SPECIFICATION and CONTRACT DOCUMENTS

FOR

2023 INFLOW AND INFILTRATION SEWER REPAIR PROJECT

CITY OF MORGAN HILL

MORGAN HILL, CALIFORNIA

ENGINEERING AND UTILITIES DIVISION

January 2023

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NOTICE INVITING BIDS

1. **Bid Submission.** The City of Morgan Hill ("City"), will accept sealed bids for its 2023 Inflow and Infiltration Sewer Repair Project ("Project"), by or before February 17, 2023, at 2:00 p.m., at its DEVELOPMENT SERVICES CENTER, located at 17575 PEAK AVENUE MORGAN HILL, California, at which time the bids will be publicly opened and read aloud.

2. **Project Information.**

   2.1 Location and Description. The Project is located at within existing City streets and along City easement at various locations in Morgan Hill, CA 95037, and is described as follows:

   The project scope is to locate, video, and mark the locations of all proposed excavations for sewer repair work (Open Trench, Pipe Bursting, Lining, and Point Repair), review the proposed work with the City and receive written approval for proceeding to complete the sewer repair on all these locations as stated on the improvement plans.

   2.2 Time for Final Completion. The Project must be fully completed within 210 calendar days from the start date set forth in the Notice to Proceed. City anticipates that the Work will begin on or about April 3, 2023, but the anticipated start date is provided solely for convenience and is neither certain nor binding.

   2.3 Estimated Cost. The estimated construction cost is $2,500,000.00.

3. **License and Registration Requirements.**

   3.1 License. This Project requires a valid California contractor's license for the following classification(s): Class A License.

   3.2 DIR Registration. City will not accept a Bid Proposal from or enter into the Contract with a bidder, without proof that the bidder and its Subcontractors are registered with the California Department of Industrial Relations ("DIR") to perform public work pursuant to Labor Code Section 1725.5, subject to limited legal exceptions.

4. **Contract Documents.** The plans, specifications, bid forms and contract documents for the Project, and any addenda thereto ("Contract Documents") may be obtained from the City of Morgan Hill, at 17575 Peak Avenue, Morgan Hill, CA, (408) 778-6480. Electronic copies of the Contract Documents are available on CD for twenty-five dollars ($25.00). If mailing

by USPS, a ten dollars ($10.00) charge will be added. To download plans and specifications at no charge, register at www.publicpurchase.com.

5. Bid Proposal and Security.

5.1 Bid Proposal Form. Each Bid must be submitted using the Bid Proposal form provided with the Contract Documents.

5.2 Bid Security. The Bid Proposal must be accompanied by bid security of ten percent of the maximum bid amount, in the form of a cashier's or certified check made payable to City of Morgan Hill, or a bid bond executed by a surety licensed to do business in the State of California on the Bid Bond form included with the Contract Documents. The bid security must guarantee that within ten (10) days after City issues the Notice of Award, the successful bidder will execute the Contract and submit payment and performance bonds and insurance certificates and endorsements as required by the Contract Documents and the Notice of Award.

6. Prevailing Wage Requirements.

6.1 General. Pursuant to California Labor Code Section 1720 *et seq*., this Project is subject to the prevailing wage requirements applicable to the locality in which the Work is to be performed for each craft, classification or type of worker needed to perform the Work, including employer payments for health and welfare, pension, vacation, apprenticeship and similar purposes.

6.2 Rates. These prevailing rates are available online at http://www.dir.ca.gov/DLSR. Each Contractor and Subcontractor must pay no less than the specified rates to all workers employed to work on the Project. The schedule of per diem wages is based upon a working day of eight hours. The rate for holiday and overtime work must be at least time and one-half.

6.3 Compliance. The Contract will be subject to compliance monitoring and enforcement by the California Department of Industrial Relations, pursuant to Labor Code Section 1771.4.

7. Performance and Payment Bonds. The successful bidder will be required to provide performance and payment bonds each for one hundred percent of the Contract Price as further described in the Contract Documents.

8. Substitution of Securities. Substitution of appropriate securities in lieu of retention amounts from progress payments is permitted under Public Contract Code Section 22300.

9. **Subcontractor List.** Each Subcontractor must be registered with the DIR to perform work on public projects. Each bidder must submit a completed Subcontractor List form with its Bid Proposal, including the name, location of the place of business, California contractor license number and DIR registration number and percentage of the Work to be performed (based on the base bid price) for each Subcontractor who will perform Work or service or fabricate or install Work for the prime contractor in excess of one-half (1/2) of one percent (1%) of the bid price, using the Subcontractor List form included with the Contract Documents. For street or highway construction, this requirement applies to any subcontract of $10,000 or more.

10. **Instructions to Bidders.** All bidders should carefully review the Instructions to Bidders for more detailed information before submitting a Bid Proposal. The definitions provided in Article 1 of the General Conditions apply to all of the Contract Documents, as defined therein, including this Notice Inviting Bids.

By: Michelle Bigelow Date: January 12,2023

Publication Dates: 1) January 20, 2023 2) January 27, 2023

END OF NOTICE INVITING BIDS

INSTRUCTIONS TO BIDDERS

Each Bid Proposal submitted to the City of Morgan Hill ("City") for its 2023 Inflow and Infiltration Sewer Repair Project ("Project") must be submitted in accordance with the following instructions and requirements:

1. Bid Submission.

1.1 General. Each Bid Proposal must be signed, sealed and submitted to City, using the form provided in the Contract Documents, by or before the date and time set forth in Section 1 of the Notice Inviting Bids, or as amended by subsequent addendum. Faxed or emailed Bid Proposals will not be accepted, unless otherwise specified. Late submissions will be returned unopened. City reserves the right to postpone the date or time for receiving or opening bids. Each bidder is solely responsible for all of its costs to prepare and submit its bid and by submitting a bid waives any right to recover those costs from City. The bid price(s) must include all costs to perform the Work as specified, including all labor, materials, supplies, and equipment and all other direct or indirect costs such as applicable federal, state and local taxes, insurance and overhead.

1.2 Bid Envelope. The envelope containing the sealed Bid Proposal and all required forms and attachments must be clearly labeled and addressed as follows:

BID PROPOSAL
Morgan Hill Development Services Center
2023 Inflow and Infiltration Sewer Repair Project
City of Morgan Hill
17575 Peak Avenue
Morgan Hill, CA 95037
Attention: Bid Opening
Bid Date:_____
Bid Time: _____

The envelope must also be clearly labeled, as follows, with the bidder's name, address, and its registration number with the California Department of Industrial Relations ("DIR") for bidding on public works contracts (Labor Code sections 1725.5 and 1771.1):

[Contractor company name]
[Street address]
[City, state, zip code]
DIR Registration No._____

1.3 DIR Registration. Subject to limited legal exceptions for joint venture bids and federally-funded projects, City will not accept a Bid Proposal from a bidder without proof that the bidder is registered with the DIR to perform public work under Labor Code Section 1725.5.

Please note: If City is unable to confirm that the bidder is currently registered with the DIR, City may disqualify the bidder and return its bid unopened (Labor Code Section 1725.5 and 1771.1(a)).

2. **Bid Proposal Form and Enclosures.** Each Bid Proposal must be completed in ink using the Bid Proposal form included with the Contract Documents. The Bid Proposal form must be fully completed without interlineations, alterations, or erasures. Any necessary corrections must be clear and legible, and must be initialed by the bidder's authorized representative. A Bid Proposal submitted with exceptions or terms such as "negotiable," "will negotiate," or similar, will be considered nonresponsive. Each Bid Proposal must be accompanied by bid security, as set forth in Section 4 below, and by a completed Subcontractor List and Non-Collusion Declaration using the forms included with the Contract Documents.

3. **Authorization and Execution.** Each Bid Proposal must be signed by the bidder's authorized representative. A Bid Proposal submitted by a partnership must be signed in the partnership name by a general partner with authority to bind the partnership. A Bid Proposal submitted by a limited liability company (LLC) must be signed in the name of the LLC by a member or manager with authority to bind the LLC. A Bid Proposal submitted by a corporation must be signed with the legal name of the corporation, followed by the signature and title of two officers of the corporation with full authority to bind the corporation to the terms of the Bid Proposal, under California Corporation Code Section 313.

4. **Bid Security.** Each Bid Proposal must be accompanied by bid security of ten percent of the maximum bid amount, in the form of a cashier's check or certified check, made payable to the City, or bid bond using the form included in the Contract Documents and executed by a surety licensed to do business in the State of California. The bid security must guarantee that, within ten days after issuance of the Notice of Award, the bidder will: execute and submit the enclosed Contract for the bid price; submit payment and performance bonds for 100% of the maximum Contract Price; and submit the insurance certificates and endorsements and any other submittals, if any, required by the Contract Documents or the Notice of Award.

4.1 Withdrawal of Bid Proposals. A Bid Proposal may not be withdrawn for a period of 90 days after the bid opening without forfeiture of the bid security, except as authorized for material error under Public Contract Code Section 5100 *et seq*.

5. Requests for Information. Questions or requests for clarifications regarding the Project, the bid procedures, or any of the Contract Documents must be submitted in writing to Edgard E. Rizo, Project Engineer, at Edgard.Rizo@morganhill.ca.gov. Oral responses are not authorized and are not binding on the City. Bidders should submit any such written inquiries at least five Working Days before the scheduled bid opening. Questions received any later might not be addressed before the bid deadline. An interpretation or clarification by City in response to a written inquiry will be issued in an addendum.

6. Pre-Bid Investigation.

6.1 General. Each bidder is solely responsible at its sole expense for diligent and thorough review of the Contract Documents, examination of the Project site, and reasonable and prudent inquiry concerning known and potential site and area conditions prior to submitting a Bid Proposal. Each bidder is responsible for knowledge of conditions and requirements which reasonable review and investigation would have disclosed. However, except for any areas that are open to the public at large, bidders may not enter property owned or leased by the City or the Project site without prior written authorization from City.

6.2 Document Review. Each bidder is responsible for review of the Contract Documents and any informational documents provided "For Reference Only," e.g., as-builts, technical reports, test data, and the like. A bidder is responsible for notifying City of any errors or, omissions, inconsistencies, or conflicts it discovers in the Contract Documents prior to submitting a Bid Proposal, subject to the limitations of Public Contract Code Section 1104. Notification of any such errors, omissions, inconsistencies, or conflicts must be submitted in writing to the City no later than five Working Days before the scheduled bid opening. (See Section 5, above.) City expressly disclaims responsibility for assumptions a bidder might draw from the presence or absence of information provided by City.

6.3 Project Site. Questions regarding the availability of soil test data, water table elevations, and the like should be submitted to the City in writing, as specified in Section 5, above. Any subsurface exploration at the Project site must be done at the bidder's expense, but only with prior written authorization from City. All soil data and analyses available for inspection or provided in the Contract Documents apply only to the test

hole locations. Any water table elevation indicated by a soil test report existed on the date the test hole was drilled. The bidder is responsible for determining and allowing for any differing soil or water table conditions during construction. Because groundwater levels may fluctuate, difference(s) in elevation between ground water shown in soil boring logs and ground water actually encountered during Project construction will not be considered changed Project site conditions. Actual locations and depths must be determined by bidder's field investigation. The bidder may request access to underlying or background information on the Project site in City's possession that is necessary for the bidder to form its own conclusions, including, if available, record drawings or other documents indicating the location of subsurface lines, utilities, or other structures.

6.4 Utility Company Standards. The Project must be completed in a manner that satisfies the standards and requirements of any affected utility companies or agencies (collectively, "utility owners"). The successful bidder may be required by the third-party utility owners to provide detailed plans prepared by a California registered civil engineer showing the necessary temporary support of the utilities during coordinated construction work. Bidders are directed to contact the affected third-party utility owners about their requirements before submitting a Bid Proposal.

7. Bidders Interested in More Than One Bid. No person, firm, or corporation may submit or be a party to more than one Bid Proposal unless alternate bids are specifically called for. However, a person, firm, or corporation that has submitted a subcontract proposal or quote to a bidder may submit subcontract proposals or quotes to other bidders.

8. Addenda. Any addenda issued prior to the bid opening are part of the Contract Documents. Subject to the limitations of Public Contract Code section 4104.5, City reserves the right to issue addenda prior to bid time. Each bidder is solely responsible for ensuring it has received and reviewed all addenda prior to submitting its bid. Bidders should check City's website periodically for any addenda or updates on the Project at: http://www.publicpurchase.com

9. Brand Designations and "Or Equal" Substitutions. Any specification designating a material, product, thing, or service by specific brand or trade name, followed by the words "or equal," is intended only to indicate quality and type of item desired, and bidders may request use of any equal material, product, thing, or service. All data substantiating the proposed substitute as an "equal" item must be submitted with the written request for substitution. This provision does not apply to materials, products, things, or services that may lawfully be designated by a specific brand or trade name under Public Contract Code Section 3400(c).

9.1 Pre-Bid Requests. Any request for submission made before the Contract is awarded must be submitted to the City Engineer at least ten (10) days before the opening of bids so that all interested bidders may be notified of any approved alternative.

9.2 Post-Award Requests. After the Contract is awarded, Contractor may submit a substitution within fourteen (14) days after the date of award of the Contract, or as specified in the Special Conditions.

10. Bid Protest. Any bid protest against another bidder must be submitted in writing and received by City at the City Attorney's Office at 17575 Peak Avenue, Morgan Hill, CA, (Fax: (408) 779-1592 or Email to cynthia.hasson@morganhill.ca.gov)), before 5:00 p.m. no later than two Working Days following bid opening ("Bid Protest Deadline") and must comply with the following requirements:

10.1 General. Only a bidder who has actually submitted a Bid Proposal is eligible to submit a bid protest against another bidder. Subcontractors are not eligible to submit bid protests. A bidder may not rely on the bid protest submitted by another bidder, but must timely pursue its own protest. If required by City, the protesting bidder must submit a non-refundable fee in the amount specified by City, based upon City's reasonable costs to administer the bid protest. Any such fee must be submitted to City no later than the Bid Protest Deadline, unless otherwise specified. For purposes of this Section 10, a "Working Day" means a day that City is open for normal business, and excludes weekends and holidays observed by City. Pursuant to Public Contract Code Section 4104, inadvertent omission of a Subcontractor's DIR registration number on the Subcontractor List form is not grounds for a bid protest, provided it is corrected within 24 hours of the bid opening or as otherwise provided under Labor Code Section 1771.1(b).

10.2 Protest Contents. The bid protest must contain a complete statement of the basis for the protest and must include all supporting documentation. Material submitted after the Bid Protest Deadline will not be considered. The protest must refer to the specific portion or portions of the Contract Documents upon which the protest is based. The protest must include the name, address, email address, and telephone number of the protesting bidder and any person submitting the protest on behalf of or as an authorized representative of the protesting bidder.

10.3 Copy to Protested Bidder. Upon submission of its bid protest to City, the protesting bidder must also concurrently transmit the protest and all supporting documents to the protested bidder, and to any other bidder who has a reasonable prospect of receiving an award depending upon the

outcome of the protest, by email or hand delivery to ensure delivery before the Bid Protest Deadline.

10.4 Response to Protest. The protested bidder may submit a written response to the protest, provided the response is received by City before 5:00 p.m., within two Working Days after the Bid Protest Deadline or after actual receipt of the bid protest, whichever is sooner (the "Response Deadline"). The response must include all supporting documentation. Material submitted after the Response Deadline will not be considered. The response must include the name, address, email address, and telephone number of the person responding on behalf of or representing the protested bidder if different from the protested bidder.

10.5 Copy to Protesting Bidder. Upon submission of its response to the bid protest to City, the protested bidder must also concurrently transmit by email or hand delivery, by or before the Response Deadline, a copy of its response and all supporting documents to the protesting bidder and to any other bidder who has a reasonable prospect of receiving an award depending upon the outcome of the protest.

10.6 Exclusive Remedy. The procedure and time limits set forth in this Section are mandatory and are the bidder's sole and exclusive remedy in the event of a bid protest. A bidder's failure to comply with these procedures will constitute a waiver of any right to further pursue a bid protest, including filing a Government Code Claim or initiation of legal proceedings.

10.7 Right to Award. City reserves the right, acting in its sole discretion, to reject any bid protest that it determines lacks merit, to award the Contract to the bidder it has determined to be the responsible bidder submitting the lowest responsive bid, and to issue a Notice to Proceed with the Work notwithstanding any pending or continuing challenge to its determination.

11. Reservation of Rights. City reserves the unfettered right, acting in its sole discretion, to waive or to decline to waive any immaterial bid irregularities; to accept or reject any or all bids; to cancel or reschedule the bid; to postpone or abandon the Project entirely; or to perform all or part of the Work with its own forces. The Contract will be awarded, if at all, within ninety days after opening of bids or as otherwise specified in the Special Conditions, to the responsible bidder that submitted the lowest responsive bid. Any planned start date for the Project represents the City's expectations at the time the Notice Inviting Bids was first issued. City is not bound to issue a Notice to Proceed by or before such planned start date, and it reserves the right to issue the Notice to Proceed when the City determines, in its sole discretion, the appropriate time for commencing the

Work. The City expressly disclaims responsibility for any assumptions a bidder might draw from the presence or absence of information provided by the City in any form. Each bidder is solely responsible for its costs to prepare and submit a bid, including site investigation costs.

12. **Bonds.** Within ten calendar days following City's issuance of the Notice of Award to the apparent low bidder, the bidder must submit payment and performance bonds to City as specified in the Contract Documents using the bond forms included in the Contract Documents. All required bonds must be calculated on the maximum total Contract Price as awarded, including additive alternates, if applicable.

13. **License(s).** The successful bidder and its Subcontractor(s) must possess the California contractor's license(s) in the classification(s) required by law to perform the Work. The successful bidder must also obtain a City business license within ten days following City's issuance of the Notice of Award. Subcontractors must also obtain a City business license before performing any Work.

14. **Ineligible Subcontractor.** Any Subcontractor who is ineligible to perform work on a public works project under Labor Code Sections 1777.1 or 1777.7 is prohibited from performing work on this Project.

15. **Evidence of Responsibility.** Within twenty four (24) hours following a request by City, a bidder must submit to City satisfactory evidence showing the bidder's financial resources, the bidder's experience in the type of work being required by City, the bidder's organization available for the performance of the Contract and any other required evidence of the bidder's qualifications to perform the proposed Contract. City may consider such evidence before making its decision awarding the proposed Contract.

16. **Subcontractor Work Limits.** The prime contractor must perform at least 50% of the Work on the Project, calculated as a percentage of the base bid price, with its own forces, except for any Work identified as "Specialty Work" in the Contract Documents. The total bid amount for any such Specialty Work, as shown on the Bid Schedule, may be deducted from the base bid price before computing the <__>% self-performance requirement. The remaining Work may be performed by qualified Subcontractor(s).

17. **Bid Schedule.** Each bidder must complete the Bid Schedule form with unit prices as indicated, and submit the completed Bid Schedule with its Bid Proposal.

17.1 Incorrect Totals. In the event a computational error for any bid item (base bid or alternate) results in an incorrect extended total for that item, the submitted base bid or bid alternate total will be adjusted to reflect the corrected amount as the product of the estimated quantity and the unit cost. In the event of a discrepancy between the actual total of the itemized or unit prices shown on the Bid Schedule for the base bid, and the amount entered as the base bid on the Bid Proposal form, the actual total of the itemized or unit prices shown on the Bid Schedule for the base bid will be deemed the base bid price. Likewise, in the event of a discrepancy between the actual total of the itemized or unit prices shown on the Bid Schedule for any bid alternate, and the amount entered for the alternate on the Bid Proposal form, the actual total of the itemized prices shown on the Bid Schedule for that alternate will be deemed the alternate price. Nothing in this provision is intended to prevent a bidder from requesting to withdraw its bid for material error under Public Contract Code § 5100 et seq.

17.2 Estimated Quantities. The quantities shown on the Bid Schedule are estimated and the actual quantities required to perform the Work may be greater or less than the estimated amount. The Contract Price will be adjusted to reflect the actual quantities required for the Work based on the itemized or unit prices provided in the Bid Schedule, with no allowance for anticipated profit for quantities that are deleted or decreased, and no increase in the unit price, and without regard to the percentage increase or decrease of the estimated quantity and the actual quantity.

18. **Bidder's Questionnaire.** A completed, signed Bidder's Questionnaire using the form provided with the Contract Documents and including all required attachments must be submitted within 48 hours following a request by City. A bid that does not fully comply with this requirement may be rejected as nonresponsive. A bidder who submits a Bidder's Questionnaire which is subsequently determined to contain false or misleading information, or material omissions, may be disqualified as non-responsible.

19. Safety Orders. If the Project includes construction of a pipeline, sewer, sewage disposal system, boring and jacking pits, or similar trenches or open excavations, which are five feet or deeper, each bid must include a bid item for adequate sheeting, shoring, and bracing, or equivalent method, for the protection of life or limb, which comply with safety orders as required by Labor Code Section 6707.

END OF INSTRUCTIONS TO BIDDERS

BID PROPOSAL

2023 INFLOW AND INFILTRATION SEWER REPAIRS PROJECT

_____ ("Bidder") hereby submits this Bid Proposal to the City of Morgan Hill ("City") for the above-referenced project ("Project") in response to the Notice Inviting Bids and in accordance with the Contract Documents referenced therein.

1. **Base Bid.** Bidder proposes to perform and fully complete the Work for the Project as specified in the Contract Documents, within the time required for full completion of the Work, including all labor, materials, supplies, and equipment and all other direct or indirect costs including, but not limited to, taxes, insurance and all overhead for the following price ("Base Bid"):
   $ _____.

2. **Addenda.** Bidder agrees that it has confirmed receipt of or access to, and reviewed, all addenda issued for this Bid. Bidder waives any claims it might have against the City based on its failure to receive, access, or review any addenda for any reason. Bidder specifically acknowledges receipt of the following addenda:

Addendum:	Date Received:	Addendum:	Date Received:
#01	_____	#05	_____
#02	_____	#06	_____
#03	_____	#07	_____
#04	_____	#08	_____

3. **Bidder's Certifications and Warranties.** By signing and submitting this Bid Proposal, Bidder certifies and warrants the following:

   3.1 Examination of Contract Documents. Bidder has thoroughly examined the Contract Documents, and represents that, to the best of Bidder's knowledge there are no errors, omissions, or discrepancies in the Contract Documents subject to the limitations of Public Contract Code Section 1104.

   3.2 Examination of Worksite. Bidder has had the opportunity to examine the Worksite and local conditions at the Project location.

   3.3 Bidder Responsibility. Bidder is a responsible bidder, with the necessary ability, capacity, experience, skill, qualifications, workforce, equipment, and resources to perform or cause the Work

to be performed in accordance with the Contract Documents and within the Contract Time.

3.4 Responsibility for Bid. Bidder has carefully reviewed this Bid Proposal and is solely responsible for any errors or omissions contained in its completed Bid. All statements and information provided in this Bid Proposal and enclosures are true and correct to the best of Bidder's knowledge.

3.5 Nondiscrimination. In preparing this Bid, the Bidder has not engaged in discrimination against any prospective or present employee or Subcontractor on grounds of race, color, ancestry, national origin, ethnicity, religion, sex, sexual orientation, age, disability, or marital status.

3.6 Iran Contracting Act. Bidder certifies that it is not identified on a list created under the Iran Contracting Act, Public Contract Code Section 2200 *et seq*. (the "Act"), as a person engaging in investment activities in Iran, as defined in the Act, or is otherwise expressly exempt under the Act.

4. Award of Contract. By signing and submitting this Bid Proposal, Bidder agrees that if Bidder is awarded the Contract for the Project, that within ten days following issuance of the Notice of Award to Bidder, Bidder will do all of the following:

4.1 Execute Contract. Enter into the Contract with City in accordance with the terms of this Bid Proposal, by signing and submitting to City the Contract prepared by City using the form included with the Contract Documents;

4.2 Submit Required Bonds. Submit to City a payment bond and a performance bond, each for one hundred percent (100%) of the Contract Price, using the bond forms provided and in accordance with the requirements of the Contract Documents; and

4.3 Insurance Requirements. Submit to City the insurance certificate(s) and endorsement(s) as required by the Contract Documents.

5. Wage Theft Prevention. All Bidders are expected to have read and understand the "Wage Theft Prevention Policy" adopted by the City Council on July 26, 2017.

The undersigned Bidder certifies that neither Bidder nor its principals have been found by a final court judgement or final administrative action of an investigatory agency to have violated federal, state or local wage and hour laws within the past five years from the date of the submitted bid. Bidder or its principals who are unable to so certify, must disclose wage and hour violations, and shall provide a copy of (i) the court order and judgment and/or final administrative decision; and (ii) documents demonstrating either that the order/judgment has been satisfied, or if the order/judgment has not been fully satisfied, a written and signed description of Bidder's efforts to date to satisfy the order/judgment. Signing this bid shall constitute signature of this Certification.

The City, at its sole discretion, may disqualify a bidder based on one or more disclosed judgments consistent with the criteria set forth in the Policy.

6. Bid Security. As a guarantee that if awarded the Contract, Bidder will perform its obligations under Section 4 above Bidder is enclosing bid security in the amount of ten percent (10%) of its maximum bid amount in one of the following forms (check one):

____ A cashier's check or certified check payable to City of Morgan Hill and issued by _____ Bank in the amount of $_____.

____ A bid bond, using the Bid Bond form included with the Contract Documents, payable to City of Morgan Hill and executed by a surety licensed to do business in the State of California.

This Bid Proposal is hereby submitted on _____, 20__:

s/ _____ _____
Name and Title [print]

_____ _____
Company Name License # and Classification

_____
DIR Registration #

_____ _____
Address Phone

_____ _____
City, State, Zip Fax

END OF BID PROPOSAL

BID SCHEDULE I – GENERAL

2023 INFLOW AND INFILTRATION SEWER REPAIR PROJECT

This Bid Schedule must be completed in ink and included with the sealed Bid Proposal. Pricing must be provided for each Bid Item as indicated. Items marked "(SW)" are Specialty Work that must be performed by a qualified Subcontractor. The lump sum or unit cost for each item must be inclusive of all costs, whether direct or indirect, including profit and overhead. The sum of all amounts entered in the "Extended Total Amount" column must be identical to the Base Bid price entered in Section 1 of the Bid Proposal Form. Quantities shown are required for bid purposes and may or may not be final pay quantities. Actual quantities, if different, must be substantiated during the Project by the Contractor (either by field measurement, trucking tags, or other means acceptable to the Engineer).

AL = Allowance CF = Cubic Feet CY = Cubic Yard EA = Each LB = Pounds
LF = Linear Foot LS = Lump Sum SF = Square Feet TON = Ton (2000 lbs)

Bid Item No.	Description of Bid Item	Estimated Quantity/ Unit of Measure	Unit Price	Extended Total Amount
1	Mobilization and Demobilization	1/LS	$	$
2	Pedestrian and Traffic Control	1/LS	$	$
3	Shoring	1/LS	$	$
4	Water Pollution Control Plan (WPCP)	1/LS	$	$
5	Temporary Bypass Pumping and Piping	1/LS	$	$
6	Bonds and Insurance	1/LS	$	$
7	6-inch Spot Repair - Greater than 5-feet in Depth	7/EA	$	$
8	8-inch Spot Repair - Greater than 5-feet in Depth	7/EA	$	$
9	10-inch Spot Repair - Greater than 5-feet in Depth	2/EA	$	$
10	15-inch Spot Repair - Greater than 5-feet in Depth	1/EA	$	$
11	6-inch Pipe Lining - 17519 Del Monte (PID#6302)	170/LF	$	$
12	6-inch Pipe Lining - 80 Central Ave. (PID#4388)	109/LF	$	$

13	6-inch Pipe Lining - 80 Central Ave. (PID#4389 and 3689)	305/LF	$	$
14	8-inch Pipe Lining - 17101 Kruse Ranch Ln (PID#4852)	203/LF	$	$
15	8-inch Pipe Lining - 17101 Kruse Ranch Ln (PID#6577)	359/LF	$	$
16	8-inch Pipe Lining - 17101 Kruse Ranch Ln (PID#6579)	318/LF	$	$
17	8-inch Pipe Lining - 45 Central Ave. (PID#3689)	88/LF	$	$
18	6-inch Spot Repair - 15800 Sunnyside Ave. (PID#5082)	5/LF	$	$
19	6-inch Spot Repair - 2245 Brega Ln. (PID#6867)	5/LF	$	$
20	6-inch Spot Repair - 8090 Tahoe Way (PID#4152)	10/LF	$	$
21	6-inch Spot Repair - 18663 Castle Lake Dr. (PID#3812)	30/LF	$	$
22	6-inch Spot Repair – 1140 Appian Way (PID#4139)	10/LF	$	$
23	8-inch Spot Repair - 16650 Trail Dr. (PID#4320)	10/LF	$	$
24	8-inch Spot Repair - 18790 Alicante Cir. (PID#15704)	5/LF	$	$
25	8-inch Spot Repair - 17002 Tassajara Cir. (PID#4253)	10/LF	$	$
26	6-inch Open Trench Repair - 13 W 2nd St. (PID#3737)	40/LF	$	$
27	6-inch Open Trench Repair - 17519 Del Monte Ave. (PID#6302)	40/LF	$	$
28	6-inch Open Trench Repair - 17799 Florence St. (PID#3702)	210/LF	$	$
29	6-inch Open Trench Repair - 16310 Monterey Rd. (PID#3935)	20/LF	$	$
30	6-inch Open Trench Repair - 18525 Old Monterey Rd. (PID#3596)	147/LF	$	$
31	6-inch Open Trench Repair - 3615 Jackson Oaks Ct. (PID#4787)	10/LF	$	$
32	8-inch Open Trench Repair - 15880 El Pajaro Ct. @ Trail (PID#4077)	15/LF	$	$
33	8-inch Open Trench Repair - 17065 Creekside Cir. (PID#4055)	30/LF	$	$

34	8-inch Open Trench Repair – 17101 Kruse Ranch Ln. (PID#6576)	75/LF	$	$
35	8-inch Open Trench Repair - 3490 Oak Hill Ct. (PID#4784)	235/LF	$	$
36	8-inch Open Trench Repair - 3490 Oak Hill Ct. (PID#4783)	217/LF	$	$
37	10-inch Open Trench Repair - Cochrane Rd. @ Sierra Park (PID#6507)	15/LF	$	$
38	10-inch Open Trench Repair - 580 Diana Ave. (PID#3870)	150/LF	$	$
39	10-inch Open Trench Repair - 625 Diana Ave. (PID#3891)	30/LF	$	$
40	10-inch Open Trench Repair - 19145 Eagle View Dr. (PID#4644)	60/LF	$	$
41	15-inch Open Trench Repair - 17845 Hale Ave. (PID#3677)	21LF	$	$
42	Pipe Bursting Existing 6-inch w/ New 8-inch – 55 Spring Ave. (PID#16378)	280/LF	$	$
43	Reinstate Lateral	2/EA	$	$
44	Reconnect Lateral Connection at Open Trench Location	15/EA	$	$
45	Reconnect Lateral Connection at Bursting Locations	3/EA	$	$
46	Clean Sewer, Remove Grease and Roots, and CCTV Inspect	2,650/LF	$	$
47	New Manhole Structure #1 - Creekview Road (Depth 4 feet)	1/EA	$	$
48	New Manhole Structure #2 - McKelvey Ln. (Depth 6.5 feet)	1/EA	$	$
49	New Manhole Structure #3 – Florence Ct. (Depth 5 feet)	1/EA	$	$
50	New Manhole Structure #4 – Old Monterey Dr. (Depth 4 feet)	1/EA	$	$
51	New Manhole Structure #5 – Kruse Ranch (Depth 5 feet)	1/EA	$	$
52	Remove and Dispose of Asbestos Concrete Pipe	75/LF	$	$
53	Supplemental Work (Revokable)	1/LS	$250,000	$250,000

Bid Schedule I Total	

TOTAL BASE BID: Items 1 through 56 inclusive: $_____

Note: The amount entered as the "Total Base Bid" should be identical to the Base Bid amount entered in Section 1 of the Bid Proposal form.

END OF BID SCHEDULE

SUBCONTRACTOR LIST

For each Subcontractor who will perform a portion of the Work in an amount in excess of one-half of 1% of the Bidder's total Contract Price,[1] the bidder must list a description of the Work, the name of the Subcontractor, its California contractor license number, the location of its place of business, its DIR registration number, and the portion of the Work that the Subcontractor is performing based on a percentage of the Base Bid price.
Bidders: Please print legibly. Illegible forms may be rejected.

DESCRIPTION OF WORK	SUBCONTRACTOR NAME	CALIFORNIA CONTRACTOR LICENSE NUMBER	DIR REG. NO.	LOCATION OF BUSINESS	LOCAL VENDOR[2] YES/NO	PERCENT OF WORK

END OF SUBCONTRACTOR LIST

[1] For street or highway construction this requirement applies to any subcontract of $10,000 or more.
[2] A Subcontractor is considered local if its principle place of business is within the city limits of Morgan Hill.

NONCOLLUSION DECLARATION

(To be executed by bidder and submitted with bid)

State of California County of _____	)))	ss.

The undersigned declares:

I am the _____ [title] of _____ [business name], the party making the foregoing bid.

The bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation. The bid is genuine and not collusive or sham. The bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid. The bidder has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or to refrain from bidding. The bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of the bidder or any other bidder, or to fix any overhead, profit, or cost element of the bid price, or of that of any other bidder. All statements contained in the bid are true. The bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, to any corporation, partnership, company, association, organization, bid depository, or to any member or agent thereof, to effectuate a collusive or sham bid, and has not paid and will not pay, any person or entity for such purpose.

This declaration is intended to comply with California Public Contract Code Section 7106 and Title 23 U.S.C Section 112.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct and that this declaration is executed on _____ [date], at _____ [city], _____ [state].

s/_____

_____
Name [print]

CALIFORNIA ALL-PURPOSE ACKNOWLEDGMENT CIVIL CODE ' 1189

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document, to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of **CALIFORNIA**)

County of SANTA CLARA)

On _____, before me,

_____

a Notary Public in and for said County and State, personally appeared

_____

_____

proved to me on the basis of satisfactory evidence to be the person/s whose name/s is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity/ies, and that by his/her/their signature/s on the instrument the person/s, or the entity upon behalf of which the person/s acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

_____

SIGNATURE OF NOTARY PUBLIC

Place Notary Seal Above

BID BOND

_____ ("Bidder") has submitted a bid, dated _____, 20_____ ("Bid"), to the City of Morgan Hill ("City") for work on the _____ ("Project"). Under this duly executed bid bond ("Bid Bond"), Bidder as Principal and _____, its surety ("Surety"), are bound to City as obligee in the penal sum of ten percent (10%) of the maximum amount of the Bid (the "Bond Sum"). Bidder and Surety bind themselves and their respective heirs, executors, administrators, successors and assigns, jointly and severally, as follows:

1. **General.** If Bidder is awarded the Contract for the Project, Bidder will enter into the Contract with City in accordance with the terms of the Bid.

2. **Submittals.** Within ten days following issuance of the Notice of Award to Bidder, Bidder must submit to City the following:

   2.1 Contract. The executed Contract, using the form provided by City in the Project contract documents ("Contract Documents");

   2.2 Payment Bond. A payment bond for one hundred percent (100%) of the maximum Contract Price, executed by a surety licensed to do business in the State of California using the Payment Bond form included with the Contract Documents;

   2.3 Performance Bond. A performance bond for one hundred percent (100%) of the maximum Contract Price, executed by a surety licensed to do business in the State of California using the Performance Bond form included with the Contract Documents; and

   2.4 Insurance. The insurance certificate(s) and endorsement(s) required by the Contract Documents, and any other documents required by the Instructions to Bidders.

3. **Enforcement.** If Bidder fails to execute the Contract and to submit the bonds and insurance certificates as required by the Contract Documents, Surety guarantees that Bidder forfeits the Bond Sum to City. Any notice to Surety may be given in the manner specified in the Contract and delivered or transmitted to Surety as follows:

   Attn: _____
   Address: _____
   City/State/Zip: _____
   Phone: _____

Fax: _____
Email: _____

4. **Duration; Waiver.** If Bidder fulfills its obligations under Section 2, above, then this obligation will be null and void; otherwise it will remain in full force and effect for ninety days following the bid opening or until this Bid Bond is returned to Bidder, whichever occurs first. Surety waives the provisions of Civil Code Sections 2819 and 2845.

This Bid Bond is entered into and is effective on _____, 20_____.

SURETY:

_____

s/ _____

Name: _____

Title: _____

(Attach Acknowledgement, Notary Seal, and Attorney-In-Fact Certificate)

CONTRACTOR:

_____

s/ _____

Name: _____

Title: _____

APPROVED AS TO FORM:

By:_____
Donald A. Larkin, City Attorney

Date:_____

BIDDER'S QUESTIONNAIRE

2023 INFLOW AND INFILTRATION SEWER REPAIR PROJECT

Within forty-eight (48) hours following a request by City, a bidder must submit to City a completed, signed Bidder's Questionnaire using this form and all required attachments, including clearly labeled additional sheets as needed. City may request the Questionnaire from one or more of the apparent low bidders following the bid opening, and may use the completed Questionnaire as part of its investigation to evaluate a bidder's qualifications for this Project. The Questionnaire must be filled out completely, accurately, and legibly. Any errors, omissions, or misrepresentations in completion of the Questionnaire may be grounds for rejection of the bid or termination of a Contract awarded pursuant to the bid.

Part 1: General Information

Bidder Business Name: _____ ("Bidder")

Check One: ___ Corporation State of Incorporation _____
___ Partnership
___ Sole Proprietorship
___ Joint Venture of:_____
___ Other:_____

Main Office Address:
_____

_____

Phone: _____

Fax: _____

Local Office Address and Phone: _____

_____

Website address: _____

Owner of Business: _____

Contact Name and Title: _____

Contact phone and email:
_____

Bidder's California Contractor's License Number(s):
_____

Bidder's DIR Registration Number: _____

Part 2: Bidder Experience

1. How many years has Bidder been in business under its present business name? _____ years

2. Has Bidder completed projects similar in type and size to this Project as a general contractor? ___ Yes _____ No

3. Has Bidder ever been disqualified from a bid on grounds that it is not responsible, or otherwise disqualified or disbarred from bidding under state or federal law? ?

_____ Yes _____ No

If yes, provide additional information on a separate sheet regarding the disqualification or disbarment, including the name and address of the agency or owner of the project, the type and size of the project, the reasons that Bidder was disqualified or disbarred, and the month and year in which the disqualification or disbarment occurred.

4. Has Bidder ever been terminated for cause, alleged default, or legal violation from a construction project, either as a general contractor or as a subcontractor?

_____ Yes _____ No

If yes, provide additional information on a separate sheet regarding the termination, including the name and address of the agency or owner of the subject project, the type and size of the project, whether Bidder was under contract as a general contractor or a subcontractor, the reasons that Bidder was terminated, and the month and year in which the termination occurred.

5. Provide information about Bidder's past projects performed as general contractor as follows:

5.1 Six most recently completed public works projects within the last three years;

5.2 Three largest completed projects within the last three years; and

5.3 Any project which is similar to this Project including scope and character of the work.

6. Use separate sheets to provide all of the following information for each project identified in response to the above three categories:

6.1 Project name
6.2 Location
6.3 Owner
6.4 Owner contact (name, address, email, and phone number)
6.5 Prime contractor, if applicable (name, address, email, and phone number);
6.6 Architect or engineer name
6.7 Architect or engineer contact (name, email and phone number)
6.8 Project and/or construction manager (name and current phone number)
6.9 Description of project, scope of work performed
6.10 Initial contract value (at time of bid award)
6.11 Final cost of construction (including change orders)
6.12 Original scheduled completion date
6.13 Time extensions granted (number of days)
6.14 Actual date of completion
6.15 Number and amount of stop notices or mechanic's liens filed
6.16 Amount of liquidated damages assessed against Bidder
6.17 Nature and resolution of any project-related claim, lawsuit, mediation and/or arbitration involving Bidder.

Part 3: Safety

1. Provide Bidder's Experience Modification Rate (EMR) for the last three years:

Year	EMR

2. Complete the following, based on information provided in Bidder's CalOSHA Form 300 or Form 300A, Annual Summary of Work-Related Illnesses and Injuries, from the most recent past calendar year:

2.1 Number of lost workday cases: ____
2.2 Number of medical treatment cases: ____
2.3 Number of deaths: ____

3. Has Bidder ever been cited, fined, or prosecuted by any local, state, or federal agency, including OSHA, CalOSHA, or EPA, for violation of any law, regulation, or requirements pertaining to health and safety?

_____ Yes _____ No

If yes, provide additional information on a separate sheet regarding each such citation, fine, or prosecution, including the name and address of the agency or owner of the project, the type and size of the project, the reasons for and nature of the citation, fine, or prosecution, and the month and year in which the incident giving rise to the citation, fine, or prosecution occurred.

4. Name, title, and email for person responsible for Bidder's safety program:

_____	_____	_____
Name	Title	Email
_____	_____	_____
Name	Title	Email

Part 4: Verification

In signing this document, I, the undersigned, declare that I am duly authorized to sign and submit this Bidder's Questionnaire on behalf of the named Bidder, and that all responses and information set forth in this Bidder's Questionnaire and accompanying attachments are, to the best of my knowledge, true, accurate and complete as of the date of submission. **I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct.**

Signature: _____ Date: _____

By [name, title]: _____

END OF BIDDER'S QUESTIONNAIRE

CONTRACT

This public works contract ("Contract") is entered into by and between the City of Morgan Hill ("City") and _____ ("Contractor") for work on the _____ Project ("Project").

The parties agree as follows:

1. **Award of Contract**. In response to the Notice Inviting Bids, Contractor has submitted a Bid Proposal to perform the Work to construct on the Project. On _____, 20___, City authorized award of this Contract to Contractor for the amount set forth in Section 4, below.

2. **Contract Documents**. The Contract Documents incorporated into this Contract include and are comprised of all of the documents listed below. The definitions provided in Article 1 of the General Conditions apply to all of the Contract Documents, including this Contract.

   2.1 Notice Inviting Bids;
   2.2 Instructions to Bidders;
   2.3 Addenda, if any;
   2.4 Bid Proposal and attachments thereto;
   2.5 Contract;
   2.6 Payment and Performance Bonds;
   2.7 General Conditions;
   2.8 Special Conditions;
   2.9 Project Plans and Specifications;
   2.10 Change Orders, if any;
   2.11 Notice of Award;
   2.12 Notice to Proceed; and
   2.13 The following:City Standard Details; Appendix

3. **Contractor's Obligations.** Contractor will perform all of the Work required for the Project, as specified in the Contract Documents. Contractor must provide, furnish, and supply all things necessary and incidental for the timely performance and completion of the Work, including all necessary labor, materials, supplies, tools, equipment, transportation, onsite facilities, and utilities, unless otherwise specified in the Contract Documents. Contractor must use its best efforts to diligently prosecute and complete the Work in a professional and expeditious manner and to meet or exceed the performance standards required by the Contract Documents.

4. **Payment.** As full and complete compensation for Contractor's timely performance and completion of the Work in strict accordance with the terms and conditions of the Contract Documents, City will pay Contractor _____ Dollars ($_____) (the "Contract Price"), for all of Contractor's direct and indirect costs to perform the Work, including all labor, materials, supplies, equipment, taxes, insurance, bonds and all overhead costs, in accordance with the payment provisions in the General Conditions.

5. **Time for Completion.** Contractor will fully complete the Work for the Project, meeting all requirements for Final Completion, within 210 calendar days from the commencement date given in the Notice to Proceed ("Contract Time"). By signing below, Contractor expressly waives any claim for delayed early completion.

6. **Liquidated Damages.** If Contractor fails to complete the Work within the Contract Time, City will assess liquidated damages in the amount of Twelve-Hundred Dollars ($1,200.00) per day for each day of unexcused delay in achieving Final Completion, and such liquidated damages may be deducted from City's payments due or to become due to Contractor under this Contract Price will be reduced accordingly.

7. **Labor Code Compliance.**

   7.1 General. This Contract is subject to all applicable requirements of Chapter 1 of Part 7 of Division 2 of the Labor Code, including requirements pertaining to wages, working hours and workers' compensation insurance, as further specified in Article 9 of the General Conditions.

   7.2 Prevailing Wages. This Project is subject to the prevailing wage requirements applicable to the locality in which the Work is to be performed for each craft, classification or type of worker needed to perform the Work, including employer payments for health and welfare, pension, vacation, apprenticeship and similar purposes. Copies of these prevailing rates are available online at http://www.dir.ca.gov/DLSR.

   7.3 DIR Registration. City will not enter into the Contract with a bidder without proof that the bidder and its Subcontractors are registered with the California Department of Industrial Relations to perform public work pursuant to Labor Code Section 1725.5, subject to limited legal exceptions.

8. **Workers' Compensation Certification.** Pursuant to Labor Code Section 1861, by signing this Contract, Contractor certifies as follows: "I am aware of the provisions of Labor Code Section 3700 which require every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that code, and I will comply with such provisions before commencing the performance of the Work on this Contract."

9. **Conflicts of Interest**. Contractor, its employees, Subcontractors and agents, may not have, maintain or acquire a conflict of interest in relation to this Contract in violation of any City ordinance or requirement, or in violation of any California law, including Government Code Section 1090 *et seq*., or the Political Reform Act, as set forth in Government Code Section 81000 *et seq*. and its accompanying regulations. Any violation of this Section constitutes a material breach of the Contract.

10. **Independent Contractor.** Contractor is an independent contractor under this Contract and will have control of the Work and the means and methods by which it is performed. Contractor and its Subcontractors are not employees of City and are not entitled to participate in any health, retirement, or any other employee benefits from City.

11. **Notice.** Any notice required by the Contract Documents must be made in writing, signed, dated, and sent to the other party by personal delivery, U.S. Mail, a reliable overnight delivery service, or by email as a PDF (or comparable) file. Notice is deemed effective upon delivery unless otherwise specified. Notice for each party must be given as follows:

    City:

    City of Morgan Hill
    17575 Peak Avenue
    Morgan Hill, CA 95037
    Phone: (409) 779-7259
    Attn: City Clerk
    Email: michelle.bigelow@morganhill.ca.gov
    Copy to: Edgard.rizo@morganhill.ca.gov

    Contractor:

    Name:_____
    Address:_____
    City/State/Zip:_____
    Phone:_____
    Attn:_____
    Email:_____
    Copy to:_____

12. General Provisions.

12.1 Assignment and Successors. Contractor may not assign its rights or obligations under this Contract, in part or in whole, without City's written consent. This Contract is binding on Contractor's and City's lawful heirs, successors and permitted assigns.

12.2 Third Party Beneficiaries. There are no intended third-party beneficiaries to this Contract.

12.3 Governing Law and Venue. This Contract will be governed by California law and venue will be in the Superior Court of Santa Clara County, and no other place. Contractor waives any right it may have pursuant to Code of Civil Procedure Section 394, to file a motion to transfer any action arising from or relating to this Contract to a venue outside of Santa Clara County, California.

12.4 Amendment. No amendment or modification of this Contract will be binding unless it is in a writing duly authorized and signed by the parties to this Contract.

12.5 Integration. This Contract and the Contract Documents incorporated herein, including authorized amendments or Change Orders thereto, constitute the final, complete, and exclusive terms of the agreement between City and Contractor.

12.6 Severability. If any provision of the Contract Documents, is determined to be illegal, invalid, or unenforceable, in whole or in part, the remaining provisions of the Contract Documents will remain in full force and effect.

12.7 Iran Contracting Act. If the Contract Price exceeds $1,000,000, Contractor certifies, by signing below, that it is not identified on a list created under the Iran Contracting Act, Public Contract Code Section 2200 *et seq*. (the "Act"), as a person engaging in investment activities in Iran, as defined in the Act, or is otherwise expressly exempt under the Act.

12.8 Authorization. Each individual signing below warrants that he or she is authorized to do so by the party that he or she represents, and that this Contract is legally binding on that party. If Contractor is a corporation, signatures from two officers of the corporation are required pursuant to California Corporation Code Section 313. If Contractor is a partnership, signature by a general partner with authority to bind the partnership is required. If Contractor is a limited liability company (LLC), a signature by a member or manager with authority to bind the LLC is required.

12.9 Electronic Signatures. Unless otherwise prohibited by law or CITY policy, the Parties agree that an electronic copy of a signed contract, or an electronically signed contract, has the same force and legal effect as a contract executed with an original ink signature. The term "electronic copy of a signed contract" refers to a transmission by facsimile, electronic mail, or other electronic means of a copy of an original signed contract in a portable document format. The term "electronically signed contract" means a contract that is executed by applying an electronic signature using technology approved by the CITY.

[Signatures are on the following page.]

AS SET FORTH IN CA. CORP. CODE § 313, TWO SIGNATURES ARE REQUIRED FOR CALIFORNIA CORPORATIONS:
(1) CHAIRPERSON OF THE BOARD, PRESIDENT, OR VICE PRESIDENT; AND
2) SECRETARY, ASSISTANT SECRETARY, CHIEF FINANCIAL OFFICER OR ASSISTANT TREASURER.

The parties agree to this Contract as witnessed by the signatures below:

CITY OF MORGAN HILL:

_____
Christina J. Turner
City Manager

Date: _____

Attest:

_____
Michelle Bigelow
City Clerk

Date: _____

Approved as to Form:

_____
Donald A. Larkin
City Attorney

Date: _____

CONTRACTOR:
[NAME OF CONTRACTOR]

_____
Signature

_____
Name/Title [print]

Date: _____

Corporate entities must provide a second signature:

_____
Signature

_____
Name/Title [print]

Date: _____

_____
Contractor's License Number(s)

_____
Expiration Date(s)

Seal:

_____
Contractor's DIR Registration Number(s)

_____
Expiration Date

END OF CONTRACT

PAYMENT BOND

The City of Morgan Hill ("City") and _____ ("Contractor") have entered into a contract for work on the _____ Project ("Project"). The Contract is incorporated by reference into this Payment Bond ("Bond").

1. **General.** Under this Bond, Contractor as principal and _____ _____, its surety ("Surety"), are bound to City as obligee in an amount not less than _____ Dollars ($_____) ("Bond Sum"), under California Civil Code Sections 9550, *et seq*., to ensure payment to authorized claimants. This Bond is binding on the respective successors, assigns, owners, heirs, or executors of Surety and Contractor

2. **Surety's Obligation.** If Contractor or any of its Subcontractors fails to pay a person authorized in California Civil Code Section 9100 to assert a claim against a payment bond, any amounts due under the Unemployment Insurance Code with respect to work or labor performed under the Contract, or any amounts required to be deducted, withheld, and paid over to the Employment Development Department from the wages of employees of Contractor and its Subcontractors, under California Unemployment Insurance Code Section 13020, with respect to the work and labor, then Surety will pay the obligation.

3. **Beneficiaries.** This Bond inures to the benefit of any of the persons named in California Civil Code Section 9100, so as to give a right of action to those persons or their assigns in any suit brought upon this Bond. Contractor must promptly provide a copy of this Bond upon request by any person with legal rights under this Bond.

4. **Duration.** If Contractor promptly makes payment of all sums for all labor, materials, and equipment furnished for use in the performance of the Work required by the Contract, in conformance with the time requirements set forth in the Contract and as required by California law, Surety's obligations under this Bond will be null and void. Otherwise, Surety's obligations will remain in full force and effect.

5. **Waivers.** Surety waives any requirement to be notified of alterations to the Contract or extensions of time for performance of the Work under the Contract. Surety waives the provisions of Civil Code Sections 2819 and 2845. City waives the requirement of a new bond for any supplemental contract under Civil Code Section 9550. Any notice to Surety may be given

in the manner specified in the Contract and delivered or transmitted to Surety as follows:

Attn: _____
Address: _____
City/State/Zip: _____
Phone: _____
Email: _____

6. **Law and Venue.** This Bond will be governed by California law, and venue for any dispute pursuant to this Bond will be in the Superior Court of Santa Clara County, and no other place. Surety will be responsible for City's attorneys' fees and costs in any action to enforce the provisions of this Bond.

7. **Effective Date; Execution.** This Bond is entered into and is effective on _____, 20__.

SURETY:	CONTRACTOR:
s/ _____	s/ _____
Name: _____	Name: _____
Title: _____	Title: _____
(Attach Acknowledgment with Notary Seal and Power of Attorney)	

APPROVED AS TO FORM:

By:_____
Donald A. Larkin, City Attorney

Date:_____

END OF PAYMENT BOND

PERFORMANCE BOND

The City of Morgan Hill ("City") and _____ ("Contractor") have entered into a contract for work on the _____ ("Project"). The Contract is incorporated by reference into this Performance Bond ("Bond").

1. **General.** Under this Bond, Contractor as Principal and _____ _____, its surety ("Surety"), are bound to City as obligee for an amount not less than _____ Dollars ($_____) (the "Bond Sum"). By executing this Bond, Contractor and Surety bind themselves and their respective heirs, executors, administrators, successors and assigns, jointly and severally, to the provisions of this Bond.

2. **Surety's Obligations.** Surety's obligations are co-extensive with Contractor's obligations under the Contract. If Contractor fully performs its obligations under the Contract, including its warranty obligations under the Contract, Surety's obligations under this Bond will become null and void. Otherwise, Surety's obligations under this bond will remain in full force and effect.

3. **Waiver.** Surety waives any requirement to be notified of and further consents to any alterations to the Contract made under the applicable provisions of the Contract Documents, including changes to the scope of Work or extensions of time for performance of Work under the Contract. Surety waives the provisions of Civil Code Sections 2819 and 2845.

4. **Application of Contract Balance.** Upon making a demand on this Bond for completion of the Work prior to acceptance of the Project, City will make the Contract Balance available to Surety for completion of the Work under the Contract. For purposes of this provision, the Contract Balance is defined as the total amount payable by City to Contractor as the Contract Price minus amounts already paid to Contractor, and minus any liquidated damages, credits, or backcharges to which City is entitled under the terms of the Contract.

5. **Contractor Default.** Upon written notification from City that Contractor is in default under Article 13 of the Contract General Conditions, time being of the essence, Surety must act within the time specified in Article 13 to remedy the default through one of the following courses of action:

   5.1 Arrange for completion of the Work under the Contract by Contractor, with City's consent, but only if Contractor is in default solely due to its financial inability to complete the Work;

5.2 Arrange for completion of the Work under the Contract by a qualified contractor acceptable to City, and secured by performance and payment bonds issued by an admitted surety as required by the Contract Documents, at Surety's expense, or

5.3 Waive its right to complete the Work under the Contract and reimburse City the amount of City's costs to have the remaining Work completed.

6. **Surety Default.** If Surety defaults on its obligations under the Bond, City will be entitled to recover all costs it incurs due to Surety's default, including legal, design professional, or delay costs.

7. **Notice.** Any notice to Surety may be given in the manner specified in the Contract and delivered or transmitted to Surety as follows:

Attn: _____
Address: _____
City/State/Zip: _____
Phone: _____
Fax: _____
Email: _____

8. **Law and Venue.** This Bond will be governed by California law, and venue for any dispute pursuant to this Bond will be in the Superior Court of Santa Clara County, and no other place. Surety will be responsible for City's attorneys' fees and costs in any action to enforce the provisions of this Bond.

9. **Effective Date; Execution.** This Bond is entered into and effective on _____, 20___.

[Signatures are on the following page.]

SURETY:

s/ _____

Name: _____

Title: _____

(Attach Acknowledgment with Notary Seal and Power of Attorney)

CONTRACTOR:

s/ _____

Name: _____

Title: _____

APPROVED AS TO FORM:

By:_____
Donald A. Larkin, City Attorney

Date:_____

END OF PERFORMANCE BOND

GENERAL CONDITIONS

Article 1 - Definitions

1.1 Definitions. The following definitions apply to all of the Contract Documents unless otherwise indicated, e.g., additional definitions that apply solely to the Specifications or other technical documents. Defined terms and titles of documents are capitalized in the Contract Documents, with the exception of the following (in any tense or form): “day,” “furnish,” “including,” “install,” “work day” or “working day.”

Allowance means a specific amount that must be included in the Bid Proposal for Work that may or may not be included in the Project, depending on conditions that will not become known until after bids are opened. If the Contract Price includes an Allowance and the cost of performing the Work covered by that Allowance is greater or less than the Allowance, the Contract Price will be increased or decreased accordingly.

Article, as used in these General Conditions, means a numbered Article of the General Conditions, unless otherwise indicated by the context.

Change Order means a written document duly approved and executed by City, which changes the scope of Work, the Contract Price, or the Contract Time.

City means the City of Morgan Hill, acting through its City Council, officers, employees, and authorized representatives.

City Engineer means the City Engineer for City and his or her authorized delegee(s) designated to oversee and manage the Project on City’s behalf.

Claim means a separate demand by Contractor for a change in the Contract Time or Contract Price, that has previously been submitted to City in accordance with the requirements of the Contract Documents, and which has been rejected by City, in whole or in part; or a written demand by Contractor objecting to the amount of Final Payment.

Contract means the signed agreement between City and Contractor for performing the Work required for the Project, and all documents expressly incorporated therein.

Contract Documents means, collectively, all of the documents listed as such in Section 2 of the Contract, including the Notice Inviting Bids; the Instructions to Bidders; addenda, if any; the Bid Proposal, and attachments thereto; the Contract; the Notice of Award and Notice to Proceed; the payment and performance bonds; the General Conditions; the Special Conditions; the Project Plans and Specifications; any Change Orders; and any other documents

expressly made part of the Contract Documents. The Contract Documents do not include documents provided “For Reference Only,” or documents that are intended solely to provide information regarding existing conditions.

Contract Price means the total compensation to be paid to Contractor for performance of the Work, as set forth in the Contract and as may be amended by Change Order or adjusted for an Allowance. The Contract Price is not subject to adjustment due to inflation or due to the increased cost of labor, material, supplies, or equipment following submission of the Bid Proposal. The Contract Price is deemed to include all applicable federal, state, and local taxes.

Contract Time means the number of calendar days specified for complete performance of the Work, as set forth in the Contract and as may be amended by Change Order.

Contractor means the individual, partnership, corporation, or joint-venture that has signed the Contract with City to perform the Work.

Day means a calendar day unless otherwise specified.

Design Professional means the licensed individual(s) or firm(s) retained by City to provide architectural or engineering services for the Project. If no Design Professional has been retained for this Project, any reference to Design Professional is deemed to refer to the Engineer.

DIR means the California Department of Industrial Relations.

Drawings has the same meaning as Plans.

Engineer means the City Engineer for the City of Morgan Hill and his or her authorized delegee(s).

Excusable Delay is defined in Section 5.3(B), Excusable Delay.

Extra Work means new or unforeseen work added to the Project, as determined by the Engineer in his or her sole discretion, including Work that was not part of or incidental to the scope of the Work when the Contractor’s bid was submitted; Work that is substantially different from the Work as described in the Contract Documents at bid time; or Work that results from a substantially differing and unforeseeable condition.

Final Completion means Contractor has fully completed all of the Work required by the Contract Documents to the City’s satisfaction, including all punch list items, and any required commissioning or training, and has provided the City with all required submittals, including the instructions and manuals, product warranties, and as-built drawings.

Final Payment means payment to Contractor of the unpaid Contract Price, including release of undisputed retention, less amounts withheld or deducted pursuant to the Contract Documents.

Furnish means to purchase and deliver for the Project.

Government Code Claim means a claim submitted pursuant to California Government Code § 900 et seq.

Hazardous Materials means any substance or material identified now or in the future as hazardous under any Laws, or any other substance or material that may be considered hazardous or otherwise subject to Laws governing handling, disposal, or cleanup.

Including, whether or not capitalized, means "including, but not limited to," unless the context requires otherwise.

Inspector means the individual(s) or firm(s) retained or employed by City to inspect the workmanship, materials, and manner of construction of the Project and its components to ensure compliance with the Contract Documents and all Laws.

Install means to fix in place for materials, and to fix in place and connect for equipment.

Law(s) means all applicable local, state, and federal laws, regulations, rules, codes, ordinances, permits, orders, and the like enacted or imposed by or under the auspices of any governmental entity with jurisdiction over any of the Work or any performance of the Work, including health and safety requirements.

Non-Excusable Delay is defined in Section 5.3(D), Non-Excusable Delay.
Plans means the City-provided plans, drawings, details, or graphical depictions of the Project requirements, but does not include Shop Drawings.

Project means the public works project referenced in the Contract.

Project Manager means the individual designated by City to oversee and manage the Project on City's behalf and may include his or her authorized delegee(s) when the Project Manager is unavailable. If no Project Manager has been designated for this Project, any reference to Project Manager is deemed to refer to the Engineer.

Recoverable Costs is defined in Section 5.3(F), Recoverable Costs.

Request for Information or RFI means a Contractor's written request for information about the Contract Documents, the Work or the Project, submitted to City in the manner and format specified by City.

Section, when capitalized in these General Conditions, means a numbered section or subsection of the General Conditions, unless the context clearly indicates otherwise.

Shop Drawings means drawings, plan details or other graphical depictions prepared by or on behalf of Contractor, and subject to City acceptance, which are intended to provide details for fabrication, installation, and the like, of items required by or shown in the Plans or Specifications.

Specialty Work means Work that must be performed by a specialized Subcontractor with the specified license or other special certification, and that the Contractor is not qualified to self-perform.

Specifications means the technical, text specifications describing the Project requirements, which are prepared for and incorporated into the Contract by or on behalf of City, and does not include the Contract, General Conditions or Special Conditions.

Subcontractor means an individual, partnership, corporation, or joint-venture retained by Contractor directly or indirectly through a subcontract to perform a specific portion of the Work. The term Subcontractor applies to subcontractors, suppliers, fabricators, and equipment lessors of all tiers, unless otherwise indicated by the context. A third party such as a utility performing related work on the Project is not a Subcontractor, even if Contractor must coordinate its Work with the third party.

Technical Specifications has the same meaning as Specifications.

Work means all of the construction and services necessary for or incidental to completing the Project in conformance with the requirements of the Contract Documents.

Work Day or Working Day, whether or not capitalized, means a weekday when the City is open for business, and does not include holidays observed by City.

Worksite means the place or places where the Work is performed, which includes, but may extend beyond the Project site, including separate locations for staging, storage, or fabrication.

Article 2 - Roles and Responsibilities

2.1 City.

(A) ***City Council.*** The City Council has final authority in all matters affecting the Project, except to the extent it has delegated authority to the Engineer.

(B) ***Engineer.*** The Engineer, acting within the authority conferred by the City Council, is responsible for administration of the Project on behalf of City, including authority to provide directions to the Design Professional and to Contractor to ensure proper and timely completion of the Project. The Engineer's decisions are final and conclusive within the scope of his or her authority, including interpretation of the Contract Documents.

(C) ***Project Manager.*** The Project Manager assigned to the Project will be the primary point of contact for the Contractor and will serve as City's representative, for daily administration of the Project on behalf of City. Unless otherwise specified, all of Contractor's communications to City (in any form) will go to or through the Project Manager. City reserves the right to reassign the Project Manager role at any time or to delegate duties to additional City representatives, without prior notice to or consent of Contractor.

(D) ***Design Professional.*** The Design Professional is responsible for the overall design of the Project, and, to the extent authorized by City, may act on City's behalf to ensure performance of the Work in compliance with the Plans and Specifications, including any design changes authorized by Change Order. The Design Professional's duties may include review of Contractor's submittals, visits to any Worksite, inspecting the Work, evaluating test and inspection results, and participation in Project-related meetings, including any pre-construction conference, weekly meetings, and coordination meetings. The Design Professional's interpretation of the Plans or Specifications is final and conclusive.

2.2 Contractor.

(A) ***General.*** Contractor must provide all labor, materials, supplies, equipment, services, and incidentals necessary to perform and timely complete the Work in strict accordance with the Contract Documents, and in an economical and efficient manner in the best interests of City, and with minimal inconvenience to the public.

(B) ***Responsibility for the Work and Risk of Loss.*** Contractor is responsible for supervising and directing all aspects of the Work to facilitate the efficient and timely completion of the Work. Contractor is

solely responsible for, and required to exercise full control over the Work, including the construction means, methods, techniques, sequences, procedures, safety precautions and programs, and coordination of all portions of the Work with that of all other contractors and Subcontractors, except to the extent that the Contract Documents provide other specific instructions. Contractor's responsibilities extend to any plan, method or sequence suggested, but not required by City or specified in the Contract Documents. From the date of commencement of the Work until either the date on which City formally accepts the Project or the effective date of termination of the Contract, whichever is later, Contractor bears all risks of injury or damage to the Work and the materials and equipment delivered to any Worksite, by any cause including fire, earthquake, wind, weather, vandalism or theft.

(C) ***Project Administration.*** Contractor must provide sufficient and competent administration, staff, and skilled workforce necessary to perform and timely complete the Work in accordance with the Contract Documents. Before starting the Work, Contractor must designate in writing and provide complete contact information, including telephone numbers and email address, for the officer or employee in Contractor's organization who is to serve as Contractor's primary representative for the Project, and who has authority to act on Contractor's behalf. A Subcontractor may not serve as Contractor's primary representative.

(D) ***On-Site Superintendent.*** Contractor must, at all times during performance of the Work, provide a qualified and competent full-time superintendent, acceptable to City, and assistants, as necessary, who must be physically present at the Project site while any aspect of the Work is being performed. The superintendent must have full authority to act and communicate on behalf of Contractor, and Contractor will be bound by the superintendent's communications to City. City's approval of the superintendent is required before the Work commences. If City is not satisfied with the superintendent's performance, City may request a qualified replacement of the superintendent. Failure to comply may result in temporary suspension of the Work, at Contractor's sole expense and with no extension of Contract Time, until an approved superintendent is physically present to supervise the Work. Contractor must provide written notice to City, as soon as practicable, before replacing the superintendent.

(E) ***Standards.*** Contractor must, at all times, ensure that the Work is performed in an efficient, skillful manner following best practices and in full compliance with the Contract Documents and Laws and applicable manufacturer's recommendations. Contractor has a material and ongoing obligation to provide true and complete information, to the best of its knowledge, with respect to all records, documents, or communications

pertaining to the Project, including oral or written reports, statements, certifications, Change Order requests, or Claims.

(F) ***Meetings.*** Contractor, its project manager, superintendent, and any primary Subcontractors requested by City, must attend a pre-construction conference, if requested by City, as well as weekly Project progress meetings scheduled with City. If applicable, Contractor may also be required to participate in coordination meetings with other parties relating to other work being performed on or near the Project site or in relation to the Project, including work or activities performed by City, other contractors, or other utility owners.

(G) ***Construction Records.*** Contractor will maintain up-to-date, thorough, legible, and dated daily job reports, which document all significant activity on the Project for each day that Work is performed on the Project. The daily report for each day must include the number of workers at the Project site; primary Work activities; major deliveries; problems encountered, including injuries, if any; weather and site conditions; and delays, if any. Contractor will take date and time-stamped photographs to document general progress of the Project, including site conditions prior to construction activities, before and after photographs at offset trench laterals, existing improvements and utilities, damage and restoration. Contractor will maintain copies of all subcontracts, Project-related correspondence with subcontractors, and records of meetings with Subcontractors. Upon request by the City, Contractor will permit review of and/or provide copies of any of these construction records.

(H) ***Responsible Party.*** Contractor is solely responsible to City for the acts or omissions of any Subcontractors, or any other party or parties performing portions of the Work or providing equipment, materials or services for or on behalf of Contractor or the Subcontractors. Upon City's written request, Contractor must promptly and permanently remove from the Project, at no cost to City, any employee, Subcontractor, or employee of a Subcontractor who the Engineer has determined to be incompetent, intemperate or disorderly, or who has failed or refused to perform the Work as required under the Contract Documents.

(I) ***Correction of Defects.*** Contractor must promptly correct, at Contractor's sole expense, any Work that is determined by City to be deficient or defective in any way, including workmanship, materials, parts or equipment. Workmanship, materials, parts or equipment that do not conform to the requirements under the Plans, Specifications and every other Contract Document, as determined by City, will be considered defective and subject to rejection. Contractor must also promptly correct, at Contractor's sole expense, any Work performed beyond the lines and grades shown on the Plans or established by City, and any Extra Work

performed without City's prior written approval. If Contractor fails to correct or to take reasonable steps toward correcting defective Work within five days following notice from City, or within the time specified in City's notice to correct, City may elect to have the defective Work corrected by its own forces or by a third party, in which case the cost of correction will be deducted from the Contract Price. If City elects to correct defective Work due to Contractor's failure or refusal to do so, City or its agents will have the right to take possession of and use any equipment, supplies, or materials available at the Project site or any Worksite on City property, in order to effectuate the correction, at no extra cost to City. Contractor's warranty obligations under Section 11.2, Warranty, will not be waived nor limited by City's actions to correct defective Work under these circumstances. Alternatively, City may elect to retain defective Work, and deduct the difference in value, as determined by the Engineer, from payments otherwise due to Contractor. This paragraph applies to any defective Work performed by Contractor during the one-year warranty period under Section 11.2.

(J) ***Contractor's Records.*** Contractor must maintain all of its records relating to the Project in any form, including paper documents, photos, videos, electronic records, approved samples, and the construction records required pursuant to paragraph (G), above. Project records subject to this provision include, but are not limited to, complete Project cost records and records relating to preparation of Contractor's bid, including estimates, take-offs, and price quotes or bids.

(1) Contractor's cost records must include all supporting documentation, including original receipts, invoices, and payroll records, evidencing its direct costs to perform the Work, including, but not limited to, costs for labor, materials and equipment. Each cost record should include, at a minimum, a description of the expenditure with references to the applicable requirements of the Contract Documents, the amount actually paid, the date of payment, and whether the expenditure is part of the original Contract Price, related to an executed Change Order, or otherwise categorized by Contractor as Extra Work. Contractor's failure to comply with this provision as to any claimed cost operates as a waiver of any rights to recover the claimed cost.

(2) Contractor must continue to maintain its Project-related records in an organized manner for a period of five years after City's acceptance of the Project or following Contract termination, whichever occurs first. Subject to prior notice to Contractor, City is entitled to inspect or audit any of Contractor's Project records relating to the Project or to investigate Contractor's plant or equipment during Contractor's normal business hours. The record-

keeping requirements set forth in this subsection 2.2(J) will survive expiration or termination of the Contract.

(K) ***Copies of Project Documents.*** Contractor and its Subcontractors must keep copies, at the Project site, of all Work-related documents, including the Contract, permit(s), Plans, Specifications, Addenda, Contract amendments, Change Orders, RFIs and RFI responses, Shop Drawings, as-built drawings, schedules, daily records, testing and inspection reports or results, and any related written interpretations. These documents must be available to City for reference at all times during construction of the Project.

2.3 Subcontractors.

(A) ***General.*** All Work which is not performed by Contractor with its own forces must be performed by Subcontractors, <subject to the 50% limitation set forth in the Instructions to Bidders>. City reserves the right to approve or reject any and all Subcontractors proposed to perform the Work, for reasons including the subcontractor's poor reputation, lack of relevant experience, financial instability, and lack of technical ability or adequately trained workforce. Each Subcontractor must obtain a City business license before performing any Work.

(B) ***Contractual Obligations.*** Contractor must require each Subcontractor to comply with the provisions of the Contract Documents as they apply to the Subcontractor's portion(s) of the Work, including the generally applicable terms of the Contract Documents, and to likewise bind their subcontractors. Contractor will provide that the rights that each Subcontractor may have against any manufacturer or supplier for breach of warranty or guarantee relating to items provided by the Subcontractor for the Project, will be assigned to City. Nothing in these Contract Documents creates a contractual relationship between a Subcontractor and City, but City is deemed to be a third-party beneficiary of the contract between Contractor and each Subcontractor. Copies of subcontracts must be available to the Engineer upon request. Before a Subcontractor commences Work on the Project, Contractor must provide the Engineer a written statement with the name of the Subcontractor, a description of each portion of the Work performed by the Subcontractor, and the percentage of the overall Work to be performed by the Subcontractor.

(C) ***Termination.*** If the Contract is terminated, each Subcontractor's agreement must be assigned by Contractor to City, subject to the prior rights of any surety, but only if and to the extent that City accepts, in writing, the assignment by written notification, and assumes all rights and obligations of Contractor pursuant to each such subcontract agreement.

(D) ***Substitution of Subcontractor.*** If Contractor requests substitution of a listed Subcontractor under Public Contract Code Section 4107, Contractor is solely responsible for all costs City incurs in responding to the request, including legal fees and costs to conduct a hearing, and any increased subcontract cost to perform the Work that was to be performed by the listed Subcontractor. If City determines that a Subcontractor is unacceptable to City based on the Subcontractor's failure to satisfactorily perform its Work, or for any of the grounds for substitution listed in Public Contract Code Section 4107(a), City may request removal of the Subcontractor from the Project. Upon receipt of a written request from City to remove a Subcontractor pursuant to this paragraph, Contractor will immediately remove the Subcontractor from the Project and, at no further cost to City, will either (1) self-perform the remaining Work to the extent that Contractor is duly licensed and qualified to do so, or (2) substitute a Subcontractor that is acceptable to City, in compliance with Public Contract Code Section 4107, as applicable.

2.4 Coordination of Work.

(A) ***Concurrent Work.*** City reserves the right to perform have performed, or permit performance of other work on or adjacent to the Project site while the Work is being performed for the Project. Contractor is responsible for coordinating its Work with other work being performed on or adjacent to the Project site, including by any utility companies or agencies, and must avoid hindering, delaying, or interfering with the work of other contractors, individuals, or entities, and must ensure safe and reasonable site access and use as required or authorized by City. To the full extent permitted by law, Contractor must hold harmless and indemnify City against any and all claims arising from or related to Contractor's avoidable, negligent, or willful hindrance of, delay to, or interference with the work of any utility company or agency or another contractor or subcontractor.

(B) ***Coordination.*** If Contractor's Work will connect or interface with work performed by others, Contractor is responsible for independently measuring and visually inspecting such work to ensure a correct connection and interface. Contractor is responsible for any failure by Contractor or its Subcontractors to confirm measurements before proceeding with connecting Work. Before proceeding with any portion of the Work affected by the construction or operations of others, Contractor must give the Project Manager prompt written notification of any defects Contractor discovers which will prevent the proper execution of the Work. Failure to give notice of any known or reasonably discoverable defects will be deemed acknowledgement by Contractor that the work of others is not defective and will not prevent the proper execution of the Work. Contractor must also promptly notify City if work performed by others, including work

or activities performed by City's own forces, is operating to hinder, delay, or interfere with Contractor's timely performance of the Work. City reserves the right to backcharge Contractor for any additional costs incurred due to Contractor's failure to comply with the requirements in this Section 2.4.

2.5 Submittals. Unless otherwise specified, Contractor must submit to Engineer for review and acceptance, all schedules, Shop Drawings, samples, product data and similar submittals required by the Contract Documents, or upon request by Engineer. Unless otherwise specified, all submittals, including Requests for Information (RFIs) are subject to the provisions of this Section, as well as specific submittal requirements that may be included elsewhere in the Contract Documents, including the Special Conditions or Specifications. The Engineer may require submission of a submittal schedule at or before a pre-construction conference, as may be specified in the Notice to Proceed.

(A) ***General.*** Contractor is responsible for ensuring that its submittals are accurate and conform to the Contract Documents.

(B) ***Time and Manner of Submission.*** Contractor must ensure that its submittals are prepared and delivered in a manner consistent with the current City-accepted schedule for the Work and within the applicable time specified elsewhere in the Contract Documents, or if no time is specified, in such time and sequence so as not to delay the performance of the Work or completion of the Project.

(C) ***Required Contents.*** Each submittal must include the Project name and contract number, Contractor's name and address, the name and address of any Subcontractor or supplier involved with the submittal, the date, and references to applicable Specification section(s) and/or drawing and detail number(s).

(D) ***Required Corrections.*** If corrections are required, Contractor must promptly make and submit any required corrections as specified in full conformance with the requirements of this Section, or other requirements that apply to that submittal.

(E) ***Effect of Review and Acceptance.*** Review and acceptance of a submittal by City will not relieve Contractor from complying with the requirements of the Contract Documents. Contractor is responsible for any errors in any submittal, and review or acceptance of a submittal by City is not an assumption of risk or liability by City.

(F) ***Enforcement.*** Any Work performed or any material furnished, installed, fabricated, or used without City's prior acceptance of a required

submittal is performed or provided at Contractor's risk, and Contractor may be required to bear the costs incident thereto, including the cost of removing and replacing such Work or material, repairs to other affected portions of the Work, and the cost of additional time or services required of City, including costs for the Design Professional, Project Manager, or Inspector.

(G) **Excessive RFIs.** An RFI will be considered excessive or unnecessary if the City determines that the explanation or response to the RFI is clearly and unambiguously discernable from the Contract Documents. City's costs to review and respond to excessive or unnecessary RFIs may be deducted from payments otherwise due to Contractor.

2.6 Shop Drawings. When Shop Drawings are required by the Specifications or requested by the Engineer, they must be prepared according to best practices at Contractor's expense. The Shop Drawings must be of a size and scale to clearly show all necessary details. Unless otherwise specified by City, Shop Drawings must be provided to the Engineer for review and acceptance at least 30 days before the Work will be performed. If City requires changes, the corrected Shop Drawings must be resubmitted to the Engineer for review within the time specified by the Engineer. For all Project components requiring Shop Drawings, Contractor will not furnish materials or perform any Work until the Shop Drawings for those components are accepted by City. Contractor is responsible for any errors or omissions in the Shop Drawings, shop fits and field corrections; any deviations from the Contract Documents; and for the results obtained by the use of Shop Drawings. Acceptance of Shop Drawings by City does not relieve Contractor of Contractor's responsibility.

2.7 Access to Work. Contractor must afford prompt and safe access to any Worksite by City and its employees, agents, or consultants authorized by City; and upon request by City, Contractor must promptly arrange for City representatives to visit or inspect manufacturing sites or fabrication facilities for items to be incorporated into the Work.

2.8 Personnel. Contractor and its Subcontractors must employ only competent and skillful personnel to perform the Work. Contractor and its Subcontractor's supervisors, security or safety personnel, and employees who have unescorted access to the Project site must possess proficiency in English sufficient to read, understand, receive, and implement oral or written communications or instructions relating to their respective job functions, including safety and security requirements. Upon written notification from the Engineer, Contractor and its Subcontractors must immediately discharge any personnel who are incompetent, disorderly, disruptive, threatening, abusive, or profane, or otherwise refuse or fail to comply with the requirements of the Contract Documents or Laws, including Laws pertaining to health and safety. Any such

discharged personnel may not be re-employed or permitted on the Project in any capacity without City's prior written consent.

