanied by supporting data to the

Architect/Engineer for formal decision, with a copy to the other party. Such formal decision of the Architect/Engineer is binding upon the Contractor and the Owner unless either or both notify each other and the Architect/Engineer in writing within 15 days of their receipt of the decision that they are unwilling to abide by the Architect's/Engineer's decision, are thereby aggrieved in connection with the decision, and are separately exercising such rights as either may have under the Contract Documents or by law and regulation. If the Architect/Engineer fails to provide a written decision or a reasonable schedule to issue a written decision within ten days after the County or the Contractor has presented its request, that party may consider itself aggrieved and may proceed to exercise its rights.

- 12.2** A settlement agreement signed by the County and the Contractor shall supersede and cancel any other dispute resolution proceedings regarding the same matter.
- 12.3** Unless work is stopped or payment withheld in accordance with the conditions of the Contract, or unless otherwise agreed in writing, the Contractor shall carry on the Work and maintain its progress during any dispute resolution proceedings, and the Owner shall continue to make payments to the Contractor in accordance with the Contract Documents.

13. DISPUTE RESOLUTION

- 13.1** Either County or Contractor may request mediation pursuant to the New Mexico Public Works Mediation Act, 13-4C-1 NMSA 1978, of any claim before such decision become final and binding. The request for mediation shall be submitted in writing to the other party. Timely submission of the request shall stay the effect of Paragraph 12.1.
- 13.2** County and Contractor shall participate in the mediation process in good faith. The process shall be completed within 60 days of filing of the request. The mediation shall be governed by the rules for mediation pursuant to the New Mexico Public Works Mediation Act.
- 13.3** If the dispute is not resolved by mediation, the dispute shall be resolved through litigation in the district court. The parties agree that the exclusive forum for such litigation shall be the State of New Mexico District Court for the First Judicial District at Santa Fe, New Mexico. Contractor irrevocably consents to the jurisdiction of said Court and agrees to accept service of a summons and complaint by mail or commercial courier service in accordance with Rule 1-004(E) (3) NMRA.

14. INSURANCE

- 14.1** The Contractor shall not commence work under this contract until they have obtained all the insurance required under this paragraph and such insurance has been approved by the County, nor shall the Contractor allow any subcontractor to commence work on its subcontract until the insurance required of the subcontractor has been so obtained and approved.
- 14.2** Proof of Carriage of Insurance. The Contractor shall furnish the County with certificates showing the type, amount, class of operations covered, effective dates and date of expiration of policies. Such certificates shall also contain substantially the following statement: "Should any

of the above described policies be cancelled before the expiration date thereof, notice will be delivered in accordance with the policy provisions”.

- 14.3 General Conditions.** The Contractor shall submit evidence of insurance as is required herein. Policies of insurance shall be written by companies authorized to write such insurance in New Mexico.
- 14.4 General Liability Insurance, Including Automobile.** The Contractor shall procure and maintain during the life of this Agreement a comprehensive general liability and automobile insurance policy with liability limits in amounts not less than \$1,000,000.00 combined single limits of liability for bodily injury, including death, and property damage for any one occurrence. Said policies of insurance shall include coverage for all operations performed for the County by the Contractor; coverage for the use of all owned, non-owned, hired automobiles, vehicles and other equipment, both on and off work; and contractual liability coverage under which this Agreement is an insured contract. The Santa Fe County shall be a named additional insured on the policy.
- 14.5 Subcontractor's Public Liability and Property Damage Insurance and Vehicle Liability Insurance.** The Contractor shall require each of its subcontractors to procure and to maintain during the life of its subcontract, Subcontractor's Public Liability and Property Damage Insurance and Vehicle Liability Insurance of the type and in the amounts specified in 14.4 above.
- 14.6 Workers' Compensation Insurance.** The Contractor shall comply with the provisions of the Workers' Compensation Act, 52-1-1 to 52-1-70 NMSA 1978. The Contractor shall procure and shall maintain during the life of this contract Workmen's Compensation Insurance as required by applicable State law for all of its employees to be engaged in work at the site of the project under this Contract and, in case of any such work sublet, the Contractor shall require the subcontractor similarly to provide Workmen's Compensation Insurance for all of the latter's employees to be engaged in such work unless such employees are covered by the protection afforded by the Contractor's Workmen's Compensation Insurance. In case any class of employees engaged in hazardous work on the project under this contract is not protected under the Workmen's Compensation law, the Contractor shall provide and shall cause each subcontractor to provide adequate employer's liability insurance for the protection of such of its employees as are not otherwise protected.
- 14.7 Scope of Insurance and Special Hazards.** The insurance require under subparagraphs 14.4 and 14.5 hereof shall provide adequate protection for the Contractor and his subcontractors, respectively, against damage claims which may arise from operations under this Contract, whether such operations be by the insured or by anyone directly or indirectly employed by him and, also against any of the special hazards which may be encountered in the performance of this Contract.
- 14.8 Builder's Risk Insurance (Fire and Extended Coverage).** Until the project is completed and accepted by the County, the County, or Contractor at the County's option is required to maintain Builder's Risk Insurance (fire and extended coverage) on a 100 percent completed value basis on the insurable portion of the project for the benefit of the County, the Contractor, subcontractors as their interests may appear. The Contractor shall not include any costs for

Builder's Risk Insurance (fire and extended coverage) premiums during construction unless the Contractor is required to provide such insurance; however, this provision shall not release the Contractor from its obligation to complete, according to plans and specifications, the project covered by the contract, and the Contractor and his Surety shall be obligated to full performance of the Contractor's undertaking.

14.9 Increased Limits. If, during the life of this Agreement, the New Mexico State Legislature increases the maximum limits of liability under the Tort Claims Act (NMSA 1978, Sections 41-4-1 through 41-4-29, as amended), the Contractor shall increase the maximum limits of any insurance required herein.

14.10 Additional insured. Santa Fe County will be listed as an additional insured on all policies, and proof of coverage must be provided before work begins. Contractor shall maintain adequate insurance in at least the maximum amounts which the County could be liable under the New Mexico Tort Claims Act. It is the sole responsibility of the Contractor to be in compliance with the law.

