

INVITATION FOR BIDS



FOR CONSTRUCTING

LLANO TRUNK LINING – W COLLEGE UTILITIES FACILITY

CONTRACT NUMBER

C02042

ISSUED BY

CAPITAL PROJECTS ENGINEERING DIVISION

CITY OF SANTA ROSA, CALIFORNIA

2019

ATTENTION
Prebid Conference
See Page 1



STATE OF CALIFORNIA

INVITATION FOR BIDS

CONTAINING:

NOTICE TO BIDDERS

SPECIAL PROVISIONS

BID FORMS

CONTRACT

FOR

**LLANO TRUNK LINING – W COLLEGE UTILITIES
FACILITY**

Contract No. C02042

LLANO TRUNK LINING – W COLLEGE UTILITIES

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CITY OF SANTA ROSA
STATE OF CALIFORNIA

NOTICE TO BIDDERS

➤	For technical questions regarding this project, contact Tracy Duenas at (707) 543-3952.
➤	For direct access to plans, specifications and planholders' lists, go to www.srcity.org/bids and click on <u>Bid/Proposal Opportunities</u> or call (707) 543-3800.
➤	For direct access to bid results, go to www.srcity.org/bids . Under Link to Capital Projects, click on <u>Capital Projects Contracts</u> or call (707) 543-3835.

- IMPORTANT -

Bid Acceptance Deadline

Sealed bids will be accepted at the Transportation and Public Works Department, 69 Stony Circle, Santa Rosa, California 95401 until 10:00 a.m., May 21, 2019, for Llano Trunk Lining – W College Utilities Facility, Contract No. C02042. (Engineer's Estimate: \$1,700,369.00)

Bids tendered after this deadline will not be accepted. The official time clock for accepting bids will be an electric date and time stamping clock, located in the Transportation and Public Works Department, 69 Stony Circle, Santa Rosa, California. In order to be accepted, bids must be received prior to 2:00 p.m. Therefore, a bid stamped in at 1:59 p.m. will be accepted, but one delivered at or after 2:00 p.m. is late and will not be accepted.

Pre-Bid Meeting

Prospective bidders, subcontractors, and material suppliers are invited to attend a pre-bid meeting scheduled to be held at 10:00 a.m., May 13, 2019, in the Transportation and Public Works Department located at 69 Stony Circle, Santa Rosa, California.

Subcontractor Information; Department of Industrial Relations Registration

Bidders shall provide the names, business addresses and license numbers of all subcontractors listed on bidder's List of Subcontractors. No contractor or subcontractor may be listed on a bid for this public works project unless registered with the Department of Industrial Relations (DIR) pursuant to Labor Code section 1725.5. No contractor or subcontractor may be awarded a contract for this public works project unless registered with the DIR pursuant to Labor Code section 1725.5. This public works project is subject to compliance monitoring and enforcement by the DIR.

**CITY OF SANTA ROSA
ESTIMATED QUANTITIES
LLANO TRUNK LINING - W COLLEGE UTILITIES FACILITY**

Item No.	Description	Quantity	Units
1	CONTRACT EXECUTION INCENTIVE (I)	1	LS
2	MOBILIZATION AND DEMOBILIZATION	1	LS
3	TRAFFIC CONTROL	1	LS
4	POTHOLING	1	LS
5	UTILITY CONFLICT RESOLUTION	1	FA
6	SEAL COAT- UFO	11,830	SF
7	PERMANENT TRENCH PAVING	27	TON
8	MANHOLE REHABILITATION - EPOXY LINING	4	EA
9	JUNCTION STRUCTURE REHABILITATION - POLYURETHANE LINING - UFO	1	EA
10	MANHOLE REHABILITATION - POLYURETHANE LINING - NORTH FULTON	1	EA
11	BRACING AND SHORING	1	LS
12	MANHOLE FRAME AND BOLT-DOWN LID	4	EA
13	MANHOLE GRADE RINGS, FRAME AND BOLT - DOWN LID	2	EA
14	36" PRE-CIPP REHABILITATION CCTV INSPECTION	120	LF
15	48" PRE-CIPP REHABILITATION CCTV INSPECTION	1,998	LF
16	36" POST-CIPP REHABILITATION CCTV INSPECTION	60	LF
17	48" POST-CIPP REHABILITATION CCTV INSPECTION - UFO	386	LF
18	48" POST-CIPP REHABILITATION CCTV INSPECTION - NORTH FULTON	613	LF
19	36" PRE-CIPP SEWER CLEANING	60	LF
20	48" PRE-CIPP SEWER CLEANING	999	LF
21	48" PRE-CIPP SEWER HEAVY CLEANING - NORTH FULTON	613	LF
22	48" PRE-CIPP MAN ENTRY INSPECTION AND REPORTING- NORTH FULTON	1	LS
23	36" CIPP LINER REHABILITATION - II2717MH3 TO II2717MH58 - UFO	60	LF
24	48" CIPP LINER REHABILITATION - II2717MH3 TO II2712MH1 - UFO	386	LF
25	48" CIPP LINER REHABILITATION - II2712MH1 TO II2712MH3 - NORTH FULTON	613	LF
26	SANITARY SEWER BYPASS	1	LS

The foregoing quantities are approximate only, being given as a basis for the comparison of bids, and the City of Santa Rosa does not expressly or by implication, agree that the actual amount of work will correspond therewith, but reserves the right to increase or decrease the amount of any class or portion of the work, as may be deemed necessary or expedient by the Engineer.

Bids shall be made in accordance with the prevailing hourly rate of per diem wages for this locality and project as determined by the Director of the DIR pursuant to Labor Code sections 1770 *et seq.*

Contractor shall be responsible for compliance with the Immigration Reform Control Act of 1986.

If the project requires the employment of workers in any apprenticeable craft or trade, once awarded, Contractor and subcontractors must apply to the Joint Apprenticeship Council unless already covered by local apprentice standards (see Labor Code section 1777.5).

All bids are to be compared on the basis of the Engineer's estimate of the quantities of work to be performed. No bid will be awarded to a contractor who is not licensed in accordance with the provisions of Chapter 9 of Division 3 of the Business and Professions Code. Contractor must hold a Class A license for this project.

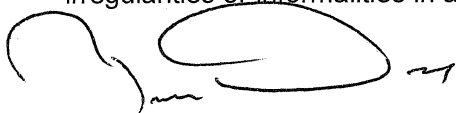
Project plans, bid and contract forms for C02042 Llano Trunk Lining – W College Utilities Facility may be obtained through PlanetBids at www.srcity.org/bids. These documents can no longer be obtained at the Transportation and Public Works Department.

No bid will be accepted unless it is made on the contract bid forms furnished by the Transportation and Public Works Department through PlanetBids. The original of the completed bid forms bearing original signatures must be submitted. A bid will not be accepted unless the bidder registers as a vendor through PlanetBids at www.srcity.org/bids, downloads documents/attachments, and is added to the prospective bidders list for this project. If there is an addendum, bidders must log into PlanetBids and acknowledge the addendum to be eligible for bidding.

The successful bidder will be required to hold a current City of Santa Rosa business tax certificate issued pursuant to Chapter 6.04 of the Santa Rosa City Code before commencing work on this project. For information regarding the business tax, contact Revenue and Collections at (707) 543-3170.

For any moneys earned by Contractor and withheld by the City of Santa Rosa to ensure the performance of the Contract, Contractor may, at its request and expense, substitute securities equivalent to the amount withheld in the form and manner and subject to the conditions provided in Section 22300 of the California Public Contract Code.

The City of Santa Rosa reserves the right to reject any or all bids and the right to waive minor irregularities or informalities in any bid or bonds.



TRACY DUENAS
Supervising Engineer

5/7/19

Date

SPECIAL PROVISIONS

General Specifications

CITY OF SANTA ROSA, CALIFORNIA

LLANO TRUNK LINING – W COLLEGE UTILITIES FACILITY

1 GENERAL

The work described herein shall be done in accordance with the “Contract Documents,” which are the:

1. Special Provisions
2. Project Exhibits, consisting of 6 sheets entitled Llano Trunk Lining – W College Utilities Facility, 2019-0025
3. City of Santa Rosa Design and Construction Standards (City Standards)
4. City of Santa Rosa Construction Specifications for Public improvements (City Specifications)
5. State of California Department of Transportation Standard Specifications 2010 (Standard Specifications), and
6. State of California Department of Transportation Standard Plans 2010 (Standard Plans).

In the event of a conflict in any of these documents, the order of precedence shall be determined by Section 5-1.02 of these Special Provisions.

Whenever the Standard Specifications use the terms State of California, Department of Transportation, Director, Engineer, or Laboratory, the following terms shall be substituted therefor, and any reference to any of the foregoing terms shall be understood and interpreted to mean and refer to such substituted terms as follows:

For State of California - the City of Santa Rosa;

For Department - the City of Santa Rosa Department of Transportation and Public Works or the City of Santa Rosa Water Department;

For Director - the City Engineer of the City of Santa Rosa;

For Engineer - the City Engineer of the City of Santa Rosa or the City Engineer's authorized agents;

For Laboratory – Materials Engineering of the City of Santa Rosa Water Department, or such other laboratory as may be authorized by the City.

Unless otherwise provided, whenever in these Special Provisions attention is directed to specific provisions in the Standard Specifications, such direction shall not be interpreted as excluding other applicable provisions of the Standard Specifications.

Unless otherwise provided, when sections and subsections of the Standard Specifications are used in these Special Provisions, such use is not exclusive and shall not be interpreted as excluding other applicable provisions of said sections and subsections, but is only intended to add to or modify such sections or subsections.

Unless otherwise provided, full compensation for compliance with these Special Provisions is included in the contract price and no additional allowance will be made to Contractor therefor.

The Standard Specifications are hereby modified to delete any reference or incorporation of provisions providing for or requiring arbitration of any and all claims and disputes arising under this contract.

2 BIDDING

2-1.06 Bid Documents: Prospective bidders will be furnished with an Invitation for Bids which will state the location and description of the contemplated public works project and will show the approximate estimate of the various quantities and kinds of work to be performed and materials to be furnished with a schedule of items for which unit prices are requested.

2-1.07 Approximate Estimate: The quantities given in the Contract Documents are approximate only, being given as a basis for the comparison of bids, and the City does not, expressly or by implication, agree that the actual amount of work will correspond therewith, but reserves the right to increase or decrease the amount of any class or part of the work or to omit parts of the work, as may be deemed necessary or advisable by the Engineer.

2-1.31 Examination of Project Plans, Specifications, City Standards, Invitation for Bids and Work Site: Prior to submitting a bid, the bidder shall carefully examine the Project Plans, Invitation for Bids, City Standards and the proposed work site. If any person contemplating submitting a bid for this public works project is in doubt as to the meaning of any part of the Contract Documents, or finds discrepancies in or omissions from the Contract Documents, he or she may submit a written request for interpretation or correction to the Engineer. The written request must be received by the Engineer a minimum of 96 hours prior to bid opening. Any interpretation or correction of the Contract Documents prior to bid opening will be made only by written addendum issued by the City. Notification of addenda will be handled through PlanetBids: the listed primary contact will receive an e-mail generated by PlanetBids informing them of a recently uploaded addendum. The City will not be bound by any other explanations or interpretations of the Contract Documents.

2-1.33 Bid Document Completion: Any references to Opt Out of Payment Adjustments for Price Index Fluctuations in the Standard Specifications are deleted in their entirety.

2-1.33A Bid Forms: All bids shall be made on bid forms obtained from PlanetBids at www.srcity.org/bids. The bidder shall submit its bid on the original bid forms furnished by the City. Bids submitted on forms other than the forms furnished to the bidder by the City will not be considered.

The bid forms to be submitted at the time of and with the bid are:

1. Unit Price Schedule
2. List of Subcontractors
3. List of Previous Similar Jobs
4. Noncollusion Declaration
5. Bid Guaranty Information and Bidder's Information and Signature
6. Bid Guaranty (Bid Bond or alternate security)

All bids shall give the proposed prices and must bear the original signature of the bidder. Bidders shall fill in all blanks on the bid forms where required. A bid will not be accepted unless the bidder registers as a vendor through PlanetBids at www.srcity.org/bids, downloads documents/attachments, and is added to the prospective bidders list for this project. If there is an addendum, bidders must log into PlanetBids and acknowledge the addendum to be eligible for bidding.

2-1.33B Registration with DIR: No contractor or subcontractor may be listed on a bid for this public works project unless registered with the Department of Industrial Relations (DIR) pursuant to Labor Code section 1725.5. No contractor or subcontractor may be awarded a contract for this

public works project unless registered with the DIR pursuant to Labor Code section 1725.5. This public works project is subject to compliance monitoring and enforcement by the DIR.

2-1.33C Subcontractors: The Subletting and Subcontracting Fair Practices Act, Public Contract Code sections 4100-4113, inclusive (the "Act") shall apply to all subcontracts in excess of one-half of one percent of the total amount of a bid. The Act requires subcontractors, if used for such work, to be listed in the contractor's bid and prohibits the substitution of subcontractors, except as authorized by the Act. Each bidder shall, with respect to the work of any subcontractor in excess of one-half of one percent of the total amount of the bid, include as part of the bid on the bid form provided:

1. The name, business address and DIR registration number of each subcontractor who will perform work or labor or render services to the Contractor in or about the construction of the work or improvement, or a subcontractor licensed by the State of California who, under subcontract to the Contractor, specially fabricates and installs a portion of the work or improvement according to detailed drawings contained in the Project Plans or other Contract Documents in an amount in excess of one-half of one percent of the Contractor's total bid; and
2. The portion of the work that will be done by each subcontractor. Only one subcontractor shall be listed for each portion.

The purchase of sand, gravel, crushed rock, batched concrete, aggregate, ready-mixed concrete, and/or any other materials produced and furnished by established and recognized commercial plants, together with the delivery of such materials to the work site by the source of the materials or by recognized commercial hauling companies, is not considered as subcontracting under this section.

2-1.33E Rejection of Bids Containing Alterations, Erasures or Irregularities: Bids may be rejected if they show any alterations of forms, additions not called for, conditional bids, incomplete bids, erasures or irregularities of any kind.

2-1.34 Bid Guaranty: All bids shall be presented under sealed cover and shall be accompanied by cash, cashier's or certified check, or by a bidder's bond made payable to the City of Santa Rosa and executed as surety by a corporate surety authorized and admitted to transact a surety business in the State of California in an amount equal to ten percent of the amount of the bid. No bid shall be considered unless such cash, cashiers or certified check, or bidder's bond is enclosed with the bid. Any bidder's bond shall contain provisions for forfeiture consistent with California Public Contract Code section 20172.

2-1.36 Contractor Safety Program Qualification Requirements: In accordance with Sections 20162, 20783 and 20803 of the California Public Contract Code, the following safety qualification guidelines shall be used to determine the responsible Bidder. For a Bidder to be considered responsible with regard to their safety record and for the Bidder's bid to be considered valid, the Bidder shall meet at least two of the three minimum safety standards as specified in paragraphs 2-1.36A through 2-1.36C hereinafter. Bidder shall submit the appropriate forms included herein as part of the bid to demonstrate the Bidder's safety qualifications.

2-1.36A Experience Modification Rate (EMR): Experience modification rates are calculated by the insurance industry as a way to determine equitable workers' compensation insurance premiums. It is calculated as a three-year moving average. Due to the particular safety hazards inherent in working in a wastewater collection, handling, treatment and/or disposal environment, the Engineer has deemed it necessary that a Bidder shall have a current three-year average (as described in forms herein) EMR of **1.0** or lower to satisfy this safety standard.

2-1.36B Recordable Incident Rate (RIR): The RIR is a measure of the frequency of injuries and is a measure of all occupational injuries and illnesses that occur within an organization. It is calculated from the OSHA Log 300 form. Due to the particular safety hazards inherent in working in a wastewater collection, handling, treatment and/or disposal environment, the Engineer has deemed it necessary that a Bidder shall have a current three-year average (as described in forms herein) RIR of **3.0** or lower to satisfy this safety standard.

2-1.36C Lost Time Incident Rate: The LTIR is an indicator of the severity of a company's occupational injuries. The LTIR deals only with incidents that result in lost work time. Like the RIR, the information needed to calculate the LTIR is derived OSHA Log 300 form. Due to the particular safety hazards inherent in working in a wastewater collection, handling, treatment and/or disposal environment, the Engineer has deemed it necessary that a Bidder shall have a current three-year average (as described in forms herein) RIR of **1.1** or lower to satisfy this safety standard.