Article 3 - Contract Documents

3.1 Interpretation of Contract Documents.

(A) ***Plans and Specifications.*** The Plans and Specifications included in the Contract Documents are complementary. If Work is shown on one but not on the other, Contractor must perform the Work as though fully described on both, consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results. The Plans and Specifications are deemed to include and require everything necessary and reasonably incidental to completion of the Work, whether or not particularly mentioned or shown. Contractor must perform all Work and services and supply all things reasonably related to and inferable from the Contract Documents. In the event of a conflict between the Plans and Specifications, the Specifications will control, unless the Plan(s) at issue are dated later than the Specification(s) at issue. Detailed drawings take precedence over general drawings, and large-scale drawings take precedence over smaller scale drawings. Any arrangement or division of the Plans and Specifications into sections is for convenience and is not intended to limit the Work required by separate trades. A conclusion presented in the Plans or Specifications is only a recommendation. Actual locations and depths must be determined by Contractor's field investigation. Contractor may request access to underlying or background information in City's possession that is necessary for Contractor to form its own conclusions.

(B) ***Duty to Notify and Seek Direction.*** If Contractor becomes aware of a changed condition in the Project, or of any ambiguity, conflict, inconsistency, discrepancy, omission, or error in the Contract Documents, including the Plans or Specifications, Contractor must promptly submit a Request for Information to the Engineer and wait for a response from City before proceeding further with the related Work. The RFI must notify the City of the issue and request clarification, interpretation, or direction. The Engineer's clarification, interpretation, or direction will be final and binding on Contractor. If Contractor proceeds with the related Work before obtaining City's response, Contractor will be responsible for any resulting costs, including the cost of correcting any incorrect or defective Work that results. Timely submission of a clear and complete RFI is essential to avoiding delay. Delay resulting from Contractor's failure to submit a timely and complete RFI to the Engineer is Non-Excusable Delay. If Contractor believes that City's response to an RFI justifies a change to the Contract Price or Contract Time, Contractor must perform the Work as directed, but

may submit a timely Change Order request in accordance with the Contract Documents. (See Article 5 and 6.)

(C) ***Figures and Dimensions.*** Figures control over scaled dimensions.

(D) ***Technical or Trade Terms.*** Any terms that have well-known technical or trade meanings will be interpreted in accordance with those meanings, unless otherwise specifically defined in the Contract Documents.

(E) ***Measurements.*** Contractor must verify all relevant measurements in the Contract Documents and at the Project site before ordering any material or performing any Work, and will be responsible for the correctness of those measurements or for costs that could have been avoided by independently verifying measurements.

(F) ***Compliance with Laws.*** The Contract Documents are intended to comply with Laws and will be interpreted to comply with Laws.

3.2 Order of Precedence. Information included in one Contract Document but not in another will not be considered a conflict or inconsistency. Unless otherwise specified in the Special Conditions, in case of any conflict or inconsistency among the Contract Documents, the following order of precedence will apply, beginning from highest to lowest, with the most recent version taking precedent over an earlier version:

(A) Change Orders;
(B) Addenda;
(C) Contract;
(D) Notice to Proceed;
(E) Appendix B- Federal Contract Requirements (only if used);
(F) Special Conditions;
(G) General Conditions;
(H) Payment and Performance Bonds;
(I) Specifications;
(J) Plans;
(K) Notice of Award
(L) Notice Inviting Bids;
(M) Appendix A – Federal Bidding Requirements (only if used);
(N) Instructions to Bidders;
(O) Contractor's Bid Proposal and attachments;
(P) The City's standard specifications, as applicable; and
(Q) Any generic documents prepared by and on behalf of a third party, that were not prepared specifically for this Project, such as Caltrans Standard Specifications or Caltrans Special Provisions.

3.3 Caltrans Standard Specifications. Any reference to or incorporation of the Standard Specifications of the State of California, Department of Transportation ("Caltrans"), including "Standard Specifications," "Caltrans Specifications," "State Specifications," or "CSS," means the most current edition of Caltrans' Standard Specifications, unless otherwise specified ("Caltrans Standard Specifications"), including the most current amendments as of the date that Contractor's bid was submitted for this Project. The following provisions apply to use of or reference to the Caltrans Standard Specifications or Special Provisions:

(A) ***Limitations.*** None of the "General Provisions" of the Caltrans Standard Specifications, i.e., Sections 1 through 9, applies to these Contract Documents with the exception of any specific provisions, if any, which are expressly stated to apply to these Contract Documents.

(B) ***Conflicts or Inconsistencies.*** If there is a conflict or inconsistency between any provision in the Caltrans Standard Specifications or Special Provisions and a provision of these Contract Documents, as determined by City, the provision in the Contract Documents will govern.

(C) ***Meanings.*** Terms used in the Caltrans Standard Specifications or Special Provisions are to be interpreted as follows:

(1) Any reference to the "Engineer" is deemed to mean the City Engineer.

(2) Any reference to the "Special Provisions" is deemed to mean the Special Conditions, unless the Caltrans Special Provisions are expressly included in the Contract Documents listed in Section 2 of the Contract.

(3) Any reference to the "Department" or "State" is deemed to mean City.

3.4 For Reference Only. Contractor is responsible for the careful review of any document, study, or report provided by the City or appended to the Contract Documents solely for informational purposes and identified as "For Reference Only." Nothing in any document, study, or report so appended and identified is intended to supplement, alter, or void any provision of the Contract Documents. Contractor is advised that City or its representatives may be guided by information or recommendations included in such reference documents, particularly when making determinations as to the acceptability of proposed materials, methods, or changes in the Work. Any record drawings or similar final or accepted drawings or maps that are not part of the Contract Documents are deemed to be For Reference Only. The provisions of the Contract Documents

are not modified by any perceived or actual conflict with provisions in any document that is provided For Reference Only.

3.5 Current Versions. Unless otherwise specified by City, any reference to standard specifications, technical specifications, or any City or state codes or regulations means the latest specification, code or regulation in effect at the time the Contract is signed.

3.6 Conformed Copies. If City prepares a conformed set of the Contract Documents following award of the Contract, it will provide Contractor with two hard copy (paper) sets and one copy of the electronic file in PDF format. It is Contractor's responsibility to ensure that all Subcontractors, including fabricators, are provided with the conformed set of the Contract Documents at Contractor's sole expense.

3.7 Ownership. No portion of the Contract Documents may be used for any purpose other than construction of the Project, without prior written consent from City. Contractor is deemed to have conveyed the copyright in any designs, drawings, specifications, Shop Drawings, or other documents (in paper or electronic form) developed by Contractor for the Project, and City will retain all rights to such works, including the right to possession.

Article 4 - Bonds, Indemnity, and Insurance

4.1 Payment and Performance Bonds. Within ten days following issuance of the Notice of Award, Contractor is required to provide a payment bond and a performance bond, each in the penal sum of not less than 100 percent of the Contract Price, and each executed by Contractor and its surety using the bond forms included with the Contract Documents.

(A) ***Surety.*** Each bond must be issued and executed by a surety admitted in California. If an issuing surety cancels the bond or becomes insolvent, within seven days following written notice from City, Contractor must substitute a surety acceptable to City. If Contractor fails to substitute an acceptable surety within the specified time, City may, at its sole discretion, withhold payment from Contractor until the surety is replaced to City's satisfaction, or terminate the Contract for default.

(B) ***Supplemental Bonds for Increase in Contract Price.*** If the Contract Price increases during construction by five percent or more over the original Contract Price, Contractor must provide supplemental or replacement bonds within ten days of written notice from City pursuant to this Section, covering 100% of the increased Contract Price and using the bond forms included with the Contract Documents.

4.2 Indemnity. To the fullest extent permitted by law, Contractor must indemnify, defend, and hold harmless City, its Council, officers, officials, employees, agents, volunteers, and consultants, (individually, an "Indemnitee," and collectively the "Indemnitees") from and against any and all liability, loss, damage, claims, causes of action, demands, charges, fines, costs, and expenses (including, without limitation, attorney fees, expert witness fees, paralegal fees, and fees and costs of litigation or arbitration) (collectively, "Liability") of every nature arising out of or in connection with the acts or omissions of Contractor, its employees, Subcontractors, representatives, or agents, in bidding or performing the Work or in failing to comply with any obligation of Contractor under the Contract, except such Liability caused by the active negligence, sole negligence, or willful misconduct of an Indemnitee. This indemnity requirement applies to any Liability arising from alleged defects in the content or manner of submission of Contractor's bid for the Contract. Contractor's failure or refusal to timely accept a tender of defense pursuant to this Contract will be deemed a material breach of this Contract. City will timely notify Contractor upon receipt of any third-party claim relating to the Contract, as required by Public Contract Code Section 9201. Contractor waives any right to express or implied indemnity against any Indemnitee. Contractor's indemnity obligations under this Contract will survive the expiration or any early termination of the Contract.

4.3 Insurance. No later than ten days following issuance of the Notice of Award, Contractor must procure and provide proof of the insurance coverage required by this Section in the form of certificates and endorsements acceptable to City. The required insurance must cover the activities of Contractor and its Subcontractors relating to or arising from the performance of the Work, and must remain in full force and effect at all times during the period covered by the Contract through the date of City's acceptance of the Project. The coverages may be arranged under a single policy for the full limits required or by a combination of underlying policies with the balance provided by excess or "umbrella" policies, provided each such policy complies with the requirements set forth herein. All required insurance must be issued by a company licensed to do business in the State of California, and each such insurer must have an A.M. Best's financial strength rating of "A" or better and a financial size rating of "VIII" or better. If Contractor fails to provide any of the required coverage in full compliance with the requirements of the Contract Documents, City may, at its sole discretion, purchase such coverage at Contractor's expense and deduct the cost from payments due to Contractor, or terminate the Contract for default. Contractor further understands that City reserves the right to modify the insurance requirements set forth herein, with thirty (30) days' notice provided to Contractor, at any time as deemed necessary to protect the interests of City. The procurement of the required insurance will not be construed to limit Contractor's liability under this Contract or to fulfill Contractor's indemnification obligations under this Contract.

(A) **Deductibles and Self-Insured Retentions.** Any deductibles or self-insured retentions must be declared to and approved by City. If the City's Risk Manager determines that the deductibles and/or self-insured retentions are unacceptably high, at City's option, Contractor must either reduce or eliminate the deductibles and/or self-insured retentions as they apply to City and all required Additional Insured; or must provide a financial guarantee, to City's satisfaction, guaranteeing payment of losses and related investigation, claim administration, and legal expenses.

(B) **Policies and Limits.** The following insurance policies and limits are required for this Contract unless otherwise specified in the Special Conditions:

(1) **Commercial General Liability Insurance ("CGL").** Contractor shall maintain CGL and must include coverage for liability arising from Contractor's or its Subcontractor's acts or omissions in the performance of the Work against claims and liabilities for personal injury, death, or property damage providing protection in the minimum amount of: (i) two million dollars ($2,000,000.00) combined single limit each occurrence and either a general aggregate limit of four million dollars ($4,000,000.00) or a general aggregate limit of two million dollars ($2,000,000.00) as applied on a "per project" or "per location" basis, or (ii) the maximum amount of such insurance available to Contractor under Contractor's combined insurance policies (including any excess or "umbrella" policies), whichever is greater.

a. CGL policy may not exclude explosion, collapse, underground excavation hazard, or removal of lateral support.

b. CGL policy must include contractor's protected coverage, blanket contractual, and completed operations.

(3) **Workers' Compensation Insurance and Employer's Liability***:* Contractor shall maintain Workers Compensation coverage, as required by law. The policy must comply with the requirements of the California Workers' Compensation Insurance and Safety Act and provide protection in the minimum amount of: (i) One Million Dollars ($1,000,000.00) for any one accident or occurrence, or (ii) the maximum amount of such insurance available to Contractor under Contractor's combined insurance policies (including any excess or "umbrella" policies), whichever is greater. If Contractor is self-insured, Contractor must provide its Certificate of Permission to Self-

Insure, duly authorized by the Department of Industrial Relations.

(4) **Automobile Liability**: Contractor shall maintain Automobile Liability covering all owned, non-owned and hired automobiles (if Contractor does not own automobiles, then Contractor shall maintain Hired/Non-owned Automobile Liability) against claims and liabilities for personal injury, death, or property damage providing protection in the minimum amount of: (i) One Million Dollars ($1,000,000.00) combined single limit, or (ii) the maximum amount of such insurance available to Contractor under Contractor's combined insurance policies (including any excess or "umbrella" policies), whichever is greater.

(5) **Pollution (Environmental) Liability**: If the performance of Contractor's work or service under this Contract involves hazardous materials, contaminated soil disposal, and/or a risk of accidental release of fuel oil, chemicals or other toxic gases or hazardous materials, Contractor shall procure and maintain Pollution Liability covering Contractor's liability for bodily injury, property damage and environmental damage resulting from pollution and related cleanup costs arising out of the work or services to be performed under this Contract. Coverage shall be provided for both work performed on site, as well as during the transport of hazardous materials. Such coverage shall be in the minimum amount of: (i) Two Million Dollars ($2,000,000.00) for any one accident or occurrence, or (ii) the maximum amount of such insurance available to Contractor under Contractor's combined insurance policies (including any excess or "umbrella" policies), whichever is greater.

(6) **Professional Liability**:

a. If the performance of Contractor's work or service under this Contract involves professional and/or technical services (examples include, but are not limited to, architects, engineers, land surveyors, legal services, and appraisers), Contractor shall procure and maintain either a claims made or occurrence Errors and Omission liability insurance in the minimum amount of: (i) One Million Dollars ($1,000,000.00) each claim, or (ii) the maximum amount of such insurance available to Contractor under Contractor's combined insurance policies (including any excess or "umbrella" policies), whichever is greater. Further, if Contractor maintains a claims-made policy, Contractor shall provide written evidence of such insurance to City for at least five (5)

years after the completion of work performed under this Contract.

(C) **Required Endorsements.** Contractor must provide proof of the following endorsements, listed for each policy for which endorsements are required, as outlined below:

(1) For all Policies except Builder's Risk and Professional Liability:

a. "Waiver of Subrogation" endorsements providing that the carrier agrees to waive any right of subrogation it may have against the City of Morgan Hill and the City's elected or appointed officials, boards, agencies, officers, agents, employees, and volunteers.

(2) General Liability, Automobile, and Pollution Liability:

a. "Additionally Insured" - The City of Morgan Hill, its elected or appointed officials, boards, agencies, officers, agents, employees, and volunteers are named as additional insureds on a form at least as broad as ISO Form CG 20 10 for ongoing operations and at least as broad as ISO Form CG 20 37 for completed operations.

b. "Primary and Non-Contributing" - Insurance shall be endorsed to be primary and non-contributory and will not seek contribution from the City's insurance or self-insurance and shall be at least as broad as ISO Form CG 20 01.

(3) General Liability:

a. Separation of Insureds" endorsements stating that the inclusion of more than one insured will not operate to impair the rights of one insured against another, and the coverages afforded will apply as though separate policies have been issued to each insured.

(D) **Subcontractors.** Contractor must ensure that each Subcontractor is required to maintain the same insurance coverage required under this Section 4.3, with respect to its performance of Work on the Project, including those requirements related to the additional insureds and waiver of subrogation. Contractor must confirm that each Subcontractor has complied with requirements as outlined herein. The insurance requirements for Subcontractors do not replace or limit the Contractor's

insurance obligations.

(E) **Certificates**. Contractor must furnish City with copies of all certificates as outlined herein, whether new or modified, promptly upon receipt. In the event of a claim or legal action, CONSULTANT shall promptly furnish CITY of Morgan Hill with copies of all policies outlined herein. No policy subject to Contractor's Contract with City shall be reduced, canceled, allowed to expire, or materially changed except after thirty (30) days' notice by the insurer to City, unless due to non-payment of premiums, in which case ten (10) days written notice must be made to City. Certificates, including renewal certificates, may be mailed electronically to riskmgmt@morganhill.ca.gov or delivered to the Certificate Holder address as follows:

City of Morgan Hill
Attn: Risk Management
17575 Peak Avenue
Morgan Hill, CA 95037

(F) ***Contractor's Responsibilities.*** This Section 4.3 establishes the minimum requirements for Contractor's insurance coverage in relation to this Project, but is not intended to limit Contractor's ability to procure additional or greater coverage. Contractor is responsible for its own risk assessment and needs and is encouraged to consult its insurance provider to determine what coverage it may wish to carry beyond the minimum requirements of this Section. Contractor is solely responsible for the cost of its insurance coverage, including premium payments, deductibles, or self-insured retentions, and no Additional Insured will be responsible or liable for any of the cost of Contractor's insurance coverage.

Article 5 - Contract Time

5.1 Time is of the Essence. Time is of the essence in Contractor's performance and completion of the Work, and Contractor must diligently prosecute the Work and complete it within the Contract Time.

(A) ***General.*** Contractor must commence the Work on the date indicated in the Notice to Proceed, and must fully complete the Work in strict compliance with all requirements of the Contract Documents and within the Contract Time. Contractor may not begin performing the Work before the date specified in the Notice to Proceed.

(B) ***Authorization***. Contractor is not entitled to compensation or credit for any Work performed before the date specified in the Notice to Proceed,

with the exception of any schedules, submittals, or other requirements, if any, that must be provided or performed before issuance of the Notice to Proceed

(C) ***Rate of Progress.*** Contractor and its Subcontractors must, at all times, provide workers, materials, and equipment sufficient to maintain the rate of progress necessary to ensure full completion of the Work within the Contract Time. If City determines that Contractor is failing to prosecute the Work at a sufficient rate of progress, City may, in its sole discretion, direct Contractor to provide additional workers, materials, or equipment, or to work additional hours or days without additional cost to City, in order to achieve a rate of progress satisfactory to City. If Contractor fails to comply with City's directive in this regard, City may, at Contractor's expense, separately contract for additional workers, materials, or equipment or use City's own forces to achieve the necessary rate of progress. Alternatively, City may terminate the Contract based on Contractor's default.

5.2 Schedule Requirements. Contractor must prepare all schedules using standard, commercial scheduling software acceptable to Engineer, and must provide the schedules in electronic and paper form as requested by the Engineer. In addition to the general scheduling requirements set forth below, Contractor must also comply with any scheduling requirements included in the Special Conditions or in the Technical Specifications.

(A) ***Baseline (As-Planned) Schedule.*** Within ten calendar days following City's issuance of the Notice to Proceed (or as otherwise specified in the Notice to Proceed), Contractor must submit to City for review and acceptance a baseline as-planned schedule using critical path methodology showing in detail how Contractor plans to perform and fully complete the Work within the Contract Time including labor, equipment, materials and fabricated items. The baseline schedule must show the order of the major items of Work and the dates of start and completion of each item, including when the materials and equipment will be procured. The schedule must also include the work of all trades reflecting anticipated labor or crew hours and equipment loading for the construction activities, and must be sufficiently comprehensive and detailed to enable progress to be monitored on a day-by-day basis. For each activity, the baseline schedule must be dated, provided in the format specified in the Contract Documents or as required by City, and must include, at a minimum, a description of the activity, the start and completion dates of the activity, and the duration of the activity.

(1) *Specialized Materials Ordering*. Within five calendar days following issuance of the Notice to Proceed, Contractor must order any specialized material or equipment for the Work that is not

readily available from material suppliers. Contractor must also retain documentation of the purchase orders date(s).

(B) ***City's Review of Schedules.*** City will review and may note exceptions to the baseline schedule, and to the progress schedules submitted as required below, to assure completion of the Work within the Contract Time. Contractor is solely responsible for resolving any exceptions noted in a schedule and, within seven days, must correct the schedule to address the exceptions. City's review or acceptance of Contractor's schedules will not operate to waive or limit Contractor's duty to complete the Project within the Contract Time, nor to waive or limit City's right to assess liquidated damages for Contractor's unexcused failure to do so.

(C) ***Progress Schedules.*** After City accepts the final baseline schedule with no exceptions, Contractor must submit an updated progress schedule and three week look-ahead schedule, in the format specified by City, for review and acceptance with each application for a progress payment or when otherwise specified by City, until completion of the Work. The updated progress schedule must show: how the actual progress of the Work as constructed to date compares to the baseline schedule; reflect any proposed changes in the construction schedule or method of operations, including to achieve Project milestones within the Contract Time; and identify any actual or potential impacts to the critical path. Contractor must also submit periodic reports to City of any changes in the projected material or equipment delivery dates for the Project.

(1) *Float.* The progress schedule must show early and late completion dates for each task. The number of days between those dates will be designated as the "float." Any float belongs to the Project and may be allocated by the Engineer to best serve timely completion of the Project.

(2) *Failure to Submit Schedule.* Reliable, up-to-date schedules are essential to efficient and cost-effective administration of the Project and timely completion. If Contractor fails to submit a schedule within the time periods specified in this Section, or submits a schedule to which City has noted exceptions that are not corrected, City may withhold up to ten percent from payment(s) otherwise due to Contractor until the exceptions are resolved, the schedule is corrected and resubmitted, and City has accepted the schedule. In addition, Contractor's failure to comply with the schedule requirements in this Section 5.2 will be deemed a material default and a waiver of any claims for Excusable Delay or loss of productivity arising during any period when Contractor is out of

compliance, subject only to the limits of Public Contract Code Section 7102.

(D) ***Recovery Schedule.*** If City determines that the Work is more than one week behind schedule, within seven days following written notice of such determination, Contractor must submit a recovery schedule, showing how Contractor intends to perform and complete the Work within the Contract Time, based on actual progress to date.

(E) ***Effect of Acceptance.*** Contractor and its Subcontractors must perform the Work in accordance with the most current City-accepted schedule unless otherwise directed by City. City's acceptance of a schedule does not operate to extend the time for completion of the Work or any component of the Work, and will not affect City's right to assess liquidated damages for Contractor's unexcused delay in completing the Work within the Contract Time.

(F) ***Posting.*** Contractor must at all times prominently post a copy of the most current City-accepted progress or recovery schedule in its on-site office.

(G) ***Reservation of Rights.*** City reserves the right to direct the sequence in which the Work must be performed or to make changes in the sequence of the Work in order to facilitate the performance of work by City or others, or to facilitate City's use of its property. The Contract Time or Contract Price may be adjusted to the extent such changes in sequence actually increase or decrease Contractor's time or cost to perform the Work.

(H) ***Authorized Working Days and Times.*** Contractor is limited to working Monday through Friday, excluding City of Morgan Hill-observed holidays, during City's normal business hours, except as expressly provided in the Special Conditions, or as authorized in writing by City. City reserves the right to charge Contractor for additional costs incurred by City due to Work performed on days or during hours not expressly authorized in the Contract Documents, including reimbursement of costs incurred for inspection, testing, and construction management services.

5.3 Delay and Extensions of Contract Time.

(A) ***Notice of Delay.*** If Contractor becomes aware of any actual or potential delay affecting the critical path, Contractor must promptly notify the Engineer in writing, regardless of the nature or cause of the delay, so that City has a reasonable opportunity to mitigate or avoid the delay.

(B) ***Excusable Delay.*** The Contract Time may be extended if Contractor encounters "Excusable Delay," which is an unavoidable delay in completing the Work within the Contract Time due to causes completely beyond Contractor's control, and which Contractor could not have avoided or mitigated through reasonable care, planning, foresight, and diligence, provided that Contractor is otherwise fully performing its obligations under the Contract Documents. Grounds for Excusable Delay may include fire, natural disasters, including earthquake or unusually severe weather, acts of terror or vandalism, epidemic, unforeseeable adverse government actions, unforeseeable actions of third parties, encountering unforeseeable hazardous materials, unforeseeable site conditions, or suspension for convenience under Article 13. The Contract Time will not be extended based on circumstances which will not unavoidably delay completing the Work within the Contract Time based on critical path analysis.

(C) ***Weather Delays.*** A "Weather Delay Day" is a Working Day during which Contractor and its forces, including Subcontractors, are unable to perform more than 40% of the critical path Work scheduled for that day due to adverse weather conditions which impair the ability to safely or effectively perform the scheduled critical path Work that day. Adverse weather conditions may include rain, saturated soil, and Project site clean-up required due to adverse weather. Determination of what constitutes critical path Work scheduled for that day will be based on the most current, City-approved schedule. Contractor will be entitled to a non-compensable extension of the Contract Time for each Weather Delay Day in excess of the normal Weather Delay Days within a given month as determined by reliable records, including monthly rainfall averages, for the preceding ten years (or as otherwise specified in the Special Conditions or Specifications).

(1) Contractor must fully comply with the applicable procedures in Articles 5 and 6 of the General Conditions regarding requests to modify the Contract Time.

(2) Contractor will not be entitled to an extension of time for a Weather Delay Day to the extent Contractor is responsible for concurrent delay on that day.

(2) Contractor must take reasonable steps to mitigate the consequences of Weather Delay Days, including prudent workforce management and protecting the Work, Project Site, materials, and equipment.

(D) ***Non-Excusable Delay****.* Delay which Contractor could have avoided or mitigated through reasonable care, planning, foresight and

diligence is “Non-Excusable Delay.” Contractor is not entitled to an extension of Contract Time or any compensation for Non-Excusable Delay, or for Excusable Delay that is concurrent with Non-Excusable Delay. Non-Excusable Delay includes delay caused by:

(1) weather conditions which are normal for the location of the Project, as determined by reliable records, including monthly rainfall averages, for the preceding ten years;

(2) Contractor’s failure to order equipment and materials sufficiently in advance of the time needed for completion of the Work within the Contract Time;

(3) Contractor’s failure to provide adequate notification to utility companies or agencies for connections or services necessary for completion of the Work within the Contract Time;

(4) foreseeable conditions which Contractor could have ascertained from reasonably diligent inspection of the Project site or review of the Contract Documents or other information provided to the Contractor;

(5) Contractor’s failure, refusal, or financial inability to perform the Work within the Contract Time, including insufficient funds to pay its Subcontractors or suppliers.

(6) performance or non-performance by Contractor’s Subcontractors or suppliers;

(7) the time required to respond to excessive RFIs (see Section 2.5(G));

(8) delayed submission of required submittals, or the time required for correction and resubmission of defective submittals;

(9) time required for repair of, re-testing, or re-inspection of defective Work;

(10) enforcement of Laws by City, or outside agencies with jurisdiction over the Work; or

(11) City’s exercise or enforcement of any of its rights or Contractor’s duties pursuant to the Contract Documents, including correction of defective Work, extra inspections or testing due to non-compliance with Contract requirements, safety compliance,

environmental compliance, or rejection and return of defective or deficient submittals.

(E) ***Compensable Delay.*** Pursuant to Public Contract Code Section 7102, in addition to entitlement to an extension of Contract Time, Contractor is entitled to compensation for costs incurred due to delay caused solely by City, when that delay is unreasonable under the circumstances involved and not within the contemplation of the parties ("Compensable Delay"). Contractor is not entitled to an extension of Contract Time or recovery of costs for Compensable Delay that is concurrent with Non-Excusable Delay. Delay due to causes that are beyond the control of either City or Contractor, including Weather Delay Days, discovery of Historic or Archeological Items pursuant to Section 7.18, or the actions or inactions of third parties or other agencies, is not Compensable Delay, and will only entitle Contractor to an extension of time commensurate with the time lost due to such delay.

(F) ***Recoverable Costs.*** Contractor is not entitled to compensation for Excusable Delay unless it is Compensable Delay, as defined above. Contractor is entitled to recover only the actual, direct, reasonable, and substantiated costs ("Recoverable Costs") for each working day that the Compensable Delay prevents Contractor from proceeding with more than 50% of the critical path Work scheduled for that day, based on the most recent progress schedule accepted by City. Recoverable Costs will not include home office overhead or lost profit.

(G) ***Request for Extension of Contract Time or Recoverable Costs.*** A request for an extension of Contract Time or any associated Recoverable Costs must be submitted in writing to City within ten calendar days of the date the delay is first encountered, even if the duration of the delay is not yet known at that time, or any entitlement to the Contract Time extension or to the Recoverable Costs will be deemed waived. In addition to complying with the requirements of this Article 5, the request must be submitted in compliance with the Change Order request procedures in Article 6, below. Strict compliance with these requirements is necessary to ensure that any delay or consequences of delay may be mitigated as soon as possible, and to facilitate cost-efficient administration of the Project and timely performance of the Work. Any request for an extension of Contract Time or Recoverable Costs that does not strictly comply with all of the requirements of Article 5 and Article 6 will be deemed waived.

(1) *Required Contents.* The request must include a detailed description of the cause(s) of the delay, and must also describe the measures that Contractor has taken to mitigate the delay and/or its effects, including efforts to mitigate the cost impact of the delay, such as by workforce management, or by a change in sequencing.

If the delay is still ongoing at the time the request is submitted, the request should also include Contractor's plan for continued mitigation of the delay or its effects.

(2) *Delay Days and Costs.* The request must specify the number of days of Excusable Delay claimed, or provide a realistic estimate if the duration of the delay is not yet known. If the Contractor believes it is entitled to Recoverable Costs for Compensable Delay, the request must specify the amount of and basis for the Recoverable Costs that are claimed or provide a realistic estimate if the amount is not yet known. Any estimate of delay duration or cost must be updated in writing and submitted with all required supporting documentation as soon as the actual time and cost is known. The maximum extension of Contract Time will be the number of days, if any, by which an Excusable Delay or a Compensable Delay exceeds any concurrent Non-Excusable Delay. Contractor is entitled to an extension of Contract Time, or compensation for Recoverable Costs, only if, and only to the extent that, such delay will unavoidably delay Final Completion.

(3) *Supporting Documentation.* The request must also include any and all supporting documentation necessary to evidence the delay and its actual impacts, including scheduling and cost impacts, with a time impact analysis using critical path methodology, and demonstrating the unavoidable delay to Final Completion. The time impact analysis must be submitted in a form or format acceptable to City.

(4) *Burden of Proof.* Contractor has the burden of proving that the delay was an Excusable or Compensable Delay, as defined above; Contractor has fully complied with its scheduling obligations in Section 5.2, Schedule Requirements; Contractor has made reasonable efforts to mitigate the delay and its schedule and cost impacts; the delay will unavoidably result in delaying Final Completion, and any Recoverable Costs claimed by Contractor were actually incurred and were reasonable under the circumstances.

(5) *Legal Compliance.* Nothing in this Section 5.3 is intended to require the waiver, alteration, or limitation of the applicability of Public Contract Code Section 7102.

(6) *No Waiver.* Any grant of an extension of Contract Time or compensation for Recoverable Costs due to Compensable Delay will not operate as a waiver of City's right to assess liquidated damages for Non-Excusable Delay.

(7) *Dispute Resolution.* In the event of a dispute over entitlement to an extension of Contract Time or compensation for Recoverable Costs, Contractor may not stop Work pending resolution of the dispute, but must continue to comply with its duty to diligently prosecute the performance and timely completion of the Work. Contractor's sole recourse for an unresolved dispute based on City's rejection of a Change Order request for an extension of Contract Time or compensation for Recoverable Costs is to comply with the dispute resolution provisions set forth in Article 12, below.

5.4 Liquidated Damages. It is expressly understood that if Final Completion is not achieved within the Contract Time, City will suffer damages from the delay that are difficult to determine and accurately specify. Pursuant to Public Contract Code section 7203, if Contractor fails to achieve Final Completion within the Contract Time, City will charge Contractor in the amount specified in the Contract for each day that Final Completion is delayed beyond the Contract Time, as liquidated damages and not as a penalty. Any waiver of accrued liquidated damages, in whole or in part, is subject to approval of the City Council or its authorized delegee.

(A) ***Liquidated Damages.*** Liquidated damages will not be assessed for any Excusable or Compensable Delay, as set forth above.

(B) ***Milestones.*** Liquidated damages may also be separately assessed for failure to meet milestones specified elsewhere in the Contract Documents.

(C) ***Setoff.*** City is entitled to deduct the amount of liquidated damages assessed against any payments otherwise due to Contractor, including progress payments, Final Payment, or unreleased retention. If there are insufficient Contract funds remaining to cover the full amount of liquidated damages assessed, City is entitled to recover the balance from Contractor or its performance bond surety.

(D) ***Occupancy or Use.*** Occupancy or use of the Project in whole or in part prior to Final Completion does not constitute City's acceptance of the Project and will not operate as a waiver of City's right to assess liquidated damages for Contractor's Non-Excusable Delay in achieving Final Completion.

(E) ***Other Remedies.*** City's right to liquidated damages under this Section applies only to damages arising from Contractor's Non-Excusable Delay or failure to complete the Work within the Contract Time. City retains its right to pursue all other remedies under the Contract for other types of damage, including damage to property or persons, costs or

diminution in value from defective materials or workmanship, costs to repair or complete the Work, or other liability caused by Contractor.

Article 6 - Contract Modification

6.1 Contract Modification. Subject to the limited exception set forth in subsection (D) below, any change in the Work or the Contract Documents, including the Contract Price or Contract Time, will not be a valid and binding change to the Contract unless it is formalized in a Change Order, including a "no-cost" Change Order or a unilateral Change Order. Changes in Work will not operate to release, limit, or abridge Contractor's warranty obligations pursuant to Article 11 or any obligations of Contractor's bond sureties.

(A) ***City-Directed Changes.*** City may direct changes in the scope or sequence of Work or the requirements of the Contract Documents, without invalidating the Contract. Such changes may include Extra Work as set forth in subsection (C) below, or deletion or modification of portions of the Work. Contractor must promptly comply with City-directed changes in the Work in accordance with the intent of the original Contract Documents, even if Contractor and City have not yet reached agreement as to adjustments to the Contract Price or Contract Time for the change in the Work or for the Extra Work. Contractor is not entitled to extra compensation for cost savings resulting from "value engineering" pursuant to Public Contract Code Section 7101, except to the extent authorized in advance by City in writing, and subject to any applicable procedural requirements for submitting a proposal for value engineering cost savings.

(B) ***Disputes.*** In the event of a dispute over entitlement to or the amount of a change in Contract Time or a change in Contract Price related to extra City-directed change in the Work, Contractor must perform the Work as directed and may not delay its Work or cease Work pending resolution of the dispute, but must continue to comply with its duty to diligently prosecute the performance and timely completion of the Work, including the Work in dispute. Likewise, in the event that City and Contractor dispute whether a portion or portions of the Work are already required by the Contract Documents or constitute Extra Work, or otherwise dispute the interpretation of any portion(s) of the Contract Documents, Contractor must perform the Work as directed and may not delay its Work or cease Work pending resolution of the dispute, but must continue to comply with its duty to diligently prosecute the performance and timely completion of the Work, including the Work in dispute, as directed by City. If Contractor refuses to perform the Work in dispute, City may, acting in its sole discretion, elect to delete the Work from the Contract and reduce the Contract Price accordingly, and self-perform the

Work or direct that the Work be performed by others. Alternatively, City may elect to terminate the Contract for convenience or for cause. Contractor's sole recourse for an unresolved dispute related to changes in the Work or performance of any Extra Work is to comply with the dispute resolution provisions set forth in Article 12, below.

(C) ***Extra Work.*** City may direct Contractor to perform Extra Work related to the Project. Contractor must promptly perform any Extra Work as directed or authorized by City in accordance with the original Contract Documents, even if Contractor and City have not yet reached agreement on adjustments to the Contract Price or Contract Time for such Extra Work. If Contractor believes it is necessary to perform Extra Work due to changed conditions, Contractor must promptly notify the Engineer in writing, specifically identifying the Extra Work and the reason(s) the Contractor believes it is Extra Work. This notification requirement does not constitute a Change Order request pursuant to Section 6.2, below. Contractor must maintain detailed daily records that itemize the cost of each element of Extra Work, and sufficiently distinguish the direct cost of the Extra Work from the cost of other Work performed. For each day that Contractor performs Extra Work, or Work that Contractor contends is Extra Work, Contractor must submit no later than the following Working Day, a daily report of the Extra Work performed that day and the related costs, together with copies of certified payroll, invoices, and other documentation substantiating the costs ("Extra Work Report"). The Engineer will make any adjustments to Contractor's Extra Work Report(s) based on the Engineer's records of the Work. When an Extra Work Report(s) is agreed on and signed by both City and Contractor, the Extra Work Report(s) will become the basis for payment under a duly authorized and signed Change Order. Failure to submit the required documentation by close of business on the next Working Day is deemed a full and complete waiver for any change in the Contract Price or Contract Time for any Extra Work performed that day.

(D) ***Minor Changes and RFIs.*** Minor field changes, including RFI replies from City, that do not affect the Contract Price or Contract Time and that are approved by the Engineer acting within his or her scope of authority, do not require a Change Order. By executing an RFI reply from City, Contractor agrees that it will perform the Work as clarified therein, with no change to the Contract Price or Contract Time.

(E) ***Remedy for Non-Compliance.*** Contactor's failure to promptly comply with a City-directed change is deemed a material breach of the Contract, and in addition to all other remedies available to it, City may, at its sole discretion, hire another contractor or use its own forces to

complete the disputed Work at Contractor's sole expense, and may deduct the cost from the Contract Price.

6.2 Contractor Change Order Requests. Contractor must submit a request or proposal for a change in the Work, compensation for Extra Work, or a change in the Contract Price or Contract Time as a written Change Order request or proposal.

(A) ***Time for Submission.*** Any request for a change in the Contract Price or the Contract Time must be submitted in writing to the Engineer within ten calendar days of the date that Contractor first encounters the circumstances, information or conditions giving rise to the Change Order request, even if the total amount of the requested change in the Contract Price or impact on the Contract Time is not yet known at that time. If City requests that Contractor propose the terms of a Change Order, unless otherwise specified in City's request, Contractor must provide the Engineer with a written proposal for the change in the Contract Price or Contract Time within five working days of receiving City's request, in a form satisfactory to the Engineer.

(B) ***Required Contents.*** Any Change Order request or proposal submitted by Contractor must include a complete breakdown of actual or estimated costs and credits, and must itemize labor, materials, equipment, taxes, insurance, subcontract amounts, and if applicable, Extra Work Reports. Any estimated cost must be updated in writing as soon as the actual amount is known.

(C) ***Required Documentation.*** All claimed costs must be fully documented, and any related request for an extension of time or delay-related costs must be included at that time and in compliance with the requirements of Article 5 of the General Conditions. Upon request, Contractor must permit City to inspect its original and unaltered bidding records, subcontract agreements, subcontract change orders, purchase orders, invoices, or receipts associated with the claimed costs.

(D) ***Required Form.*** Contractor must use City's form(s) for submitting all Change Order requests or proposals, unless otherwise specified by City.

(E) ***Certification.*** All Change Order requests must be signed by Contractor and must include the following certification:

> "The undersigned Contractor certifies under penalty of perjury that its statements and representations in this Change Order request are true and correct. Contractor warrants that this Change Order request is comprehensive and complete as to the Work or

Changes referenced herein, and agrees that any costs, expenses, or time extension requests not included herein are deemed waived."

6.3 Adjustments to Contract Price. The amount of any increase or decrease in the Contract Price will be determined based on one of the following methods listed below, in the order listed with unit pricing taking precedence over the other methods. Markup applies only to City-authorized time and material Work, and does not apply to any other payments to Contractor. For Work items or components that are deleted in their entirety, Contractor will only be entitled to compensation only for those direct, actual, and documented costs (including restocking fees), reasonably incurred before Contractor was notified of the City's intent to delete the Work, with no markup for overhead, profit, or other indirect costs.

(A) ***Unit Pricing.*** Amounts previously provided by Contractor in the form of unit prices, either in a bid schedule or in a post-award schedule of values pursuant to Section 8.1 Schedule of Values, will apply to determine the price for the affected Work, to the extent applicable unit prices have previously been provided for that type of Work. No additional markup for overhead, profit, or other indirect costs. will be added to the calculation.

(B) ***Lump Sum.*** A mutually agreed upon, all-inclusive lump sum price for the affected Work with no additional markup for overhead, profit, or other indirect costs;

(C) ***Time and Materials.*** On a time and materials basis, if and only to the extent compensation on a time and materials basis is expressly authorized by City in advance of Contractor's performance of the Work and subject to any not-to-exceed limit. Time and materials compensation for increased costs or Extra Work (but not decreased costs or deleted Work), will include allowed markup for overhead, profit, and other indirect costs, and which may include a not-to-exceed limit, calculated as the total of the following sums, the cumulative total of which may not exceed the maximum markup rate of 15%:

(1) All direct labor costs provided by the Contractor, excluding superintendence, project management, or administrative costs plus 15 percent markup;

(2) All direct material costs provided by the Contractor, including sales tax, plus 15 percent markup;

(3) All direct plant and equipment rental costs provided by the Contractor, plus 15 percent markup;

(4) All direct additional subcontract costs plus ten percent markup for Work performed by Subcontractors; and

(5) Increased bond or insurance premium costs computed at 1.5% percent of total of the previous four sums.

6.4 Unilateral Change Order. If the parties dispute the terms of a proposed Change Order, including disputes over the amount of compensation or extension of time that Contractor has requested, the value of deleted or changed Work, what constitutes Extra Work, or quantities used, City may elect to issue a unilateral Change Order, directing performance of the Work, and authorizing a change in the Contract Price or Contract Time for the amount of compensation or added time that the City believes is merited. Contractor's sole recourse to dispute the terms of a unilateral Change Order is to submit a timely Claim pursuant to Article 12, below.

6.5 Non-Compliance Deemed Waiver. Contractor waives its entitlement to any increase in the Contract Price or Contract Time if Contractor fails to fully comply with the provisions of this Article. Contractor will not be paid for unauthorized Extra Work.

Article 7 - General Construction Provisions

7.1 Permits, Fees, Business License, and Taxes.

(A) ***Permits, Fees, and City Business License.*** Contractor must obtain and pay for all permits, fees, or licenses required to perform the Work, including a City business license. Contractor must cooperate with and provide notifications to all government agencies with jurisdiction over the Project, as may be required. Contractor must provide City with copies of all records of permits and permit applications, payment of required fees, and any licenses required for the Work.

(B) ***Taxes.*** Contractor must pay for all taxes on labor, material and equipment, except Federal Excise Tax to the extent that City is exempt from Federal Excise Tax.

7.2 Temporary Facilities. Contractor must provide, at Contractor's sole expense, any and all temporary facilities for the Project, including an onsite staging area for materials and equipment, a field office, sanitary facilities, utilities, storage, scaffolds, barricades, walkways, and any other temporary structure required to safely perform the Work along with any incidental utility services. The location of all temporary facilities must be approved by the City prior to installation. Temporary facilities must be safe

and adequate for the intended use, and installed and maintained in accordance with Laws and the Contract Documents. Contractor must fence and screen the Project site and, if applicable, any separate Worksites, including the staging area, and its operation must minimize inconvenience to neighboring properties. Additional provisions pertaining to temporary facilities may be included in the Specifications or Special Conditions.

(A) ***Utilities***. Contractor must install and maintain the power, water, sewer and all other utilities required for the Project site, including the piping, wiring, internet and Wi-Fi connections, and any related equipment necessary to maintain the temporary facilities.

(B) ***Removal and Repair.*** Contractor must promptly remove all such temporary facilities when they are no longer needed or upon completion of the Work, whichever comes first. Contractor must promptly repair any damage to City's property or to other property caused by the installation, use, or removal of the temporary facilities, and must promptly restore the property to its original or intended condition.

7.3 Noninterference and Site Management. Contractor must avoid interfering with City's use of its property at or adjacent to the Project site, including use of roadways, entrances, parking areas, walkways, and structures. Contractor must also minimize disruption of access to private property in the Project vicinity. Contractor must coordinate with affected property owners, tenants, and businesses, and maintain some vehicle and pedestrian access to their residences or properties at all times. Temporary access ramps, fencing or other measures must be provided as needed. Before blocking access to a private driveway or parking lot, Contractor must provide effective notice to the affected parties at least 48 hours in advance of the pending closure and allow them to remove vehicles. Private driveways, residences and parking lots must have access to a roadway during non-Work hours.

(A) ***Offsite Acquisition.*** Unless otherwise provided by City, Contractor must acquire, use and dispose of, at its sole expense, any additional Worksites, licenses, easements, and temporary facilities necessary to access and perform the Work.

(B) ***Offsite Staging Area and Field Office.*** If additional space beyond the Project site is needed, such as for the staging area or the field office, Contractor may need to make arrangements with the nearby property owner(s) to secure the space. Before using or occupying any property owned by a third party, Contractor must provide City with a copy of the necessary license agreement, easement, or other written authorization from the property owner, together with a written release from the property

owner holding City harmless from any related liability, in a form acceptable to the City Attorney.

(C) ***Traffic Management.*** Contractor must provide traffic management and traffic controls as specified in the Contract Documents, as required by Laws, and as otherwise required to ensure the public and worker safety, and to avoid interference with public or private operations or the normal flow of vehicular, bicycle, or pedestrian traffic.

7.4 Signs. No signs may be displayed on or about City's property, except signage which is required by Laws or by the Contract Documents, without City's prior written approval as to size, design, and location.

7.5 Project Site and Nearby Property Protections.

(A) ***General.*** Contractor is responsible at all times, on a 24-hour basis and at its sole cost for protecting the Work, the Project site, and the materials and equipment to be incorporated into the Work until the City has accepted the Project, excluding any exceptions to acceptance, if any. Except as specifically authorized by City, Contractor must confine its operations to the area of the Project site indicated in the Plans and Specifications. Contractor is liable for any damage caused by Contractor or its Subcontractors to the Work, City's property, the property of adjacent or nearby property owners and the work or personal property of other contractors working for City, including damage related to Contractor's failure to adequately secure the Work or any Worksite.

(1) Subject to City's approval, Contractor will provide and install safeguards to protect the Work; any Worksite, including the Project site; City's real or personal property and the real or personal property of adjacent or nearby property owners, including plant and tree protections.

(2) City wastewater systems may not be interrupted. If the Work disrupts existing sewer facilities, Contractor must immediately notify City and establish a plan, subject to City's approval, to convey the sewage in closed conduits back into the sanitary sewer system. Sewage must not be permitted to flow in trenches or be covered by backfill.

(3) Contractor must remove with due care, and store at City's request, any objects or material from the Project site that City will salvage or reuse at another location.

(4) If directed by Engineer, Contractor must promptly repair or replace any property damage, as specified by the Engineer.

However, acting in its sole discretion, City may elect to have the property damage remedied otherwise, and may deduct the cost to repair or replace the damaged property from payment otherwise due to Contractor.

(5) Contractor will not permit any structure or infrastructure to be loaded in a manner that will damage or endanger the integrity of the structure or infrastructure.

(B) ***Securing Project Site.*** After completion of Work each day, Contractor must secure the Project site and, to the extent feasible, make the area reasonably accessible to the public unless City approves otherwise. All excess materials and equipment not protected by approved traffic control devices must be relocated to the staging area or demobilized. Trench spoils must be hauled off the Project site daily and open excavations must be protected with steel plates. Contractor and Subcontractor personnel may not occupy or use the Project site for any purpose during non-Work hours, except as may be provided in the Contract Documents or pursuant to prior written authorization from City.

(C) ***Unforeseen Conditions.*** If Contractor encounters facilities, utilities, or other unknown conditions not shown on or reasonably inferable from the Plans or apparent from inspection of the Project site, Contractor must immediately notify the City and promptly and submit a Request for Information to obtain further directions from the Engineer. Contractor must avoid taking any action which could cause damage to the facilities or utilities pending further direction from Engineer. If Engineer's subsequent direction to Contractor affects Contractor's cost or time to perform the Work, Contractor may submit a Change Order request as set forth in Article 6, above.

(D) ***Support; Adjacent Properties.*** Contractor must provide, install, and maintain all shoring, bracing, and underpinning necessary to provide support to City's property and adjacent properties and improvements thereon. Contractor must provide notifications to adjacent property owners as may be required by Laws. See also Section 7.15 Trenching of Five Feet or More.

(E) ***Notification of Property Damage.*** Contractor must immediately notify the City of damage to any real or personal property resulting from Work on the Project. Contractor must immediately provide a written report to City of any such property damage in excess of $500 (based on estimated cost to repair or replace) within 24 hours of the occurrence. The written report must include: (1) the location and nature of the damage, and the owner of the property, if known; (2) the name and address of each employee of Contractor or any Subcontractor involved in the damage; (3)

a detailed description of the incident, including precise location, time, and names and contact information for known witnesses; and (4) a police or first responder report, if applicable. If Contractor is required to file an accident report with another government agency, Contractor will provide a copy of the report to City.

7.6 Materials and Equipment.

(A) ***General.*** Unless otherwise specified, all materials and equipment required for the Work must be new, free from defects, and of the best grade for the intended purpose, and furnished in sufficient quantities to ensure the proper and expeditious performance of the Work. . Contractor must employ measures to preserve the specified quality and fitness of the materials and equipment. Unless otherwise specified, all materials and equipment required for the Work are deemed to include all components required for complete installation and intended operation, and must be installed in accordance with the manufacturer's recommendations or instructions. Contractor is responsible for all shipping, handling, and storage costs associated with the materials and equipment required for the Work. Contractor is responsible for providing security and protecting the Work and all of the required materials, supplies, tools and equipment at Contractor's sole cost until City has formally accepted the Project as set forth in Section 11.1, Final Completion. Contractor will not assign, sell, mortgage, or hypothecate any materials or equipment for the Project, or remove any materials or equipment that have been installed or delivered.

(B) ***City-Provided.*** If the Work includes installation of materials or equipment to be provided by City, Contractor is solely responsible for the proper examination, handling, storage, and installation in accordance with the Contract Documents. Contractor must notify City of any defects discovered in City-provided materials or equipment sufficiently in advance of scheduled use or installation to afford adequate time to procure replacement materials or equipment as needed. Contractor is solely responsible for any loss of or damage to such items which occurs while the items are in Contractor's custody and control, the cost of which may be offset from the Contract Price and deducted from any payment(s) due to Contractor.

(C) ***Intellectual Property Rights.*** Contractor must, at its sole expense, obtain any authorization or license required for use of patented or copyright-protected materials, equipment, devices or processes that are incorporated into the Work. Contractor's indemnity obligations in Article 4 apply to any claimed violation of intellectual property rights in violation of this provision.

7.7 Substitutions.

(A) ***"Or Equal."*** Any Specification designating a material, product, or thing (collectively "item") or service by specific brand or trade name, followed by the words "or equal," is intended only to indicate the quality and type of item or service desired, and Contractor may request use of any equal item or service. Unless otherwise stated in the Specifications, any reference to a specific brand or trade name for an item that is used solely for the purpose of describing the type of item desired, will be deemed to be followed by the words "or equal." A substitution will only be approved if it is a true "equal" item in every aspect of design, function, and quality, as determined by City, including dimensions, weight, maintenance requirements, durability, fit with other elements, and schedule impacts.

(B) ***Request for Substitution.*** A post-award request for substitution of an item or service must be submitted in writing to the Engineer for approval in advance, within the applicable time period provided in the Contract Documents. If no time period is specified, the substitution request may be submitted any time within 35 days after the date of award of the Contract, or sufficiently in advance of the time needed to avoid delay of the Work, whichever is earlier.

(C) ***Substantiation.*** Any available data substantiating the proposed substitute as an equal item or service must be submitted with the written request for substitution. Contractor's failure to timely provide all necessary substantiation, including any required test results as soon as they are available, is grounds for rejection of the proposed substitution, without further review.

(D) ***Burden of Proving Equality.*** Contractor has the burden of proving the equality of the proposed substitution. City has sole discretion to determine whether a proposed substitution at Contractor's sole cost is equal, and City's determination is final.

(E) ***Approval or Rejection.*** If the proposed substitution is approved, Contractor is solely responsible for any additional costs or time associated with the substituted item or service. If the proposed substitution is rejected, Contractor must, without delay, install the item or use the service as specified by the City.

(F) ***Contractor's Obligations.*** City's approval of a proposed substitution will not relieve Contractor from any of its obligations under the Contract Documents. In the event Contractor makes an unauthorized substitution, Contractor will be solely responsible for all resulting cost impacts, including the cost of removal and replacement and the impact to other design elements.

7.8 Testing and Inspection.

(A) ***General.*** All materials, equipment, and workmanship used in the Work are subject to inspection and testing by City at all times and locations during construction and/or fabrication and at any Worksite, including at shops and yards as well as at the Project site. All manufacturers' application or installation instructions must be provided to the Inspector at least ten days prior to the first such application or installation. Contractor must, at all times, make the Work available for testing or inspection. Neither City's inspection or testing of Work, nor its failure to do so, operate to waive or limit Contractor's duty to complete the Work in accordance with the Contract Documents.

(B) ***Scheduling and Notification.*** Contractor must cooperate with City in coordinating the inspections and testing. Contractor must submit samples of materials, at Contractor's expense, and schedule all tests required by the Contract Documents in time to avoid any delay to the progress of the Work. Contractor must notify the Engineer no later than noon of the Working Day before any inspection or testing and must provide timely notice to the other necessary parties as specified in the Contract Documents. If Contractor schedules an inspection or test beyond regular Work hours, or on a Saturday, Sunday, or recognized City holiday, Contractor must notify the Engineer at least two Working Days in advance for approval. If approved, Contractor must reimburse City for the cost of the overtime inspection or testing. Such costs, including the City's hourly costs for required personnel, may be deducted from payments otherwise due to Contractor.

(C) ***Responsibility for Costs.*** City will bear the initial cost of inspection and testing to be performed by independent testing consultants retained by City, subject to the following exceptions:

(1) Contractor will be responsible for the costs of any subsequent tests which are required to substantiate compliance with the Contract Documents, and any associated remediation costs.

(2) Contractor will be responsible for inspection costs, at City's hourly rates, for inspection time lost because the Work is not ready, or Contractor fails to appear for a scheduled inspection.

(3) If any portion of the Work that is subject to inspection or testing is covered or concealed by Contractor prior to the inspection or testing, Contractor will bear the cost of making that portion of the Work available for the inspection or testing required by the Contract Documents, and any associated repair or remediation costs.

(3) Contractor is responsible for properly shoring all compaction test sites deeper than five feet below grade, as required under Section 7.15 below.

(4) Any Work or material that is defective or fails to comply with the requirements of the Contract Documents must be promptly repaired, removed, replaced, or corrected by Contractor, at Contractor's sole expense, even if that Work or material was previously inspected or included in a progress payment

(D) ***Contractor's Obligations.*** Contractor is solely responsible for any delay occasioned by remediation of defective or of noncompliant Work or material. Inspection of the Work does not in any way relieve Contractor of its obligations to perform the Work as specified. Any Work done without the required inspection(s) will also be subject to rejection by City.

(E) ***Distant Locations.*** If required off-site testing or inspection must be conducted at a location more than 100 miles from the Project site, Contractor is solely responsible for the additional travel costs required for testing and/or inspection at such locations.

(F) ***Final Inspection.*** The provisions of this Section 7.8 also apply to final inspection under Article 11, Completion and Warranty Provisions.

7.9 Project Site Conditions and Maintenance. Contractor must at all times, on a 24-hour basis and at its sole cost, maintain the Project site and staging and storage areas in clean, neat, and sanitary condition and in compliance with all Laws pertaining to safety, air quality, and dust control. Adequate toilets must be provided, and properly maintained and serviced for all workers on the Project site, located in a suitably secluded area, subject to City's prior approval. Contractor must also, on a daily basis and at its sole cost, remove and properly dispose of the debris and waste materials from the Project site.

(A) ***Air Emissions Control.*** Contractor must not discharge smoke or other air contaminants into the atmosphere in violation of any Laws.

(B) ***Dust and Debris.*** Contractor must minimize and confine dust and debris resulting from the Work. Contractor must abate dust nuisance by cleaning, sweeping, and immediately sprinkling with water excavated areas of dirt or other materials prone to cause dust, and within one hour after the Engineer notifies Contractor that an airborne nuisance exists. The Engineer may direct that Contractor provide an approved water-spraying truck for this purpose. If water is used for dust control, Contractor will only use the minimum necessary. Contractor must take all necessary steps to keep wastewater out of streets, gutters, or storm drains. See

Section 7.19, Environmental Control. If City determines that the dust control is not adequate, City may have the work done by others and deduct the cost from the Contract Price. Contractor will immediately remove any excess excavated material from the Project site and any dirt deposited on public streets.

(C) ***Clean up.*** Before discontinuing Work in an area, Contractor must clean the area and remove all rubbish debris and waste along with the construction equipment, tools, machinery, waste and surplus materials. Contractor must, at all times, minimize and confine dust and debris resulting from construction activities.

(1) Except as otherwise specified, all excess Project materials, and the materials removed from existing improvements on the Project site with no salvage value or intended reuse by City, will be Contractor's property.

(2) Hauling trucks and other vehicles leaving the Project site must be cleaned of exterior mud or dirt before traveling on City streets. Materials and loose debris must be delivered and loaded to prevent dropping materials or debris. Contractor must immediately remove spillage from hauling on any publicly traveled way. Streets affected by Work on the Project must be kept clean by street sweeping.

(D) ***Disposal.*** Contractor must dispose of all Project debris and waste materials in a safe and legal manner. Contractor may not burn or bury waste materials on the Project site. Contractor will not allow any dirt, refuse, excavated material, surplus concrete or mortar, or any associated washings, to be disposed of onto streets, into manholes or into the storm drain system.

(E) ***Completion.*** At the completion of the Work, Contractor must remove from the Project site all of its equipment, tools, surplus materials, waste materials and debris., presenting a clean and neat appearance. Before demobilizing from the Project site, Contractor must ensure that all surfaces are cleaned, sealed, waxed, or finished as applicable, and that all marks, stains, paint splatters, and the like have been properly removed from the completed Work and the surrounding areas. Contractor must ensure that all parts of the construction are properly joined with the previously existing and adjacent improvements and conditions. Contractor must provide all cutting, fitting and patching needed to accomplish that requirement. Contractor must also repair or replace all existing improvements that are damaged or removed during the Work, both on and off the Project site, including curbs, sidewalks, driveways, fences, signs, utilities, street surfaces and structures. Repairs and replacements must be at least equal to the previously existing improvements, and the condition,

finish and dimensions must match the previously existing improvements. Contractor must restore to original condition all property or items that are not designated for alteration under the Contract Documents and leave each Worksite clean and ready for occupancy or use by City.

(F) ***Non-Compliance.*** If Contractor fails to commence compliance with its maintenance and cleanup obligations within two business days following written notification from any City or its representative clean up order, City may, acting in its sole discretion, elect to suspend the Work until the condition(s) is corrected with no increase in the Contract Time or Contract Price, or undertake appropriate cleanup measures without further notice and the cost will be deducted from any amounts due or to become due to Contractor.

7.10 Instructions and Manuals. Contractor must provide to City three copies each of all instructions and manuals required by the Contract Documents, unless otherwise specified. These must be complete as to drawings, details, parts lists, performance data, and other information that may be required for City to easily maintain and service the materials and equipment installed for this Project.

(A) ***Submittal Requirements.*** All manufacturers' application or installation instructions must be provided to the City at least ten days prior to the first such application. The instructions and manuals, along with any required guarantees, must be delivered to City for review.

(B) ***Training.*** Contractor or its Subcontractors must train City's personnel in the operation and maintenance of any complex equipment or systems as a condition precedent to Final Completion, if required in the Contract Documents.

7.11 As-built Drawings. Contractor and its Subcontractors must prepare and maintain at the Project site a detailed, complete, and accurate as-built set of the Plans which will be used solely for the purpose of recording changes made in any portion of the original Plans in order to create accurate record drawings at the end of the Project.

(A) ***Duty to Update.*** The as-built drawings must be updated as changes occur, on a daily basis if necessary. City may withhold the estimated cost for City to have the as-built drawings prepared from payments otherwise due to the Contractor, until the as-built drawings are brought up to date to the satisfaction of City. Actual locations to scale must be identified on the as-built drawings for all runs of mechanical and electrical work, including all site utilities, installed underground, in walls, floors, or otherwise concealed. Deviations from the original Plans must be shown in detail. The exact location of all main runs, whether piping,

conduit, ductwork, or drain lines, must be shown by dimension and elevation. The location of all buried pipelines, appurtenances, or other improvements must be represented by coordinates and by the horizontal distance from visible above-ground improvements.

(B) ***Final Completion.*** Contractor must verify that all changes in the Work are depicted in the as-built drawings and must deliver the complete set of as-built drawings to City for review and acceptance as a condition precedent to Final Completion and Final Payment.

7.12 Existing Utilities.

(A) General. The Work may be performed in developed, urban areas with existing utilities, both above and below ground, including utilities identified in the Contract Documents or in other informational documents or records. Contractor must take due care to locate identified or reasonably identifiable utilities before proceeding with trenching, excavation, or any other activity that could damage or disrupt existing utilities. This may include excavation with small equipment, potholing, or hand excavation, and, if practical, using white paint or other suitable markings to delineate the area to be excavated. Except as otherwise provided herein, Contractor will be responsible for costs resulting from damage to identified or reasonably identifiable utilities due to Contractor's negligence or failure to comply with the Contract Documents, including the requirements in this Article 7.

(B) ***Unidentified Utilities.*** Pursuant to Government Code Section 4215, if, during the performance of the Work, Contractor discovers utility facilities not identified by City in the Contract Documents, Contractor must immediately provide written notice to City and the utility. City assumes responsibility for the timely removal, relocation, or protection of existing main or trunkline utility facilities located on the Project site, if those utilities are not identified in the Contract Documents. Contractor will be compensated in accordance with the provisions of the Contract Documents for the costs of locating, repairing damage not due to Contractor's failure to exercise reasonable care, and removing or relocating such utility facilities not indicated in the Plans or Specifications with reasonable accuracy, and for equipment on the Project necessarily idled during such work. Contractor will not be assessed liquidated damages for delay in completion of the Work, to the extent such delay was caused by City's failure to provide for removal or relocation of the utility facilities.

7.13 Notice of Excavation. Contractor must comply with all applicable requirements in Government Code Sections 4216 through 4216.5, which are incorporated herein. Government Code Section 4216.2, requires that

except in an emergency, Contractor must contact the appropriate regional notification center, or Underground Services Alert, at least two working days, but not more than fourteen calendar days before starting any excavation if the excavation will be conducted in an area that is known, or reasonably should be known, to contain subsurface installations. Contractor may not begin excavation until it has obtained and submitted to Engineer an inquiry identification number from Underground Services Alert.

7.14 Trenching and Excavations of Four Feet or More. As required by Public Contract Code Section 7104, if the Work includes digging trenches or other excavations that extend deeper than four feet below the surface, the provisions in this Section apply to the Work and the Project.

(A) ***Duty to Notify.*** Contractor must promptly, and before the following conditions are disturbed, provide written notice to City if Contractor finds any of the following conditions:

(1) Material that Contractor believes may be a hazardous waste, as defined in Section 25117 of the Health and Safety Code, that is required to be removed to a Class I, Class II, or Class III disposal site in accordance with the provisions of existing Laws;

(2) Subsurface or latent physical conditions at the Project site differing from those indicated by information about the Project site made available to bidders prior to the deadline for submitting bids; or

(3) Unknown physical conditions at the Project site of any unusual nature, materially different from those ordinarily encountered and generally recognized as inherent in work of the character required by the Contract Documents.

(B) ***City Investigation.*** City will promptly investigate the conditions and if City finds that the conditions materially differ from those indicated, apparent, or reasonably inferred from information about the Project site made available to bidders, or do involve hazardous waste, and cause a decrease or increase in Contractor's cost of, or the time required for, performance of any part of the Work, City will issue a Change Order.

(C) ***Disputes.*** In the event that a dispute arises between City and Contractor regarding any of the conditions specified in subsection (B) above, or the terms of a Change Order issued by the City, Contractor will not be excused from completing the Work within the Contract Time, but must proceed with all Work to be performed under the Contract. Contractor will retain any and all rights provided either by the Contract or

by Laws which pertain to the resolution of disputes between Contractor and City.

7.15 Trenching of Five Feet or More. As required by Labor Code Section 6705, if the Contract Price exceeds $25,000.00 and the Work includes the excavation of any trench or trenches of five feet or more in depth, a detailed plan must be submitted to City for acceptance in advance of the excavation. The detailed plan must show the design of shoring, bracing, sloping, or other provisions to be made for worker protection from the hazard of caving ground during the excavation. If the plan varies from the shoring system standards, it must be prepared by a California registered civil or structural engineer. Use of a shoring, sloping, or protective system less effective than that required by the Construction Safety Orders is prohibited.

7.16 New Utility Connections. Except as otherwise specified, City will pay connection charges and meter costs for new permanent utilities required by the Contract Documents, if any. Contractor must notify City sufficiently in advance of the time needed to request service from each utility provider so that connections and services are initiated in accordance with the Project schedule.

7.17 Lines and Grades. Contractor is required to use any benchmark provided by the Engineer. Unless otherwise specified in the Contract Documents, Contractor must provide all lines and grades required to execute the Work. Contractor must also provide, preserve, and replace if necessary, all construction stakes required for the Project. All stakes or marks must be set by a California licensed surveyor or a California registered civil engineer. Contractor must notify the Engineer of any discrepancies found between Contractor's staking and grading and information provided by the Contract Documents. Upon completion, all Work must conform to the lines, elevations, and grades shown in the Plans, including any changes directed by a Change Order.

7.18 Historic or Archeological Items.

(A) ***Contractor's Obligations.*** Contractor must ensure that all persons performing Work at the Project site are required to immediately notify the Project Manager, upon discovery of any potential historic or archeological items, including historic or prehistoric ruins, a burial ground, archaeological or vertebrate paleontological site, including fossilized footprints or other archeological, paleontological or historical feature on the Project site (collectively, "Historic or Archeological Items").

(B) ***Discovery; Cessation of Work.*** Upon discovery of any potential Historic or Archeological Items, Work must be stopped within an 85-foot

radius of the find and may not resume until authorized in writing by City. If required by City, Contractor must assist in protecting or recovering the Historic or Archeological Items, with any such assistance to be compensated as Extra Work on a time and materials basis under Article 6, Contract Modification. At City's discretion, a suspension of Work required due to discovery of Historic or Archeological Items may be treated as Excusable Delay pursuant to Article 5 or as a suspension for convenience under Article 13.

7.19 Environmental Control. Contractor must not pollute any drainage course or its tributary inlets with fuels, oils, bitumens, acids, insecticides, herbicides or other harmful materials. Contractor must prevent the release of any hazardous material or hazardous waste into the soil or groundwater, and prevent the unlawful discharge of pollutants into City's storm drain system and watercourses as required below. Contractor and its Subcontractors must at all times in the performance of the Work comply with all Laws concerning pollution of waterways.

(A) ***Stormwater Permit.*** Contractor must comply with all applicable conditions of the State Water Resources Control Board National Pollutant Discharge Elimination System General Permit for Waste Discharge Requirements for Discharges of Stormwater Runoff Associated with Construction Activity ("Stormwater Permit").

(B) ***Contractor's Obligations.*** If required for the Work, a copy of the Stormwater Permit is on file in City's principal administrative offices, and Contractor must comply with the same without adjustment of the Contract Price or the Contract Time. Contractor must timely and completely submit required reports and monitoring information required by the conditions of the Stormwater Permit. Contractor must also comply with all other Laws governing discharge of stormwater, including applicable municipal stormwater management programs.

7.20 Noise Control. Contractor must comply with all applicable noise control Laws. Noise control requirements apply to all equipment used for the Work or related to the Work, including trucks, transit mixers or transient equipment that may or may not be owned by Contractor.

7.21 Mined Materials. Pursuant to the Surface Mining and Reclamation Act of 1975, Public Resources Code Section 2710 *et seq*., any purchase of mined materials, such as construction aggregate, sand, gravel, crushed stone, road base, fill materials, and any other mineral materials must originate from a surface mining operation included on the AB 3098 List, which is available online at: ftp://ftp.consrv.ca.gov/pub/omr/AB3098%20List/AB3908List.pdf.

Article 8 - Payment

8.1 Schedule of Values. Prior to submitting its first application for payment, Contractor must prepare and submit to the Project Manager a schedule of values apportioned to the various divisions and phases of the Work, including mobilization and demobilization. If a Bid Schedule was submitted with Contractor's bid, the amounts in the schedule of values must be consistent with the Bid Schedule. Each line item contained in the schedule of values must be assigned a value such that the total of all items equals the Contract Price. The items must be sufficiently detailed to enable accurate evaluation of the percentage of completion claimed in each application for payment, and the assigned value consistent with any itemized or unit pricing submitted with Contractor's bid.

(A) ***Measurements for Unit Price Work.*** Materials and items of Work to be paid for on the basis of unit pricing will be measured according to the methods specified in the Contract Documents.

(B) ***Deleted or Reduced Work.*** Contractor will not be compensated for Work that City has deleted or reduced in scope, except for any labor, material or equipment costs for such Work that Contractor reasonably incurred before Contractor learned that the Work could be deleted or reduced. Contractor will only be compensated for those actual, direct and documented costs incurred, and will not be entitled to any mark up for overhead or lost profits.

8.2 Progress Payments. Following the last day of each month, or as otherwise required by the Special Conditions or Specifications, Contractor will submit to Project Manager a monthly application for payment for Work performed during the preceding month based on the estimated value of the Work performed during that preceding month.

(A) ***Application for Payment.*** Each application for payment must be itemized to include labor, materials, and equipment incorporated into the Work, and materials and equipment delivered to the Project site, as well as authorized and approved Change Orders. Each payment application must be supported by the unit prices submitted with Contractor's Bid Schedule and/or schedule of values and any other substantiating data required by the Contract Documents. **Each application for payment shall be accompanied by completed "Contract Balance Form," a copy of which is provided at the end of Article 8.**

(B) ***Payment of Undisputed Amounts.*** City will pay the undisputed amount due within thirty days after Contractor has submitted a complete and accurate payment application, subject to Public Contract Code

Section 20104.50. City will deduct a percentage from each progress payment as retention, as set forth in Section 8.5, below, and may withhold additional amounts as set forth in Section 8.3, below.

8.3 Adjustment of Payment Application. City may adjust or reject the amount requested in a payment application, including application for Final Payment, in whole or in part, if the amount requested is disputed or unsubstantiated. Contractor will be notified in writing of the basis for the modification to the amount requested. City may also deduct or withhold from payment otherwise due based upon any of the circumstances and amounts listed below. Sums withheld from payment otherwise due will be released when the basis for that withholding has been remedied and no longer exists.

(A) For Contractor's unexcused failure to perform the Work as required by the Contract Documents, including correction or completion of punch list items. City may withhold or deduct an amount based on the City's estimated cost to correct or complete the Work.

(B) For loss or damage caused by Contractor or its Subcontractors arising out of or relating to performance of the Work, or any failure to protect the Project site, City may deduct an amount based on the estimated cost to repair or replace.

(C) For Contractor's failure to pay its Subcontractors and suppliers when payment is due. City may withhold an amount equal to the total of past due payments and may opt to pay that amount separately via joint check pursuant to Section 8.6(B), Joint Checks.

(D) For Contractor's failure to timely correct rejected, nonconforming, or defective Work. City may withhold or deduct an amount based on the City's estimated cost to correct or complete the Work.

(E) For any unreleased stop notice, City may withhold 125% of the amount claimed.

(F) For Contractor's failure to submit any required schedule or schedule update in the manner and within the time specified in the Contract Documents, City may withhold an amount equal to five percent of the total amount requested until Contractor complies with its schedule submittal obligations.

(G) For Contractor's failure to maintain or submit as-built documents in the manner and within the time specified in the Contract Documents; City may withhold or deduct an amount based on the City's cost to prepare the as-builts.

(H) Work performed without Shop Drawings, that have been accepted by the City when accepted Shop Drawings are required before proceeding with the Work. City may deduct an amount based on the estimated costs to correct unsatisfactory Work or diminution in value.

(I) For fines, payments, or penalties assessed under the Labor Code, City may deduct from payments due to Contractor as required by Laws and as directed by the Division of Labor Standards Enforcement.

(J) For any other costs or charges that may be withheld or deducted from payments to Contractor, as provided in the Contract Documents, including liquidated damages, City may withhold or deduct such amounts from payment otherwise due to Contractor.

8.4 Early Occupancy. Neither City's payment of progress payments nor its partial or full use or occupancy of the Project constitutes acceptance of any part of the Work.

8.5 Retention. City will retain five percent of the full amount due on each progress payment (i.e., the amount due before any withholding or deductions pursuant to Section 8.3, Adjustment to Payment Application), or the percentage stated in the Notice Inviting Bids, whichever is greater, as retention to ensure full and satisfactory performance of the Work. Contractor is not entitled to any reduction in the rate of withholding at any time, nor to release of any retention before 35 days following City's acceptance of the Project.

(A) ***Substitution of Securities.*** As provided by Public Contract Code Section 22300, Contractor may request in writing that it be allowed, at its sole expense, to substitute securities for the retention withheld by City. Any escrow agreement entered into pursuant to this provision must fully comply with Public Contract Code Section 22300, and will be subject to approval as to form by City's legal counsel. If City exercises its right to draw upon such securities in the event of default pursuant to section (7) of the statutory Escrow Agreement for Security Deposits in Lieu of Retention, pursuant to subdivision (f) of Public Contract Code Section 22300 ("Escrow Agreement"), and if Contractor disputes that it is in default, its sole remedy is to comply with the dispute resolution procedures in Article 12 and the provisions therein. It is agreed that for purposes of this paragraph, an event of default includes City's rights pursuant to these Contract Documents to withhold or deduct sums from retention, including withholding or deduction for liquidated damages, incomplete or defective Work, stop payment notices, or backcharges. It is further agreed that if any individual authorized to give or receive written notice on behalf of a party pursuant to section (10) of the Escrow Agreement are unavailable to

give or receive notice on behalf of that party due to separation from employment, retirement, death, or other circumstances, the successor or delegee of the named individual is deemed to be the individual authorized to give or receive notice pursuant to section (10) of the Escrow Agreement.

(B) ***Release of Undisputed Retention.*** All undisputed retention, less any amounts that may be assessed as liquidated damages, retained for stop notices, or otherwise withheld pursuant to Section 8.3 Adjustment of Payment Application will be released as Final Payment to Contractor no sooner than 35 days following recordation of the notice of completion, and no later than 60 days following acceptance of the Project by City's governing body or authorized designee pursuant to Section 11.1(C) Acceptance, or, if the Project has not been accepted, no later than 60 days after the Project is otherwise considered complete pursuant to Public Contract Code Section 7107(c).

8.6 Payment to Subcontractors and Suppliers. Each month, Contractor must promptly pay each Subcontractor and supplier the value of the portion of labor, materials, and equipment incorporated into the Work or delivered to the Project site by the Subcontractor or supplier during the preceding month. Such payments must be made in accordance with the requirements of Laws pertaining to such payments, and those of the Contract Documents and applicable subcontract or supplier contract.

(A) ***Withholding for Stop Notice.*** Pursuant to Civil Code Section 9358, City will withhold 125% of the amount claimed by an unreleased stop notice, a portion of which may be retained by City for the costs incurred in handling the stop notice claim, including attorneys' fees and costs, as authorized by law.

(B) ***Joint Checks.*** City reserves the right, acting in its sole discretion, to issue joint checks made payable to Contractor and a Subcontractor or supplier, if City determines this is necessary to ensure fair and timely payment to Subcontractor or supplier who has provide services or goods for the Project. . As a condition to release of payment by a joint check, the joint check payees may be required to execute a joint check agreement in a form provided or approved by the City Attorney's Office. The joint check payees will be jointly and severally responsible for the allocation and disbursement of funds paid by joint check. Payment by joint check will not be construed to create a contractual relationship between City and a Subcontractor or supplier of any tier beyond the scope of the joint check agreement.

8.7 Final Payment. Contractor's application for Final Payment must comply with the requirements for submitting an application for a progress payment

as stated in Section 8.2, above. Corrections to previous progress payments, including adjustments to estimated quantities for unit priced items, may be included in the Final Payment. If Contractor fails to submit a timely application for Final Payment, City reserves the right to unilaterally process and issue Final Payment without an application from Contractor in order to close out the Project. For the purposes of determining the deadline for Claim submission pursuant to Article 12, the date of Final Payment is deemed to be the date that City acts to release undisputed retention as final payment to Contractor, or otherwise provides written notice to Contractor of Final Payment. . or that no undisputed funds remain available for Final Payment due to offsetting withholdings or deductions pursuant to Section 8.3, Adjustment of Payment Application. If the amount due from Contractor to City exceeds the amount of Final Payment, City retains the right to recover the balance from Contractor or its sureties.

8.8 Release of Claims. City may, at any time, require that payment of the undisputed portion of any progress payment or Final Payment be contingent upon Contractor furnishing City with a written waiver and release of all claims against City arising from or related to the portion of Work covered by those undisputed amounts, subject to the limitations of Public Contract Code Section 7100. Any disputed amounts may be specifically excluded from the release.

8.9 Warranty of Title. Contractor warrants that title to all work, materials, or equipment incorporated into the Work and included in a request for payment will pass over to City free of any claims, liens, or encumbrances upon payment to Contractor.

CONTRACT BALANCE FORM

2023 INFLOW AND INFILTRATION SEWER REPAIR PROJECT

Note: A detailed invoice MUST be attached to this Contract Balance Form.

CONTRACTOR NAME: _____ DATE: _____

MAILING ADDRESS: _____ TELEPHONE NO.: _____

_____ FAX NO.: _____

_____ PROJECT NO.: _____

INVOICE NO.: _____

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1. ORIGINAL CONTRACT AMOUNT: $_____

2. APPROVED CHANGE ORDERS TOTAL: $_____

3. REVISED CONTRACT AMOUNT: (1+2) $_____

4. PREVIOUS BALANCE PAID: $_____

5. REMAINING BALANCE: (3-4) $_____

6. CURRENT PROGRESS PAYMENT DUE: $_____
   (before retention)

7. 5% RETENTION FROM WORK DONE: (-)$_____

8. CURRENT BALANCE DUE: (6-7) $_____

9. REMAINING BALANCE OF REVISED CONTRACT AMOUNT: (5-8) $_____
   (including retention)

Article 9 - Labor Provisions

9.1 Discrimination Prohibited. Discrimination against any prospective or present employee engaged in the Work on grounds of race, color, ancestry, national origin, ethnicity, religion, sex, sexual orientation, age, disability, or marital status is strictly prohibited. Contractor and its Subcontractors are required to comply with all applicable Laws prohibiting discrimination, including the California Fair Employment and Housing Act (Government Code Sections 12900 *et seq.*), Government Code Section 11135, and Labor Code Sections 1735, 1777.5, 1777.6, and 3077.5.

9.2 Labor Code Requirements.

(A) ***Eight Hour Day.*** Pursuant to Labor Code Section 1810, eight hours of labor constitute a legal day's work under this Contract.

(B) ***Penalty.*** Pursuant to Labor Code Section 1813, Contractor will forfeit to City as a penalty, the sum of $25.00 for each day during which a worker employed by Contractor or any Subcontractor is required or permitted to work more than eight hours in any one calendar day or more than 40 hours per calendar week, except if such workers are paid overtime under Labor Code Section 1815.

(C) ***Apprentices.*** Contractor is responsible for compliance with the requirements governing employment and payment of apprentices, as set forth in Labor Code Section 1777.5, which is fully incorporated by reference.

(D) ***Notices.*** Pursuant to Labor Code Section 1771.4, Contractor is required to post all job site notices prescribed by Laws.

9.3 Prevailing Wages. Each worker performing Work under this Contract that is covered under Labor Code Sections 1720 or 1720.9, including cleanup at the Project site, must be paid at a rate not less than the prevailing wage as defined in Sections 1771 and 1774 of the Labor Code. The prevailing wage rates are available online at http://www.dir.ca.gov/dlsr. Contractor must post a copy of the applicable prevailing rates at the Project site.