15. INDEPENDENT CONTRACTOR

15.1 The Contractor and the Contractor's agents and employees are independent contractors performing professional and technical services for the County and are not employees of the County. The Contractor and the Contractor's agents and employees shall not accrue leave, retirement, insurance, bonding, use of County's vehicles, or any other benefits afforded to employees of the County as a result of this Agreement.

15.2 The Contractor shall not subcontract any portion of the services to be performed under this Agreement without prior written approval of the County.

15.3 The Contractor shall maintain detailed time records which indicate the date, time and nature of services rendered. These records shall be subject to inspection by the County and the State Auditor. The County shall have the right to audit billings both before and after payment. Payment under this Agreement shall not foreclose the right of the County to recover excessive illegal payments.

16. CONFLICT OF INTEREST OF OFFICERS OR EMPLOYEES OF THE LOCAL JURISDICTION, MEMBERS OF THE LOCAL GOVERNING BODY, OR OTHER PUBLIC OFFICIALS

16.1 No officer or employee of the local jurisdiction or its designees or agents, no member of the governing body, and no other public official of the locality who exercises any function or responsibility with respect to this contract, during its tenure or for one year thereafter, shall have any interest, direct or indirect, in any contract or subcontract, or the proceeds thereof, for work to be performed. Further, the Contractor shall cause to be incorporated in all subcontracts the language set forth in this paragraph prohibiting conflict of interest.

16.2 No official of the County who is authorized in such capacity and on behalf of the County to negotiate, make, accept or approve, or to take part in negotiating, making accepting or approving

any architectural, engineering, inspection, construction or material supply contract or any subcontract in connection with the construction of the project, shall become directly or indirectly interested personally in this contract or in any part hereof. No officer, employee, architect, attorney, engineer or inspector of or for the County who is authorized in such capacity and on behalf of the County to exercise any legislative, executive, supervisory or other similar functions in connection with the construction of the project, shall become directly or indirectly interested personally in this contract or in any part thereof, any material supply contract, subcontract, insurance contract, or any other contract pertaining to the project.

- 16.3** The Contractor warrants that the Contractor presently has no interest and shall not acquire any interest, direct or indirect, which would conflict in any manner or degree with the performance or services required under this Agreement.

17. ASSIGNMENT

- 17.1** The Contractor shall not assign or transfer any interest in this Agreement or assign any claims for money due or to become due under this Agreement without the advance written approval of the County. Any attempted assignment or transfer without the County's advance written approval shall be null and void and without any legal effect.

18. SUBCONTRACTING

- 18.1** The Contractor shall not subcontract or delegate any portion of the services to be performed under this Agreement without the advance written approval of the County. Any attempted subcontracting or delegating without the County's advance written approval shall be null and void and without any legal effect.
- 18.2** Contractor shall provide to the County a listing of subcontractors within ten (10) days of the Contract award.
- 18.3** Contractor shall adhere to all provisions of the Subcontractor's Fair Practices Act 13-4-31 to 13-4-42, NMSA 1978.
- 18.4** Contractor shall provide to the County completed Non-Collusion Affidavit of Subcontractor form and Certification of Subcontractor Regarding Equal Employment Opportunity form for all subcontractors listed.
- 18.5** The Contractor shall not award any work to any subcontractor without prior written approval of the County, which approval will not be given until the Contractor submits to the County a written statement concerning the proposed award to the subcontractor, which statement shall contain such information as the County may require.
- 18.6** The Contractor shall be as fully responsible to the County for the acts and omissions of its subcontractors, and of persons either directly or indirectly employed by them, as they are for the acts and omissions of persons directly employed by them.

18.7 The Contractor shall cause appropriate provisions to be inserted in all subcontracts relative to the work to bind subcontractors to the Contractor by the terms of the General Conditions and other contract documents insofar as applicable to the work of subcontractors and to give the Contractor the same power as regards terminating any subcontract that the County may exercise over the Contractor under any provision of the contract documents.

18.8 Nothing contained in this contract shall create any contractual relation between any subcontractor and the County.

18.9 All Work performed for Contractor by a Subcontractor or Supplier will be pursuant to an appropriate written agreement between Contractor and the Subcontractor or Supplier which specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of County. Any contract between Contractor and a Subcontractor or Supplier shall provide that any remedy or claim for nonpayment of sums due or owing to Subcontractor or Supplier or services performed or materials provided is against Contractor and not County, subject to any remedy or rights Subcontractor or Supplier may have under the terms of the Contractor's Performance Bond and Section 13-4-19 NMSA 1978, the New Mexico Little Miller Act.

19. PERSONNEL

19.1 All work performed under this Agreement shall be performed by the Contractor or under its supervision.

19.2 The Contractor represents that it has, or will secure at its own expense, all personnel required to discharge its obligations under this Agreement. Such personnel (i) shall not be employees of or have any contractual relationships with the County and (ii) shall be fully qualified and licensed or otherwise authorized or permitted under federal, state, and local law to perform such work.

20. NOTICES

20.1 Any notice required to be given to either party by this Agreement shall be in writing and shall be delivered in person, by courier service or by U.S. mail, either first class or certified, return receipt requested, postage prepaid, as follows:

To the County: Santa Fe County
 Office of the County Attorney
 102 Grant Avenue
 Santa Fe, New Mexico 87501

To the Contractor: _____

20.2 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 hereinabove provided.

21. RELEASE

The Contractor, upon final payment of the amounts due under this Agreement, releases the County, the County's officers and employees from all liabilities and obligations arising from or under this Agreement, including, without limitation, all damages, losses, costs, liability, and expenses, including, without limitation, attorney's fees and costs of litigation that the Contractor may have.

22. 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 construed to waive or lessen the right of either party to insist upon performance by the other party in strict 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.