2-1.40 Withdrawal of Bid: A bid may be withdrawn prior to, but not after, the hour fixed in the public notice for the opening of bids, provided that a written request to withdraw the bid, executed by the bidder or the bidder's authorized representative, is filed with the Engineer before this deadline. The withdrawal of a bid shall not prejudice the right of a bidder to submit a new bid.

2-1.43 Public Opening of Bids: Bids will be opened and read publicly at the time and place indicated in the Notice to Bidders. Bidders or their authorized agents are invited to be present.

2-1.46 Disqualification of Bidders: Serial bids from the same bidder will not be accepted. This section shall not be interpreted to mean that the same contractor may not be the contractor in one bid and listed as a subcontractor in another bid, provided that no collusion exists.

2-1.48 Competency of Bidders: No bid will be accepted from or contract awarded to a contractor that is not licensed in accordance with the law, that does not hold a license qualifying it to perform work under this contract, to whom a bid form has not been issued by the Engineer, or that has not successfully completed projects of similar character, scope and cost to the proposed project. Bidders will be required to provide a list of previous similar jobs with their bids.

3 CONTRACT AWARD AND EXECUTION

3-1.04 Contract Award: The City reserves the right to reject any or all bids. Bids are required for the entire work described herein. All bids will be compared with the Engineer's estimate of the quantities of work to be completed. Contract award, if any, will be made to the lowest responsible bidder within sixty days from the date bids are opened.

This project is anticipated to be awarded May 23, 2019.

3-1.05 Contract Bonds: Within ten days after receipt of the Notice of Award, the successful bidder shall provide the following bonds to the City:

- a. **Performance Bond:** A performance bond to guarantee the faithful performance of the terms and conditions of the Contract by Contractor, which shall be executed in a sum of not less than one-half of the Contract price;
- b. **Labor and Materials Bond:** A labor and materials bond (payment bond) in accordance with Part 6 of Division 4, sections 8000 *et seq.* of the California Civil Code, to guarantee against any and all claims of subcontractors or other third parties furnishing labor, materials, or supplies for the Contract, which shall be executed in a sum of 100% of the Contract price; and
- c. **Material Guaranty Bond:** A material guaranty bond (warranty bond) to serve as surety for the guarantee requirements outlined in Section 6-3.01B, which shall be executed in a sum of not less than one-half of the Contract price.

The bond(s) shall be provided in a form acceptable to the City and issued by a corporate surety in good financial standing and authorized and admitted to transact a surety business in the state of California for the purposes and in the amount(s) stated above.

Whenever the financial or legal status of any surety on any such bond(s) is/are unacceptable to the City, it may make a demand to Contractor for further bond(s) or additional surety, not exceeding the sums originally required. Thereafter, no payment shall be made upon the Contract to Contractor or any assignees of Contractor until such bond(s) or additional surety has/have been provided to the City.

3-1.07 Indemnification and Insurance: Indemnification: Contractor shall defend, hold harmless and indemnify City, its officers, agents and employees, and each and every one of them, from and against any and all actions, damages, costs, liabilities, claims, demands, losses, judgments, penalties, costs and expenses of every type and description, including, but not limited to, any fees and/or costs reasonably incurred by City's staff attorneys or outside attorneys and any fees and expenses incurred in enforcing this provision (hereafter collectively referred to as "Liabilities"), including but not limited to Liabilities arising from personal injury or death; damage to personal, real or intellectual property or the environment; contractual or other economic damages, or regulatory penalties, arising out of or in any way connected with the performance of or the failure to perform the Contract by Contractor, any subcontractor or agent, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, whether or not such Liabilities are caused in part by a party indemnified hereunder, or such Liabilities are litigated, settled or reduced to judgment; provided, that the foregoing indemnity does not apply to liability for any damage or expense for death or bodily injury to persons or damage to property to the extent arising from (i) the sole negligence, or willful misconduct of, or defects in design furnished by City, its agents, servants, or independent contractors who are directly responsible to City (excluding Contractor), or (ii) the active negligence of City.

The existence of any of the insurance policies or coverages described in this Contract shall not affect or limit any of City's rights hereunder, nor shall the limits of such insurance limit Contractor's liability to the City hereunder. The provisions of this section shall survive any expiration or termination of the Contract.

Insurance: Contractor shall maintain in full force and effect all of the insurance coverage described in and in accordance with the insurance requirements set forth below. Maintenance of such insurance coverage during the entire performance of the Contract is a material element of the Contract. Failure by Contractor to (i) maintain or renew coverage, (ii) provide notice of any changes, modifications, or reductions in coverage, or (iii) provide evidence of renewal, if necessary, may be deemed a material breach of the Contract by Contractor, whereas the City shall be entitled to all rights and remedies at law or in equity. Notwithstanding the foregoing, any failure by Contractor to maintain required insurance coverage shall not excuse or alleviate Contractor from any of its other duties or obligations under the Contract. In the event Contractor retains or utilizes any subcontractors or sub-consultants in performance of the work, Contractor shall assure that any such subcontractor has first obtained, and shall maintain, all of the insurance coverage requirements herein set forth below.

Insurance Requirements

A. Insurance Policies: Contractor shall maintain and keep in full force and effect, the following policies of insurance with minimum coverage as indicated below and issued by insurers with an AM Best rating of no less than A:-VI or a rating otherwise acceptable to the City.

	Insurance	Minimum Coverage Limits	Additional Coverage Requirements
1.	Commercial general liability	\$5 million per occurrence \$5 million aggregate	Coverage must be at least as broad as ISO CG 00 01 and must include products liability and completed operations coverage which shall continue for a period of three years after acceptance of the work by the City. If insurance applies separately to a project/location, aggregate may be equal to per occurrence amount. Coverage may be met by a combination of primary and umbrella or excess insurance but umbrella and excess shall provide coverage at least as broad as specified for underlying coverage. Completed Operations Coverage can be provided in the form of an endorsement to Contractor's insurance (at least as broad as ISO Form CG 20 37 04 13. See endorsements below for other Additional Insured Requirements. Coverage shall not exclude subsidence. Coverage at least as broad as ISO Form Number CA 00 01 covering any auto (Code 1). Insurance shall cover owned, non-owned and hired autos.
2.	Business auto coverage	\$3 million	

3.	Workers' compensation and Employer's Liability	\$1 million	As required by the State of California, with Statutory Limits and Employer's Liability Insurance with limit of no less than \$1 million per accident for bodily injury or disease. The Workers' Compensation policy shall be endorsed with a waiver of subrogation in favor of the City for all work performed by Contractor, its employees, agents and subcontractors.
4.	Contractor's pollution legal liability and/or asbestos legal liability and/or errors and omission	\$1 million per occurrence or claim \$2 million aggregate	If the work involves lead-based paint or asbestos identification/remediation, the pollution liability policy must not contain lead-based paint or asbestos exclusions. If the work involves mold identification, the pollution liability policy must not contain a mold exclusion and a definition of "Pollution" in said policy shall include microbial matter including mold.
5.	Course of construction/builders' risk	Amount of completed value of project without co-insurance provisions	Required for construction projects over \$3 million. The City shall be named as loss payee.

B. Endorsements:

1. All policies shall provide or be endorsed to provide that coverage shall not be canceled by either party, except after prior written notice has been provided to the City in accordance with the policy provisions.
2. Liability policies shall provide or be endorsed to provide the following:
 - a. For any claims related to this Contract, Contractor's insurance coverage shall be primary and any insurance or self-insurance maintained by City shall be in excess of Contractor's insurance and shall not contribute with it. Endorsements at least as broad as 20 01 04 13 or evidence of policy language will be required in non ISO CGL policies.
 - b. **The City of Santa Rosa, its officers, agents and employees are to be covered as additional insureds on the CGL policy.** Additional Insured Endorsements at least as broad as 20 10 04 13 or 20 38 04 13 are required.

C. Verification of Coverage and Certificates of Insurance: Contractor shall furnish City with original certificates and endorsements effecting coverage required above. Certificates and endorsements shall make reference to policy numbers. All certificates and endorsements are to be received and approved by the City before work commences and must be in effect for the duration of the Contract. The City reserves the right to require complete copies of all required policies and endorsements during the duration of the Contract and for a period of three years following City's acceptance of the work.

D. Other Insurance Provisions:

1. No policy required by this Contract shall prohibit Contractor from waiving any right of recovery prior to loss. Contractor hereby waives such right with regard to the indemnitees.

2. All insurance coverage amounts provided by Contractor and available or applicable to this Contract are intended to apply to the full extent of the policies. Nothing contained in this Contract limits the application of such insurance coverage. Coverage for an additional insured shall NOT be limited to the insured's vicarious liability. Defense costs must be paid in addition to coverage amounts.
3. Self-insured retentions above \$10,000 must be approved by the City. At the City's option, Contractor may be required to provide financial guarantees.
4. City reserves the right to modify these insurance requirements, including limits, based on the nature of the risk, prior experience, insurer, coverage, or other special circumstances.

3-1.18 Contract Execution: The fully executed Contract, original bonds and insurance certificates and endorsements required under the Contract shall be delivered to the City within ten calendar days of Contractor's receipt of the Notice of Award.

Contract Execution Incentive – The City shall pay the successful bidder the Contract Execution Incentive if the successful bidder returns the signed contracts with one copy each of the required bonds and the correct insurance certificates complete and in a format fully acceptable to the City **within five (5) working days from the date of the Notice of Award.** If the successful bidder is a corporation, the contract shall be signed by two corporate officers, one from each of the following two groups: a) the chairman of the board, president or any vice-president; b) the secretary, any assistant secretary, chief financial officer, or any assistant treasurer. The title and printed name of each corporate officer shall be listed under the signature. If the aforementioned contractual paperwork is incomplete, incorrect, or returned to the City after the passage of five (5) working days from the date of the Notice of Award, no incentive payment will be made.

Full compensation for **Contract Execution Incentive** will be made at the contract lump sum price and requires that the successful bidder meet all requirements pertaining to the Contract Execution Incentive as specified herein and no additional allowance will be made therefor.

The Engineer will supply Contractor with up to ten sets of the Invitation for Bids and Project Plans. At least one complete set of the Invitation for Bids and Project Plans shall be kept at the construction site in good condition and made available to the Engineer at all times. Additional copies of the Invitation for Bids and Project Plans will be provided by the Engineer at Contractor's cost.

3-1.20 Failure to Execute Contract: Contractor's failure to deliver to the City the fully executed Contract within ten calendar days of Contractor's receipt of the Notice of Award shall be cause for the cancellation of the award and the forfeiture of the bid guaranty to the City. If the successful bidder refuses or fails to execute the Contract, the City may award the Contract to the second lowest responsible bidder. If the second lowest responsible bidder refuses or fails to execute the Contract, the City may award the Contract to the third lowest responsible bidder. The refusal or failure by the second or third lowest responsible bidder to deliver to the City the fully executed Contract within ten calendar days of receipt of the Notice of Award to the respective bidder shall likewise be cause for the cancellation of the award and the forfeiture of the bid guaranty of the respective bidder. In its discretion, the City may then re-advertise the project or construct it by day labor.

3-1.21 Return of Bid Guarantees: Within ten days after the opening of bids, the City will return the bid guarantees to all bidders except the three lowest responsible bidders. The bid guarantees of the three lowest responsible bidders will be retained until the Contract has been fully executed. In the event all bids are rejected, all bid guarantees will be returned to the respective bidders.

3-1.22 Subcontractors: The successful bidder shall furnish a list of all subcontractors as required under Sections 2-1.33C. The list shall include the name, business address, DIR registration

number and the state contractor's license number of each subcontractor on the list and the names of the responsible managing employees whose names appear on the subcontractors' licenses.

4 SCOPE OF WORK

4-1.05 Changes and Extra Work: All changes to the Contract shall be made by written change order only.

All extra work shall be recorded by Contractor on a daily report signed by both the City and Contractor. The “daily reports” shall thereafter be considered the true record of extra work performed. A copy of the daily reports will be furnished to Contractor. Contractor is directed to Section 9-1.04 of this Invitation for Bids.

4-1.05C Compensation for Altered Quantities: Payment and compensation for altered quantities shall conform to the provisions of Section 9-1.06 of the Standard Specifications, except as modified herein.

5 CONTROL OF WORK

5-1.02 Contractor's Copies of Contract Documents: In the event of a conflict in any of the Contract Documents, the order of precedence from highest to lowest shall be as follows:

1. Special Provisions
2. Project Exhibits, consisting of 6 sheets entitled Llano Trunk Lining – W College Utilities Facility, 2019-0025
3. City Standards
4. City Specifications
5. Standard Specifications
6. Standard Plans

5-1.05 Order of Work: The work as shown on the Project Plans and as specified in the Invitation for Bids shall be constructed in a sequence that is satisfactory to and approved by the Engineer.

Contractor shall prepare a work schedule per Section 8-1.02 of the Standard Specifications.

Suggested recommendation is to perform other work activities concurrent with the 48” Pre-CIPP Sewer Heavy Cleaning, Man Entry Inspection and Reporting items of work, including but not limited to manhole and/or CIPP Liner rehabilitation outside the work limits between II2712MH1 to II2712MH3. Attention is directed to Section 130-2.01 ‘Description’ regarding 48” CIPP Liner Rehabilitation - II2712MH1 to II2712MH3 work.

With the exception of trenching, all existing street, street light base, curb and gutter, storm drain, water line, and sewer line work shall be completed before any existing street paving is removed.

Full compensation for the conformance to the requirements of this section is included in the Contract price and no additional allowance will be made to Contractor for this work.

5-1.17 Character of Workers: Contractor is directed to Section 5-1.17 of the Standard Specifications which states:

"If any subcontractor or person employed by the Contractor shall appear to the Engineer to be incompetent or to act in a disorderly or improper manner, he shall be discharged immediately on the request of the Engineer, and such person shall not again be employed on the work."

No additional compensation shall be granted to Contractor in the event City exercises any part of its rights under this section and any and all costs related to such exercise shall be borne by Contractor.

5-1.20 Cooperation with Other Entities: Attention is directed to Section 5-1.20 of the Standard Specifications.

Other construction including but not limited to utility, power, and pipe line relocation, may be in progress by other forces within and adjacent to the project area at the same time work is being performed under this Contract by Contractor.

Contractor shall cooperate with the forces performing other work, to the end that such forces may conduct their operations with as little inconvenience and delay as possible. Contractor shall grant such forces access to the project area as is reasonable and necessary to transport materials and equipment to the site of operations by the other forces.

5-1.20B(4)(a) Offsite Staging Areas and Construction Yards: Attention is directed to Santa Rosa City Code section 20-52.040, Temporary Use Permit.

A Temporary Use Permit shall be obtained for any offsite construction yard on private property to be used for any of the following:

- a. Stockpiling of equipment and/or materials;
- b. Staging of construction;
- c. Placement of work trailers or mobile offices;
- d. Storage of trench spoils; or
- e. Other construction related activities not specifically enumerated above.

5-1.26 Lines and Grades: Contractor shall carefully preserve all bench marks, grade stakes, and all other survey markers. In the case of willful or careless destruction, Contractor shall bear the cost of replacing the markers.

Contractor shall contact the Engineer directly for coordination of survey staking. Written staking requests must be submitted at least two working days in advance of the date and time stakes are needed.

5-1.27B Examination and Audit: Pursuant to California Government Code section 8546.7, any contract with the City involving expenditures in excess of \$10,000 shall be subject to the examination and audit of the California State Auditor for a period of three years after final payment is made to Contractor by City under this Contract. Any such examination and audit will be confined to those matters connected with the performance of this Contract.

5-1.30A Inspection: Contractor shall bear all costs associated with the re-inspection of any defective, rejected or unauthorized work as determined by the Engineer in Engineer's sole discretion. Such costs of re-inspection, including any costs incurred by the City for additional staff time or fees for third-party consultant inspectors, will be deducted from one or more progress payments hereunder.

5-1.36A Property and Facility Preservation: Attention is directed to Section 5-1.36 of the Standard Specifications.

At Contractor's sole expense, all fences, gates, landscaping, drainage ditches, sidewalks, irrigation systems, and any other improvements that are damaged, removed or destroyed because of Contractor's operations, shall be replaced in accordance with City Standards at a minimum and restored to the same or better condition. Concrete surface treatment and score marks shall match adjacent existing concrete improvements.