(A) ***Penalties.*** Pursuant to Labor Code Section 1775, Contractor and any Subcontractor will forfeit to City as a penalty up to $200.00 for each calendar day, or portion a day, for each worker paid less than the applicable prevailing wage rate. Contractor must also pay each worker the difference between the applicable prevailing wage rate and the amount actually paid to that worker.

(B) ***Federal Requirements.*** If this Project is subject to federal prevailing wage requirements in addition to California prevailing wage requirements, Contractor and its Subcontractors are required to pay the higher of the currently applicable state or federal prevailing wage rates.

9.4 Payroll Records. Contractor must comply with the provisions of Labor Code Sections 1776 and 1812 and all implementing regulations, which are fully incorporated by this reference, including requirements for electronic submission of payroll records to the DIR.

(A) ***Contractor and Subcontractor Obligations***. Contractor and each Subcontractor must keep accurate payroll records, showing the name, address, social security number, work classification, straight time and overtime hours worked each day and week, and the actual per diem wages paid to each journeyman, apprentice, worker, or other employee employed in connection with the Work. Each payroll record must contain or be verified by a written declaration that it is made under penalty of perjury, stating both of the following:

(1) The information contained in the payroll record is true and correct.

(2) Contractor or Subcontractor has complied with the requirements of Labor Code Sections 1771, 1811, and 1815 for any Work performed by its employees on the Project.

(B) ***Certified Record.*** A certified copy of an employee's payroll record must be made available for inspection or furnished to the employee or his or her authorized representative on request, to City, or to the Division of Labor Standards Enforcement, to the Division of Apprenticeship Standards of the DIR, and as further required by the Labor Code.

(C) ***Enforcement.*** Upon notice of noncompliance with Labor Code Section 1776, Contractor or Subcontractor has ten days in which to comply with the requirements of this section. If Contractor or Subcontractor fails to do so within the ten-day period, Contractor or Subcontractor will forfeit a penalty of $100.00 per day, or portion a day, for each worker for whom compliance is required, until strict compliance is achieved. Upon request by the Division of Apprenticeship Standards, or the Division of Labor Standards Enforcement, these penalties will be withheld from payments then due to Contractor.

9.5 Labor Compliance. Pursuant to Labor Code Section 1771.4, the Contract for this Project is subject to compliance monitoring and enforcement by the DIR.

9.6 Wage Theft Prevention. Compliance with Wage and Hour Laws: Contractor, and any subcontractor it employs to complete work under this Agreement, shall comply with all applicable federal, state and local wage and hour laws. Applicable laws may include, but are not limited to, the Federal Fair Labor Standards Act and the California Labor Code.

Final Judgments, Decisions, and Orders: For purposes of this Section, a "final judgment, decision, or order" refers to one for which all appeals have been exhausted or the time to appeal has expired. Relevant investigatory government agencies include: the federal Department of Labor, the California Division of Labor Standards Enforcement, or any other governmental entity or division tasked with the investigation and enforcement of wage and hour laws.

Prior Judgments against Contractor and/or its Subcontractors: BY SIGNING THIS AGREEMENT, CONTRACTOR AFFIRMS THAT IT HAS DISCLOSED ANY FINAL JUDGMENTS, DECISIONS OR ORDERS FROM A COURT OR INVESTIGATORY GOVERNMENT AGENCY FINDING – IN THE FIVE (5) YEARS PRIOR TO EXECUTING THIS AGREEMENT – THAT CONTRACTOR OR ITS SUBCONTRACTOR(S) HAS VIOLATED ANY APPLICABLE WAGE AND HOUR LAWS. CONTRACTOR FURTHER AFFIRMS THAT IT OR ITS SUBCONTRACTOR(S) HAS SATISFIED AND COMPLIED WITH – OR HAS REACHED AGREEMENT WITH THE CITY REGARDING THE MANNER IN WHICH IT WILL SATISFY – ANY SUCH JUDGMENTS, DECISIONS OR ORDERS.

Judgments or Decisions During Term of Contract: If at any time during the term of this Agreement, a court or investigatory government agency issues a final judgment, decision or order finding that Contractor or an subcontractor it employs to perform work under this Agreement has violated any applicable wage and hour law, or Contractor learns of such a judgment, decision, or order that was not previously disclosed, Contractor shall inform the City Attorney, no more than fifteen (15) days after the judgment, decision or order becomes final or of learning of the final judgment, decision or order. Contractor and its subcontractors shall promptly satisfy and comply with any such judgment, decision, or order, and shall provide the City Attorney with documentary evidence of compliance with the final judgment, decision or order within five (5) days of satisfying the final judgment, decision or order. The City reserves the right to require Contractor to enter into an agreement with the City regarding the manner in which any such final judgment, decision, or order will be satisfied.

City's Right to Withhold Payment: Where Contractor or any subcontractor it employs to perform work under this Agreement has been found in

violation of any applicable wage and hour law by a final judgment, decision or order of a court or government agency, the City reserves the right to withhold payment to Contractor until such judgment, decision or order has been satisfied in full.

Material Breach: Failure to comply with any part of this Section constitutes a material breach of this Agreement. Such breach may serve as a basis for immediate termination of this Agreement and/or any other remedies available under this Agreement and/or law.

Notice to City Related to Wage Theft Prevention: Notice provided to the City Attorney as required under this Section shall be addressed to: City Attorney, City of Morgan Hill, 17575 Peak Avenue, Morgan Hill, CA 95037. The Notice provisions of this Section are separate from any other notice provisions in this Agreement and, accordingly, only notice provided to the above address satisfies the notice requirements in this Section.

Article 10 - Safety Provisions

10.1 Safety Precautions and Programs. Contractor and its Subcontractors are fully responsible for safety precautions and programs, and for the safety of persons and property in the performance of the Work. Contractor and its Subcontractors must at all times comply with all applicable health and safety Laws and seek to avoid injury, loss, or damage to persons or property by taking reasonable steps to protect its employees and other persons at any Worksite, materials and equipment stored on or off site, and property at or adjacent to any Worksite.

(A) ***Reporting Requirements.*** Contractor must immediately notify the City of any death, serious injury or illness resulting from Work on the Project. Contractor must immediately provide a written report to City of each recordable accident or injury occurring at any Worksite within 24 hours of the occurrence. The written report must include: (1) the name and address of the injured or deceased person; (2) the name and address of each employee of Contractor or of any Subcontractor involved in the incident; (3) a detailed description of the incident, including precise location, time, and names and contact information for known witnesses; and (4) a police or first responder report, if applicable. If Contractor is required to file an accident report with a government agency, Contractor will provide a copy of the report to City.

(B) ***Legal Compliance.*** Contractor's safety program must comply with the applicable legal and regulatory requirements. Contractor must provide City with copies of all notices required by Laws.

(C) ***Contractor's Obligations.*** Any damage or loss caused by Contractor arising from the Work which is not insured under property insurance must be promptly remedied by Contractor.

(D) ***Remedies.*** If City determines, in its sole discretion, that any part of the Work or Project site is unsafe, City may, without assuming responsibility for Contractor's safety program, require Contractor or its Subcontractor to cease performance of the Work or to take corrective measures to City's satisfaction. If Contractor fails to promptly take the required corrective measures, City may perform them and deduct the cost from the Contract Price. Contractor agrees it is not entitled to submit a Claim for damages, for an increase in Contract Price, or for a change in Contract Time based on Contractor's compliance with City's request for corrective measures pursuant to this provision.

10.2 Hazardous Materials. Unless otherwise specified in the Contract Documents, this Contract does not include the removal, handling, or disturbance of any asbestos or other Hazardous Materials. If Contractor encounters materials on the Project site that Contractor reasonably believes to be asbestos or other Hazardous Materials, and the asbestos or other Hazardous Materials have not been rendered harmless, Contractor may continue Work in unaffected areas reasonably believed to be safe, but must immediately cease work on the area affected and report the condition to City. No asbestos, asbestos-containing products or other Hazardous Materials may be used in performance of the Work.

10.3 Material Safety. Contractor is solely responsible for complying with Section 5194 of Title 8 of the California Code of Regulations, including by providing information to Contractor's employees about any hazardous chemicals to which they may be exposed in the course of the Work. A hazard communication program and other forms of warning and training about such exposure must be used. Contractor must also maintain Safety Data Sheets ("SDS") at the Project site, as required by Law, for materials or substances used or consumed in the performance of the Work. The SDS will be accessible and available to Contractor's employees, Subcontractors, and City.

(A) ***Contractor Obligations.*** Contractor is solely responsible for the proper delivery, handling, use, storage, removal, and disposal of all materials brought to the Project site and/or used in the performance of the Work. Contractor must notify the Engineer if a specified product or material cannot be used safely.

(B) ***Labeling.*** Contractor must ensure proper labeling on any material brought onto the Project site so that any persons working with or in the vicinity of the material may be informed as to the identity of the material,

any potential hazards, and requirements for proper handling, protections, and disposal.

10.4 Hazardous Condition. Contractor is solely responsible for determining whether a hazardous condition exists or is created during the course of the Work, involving a risk of bodily harm to any person or risk of damage to any property. If a hazardous condition exists or is created, Contractor must take all precautions necessary to address the condition and ensure that the Work progresses safely under the circumstances. Hazardous conditions may result from, but are not limited to, use of specified materials or equipment, the Work location, the Project site condition, the method of construction, or the way any Work must be performed.

10.5 Emergencies. In an emergency affecting the safety or protection of persons, Work, or property at or adjacent to any Worksite, Contractor must take reasonable and prompt actions to prevent damage, injury, or loss, without prior authorization from the City if, under the circumstances, there is inadequate time to seek prior authorization from the City.

Article 11 - Completion and Warranty Provisions

11.1 Final Completion.

(A) ***Final Inspection and Punch List.*** When the Work required by this Contract is fully performed, Contractor must provide written notification to City requesting final inspection. The Engineer will schedule the date and time for final inspection, which must include Contractor's primary representative for the Project and its superintendent. Based on that inspection, City will prepare a punch list of any items that are incomplete, missing, defective, incorrectly installed, or otherwise not compliant with the Contract Documents The punch list to Contractor will specify the time by which all of the punch list items must be completed or corrected. The punch list may include City's estimated cost to complete each punch list item if Contractor fails to do so within the specified time. The omission of any non-compliant item from a punch list will not relieve Contractor from fulfilling all requirements of the Contract Documents. Contractor's failure to complete any punch list item within the time specified in the punch list will not waive or abridge its warranty obligations for any such items that must be completed by the City or by a third party retained by the City due to Contractor's failure to timely complete any such outstanding item.

(B) ***Requirements for Final Completion.*** Final Completion will be achieved upon completion or correction of all punch list items, as verified by City's further inspection, and upon satisfaction of all other Contract requirements, including any commissioning required under the Contract

Documents, and submission of all final submittals, including instructions and manuals as required under Section 7.10, and complete, final as-built drawings as required under Section 7.11, all to City's satisfaction.

(C) ***Acceptance.*** The Project will be considered accepted upon City Council action during a public meeting to accept the Project, unless the Engineer is authorized to accept the Project, in which case the Project will be considered accepted upon the date of the Engineer's issuance of a written notice of acceptance. In order to avoid delay of Project close out, the City may elect, acting in its sole discretion, to accept the Project as complete subject to exceptions for punch list items that are not completed within the time specified in the punch list.

(D) ***Final Payment and Release of Retention.*** Final Payment and release of retention, less any sums withheld pursuant to the provisions of the Contract Documents, will not be made sooner than 35 days after recordation of the notice of completion. If Contractor fails to complete all of the punch list items within the specified time, City may withhold up to 150% of City's estimated cost to complete each of the remaining items from Final Payment and may use the withheld retention to pay for the costs to self-perform the outstanding items or to retain a third party to complete any such outstanding punch list item.

11.2 Warranty.

(A) ***General.*** Contractor warrants that all materials and equipment will be new unless otherwise specified, of good quality, in conformance with the Contract Documents, and free from defective workmanship and materials. Contractor further warrants that the Work will be free from material defects not intrinsic in the design or materials required in the Contract Documents. Contractor warrants that materials or items incorporated into the Work comply with the requirements and standards in the Contract Documents, including compliance with Laws, and that any Hazardous Materials encountered or used were handled as required by Laws. At City's request, Contractor must furnish satisfactory evidence of the quality and type of materials and equipment furnished. Contractor's warranty does not extend to damage caused by normal wear and tear, or improper use or maintenance.

(B) ***Warranty Period.*** Contractor's warranty must guarantee its Work for a period of one year from the date of Project acceptance (the "Warranty Period"), except when a longer guarantee is provided by a supplier or manufacturer or is required by the Specifications or Special Conditions. Contractor must obtain from its Subcontractors, suppliers and manufacturers any special or extended warranties required by the Contract Documents.

(C) ***Warranty Documents.*** As a condition precedent to Final Completion, Contractor must supply City with all warranty and guarantee documents relevant to equipment and materials incorporated into the Work and guaranteed by their suppliers or manufacturers.

(D) ***Subcontractors.*** The warranty obligations in the Contract Documents apply to Work performed by Contractor and its Subcontractors, and Contractor expressly agrees to be co-guarantor of such Work.

(E) ***Contractor's Obligations.*** Upon written notice from City to Contractor of any defect in the Work discovered during the Warranty Period, Contractor or its responsible Subcontractor must promptly correct the defective Work at its own cost. Contractor's obligation to correct defects discovered during the Warranty Period will continue past the expiration of the Warranty Period as to any defects in Work for which Contractor was notified prior to expiration of the Warranty Period. Work performed during the Warranty Period ("Warranty Work") will be subject to the warranty provisions in this Section 11.2 for a one-year period that begins upon completion of such Warranty Work to City's satisfaction.

(F) ***City's Remedies.*** If Contractor or its responsible Subcontractor fails to correct defective Work within ten days following notice by City, or sooner, if required by the circumstances, Contractor expressly agrees that City may correct the defects to conform with the Contract Documents at Contractor's sole expense. Contractor must reimburse City for its costs in accordance with subsection (H) below.

(G) ***Emergency Repairs.*** In cases of emergency where any delay in correcting defective Work could cause harm, loss or damage, City may immediately correct the defects to conform with the Contract Documents at Contractor's sole expense. Contractor or its surety must reimburse City for its costs in accordance with subsection (H), below.

(H) ***Reimbursement.*** Contractor must reimburse City for its costs to repair under subsections (F) or (G), above, within 30 days following City's submission of a demand for payment pursuant to this provision. If City is required to initiate legal action to compel Contractor's compliance with this provision, and City is the prevailing party in such action, Contractor and its surety are solely responsible for all of City's attorney's fees and legal costs expended to enforce Contractor's warranty obligations herein in addition to any and all costs City incurs to correct the defective Work.

11.3 Use Prior to Final Completion. City reserves the right to occupy or make use of the Project, or any portions of the Project, prior to Final

Completion if City has determined that the Project or portion of it is in a condition suitable for the proposed occupation or use, and that it is in its best interest to occupy or make use of the Project, or any portions of it, prior to Final Completion. City will notify Contractor in writing of its intent to occupy or make use of the Project or any portions of the Project, pursuant to this provision.

(A) ***Non-Waiver.*** Occupation or use of the Project, in whole or in part, prior to Final Completion will not operate as acceptance of the Work or any portion of it, nor will it operate as a waiver of any of City's rights or Contractor's duties pursuant to these Contract Documents, and will not affect nor bear on the determination of the time of substantial completion with respect to any statute of repose pertaining to the time for filing an action for construction defect.

(B) ***City's Responsibility.*** City will be responsible for the cost of maintenance and repairs due to normal wear and tear with respect to those portions of the Project that are being occupied or used before Final Completion. The Contract Price or the Contract Time may be adjusted pursuant to the applicable provisions of these Contract Documents if, and only to the extent that, any occupation or use under this Section actually adds to Contractor's cost or time to complete the Work within the Contract Time.

11.4 Substantial Completion. For purposes of determining "substantial completion" with respect to any statute of repose pertaining to the time for filing an action for construction defect, "substantial completion" is deemed to mean the last date that Contractor or any Subcontractor performs Work on the Project prior to City acceptance of the Project, except for warranty work performed under this Article.

Article 12 - Dispute Resolution

12.1 Claims. This Article applies to and provides the exclusive procedures for any Claim arising from or related to the Contract or performance of the Work.

(A) ***Definition.*** "Claim" means a separate demand by Contractor, submitted in writing by registered or certified mail with return receipt requested, for a change in the Contract Time, including a time extension or relief from liquidated damages, or a change in the Contract Price when the demand has previously been submitted to City in accordance with the requirements of the Contract Documents, and which has been rejected or disputed by City, in whole or in part. A Claim may also include that portion of a unilateral Change Order that is disputed by the Contractor.

(B) ***Limitations.*** A Claim may only include the portion of a previously rejected demand that remains in dispute between Contractor and City. With the exception of any dispute regarding the amount of money actually paid to Contractor as Final Payment, Contractor is not entitled to submit a Claim demanding a change in the Contract Time or the Contract Price, which has not previously been submitted to City in full compliance with Article 5 and Article 6, and subsequently rejected in whole or in part by City.

(C) ***Scope of Article.*** This Article is intended to provide the exclusive procedures for submission and resolution of Claims of any amount, and applies in addition to the provisions of Public Contract Code Section 9204 and Sections 20104 *et seq.*, which are incorporated herein by this reference.

(D) ***No Work Delay.*** Notwithstanding the submission of a Claim or any other dispute between the parties related to the Project or the Contract Documents, Contractor must perform the Work and may not delay or cease Work pending resolution of a Claim or other dispute, but must continue to diligently prosecute the performance and timely completion of the Work, including the Work pertaining to a Claim or other dispute.

(E) ***Informal Resolution.*** Contractor will make a good faith effort to informally resolve a dispute before initiating a Claim, preferably by face-to-face meeting between authorized representatives of Contractor and City.

12.2 Claims Submission. The following requirements apply to any Claim subject to this Article:

(A) ***Substantiation.*** The Claim must be submitted to City in writing, clearly identified as a "Claim" submitted pursuant to this Article 12, and must include all of the documents necessary to substantiate the Claim including the Change Order request that was rejected in whole or in part, and a copy of City's written rejection that is in dispute. The Claim must clearly identify and describe the dispute, including relevant references to applicable portions of the Contract Documents, and a chronology of relevant events. Any Claim for additional payment must include a complete, itemized breakdown of all known or estimated labor, materials, taxes, insurance, and subcontract, or other costs. Substantiating documentation such as payroll records, receipts, invoices, or the like, must be submitted in support of each component of claimed cost. Any Claim for an extension of time or delay costs must be substantiated with a schedule analysis and narrative depicting and explaining claimed time impacts. Contractor understands that submission of a Claim which has no basis in fact or which Contractor knows to be false may violate the False Claims Act (Government Code Section 12650 et seq.).

(B) ***Claim Format and Content.*** A Claim must be submitted in the following format:

(1) Provide a cover letter, specifically identifying the submission as a “Claim” submitted under this Article 12 and specifying the requested remedy (e.g., amount of proposed change to Contract Price and/or change to Contract Time).

(2) Provide a summary of each Claim, including underlying facts and the basis for entitlement, and identify each specific demand at issue, including the specific Change Order request (by number and submittal date), and the date of City's rejection of that demand, in whole or in part.

(3) Provide a detailed explanation of each issue in dispute. For multiple issues included within a single Claim or for multiple Claims submitted concurrently, separately number and identify each individual issue or Claim and include the following for each separate issue or Claim:

(a) A succinct statement of the matter in dispute, including Contractor’s position and the basis for that position;

(b) Identify and attach all documents that substantiate the Claim, including relevant provisions of the Contract Documents, RFIs, calculations, and schedule analysis (see subsection (A), Substantiation above); and

(c) A chronology of relevant events; and

(d) Analysis and basis for claimed changes to Contract Price, Contract Time, or any other remedy requested.

(4) Provide a summary of issues and corresponding claimed damages. If, by the time of the Claim submission deadline (below), the precise amount of the requested change in the Contract Price or Contract Time is not yet known, Contractor must provide a good faith estimate, including the basis for that estimate, and must identify the date by which it is anticipated that the Claim will be updated to provide final amounts.

(5) Include the following certification, executed by Contractor’s authorized representative:

"The undersigned Contractor certifies under penalty of perjury that its statements and representations in this Claim submittal are true and correct. Contractor warrants that this Claim submittal is comprehensive and complete as to the matters in dispute, and agrees that any costs, expenses, or delay not included herein are deemed waived.

(C) ***Submission Deadlines.***

(1) A Claim disputing rejection of a request for a change in the Contract Time or Contract Price must be submitted within 15 days following the date that City notified Contractor in writing that a request for a change in the Contract Time or Contract Price, duly submitted in compliance with Article 5 and Article 6, has been rejected in whole or in part. A Claim disputing the terms of a unilateral Change Order must be submitted within 15 days following the date of issuance of the unilateral Change Order. These Claim deadlines apply even if Contractor cannot yet quantify the total amount of any requested change in the Contract Time or Contract Price. If the Contractor cannot quantify those amounts, it must submit an estimate of the amounts claimed pending final determination of the requested remedy by Contractor.

(2) With the exception of any dispute regarding the amount of Final Payment, any Claim must be filed on or before the date of Final Payment, or will be deemed waived.

(3) A Claim disputing the amount of Final Payment must be submitted within 15 days of the effective date of Final Payment, under Section 8.7, Final Payment, above.

(4) Strict compliance with these Claim submission deadlines is necessary to ensure that any dispute may be mitigated as soon as possible, and to facilitate cost-efficient administration of the Project. Any Claim that is not submitted within the specified deadlines will be deemed waived by Contractor.

12.3 City's Response. City will respond within 45 days of receipt of the Claim with a written statement identifying which portion(s) of the Claim are disputed, unless the 45-day period is extended by mutual agreement of City and Contractor or as otherwise allowed under Public Contract Code Section 9204. However, if City determines that the Claim is not adequately substantiated pursuant to Section 12.2(A), Substantiation, City may first request, in writing, within 30 days of receipt of the Claim, any additional documentation supporting the Claim or relating to defenses to the Claim that City may have against the Claim.

(A) ***Additional Information.*** If additional information is thereafter required, it may be requested and provided upon mutual agreement of City and Contractor. If Contractor's Claim is based on estimated amounts, Contractor has a continuing duty to update its Claim as soon as possible with information on actual amounts in order to facilitate prompt and fair resolution of the Claim.

(B) ***Non-Waiver.*** Any failure by City to respond within the times specified above will not be construed as acceptance of the Claim in whole or in part, or as a waiver of any provision of these Contract Documents.

12.4 Meet and Confer. If Contractor disputes City's written response, or City fails to respond within the specified time, within 15 days of receipt of City's response, or within 15 days of City's failure to respond within the applicable 45-day time period, respectively, Contractor may notify City of the dispute in writing sent by registered or certified mail, return receipt requested and demand an informal conference to meet and confer for settlement of the issues in dispute. If Contractor fails to dispute City's response, in writing, within the specified time, Contractor's Claim will be deemed waived.

(A) ***Schedule Meet and Confer.*** Upon receipt of the demand to meet and confer, City will schedule the meet and confer conference to be held within 30 days, or later if needed to ensure the mutual availability of each of the individuals that each party requires to represent its interests at the meet and confer conference.

(B) ***Location for Meet and Confer.*** The meet and confer conference will be scheduled at a location at or near City's principal office.

(C) ***Written Statement After Meet and Confer.*** Within ten working days after the meet and confer has concluded, City will issue a written statement identifying which portion(s) of the Claim remain in dispute, if any.

(D) ***Submission to Mediation.*** If the Claim or any portion remains in dispute following the meet and confer conference, within ten working days after the City issues the written statement identifying any portion(s) of the Claim remaining in dispute, the Contractor may identify in writing disputed portion(s) of the Claim, which will be submitted for mediation, as set forth below.

12.5 Mediation and Government Code Claims.

(A) ***Mediation.*** Within ten working days after the City issues the written statement identifying any portion(s) of the Claim remaining in dispute**,** following the meet and confer, City and Contractor will mutually agree to a mediator, as provided under Public Contract Code Section 9204. Mediation will be scheduled to ensure the mutual availability of the selected mediator and all of the individuals that each party requires to represent its interests. If there are multiple Claims in dispute, the parties may agree to schedule the mediation to address all outstanding Claims at the same time. The parties will share the costs of the mediator and mediation fees equally, but each party is otherwise solely and separately responsible for its own costs to prepare for and participate in the mediation, including costs for its legal counsel or any other consultants.

(B) ***Government Code Claims***.

(1) Timely presentation of a Government Code Claim is a condition precedent to filing any legal action based on or arising from the Contract. Compliance with the Claim submission requirements in this Article 12 is a condition precedent to filing a Government Code Claim.

(2) The time for filing a Government Code Claim will be tolled from the time Contractor submits its written Claim pursuant to Section 12.2, above, until the time that Claim is denied in whole or in part at the conclusion of the meet and confer process, including any period of time used by the meet and confer process. However, if the Claim is submitted to mediation, the time for filing a Government Code Claim will be tolled until conclusion of the mediation, including any continuations, if the Claim is not fully resolved by mutual agreement of the parties during the mediation or any continuation of the mediation.

12.6 Tort Claims. This Article does not apply to tort claims and nothing in this Article is intended nor will be construed to change the time periods for filing tort-based Government Code Claims.

12.7 Arbitration. It is expressly agreed, under Code of Civil Procedure Section 1296, that in any arbitration to resolve a dispute relating to this Contract, the arbitrator's award must be supported by law and substantial evidence.

12.8 Burden of Proof and Limitations. Contractor bears the burden of proving entitlement to and the amount of any claimed damages. Contractor is not entitled to damages calculated on a total cost basis, but must prove actual damages. Contractor is not entitled to speculative, special, or consequential damages, including home office overhead or

any form of overhead not directly incurred at the Project site or any other Worksite; lost profits; loss of productivity; lost opportunity to work on other projects; diminished bonding capacity; increased cost of financing for the Project; extended capital costs; non-availability of labor, material or equipment due to delays; or any other indirect loss arising from the Contract. The Eichleay Formula or similar formula will not be used for any recovery under the Contract. The City will not be directly liable to any Subcontractor or supplier.

12.9 Legal Proceedings. In any legal proceeding that involves enforcement of any requirements of the Contract Documents, the finder of fact will receive detailed instructions on the meaning and operation of the Contract Documents, including conditions, limitations of liability, remedies, claim procedures, and other provisions bearing on the defenses and theories of liability. Detailed findings of fact will be requested to verify enforcement of the Contract Documents. All of the City's remedies under the Contract Documents will be construed as cumulative, and not exclusive, and the City reserves all rights to all remedies available under law or equity as to any dispute arising from or relating to the Contract Documents or performance of the Work.

12.10 Other Disputes. The procedures in this Article 12 will apply to any and all disputes or legal actions, in addition to Claims, arising from or related to this Contract, including disputes regarding suspension or early termination of the Contract, unless and only to the extent that compliance with a procedural requirement is expressly and specifically waived by City. Nothing in this Article is intended to delay suspension or termination under Article 13.

Article 13 - Suspension and Termination

13.1 Suspension for Cause. In addition to all other remedies available to City, if Contractor fails to perform or correct Work in accordance with the Contract Documents, including non-compliance with applicable environmental or health and safety Laws, City may immediately order the Work, or any portion of it, suspended until the circumstances giving rise to the suspension have been eliminated to City’s satisfaction.

(A) ***Notice of Suspension***. Upon receipt of City’s written notice to suspend the Work, in whole or in part, except as otherwise specified in the notice of suspension, Contractor and its Subcontractors must promptly stop Work as specified in the notice of suspension; comply with directions for cleaning and securing the Worksite; and protect the completed and in-progress Work and materials. Contractor is solely responsible for any

damages or loss resulting from its failure to adequately secure and protect the Project.

(B) ***Resumption of Work.*** Upon receipt of the City's written notice to resume the suspended Work, in whole or in part, except as otherwise specified in the notice to resume, Contractor and its Subcontractors must promptly re-mobilize and resume the Work as specified; and within ten days from the date of the notice to resume, Contractor must submit a recovery schedule, prepared in accordance with the Contract Documents, showing how Contractor will complete the Work within the Contract Time.

(C) ***Failure to Comply.*** Contractor will not be entitled to an increase in Contract Time or Contract Price for a suspension occasioned by Contractor's failure to comply with the Contract Documents.

(D) ***No Duty to Suspend.*** City's right to suspend the Work will not give rise to a duty to suspend the Work, and City's failure to suspend the Work will not constitute a defense to Contractor's failure to comply with the requirements of the Contract Documents.

13.2 Suspension for Convenience. City reserves the right to suspend, delay, or interrupt the performance of the Work in whole or in part, for a period of time determined to be appropriate for City's convenience. Upon notice by City pursuant to this provision, Contractor must immediately suspend, delay, or interrupt the Work and secure the Project site as directed by City, except for taking measures to protect completed or in progress Work as directed in the suspension notice, and subject to the provisions of Section 13.1(A) and (B), above. If Contractor submits a timely request for a Change Order in compliance with Articles 5 and 6, the Contract Price and the Contract Time will be equitably adjusted by Change Order pursuant to Articles 5 and 6 to reflect the cost and delay impact occasioned by such suspension for convenience except to the extent that any such impacts were caused by Contractor's failure to comply with the Contract Documents or the terms of the suspension notice or notice to resume. However, Contract Time will only be extended if the suspension causes or will cause unavoidable delay in Final Completion. If Contractor disputes the terms of a Change Order issued for such equitable adjustment due to suspension for convenience, its sole recourse is to comply with the Claim procedures in Article 12.

13.3 Termination for Default. City may declare that Contractor is in default of the Contract for a material breach of or inability to fully, promptly, or satisfactorily perform its obligations under the Contract

(A) ***Default.*** Events giving rise to a declaration of default include Contractor's refusal or failure to supply sufficient skilled workers, proper

materials, or equipment to perform the Work within the Contract Time; Contractor's refusal or failure to make prompt payment to its employees, Subcontractors, or suppliers or to correct defective Work or damage; Contractor's failure to comply with the Laws, or orders of any public agency with jurisdiction over the Project; evidence of Contractor's bankruptcy, insolvency, or lack of financial capacity to complete the Work as required within the Contract Time; suspension, revocation, or expiration and nonrenewal of Contractor's license or DIR registration; dissolution, liquidation, reorganization, or other major change in Contractor's organization, ownership, structure or existence as a business entity; unauthorized assignment of Contractor's rights or duties under the Contract; or any material breach of the Contract requirements.

(B) ***Notice of Default and Opportunity to Cure.*** Upon City's declaration that Contractor is in default, due to a material breach of the Contract Documents, if City determines that the default is curable, City will afford Contractor the opportunity to cure the default within ten days of City's notice of default, or within a period of time reasonably necessary for such cure, including a shorter period of time if applicable.

(C) ***Termination.*** If Contractor fails to cure the default or fails to expediently take steps reasonably calculated to cure the default within the time period specified in the notice of default, City may issue written notice to Contractor and its performance bond surety of City's termination of the Contract for default.

(D) ***Waiver.*** Time being of the essence in the performance of the Work, if Contractor's surety fails to arrange for completion of the Work in accordance with the Performance Bond, within seven calendar days from the date of the notice of termination, pursuant to Paragraph (C), City may immediately make arrangements for the completion of the Work through use of its own forces, by hiring a replacement contractor, or by any other means that City determines advisable under the circumstances. Contractor and its surety will be jointly and severally liable for any additional cost incurred by City to complete the Work following termination, where "additional cost" means all cost in excess of the cost City would have incurred if Contactor had timely completed Work without the default and termination. In addition, City will have the right to immediate possession and use of any materials, supplies, and equipment procured for the Project and located at the Project site or any Worksite on City property for the purposes of completing the remaining Work.

(E) ***Compensation.*** Within 30 days of receipt of updated as-builts, all warranties, manuals, instructions, or other required documents for Work installed to date, and delivery to City of all equipment and materials for the Project for which Contractor has already been compensated, Contractor

will be compensated for the Work satisfactorily performed in compliance with the Contract Documents up to the effective date of the termination pursuant to the terms of Article 8, Payment, subject to City's rights to withhold or deduct sums from payment otherwise due pursuant to Section 8.3, and excluding any costs Contractor incurs as a result of the termination, including any cancellation or restocking charges or fees due to third parties. If Contractor disputes the amount of compensation determined by City, its sole recourse is to comply with the Claim Procedures in Article 12, by submitting a Claim no later than 30 days following notice from City of the total compensation to be paid by City.

(F) ***Wrongful Termination.*** If Contractor disputes the termination, its sole recourse is to comply with the Claim procedures in Article 12. If a court of competent jurisdiction or an arbitrator later determines that the termination for default was wrongful, the termination will be deemed to be a termination for convenience, and Contractor's damages will be strictly limited to the compensation provided for termination for convenience, under Section 13.4, below. Contractor waives any claim for any other damages for wrongful termination including special or consequential damages, lost opportunity costs or lost profits, and any award of damages is subject to Section 12.8, Burden of Proof and Limitations.

13.4 Termination for Convenience. City reserves the right, acting in its sole discretion, to terminate all or part of the Contract for convenience upon written notice to Contractor.

(A) ***Compensation to Contractor.*** In the event of City's termination for convenience, Contractor waives any claim for damages, including for loss of anticipated profits from the Project. The following will constitute full and fair compensation to Contractor, and Contractor will not be entitled to any additional claim or compensation.

(1) ***Completed Work.*** The value of its Work satisfactorily performed as of the date notice of termination is received, based on Contractor's schedule of values and unpaid costs for items delivered to the Project site that were fabricated for incorporation in the Work;

(2) ***Demobilization.*** Demobilization costs specified in the schedule of values, or if demobilizations cost were not provided in a schedule of values pursuant to Section 8.1, then based on actual, reasonable, and fully documented demobilization costs; and

(3) ***Termination Markup.*** Five percent of the total value of the Work performed as of the date of notice of termination including reasonable, actual, and documented costs to comply with the

direction in the notice of termination for convenience, and demobilization costs, which is deemed to cover all overhead and profit to date.

(B) ***Disputes.*** If Contractor disputes the amount of compensation determined by City pursuant to paragraph (A), above, its sole recourse is to comply with the Claim procedures in Article 12, by submitting a Claim no later than 30 days following notice from City of total compensation to be paid by City.

13.5 Actions Upon Termination for Default or Convenience. The following provisions apply to any termination under this Article, whether for default or convenience, and whether in whole or in part.

(A) ***General.*** Upon termination City may immediately enter upon and take possession of the Project and the Work and all tools, equipment, appliances, materials, and supplies procured or fabricated for the Project. Contractor will transfer title to and deliver all completed Work and all Work in progress to City.

(B) ***Submittals.*** Unless otherwise specified in the notice of termination, Contractor must immediately submit to City all designs, drawings, as-built drawings, Project records, contracts with vendors and Subcontractors, manufacturer warranties, manuals, and other such submittals or Work-related documents required under the terms of the Contract Documents, including incomplete documents or drafts.

(C) ***Close Out Requirements.*** Except as otherwise specified in the notice of termination, Contractor must comply with all of the following:

(1) Immediately stop the Work, except for any Work that must be completed pursuant to the notice of termination and comply with City's instructions for cessation of labor and securing the Project and any other Worksite(s).

(2) Comply with City's instructions to protect the completed Work and materials, using best efforts to minimize further costs.

(3) Contractor must not place further orders or enter into new subcontracts for materials, equipment, services or facilities, except as may be necessary to complete any portion of the Work that is not terminated.

(4) As directed in the notice, Contractor must assign to City or cancel existing subcontracts that relate to performance of the terminated Work, subject to any prior rights, if any, of the surety for

Contractor's performance bond, and settle all outstanding liabilities and claims, subject to City's approval.

(5) As directed in the notice, Contractor must use its best efforts to sell any materials, supplies, or equipment intended solely for the terminated Work in a manner and at market rate prices acceptable to City.

(D) ***Payment Upon Termination.*** Upon completion of all termination obligations, as specified herein and in the notice of termination, Contractor will submit its request for Final Payment, including any amounts due following termination pursuant to this Article 13. Payment will be made in accordance to the provisions of Article 8, based on the portion of the Work satisfactorily completed, including the close out requirements, and consistent with the previously submitted schedule of values and unit pricing, including demobilization costs. Adjustments to Final Payment may include deductions for the cost of materials, supplies, or equipment retained by Contractor; payments received for sale of any such materials, supplies, or equipment, less re-stocking fees charged; and as otherwise specified in Section 8.3, Adjustment of Payment Application.

(E) ***Continuing Obligations.*** Regardless of any Contract termination, Contractor's obligations for portions of the Work already performed will continue and the provisions of the Contract Documents will remain in effect as to any claim, indemnity obligation, warranties, guarantees, submittals of as-built drawings, instructions, or manuals, record maintenance, or other such rights and obligations arising prior to the termination date.

Article 14 - Miscellaneous Provisions

14.1 Assignment of Unfair Business Practice Claims. Under Public Contract Code Section 7103.5, Contractor and its Subcontractors agree to assign to City all rights, title, and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. Section 15) or under the Cartwright Act (Chapter 2 (commencing with Section 16700) of Part 2 of Division 7 of the Business and Professions Code), arising from purchases of goods, services, or materials pursuant to the Contract or any subcontract. This assignment will be effective at the time City tenders Final Payment to Contractor, without further acknowledgement by the parties.

14.2 Provisions Deemed Inserted. Every provision of law required to be inserted in the Contract Documents is deemed to be inserted, and the Contract Documents will be construed and enforced as though such

provision has been included. If it is discovered that through mistake or otherwise that any required provision was not inserted, or not correctly inserted, the Contract Documents will be deemed amended accordingly.

14.3 Waiver. City's waiver of a breach, failure of any condition, or any right or remedy contained in or granted by the provisions of the Contract Documents will not be effective unless it is in writing and signed by City. City's waiver of any breach, failure, right, or remedy will not be deemed a waiver of any other breach, failure, right, or remedy, whether or not similar, nor will any waiver constitute a continuing waiver unless specified in writing by City.

14.4 Titles, Headings, and Groupings. The titles and headings used and the groupings of provisions in the Contract Documents are for convenience only and may not be used in the construction or interpretation of the Contract Documents or relied upon for any other purpose.

14.5 Statutory and Regulatory References. With respect to any amendments to any statutes or regulations referenced in these Contract Documents, the reference is deemed to be the version in effect on the date that that bids were due.

14.6 Survival. The provisions that survive termination or expiration of this Contract include Contract Section 11, Notice, and subsections 12.1, 12.2, 12.3, 12.4, 12.5, and 12.6, of Section 12, General Provisions; and the following provisions in these General Conditions: Section 2.2(J), Contractor's Records, Section 2.3(C), Termination, Section 3.7, Ownership, Section 4.2, Indemnity, Article 12, Dispute Resolution, and Section 11.2, Warranty.

END OF GENERAL CONDITIONS

1.0 Shop Drawings. Whenever Shop Drawings are required by the Contract Documents or by the Engineer, Contractor must submit five (5) prints of each shop drawing to the Engineer.

(A) If three (3) prints of the drawing are returned to Contractor marked "NO EXCEPTIONS TAKEN," further revision of the drawings will not be required. If one (1) print of the drawing is returned to Contractor marked "REVISE AND RESUBMIT," Contractor must revise the drawing and resubmit five (5) copies of the revised drawing to the Engineer. City reserves the right to withhold payment due Contractor to cover additional costs of the Engineer's review beyond the second submission.

(B) Fabrication of an item may not commence before the Engineer has reviewed the pertinent shop drawings and returned copies to Contractor marked either "NO EXCEPTIONS TAKEN" or "MAKE CORRECTIONS NOTED."

(C) Revisions indicated on shop drawings are deemed necessary to meet the existing requirements of the Contract Documents and may not be taken as the basis of claims for extra Work. Contractor is not entitled to claim for damages or extension of time due to any delay resulting from making the required revisions to shop drawings. The Engineer's review of the shop drawings does not relieve Contractor of responsibility for any errors or omissions contained in the shop drawings nor will such review operate to waive or modify any provision contained in the Contract Documents.

2.0 *Waste Water.* City will provide water required for performance of the Work. Contractor is responsible for the appropriate disposal of waste water in coordination with City personnel. Contractor must provide a backflow preventer on all point of connections to City's Water System. All backflow preventers must be checked and approved by City's Public Works Water Division. Contractor must provide a deposit (refundable) and make necessary arrangements to pick up a hydrant meter at City's Public Works Office. At the completion of the Project, if the hydrant meter is not returned promptly or if it is damaged, Contractor shall forfeit its deposit.

3.0 *Equipment.* Contractor must provide and use equipment and plants suitable to produce the quality of Work and materials required by the Contract Documents. Contractor may be required to remove equipment which the Engineer deems unsuitable for the Work. Contractor must ensure that equipment is operated by trained, experienced operators, and at a speed or rate of production not to exceed that recommended by the manufacturer. Any vehicles used to haul materials over existing streets and highways must be equipped with pneumatic tires.

4.0 Lines and Grades. The Engineer will set the stakes or marks necessary to establish the lines and grades required for the completion of the Work in accordance with the Contract Documents. Contractor must give at least two (2) working days' notice to the Engineer of the need for setting any lines and grades.

(A) ***Measurements.*** Distances and measurements are given and will be made in a horizontal plane. Grades are given from the top of stakes or nail unless otherwise noted. Three (3) consecutive points shown on the same rate of slope must be used in common in order to detect any variation from a straight grade. Any variation from a straight grade, straight slope or line, must be reported to the Engineer. If such discrepancy is not reported to the Engineer, Contractor is responsible for any error in the finished work.

(B) ***Stakes.*** Contractor must preserve all stakes and points set for lines, grades or measurements of the Work in their proper places until authorized by the Engineer to remove them. All expense incurred by replacing stakes that have been removed without proper authority may be deducted from any payment due to Contractor.

5.0 Disposal of Materials Outside of Street Right-of-Way. Unless otherwise specified in the Specifications or Special Conditions, Contractor is solely responsible for disposing of materials outside the street right-of-way and for all associated costs. Before disposing materials outside the street right-of-way, Contractor must 1) obtain a written release from the property owner releasing City from any and all responsibility in connection with the disposal of material on that property; and 2) obtain permission from the Engineer to dispose of the material at the permitted location.

6.0 Emergency Contact. Prior to the commencement of Work on the Project, Contractor must provide contact information to the Engineer for the person designated by Contractor to respond to any emergency that arises on the Worksite during the course of the Project. That person will be responsible for responding to the Worksite within thirty (30) minutes following notification of an emergency by City's Police or Fire Department, regardless of the time of day.

7.0 Right-of-Way. City will provide the right-of-way for performance of the Work. Contractor is solely responsible for any additional area required outside of the designated the right-of-way, unless otherwise provided in the Contract Documents.

(A) ***Environmental Control.*** Contractor must not pollute any drainage course or its tributary inlets with fuels, oils, bitumens, acids, insecticides,

herbicides or other harmful materials. Contractor and its subcontractors shall at all times in the performance of the Work comply with all applicable federal, state, and local laws and regulations concerning pollution of waterways.

8.0 Authorized Work Days and Hours.

(A) ***Authorized Work Days.*** Except as expressly authorized in writing by City, Contractor is limited to performing Work on the Project on the following days of the week, excluding holidays observed by City:
Monday to Friday
(B) ***Authorized Work Hours.*** Except as expressly authorized in writing by City, Contractor is limited to performing Work on the Project during the following hours:

7:00am to 5:00pm

9.0 ***Pre-Construction Conference.*** City will designate a date and time for a pre-construction conference with Contractor following Contract execution. Project administration procedures and coordination between City and Contractor will be discussed, and Contractor must present City with the following information or documents at the meeting for City's review and acceptance before the Work commences:

9.1 Name, 24-hour contact information, and qualifications of the proposed on-site superintendent;

9.2 List of all key Project personnel and their complete contact information, including email addresses and telephone numbers during regular hours and after hours;

9.3 Staging plans that identify the sequence of the Work, including any phases and alternative sequences or phases, with the goal of minimizing the impacts on residents, businesses and other operations in the Project vicinity;

9.4 If required, traffic control plans associated with the staging plans that are signed and stamped by a licensed traffic engineer;

9.5 Draft baseline schedule for the Work as required under Section 5.2, to be finalized within ten days after City issues the Notice to Proceed;

9.6 Breakdown of lump sum bid items, to be used for determining the value of Work completed for future progress payments to Contractor;

9.7 Schedule with list of Project submittals that require City review, and list of the proposed material suppliers;

9.8 Plan for coordination with affected utility owner(s) and compliance with any related permit requirements;

9.9 Videotape and photographs recording the conditions throughout the pre-construction Project site, showing the existing improvements and current condition of the curbs, gutters, sidewalks, signs, landscaping, streetlights, structures near the Project such as building faces, canopies, shades and fences, and any other features within the Project area limits;

9.10 If requested by City, Contractor's cash flow projections; and

9.11 Any other documents specified in the Special Conditions or Notice of Award.

10.0 **Weather Delay Days.** This provision is intended to supplement the requirements of General Conditions Section 5.2 on Schedule Requirements and Section 5.3 on Delays and Extensions of Contract Time.

(A) ***Weather Delay Day***. A Weather Delay Day is a Working Day during which Contractor and its forces, including Subcontractors, are unable to perform more than forty percent (40%) of the critical path Work scheduled for that day due to adverse weather conditions which impair the ability to safely or effectively perform the scheduled critical path Work that day. Adverse weather conditions may include rain, saturated soil, and Worksite clean-up required due to adverse weather. Determination of what constitutes critical path Work scheduled for that day will be based on the most current, City-approved schedule.

(B) ***Normal Weather Delay Days.*** Based on historic records for the Project location, Contractor's schedule should assume the following number of normal Weather Delay Days for each month:

Month	# Normal Weather Delay Days
January	11
February	11
March	10

April	6
May	4
June	2
July	1
August	1
September	1
October	4
November	7
December	10

Weather Delay Days which do not occur during a given month based on the number of days allocated for that month (above) do not carry over to another month.

11.0 Close Out Requirements. Contractor's close out requirements include the following, if applicable:

11.1 Contractor must replace, with thermoplastic, any existing striping within and adjacent to the Project site that is damaged during the Work. Partially damaged striping must be replaced in its entirety.

11.2 Contractor must replace any survey monuments that are damaged or removed during the Work, with a Record of Survey filed by a licensed land surveyor as required by California law.

11.3 Before removing any traffic control or street signs on the Project site, Contractor must take photographs showing their original locations. Upon completion of each phase of construction, Contractor must temporarily reset the signs at those locations. Contractor must then replace the signs permanently upon completion of the Work and the cost of their removal and replacement must be included in the Bid Proposal.

11.4 Contractor must maintain any rural mail boxes on the Project site and relocate them to their permanent locations as soon as possible in the course of the Work, to the satisfaction of the affected property owners and the postal service.

12.0 Value Engineering. The Contractor may be entitled to additional compensation for cost reduction changes made pursuant to a value engineering proposal submitted by the Contractor, subject to the limitations of Public Contract Code Section 7107, and in strict compliance with this Section __. Contractor will not be entitled to any such additional compensation unless all of the following requirements have been met:

12.1 The Contractor must submit a written proposal for changes to the Plans or Specifications for the Project, in which it:

(A) Identifies the written proposal as a proposal for cost reduction changes with reference to this section;

(B) Clearly and specifically identifies the proposed cost reduction changes by describing in detail each of the changes proposed with specific references to each of the Specifications and Plans involved in the proposed changes, and providing proposed revised Specifications and Plans as applicable; and

(C) Estimates the net amount of the cost reduction and provides the basis for that estimate.

12.2 The proposed changes have been identified and developed solely by the Contractor, and not, in whole or in part, by the City.

12.3 The City accepts the proposed changes in whole or in part in a writing signed by the Engineer. The Contractor will only be entitled to additional compensation for those changes specifically accepted by the City. The Engineer will determine the net savings in construction costs from any such changes that are both accepted and implemented by the City. Contractor will not be entitled to more than 50% of the net savings as determined by the Engineer, acting in his or her sole discretion.

END OF SPECIAL CONDITIONS

Technical Specifications

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SECTION 01120
WORK CONSTRAINTS

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:

1. Site Use and Construction Restrictions.
2. Temporary Construction Access Requirements and Limitations
3. Utility restrictions and requirements.

1.02 SITE USE AND CONSTRUCTION RESTRICTIONS

A. The project sites are within existing City streets and along City easements within residential and commercial side yards and backyards. Some project sites have low hanging overhead utilities and trees.

B. Site access is extremely limited in locations where work is occurring in side yards, backyards, and outside of the street right-of-way. Access is limited to foot traffic and handheld equipment in several locations. Contractor shall visit all sites within the street right-of-way during bidding to review project locations and access restrictions. Contractor shall consider access issues and limitations when bidding, no additional compensation will be made for difficult and limited site access.

1. Contractor shall carefully review the Site Information Report (included as Appendix A to these specifications) during bidding to identify the existing site conditions. Contractor shall consider all items shown and identified within the Site Information Report when bidding, no additional compensation will be made for items identified and shown on the Report.

C. Construction impacts due to identified or observable site access constraints shall be considered by the Contractor when making his bid, and the costs associated with such constraints shall not be compensated for beyond the provisions contained herein.

D. Contractor shall provide access to residences at all times during construction. Contractor shall maintain access to driveways to the maximum extent possible.

E. Advance notice to property owners' is required prior to accessing easements on their property. City will coordinate initial notice at least one month prior to access of the easement based on the Contractor's

Schedule. Contractor shall provide additional notices one week and twenty-four hours prior to work within easements. The notice shall be provided to the property owner, by delivering or mailing a City approved flyer that lists planned work dates, work hours, work duration, a general description of planned work, and contractor's contact information with phone number. Workers accessing easements shall have **state issued photo identification** on them at all times and available to present if requested by property owner(s).

F. Contractor shall submit a connection plan developed with the intent of minimizing the down time to City customers and will be reviewed and approved by the City.

G. When customers are affected, the Contractor shall notify the City a minimum of seven working days before the time of any proposed shutdown of existing mains or services. The City inspector may postpone or reschedule any shutdown operation if for any reason he feels that the Contractor is improperly prepared with competent personnel, equipment, or materials to proceed with the connection work.

H. When no customers are affected, the Contractor shall notify the City a minimum of two working days before the time of any proposed shutdown of existing mains or services. The City inspector may postpone or reschedule any shutdown operation if for any reason he feels that the Contractor is improperly prepared with competent personnel, equipment, or materials to proceed with the connection work.

I. See the City's General conditions for work hours and limitations.

1.03 DOCUMENTATION OF EXISTING CONDITIONS

A. The Contractor is responsible for reviewing and documenting the existing site conditions at each project location prior to performing any work. Documentation shall include photographs, videos, notes, and other items as necessary to accurately document the condition of all items that may be affected by the work.

1. At a minimum documentation shall include all areas within the proposed limits of work and proposed access routes.

B. The Contractor shall submit the documentation of existing conditions to the City prior to proceeding with the work at each site.

1.04 WORK WITHIN EASEMENTS AND PRIVATE PROPERTIES

A. The Contractor shall provide advance notifications prior to accessing and performing work outside of the street right-of-way as specified herein.

B. Work requires access through and within private properties. The City will obtain right of entry agreements for private properties where access is necessary to complete the work. The Contractor shall not access or enter private property until access agreements have been executed, notifications have been completed as specified herein, and the City has authorized the work within each specific property to begin.

   1. The City will provide the Contractor with a list of all properties where right of entry agreements have been obtained.
   2. If the Contractor identifies additional private properties where access is needed and right of entry agreements have not been obtained, the Contractor shall notify the City 30 days prior to the scheduled work within the private property.

C. Once all advance notifications have been provided the Contractor shall perform the following prior to proceeding with any site work within easements:

   1. The Contractor shall locate and mark the locations of all proposed excavations within easements and identify the impacts to private improvements.
   2. Mark all private improvements, landscaping, and trees that are proposed to be impacted and/or removed during construction.
   3. Review the proposed work and impacts within easements with the City.
   4. Receive written approval for proceeding with proposed work within easements prior performing any site work.
   5. The Contractor shall anticipate a 72-hour delay from when the site improvements are reviewed with the City until obtaining approval from the City to proceed with the proposed work.

D. Contractor shall minimize impact on property owners during Construction.

E. Contractor shall complete work on each manhole to manhole sewer segment in consecutive working days. The Contractor shall complete all site work, sewer improvements, and site restoration within each easement before starting any site work at other project/easement locations.

1.05 UNDERGROUND FACILITIES

A. The Contractor shall note that not all existing utilities are shown on the plans and the location of the utilities shown are approximate. The location of the utilities shown on the plans are based on utility basemaps and are approximate in nature.

B. Utility depths and locations are approximate in nature.

C. The Contractor shall have all utilities located by contacting USA, review utility locations, and clearly mark all utilities to be potholed in the field. The Contractor shall submit the proposed utilities to be potholed to the City for review. The Contractor shall receive written authorization from the City to proceed with potholing activities prior to construction.

D. In locations where open trench or pipe bursting are proposed, all water main crossings shall be potholed at least 5 days prior to construction and results shall be submitted to the City. Contractor shall immediately notify the City of any potential conflicts.

E. The Contractor shall pothole all potential utility conflicts prior to construction. Potholing results and any identified conflicts shall be submitted to the City for review prior to construction.

F. The Contractor is responsible for coordinating all project documentation, including but not necessarily limited to, the Contract Documents and existing record drawings for the determination of the location of all underground facilities. Contractor shall have utilities marked in the field by Underground Services Alert a minimum of 48 hours prior to the start of construction.

G. The Contractor shall exercise care in all excavations to avoid damage to existing underground facilities. This shall include potholing or hand digging in those areas where underground facilities are known to exist until they have been sufficiently located to avoid damage to the facilities.

H. The Contractor shall notify the Engineer of any potential utility conflicts as soon as they are known.

I. The Contractor shall locate and expose water main locations within 5 feet of sewer mains prior to bursting sewer main. See Sections 01120-1.12 and 02345 for additional requirements.

J. Notify the City's Water Division prior to excavating within 5 feet of existing water mains. The City may elect to depressurize all water main within 5 feet of excavation per Section 01120-1.12.

1.06 OVERHEAD ELECTRIC UTILITIES

A. Low hanging high voltage overhead power transmission utilities are present at project locations.

B. Contractor shall consider the proximity of overhead electric utilities when bidding, and no additional compensation shall be made for additional

work necessitated by the presence of overhead electric utilities (smaller equipment, etc.).

C. Contractor shall insure a minimum clearance between the power lines and the work at all times as dictated by OSHA and PG&E regulations.

1.07 TREE AND PLANT PROTECTION

A. Preserve and protect all existing trees and plants at or adjacent to the site, unless otherwise indicated on the Drawings.

B. See Section 01532 Tree Care, Protection, and Removal

1.08 WORK SEQUENCE

A. The overall sequence of the Work is at the Contractor's discretion, subject to City approval.

B. The use of multiple crews is at the sole discretion of the Contractor and no additional compensation will be allowed to meet the contract requirements.

1.09 MAINTAINING SEWER SERVICE

A. See Section 01531 Temporary Flow Control.

1.10 TRAFFIC CONTROL

A. The Contractor shall supply and install all traffic control devices (including all warning, regulatory, and guide signs) required for the Project. The City will not furnish signs nor any other traffic control devices for the Project.

B. The Contractor shall submit for City review and approval its Traffic Control and Detour Plan. Submit said plan a minimum of two (2) full Working Days prior to the Pre-Construction Meeting. The plan shall include (where necessary) lane closures, detours, no parking areas, signing program for construction, access to private property and business establishments, pedestrian traffic, transit routes, loading areas, the proposed routing of the construction vehicles, hours required for access and the safe guards and procedures necessary to carry out the Work, as well as where Contractor plans to park construction vehicles and equipment, and other matters which might be important to the safe movement of traffic. The plan shall also indicate placement and type of warning signs, lights, devices, flag persons; and have a schedule for implementation.

C. It is imperative that field traffic control be handled in such a manner as to adequately and safely direct all traffic movements in the Project area. The Contractor shall not be allowed to proceed with construction at any time that, in the opinion of the Engineer, traffic control is inadequate to meet the field conditions. Traffic control measures, in addition to those indicated on the approved traffic control plans, may be required as field conditions dictate.

D. The Contractor shall not be allowed to restrict vehicle access to any of the properties in the Project area at all times during construction if practical. If restricting vehicle access is absolutely necessary, Contractor shall notify property owners advanced notice of the extent of any delays. Under no circumstance shall the Contractor restrict vehicle access outside of the normal working hours.

E. Areas to be posted with “No Parking” signs must be verified as correct by the City Police Department. Signs must be verified by the Police Department and posted a minimum of forty-eight (48) hours prior to the start of construction in each area requiring parking restrictions.

F. The Contractor shall conduct his operations as to cause the least possible obstruction and inconvenience to both vehicular and pedestrian traffic.

G. Street Lane and Sidewalk Closures: Below are specific lane and sidewalk closure requirements and restrictions which shall apply unless specifically modified by an approved Traffic Control Plan. Said Plan may be reviewed or modified by the Engineer at any time when, in the opinion of the Engineer, changes are necessary to provide for the safety, health, welfare, or convenience of the public.

    1. Street Lane Closures: Contractor shall provide continuous pedestrian traffic access. All traffic lanes shall remain open during the non-working hours as defined in the City’s General Conditions. Lanes may individually be closed during working hours.

    2. Residents along the road or street shall be provided passage. Convenient access to driveways, houses, and buildings along the road or street shall be maintained. Temporary crossings shall be provided and maintained in good condition.

    3. The blocking of industrial, commercial, or institutional driveways shall not be allowed. Access shall be provided to permit the movement of vehicles to and from the grounds of such establishments. Contractor shall provide vehicular access to all other types of driveways at all times except during actual construction.

4. Wherever it is necessary that trenches and excavation be bridged, these bridges shall permit unobstructed flow of traffic or pedestrians (ADA compliant) and shall meet the following criteria:

    a. Bridging shall be secured against displacement by using adjustable cleats, angles, bolts, or other devices.

    b. Bridging shall be installed to operate with minimum noise.

    c. The trench shall be adequately shored, to support the bridging and traffic.

    d. Only steel plates shall be used for bridging. Steel plates used for bridging shall extend one foot (minimum) beyond the edges of the trench.

H. Bus Routes: Some project locations are within bus routes. The Contractor is responsible for identify impacts to the bus routes, coordinating with the transit operator, and accommodating any necessary detours, notifications, and signage requirements. The Contractor shall submit the proposed impacts to the City for review and approval prior to coordinating with the transit operator.

I. Sidewalk Closures: Contractor must comply with the following requirements.

1. Where walks, pathways, or access ways are closed by the Work, an ADA complaint, alternate walkway shall be provided, preferably within the immediate location of the pathway or access to be closed. Where it is necessary to divert pedestrians into a major detour and/or into a parking lane or traffic area, at no time shall pedestrians be diverted into a portion of a street used for vehicular traffic. Any deviation from the above must have prior approval of the Engineer.

2. At locations where adjacent alternate walkways cannot be provided (i.e., where no pathway or access is available within the immediate location of the interruption) ADA compliant detours shall be clearly planned, marked, and constructed. Appropriate signs and barricades must be installed at the limits of construction and in advance of the closure (or detour) in order to divert pedestrians to the appropriate walkway or detour.

3. Contractor shall provide sufficient signage, indicating by way of arrows and text, pedestrian route closures, and new pathways and detours required for alternate pedestrian routes around the construction. Alternate pedestrian routes, the final sign configuration, the exact wording of the base sign and all mounting locations shall be approved by the City.

J. The Contractor shall pay for all street and sidewalk closures, including but not limited to, the appropriate street closure and temporary directional

signage, crosswalks, flag persons as required to control construction traffic and implement the Traffic Control and Detour Plan. Contractor shall take all necessary precautions to protect the public from construction activities.

K. The Contractor shall observe all posted traffic signage on and in adjacent neighborhoods.

L. The Contractor shall not be relieved from responsibility for public safety by City's direction, lack of same, or approval of the Traffic Control and Detour Plan with respect to signs, lights, and/or protective devices.

1.11 EQUIPMENT RESTRICTIONS

A. Site access at several locations is limited to foot traffic and handheld equipment due to narrow pathways and limited site access. Work within streets may also be limited to small equipment due to narrow streets and low hanging utilities and trees. It is the contractor's responsibility to inspect all sites and access points prior to bidding and adjust proposed means and methods accordingly.

1.12 WATER MAIN SEPARATION AND SHUTDOWN REQUIREMENTS

A. The Contractor shall identify all locations where the horizontal clearance between existing water mains and new sewer mains (where open trench or pipe bursting construction methods are identified) is less than five (5) feet. Locations where the water main crosses the sewer main with five (5) feet or less of separation shall be exposed prior to bursting. The approximate locations where the clearance is less than five (5) feet are shown on the plans.

B. The City's Water Division may elect to temporarily shut down or depressurize water mains during construction where the clearance between the water main and sewer main is less than five (5) feet. The water main shutdown requirements are listed below.

C. Water Main Shutdown Requirements:

1. The Contractor shall not operate the City's water valves at any time.
2. The Contractor shall notify the City's Water Division three (3) working days in advance of all excavations within five (5) feet of a water main.
3. Contractor shall notify affected residences and businesses of water outages at least 48 hours prior.
4. Shutdowns are limited to six (6) hours maximum during the hours of 9:00 AM to 5:00 PM, Monday through Thursday.

5. Any open trench within five (5) feet of horizontal clearance between parallel existing water mains, new sewer mains and/or outside edge of the manholes shall be fully backfilled and compacted prior to the end of the shutdown.
6. Shutdowns for the same customers are limited to two days within a ten working day window.
7. Notification from the Contractor under item one above is considered a shutdown, even if the contractor later decides a shutdown needs to be rescheduled or is no longer needed.
8. Contractor shall take great care to ensure the existing water main and appurtenances are not damaged. The Contractor will be responsible for repairs to the water main should any damage or leaks occur due to the Contractor's work.

D. Contractor shall minimize water system interruptions.

1.13 SITE RESTORATION

A. All sites shall be restored to preconstruction conditions.

B. All disturbed soil located in unimproved areas shall receive seed and erosion control blanket.

C. Erosion control blanket for disturbed soil protection and revegetation – The following or approved equal:
1. Western Excelsior Excel SS-2 All Natural

D. Seed:
1. Seed shall be a fresh, clean, new crop, and mixed by a dealer. Seed shall be packaged in dealer's unopened container with original label. Containers without a label or tag will not be accepted.
2. Commercially obtained seed shall be labeled under the California Food and Agricultural Code, and by the vendors supplying the seed. Seed shall have been tested for purity and germination not more than 15 months prior to the application of the seed.
3. Seed labels furnished by the seed vendors supplying the seed shall indicate the purity, germination, weed content, and inert material as determined by testing and shall be provided to the Engineer prior to applying the seed. The percent of weed seed shall not exceed 1.5 percent by weight of the total seed mixture. Seed treated with Mercury compounds shall not be used.
4. Contractor is responsible for coordinating with seed suppliers within 60 days of Notice to Proceed to ensure that all required seed species are available for installation. The seed mix may be adjusted

depending on the commercial availability and seed collection locations for each species. Any adjustments must meet the approval of the Engineer prior to application. Seed is available from Pacific Coast Seed [(925) 373-4417, contact: David Gilpin.

5. Seed shall originate from collection sites within Counties adjacent to the San Francisco Bay. Seed originating from other counties shall not be utilized without prior approval from the Engineer.

6. Contractor shall be required to procure seed mix of the species and proportions presented in the table below.

Scientific Name	Common Name	Pounds of Pure Live Seed/Acre
Artemisia douglasiana	mugwort	2
Bromus carinatus	California brome	8
Carex barbarae	Santa Barbara sedge	4
Elymus glaucus	blue wild rye	6
Hordeum brachyantherum	meadow barley	8
Leymus triticoides	creeping wildrye	10
Nassella pulchra	purple needlegrass	6
Vulpia microstachys	fescue	6
	Total	50

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

*****END OF SECTION*****

SECTION 01125
MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.01 MEASUREMENT OF QUANTITIES

A. Measurements of the completed work shall be in accordance with, and by instruments and devices calibrated to United States Standard Measures and the units of measurement for payment, and the limits thereof, shall be made as shown on the Plans, Specifications, General Requirements, and Supplementary Conditions.

B. Payment for the various items of the Bid Schedule, as further described herein, shall include all compensation to be received by the Contractor for furnishing all tools, equipment, supplies and manufactured items and for all operations, and incidental appurtenances to the items of work being described, as necessary to complete the various items of work all in accordance with the requirements of the Contract Documents. Payment for the various items of the Bid Schedule shall include all costs of permits, business licenses, and the cost of compliance with the regulations of public agencies having jurisdiction, including the Department of Public Health, Safety and Health Requirements of the California Division of Industrial Safety and the Occupational Safety and Health Administration of the U.S. Department of Labor (OSHA). No separate payment will be made for any item that is not specifically set forth in the Bid Schedule, and all costs therefore shall be included in the prices named in the Bid Schedule for various appurtenant items of work.

1.02 UNITS OF MEASUREMENT

A. Measurements shall be in accordance with U.S. Standard Measures. A pound is an avoirdupois pound. A ton is 2,000 pounds avoirdupois. The unit of liquid measure is the U.S. gallon.

B. When payment is to be made on the basis of weight, the weighing shall be done on certified platform scales, or when approved by the City's Representative, on a completely automated weighing and recording system. The Contractor shall furnish the City's Representative with duplicate licensed weighmaster's certificates showing the actual net weights. The City will accept the certificates as evidence of the weights delivered.

1.03 METHODS OF MEASUREMENT

A. Materials and items of work, which are to be paid for on the basis of measurement, shall be measured in accordance with the method stipulated in the particular sections involved. In determining quantities, all measurements shall be made in a horizontal plane unless otherwise specified.

B. Material not used in the work and remaining on a transporting vehicle shall be determined by the City's Representative and deducted from the certified tag.

C. When material is to be measured and paid for on a volume basis and it would be impractical to determine the volume, or when requested by the Contractor in writing and approved by the City in writing, the material will be weighed and converted to volume measurement for payment purposes. Factors for conversion from weight measurement to volume measurement will be determined by the City and shall be agreed to by the Contractor before such method of measurement of pay quantities will be adopted.

D. Full compensation for all expense involved in conforming to the above requirements for measuring and weighing materials shall be considered as included in the unit prices paid for the materials being measured or weighed and no additional allowances will be made, therefore.

E. Quantities of material wasted or disposed of in a manner not called for under the Contract; or rejected loads of material, including material rejected after it has been placed by reason of failure of the Contractor to conform to the provisions of the Contract; or material not unloaded from the transporting vehicle; or material placed outside the lines indicated on the plans or given by the City's Representative; or material remaining on hand after completion of the Contract, will not be paid for and such quantities will be deducted from the final total quantities. No compensation will be allowed for hauling rejected material.

1.04 DESCRIPTION OF BID ITEMS

A. The bid items are presented to indicate major categories of the work for purposes of comparative bid analyses, and a preliminary breakdown for monthly progress payments. Bid items are not intended to be exclusive descriptions of work categories and the Contractor shall determine and include in its pricing all materials, labor, and equipment necessary to complete each Bid Item as shown and specified.

B. Contractor shall perform all work depicted in the Contract Documents whether it is specifically mentioned in the Bid Schedule and bid item

descriptions or not. The Bid Schedule and the Bid Item Descriptions below are intended to cover any and all Work depicted in the Contract Documents. Not all elements of every part of the Work are explicitly listed. It is the intention of City and a provision of this Contract, that any and all of the Work depicted shall be included in Contractor's bid and installed complete at a price included in a Bid Item submitted with Contractor's bid. No adjustments will be made to unit, extended, or total prices for an item that is depicted in the contract documents but is not specifically described or itemized. Such items may be included for payment in a bid item of the Contractors' choice, as long as the chosen bid item is closely related.

C. Bid Item Descriptions

1. Mobilization and Demobilization

Mobilization shall consist of preparatory work and operations, including but not limited to, those necessary for the movement of personnel, equipment, supplies and incidentals to the Project Site; for the establishment of all offices, buildings, and other facilities necessary for work on the Project; and for all other work and operations which must be performed, or costs incurred prior to beginning work on the various Contract items on the Project Site. Payment for this item shall be on a lump sum basis. It will be paid on a monthly prorated basis beginning in the month when the first Mobilization and Demobilization takes place on per location basis.

2. Pedestrian and Traffic Control

This lump sum bid item includes all work necessary to prepare, implement, and maintain a pedestrian and traffic control plan in conformance with the Contract Documents. It will be paid on a monthly prorated basis beginning in the month when the first traffic control measures are installed.

3. Shoring

This bid item includes all work necessary to comply with OSHA, Cal OSHA, and California Labor Code Section 6707, including the preparation of an excavation safety plan. Measurement for this item will be equal to the percentage of grading and excavation completed as specified herein and as estimated by the City. This Bid Item shall include full compensation for completion of all planning, design, engineering fees, furnishing and construction, and removal and disposal of such temporary sheeting, shoring and bracing, complete, as required under the provisions of any permits, and in accordance with the requirements of OSHA and the Construction Safety Orders of the State of California, pursuant to the provisions of Section 6707 of the California Labor Code. Payment for this bid item shall be a lump sum basis.

4. Water Pollution Control Plan (WPCP)

This lump sum bid item includes all work to prepare and implement water pollution and erosion controls in conformance with the applicable permits, including the City's NPDES permit for Storm Water Pollution Prevention. This bid item includes all work to prepare and implement a Water Pollution Control Plan (WPCP) and the requisite construction Best Management Practices (BMPs) to prevent the illegal discharge of pollutants.

5. Temporary Bypass Pumping and Piping

This lump sum Bid price for this item shall constitute full compensation for providing all materials, labor, tools, equipment, services, and power to provide adequate pumping of sanitary sewage throughout construction. This Bid item also includes any necessary temporary re-routing of gravity sewer lines during construction. Sewage service must be maintained at all times and the Contractor shall be responsible for providing adequate pumping capacity. This Bid item includes coordination with the City and the payment of any required fees.

6. Bonds and Insurance

This bid item includes all costs for the performance bond, payment bond, and required insurance. It will be paid as a lump sum after the City receives satisfactory bond and insurance.

7. 6-inch Spot Repair, Greater than 5-feet in Depth

The unit price bid per each for this bid item shall constitute full compensation for all material, labor, equipment, tools, and services necessary to repair the existing 6-inch sanitary sewer main as shown on the Plans and specified herein. This price includes removal and disposal of the existing sewer line, bypass pumping, fittings, couplings, backfill, pavement, traffic striping, site restoration, CCTV videoing (pre-video and post video), and other items as required to facilitate the construction of the work.

8. 8-inch Spot Repair, Greater than 5-feet in Depth

The unit price bid per each for this bid item shall constitute full compensation for all material, labor, equipment, tools, and services necessary to repair the existing 8-inch sanitary sewer main as shown on the Plans and specified herein. This price includes removal and disposal of the existing sewer line, bypass pumping, fittings, couplings, backfill, pavement, traffic striping, site restoration, CCTV videoing (pre-video and post-video) (pre-video and post video),, and other items as required to facilitate the construction of the work.

9. 10-inch Spot Repair, Greater than 5-feet in Depth

The unit price bid per each for this bid item shall constitute full compensation for all material, labor, equipment, tools, and services necessary to repair the existing 10-inch sanitary sewer main as shown on the Plans and specified herein. This price includes removal and disposal of the existing sewer line, bypass pumping, fittings, couplings, backfill, pavement, traffic striping, site restoration, CCTV videoing (pre-video and post-video) (pre-video and post video),, and other items as required to facilitate the construction of the work.

10. 15-inch Spot Repair, Greater than 5-feet in Depth

The unit price bid per each for this bid item shall constitute full compensation for all material, labor, equipment, tools, and services necessary to repair the existing 15-inch sanitary sewer main as shown on the Plans and specified herein. This price includes removal and disposal of the existing sewer line, bypass pumping, fittings, couplings, backfill, pavement, traffic striping, site restoration, CCTV videoing (pre-video and post-video) (pre-video and post video),, and other items as required to facilitate the construction of the work.

11. 6-inch Pipe Lining – 17519 Del Monte (PID#6302)

The unit price bid per linear foot for this bid item shall constitute full compensation for all material, labor, equipment, tools, and services necessary to furnish and properly install cured-in-place pipe (CIPP) lining in an existing 6-inch diameter sewer as shown on **Exhibit 1 (EX-1)** and specified herein at the Del Monte location. The lining length is measured from center of manhole to center of manhole. This price includes bypass pumping, site restoration, CCTV videoing (pre-video and post-video), and other items as required to facilitate the construction of the work.

12. 6-inch Pipe Lining – 80 Central Ave. (PID #4388)

The unit price bid per linear foot for this bid item shall constitute full compensation for all material, labor, equipment, tools, and services necessary to furnish and properly install cured-in-place pipe (CIPP)

lining in an existing 6-inch diameter sewer as shown on **Exhibit 2A (EX-2A)** and specified herein at the Centra Ave. location. The lining length is measured from center of manhole to center of manhole. This price includes bypass pumping, site restoration, CCTV videoing (pre-video and post-video), and other items as required to facilitate the construction of the work.

13. 6-inch Pipe Lining – 80 Central Ave. (PID #4389)

The unit price bid per linear foot for this bid item shall constitute full compensation for all material, labor, equipment, tools, and services necessary to furnish and properly install cured-in-place pipe (CIPP) lining in an existing 6-inch diameter sewer as shown on **Exhibit 2B (EX-2B)** and specified herein at the Centra Ave. location. The lining length is measured from center of manhole to center of manhole. This price includes bypass pumping, site restoration, CCTV videoing (pre-video and post-video), and other items as required to facilitate the construction of the work.

14. 8-inch Pipe Lining – 17101 Kruse Ranch Ln. (PID#4852)

The unit price bid per linear foot for this bid item shall constitute full compensation for all material, labor, equipment, tools, and services necessary to furnish and properly install cured-in-place pipe (CIPP) lining in an existing 8-inch diameter sewer as shown on the Plans and specified herein at the Kruse Ranch location. The lining length is measured from center of manhole to center of manhole. This price includes bypass pumping, site restoration, CCTV videoing (pre-video and post-video), and other items as required to facilitate the construction of the work.

15. 8-inch Pipe Lining – 17101 Kruse Ranch Ln. (PID#6577)

The unit price bid per linear foot for this bid item shall constitute full compensation for all material, labor, equipment, tools, and services necessary to furnish and properly install cured-in-place pipe (CIPP) lining in an existing 8-inch diameter sewer as shown on the Plans and specified herein at the Kruse Ranch Ln. location. The lining length is measured from center of manhole to center of manhole. This price includes bypass pumping, site restoration, CCTV videoing (pre-video and post-video), and other items as required to facilitate the construction of the work.

16. 8-inch Pipe Lining – 17101 Kruse Ranch Ln. (PID#6579)

The unit price bid per linear foot for this bid item shall constitute full compensation for all material, labor, equipment, tools, and services necessary to furnish and properly install cured-in-place pipe (CIPP) lining in an existing 8-inch diameter sewer as shown on Plans and specified herein at the Kruse Ranch Ln. location. The lining length is measured from center of manhole to center of manhole. This price

includes bypass pumping, site restoration, CCTV videoing (pre-video and post-video), and other items as required to facilitate the construction of the work.

17. 8-inch Pipe Lining – 45 Central Ave. (PID#6579)

The unit price bid per linear foot for this bid item shall constitute full compensation for all material, labor, equipment, tools, and services necessary to furnish and properly install cured-in-place pipe (CIPP) lining in an existing 8-inch diameter sewer as shown on **Exhibit 2B (EX-2B)** and specified herein at the Centra Ave. location. The lining length is measured from center of manhole to center of manhole. This price includes bypass pumping, site restoration, CCTV videoing (pre-video and post-video), and other items as required to facilitate the construction of the work.

18. 6-inch Spot Repair – 15540 Sunnyside Ave. (PID#5082)

The unit price bid per linear foot for this bid item shall constitute full compensation for all material, labor, equipment, tools, and services necessary to remove and replace the damaged section of the existing 6-inch sewer main at the Sunnyside Ave. location as shown on **Exhibit 3 (EX-3)**. This bid item includes installing a section of new 6-inch SDR-26 sanitary sewer main as shown on the Plans and specified herein. This price includes removal and disposal of the existing sewer line (Polyvinyl Chloride Pipe), bypass pumping, fittings, couplings, backfill, site restoration, CCTV videoing (pre-video and post-video), and other items as required to facilitate the construction of the work.

19. 6-inch Spot Repair – 2245 Brega Ln. (PID#6867)

The unit price bid per linear foot for this bid item shall constitute full compensation for all material, labor, equipment, tools, and services necessary to remove and replace the damaged section of the existing 6-inch sewer main at the Brega Ln. location from as shown on **Exhibit 4 (EX-4)**. This bid item includes installing a section of new 6-inch SDR-26 sanitary sewer main as shown on the Plans and specified herein. This price includes removal and disposal of the existing sewer line (Truss Pipe), bypass pumping, fittings, couplings, backfill, site restoration, CCTV videoing (pre-video and post-video), and other items as required to facilitate the construction of the work.

20. 6-inch Spot Repair – 8090 Tahoe Way (PID#4152)

The unit price bid per linear foot for this bid item shall constitute full compensation for all material, labor, equipment, tools, and services necessary to remove and replace the damaged section of the existing 6-inch sewer main at the Tahoe Way location as shown on **Exhibit 5 (EX-5)**. This bid item includes installing a section of new 6-inch SDR-26 sanitary sewer main as shown on the Plans and specified herein. This price includes removal and disposal of the existing sewer line (Polyvinyl

Chloride Pipe), bypass pumping, fittings, couplings, backfill, site restoration, CCTV videoing (pre-video and post-video), and other items as required to facilitate the construction of the work.

21. 6-inch Spot Repair – 18663 Castle Lake Dr. (PID#3812)

The unit price bid per linear foot for this bid item shall constitute full compensation for all material, labor, equipment, tools, and services necessary to remove and replace the damaged section of the existing 6-inch sewer main at the Castle Lake Dr. location as shown on **Exhibit 9 (EX-6)**. This bid item includes installing a section of new 6-inch SDR-26 sanitary sewer main as shown on the Plans and specified herein. This price includes removal and disposal of the existing sewer line (Truss Pipe), bypass pumping, fittings, couplings, backfill, site restoration, CCTV videoing (pre-video and post-video), and other items as required to facilitate the construction of the work.