CONDITIONS OF THE WORK

1. ADDITIONAL INSTRUCTIONS AND DETAIL DRAWINGS

- 1.1** The Contractor will be furnished additional instructions and detail drawings as necessary to carry out the work included in the Contract. The additional drawings and instructions supplied to the Contractor will coordinate with the Contract Documents and will be so prepared that they can be reasonably interpreted as part thereof. The Contractor shall carry out the work in accordance with the additional detail drawings and instructions. The Contractor and the Architect/Engineer/County will prepare jointly (a) a schedule, fixing the dates at which special detail drawings will be required, such drawings, if any, to be furnished by the Architect/Engineer/County in accordance with the schedule, and (b) a schedule fixing the respective dates for the submission of shop drawings, the beginning of manufacture, testing and installation of materials, supplies and equipment, and the completion of the various parts of the work; each schedule to be subject to change from time to time in accordance with progress of the work.

2. SHOP OR SETTING DRAWINGS

- 2.1** The Contractor shall submit promptly to the Architect/Engineer/County two (2) copies of each shop or setting drawing prepared in accordance with the schedule predetermined as aforesaid. After examination of such drawings by the Architect/Engineer/County and the return thereof, the Contractor shall make such corrections to the drawings as have been indicated and shall furnish the Architect/ Engineer/County with two corrected copies. If requested by the

Architect/Engineer/County the Contractor must furnish additional copies. Regardless of corrections made in or approval given to such drawings by the Architect/Engineer/County, the Contractor will be responsible for the accuracy of such drawings and for their conformity to the Plans and Specifications, unless the Contractor notifies the Architect/Engineer/County in writing of any deviations at the time the Contractor furnishes such drawings.

3. MATERIALS, SERVICES AND FACILITIES

3.1 It is understood that except as otherwise specifically stated in the Contract Documents, the Contractor shall provide and pay for all materials, labor, tools, equipment, water, light, power, transportation, superintendence, temporary construction of every nature, and all other services and facilities of every nature whatsoever necessary to execute, complete, and deliver the work within the specified time.

3.2 Any work necessary to be performed after regular working hours, on Sundays or legal holidays, shall be performed without additional expense to the County.

4. CONTRACTOR'S TITLE TO MATERIALS

4.1 No materials or supplies for the work shall be purchased by the Contractor or by any subcontractor subject to any chattel mortgage or under a conditional sale contract or other agreement by which an interest is retained by the seller. The Contractor warrants that he/she has good title to all materials and supplies used by him/her in the work, free from all liens, claims or encumbrances.

5. INSPECTION AND TESTING OF MATERIALS

5.1 All materials and equipment used in the construction of the project shall be subject to adequate inspection and testing in accordance with accepted standards. The laboratory or inspection agency shall be selected by the County. The County will pay for all laboratory inspection service direct, and not as a part of the Contract.

5.2 Materials of construction, particularly those upon which the strength and durability of the structure may depend, shall be subject to inspection and testing to establish conformance with specifications and suitability for uses intended.

6. "OR EQUAL" CLAUSE

6.1 Whenever a material, article or piece of equipment is identified on the plans or in the specifications by reference to manufacturers' or vendors' names, trade names, catalogue numbers, etc., it is intended merely to establish a standard; and, any material, article, or equipment or other manufacturers and vendors which will perform adequately the duties imposed by the general design will be considered equally acceptable provided the material, article, or equipment so proposed, is, in the opinion of the Architect/Engineer/County, of equal substance and function. It shall not be purchased or installed by the Contractor without the Architect/Engineer/County's written approval.

7. PATENTS

- 7.1** The Contractor shall hold and save the County and its officers, agents, servants, and employees harmless from liability of any nature or kind, including cost and expenses for, or on account of, any patented or unpatented invention, process, article, or appliance manufactured or used in the performance of the Contract, including its use by the County, unless otherwise specifically stipulated in the Contract Documents.
- 7.2** License and/or Royalty Fees for the use of a process which is authorized by the County of the project must be reasonable, and paid to the holder of the patent, or its authorized licensee, direct by the County and not by or through the Contractor.
- 7.3** If the Contractor uses any design, device or materials covered by letters, patent or copyright, the Contractor shall provide for such use by suitable agreement with the County of such patented or copyrighted design, device or material. It is mutually agreed and understood, that, without exception, the Contract prices shall include all royalties or costs arising from the use of such design, device or materials, in any way involved in the work. The Contractor and/or its Sureties shall indemnify and save harmless the County of the project from any and all claims for infringement by reason of the use of such patented or copyrighted design, device or materials, or any trademark or copyright in connection with work agreed to be performed under this Contract, and shall indemnify the County for any cost, expense or damage which it may be obliged to pay by reason of such infringement at any time during the prosecution of the work or after, completion of the work.

8. SURVEYS, PERMITS AND REGULATIONS

- 8.1** Unless otherwise expressly provided for in the Specifications, the County will furnish to the Contractor all surveys necessary for the execution of the work.
- 8.2** Unless otherwise expressly provided for in the Specifications, the Contractor shall procure and pay all permits, licenses and approvals necessary for the execution of this Contract.
- 8.3** The Contractor shall comply with all laws, ordinances, rules, orders, and regulations relating to performance of the work, the protection of adjacent property, and the maintenance of passageways, guard fences or other protective facilities.

9. CONTRACTOR'S OBLIGATIONS

- 9.1** The Contractor shall and will, in good workmanlike manner, do and perform all work and furnish all supplies and materials, machinery, equipment, facilities and means, except as herein otherwise expressly specified, necessary or proper to perform and complete all the work required by this Contract, within the time herein specified. The Contractor will perform the Work in accordance with the provisions of this Contract and said specifications and in accordance with the plans and drawings covered by this Contract any and all supplemental plans and drawings, and in accordance with the directions of the Architect/Engineer/County as given from time to

time during the progress of the work. The Contractor shall furnish, erect, maintain, and remove such construction plans and such temporary works as may be required.

- 9.2** The Contractor shall observe, comply with, and be subject to all terms, conditions, requirements, and limitations of the Contract and specifications, and shall do, carry on, and complete the entire work to the satisfaction of the Architect/Engineer and the County.