5-1.36E Obstructions: Attention is directed to Section 5-1.36 of the Standard Specifications and to the possible existence of underground gas mains, high voltage lines, telephone ducts, storm drains and water and sewers systems, the locations of which are not shown on the Project Plans. The determination of the location of these facilities and the cost of repair or replacement in the event of damage to such facilities are the sole responsibility of Contractor.

Should Contractor alter any public utility or private improvements to facilitate its operations or for its sole benefit, which alteration would not be otherwise required, Contractor shall make whatever arrangements are necessary with the owner or controlling authorities, and shall bear all expenses in connection therewith. Any damages to any public utility or private improvement caused by Contractor shall be repaired by Contractor at its sole expense and to the full satisfaction of the Engineer or the controlling authority.

Any subsurface information and data furnished under any part of this Contract are not intended as a representation or warranty but are furnished for information only. It is expressly understood that the City will not be responsible for the accuracy thereof or for any deduction, interpretation or conclusion drawn therefrom by Contractor. The information is made available so that Contractor may have ready access to the same information available to the City and is not part of this Contract.

PRIOR TO STARTING ANY EXCAVATION, CONTRACTOR SHALL (AT LEAST TWO WORKING DAYS IN ADVANCE) CALL UNDERGROUND SERVICE ALERT (USA) toll free at (800) 227-2600 and provide USA with all necessary data relative to the proposed excavation. USA will accept calls and process information to participating agencies who have underground facilities in the area between the hours of 7:30 a.m. and 5:00 p.m. daily, except Saturdays, Sundays, and holidays. Between the hours of 5:00 p.m. and 7:30 a.m., calls will be recorded and then processed after 7:30 a.m. For emergency situations, after hours, and on Saturdays, Sundays and holidays, Contractor shall contact the owner of the affected facility.

Contractor shall coordinate all work with the appropriate City field personnel. When City work forces are required at the job site to perform Contract items of work, Contractor shall give a minimum of two working days advanced notification to the appropriate field office:

Water Division:	(707) 543-4200
Sewer Division:	(707) 543-4200
Street Division:	(707) 543-3880
Survey Division:	(707) 543-3834

5-1.43 Potential Claims and Dispute Resolution: "Claim" means a separate demand by Contractor sent by registered mail or certified mail with return receipt requested, for one or more of the following: (A) A time extension, including, without limitation, for relief from damages or penalties for delay assessed by the City under the Contract; (B) Payment by the City of money or damages arising from work done by, or on behalf of, Contractor pursuant to the Contract and payment for which is not otherwise expressly provided or to which the claimant is not otherwise entitled; or (C) Payment of an amount that is disputed by the City.

Upon receipt of a Claim, the City shall conduct a reasonable review of the Claim and, within a period not to exceed 45 days, shall provide Contractor a written statement identifying what portion of the Claim is disputed and what portion is undisputed, provided, the parties may extend the 45 day time period by mutual agreement.

If the City needs approval from the City Council to provide the claimant a written statement identifying the disputed portion and the undisputed portion of the Claim, and the Council does not meet within the 45 days or within the mutually agreed to extension of time following receipt of a Claim, the City shall have up to three days following the next duly publicly noticed meeting of the City Council after the 45-day period, or extension expires to provide Contractor a written statement identifying the disputed portion and the undisputed portion.

Any payment due on an undisputed portion of the Claim shall be processed and made within 60 days after the City issues its written statement. If the City fails to issue a written statement, the Claim shall be deemed rejected in its entirety.

If a Contractor disputes the City's written response, or if the City fails to respond to a Claim within the time prescribed, the Contractor may demand in writing an informal conference to meet and confer for settlement of the issues in dispute. Upon receipt of a demand in writing sent by registered mail or certified mail, return receipt requested, the City shall conduct a meet and confer conference within 30 days for settlement of the dispute. Within 10 business days following the conclusion of the meet and confer conference, if the Claim or any portion of the Claim remains in dispute, the City shall provide the Contractor a written statement identifying the portion of the Claim that remains in dispute.

and the portion that is undisputed. Any payment due on an undisputed portion of the Claim shall be processed and made within 60 days after the City issues its written statement. Any disputed portion of the Claim, as identified by Contractor in writing, shall be submitted to nonbinding mediation, with the City and the Contractor sharing the associated costs equally. The City and Contractor shall mutually agree to a mediator within 10 business days after the disputed portion of the Claim has been identified in writing. If the parties cannot agree upon a mediator, each party shall select a mediator and those mediators shall select a qualified neutral third party to mediate with regard to the disputed portion of the Claim. Each party shall bear the fees and costs charged by its respective mediator in connection with the selection of the neutral mediator.

6 CONTROL OF MATERIALS

6-2.01 Source of Supply and Quality of Materials: All materials required to complete the work under the Contract shall be furnished by Contractor and shall be free of hazardous substances.

6-3.01 General: Statistical means will not be used by the City for determination of Standard Specification compliance. Whenever both operating range test results and Contract compliance requirements are specified in these special provisions, the operating range requirements shall apply to the individual test results.

6-3.01A Material Submittals: Upon award of the Contract by City, Contractor shall submit to the Engineer a list of all materials proposed to be used on this project and any supporting documentation and/or samples required and source of supply.

For material listed on the "Engineer's List of Approved Items" which is located in the Sewer and Water sections only of the City Standards, the Engineer shall be provided with the name of the manufacturer and model/part number for all material proposed for this project, unless that item has been replaced as shown on the Project Plans or in the Invitation for Bids.

For all other materials used on this project, regardless of the type of work, Contractor shall provide to the Engineer the name of the manufacturer and model/part number along with supporting documentation and/or samples that will allow the Engineer to determine the material's acceptability.

The Engineer reserves the right to reject any proposed material, whether on the City's "Engineer's List of Approved Items" or not. If the City obtains information indicating that a listed item is not performing satisfactorily or is found to be defective, that item will be rejected and Contractor shall submit a replacement for review at no additional cost to the City.

6-3.01B Material Guarantee: Before any contract is awarded, the bidder may be required to furnish samples of materials and detailed descriptions of equipment to be used in the construction of the project. The materials samples may be subjected to the tests provided for in the Standard Specifications or in this Invitation for Bids to determine their quality and fitness for the project. The successful bidder shall unconditionally guarantee project materials and workmanship for a period of one year from the date of recording of the Notice of Completion. The guarantee shall cover 100% of all costs of repairs within the one year period, including all costs of labor, materials, equipment, and incidentals. Except as may be otherwise provided in Section 3-1.05, the successful bidder shall provide a surety bond executed by a corporate surety authorized and admitted to transact a surety business in the state of California in the minimum amount of one-half of the Contract price to cover this guarantee.

6-3.05 Quality Assurance: California Test 216 (Relative Compaction) testing will be modified as follows: A mechanical compactor (Ploog Engineering Co. Model M 100 or equivalent) with 10-pound hammer and split compaction molds shall be used in lieu of the specified manual compaction equipment.

California Test 231 (Nuclear Gage Determination of In-Place Density) will be modified as follows: In-place density and relative compaction may be determined on the basis of individual test sites in lieu of the area concept, at the discretion of the Engineer.

6-4 Water Utility

6-4.01A Construction Water: All water required for the performance of the work shall be provided by Contractor. Prior to obtaining water from the City's water system, Contractor shall obtain a Water

Use Permit from the City of Santa Rosa Water Department and rent a hydrant or bridge meter. Contractor is responsible for the cost of all water and the cost of all deposits, permits and fees.

Contractor is prohibited from operating gate valves or fire hydrants on the City system.

The acquisition of water from the City's water system through un-metered hydrants or other facilities is a violation of City ordinance and State law. The use of water from sources other than the City's water system must be approved by the Engineer in advance of the use.

Citations and fines will be levied for violation of these and other utility regulations and deductions will be made from payments consistent with Section 7-1.02A(1) of the Standard Specifications.

6-4.01B Water Utility Notification: Contractors or parties requiring work of any kind by the City of Santa Rosa Water Department forces shall request such services a minimum of 48 hours in advance of the time such services are desired. Work requests which will involve the City of Santa Rosa Water Department forces for more than eight hours or an extensive number of City parts shall be requested a minimum of seven calendar days in advance.

If it is necessary to terminate or disrupt utility service to any customer, Contractor shall make the request for such work by City forces an additional 72 hours (three additional working days for a total of five working days advance notice) in advance of the time such services are desired to allow affected customers a minimum of 72 hours' notice. Contractors who fail to keep field appointments will be billed for scheduled City of Santa Rosa Water Department crew standby time which was used and the Contractor shall bear the costs incurred by the City of Santa Rosa's Water Department for re-notification of customers.

City of Santa Rosa Water Department crews work a 9/80 schedule. This schedule may prohibit shutdowns for tie-ins on alternating Fridays. After hours work or weekend work may be performed if prior authorization from the Engineer is obtained.

Other than the hours specified in this Invitation for Bids, requests by Contractor for after hours or weekend work is to be avoided whenever possible. Any overtime costs incurred by City for such work shall be borne by Contractor.

Interruption of utilities service to commercial customers shall be coordinated with the customer to minimize disruption to the enterprise to the greatest extent practicable. After notification by the Contractor of the need, the City of Santa Rosa Water Department will contact all commercial customers and inform Contractor accordingly.

6-4.01C Water Facility Damage: All damage caused to the City's water system shall be immediately reported to the Engineer.

Damage caused to the City's water system by Contractor's operations shall be repaired by the Contractor at Contractor's sole expense in a manner satisfactory to the City of Santa Rosa Water Department. Such repairs shall not be charged to the City or any City project. All repair work shall be witnessed and approved by the City of Santa Rosa Water Department prior to backfilling the excavation. The City will require re-excavation if backfilling occurs prior to inspection, which costs shall be borne by Contractor.

Contractor is responsible for, at its sole cost and expense, the repair and remediation of damage to property and facilities caused by any of the following circumstances:

- a. Contractor fails to make a written request for a markout or begins excavation without providing the City of Santa Rosa Water Department a reasonable opportunity to mark facilities;

- b. Contractor destroys markouts;
- c. Contractor fails to perform hand digging or probing for utilities near markouts; or
- d. Contractor fails to use reasonable caution, regardless of whether markouts are present or clear. Reasonable caution includes any efforts to avoid damaging existing facilities, such as when excavating in the vicinity of water mains.

City may, in its discretion, opt to make the repairs for which Contractor is responsible with its own forces. In such cases, the repairs will be made at Contractor's expense in accordance with the emergency repair rate schedule of the City of Santa Rosa Water Department. The City may make repairs whenever restoration of service requires extraordinary speed or special equipment. Contractor will be billed accordingly and City shall have the right and option to withhold payment hereunder, or a portion thereof, for any such costs billed but not promptly paid by Contractor.

6-4.02 Salvage: All valves, hydrants, and other appurtenances of the water system that are the property of City and removed by Contractor shall be delivered to the City's Municipal Services Center (55 Stony Point Road) unless Contractor has obtained specific written approval from the City of Santa Rosa Water Department to otherwise dispose of the materials.

6-4.03 Trade Names and Alternatives: Unless otherwise specified, material and equipment specifications that identify a particular patent, trade name or manufacturer, may be satisfied through substitute materials and equipment accepted by the City. Contractor may offer substitute materials and equipment of equal or better quality to the City. Any such offer shall be made in writing to the Engineer at least four weeks in advance of the time Contractor wishes to order the materials or equipment. Contractor shall include sufficient data which, together with any other information the Engineer may require, will enable the Engineer to determine the acceptability of the materials and equipment. When the substitute materials or equipment necessitate changes to any part of the work, the information shall include drawings and details showing all such changes and Contractor shall perform these changes as a part of any acceptance of substitute materials or equipment. The use of substituted materials and equipment will be permitted only after written acceptance of the materials and equipment by the Engineer. Such acceptance shall not relieve the Contractor from full responsibility for the sufficiency, quality and performance of the substitute materials and equipment.

The City will not, under any circumstances, acknowledge or consider any offers to accept substitute materials or equipment between the dates of public notice of advertisement and the bid opening.

7 LEGAL RELATIONS AND RESPONSIBILITY TO THE PUBLIC

7-1.02A(1) Forfeitures for Health and Safety Violations: Contractor shall comply with all applicable provisions of the Santa Rosa City Code and any failure to do so shall constitute a breach of the Contract. In the event of any violation of the Santa Rosa City Code that may impact public health and safety, including, but not limited to Chapter 17-12, "Storm Water" and Chapter 13-04, "Street Encroachments," City shall have the right to impose a charge against Contractor in an amount equal to \$500.00 per violation per day. Prior to the imposition of any charge hereunder, City shall first provide a written notice to Contractor of the violation and setting forth a reasonable period of time for Contractor to cure the violation(s). In the event Contractor fails to cure any such violation within the time provided, City shall have the right, in addition to all other rights and remedies available to City, to deduct and withhold as a permanent forfeiture by Contractor the appropriate amounts from any payment otherwise due Contractor under this Contract.

7-1.02K(2) Wages: Pursuant to Labor Code sections 1770 *et seq.*, each laborer or mechanic of Contractor or any subcontractor engaged in work on the project under this contract shall be paid not less than the hourly wage rate of per diem wages set forth in the prevailing wage rate schedule published by the Director of Industrial Relations, regardless of any contractual relationship which may be alleged to exist between Contractor or any subcontractor and such laborers and mechanics. A copy of the schedule of prevailing wage rates can be obtained online at www.dir.ca.gov or from the Department of Transportation and Public Works at 69 Stony Circle, Santa Rosa.

Any laborer or mechanic employed to perform work on the public works project under this Contract, which work is not covered by any of the foregoing classifications, shall be paid not less than the prevailing wage rate of per diem wages specified herein for the classification which most nearly corresponds to the work to be performed by the worker.

The foregoing specified prevailing wage rates are minimum rates only, and Contractor may pay any wage rate in excess of the applicable rate.

Pursuant to Labor Code Section 1775, Contractor as a penalty to the owner shall forfeit not more than \$200.00 for each calendar day, or a portion thereof, for each worker paid less than the prevailing wage rate established by the Department of Industrial Relations for such work or craft in which such worker is employed. The difference between such prevailing wage rates and the amount paid to each worker for each calendar day or portion thereof for which the worker was paid less than the prevailing wage rate shall be paid to each worker by Contractor.

Contractor shall only provide prevailing wage reports upon written request from City.

7-1.02K(4) Apprentices: Contractor agrees to comply with Chapter 1, Part 7, Division 2, sections 1777.5 *et seq.* of the California Labor Code. These sections require contractors and subcontractors to employ apprentices in apprenticeable occupations in a ratio of not less than one hour of apprentice work for each five hours of journeyman work (unless an exception is granted in accordance with Section 1777.5), and the contractors and subcontractors shall not discriminate among otherwise qualified employees as apprentices solely on the ground of sex, race, religion, creed, national origin, ancestry, or color. Only apprentices as defined in Labor Code section 3077, who are in training under apprenticeship standards and who have written apprentice agreements will be employed on public works in apprenticeable occupations. The responsibility for compliance with these provisions is fixed with the prime contractor for all apprenticeable occupations.

7-1.02K(6)(a)(1) Notice to Vendors: Attention is directed to the current OSHA Standards. All equipment, tools and materials which are furnished and/or installed as part of this Contract shall meet or exceed the aforementioned standards in order to be considered acceptable.

7-1.02K(6)(b) Excavation Safety: When the digging or excavation occurs during project construction, Contractor shall:

- a. Promptly notify City in writing of the following conditions before any such conditions are disturbed:
 1. Material that the Contractor believes may be hazardous waste as defined in Health and Safety Code section 25117 that is required to be removed to a Class I, Class II or Class III disposal site in accordance with provisions of existing law;
 2. Subsurface or latent physical conditions at the site differing from those indicated in the Invitation for Bids; and
 3. Physical conditions at the site of any unusual nature, materially different from those ordinarily encountered and generally recognized as inherent in the type of work under the Contract.
- b. The City will investigate the conditions and will issue a change order under the terms of the Contract if it finds that the conditions warrant it.
- c. If a dispute arises between City and Contractor as to whether a change order is warranted, Contractor shall not be excused from any scheduled completion date provided for in the Contract, but shall proceed with all work to be performed under the Contract.