22. 6-inch Spot Repair – 1140 Apian Way (PID#4139)

The unit price bid per linear foot for this bid item shall constitute full compensation for all material, labor, equipment, tools, and services necessary to remove and replace the damaged section of the existing 6-inch sewer main at the Monterey Rd. location as shown on **Exhibit 7 (EX-7)**. This bid item includes installing a section of new 6-inch SDR-26 sanitary sewer main as shown on the Plans and specified herein. This price includes removal and disposal of the existing sewer line (Cast Iron), bypass pumping, fittings, couplings, backfill, site restoration, CCTV videoing (pre-video and post-video), and other items as required to facilitate the construction of the work.

23. 8-inch Spot Repair – 16650 Trail Dr. (PID#4320)

The unit price bid per linear foot for this bid item shall constitute full compensation for all material, labor, equipment, tools, and services necessary to remove and replace the damaged section of the existing 8-inch sewer main at the Trail Dr. location as shown on **Exhibit 8 (EX-8)**. This bid item includes installing a section of new 8-inch SDR-26 sanitary sewer main as shown on the Plans and specified herein. This price includes removal and disposal of the existing sewer line (Polyvinyl Chloride Pipe), bypass pumping, fittings, couplings, backfill, site restoration, CCTV videoing (pre-video and post-video, and other items as required to facilitate the construction of the work.

24. 8-inch Spot Repair – 18790 Alicante Cir. (PID#15704)

The unit price bid per linear foot for this bid item shall constitute full compensation for all material, labor, equipment, tools, and services necessary to remove and replace the damaged section of the existing 8-inch sewer main at the Alicante Cir. location as shown on **Exhibit 9 (EX-9)**. This bid item includes installing a section of new 8-inch SDR-26 sanitary sewer main as shown on the Plans and specified herein. This

price includes removal and disposal of the existing sewer line (Polyvinyl Chloride Pipe), bypass pumping, fittings, couplings, backfill, site restoration, CCTV videoing (pre-video and post-video), and other items as required to facilitate the construction of the work.

25. 8-inch Spot Repair – 17002 Tassajara Cir. (PID#4253)

The unit price bid per linear foot for this bid item shall constitute full compensation for all material, labor, equipment, tools, and services necessary to remove and replace the damaged section of the existing 8-inch sewer main at the Alicante Cir. location as shown on **Exhibit 10 (EX-10)**. This bid item includes installing a section of new 8-inch SDR-26 sanitary sewer main as shown on the Plans and specified herein. This price includes removal and disposal of the existing sewer line (Truss Pipe), bypass pumping, fittings, couplings, backfill, site restoration, CCTV videoing (pre-video and post-video), and other items as required to facilitate the construction of the work.

26. 6-inch Open Trench Repair – 13 W 2nd St. (PID#3737)

The unit price bid per linear foot for this bid item shall constitute full compensation for all material, labor, equipment, tools, and services necessary to remove and replace the damaged section of the existing 6-inch sewer main at the W 2nd St. location as shown on **Exhibit 11 (EX-11)**. This bid item includes installing a section of new 6-inch SDR-26 sanitary sewer main as shown on the Plans and specified herein. This price includes removal and disposal of the existing sewer line (Vitrified Clay Pipe), bypass pumping, fittings, couplings, backfill, site restoration, CCTV videoing (pre-video and post-video), and other items as required to facilitate the construction of the work.

27. 6-inch Open Trench Repair – 17519 Del Monte Ave. (PID#6302)

The unit price bid per linear foot for this bid item shall constitute full compensation for all material, labor, equipment, tools, and services necessary to remove and replace the damaged section of the existing 6-inch sewer main at the Del Monte Ave. location as shown on **Exhibit 1 (EX-1)**. This bid item includes installing a section of new 6-inch SDR-26 sanitary sewer main as shown on the Plans and specified herein. This price includes removal and disposal of the existing sewer line (Vitrified Clay Pipe), bypass pumping, fittings, couplings, backfill, site restoration, CCTV videoing (pre-video and post-video), and other items as required to facilitate the construction of the work.

28. 6-inch Open Trench Repair – 17799 Florence St. (PID#3702)

The unit price bid per linear foot for this bid item shall constitute full compensation for all material, labor, equipment, tools, and services necessary to remove and replace the damaged section of the existing 6-inch sewer main at the Florence St. location as shown on **Exhibit 12 (EX-12)**. This bid item includes installing a section of new 6-inch SDR-

26 sanitary sewer main as shown on the Plans and specified herein. This price includes removal and disposal of the existing sewer line (Vitrified Clay Pipe), bypass pumping, fittings, couplings, backfill, site restoration, CCTV videoing (pre-video and post-video), and other items as required to facilitate the construction of the work.

29. 6-inch Open Trench Repair – 16310 Monterey Rd. (PID#3935)

The unit price bid per linear foot for this bid item shall constitute full compensation for all material, labor, equipment, tools, and services necessary to remove and replace the damaged section of the existing 6-inch sewer main at the Monterey Rd. location as shown on **Exhibit 13 (EX-13)**. This bid item includes installing a section of new 6-inch SDR-26 sanitary sewer main as shown on the Plans and specified herein. This price includes removal and disposal of the existing sewer line (Vitrified Clay Pipe), bypass pumping, fittings, couplings, backfill, site restoration, CCTV videoing (pre-video and post-video), and other items as required to facilitate the construction of the work.

30. 6- inch Open Trench Repair – 18525 Old Monterey Rd. (PID#3596)

The unit price bid per linear foot for this bid item shall constitute full compensation for all material, labor, equipment, tools, and services necessary to remove and replace the damaged section of the existing 6-inch sewer main at the Old Monterey Rd. location as shown on **Exhibit 14 (EX-14)**. This bid item includes installing a section of new 6-inch SDR-26 sanitary sewer main as shown on the Plans and specified herein. This price includes removal and disposal of the existing sewer line (Vitrified Clay Pipe), bypass pumping, fittings, couplings, backfill, site restoration, CCTV videoing (pre-video and post-video), and other items as required to facilitate the construction of the work.

31. 6-inch Open Trench Repair – 3615 Jackson Oaks Ct. (PID#4787)

The unit price bid per linear foot for this bid item shall constitute full compensation for all material, labor, equipment, tools, and services necessary to remove and replace the damaged section of the existing 6-inch sewer main at the Jackson Oak Ct. location as shown on **Exhibit 15 (EX-15)**. This bid item includes installing a section of new 6-inch SDR-26 sanitary sewer main as shown on the Plans and specified herein. This price includes removal and disposal of the existing sewer line (Vitrified Clay Pipe), bypass pumping, fittings, couplings, backfill, site restoration, CCTV videoing (pre-video and post-video), and other items as required to facilitate the construction of the work.

32. 8-inch Open Trench Repair – 15880 El Pajaro Cir. (PID#4077)

The unit price bid per linear foot for this bid item shall constitute full compensation for all material, labor, equipment, tools, and services necessary to remove and replace the damaged section of the existing 6-

inch sewer main at the El Pajaro Cir. location as shown on **Exhibit 16 (EX-16)**. This bid item includes installing a section of new 8-inch SDR-26 sanitary sewer main as shown on the Plans and specified herein. This price includes removal and disposal of the existing sewer line (Truss Pipe), bypass pumping, fittings, couplings, backfill, site restoration, CCTV videoing (pre-video and post-video), and other items as required to facilitate the construction of the work.

33. 8-inch Open Trench Repair – 17065 Creekside Cir. (PID#4055)

The unit price bid per linear foot for this bid item shall constitute full compensation for all material, labor, equipment, tools, and services necessary to remove and replace the damaged section of the existing 8-inch sewer main at the Creekside Cir. location as shown on **Exhibit 17 (EX-17)**. This bid item includes installing a section of new 8-inch SDR-26 sanitary sewer main as shown on the Plans and specified herein. This price includes removal and disposal of the existing sewer line (Truss Pipe), bypass pumping, fittings, couplings, backfill, site restoration, CCTV videoing (pre-video and post-video), and other items as required to facilitate the construction of the work.

34. 8-inch Open Trench Repair – 17101 Kruse Ranch (PID#6577)

The unit price bid per linear foot for this bid item shall constitute full compensation for all material, labor, equipment, tools, and services necessary to remove and replace the damaged section of the existing 8-inch sewer main from Station 304+90.77 to Station 305+65.77 at the Kruse Ranch location as shown on the Plans. This bid item includes installing a section of new 8-inch SDR-26 sanitary sewer main as shown on the Plans and specified herein. This price includes removal and disposal of the existing sewer line (Asbestos Pipe), bypass pumping, fittings, couplings, backfill, site restoration, CCTV videoing (pre-video and post-video), and other items as required to facilitate the construction of the work.

35. 8-inch Open Trench Repair – 3490 Oak Hill Ct. (PID#4784)

The unit price bid per linear foot for this bid item shall constitute full compensation for all material, labor, equipment, tools, and services necessary to remove and replace the damaged section of the existing 8-inch sewer main from Station 20+00.00 to Station 22+36.19 at the Oak Hill Ct. location as shown on the Plans. This bid item includes installing a section of new 8-inch SDR-26 sanitary sewer main as shown on the Plans and specified herein. This price includes removal and disposal of the existing sewer line (Vitrified Clay Pipe), bypass pumping, fittings, couplings, backfill, site restoration, CCTV videoing (pre-video and post-video), and other items as required to facilitate the construction of the work.

36. 8-inch Open Trench Repair – 3490 Oak Hill Ct. (PID#4783)

The unit price bid per linear foot for this bid item shall constitute full compensation for all material, labor, equipment, tools, and services necessary to remove and replace the damaged section of the existing 8-inch sewer main from Station 22+36.19 to Station 24+34.59 at the Oak Hill Ct. location as shown on the Plans. This bid item includes installing a section of new 8-inch SDR-26 sanitary sewer main as shown on the Plans and specified herein. This price includes removal and disposal of the existing sewer line (Vitrified Clay Pipe), bypass pumping, fittings, couplings, backfill, site restoration, CCTV videoing (pre-video and post-video). and other items as required to facilitate the construction of the work.

37. 10-inch Open Trench Repair – Cochrane Rd. (PID#6507)

The unit price bid per linear foot for this bid item shall constitute full compensation for all material, labor, equipment, tools, and services necessary to remove and replace the damaged section of the existing 8-inch sewer main at the Cochrane Rd. near Sierra Park, as shown on **Exhibit 18 (EX-18)**. This bid item includes installing a section of new 10-inch SDR-26 sanitary sewer main as shown on the Plans and specified herein. This price includes removal and disposal of the existing sewer line (Truss Pipe), bypass pumping, fittings, couplings, backfill, site restoration, CCTV videoing (pre-video and post-video), and other items as required to facilitate the construction of the work.

38. 10-inch Open Trench Repair – 580 Diana Ave. (PID#3890)

The unit price bid per linear foot for this bid item shall constitute full compensation for all material, labor, equipment, tools, and services necessary to remove and replace the damaged section of the existing 10-inch sewer main from Station 7+42.53 to Station 8+57.53 at Diana Ave. location, as shown on the Plans. This bid item includes installing a section of new 10-inch SDR-26 sanitary sewer main as shown on the Plans and specified herein. This price includes removal and disposal of the existing sewer line (Vitrified Clay Pipe), bypass pumping, fittings, couplings, backfill, site restoration, CCTV videoing (pre-video and post-video), and other items as required to facilitate the construction of the work.

39. 10-inch Open Trench Repair – 625 Diana Ave. (PID#3891)

The unit price bid per linear foot for this bid item shall constitute full compensation for all material, labor, equipment, tools, and services necessary to remove and replace the damaged section of the existing 10-inch sewer main from Station 10+42.50 to Station 10+72.50 at Diana Ave. location, as shown on the Plans. This bid item includes installing a section of new 10-inch SDR-26 sanitary sewer main as shown on the Plans and specified herein. This price includes removal and disposal of the existing sewer line (Vitrified Clay Pipe), bypass pumping, fittings,

couplings, backfill, site restoration, CCTV videoing (pre-video and post-video), and other items as required to facilitate the construction of the work.

40. 10-inch Open Trench Repair – 19145 Eagle View Dr. (PID#4644)

The unit price bid per linear foot for this bid item shall constitute full compensation for all material, labor, equipment, tools, and services necessary to remove and replace the damaged section of the existing 6-inch sewer main at the Eagle View Dr. location as shown on **Exhibit 19 (EX-19)**. This bid item includes installing a section of new 10-inch SDR-26 sanitary sewer main as shown on the Plans and specified herein. This price includes removal and disposal of the existing sewer line (Vitrified Clay Pipe), bypass pumping, fittings, couplings, backfill, site restoration, CCTV videoing (pre-video and post-video), and other items as required to facilitate the construction of the work.

41. 15-inch Open Trench Repair – 17845 Hale Ave. (PID#3677)

The unit price bid per linear foot for this bid item shall constitute full compensation for all material, labor, equipment, tools, and services necessary to remove and replace the damaged section of the existing 6-inch sewer main at the Eagle View Dr. location as shown on **Exhibit 20**. This bid item includes installing a section of new 15-inch SDR-26 sanitary sewer main as shown on the Plans and specified herein. This price includes removal and disposal of the existing sewer line (Vitrified Clay Pipe), bypass pumping, fittings, couplings, backfill, site restoration, CCTV videoing (pre-video and post-video, and other items as required to facilitate the construction of the work.

42. Pipe Bursting Existing 6-inch w/ New 8-inch – 55 Spring Ave. (PID#16378)

The unit price bid per linear foot for this bid item shall constitute full compensation for all material, labor, equipment, tools, and services necessary to burst the existing sewer main as shown on the plans. This price includes CCTV inspection, bypass pumping, locating and exposing utilities, excavation for insertion pits and any necessary receiving pits, new piping, backfill, compaction, pipe testing, site restoration, and other items as required to facilitate the construction of the work.

43. Reinstate Lateral

The unit price per each for this bid item shall constitute full compensation for all material, labor, equipment, tools, and services necessary to reinstate the lateral connection to the sewer main using a robotic cutter after the pipe has been lined with cured-in-place pipe (CIPP). This price includes bypass pumping and other items as required to facilitate the construction of the work.

44. Reconnect Lateral Connection at Open Trench Locations

The unit price bid per each for this bid item shall constitute full compensation for all material, labor, equipment, tools, and services necessary to reconnect sewer lateral connections to the sewer main after open trench repair or replacement of the sewer main. This price includes locating utilities, excavation, disconnection of the lateral connection prior to open trench repair or replacement, reconnection of the lateral after open trench repair or replacement, backfill, compaction, site restoration, and other items as required to facilitate the construction of the work.

45. Reconnect Lateral Connection at Bursting Locations

The unit price bid per each for this bid item shall constitute full compensation for all material, labor, equipment, tools, and services necessary to reconnect the sewer lateral to the sewer main after pipe bursting the sewer main. This price includes locating utilities, excavation, disconnection of the lateral connection prior to bursting, reconnection of the lateral connection after bursting, couplings, backfill, compaction, site restoration, and other items as required to facilitate the construction of the work.

46. Clean Sewer, Remove Grease and Roots, and CCTV

The unit price bid per linear foot for this bid item shall constitute full compensation for all material, labor, equipment, tools, and services necessary to clean sewer, remove, and dispose of the existing grease and roots within the existing sewer mains, and complete CCTV inspection of existing sewer as shown on the Plans. The televising length included on the project drawings are measured from center of manhole to center of manhole. This price includes bypass pumping, site restoration, CCTV videoing (pre-video and post-video), and other items as required to facilitate the construction of the work.

47. New Manhole Structure #1 – Creekview Rd. (Depth 4 Feet)

The lump sum bid price for this bid item shall constitute full compensation for all material, labor, equipment, tools, and services necessary to furnish and properly install new manhole #1 and appurtenances at the Creekview Rd. location as shown on the Plans and specified herein. This bid item includes locating utilities, excavation, bedding, stabilization fabric, backfill, dewatering, compaction, pipe connections, invert and bench forming, concrete pad, removal and replace of the existing concrete curb, bypass pumping, manhole testing, site restoration, and other items as required to facilitate the construction of the work.

48. New Manhole Structure #2 – McKelvey Ln. (Depth 6.5 Feet)

The lump sum bid price for this bid item shall constitute full compensation for all material, labor, equipment, tools, and services necessary to furnish and properly install new manhole #2 and appurtenances at the McKelvey Ln location as shown on the Plans and specified herein. This bid item includes locating utilities, excavation, bedding, stabilization fabric, backfill, dewatering, compaction, pipe connections, invert and bench forming, concrete pad, bypass pumping, manhole testing, site restoration, and other items as required to facilitate the construction of the work.

49. New Manhole Structure #3 – Florence Ct. (Depth 5 Feet)

The lump sum bid price for this bid item shall constitute full compensation for all material, labor, equipment, tools, and services necessary to furnish and properly install new manhole #3 and appurtenances at the Florence Ct. location as shown on the Plans and specified herein. This bid item includes locating utilities, excavation, bedding, stabilization fabric, backfill, dewatering, compaction, pipe connections, invert and bench forming, concrete pad, bypass pumping, manhole testing, site restoration, and other items as required to facilitate the construction of the work.

50. New Manhole Structure #4 – Old Monterey Rd. (Depth 4 feet)

The lump sum bid price for this bid item shall constitute full compensation for all material, labor, equipment, tools, and services necessary to furnish and properly install new manhole #4 and appurtenances at the Old Monterey Rd. location as shown on the Plans and specified herein. This bid item includes locating utilities, excavation, bedding, stabilization fabric, backfill, dewatering, compaction, pipe connections, invert and bench forming, concrete pad, bypass pumping, manhole testing, site restoration, and other items as required to facilitate the construction of the work.

51. New Manhole Structure #5 – Kruse Ranch (Depth 5 feet)

The lump sum bid price for this bid item shall constitute full compensation for all material, labor, equipment, tools, and services necessary to furnish and properly install new manhole #5 and appurtenances at the Kruse Ranch location as shown on the Plans and specified herein. This bid item includes locating utilities, excavation, bedding, stabilization fabric, backfill, dewatering, compaction, pipe connections, invert and bench forming, concrete pad, bypass pumping, manhole testing, site restoration, and other items as required to facilitate the construction of the work.

52. Remove and Dispose of Asbestos Concrete Pipe

The unit price bid per linear feet for this bid item shall constitute full compensation for all material, labor, equipment, tools, and services necessary to remove and properly dispose of Asbestos Clay Pipe as shown on the Plans and specified herein. This bid item includes Transportation, disposal, storage, containment of and housekeeping activities involving asbestos or products containing asbestos, on the site or location at which construction activities are performed.

53. Supplemental Work (Revokable)

The lump sum allowance for this item shall be used by at City's discretion for items that could not be reasonably anticipated from the construction documents. This item may be used by the City for payment for items such as repairing laterals, relocating utilities, or other items that could not be reasonably anticipated from the bid documents or pre-bid site visits. At the completion of the Construction Contract, a balancing change order will be issued, and funds not used from the Bid Allowance lump sum amount named in the Bid Schedule will be revoked.

1.01 CONTRACTOR'S COST BREAKDOWN

A. The Contractor shall submit a Schedule of Values to the City's Representative at the preconstruction conference. The price breakdown, as agreed upon by the Contractor and the City's Representative, shall be used for preparing future estimates for partial payments to the Contractor, and shall list the major items of work with a price fairly apportioned to each item. Overhead and other general costs and profit shall be prorated to each item so that the total of the prices for all items equal the lump sum price.

B. The price breakdown shall be generally in the same format as the Contract specifications divisions and subdivisions, with major items of work listed individually. The price breakdown shall be by structural, civil, landscaping, or other logical division of work. The price breakdown shall include separate allowances for any testing and startup work required. Measurable approximate quantities of work performed by the Contractor or its subcontractors shall be provided. For quantities that are the sum total of several individual quantities, backup summaries shall be provided which list the individual descriptions and quantities. These summaries then will be used to determine the quantities of work in place in subsequent progress payment requests.

C. The above is a statement of the intent of the Contract Documents to provide a moderate level of detail, acceptable to the City's Representative, to allow a fair and reasonable estimate to be made of the value of work installed. The detail of the price breakdown must be sufficient to provide timely processing of the monthly progress payment request.

D. The price breakdown will be subject to the approval of the City's Representative, and upon request, the Contractor shall substantiate the price for any or all items and provide additional level of detail, including quantities of work. The price breakdown shall be sufficiently detailed to permit its use by the City's Representative as one of the bases for evaluating requests for payments. The City's Representative shall be the sole judge of the adequacy of the price breakdown.

E. The Schedule of Values shall be solely used to determine progress payments. The Schedule of Values shall not be considered in determining payment or credit for additional or deleted work.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

*****END OF SECTION*****

SECTION 01354
HAZARDOUS MATERIALS CONDITIONS AND PROCEDURES

PART 1 GENERAL

1.01 DESCRIPTION

A. Section includes description of existing site conditions, general requirements, and procedures for work in the presence of hazardous materials, and requirements for personal protective equipment, training, and monitoring.

B. Requirements of this section apply to the Work or any portion thereof which involves disturbance of or exposure to hazardous materials.

1.02 DEFINITIONS

A. Hazardous Materials: Materials consisting of or containing any substances defined, regulated or listed as hazardous substances, hazardous materials, hazardous wastes, health hazards, toxic waste, pollutant or toxic substances or similarly identified as hazardous to human health or the environment in or pursuant to CERCLA, the Hazardous Materials Transportation Act, RCRA, the Clean Water Act, California Health and Safety Code, the Clean Air Act, the California Water Code or any other appropriate regulation or law including without limitation friable asbestos, polychlorinated biphenyls, petroleum, natural gas and synthetic fuel products and by-products.

B. Personal Protective Equipment (PPE): Individually donned equipment and clothing used in conjunction with appropriate engineering controls and work practices to protect project workers from unacceptable risk related to the handling of soil, building material, or groundwater impacted with hazardous materials.

C. Training and Personnel Monitoring – Labor, materials, equipment, and analyses, utilized to provide appropriate baseline and ongoing training, communication, and verification, including medical surveillance (if needed), of conditions related to employee exposure to hazardous materials.

D. Contaminated Materials:

1. Contaminated Soil: Soil that cannot be disposed of at a Class III landfill/disposal site.

2. Contaminated Water: Ground water from dewatering operations containing constituents at measured levels in excess of permit thresholds for discharge into the sanitary sewer system.
3. Contaminated Sludge: Sludge, sediment and debris removed from the sanitary sewer facilities that cannot be disposed of at a Class III landfill/disposal site.
4. Site materials, whether existing or new, other than soil or water that cannot be disposed of at a Class III landfill/disposal site shall also be considered as contaminated material.

1.03 SUBMITTALS

A. Hazardous Materials Site-Specific Health and Safety Plan (HMSSHASP): Submit for acceptance by the Engineer within 21 days after Notice to Proceed.

B. Amendments: Submit amendments to the HMSSHASP for review and acceptance by the Engineer as they occur.

C. Contaminated Soil Excavation and Disposal Work Plan (CSEDWP):

1. The CONTRACTOR shall prepare and submit to the ENGINEER for approval a CSEDWP. The plan shall be approved prior to beginning any excavation work.
2. The CSEDWP shall address the management of contaminated soils and ground water that may be encountered during the prosecution of the Work. All contaminated material encountered in work areas shall be disposed of at a landfill/disposal site approved for the type of material encountered.
3. The CSEDWP shall address removal and disposal procedures for contaminated soils encountered along the pipeline alignments. The Plan will provide, at a minimum, the following information:
   a. The name(s) and address(es) of Subcontractor(s) for work of this Section.
   b. As discussed in 2.01, the methodology for all waste tracking activities to prevent the occurrence of cross contamination; excavation methods detailing operations necessary to ensure no blending of contaminated soil with non-contaminated soil; and temporary stockpiling methods.
   c. Corporate name, address, and contact person information (name, telephone, and fax number) of all hazardous waste transporters. Include proof of current permit, license, and/or authorization to transport hazardous waste within the state.
   d. Disposal facility information described in 2.01 herein.
   e. The CONTRACTOR shall submit documentation certifying that all contaminated materials were transported to, accepted, and disposed of, at the disposal facility.

1.04 EXISTING SITE CONDITIONS

A. Contaminated Material:

1. The work requires removal and disposal of existing asbestos cement (AC) pipe as indicated on the plans. See specification Section 02170 Asbestos Cement Pipe Removal and Disposal.
2. The Contractor may encounter contaminated materials (as defined herein) on work site surfaces or within equipment that may be abandoned on-site or demolished and removed from site.
3. Other than AC pipe, the City is not aware of substantial contamination at these Work sites; however, there is a potential for contaminated material which could include lead-based paint, residual solvents, and petroleum hydrocarbons.

1.05 GENERAL REQUIREMENTS

A. No work that disturbs existing structures, soil, or groundwater containing hazardous materials shall be performed until the Hazardous Substance Site-Specific Health and Safety Plan is reviewed and accepted by the Engineer.

B. Documentation:

1. Maintain logs on-site of monitoring equipment calibration.
2. Maintain logs on-site of the results of field monitoring measurements.
3. Maintain copies on-site of any laboratory analytical results associated with health and safety monitoring.

C. Contractor shall comply with the following general work practices:

1. Do not smoke, chew gum, apply cosmetics, or consume food and beverages in areas where hazardous materials are being handled.
2. Wash hands thoroughly before eating, smoking, or drinking.
3. Do not store food in areas where it may come in contact with hazardous materials, including soil and dusts.
4. To the extent practical, stay upwind from operations that emit vapors, gases, or particulates.
5. Clean clothing and footwear upon leaving jobsite and prior to entering any vehicle, mobile equipment, or office.
6. Clean vehicle interiors and handheld tools as needed to prevent accumulation of particulates.

D. Follow guidelines for the selection and use of proper personal protective equipment as outlined in the applicable job safety or task hazard analysis from the Hazardous Material Site Specific Health and Safety Plan. At a minimum all Contractor personnel that may come into contact with site soils shall be suitably dressed to perform their work in a safe manner that

minimizes exposure to soil and does not interfere with their hearing, vision, or free use of their hands or feet. The following minimum PPE shall be worn by all Contractor employees who may come into contact with site soils:

1. Waist length shirts with sleeves.
2. Trousers covering the entire leg.
3. Work boots.
4. Eye protection meeting the latest American National Standard for Occupational and Educational eye and face protection.
5. Work gloves when handling soil or hand tools in contact with soil.
6. Additional equipment may modify this minimum requirement and, if required, will be outlined in the Hazardous Material Site Specific Safety and Health Plan as part of the job safety or task hazard analysis.

E. Use equipment, in addition to the minimum outlined herein, if listed in the Hazardous Material Site Specific Safety and Health Plan as part of the job safety or task hazard analysis.

1.06 HAZARDOUS MATERIALS SITE-SPECIFIC HEALTH AND SAFETY PLAN

A. Prepare a Hazardous Materials Site-Specific Health and Safety Plan (HMSSHASP) for all site personnel in accordance with the federal OSHA, and Cal/OSHA regulations.

1. The Plan shall include:
    a. Provisions specific to handling soils and ballast containing elevated concentrations of petroleum hydrocarbons, poly-nuclear aromatic hydrocarbons, and the metals lead and arsenic.
    b. Additional information or procedures as determined necessary by the Contractor for safe performance of work in the presence of hazardous materials.

B. Implement the HMSSHASP, including use of engineering controls, providing its site personnel with the appropriate training and monitoring and personal protective equipment (PPE) based upon the type of work to be performed and the associated hazard, and ensuring proper use of PPE and compliance with safe work practices. The Contractor shall perform all monitoring necessary to determine the ongoing appropriate level of PPE for the work.

C. The Engineer will have the authority to stop work if, in the opinion of the Engineer, the level of PPE selected by the Contractor is not appropriate or site personnel are not complying with the requirements of the HMSSHASP.

1.07 UNKNOWN HAZARDOUS MATERIALS

A. When the presence of hazardous materials are not indicated in the Contract Documents and the Contractor encounters materials, including groundwater, which the Contractor reasonably believes to be hazardous and the hazardous materials have not been rendered harmless, the Contractor shall immediately cease work in the affected area and report the condition to the Engineer in writing. The Contractor may continue work in unaffected areas reasonably believed to be safe.

B. The Engineer will direct the Contractor as to sampling, testing, disposal, and/or remedial work that might take place either through the Contractor's forces or City's own forces or an authorized agent. If the consequent delay of work in the affected area delays a current controlling operation, the delay will be considered in accordance with the Contract General Provisions.

PART 2 PRODUCTS

2.01 CONTAMINATED SOILS

A. The CONTRACTOR shall perform all work of this Section in accordance with the Hazardous Materials Site-Specific Health and Safety Plan. The Hazardous Materials Site-Specific Health and Safety Plan shall contain the information listed below.

B. Hazardous Materials Site-Specific Health and Safety Plan

1. Detail the Methods and Procedures to comply with California Labor Code Section 6401.7, Federal, and Local Health and Safety Laws, Rules and Requirements for the duration of the Contract Times. Include the following:
    a. Identification of the certified or licensed safety consultant, who will prepare, initiate, maintain, and supervise safety programs, and procedures. Consultant shall meet the following requirements:
        1) Health, Safety, and Environmental (HSE) consultants per OSHA requirements, or
        2) Certified Safety Professionals (CSP) per OSHA requirements.
    b. Procedures for providing workers with an awareness of safety and health hazards expected to be encountered in the course of construction.
    c. Safety equipment appropriate to the safety and health hazards expected to be encountered during construction. Include warning devices, barricades, safety equipment in public right-of-

way and protected areas, and safety equipment used in multi-level structures.
   d. Methods for minimizing employees' exposure to safety and health hazards expected during construction.
   e. Procedures for reporting safety or health hazards.
   f. Procedures to follow to correct a recognized safety and health hazard.
   g. Procedures for investigation of accidents, injuries, illnesses, and unusual events that have occurred at the construction site.
   h. Periodic and scheduled inspections of general work areas and specific work stations.
   i. Training for employees and workers at the jobsite.
   j. Methods of communication of safe working conditions, work practices and required personal protection equipment.
2. Assume responsibility for every aspect of Health and Safety on the jobsite, including the health and safety of subcontractors, suppliers, and other persons on the jobsite.
   a. Employ additional health and safety measures specified by the Safety Consultant, as necessary, for workers in accordance with OSHA guidelines.
3. Transmit to CITY and ENGINEER copies of reports and other documents related to accidents or injuries encountered during construction.

C. On all portions of the work involving grading or excavation, the CONTRACTOR shall examine soil as evidenced by site history, discoloration, odor, differences in soil properties, abandoned underground tanks or pipes, or buried debris.

1. If the project is not within an area of known soil contamination and no evidence of soil contamination is found, then testing of the soil will only be required if directed by the ENGINEER. The CONTRACTOR shall follow the paragraphs below, if contamination is suspected or found.
2. If the work is within an area of known soil contamination or evidence of soil contamination is found, then soil from grading or excavation operations shall be tested.
   a. The soil shall be managed as required by the governing agencies.
   b. The CONTRACTOR shall test excavated material suspected of contamination for disposal characteristics.
   c. All confirmation and stockpile soil samples for testing shall be submitted to a State-certified analytical laboratory for chemical analysis.
3. If the project is found to be within an area of soil contamination not identified by the CITY in the Contract Documents, a change order

shall be negotiated to cover additional work performed by the CONTRACTOR.

D. During excavation, if the CONTRACTOR encounters contaminated soil, the CONTRACTOR shall immediately implement the CSEDWP. Any non-contaminated soil that becomes mixed with contaminated soil shall be designated as contaminated and shall be handled and disposed as such at no additional cost to the CITY. CONTRACTOR will not be paid for handling and disposal of the volume of non-contaminated soil at the contaminated soil price, if it is mixed with contaminated soil.

E. The CONTRACTOR shall temporarily stockpile excavated soil in piles not exceeding a volume of 500 cubic yards pending soil characterization and analytical results. Stockpiles shall be securely barricaded and clearly labeled. Excavated material will not have to be segregated into different stockpiles for sampling and disposal. However, if a clearly segregable material is encountered (railroad ballast or other soil that is stained, odorous, or discolored) the material shall be stockpiled separately and sampled for disposal characteristics.

F. Contaminated soils stored at the temporary stockpile area shall be covered with visqueen material to prevent the migration of contaminants from the material. CONTRACTOR shall provide temporary berms constructed of clean soil or hay bales and covered with visqueen to contain runoff from the stockpiled soil. Visqueen material shall have a thickness of at least 10 milli-inches. CONTRACTOR shall recover all rainwater or other water that collects in the temporary stockpile area.

G. The CONTRACTOR shall implement a material tracking system to track all contaminated soil between collection, excavation, stockpiling or storage, sampling and testing, and final disposition. The waste tracking system shall include identification of the source of the soil (location, depths, and date of excavation) and stockpile or storage location.

   1. The CONTRACTOR shall identify a minimum of one landfill that is permitted to and will accept the contaminated soils expected for disposal. The CONTRACTOR shall select landfills that are established, fully operational, and in full compliance with all applicable federal, state, and local regulations.

H. All construction equipment used for the handling of contaminated material shall be decontaminated prior to use for other work elements or removal from site.

2.02 CONTAMINATED WATER

A. The CONTRACTOR shall perform all work of this Section in accordance with the Construction Safety Plan described in this specification.

B. The CONTRACTOR shall contain and properly dispose of all water generated from excavation work in contaminated areas, as described in this Section.

C. The CONTRACTOR shall test excavated ground water for disposal characteristics. The CONTRACTOR shall allow the suspended particles to settle out of solution prior to testing water. Water samples taken during initial studies included suspended particles that contained metals. All confirmation samples will be submitted to a State-certified analytical laboratory for chemical analysis.

D. During excavation operations, if the CONTRACTOR encounters contaminated water, the CONTRACTOR shall immediately implement the CSEDWP. Any non-contaminated water that becomes mixed with contaminated water shall be designated as contaminated water and shall be handled and disposed as such at no additional cost to the CITY. CONTRACTOR will not be paid for handling and disposal of the volume of non-contaminated water at the contaminated price, if it is mixed with contaminated water.

E. The CONTRACTOR shall temporarily store water from dewatering activities pending water characterization and analytical results. Stored water shall be clearly labeled. Contractor shall install in-line filtration system prior to disposal for water if required by disposal facility.

F. The CONTRACTOR shall identify a minimum of one disposal site that is permitted to and will accept the contaminated water expected for disposal. The CONTRACTOR shall select facilities that are established, fully operational, and in full compliance with all applicable federal, state, and local regulations.

G. All construction equipment used for the handling of contaminated material shall be decontaminated prior to use for other work elements or removal from site.

PART 3 EXECUTION

3.01 HAZARDOUS MATERIALS INDEMNITY

A. From and after CONTRACTOR undertakes work on the property subject to this Agreement, CONTRACTOR shall indemnify, defend (with counsel selected by CITY) and hold harmless CITY, from and against all Liability concerning CONTRACTOR’s operations on said property. CONTRACTOR and CITY agree that upon receipt of any notices of a release or potential release of Hazardous Materials during work on the property subject to this Agreement or transportation to or from the

disposal facility at which the hazardous soils may be placed, the parties will provide prompt notice to the other. CONTRACTOR shall timely initiate and diligently pursue and complete all appropriate response, remediation, and removal actions for the release, within the deadlines specified by applicable laws and regulations.

B. So long as CONTRACTOR is not in material breach hereof, and is discharging its defense and indemnity obligations in a reasonable and responsible manner for a Liability, and it has accepted and is discharging responsibility hereunder for such liability without any reservation of rights, CITY hereby assigns to CONTRACTOR all of its present and future rights to recover, or receive contribution, from any and all potentially responsible third parties for those costs, expenses and fees incurred by CONTRACTOR pursuant to this Indemnity. Subject to the foregoing, CITY hereby also assigns its rights to CONTRACTOR to bring an action against or otherwise cause any or all of such potentially responsible parties to take responsive actions, and to remove and remediate the Hazardous Materials. Each party agrees to cooperate fully with the other in the preservation and prosecution of all such claims and private enforcement actions.

C. So long as CONTRACTOR is not in material breach hereof, and is discharging its defense and indemnity obligations in a reasonable and responsible manner for a Liability, and it has accepted responsibility hereunder for such liability without any reservation of rights, CONTRACTOR shall have control over the defense of such Liability without any reservation of rights, and over all negotiations relating to the settlement thereof. CONTRACTOR's exercise of control over settlements shall not relieve CONTRACTOR of its indemnity and defense obligations to CITY.

3.02 HAZARDOUS MATERIAL AND WASTE MANAGEMENT

A. Storage: The CONTRACTOR shall label and store all hazardous materials, such as pesticides, paints, thinners, solvents, and fuels; and all hazardous wastes, such as waste oil and antifreeze; in accordance with all applicable local, State and Federal regulations.

1. The CONTRACTOR shall store all hazardous materials and all hazardous wastes in accordance with secondary containment regulations, and it is recommended that these materials and wastes be covered, as needed, to avoid potential management of collected rainwater as a hazardous waste.
2. The CONTRACTOR shall keep an accurate, up-to-date inventory, including, but not limited to, Material Safety Data Sheets (MSDSs) of hazardous materials and hazardous wastes stored on-site, to assist emergency response personnel in the event of a hazardous materials incident.

B. Usage: When rain forecast within 24 hours or during wet weather, the Engineer may prevent the CONTRACTOR from applying chemicals in outside areas. The CONTRACTOR shall not over-apply pesticides or fertilizers and shall follow material manufacturer's instructions regarding uses, protective equipment, ventilation, flammability, and mixing of chemicals.

C. Disposal: The CONTRACTOR shall arrange for regular hazardous waste collection to comply with time limits on storage of hazardous wastes. The CONTRACTOR shall dispose of hazardous waste only at authorized and permitted Treatment, Storage, and Disposal Facilities, and use only licensed hazardous waste haulers to remove the waste off-site, unless quantities to be transported are below applicable threshold limits for transportation specified in State and Federal regulations. CONTRACTOR shall ensure that CITY receives a copy of the Uniform Hazardous Waste Manifest form completed by the hazardous waste facility that accepted said materials.

*****END OF SECTION*****

SECTION 01531
TEMPORARY FLOW CONTROL

PART 1 - GENERAL

1.01 SUMMARY

A. This Project consists of construction of new main sewer, removal and replacement of an existing main sewer, abandonment of an existing main sewer, and transfer of existing building sewer connections from existing main sewer to new main sewer. It shall be the Contractor's responsibility to maintain at all times the sewer flows, regardless of volume, through the Project site and from the adjacent properties.

B. Provide bypass pumping during removal, abandonment, and installation of the main sewer. Accommodate flows at all times from collector and trunk sewer connections at manholes, where they occur. NO SEWAGE FLOW into the trench shall be allowed.

C. Coordinate directly with residents and businesses to minimize wastewater flows during the scheduled work.

D. The Contractor may work with residents and businesses to minimize discharge to the sewer and may utilize temporary plugging or flow stoppage from the building sewers (laterals) during the work period if no adverse back up of sewage occurs at connected buildings, otherwise the Contractor shall actively bypass pump from building sewer (lateral) connections and/or cleanouts.

E. Provide sewer outage notifications per the project Technical Specifications.

F. This Section specifies the requirements for temporary bypassing, dewatering, and disposal of water and wastewater from the sewer facilities as required to perform the work. Extract, pump, and/or dispose of wastewater from bypassing and dewatering gravity sanitary sewer pipelines, building sewers (laterals), and cleanouts as required.

G. Sewer flow discharges shall be to the sanitary sewer system.

H. Dewatering requirements for grading, excavation, backfilling, and compacting are specified elsewhere in the Contract Documents.

I. Work shall include a mandatory field meeting, conducted to discuss the traffic control prior to design and submittal of the traffic control plan and the sewage bypass pumping plan. The meeting shall be attended by the Contractor (foreman, project manager, and person in charge of bypass pumping), the Engineer, and the City.

1.02 PROJECT REQUIREMENTS

A. Provide labor, materials, and full-time supervision, as required, to set up necessary equipment, and contain, bypass, dewater, and dispose of raw wastewater, treated wastewater, and storm drain flows, as necessary, for abandonment, television inspections, spot repairs, replacements, connections, rehabilitation, and other modifications made to complete the work.

B. The Work shall not result in spills into the work area. Spill of sanitary wastewater can result in costs and/or fines levied against the City. In the event that there is a spill, the Contractor shall be responsible for fines, penalties and charges due to sanitary sewer spills resulting from the Contractor's operations and/or failure of bypass pumping.

C. Provide facilities and controls required to intercept, convey, and discharge sanitary sewer flows around the work area at all times during Construction.

1.03 NOTE USED

1.04 SUBMITTALS

A. Within five (5) days of Notice to Proceed and at least fourteen (14) days prior to initiating bypass activities, submit a detailed Bypass Pumping Plan consisting of drawings and complete design data in accordance with the Contract Documents. Submittal shall show all proposed methods, layout, equipment, and discharge locations for bypassing and dewatering.

B. The Submittal shall include the following information:

1. A site plan showing the size and layout of pumps, valves, and temporary pipelines. Layout shall show how temporary facilities will be protected during use.
2. Narrative description of system staffing, monitoring, and controls.
3. Catalog data on pump controls and audible alarms.
4. Catalog data for portable generators when electric pumps are used.
5. Drawings indicating the locations of temporary plugs, taps, pumping systems, suction and discharge piping, and locations of sanitary sewers and manholes to receive discharges of raw or treated wastewater.
6. Data that includes the locations and elevations of existing sanitary sewer systems, and the capacities of duty and standby pumps, prime movers, power and standby power, and other equipment.
7. Design calculations that prove the adequacy of the bypassing, dewatering, and disposal system(s) and selected equipment. Design calculations shall confirm that the bypassing and pumping operations shall not cause surcharge in any portion of the existing sanitary sewer system. Design calculations shall be signed and sealed by a civil engineer registered in the State of California qualified to perform said analysis.
8. An emergency response plan that provides, in detail, the procedure to be followed in the event of a failure of the bypass pumping systems. The plan shall include the name and telephone number of the person who will be in charge of the response in an accidental spill and is required to:
    - Make the maximum effort to stop the spill immediately.
    - Verbally notify the City of Morgan Hill within 15 minutes of knowledge of the accidental spill.
    - Submit a written report within 15 working days of knowledge of the accidental spill explaining the cause, nature, volume and duration of the accidental spill, and

the procedures taken to clean up the spill.

- If the accidental spill enters the storm drain system or a stream, immediately conduct a sampling and analysis program of the contaminated water body demonstrating up to 21 consecutive days that the stream has recovered to its natural state. The first sample result shall be submitted within 30 days of the accidental spill.

9. Odor mitigation plan.

1.05 JOB CONDITIONS

A. Available Data:

1. The maximum expected dry weather flow is 2,190 gpm. The maximum expected wet weather flow is 3,500 gpm. These values shall serve as an estimate only. The Contractor shall be responsible for flow verification, design, construction, and operation of an adequate and properly functioning bypass and dewatering system.
2. Any testing or gathering of flow data is the responsibility of the Contractor.
3. Coordinate all sewer bypassing and dewatering operations with the Engineer.

B. Protection:

1. Where bypassing is required, ensure that service for connecting laterals is not disrupted. All bypassed flow shall be discharged into the nearest (downstream) sanitary sewer manhole. Take appropriate steps to ensure odor control at the discharge manholes.
2. Bypassing and dewatering operations resulting in discharges to the ground surface, streams, creeks, culverts, ditches, storm drains, or groundwater shall not be permitted. Perform work so as to protect the public from potential health hazards, and work shall be performed to protect the environment from contamination.

C. Scheduling:

1. The bypassing and dewatering systems shall not be shut down between shifts, during work stoppages, or during any periods when flows through the main sewer have not been properly restored.
2. Provide fourteen (14) days written notice to the Engineer prior to performing all bypassing, dewatering, and disposal work.

D. Permits and Approvals:

1. Obtain approval from the Engineer for the proposed Bypass Pumping Plan.
2. If the Engineer determines that the Contractor's diversion plan is inadequate, the Contractor shall provide equipment, materials, and labor to develop a viable diversion and pumping plan.
3. Prior to plugging any lines, the contractor shall notify the project manager and project inspector, at least 24 hours in advance. Included in this item of work is pumping of local depressions in the pipe that may or may not be shown on the plans.

PART 2 - PRODUCTS

2.01 PUMPS AND GENERATORS

A. The Contractor shall provide suitable “trash-type” primary sewage pumps capable of bypassing all flows around the worksite.
B. Pumps shall be variable rate units, rated for continuous duty, and shall be capable of pumping the specified flow range without surging, cavitation, or vibration.
C. A minimum of two primary pumps are required for each flow control system. If two pumps are used, each pump and generator must be able to handle the peak flows. If three are used, each pump and generator must be able to handle at least 50% of the peak flows.
D. Keep all generators fueled at all times.
E. Generators shall be placed on spill guard mats or other approved double containment devices to eliminate the possibility of fuel spills to ground surface. Provide materials and equipment that will ensure continuous and successful operation of temporary flow control systems.

2.02 PIPING

A. In order to prevent the accidental spillage of flows all exposed discharge piping systems installed on the ground surface for temporary bypass pumps shall be constructed of either rigid pipe with positive, restrained joints (Yellowmine pipe or approved equal), or ribbed, heavy duty hard suction hoses with flanged couplings and driveway ramps at all existing driveways. Under no circumstances will aluminum "irrigation" type piping or glued PVC pipe be allowed for exposed piping systems. Discharge hose will only be allowed in short sections and by

specific permission from the Engineer. Collapsible discharge hoses will not be permitted.

B. Pipe crossing roadways shall be installed in temporary slit trenches, bedded, backfilled, and paved as shown on the details in the Contract Drawings.
C. The sewage flow control piping shall be completely leak free. Any drips or leaks shall be repaired by the Contractor immediately.
D. A minimum of two pipes is required for all sewer bypasses. Each pump may be piped separately to the discharge point, or the pump discharge lines can be manifolded together.

2.03 TEMPORARY BULKHEADS AND PLUGS

A. Design and provide bulkheads and plugs to withstand anticipated upstream differential head without leakage or displacement.
B. A watertight seal is required to prevent sewage from entering the work area.
C. The Contractor shall provide double bulkheads and plugs, both able to withstand upstream head, upstream of locations where persons will be entering the sewer and at all flow diversions. Coordinate installation and removal of bulkheads and plugs with the Engineer.

2.04 STANDBY EQUIPMENT

A. The Contractor shall have available onsite sufficient equipment and materials to ensure continuous and successful leak-free operation of the sewage flow control system.
B. The Contractor shall have available onsite sufficient number of valves, tees, elbows, connections, tools, sewer bulkheads for different pipe sizes as needed, piping and other parts of system hardware to ensure immediate repair or modifications of any part of the system as necessary.
C. The Contractor shall have on site one standby pump with capacity equal to or greater than the largest primary pump. If the standby pump is electric, a standby generator shall be provided on site. The standby pump shall be operational and shall be connected to the bypass piping to allow immediate standby service at all times.
D. Generator shall be fueled at all times. Generators shall be placed on spill guard mats or other approved double containment devices to eliminate the possibility of fuel spills to ground surface.
E. Bypassing and dewatering systems shall have one hundred percent (100%) redundancy.

PART 3 - EXECUTION

3.01 PLUGGING, BLOCKING AND PUMPING

A. Flow control will be required for this Project. Bypass pumping will be allowed only during Contractor’s working hours. At the end of every working day, flows must be properly restored to the sanitary sewer. Any emergency pumping operations that are required outside of the Contractor’s working hours must be approved in advance by the Engineer.
B. Furnish, install and operate pumps, plugs, conduits, and other equipment to

dewater existing sewer pipelines or to divert the flow of wastewater around the pipeline reach in which work is to be performed, and to maintain service to all properties connected to the sewer being replaced. Plugs shall be so designed that all or any portion of the wastewater can be released. Plugs shall be provided with a tag line.

C. The pumping system shall be of sufficient capacity to manage existing flows plus additional flow that may occur during a rainstorm. If pumping is required outside normal working hours, engines shall be equipped and/or shielded in a manner to keep noise to a minimum. Noise level shall conform to the noise ordinance requirements of the governing jurisdiction.
D. Engines shall be equipped with mufflers and/or shall be enclosed to comply with all local noise ordinances. Pumps and bypass lines shall be of adequate capacity and size to handle the flows. All bypassed flow shall be discharged to the nearest downstream manhole.
E. Bypass pumping shall be completed in such a manner as will not damage private or public property or create a nuisance or public health menace. The pumped wastewater shall be in an enclosed hose or pipe that is adequately protected from traffic and shall be redirected into the sanitary sewer system. Dumping or free flow of wastewater on private property, gutters, trenches, streets, sidewalks, or into storm sewers is prohibited. The Contractor shall be liable for all damages associated with this work. After the work is completed, flow shall be restored to original conditions and temporary facilities removed.

3.02 SEWER DEWATERING

A. Extract, pump, and/or dispose of wastewater from dewatering the existing sewers.
B. Dewater all sagged or submerged portions of the existing sewer as required for abandonment, or as otherwise required to complete the work.
C. Dewatering of excavations shall be conducted in accordance with the Contract Documents.
D. Coordinate all work with the Engineer. Comply with the Contract Documents for work outage requests related to City’s existing facilities.

3.03 SEWER BYPASSING

A. Where Contractor’s work on constructing the project pipeline requires sanitary sewers to be removed temporarily from operation, sewer bypassing shall be accomplished by pumping or diverting the upstream flow around the Contractor's work in accordance with this Section.
B. Unless otherwise specified, sewer flow shall be bypassed around the work whenever the Contractor's equipment is operating in the sewer, or when work related to the sewer provides an obstruction or otherwise restricts flow and causes the depth of flow as measured at the inlet pipe to the upstream manhole adjacent to the Contractor's work to exceed half of the diameter of the pipe.
C. The use of storm sewers for purposes of diverting or pumping sanitary sewer flows shall not be permitted.

3.04 DAMAGES

The Contractor shall pay for all fines and repair without cost to the City any damage that may result from the Contractor’s negligence, inadequate or improper installation, maintenance and operation of bypassing and a dewatering system including mechanical or electrical failures and sewage flow into the trench. Contractor shall also be responsible for all costs associated with reporting the spill, performing the cleanup after a spill, fines, criminal prosecution, and work stoppage.

3.05 MONITORYING

A. Provide monitoring of flow levels and pump operation to assure continued operation of bypass pumping.
B. Monitoring by Contractor’s personnel shall take place at all times that bypass pumps are in operation (including 24-hour, around-the-clock operation if required during an emergency). An audible alarm system shall be installed to notify workers when the pumps fail to operate.
C. In the event the pumps fail, workers shall immediately evacuate trenches until the bypass pumping system is operational.

3.06 ODOR MITIGATION

A. In accordance with the Contract Documents, submit an odor mitigation plan.
B. When working inside manholes and sewer lines, exercise caution and comply with CAL/OSHA requirements when working in the presence of hydrogen sulfide. Contractor is warned that the existing sewers and the structures associated with the project may contain high levels of hydrogen sulfide gas, a natural gaseous

by-product of sanitary sewage. Take all the necessary precautions, such as portable hydrogen sulfide detectors per CAL/OSHA requirements, to ensure that the environment is safe for those at the work site.

C. A complete Health and Safety Plan shall be submitted to the Engineer as described in the contract documents. No entry to any of the existing facilities will be permitted until appropriate work crews are certified for confined space entry and the Health and Safety Plan is reviewed. The Health and Safety Plan shall be developed specifically for the project.
D. The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the work.
E. To minimize the dispersal of sewer odors above ground the Contractor shall:
    1. Seal all open sanitary manholes or access openings in the sewers when his operations have been suspended for a period of two hours or more.
    2. During construction operations when open manholes or access openings cannot be sealed, vent and filter hydrogen sulfide gases upstream of the openings in the sewer.
F. Odor related to construction around the work shall be controlled through the use of filters, chemical addition to the wastewater, and masking agents as needed to limit the levels of hydrogen sulfide gas to 5 ppm (by volume) 25 feet from the source or at the outside wall of any habitable structure.
G. Payment for compliance with this Section shall be deemed included in the various other items of work, and no additional compensation will be allowed therefore.

*****END OF SECTION*****

SECTION 01532
TREE CARE, PROTECTION, AND REMOVAL

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:

1. Requirements for protection of existing trees to remain during construction. These requirements apply to all trees that have a dripline within 5 feet of construction equipment or areas where the ground will be disturbed.
2. Tree care work to be performed by a qualified Tree Surgeon or certified Arborist.
3. Requirements for planting trees.
4. Requirements for trees to be removed.
5. Permit requirements for tree removal.

B. Related Work Specified Elsewhere:

1. Environmental Protection: Section 01600.
2. Earthwork: Section 02300.
3. Trenching: Section 02318

1.02 REFERENCES

A. Reference Data:

1. If the year of the adoption or latest revision is omitted from the designation, it shall mean the specification, manual, or test designation in effect the date the Notice to Proceed with the Work is given.

1.03 SUBMITTALS

A. Tree Protection Plan

B. Statement of Qualification for Tree Care Work.

C. List of materials to be used by Tree Surgeon/Arborist for Tree Care Work.

D. Tree Surgeon's/Arborist's Field Reports.

1.04 QUALITY ASSURANCE

A. Tree Surgeon or Arborist must have minimum supervisory experience of five (5) years, crew experience of two (2) years average in work similar to that required for this Project, and be listed by at least two (2) cities in San Mateo or Santa Clara County as approved for tree care work.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Acceptable Manufacturers:

1. Manufacturers of materials are listed to set a standard for product performance.
2. Products of manufacturers not listed may be proposed for substitution, provided that they are equal in product performance. It is the responsibility of the contractor to provide supporting evidence that product is equal.

2.02 FERTILIZER

A. Romeo 6-25-25, and 22-14-14

PART 3 EXECUTION

3.01 OPERATIONS

A. The Contractor shall prepare and submit a tree protection plan. The Contractor shall receive a favorable review of the tree protection plan prior to construction.

B. Notify City Arborist 48 hours before excavating within the driplines of trees scheduled to remain and to verify the Contractor has met all tree protection requirements.

C. The Contractor shall utilize all means necessary to protect existing trees to remain. Trimming of trees shall not be performed without the presence and authorization of the City's Arborist.

D. Continuously supervise excavating, grading, filling and subsequent construction operations of all construction areas to protect trees.

E. Trenching within tree drip-line not permitted without approval from the City's Arborist.

F. All excavation, including trenching for utilities within drip-lines of trees shall be by hand or air spade only. Tunnel under roots 2" and larger, cleanly cut roots 3/4" diameter to 2". No tree roots larger than 2” in diameter shall be cut without approval from the City Arborist.

G. Use air spade when excavating within drip-lines when directed by the City’s Arborist.

H. Operate no machinery, including trucks, etc., which may compact soils at planting areas to remain.

I. Construct fills so as to prevent disturbance to root zones of existing trees.

J. Store no materials, including topsoil, under tree canopies.

K. Park no vehicles under trees; do not allow construction access or roads under tree canopies.

L. Washing of equipment such as paint sprayers, concrete chutes or pumping equipment, hand tools for concrete work, paint brushes, etc. shall NOT be allowed within drip-lines of, or uphill from trees.

M. The Contractor shall provide adequate protection for all existing trees to remain and is responsible for the maintenance of tree protection barriers during construction. Tree trunks' damage will result in fines based on square inches of damaged bark to be paid by the Contractor. Any repairable damage done to a tree shall be treated by a qualified tree surgeon at no cost to City.

N. The Contractor shall not trim tree branches larger than 2 inches in diameter with approval from the City’s Arborist.

3.02 TREE CARE

A. Arrange and pay for the following tree care work to be performed by a qualified tree surgeon/arborist on all trees impacted by construction.

1. Under City Arborist’s observation, trim and remove tree limbs to ISA standards to provide for continuing health, and to maintain adequate clearance for equipment during construction operations. Provide guy wire support to trees if needed.

2. Prior to beginning of construction and weekly thereafter inspect field conditions, health of trees and note any adverse impact to trees by construction operations. Perform pesticide spraying when needed, and watering and folar feeding as stated below. Submit report to City Arborist at each inspection.

3. After trimming tree or excavating within dripline of the tree, spray water or folar feed on tree as directed by the City Arborist.

4. Folar feed tree in construction area as directed by the City Arborist. Fall: Fertilize trees with spray of Romeo's or equal 6-25-25 fertilizer at five pounds per 100 gallons of water. Spring: Romeo's 22-14-14 at five pounds per 100 gallons.

3.03 TREE REMOVAL

A. All trees shown on the plans to be removed shall be safely removed and properly disposed of offsite. Portions of tree stumps and roots located within the excavation for improvements shall be removed. Portions of the tree stumps outside of the excavation shall be grinded down to a minimum depth of eight inches below grade. Removed trees, stumps and roots shall become the property of the Contractor and shall be removed from the project site.

B. All debris resulting from tree removal work, including broken branches, fallen leaves, wood chips, and sawdust produced from stump and root removal work, shall be promptly removed from the work site. If the tree to be removed is within the drip line of any other tree that is to remain, the tree removal work shall be done under the direction of a Certified Arborist. The holes resulting from tree stump and tree root removal activities shall be backfilled as provided in Section 02300, "Earthwork", of these Specifications.

C. Burning of trees and debris on-site is not permitted.

*****END OF SECTION*****

SECTION 01600
ENVIRONMENTAL PROTECTION

PART 1 GENERAL

1.01 REGULATORY REQUIREMENTS

A. These specifications reflect regulatory permit requirements known at the time of bidding.

B. Contractor shall adhere to all related requirements set forth in the State Water Resources Control Board NPDES General Permit Requirements (Order No. 2009-0009-DWQ). Permit requirements are available for download on the State Water Resource Control Board's website (http://www.waterboards.ca.gov).

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):

1. D 3786 - Test Method for Hydraulic Bursting Strength for Knitted Goods and Nonwoven Fabrics.
2. D 4632 - Standard Test Method for Breaking Load and Elongation of Geotextiles (Grab Method).

B. California Department of Transportation (Caltrans):

1. Caltrans Storm Water Quality Handbook, Construction Site Best Management Practices (BMPs) Reference Manual

C. California Stormwater Quality Association (CASQA)

1. Stormwater Best Management Practice (BMP), Handbook Portal, Construction.

D. California State Water Resources Control Board:

1. National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities, Order No. 2009-0009-DWQ, NPDES No. CAS000002.

1.03 SUBMITTALS

A. Water Pollution Control Plan (WPCP)

1. Submit to the City a Water Pollution Control Plan (WPCP) detailing the placement of physical Best Management Practices (BMPs) to comply with the requirements set forth in the State Water Resources Control Board NPDES General Permit Requirements (Order No.

2009-0009-DWQ) and required for the Work, and the methods used to comply with those BMPs directed at operational procedures, Monitoring Program and Reporting Plan. The plan shall specifically address and detail changes from the alternatives called out in this section. The Contractor's preferred techniques shall show how it will comply with the stated objectives of the program.

2. The Contractor shall submit details and product data for proposed BMP's. Details shall be from the CASQA Storm water Best Management Practice (BMP), Handbook Portal, Construction, and shall be marked to show compliance or marked to show deviation.
3. The entire plan shall be kept and maintained by the Contractor on the construction site during the duration of the project.
4. The Contractor shall be responsible for taking the proper actions to prevent contaminants and sediments from entering the storm sewer drainage system should any unforeseen circumstance occur. The Contractor shall take immediate action if directed by the Engineer, or if the Contractor observes contaminants and/or sediments entering the storm drainage system, to prevent further storm water from entering the system.

B. Product Data: On all proposed products.

PART 2 PRODUCTS

2.01 GENERAL

A. All necessary erosion control products and systems required by the State Water Resources Control Board NPDES General Permit (Order No. 2009-0009-DWQ) shall be used. All products and installations shall adhere to the CASQA Stormwater Best Management Practice Handbook.

2.02 FIBER ROLLS

A. Contractor shall install fiber rolls as shown in the submitted WPCP and as directed by the Engineer to sufficiently control erosion.

B. Cylinders of biodegradable plant material such as weed-free straw, coir, compost, wood chips, excelsior, or wood fiber or shavings encased within biodegradable netting.

C. Fiber rolls shall be 8" minimum diameter.

D. Fiber rolls shall be staked with oak stakes with minimum dimensions of 0.75 inches square by 24 inches long.

E. Netting Material: Clean, evenly woven, and free of encrusted concrete or other contaminating materials such as preservatives. Also free from cuts, tears, or weak places with a minimum lifespan of 6 months.

2.03 FILTER FABRIC:

A. Woven or nonwoven geotextile filter fabric made of either polypropylene, polyethylene, ethylene, or polyamide material, in continuous rolls of longest practical length.
B. Grab Strength: 100 psi in any principal direction (ASTM D-4632), Mullen burst strength >200 psi (ASTM D-3786), and equivalent opening size between 50 and 140.
C. Furnish ultraviolet inhibitors and stabilizers for minimum 6 months of expected usable construction life at temperature range of 0 degrees F to 120 degrees F.

2.04 SANDBAGS:

A. Polypropylene, polyethylene, or polyamide woven fabric, with minimum unit weight of 4 ounces per square yard, Muller burst strength exceeding 300 psi, and ultraviolet stability exceeding 70 percent. Fill bags with bank-run sand.

PART 3 EXECUTION

3.01 SITE PROTECTION

A. All site protection measures described herein, including stormwater pollution prevention and habitat protection as described in the Special Provisions, shall be maintained in place continuously for the duration of construction.

B. The Contractor shall maintain a controlled and stable work area at all times. The Contractor is responsible to take those measures needed to control site runoff and soil disturbance, including the placement of temporary aggregate base course at work sites to prevent soil erosion during construction as required.

3.02 DUST CONTROL

A. The Contractor at its expense shall take whatever steps, procedures, or means as are required to prevent abnormal dust conditions being caused by its operations in connection with the execution of the Work; and on any unpaved road which the Contractor or any of its subcontractors are using, excavation or fill areas, demolition operations, or other activities. Control shall be by sprinkling, use of dust palliatives, modification of operations, or any other means acceptable to agencies having jurisdiction.

B. All construction areas shall be watered at least twice daily and more often during windy periods. Active areas adjacent to residences should be kept damp at all times.

C. Unless the construction dictates otherwise, and unless otherwise approved by the City's Representative, the Contractor shall furnish and operate a self-loading motor sweeper with spray nozzle. The paved streets, parking areas, and staging areas shall be swept at the end of each day of construction as necessary to keep paved areas acceptably clean and to prevent sediment discharges from reaching the drainage system. Adjacent public streets where visible material has been carried onto shall be swept daily.

D. Enclose, cover, water twice daily, or apply (non-toxic) soil binders to exposed stockpiles (dirt, sand, etc.)

E. Vehicles driving on dirt areas will travel at speeds no greater than 10 mph to minimize noise and dust disturbance.

F. Cover all trucks hauling soil, sand, and other loose materials or require trucks to maintain at least two feet of freeboard above the load.

G. Suspend construction activities that cause visible dust plumes that extend beyond the construction site.

3.03 NOISE ABATEMENT

A. Operations at the work sites shall be performed so as to minimize unnecessary noise. Special measures shall be taken to suppress noise during any approved working hour variances. Noise levels due to construction activity shall not exceed the levels specified by local ordinance.

B. Internal combustion engines used on the Work shall be equipped with a muffler of a type recommended by the manufacturer. No internal combustion engine shall be operated without said muffler.

C. All noise generating activity shall comply with the City of Morgan Hill Municipal Code Sections 8.28.

D. The City will designate a “disturbance coordinator” who is responsible for responding to any local complaints about construction noise and/or vibration. The City may require that the Contractor take reasonable measures to correct the problem, especially if the Contractor is in violation of the noise ordinance.

3.04 INSTALLATION OF FIBER ROLLS

A. Fiber roll materials shall be as specified herein.

B. The Engineer will monitor fiber rolls for effectiveness (see also Section 3.10). Should the installed fiber rolls prove to be an ineffective means of runoff pollution control as measured below, the Contractor shall replace fiber rolls as required until adequate pollution control is achieved.

3.05 REMOVAL OF SEDIMENT CONTROLS

A. All spoil material trapped behind sediment controls shall be disposed of off-site in conformance with all applicable regulatory requirements.

3.06 MAINTAINING WORK AREAS

A. The Contractor shall, at all times, keep property on which work is in progress and the adjacent property free from accumulations of waste material or rubbish caused by employees or by the Work. All surplus material shall be removed from the site immediately after completion of the work causing the surplus materials. Upon completion of the construction, the Contractor shall remove all temporary structures, rubbish, and waste materials resulting from its operations.

B. This provision also applies to any material stockpile and equipment storage areas.

C. All equipment (including personal gear) will be cleaned of soil, seeds, and plant material prior to arriving on-site and after working in areas with invasive non-native plants, such as perennial pepperweed (*Lepidium latifolium*), to prevent the spread of weeds.

D. All stockpiled materials not actively being used shall be bermed and covered from wind and rain. All chemicals shall be stored in watertight containers (with appropriate secondary containment to prevent any spillage or leakage) or in a storage shed. All waste containers shall be covered at the end of each day and before rain events.

E. Concrete transit mixers shall only be washed out in designated wash-out areas where the water will flow into a temporary pit in dirt area or onto stockpiles of aggregate base or sand. Concrete washouts must be watertight.

F. All construction entrances and exits shall be stabilized to sufficiently control sediment tracking from the site. Construction activity traffic to and from the project shall be limited to the stabilized entrances and exits.

G. All storm drain inlet and perimeter controls, as well as construction entrances and exits shall be maintained and replaced as necessary or as determined by the City inspector. BMP maintenance and repair shall begin within 72 hours of failure or shortcoming identification.

3.07 EQUIPMENT AND VEHICLE REFUELING

A. Contractor shall prepare and implement a spill prevention and response plan for refueling equipment, machinery, and vehicles at the project site. Appropriate spill response personnel must be assigned and trained.

1. Submit to Engineer for review prior to beginning any refueling activity.

B. Machinery, vehicles, and construction equipment shall only be refueled on paved surfaces, with secondary containment to prevent contamination of waterways.

3.08 DISPOSAL OF MATERIAL

A. Contractor shall only dispose of material at an appropriate landfill or licensed facility.

B. The Contractor shall make arrangements for disposing of materials outside the Site and the Contractor shall pay all costs involved. The Contractor shall first obtain permission from the property owner on whose property the disposal is to be made and absolve the City from any and all responsibility in connection with the disposal of material on said property. When material is disposed of as provided above, the Contractor shall conform to all required codes pertaining to grading, hauling, and filling of earth.

C. This provision also applies to any material stockpile and equipment storage areas.

D. During the course of construction activities, all trash and debris shall be collected in trash receptacles with a tightly secured lid to prevent attracting predators to the site. All trash cans shall be removed and emptied at an appropriate facility once per week at minimum. If no garbage receptacles are available, all debris including food wrappers and drink containers shall be collected and removed from the area on a daily basis for disposal at an appropriate facility.

3.09 SITE CONTROL DURING INCLEMENT WEATHER

A. The Contractor is solely responsible for site protection during periods of inclement weather.

B. All construction activity with the potential to cause erosion, sedimentation, or water pollution shall be suspended during periods of inclement weather.

1. Inclement weather is defined as a rain event with a forecasted probability of 50% or greater of measurable (0.01 inch or more) rainfall.
2. The Contractor is responsible for keeping track of upcoming inclement weather and must obtain the precipitation forecast information from the National Weather Service Forecast Office (http://www.srh.noaa.gov/).
3. Contractor shall notify the City 48 hours prior to forecast inclement weather.

3.10 WATER POLLUTION MONITORING

A. The Contractor is responsible for monitoring operations and site maintenance to ensure compliance with the NPDES General Construction Permit and other regulatory requirements.

B. If deemed necessary by the City, Contractor, or regulatory agency, the Contractor shall sample site runoff during discharge events for the following constituents and compare to Regional Water Quality Control Board numeric effluent limits (NELs):

1. Turbidity: Maximum turbidity measured in runoff leaving the construction sites will not be allowed to exceed 250 NTU (roughly equivalent to 750 mg/l).
2. pH: Measured pH runoff leaving the construction sites must be between 6.5 and 8.5 pH units.

C. If effluent limits are exceeded during a discharge event, all work shall cease, and the Contractor shall employ other housekeeping and pollution control measures until compliance is reached.

D. The contractor is responsible for maintaining the identified effluent limits for all runoff leaving the construction site. No exceptions will be made for poor quality run-on water. Run-on from off site shall be directed away from the disturbed area or shall collectively be in compliance with the effluent limits.

3.11 FINES FOR PERMIT VIOLATION

A. Contractor is responsible for all permit violation fines and necessary corrective actions due to his negligence.

B. NPDES permit violation fines will be identified within the permit language. Typical fines per violation are:

1. Maximum of $10,000/day and $10/gallon over 1000 gallons discharged
2. Minimum mandatory penalties of $3,000 per violation

3.12 DOCUMENTATION

A. Contractor shall retain storm water monitoring and control and BMP records for a period of at least three years. Records shall be retained on-site while construction is ongoing. Documentation shall be well organized and shall contain the following items at a minimum:

1. Document all housekeeping BMPs in the WPCP in accordance with the nature and phase of the construction project.
2. Printed copies of all likely precipitation event forecast of 50% or greater probability during all phases of construction.
3. Copies of all storm water related inspection, sampling, observation, and annual reports.
4. Records of any corrective actions and follow-up activities that resulted from analytical results, visual observations, or inspections.

END OF SECTION

SECTION 02170
ASBESTOS CEMENT PIPE REMOVAL AND DISPOSAL

PART 1 GENERAL

1.01 DESCRIPTION

A. The project requires cutting, removing, and disposing of existing asbestos cement pipe (ACP) during the prosecution of this work. The Contractor shall remove and dispose of ACP in accordance with State of California requirements, and the Contract Documents. Removal of ACP shall be performed by a Contractor

B. The Contractor shall follow the AWWA guidelines for handling, removing and disposing of ACP as stated in the applicable sections of AWWA Standards C400, C401, C402, and C403 covering Asbestos-Cement Transmission and Distribution Pipe.

1.02 EXISTING SITE CONDITIONS

A. The project requires cutting, removing, and disposing of existing ACP as shown on the Plans. Additional ACP may also be encountered during trenching activities.

1.03 SUBMITTALS

A. **Asbestos Cement Pipe Removal and Disposal Plan:** The Contractor shall complete and submit an Asbestos Cement Pipe Removal and Disposal Plan for review and approval prior to construction. The Contractor shall clearly describe his proposed methods for the removal and disposal of ACP that ensures no exposure to airborne asbestos by the Contractor's personnel or by the public.

B. The Contractor shall submit documentation certifying that all ACP was transported to, accepted, and properly disposed of, at a legal disposal facility.

PART 2 PRODUCTS

2.01 EQUIPMENT

A. Snap cutting tools shall be used for the removal of asbestos cement pipe whenever the removal of intact pipe sections is not possible. Power "Cut-Off" saws, hand-saws, and other devices and methods that result in the

release of asbestos fibers into the air shall not be used for the removal of ACP.

2.02 ENCAPSULANT

A. If during the removal of ACP broken edges occur, the broken edges shall be encapsulated with Certane 1000 Post Removal Encapsulant, or approved equal.

PART 3 EXECUTION

3.01 GENERAL

A. The Contractor shall perform all cutting and handling of asbestos cement pipe in accordance with State of California requirements. The Contractor shall provide sufficient supervision and perform monitoring to assure conformance with State requirements. Under no circumstances shall the Contractor utilize methods of removal that result in the release of asbestos fibers into the air.

3.02 REMOVAL

A. The Contractor shall, whenever possible, accomplish the removal of ACP by removing intact pipe sections.

B. Snap cutting tools shall be used for the removal of ACP whenever the removal of intact pipe sections is not possible. The pipe shall be wetted prior to the snapping operation being performed. Use of a hammer and chisel to gradually split an ACP coupling lengthwise may only be performed if the “Asbestos Cement Pipe Removal and Disposal Plan” developed by the Contractor incorporates measures to prevent the release of asbestos fibers into the air, and is approved by the City. Power “Cut-Off” saws, hand-saws, and other devices and methods that result in the release of asbestos fibers into the air shall not be used for the removal of ACP.

C. The Contractor shall continuously wet the ACP around the snap cutting tool during the removal operation. All personnel handling the ACP shall wear properly fitted respirators during the removal and bagging operation, and shall be trained in the use of the respirator equipment. All pedestrian traffic shall be rerouted to maintain 30 feet clear of the ACP work area.

D. All removed sections or pieces of ACP shall be bagged and prepared for disposal immediately after removal as described below. If during the removal of ACP broken edges occur, the broken edges shall be encapsulated with Certane 1000 Post Removal Encapsulant, prior to bagging, in accordance with the manufacturers recommendations.

3.03 DISPOSAL

A. The Contractor shall transport and dispose of all sections and pieces of ACP in accordance with State requirements at a legally operating landfill that accepts ACP. All sections or pieces of ACP shall be wetted and double wrapped or bagged with polyethylene wrap immediately after removal. The minimum thickness of polyethylene wrap shall be 6 mils. The outer wrap shall be securely held in place with tape in a manner to prevent the release of airborne asbestos fibers.

B. The Contractor shall submit documentation certifying that all ACP was transported to, accepted, and properly disposed of, at a legal disposal facility.

END OF SECTION

SECTION 02260
EXCAVATION SUPPORT AND PROTECTION

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Requirements for designing, furnishing and installing, maintaining, and removing excavation support and protection.

B. Related Sections:

1. Section 02300 – Earthwork.
2. Section 02318 - Trenching.

1.02 REFERENCES

A. American Institute of Steel Construction, Inc. (AISC):

1. Manual of Steel Construction Allowable Stress Design.

B. American Society of Civil Engineers:

1. Guidelines of Engineering Practice for Braced and Tied-Back Excavations.

C. California Code of Regulations (CCR):

1. Title 8 - Construction Safety Orders.

D. California Labor Code Sections 6705 to 6707 (CLC).

E. Department of the Navy Naval Facilities Engineering Command (NAVFAC):

1. NAVFAC Design Manual 7.2 - Foundations and Earth Structures.
2. NAVFAC Design Manual 7.3 - Soil Dynamics Deep Stabilization and Special Geotechnical Construction.

F. International Code Council (ICC):

1. California Building Code (CBC).

G. State of California Department of Transportation (Caltrans):

1. Caltrans California Trenching and Shoring Manual.

H. United States Steel Corporation (USS):

1. USS Steel Sheet Piling Design Manual.

1.03 DEFINITIONS

A. General Engineering Design Practice: General engineering design practice in area of the Project, performed in accordance with recent engineering literature on subject of shoring and stability of excavations.

B. Shoring: A temporary structural system designed to support vertical faces, or nearly vertical faces, of soil or rock for purposes of excavation. Shoring includes internally braced sheet piling, slurry walls, soldier piles and lagging, and other similar shoring systems. Sloping of the soil is not shoring.

1.04 CONTRACTOR'S RESPONSIBILITIES

A. CONTRACTOR assumes full and complete responsibility for excavation support and protection, including shoring design and installation.

B. The review of CONTRACTOR's shoring system design, submittals, and/or installations by the ENGINEER does not relieve CONTRACTOR of his responsibility for excavation safety. This requirement shall apply continuously and is not limited to normal working hours.

C. CONTRACTOR's reliance upon documents furnished by City does not provide relief from these requirements.

1.05 SYSTEM DESCRIPTION

A. The shoring systems shall be installed such that the intrusion of groundwater is kept to an absolute minimum.

B. Shoring drawings and calculations for all shoring systems for excavations deeper than 5 feet shall be prepared and signed by a civil or structural engineer registered in California.

C. Shoring plan shall be prepared and approved prior to start of excavation.

D. Design Requirements:

1. General:
    a. Design means for safe and stable excavations in accordance with general engineering design practice.
    b. Design shall meet the requirements of Caltrans Trenching and Shoring manual.
    c. Design steel members in accordance with the California Building Code and the AISC Manual of Steel Design.
    d. Design shoring involving materials other than steel in accordance with California Building Code.
    e. The maximum height of cantilever shoring above the bottom of excavation shall not exceed 10 feet. Use braced shoring when

the height of shoring above the bottom of excavation exceeds 10 feet.

f. The location of the point of fixity for shoring shall not be less than half the calculated minimum embedment depth below the bottom of the excavation.

g. Generally acceptable references for the design of shoring and excavations are as follows:
   1) Caltrans California Trenching and Shoring Manual.
   2) NAVFAC Design Manual 7.2 - Foundations and Earth Design.
   3) NAVFAC Design Manual 7.3 - Soil Dynamics Deep Stabilization and Special Geotechnical Construction.
   4) USS Steel Sheet Piling Design Manual.
   5) Guidelines of Engineering Practice for Braced and Tied-Back Excavations published by American Society of Civil Engineers.
   6) FHWA Circular No. 4 - Ground Anchors and Anchored Systems

h. Shoring design shall be performed by a Civil or Structural Engineer licensed to practice in California. Include costs for this shoring design in the bid.

E. Performance Requirements:

1. General:
   a. Support faces of excavations and protect structures and improvements in vicinity of excavations from damage and loss of function due to settlement or movement of soils, alterations in ground water level caused by such excavations, vibration associated with installation and removal of excavation support structures, and related operations.
   b. Herein Specified Provisions:
      1) Complement, but do not substitute or diminish, obligations of Contractor for the furnishing of a safe place of work pursuant to provisions of the Occupational Safety and Health Act of 1970 and its subsequent amendments and regulations and for protection of the Work, structures, and other improvements.
      2) Represent minimum requirement for:
         a) Number and types of means needed to maintain soil stability.
         b) Strength of such required means.
         c) Methods and frequency of maintenance and observation of means used for maintaining soil stability.
2. Provide safe and stable excavations by means of sheeting, shoring, bracing, sloping, and other means and procedures, such as draining and recharging groundwater and routing and disposing of surface runoff, required to maintain the stability of soils and rock.

3. Provide support for trench excavations for protection of workers from hazard of caving ground.
4. Provide Shoring:
    a. Where, as result of excavation work and analysis performed pursuant to general engineering design practice, as defined in this Section:
        1) Excavated face or surrounding soil mass may be subject to slides, caving, or other types of failures.
        2) Stability and integrity of structures and other improvements may be compromised by settlement or movement of soils, or changes in soil load on structures and other improvements.
    b. For trenches 5 feet and deeper.
    c. For trenches less than 5 feet in depth, when there is a potential for cave-in.
    d. Where indicated on the Drawings.
5. For safe and stable excavations, use appropriate design and procedures for construction and maintenance to minimize settlement of supported ground and to prevent damage to structures and other improvements, including:
    a. Using stiff support systems.
    b. Following appropriate construction sequence.
    c. Preventing soil loss through or under support system.
        1) Provide support system that is tight enough to prevent loss of soil and extend deep enough to prevent heave or flow of soils from supported soil mass into the excavation.
    d. Providing surface runoff routing and discharge away from excavations.
    e. Where dewatering is necessary, recharge groundwater as necessary to prevent settlement in area surrounding excavation.
    f. Where sheet piling is used, use interlocking type sheets including interlocking corners. The sheet piles shall be continuous and driven in interlock. If the bottom of the excavation is located below the water table, use "thumb and finger" type interlock.
    g. Not applying shoring loads to existing structures and other improvements.
    h. Not changing existing soil loading on existing structures and other improvements.
    i. Provide welded steel packing between soil retaining members such as sheet piles and wales and similar members when the gap exceeds 1/2 inch before the wales are loaded.