10. WEATHER CONDITIONS

- 10.1** In the event of temporary suspension of work, or during inclement weather, or whenever the Architect/Engineer/County shall direct, the Contractor will, and will cause its subcontractors to protect carefully its and their work and materials against damage or injury from the weather. If, in the opinion of the Architect/Engineer/County, any work or materials shall have been damaged or injured by reason of failure on the part of the Contractor or any of its Subcontractors so to protect its work, such materials shall be removed and replaced at the expense of the Contractor.

11. PROTECTION OF WORK AND PROPERTY-EMERGENCY

- 11.1** The Contractor shall at all times safely guard the County's property from injury or loss in connection with this Contract. The Contractor shall at all times safely guard and protect its own work, and that of adjacent property from damage. The Contractor shall replace or make good any such damage, loss or injury unless such is caused directly by errors contained in the Contract or by the County, or its duly authorized representatives.
- 11.2** In case of an emergency which threatens loss or injury of property, and/or safety of life, the Contractor will be allowed to act, without previous instructions from the Architect/Engineer/County, in a diligent manner. The Contractor shall notify the Architect/Engineer/County immediately thereafter. Any claim for compensation by the Contractor due to such extra work shall be promptly submitted to the Architect/Engineer/County for approval.
- 11.3** Where the Contractor has not taken action but has notified the Architect/Engineer/County of an emergency threatening injury to persons or to damage to the work or any adjoining property, the Contractor shall act as instructed or authorized by the Architect/Engineer/County.
- 11.4** The amount of reimbursement claimed by the Contractor on account of any emergency action shall be determined in the manner provided in Paragraph 15 of these Conditions of the Work.

12. INSPECTION

- 12.1** The authorized representatives and agents of the County shall be permitted to inspect all work, materials, payrolls, records of personnel, invoices of materials, and other relevant data and records.

13. REPORTS, RECORDS AND DATA

- 13.1** The Contractor shall submit to the County such schedule of quantities and costs, progress schedules, payrolls, reports, estimates, records and other data as the County may request concerning work performed or to be performed under this Contract.

14. SUPERINTENDENT BY CONTRACTOR

- 14.1** At the site of the work the Contractor shall employ a construction superintendent or foreman who shall have full authority to act for the Contractor. It is understood that such representative shall be acceptable to the Architect/ Engineer/County and shall be one who can be continued in that capacity for the particular job involved unless he/she ceases to be on the Contractor's payroll.

15. CHANGES IN WORK

- 15.1** No changes in the work covered by the approved Contract Documents shall be made without having prior written approval of the County. Charges or credits for the work covered by the approved change shall be determined by one or more, or a combination of the following methods:

- A. Unit bid prices previously approved.
- B. An agreed lump sum.
- C. The actual cost of:
 - 1) Labor, including foremen;
 - 2) Materials entering permanently into the work;
 - 3) The County's or rental cost of construction equipment during the time of use on the extra work;
 - 4) Power and consumable supplies for the operation of power equipment;
 - 5) Insurance;
 - 6) Social Security and old age and unemployment contributions.
- D. To the costs for changes in work a fixed fee will be added to be agreed upon but not to exceed ten percent (10%) of the actual cost of the work. The fee shall be compensation to cover the cost of supervision, overhead, bond, profit and any other general expenses.

16. EXTRAS

- 16.1** Without invalidating the contract, the County may order extra work or make changes by altering, adding to or deducting from the work, the contract sum being adjusted accordingly, and the consent of the Surety being first obtained where necessary or desirable. All the work of the kind bid upon shall be paid for at the price stipulated in the proposal, and no claims for any extra work or materials shall be allowed unless the work is ordered in writing by the County or the Architect/Engineer, acting officially for the County, and the price is stated in such order.

17. INSPECTION OF SERVICES

- 17.1** The Contractor shall provide and maintain an inspection system acceptable to the County covering the services under this Contract. Complete records of all inspection work performed by the Contractor shall be maintained and made available to the County during contract

performance and for as long afterwards as the Contract requires.

- 17.2** The County has the right to inspect and test all services called for by the Contract, to the extent practicable at all times and places during the term of the Contract. The County shall perform inspections and tests in a manner that will not unduly delay the work.
- 17.3** If the County performs inspections or tests on the premises of the Contractor or a subcontractor, the Contractor shall furnish, and shall require subcontractors to furnish, at no increase in contract price, all reasonable facilities and assistance for the safe and convenient performance of these duties.
- 17.4** If any of the services do not conform with the Contract requirements, the County may require the Contractor to perform the services again in conformity with Contract requirements, at no increase in contract amount. When the defects in services cannot be corrected by re-performance, the County may require the Contractor to take necessary action to ensure that future performance conforms to contract requirements; and reduce the Contract sum to reflect the reduced value of the services performed.
- 17.5** If the Contractor fails to promptly perform the services again or to take the necessary action to ensure future performance in conformity with Contract requirements, the County may by contract or otherwise, perform the services and charge to the Contractor any cost incurred by the County that is directly related to the performance of such service, or terminate the Contract for default.

18. CORRECTION OF WORK

- 18.1** All work, all materials, whether incorporated in the work or not, all processes of manufacture, and all methods of construction shall be at all times and places subject to the inspection of the Architect/ Engineer/County who shall be the final judge of the quality and suitability of the work, materials, processes of manufacture, and methods of construction for the purposes for which they are used. Should they fail to meet their approval they shall be forthwith reconstructed, made good, replaced and/or corrected, as the case may be, by the Contractor at its own expense. Rejected material shall immediately be removed from the site. If, in the opinion of the Architect/Engineer/County, it is undesirable to replace any defective or damaged materials or to reconstruct or correct any portion of the work injured or not performed in accordance with the Contract Documents, the compensation to be paid to the Contractor hereunder shall be reduced by such amount as in the judgment of the Architect/Engineer/County shall be equitable.

19. WARRANTY OF CONSTRUCTION

- 19.1** In addition to any other warranties in this Contract, the Contractor warrants that work performed under this Contract conforms to the Contract requirements and is free of any defect in equipment, material, or design furnished, or workmanship performed by the Contractor or any subcontractor or supplier at any tier.
- 19.2** This warranty shall continue for a period of one (1) year from the date of final acceptance of the work. If the County takes possession of any part of the work before final acceptance, this

warranty shall continue for a period of one (1) year from the date the County takes possession.