7-1.02K(6)(b)(1) Trench Excavation Safety Plans: When the estimated cost for the excavation of any trench or trenches five feet or more in depth will exceed \$25,000.00, Contractor shall submit to the Engineer in advance of excavation a detailed plan showing the design of shoring, bracing, sloping or other provisions to be made for worker protection from the hazard of caving ground during the excavation of such trench or trenches. If such plan varies from the shoring system standards established by the construction safety orders, or if the trench is anticipated to be greater than 20 feet, the plan shall be prepared by a registered civil or structural engineer.

A permit to do the above described work shall be obtained from the State of California, Division of Industrial Safety. Proof of such permit shall be submitted to the Engineer prior to starting the trench work.

Full compensation for complying with the provisions of this section shall be considered as included in the Contract price and no additional allowance will be made for the work.

7-1.02K(6)(d) Confined Space Safety: Any confined space entry for this project, including but not limited to manhole or water storage tank entry, will require a confined space entry permit pursuant to Cal/OSHA regulations as set forth in title 8 California Code of Regulations (CCR) sections 5157 or 5158. Confined space entry shall have the meaning ascribed in title 8 CCR sections 5157 and 5158. For any confined space entry for construction operations regulated by title 8 CCR section 1502, Contractor shall comply with title 8 CCR section 5158, "Other Confined Space Operations." For any other confined space operations, Contractor shall comply with title 8 CCR section 5157, "Permit-Required Confined Spaces."

Attention is directed to the technical specifications in the Special Provisions for information regarding entry to any City maintained confined space. Pursuant to title 8 CCR section 5157, Contractor is required to obtain any available information regarding hazards and operations for any City maintained confined spaces. The City maintained Confined Space Entry Manual is available

for viewing at the City of Santa Rosa Water Department or Transportation and Public Works Department office at 69 Stony Circle, Santa Rosa.

Contractor shall immediately inform the Engineer of any previously unidentified hazards confronted or created during confined space entry.

7-1.02L(2)(a) Patents and Royalties: All fees, royalties, or claims for any patented invention, article, process or method that may be used upon or in any manner connected with the work under this Contract shall be paid by Contractor. Contractor and its sureties shall protect and hold harmless City and its officers, agents, and employees from any and all demands made for such fees royalties or claims brought or made by any third party, and before the final payment is made on the account of the Contract, Contractor shall, if requested by City, furnish acceptable proof of a proper release from all such claims and liabilities.

Should Contractor, its officers, agents, or employees, or any one of them be enjoined from furnishing or using any invention, article, material, or plans supplied or required to be supplied or used under the Contract, Contractor shall promptly substitute other articles, materials, or appliances in lieu thereof of equal efficiency, quality, finish, suitability, and market value, and satisfactory in all respects to the Engineer. In the event that the Engineer elects, in lieu of such substitution, to have supplied and to retain and use any such invention, article, materials, or plans as may be required to be supplied by the Contract, Contractor shall pay such royalties and secure such valid licenses as may be requisite and necessary for City, its officers, agents, and employees, or any one of them to use such invention, article, materials, or appliance without being disturbed or in any way interfered with by any proceeding in law of equity on account thereof. Should Contractor neglect or refuse to make the substitution promptly or to pay such royalties and secure such licenses as may be necessary, then in that event the Engineer shall have the right to make such substitutions or City may pay such royalties and secure such licenses and charge Contractor even though final payment under the Contract may have been made.

7-1.02M(3) Mined Materials: California Public Contract Code section 20676 prohibits surface mining operators which are subject to the Surface Mining and Reclamation Act of 1975 (SMARA) from selling California mined construction material to the City unless the operator is identified in a list referred as the **3098 List**. The List, which is maintained by the Department of Conservation's Office of Mine Reclamation (OMR), changes throughout the year and can be viewed at the OMR website: http://www.consrv.ca.gov/OMR/ab_3098_list/index.htm. To confirm whether or not a specific operator is on the List at any given time, Contractor shall call the OMR at (916)323-9198.

7-1.03A Maintaining Traffic: Attention is directed to Sections 7-1.04 of the Standard Specifications and to the following modifications thereof.

If construction is within City owned right-of-way, provisions shall be made for the safe passage of public traffic through the work site at all times consistent with the requirements of Santa Rosa City Code Chapter 13-04.

Except for projects to be performed under a minor contract, Contractor shall install and maintain project identification signs at each end of the project or as directed by the Engineer two weeks prior to any construction activity. City shall furnish the appropriate sign panels upon request from Contractor. To mount the sign panels, Contractor shall furnish and install 4" X 4" posts or mount by other appropriate methods as approved by the Engineer. These sign panels shall be returned to the City Corporation Yard at 55 Stony Point Road after completion of the project.

Two weeks prior to any construction activity, advance notice signs for road closures shall be furnished and installed by Contractor at each end of the project and shall remain in place throughout the duration of the subject closure. Details of panel construction and lettering shall be approved by the Engineer.

Contractor shall furnish, install, and maintain at its expense all barricades, signs, lights, and other devices necessary to adequately warn of any obstructions to the traveled and pedestrian way and provide flaggers as necessary for the safety of public traffic and pedestrians and to provide access to property adjacent to the work site and Contractor shall comply with the Americans with Disabilities Act of 1990 (42 U.S.C. 12101, *et seq.*) (ADA) and any regulations and guidelines issued pursuant to the ADA.

Contractor shall comply with the current edition of the California Manual of Uniform Traffic Control Devices (CA MUTCD) for all items related to traffic within the work site.

Rain and other occurrences that may cause the suspension or delay of the work shall in no way relieve Contractor of its responsibility to provide traffic control and public access through the work site as specified herein. At all times, Contractor shall keep at the work site such materials, forces and equipment as may be necessary to keep roads, streets, and driveways within the work site open to traffic and in good repair and shall expedite the passage of such traffic, using such forces and equipment as may be necessary.

Should Contractor fail, in the opinion of the Engineer, to provide all the materials, forces and equipment necessary to maintain traffic through the work site as set forth herein, City may take steps necessary to remedy any such failure, including but not limited to causing such work to be performed and/or suspending any further work under the Contract. Any such remedial cost and expense incurred by the City, plus an administrative charge of 15%, shall be immediately due and payable by Contractor and may be deducted from any amounts owed to Contractor hereunder. In the event there are insufficient sums owed to Contractor hereunder to cover the foregoing costs and charges, City shall have the right to pursue any other remedy to recover the same, including but not limited to, proceeding against any surety or bond in favor of City. City's rights under Section 7-1.02 are intended to be in addition to and not in lieu of any charges imposed by City against Contractor under Section 7-1.02A(1) above for violations of the Santa Rosa City Code.

Contractor shall be responsible for informing emergency response agencies operating within the area of the work of obstructions to either public or private roads caused by reason of Contractor's operations hereunder.

Contractor shall make provisions for the safe passage of pedestrians around the project work site at all times.

8 PROSECUTION AND PROGRESS

8-1.01A Assignments: Once awarded, this Contract shall not be transferred, assigned, or sub-contracted, except as herein expressly provided without the prior written consent of the City in the City's sole and absolute discretion. See Section 5-1.12 of the Standard Specifications.

8-1.04B Standard Start: Contractor shall begin work within ten calendar days after the date authorized in the Notice to Proceed and shall diligently prosecute the Contract to completion before the expiration specified under Section 8-1.05 'Time'.

8-1.05 Time: All work requiring bypass pumping operations shall be completed by **October 15th, 2019**.

All other remaining base contract work shall be completed by **November 15th, 2019**.

With the exception of work associated with CIPP installation/curing and bypass operations & maintenance, Contractor shall not conduct any activities that generate noise earlier than 7:00 a.m. and later than 7:00 p.m. unless otherwise directed by the Engineer

8-1.10 Liquidated Damages: Contractor hereby agrees that Contractor shall pay to the City liquidated damages for each and every calendar day delay over and above the prescribed above for finishing the work in the amount shown in Section 8-1.10 of the Standard Specifications.

9 MEASUREMENT AND PAYMENT

9-1.04 Force Account Work: All work done on a force account basis shall be recorded daily on report sheets prepared by Contractor and signed by both the Engineer and Contractor. Such reports shall thereafter be considered the true record of force account work performed during the project. Such reports shall be furnished to the Engineer and a copy retained by Contractor.

All extensions of labor, equipment, and material costs shall be completed by Contractor and submitted to the Engineer within 30 days of the completion of the extra work. Completed and extended extra work reports received later than the times herein prescribed may be deemed invalid and rejected without payment at the discretion of the Engineer.

9-1.07 Payment Adjustments For Price Index Fluctuations: Any references to Opt Out of Payment Adjustments for Price Index Fluctuations in the Standard Specifications are deleted in their entirety.

9-1.16 Progress Payments: Once each month for progress pay purposes, the City will prepare a written estimate of the total amount of completed work and accepted materials purchased by Contractor but not installed. The City shall retain five percent of such estimated value of the completed work and the unused materials and pay Contractor the balance after deducting all previous payments and all sums to be retained under the provisions of the Contract. No such estimate or payment shall be required to be made when, in the judgment of the Engineer, the work is not proceeding in accordance with the provisions of the Contract or when, in the Engineer's judgment, the total value of the completed work since the last estimate is less than \$500.00. No such estimate or payment shall be construed to be an acceptance of any defective work or improper materials.

After Contract acceptance, the Engineer will prepare a written proposed final estimate of the proposed final quantities of work completed under the Contract and the value of such work and will submit such estimate to Contractor. The City shall retain five percent of such estimated value of the work done and shall pay to Contractor the balance after deducting all amounts to be retained under the provisions of the Contract.

The City may, at its option and at any time, retain out of any amounts due Contractor sums sufficient to cover any unpaid claims of City or others, provided that sworn statements of all non-City claims shall have been filed with the Director of Finance.

9-1.16E(6) Substitution of Securities for Withheld Amounts: Pursuant to Public Contract Code section 22300, securities may be substituted for any moneys withheld by City to ensure performance under this Contract, provided that substitution of securities provisions shall not be required in contracts in which there will be financing provided by the Farmer's Home Administration of the United States Department of Agriculture pursuant to the Consolidated Farm and Rural Development Act (7 USC sections 1921 *et seq.*), and where federal regulations or policies or both do not allow the substitution of securities. At the request and expense of Contractor, securities equivalent to the amount withheld shall be deposited with the City, or with a state or federally chartered bank as the escrow agent, which shall then pay such moneys to Contractor. The Director of Finance is authorized to execute substitution of securities agreements on behalf of the City. The City will return the securities to Contractor upon satisfactory completion of the Contract as determined by City in its sole discretion and the resolution of all outstanding claims against the securities. Contractor shall be the beneficial owner of any securities substituted for moneys withheld and shall receive any interest thereon.

Securities eligible for investment under this section shall include those listed in Government Code section 16430, bank or savings and loan certificates of deposit, interest bearing demand deposit accounts, standby letters of credit or any other security mutually agreed to by Contractor and the City, provided that the substituted security is equal to or not less than five percent of the Contract amount.

Security substitutions must be submitted by Contractor and approved by City prior to the time of the first progress payment to be made under the Contract. No other method of substituting securities for retention will be accepted. The security substitution shall be done only upon execution of an agreement satisfactory to City which includes the following provisions:

- a. The amount of securities to be deposited;
- b. The terms and conditions of conversion to cash in case of the default of Contractor;
and
- c. The procedure for return of securities upon completion of the Contract.

9-1.17D Final Payment and Claims: The processing of payment of the final estimate shall not be commenced less than 35 days after the date of recording of the Notice of Completion with the County Recorder's Office. Contractor is advised that it takes approximately ten days for a check to be issued following a request for payment.

Contractor shall submit its written statement of all claims for additional compensation under the Contract to the Engineer within 15 days after submission to Contractor of the proposed final estimate.

If Contractor does not file a claim within the 15 day period, or upon Contractor's approval, the Engineer will issue a final written estimate and the City shall pay to Contractor the entire sum due after deducting all previous payments, if any, and all amounts to be retained under the provisions of the Contract.

If Contractor files a claim within the 15 day period, the Engineer will furnish a semi-final estimate and pay the amount due under the semi-final estimate within 30 days. The semi-final estimate is conclusive as to the amount payable except as may be affected by claims and any amount retained. The Engineer shall then consider and investigate such claim, and shall make such revision in the final quantities as the Engineer may find to be due, and shall then make and issue a final written estimate. The City will pay the amount due, after deducting all previous payments, if any, and amounts to be retained under the provisions of the Contract.

Any and all prior partial estimates and payments shall be subject to correction in the final estimate and payment.

The final estimate shall be conclusive and binding against both parties to the Contract on all questions relating to the performance of the Contract and the amount of work done thereunder and compensation therefor, except in the case of gross error.

9-1.17D(3) Final Determination of Claims: Claims filed by Contractor shall be in sufficient detail to enable the Engineer to determine the basis and amount of the Claims. Contractor shall also furnish reasonable documentation to the City to support Claims. If additional information is required by the Engineer, Contractor shall provide such information to the Engineer no later than the 15th day after receipt of the written request from the Engineer. If the 15th day falls on a weekend, holiday, or day City offices are closed, then the information shall be provided to the Engineer no later than close of the next business day. Failure to submit the requested information to the Engineer within the time specified will be sufficient cause for denying the Claim.

Contractor shall keep full and complete records of the costs and additional time incurred for any work for which a claim for additional compensation is made. The Engineer or any designated Claim

investigator or auditor shall have access to those records and any other records as may be reasonably required by the Engineer to determine the facts or contentions in each Claim. Failure to grant access to such records shall be sufficient cause for denying the Claims.

9-1.22 Arbitration: Any references to Arbitration in the Standard Specifications are deleted in their entirety.

Claims submitted by Contractor shall be accompanied by a notarized certificate containing the following language:

Under the penalty of law for perjury or falsification and with specific reference to the California False Claims Act, Government Code sections 12650 *et seq.*, the undersigned,

_____,
(Name)

_____ of
(Title)

(Contractor)

hereby certifies that the claim for additional compensation made herein is supported by a true statement of the actual costs incurred and time expended on this project, and is fully documented by records maintained by Contractor.

Dated _____

/s/ _____

Subscribed and sworn before me this _____ day of

Notary Public

My Commission Expires _____

Failure to submit the notarized certificate will be sufficient cause for denying the claim.

Any claim for overhead expenses, in addition to being certified as stated above, shall be supported by an audit report of an independent Certified Public Accountant. Any such overhead claim shall also be subject to audit by the City at its discretion.

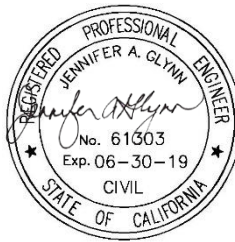
Any costs or expenses incurred by the City in reviewing or auditing any claims that are not supported by Contractor's cost accounting or other records shall be deemed to be damages incurred by the City within the meaning of the California False Claims Act.



Special Provisions

**LLANO - TRUNK LINING – W COLLEGE
UTILITIES FACILITY**

May 2019



**Jennifer Glynn, RCE 61303
Exp. 06/30/19**

Date: May 6, 2019



WOODARD & CURRAN
2175 North California Boulevard, Suite 315
Walnut Creek, CA 94596
(925) 627-4100

SECTION 10

GENERAL CONSTRUCTION

10-2.01 Description: Mobilization shall conform to the provisions in Section 9-1.16D, "Mobilization," of the Standard Specifications and as modified herein.

Mobilization shall include the obtaining of all permits, moving onto the site of all equipment, temporary buildings, if needed, temporary fencing, and other construction facilities as required for the proper performance and completion of the work.

Mobilization shall include but not be limited to the following principal items:

1. Signed Contract by the City and the Contractor.
2. Completion of all tasks and submittal of all documents (bonds, insurance, schedule, etc.) required as conditions of issuing the Notice to Proceed.
3. Moving onto the site(s) of all Contractor's equipment required for operations.
4. Installing temporary construction water supply, power, wiring and lighting facilities, as required.
5. Providing field office trailers if needed by the Contractor.
6. Providing all on-site communication facilities, including telephones and radio pagers.
7. Obtaining and adhering to all required permits.
8. Compliance with submittal process.
9. Having all OSHA required notices and establishment of safety programs.
10. Attendance at Pre-Construction and weekly progress meetings of Contractor's principal construction personnel.
11. Beginning work on the project or at the subject site as applicable.
12. Demobilization from the site(s).