1.06 SUBMITTALS

A. Shop Drawings and Calculations:

1. In accordance with requirements in California Labor Code for trench excavations 5 feet or more in depth and for trenches less than 5 feet in depth when there is potential for cave-in. Submit in advance of excavation work, detailed drawings showing means for safe and stable excavations.
    a. Where such drawings vary from excavation support standards set forth in California Code of Regulations Title 8 - Construction Safety Orders, submit design calculations pursuant to general engineering design practice.
    b. Provide means for safe and stable excavations that are not less effective than required in CCR Title 8 - Construction Safety Orders.
2. For excavations other than trenches, submit, in advance of excavation work, design calculations as performed pursuant to general engineering design practice, as specified in this Section, and detail drawing showing means for safe and stable excavations. In design calculations and detail drawing, cover, as a minimum:
    a. Excavations adjacent to structures and other improvements, and
    b. Excavations 5 feet or more in depth, or less than 5 feet in depth when there is potential for cave-in, at other locations.
3. Submit Following:
    a. Provide calculations for the different load, support, and other conditions that occur during the sequence of installation of shoring, construction of facilities protected by the shoring, and sequence of removal of shoring.
    b. Provide sketches showing the condition at various stages of installation and removal of shoring.
    c. Show structures, pipelines, and other improvements located near the shoring, and the shoring on a plan.
    d. When utilities penetrate the shoring, submit an elevation of all sides of the shoring showing the locations of the penetrations. Submit details on ground support and sealing around utility penetrations.
    e. Provide drawings and calculations of support for major utility crossing excavations. Any utility 8-inches in dimeter or larger or where utilities span for more than 4 foot across the excavation the method of support shall be submitted to the Engineer.

B. Detailed Sequence of Installation and Removal of Shoring:

1. Consider effects of ground settlement in the sequence of installation and removal of shoring.
2. Provide sketches showing the conditions at various stages in the sequence of installation and removal of shoring.
3. Clay and silt may stick to sheet piles when sheet piles are removed.
4. All voids shall be filled during removal of shoring systems. Provide detailed information for proposed measures to fill the voids during removal of the shoring systems.

C. Submit submittals for stability of excavations as a complete package and include all items required in this section. Incomplete submittals will not be reviewed and will be returned for resubmittal as a complete package. Complete submittal shall include all necessary information regarding the dewatering system as specified in Section 02300.

1.07 SEQUENCING AND SCHEDULING

A. Do not begin work on excavations, trenches, and means for providing stability of excavation and trenches until submittals have been accepted by Engineer and until materials necessary for installation are on site.

B. Submit submittals a minimum of 30 days prior to the scheduled date to begin excavation work.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.01 INSTALLATION AND REMOVAL

A. Install means for providing safe and stable excavations as indicated in the submittals section above.

B. Except for concrete encased soldier piles, slurry walls, and similar shoring systems, remove shoring by completion of the Work. Select shoring system and method of removal, which will minimize soil that sticks to shoring from creating large voids and causing settlement. To prevent settlement caused by pulling shoring, fill voids with sand, pea gravel, or pressure injected grout. The methods used shall prevent settlement.

C. Backfilling of excavations shall occur simultaneously with shoring removal. Backfilling of the excavation with shoring measures in-place will not be acceptable.

3.02 MAINTENANCE

A. Where loss of soil occurs, plug gap in shoring and replace lost soil with fill material acceptable to Engineer.

B. Where measurements and observations indicate possibility of failure or excessive movement of excavation support, determined in accordance with general engineering design practice, take appropriate action immediately.

END OF SECTION

SECTION 02300
EARTHWORK

PART 1 GENERAL

1.01 SUMMARY

A. The general extent of all excavation, fill and grading is shown on the Plans.

B. Section Includes:

1. Removal of excess and unsuitable material from the site.
2. Excavation of material to allow for the placement of underground structures, including any necessary shoring and bracing.
3. Backfilling of underground conduit, pipe, and structures.
4. Preparation of subgrade for concrete slab work and pavement.
5. Furnish and compact artificial fill.
6. Finish grading.

C. Related Sections:

1. Section 02260 – Excavation Support and Protection.
2. Section 02318 – Trenching.
3. Section 02722 – Aggregate Base Course.
4. Section 03300 – Cast-In-Place Concrete.

1.02 REFERENCES

A. Associated General Contractors (AGC):

1. Manual of Accident Prevention in Construction (Section 9).

B. American Society for Testing and Materials (ASTM):

1. C 131 - Test Method for Resistance to Degradation of Small-Size Course Aggregate by Abrasion and Impact in the Los Angeles Machine.
2. C 136 - Test Method for Sieve Analysis of Fine and Course Aggregates.
3. D 422 - Standard Test Method for Particle - Size Analysis of Soils.
4. D 1556 - Test Method for Density and Unit Weight of Soil in Place by the Sand Cone Method.
5. D 1557 - Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3 (2,700 kN-m/m).
6. D 2419 - Test Method for Sand Equivalent Value of Soils and Fine Aggregate.

7. D 2922 - Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
8. D 3017 - Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).
9. D 4318 - Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

C. Division of Industrial Safety (DIS).

D. Institute of Makers of Explosives (IOMOE).

E. Occupational Safety and Health Act (OSHA).

F. State of California Department of Transportation (Caltrans).

1.03 DEFINITIONS

A. Excavation: Consists of satisfactory loosening, removing, loading, transporting, and disposing of in final location, wet and dry materials, necessary to be removed for purposes of construction.

B. Backfill Adjacent to Structure: Is backfill around the exterior surfaces of a structure from the bottom of the excavation to finish grade.

C. In-Place Density of Compacted Backfill: Is density determined in accordance with ASTM D 1556, or with ASTM D 2922 and ASTM D 3017.

D. Maximum Density: Is maximum density obtained in laboratory when tested in accordance with ASTM D 1557 and ASTM D4253 for levee toe drain aggregate.

E. Definitions Related to Compaction of Coarse Fill:

1. One Pass: Defined as one movement of roller over area being compacted.
2. Measurement of Pass Width: Measure width of pass between centers of outside tires or outside edge of roller wheel.

F. Optimum Moisture Content: Is the optimum content at the maximum density when tested in accordance with ASTM D 1557.

1.04 SYSTEM DESCRIPTION

A. Performance Requirements:

1. General:
   a. Obtain acceptable material from other sources if surplus or borrow materials obtained within project site do not conform to specified requirements or are not sufficient in quantity for

structural backfill.
    b. No extra compensation will be made for hauling fill materials or for water required to compact fills.
2. Subgrade Preparation:
    a. Where mud or other soft or unstable material is encountered, remove such material to a minimum of 18 inches. The bottom of the over-excavation should then be completely covered with stabilization fabric and backfilled with crushed rock. The stabilization fabric should be wrapped around the backfill up to the bottom of the excavation.
3. Structural Backfill:
    a. Material for Backfill: As specified in these specifications
4. Compacted Fills:
    a. Provide specified compaction for backfill, fill, and other earthwork.
    b. The City will perform confirmation tests to verify and confirm that work has complied, and is complying at all times, with requirements specified in this Section concerning field quality control testing.
5. Borrow Area:
    a. Where borrow material is required, provide such material from source selected by the Contractor, subject to acceptance by the Engineer, but not necessarily from within project site.
    b. Use of imported borrow shall not cause additional cost to the Contract.

B. Environmental Requirements:

1. Keep excavations reasonably free from water.
2. Provide standby power to ensure continuous dewatering in case of power failure.

1.05 SUBMITTALS

A. Product Data: Submit material source, gradation, and testing data for all materials, including imported and on-site materials.

B. Test Reports: Submit certified test reports of all tests specified to be performed by the Contractor. Test reports shall be signed and sealed by a registered geotechnical engineer in the state of California.

C. Excavation Plan: Submit proposed excavation plan which shall include a detailed description of materials and equipment to be used, limits of excavation, material stockpile locations, and a shoring plan in accordance with Section 02260.

D. Dewatering Plan: Proposed dewatering plan including arrangement, location, and depths of system components, type, and sizes of filters,

water sample, and required permits.

1.06 QUALITY ASSURANCE

A. Compaction Sequence Requirements: Until specified degree of compaction on previously specified amounts of earthwork is achieved, do not perform additional earthwork of the same kind.

B. After satisfactory conclusion of initial compaction demonstration and at any time during construction, provide confirmation tests as directed by the Engineer.

C. Dewatering: Dispose of water from dewatering in accordance with this Specification Section 02300, Paragraph 3.08 – Control of Water.

1.07 SEQUENCING AND SCHEDULING

A. Schedule earthwork operations to meet requirements as provided in this Section for excavation and uses of excavated material.

B. Excavation and Filling: Perform excavation and filling, during construction, in manner and sequence that provides drainage at all times.

PART 2 PRODUCTS

2.01 MATERIALS

A. Water for Compacting Fills: Use water from source acceptable to Engineer.

B. Geotextile, Stabilization Fabric:
   a. Mirafi RS 380i
   b. Or Approved Equal.

C. Fill Materials:
   1. General:
      a. Provide aggregate base course, select material, bedding, engineered fill and native material, where required for fill and backfill.
      b. Obtain material for fills from cut sections or from borrow sources.
      c. Provide material having maximum particle size not exceeding 1 inch and that is free of trash, lumber, debris, leaves, grass, roots, stumps, and other vegetable matter.
      d. Fill materials provided shall be free of environmental contaminates.

e. Imported soils shall not be more corrosive than the native materials based on laboratory testing for pH, soluble sulfates, chlorides, and resistivity.
f. Materials derived from processing demolished or removed asphalt concrete are not acceptable.
g. Proposed imported fill shall be approved by the Engineer at least 10 working days prior to site delivery. Compliance testing for aggregate base may require up to 15 days.

2. Crushed Rock: Crushed rock format foundation underlayment, and where necessary to stabilize excavation bottom shall be a clean, durable, open graded rock meeting the requirements of ASTM No. 57 Stone with the following gradation:

Sieve Size	Percent Passing
1 1/2-inch	100
1-inch	95-100
1/2-inch	25-60
No. 4	0-10
No. 8	0-5

3. Aggregate Base Course: As specified in Section 02722.
4. Pipe Bedding and Pipe Zone Backfill Material:
   a. As shown on the plans and specified herein, the pipe bedding and pipe zone material shall conform to the practice recommended for Class III Material (Sand) in ASTM D 2321 “Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications”.
5. Trench Backfill / Intermediate Backfill Materials:
   a. Aggregate Base Course in all locations under, or within 5 feet of a roadway, driveway, retaining wall, building, or other structure or surface improvement where deemed necessary.
   b. Backfill in unimproved areas:
      1) Aggregate Base Course or approved General Fill Material.
6. General Fill Material:
   a. General fill material should consist of soil and bedrock materials derived from on-site excavations or imported fill meeting the project specifications and shall be used for backfill wherever the Plans do not specifically indicate a defined fill material.
   b. General earth fill shall consist of clean soils with an organic content of 3 percent or less.
   c. General fill material shall have a Liquid Limit of less than 30 and a Plastic Index less than 12 when tested in conformance with ASTM D 4318.
   d. General fill material shall not contain rocks or lumps larger than 3

inches in greatest dimension, with no more than 30 percent larger than 3/4 inches.

e. All placed fill shall meet the minimum compaction requirement shown on the project Plans and in these specifications.
f. All placed fill shall be firm and unyielding under the weight of the compaction equipment or other construction equipment regardless of moisture content and degree of compaction. Any fill that is pumping and/or rutting should be removed as directed by the engineer.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verification of Conditions:

1. Character and Quantity of Material:
   a. Verify character and quantity of rock, gravel, sand, silt, water, and other inorganic or organic materials to be encountered in work to be performed.
   b. Determine gradation and shrinkage of excavation and fill material, and suitability of material for use intended in work to be performed.
   c. Determine quantity of material, and cost thereof, required for construction of excavations and fills, whether from on-site excavations, borrow areas, or imported materials. Include in cost of work to be performed.
   d. Include wasting of excess material, if required, in cost of work to be performed.
   e. All excavated soils will need to be segregated, cleaned, and/or screened prior to re-use (Native Material).
   f. The Contractor shall, prior to submitting his bid, visit the site and become familiar with actual site and soil conditions. No allowance will be made by the City for any unfavorable conditions or events which should have been foreseen from a thorough examination of the contract documents, the geotechnical reports, the site, and working conditions.

B. Verification of Prepared Subgrade prior to Constructing Improvements:

1. The Contractor shall request the Engineer to visually inspect and provide written confirmation of the suitability of prepared subgrade soils prior to the continuation of work.
   a. Work completed without such confirmation is at the Contractor's risk and subject to removal at the direction of the City.
   b. The City will perform this inspection no later than two working days after the Contractor makes his request.

2. Contractor shall protect excavation prior to and during the inspection.
    a. The Contractor remains solely responsible for excavation safety. This responsibility is not waived when the Engineer agrees to enter the work site for inspection.

3.02 PROTECTION

A. The Contractor shall maintain sewer service at all times during construction as specified in section 01531.

B. If existing live utilities are encountered, they are to be protected from damage and the proper authorities and affected utility companies notified.

C. Record unmarked utility locations on record drawings and notify the Engineer.

D. Open excavations, trenches, and the like are to be protected with fences, barricades, covers, and railings as required.

E. Every precaution shall be taken to prevent spillage when hauling on or adjacent to any public street or highway. Any spillage shall be promptly removed.

3.03 SAFETY

A. In conformance with Section 02260, the Contractor is solely responsible for excavation safety, including support to all adjacent improvements at all times.

B. Contractor shall submit and obtain approval by the Engineer a shoring plan with calculations signed by a licensed Civil Engineer prior to excavating depth greater than 4 feet. Shoring design shall be in compliance with Cal/OSHA, Caltrans trenching and shoring manual, and any relevant geotechnical report.

3.04 PREPARATION

A. Surface Preparation:

1. Preparing Ground Surfaces for Fill or Concrete:
    a. After clearing, grubbing and stripping is completed, scarify entire areas which underlie fill sections or structures to a depth of 6 inches and until surface is free of ruts, hummocks, and other features which would prevent uniform compaction by equipment to be used.
    b. Moisture condition and recompact areas to density specified in "Compacted Fills" before placing of fill material or concrete.
    c. Where subgrade stabilization is required, scarification and

compaction of native soils is not practical. In these instances, stabilize the subgrade by placing stabilization and crushed rock as shown on the plans and/or specified herein.

d. Finished compacted subgrade shall be firm and non-yielding under the weight of compaction equipment. If the relative compaction of the subgrade is less than specified, or the surface of the subgrade exhibits significant yielding, over-excavate the area and rebuild or rework the area until the subgrade compaction conforms to this specification.

2. Preparing for Backfill:
   a. After completion of foundation footings and walls and other construction below the elevation of the final grades and prior to backfilling, all forms shall be removed, and excavation shall be cleaned of all trash and debris.
   b. After inspection of foundation, walls, and pipes, backfill shall be placed symmetrically to prevent eccentric loading upon or against structures.
   c. All backfill shall be compacted per Compaction of this specification.

3.05 APPLICATION

A. General:

1. Contractor shall dispose of excavated materials which are not required or unsuitable for fill and backfill in lawful manner. The proper and legal disposal shall be the responsibility of the Contractor.
2. Contractor shall include export and disposal of material in the cost of work to be performed. The Contractor shall include environmental analytical testing in the cost of the work to be performed.
3. Contractor shall maintain proper documentation, in accordance with applicable laws, to provide evidence of proper disposal of off-hauled materials.
4. Contractor shall dispose of surplus material on private property only when written permission agreement is furnished by owner of property. Submit copies of such agreements. No surplus material should be disposed of at the project site or adjacent private properties.
5. Rocks, broken concrete, or other solid materials larger than 4 inches in greatest dimension shall not be placed in fill areas but removed from project site at no additional cost to the Contract.
6. Stabilization of Subgrade: Crushed rock and stabilization fabric shall be used to stabilize the subgrade during excavation and placement of fill material.
7. No material larger than 1” shall be placed in the first two feet below subgrade.

B. Excavation:
    1. Excavations for Structures:
        a. All excavations shall comply with Section 02260, Excavation Support and Protection.
        b. Dimensions and Elevations of Excavations: Provide excavations conforming to dimensions and elevations indicated on the Drawings for each structure, including trenching for adjacent piping and all work incidental thereto.
        c. Soil of Unsuitable Bearing Value: Where soil is encountered having unsuitable bearing value, Engineer may direct in writing that excavation be carried to elevations above or below those indicated on the Drawings.
        d. Unless directed by the Engineer, excavations shall not be carried below elevations indicated on the Drawings.
        e. Bottom of Excavations for Structures: Consist of native material with top 6 inches compacted to 95 percent of maximum density and graded to conform to outside limits of structures as indicated on the Drawings, except where otherwise indicated on the Drawings or specified.
    2. Necessary Over Excavation:
        a. General:
            1) Where it becomes necessary to excavate beyond normal lines of excavation in order to excavate through the bay mud, remove boulders or other interfering objects, backfill voids remaining after removal as specified in Backfilling of Voids, or as acceptable to the Engineer.
            2) Perform necessary excavation beyond normal lines as specified above and backfill such voids.
        b. Backfilling of Voids:
            1) Fill voids with crushed rock acceptable to the Engineer, placed in manner and to same uniform density as surrounding material.
            2) Wrap the crushed rock with stabilization fabric.

C. Compaction:

    1. Compacted Fills:
        a. Lines and Grades:
            1) Construct fills, and backfills, designated herein as fills, at locations and to lines and grades indicated on the Plans.
    2. Where required, Contractor shall provide necessary imported fill material from outside sources.
        a. Compacted Fill Shape and Sections: Provide completed fill that corresponds to shape of typical sections indicated on the Plans or that meets requirements for particular case.
        b. Preparation of Areas Designated to Receive Fill Material: Scarify to minimum depth of 6 inches, unless otherwise indicated on the

Drawings, and recompact to density of fill material as specified in following Article.

c. Fills and Backfills and Upper 6 Inches in Cuts: Compact to percentage of maximum density as follows and as determined by ASTM D1557:
    1) Backfill adjacent to structures: 95 percent.
    2) Under present and future structures: 95 percent.
    3) Under paved areas not subject to traffic loading, curbs, and sidewalks: 90 percent.
    4) Other areas: 85 percent.
    5) Demolition areas: 95 percent.
d. Placing Compacted Fills:
    1) Placement: Place loose material in successive layers that do not exceed 8 inches in thickness after compaction.
    2) Moisture Content: Bring each layer to specified moisture content for maximum density before compaction by rolling.
    3) Each successive lift shall be firm and non-yielding under the weight of construction equipment.
    4) Defective Compacted Fills: Remove and recompact.

3. Crushed rock should be consolidated in place with light vibratory equipment. Rubber-tire equipment should not be allowed to operate on the exposed subgrade; the crushed rock should be stockpiled and pushed out over the stabilization fabric.
4. Excavations should be backfilled simultaneously with shoring removal to ensure that all voids are filled. See Section 02260-3.01 for additional requirements.
5. Traffic loading, construction equipment loading, and stockpiled materials adjacent to open trenches shall be minimized to the extent feasible to prevent heaving of soils and settling of adjacent soils.

3.06 FIELD QUALITY CONTROL

A. Tests:

1. Confirmation Tests:
    a. Contractor shall accomplish specified compaction for backfill, fill, and other earthwork.
    b. Contractor may, at his option, arrange for conformation testing through his own forces or a testing laboratory.
    c. Confirmation testing is only for the Contractor’s benefit and shall not substitute for Compliance Tests as specified herein.
    d. Control operations in response to confirmation tests and City Compliance Testing to verify that compaction work complies, and is complying at all times, with requirements specified in this Section concerning compaction, control, and testing.
    e. Cost of Confirmation Tests: Paid for by the Contractor.
    f. Confirmation Test submittals are not required.

2. Compliance Tests:
    a. Compliance tests will be made by the Engineer to verify that compaction is meeting requirements specified herein.
    b. City's Testing Laboratory will perform confirmation testing as acceptable to the Engineer.
    c. Contractor shall coordinate with Engineer regarding the frequency of Compliance Testing and testing results.
    d. Copies of Compliance Test Reports will be submitted promptly to the Engineer for disbursement to Contractor.
    e. Coordination with Engineer Testing: Remove overburden above level at which the Engineer wishes to test and backfill and recompact excavation after testing is completed.
    f. If compaction fails to meet specified requirements, perform remedial work by one of the following methods:
        1) Remove and replace backfill at proper density.
        2) Bring density up to specified level by other means acceptable to the Engineer.
    g. Retesting:
        1) Costs of Retesting: Costs of retesting required to confirm and verify that remedial work has brought compaction within specified requirements shall be borne by the Contractor.
        2) City's Compliance Tests During Performance of Remedial Work will be performed as follows:
            a) Tests will be performed in a manner acceptable to the Engineer.
            b) Frequency: Double amount specified for initial confirmation tests.

B. Tolerances:

1. Finish Grading of Excavations, Backfill and Fills:
    a. Perform fine grading under concrete structures such that finished surfaces are never above established grade or approved cross section and are never more than 0.10 feet below.
    b. Provide finish surface areas outside of structures that are not more than 0.10 feet above or below established grade or accepted cross section.
2. Of Areas Which Are Not under Structures, Concrete, Asphalt, Roads, Pavements, Walks, Dikes and Similar Type Items:
    a. Provide finish graded surfaces of either undisturbed natural soil, or cohesive material not less than 6 inches deep.
    b. Intent of preceding is to avoid sandy or gravelly areas.
3. Finished Grading Surfaces:
    a. Reasonably smooth, compacted, and free from irregular surface changes.
    b. Provide degree of finish that is ordinarily obtainable from blade grader operations, except as otherwise specified.

c. Uniformly grade areas which are not under concrete.
d. Finish gutters and ditches so that they drain readily.

3.07 WET WEATHER AND WET SOIL CONDITIONS

A. To the maximum extent possible within schedule constraints, major excavation should take place during periods of suitable weather conditions.

B. When the moisture content of fill materials is significantly above optimum:

1. Scarify and air dry until fill materials have a suitable moisture content for compaction; or
2. Over-excavate the fill and replace with suitable on-site or import materials with an appropriate moisture content; and/or
3. Install a geotextile or geogrid to reinforce soft fill.
4. Chemically treat with lime, kiln-dust, or cement to reduce the moisture content and increase the strength of the fill.

3.08 CONTROL OF WATER

A. Water may be encountered within the Work at any time. Contractor shall control site water so that work may be done in the dry in a safe working environment according to relevant provisions of the Safety Orders.

B. Contractor may discharge disposal water to the City's sewer system provided the following requirements are met:

1. Contractor shall obtain approval and all necessary permits from the City of Morgan Hill Wastewater Division prior to discharging any groundwater into the sewer system.
2. Contractor shall secure and comply with the provisions of permits required for dewatering operations, including permits from the City, the County of Santa Clara, and the Regional Water Quality Control Board.
3. If the groundwater to be discharge is cloudy, murky, or otherwise colored, or where required by the City, the discharged water shall be settled or filtered using a City approved method to remove sand, silt, and fine soil particles before disposal into any sanitary sewer system. At a minimum, the filtration system should include a filter fabric bag attached to the discharge outlet and a debris trap in downstream manhole(s). If discharge continues to be murky or colored, or if these methods are determined to be inadequate by the City, then additional settlement and/or filtration will be required. Additional treatment may include the use of Baker or Adler tanks, and/or particulate filtration systems.
4. The Contractor shall remove and dispose of any material that accumulates in the sanitary sewer systems used for water discharge

as a result of dewatering operations.

5. Comply with all Federal, State, and local laws and regulations concerning environmental pollution arising from construction activities.
6. The discharge of water or wastewater from dewatering operations into the sanitary sewer system within twenty-four (24) hours of a rain event will be prohibited.
7. The discharge of water from dewatering operations into the sanitary sewer system shall not exceed a flow rate of fifty (50) gallons per minute at any time.
8. Control the rate and effect of dewatering so as to avoid settlement, subsidence or damage to structures or facilities adjacent to areas of proposed dewatering.
9. Be fully responsible and liable for all damages that result from failure to adequately keep excavations dewatered, and shall repair, restore and/or replace facilities or structures damaged as a result of dewatering operations.

C. If the Contractor chooses to discharge any water the storm drain system, the Contractor shall adhere to the requirements within the State Water Resources Control Board NPDES General Permit Requirements (Order No. 2009-0009-DWQ) for Risk Level 1 sites.

D. During excavation operations, if the Contractor encounters suspected contaminated water, the Contractor shall immediately implement the CSEDWP and stop the disposal of excavated groundwater. Any non-contaminated water that becomes mixed with contaminated water shall be designated as contaminated water and shall be handled and disposed as such at no additional cost to the City. Contractor will not be paid for handling and disposal of the volume of non-contaminated water at the negotiated contaminated price, if it is mixed with contaminated water.

E. If contaminated water is discovered, the Contractor shall identify a minimum of one disposal site that is permitted to and will accept the contaminated water expected for disposal. The Contractor shall select facilities that are established, fully operational, and in full compliance with all applicable federal, state, and local regulations.

F. All construction equipment used for the handling of contaminated material shall be decontaminated prior to use for other work elements or removal from site.

G. Prior to the preparation of bedding or subgrade, the excavation shall be thoroughly dewatered by the use of sump pumps and dewatering equipment as necessary to safely convey water away from structural excavations.

H. The Contractor shall prevent surface water (e.g. rainwater) and subsurface or groundwater from flowing into excavations and from flooding the project site and surrounding areas.

I. The Contractor shall remove all water which accumulates in all excavations during the progress of work so that all work can be done in the dry. Excavated areas shall be kept free from water while structures are constructed, while concrete is setting and until backfill has been placed to a sufficient height to anchor the work against possible floatation.

J. Contractor shall implement sufficient measures to limit the inflow of groundwater so that the maximum allowed dewatering pumping rate of 50 gpm is sufficient to keep excavated areas free from water.

K. Sufficient pumping equipment for immediate use shall be on the project site at all times, including standby pumps for use in case other pumps become inoperable. Water shall be disposed of so as to cause no injury to public or private property, or to be a menace to the public health.

L. Dewatering devices shall be adequately filtered to prevent the removal of fines from the soil.

M. The Contractor shall be responsible for any damage to foundations or other parts of existing structures or of the new work, caused by the failure of any part of the Contractor's protective works.

N. Depending upon groundwater conditions and the degree of project completion, underground structures are susceptible to floatation prior to backfill and anchorage. Contractor shall prevent the floatation or movement of structures during construction.

O. After dewatering is no longer necessary, all dewatering pumps and appurtenances shall be removed by the Contractor.

3.09 ADJUSTING

A. Finish Grades of Excavations, Backfilling and Fill:

1. Repair and reestablish grades to required elevations and slopes due to any settlement or washing way that may occur from action of the elements or any other cause prior to final acceptance.

B. Finish Grades of Excavations, Backfilling and Fill:

1. Protect newly graded areas from action of the elements.

END OF SECTION

SECTION 02318
TRENCHING

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Trench excavation, fine grading, pipe bedding, backfilling, and compaction for the construction of new sanitary sewer infrastructure.

B. Related Sections:

1. Section 02300 - Earthwork.
2. Section 02700 - PVC Pipe and Fittings.
3. Section 02720 – High Density Polyethylene Pipe
4. Section 03300 – Cast in Place Concrete

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):

1. C 131 - Test Method for Resistance to Degradation of Small-Size Course Aggregate by Abrasion and Impact in the Los Angeles Machine.
2. C 136 - Test Method for Sieve Analysis of Fine and Course Aggregates.
3. D 1556 - Test Method for Density and Unit Weight of Soil in Place by the Sand Cone Method.
4. D 1557 - Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft.lbf/ft^3 (2,700 kN.m/m^3)).
5. D 2922 - Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
6. D 4318 - Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

1.03 SUBMITTALS

A. Products Data: For all proposed bedding and backfill materials.

1. Material source.
2. Gradation.
3. Testing data and testing laboratory qualifications including lab certification.

PART 2 PRODUCTS

2.01 MATERIALS

A. General:

1. Materials derived from processing demolished or removed asphalt concrete are not acceptable.

B. Geotextile Stabilization Fabric: As specified in Section 02300.

C. Bedding: Bedding as specified in Section 02300.

D. Backfill: Backfill as specified in Section 02300.

PART 3 EXECUTION

3.01 PREPARATION

A. General:

1. Trench Condition:
   a. Install pipe and materials as specified herein and detailed on the Plans.

3.02 INSTALLATION

A. Trench Excavation:

1. General Requirements:
   a. Trench Widths: As shown on the plans
   b. For Manholes or Other Accessories:
      1) Provide excavations sufficient to leave at least 12 inches clear between their outer surfaces and embankment or shoring which may be used to hold banks and protect them.
      2) Do not backfill with earth under manholes, vaults, tanks, or valves.
      3) Fill any unauthorized excess excavation below elevation indicated on the Plans for foundation of any structure with foundation material at no additional cost. Backfill material may be substituted for foundation material in areas where foundation material is not required and when approved by the Engineer.
      4) Backfilling of Manhole Excavation: Conform to backfilling requirements as specified for trenches in this Section.

B. Pipe Bedding:

1. Bedding material shall be as specified in Section 02300 unless otherwise specified or shown on the drawings.
2. General:
   a. Over excavate bottom of trench as shown on the plans.
   b. Place bedding material at uniform density, with minimum possible compaction.
3. Bell or Coupling Holes:
   a. Dig holes after trench fine grading has been placed.
   b. Excavate holes only as necessary in making joints and to ensure that pipe rests upon prepared trench bottom and not supported by any portion of the joint.
4. Depressions for Joints, Other than Bell-and-spigot:
   a. Make in accordance with recommendations of joint manufacturer for particular joint used.
5. After Pipe Laid:
   a. Place bedding material under, around, and above pipe in maximum 6-inch lifts and compact to 90 percent of maximum density.
6. Pipe Displacement:
   a. Take necessary precautions in placement and compaction of bedding material to prevent displacement of piping.
   b. In event there is movement or floating, re-excavate, re-lay, and backfill the pipe.
7. Consolidation:
   a. Bedding shall be mechanically compacted at optimum moisture content or above according to ASTM D1557 with non-vibratory compaction equipment. Water settling methods such as flooding, and jetting are prohibited.

C. Trench Backfill:

1. Bedding material shall be as specified in Section 02300 unless otherwise specified or shown on the drawings.
2. Place and compact backfill in accordance with following requirements:
   a. From 6 inches above top of pipe to natural surface level. Match finish grade as indicated on the Drawings.
   b. Trench Backfill from 6 inches above top of pipe to finish grade with backfill material compacted to 95 percent of maximum density.
   c. Existing Conditions: Where existing underground pipes or conduits larger than 3 inches in diameter cross trenches above new work:
      1) Backfill from bottom of intersecting trench to spring line of intersecting pipe or conduit with backfill material compacted

to 90 percent of maximum density when tested in accordance with ASTM D 1556 or ASTM D 2922.

2) Extend backfill material 1 foot on either side of intersecting pipe or conduit.

d. Backfill shall be mechanically compacted at optimum moisture content or above according to ASTM D1557 with non-vibratory equipment weighing no more than 12 tons static weight. All backfill shall be placed in maximum 8-inch lifts. Water settling methods such as flooding, and pooling or jetting are prohibited.

D. Excess Material:

1. Remove excess excavated material and any excavated Bay Mud from the project site and dispose of legally off-site.

3.03 FIELD QUALITY CONTROL

A. Compaction testing shall be performed as specified in Section 02300.

B. Testing Pipe:

a. After Bedding the Pipe, Contractor Has the Following Option To:

1) Test pipe as specified in Section 02770.

2) Backfill to surface, at his own risk, before testing pipe.

b. If pipe does not pass test, uncover pipe, locate leaks, repair, and retest, repeating until pipe section under test passes.

END OF SECTION

SECTION 02345
PIPE BURSTING

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Installation of high-density polyethylene pipe (HDPE) pipe by pipe bursting.

B. The Contractor shall provide all materials, labor, equipment, and services necessary for bypass pumping and/or diversion of sewage flows, installation of the pipe, reconnection of lateral sewers, and CCTV inspection and testing of the completed pipe system.

C. Related Sections:
   1. Section 02300 – Earthwork
   2. Section 02531 – Sewer Laterals
   3. Section 02720 – HDPE Pipe
   4. Section 02760 – Closed Circuit Television (CCTV) Inspection
   5. Section 02770 – Sanitary Sewer Testing

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):
   1. C 131 - Test Method for Resistance to Degradation of Small-Size Course Aggregate by Abrasion and Impact in the Los Angeles Machine.
   2. C 136 - Test Method for Sieve Analysis of Fine and Course Aggregates.
   3. D 1556 - Test Method for Density and Unit Weight of Soil in Place by the Sand Cone Method.
   4. D 1557 - Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft.lbf/ft^3 (2,700 kN.m/m^3)).
   5. D 2922 - Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
   6. D 4318 - Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

1.03 SUBMITTALS

A. Pipe Bursting Contractor/Subcontractor Qualifications shall be submitted and shall meet the requirements specified in Section 1.04 below.

B. The Contractor shall submit catalog cuts, specifications, dimensioned drawings, the proposed diameters of bursting head and expander to be used for each pipe size manufacturer's recommendation for installation, installation details, and sketches, and other pertinent information for the pipe installation work. All materials provided shall be fully in accordance with the requirements of the reference specifications specified herein.

1. Submittal shall include the following additional items at a minimum:

    a. Site plan for each pipe bursting location showing the insertion and receiving pit locations and sizes,

    b. Pipe laydown area and duration pipe will be stored.

    c. Existing laterals.

    d. Utilities, structures, and other items that will be exposed during pipe bursting.

C. The Contractor shall submit written description of the construction procedure, sequence to bypass sewage flow, install pipe, and reconnect lateral sewers.

D. The Contractor shall submit Pre- and Post-CCTV Inspection videos of the sewer main in conformance with Section 02760.

1.04 QUALITY ASSURANCE

A. Pipe Bursting Contractor/Subcontractor shall meet the following minimum qualification requirements.

1. The contractor/subcontractor performing all pipe bursting work must have completed at least five (5) pipe bursting projects containing a total of 5,000 linear feet of 6-inch or larger in wastewater collection systems in the US within the past five (5) years.
2. Contractor shall submit the following minimum information along with the required product submittals for at least five (5) projects performed by the contractor/subcontractor performing all pipe work, to meet the requirements herein.
    a. Project Name:
    b. Project Owner, Contact Person, Address, and Phone Number
    c. Project Location, Date Completed, Pipe Size(s) (inches)
    d. Quantity(ies) of Qualifying pipe bursting Installed (lineal feet)
3. The Contractor/subcontractor performing all pipe bursting work shall not have had his license suspended at any time or for any reason within the State of California within the last five years. Any evidence of suspension will render the bid nonresponsive.

B. Fusion joining and other procedures necessary for correct assembly of the pipe shall be done only by personnel trained in those skills and have

three years of experience in fusion joining, to the satisfaction of the City or its appointed Representative and the pipe manufacturer/supplier.

C. Only those tools designed for the aforementioned procedures and approved by the pipe manufacturer or supplier and the City, shall be used for assembly of pipe fittings to ensure proper installation. The heater plate shall be equipped with suitable means to measure the temperature of plate surfaces and to assure uniform heating such as thermometers or pyrometers.

D. The Contractor and/or Subcontractor performing the pipe bursting work, if applicable, shall provide to the City a warranty to be in force and effect for a period of one (1) year from the date of final project acceptance by the City. The warranty shall require the Contractor and/or Subcontractor to repair or replace the pipe should leakage, separation, collapse or other failure result from faulty materials or installation as determined by the City.

E. The Contractor shall video the installed pipe after existing services have been reconnected and manhole work has been completed. The television inspection video shall be provided to the City for approval.

F. Each fusion connection shall be recorded and logged by an electronic monitoring device (data logger) connected to the fusion machine. The data logger shall be calibrated per the manufacturer's recommendations. The fusion data logging report shall be generated by software developed specifically for the fusion of fusible pipe type. Data not logged by the data logger shall be logged manually and be included in the Fusion Technician's joint report. The fusion data logging reports shall be submitted to the City.

1.05 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall exercise special care during the unloading, handling, and storage of all pipe to ensure that the pipe is not cut, gouged, scored, or otherwise damaged. Any pipe segment which has cuts in the pipe wall exceeding 10 percent of the wall thickness shall be cut out and removed from the site at the Contractor's cost. The pipe shall be stored so that it is not deformed axially or circumferentially.

B. Pipe without an ultraviolet inhibitor shall not be stored unprotected from the elements.

PART 2 PRODUCTS

2.01 MATERIALS

A. Piping used for bursting shall be HDPE in accordance with Section 02720.

B. Joints: Pipe shall be joined by butt fusion welding as specified in Section 02720.

2.02 LATERAL RECONNECTIONS

A. Contractor shall locate and expose all active laterals prior to bursting sewer main. Reconnection to sewer main shall be immediately following bursting of the sewer main. Permanent sewer main connection shall be made after sufficient relaxation period.

B. Reconnections to abandoned or capped laterals shall not be made.

C. Lateral connections to the main shall be installed as wyes whenever possible.

D. Lateral connection to the main shall not protrude into the main.

E. Lateral reconnections shall be connected by use of electrofusion couplings or butt fusion joints. Electrofusion couplings or butt fusion joints shall be one of the following:

1. Central Plastics
2. Industrial Pipe Fittings – Plasson
3. PolyPipe
4. Or Approved Equal

PART 3 EXECUTION

3.01 GENERAL

A. Installation guidelines from the pipe supplier shall be followed for all installation.

B. The Contractor shall inspect each pipe and fitting prior to butt-fusion welding and again prior to installation. Any damaged pipe or fittings shall be replaced by the Contractor.

3.02 PREPARATION

A. CCTV Video: Contractor shall clean and inspect sewer prior to bursting to identify laterals and determine whether there are any issues in the main that may preclude a successful bursting operation.

B. Utilities:

1. Contractor shall locate all nearby utilities.
2. Where water main is within five (5) feet of sewer main, contractor shall expose water main while bursting.
3. Contactor shall expose all other utilities within 36-inches of sewer main while bursting.

C. Where building foundations, retaining wall foundations or other structures are located within 36-inches feet of the sewer main to be pipe burst, contractor shall expose the sewer main while bursting.

D. The locations for the insertion/receiving pits are to be determined by the Contractor and approved by the City. In considering locations for insertion/receiving pits, the Contractor shall consider the size of the existing sewer and new pipe, locations of obstructions and services, locations of manholes, pulling distances, traffic conditions, bending radius, and locations of utilities. Insertion pits shall have a maximum slope of 2.5:1 entry slope and shall be shaped to permit as long a radius in the new pipe as feasible.

E. The Contractor shall mark and review the proposed insertion/receiving pit locations with the City prior to construction.

F. If existing manholes are destroyed or damaged while constructing the insertion/receiving pits, they shall be reconstructed and/or repaired at no cost to the City.

G. The Contractor shall physically disconnect all laterals from the existing main prior to pipe bursting.

3.03 INSTALLATION

A. The pipe shall be installed in a manner, so the pipe curve radius is never less than the pipe manufacturer's recommended minimum bending radius.

B. The Contractor shall install the pipe by utilizing static or pneumatic bursting methods. The void created by the bursting device shall be sufficient in size to accommodate the pipe which shall be installed immediately after the void has been formed.

C. Where pipe is installed by pulling in tension, the recommended Safe Pulling Force, according to the pipe supplier, shall not be exceeded.

D. The Contractor may utilize existing manholes where practical. Manhole inverts and bottoms shall be removed to permit access for installation equipment and the larger proposed pipe. Structural damage to manholes during pulling operations shall be repaired by Contractor at no extra cost to the City.

E. The Contractor shall anchor the pipe to concrete structures or manholes after the pipe has been installed along the length of sewer replaced. The Contractor shall use a water stop or flange adapter, as supplied by the pipe manufacturer that is firmly seated perpendicular to the pipe axis, around the pipe exterior and cast into the structure base or near the structure wall center. The structure or manhole connection shall be made after adequate time has been allowed for the pipe to relax from the applied tension forces.

F. Backfill excavations in accordance with Section 02300 and per the trench details on the Plans.

G. The contractor shall modify the manhole troughs and benches as detailed on the Plans.

3.04 PIPE RELAXATION

A. The Contractor shall allow the pipe to return to its original length and shape in the unstressed state prior to trimming the excess pipe in the manholes. The pipe manufacturer's recommendations shall be followed regarding the relief and normalization of stress and strain due to temporary stretching or elongation after pulling operations are completed. Contractor shall consider temperature and pulling time required when calculating required time for stress and strain relief. Time allowed for stress and strain relief shall be not less than 24 hours without a specific recommendation otherwise from the pipe manufacturer.

B. The Contractor shall allow a minimum of four (4) hours to elapse after pipe bursting mainlines prior to connecting permanent lateral connections to the new main, in order to allow the pipe to relax from the applied tension forces. The Contractor shall provide temporary lateral connections and or bypassing as required to prevent overflows from laterals.

3.05 PIPE TESTING

A. Pipe testing shall be done in conformance with Section 02770.

B. Post-CCTV Inspection videos of the sewer main in conformance with Section 02760.

END OF SECTION

SECTION 02531
SEWER LATERALS

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Reconnection of existing sanitary sewer laterals to new sewer mains as shown on the Contract Drawings.

B. Related Sections:

1. Section 02318 – Trenching
2. Section 02345 – Pipe Bursting
3. Section 02700 – PVC Pipe and Fittings
4. Section 02720 – HDPE Pipe
5. Section 02760 – Closed Circuit Television (CCTV) Inspection

1.02 SUBMITTALS

A. Products Data:

1. Lateral pipe materials
2. Coupling materials

PART 2 PRODUCTS

2.01 MATERIALS

A. Lateral Materials in Pipe Bursting Locations: Electrofusion saddles per Section 02345.

B. Lateral Materials in Non-Pipe Bursting Locations: Sewer laterals shall be PVC, conforming to the requirements of Section 02700.

C. Couplings: Banded rubber coupling with shield shall be of a variety designed to couple the new pipe material with the existing pipe material. Shield, band, and hardware shall be 316 stainless steel. Connections are to be of Mission Rubber Flex Seal ARC MR02 series couplings or approved equal.

D. Couplings shall be elastomeric plastic or synthetic rubber resistant to sewage and grease, chemicals and normal sewer gases, and with stainless steel shear shielding. Couplings shall be designed to slip over the outside of the pipes being connected with a snug fit. Coupling shall be held in place and sealed with a stainless-steel band clamp around each

end. Couplings shall be specifically manufactured for making the transition between various types of pipe with different outside diameters.

PART 3 EXECUTION

3.01 PREPARATION

A. General:

1. Contractor shall CCTV inspect existing sewer lines to confirm location of lateral connections prior to excavating in conformance with Section 02760.
2. Laterals indicated on the Contract Plans to be replaced, repaired, reinstated, and abandoned are based on review of existing CCTV data and information provided by the City. Some of the previously reviewed data may not be complete, accurate, and may be dated; therefore, the Contractor is responsible for identifying all active, inactive, and capped laterals. All inactive or capped laterals shall not be replaced or reinstated. If the Contractor is unable to determine if a lateral is inactive the Contractor shall coordinate with the City to determine if the lateral should be replaced/reinstated or abandoned.

3.02 INSTALLATION

A. Lateral Reconnection:

1. Excavate and backfill lateral in conformance with Sections 02300 and 02318.
2. Reconnect sanitary sewer lateral in conformance with the Contract drawings.

B. Connections shall be made only in the presence of the City inspector, and no connection work shall proceed until the inspector has given notice to proceed. If progress is inadequate during the connection operations to complete the connection in the time specified, the engineer shall order necessary corrective measures. All costs for corrective measures shall be paid by the Contractor.

C. The Contractor shall furnish all materials and labor required for making the connections. In addition, the Contractor shall assist the City in alleviating any hardship incurred during the shutdown for connections. Standby equipment or materials may be required by the inspector.

D. The CONTRACTOR shall de-water and bypass pump the existing mains, as required, in the presence of the inspector.

E. Connections shall be made with as little change as possible in the grade of the pipeline. If the grade of the existing pipe is below that of the new

pipeline, a sufficient length of the new line shall be deepened so as to prevent the creation of any high spot or abrupt changes in grade of the new line. Where the grade of the existing pipe is above that of the new pipeline, the new line shall be laid at specified depth, except for the first joint adjacent to the connection, which shall be deflected within the allowances of the pipe manufacturer as necessary to meet the grade of the existing pipe. If sufficient change in direction cannot be obtained by the limited deflection of the first joint, a fitting of the proper angle shall be installed.

3.03 LATERAL ABANDONMENT

A. If the Contractor identifies existing laterals that are inactive or that have been capped they shall be abandoned (when pipe is being rehabilitated or replaced). Contractor shall confirm lateral is inactive with pre-construction CCTV inspection, Dye Testing, or other methods prior to abandoning laterals.

B. Contractor shall document the information used to determine if lateral is inactive and submit data with all backup information to the City.

C. Contractor is responsible for repairing and/or reinstating any lateral that was abandoned as part of the project but is later determined to be active. Contractor is also responsible to any damage to public or private property that occurs as result of abandoning an existing active lateral.

D. Lateral abandonment shall be accomplished by not reinstating lateral once pipe rehabilitation/replacement has been completed.

END OF SECTION

SECTION 02700
POLYVINYL CHLORIDE (PVC) PIPE AND FITTINGS

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:

1. PVC Pipe and Fittings for Gravity Sewers.

B. Related Sections:

1. Section 02300 – Earthwork.
2. Section 02318 – Trenching.
3. Section 02760 – Closed Circuit Television (CCTV) Inspection.
4. Section 02770 – Sanitary Sewer Testing
5. Section 03300 – Cast in Place Concrete.
6. Section 03400 – Pre-Cast Concrete.
7. Section 03600 – Grouts.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):

1. D 2241 - Standard Specification for Poly (Vinyl Chloride) (PVC) Pressure – Rated Pipe (SDR Series).
2. D 3034 - Specifications for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
3. D 3212 – Specification for Joint for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals.
4. D 3965 – Classification System and Basis for Specifications for Rigid Acrylonitrile-Butadiene-Styrene (ABS) Materials for Pipe and Fittings.
5. F 477 - Specifications for Elastomeric Seals (Gaskets) for Joining Plastic Pipe.

B. American Water Works Association (AWWA):

1. C900 - Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings

1.03 SUBMITTALS

A. Product Data:

1. PVC Pipe.
2. Fittings.

B. Post installation CCTV inspection reports and videos.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Pipe Manufacturers:

1. Diamond Plastic Corporation.
2. JM Eagle.
3. North American Specialty Products.
4. Or Approved Equal.

B. Manhole Connection:

1. New manholes: Refer to water stops Section 03300.
2. Existing manholes:
   a. Concrete manhole adapter waterstop manufactured by Fernco or approved equal.

2.02 MATERIALS

A. Gravity Sewer Main PVC Pipe and Fittings:

1. Minimum wall and strength requirements of SDR-26 in conformance with ASTM D3034.
2. Bell and spigot type joints.
3. Sealing gaskets shall meet the requirements of ASTM F477.
4. Pipe shall be marked with “SANITARY SEWER” in 1-5/8” high block lettering with permanent ink. The marking shall be repeated at 2-foot spacing along the pipe length.

B. Sewer Lateral PVC Pipe and Fittings:

1. PVC with minimum wall and strength requirements of SDR-26 in conformance with ASTM D3034.
2. See Section 02531.

C. Bedding and Backfill

1. Per specification Sections 02300 and 02318.

D. Couplings: Banded rubber coupling with shield shall be of a variety designed to couple the new pipe material with the existing pipe material. Shield, band, and hardware shall be 316 stainless steel. Connections are to be of Mission Rubber Flex Seal ARC MR02 series couplings or approved equal.

PART 3 EXECUTION

3.01 PIPE STORAGE

A. Precautions shall be taken to prevent damage to the stored pipe.

B. PVC shall be protected from damage due to sunlight exposure.

3.02 HANDLING

A. Care shall be taken in handling, transporting and placing pipe to prevent damage. No interior hooks or slings shall be used in lifting pipe. All handling operations shall be done with an exterior sling or with a suitable forklift.

B. No damaged pipe will be accepted and will be replaced with new pipe to the next joint.

3.03 EXCAVATION AND BACKFILL

A. Trenching, Excavating and Backfilling shall be done in accordance with Sections 02300 and 02318.

3.04 CONNECTIONS

A. Thoroughly clean pipe and fittings of dirt, dust, and moisture before installation. Installation and joining methods shall be as recommended by the pipe and fitting manufacturers.

B. Cut pipe square for good joint integrity. After cutting pipe, ream inside and chamfer outside to remove burrs, shoulders, and ragged edges.

3.05 MANHOLE CONNECTION

A. Core drill through existing manhole as necessary to accommodate the new sewer pipe.

B. Manhole sewer connection shall be installed with a water stop and non-shrink epoxy grout applied 360 degrees around new sewer pipe in conformance with manufacturer's instructions.

3.06 INSPECTION

A. All installed sewers and connections shall be visually inspected by the City prior to backfill. The City may require the Contractor to excavate any sewer pipe or connection that is not visually inspected by the City prior to backfill.

B. All new sewer pipes shall be post installation CCTV video inspected by the contractor and submitted to the City in accordance with Section 02760.

3.07 TESTING

A. Testing shall be completed in accordance with Section 02770.

END OF SECTION

SECTION 02720
HIGH DENSITY POLYETHYLENE (HDPE) PIPE

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:

1. HDPE Pipe.

B. Related Sections:

1. Section 02318 – Trenching.
2. Section 02345 – Pipe Bursting.
3. Section 02760 – Closed Circuit Television (CCTV) Inspection.
4. Section 03300 – Cast in Place Concrete.
5. Section 03400 – Pre-Cast Concrete.
6. Section 03600 – Grouts.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):

1. D 2122 – Determining Dimensions of Thermal Plastic Pipe and Fittings
2. D 2321 – Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity Flow Applications
3. D 2837 – Hydrostatic Design Basis for Thermal Plastic Pipe Materials
4. D 3350 – Polyethylene Plastics Pipe and Fittings Material
5. F 714 – Polyethylene Plastic Pipe Based on Outside Diameter
6. F 1667 – Guide for Construction Procedures for Buried Plastic Pipe

1.03 SUBMITTALS

A. Product Data:

1. HDPE Pipe.

B. Submit debeading process and equipment for use in removing the internal bead for the newly joined HDPE pipe sections.

C. The Contractor shall submit a copy of the technician's certification(s) for the operation of the fusion equipment.

D. Pipe Fusion:

1. Fusion Machine Product Data

2. Data Logger Product Data

3. Calculations for fusion parameters for each pipe size, thickness, and fittings to be fused. Calculations should include the following and be calculated based on the fusion machine manufacturer and/or Plastic Pipe Institute recommendations:

    a. Pipe diameter

    b. Wall Thickness

    c. Interfacial Pressure

    d. Drag Pressure

    e. Heat soak pressure and time

    f. Fusion/Cool pressure and time

4. Recorded Fusion Logs

E. Post installation CCTV.

PART 2 PRODUCTS

2.01 MATERIALS

A. Materials used for the manufacture of HDPE pipe and fittings shall be extra high molecular weight, high density ethylene/hexene copolymer PE 3408 polyethylene resin meeting a minimum cell classification of 345434D per ASTM D3350.

B. The HDPE pipe manufacturer shall provide certification that stress regression testing has been performed on the specified material. Said certification shall be done in conformance with ASTM D2837, and the manufacturer shall provide a product supplying a minimum hydrostatic design basis (HDB) of 1,600 psi.

C. HDPE materials shall be listed by the Plastics Pipe Institute in PPI TR-4 with a 73°F hydrostatic design stress rating of 800 psi, and a 140°F hydrostatic design stress rating of 400 psi. The PPI listing shall be in the name of the pipe manufacturer, based on ASTM D2837 and PPI TR-3 testing and validation of samples of the pipe manufacturer's production pipe.

D. The physical properties of the pipe and fittings material shall be as indicated in the table below:

PROPERTY	TEST METHOD	VALUE
Density	ASTM D 1505	0.955 gm/cc
Melt Index	ASTM D 1238	0.14 gm/10 min
Environmental Stress-Cracking Resistance[1]	ASTM D 1693	> 5,000 hr > 800 hr
Tensile Strength, Yield[2]	ASTM D 638	3,200 psi
Elongation at Break[3]	ASTM D 638	> 750 percent
Vicat Softening Temperature	ASTM D 1525	257º F
Brittleness Temperature	ASTM D 746	< -180º F
Flexural Modulus	ASTM D 3350	125,000 psi
Modulus of Elasticity	ASTM D 638	105,000 psi
Hardness	ASTM D 2240	65 Shore D
Coefficient of Linear Thermal Expansion[4]	ASTM D 696	8.3x10-5 in/in/°F 1.2x10-4 in/in/°F
Long Term Strength[5]	ASTM D 2837	1,600 psi 800 psi

1. Condition A, B & C @ 0°F; Compressed Ring @ 50°F
2. Type IV specimen
3. Type IV specimen
4. Molded specimen; Extruded pipe
5. @ 73°F; @ 140°F

2.02 HDPE PIPE

A. Pipe supplied under this specification shall have a nominal IPS (iron pipe size) outside diameter. Pipe shall be produced to the specifications of ASTM F714.

B. The minimum SDR (standard dimension ratio) shall be 17 for pipe installed by pipe bursting. The Contractor shall determine if thicker pipe is necessary to accommodate anticipated installation conditions.

C. Interior of the pipe shall have a light color, such as grey, and green strips on the exterior.

D. Pipe shall be marked with nominal size, dimension ration (SDR), trade name, material classification (PE3408), certification base (ASTM F714), and date produced.

2.03 HDPE FITTINGS

A. Standard HDPE fittings shall be commercial products manufactured by injection molding or by extrusion and machining or shall be fabricated from HDPE pipe conforming to this specification.

B. Fittings shall be fully pressure rated by the manufacturer to provide a working pressure equal to that of the pipe.

C. Fittings shall be manufactured from the same resin type, grade, and cell classification as the pipe itself.

D. Lateral shall be connected with Electrofusion saddles per Section 02345.

PART 3 EXECUTION

3.01 PIPE STORAGE AND HANDLING

A. Pipe shall be stored and handled in conformance with the pipe supplier's guidelines.

B. Pipe may be stored on the project site at the Contractor's own risk. Precautions shall be taken to prevent damage to the stored pipe.

C. Care shall be taken in handling, transporting and placing pipe to prevent damage. No interior hooks or slings shall be used in lifting pipe. All handling operations shall be done with an exterior sling or with a suitable forklift.

D. No damaged pipe will be accepted.

3.02 FUSION PROCESS

A. Fusing pipe shall only be done by qualified fusion technicians holding current qualification credentials for the pipe being fused.

B. Pipe supplier's procedures shall be followed at all times during fusion operation.

C. Each fusion join shall be recorded and logged by an approved electronic monitoring device (data logger) connected to the fusion machine, which utilizes a current version of the pipe supplier's recommended and compatible software. A copy of all fusion logs shall be submitted to the Town.

D. Use only appropriately sized and outfitted fusion machines.

E. Pipe shall be joined using the butt fusion method providing a joint weld strength equal or greater than the tensile strength of the pipe.

F. All internal beads for newly joined HDPE pipe sections shall be removed.

3.03 INSTALLATION

A. Refer to Pipe Bursting specification Section 02345.

3.04 TESTING

A. Testing shall be completed in accordance with Section 02770.

B. Video inspection shall be performed per Section 02760.

END OF SECTION

SECTION 02722
AGGREGATE BASE

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Aggregate base.

B. Related Sections:

1. Section 02300 - Earthwork
2. Section 03200 - Asphaltic Concrete Paving.
3. Section 03300 - Cast in Place Concrete.
4. Section 03400 - Precast Concrete

1.02 REFERENCES

A. American Concrete Institute (ACI):

1. C 117 - Test Method for Material Finer than 75-µm (No. 200) Sieve in Mineral Aggregate by Washing.
2. C 136 - Method for Sieve Analysis of Fine and Coarse Aggregates.
3. D 4318 - Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

B. State of California Department of Transportation.

1. CALTRANS - Standard Specifications.

1.03 SUBMITTALS

A. Product Data:

1. Source, gradation, and testing data for aggregate base course.

B. Quality Control:

1. Test Reports: Reports for tests required by Sections of CALTRANS Standard Specifications.

C. Certificates of Compliance: Certificates as required by Sections of CALTRANS Standard Specifications.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Storage and Protection: Protect from segregation and excessive moisture during delivery, storage, and handling.

PART 2 PRODUCTS

2.01 MATERIALS

A. Aggregate Base Course:

1. Class 2, 3/4-inch maximum aggregate size free from vegetable matter and other deleterious substances, and of such nature that aggregate can be compacted readily under watering and rolling to form a firm, stable base.
2. Materials derived from processing demolished or removed asphalt concrete are not acceptable.
3. Coarse aggregate material retained in Number 4 sieve shall consist of material of which at least 25 percent by weight shall be crushed particles when tested in accordance with California Test 205.
4. Aggregate shall not be treated with lime, cement, or other chemical material before the Durability Index test is performed.
5. Aggregate grading and sand equivalent tests shall be performed to represent not more than 500 cubic yards or one day's production of material, whichever is smaller.
6. Grade within the limits and conform to quality requirements as follows when tested in accordance with California Test 202:

Sieve Sizes (Square Openings)	Percent by Weight Passing Sieve
1 inch	100
3/4 inch	90-100
Number 4	35-60
Number 30	10-30
Number 200	2-9

Quality Requirements		
Description	California Test	Minimum Test Result
Resistance (R Value)	301	78
Sand Equivalent	217	22
Durability Index	229	35

PART 3 EXECUTION

3.01 EXAMINATION

A. Verification of Conditions: Examine conditions upon which the work specified in this Section depends for defects that may influence installation and performance.

B. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Subgrade Preparation: Prepare as specified in Section 02300.

3.03 INSTALLATION

A. Furnish, spread, and compact aggregate base course material to the lines, grades, and dimensions indicated on the Drawings.

1. Aggregate bases, after compaction, shall be watered in conformance with the provisions in Section 17, “Watering”, of the Caltrans Standard Specifications.
2. The relative compaction of each layer of compacted base material shall be not less than 95 percent.
3. The surface of the finished aggregate base at any point shall not vary more than 0.05 foot above or below the grade established by the Engineer.
4. Spreading: Spread in accordance with sections of Caltrans Standard Specifications.
5. Compacting: Compact in accordance with sections of Caltrans Standard Specifications.

3.04 FIELD QUALITY CONTROL

A. Tests: Perform field tests as required by sections of CALTRANS Standard Specifications.

END OF SECTION

SECTION 02750
PAVEMENT MARKINGS

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: All Pavement and Concrete paint and markings

B. Related Sections:
   1. Section 02772 – Concrete Curbs, Gutters, and Sidewalks
   2. Section 02990 – Pavement Restoration and Rehabilitation

1.02 REFERENCES

A. State of California Department of Transportation Standard Specifications, latest edition (CALTRANS Standard Specifications).
   1. Section 84 – Traffic Stripes and Pavement Markings
   2. Section 85 – Pavement Markers

1.03 WORK RESTRICTIONS

A. Prior to the removal of any of the existing traffic control delineation and markings, the CONTRACTOR shall document existing striping configuration including lane width, type of details, arrows, markings and legends and any other existing delineation for reinstallation. The CONTRACTOR shall take whatever action is necessary to ensure that said delineation can be accurately replaced at its previous location upon completion of paving operations.

B. If on those streets not designated to be resurfaced, the existing traffic control system is impacted construction activities, the CONTRACTOR shall install traffic tape or paint until the permanent traffic control system can be replaced by the CONTRACTOR.

C. The CONTRACTOR shall provide temporary stop legend and cross-walk replacement as necessary until the permanent installation has been done per direction of the ENGINEER.

1.04 SUBMITTALS

A. The CONTRACTOR is required to provide shop drawings and/or submittals for the following items listed:
   1. Thermoplastic Striping Paint

1.05 QUALITY ASSURANCE

A. The CONTRACTOR warrants and guarantees that all material and equipment used or furnished and all workmanship are of the type and quality specified herein. The CONTRACTOR further guarantees that any latent fault in construction or defective material discovered within one year after acceptance of the work shall be remedied by him without cost to the CITY, upon written notice given to him. Other subsequent latent defects shall be covered by responsibilities set forth in the law.

B. In the event of failure to comply with the above-mentioned conditions within a reasonable time after notice, the CITY will have the defects repaired and made good at the expense of the CONTRACTOR, who agrees to pay the costs and charges therefore immediately upon demand.

PART 2 MATERIALS

2.01 PAINT AND PROTECTIVE COATINGS FOR TRAFFIC STRIPING, PAVEMENT MARKING, AND CURB MARKING

A. Paint shall conform to the provisions of Section 84 of Caltrans Specifications. Thermoplastic paints are required on this project.

B. Colors:
   1. Text: White
   2. Parking Dividers: White
   3. No Parking Zone Markings: White
   4. No Parking Curb: Red
   5. Handicap Zone Markings: Blue and White
   6. Directional Arrows: White
   7. Driving Lane Dividers: White
   8. Intersection Stop Lines: White
   9. Crosswalk Lines: White
   10. Road Centerlines: Yellow

C. Pavement Markers shall conform to the provisions of Section 85 of Caltrans Specifications.

PART 3 EXECUTION

3.01 PAINT AND PROTECTIVE COATINGS FOR TRAFFIC STRIPING, PAVEMENT MARKING, AND CURB MARKING

A. Application of striping, marking, and setting pavement markers shall conform to Sections 84 and 85 of Caltrans Specifications, in addition to the requirements in this Section.

B. Remove dirt, oil, grease, and other materials which may affect paint adhesion.

C. Apply paint with specifically designed and manufactured equipment for pavement marking. Provide:
   1. Uniform straight edges without overspray.
   2. Four inch wide lines, unless indicated otherwise.
   3. Hatching in handicap parking areas.

D. Apply paint to obtain thickness recommended by paint manufacturer.

E. Paint traffic control markings, including striping, directional arrows, cross walks and lettering, and handicap striping and symbols as indicated on the Drawings and in accordance with local governing agency's standards. Use stencils for arrows, lettering, and symbols.

*****END OF SECTION*****

SECTION 02760
CLOSED CIRCUIT TELEVISION (CCTV) INSPECTION

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Closed circuit television (CCTV) inspection of sanitary sewer pipes.

B. Related Sections:
   1. Section 02345 – Pipe Bursting
   2. Section 02531 – Sewer Laterals
   3. Section 02700 – PVC Pipe and Fittings
   4. Section 02720 – HDPE Pipe

C. The Contractors shall perform cleaning, inspections and assessments as needed to complete the rehabilitation of the pipelines and manholes included in the project drawings. The inspections and assessment shall be in compliance with the National Association of Sewer Service Companies' (NASSCO) Pipe and Manhole Assessment and Certification Programs (PACP and MACP).

D. The Contractors shall provide a condition assessment consistent with the PACP methodologies for all pipe segments. The assessment shall include defect descriptions.

E. This section includes all the equipment, labor, and materials necessary to perform all work for the Closed-Circuit Televising (CCTV) and field inspection and assessment of sewer mains. The City requires the use of NASSCO’s PACP, LACP, and/or MACP version 7.0 or later collected on the POSM inspection software program.

1.02 DEFINITIONS

A. NASSCO: National Association of Sewer Service Companies.

B. PACP: Pipeline Assessment Certification Program.

C. MACP: Manhole Assessment and Certification Program

1.03 STANDARD ABBREVIATIONS

AMH Access Manhole

CCTV Closed Circuit Televising

LACP American National Standards Institute

MACP Manhole Assessment and Certification Program

MGO Manhole General Observation

NASSCO National Association of Sewer Service Companies

PACP Pipeline Assessment and Certification Program

RPZ Reduced Pressure Principle Backflow Prevention Assembly

1.04 SUBMITTALS

A. Inspections on hard drive at the completion of inspection:
   1. Inspection videos saved in MPEG format or Windows Media video format.
   2. Electronic version (.pdf) of the pipe inspection reports.
   3. PACP export pipe inspection database (.mdb).
   4. Inspection digital photographs in JPEG format.

B. Contractor shall submit pre-construction CCTV inspection videos for review and approval prior to construction. Pre-construction videos shall be submitted for all pipe segments where improvements are proposed. The Contractor shall receive an approved submittal prior to proceeding with the proposed work.

C. Submit a written description of procedures to be used to the Owner, including product literature for all digital video equipment including, but not limited to cabling, camera, monitor, footage counter, digital video titling device, and recorder.

D. Consultant's project-specific safety plan. Consultant is solely responsible for the safety of workers and the public. Must be provided prior to the start of any field work.

E. Emergency Response Plan in the event of Sanitary Sewer Overflows (SSOs). Provide prior to the start of any field work.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Storage and Protection: Protect from segregation and excessive moisture during delivery, storage, and handling.

1.06 QUALITY ASSURANCE

A. Comply with all codes, laws, ordinances, and regulations of governmental authorities having jurisdiction over this part of the work.

B. The Contractor shall comply with the latest revision of the California Occupational Safety and Health requirements.

C. The Contractor shall comply with California Water Quality Regional Board requirements.

D. All main line inspections shall be performed in accordance with the National Association of Sewer Service Companies' (NASSCO) Pipeline Assessment and Certification Program (PACP) version 7.0 format or later. Inspections conducted or submitted in other formats that do not meet all the requirements of this specification are subject to being rejected. Any survey that is rejected must be re-televised to meet the guidelines for CCTV Inspections.

E. All surveyors and/or operators must have a valid PACP and LACP certification from the National Association of Sewer Service Companies prior to assessing and televising sewer mains or laterals within the City sewer system.

F. Each CCTV survey is to be a full PACP or LACP survey, continuous from a starting manhole or access point to a finishing manhole, access point, or utility feature where possible. Any line that is not televised from a starting manhole, access point, or utility feature to a finishing manhole, access point, or ending utility feature will be considered as a partial or incomplete survey and will be rejected unless specified to do so otherwise or if the camera cannot not pass through the entire line due to an obstacle or other defect.

G. Each CCTV inspection shall be performed one line segment at a time in accordance with NASSCO guidelines. A line segment is defined as the sewer main or lateral assembly from a manhole, cleanout, special chamber, or utility feature to the next in-line manhole, sewer main, special chamber, or utility feature. Any CCTV survey that contains multiple line segments within a single PACP or LACP inspection and/or video file will be rejected.

H. All media, videos, and images are to be televised and recorded in color and shall correctly reflect the true colors within the pipe and on the video display. Videos and inspection stills televised or submitted in black and white will be rejected.

I. All media, videos, and images shall provide a clear, accurate, undistorted, and in-focus picture of the entire periphery of the pipeline for all conditions encountered. Every possible means shall be taken to ensure total viewability of the inside periphery of the pipeline.

J. All digital video files shall be continuous with no evidence of missed footages or “blink- outs”. Proof that the entire pipeline segment was traversed and inspected shall be obvious on the final video recording.

K. All post construction CCTV surveys and assessments are to be conducted after, and only after, all major construction has been completed and the line segment has passed all required post construction testing. Any line segment that has been televised or assessed prior to the full completion or testing of any newly constructed or rehabilitated sewer appurtenance will be rejected.

L. DO NOT PROVIDE VOICEOVER PIPE DEFECTS. Voiceover to be used to document operational issues only, equipment issues, or other pertinent information to describe an interruption in image.

1.07 COORDINATION

A. Whenever the Contractor desires to use a hydrant for water supply, the Contractor shall obtain the permission of the owner. All costs associated with the use of water supplied from hydrants shall not be paid for separately but shall be deemed to be included in the bid. Operation of hydrant shall be in accordance with the City Water Utility. Use of an RPB device and/or air gap is required.

B. The Contractor shall prepare, submit traffic control plans and obtain the necessary permits to work in public right-of-way. The project is located in Santa Clara County within the City of Morgan Hill.

C. The Contractor shall comply with the Emergency Spill Response Plan requirements detailed the City’s 2018 Sanitary Sewer Management Plan which can be found here:

https://www.morgan-hill.ca.gov/DocumentCenter/View/22618

PART 2 PRODUCTS

2.01 EQUIPMENT

A. Closed Circuit Television Camera:
   1. The television camera used for the inspection shall be one specifically designed and constructed for such inspection. The camera shall be operative in 100 percent humidity conditions. The camera, television monitor, and other components of the digital video system shall be capable of producing picture quality to the satisfaction of the City.
   2. The camera unit shall be a color pan and tilt unit with autofocusing and zoom features. The television camera shall have a resolution of 480 lines minimum and shall have a source of illumination attached to it. All CCTV equipment must have the capabilities to televise inspections in color & in full detail. With the monitor adjusted for correct saturation, the six colors plus

black and white shall be clearly resolved with the primary and complementary colors in order of decreasing luminance. The gray scale shall appear in contrasting shades of gray with no tint. In order to ensure color constancy, no variation in illumination shall take place while the camera or transporter is in motion. The televised image shall be displayed on a monitor, located in an enclosed space in the television inspection vehicle.

3. CCTV Focus/Iris/Illumination: The adjustment of focus and iris shall allow optimum picture quality to be achieved and shall be remotely operated. The adjustment of focus and iris shall provide a minimum focal range from 6 inches in front of the camera's lens to infinity. The distance along the sewer in focus from the initial point of observation shall be a minimum of twice the vertical height of the sewer. The illumination must allow an even distribution of the light around the sewer perimeter without the loss of contrast or flare out of picture shadowing.
4. The camera shall be self-propelled or mounted on skids and drawn through the sewer by winches for pipelines with an equivalent diameter from 6 to 36 inches. The use of winches and skids shall be approved by the City prior to CCTV inspection services. The inspecting equipment shall be capable of inspecting a length of sewer up to at least 1,000 feet when entry into the sewer may be obtained at each end and up to 750 feet where a self-propelled unit is used, where entry is possible at one end only. The Contractor shall maintain this equipment in full working order.

B. Where the CCTV camera or transporter is towed by winch and bond through the sewer, all winches shall be stable with either lockable or ratcheted drums. All bonds shall be steel or of an equally non-elastic material to ensure the smooth and steady progress of the CCTV camera and/or Sonar equipment. All winches shall be inherently stable under loaded conditions.

C. Each inspection unit shall contain a means of transporting the CCTV camera equipment in a stable condition through the sewer under inspection. Such equipment shall ensure the maintained location of the CCTV camera on or near to the central axis of a circular shaped sewer when required in the prime position.

D. Software: CCTV collection software shall be POSM which is compatible with PACP, MACP, and LACP version 7.0 certified or better. All inspection data shall be stored in POSM software database(s) and shall be compatible and transferable to existing City POSM databases.

E. Recordings of all sewer line inspections shall be transferred to a memory stick or portable hard drive. The audio portion of the composite digital video shall be sufficiently free from electrical interference and background noise to provide complete intelligibility of the oral report.

F. Footage Counter Device: Measurement for location of defects during the inspection shall be aboveground by means of a footage counter device. Marking

on the cable, or the like, which would require interpolation for depth of manhole, will not be allowed. Accuracy of the distance meter shall be checked by use of a walking meter, roll-a-tape, or other suitable device. The footage counter device shall be accurate to plus or minus 2 feet in 1,000 feet and be subject to approval by the City.

G. Digital video equipment shall include genlocking capabilities to the extent that computer generated data (i.e., footage, date, size, address and location, etc.) as determined by the Owner can be overlaid onto digital video, and both indicated on the television monitor and permanently recorded on the digital inspection.

H. Video Capture System:
   1. The video and audio recordings of the sewer inspections shall be made using digital video equipment. A video enhancer may be used in conjunction with, but not in lieu of, the required equipment. The digital recording equipment shall capture sewer inspection on hard drive, with each sewer reach inspection recorded as an individual movie file (.MPEG, .MPG, or .WMV) or approved equal.
   2. The video file name shall contain both the upstream and downstream manhole number and date of inspection.
   3. The video file names will be referenced in the inspection database and in an inspection, report generated in PDF format. The pipeline collection and real time video capture and data acquisition systems shall be provided.
   4. The system shall use the most current PACP compliant application software and shall be fully object oriented or approved equal. It shall be capable of printing pipeline inspection reports with captured images of defects or other related significant visual information on a standard color printer.
   5. The imaging capture system shall store digitized color picture images and be saved in digital format on a hard drive or approved equal storage device. Also, this system shall have the capability to supply the City with inspection data reports for each line segment.
   6. The contractor's equipment shall have the ability to "Link". “Linking” is defined as storing the video time frame code with each observation or defect with the ability to navigate from/to any previously recorded observation or defect instantaneously.
   7. The system shall be able to produce data reports to include, at a minimum, all observation points and pertinent data. All data reports shall match the defect severity codes in accordance with PACP naming conventions.
   8. Camera footage, date & manhole numbers shall be maintained in real time and shall be displayed on the video monitor as well as the video character generators illuminated footage display at the control console.
   9. The audio portion shall be sufficiently free of background and electrical noise so as to produce an oral report that is clear and discernible.
   10. The CCTV equipment/software shall be capable of producing digitized images of all sewer line defects, and sewer line service connections in .jpeg format. CONTRACTOR shall plan to take digital still images of each defect,

construction features and service connection to clearly depict it. More images may be necessary depending upon the condition of the pipe.

2.02 REPORTING CAPABILITIES

A. The following information is mandatory for all inspections:
   1. Inspection Information – Refers to the area of pipe to be inspected between two manholes or the address of the lateral to be inspected.
      a. Project Name;
      b. Surveyed by (Operator/Surveyor's name);
      c. Operator/Surveyor Certificate number;
      d. Date;
      e. Time;
      f. Street Name and Number;
      g. Additional Location Information (e.g. backyard, parking lot, etc);
      h. Upstream Manhole Number (City standard Asset Number);
      i. Upstream MH rim to invert (depth);
      j. Downstream Manhole Number (City standard Asset Number);
      k. Downstream MH rim to invert (depth);
      l. Direction of inspection (Upstream or Downstream);
      m. Flow control (e.g. plugged, lift station, bypassed, not controlled);
      n. Type of Pipe;
      o. Pipe Size;
      p. Pipe Material;
      q. Lining Material (for lined sewers);
      r. Purpose of Inspection (pre-construction, post construction, etc.)
      s. Pre Cleaning (jetter, heavy cleaning, no pre-cleaning);
      t. Weather;
      u. Additional information/Comments
   2. Observation Data – Refers to the portion of pipe where an observation is discovered. Observations shall be noted by text descriptions and defect code number using PACP defects codes, still frame pictures and video clips captured and recorded. Each observation shall include the following:
      a. Actual observation footage;
      b. Location and clock position of any defects;
      c. Location and clock position of any connection;
      d. Code (Group/Descriptor/Modifier/Severity)
      e. Whether it is a continuous defect
      f. Whether the defect occurs at a joint
      g. Severity level;
      h. Counter;
      i. Final footage;
      j. Video clip ID for each observation
      k. Image reference (file name of photos)
      l. Remarks (as appropriate or needed)

3. Formats - Standard and/or custom designed reports shall have the following formats available and shall be able to be produced in hard copy or viewed on the monitor.
    a. Site Observation: Displays detailed site observation reports in landscape or portrait views.
    b. Directory Report: Displays a list of all the projects sorted by manhole number
    c. Picture Reports: Displays site data and include full size single photos or half size double photos of discrepancies
    d. Pipe Run: Displays a graphical display of the site indicating footage, observations, and comments.
    e. Project Data: Displays the project, client, and contractor information.
    f. Custom Sort: Creates user-defined reports of selected site, project, and observation data.

B. Software Compatibility:

1. All inspections shall be provided to City in electronic format that allows the city to import into their CCTV software database, which utilizes IT Pipes. Any NASSCO certified PACP software that utilizes a NASSCO PACP exchange database (with PACP version 6.2) will be compatible with the City's database. A list of NASSCO certified software can be found here: https://www.nassco.org/certified-software-vendors-0

PART 3 EXECUTION

3.01 GENERAL

A. The camera shall pan the periphery of the start and finish manhole from casting to invert. To achieve this, the CCTV camera operator shall pan and zoom the manhole to obtain the best possible image of the manhole, including the wall, cone and chimney section(s).

B. The depth of each manhole shall be measured to the nearest 1/10th of a foot and documented on the inspection forms. Estimates of manhole depths will not be accepted.

C. Wherever possible the inspections shall be performed in the upstream to downstream direction. All sewer segments shall be recorded in a logical order in the same direction they are cleaned and televised.

D. When sewer conditions prevent forward movement of the camera, the camera shall be withdrawn, and CONTRACTOR shall televise the line from the opposite direction.

E. Flow levels within existing sewers to be inspected shall not exceed 5% of the pipe diameter. If water levels prevent adequate televising of the sewer, then conducting the work during low flow periods or other methods like plugging and bypass pumping shall be implemented.

F. For inspection of new sewers (not yet in service), the CONTRACTOR shall introduce clean water into the upstream manhole and keep water flowing until flow is observed at the downstream manhole location.

G. If the video recording is of poor quality, the City has the right to require a re-submittal of the sewer and no payment will be made until an acceptable video recording is made and accepted by the City.

H. The contractor shall be responsible for all traffic control measures required to perform the work.

I. Operation of the television inspection equipment shall be controlled from above ground, with a skilled technician at the control panel in the television inspection van controlling the movement of the television camera. The technician shall have the capability to: adjust the brilliance of the built-in lighting system; change the focus of the television camera by remote control; control the pan, tilt, and zoom features of the camera; control the forward and reverse motion of the camera; and determine the camera's position, at any time.

J. Each digitally encoded inspection video shall begin with the camera facing towards the bottom of the manhole and oriented so that the outgoing sewer connection is at the 6 o'clock position. This position shall be held during video recording for a minimum of five (5) seconds then followed by the operator panning then tilting the surrounding above ground area of the entrance manhole prior to lowering the camera to the bottom of the manhole. The CCTV video shall include the view of the camera as it is placed within the manhole, the size measurement of the pipe that is to be inspected, and clearly show which pipe the CCTV camera is inserted. Any notable defects present within the manhole are to be coded as General Observations (MGO's) and to be catalogued only after the initial access point and water level observations have been coded.

K. When the Contractor elects to "pull through" a manhole during a CCTV and/or Sonar Inspection, a new inspection will be started at the manhole "pulled through", and the footage re-set to zero (0.0) at the manhole wall where the pipe exits/enters the manhole. The video shall begin with the camera being centered within the "pull through" manhole looking down the line segment to be televised. The Contractor shall begin the inspection by cataloguing the initial PACP access and water level codes followed by slowly panning then tilting the camera around the manhole for no less than 5 seconds. The Consultant/Contractor shall also be required to visually capture and catalogue the field measurement of the pipe size at any "pulled through" manhole location.