- 19.3** The Contractor shall remedy at the Contractor's expense any failure to conform, or any defect. In addition, the Contractor shall remedy at the Contractor's expense any damage to County-owned or controlled real or personal property, when that damage is the result of the Contractor's failure to conform to contract requirements or any defect of equipment, material, workmanship, or design furnished.
- 19.4** The Contractor shall restore any work damaged in fulfilling the terms and conditions of this clause. The Contractor's warranty with respect to work repaired or replaced will run for one (1) year from the date of repair or replacement.
- 19.5** The County shall notify the Contractor, in writing, within a reasonable time after the discovery of any failure, defect, or damage.
- 19.6** If the Contractor fails to remedy any failure, defect, or damage within a reasonable time after receipt of notice, the County shall have the right to replace, repair, or otherwise remedy the failure, defect, or damage at the Contractor's expense.
- 19.7** With respect to all warranties, express or implied, from subcontractors, manufacturers, or suppliers for work performed and materials furnished under this Contract, the Contractor shall obtain all warranties that would be given in normal commercial practice; require all warranties to be executed, in writing, for the benefit of the County, if directed by the County; and, enforce all warranties for the benefit of the County, if directed by the County.
- 19.8** In the event the Contractor's warranty under subparagraph 19.4 of this clause has expired, the County may bring suit at its expense to enforce a subcontractor's, manufacturer's, or supplier's warranty.
- 19.9** Unless a defect is caused by the negligence of the Contractor or subcontractor or supplier at any tier, the Contractor shall not be liable for the repair of any defects of material or design furnished by the County nor for the repair of any damage that results from any defect in County-furnished material or design.
- 19.10** This warranty shall not limit the County's rights under the Inspection and Acceptance clause of this Contract with respect to latent defects, gross mistakes, or fraud.

20. SUBSURFACE CONDITIONS FOUND DIFFERENT

- 20.1** Should the Contractor encounter sub-surface and/or latent conditions at the site materially differing from those shown on the Plans or indicated in the Specifications, the Contractor shall immediately give notice to the Architect/Engineer/County of such conditions before they are disturbed. The Architect/Engineer/County will thereupon promptly investigate the conditions, and if they find that they materially differ from those shown on the Plans or indicated in the Specifications, they will at once make such changes in the Plans and/or Specifications as they may find necessary, any increase or decrease of cost resulting from such changes to be adjusted

in the manner provided in Paragraph 15 above.

21. CLAIMS FOR EXTRA COST

- 21.1** No claim for extra work or cost shall be allowed unless the same was done in pursuance of a written order of the Architect/Engineer approved by the County, as aforesaid, and the claim presented with the first estimate after the changed or extra work is done. When work is performed under the terms of General Conditions, the Contractor shall furnish satisfactory bills, payrolls and vouchers covering all items of cost and when requested by the County, giving the County access to accounts relating thereto.

22. CONSTRUCTION SCHEDULE AND PERIODIC ESTIMATES

- 22.1** Immediately after execution and delivery of the Contract, and before the first partial payment is made, the Contractor shall deliver to the County an estimated construction progress schedule in a form satisfactory to the County, showing the proposed dates of commencement and completion of each of the various subdivisions of work required under the Contract Documents and the anticipated amount of each monthly payment that will become due to the Contractor in accordance with the progress schedule. The Contractor shall also furnish on forms to be supplied by the County (a) a detailed estimate giving a complete breakdown of the Contract sum and (b) periodic itemized estimates of work done for the purpose of making partial payments thereof. The costs employed in making up any of these schedules will be used only for determining the basis of partial payments and will not be considered as fixing a basis for additions to or deductions from the Contract price.

22.2 Schedule

The Contractor shall, within five (5) days after the effective date of Notice to Proceed, prepare and submit five (5) copies of a progress schedule covering project operations for the Contract period. This progress schedule shall be of the type generally referred to as a Critical Path Method (CPM), Critical Path Schedule (CPS), and Critical Path Analysis (CPA), and other similar designations. The CPM shall be used to control the timing and sequences of the project. All work shall be done in accordance with the CPM Planning and Scheduling. A written statement of explanation shall be submitted with the progress schedule. All costs incurred by the contractor to implement the CPM shall be borne by the Contractor .

23. ASSIGNMENTS

- 23.1** The Contractor shall not assign the whole or any part of this Contract or any monies due or to become due hereunder without written consent of the County. In case the Contractor assigns all or any part of any monies due or to become due under this Contract, the instrument of assignment shall contain a clause substantially to the effect that it is agreed that the right of the assignee in and to any monies due or to become due to the Contractor shall be subject to prior claims of all persons, firms and corporations of services rendered or materials supplied for the performance of the work called for in this Contract.

24. MUTUAL RESPONSIBILITY OF CONTRACTORS

- 24.1** If, through acts of neglect on the part of the Contractor, any other Contractor or any subcontractor shall suffer loss or damage on the work, the Contractor agrees to settle with such other Contractor or subcontractor by agreement or arbitration if such other Contractor or subcontractors will so settle. If such other Contractor or subcontractor shall assert any claim against the County on account of any damage alleged to have been sustained, the County shall notify the Contractor, who shall indemnify and save harmless the County against any such claim.

25. SEPARATE CONTRACT

- 25.1** The Contractor shall coordinate its operations with those of other contractors. Cooperation will be required in the arrangement for the storage of materials and in the detailed execution of the work. The Contractor, including its subcontractors, shall keep informed of the progress and the detail work of other contractors and shall notify the Architect/ Engineer/County immediately of lack of progress or defective workmanship on the part of other contractors. Failure of a contractor to keep informed of the work progressing on the site and failure to give notice of lack of progress or defective workmanship by others shall be construed as acceptance by the Contractor of the status of the work as being satisfactory for proper coordination with its own work.