Only one mobilization charge shall be allowed for this project. No charges will be allowed for movement of equipment between project sites or locations.

10-2.02 Payment: Mobilization/Demobilization shall not exceed 5% of the total contract price and shall be paid for at the contract **lump sum** price, which price shall include full compensation for conforming to the provisions of this section and no additional compensation will be allowed therefor. 90% of payment shall be for mobilization and 10% of payment shall be for demobilization.

SECTION 11

QUALITY CONTROL AND ASSURANCE

11-10.01 General: All visitors, contractors and others on City property shall, at all times, observe all applicable Local, State and Federal safety requirements, including but not limited to **Division of Occupational Safety and Health (Cal/OSHA)** and **Society for Protective Coatings (SSPC)**. In addition, all visitors, contractors and other's on City property shall, at all time, observe the safety rules and requirements listed in Section 13 of these Special Provisions.

11-10.02 Safety Requirements: The Contractor shall designate a Safety Supervisor who is qualified and authorized to supervise and enforce compliance with the Contractor's Safety Program. The Contractor shall notify the Engineer in writing prior to the commencement of work of the name of the Contractor's Safety Supervisor. The Contractor will ensure that all of its employees and its subcontractors of any tier, fully comply with these Special Provisions. The Safety Supervisor shall be either a full-time employee of the Contractor or a contracted safety consultant with experience and/or professional certifications indicating experience in construction safety. The Safety Supervisor provided by the contractor must be approved by the City and provide the City with weekly safety inspection reports identifying hazards found and corrective actions taken. The site Safety Supervisor shall be responsible for supervising compliance with applicable safety requirements on the work site and to develop and implement safety training for all job personnel. The City shall have the authority to remove the Contractor's Safety Supervisor if his/her performance of duties is judged to be improper or inadequate. However, the City shall not in any way affect the Contractor's sole responsibility for performing work safely, nor shall it impose any obligation upon the City to ensure the Contractor performs its work safely.

The Contractor shall take all necessary action to prevent damage, injury, and loss to:

- A. All employees on the Project, employees of all subcontractors, and other persons and organizations who may be affected.
- B. All work materials and equipment to be incorporated therein, whether in storage on or off the site.
- C. Other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities, and underground facilities not designated for removal, relocation, or replacement in the course of construction.

The Contractor shall comply with all applicable laws and regulations of any public body having jurisdiction for the safety of persons or property or to protect them from damage, injury or loss and shall erect and maintain all necessary safeguards for such safety and protection. All injury or loss to any property caused, directly or indirectly, in whole or in part, by the Contractor, any subcontractor, supplier or any other person or organization directly or indirectly employed by any of them in connection with the work or anyone for whose acts any of them may be liable, shall be remedied by the Contractor.

No smoking in any area designated "No Smoking" or "Flammable Storage" or any other area where smoking is prohibited by law.

Only City employees are permitted to have facility keys. Contractors are not permitted to have keys or other devices to gain access to City facilities.

Contractors are responsible for providing their employees with the required safety equipment such as, but not limited to, gas detection meters, rescue equipment, and personal protective equipment.

Contractor shall not move or relocate City first-aid equipment, blankets, stretchers, emergency eyewash/shower units, or any other safety equipment, without the permission of the City.

Contractors who damage City equipment or property shall report the incident immediately to the Engineer and complete the Contractor's Report of Damage to City Equipment or Property (*form(s) provided at Project's pre-construction meeting*).

Unless otherwise approved through a written authorization by the Engineer or their designee, Contractor is not allowed to tamper with valves, pumps, chemical storage tanks or any other City equipment.

11-10.04 Accidents And Safety Emergencies(CCR Title 8, Sections 3203, 14301, 14001): In emergencies affecting the safety or protection of persons or the work or property at the site or adjacent thereto, the Contractor, without special instruction or authorization from the Engineer, is obligated to act to prevent threatened damage, injury or loss. The Contractor shall give the Engineer prompt written notice if the Contractor believes that any significant changes in the work or variations from the Contract Documents have been caused thereby.

All accidents involving lost work time or damaged City property shall be reported to the Engineer on the same workday the incident occurred using the **Contractor's Injury/Fatality Incident Report** (*form(s) provided at Project's pre-construction meeting*) and/or the **Contractor's Report of Damage to City Equipment or Property** (*form(s) provided at Project's pre-construction meeting*).

Should a *serious accident or emergency* occur, or if an emergency requires off-site emergency responders (police, fire, medical, etc.), Contractor shall immediately notify, including nights, weekends, and holidays, the City according to the **Emergency Equipment/Contact Information** (*form(s) provided at Project's pre-construction meeting*).

Should a *serious accident or emergency* occur, the City reserves the right to conduct an accident investigation of the incident, either in conjunction with, or separate of, the Contractor. The Contractor shall provide complete access to the City's representative(s) and shall allow the City's representative(s) to take photos and private witness statements.

Accidents involving lost work time or damaged City property shall be investigated and a copy of the **Contractor's Injury/Fatality Incident Report** (*form(s) provided at Project's pre-construction meeting*) and/or the **Contractor's Report of Damage to City Equipment or Property** (*form(s) provided at Project's pre-construction meeting*) provided to the Engineer or designee within 24 hours of the incident.

If a claim is made by anyone against the Contractor or any subcontractor on account of any accident, the Contractor shall promptly report the facts in writing to the Engineer, giving full details of the claim.

11-10.05 Crane Operation (CCR Title 8, Sections 1604-1616, 4884-5049, et al): All Contractors shall only permit operators who have a valid certificate of competency (certificate) issued in accordance with CCR Title 8 Section 5006.1 by an Accredited Certifying Entity for the type of crane to be used to operate mobile cranes having a boom length equal to or greater than 25 feet or a maximum rated load capacity equal to or greater than 15,000 pounds.

Contractor shall only use cranes and hoisting equipment that have been inspected in accordance with CCR, Title 8, Article 99. Any defects noted during any inspection shall be corrected prior to using the equipment.

All rigging equipment (i.e. slings, softeners, bridles, blocking cables, and the like) shall be in good condition, properly identified as to capacity and properly stored when not in use.

A qualified signal person shall be provided when the point of operation is not in full and direct view of the crane operator.

All cranes shall be equipped with an audible warning device controllable by the operator.

No crane shall be operated with wheels or tracks off the ground unless properly bearing on outriggers.

All crane operators shall have documented training, including Cal/OSHA's Crane Operating Rules (CCR, Title 8, Article 98) and shall have crane operating experience prior to using a crane on City's property.

Crane operators shall have no physical impairments that will affect the safe operations of the assigned crane.

The Contractor shall not use or operate the City's cranes or hoisting equipment without approval. Such approval to use the City's crane or hoisting equipment shall be in writing.

11-10.07 Emergency Action Plan (CCR, Title 8, Section 1512, 3220 & 3400): Contractor shall submit a written *Emergency Action Plan* that is applicable to the work site and work activities being performed for review at least two weeks prior to any work that involves man-entry into any pipes or structures.

Contractor is responsible for ensuring the availability of *emergency medical services* for its employees. Contractor employees who will render basic first aid are to be trained and immediately available. Contractor shall also provide its own first aid kit(s) that contain the minimum first-aid supplies as determined by a licensed physician or in accordance with CCR, Title 8, Section 1512.

To facilitate prompt emergency services, Contractor shall:

- A. Determine who is responsible for making emergency calls.
- B. Conspicuously post a list of emergency phone numbers along with information to be transmitted.

11-10.08 Fire Prevention & Protection (CCR Title 8, Sections 1922, 1930-1938, 3221, 5415-5551, et al): Contractor's employees shall not smoke in areas where "No Smoking" signs are posted or in any other area in which smoking is prohibited by law. In accordance with California law, all buildings are considered no smoking areas. Areas where smoking, open flames, or other ignition sources are prohibited included, but are not limited to:

- A. On or near sewage digester gas storage areas or equipment.
- B. Flammable/combustible storage areas.
- C. Welding areas.
- D. Spray paint booths.

All flammable and combustible materials shall be stored, piled and handled in accordance with the National Fire Protection Association, Uniform Fire Code and CCR, Title 8 requirements.

Additionally:

- A. Flammable liquids shall be stored in an approved manner, and shall only be dispensed using approved safety containers.
- B. Oily rags shall only be stored in metal containers with self-closing lids and shall not be placed into any dumpster or trash receptacle.
- C. Welding gases shall be stored and handled in accordance with the "Compressed Gas Cylinders" section of this handbook.
- D. Cigarettes, matches, or other open lights shall be disposed of into an approved container or receptacle.

Contractor shall furnish a sufficient number of fire extinguishers to protect its work areas and material storage areas in accordance with the National Fire Protection Association, Uniform Fire Code and CCR, Title 8 requirements. Fire extinguishers shall be currently certified and shall be inspected monthly. Monthly inspections shall be documented using the affixed tag or other means.

Contractor shall not move, block or otherwise render fire equipment inaccessible.

Outdoor storage of flammable materials and liquids shall be located in a manner that reduces the spread of fire to other materials or to adjacent properties. Areas used for storing flammable materials and liquids shall be kept free of combustibles. Open flames and smoking is prohibited in these areas and the area shall be posted with a suitable warning sign.

Rubbish and debris shall not be allowed to accumulate on the City property. All trash and debris shall be routinely and properly disposed of.

11-10.09 Hazard Communication (CCR Title 8, Section 5194): Contractor's wishing to bring any substance, other than gasoline or diesel, for which the manufacturer has prepared a Materials Safety Data Sheet (MSDS), hereafter referred to as a hazardous substances, in quantities greater **25 lbs** onto City properties, or whose work activities may expose City employees to hazardous substances, must first complete the **Request to Use/Store Hazardous Substances on City Property Form** (form(s) provided at *pre-construction* meeting).

MSDS's for all hazardous chemicals brought onto City property shall be kept on the premises where the hazardous chemical is used and/or stored and made available to City employees and their representative upon request.

Contractors who bring hazardous substances to the work site must take the appropriate safety precautions to protect the Contractor's and City employees and the general public from harmful exposure.

The City maintains MSDS's for each hazardous chemical it owns. Contractors and their representatives can request a copy of an MSDS for any City hazardous chemical by contacting the Engineer.

11-10.10 Hazardous, Flammable, Toxic Materials (CCR Title 22 & CCR Title 8, Sections 5139-5155): Contractor shall comply with all Federal, State, and Local hazardous materials laws, regulations, and ordinances.

Contractor shall request permission (in writing) to bring any hazardous substance(s) on site that, if released, may significantly impact site employees, Contractor employees, general public, or the

environment. The request procedure shall include the type and quantity of material, where and how it will be stored, the type of secondary containment that will be used, and where and by whom the material will be used. Material Safety Data Sheets from the manufacturer shall accompany this request.

Any hazardous materials brought on-site shall be promptly removed or properly disposed as a hazardous waste once expired, is no longer needed, or when the project is completed.

Hazardous materials shall be limited to the amount needed to perform the job.

11-10.11 Hot Work Permits (CCR Title 8, Sections 4848 and 6777): Contractor shall use a *hot work permit* in accordance with CCR, Title 8, Section 6777 whenever job activities present a risk of fire from welding, cutting, grinding, brazing, burning, soldering, or any other use of open flames that may ignite materials, fumes, or vapors.

A completed copy of the *hot work permit* shall be posted in the immediate work area at all times during the work.

Employees performing *hot work* shall be trained on hot work safety.

Fire watchers equipped with, and trained on, appropriate fire suppression equipment shall be present whenever hot work is performed in locations where fire hazards might develop, or whenever any of the following conditions exist:

- A. There are appreciable combustible material closer than 35 feet to the hot work activities.
- B. There are appreciable combustibles that could be easily ignited by sparks.
- C. If wall or floor openings within a 35-foot radius expose combustible materials in adjacent areas including concealed spaces in walls or floors.
- D. If combustible materials are adjacent to the opposite side of metal partitions, walls, ceilings, or roofs and are likely to be ignited by conduction or radiation.

Fire watchers shall be trained on how to sound an alarm and shall be stationed at the hot work area for at least ½ hour after the hot work activities are completed to detect and distinguish smoldering fires.

11-10.12 Housekeeping (CCR Title 8, Sections 1513, 1529, 1532.1, et al): During the course of work all work areas, passageways, stairs, in and around buildings and structures shall be kept clear of debris. Construction materials shall be stored in an orderly manner and only in those areas designated by the City. Storage areas and walkways on the site shall be maintained free of depressions, obstructions and debris.

Scrap lumber, metal, trash and garbage shall be removed each day. City trash disposal containers shall not be used unless special provisions have been made.

Unattended materials shall not be stored overhead without proper protection.

Work shall be performed in a manner that will minimize noise and mitigate the spread of dust and dirt into adjacent work areas.

Protruding nails, wire, spikes, etc. shall be immediately removed or completely bent.

Oil, grease and water spills shall be cleaned up immediately or covered with absorbent materials.

All reinforced steel and rebar shall be removed, bent over, flattened, covered with steel reinforcing caps or wooden troughs, or be protected using other engineering controls that will eliminate exposure to the exposed reinforced steel.

Note: Mushroom caps shall not be used for protection against impalement hazards.

Spillage of earth, dusty materials, boulders, and mud on roads located on City property is not permitted. If spillage cannot be prevented, Contractor shall provide an hourly patrol to police and sweep such areas throughout the workday.

11-10.13 Industrial Trucks (Forklifts) (CCR Title 8, Section 3649-3669): Only trained and authorized personnel shall operate forklifts. Training documentation shall be provided upon request of the City.

Contractor shall provide its own forklift that meets the design and construction requirements of Part II ANS/ B-56.1-1975.

The rated lifting capacity shall be posted in a location readily visible to the operator.

A forklift shall not be used to elevate employees unless a platform with guardrails, a backguard and a kill switch are provided on the vehicle. If guardrails are not possible, fall protection is required.

A copy of the operating rules shall be immediately available and shall be enforced at all times.

11-10.14 Lockout/Tagout (CCR Title 8, Sections 2320.1-2320.9, 3314, et al): Work involving systems shutdown or startup (e.g. tie-ins, connections, equipment shutdowns, etc.) shall be coordinated with, and approved by, the Engineer using whatever procedures or mechanism the Engineer deems appropriate.

Under no circumstances, shall Contractor initiate shutdown procedures of any City work, processes or equipment, without prior approval of the Engineer.

Whenever work is to be performed on any equipment or systems that may result in hazardous energy exposures to workers or other affected personnel, all sources of energy (primary and secondary) shall be de-energized and locked out or blocked.

Lockout procedures shall comply with the most stringent applicable standard, (e.g. CCR Title 8, CFR Parts 1910 and 1926, NEC) and shall include the following:

- A. Lockout procedures shall be coordinated between the Contractor and the City's designated representative.
- B. All locks shall be individually keyed. Group or crew locks are not allowed.
- C. All equipment or systems that have been locked out shall have a current accident prevention tag noting the reason for placing the tag, name of the individual placing the tag, how that person may be contacted, and the date the tag was placed.
- D. No employee shall remove another employee's lock(s) or tag(s). Any exceptions shall be coordinated between the Contractor and the Engineer.

If equipment or systems cannot be locked out or blocked, suitable tagout procedures shall be implemented. Only the person whose signature is on the accident prevention tag may remove it.

Any exceptions to this shall be coordinated between the Contractor and the Engineer.

Upon completion of the work, energizing equipment is prohibited until all tags and locks have been removed. The person removing the last tag is responsible for re-installation of guards and for warning all affected personnel.

11-10.16A Spray Painting/Coating Operations: Contractor shall use positive-pressure airline respiratory protection when spraying in a confined space, or if employees are exposed to any hazardous contaminant in the product that is greater than the Permissible Exposure Limit (*PEL*). If flammable or combustible paints or products are used, continuous monitoring for combustible gas is required. When 10% of the lower explosive limit is reached, painting operations shall be suspended.

Contractor shall use *NIOSH* or *MSHA* approved respiratory equipment that provides adequate protection for the substance being used.

Contractor employees shall be instructed in the correct operation and location of all fire protection and safety equipment in the work area. An appropriately rated fire extinguisher shall be placed in a convenient location near any spray-painting/coating operation.

All air and steam equipment shall be bonded if using flammable or combustible paints.