L. If during an inspection an unmapped manhole is found, follow PACP procedures and code the manhole and close out the inspection. In the corresponding manhole field of the header page, call out and label the unmapped manhole with the Facility ID of the next concurrent downstream manhole with a suffix of “-A” at the end of the field. When proceeding on, start a new inspection from the said unmapped manhole and note the “Pipe Segment Reference” field in this inspection as “Gm. -” if sanitary sewer or “SWC. -” for storm sewer to indicate that this is different line segment than the one previously televised as this segment will require a new and unique “Facility Id”. Should multiple concurrent manholes be encountered during an inspection, the surveyor shall continue the naming convention of applying the next available letter to the end of the corresponding manhole field.

M. If the camera lens becomes covered with sewage, grease, deposits etc. resulting in poor picture quality then the inspection shall be suspended, and the camera shall be removed and cleaned. The inspection can then be resumed at the last clear camera location.

N. If the camera fails to pass through the entire pipe section due to the pipeline being inadequately or insufficiently cleaned, this section must be re-cleaned having all the debris removed from the system and the entire length re-televised per this specification.

O. If, and only if, during a normal flow CCTV survey the televising camera cannot pass through the entire pipe section due to a defect, anomaly, or obstruction in the pipe, the Contractor shall attempt a reverse setup so that the inspection can be performed from the opposite manhole, wet well, or access point.

P. When a reverse or second inspection is required to complete the inspection of a sewer, the PACP database field "Reverse Setup" shall be populated with corresponding inspection number. The "Reverse Setup" field shall be null for all inspections that are not reverse or follow-up inspections.

Q. At the start of each sewer length being surveyed or inspected and each reverse setup, the length of pipeline from zero footage (middle of the man) up to the cable calibration point shall be recorded and reported in order to obtain a full record of the sewer length. If the start manhole wall measures something other than 48” in diameter then this shall be noted in the ‘Additional Comments’ field of the survey.

R. The Contractor shall adjust the camera height as necessary to ensure that the camera is centered in the pipeline at the beginning of the inspection. A position tolerance of ± 10% of the vertical sewer pipeline diameter dimension will be allowed (i.e. for an 8-inch diameter pipeline the camera shall be centered within +/- 0.8 inches of the center of the pipeline). Inspections of any pipe sections in which the camera, in the opinion of the City, is skewed or not properly centered within the main shall be re-televised at no additional cost to the Sewer Utility.

S. When beginning a CCTV inspection, the operator shall verify the diameter of the pipeline to be inspected by inserting a tape measure or surveying rod into the manhole and measure the pipeline diameter to the nearest 1/10th inch. Video proof of this measurement shall be captured during the CCTV inspection after the camera has been adequately positioned so that this measurement can be clearly read. This measurement is also to be recorded in the “height” field of the inspection database.

T. All distances and time stamps called out for each PACP code, observation, or defect must be listed as a positive, rational number. Surveys that do not list positive numbers for distances and time stamps will be rejected.

U. At the start of each sewer length, a data generator shall electronically generate and clearly display on the viewing monitor and subsequently on the final recording a record of data in alpha-numeric form containing the following minimum information:
    1. Automatic update of the camera’s footage position in the sewer line from adjusted zero.
    2. Sewer dimensions in inches
    3. Manhole numbers (must conform to Owner’s identification number)
    4. Date of survey
    5. Road name (nearest)/location
    6. Direction of survey, i.e., downstream or upstream
    7. Time of start of survey
    8. Material of construction of the pipe
    9. Consultant/Contractor

V. The size and position of the data display shall be such as not to interfere with the main subject of the picture.

W. Once the survey of the pipeline is under way, the following minimum information shall be continually displayed:
    1. Automatic update of the camera’s footage position in the sewer line from adjusted zero.
    2. Sewer dimensions in inches
    3. Manhole numbers (must conform to Owner’s identification number)
    4. Direction of survey, i.e., downstream or upstream

X. If for any reason the Contractor’s equipment becomes disabled or lodged inside the sewer and cannot further proceed, the Contractor shall be responsible for retrieving the equipment and restoring the sewer at no additional cost to the Owner.

3.02 SEWER LINE CLEANING

A. All line segments and manholes shall be clean or be cleaned to the point that the entire pipe or manhole is visible unless if specified otherwise. Very light deposits may, in the opinion of City, be acceptable. However, any deposits that obscure a

joint, obscure a potential defect, or result in any “holding of flow” shall not be acceptable. Inspections of any pipe sections that are, in the opinion of the City, not properly cleaned shall be re-cleaned and re-televised at no additional cost to the Sewer Utility. The inspection shall be conducted within 36 hours after being cleaned. Under no circumstances shall cleaning or flow control jetting be conducted simultaneously with a CCTV inspection.

B. The contractor shall completely remove and dispose of all dirt, debris, rubbish and surplus, and unsuitable materials out of the system at the end of each workday at no additional cost to the Sewer Utility. The disposal will be the responsibility of the Contractor

C. For all line segments that have been cleaned prior to a CCTV survey, the contractor is to allow enough time for a steady flow rate to return to the line to refill any dips or sags in the line. If a sufficient flow rate into the line cannot be achieved then the contractor must add ample water to the upstream manhole or access point at a rate slow enough to mimic normal flow conditions until flow is visible in the next downstream manhole, wet well, or access point prior to televising the main.

D. During sewer cleaning operations, satisfactory precautions shall be taken in the use of cleaning equipment to insure the water pressure created does not damage or cause flooding of property or buildings being served by the sewer.

E. The designated sewer sections shall be cleaned using high-velocity jet equipment. The equipment shall be capable of removing dirt, grease, rocks, sand, and other materials and obstructions from the sewer lines and manholes. If cleaning of an entire section cannot be successfully performed from one manhole, the equipment shall be set up on the other manhole and cleaning again attempted. If, again, successful cleaning cannot be performed or the equipment fails to traverse the entire section, it will be assumed that a major blockage exists, and the cleaning effort shall be abandoned.

F. Roots shall be removed in the sections where root intrusion is a problem. Special attention should be used during the cleaning operation to assure almost complete removal of roots from the joints. Roots which could prevent installation of a pipe liner shall be removed. Procedures may include the use of mechanical equipment such as rodding machines, bucket machines, and winches using root cutters and porcupines, and equipment such as high-velocity jet cleaners.

G. Sludge, dirt, sand, rocks, grease, and other solid or semisolid material resulting from the cleaning operation shall be captured and removed at the downstream manhole of the section being cleaned, loaded in a suitable container, transported to the South County Regional Wastewater Treatment Facility in Gilroy and disposed of at that facility in accordance with all requirements and charges.

H. Water used to clean the sewer lines shall be discharged into the sanitary sewer downstream of the cleaning operation. Under no circumstances shall the contractor discharge water used to clean sewer lines onto the ground or into streams.

I. Acceptance of sewer line cleaning shall be made upon the successful completion of the television inspection and shall be to the satisfaction of the City. If television inspection shows the cleaning to be unsatisfactory, the contractor shall be required to re-clean and re-inspect the sewer line until the cleaning is shown to be satisfactory.

J. The contractor must have the means to access all manholes and lines that are to be surveyed. Additional equipment may be required to access off-road sewer lines or for manholes which require a tripod and harness for entry.

K. The Consultant/Contractor must have the means to access all manholes and lines that are to be surveyed. Additional equipment may be required to access off-road sewer lines or for manholes which require a tripod and harness for entry.

L. After the sewer main and/or lateral cleaning operation is completed, the line sections shall be visually inspected internally by means of color closed-circuit television. The television inspection shall be performed one line section at time.

3.03 PRE-CONSTRUCTION INSPECTION

A. Procedure:
   1. Prior to any repair or replacement work, the entire sewer line (from manhole to manhole) shall be televised. The pre-construction inspection shall be used to determine whether the line has been cleaned sufficiently; to confirm the location and nature of defects; and to confirm that the proposed method of repair is proper method for the defects observed.
   2. The camera shall be moved through the line in either direction at a moderate rate, stopping when necessary to permit documentation of the sewer's condition. In no case will the television camera be pulled at a speed greater than 30 feet per minute. Manual winches, power winches, TV cable, and power rewinds or other devices that do not obstruct the camera view or interfere with proper documentation of the sewer conditions shall be used to move the camera through the sewer line. If, during the inspection operation, the television camera will not pass through the entire manhole section, the contractor shall set up his equipment so that the inspection can be performed from the opposite manhole (reverse set-up).
   3. When manually operated winches are used to pull the television camera through the line, telephones, radios or other suitable means of communication shall be set up between the two manholes of the section

being inspected to insure good communication between members of the crew.

4. The importance of accurate distance measurements is emphasized. The location of defects shall be within one (1) foot.
5. The inspection shall be performed with the camera traveling in a forward direction. The camera shall only travel backward as needed to allow a fuller view of a defect or observation. Inspections that are accomplished with the camera traversing backward or in reverse will be rejected.
6. While in motion, the CCTV camera is to be fully zoomed out and fixed to the “home position” where the camera head is kept at the level horizon and is centered and pointed true down the alignment of the pipe for the duration of each CCTV survey. Only when necessary to fully capture defects/observations or to avoid getting the camera lens dirty should the camera be allowed to leave the home position or use the zoom, pan, or tilt features. After the flow conditions have normalized in the pipe or the full extent of an observation/defect has been captured the camera must return to the level home position.
7. Excessive use of the pan, tilt, or zoom features, including using any of the features simultaneously, shall be avoided. The operator shall not use the pan, tilt, or zoom features of the camera until the camera tractor is at a full and complete stop.
8. The operator shall bring the camera to a complete stop at all suspected defects, noted observations, and service connections, panning then tilting the camera as necessary to closely view the defect/observation in question. The full extent of the defect/observation shall be observed.
9. When coding any defect or observation, the operator shall adjust the camera back to the “home position” as best as possible while showing the defect/observation in its entirety in relation to the pipe. The operator shall cease all movements of the camera head and tractor to allow for a clear photograph of the defect/observation while the observation is being cataloged.
10. At each coded observation, the following minimum information shall be displayed:
    a. The PACP code and/or PACP code description.
    b. The footage position of the defect.
    c. The “Additional Info” field in any cases where it is utilized.
11. During the CCTV inspection, lighting intensity shall be adjusted as necessary to minimize glare and maximize viewing ability.
12. Upon reaching an end point manhole or other access point, the camera shall be maneuvered to the center of the manhole and tilted upward and slowly panned for a minimum of 5 seconds in order to view the interior of the manhole in full detail. Any notable defect observed within the manhole or access point shall be coded as a General Observation (MGO) and be catalogued prior to coding the manhole (AMH) to close out the inspection.

B. Documentation:
    1. Television Inspection Logs - Printed location records shall be kept by the contractor and will clearly show the location in relation to an adjacent manhole of each infiltration point observed during inspection. In addition, other points of significance such as locations of building sewers, unusual conditions, roots, storm sewer connections, broken pipe, presence of scale and corrosion, and other discernible features will be recorded, and a copy of such records shall be supplied to the City. The contractor shall record all visuals observations on a "Television Inspection Report" form.
    2. Once recorded, the digital data shall be labeled and become the property of the City. The contractor shall have all readings and necessary playback equipment readily accessible for review by the City during the project.
    3. The Contractor shall submit pre-construction inspections to the City for review and approval prior to proceeding with the proposed work.

3.04 POST CONSTRUCTION INSPECTION

A. Procedure:
    1. After the sewer line rehabilitation has been completed, the entire sewer line from manhole to manhole shall be televised. The post construction inspection shall be used to determine whether or not all of the approved sewer line defects and infiltration sources previously located have been fully repaired to the satisfaction of the City.
    2. The camera shall be moved through the line in either direction at a moderate rate, stopping when necessary to permit documentation of the sewer's condition. In no case will the television camera be pulled at a speed greater than 30 feet per minute. Manual winches, power winches, TV cable, power rewinds or other devices that do not obstruct the camera view or interfere with proper documentation of the sewer conditions shall be used to move the camera through the sewer line. If, during the inspection operation, the television camera will not pass through the entire manhole section, the contractor shall set up his equipment so that the inspection can be performed from the opposite manhole or direction. (reverse-setup)
    3. When manually operated winches are used to pull the television camera through the line, telephones, radios or other suitable means of communication shall be set up between the two manholes of the section being inspected to insure good communication between members of the crew.
    4. The importance of accurate distance measurements is emphasized. The location of defects shall be within one foot.
    5. During the internal inspection the television camera shall be temporarily stopped at each repair. The camera shall also be stopped at any unnoticed or non-repaired point source of infiltration.

3.05 SEWER BYPASSING AND DEWATERING

A. Contractor shall be responsible for bypassing sewer flow around his work and dewatering of sewer lines in accordance with the requirements of Section 01120. Where sags or submerged sections of the sewer are encountered during TV inspection, the contractor shall first complete inspection of the entire reach to determine the extent of such areas prior to dewatering the sewer. Dewatered sections of the sewer shall then be TV inspected.

B. On all sewer mains which have sags or dips, to an extent that the television camera lens becomes submerged during the television inspection, the contractor shall use a high pressure cleaner to draw the water out of the pipe, or other means, to allow inspection of the pipe and identification of pipe defects, cracks, holes and location of service connections.

3.06 LINEAR MEASUREMENT

A. The CCTV camera location footage counter shall be zeroed at the beginning of each inspection. The survey unit location entered on the footage counter at the start of the inspection shall allow for the distance from the accepted start of the length of the sewer to the initial point of observation of the camera (pre-set footage). In the case of resuming an inspection at an intermediate point within a sewer reach, the footage counter shall be set to start at the distance from the upstream maintenance hole to that point, as previously recorded by the counter. The CONTRACTOR shall ensure that the footage counter starts to register immediately when the survey unit starts to move.

B. The lateral camera shall be pushed from cleanouts to the sewer main and be equipped with a footage counter to display and record inspection footage. Maximum rate of travel shall be 30 feet per minute when recording.

C. Prior to commencing inspections, the CONTRACTOR shall demonstrate compliance with the linear measurement tolerance specified below:
    1. After the sewer line rehabilitation has been completed, the entire sewer line from manhole to manhole shall be televised. The post construction inspection shall be used to determine whether or not all of the approved sewer line defects and infiltration sources previously located have been fully repaired to the satisfaction of the City.
    2. The camera shall be moved through the line in either direction at a moderate rate, stopping when necessary to permit documentation of the sewer's condition. In no case will the television camera be pulled at a speed greater than 30 feet per minute. Manual winches, power winches, TV cable, power rewinds or other devices that do not obstruct the camera view or interfere with proper documentation of the sewer conditions shall be used to move the camera through the sewer line. If, during the inspection operation, the television camera will not pass through the entire manhole section, the contractor shall set up his

equipment so that the inspection can be performed from the opposite manhole or direction. (reverse-setup)

3.07 CCTV MONITOR DISPLAY

A. The images displayed on the CCTV monitors will be a view of the pipe above the water surface as seen by the CCTV camera as the unit is conveyed through the sewer.

B. The camera lighting shall be fixed in intensity prior to commencing the survey and the white balance set to the color temperature emitted. In order to ensure color constancy, no variation in illumination shall take place during the survey.

C. The video equipment shall be checked using an approved test card with a color bar prior to commencing each day's survey. The camera shall be positioned centrally and parallel to the test card at a distance where the full test card just fills the monitor screen. The card shall be illuminated evenly and uniformly without any reflection.

3.08 DATA DISPLAYS

A. The CCTV images shall include an initial data display that identifies the sewer reach being surveyed and a survey status display that provides continuously updated information on the location of the survey unit as the survey is being performed. These data displays shall be in alphanumeric form. The size and position of the data shall not interfere with the main subject of the monitor picture.

B. The on-screen display should be white during inspections where the background behind the display is dark and, conversely, black where the background is light.

C. At the beginning of each reach of sewer being inspected, the following information shall be electronically generated and displayed on the CCTV monitors as well as included in the audio track:
    1. Date of survey
    2. Inspection company name and inspector
    3. Street name or location
    4. Manhole number to manhole number (in order of inspection)
    5. Direction of survey (upstream or downstream)
    6. Time of start of survey

D. During inspections, the following information shall be electronically generated, automatically updated, and displayed on the CCTV monitors:
    1. Survey unit location in the sewer line in feet and tenths of feet from adjusted zero
    2. Sewer diameter
    3. Upstream and downstream manholes reference numbers as per approved drawings

3.09 NOTIFICATIONS

A. Consultant/Contractor shall promptly notify the City whenever they encounter any one of the following conditions: Potentially illicit connections draining into the sanitary sewer system or cross connections between the sanitary and storm drain systems. Potentially hazardous materials (liquid or solid). Pipe collapse or blockage requiring immediate attention. Locations of system surcharging. Locations of sulfide odor or other hazardous atmospheric conditions. Any defects posing imminent danger to the public (missing lids, covers broken during inspection, sink holes, etc.).

B. Notify all residents within work areas at least one (1) week in advance of cleaning and CCTV inspection activity, in the form of letters or door hangers. Identify locations where access into private property is required and provide a list of these addresses to the City prior to accessing the properties.

3.10 MANHOLE NUMBERING AND DEFECT CODES

A. The Contractor will be required to use the manhole numbering as shown on the contract drawings.

B. The defect codes, inspection forms, inspection database and inspection protocols shall be in accordance with the National Association of Sewer Service Companies (NASSCO) Pipeline Assessment and Certification Program (PACP).

*****END OF SECTION*****

SECTION 02770
SANITARY SEWER TESTING

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:

1. Testing of sanitary sewer systems.

B. Related Sections:

1. Section 02700 – Polyvinyl Chloride (PVC) Pipe and Fittings
2. Section 02720 – HDPE Pipe
3. Section 02760 – Closed Circuit Television (CCTV) Inspection
4. Section 02900 – Cured in Place Pipe (CIPP)
5. Section 03300 – Cast in Place Concrete
6. Section 03400 – Precast Concrete

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):

1. C 969 – Standard Practice for Infiltration and Exfiltration Acceptance Testing of Installed Precast Concrete Pipe Sewer Lines
2. C 1091-03a – Test Method for Hydrostatic Infiltration Testing of Vitrified Clay Pipe Lines
3. F 1417 – Standard Practice for Installation Acceptance of Plastic Non-pressure Sewer Lines Using Low-Pressure Air
4. D 3034 – Specification for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings
5. F 1667 – Guide for Construction Procedures for Buried Plastic Pipe

B. Uni-Bell PVC Pipe Association

1. B-6 – Recommended Practice for low Pressure Air Testing of Installed Sewer Pipe

PART 2 PRODUCTS

2.01 GENERAL

A. Temporary plugs, bypass pumping, low-pressure testing equipment and all other necessary materials shall be provided by the Contractor, subject to the City's approval. All testing shall be performed by the Contractor in the presence of the City's representative. No materials shall be used

which would be injurious to the public, personnel, adjacent improvements or the pipeline.

2.02 PRESSURE GAUGES

A. Pressure gauges shall be laboratory-calibrated test gauges and shall be recalibrated by a certified laboratory prior to the leakage test. Gauge shall be easy to read in no more than one (1) pound per square inch (psi) increments and have a maximum full-scale range of five (5) psi.

PART 3 EXECUTION

3.01 LEAKAGE TESTING

A. Pipe leakage testing is required for all newly constructed sewers where the entire manhole to manhole pipe section is being replaced (open trench and pipe bursting methods) or lined/rehabilitated with Cured in Place Pipe (CIPP).

B. Pipe leakage testing shall be performed after the pipe has been installed and prior to replacing / reinstating laterals.

C. Testing shall be performed in the presence and under the direction of the City or its appointed Representative, prior to re-connecting laterals.

D. All plugs shall be adequately braced and restrained to support the full load developed. No workers shall be allowed in the excavation or manhole while the line is under pressure. The Contractor shall make provisions for reading the pressure at the ground surface and for safely releasing the air pressure without entering the manhole or excavation.

E. If any leaks are found, the air pressure shall be released, the leaks eliminated, and the test procedure re-started.

F. The following procedure shall be used for air testing:

1. Plug all pipe outlets with suitable test plugs. Brace each plug securely.
2. If the pipe to be tested is submerged in groundwater, insert a pipe probe by boring or jetting into the backfill material adjacent to the center of the pipe, and determine the pressure in the probe when air passes slowly through it. This is the backpressure due to groundwater submergence over the end of the probe. All gauge pressures in the test shall be increased by this amount.
3. Add air slowly to the portion of the pipe being tested until the internal pressure is raised to 4.0 psig.
4. After an internal pressure of 4.0 psig is obtained, allow at least two (2) minutes for air temperature to stabilize, adding only the amount

of air required to maintain pressure. After two (2) minute period, disconnect the air supply.

5. Check exposed pipe and plugs for abnormal leakage by coating with a soap solution. If any leakage is observed, bleed off air and make necessary repairs.
6. Begin the test period. In no case shall the air pressure within the line be less than four (4) pounds per square inch at the beginning of the test period.
7. Main Sewers:
   a. If the pressure drop during the required test period equal to or less than 1 psi (6.9 kPa), the line has passed. If the pressure drop is greater than 1 psi (6.9 kPa) during the test time, the line has failed the test.
   b. The required test time shall be based on the diameter and length of pipe to be tested and in accordance with the following, or 10 minutes, whichever is greater:

Minimum Test Time for Various Sewer Main Pipe Sizes	
Nominal Pipe Size (inches)	Test Time (min/100 ft.)
6	0.7
8	1.2
10	1.5
12	1.8

   c. At the City's option, one half of the test time specified above may be used with a maximum pressure drop of 0.5 psi (3.45kPa), but in no case will a test time of less than 10 minutes be allowed.

G. **TEST REPORT:** Contractor shall prepare and submit a report detailing all pipes tested. The report shall include the pipe location, pipe size, upstream and downstream manhole ID, testing date, testing pressure, pressure drop, test time, and test date. The report shall be submitted to the City within one week of performing the test. The City will review the report and if acceptable the City will sign the report for acceptance of the test.

3.02 ALLOWABLE PIPELINE SAG

A. For new piping installed by open trench method, if it is determined that a sag is present during the post-installation CCTV inspection and the sag

depth is equal to or greater than ten (10) percent of the new pipe inside diameter, the contractor shall repair the sag at no additional cost to the City.

B. The Contractor shall re-perform testing as specified herein and post-installation CCTV inspection after the pipeline sag has been repaired. All costs associated with re-testing and re-inspection of the pipeline shall be borne by the Contractor.

3.03 MANHOLE TESTING

A. See Section 09900 for manhole rehabilitation testing requirements.

B. All new concrete manholes shall be vacuum tested by the Contractor for leakage after installation and prior to backfilling. Testing shall be performed in the presence and under the direction of the City or its appointed Representative. Recently rehabilitated manholes do not need to be vacuum tested but should be inspected by the City during and after installation.

C. Prior to vacuum testing, all manholes shall be visually inspected. All defects shall be repaired by the Contractor, with grout, to the satisfaction of the City or the City's Representative.

D. All pipes entering the manhole shall be sealed at a point outside the manhole walls so as to include testing of the pipe/manhole joints.

E. A vacuum of ten (10) inches of mercury shall be drawn on the manhole, the valve on the vacuum line of the test hood closed and the vacuum pump shut off. The manhole shall be deemed to have passed the test if the vacuum drop is less than one (1) inch of mercury during the required test period. The minimum duration of the test period shall be based on the inside diameter of the manhole and shall conform to the following table:

Vacuum Test Time for Manholes	
Manhole Inside Diameter (inches)	**Test Time (seconds)**
48	60
60	75
72	90

F. If the manhole does not pass the vacuum testing, then the Contractor shall either replace the manhole or make the necessary repairs and re-test at no additional Cost to the City.

G. **TEST REPORT:** Contractor shall prepare and submit a report detailing all manholes tested. The report shall include the manhole location, manhole ID, testing date, testing pressure, pressure drop, test time, and test date. The report shall be submitted to the City within one week of performing the test. The City will review the report and if acceptable the City will sign the report for acceptance of the test.

3.04 CCTV VIDEO INSPECTION

A. Contractor shall visually inspect the alignment and properties with CCTV prior to construction.

B. All new and rehabilitated sewer mains shall be visually inspected using CCTV video inspection in accordance with specification Section 02760.

END OF SECTION

SECTION 02772
CONCRETE CURBS, GUTTERS, AND SIDEWALKS

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Concrete curbs, gutters, sidewalks, driveways and access ramps to replace those demolished or damaged during construction.

B. Related Sections:

1. Section 02990 - Pavement Restoration and Rehabilitation.
2. Section 03300 – Cast-in-Place Concrete.

C. Concrete work to replace structures demolished as necessary to accomplish the Work as described in the Plans and Specifications shall be paid for in the item of work that necessitates the demolition. Replacing existing concrete work intentionally or unintentionally damaged during the course of construction operations, which is not shown as needing to be demolished on the Plans, shall be the responsibility of the Contractor and no additional compensation will be made thereto.

1.02 SYSTEM DESCRIPTION

A. Performance Requirements: Construct various types of concrete curb, gutter, sidewalk, driveways, and ramps to dimensions and details indicated on the Drawings or to replace the damaged facility in kind, as directed by the Engineer.

1.03 SUBMITTALS

A. Product Data: Submit data completely describing products.

B. Samples: Submit samples when requested.

1.04 SEQUENCING AND SCHEDULING

A. Schedule placing of concrete in such manner as to complete any single placing operation to construction, contraction, or expansion joint.

PART 2 PRODUCTS

2.01 MATERIALS

A. Concrete: Shall conform to the applicable requirements of Section 03300.

B. Curb Finishing Mortar: 1 part portland cement to 2 parts sand.

C. Form Release Material: Light oil or other releasing agent of concrete type that does not discolor concrete or interfere with the application of finishing mortar to curb tops and faces.

D. Joint Materials:

1. Expansion: Comply with requirements as specified in Section 03300.
2. Construction: Steel dividers or plastic inserts.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verification of Conditions:

1. Verify field conditions, including subgrade condition and interferences, before beginning construction.

3.02 PREPARATION

A. Removal of Existing Concrete

1. All damaged concrete shall be removed and replaced by the Contractor at the Contractor's expense.
2. All concrete curbs, gutters, and sidewalks to be removed shall be removed and replaced to the nearest existing cold joint.

B. Surface Preparation:

1. Subgrade:
   a. Construct and compact true to grades and lines indicated on the Drawings and requirements as specified in this section.
   b. Remove soft or unsuitable material to depth of not less than 6 inches below subgrade elevation and replace with satisfactory material.
2. Forms and Subgrade: Water immediately in advance of placing concrete.

3.03 PROJECT CONDITIONS

A. Environmental Requirements:

1. Hot Weather Concreting:
   a. When Ambient Air Temperature Is above 90 Degrees Fahrenheit: Prior to placing concrete, cool forms and reinforcing steel to by water cooling to below 90 degrees Fahrenheit.

b. Temperature of Concrete Mix at Time of Placement: Keep temperature below 90 degrees Fahrenheit by methods which do not impair quality of concrete.

2. Cold Weather Concreting:
   a. Concrete placed below ambient air temperature of 45 degrees Fahrenheit and falling or below 40 degrees Fahrenheit: Make provision for heating water.
   b. If materials have been exposed to freezing temperatures to degree that any material is below 35 degrees Fahrenheit: Heat such materials.
   c. Heating Water, Cement, or Aggregate Materials:
      1) Do not heat in excess of 160 degrees Fahrenheit.
   d. Protection of Concrete in Forms:
      1) Protect by means of covering with tarpaulins, or other acceptable covering.
      2) Provide means for circulating warm moist air around forms in manner to maintain temperature of 50 degrees Fahrenheit for at least 5 days.

B. For conditions that promote rapid drying of freshly placed concrete such as low humidity, high temperature, and wind: Take corrective measures to minimize rapid water loss from concrete.

1. Furnish and use sufficient number of maximum and minimum self-recording thermometers to adequately measure temperature around concrete.

3.04 INSTALLATION

A. Special Techniques:

1. Contractor's Option:
   a. Construct concrete curbs and gutters by conventional use of forms, or by means of curb and gutter machine when acceptable to the Engineer.
   b. When use of machines designed specifically for work of this Section are accepted by the Engineer, results must be equal to or better than those produced by use of forms.
   c. Applicable requirements of construction that apply to use of forms also apply to use of machines.
   d. Discontinue use of machines when results are not satisfactory to the Engineer.

B. Forms:

1. Carefully set to line and grade and securely stake in position forms conforming to dimensions of items to be constructed.
2. Thoroughly clean prior to each use and coat with form releasing material.

C. Expansion and Contraction Joints:

1. Expansion Joints:
    a. Construct vertically, and at right angles to centerline of street and match joints in adjacent pavement or sidewalks.
    b. Constructed at radius points, driveways, alley entrances, and at adjoining structures.
    c. Fill joints with expansion joint filler material.
2. Contraction Joints:
    a. Constructed not more than 15 feet apart.
    b. Make joints of construction joint material, scoring or saw cutting to depth of not less than 1-1/2 inches and matching joints in adjacent pavement or sidewalk.

D. Concrete:

1. Placing:
    a. Thoroughly spade concrete away from forms so that no rock pockets exist next to forms and so that no coarse aggregate will show when forms are removed.
2. Compacting:
    a. Compact by mechanical vibrators accepted by the Engineer.
    b. Continue tamping or vibrating until mortar flushes to surface and coarse aggregate is below concrete surface.
3. Form Removal:
    a. Front Form Faces: Do not remove before concrete has taken initial set and has sufficient strength to carry its own weight.
    b. Gutter and Rear Forms: Do not remove until concrete has hardened sufficiently to prevent damage to edges. Take special care to prevent damage.
4. Finishing and Curing:
    a. As soon as curb face forms are stripped, apply finishing mortar to the top and face of curb and trowel to a smooth, even finish. Finish with fine haired broom in direction of work.
    b. Where curb is installed without integral gutter, extend finish 2 inches below grade.
    c. Edge concrete at expansion joints to 1/4-inch radius.
    d. Flow lines of gutters shall be troweled smooth 4 inches out from curb face for integral curb and gutter and 4 inches on both sides of flowline 4 gutters without curbs.

E. Backfilling:

1. Unless otherwise specified, backfill behind curbs, gutters, or sidewalks with soil native to area and to lines and grades indicated on the Drawings.

3.05 FIELD QUALITY CONTROL

A. Tests:

1. Curbs and Gutters:
   a. Test face, top, back, and flow line with 10-foot straightedge or curve template longitudinally along surface.
   b. Correct deviations in excess of 1/4 inch.
2. Gutters:
   a. Frequency of Testing: When required by the Engineer, where gutters have slope of 0.8 foot per hundred feet or less, or where unusual or special conditions cast doubt on capability of gutters to drain.
   b. Test Method: Establish flow in length of gutter to be tested by supplying water from hydrant, tank truck, or other source.
   c. Required Results:
      1) 1 hour after supply of water is shut off, inspect gutter for evidence of ponding or improper shape.
      2) In event water is found ponded in gutter to depth greater than ½-inch, or on adjacent asphalt pavement, correct defect or defects in manner acceptable to the Engineer without additional cost to the Contract.

3.06 ADJUSTING

A. Repair portions of concrete damaged while stripping forms or, when damage is severe, replace such work at no additional cost to the Contract. Evidence of repairs shall not be noticeable in the finished product.

B. Remove and replace sections of work deficient in depth or not conforming to requirements indicated on the Drawings and specified in the Specifications at no additional cost to the Contract. Removal and replacement shall be the complete section between two joints.

END OF SECTION

SECTION 02900
CURED-IN-PLACE PIPE (CIPP)

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Cured in Place Pipe (CIPP)

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):

1. D 543 – Standard Practices for Evaluating the Resistance of Plastics to Chemical Reagents.
2. D 638 – Standard Test Method for Tensile Properties of Plastics.
3. D 790 - Test Methods for Flexural Properties of Un-reinforced and Reinforced Plastics and Electrical Insulating Materials.
4. D 2990 - Tensile, Compressive, and Flexural Creep and Creep-Rupture of Plastics.
5. D 5813 - Cured-in-Place Thermosetting Resin Sewer Pipe.
6. F 1216 - Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of a Resin-Impregnated Tube.
7. F 1743 - Rehabilitation of Existing Pipelines and Conduits by Pulled-in-Place Installation of Cured-in-Place Thermosetting Resin Pipe (CIPP).
8. F 2019 – Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Pulled-in-Place Installation of Glass Reinforced Plastic (GRP) Cured-in-Place Thermosetting Resin Pipe (CIPP)
9. F2599 – Standard Practice for the Section Repair of Damaged Pipe by Means of an Inverted Cured-in-Place Liner.

1.03 SUBMITTALS

A. CIPP Contractor Qualifications shall be submitted and shall meet the requirements in Section 1.04 below.

B. Product Data:

1. Material data.
2. CIPP design calculations and assumptions.

C. Quality Control Submittals:

1. Manufacturer's Instructions: Submit instructions for materials specified in this Section that are specified to be installed with such instructions.
2. Pre-construction inspection video see Section 02760 for inspection requirements.

3. A letter identifying any conditions that may prevent proper installation of CIPP.
4. Post construction inspection video see Section 02760 for inspection requirements.

1.04 QUALITY ASSURANCE

A. All cured-in-place pipe (CIPP) products and installers shall meet the following minimum qualification requirements.

1. The contractor/subcontractor performing all CIPP work must have completed at least five (5) projects containing a total of 10,000 linear feet of 6-inch or larger CIPP in wastewater or storm collection systems in the US within the past five (5) years. The curing method used on the submitted experience shall match the curing method identified in these specifications to be considered qualifying experience.
2. Contractor shall submit the following minimum information along with the required product submittals for at least five (5) projects performed by the contractor/subcontractor performing all CIPP work, to meet the requirements herein.
   a. Project Name:
   b. Project Owner, Contact Person, Address, and Phone Number
   c. Project Location, Date Completed, Pipe Size(s) (inches)
   d. Quantity(ies) of Qualifying CIPP Installed (lineal feet)
   e. CIPP Manufacturer and Product Name:
   f. Method of Curing Used:
3. The contractor/subcontractor performing all CIPP work shall not have had his license suspended at any time or for any reason within the State of California within the last five years. Any evidence of suspension will render the bid nonresponsive.

B. The CIPP tube material for all submitted experience must be a non-woven felt fabric meeting the requirements of ASTM F1216 or ASTM 1743, must have been impregnated (wet out) with resin, and must have been cured with steam pressure.

C. Sewer rehabilitation products submitted for approval must provide third party test results supporting the structural performance (short-term and long-term) of the product and such data shall be satisfactory to the Owner. Test samples shall be prepared so as to simulate installation methods and trauma of the product. No product will be approved without independent third-party testing verification.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Tube:

1. Consist of one or more layers of absorbent non-woven felt fabric and meet the requirements of ASTM F1216, Section 5.1 or ASTM F1743, Section 5.2.1
2. Constructed to withstand installation pressures, have sufficient strength to bridge missing pipe, and stretch to fit irregular pipe sections.
3. The wet-out Tube shall have a relatively uniform thickness that when compressed at installation pressures will equal or exceed the calculated minimum design thickness.
4. The Tube shall be manufactured to a size that when installed will tightly fit the internal circumference and length of the original pipe. Allowance should be made for circumferential stretching during inversion. Overlapped layers of felt in longitudinal seams that cause lumps in the final product shall not be utilized.
5. The outside layer of the Tube shall be coated with an impermeable, flexible membrane that will contain the resin and all the resin impregnation (wet out) procedure to be monitored.
6. The Tube shall be homogeneous across the entire wall thickness containing no intermediate or encapsulated elastomeric layers. No material shall be included in the Tube that may cause de-lamination in the cured CIPP. No dry or unsaturated layers shall be evident.
7. The wall color of the interior pipe surface of CIPP after installation shall be a relatively light reflective color so that a clear detailed examination with closed circuit television inspection equipment may be made.
8. Seams in the Tube shall be stronger than the non-seamed felt material.
9. The Tube shall be marked for distance at regular intervals along its entire length, not to exceed 5 ft. Such markings shall include the Manufacturers name or identifying symbol. The tubes must be manufactured in the USA.

B. Resin: The resin system shall be a corrosion resistant polyester, vinyl ester, or epoxy system including all required catalysts, initiators or hardeners that when cured within the tube create a composite that satisfies the requirements of ASTM F1216 and ASTM F1743, the physical properties herein, and those which are to be utilized in the design of the CIPP for this project. The resin shall produce a CIPP that will comply with the structural and chemical resistance requirements of this specification.

2.02 CIPP DESIGN

A. The CIPP shall be designed as per ASTM F1216, Appendix X.1. The CIPP design shall assume no bonding to the original pipe wall.

B. The Contractor must have performed long-term testing for flexural creep of the CIPP pipe material installed by his Company. Such testing results are to be used to determine the long-term, time dependent flexural modulus to be utilized in the product design. This is a performance test of the materials (Tube and Resin) and

general workmanship of the installation and curing. A percentage of the instantaneous flexural modulus value (as measured by ASTM D790 testing) will be used in design calculations for external buckling. The percentage, or the long- term creep retention value utilized, will be verified by this testing. Retention values exceeding 50% of the short-term test results shall not be applied unless substantiated by qualified third-party test data to the Owner's satisfaction. The materials utilized for the contracted project shall be of a quality equal to or better than the materials used in the long-term test with respect to the initial flexural modulus used in the CIPP design.

C. The Enhancement Factor 'K' to be used in 'Partially Deteriorated' Design conditions shall be assigned a value of 7. Application of Enhancement (K) Factors in excess of 7 shall be substantiated through independent test data to the satisfaction of the Owner.

D. The layers of the cured CIPP shall be uniformly bonded. It shall not be possible to separate any two layers with a probe or point of a knife blade so that the layers separate cleanly or the probe or knife blade moves freely between the layers. If the layers separate during field sample testing, new samples will be required to be obtained from the installed pipe. Any reoccurrence may cause rejection of the work.

E. The CIPP lining system shall have a minimum design service life of fifty (50) years.

F. The cured pipe material (CIPP) shall conform to the following structural properties:

MINIMUM CIPP PHYSICAL PROPERTIES		
Property	**Test Method**	**Cured Polyester Composite Minimum Value**
Wall Thickness	ASTM D2122	As Calculated by Contractor
Modulus of Elasticity (short-term)	ASTM D790	300,000 psi
Modulus of Elasticity (long-term)	ASTM D790	150,000 psi
Flexural Stress	ASTM D790	4,500 psi

G. The required structural CIPP wall thickness shall be based as a minimum, on the physical properties in Section 5. Design Considerations of ASTM F1216, and the following design parameters:

Parameter	Criteria
Design Safety Factor	2
Retention Factor for Long-Term Flexural Modulus to be used in Design (as determined by long-term tests described in section 1.05,C,2 and approved by the owner)	50% Max
Ovality	5%
Groundwater Level	At Ground Level, See Plans
Soil Depth	Maximum rim to invert distance as indicated on the plans (use maximum depth of connecting manholes if additional data is not provided)
Soil Modulus	1,000 psi
Soil Density	130 pcf
Live Load	H20
Design Condition	Fully Deteriorated

2.03 CIPP END SEALER

A. The Contractor shall seal the end of all CIPP liners cut during construction with an epoxy-based sealant. Sealant shall meet the following requirements:
    1. Flexural Modulus – 82,000 psi
    2. Tensile Modulus – 76,000 psi
    3. Maximum Strength – 2,000 psi
    4. Manufacture:
        a. NeoPoxy
            1) NPR-3200 Series
        b. Approved Equal

2.04 TESTING

A. Chemical Resistance - The CIPP shall meet the chemical resistance requirements of ASTM F1216, Appendix X2. CIPP samples for testing shall be of tube and resin systems similar to that proposed for actual construction. It is required that CIPP samples with and without plastic coating meet these chemical-testing requirements.

B. Hydraulic Capacity - Overall, the hydraulic cross-section shall be maintained as large as possible. The CIPP shall have a minimum of the full flow capacity of the original pipe before rehabilitation. Calculated capacities may be derived using a

commonly accepted roughness coefficient for the existing pipe material taking into consideration its age and condition.

C. CIPP Field Samples - When requested by the Owner, the Contractor shall submit test results from field installations in the USA of the same resin system and tube materials as proposed for the actual installation. These test results must verify that the CIPP physical properties specified in Section 1.04-C-5 have been achieved in previous field applications. Samples for this project shall be made and tested as described in Section 2.03-A.

2.05 WARRANTY

A. The materials used for the project shall be certified by the manufacturer for the specified purpose. The manufacturer shall warrant the liner to be free from defects in raw materials for one (1) year from the date of installation and acceptance by the City. The Contractor shall warrant the liner installation for a period of one (1) year. During the Contractor warranty period any defect, which may materially affect the integrity, strength, function, and/or operation of the pipe, shall be repaired at the Contractor's expense.

B. After a pipe section has been lined and for a period of time up to one (1) year following completion of the project, the City may inspect all or portions of the lined system. If it is found that any of the CIPP has/have developed abnormalities since the completion of the project, the abnormalities shall be repaired and/or replaced. All verified defects shall be repaired and/or replaced by the Contractor and shall be performed in accordance with the original specifications, all at no additional cost to the City. Due to capacity constraints of the existing sewer line, repairs may require pipeline replacement with conventional cut and cover methods

PART 3 - EXECUTION

3.01 PREPARATION OF WORK SITE

A. Contractor shall remove all internal debris and roots out of the existing pipes that will interfere with the installation of CIPP. The Contractor shall also provide for the legal disposal of all debris and roots removed from the culvert during the cleaning operation.

B. Contractor is responsible for confirming the inside diameter and lengths of the existing pipes to be rehabilitated with CIPP. The pipe sizes and lengths provided on the Plans are for informational and bidding purposes only. The Contractor shall measure pipe size and length prior to CIPP design and manufacturing.

C. Contractor is responsible for confirming the locations of all lateral service connections prior to installing the CIPP. The contractor shall verify the existing

lateral locations and is responsible for reactivating the full diameter of each lateral connection and manhole opening. The Contractor shall reinstate the lateral by reopening the lateral from inside the sewer by means of a CCTV camera-controlled cutting device appropriate for CIPP. All openings shall be clean and neatly cut flush with the lateral pipe. The bottom of the opening shall be flush with the bottom of the lateral pipe. Additional requirements for sewer and service disruptions are included in Section 01354-3.02.

D. The Contractor shall provide bypass pumping to maintain existing sewer flows. The Contractor shall prepare and submit a detailed plan for maintaining sewer service as specified in Section 01354-3.02.

E. The Contractor shall perform a pre-construction video inspection of the existing sewer. The inspection shall be performed by experienced personnel trained in locating breaks and obstacles using close circuit television (CCTV). The Contractor shall submit a copy of the pre-construction inspection video to the City and shall identify any conditions that may prevent proper installation of CIPP and propose corrective actions to the City in writing.

F. The Contractor shall measure and record defects within the existing sewer. Notes have been added to the project drawings providing approximate locations. Measurements shall be completed using closed circuit television. The Contractor shall note the clock position of defect.

G. The Contractor shall perform a post-construction video inspection of the pipes lined with CIPP. The Contractor shall submit a copy of the post-construction inspection video to the City within 30 days of installation and prior to final payment.

H. Contractor shall clear the line of obstructions such as solids, roots, and protruding laterals that will prevent the insertion of CIPP. The plans indicate locations that need to be spot repaired prior to insertion of CIPP. If pre- installation inspection reveals obstruction that will prevent the CIPP installation process, that was not evident on the construction documents and it cannot be removed by conventional sewer cleaning equipment, then the Contractor shall make a point repair excavation to uncover and remove or repair the obstruction. Such excavation shall be approved in writing by the Owner's representative prior to the commencement of the work and shall be considered as a separate pay item.

I. See Section 02531-3.03 for lateral abandonment requirements.

J. Contractor shall coordinate with the City’s Public Outreach team to develop CIPP specific door hangers. CIPP specific door hangers shall be distributed to all residents and businesses directly connected to the sewer lines being rehabilitated with CIPP. Contractor shall hang the door hangers on residents and businesses door 3 days prior to performing the CIPP work. If the date of the

proposed work changes after the door hangers are distributed the Contractor shall re-distribute new door hangers with updated information a minimum of 3 days prior to the proposed CIPP work. Door hanger shall include the following minimum information:

1. Contractor's contact information.
2. Date and time of proposed CIPP installation and curing process.
3. CIPP product data and information regarding the potential odors.
4. Means for mitigating odors within businesses and homes such as running water into all drains and sinks.
5. Information regarding temporary sewer service interruption.

3.02 INSTALLATION

A. CIPP installation shall be in accordance with ASTM F1216, Section 7, or ASTM F1743, Section 6, with the following modifications:

1. Resin Impregnation - The quantity of resin used for tube impregnation shall be sufficient to fill the volume of air voids in the tube with additional allowances for polymerization shrinkage and the loss of resin during installation through cracks and irregularities in the original pipe wall. If a vacuum impregnation process is used, the point of vacuum shall be no further than 25-feet from the point of initial resin introduction. After vacuum in the tube is established, a vacuum point shall be no further than 75-feet from the leading edge of the resin. The leading edge of the resin slug shall be as near to perpendicular to the longitudinal axis of the tube as possible. A roller system shall be used to uniformly distribute the resin throughout the tube. If the Installer uses an alternate method of resin impregnation, the method must produce the equivalent results. Any alternate resin impregnation method must be documented to the Owner's satisfaction that the saturation of the CIPP is sufficient.
2. Tube Insertion – The wet-out tube shall be positioned in the pipeline using either inversion or a pull-in method. If pulled into place, a power winch should be utilized, and care should be exercised not to damage the tube as a result of pull-in friction. The tube should be pulled-in or inverted through an existing manhole or approved access point and fully extend to the next designated manhole or termination point.
3. Temperature gauges shall be placed between the tube and the host pipe's invert position to monitor the temperatures during the cure cycle.
4. Curing shall be accomplished utilizing steam pressure only.
5. Steam pressure curing shall be in accordance with the manufacturer's recommended cure schedule.
6. Excess water shall not be discharged into the sewer system.
7. Sewer lateral connections shall be reactivated within the same working day as the line is rehabilitated. Overnight service disruptions are not allowed.

3.03 PROTECTION

A. Contractor shall follow and meet the Guideline for the Safe Use and Handling of Styrene Based Resins in Cured-In-Place Pipe (CIPP), NASSCO, December 2017 Edition. The guideline is available on the following link: https://www.nassco.org/sites/default/files/Styrene%20Guideline%2004Jan2018-2018Logo.pdf

B. All worker shall have proper personal protective equipment (PPE).

C. No worker shall enter a manhole during the steam curing operation.

D. The steam exhaust shall be located a minimum of 8 feet above the manhole rim and shall be directed away from sensitive areas.

E. A perimeter should be maintained around the job site to prevent public from entering the site and areas surrounding the connecting manholes.

F. **Contractor shall attempt to create a vapor barrier on all laterals connecting to the pipe being rehabilitated with CIPP.** The vapor barrier shall be installed prior to proceeding with the CIPP curing process. The vapor barrier may include:

1. Plug within the lateral where cleanouts are accessible
2. Run a small amount of water down the lateral after CIPP installation and prior to the curing process.
3. Other approved means for creating a vapor barrier.

3.04 INSPECTION

A. When requested by the City, the Contractor shall prepare CIPP samples and submit them to the City for testing. Testing will be coordinating and paid for by the City. The physical properties will be tested in accordance with ASTM F1216 or ASTM F1743, Section 8, using either method proposed. The flexural properties must meet or exceed the values listed in Table 1 of the applicable ASTM. The Contractor will be responsible for replacing all pipe segments that do not meet the specified values.

B. Wall thickness of samples shall be determined as described in paragraph 8.1.6 of ASTM F1743. The minimum wall thickness at any point shall not be less than 87½% of the minimum design wall thickness as calculated in paragraph 5.6 of this document.

C. Visual inspection of the CIPP shall be in accordance with ASTM F1743, Section 8.6.

D. The Contractor shall perform a post-construction video inspection of all lines rehabilitated with CIPP. The CCTV inspection shall adhere to the requirements in Section 02760.

E. Testing of CIPP shall be completed per Section 02770.

END OF SECTION

SECTION 02990
PAVEMENT RESTORATION AND REHABILITATION

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:

1. Resurfacing roads and paved surfaces in which surface is removed or damaged by installation of new work.

B. Related Sections:

1. Section 02750 – Pavement Markings
2. Section 02772 – Concrete Curbs, Gutters, and Sidewalks.
3. Section 03300 – Cast-in-Place Concrete.

C. Restoration work to replace or rehabilitate pavement demolished as necessary to accomplish the Work as described in the Plans and Specifications shall be paid for in the item of work that necessitates the demolition. Replacing existing pavements intentionally or unintentionally damaged during the course of construction operations, which is not shown as needing to be demolished on the Plans, shall be the responsibility of the Contractor and no additional compensation will be made thereto.

1.02 SYSTEM DESCRIPTION

A. Performance Requirements:

1. Limiting Dimensions:
   a. Determine the exact lengths and dimensions of such roads, pavements, parking areas, and walks that will require removal and replacement for restoration.
   b. Join existing surfaces to terminals of new surfacing in smooth juncture.

1.03 SUBMITTALS

A. Mix Designs:

1. Prior to placement of asphalt concrete, submit full details, including design and calculations for the asphalt concrete mix proposed.
2. Submit gradation of aggregate base.
3. Submit proposed mix design of Portland cement concrete.

PART 2 PRODUCTS

2.01 AGGREGATE BASE COURSE

A. Aggregate base course shall meet the requirements of specification Section 02722 Aggregate Base Course.

2.02 ASPHALT PAVEMENT MATERIALS

A. Asphalts:

1. Asphalt Binder: Steam-refined paving asphalt, Performance Grade 64-10, conforming to Section 92-1.02 “Grades” of the Caltrans Standard Specifications.
2. Prime Coat and Tack Coat: Grade SC-70, conforming to Section 93-1.01 of the Caltrans Standard Specifications.
3. Fog Seal: New asphalt surfaces shall be fog sealed with SS-1 conforming to Caltrans Standard Specifications Section 37.

B. Asphalt Aggregate:

1. Aggregate for asphalt concrete shall conform to Section 39 of the Caltrans Standard Specifications for Type A, 3/4-inch and 1/2-inch maximum grading as shown on the Plans.

C. Asphalt pavement shall be produced in a batch mixing plant, a continuous pugmill mixing plant, or drier-drum mixing plant.

1. Storage shall conform to section 39-3.01 and Section 39-3.05 of the Caltrans Standard Specifications.
2. Drying shall conform to Section 39-3.02 of the Caltrans Standard Specifications.
3. Proportioning shall conform to Section 39-3.03 of the Caltrans Standard Specifications.
4. Mixing shall conform to Section 39-3.04 of the Caltrans Standard Specifications.

2.03 PORTLAND CEMENT PAVEMENT

A. Conform to the requirements of Section 03300.

2.04 SOURCE QUALITY CONTROL

A. The Engineer will perform sampling and tests of materials in accordance with California Test Method Number 304 and California Test Method Number 362 or 379, as applicable. Samples will be taken from materials as delivered to the site.

2.05 EQUIPMENT

A. Roads, Pavements, Parking Areas, and Walks:

1. Equipment Requirements: Good condition, capable of performing work intended in satisfactory manner.

PART 3 EXECUTION

3.01 INSTALLATION

A. Aggregate Surface Removal Replacement:

1. When trench cut is in aggregate surfaced areas, replace aggregate base course material with material matching existing material compacted to 95 percent of its maximum density. Depth of aggregate base course shall match depth of existing aggregate base course or shall be a minimum of 6 inches, whichever is greater, unless otherwise indicated on the Drawings.

B. Pavement Removal and Temporary Asphalt Replacement:

1. Install temporary asphalt pavement or first course of permanent pavement replacement immediately following backfilling and compaction of trenches that have been cut through existing pavement.
2. Except as otherwise provided, maintain this temporary pavement in a safe and reasonably smooth condition until required permanent pavement is installed.
3. Remove and dispose of temporary paving from project site.
4. Where longitudinal trench is partly in pavement, replace pavement to original pavement edge, on a straight line, parallel to centerline of roadway.
5. Where no part of longitudinal trench is in pavement, surfacing replacement shall only be required where existing surfacing materials have been removed.

3.02 AGGREGATE BASE INSTALLATION

A. Furnish, spread, and compact aggregate base course material to the lines, grades, and dimensions indicated on the Plans.

1. Spreading: Spread in accordance with sections of Caltrans Standard Specifications.
2. Compacting: Compact in accordance with sections of Caltrans Standard Specifications to the relative compactions specified in relevant sections of these specifications.

3.03 ASPHALT PAVEMENT REPLACEMENT

1. Replace asphalt pavement to same thickness as adjacent pavement and match as nearly as possible adjacent pavement in texture.
2. Cut existing asphalt pavements to be removed for trenches or other underground construction by wheel cutter, clay spade, or other device capable of making neat, reasonably straight, and smooth cut without damaging adjacent pavement. Cutting device operation shall be subject to acceptance of Engineer.
3. Cut and trim existing pavement after placement of required aggregate base course and just prior to placement of asphalt concrete for pavement replacement, and paint trimmed edges with material for painting asphalt concrete pavement immediately prior to constructing new abutting asphalt pavements. No extra payment will be made for these items, and all costs incurred in performing this work shall be incidental to pipe laying or pavement replacement.
4. Conform replacement of asphalt pavement to contour of original pavement.

B. Portland Cement Concrete Pavement Replacement:

1. Where trenches lie within Portland cement concrete section of streets, alleys, sidewalks, and similar concrete construction, saw cut such concrete (to a depth of not less than 1-1/2 inches) to neat, vertical, true lines in such manner adjoining surfaces are not damaged.
2. Place Portland cement concrete replacement material to dimension as indicated on the Drawings.
3. Provide expansion joints that match existing.
4. Before placing replacement concrete, thoroughly clean edges of existing pavement and wash with neat cement and water.
5. Surface Finish: Wood float finish.

C. Pavement Matching

1. Trim existing asphalt pavements which are to be matched by pavement widening or pavement extension to neat true line with straight vertical edges free from irregularities with saw specifically designed for this purpose. Minimum allowable depth of cut shall be 1-1/2 inches.
2. Cut and trim existing pavement after placement of required aggregate base course and just prior to placement of asphalt concrete for pavement widening or extension, and paint trimmed edges with material for painting asphalt concrete pavement immediately prior to constructing new abutting asphalt concrete pavements. No extra payment will be made for these items and all costs incurred in performing this work shall be incidental to widening or pavement extension.

3.04 FIELD QUALITY CONTROL

A. Inspection:

1. Asphalt Concrete:
    a. Lay 10-foot straightedge parallel to centerline of trench when the trenches run parallel to street and across pavement replacement when trench crosses street at angle.
    b. Remove and correct any deviation in cut pavement replacement greater than 1/4 inch in 10 feet.
2. Portland Cement Concrete Replacement Pavement:
    a. Lay 10-foot straightedge either across pavement replacement or longitudinal with centerline of gutter or ditch.
    b. Remove and correct any deviation in cut pavement replacement greater than 1/4 inch in 10 feet.

END OF SECTION

SECTION 03102
CONCRETE FORMWORK

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Concrete formwork.

B. Related Sections:

1. Section 03300 - Cast-in-place Concrete.

1.02 REFERENCES

A. American Concrete Institute (ACI):

1. 117 - Standard Specifications for Tolerances for Concrete Construction and Materials.
2. 347 – Recommended Practice for Concrete Form Work.

1.03 SYSTEM DESCRIPTION

A. Design Requirements:

1. Design of concrete forms, falsework, and shoring in accordance with local, state, and federal regulations.
2. Design forms and ties to withstand concrete pressures without bulging, spreading, or lifting of forms.

B. Performance Requirements:

1. Construct forms so that finished concrete conforms to shapes, lines, grades, and dimensions indicated on the Plans.
2. It is intended that surface of concrete after stripping presents smooth, hard, and dense finish that requires minimum amount of finishing.
3. Provide sufficient number of forms so that the work may be performed rapidly and present uniform appearance in form patterns and finish.
4. Use forms that are clean and free from dirt, debris, concrete, and similar type items. Coat with acceptable form release oil if required, prior to use or reuse.

1.04 SUBMITTALS

A. Information on the Contractor's Proposed Forming System: Submit in such detail as the Engineer may require to assure himself that intent of the Specifications can be complied with by use of proposed system.

B. Alternate Combinations of Plywood Thickness and Stud Spacing: May be submitted.

1.05 QUALITY ASSURANCE

A. Qualifications of Formwork Manufacturers: Use only forming systems manufactured by manufacturers having minimum 5 years experience, except as otherwise specified, or accepted in writing by the Engineer.

B. Regulatory Requirements: Install work of this Section in accordance with local, state, and federal regulations.

1.06 PROJECT CONDITIONS

A. Requirements Due to Weather Condition: Do not remove forms from concrete which has been placed when outside ambient air temperature is below 50 degrees Fahrenheit until concrete has attained specified strength as determined by test cylinders stored in field under equivalent conditions as concrete structure.

PART 2 PRODUCTS

2.01 MATERIALS

A. Form Ties:

1. General:
    a. Provide form ties for forming system selected that are manufactured by recognized manufacturer of concrete forming equipment.
    b. Do not use wire ties or wood spreaders of any form.
    c. Provide ties of type that accurately tie, lock, and spread forms.
    d. Provide form ties of such design that when forms are removed, they locate no metal or other material within 1-1/2 inches of the surface of the concrete.
    e. Do not allow holes in forms for ties to allow leakage during placement of concrete.
2. Cone-snap or Flat Bar Form Ties:
    a. Cone-snap ties shall form a cone shaped depression in the concrete with a minimum diameter of 1 inch at the surface of the concrete and 1-1/2 inches deep.

b. Provide neoprene waterseal washer which is located near the center of the concrete.

3. Taper Ties:
   a. Neoprene Plugs for Taper Tie Holes: Size so that after they are driven, plugs are located in center third of wall thickeners.
   b. Drypack Mortar for Filling Taper Tie Holes:
      1) Consist of mix of 1 part of Portland cement to 1 part of plaster sand.
      2) Amount of water to be added to cement-sand mix is to be such that mortar can be driven into holes and be properly compacted.
      3) Admixtures or Additives: Are not to be used in dry-pack mortar.

B. Built-up Plywood Forms:

1. Built-up plywood forms may be substituted for prefabricated forming system subject to following minimum requirements:
   a. Size and Material:
      1) Full size 4 by 8 feet plywood sheets, except where smaller pieces are able to cover entire area.
      2) Sheet Construction: 5-ply plywood sheets, 3/4-inch nominal, made with 100 percent waterproof adhesive, and having finish surface that is coated or overlaid with surface which is impervious to water and alkaline calcium and sodium hydroxide of cement.
   b. Wales: Minimum 2 by 4-inch lumber.
   c. Studding and Wales: Contain no loose knots and be free of warps, cups, and bows.

C. Steel or Steel Framed Forms:

1. Steel Forms: Provide forms that are:
   a. Rigidly constructed and capable of being braced for minimum deflection of finish surface.
   b. Capable of providing finish surfaces that are flat without bows, cups, or dents.
2. Steel Framed Plywood Forms:
   a. Provide forms that are rigidly constructed and capable of being braced.
   b. Plywood Paneling: 5-ply, 5/8-inch nominal or 3/4-inch nominal, made with 100 percent waterproof adhesive, and having finish surface that is coated or overlaid with surface which is impervious to water and alkaline calcium and sodium hydroxide of cement.

D. Incidentals:

1. External Angles:
    a. Where not otherwise indicated on the Plans, provide with 3/4-inch bevel, formed by utilizing true dimensioned wood or solid plastic chamfer strip on walkways, slabs, walls, beams, columns, and openings.
    b. Provide 1/4-inch bevel formed by utilizing true dimensioned wood or solid plastic chamfer strip on walkways, walls, and slabs at expansion, contraction, and construction joints.
2. Keyways: Steel, plastic, or lumber treated with form coating, applied according to label directions.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verification of Conditions:

1. Do not place any concrete until all forms have been thoroughly checked for alignment, level, strength, and to assure accurate location of all mechanical and electrical inserts or other embedded items.

3.02 INSTALLATION

A. Forms and Accessories:

1. Vertical Forms:
    a. Remain in place minimum of 24 hours after concrete is placed.
    b. If, after 24 hours, concrete has sufficient strength and hardness to resist surface or other damage, forms may be removed.
2. Other Forms Supporting Concrete and Shoring: Remain in place as follows:
    a. Sides of Footings: 24 hours minimum.
    b. Vertical Sides of Beams, Girders, and Similar Members: 48 hours minimum.
    c. Slabs, Beams, and Girders: Until concrete strength reaches specified strength or until shoring is installed.
    d. Shoring for Slabs, Beams, and Girders: Shore until concrete strength reaches specified strength.
    e. Wall Bracing: Until concrete strength of beams and slabs laterally supporting wall reaches specified strength.
3. Green Concrete:
    a. No heavy loading on green concrete will be permitted.
    b. Green concrete is defined as concrete with less than 100 percent of specified strength.

4. Immediately after forms are removed, carefully examine concrete surfaces, and repair any irregularities in surfaces and finishes as specified in Section 03300.

B. Form Ties:

1. Cone-snap Rod and Bar Ties: Tie forms together at not more than 2-foot centers vertically and horizontally. After forms are removed from wall, fill tie holes as follows:
   a. Remove form ties from surfaces.
   b. Roughen cone shaped tie holes by heavy sandblasting before repair.
   c. Dry pack cone shaped tie holes with drypack mortar as specified in Section 03600.
2. Taper Ties:
   a. Neoprene Plug in Taper Tie Holes: After forms and taper ties are removed from wall, plug tie holes with neoprene plug as follows:
      1) Heavy sandblast and then clean tie holes.
      2) After cleaning, drive neoprene plug into each of taper tie holes with steel rod. Final location of neoprene plug shall be in center third of wall thickness. Bond neoprene plug to concrete with epoxy.
      3) Locate steel rod in cylindrical recess, made in plug, during driving.
         a) At no time are plugs to be driven on flat area outside cylindrical recess.
   b. Dry Pack of Taper Tie Holes: After Installing Plugs in Tie Holes:
      1) Coat tie hole surface with epoxy bonding agent and fill with drypack mortar as specified in Section 03600.
         a) Drypack Mortar: Place in holes in layers with thickness not exceeding tie hole diameter and heavily compact each layer.
         b) Dry pack the outside of the hole no sooner than 7 days after the inside of the hole has been dry packed.
         c) Wall surfaces in area of drypacked tie holes: On the water side of water containing structures and the outside of below grade walls:
            (1) Cover with minimum of 10 mils of epoxy gel.
            (2) Provide epoxy gel coating on wall surfaces that extend minimum of 2 inches past drypack mortar filled tie holes.
            (3) Provide finish surfaces that are free from sand streaks or other voids.

C. Built-up Plywood Forms:

1. Studding:

a. Spaced at 16 inches or 24 inches on center.
b. Closer spacing may be required depending upon strength requirements of the forms, in order to prevent any bulging surfaces on faces of finished concrete work.
c. Install studs perpendicular to grain of exterior plys of plywood sheets.

2. Wales: Form wales of double lumber material minimum size as specified in this Section.
3. Number of Form Reuses: Depends upon durability of surface coating or overlay used, and ability to maintain forms in condition such that they are capable of producing flat, smooth, hard, dense finish on concrete when stripped.

D. Steel or Steel Framed Forms:

1. Steel Forms:
   a. Adequately brace forms for minimum deflection of finish surface.
2. Steel Framed Plywood Forms:
   a. Rigidly construct and brace with joints fitting closely and smoothly.
   b. Number of Form Reuses: Depends upon durability of surface coating or overlay used.
3. Built-up Plywood Forms: As specified in this Section may be used in conjunction with steel forms or steel framed plywood forms for special forming conditions such as corbels and forming around items which will project through forms.

E. Bracing and Alignment of Forms:

1. Line and Grade: Limit deviations to tolerances which will permit proper installation of structural embedded items or mechanical and electrical equipment and piping.
2. Formwork:
   a. Securely brace, support, tie down, or otherwise hold in place to prevent any movement.
   b. Make adequate provisions for uplift pressure, lateral pressure on forms, and deflection of forms.
3. When Second Lift is Placed on Hardened Concrete: Take special precautions in form work at top of old lift and bottom of new lift to prevent:
   a. Spreading and vertical or horizontal displacement of forms.
   b. Grout "bleeding" on finish concrete surfaces.
4. Pipe Stubs, Anchor Bolts, and Other Embedded Items: Set in forms where required.
5. Cracks, Openings, or Offsets at Joints in Formwork: Close those that are 1/16 inch or larger by tightening forms or by filling with acceptable crack filler.

3.03 CONCRETE PLACEMENT

A. Form pressures not to exceed 1000 psf.

B. Keep concrete lifts less than 24 inches. Thoroughly vibrate concrete to achieve good consolidation, and eliminate entrapped air thereby minimizing voids. Internally vibrate through to previous lift to avoid lift lines. Avoid vibrator contact with the form liner.

3.04 INCIDENTALS

A. Keyways: Construct keyways as indicated on the Plans.

B. Reentrant Angles: May be left square.

C. Level Strips: Install level strips at top of wall concrete placements to maintain true line at horizontal construction joints.

D. Inserts:

1. Encase anchor bolts, steps, reglets, castings, and other inserts, as indicated on the Plans or as required, in concrete.

3.05 TOLERANCES

A. Finish concrete shall conform to shapes, lines, grades, and dimensions indicated on the Plans.

B. The maximum deviation from true line and grade shall not exceed tolerances listed below at time of acceptance of project.

1. General: Comply with ACI 117, paragraphs 2.0 through 2.2 and paragraphs 4.0 through 4.5, except as modified in following:
    a. Slabs:
        1) Slope: Uniformly sloped to drain when slope is indicated on the Plans.
        2) Slabs Indicated to Be Level: Have maximum deviation of 1/8 inch in 10 feet without any apparent changes in grade.
    b. On Circular Tank Walls: The Contractor may deviate from finish line indicated on the Plans by use of forms with chord lengths not to exceed 2 feet.
    c. Inserts: Set inserts to tolerances required for proper installation and operation of equipment or systems to which insert pertains.
    d. Maximum Tolerances: As follows.

Item	Inches
Sleeves and Inserts	Plus 1/8 Minus 1/8
Projected Ends of Anchor Bolts	Plus 1/4 Minus 0.0
Anchor Bolt Setting	Plus 1/16 Minus 1/16

END OF SECTION

SECTION 03150
CONCRETE ACCESSORIES

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Preformed expansion joint material.
2. Epoxy anchoring system.

1.02 MEASUREMENT AND PAYMENT

A. No separate payment will be made for work performed under this Section. Include cost of such work in facilities requiring concrete accessories.

1.03 REFERENCES

A. American Society for Testing and Materials (ASTM):

1. C 203 - Test Methods for Breaking Load and Flexural Properties of Block-Type Thermal Insulation.
2. D 570 - Test Method for Water Absorption of Plastics.
3. D 624 - Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers.
4. D 638 - Test Method for Tensile Properties of Plastics.
5. D 746 - Test Method for Brittleness Temperature of Plastics and Elastomers by Impact.
6. D 747 - Test Method for Apparent Bending Modulus of Plastics by Means of a Cantilever Beam.
7. D 792 - Test Methods for Density and Specific Gravity (Relative Density) of Plastics by Displacement.
8. D 2240 - Test Method for Rubber Property – Durometer Hardness.

B. U. S. Army Corps of Engineers (USACE):

1. CRD-C-572, Specification for Polyvinylchloride Waterstop.

1.04 SUBMITTALS

A. Product Data:

1. Preformed Expansion Joint Material: Submit sufficient information on each type of material for review to determine conformance of material to requirements specified.

B. Quality Control Submittals:

1. Manufacturer's Instructions: Submit instructions for materials specified in this Section that are specified to be installed with such instructions.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Expanded Polystyrene Joint Filler:

1. Type: Commercially available polystyrene board, having followed minimum characteristics:
   a. Flexural Strength, Minimum: 35 pounds per square inch in accordance with ASTM C 203.
   b. Compressive Yield Strength: Between 16 and 40 pounds per square inch, at 5 percent compression.

2.02 PREFORMED EXPANSION JOINT MATERIAL

A. Material: Synthetic sponge rubber or bituminous fiber types.

B. Use specific type in applications as indicated on the Drawings.

C. Sponge Rubber Type:

1. Manufacturers: One of the following or equal:
   a. Tammstech, Inc., Cementone.
   b. Burke Concrete Accessories Inc., Neoprene Sponge Rubber Expansion Joint.

D. Bituminous Fiber Type:

1. Manufacturers: One of the following or equal:
   a. Tammstech, Inc., Hornboard/fiber.
   b. Burke Concrete Accessories Inc., Fiber Expansion Joint.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Joints:

1. Construct expansion, contraction, and construction joints as indicated on the Drawings.
2. Preformed Expansion Joint Material: Fasten expansion joint strips to concrete, masonry, or forms with adhesive. No nailing will be permitted, nor shall expansion joint strips be placed without fastening.

B. Expanded Polystyrene Joint Filler:

1. When filler is indicated on the Drawings or specified, place filler in correct position before concrete is placed against filler.
2. Fill holes and joints in filler with caulking to prevent entry of mortar into joint or passage of mortar or concrete from one side of joint to other.

END OF SECTION

SECTION 03200
CONCRETE REINFORCEMENT

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Concrete reinforcement.

B. Related Sections:

1. Section 03300 - Cast-in-place Concrete.

1.02 REFERENCES

A. American Concrete Institute (ACI):

1. 301 – Specification for Structural Concrete for Buildings.
2. 315 - Detailing Manual: Details and Detailing of Concrete Reinforcement.
3. 318 - Building Code Requirements for Structural Concrete.

B. American Society for Testing and Materials (ASTM):

1. A 143 - Practice for Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedure, for Detecting Embrittlement.
2. A 185 - Specification for Steel Welded Wire Fabric, Plain, for Concrete Reinforcement.
3. A 615 - Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
4. A 706 – Specification for Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement.

C. American Welding Society (AWS):

1. D1.4 - Structural Welding Code - Reinforcing Steel.

1.03 SYSTEM DESCRIPTION

A. The Plans contain general notes concerning amount of reinforcement and placing, details of reinforcement at wall corners and intersections, and details of extra reinforcement around openings in concrete.

1.04 SUBMITTALS

A. Shop Drawings:

1. Shop Drawings on Reinforcing Steel:

a. Submit to the Engineer copy of reinforcing steel detail drawings in accordance with Contract Documents.
b. Changes to Reinforcing Steel Contract Document Requirements:
    1) Indicate in separate letter submitted with shop drawings any changes of requirements indicated on the Plans for reinforcing steel.
    2) Such changes will not be acceptable unless the Engineer has accepted such changes in writing.
c. Review of shop drawings by the Engineer will be limited to general compliance with the Contract Documents.

B. Samples:

1. Bar Supports: Submit samples of chairs proposed for use along with letter stating where each type chair will be used.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Packing and Shipping:

1. Deliver bars bundled and tagged with identifying tags.

B. Acceptance at Site:

1. Reinforcing Bars: Deliver reinforcing bars lacking grade identification marks accompanied by manufacturer's guarantee of grade.

1.06 SEQUENCING AND SCHEDULING

A. Bar Supports: Do not place concrete until samples and attached data of bar supports has been accepted by the Engineer.

PART 2 PRODUCTS

2.01 MATERIALS

A. Reinforcement:

1. General: Provide reinforcing steel that is new material, of quality specified, free from excessive rust or scale or any defects affecting its usefulness.

B. Reinforcing Bars:

1. Reinforcing Bars to Be Embedded in Concrete or Masonry: Grade 60 deformed bars conforming to ASTM A 615 except as specified in the next subparagraph.
2. Reinforcement resisting earthquake-induced flexural and axial forces in concrete frame members and in concrete wall boundary members

shall comply with low alloy ASTM A 706. ASTM A 615 Grade 60 reinforcement may be used in these members if the following requirements are met:
    a. The actual yield strength based on mill tests does not exceed the specified yield strength by more than 18,000 pounds per square inch (retests shall not exceed this value by more than an additional 3,000 pounds per square inch).
    b. The ratio of the actual ultimate tensile stress to the actual tensile yield strength is not less than 1.25.
3. Thread Bars:
    a. Provide thread bars having continuous rolled-in pattern of thread-like deformations along entire length.
    b. Provide hex nuts and couplers for the thread bars that develop 125 percent of yield strength of bar.
    c. Thread Bars:
        1) Conform to ASTM A 615 Grade 60.
        2) Manufacturers: One of the following or equal:
            a) DYWIDAG Systems International, DYWIDAG Threadbar.
    d. Do not substitute cut threads on regular reinforcing bars for thread bars.

C. Bar Supports:

1. Reinforcement Support Chairs:
    a. Hot-dip galvanized steel. Provide hot-dip galvanized steel with plastic tips at surfaces which will be exposed to view. Use unless otherwise indicated on the Plans.
    b. Stainless Steel where indicated on the Plans.

D. Tie Wires: Annealed steel.

E. Welded Wire Fabric Reinforcement:

1. Welded Wire Fabric: ASTM A 185.
2. Fabric may be used in place of reinforcing bars if accepted by the Engineer.
3. Provide fabric in flat sheet form.
4. Provide fabric having cross-sectional area per linear foot of not less than cross-sectional area per linear foot of reinforcing bars indicated on the Plans.

2.02 FABRICATION

A. Shop Assembly:

1. Cut and bend bars in accordance with provisions of ACI 315 and ACI 318.
2. Bend bars cold.

3. Provide bars free from defects and kinks and from bends not indicated on the Plans.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verification of Conditions:

1. Reinforcing Bars:
   a. Verify that bars are new stock free from rust scale, loose mill scale, excessive rust, dirt, oil, and other coatings which adversely affect bonding capacity when placed in the work.

3.02 PREPARATION

A. Surface Preparation:

1. Reinforcing Bars: Thin coating of red rust resulting from short exposure will not be considered objectionable. Thoroughly clean any bars having rust scale, loose mill scale, or thick rust coat.
2. Cleaning of Reinforcement Materials: Remove concrete or other deleterious coatings from dowels and other projecting bars by wire brushing or sandblasting before bars are embedded in subsequent concrete placement.

3.03 INSTALLATION

A. Reinforcing Bars:

1. No field bending of bars will be allowed.
2. Welding:
   a. Weld reinforcing bars where indicated on the Plans or acceptable to the Engineer.
   b. Perform welding in accordance with AWS D1.4.

B. Placing Reinforcing Bars:

1. Accurately place bars and adequately secure them in position.
2. Overlap bars at splices as specified or indicated on the Plans.
3. Unless specifically otherwise indicated on the Plans, install bars at lap splices in contact with each other and fasten bars together with tie wire.
4. If lap splice length for bars in concrete is not specified or indicated on the Plans, bars shall be lap spliced in accordance with ACI 318.
5. If not specified or indicated on the Plans and not specified in Division 4, lap splice bars in masonry in accordance with the Uniform Building Code.
6. Bar Supports:

a. Provide in sufficient number to prevent sagging and to support loads during construction, but in no case less than quantities and at locations as indicated in ACI 315.
b. Support reinforcing for concrete placed on ground by standard manufactured chairs, with steel plates for resting on ground.
c. Do not use brick, broken concrete masonry units, spalls, rocks, or similar material for supporting reinforcing steel.

7. If not indicated on the Plans, provide protective concrete cover in accordance with ACI 318.

C. Tying of Bar Reinforcement:

1. Fasten bars securely in place with wire ties.
2. Tie bars sufficiently often to prevent shifting.
3. There shall be at least 3 ties in each bar length (does not apply to dowel lap splices or to bars shorter than 4 feet, unless necessary for rigidity).
4. Tie slab bars at every intersection around periphery of slab.
5. Tie wall bars and slab bar intersections other than around periphery at not less than every fourth intersection, but at not greater than following maximum spacings:

Bar Size	Slab Bars Spacing (Inches)	Wall Bars Spacing (Inches)
Bars Number 5 and Smaller	60	48
Bars Number 6 through Number 9	96	60
Bars Number 10 and Number 11	120	96

6. After tying wire ties, bend ends of wire ties in towards the center of the concrete section. Wire ties shall conform to the cover requirements of the reinforcing bars.
7. Above tying requirements do not apply to reinforcement for masonry. Refer to Division 4 for tying requirements for masonry.

D. Lap Splices of Reinforcing Bars:

1. Where bars are to be lapped spliced at joints in concrete, ensure bars project from concrete first placed, minimum length equal to lap splice length indicated on the Plans.
2. Where lap splice length is not indicated on the Plans, then provide lap splice length as specified in ACI 318 and this Division.

E. Welded Wire Fabric Reinforcement:

1. Install necessary wiring, spacing chairs, or supports to keep welded wire fabric in place while concrete is being placed.
2. Bend fabric as indicated on the Plans or required to fit work.
3. Unroll or otherwise straighten fabric to make perfectly flat sheet before placing in the Work.
4. Lap splice welded wire fabric as indicated on the Plans.
5. If lap splice length is not indicated on the Plans, splice fabric in accordance with ACI 318.

END OF SECTION

SECTION 03300
CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Cast-in-place concrete and Waterstops.

B. Related Sections:

1. Section 03102 - Concrete Formwork.
2. Section 03200 - Concrete Reinforcement.

1.02 REFERENCES

A. American Concrete Institute (ACI):

1. 117 – Standard Specifications for Tolerances for Concrete Construction and Materials
2. 211.2 - Standard Practice for Selecting Proportions for Structural Lightweight Concrete.
3. 301 - Specifications for Structural Concrete for Buildings.
4. 302.1R – Guide for Concrete Floor and Slab Construction
5. 318 - Building Code Requirements for Structural Concrete.
6. Manual of Concrete Practice.
7. Recommended Practices.

B. American Society for Testing and Materials (ASTM):

1. C 31 - Practice for Making and Curing Concrete Test Specimens in the Field.
2. C 33 - Specification for Concrete Aggregates.
3. C 39 - Test Method for Compressive Strength of Cylindrical Concrete Specimens.
4. C 40 - Test Method for Organic Impurities in Fine Aggregates for Concrete.
5. C 42 - Method of Obtaining and Testing Drilled Cores and Sawed Beams of Concrete.
6. C 88 - Test Method of Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate.
7. C 94 - Specification for Ready-Mixed Concrete.
8. C 114 - Test Methods for Chemical Analysis of Hydraulic Cement.
9. C 131 - Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.