26. ARCHITECT/ENGINEER'S AUTHORITY

- 26.1** The Architect/Engineer/County shall give all orders and directions contemplated under this Contract and specifications, relative to the execution of the work. The Architect/Engineer/County shall determine the amount, quality, acceptability, and fitness of the several kinds of work and materials which are to be paid for under this Contract and shall decide all questions which may arise in relation to said work and the construction thereof. The Architect/Engineer/County's estimates and decisions shall be final and conclusive, except as herein otherwise expressly provided. In case any question shall arise between the parties hereto relative to said contract or specifications, the determination or decision of the Architect/Engineer/County shall be a condition precedent to the right of the Contractor to receive any money or payment for work under this Contract affected in any manner or to any extent by such question.
- 26.2** The Architect/Engineer/County shall decide the meaning and intent of any portion of the specifications and of any plans or drawings where the same may be found obscure or be in dispute. Any differences or conflicts in regard to their work which may arise between the Contractor under this Contract and other Contractors performing work for the County shall be adjusted and determined by the Architect/Engineer/County.

27. STATED ALLOWANCES

- 27.1** It is understood that Contractor has included in its proposal for the Contract sum all allowances including "Allowed Materials" The Contractor shall purchase the "Allowed Materials" as directed by the County on the basis of the lowest and best bid of at least three competitive bids. If the actual sum for purchasing the "Allowed Materials" is more or less than the "Cash

Allowance," the Contract sum shall be adjusted accordingly. The adjustment in contract price shall be made on the basis of the purchase price without additional charges for overhead, profit, insurance or any other incidental expenses. The cost of installation of the "Allowed Materials" shall be included in the applicable sections of the Contract Specifications covering this work.

28. USE OF PREMISES AND REMOVAL OF DEBRIS

28.1 The Contractor expressly undertakes at its own expense:

- A. to take every precaution against injuries to persons or damage to property;
- B. to store its apparatus, materials, supplies and equipment in such orderly fashion at the site of the work as will not unduly interfere with the progress of its work or the work of any other subcontractors;
- C. to place upon the work or any part thereof only such loads as are consistent with the safety of the portion of the work;
- D. to clean up frequently all refuse, rubbish, scrap materials, and debris caused by its operations, to the end that at all times the site of the work shall present a neat, orderly and workmanlike appearance;
- E. before final payment to remove all surplus material, false-work, temporary structures, including foundations thereof, plant of any description and debris of every nature resulting from its operations, and to put the site in a neat, orderly condition.
- F. to effect all cutting, fitting or patching of its work required to make the same to conform to the plans and specifications and, except with the consent of the Architect/Engineer/County, not to cut or otherwise alter the work of any other Contractor.

29. QUANTITIES OF ESTIMATE

29.1 Wherever the estimated quantities of work to be done and materials to be furnished under this Contract are shown in any of the documents including the proposal, they are given for use in comparing bids and the right is especially reserved except as herein otherwise specifically limited, to increase or diminish them as may be deemed reasonably necessary or desirable by the County to complete the work contemplated by this Contract, and such increase or diminution shall in no way void this Contract, nor shall any such increase or diminution give cause for claims or liability for damages.

30. LANDS AND RIGHTS-OF-WAY

30.1 Prior to the start of construction, the County shall obtain all lands and rights-of-way necessary for the carrying out and completions of work to be performed under this Contract.

31. GENERAL GUARANTY

31.1 Neither the final certificate of payment nor any provision in the Contract Documents, nor partial or entire occupancy of the premises by the County, shall constitute an acceptance of work not done in accordance with the Contract Documents or relieve the Contractor of liability in respect to any express warranties or responsibility for faulty materials or workmanship. The Contractor

shall remedy any defects in the work and pay for any damage to other work resulting therefrom, which shall appear within a period of one (1) year from the date of final acceptance of the work unless a longer period is specified. The County will give notice of observed defects with reasonable promptness.

32. PROTECTION OF LIVES AND HEALTH

- 32.1** The Contractor shall exercise proper precaution at all times for the protection of persons and property and shall be responsible for all damages to persons or property, either on or off the site, which occur as a result of its prosecution of the work. The safety provisions of applicable laws and building and construction codes shall be observed and the Contractor shall take or cause to be taken, such additional safety and health measures as the County may determine to be reasonably necessary.

33. INTEREST OF MEMBER

- 33.1** No member of Santa Fe Board of County Commissioners shall be admitted to any share or part of this Contract or to any benefit that may arise therefrom.

34. OTHER PROHIBITED INTERESTS

- 34.1** No official of the County who is authorized in such capacity and on behalf of the County to negotiate, make, accept or approve, or to take part in negotiating, making accepting or approving any architectural, engineering, inspection, construction or material supply contract or any subcontract in connection with the construction of the project, shall become directly or indirectly interested personally in this Contract or in any part hereof. No officer, employee, architect, attorney, engineer or inspector of or for the County who is authorized in such capacity and on behalf of the County to exercise any legislative, executive, supervisory or other similar functions in connection with the construction of the project, shall become directly or indirectly interested personally in this Contract or in any part thereof, any material supply contract, subcontract, insurance contract, or any other contract pertaining to the project.

35. USE AND OCCUPANCY PRIOR TO ACCEPTANCE BY COUNTY

- 35.1** The Contractor agrees to the use and/or occupancy of a portion or unit of the project before formal acceptance by the County, provided the County:
- A. Secures written consent of the Contractor except in the event, in the opinion of the Architect/ Engineer, the Contractor is chargeable with unwarranted delay in final cleanup of punch list items or other contract requirements.
 - B. Secures endorsement from the insurance carrier and consent of the surety permitting occupancy of the building or use of the project during the remaining period of construction.
 - C. When the project consists of more than one building, and one of the buildings is occupied, secures permanent fire and extended coverage insurance, including a permit to complete construction. Consent of the surety must also be obtained.

ATTACHMENT A

BID SHEETS

ATTACHMENT B
ADDENDA & MODIFICATIONS

EXHIBIT A
PROJECT MANUAL

EXHIBIT B

TECHNICAL SPECIFICATIONS AS LISTED IN PLAN SET

EXHIBIT C**LABOR AND MATERIAL PAYMENT BOND**

KNOW ALL MEN BY THESE PRESENT, THAT WE _____
 _____ as PRINCIPAL hereinafter called the "PRINCIPAL" and
 _____ as SURETY hereinafter called the "SURETY", are held and firmly
 bound unto Santa Fe County, a Political Subdivision of the State of New Mexico as OBLIGEE hereinafter
 called the "COUNTY", for the use and benefit of any claimants as herein below defined, in the amount of
 _____ (\$.) dollars for the payment whereof PRINCIPAL and SURETY
 bind themselves, their heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by
 these presents.