Only Class I, Division I, Group D rated explosion-proof electric motors or blowers may be allowed when flammable paints or solvents are used.

The work area shall be kept clean of accumulated rags or other combustible debris.

Employees shall wear the required personal protective equipment as identified in the products' Material Safety Data Sheets (*MSDS*).

Contractor shall inspect all electrical equipment in and around the spray- painting/coating area to determine if they are an approved type and in proper working condition.

The spray-painting/coating work area shall be protected from electrical hazards using proper lockout/tagout procedures.

11-10.17 Permit And Registration Requirements (CCR Title 8, Section 341): As required by Cal/OSHA, State, City, County, or City regulations, Contractors are responsible for obtaining all applicable permits. These include, but are not limited to the following:

- A. Trench or excavation four (4) feet or more in depth in which workers may enter.
- B. Erection or demolition of any building, falsework, scaffolding, or structure of the equivalent of three (3) stories or higher.
- C. Operating diesel equipment underground.
- D. When performing asbestos-related work.
- E. When working with, transporting, or performing other work activities involving hazardous materials that require a permit.

11-10.18 Personal Protective Equipment (CCR Title 8, Sections 1514-1522, 3380-3386): All Contractors shall provide and enforce the use of personal protection equipment by all

its employees and visitors in accordance with CCR Title 8 Subchapter 7 General Industry Safety Orders Group 2 Safe Practices and Personal Protection Article 10.

All Contractors shall enforce the use head protection in accordance with CCR Title 8 Section 3381 Head Protection whenever its employees or visitors work in locations where there is a risk of receiving head injuries from flying or falling objects and/or electric shock and burns.

11-10.19 Powder-Actuated Tools (CCR Title 8, Sections 1684-1692): Contractor shall only allow *qualified persons* with valid operator cards to use powder-actuated tools.

Powder-actuated tools shall be stored in a locked container that is accessible only to *qualified persons* who carry valid operator cards.

A warning sign, as required by CCR Title 8, Section 1691, shall be posted within 50 feet of the area where the tool is being used.

Powder-actuated tools shall be serviced and inspected for worn or damaged parts. Inspection records shall be provided to the City upon request.

Eye and face protection shall be worn at all times when any powder-actuated tool is in use.

11-10.20 Protecting The General Public (CCR Title 8, Sections 1597-1599, 1662, et al): Contractor shall take every precaution to prevent injury or property damages to the general public. The public includes any person not employed by the Contractor or subcontractors of any tier. Among the precautions to be taken, the following shall be observed:

- A. Every step necessary shall be taken to protect and maintain work areas that interface with public sidewalks, building entrances, stairways and roadways. This protection shall be provided by the Contractor by installing and maintaining the appropriate barricades, fences, guardrails, overhead protection, or any other necessary form of protection.
- B. Welding screens or other means shall be used when welding in a public area to protect the public from welding hazards.
- C. Pedestrian or vehicle barriers shall be used around all open pits, manholes, or excavation openings when left unattended.

11-10.21 Signs & Barricades (CCR Title 8, Section 1513, 1541, 1590, 1597-1599, 1736, 3340, et al): When working in areas that present hazards to personnel or vehicles, Contractors shall place appropriate signs and barricades in accordance with appropriate CCR Title 8 requirements.

When signs or barricades are required, they shall be clearly visible at all times and shall be promptly removed or covered when the hazard no longer exists.

When barricades are used at night or in very dark work areas, a flashing beacon light shall be used in conjunction with the barricade.

11-10.22 Waste Disposal (CCR Title 22 Sections 60001-60283, CCR Title 8, Sections 1513, 3368): Contractor is responsible for all waste products that are produced as a result of the work being performed as part of the contract. As such, Contractor shall arrange for all debris, trash, rubble, and excavation spoils to be properly disposed of according to local, state and federal disposal regulations.

All hazardous materials, including hazardous wastes, brought on-site or generated by the

contractor shall be removed by the contractor within 30 days after the completion of the project. Failure to do so will result in the City arranging for proper disposal and disposal costs will be deducted by the City from the contract amount.

Any hazardous wastes that are generated by the Contractor remain the property of the Contractor. As such, all hazardous wastes may not be stored longer than the allowable accumulation times, and shall be stored, labeled, handled, and disposed of according to CCR Title 22 regulations. This includes, but is not limited to:

- A. Secondary containment.
- B. Rain protection if stored outdoors.
- C. Hazardous waste labels meeting California EPA labeling requirements.
- D. Containers that are in good condition and kept closed when not in use.

11-10.23 Confined Space Entry (CCR Title 8, Sections 5156 & 5157): For the purpose of this contract, all Confined Spaces, as defined in California Code of Regulations (CCR) Title 8, Section 5157 Permit-Required Confined Spaces shall be entered by adhering to the provisions set forth in Section 5157 Permit-Required Confined Spaces. All work associated with inspection of existing sanitary sewer pipelines and manholes shall be considered as **Permit-Required Confined Space** as defined by CCR Title 8, Sections 5157 and should only be entered in accordance with a Permit System as described in CCR Title 8, Section 5157, with no reclassification allowed.

Attention is directed to CCR Title 8, Section 5157 (c) General Requirements (9)(A) Obtain any available information regarding permit space hazards and entry operations from the host employer(City); (B) Coordinate entry operations with the host employer(City), when both host employer personnel and contractor personnel will be working in or near permit spaces, as required by subsection (d)(11); and (C) Inform the host employer of the permit space program that the contractor will follow and of any hazards confronted or created in permit spaces, either through a debriefing or during the entry operation. Attention is directed to CCR Title 8, Section 5157, Appendix E – Sewer System Entry requirements.

Contractor will be required to submit their Confined Space Entry and Rescue Plan, pursuant to Title 8 CCR Section 5157, for review and approval at least two weeks prior to any work where he will be required to enter existing sanitary sewer pipelines. The City will have the Contractor's Confined Space Entry and Rescue Plan reviewed by a City-provided third party on-site safety consultant, certified to the California State Fire Marshall's 40-Hour Rescue Technician Level or higher for adequacy. The Contractor will be required to correct any deficiencies noted during this review prior to commencing work.

The Contractor will be required to provide, as part of their Confined Space Entry and Rescue Plan, evidence that their on-site confined space entry rescue team have received entry rescue training in accordance with CCR Title 5157 within the prior six months.

The Contractor shall supply all confined space entry and rescue equipment. Only trained personnel are permitted to enter confined spaces and to use confined space equipment.

Whenever Contractor and City personnel are working simultaneously in a permit space, the activities will be coordinated prior to entry so that employees of one employer do not endanger the employees of any other employer. Coordination of entry procedures must include procedures for emergency evacuation.

The Contractor shall immediately inform the Engineer of any previously unidentified hazards confronted or created during confined space entry.

11-20.01 Non-Compliance (CCR Title 8, Section 3203 & 1509): If the City's designated representatives becomes aware of non-compliance with these general contractor safety provisions the City or its designee will:

- A. Notify the Contractor that the unsafe condition must be corrected or the work in question will be stopped until the condition is corrected to the satisfaction of the City. This notice, when delivered to the contractor or the contractor's representative at the job site, shall be deemed sufficient notice of the non-compliance to immediately implement corrective action.
- B. Exercise the right to issue a suspend work order suspending all or part of the work if the Contractor fails or refuses to take corrective action within the time specified in the notice. The order shall remain in effect until satisfactory corrective action has been taken.

No extension of time or additional compensation will be granted as a result of any corrective or stop order.

Willful or repeated non-compliance may result in an employee or contractor being removed for failing to perform work properly in accordance with the contract safety specifications.

A corrective order or any other action taken by the City does not relieve the Contractor of its obligations, under any applicable law, to provide a safe workplace and to comply with safety regulations.

11-20.02 Shoring and Bracing (CCR Title 8, Sections 341, 1539-1547, et al): In accordance with the provisions of Section 6705 of the Labor Code, the Contractor shall submit a detailed Shoring and Bracing Plan, or other provisions to be made for worker protection from hazard of caving ground or existing manhole structure during any work in which shoring is required. If such plans vary from the shoring system standards set forth in the Construction Safety Orders of the Division of Industrial Safety in Title 8, California Code of Regulations, the plans shall be prepared and **signed** by a currently registered civil or structural engineer in the State of California employed by the Contractor, and all costs therefore shall be included in the price named in the Contract for completion of the work as set forth in the Contract Documents. Shoring and Bracing Plan shall be submitted for review and approval at least two weeks prior to any work in which shoring is required.

For any work conducted by workers, Contractor shall:

- A. Obtain a permit from Cal/OSHA before starting work.
- B. Ensure that each employee conducting work, is protected from cave-ins, failure of protective systems, hazardous atmospheres, vehicular traffic, falling loads, and any other hazardous conditions.

If there is a potential atmospheric hazard such as oxygen deficiency or toxic gases, the atmospheres in the excavation shall be tested before employees enter any excavation depth greater than four (4) feet.

Contractor shall have a *competent person on-site* who will make daily inspections of excavations, adjacent areas, and protective systems. The *competent person* will be responsible for ensuring that the protective system is based upon soil classifications, and that it provides the required protection in accordance with CCR, Title 8, Section 1541.1.

Sloping or benching for excavations shall not be allowed.

Required shoring/bracing system shall not effect and/or reduce required dimensions and

clearances, as specified herein. The Contractor may install a shoring/bracing system that becomes either partially or entirely embedded within or adjacent to the proposed wall prism subject to the following limitations:

- A. Shoring/bracing system shall not impair the strength of construction.
- B. Shoring/bracing system to be embedded in concrete shall not be exposed to rusting or deterioration from exposure to hydrogen sulfide gas. Maintain minimum concrete cover as noted on drawings.
- C. Shoring/bracing system to be embedded in concrete shall not be constructed of aluminum or other materials that would cause electrolytic action with concrete or cause adverse effects to the material required for doing manhole retrofit work.
- D. Shoring/bracing system shall be fabricated and installed such that cutting, bending, or displacement of reinforcement from its proper location will not be required.

11-30.01 Payment: Full compensation for conforming to the safety rules and requirements as specified in these Special Provisions shall be considered as included in the prices paid for the various contract items of work involved and no additional compensation will be allowed therefor.

SECTION 12

TEMPORARY TRAFFIC CONTROL

12-1.01 General: Construction area traffic control devices shall be installed and maintained in accordance with the applicable sections of these Special Provisions, the Standard Specifications, the current edition of the California Manual on Uniform Traffic Control Devices (CAMUTCD), the Project Exhibits, and as directed by the Engineer.

12-1.02 Flagging Costs: The first paragraph of Section 12-1.03, "Flagging Cost" is amended to read: The cost of furnishing all flaggers, including transporting flaggers, to provide for passage of public traffic through the work under the provisions in Section 7-1.03, "Public Convenience", and Section 7-1.04, "Public Safety", shall be considered as included in the contract lump sum price paid for traffic control and no additional allowance will be made therefor.

12-3 Traffic-Handling Equipment and Devices

12-3.01A (3) Submittals: Prior to commencing construction which will affect existing vehicular and pedestrian traffic, the contractor shall submit for review by the Engineer, Traffic Control Plans on 11" x 17" sheets of paper which contains only information specifically related to each work zone's vehicular and pedestrian traffic control. If the Contractor proposes to use the current edition of CAMUTCD in specific work operations, they shall submit in writing for consideration which Typical Application Diagram will be used and how it will be applied for each work operation. Traffic Control Plans shall be submitted to the City of Santa Rosa for review at least two weeks prior to desired implementation.

Traffic Control Plans shall contain a title block which contains the contractor's name, address, phone number, project superintendent's name, contract name, dates and hours traffic control will be in effect, and a space for review acknowledgment.

Traffic Control Plans shall include, but is not limited to, the following:

1. Show location and limits of the work zone.
2. Give dimensions of lanes affected by traffic control that will be open to traffic.
3. Indicate signing, cone placement, and other methods of delineation and reference to appropriate CAMUTCD typical application, City Standard or Caltrans Standard as applicable.
4. Dimension location of signs and cone tapers.
5. Identify side streets and driveways affected by construction and show how they will be handled.
6. Demonstrate how two-way traffic will be maintained.
7. Location of major equipment such as boilers and liner transportation trailers or on-site wet

out facilities as required.

8. Show how pedestrian traffic will be handled through the construction site. Pedestrian pathways through the work zone shall be in compliance with the requirements of ADA during and after work hours.

No work except for installation of project identification signs and changeable message boards, as required, will be allowed to commence prior to approval of the Work Zone Traffic Control Plan.

12-3.01C Construction: Exact locations of Project Identification signs and Advance Notice signs (Section 7-1.08 "Maintaining Traffic") shall be determined in the field by the Engineer.

Portable changeable message boards will be required for this project and shall not impede into any travel lanes. Message boards shall state "ROAD WORK FROM START DATE TO END DATE". Message boards shall be installed at the locations directed by the Engineer two weeks prior to any construction activity and removed immediately after construction activity.

Lane closures will be permitted between the hours of 8:30 a.m. and 4:00 p.m. only. No lanes shall be closed at any other hours unless specifically approved by the Engineer. The Contractor shall maintain vehicle access to homes and other properties at all times while work is in progress.

The Contractor will be required to maintain vehicle access to homes and other properties within the block where work is in progress.

The Contractor shall keep the City of Santa Rosa Fire Department informed regarding the closure of any traveled way. At a minimum, the Contractor shall call the Fire Department at 707-543-3535 **and** the Communications Center at 707-543-3666 **daily** to report any traveled way closure. This means immediately upon closure for that day and again immediately after removal of the closure. For closures over multiple days, the daily notification still applies. This requirement does not apply for single lane closures on multiple lane streets.

The Contractor shall notify Santa Rosa City Bus at (707) 543-3922, the local Postal Service at (707) 526-0113 and Santa Rosa Recycling and Collection at (707) 586-8234 5 calendar days prior to any lane closures or restrictions in turning movements.

If the Contractor has been given an approved Traffic Control Plan that includes road closures, they will be required to maintain vehicular access to homes and other properties where work is in progress within the closure area.

Seventy-two (72) hours prior to construction, the Contractor shall place a notice on each front door, and attempt to notify each owner or tenant verbally that work will be underway within their block between stated hours, and request that cars be parked out of the roadway by 8:00 a.m. Service of notice shall not bar use of cars within the block; however, as individual plans change, and emergencies may arise.

Streets intersecting or crossing roadways in which work occurs will require maintenance of at least one-half ($\frac{1}{2}$) width of each street for traffic purposes, unless a parallel route is approved by the Engineer. Flagging will only be allowed between the hours of 8:30 a.m. and 4:00 p.m.

Barricades and flaggers shall be positioned to allow safe turns at intersections.

In parking lot areas, the contractor shall maintain vehicular access to throughways and gates.

Contractor staging is allowed as indicated on the Project Exhibits. The Contractor shall not be allowed to stage equipment or materials within the public right-of-way and/or in areas where traffic flow may be impacted.

Existing pavement damaged by the Contractor's operations and not shown to be replaced shall be replaced at the Contractor's expense, per City Standards and to the satisfaction of the Engineer.

12-3.01D Payment: **Traffic Control** shall be paid for at the contract **lump sum** price for each phase, which price shall include full compensation for furnishing all labor, materials, tools and equipment and doing all work involved in vehicle and pedestrian traffic control, including temporary relocation of regulatory signs; flaggers; as specified herein, and no additional allowance will be made therefor.

12-4.01 Maintaining Traffic:

1. When construction operations are not actively in progress, the full width of the traveled way shall be fully open for use by public traffic, unless otherwise authorized by the Engineer in writing.
2. The location of traffic control signing, barricades, and other facilities shall be monitored frequently (four to five times per day) by the Contractor to verify their proper location. All traffic signal and other traffic control devices shall be maintained at all times.
3. The Contractor shall conduct their operations so as to cause the minimum obstruction and inconvenience to traffic and to places of business, multiple dwelling units and residences adjacent to the work. The Contractor shall notify the Engineer of their planned work and utility service interruption at least five working days in advance to allow time to notify residents and businesses.
4. Unless otherwise authorized by the Engineer, full access shall be provided to all driveways.
5. At locations where traffic is routed perpendicular to trench excavation, the excavation shall be conducted in a manner to provide a surface reasonably satisfactory for traffic at all times. Substructure installation or construction shall be conducted on only one-half the width of the roadway at a time, and that portion of the roadway being used by traffic shall be kept open and unobstructed until the opposite side of the roadway is ready for use.