10. C 136 - Test Method for Sieve Analysis of Fine and Coarse Aggregates.
11. C 143 - Test Method for Slump of Hydraulic Cement Concrete.
12. C 150 - Specification for Portland Cement.
13. C 157 - Test Method for Length Change of Hardened Hydraulic-Cement Mortar and Concrete.
14. C 171 – Sheet Materials for Curing Concrete
15. C 172 - Practice for Sampling Freshly Mixed Concrete.
16. C 173 - Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method.
17. C 203 - Test Methods for Breaking Load and Flexural Properties of Block-Type Thermal Insulation.
18. C 227 - Test Method for Potential Alkali Reactivity of Cement-Aggregate Combinations (Mortar-Bar Method).
19. C 231 – Test Method for Air Content of Freshly Mixed Concrete by Pressure Method
20. C 260 - Specification for Air-Entraining Admixtures for Concrete.
21. C 289 - Test Method for Potential Alkali-Silica Reactivity of Aggregates (Chemical Method).
22. C 309 - Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
23. C 311 - Test Methods for Sampling and Testing Fly Ash or Natural Pozzolans for Use as a Mineral Admixture in Portland-Cement Concrete.
24. C 330 - Specification for Lightweight Aggregates for Structural Concrete.
25. C 469 - Test Method for Static Modulus of Elasticity and Poisson's Ratio of Concrete in Compression.
26. C 494 - Specification for Chemical Admixtures for Concrete.
27. C 567 - Test Method for Density of Structural Lightweight Concrete.
28. C 595 - Specification for Blended Hydraulic Cements.
29. C 618 - Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Portland-Cement Concrete.
30. C 881 – Specification for Epoxy-Resin-Base Bounding Systems for Concrete
31. D 75 - Practices for Sampling Aggregates.
32. D 1751 - Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)

1.03 DEFINITIONS

A. Alkali: Is defined to mean sum of sodium oxide and potassium oxide calculated as sodium oxide.

B. Hairline Crack: Crack with a crack width of less than 4 thousandths of an inch.

1.04 SYSTEM DESCRIPTION

A. Performance Requirements:

1. General:
   a. Except as otherwise specified, provide concrete composed of portland cement, fine aggregate, coarse aggregate, and water so proportioned and mixed as to produce plastic, workable mixture in accordance with requirements as specified in this Section and suitable to specific conditions of placement.
   b. Proportion materials in manner such as to secure lowest water-cement ratio which is consistent with good workability, plastic, cohesive mixture, and one which is within specified slump range.
   c. Proportion fine and coarse aggregate in manner such as not to produce harshness in placing nor honeycombing in structures.
2. Watertightness of Concrete Work: It is intent of this Section to secure for every part of the Work concrete and grout of homogeneous structure, which when hardened will have required strength, watertightness, and durability.
   a. It is recognized that some surface hairline cracks, and crazing will develop in the concrete surfaces.
   b. Construction, contraction, and expansion joints have been positioned in structures as indicated on the Plans, and curing methods specified, for purpose of reducing number and size of these expected cracks, due to normal expansion and contraction expected from specified concrete mixes.
   c. Class A and Rapid Strength Concrete (RSC): Watertight: Repair cracks which develop in walls or slabs and repair cracks which show any signs of leakage until all leakage is stopped.
   d. Walls or foundation slabs that leak or sweat because of porosity or cracks too small for successful pressure grouting: Seal on water side by coatings of surface sealant system, as specified in this Section.
   e. Grouting and Sealing: Continue as specified above until structure is watertight and remains watertight for not less than one year after final acceptance or date of final repair, whichever occurs later in time.
3. Workmanship and Methods: Provide concrete work, including detailing of reinforcing, conforming with best standard practices and as set forth in ACI 318, Manuals, and Recommended Practices.

1.05 SUBMITTALS

A. Product Data: Submit data completely describing products.

B. Information on Heating Equipment to Be Used for Cold Weather Concreting: Submit information on type of equipment to be used for heating materials and/or new concrete in process of curing during excessively cold weather.

C. For conditions that promote rapid drying of freshly placed concrete such as low Humidity, high temperature, and wind: Submit corrective measures proposed for use prior to placing concrete.

D. Copies of Tests of Concrete Aggregates: Submit certified copies in triplicate of commercial laboratory tests of all samples of concrete aggregates.

1. Fine Aggregate:
    a. Clay lumps.
    b. Reactivity.
    c. Shale and chert.
    d. Soundness.
    e. Color.
    f. Decantation.
2. Coarse Aggregate:
    a. Clay lumps and friable particles.
    b. Reactivity.
    c. Shale and chert.
    d. Soundness.
    e. Abrasion loss.
    f. Coal and lignite.
    g. Materials finer than 200 sieve.

E. Sieve Analysis: Submit sieve analyses of fine and coarse aggregates being used in triplicate at least every 3 weeks and at any time there is significant change in grading of materials.

F. Concrete Mixes: Submit full details, including mix design calculations for concrete mixes proposed for use for each class of concrete.

1. Include information on correction of batching for varying moisture contents of fine aggregate.
2. Submit source quality test records with mix design submittal.
    a. Include calculations for f'_{cr} based on source quality test records.

G. Change in Aggregate Source, or Aggregate Quality from Same Source: Submit new set of design mixes covering each class of concrete.

H. Test Batch Test Data:

1. Submit data for each test cylinder.
2. Submit data that identifies mix and slump for each test cylinder.

I. Sequence of Concrete Placing: Submit proposed sequence of placing concrete showing proposed beginning and ending of individual placements.

J. Curing Compound Other than Specified Compound: Submit complete data on proposed compound.

K. Repair of Defective Concrete: Submit mix design for grout.

L. Acceptance of Method of Concrete Repair: Make no repair until the Engineer has accepted method of preparing surfaces and proposed method of repair.

M. If Either Fine or Coarse Aggregate Is Batched from More than One Bin: Submit analyses for each bin, and composite analysis made up from these, using proportions of materials to be used in mix.

N. Cement Mill Tests: Include alkali content, representative of each shipment of cement for verification of compliance with specified requirements.

O. Pozzolan Certificate of Compliance: Identify source of pozzolan and certify compliance with requirements of ASTM C 618.

P. Information on mixing equipment.

Q. Drying shrinkage test data.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Packing and Shipping:

1. Deliver, store, and handle concrete materials in manner as to prevent damage and inclusion of foreign substances.
2. Deliver and store packaged materials in original containers until ready for use.
3. Deliver aggregate to mixing site and handle in such manner that variations in moisture content will not interfere with steady production of concrete of specified degree of uniformity and slump.

B. Acceptance at Site: Reject material containers or materials showing evidence of water or other damage.

1.07 PROJECT CONDITIONS

A. Environmental Requirements:

1. Hot Weather Concreting:
   a. When Ambient Air Temperature Is above 90 Degrees Fahrenheit: Prior to placing concrete, cool forms and reinforcing steel to by water cooling to below 90 degrees Fahrenheit.
   b. Temperature of Concrete Mix at Time of Placement: Keep temperature below 90 degrees Fahrenheit by methods which do not impair quality of concrete.
2. Cold Weather Concreting:
   a. Concrete placed below ambient air temperature of 45 degrees Fahrenheit and falling or below 40 degrees Fahrenheit: Make provision for heating water.
   b. If materials have been exposed to freezing temperatures to degree that any material is below 35 degrees Fahrenheit: Heat such materials.
   c. Heating Water, Cement, or Aggregate Materials:
      1) Do not heat in excess of 160 degrees Fahrenheit.
   d. Protection of Concrete in Forms:
      1) Protect by means of covering with tarpaulins, or other acceptable covering.
      2) Provide means for circulating warm moist air around forms in manner to maintain temperature of 50 degrees Fahrenheit for at least 5 days.
3. For conditions that promote rapid drying of freshly placed concrete such as low humidity, high temperature, and wind: Take corrective measures to minimize rapid water loss from concrete.
   a. Furnish and use sufficient number of maximum and minimum self-recording thermometers to adequately measure temperature around concrete.

1.08 SEQUENCING AND SCHEDULING

A. Schedule placing of concrete in such manner as to complete any single placing operation to construction, contraction, or expansion joint.

1.09 DESCRIPTION OF WORK

A. The work included under this section consists of furnishing all material, supplies, equipment, tools, transportation, and facilities, and performing all labor and services necessary for, required in connection with or properly incidental to furnishing, and installing cast-in-place concrete work as described in this section of the specifications, shown on the accompanying drawings, or reasonably implied therefrom, except as hereinafter specifically excluded.

B. Work Included:

1. Design of Concrete Mixes.
2. All concrete and cement finishing; all surface treatment and curing, including non-slip finishes and color work.
3. Installation of all reglets, bolts, anchors, cans, sleeves, column anchor bolts, etc., whether furnished under this section or by others.
4. The furnishing of all items required to be or shown on the drawings as embedded in concrete, which are not specifically required under other sections.
5. Setting headers and screeds. Curing and protecting concrete.
6. Drilling of existing concrete for placement of bars, dowels, and rods.
7. Grouting of bars, dowels, and rods in existing concrete.

1.10 QUALITY ASSURANCE

A. Codes and Standards: Comply with all Federal, State and Local Codes and Safety Regulations. In addition, comply with the provisions of the following codes, specifications, and standards, except where more stringent requirements are shown or specified:

1. ACI 301, "Specifications for Structural Concrete for Buildings", current edition.
2. ACI 318, "Building Code Requirements of Reinforced Concrete", current edition.
3. Concrete Reinforcing Steel Institute, "Manual of Standard Practice".
4. ASTM C94, "Specifications for Ready Mixed Concrete".

B. Certificates of Compliance: The Contractor shall provide Certificates of Compliance for concrete materials in accordance with the requirements of Part 1.05, "Submittals", of these specifications. When Certificates of Compliance cannot be provided, laboratory test reports shall be provided in accordance with the requirements of Part 1.05, "Submittal" of these specifications.

C. Engineer’s Review: The Engineer will review the mix designs prepared by the testing laboratory hired by the Contractor.

D. Sampling, Testing and Inspection:

1. General:
   a. All materials and work shall be subject to inspection at the batch plant, and at the building site. Material or workmanship not complying fully with the drawings, and/or specifications will be rejected.
   b. If the City’s agent, through oversight or otherwise, has accepted material or work which is defective or contrary to specifications,

this material or work, regardless of state of completion, may be rejected.

2. City: The City shall employ an independent testing laboratory or the Engineer as the City's agent to perform the sampling, testing, and inspections shown on the contract drawings, and submit certified test results. Testing agencies shall meet the requirements of ASTM C1077. Testing agencies shall be accepted by the Architect/Engineer before performing any work.
3. Contractor:
    a. The Contractor shall cooperate with and notify City's agent at least 24 hours in advance of inspection required and shall provide samples and facilities for inspection without extra charge.
    b. The Contractor shall provide and maintain adequate facilities on the project site for safe storage and initial curing of concrete test specimens as required by ASTM C31 for the sole use of the testing agency.
    c. The Contractor shall hire a professional testing laboratory to provide concrete mix designs for each type of concrete on the job. Each mix design shall be verified by trial batch tests or laboratory test reports and certified to by a principal of the laboratory who is a registered Civil Engineer in the State of California and submitted to the City for review. Laboratory test reports, in order to be acceptable, must indicate that not less than 90 percent of at least 20 consecutive 28-day tests exceed the specified strength, and none of said tests are less than 95 percent of specified strength.
    d. Each mix design shall be verified by trial batch tests or field test records and certified to by a principal of a testing agency who is a registered Civil Engineer in the State of California and submitted to the Architect/Engineer for review. Agency field test records, in order to be acceptable, must satisfy the requirement of ACI 318 section 5.3 otherwise trial mixture meeting the requirements of ACI 318 section 5.3 shall be made. The Contractor shall submit data on qualifications of proposed testing agency for acceptance and hire the accepted testing agency to provide trial mixture test data for each type of concrete on the job.
    e. Prior to placing any concrete, a trial batch of each Class of concrete shall be prepared using the design mix proposed for the project. From the trial batch, at least three (3) specimens for determining the "Drying Shrinkage" shall be prepared. The drying shrinkage specimens shall be 4 x 4 x 11-inch prisms, fabricated, cured, dried, and measured in the manner outlined in ASTM Designation C157. Measurements shall be made and reported separately for 7, 14, and 21 days of drying after 7 days

of moist curing. The effective gage length of specimen shall be 10 inches. The average "Drying Shrinkage" of the test specimens after 21 days of drying shall not exceed .036 percent.

f. At least 60 days before concrete is required for the project, submit to testing agency of City's choice a fifty-pound (50#) sample of fine aggregate and one-hundred-pound (100#) samples of each size of coarse aggregate proposed for use. Select samples to fairly represent average quality and grading of aggregates proposed for the work. When aggregates have been approved, no change will be allowed without written permission of the Engineer. Maintain stocks of accepted aggregates so no pour need be interrupted.

PART 2 PRODUCTS

2.01 MATERIALS

A. Aggregate:

1. General:
   a. Provide concrete aggregates that are sound, uniformly graded, and free of deleterious material in excess of allowable amounts specified.
   b. Grade aggregate in accordance with ASTM D75 and C136.
   c. Provide unit weight of fine and coarse aggregate which produces in place concrete with a calculated equilibrium density of not more than 135 pounds per cubic foot.

B. Fine Aggregate:

1. Provide fine aggregate for concrete or mortar consisting of clean, natural sand or of sand prepared from crushed stone or crushed gravel.
2. Do not provide aggregate having deleterious substances in excess of following percentages by weight of contaminating substances. In no case shall total exceed percent listed.

Item	Test Method	Percent
Removed by decantation (dirt, silt, etc.)	ASTM C117	3
Shale or Chert	ASTM C295	1
Clay Lumps	ASTM C142	1

3. Except as otherwise specified, grade fine aggregate from coarse to fine in accordance with requirements of ASTM C33.

C. Coarse Aggregate:

1. General: Provide coarse aggregate consisting of gravel or crushed stone made up of clean, hard, durable particles free from calcareous coatings, organic matter, or other foreign substances.
2. Weight: Not exceeding 15 percent, for thin or elongated pieces having length greater than 5 times average thickness.
3. Deleterious Substances: Not in excess of following percentages by weight, and in no case having total of all deleterious substances exceeding 2 percent.

Item	Test Method	Percent
Shale or chert	ASTM C295	1
Coal and lignite	ASTM C123	1/4
Clay lumps and friable particles	ASTM C142	1/4
Materials finer than Number 200 sieve	ASTM C117	1/2*
* Except when material finer than Number 200 sieve consists of crusher dust, maximum amount shall be 1 percent.		

4. Grading:
   a. Aggregate: As specified in ASTM C33, Size Number 57, except as otherwise specified or authorized in writing by the Engineer.

D. Portland Cement:

1. General: Conform to specifications and tests for ASTM C150, Types II or III, Low Alkali, except as specified otherwise.
2. Low Alkali Portland: Have total alkali containing not more than 0.60 percent.
3. Exposed Concrete in Any Individual Structure: Use only one brand of portland cement.
4. Cement for Finishes: Provide cement from same source and of same type as concrete to be finished.

E. Admixtures:

1. General:
   a. Do not use admixtures of any type, except as specified, unless written authorization has been obtained from the Engineer.
   b. Compatible with concrete and other admixtures.
   c. Do not use admixtures containing chlorides calculated as chloride ion in excess of 0.5 percent by weight.
   d. Use in accordance with manufacturer's recommendations and add each admixture to concrete mix separately.

2. Air Entraining Admixture:
    a. Provide all concrete with 5 percent, plus or minus 1 percent, entrained air of evenly dispersed air bubbles at time of placement.
    b. Conform to ASTM C260.
3. Pozzolan Admixture:
    a. Fly Ash Pozzolan:
        1) Conforming to requirements of ASTM C618, Class F, may be used as admixture in concrete made with Type II portland cement.
        2) Pozzolan may replace portland cement at ratio of 1.0-pound fly ash for each pound of portland cement replaced.
        3) Maximum of 15 percent by weight of minimum quantities of portland cement listed in Table A under paragraph 2.03E may be replaced with fly ash pozzolan.
        4) Do not use pozzolan as an admixture in concrete made with portland-pozzolan cement.
        5) Loss on Ignition for Pozzolan: Not exceed four percent.
    b. Ground granulated blast-furnace slag, grades 100 or 120, complying with ASTM C989 may substitute for portland cement up to a maximum of 25% of the total cementitious material by weight.
    c. Substitutions that combine fly ash and ground granulated blast-furnace slag are limited to a combined total of 30% of the total cementitious material by weight with fly ash no more than 15% of the total.
4. Water Reducing Admixture:
    a. May be used at the Contractor's option.
    b. Conform to ASTM C494, Type A or Type D.
    c. May not contain air entraining agents.
    d. Must be liquid form before adding to the concrete mix.
    e. No decrease in cement is permitted as result of use of water reducing admixture.
5. Superplasticizers: Are not to be used without acceptance by Engineer.

F. Water:

1. Water for Concrete, Washing Aggregate, and Curing Concrete: Clean and free from oil and deleterious amounts of alkali, acid, organic matter, or other substances.
2. Chlorides and Sulfate Ions:
    a. Water for Conventional Reinforced Concrete: Use water not containing more than 1,000 milligrams per liter of chlorides calculated as chloride ion, nor more than 1,000 milligrams per liter of sulfates calculated as sulfate ion.

G. Coloring:

1. All concrete with exposed surfaces (such as sidewalks, curb and gutter, driveways, etc.) shall be colored by adding 1 pound of Lamp Black per cubic yard of Concrete.

H. Keyway Material: Steel, plastic, or lumber.

I. Sprayed Membrane Curing Compound: Clear type with fugitive dye conforming to ASTM C 309, Type 1D.

J. Surface Sealant System: Manufacturers: One of the following or equal:

1. Radcon Laboratories, Inc., Las Vegas, Nevada, Formula Number 7.
2. IPA Systems, Philadelphia, Pennsylvania, Duripal.

2.02 EQUIPMENT

A. Mixing Concrete:

1. Mixers may be of stationary plant, paver, or truck mixer type.
2. Provide adequate equipment and facilities for accurate measurement and control of materials and for readily changing proportions of material.
3. Mixing Equipment:
   a. Capable of combining aggregates, cement, and water within specified time into thoroughly mixed and uniform mass and of discharging mixture without segregation.
   b. Maintain concrete mixing plant and equipment in good working order and operated at loads, speeds, and timing recommended by manufacturer or as specified.
   c. Proportion cement and aggregate by weight.

B. Machine Mixing:

1. Batch plant shall be capable of controlling delivery of all material to mixer within 1 percent by weight of individual material.
2. If bulk cement is used, weigh it on separate visible scale which will accurately register scale load at any stage of weighing operation from zero to full capacity.
3. Prevent cement from coming into contact with aggregate or with water until materials are in mixer ready for complete mixing with all mixing water.
4. Procedure of mixing cement with sand or with sand and coarse aggregate for delivery to project site, for final mixing and addition of mixing water will not be permitted.
5. Retempering of concrete will not be permitted.
6. Discharge entire batch before recharging.

7. Volume of Mixed Material Per Batch: Not exceed manufacturer's rated capacity of mixer.
8. Mixers:
    a. Perform mixing in batch mixers of acceptable type.
    b. Equip each mixer with device for accurately measuring and indicating quantity of water entering concrete, and operating mechanism such that leakage will not occur when valves are closed.
    c. Equip each mixer with device for automatically measuring, indicating, and controlling time required for mixing.
        1) Interlock device to prevent discharge of concrete from mixer before expiration of mixing period.

C. Transit-mixed Concrete:

1. Mix and deliver in accordance with ASTM C 94.
2. Total Elapsed Time Between Addition of Water at Batch Plant and Discharging Completed Mix: Not to exceed 90 minutes or elapsed time at project site shall not exceed 30 minutes.
3. Under conditions contributing to quick setting, total elapsed time permitted may be reduced by the Engineer.
4. Equip each truck mixer with device interlocked so as to prevent discharge of concrete from drum before required number of turns and furnish such device that is capable of counting number of revolutions of drum.
5. Continuously revolve drum after it is once started until it has completely discharged its batch.
    a. Do not admit water until drum has started revolving.
    b. Right is reserved to increase required minimum number of revolutions or to decrease designated maximum number of revolutions allowed, if necessary, to obtain satisfactory mixing. The Contractor will not be entitled to additional compensation because of such increase or decrease.

D. Other Types of Mixers: In case of other types of mixers, mixing shall be as follows:

1. Mix concrete until there is uniform distribution of materials, and discharge mixer completely before recharging.
2. Neither speed nor volume loading of mixer shall exceed manufacturer's recommendations.
3. Continue mixing for minimum of 1-1/2 minutes after all materials are in drum, and for batches larger than one cubic yard increase minimum mixing time 15 seconds for each additional cubic yard or fraction thereof.

2.03 MIXES

A. Measurements of Materials:

1. Measure materials by weighing, except as otherwise specified or where other methods are specifically authorized in writing by the Engineer.
2. Furnish apparatus for weighing aggregates and cement that is suitably designed and constructed for this purpose.
3. Accuracy of Weighing Devices: Furnish devices that have capability of providing successive quantities of individual material that can be measured to within one percent of desired amount of that material.
4. Measuring or Weighing Devices: Subject to review by the Engineer and bear valid seal of the Sealer of Weights and Measures having jurisdiction.
5. Weighing Cement:
   a. Weigh cement separately.
   b. Cement in Unbroken Standard Packages (Sacks): Need not be weighed.
   c. Bulk Cement and Fractional Packages: Weigh such cement.
6. Mixing Water: Measured by volume or by weight.

B. Concrete Proportions and Consistency:

1. Concrete Consistency and Composition:
   a. Provide concrete that can be worked readily into corners and angles of forms and around reinforcement without excessive vibration and without permitting materials to segregate or free water to collect on surface.
   b. Prevent unnecessary or haphazard changes in consistency of concrete.
2. Ratio of Coarse Aggregate to Fine Aggregate: Not less than 1.0 nor more than 2.0 for all concrete Classes.
3. Aggregate:
   a. Obtain aggregate from source which is capable of providing uniform quality, moisture content, and grading during any single day's operation.
4. Concrete Mix Water to Cement Ratio, Minimum Cement Content, and Slump Range: Conform to values specified in Table 1 in this Section.
5. Concrete Batch Weights: Control and adjust so as to secure maximum yield, and at all times maintain proportions of concrete mix within specified limits.
6. Mixture Modification: If required, by the Engineer, modify mixture within limits set forth in this Section.

C. Concrete Mixes:

1. Proportioning of Concrete Mix: Proportion mixes to meet required average compressive strength f'_{cr} as defined in Subparagraph 2.03E2.
2. Mixes:
    a. Adjusting of Water: After acceptance, do not change mixes without acceptance by Engineer, except that at all times adjust batching of water to compensate for free moisture content of fine aggregate.
    b. Total Water Content of Each Concrete Class: Not exceed those specified in Table 1 in this Section.
    c. Checking Moisture Content of Fine Aggregate: Furnish satisfactory means at batching plant for checking moisture content of fine aggregate.
3. Change in Mixes: Undertake new trial batch and test program as specified in this Section.

D. Hand Mixed Concrete:

1. Hand mix concrete only when acceptable to the Engineer.
2. Prepare hand mixed concrete on watertight, level platform in batches not to exceed 1/3 cubic yard each.
3. Aggregate:
    a. First spread required amount of coarse aggregate on platform in an even and uniform layer, and then over such aggregate spread proper proportion of fine aggregate.
    b. Combined Depth of Both Such Layers: Not be greater than one foot.
4. Cement:
    a. First evenly spread required quantity of cement over fine aggregate.
    b. Then turn entire batch with shovels at least twice before adding water.
5. Water:
    a. Then uniformly sprinkle or spray proper amount of water over batched materials.
    b. Then turn with shovels not less than three times before being removing from platform.

E. Classes of Concrete:

1. All concrete, unless specified or otherwise indicated on the Plans: Use Class 3 concrete.
2. Classes:
    a. Class 3 made with Type II low alkali cement.
    b. Admixtures: Provide admixtures as specified in this Section.

TABLE 1 CONCRETE WITH AIR ENTRAINMENT				
Class	**Specified Compressive Strength f'c at 28 Days (Pounds per Square Inch)**	**Maximum Net Water to Cement Ratio**	**Minimum Cement per Cubic Yard of Concrete by Weight (Pounds)**	**Maximum Slump (Inches)**
3	3,000	0.50	470	4

F. Air Entraining Admixture:

1. Add agent to batch in portion of mixing water.
2. Batch solution by means of mechanical batcher capable of accurate measurement.

2.04 WATERSTOPS

A. All concrete joints shall be made watertight by using a preformed plastic material that is permanently self-adhering and flexible. Compound shall be “Ram-Nek” by Henry Company or approved equal.

B. Manhole pipe connection shall have a rubber water stop, such as A-Lox X-Cel water stop or approved equal.

PART 3 EXECUTION

3.01 INSTALLATION

A. Surface Sealant System: Apply as recommended by manufacturer published instructions. Where concrete continues to sweat or leak, apply additional coats of surface sealant until the sweating or leaks stop.

B. Joints and Bonding:

1. As far as practicable construct concrete work as monolith.
2. Locations of contraction, construction, expansion, and other joints are indicated on the Plans or as specified in this Section.
3. Construction Joints:
   a. Where construction joints are not indicated on the Plans, provide slabs and walls with construction joints at intervals not greater than 30 feet.
   b. In order to preserve strength and watertightness of structures, make no other joints, except as authorized the Engineer.
   c. At construction joints, thoroughly clean concrete of laitance, grease, oil, mud, dirt, curing compounds, mortar droppings, or

other objectionable matter by means of heavy sandblasting, and wash surfaces just prior to succeeding concrete placement.

d. At Horizontal Joints: Immediately prior to resuming concrete placing operations, thoroughly spread bed of grout not less than 1/2 inch in thickness, nor more than 1 inch in thickness over horizontal joint surfaces.

4. Keyways in Joints:
   a. Provide keyways in joints as indicated on the Plans.
   b. Treat lumber keyway material with form release coating, applied in accordance with manufacturer's instructions.
5. Take special care to ensure that concrete is well consolidated around and against waterstops and that waterstops are secured in proper position.
6. Cleaning of Construction Joints:
   a. Wash construction joints free of sawdust, chips, and other debris after forms are built and immediately before concrete or grout placement.
   b. Should formwork confine sawdust, chips, or other loose matter in such manner that it is impossible to remove them by flushing with water, use vacuum cleaner for their removal, after which flush cleaned surfaces with water.
   c. Provide cleanout hole at base of each wall and column for inspection and cleaning.
7. Expansion, Contraction, and Construction Joints
   a. Constructed where and as indicated on the Plans.
8. Repair of Concrete: Where it is necessary to repair concrete by bonding mortar or new concrete to concrete which has reached its initial set, first coat surface of set concrete with epoxy bonding agent.
9. Take special care to ensure that concrete is well consolidated around and against waterstops and that waterstops are secured in proper position.

C. Conveying and Placing Concrete:

1. Convey concrete from mixer to place of final deposit by methods which prevent separation or loss of materials.
2. Use equipment for chuting, pumping, and conveying concrete of such size and design as to ensure practically continuous flow of concrete at delivery end without separation of materials.
3. Design and use chutes and devices for conveying and depositing concrete that direct concrete vertically downward when discharged from chute or conveying device.
4. Keep equipment for conveying concrete thoroughly clean by washing and scraping upon completion of any day's placement.

D. Placing Concrete:

1. Place no concrete without prior authorization of the Engineer.
2. Do Not Place Concrete Until:
    a. Reinforcement is securely and properly fastened in its correct position and loose form ties at construction joints have been retightened.
    b. Dowels, bucks, sleeves, hangers, pipes, conduits, bolts, and any other fixtures required to be embedded in concrete have been placed and adequately anchored.
    c. Forms have been cleaned and oiled as specified.
3. Placement of concrete in which initial set has occurred, or of retempered concrete, will not be permitted.
4. Place no concrete during rainstorms or high velocity winds.
5. Protect concrete placed immediately before rain to prevent water from coming in contact with such concrete or winds causing excessive drying.
6. Keep sufficient protective covering on hand at all times for protection of concrete.
7. After acceptance, adhere to proposed sequence of placing concrete, except when specific changes are requested and accepted by the Engineer.
8. Notify the Engineer in writing of readiness, not just intention, to place concrete in any portion of the work.
    a. Provide this notification in such time in advance of operations as the Engineer deems necessary to make final inspection of preparations at location of proposed concrete placing.
    b. Place forms, steel, screeds, anchors, ties, and inserts in place before notification of readiness is given to the Engineer.
    c. Depositing Concrete:
        1) Deposit concrete at or near its final position to avoid segregation caused by rehandling or flowing.
        2) Do not deposit concrete in large quantities in one place and work along forms with vibrator or by other methods.
        3) Do not drop concrete freely into place from height greater than 5 feet.
        4) Use tremies for placing concrete where drop is over 5 feet.
        5) Commence placement of concrete on slopes, at bottom of slope.
9. Place concrete in approximately horizontal layers not to exceed 24 inches in depth and bring up evenly in all parts of forms.
10. Continue concrete placement without avoidable interruption, in continuous operation, until end of placement is reached.
11. If more than 20 minutes lapse prior to placement of new concrete over concrete previously placed, reduce depth of layers being placed at one time, and/or increase placing equipment, until it is possible to return with placing operation to previously placed concrete within 20 minutes.

12. If concrete is to be placed over previously placed concrete and more than 20 minutes have elapsed, then spread layer of grout not less than 1/2 inch in thickness nor more than 1 inch in thickness over surface before placing additional concrete.

E. Consolidating Concrete:

1. Place concrete with aid of acceptable mechanical vibrators.
2. Thoroughly consolidate concrete around reinforcement, pipes, or other shapes built into the work.
3. Provide sufficiently intense vibration to cause concrete to flow and settle readily into place and to visibly affect concrete over radius of at least 18 inches.
4. Vibrators:
    a. Keep sufficient vibrators on hand at all times to vibrate concrete as placed.
    b. In addition to vibrators in actual use while concrete is being placed, have on hand minimum 1 spare vibrator in serviceable condition.
    c. Place no concrete until it has been ascertained that all vibrating equipment, including spares, are in serviceable condition.
5. Take special care to place concrete solidly against forms so as to leave no voids.
6. Take every precaution to make concrete solid, compact, and smooth, and if for any reason surfaces or interiors have voids or are in any way defective, repair such concrete in manner acceptable to the Engineer.

F. Footings and Slabs on Grade:

1. Do not place concrete on ground or compacted fill until subgrade is in moist condition acceptable to the Engineer.
2. If necessary, sprinkle subgrade with water not less than 6 nor more than 20 hours in advance of placing concrete.
3. If it becomes dry prior to actual placing of concrete, sprinkle again, without forming pools of water.
4. Place no concrete if subgrade is muddy or soft.

G. Loading Concrete:

1. Green Concrete:
    a. No heavy loading of green concrete will be permitted.
    b. Green concrete is defined as concrete with less than 100 percent of the specified strength.
2. No backfill shall be placed against concrete walls until the concrete has reached the specified strength and the connecting slabs and beams have been cast and have reached the specified strength.

3. Use construction methods, sequencing, and allow time for concrete to reach adequate strength to prevent overstress of the concrete structure during construction.

H. Curing Concrete:

1. General:
   a. Cure concrete by methods specified in this Section.
   b. Cure concrete minimum of 7 days.
   c. Cure concrete to be painted with water or plastic membrane.
   d. Do not use curing compound on concrete surfaces that are to receive paint or upon which any material is to be bonded.
   e. Water cure or plastic membrane cure concrete slabs which are specified to be sealed by concrete sealer.
   f. Cure other concrete by water curing or sprayed curing membrane at the Contractor's option.
   g. Floor slabs may be cured using plastic membrane curing.
2. Water Curing:
   a. Keep surfaces of concrete being water cured constantly and visibly moist day and night for period of not less than 7 days.
   b. Each day forms remain in place may count as 1 day of water curing.
   c. No further curing credit will be allowed for forms in place after contact has once been broken between concrete surface and forms.
   d. Do not loosen form ties during period when concrete is being cured by leaving forms in place.
   e. Flood top of walls with water at least 3 times per day and keep concrete surfaces moist at all times during 7-day curing period.
3. Sprayed Membrane Curing:
   a. Apply curing compound to concrete surface after repairing and patching, and within 1 hour after forms are removed.
   b. If more than 1-hour elapses after removal of forms, do not use membrane curing compound, but apply water curing for full curing period.
   c. If surface requires repairing or painting, water cure such concrete surfaces.
   d. Curing Compound:
      1) Do not remove curing compound from concrete in less than 7 days.
      2) Curing compound may be removed only upon written request by the Contractor and acceptance by the Engineer, stating what measures are to be performed to adequately cure structures.
      3) Take care to apply curing compound in area of construction joints to see that curing compound is placed within construction joint silhouette.

4) Remove curing compound placed within construction joint silhouette by heavy sandblasting prior to placing any new concrete.
5) Contractor's Option: Instead of using curing compound for curing of construction joints such joints may be water cured.
6) Apply curing compound by mechanical, power operated sprayer and mechanical agitator that will uniformly mix all pigment and compound.
7) Apply compound in at least 2 coats.
8) Apply each coat in direction 90 degrees to preceding coat.
9) Apply compound in sufficient quantity so that concrete has uniform appearance and that natural color is effectively and completely concealed at time of spraying.
10) Continue to coat and recoat surfaces until specified coverage is achieved and until coating film remains on concrete surfaces.
11) Thickness and Coverage of Compound: Provide compound having film thickness that can be scraped from surfaces at any and all points after drying for at least 24 hours.
12) The Contractor is cautioned that method of applying curing compound specified herein may require more compound than normally suggested by manufacturer of compound and also more than is customary in the trade.
13) Apply amounts specified herein, regardless of manufacturer's recommendations or customary practice, if curing compound is used in place of water curing.
14) If the Contractor desires to use curing compound other than specified compound, coat sample areas of concrete wall with proposed compound and also similar adjacent area with specified compound in specified manner for comparison.
    a) If proposed sample is not equal or better, in opinion of the Engineer, in all features, proposed substitution will not be allowed.
15) Prior to final acceptance of the work, remove, by sandblasting or other acceptable method, any curing compound on surfaces exposed to view, so that only natural color of finished concrete is visible uniformly over entire surface.

4. Plastic Membrane Curing:
   a. Polyethylene film may be used to cure slabs. Seal joints and edges with small sand berm.
   b. Install plastic membrane as soon as concrete is finished and can be walked on without damage.
   c. Keep concrete moist under plastic membrane.

3.02 CONCRETE FINISHING

A. Protect persons and adjacent materials and finishes from dust, dirt and other surface or physical damage during finishing operations, including materials driven by wind.

B. Cement for Finishes:

1. Addition of white cement may be required to produce finish which matches color of concrete to be finished.

C. Exposed Concrete Surfaces:

1. Repair defective work, remove fins, offsets, and curing membrane, and grind projections smooth. Fill depressions 1/4 inch or larger in depth or width and tie holes with mortar after removal of curing membrane.
    a. Provide finished surfaces without gravel pockets and other defacements.
2. Provide a sacked finish by coating the concrete with sacking mortar.
    a. Coat entire surface with sacking mortar as soon as surface of concrete approaches surface dryness.
    b. Thoroughly rub mortar over area with clean burlap pads to fill all voids.
    c. While mortar is still plastic but partially set (so it cannot be pulled from voids), sack-rub surface with dry mix of sacking mortar (without water). There shall be no discernible thickness of mortar on concrete surfaces, except in voids; all surfaces shall be uniformly textured.
    d. Immediately begin a continuous moist cure for 72 hours.
3. At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a sacked texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces.

D. Horizontal Concrete: After proper and adequate vibration and tamping, use the following finishes for horizontal concrete surfaces.

1. All surfaces except where otherwise indicated herein: Steel trowel finish, without local depressions or high points, followed by light hairbroom finish. Do not use stiff bristle brooms or brushes. Perform brooming parallel to slab-drainage. Provide resulting finish that is rough enough to provide nonskid finish.

E. Edges of Joints:

1. Provide joints having edges as indicated on the Plans.

2. Protect wall and slab surfaces at edges against concrete spatter and thoroughly clean upon completion of each placement.

3.03 FIELD QUALITY CONTROL

A. Testing of Concrete:

1. During progress of construction, the City will have tests made to determine whether the concrete, as being produced, complies with requirements specified.
2. Tests will be performed in accordance with ASTM C 31, ASTM C 39, and ASTM C 172.
3. The City's laboratory technician will make and deliver test cylinders to the laboratory for testing.
4. Required Number Cylinders for testing by City:
   a. Not less than 3-cylinder specimens, 6-inch diameter by 12-inch long, will be tested for each 150 cubic yards of each class of concrete with minimum of 3 three specimens for each class of concrete placed and not less than 3 specimens for each half day's placement.
   b. One cylinder will be broken at 7 days and 2 at 28 days.
5. The City's laboratory technician will test slump at the beginning of each placement, as often as necessary to keep slump within the specified range, and when requested to do so by the Engineer.
6. The Contractor shall:
   a. Coordinate test cylinder sampling with City's laboratory technician.
   b. Coordinate slump tests of concrete with the City's laboratory technician, who will use a slump cone in accordance with requirements of ASTM C 143.
   c. Not use concrete that does not meet specification requirements in regards to slump but remove such concrete from project site.
   d. Provide concrete for test specimens when requested by the Engineer for the purposes of Quality Assurance testing.

B. Air Entraining Admixture:

1. Test percent of entrained air in concrete at beginning of each placement, as often as necessary to keep entrained air within specified range, and when requested to do so by the Engineer.
2. Provide test equipment.
3. Do not use concrete that does not meet Specification requirements as to air entrainment and shall remove such concrete from project site.
4. Test air entrainment in concrete in accordance with ASTM C 173.
5. The Engineer may at any time test percent of entrained air in concrete received on project site.

C. Enforcement of Strength Requirement:

1. Concrete is expected to reach higher compressive strength than that which is indicated in Table 1 as specified compressive strength f'c.
2. Strength Level of Concrete: Will be considered acceptable if following conditions are satisfied.
    a. Averages of all sets of 3 consecutive strength test results is greater or equal to specified compressive strength f'c.
    b. No individual strength test (average of 2 cylinders) falls below specified compressive strength f'c by more than 500 pounds per square inch.
    c. Whenever one, or both, of 2 conditions stated above is not satisfied, provide additional curing of affected portion followed by cores taken in accordance with ASTM C 42 and ACI 318 and comply with following requirements:
        1) If additional curing does not bring average of 3 cores taken in affected area to at least specified compressive strength f'c, designate such concrete in affected area as defective.
        2) The Engineer may require the Contractor to strengthen defective concrete by means of additional concrete, additional reinforcing steel, or replacement of defective concrete, all of the Contractor's expense.

3.04 ADJUSTING

A. Repair of Defective Concrete:

1. Remove and replace or repair defective work.
2. Correct defective work as specified in this Article.
3. Do not patch, repair, or cover defective work without inspection by the Engineer.
4. Provide repairs having strength equal to or greater than specified concrete for areas involved.
    a. Chip out and key imperfections in the work and make them ready for repair.
5. Dry Pack Method:
    a. Dry Pack Method: Use for holes having depth nearly equal to or greater than least surface dimension of hole, for cone-bolt, and narrow slots cut for repair.
    b. Smooth Holes: Clean and roughen by heavy sandblasting before repair.
6. Mortar Method of Replacement: Use for following:
    a. Holes too wide to dry pack and too shallow for concrete replacement.
    b. Comparatively shallow depressions, large or small, which extend no deeper than reinforcement nearest surface.
7. Concrete Replacement:

a. Use: When holes extend entirely through concrete section or when holes are more than 1 square foot in area and extend halfway or more through the section.
b. Method of Repair for Surfaces of Set Concrete to Be Repaired: First coat with epoxy bonding agent.

8. Acceptable Method of Concrete Repair:
   a. Make no repair until the Engineer has accepted method of preparing surfaces and proposed method of repair.

END OF SECTION

SECTION 03400
PRECAST CONCRETE

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:

1. Precast concrete manholes – Not Allowed unless approved by Project Engineer
2. Adjusting Grade Rings.
3. Manhole appurtenances.

B. Related Sections:

1. Section 02300 - Earthwork.
2. Section 03300 - Cast in Place Concrete

1.02 QUALITY ASSURANCE

A. American Concrete Institute (ACI), *Building Code Requirements for Reinforced Concrete*.

B. Caltrans Standard Specifications.

1.03 REFERENCE STANDARDS

A. American Society for Testing and Materials (ASTM):
1. C478 - Precast Reinforced Concrete Manhole Sections.
2. C857 – Minimum Structural Design Loading for Underground Precast Concrete Utility Structures.
3. C858 - Underground Precast Concrete Utility Structures.
4. C913 - Precast Concrete Water/Wastewater Structures.

B. American Concrete Institute (ACI):
1. 350 – Requirements for Environmental Engineering Concrete Structures.

1.04 SUBMITTALS

A. Standard manufacturer's product data including shop drawings, concrete mix design, connections, etc.

1.05 DELIVERY, STORAGE, AND HANDLING

A. All materials shall be delivered to the jobsite as a complete unit, clearly labeled with the manufacturer's product identification and printed instructions.

B. All materials shall be stored in a secure location to prevent theft or damage and in accordance with the manufacturer's recommendations.

C. All materials shall be handled and installed in accordance with the manufacturer's instructions.

PART 2 PRODUCTS

2.01 PRECAST MANHOLES

A. Where shown on the plans, the Contractor may use reinforced concrete structures that are cast at an off-site location. In general, these structures include manholes, cleanout boxes, and other required structures.

1. Precast concrete structures shall conform to ASTM C478, C858, and C913.

B. All precast concrete structures shall be manufactured in a plant especially designed for that purpose. Standard Products should be used wherever feasible.

C. Precast concrete manholes, frames, and covers shall be rated for H-20 traffic loading.

D. Design of precast concrete structures is the responsibility of the Contractor. Design requirements are listed below:

1. Manholes shall be design based on the loading criteria in ASTM C 857 and ACI 350.
2. Structures shall be designed to resist buoyant forces from groundwater assuming a depth of groundwater at finish grade.
3. Design loads shall consist of dead load, live load, impact load, full depth interior fluid, loads due to groundwater table at finish grade, seismic loads, and any other loads which may be imposed on the structure. Soil properties and loading values detailed in the project geotechnical report shall be used for the design of precast concrete structures.
4. Individual riser sections shall be designed to utilize as few joints as possible. Vertical joints are not allowed.
5. Precast structures shall be designed to be watertight and to limit movement and deflections.

E. The Contractor shall submit shop drawings showing reinforcement, connections, embedded items, etc. Pipe penetrations shall be formed, or core drilled. Penetrations 4 inches in diameter or larger shall be formed at the precast concrete plant.

2.02 JOINT SEALERS

A. All joints between precast concrete sections and grade rings shall be made watertight by using a preformed plastic material that is permanently self-adhering and flexible. Compound shall be “Ram-Nek” as manufactured by K.T. Snyder Company, Houston, Texas or approved equal.

1. “Ram-Nek” is distributed locally by Hanson Concrete Products of Milpitas.
2. Follow manufacturer’s recommended installation procedures.

B. Where cast in place concrete is poured against a precast concrete structure, two sets of a pre-formed rubber hydrophilic water stop with adhesive back shall be installed on the precast side of the joint prior to the pour. Water stop shall be Adeka Ultra Seal MC-2010M or equivalent.

1. Follow manufacturer’s recommended installation procedures.

C. Grout used to seal pipe penetrations shall be non-shrink grout conforming to Section 03600-2.01D.

2.03 ADJUSTING GRADE RINGS

A. Adjusting grade rings shall be precast concrete.

B. Adjusting grade rings shall be made watertight in accordance with manufacturer’s recommendations.

C. Adjusting grade rings shall be HS-20 loading traffic rated.

PART 3 EXECUTION

3.01 CASTING

A. Precast concrete structures shall be cast and cured at the plant following manufacturer’s procedures.

B. Structures shall not be shipped to the job site until fully cured.

3.02 STORAGE, HANDLING AND DELIVERY

A. Precast concrete structures shall be fully braced (with temporary struts if necessary) until delivered to the project site, installed, leveled and anchored into place as shown on the Plans.

B. After cure, precast concrete structures may be stored on the project site in conformance with these specifications, at the Contractor's own risk.

C. Contractor is responsible for coordinating the delivery of precast concrete structures and all trades required for their installation and anchorage.

3.03 INSTALLATION

A. Precast concrete structures shall be installed as shown on the Plans, according to the manufacturer's recommendations.

B. Joint sealers shall be used as specified herein for a watertight installation.

3.04 DEFECTIVE CONCRETE AND REPAIRS

A. Precast concrete showing cracks, rock pockets, voids, spalls, or other defects that adversely affect the structural adequacy of the concrete shall be considered defective.

   1. The Engineer shall be the arbiter as to whether concrete is defective.

B. Defective concrete resulting from improper casting or curing shall be repaired or replaced at the plant prior to shipment.

   1. All damaged concrete surfaces shall be inspected and any pour joints, voids, rock pockets, tie holes, etc. shall be patched at one time.

C. Damaged concrete that results from transportation, handling, or storage after the piece has left the plant shall be repaired or replaced at no expense to the Town.

END OF SECTION

SECTION 03600
GROUTS

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Concrete mortar.
2. Grout.
3. Drypack mortar.
4. Nonshrink grout.
5. Epoxy grout.
6. Non-shrink epoxy grout.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):

1. C109 - Test Method for Compressive Strength of Hydraulic Cement Mortars (using 2 inch or 50-millimeter cube specimens).
2. C230 – Standard Specification for Flow Table for Use in Tests of Hydraulic Cement
3. C531 - Test Method for Liner Shrinkage and Coefficient of Thermal Expansion of Chemical-Resistant Mortars, Grouts, Monolithic Surfacings, and Polymer Concretes.
4. C579 - Test Method for Compressive Strength of Chemical-Resistant Mortars and Monolithic Surfacings.
5. C827 - Test Method for Change in Height at Early Ages of Cylindrical Specimens from Cementitious Mixtures.
6. C939 - Test Method for Flow of Grout for Preplaced-Aggregate Concrete (Flow Cone Method).
7. C1090 - Test Method for Measuring Change in Height of Cylindrical Specimens from Hydraulic-Cement Grout.
8. C1107 - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink).
9. C1181 - Test Methods for Compressive Creep of Chemical-Resistant Polymer Machinery Grouts.

1.03 SUBMITTALS

A. Nonshrink Grout and Non-shrink Epoxy Grout: Submit manufacturer's literature and certified test data prior to installation.

1.04 DELIVERY, STORAGE, AND HANDLING

A. All materials shall be delivered to the jobsite in their original, unopened packages or containers, clearly labeled with the manufacturer's product identification and printed instructions.

B. All materials shall be stored in a cool dry place and in accordance with the manufacturer's recommendations.

C. All materials shall be handled in accordance with the manufacturer's instructions.

1.05 PROJECT/SITE CONDITIONS

A. Refer to manufacturer's literature or contact the manufacturer for any special physical or environmental limitations that may be required for use of products.

1.06 WARRANTIES

A. Non-shrink Grout: The manufacturer shall warranty that the non-shrink grout will never go below its initial placement volume when tested in accordance with ASTM C1107.

B. Non-shrink Epoxy Grout: The manufacturer shall warranty that non-shrink epoxy grout will show negligible shrinkage or expansion when tested in accordance with ASTM C531.

PART 2 PRODUCTS

2.01 MATERIALS

A. Concrete Mortar:

1. General: Consist of concrete mixture with coarse aggregate removed and water quantity adjusted as required.
2. At Exposed Concrete Surfaces Not to Be Painted or Submerged in Water: White cement.

B. Grout:

1. Consist of mixture of Portland cement and sand.

C. Dry-pack Mortar:

1. Consist of mixture of Portland cement and sand.

D. Non-shrink Grout:

1. Non-shrink grout shall be a preportioned and prepackaged cement-based mixture. It shall contain no metallic particles such as aluminum powder and no metallic aggregate such as iron filings. It shall require only the addition of potable water.
2. Potable water for pre-soaking, mixing, and curing shall be clean and free of oils, acids, alkalies, organics, and any other deleterious matter.
3. Bleeding: Non-shrink grout shall be free from the emergence of mixing water from within or the presence of water on its surface.
4. Non-shrink grout shall be in accordance with ASTM C1107.
5. Consistency: Non-shrink grout shall remain at a minimum flowable consistency for at least 45 minutes after mixing at 45 degrees Fahrenheit to 90 degrees Fahrenheit when tested in accordance with ASTM C230. If at a fluid consistency, it shall be verified in accordance with ASTM C939.
6. Dimensional Stability (height change): Non-shrink grout shall be in accordance with ASTM C1107, volume-adjusting Grade B or C at 45 degrees to 90 degrees. It shall show 90 percent or greater bearing area under bases or baseplates.
7. Compressive Strength: Non-shrink grout shall show minimum compressive strengths at 45 degrees Fahrenheit to 90 degrees Fahrenheit in accordance with ASTM C1107 for various periods from the time of placement, including 5,000 pounds per square inch at 28 days when tested in accordance with ASTM C109 as modified by C1107.
8. Manufacturers: One of the following or equal:
    a. Five Star Products, Inc., Fairfield, CT, Five Star Grout.
    b. Master Builders, Inc., Cleveland, OH, Masterflow 928.
    c. L&M Construction Chemicals, Inc., Omaha, NE, CRYSTEX.

E. Epoxy Grout:

1. Consist of mixture of epoxy and sand.
2. Sand: Clean, bagged, graded, and kiln dried silica sand.

F. Non-shrink Epoxy Grout:

1. Non-shrink epoxy grout shall be a 100 percent solids, premeasured, prepackaged system containing a two-component thermosetting epoxy resin and inert aggregate.
2. Consistency: Non-shrink epoxy grout shall maintain a flowable consistency for at least 45 minutes at 70 degrees Fahrenheit.
3. Dimensional Stability (height change):
    a. Non-shrink epoxy grout shall have negligible shrinkage or expansion (less than 0.0006 in/in) when tested in accordance with ASTM C531.
4. Compressive Strength: Non-shrink epoxy grout shall show a minimum compressive strength of 10,000 pounds per square inch at

24 hours and 14,000 pounds per square inch at 7 days when tested in accordance with ASTM C579, Method B.

5. Compressive Creep: The compressive creep for non-shrink epoxy grout shall not exceed 0.0027 in/in when tested under a 400 pounds per square inch constant load at 140 degrees Fahrenheit in accordance with ASTM C1181.
6. Thermal Capability: The coefficient of thermal expansion for non-shrink epoxy grout shall not exceed 0.000018 inches per inch per degree Fahrenheit when tested under ASTM C531, Method B.
7. Manufacturers: One of the following or equal:
   Five Star Products, Inc., Fairfield, CT, Five Star Epoxy Grout.
   a. Master Builders, Inc., Cleveland, OH, Masterflow 648 CP Plus.
   b. L&M Construction Chemicals, Inc., EPOGROUT.

2.02 MIXES

A. Concrete Mortar Mix:

1. Use water-cement ratio that is no more than that specified for concrete being repaired.
2. At Exposed Concrete Surfaces Not to Be Painted or Submerged in Water: Use sufficient white cement to make color of finished patch match that of surrounding concrete.

B. Grout Mix:

1. For Concrete Repair: Mix in same proportions used for concrete being repaired, with only sufficient water to give required consistency for spreading.
2. For Spreading over the Surfaces of Construction or Cold Joints: Mix with no more water used than allowed by water-cement ratio specified for concrete.
3. For Other Applications: Mix in proportions by weight of one-part cement to four parts of concrete sand.

C. Dry-pack Mortar Mix: Use only enough water so that resulting mortar will crumble to touch after being formed into ball by hand.

D. Non-shrink Grout: Mix in accordance with manufacturer's installation instructions such that resulting mix has fluid or flowable consistency and is suitable for placing by pouring.

E. Epoxy Grout:

1. Mix in accordance with manufacturer's installation instructions for mixing.
2. Proportioning:
   a. For horizontal work, consist of mixture of one-part epoxy with not more than 2 parts sand.

b. For vertical or overhead work, consist of one-part epoxy gel with not more than 2 parts sand.

F. Non-shrink Epoxy Grout: Mix in accordance with manufacturer's installation instructions.

PART 3 EXECUTION

3.01 EXAMINATION

A. Inspect concrete surfaces to receive grout or mortar and verify that they are free of ice, frost, dirt, grease, oil, curing compounds, paints, impregnations and all loose material or foreign matter likely to affect the bond or performance of grout or mortar.

B. Confirm that newly placed concrete has been cured sufficiently to attain its design strength and limit further shrinkage.

C. Verify that temperature of cementitious or epoxy grout does not exceed manufacturer's recommendations.

3.02 PREPARATION

A. Surface Preparation:

1. Roughen all concrete surfaces by heavy sandblasting, chipping, or other mechanical means to assure bond. Loose or broken concrete shall be removed.
2. All grease, oil, dirt, curing compounds, laitance, and other deleterious materials that may affect bond that were identified in the inspection process shall be completely removed from concrete and bottoms of baseplates. All metal surfaces should have a 2 to 3 mil peak-to-valley profile for epoxy grouts.
3. For cementitious mortars and grouts, concrete surfaces shall be saturated surface dry. Any standing water shall be removed prior to placing grouts.
4. For epoxy grouts, do not wet concrete surfaces with water. Instead, where required, wet surfaces with epoxy for horizontal work or epoxy gel for vertical or overhead work prior to placing epoxy grouts.

B. Forms and Headboxes for Grouts (Cementitious or Epoxy):

1. Forms for grouts shall be built of material with adequate strength to withstand the placement of grouts.
2. Forms must be rigid and liquid tight. All cracks and joints shall be caulked with an elastomeric sealant. All forms shall be lined with polyethylene for easy grout release. Forms carefully waxed with two coats of heavy-duty paste wax shall also be acceptable.

3. Forms shall be 4 to 6 inches higher than the baseplate on one side of the baseplate configuration when using head pressure for placement.
4. A sufficient number of headboxes shall be built to facilitate placement of grouts.
5. Air relief holes a minimum 1/8 inch in diameter shall be provided when required by a baseplate configuration to avoid entrapping air underneath.

3.03 APPLICATION

A. Cement Mortar and Grout:

1. For Defective Concrete Repair:
   a. Filling: Filling of voids around items through the concrete.
   b. Grout Spreading: Spread over construction joints, cold joints, and similar type items.
2. Concrete Surfaces:
   a. Apply epoxy bonding agent to clean, roughened, and dry surfaces before placing mortar or grout.
3. Placing:
   a. Exercise particular care in placing Portland cement mortar or grout since they are required to furnish structural strength or impermeable water seal or both.
   b. Do not use cement mortar or grout that has not been placed within 30 minutes after mixing.

B. Epoxy Grout:

1. Apply in accordance with manufacturer's installation instructions.
2. Use where specified herein or where indicated on the Plans.

3.04 PLACEMENT

A. The Contractor shall make arrangements to have a grout manufacturer's representative present for a preconstruction meeting and during initial grout placement. Grout shall only be installed after the final equipment alignment is correct and accepted by the Engineer.

1. Grouts shall be mixed in accordance with the manufacturer's recommendations.
2. A mortar mixer with moving paddles shall be used for mixing grouts. For cementitious grouts, pre-wet the mixer and empty out excess water before beginning mixing.
3. Cementitious Grouts:
   a. Non-shrink cementitious grout shall be added to a premeasured amount of water that does not exceed the manufacturer's maximum recommended water content.

b. Mix cementitious grouts per manufacturer's instructions for uniform consistency.
c. Grouts may be drypacked, flowed, or pumped into place. All baseplate grouting shall take place from one side of a baseplate to the other to avoid trapping air. Do not overwork grouts.
d. Do not retemper grout by adding more water after stiffening.
e. Hydrostatic head pressure shall be maintained by keeping the level of the grout in the headbox above the bottom of the baseplate. The headbox should be filled to the maximum level and the grout worked down to top of baseplate.

4. Epoxy Grouts:
   a. Epoxy grouts shall be mixed in complete units. Do not vary the ratio of components or add solvent to change the consistency of the mix.
   b. Pour the hardener into the resin and mix for at least one minute and until each mixture is uniform in color. Pour the chemical components into the mortar mixer wheelbarrow and add the aggregate. Mix until aggregate is uniformly wetted. Overmixing will cause air entrapment in the mix.
   c. All epoxy grout shall be flowed into place using a headbox. All grouting shall take place from one side of a baseplate to the other in a continuous flow to avoid trapping air.
   d. Hydrostatic head pressure shall be maintained by keeping the level of grout in headboxes above the bottom of baseplates. Headboxes shall be filled to the maximum level and grout worked down to the bottom of baseplates.
   e. Epoxy grouts shall not be cut back after setting. The final level of grout will be as installed with all chamfer edges built into the formwork.

3.05 CURING

A. Cementitious Grouts:

1. Grouts must be cut back to the lower edge of baseplates after reaching initial set. Provide a 45-degree angle cut back.
2. Clean equipment and tools as recommended by the grout manufacturer.
3. Cure Grouts in accordance with manufacturer's specifications and recommendations. Keep grout moist for a minimum of 3 days. The method needed to protect grouts will depend on temperature, humidity, and wind. Wet burlap, a soaker hose, sun shading, ponding and, in extreme conditions, a combination of methods shall be employed.
4. Grouts shall be maintained above 40 degrees Fahrenheit until they have attained a compressive strength of 3,000 pounds per square

inch or above 70 degrees Fahrenheit for a minimum of 24 hours to avoid damage from subsequent freezing.

B. Epoxy Grouts:

1. Cure grouts in accordance with manufacturers' specifications and recommendations. Do not wet cure epoxy grouts.
2. Consult the manufacturer for appropriate cure schedule. In no case should any surface in contact with grout be allowed to fall below 50 degrees Fahrenheit for a minimum of 48 hours after placement.
3. Equipment and tools shall be cleaned immediately with a strong liquid detergent and water solution before grout hardens.

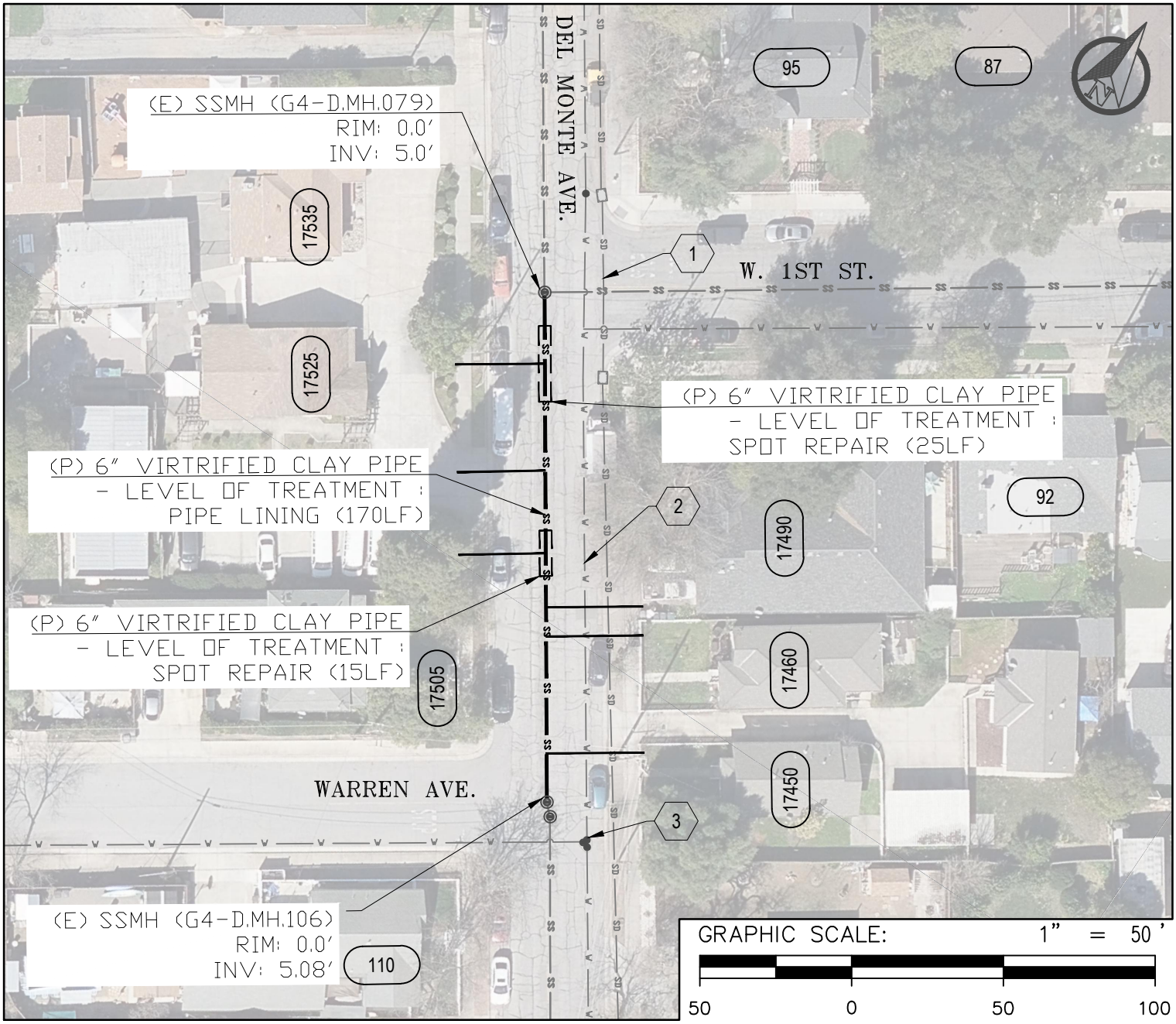
3.06 FIELD QUALITY CONTROL

A. Non-shrink cementitious grouts shall be tested for 24-hour compressive strength in accordance with ASTM C109.

B. Non-shrink grouts shall be tested for 24-hour compressive strength in accordance with ASTM C579 (Method B).

END OF SECTION

Appendix A



PLAN VIEW - PIPE LINING & SPOT REPAIRS

SCALE: 1" : 50'

NOTES:

1. FOR TAP FACTORY OR TAP EAK PLEASE SEE POSM REPORT.
2. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONTACT SERVICE ALERT 48 HOURS IN ADVANCE OF ANY EXCAVATION FOR THE MARK-OUT OF THE LOCATION OF UTILITIES AND OBTAIN A DIG ALERT IDENTIFICATION NUMBER PRIOR TO COMMENCEMENT OF WORK.
3. CONTRACTOR IS REQUIRED TO MAKE PRECAUTINDARY MEASURES TO PROTECT THE UTILITY LINES SHOWN HEREON AND ANY OTHER EXISTING LINES NOT OF RECORD OR NOT SHOW ON THESE PLANS.
4. CONTRACTOR TO CLEAN SEWER, REMOVE GREASE AND ROOTS, AND CCTV INSPECTION PER TECHNICAL SPECIFICATIONS. (170 LF) PRIOR TO ACTUAL WORK,

#	KEY NOTES
1	STORM DRAIN PIPE
2	WATER MAIN
3	WATER VALVE
4	STORM DRAIN STRUCTURE

City of Morgan Hill
Engineering and Utilities Department
17575 Peak Ave. Morgan Hill, CA 95037

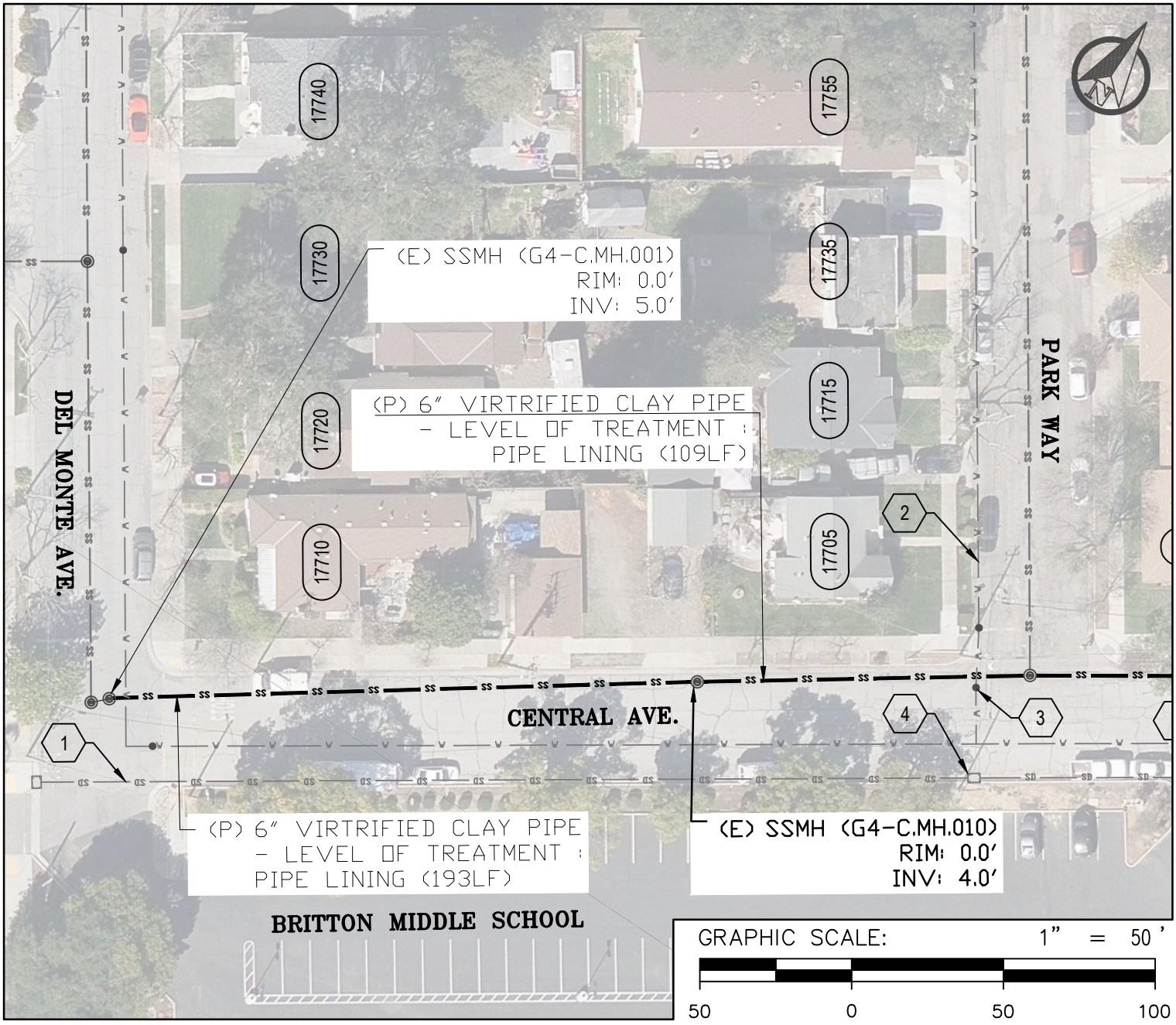
DRAWN BY: Name	**REVISION DATE:**
CHECKED BY: Y. CHO	**APPROVE DATE:** 10/12/22

2023 INFLOW AND INFILTRATION SEWER REPAIR PROJECT

17519 DEL MONTE AVE. (PID#6302)

DRAWING NO.

EX-1



PLAN VIEW - PIPE LINING

SCALE: 1" : 50'

NOTES:

1. FOR TAP FACTORY OR TAP BREAK PLEASE SEE POSM REPORT.
2. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONTACT SERVICE ALERT 48 HOURS IN ADVANCE OF ANY EXCAVATION FOR THE MARK-OUT OF THE LOCATION OF UTILITIES AND OBTAIN A DIG ALERT IDENTIFICATION NUMBER PRIOR TO COMMENCEMENT OF WORK.
3. CONTRACTOR IS REQUIRED TO MAKE PRECAUTINDARY MEASURES TO PROTECT THE UTILITY LINES SHOWN HEREON AND ANY OTHER EXISTING LINES NOT OF RECORD OR NOT SHOW ON THESE PLANS.
4. CONTRACTOR TO CLEAN SEWER, REMOVE GREASE AND ROOTS, AND CCTV INSPECTION PER TECHNICAL SPECIFICATIONS. (PID#4388 109LF) AND (PID#4389 193LF) PRIOR TO ACTUAL WORK.

#	KEY NOTES
1	STORM DRAIN PIPE
2	WATER MAIN
3	WATER VALVE
4	STORM DRAIN STRUCTURE

City of Morgan Hill
Engineering and Utilities Department
17575 Peak Ave. Morgan Hill, CA 95037

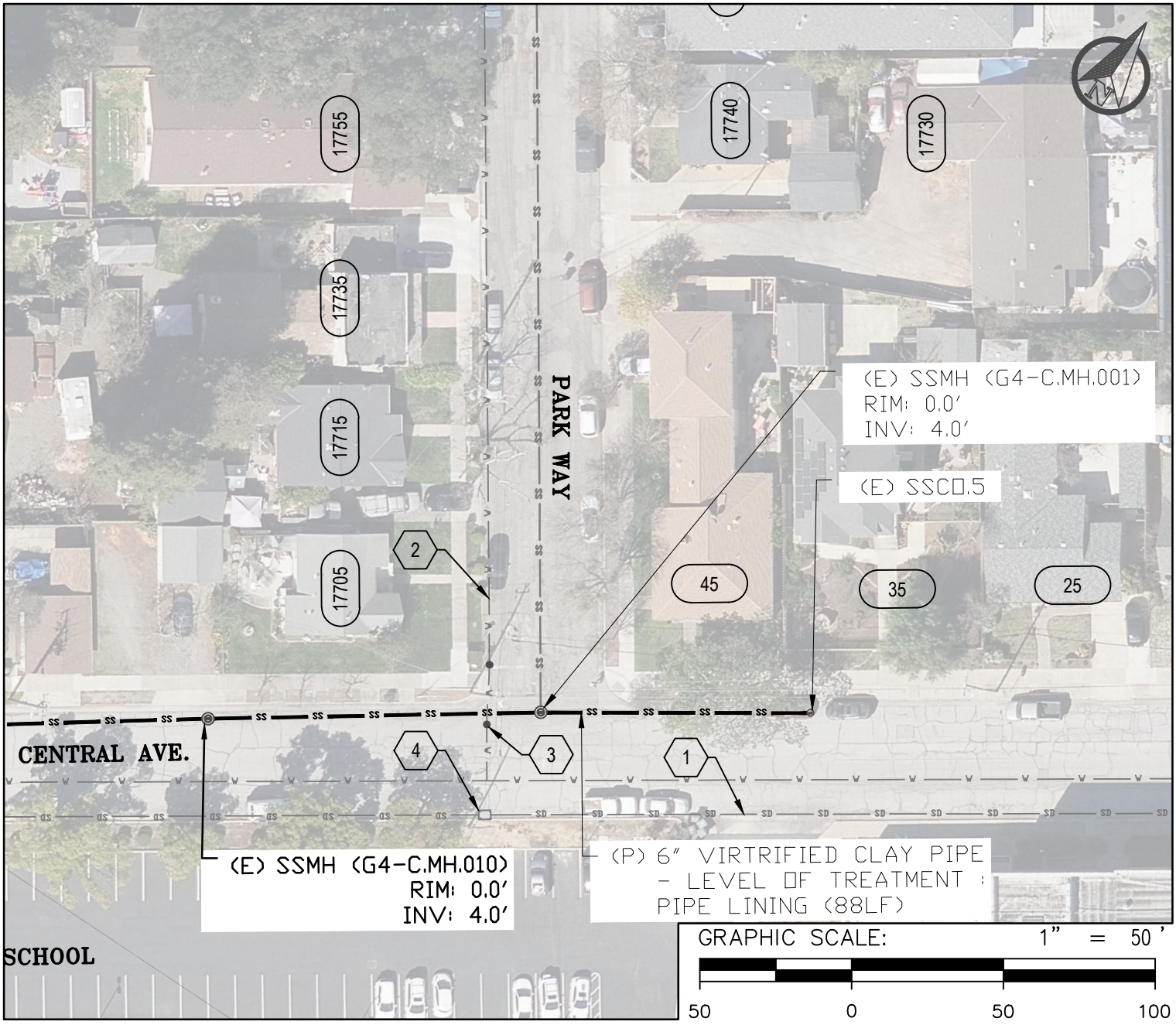
DRAWN BY: Name	REVISION DATE:
CHECKED BY: Y. CHO	APPROVE DATE: 10/12/22

2023 INFLOW AND INFILTRATION SEWER REPAIR PROJECT

80 W. CENTRAL AVE. (PID#4388,4389)

DRAWING NO.

EX-2A



PLAN VIEW - PIPE LINING

SCALE: 1" : 50'

NOTES:

1. FOR TAP FACTORY OR TAP BREAK PLEASE SEE POSM REPORT.
2. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONTACT SERVICE ALERT 48 HOURS IN ADVANCE OF ANY EXCAVATION FOR THE MARK-OUT OF THE LOCATION OF UTILITIES AND OBTAIN A DIG ALERT IDENTIFICATION NUMBER PRIOR TO COMMENCEMENT OF WORK.
3. CONTRACTOR IS REQUIRED TO MAKE PRECAUTINOARY MEASURES TO PROTECT THE UTILITY LINES SHOWN HEREON AND ANY OTHER EXISTING LINES NOT OF RECORD OR NOT SHOW ON THESE PLANS.
4. CONTRACTOR TO CLEAN SEWER, REMOVE GREASE AND ROOTS, AND CCTV INSPECTION PER TECHNICAL SPECIFICATIONS. (88 LF) PRIOR TO ACTUAL WORK.

#	KEY NOTES
1	STORM DRAIN PIPE
2	WATER MAIN
3	WATER VALVE
4	STORM DRAIN STRUCTURE

City of Morgan Hill
Engineering and Utilities Department
17575 Peak Ave. Morgan Hill, CA 95037

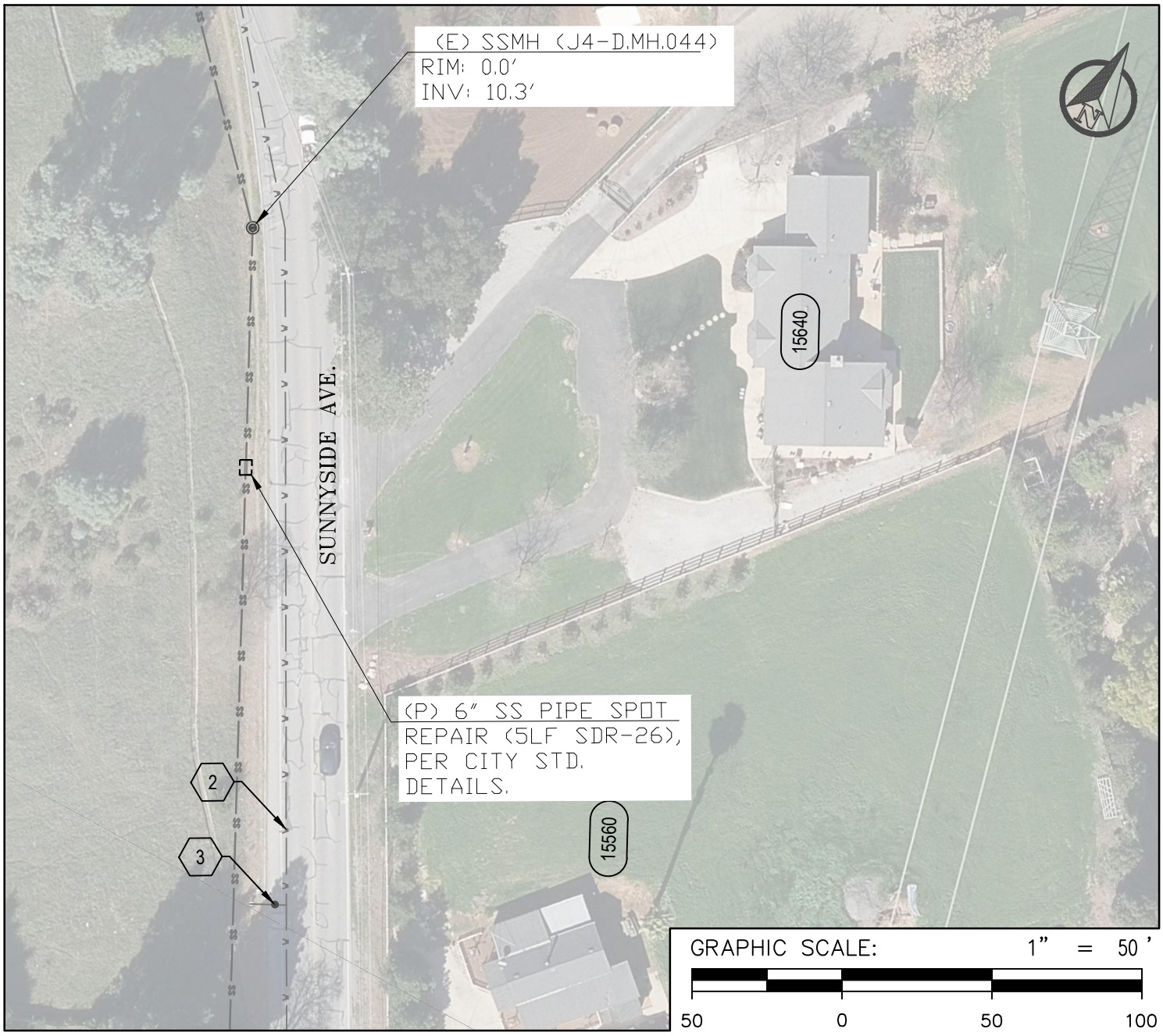
DRAWN BY: Name	**REVISION DATE:**
CHECKED BY: Y. CHO	**APPROVE DATE:** 10/12/22

2023 INFLOW AND INFILTRATION SEWER REPAIR PROJECT

45 W. CENTRAL AVE. (PID#3689)

DRAWING NO.

EX-2B



PLAN VIEW - SPOT REPAIR

SCALE: 1" : 50'

NOTES:

1. FOR TAP FACTORY OR TAP BREAK PLEASE SEE POSM REPORT.
2. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONTACT SERVICE ALERT 48 HOURS IN ADVANCE OF ANY EXCAVATION FOR THE MARK-OUT OF THE LOCATION OF UTILITIES AND OBTAIN A DIG ALERT IDENTIFICATION NUMBER PRIOR TO COMMENCEMENT OF WORK.
3. CONTRACTOR IS REQUIRED TO MAKE PRECAUTINOARY MEASURES TO PROTECT THE UTILITY LINES SHOWN HEREON AND ANY OTHER EXISTING LINES NOT OF RECORD OR NOT SHOW ON THESE PLANS.