WHEREAS, the PRINCIPAL has a written contract dated _____, 20__, with the COUNTY for
 the construction services for the (insert project description) in Santa Fe County, New Mexico,
 which must be constructed in accordance with drawings and specifications which contract is referenced and
 made a part hereof, and is hereinafter referred to as the "Contract."

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that, if PRINCIPAL shall promptly
 make payment to all claimants as hereinafter defined, for all labor and material used or reasonably required for
 use in the performance of the Contract, then this obligation shall be void; otherwise, it shall remain in full force
 and effect, subject to the following conditions:

6. A claimant is defined as one having a direct contract with the PRINCIPAL or with a subcontractor
 of the PRINCIPAL for labor, material, or both, used or reasonably required for use in the
 performance of the Contract, labor and material being construed to include but not be limited to
 that part of water, gas, power, light, heat, oil, gasoline, telephone services or rental of equipment
 directly applicable to the Contract.
7. The above named PRINCIPAL and SURETY hereby jointly and severally agree with the COUNTY
 that every claimant as herein defined, who has not been paid in full before the expiration of a period
 of ninety (90) days after the date on which the last of such claimant's work or labor was done or
 performed, or materials were furnished by such claimant, prosecute a suit to final judgment for
 such sum or sums as may be justly due claimant, and have execution thereof. The COUNTY shall
 not be liable for payment of any cost or expenses of any such suit.
8. No suit or action shall be commenced hereunder by any claimant:
 - c. Unless claimant, or other than one having a direct contract with the PRINCIPAL, shall
 have written notice in the form of an sworn statement to the COUNTY and any one or both
 of the following: the PRINCIPAL or SURETY above named, within ninety (90) days after
 such said claim is made or suit filed, stating with substantial accuracy the amount claimed
 and the name of the party to whom the materials were furnished, or for whom the work or
 labor was done or performed.
 - d. Such notice shall be served by mailing the same by registered mail or certified mail, postage
 prepaid, in an envelope addressed to the COUNTY, PRINCIPAL or SURETY, at any place
 where an office is regularly maintained by said COUNTY, PRINCIPAL or SURETY for
 the transaction of business, or served in any manner in which legal process may be served

in the State in which the aforesaid project is located, save that such service need not be made by a public officer.

9. Any suit under this Labor and Material Bond must be instituted in accordance with the statute of limitation under Section 37-1-3 NMSA 1978.
10. No right of action shall accrue on this Bond to or for the use of any person or corporation other than subcontractors or sub-subcontractors of the said Contract between PRINCIPAL and Santa Fe County named herein.

SIGNED AND SEALED THIS _____ DAY OF _____, 2015.

CONTRACTOR – PRINCIPAL (signature)

By: _____
(Printed name and title)

NOTARY PUBLIC (seal)

My Commission expires: _____

SURETY (signature)

(Printed name and title)

NOTARY PUBLIC (seal)

My Commission expires: _____

SURETY'S Authorized New Mexico Agent

EXHIBIT D**PERFORMANCE BOND**

(SAMPLE)

A. KNOW ALL MEN BY THESE PRESENT, THAT WE _____, as PRINCIPAL hereinafter called the "CONTRACTOR" and _____, as SURETY

hereinafter called the "SURETY", are held and firmly bound unto OBLIGEE Santa Fe County, a Political Subdivision of the State of New Mexico, hereinafter called the "COUNTY", in the sum 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.

B. WHEREAS, the CONTRACTOR has a written contract dated _____, 2018, with the COUNTY for the construction services for the (insert project description) Santa Fe County, New Mexico, in accordance with drawings and specifications which contract is referenced made part hereof, and is hereinafter referred to as the "Contract."

C. NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that, if CONTRACTOR shall promptly and faithfully perform said Contract (including any amendment thereto), then this obligation shall be null and void; otherwise it shall remain in full force and effect until the COUNTY shall by written instrument notify the SURETY that the obligation is discharged, except that the obligation shall continue for at least three (3) months following the expiration of the term of the Contract.

3. The SURETY hereby waives notice of any alteration or extension of the Contract time made by the COUNTY.
4. Whenever CONTRACTOR shall be, and is declared by the COUNTY to be in default under the Contract, the COUNTY having performed the COUNTY'S obligations thereunder, the SURETY must promptly remedy the default and shall promptly:

(3) Complete the Contract in accordance with its terms and conditions, or

- (4) Obtain a bid or bids for submission to the COUNTY for completing the Contract in accordance with its terms and conditions, and upon determination by the COUNTY and SURETY of the lowest responsible bidder, arrange for a contract between such bidder and Santa Fe County, and make available as work progresses (even though there should be a default or a secession 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 COUNTY to CONTRACTOR under the Contract and any amendments thereto, less the amount properly paid by the COUNTY to CONTRACTOR.

D. No right of action shall accrue on this Performance Bond to or for the use of any person or corporation other than Santa Fe County named herein or the heirs, executors, administrators, or successors of Santa Fe County.

E. This Bond shall be enforceable without the need to have recourse to any judicial or arbitral proceedings.

SIGNED AND SEALED THIS _____ DAY OF _____, 2015.

CONTRACTOR – PRINCIPAL (signature)

By: _____
(Printed name and title)

NOTARY PUBLIC (seal)

My Commission expires: _____

SURETY (signature)

(Printed name and title)

NOTARY PUBLIC (seal)

My Commission expires: _____

SURETY'S Authorized New Mexico Agent

EXHIBIT E

ASSIGNMENT OF ANTITRUST CLAIMS

TO BE EXECUTED BY GENERAL CONTRACTORS, SUBCONTRACTORS, SUPPLIERS,
AND SUBSUBCONTRACTORS OF CONTRACTORS ON COUNTY CONTRACTS.