12-7 Temporary Pedestrian Walkways

12-7.01 General: The Contractor is directed to Chapter 6D, Pedestrian and Worker Safety, in the CAMUTCD, the Project Exhibits, and these Special Provisions.

Pedestrians shall be provided with a safe, convenient and accessible path that, at a minimum, replicates the most desirable characteristics of the existing sidewalk, path or footpath. At no point along the road shall the sidewalks on both sides of the road be closed at the same time. Temporary ramps must have a non-slip surface.

The Contractor shall construct and maintain temporary pedestrian pathways through the work zone, where required, that shall be in compliance with the requirements of the Americans with

Disabilities Act (ADA), the CAMUTCD.

Contractor shall maintain ADA pedestrian access at crosswalks through the work zone.

Pedestrian routes shall not be impacted for the purposes of any non-construction activities such as parking of vehicles or equipment, or stock piling of materials.

Pedestrian routes shall be open and accessible at the end of the work day unless an alternate ADA compliant route has been approved by the Engineer. The construction of curb ramps and/or long sections of sidewalk do not alleviate the Contractor from this requirement.

Pedestrians shall not be led into conflicts with work site vehicles, equipment or operations.

Curb Ramps, or other interim facilities, shall be installed in a sequence such that pedestrians shall have access to one side of each street at all times.

12-7.04 Payment: Full compensation for furnishing all labor, materials, tools and equipment, and doing all work involved in accommodating pedestrian access and pedestrian traffic control is considered as included in the prices paid for **Traffic Control**, and no additional allowance will be made therefor.

[Revised: 05/03/14RS-DCM]

SECTION 13

WATER POLLUTION PREVENTION

Section 13-1.01A: Water Pollution Control shall be performed in accordance with Section 13, Water Pollution Control, of the Standard Specifications and these technical specifications. In addition, construction activities shall comply with:

The current California Water Quality Control Board, North Coast Region Order No. National Pollutant Discharge Elimination System Municipal Storm Water Permit, commonly referred to as the “Storm Water Permit”. A copy of the Storm Water Permit is available for review at the City of Santa Rosa Transportation and Public Works Department, 69 Stony Circle, Santa Rosa, CA, and at www.srcity.org/stormwaterpermit.

The California Stormwater Quality Association Storm Water BMP Handbook for Construction (CASQA Handbook). BMPs shall be selected, installed and maintained in accordance with the latest edition. A copy of the handbook can be viewed at the City of Santa Rosa Department of Transportation and Public Works office at 69 Stony Circle or downloaded from CASQA, <http://www.casqa.org/>.

In this technical specification the CASQA Handbook BMP numbers are appended to the associated Standard Specification sections. If a conflict occurs the CASQA Handbook BMP's shall govern.

In addition to the published requirements of BMP WM-9, temporary sanitation facilities shall have secondary containment. Contractor shall protect all storm drain inlets from non-storm water discharges with an approved inlet protection method accepted by the City. Sand/gravel bags and filter fabric or other approved sediment capture devices shall be placed in gutters adjacent to inlets to capture sediment before entering inlets. All sediment and debris accumulated behind sand/gravel bags or inlet protection devices shall be removed prior to rain events. Inlet protection or sediment capture devices that may contribute to flooding shall be removed prior to rain to prevent flooding and replaced before resuming work.

Section 13-2.01B Submittals: The program to control water pollution required to be submitted under this section of the standard specifications shall include a spill contingency plan that establishes clean-up procedures that will be followed in the event of a spill of potentially hazardous, toxic, or polluting materials.

13-3.01A Summary: This project is exempt from the State Water Resources Control Board General NPDES Permit for the Discharge of Storm Water related to Construction Activities (Construction General Permit), and not required to have a Storm Water Pollution Prevention Plan (SWPPP), therefore Section 13-3, Storm Water Pollution Prevention Plan, of the Standard Specifications does not apply to this project.

13-4.03B: Spill Prevention and Control/CASQA Spill Prevention and Control (BMP WM-4):

If a spill occurs at the construction site and the contractor does not take immediate and adequate steps to contain and clean up the spill, especially if rain is threatening or if a discharge to a storm drain or creek could occur, the City shall have the right, in its sole and absolute discretion, to clean up the spill using City forces or an independent contractor. The cost of any such cleanup, in addition to recovery of any penalty of fine imposed upon the City, plus an administrative charge of fifteen percent (15%) of the costs incurred by the City, shall be deducted

from any amounts owed to Contractor hereunder.

In the event there are insufficient amounts owed to Contractor hereunder to cover the foregoing costs and charges, the City shall have the right to pursue any other remedy to recover same, including but not limited to, proceeding against any surety or bond in favor of the City. The City's rights under this section are intended to be in addition to and not in lieu of any imposed by the City against Contractor for violations of City Code Chapter 17-12, "Storm Water".

13-4.03C(3): Stockpile Management/CASQA Stockpile Management (BMP WM-3): Do not block storm water flows.

13-4.03D(1): Waste Management/CASQA Solid Waste Management (BMP WM-5): The Contractor shall dispose of all trash, rubbish, and waste materials of any kind generated by the contractor, subcontractor, or any company hired by the Contractor on a daily basis.

13-4.03D(3): Concrete Waste/CASQA Concrete Waste Management (BMP WM-8): Ensure the containment of concrete washout areas and other washout areas that may contain pollutants so there is no discharge into the underlying soil and onto the surrounding areas.

13-4.03D(4): Sanitary and Septic Waste/CASQA Sanitary and Septic Waste Management (BMP WM-9): Sanitation facilities must be maintained periodically by a licensed service to keep them in good working order and prevent overflows. Portable toilets are required to have secondary containment.

13-4.03D(5): Liquid Waste: Liquid waste includes water generated from excavation dewatering. Minimize transfer piping by locating containers near the excavation to be dewatered while protecting the containers from moving vehicles and equipment.

13-4.03E(7): Paving, Sealing, Sawcutting, Grooving, and Grinding Activities: As listed in Part 9, sections 4 and 5 of the Storm Water Permit, the following additional BMPs shall be implemented for street paving, repaving, reconstruction, patching, digouts or resurfacing.

1. Restrict paving and repaving activity to exclude periods of rainfall or predicted rainfall unless required by emergency conditions;
2. Install BMPs at all susceptible storm drain inlets and manholes to prevent paving products and tack coat from entering;
3. Prevent the discharge of release agents including soybean oil, other oils, or diesel to the storm water drainage system or watercourses;
4. Minimize non-storm water runoff from water use for the roller and for evaporative cooling of the asphalt;
5. Clean equipment over absorbent pads, drip pans, plastic sheeting or other material to capture all spillage and dispose of properly
6. Collect liquid waste in a container, with a secure lid, for transport to a maintenance facility to be reused, recycled, or disposed of properly **13-4.03D(5)**;
7. Collect solid waste by shoveling and vacuuming or sweeping and securing in an appropriate container for transport to a maintenance facility to be reused, recycled, or disposed of properly **13-4.03D(5)**;
8. Cover "cold-mix" asphalt (i.e., pre-mixed aggregate and asphalt binder) with protective sheeting during a rainstorm **13-4.03C(3)**;
9. Cover loads with tarp before haul-off to a storage site, ensuring that trucks are not overloaded;
10. Minimize airborne dust by using water spray during grinding **14-9.03**;

11. Protect stockpiles with a cover or sediment barriers during a rain event and;
12. Avoid stockpiling soil, sand, sediment, asphalt material and asphalt grindings materials or rubble in or near storm water drainage system or watercourses **13-4.03C(1)**.

13-4.04 Payment: Full compensation for furnishing all labor, materials, tools and equipment, and doing all work for conforming to Section 13 shall be considered as included in the prices paid for the **various contract items** of work, and no additional allowance will be made therefor.

SECTION 14

ENVIRONMENTAL STEWARDSHIP

14-1.03.2 Temporary Silt Fence: Where deemed necessary by the Engineer, temporary silt fence shall be prefabricated or constructed with silt fence fabric, posts, and fasteners.

Silt fence fabric shall be geotextile manufactured from woven polypropylene or polymer material. Silt Fence Fabric may be virgin or recycled, or a combination of virgin and recycled polymer materials. No virgin or recycled polymer materials shall contain biodegradable filler materials that can degrade the physical or chemical characteristics of the finished fabric. The Engineer may order tests to confirm the absence of biodegradable filler materials in conformance to the requirements in ASTM Designation: E 204 (Fourier Transformed Infrared Spectroscopy-FTIR).

Silt fence fabric shall conform to the following requirements:

Specification	Requirements
Width, inches, min.	36
Grab tensile strength (one-inch grip), pounds, min. in each direction ASTM Designation: D 4632*	124
Elongation, percent minimum in each direction ASTM Designation: D 4632*	15
Permittivity, 1/sec., min. ASTM Designation: D 4491	0.05
Flow rate, gallons per minute per square foot, min. ASTM Designation: D 4491	10
Ultraviolet stability, percent tensile strength retained after 500 hours, min. ASTM Designation: D 4355 (xenon-arc lamp and water spray weathering method)	70

* or appropriate test method for specific polymer

Posts for temporary silt fence shall be steel and have a "U," "T," "L," or other cross-sectional shape that can resist failure from lateral loads. The steel posts shall have a minimum weight of 0.8-pound per foot and a minimum length of 4 feet. One end of the steel posts shall be pointed, and the other end shall be capped with an orange or red plastic safety cap which fits snugly to the steel post. The Contractor shall submit to the Engineer for approval a sample of the capped steel post before installation.

Fasteners for attaching silt fence fabric to posts shall be as follows:

- A. When prefabricated silt fence is used, posts shall be inserted into sewn pockets.
- B. Silt fence fabric shall be attached to wooden posts with nails or staples as recommended by the manufacturer or supplier. Tie wire or locking plastic fasteners shall be used to fasten the silt fence fabric to steel posts. Maximum spacing of fasteners shall be eight inches along the length of the steel post.

Temporary silt fence shall be repaired or replaced at the expense of the Contractor on the same day when the damage occurs.

When no longer required as determined by the Engineer, temporary silt fence shall become the property of the Contractor and be removed and disposed of off-site in conformance with all

City, County, and State regulations. Trimming the silt fence fabric and leaving it in place will not be allowed.

Ground disturbance, including holes and depressions, caused by the installation and removal of temporary silt fence shall be backfilled and repaired in conformance with the provisions in Section 5-1.36, "Property and Facility Preservation," of the Standard Specifications.

14-9.03A General: Sweeping per section 14-9.03C shall also be performed to prevent and alleviate dust.

Sweeping, covering stockpiles, applying water, and/or dust palliative, to control dust caused by public traffic is not change order work.

14-9.03C Construction: All dust-producing work and unpaved construction sites shall require a minimum watering in the middle and ending of each workday. The frequency of watering shall increase if dust is airborne. Watering shall not produce runoff.

Contractor shall maintain dust control to the satisfaction of the Engineer, 7 days a week, 24 hours per day.

At the end of each work day the Contractor shall thoroughly sweep all streets in the work zone to minimize airborne dust.

At the end of each work week the Contractor shall sweep all streets in the work zone with a commercial street sweeping truck equipped with a rear pick up broom.

At the Engineer's discretion additional sweeping or watering may be required, including the use of a commercial street sweeping truck equipped with a rear pick up broom, at any time or place.

14-10.01 General: The Contractor shall dispose of all Portland cement concrete and asphalt concrete, generated from removal or demolition activities on the project, at a recycler for these materials. The Contractor shall provide receipts verifying delivery and approximate quantity (in tons) of the material delivered to a material recycler.

All other excess materials from the project shall become the property of the Contractor and shall be disposed of at no additional cost to the City.

14-10.02A (1) Submittals: Submit a Solid Waste Disposal and Recycling Report prior to final acceptance of work performed under the Contract. Show the types and amounts of project-generated solid waste taken to or diverted from landfills or reused on the project.

14-13.1 Construction Storage Areas: Storage of construction equipment and materials shall be limited to the designated Contractor's staging area as shown on the exhibits.

The following conditions shall apply to Contractor's use of the staging area located at City of Santa Rosa Corporation Yard:

Define amount of equipment and material to be staged, before receiving approval.

No leaking equipment at the staging area or anywhere else on the project.

No debris stockpiling allowed at the staging area.

The City shall not be held responsible or liable for any material damage, equipment damage or

personnel injury with in the City Corporation Yard.

Housekeeping must be strictly adhered to, if not, permission to use the facilities may be revoked at any time.

Area shall be commercially swept and power washed at completion of project, and asphalt shall be restored per Section 37.

Store and service equipment at the designated Contractor's storage area where oil wastes shall be collected in containers. Oil wastes shall not be allowed to flow onto the ground or into surface waters. Containers shall be required at the construction site for the disposal of materials such as paint, paint thinner, solvents, motor oil, fuels, resins and other environmentally deleterious substances.

No dumping of surplus concrete or grout on the site shall be permitted.

Provide adequate secondary containment for all hazardous materials. All hazardous waste should be stored, transported, and disposed as required in Title 22 CCR, Division 4.5 and 49 CFR 261-263.

14-13.1D Payment: Full compensation for furnishing all labor, materials, tools and equipment, and doing all work for conforming to Section 14 shall be considered as included in the prices paid for the **various contract items** of work and no additional compensation will be allowed.

SECTION 15

EXISTING FACILITIES

15-1.03A General: Existing facilities disturbed by construction shall conform to the applicable provisions of Section 5-1.36. All existing active utilities found to reside in excavated areas shall be supported in place with service maintained during construction. The Contractor shall be responsible for any damage caused by their operations and any needed repairs shall be completed to the Engineer's satisfaction.

Existing storm drains found to reside in excavated areas shall be supported, removed, or replaced at the Contractor's option and at no additional cost to the City. The Contractor shall be responsible for maintaining the existing line and grade of the storm drains. If the Contractor elects to remove and replace, it shall be done per applicable City Standards and Specifications.

Existing utility trenches and/or structures that are in close proximity to proposed trenches shall be safeguarded in an appropriate manner from damage.

15-1.04 Payment: Full compensation for supporting, removal and disposal of existing utilities and their appurtenances is considered as included in the contract prices paid for **various contract items** of work and no additional allowance will be made therefor.

15-2.02C Traffic Stripes and Pavement Markings: All traffic stripes, pavement markings or any other traffic markings shall be removed by the Contractor to the satisfaction of the Engineer and in accordance with Sections 84 of the Standards, and the Project Exhibits.

15-2.02D Pavement Markers: All raised pavement markers shall be removed by the Contractor to the satisfaction of the Engineer and in accordance with Sections 85 of the Standard Specifications, City Standards, and the Project Exhibits.

15-2.10B Adjust Frames, Covers, Grates, and Manholes: Existing manhole frames and covers, valve boxes, mainline cleanouts and monuments that are disturbed as part of this Project shall be adjusted after paving to conform to new finish grade.

The Contractor shall accurately locate and record the location of existing and new manholes, valve boxes, mainline cleanouts, and monuments to be adjusted to grade and shall furnish the Engineer a copy of said record prior to starting construction.

All facilities on active systems shall be accessible at all times to City personnel unless otherwise stated in these Special Provisions or approved by the Engineer.

After placement of the finish course of asphalt concrete the Contractor shall mark all overlaid manholes, valve boxes, mainline cleanouts and monuments, whether new or existing, with white paint by the end of that working day.

All new and existing manholes, valve boxes, mainline cleanouts and monuments shall be adjusted to grade within 48 hours after placement of the finish course of asphalt concrete.

Final grade adjustments and installation of concrete collars shall be done on the same working day. Final paving around manholes, valve boxes, mainline cleanouts and monuments shall be completed the following working day.

All silt and debris shall be removed from finished structures. This shall include all existing silt and debris plus material caused by the Contractor's operation.

Prior to removal of an existing manhole frame, a platform shall be constructed in the manhole above the top of the sewer to prevent any dirt or debris from falling into the sewer. The platform shall remain in place until all work on the manhole has been completed and the asphalt concrete has been placed around the manhole. Prior to the removal of the platform from the manhole, all dirt and debris shall be removed.

All grade rings shall be set in cement mortar the same day they are placed. All joints shall be smoothly plastered inside and out.