#	KEY NOTES
1	STORM DRAIN PIPE
2	WATER MAIN
3	WATER VALVE
4	STORM DRAIN STRUCTURE

City of Morgan Hill
Engineering and Utilities Department
17575 Peak Ave. Morgan Hill, CA 95037

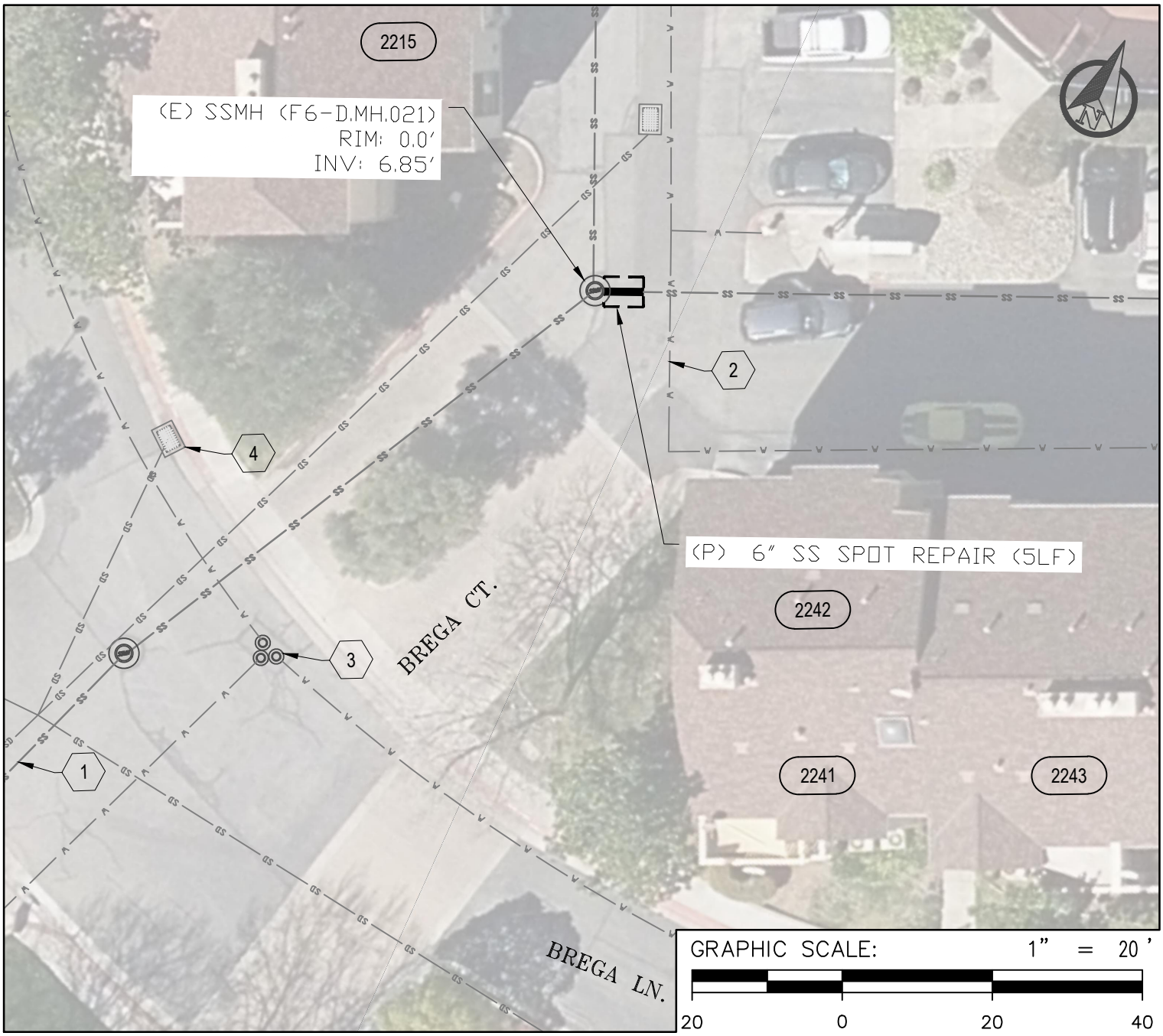
DRAWN BY: Name	**REVISION DATE:**
CHECKED BY: Y. CHO	**APPROVE DATE:** 10/12/22

2023 INFLOW AND INFILTRATION SEWER REPAIR PROJECT

15800 SUNNYSIDE AVE. (PID#5082)

DRAWING NO.

EX-3



PLAN VIEW - SPOT REPAIR

SCALE: 1" : 50'

NOTES:

1. FOR TAP FACTORY OR TAP BREAK PLEASE SEE POSM REPORT.
2. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONTACT SERVICE ALERT 48 HOURS IN ADVANCE OF ANY EXCAVATION FOR THE MARK-OUT OF THE LOCATION OF UTILITIES AND OBTAIN A DIG ALERT IDENTIFICATION NUMBER PRIOR TO COMMENCEMENT OF WORK.
3. CONTRACTOR IS REQUIRED TO MAKE PRECAUTINOARY MEASURES TO PROTECT THE UTILITY LINES SHOWN HEREON AND ANY OTHER EXISTING LINES NOT OF RECORD OR NOT SHOW ON THESE PLANS.
4. CONTRACTOR TO CLEAN SEWER, REMOVE GREASE AND ROOTS, AND CCTV INSPECTION PER TECHNICAL SPECIFICATIONS. (330 LF) PRIOR TO ACTUAL WORK.

#	KEY NOTES
1	STORM DRAIN PIPE
2	WATER MAIN
3	WATER VALVE
4	STORM DRAIN STRUCTURE

City of Morgan Hill
Engineering and Utilities Department
17575 Peak Ave. Morgan Hill, CA 95037

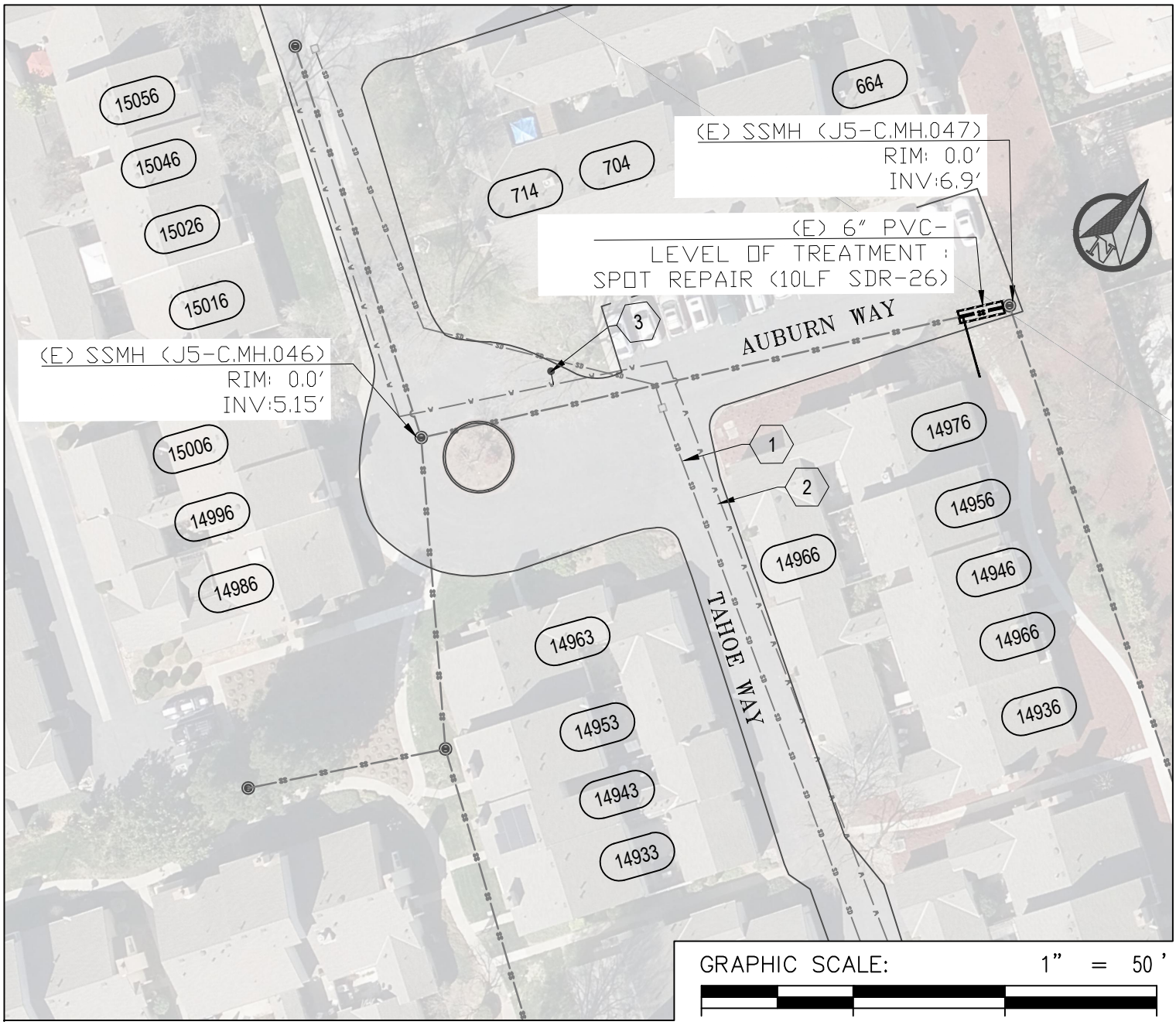
DRAWN BY: Name	**REVISION DATE:**
CHECKED BY: Y. CHO	**APPROVE DATE:** 10/12/22

2023 INFLOW AND INFILTRATION SEWER REPAIR PROJECT

2245 BREGA LANE (PID#6867)

DRAWING NO.

EX-4



PLAN VIEW - SPOT REPAIR

SCALE: 1" : 50'

NOTES:

1. FOR TAP FACTORY OR TAP BREAK PLEASE SEE POSM REPORT.
2. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONTACT SERVICE ALERT 48 HOURS IN ADVANCE OF ANY EXCAVATION FOR THE MARK-OUT OF THE LOCATION OF UTILITIES AND OBTAIN A DIG ALERT IDENTIFICATION NUMBER PRIOR TO COMMENCEMENT OF WORK.
3. CONTRACTOR IS REQUIRED TO MAKE PRECAUTINDARY MEASURES TO PROTECT THE UTILITY LINES SHOWN HEREON AND ANY OTHER EXISTING LINES NOT OF RECORD OR NOT SHOW ON THESE PLANS.

#	KEY NOTES
1	STORM DRAIN PIPE
2	WATER MAIN
3	WATER VALVE
4	STORM DRAIN STRUCTURE

City of Morgan Hill
Engineering and Utilities Department
17575 Peak Ave. Morgan Hill, CA 95037

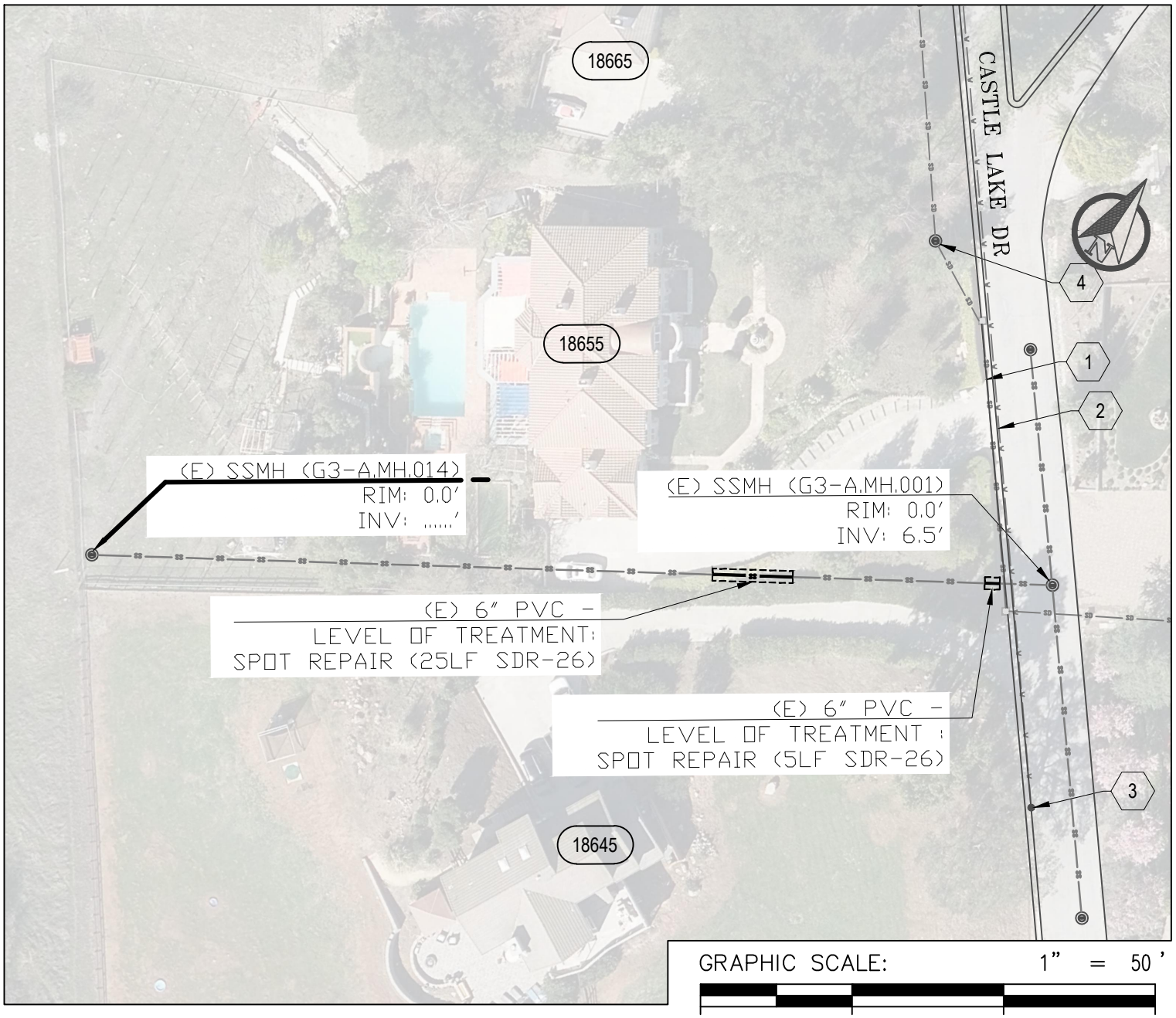
DRAWN BY: Name	**REVISION DATE:**
CHECKED BY: Y. CHO	**APPROVE DATE:** 10/12/22

2023 INFLOW AND INFILTRATION SEWER REPAIR PROJECT

8090 Tahoe Way. (PID#4152)

DRAWING NO.

EX-5



PLAN VIEW - SPOT REPAIR

SCALE: 1" : 50'

NOTES:

1. FOR TAP FACTORY OR TAP BREAK PLEASE SEE POSM REPORT.
2. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONTACT SERVICE ALERT 48 HOURS IN ADVANCE OF ANY EXCAVATION FOR THE MARK-OUT OF THE LOCATION OF UTILITIES AND OBTAIN A DIG ALERT IDENTIFICATION NUMBER PRIOR TO COMMENCEMENT OF WORK.
3. CONTRACTOR IS REQUIRED TO MAKE PRECAUTINDARY MEASURES TO PROTECT THE UTILITY LINES SHOWN HEREON AND ANY OTHER EXISTING LINES NOT OF RECORD OR NOT SHOW ON THESE PLANS.
4. CONTRACTOR TO CLEAN SEWER, REMOVE GREASE AND ROOTS, AND CCTV INSPECTION PER TECHNICAL SPECIFICATIONS. (319 LF) PRIOR TO ACTUAL WORK.

#	KEY NOTES
1	STORM DRAIN PIPE
2	WATER MAIN
3	WATER VALVE
4	STORM DRAIN STRUCTURE

City of Morgan Hill
Engineering and Utilities Department
17575 Peak Ave. Morgan Hill, CA 95037

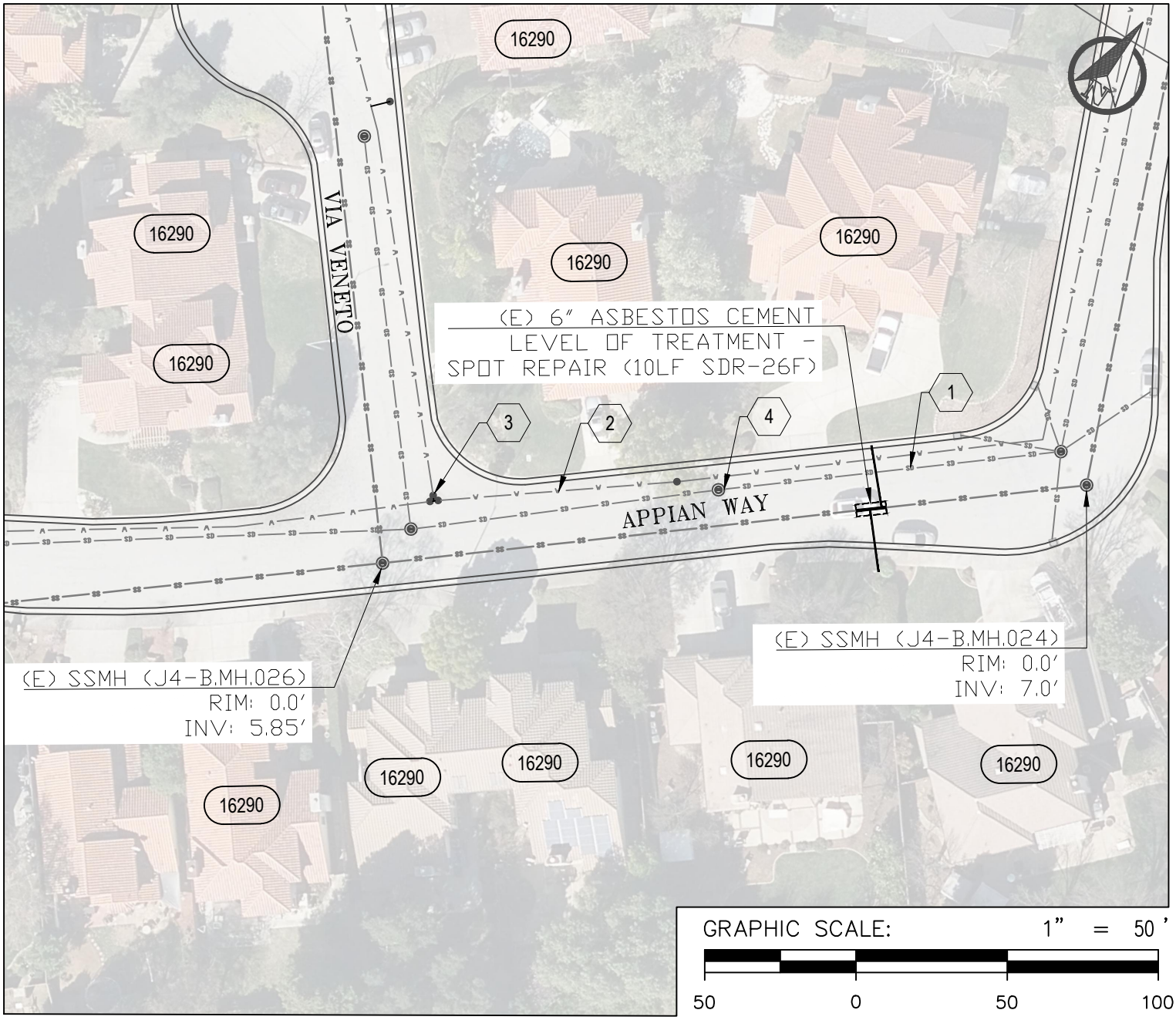
DRAWN BY: Name	**REVISION DATE:**
CHECKED BY: Y. CHO	**APPROVE DATE:** 10/12/22

2023 INFLOW AND INFILTRATION SEWER REPAIR PROJECT

18663 Castle Lake Dr. (PID#3812)

DRAWING NO.

EX-6



PLAN VIEW - OPEN TRENCH REPAIR

SCALE: 1" : 50'

NOTES:

1. FOR TAP FACTORY OR TAP BREAK PLEASE SEE POSM REPORT.
2. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONTACT SERVICE ALERT 48 HOURS IN ADVANCE OF ANY EXCAVATION FOR THE MARK-OUT OF THE LOCATION OF UTILITIES AND OBTAIN A DIG ALERT IDENTIFICATION NUMBER PRIOR TO COMMENCEMENT OF WORK.
3. CONTRACTOR IS REQUIRED TO MAKE PRECAUTINDARY MEASURES TO PROTECT THE UTILITY LINES SHOWN HEREON AND ANY OTHER EXISTING LINES NOT OF RECORD OR NOT SHOW ON THESE PLANS.

#	KEY NOTES
1	STORM DRAIN PIPE
2	WATER MAIN
3	WATER VALVE
4	STORM DRAIN STRUCTURE

City of Morgan Hill
Engineering and Utilities Department
17575 Peak Ave. Morgan Hill, CA 95037

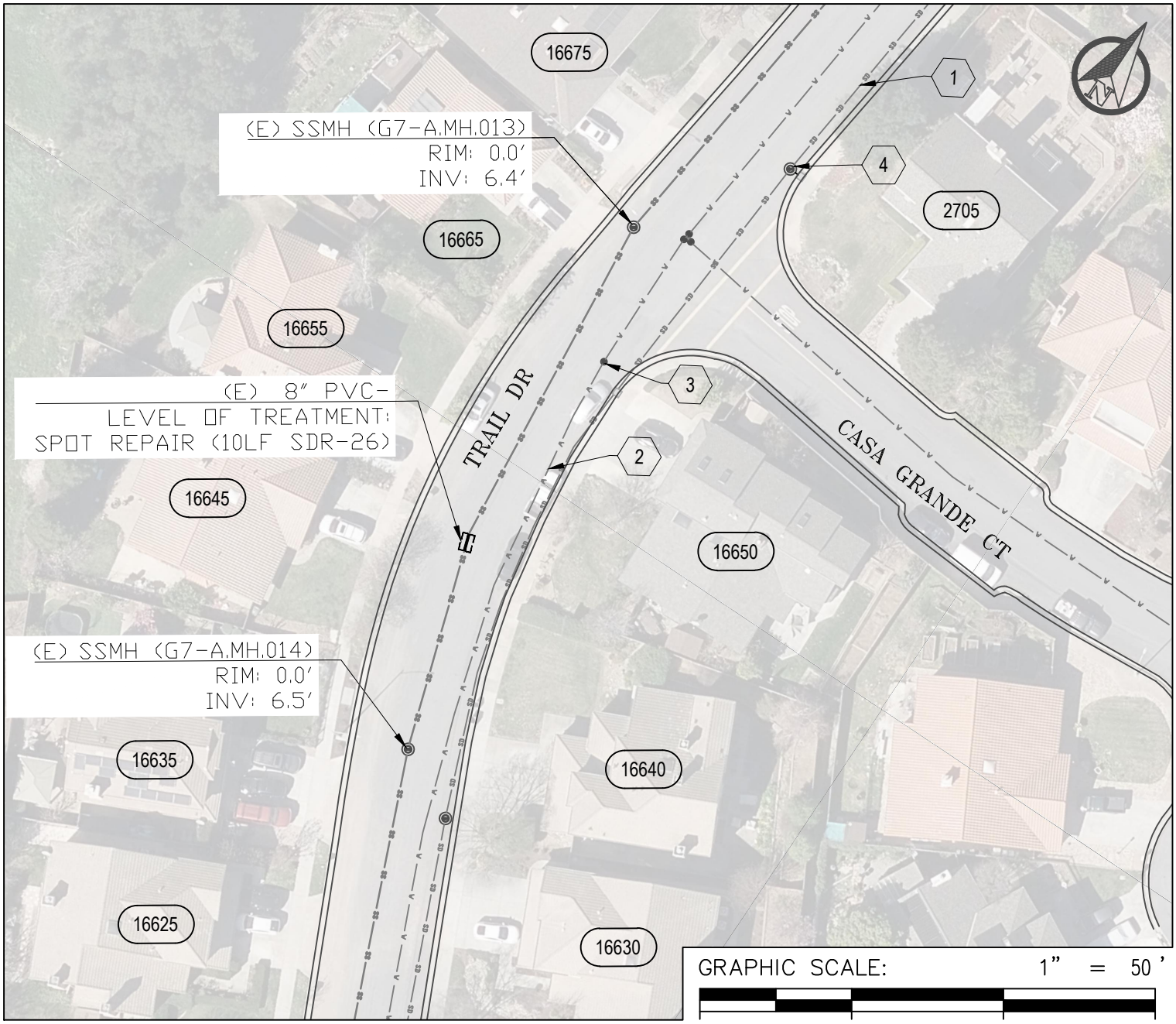
DRAWN BY: Name	**REVISION DATE:**
CHECKED BY: Y. CHO	**APPROVE DATE:** 10/12/22

2023 INFLOW AND INFILTRATION SEWER REPAIR PROJECT

1140 Appian Way. (PID#4139)

DRAWING NO.

EX-7



PLAN VIEW - SPOT REPAIR

SCALE: 1" : 50'

NOTES:

1. FOR TAP FACTORY OR TAP BREAK PLEASE SEE POSM REPORT.
2. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONTACT SERVICE ALERT 48 HOURS IN ADVANCE OF ANY EXCAVATION FOR THE MARK-OUT OF THE LOCATION OF UTILITIES AND OBTAIN A DIG ALERT IDENTIFICATION NUMBER PRIOR TO COMMENCEMENT OF WORK.
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#	KEY NOTES
1	STORM DRAIN PIPE
2	WATER MAIN
3	WATER VALVE
4	STORM DRAIN STRUCTURE

City of Morgan Hill
Engineering and Utilities Department
17575 Peak Ave. Morgan Hill, CA 95037

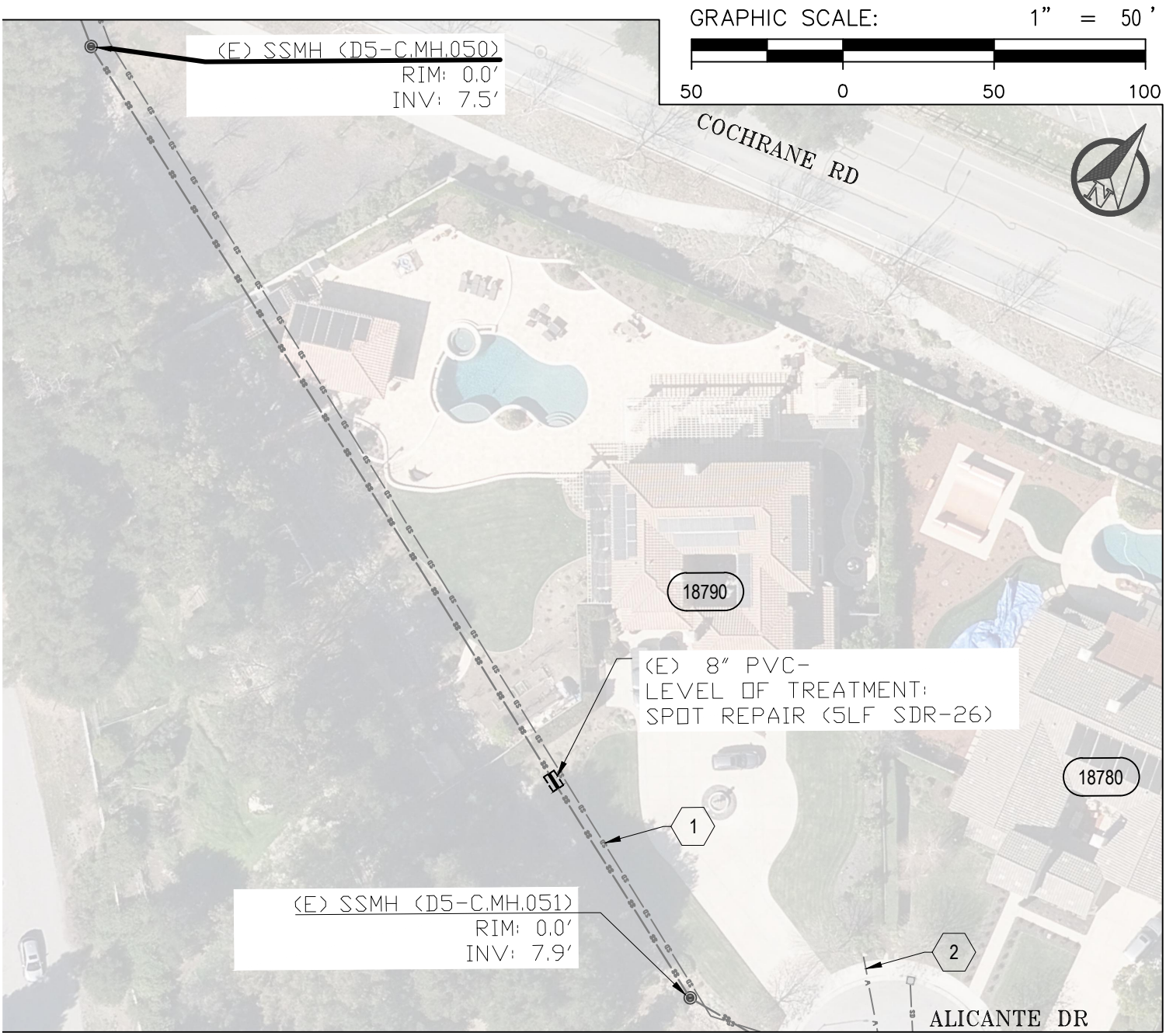
DRAWN BY: Name	**REVISION DATE:**
CHECKED BY: Y. CHO	**APPROVE DATE:** 10/12/22

2023 INFLOW AND INFILTRATION SEWER REPAIR PROJECT

16650 Trail Dr. (PID#4320)

DRAWING NO.

EX-8



PLAN VIEW - SPOT REPAIR

SCALE: 1" : 50'

NOTES:

1. FOR TAP FACTORY OR TAP BREAK PLEASE SEE POSM REPORT.
2. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONTACT SERVICE ALERT 48 HOURS IN ADVANCE OF ANY EXCAVATION FOR THE MARK-OUT OF THE LOCATION OF UTILITIES AND OBTAIN A DIG ALERT IDENTIFICATION NUMBER PRIOR TO COMMENCEMENT OF WORK.
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#	KEY NOTES
1	STORM DRAIN PIPE
2	WATER MAIN
3	WATER VALVE
4	STORM DRAIN STRUCTURE

City of Morgan Hill
Engineering and Utilities Department
17575 Peak Ave. Morgan Hill, CA 95037

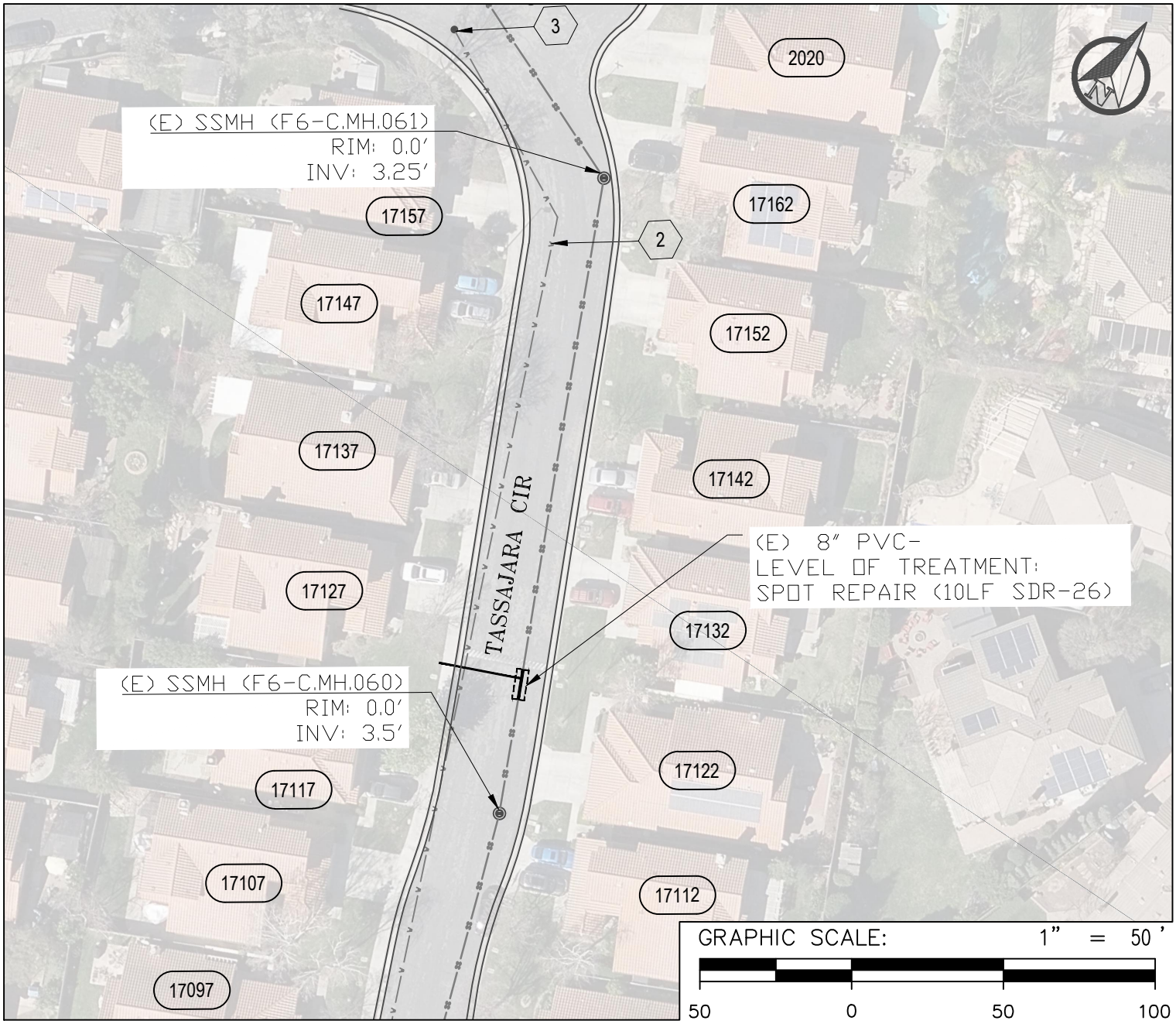
DRAWN BY: Name	REVISION DATE:
CHECKED BY: Y. CHO	APPROVE DATE: 10/12/22

2023 INFLOW AND INFILTRATION SEWER REPAIR PROJECT

18790 Alicante Cir. (PID#15704)

DRAWING NO.

EX-9



PLAN VIEW - OPEN TRENCH REPAIR

SCALE: 1" : 50'

NOTES:

1. FOR TAP FACTORY OR TAP BREAK PLEASE SEE POSM REPORT.
2. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONTACT SERVICE ALERT 48 HOURS IN ADVANCE OF ANY EXCAVATION FOR THE MARK-OUT OF THE LOCATION OF UTILITIES AND OBTAIN A DIG ALERT IDENTIFICATION NUMBER PRIOR TO COMMENCEMENT OF WORK.
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#	KEY NOTES
1	STORM DRAIN PIPE
2	WATER MAIN
3	WATER VALVE
4	STORM DRAIN STRUCTURE

City of Morgan Hill
Engineering and Utilities Department
17575 Peak Ave. Morgan Hill, CA 95037

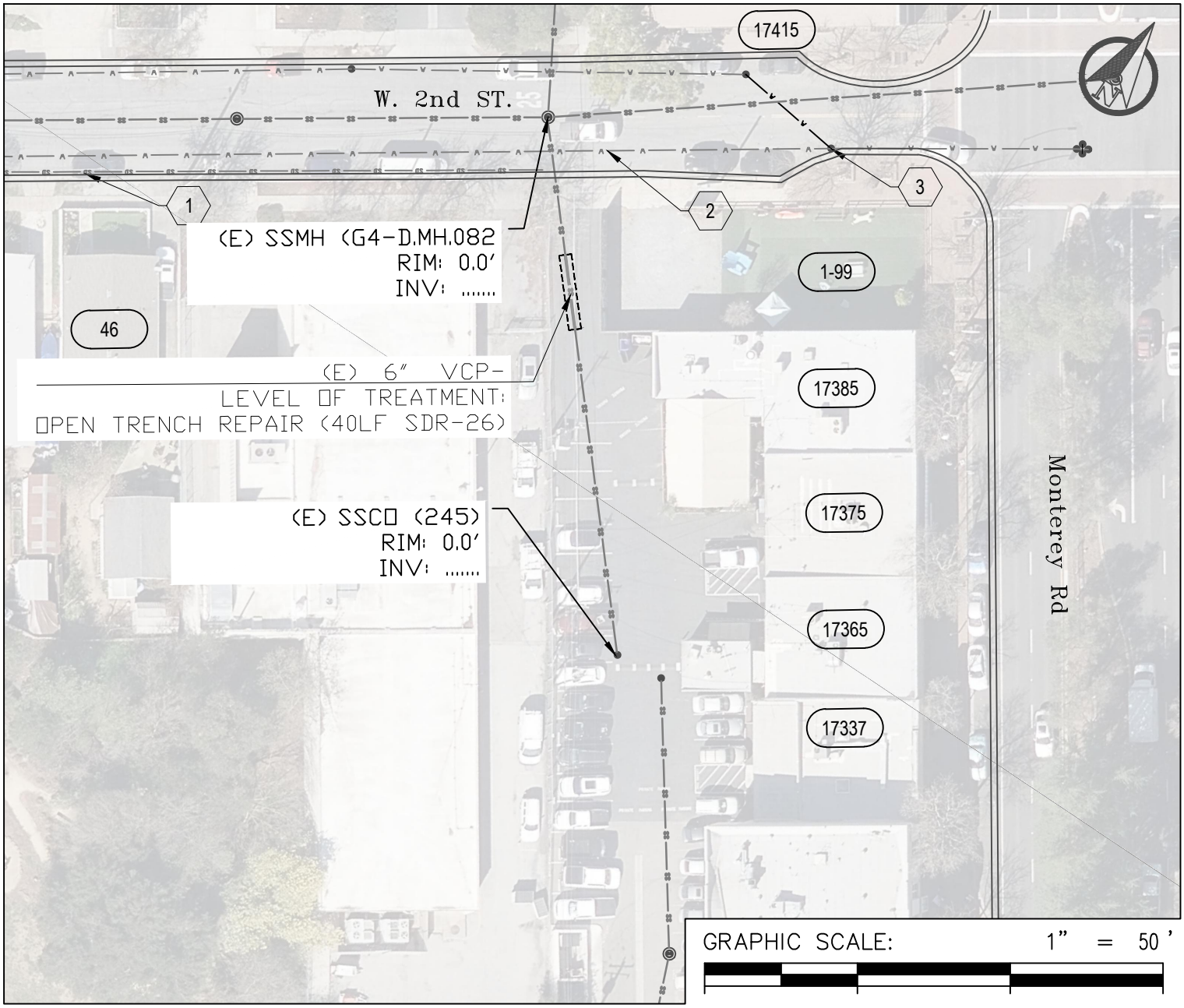
DRAWN BY: Name	**REVISION DATE:**
CHECKED BY: Y. CHO	**APPROVE DATE:** 10/12/22

2023 INFLOW AND INFILTRATION SEWER REPAIR PROJECT

Tassajara Cir. (PID#4253)

DRAWING NO.

EX-10



PLAN VIEW - OPEN TRENCH REPAIR

SCALE: 1" : 50'

NOTES:

1. FOR TAB FACTORY OR TAB BREAK PLEASE SEE POSM REPORT.
2. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONTACT SERVICE ALERT 48 HOURS IN ADVANCE OF ANY EXCAVATION FOR THE MARK-OUT OF THE LOCATION OF UTILITIES AND OBTAIN A DIG ALERT IDENTIFICATION NUMBER PRIOR TO COMMENCEMENT OF WORK.
3. CONTRACTOR IS REQUIRED TO MAKE PRECAUTINDARY MEASURES TO PROTECT THE UTILITY LINES SHOWN HEREON AND ANY OTHER EXISTING LINES NOT OF RECORD OR NOT SHOW ON THESE PLANS.
4. CONTRACTOR TO CLEAN SEWER, REMOVE GREASE AND ROOTS, AND CCTV INSPECTION PER TECHNICAL SPECIFICATIONS. (158 LF) PRIOR TO ACTUAL WORK.

#	KEY NOTES
1	STORM DRAIN PIPE
2	WATER MAIN
3	WATER VALVE
4	STORM DRAIN STRUCTURE

City of Morgan Hill
Engineering and Utilities Department
17575 Peak Ave. Morgan Hill, CA 95037

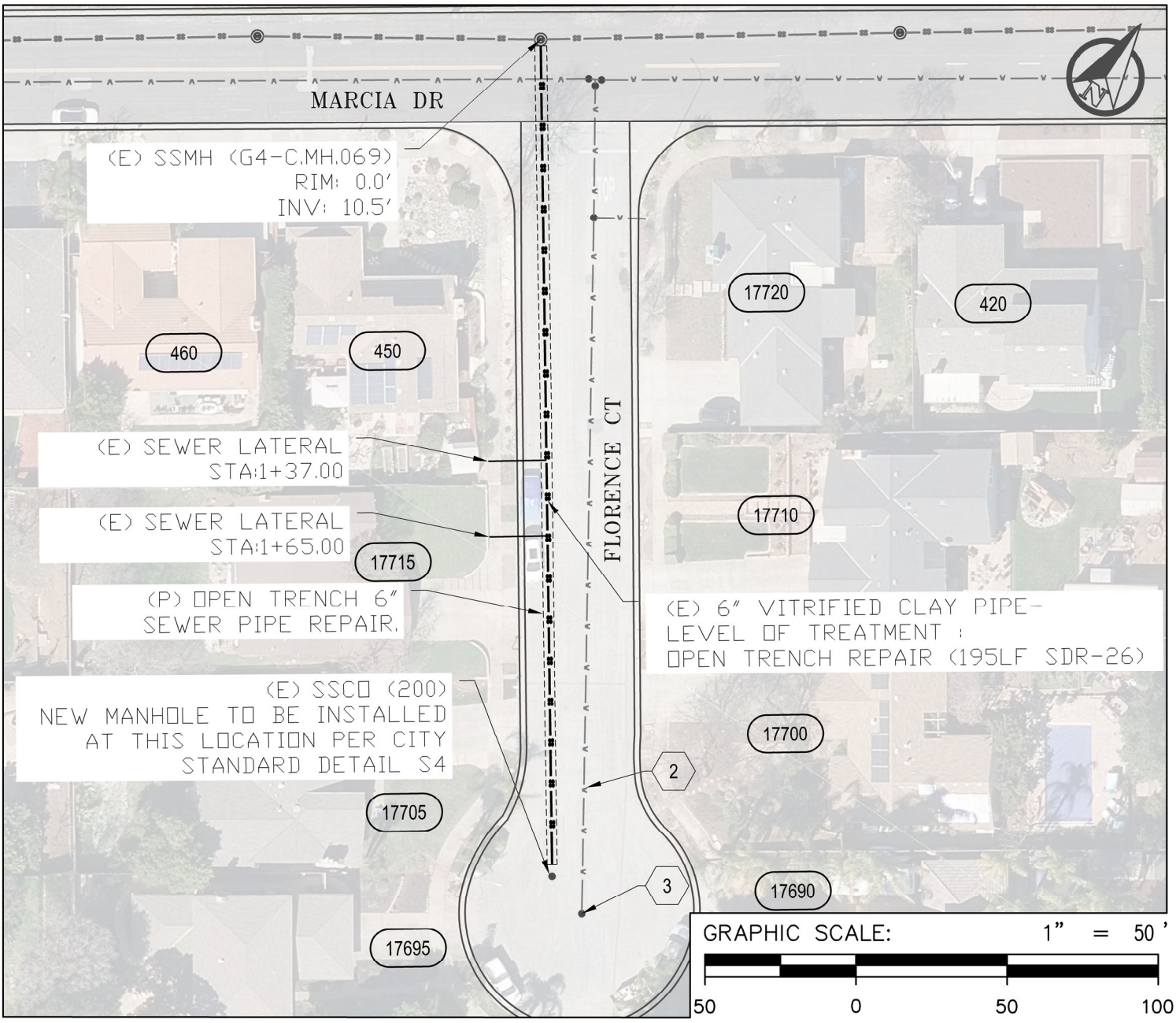
DRAWN BY: Name	**REVISION DATE:**
CHECKED BY: Y. CHO	**APPROVE DATE:** 10/12/22

2023 INFLOW AND INFILTRATION SEWER REPAIR PROJECT

13 W 2nd St. (PID#3737)

DRAWING NO.

EX-11



PLAN VIEW - OPEN TRENCH REPAIR

SCALE: 1" : 50'

NOTES:

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2. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONTACT SERVICE ALERT 48 HOURS IN ADVANCE OF ANY EXCAVATION FOR THE MARK-OUT OF THE LOCATION OF UTILITIES AND OBTAIN A DIG ALERT IDENTIFICATION NUMBER PRIOR TO COMMENCEMENT OF WORK.
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#	KEY NOTES
1	STORM DRAIN PIPE
2	WATER MAIN
3	WATER VALVE
4	STORM DRAIN STRUCTURE

City of Morgan Hill
Engineering and Utilities Department
17575 Peak Ave. Morgan Hill, CA 95037

DRAWN BY: Name	**REVISION DATE:**
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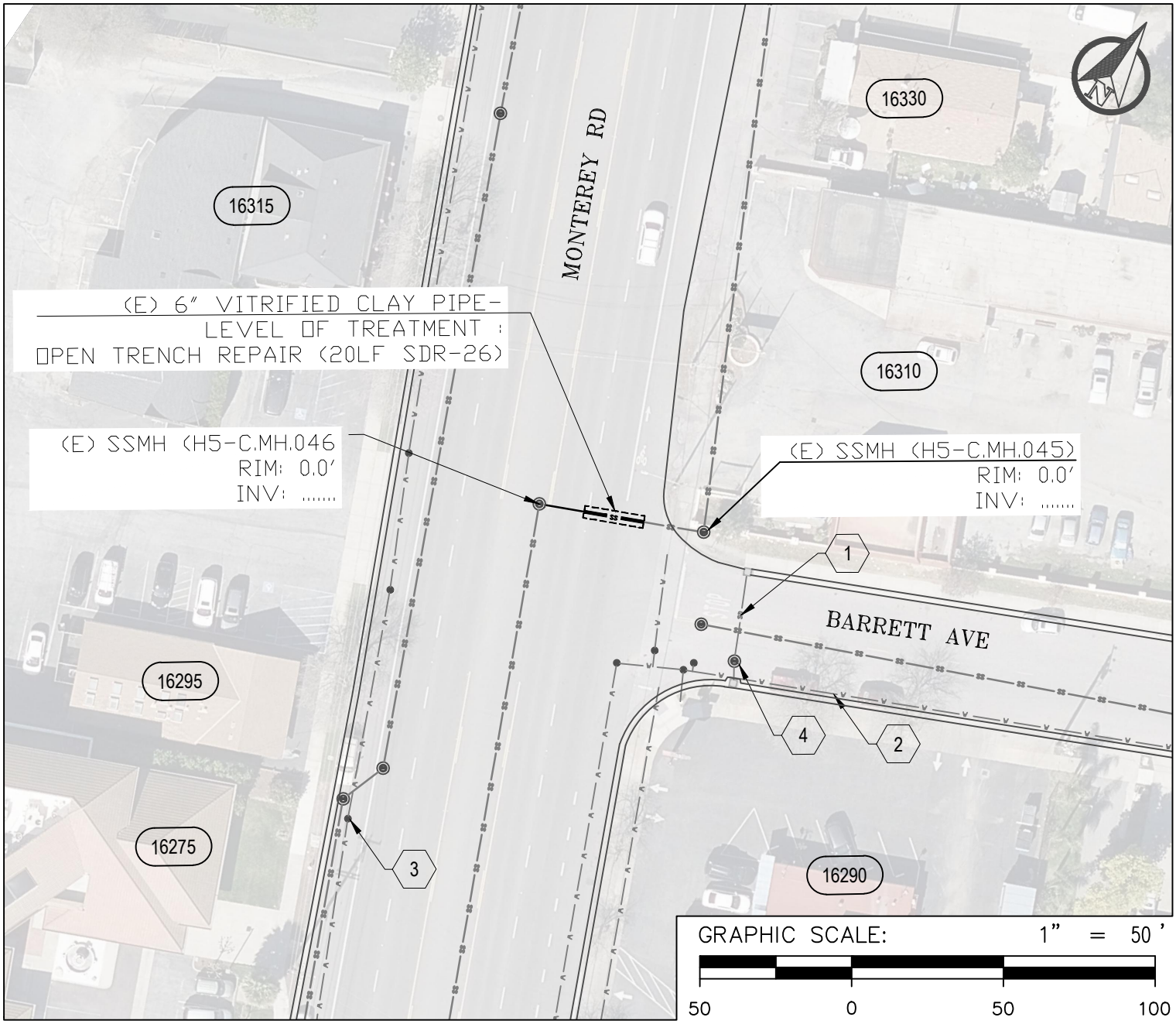
2023 INFLOW AND INFILTRATION SEWER REPAIR PROJECT

17799 Florence Ct. (PID#3702)

DRAWING NO.
EX-12



PLAN VIEW - OPEN TRENCH REPAIR

SCALE: 1" : 50'

NOTES:

1. FOR TAP FACTORY OR TAP BREAK PLEASE SEE POSM REPORT.
2. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONTACT SERVICE ALERT 48 HOURS IN ADVANCE OF ANY EXCAVATION FOR THE MARK-OUT OF THE LOCATION OF UTILITIES AND OBTAIN A DIG ALERT IDENTIFICATION NUMBER PRIOR TO COMMENCEMENT OF WORK.
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4	STORM DRAIN STRUCTURE

City of Morgan Hill
Engineering and Utilities Department
17575 Peak Ave. Morgan Hill, CA 95037

DRAWN BY: Name	**REVISION DATE:**
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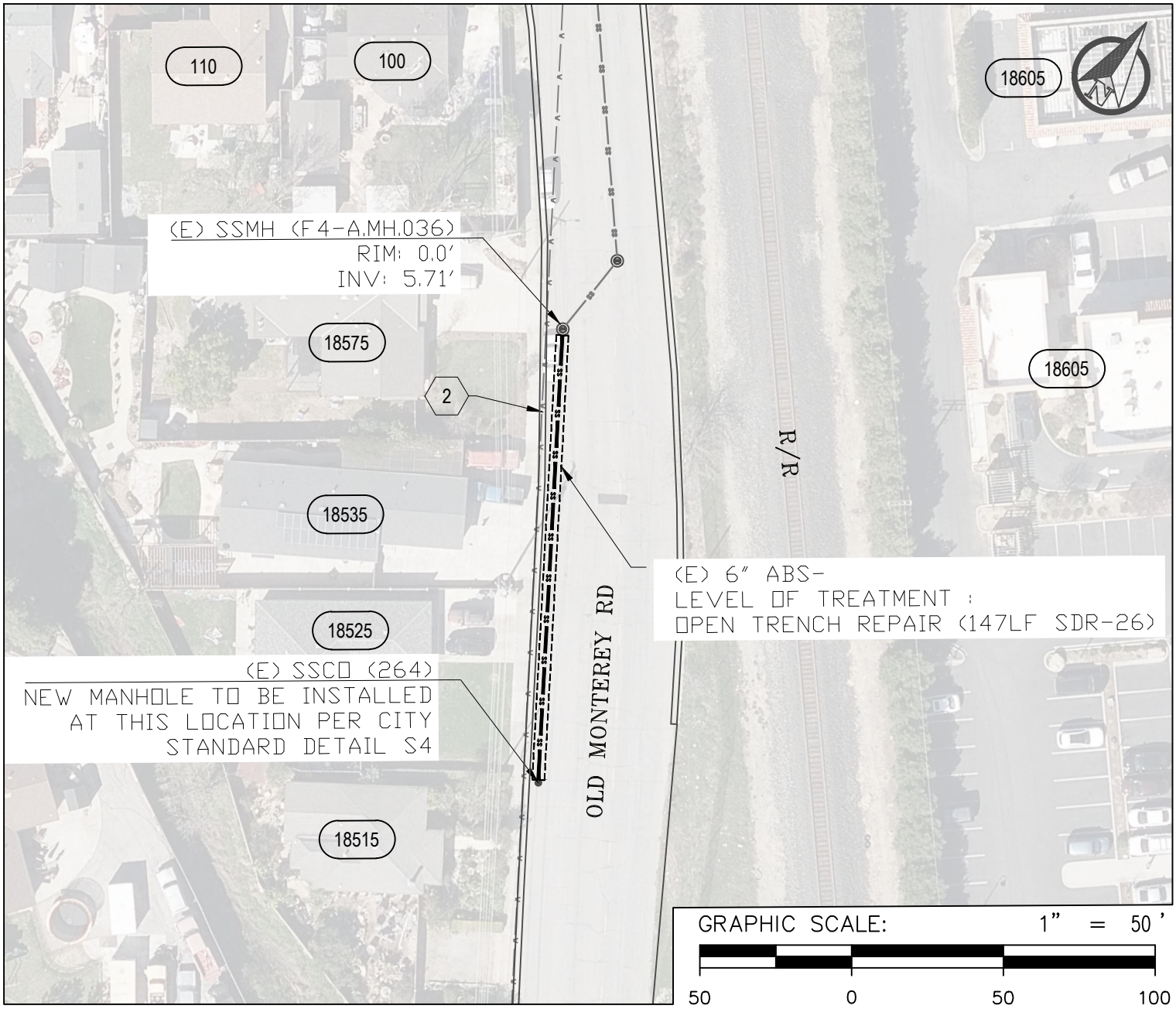
2023 INFLOW AND INFILTRATION SEWER REPAIR PROJECT

16310 Monterey Rd. (PID#3935)

DRAWING NO.

EX-13



PLAN VIEW - OPEN TRENCH REPAIR

SCALE: 1" : 50'

NOTES:

1. FOR TAP FACTORY OR TAP BREAK PLEASE SEE POSM REPORT.
2. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONTACT SERVICE ALERT 48 HOURS IN ADVANCE OF ANY EXCAVATION FOR THE MARK-OUT OF THE LOCATION OF UTILITIES AND OBTAIN A DIG ALERT IDENTIFICATION NUMBER PRIOR TO COMMENCEMENT OF WORK.
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4. CONTRACTOR TO CLEAN SEWER, REMOVE GREASE AND ROOTS, AND CCTV INSPECTION PER TECHNICAL SPECIFICATIONS. (147 LF) PRIOR TO ACTUAL WORK.

#	KEY NOTES
1	STORM DRAIN PIPE
2	WATER MAIN
3	WATER VALVE
4	STORM DRAIN STRUCTURE

City of Morgan Hill
Engineering and Utilities Department
17575 Peak Ave. Morgan Hill, CA 95037

DRAWN BY: Name	**REVISION DATE:**
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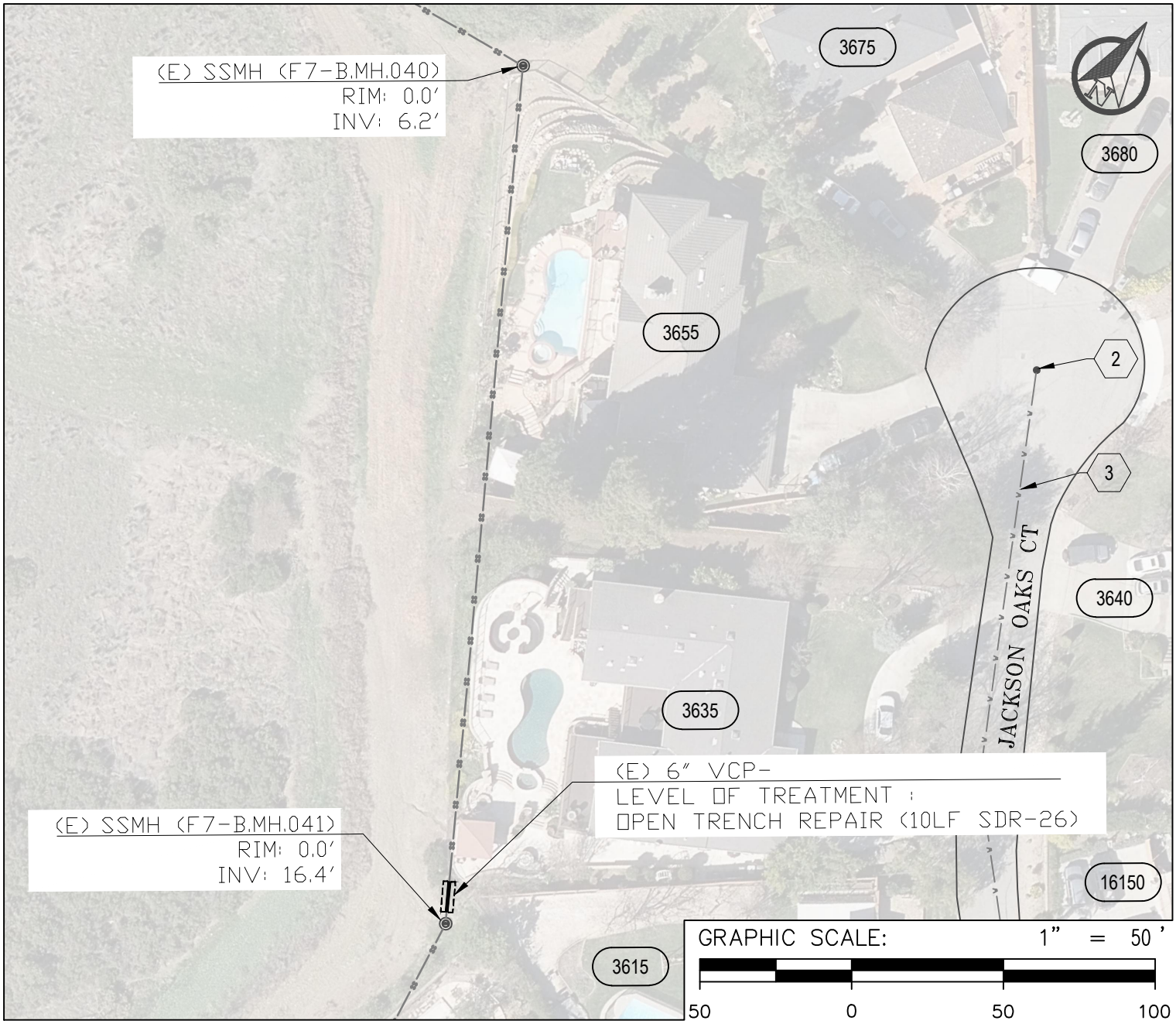
2023 INFLOW AND INFILTRATION SEWER REPAIR PROJECT

18525 Old Monterey Rd. (PID#3596)

DRAWING NO.

EX-14



PLAN VIEW - OPEN TRENCH REPAIR

SCALE: 1" : 50'

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City of Morgan Hill
Engineering and Utilities Department
17575 Peak Ave. Morgan Hill, CA 95037

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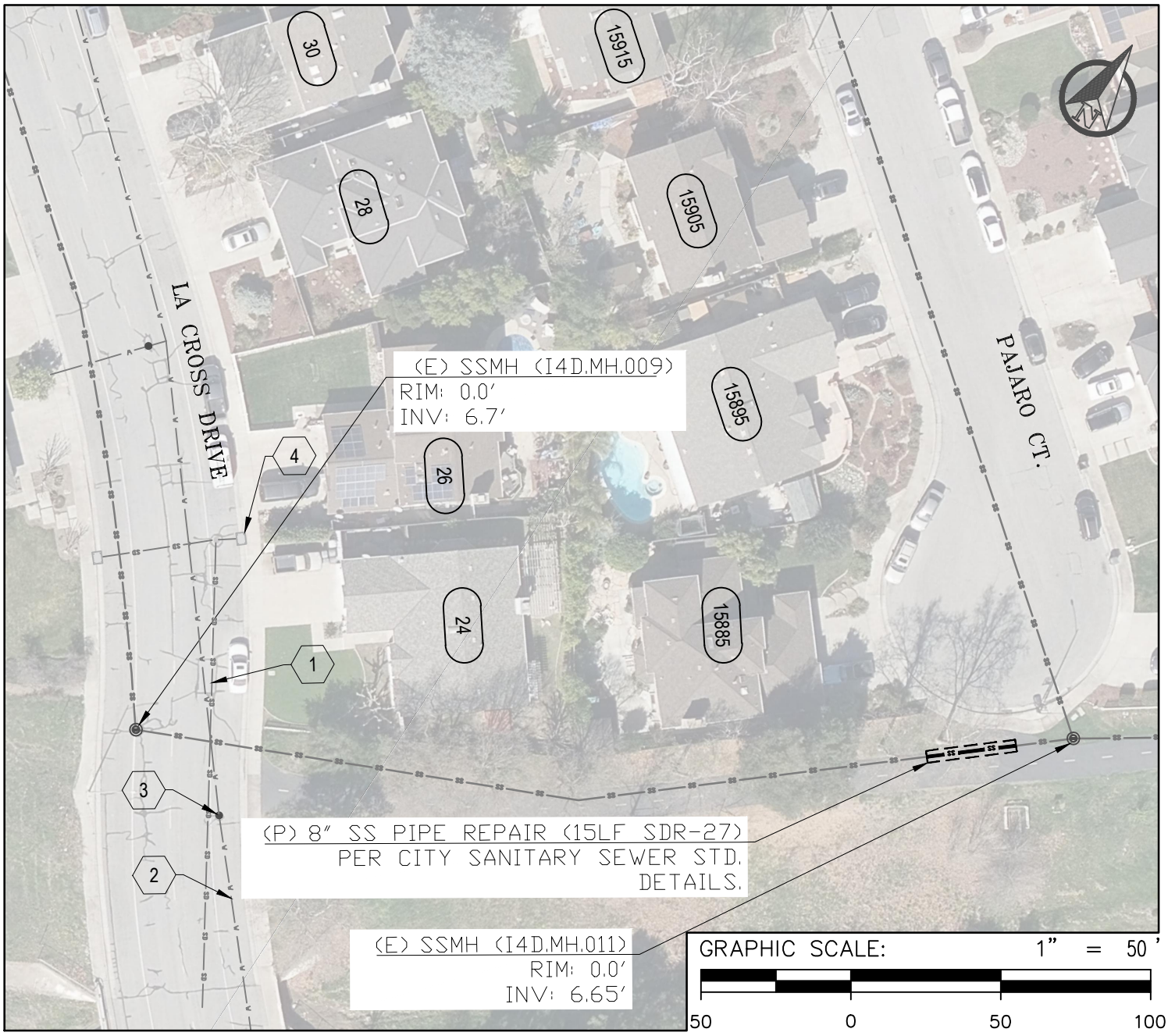
2023 INFLOW AND INFILTRATION SEWER REPAIR PROJECT

Jackson Oaks Ct. (PID#4787)

DRAWING NO.

EX-15



PLAN VIEW - OPEN TRENCH REPAIR

SCALE: 1" : 50'

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City of Morgan Hill
Engineering and Utilities Department
17575 Peak Ave. Morgan Hill, CA 95037

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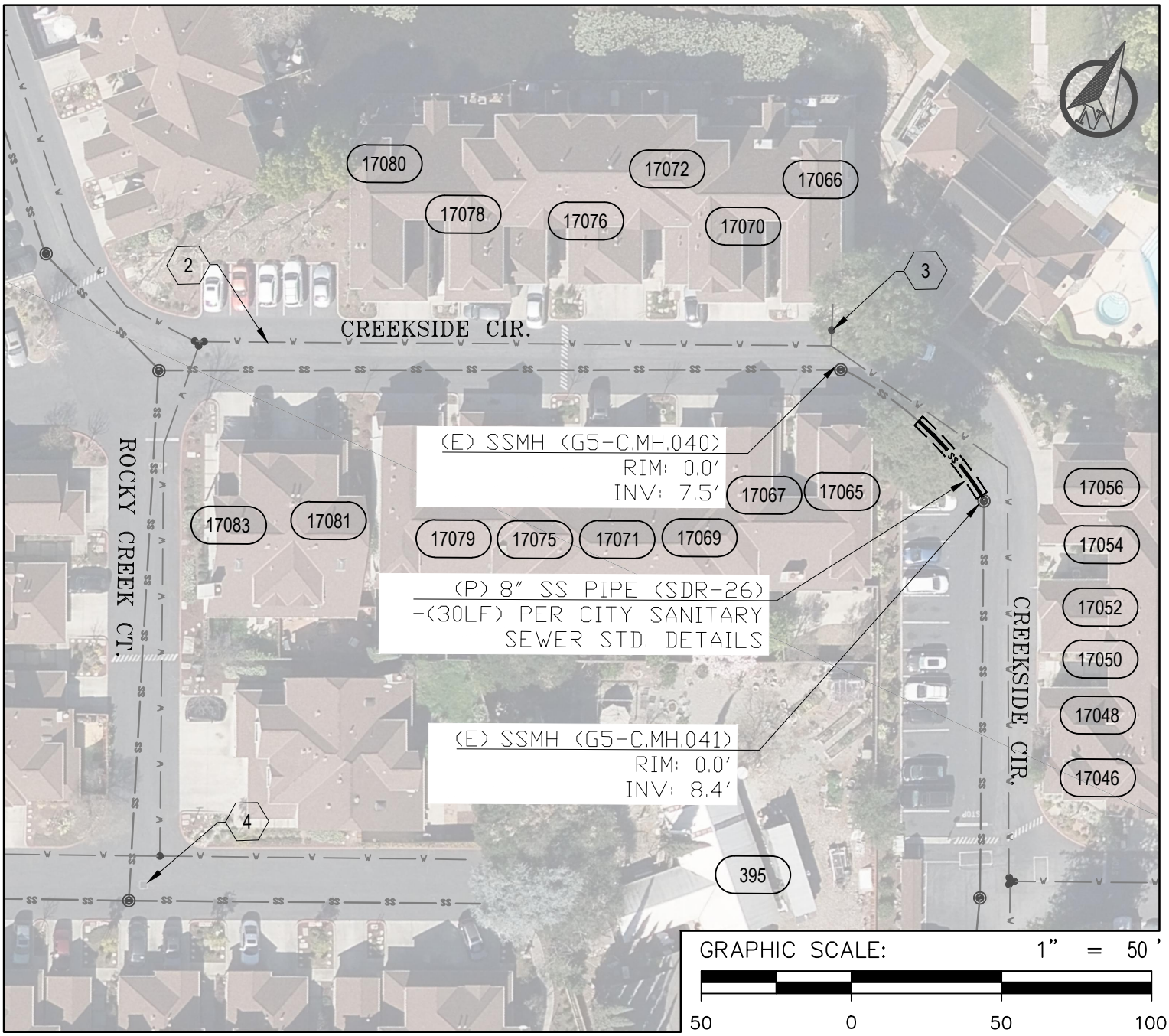
2023 INFLOW AND INFILTRATION SEWER REPAIR PROJECT

EI PAJARO CT. @ TRAIL (PID#4077)

DRAWING NO.
EX-16



PLAN VIEW - OPEN TRENCH REPAIR

SCALE: 1" : 50'

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City of Morgan Hill
Engineering and Utilities Department
17575 Peak Ave. Morgan Hill, CA 95037

DRAWN BY: Name	**REVISION DATE:**
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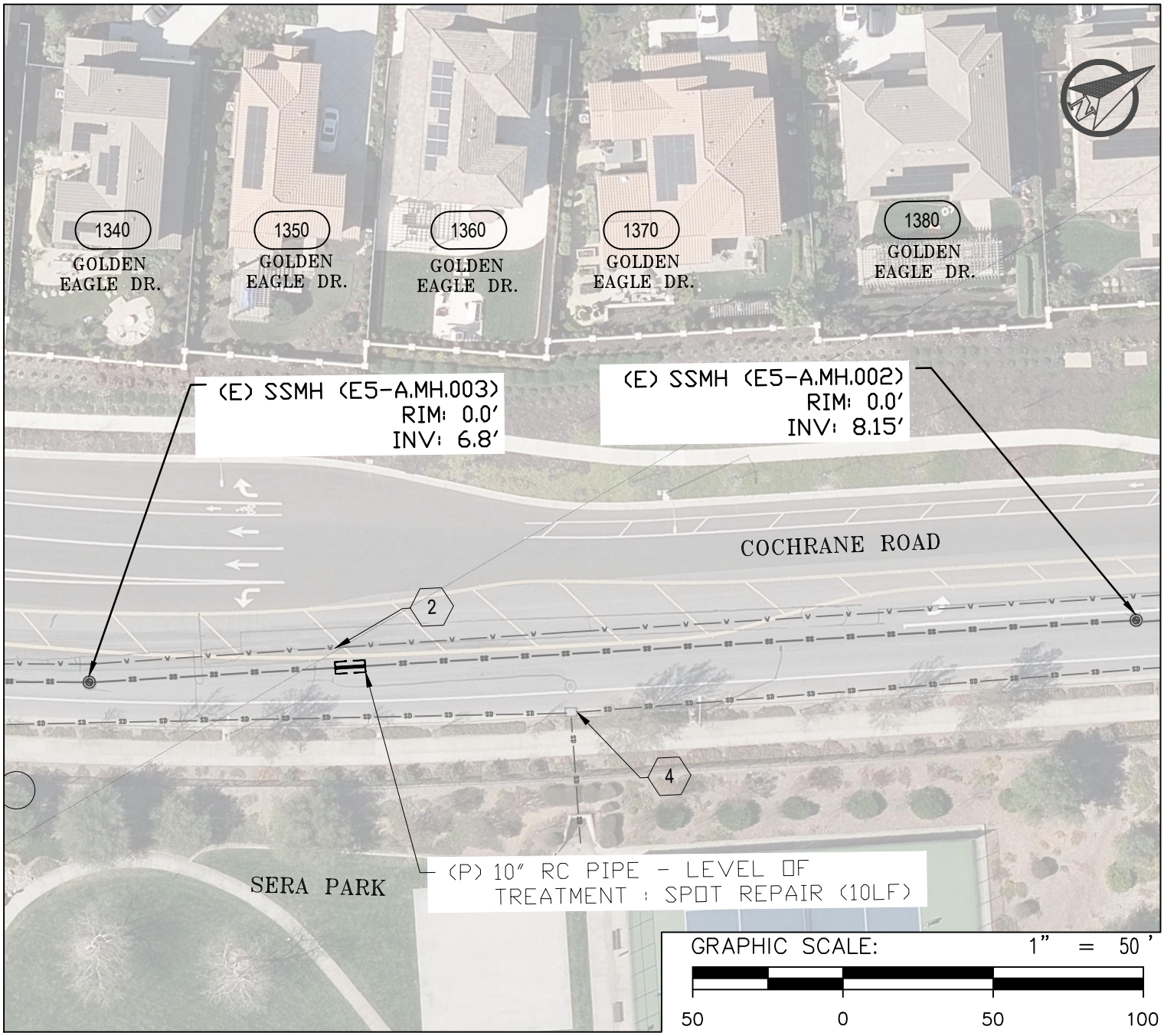
2023 INFLOW AND INFILTRATION SEWER REPAIR PROJECT

17065 CREEKSIDE CIR. (PID#4055)

DRAWING NO.

EX-17



PLAN VIEW - OPEN TRENCH REPAIR

SCALE: 1" : 50'

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17575 Peak Ave. Morgan Hill, CA 95037

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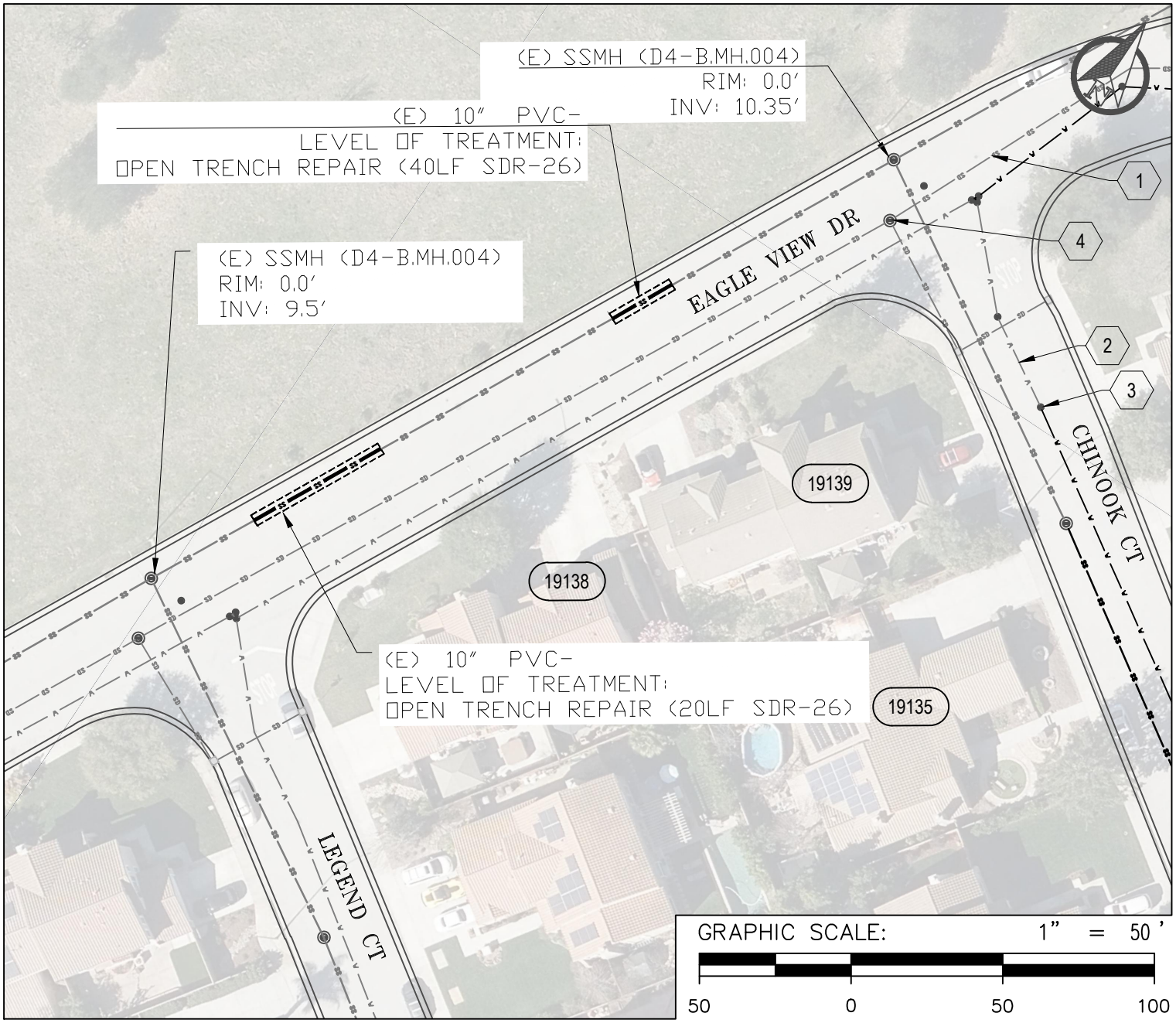
2023 INFLOW AND INFILTRATION SEWER REPAIR PROJECT

COCHRANE ROAD @ SERA PARK (PID#6507)

DRAWING NO.

EX-18



PLAN VIEW - OPEN TRENCH REPAIR

SCALE: 1" : 50'

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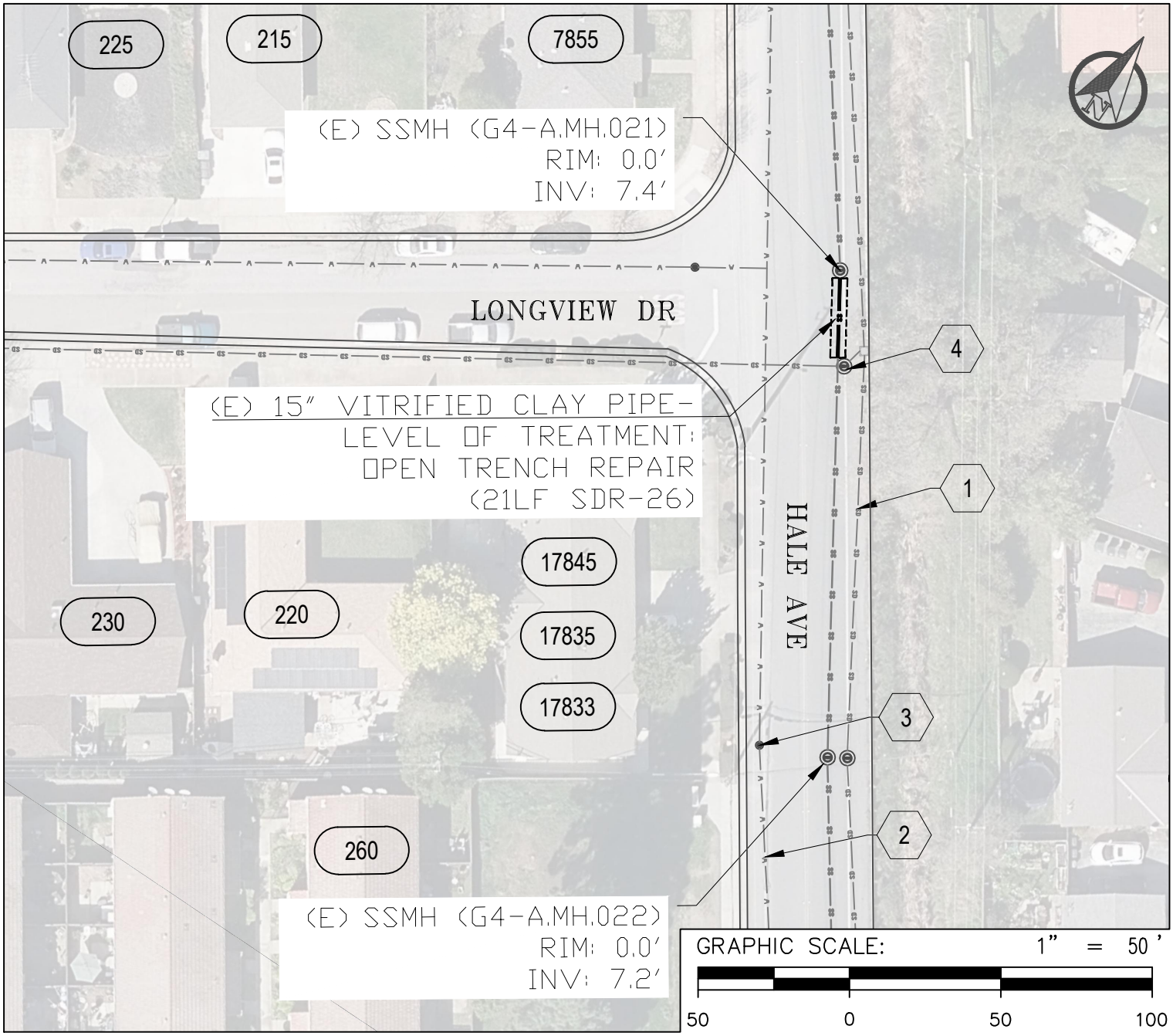
2023 INFLOW AND INFILTRATION SEWER REPAIR PROJECT

Eagle View Dr. & Legend Ct. (PID#4644)

DRAWING NO.

EX-19



PLAN VIEW - OPEN TRENCH REPAIR

SCALE: 1" : 50'

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2023 INFLOW AND INFILTRATION SEWER REPAIR PROJECT

Hale Ave. (PID#3677)

DRAWING NO.

EX-20