FIRM NAME:
ADDRESS:

PROJECT:

PHONE NO.:

PROJECT NO:

_____ agrees that any and all claims which it may have or may inure to it for overcharges resulting from antitrust violations as to goods, services, and materials purchased in connection with the above-referenced project are hereby assigned to Santa Fe County, but only to the extent that such overcharges are passed on to the County. It is agreed that the undersigned retains all rights to any such antitrust claims to the extent of any overcharges not passed on to the County, including the right to any treble damages attributable thereto.

FIRM: _____

BY: _____
Signed by Individual empowered to obligate Suppliers,
Subcontractors or Subsubcontractors

TITLE: _____

EXHIBIT F

CERTIFICATE OF LIABILITY INSURANCE

EXHIBIT G

NOTICE OF CONTRACT AWARD

TO:

FROM: _____, Public Works Department

CONTRACT NO. _____

This is to inform that you that you have been awarded the Contract for:

Project Name: _____

Date of Award _____ Amount of Award _____

Contractor Information:

Firm Name: _____ License# _____

Address: _____ Phone # _____

It is anticipated that construction will take place:

Approximate Starting Date: _____ Approximate Completion Date: _____

Santa Fe County hereby accepts your offer on the solicitation No. _____ as reflected in this award document. The rights and obligations of the parties shall be subject to and governed by this document and any documents attached or incorporated by reference.

SANTA FE COUNTY

Name of Public Works Director or designee: _____
(Print Name)

Signature

EXHIBIT H

NOTICE TO PROCEED

TO:

DATE:

PROJECT:

ATTN:

PROJECT NO.

CONTRACT NO.

IFB NO.

Enclosed is your copy of the Contract, which has been approved. Please consider this letter as official NOTICE TO PROCEED on the above-referenced project.

Your firm shall commence work within ten (10) calendar days of the above date and shall achieve Substantial Completion _____ calendar days thereafter, which shall be _____, 2015, unless modified by Change Order.

It is essential that you make reference to the above-stated project number on all documents sent to the Architect/Engineer from your office. These documents shall include correspondence, change order proposals, change orders, payment request statements, and all other project-related material which you forward to the Architect/Engineer for information and processing.

Also, before you may start any Work at the site, you must (add any other requirements):

OWNER:

Santa Fe County

SFC _____ DEPARTMENT

By:

Director, SFC Department

EXHIBIT I

CHANGE ORDER

PROJECT:

CONTRACTOR
CHANGE ORDER NO:

ARCHITECT/ENGINEER

PROJECT NO:

Contractor Telephone:
Contractor e-mail:
ENGINEER'S/ARCHITECT'S PROJECT NO:

CHANGE ORDER JUSTIFICATION (Provide definitive reason for proposed change order.)

You are directed to make the following changes in this Contract: (Provide a detailed description of the Scope of the Work.)

NOT VALID UNTIL SIGNED BY BOTH THE COUNTY AND THE ARCHITECT/ENGINEER.
Signature of the Contractor indicates his agreement herewith, including any adjustment in the Contract Sum or Contract Time.

The Original Contract Sum was	
Net change by previously authorized Change Orders	\$0.00
The Contract Sum prior to this Change Order was the Contract Sum will be increased/decreased/unchanged	
by this Change Order in the amount of	\$0.00
The new contract Sum including this Change Order will be	\$0.00
The Contract Time will be increased/decreased/unchanged by days.	
The date of Substantial Completion as of the date of this Change Order therefore is: 	

CHANGE ORDER SIGNATURE PAGE

APPROVED

SANTA FE COUNTY

By: _____

Date: _____

Approved as to form:

By: _____

Date: _____

R. Bruce Frederick
County Attorney

Finance Department:

By: _____

Date: _____

Stephanie Schardin Clarke
Finance Director

CONTRACTOR

By: _____

Date: _____

Title: _____

ARCHITECT/ENGINEER

By: _____

Date: _____

Title: _____

EXHIBIT J

CERTIFICATE OF SUBSTANTIAL COMPLETION

SANTA FE COUNTY – (INSERT DEPARTMENT)

Public Works Director or designee (name): _____

CONTRACTOR: _____

Contractor Purchase Order Number: _____

ARCHITECT/ENGINEER: _____

Project Name: _____

Contract Date: _____

Project Description - Article 2 to Agreement Between Santa Fe County and Contractor (include address and project location description):

The contractor hereby certifies the Work of this project to be in complete conformance to the Contract Documents and is substantially complete, enabling the County to make use of the Work as intended.

By its signature below the Contractor further requests Architect/Engineer and County to inspect the Work and to concur in the Work's substantial completion by their signature and/or to provide in a timely manner to Contractor a listing of work items adjudged by them as remaining to be completed or corrected. Contractor agrees to complete and correct all work items (Punch List) representative of such listing within ____ days from date of receipt from Architect/Engineer.

Contractor

Signature

Print Name

Date

Accepted by Santa Fe County

Signature (Public Works Director or Designee)_____
Print Name_____
Date**Inspected/Concurrence Architect/Engineer**_____
Signature_____
Print Name_____
Date**PUNCH LIST**

A list of items (Punch List) to be completed or corrected, verified by the Architect/Engineer and County, is appended hereto. Failure to include any incomplete items on such list does not alter the responsibility of the Contractor to provide all Work in complete conformance with the Contract Documents.

The Contractor shall complete or correct the work on the punch list appended hereto by _____
(Date)

The punch list consists of _____(indicate number of items) items.

The Work performed under this Contract has been reviewed and found to be substantially complete by the Director of Public Works who has hereby established the Date of Substantial Completion as _____ (date) which is also the date of commencement of all warranties and guarantees required by the Contract Documents. The Date of Substantial Completion of the Work or designated portion thereof is the date established by the Director of Public Works (or designee) when construction is sufficiently complete, in accordance with the Contract Documents, so the County may occupy the Work, or designated portion thereof, for the use for which it is intended.

The County accepts the Work or designated portion thereof as substantially complete and assumes full possession thereof, in accordance with the contract documents.

Punch List Items: (Use additional sheets if necessary)