Existing grade rings removed in the adjustment of manhole frames shall become the property of the Contractor and if undamaged and thoroughly cleaned of mortar may be reused in the work. If not so used, they shall be disposed of away from the site of work at the expense of the Contractor.

Manhole frames shall be reinstalled to align directly over the grade rings. Any frames misaligned by more than ½ inch shall be removed and reinstalled.

15-2.13 Payment: Full compensation for adjusting manholes to grade is considered as included in the contract prices paid for **various contract items of work** and no additional allowance will be made therefor.

15-3.03 Construction: All removed concrete shall become the property of the Contractor and shall be immediately off-hauled. None of the removed concrete shall be dumped or stockpiled on the work site. The Contractor shall dispose of all removed concrete at a recycler for this material. Burying of broken concrete within the limits of the project will not be allowed.

All concrete which is to be removed from sidewalk, curb, gutter and driveway areas shall be removed to the nearest score mark or construction joint as directed by the Engineer unless otherwise noted on Project Exhibits. The edge of existing concrete to remain shall be neat and free of defects. Saw cutting may be required to achieve this.

Reinforcing steel may be encountered in portions of concrete to be removed and no additional allowance will be made for the removal of such steel.

Irrigation facilities may be encountered during concrete removal and replacement. The Contractor shall exercise care in this area and repair any damage done by their operations at no additional cost to the City.

Landscaping and other surfaces or structures shall be restored to original condition at no additional cost to the City.

15-3.04 Payment: Payment for saw cutting, removal and disposal of concrete sidewalk, curb and gutter, driveway areas, and existing City monuments shall be included in the contract prices paid for **various contract items of work** and no additional allowance will be made therefor.

Full compensation for repair of existing irrigation facilities damaged during any phase of the work shall be included in the prices paid for various contract items of work and no additional allowance will be made therefor.

15-7 Utility Clearances: *All items noted in this Section shall take place prior to any other construction activities.*

Potholing was not performed during design. No pothole information is provided on the Project Exhibits. Schematic line work for existing utilities shall be for reference use only and shall not be considered as accurate information for any other areas within the project limits.

Contractor shall investigate, confirm and/or determine the exact locations of existing utilities (including both invert and crown elevations), and verify clearances between existing and proposed utilities at crossings, excavations (including excavations associated with installation of sewer bypass), and/or known potential conflicts. The Contractor shall determine both invert and crown elevations and alignments of existing utilities at connection points.

The Contractor shall determine elevations and alignments of existing sewer laterals, at the back of sidewalk, if a new proposed sewer main is at a higher elevation than the existing sewer main.

The Contractor shall provide all relevant information in writing to the Engineer immediately upon discovery of any conflict. Any delay in notification to the Engineer may delay direction and/or corrective action and a delay claim due to this reason shall not be considered by the City. The Contractor shall not proceed with any work that is in conflict until direction is provided by the Engineer and shall redirect crews to other contract work. All the information required to be obtained per this Section and any other information not noted but relative to the project shall be provided to the Engineer on a set of Plans when the investigative effort is complete.

15-7.01 Payment: **Potholing** shall be paid for at the contract unit price of **Lump Sum**, which price shall not exceed 5% of the contract amount for each phase and shall include full compensation for furnishing all labor, materials, tools and equipment, testing and measuring, excavation, backfill per City or County standards (whichever is more stringent), and doing all the work involved in potholing existing utility locations with vacuum excavation to verify utility clearances per City standards, and any other items necessary not specifically enumerated in the Standard Specifications and Special Provisions, and no additional allowance will be made therefor.

15-7.2 Utility Conflict Resolution: In accordance with Section 5-1.36 Property and Facility Preservation, and Section 19-1.03D Buried Man-Made Objects of the Standard Specifications: Remove, relocate or mitigate utility conflicts, man-made buried objects or other unforeseen items as ordered by the Engineer.

15-7.21 Payment: **Utility Conflict Resolution** shall be paid for on a **Force Account** basis up to the contract allowance price for each phase and shall include full compensation for furnishing all labor, materials, permits, tools and equipment, and for doing all the work involved as required to complete the Work, and as directed by the Engineer, and no additional compensation will be allowed therefor.

15-8 Tree Root Pruning: All tree roots two inches and greater which are encountered during excavation must be pruned by hand. The root shall be cut cleanly with a saw to avoid splits. When digging within the drip line of trees, Contractor shall exercise extreme caution to avoid pulling on roots with excavation equipment. Hand dig around all roots greater than one inch in diameter. The Contractor shall notify the Engineer when encountering roots within the drip line of trees which are greater than one inch. If the Engineer elects to get direction from an arborist the Contractor shall redirect crews to other contract work after safeguarding the area at no additional cost to the City.

15-8.01 Payment: Full compensation for removing and pruning tree roots, hand digging to avoid root damaging roots, and excavating cautiously with respect to tree roots is considered as included in the prices paid for **various contract items of work** and no additional allowance will be made therefor.

SECTION 19 EARTHWORK

19-1.01 General:

1. Non-contaminated site: See section 19-2.03B, Surplus Material, of these Technical Specifications.

19-1.01A Summary: Excavating for bypass, trenching, and excavation of existing manhole cones as necessary for construction.

19-1.03B Unsuitable Material: Stabilization of unsuitable material shall comply with the following provisions:

- A. Unsuitable material may be processed in place, may be excavated and placed on the grade or other locations suitable for further processing, or may be partially excavated and partially processed in place.
- B. Processing may consist of drying to provide a stable replacement material or mixing with lime per Section 24.
- C. Stabilized material shall be placed and compacted in layers as hereinafter specified for constructing embankments.

19-1.03B (1) Subgrade stabilization: Any area of the subgrade determined by the Engineer to be unsuitable shall be stabilized per 19-1.03B.

For roadway reconstruction per section 19-2.03A of these Technical Specifications where processing of unsuitable subgrade material is not allowed, the areas to be stabilized will be marked in the field by the Engineer after roadway excavation of the area is complete. Use of a pavement grinder shall be considered an acceptable method of excavation of areas requiring subgrade stabilization.

19-1.03C Grade Tolerance: When aggregate subbase or aggregate base are to be placed on the grading plane, the grading plane shall not vary more than 0.05' above or 0.1' below the grade established by the Engineer.

19-1.04 Payment: Full compensation for **Subgrade Stabilization**, if required, is considered as Extra Work.

19-2 Roadway Excavation

19-2.03A General: The Engineer shall provide reference points and cut sheets for the excavation of the roadway. The Contractor shall furnish an excavation and paving plan and a qualified grade setter to ensure that the subgrade conforms to the lines and grades established by the Engineer.

For roadway reconstruction, Roadway Excavation shall be performed with a pavement grinder. No other construction equipment including rubber-tired equipment shall be allowed on the subgrade.

Roadway excavation and asphalt concrete base paving, including Stabilization Fabric per Section 19-8.02, paving shall be completed for half the street width before beginning excavation of the remaining street.

The Contractor shall note that there are street trees near areas intended for roadway excavation. The Contractor's operation, including the size of the grinding equipment, shall be such, so as to ensure that existing street trees are not damaged. Where limited clearance under the street trees prevents the use of a grinder, excavation shall be performed by an alternate method as approved by the Engineer. Alternate methods may include jack-hammering and removal of existing pavement and base materials by hand, or by use of smaller grinding equipment.

Where tree roots are encountered during roadway excavation, the Contractor shall cut the roots off six inches below the planned subgrade. Each cut shall be clean with no torn bark or splintered wood remaining on the root and shall be accomplished by use of a saw appropriate for the size of the root to be cut.

19-2.03B Surplus Material: Surplus soil from this project has been approved for disposal at the City's Pond 2 Decommissioning and Grading Project at 35 Stony Point Road Santa Rosa, CA.

The following Pond 2 surplus soil transport and placement conditions shall be adhered to:

1. Material must be free of asphalt concrete; asphalt and soil grindings associated with roadway excavation and reconstruction;
2. Soil beneath asphalt that was previously oiled for paving is not allowed;
3. Sewer, water or storm drain pipe of any kind or type are not allowed;
4. Concrete; metal; rock greater than 6" in size; vegetation; and other deleterious materials are not allowed;
5. The quantity of trucks and the volume of soil deposited in Pond 2 from this project will be tracked. Truck drivers will be required to sign a log and be subject to periodic inspections to ensure that only soil from this project is deposited in Pond 2
6. The Contractor shall spread and compact all project soils deposited into Pond 2 to 85% relative compaction and testing will be provided and performed by the City's materials Engineering Laboratory. The cost of compaction testing will be borne by the City.
7. Contractor shall comply with all disposal regulations such as City, County, and/or State permits and licenses, as may be required.
8. Soil disposal shall be limited to Monday through Friday between the hours of 7:00 am and 4:30 pm. Advanced, 48-hour notice is required to the City inspector and Water prior to starting.
9. Pond 2 site access is directly affected by weather conditions. You should anticipate no access during and for some time after rain events, unless wet weather site conditions are met at your expense.
10. The haul route shall be through the City Municipal Service Yard. A 15 MPH speed limit shall be observed at all times with stopping at all crosswalks and stop signs. No trucks shall access the site via any other route.
11. Tracking of material from the disposal location onto any and all paved surfaces near the pond is not allowed. Should tracking become evident sweeping will be required at your cost no later than the end of day. Dust control shall be provided at all times in accordance with Section 10.
12. The Idling limits on In-Use Off-Road Diesel Vehicles in section 2449 (d) (3) in Title 13, article 4.8, chapter 9, California Code of Regulations (CCR) shall be effective and enforceable.

The City shall reserve the right to unconditionally suspend or revoke disposal at any time at no cost to the City.

19-2.04 Payment: Full compensation for **Roadway Excavation**, if required, is considered as Extra Work.

19-5 Compaction

19-5.03B Relative Compaction (95 percent): Relative compaction of not less than 95 percent shall be obtained for a minimum depth of 0.5-foot below the grading plane for the full width of the planned pavement structural section, whether in excavation or embankment.

Relative compaction of not less than 95 percent shall be obtained for embankment under bridge and retaining wall footings without pile foundations within the limits established by inclined planes sloping 1.5:1 out and down from lines one foot outside the bottom edges of the footing.

19-8 Subgrade Enhancement Geotextile

19-8.02 Materials: Soil stabilization fabric shall be installed per manufacturer's recommendations and shall meet or exceed the following specifications:

Grab Tensile Strength (ASTM D4632)	290 lb.
Mullin Burst Strength (ASTM D3786)	500 psi
Trapezoid Tearing Strength (ASTM D4533)	113 lb.
Modulus (Load at 10% Elongation) (ASTM D4632)	120 lb.
Apparent Opening Size (ASTM D4751)	40-70
sieve	
Permittivity (ASTM D4491)	0.05 sec ⁻¹

Soil stabilization fabric shall be Mirafi 600-X, GeoTex 315ST, Carthage Mills FX-66, TerraTex HD, or approved equivalent.

The soil stabilization fabric shall be held in place with wooden stakes driven through the fabric into the subgrade at the beginning and the end of the fabric and at 50-foot intervals. A minimum of three stakes shall be placed across the width of the fabric roll at each interval. The stakes shall be a minimum length of 8 inches and shall be driven at an angle opposite to the direction of pull exerted on the fabric by the paving machine.

19-8.04 Payment: Full compensation for **Stabilization Fabric**, if required, is considered as Extra Work.

[Version: 05/18/15 DCM STD2010]

SECTION 26

AGGREGATE BASE

26-1.01 Aggregate Base: Aggregate base shall be Class 2 conforming to and placed in accordance with the requirements of Section 26 of the City Specifications, with the following modifications and additional requirements.

Rolling shall commence immediately after spreading of the damp material and before the material has dried sufficiently to allow separation between the fine and coarse particles.

26-1.02 Quality Requirements: The minimum sand equivalent shall be 31 for any individual test.

26-2.01 Compacting: The surface of the finished aggregate base shall be firm and unyielding. Any visible movement vertically or horizontally of the aggregate base under the action of construction equipment or other maximum legal axle loads shall be considered as evidence that the aggregate base does not meet this requirement.

26-3.01 Payment: Full compensation for Class 2 Aggregate Base shall be considered as included in the prices paid for the **various contract items** of work involved and no additional compensation will be made therefor.

SECTION 37

BITUMINOUS SEALS

37-2.01A Summary: The work conducted under this section shall be done in accordance with Sections 37 & 94 of the Standard Specifications, the seal coat manufacturer's specifications, and any modifications herein.

This work involves the furnishing and application of a pavement seal coat to all new and existing asphalt concrete where shown on the Project Exhibits and as stated herein.

New and existing asphalt concrete dikes shall receive a seal coat on the exposed faces and top surfaces.

Seal coat shall be applied to the project staging area as the last order of work.

The Contractor shall notify the City of Santa Rosa a minimum of one week prior to starting construction activities.

The Contractor may not proceed with construction activities until gaining approval from the City of Santa Rosa.

The Contractor shall notify the City of Santa Rosa a minimum of forty-eight (48) hours prior to starting construction activities.

37-2.01C (1) Schedule: The Contractor shall provide a schedule of work to the Engineer for approval.

37-2.01C (2) Asphaltic Emulsion Seal Coat: The Contractor shall provide a submittal for any product proposed to be used to complete this work. The Contractor shall also provide a one-half gallon sample in an appropriate container prior to any application of seal coat.

37-2.01D Quality Control and Assurance: The Contractor shall provide a certificate of compliance from the manufacturer prior any shipment of material used on this project.

37-2.02 Materials: Seal coat shall be RaynGuard Steelguard Asphalt Pavement Coating, or an approved equivalent.

Oil sealant shall be Reed & Graham OverKote Oil-Spot Seal, or an approved equivalent.

Crack Seal shall be Reed & Graham OverKote Crack Filler or an approved equivalent.

All materials used as described in this section shall be compatible.

All material storage and/or mixing shall occur in secondary containment.

37-2.03 Construction:

37-2.03A General:

Immediately prior to the sealing operation, the Contractor shall cover all utility covers and remove thermoplastic pavement markings. The contractor shall remove all cover used to protect utility covers after final seal coat application has cured.

The Contractor will clean project sites of all excess material, rubbish, equipment and temporary structures associated with the performance work daily.

37-2.03D Surface Preparation: Prior to placement of seal coat, the entire surface of the designated areas shall be free of dirt, water and vegetation. Cleaning may be accomplished by air blowing, vacuum, mechanical sweeper, power washing, or other techniques as approved by the Engineer. Edges of concrete surfaces abutting areas to receive a seal coat application shall be power washed to remove moss or other contaminants. If power washing the existing surface is used, the surface shall not have any standing water prior to application of the seal coat. Where there are deposits of grease or oil, these areas shall be cleaned by scraping, burning and/or the use of an approved detergent such as trisodium phosphate (using a stiff brush to scrub the area clean). Where a detergent is used, the pavement shall be thoroughly rinsed with water. All rinsate from pavement cleaning, if any, shall be collected and disposed of in accordance with all applicable laws and regulations. Rinsate disposal shall be the responsibility of the Contractor. No rinsate, or other products from the work, shall be allowed to flow to the storm drain or off site. After cleaning and removing grease and oil deposits, the cleaned area shall be sealed with an approved oilseal, applied per manufacturer's recommendations.

Cracks in excess of 1/4 inch in width shall be sealed prior to application of the seal coat. Large cracks (1/4" or larger) shall be cleaned out with a stiff bristle broom and compressed air prior to crack sealing with crack seal. The crack seal shall be applied per manufacturer's recommendations and must be dry to the touch prior to application of the seal coat. Cracks that contain weeds and other live vegetable matter must be treated with locally approved non-oil based sterilant prior to application of crack seal.

Prior to the seal operation the Contractor is responsible for removal of all pavement markings.

The Contractor shall install BMPs on the edge of pavement and outside edge of asphalt concrete dikes to ensure asphaltic emulsion does not contaminate unpaved surfaces.

All surfaces and facilities other than those shown to be coated shall be fully covered using a heavy mil plastic or oil resistant construction paper secured by tape in such a manner leaving a neat break between the sealed and unsealed surfaces.

37-2.03F (3) Asphaltic Emulsion for Seal Coat:

One application of seal coat shall be applied at all project locations using a minimum of 20 gallons of undiluted sealer per 1,000 square feet of area.

The sealer shall be mixed to uniform free flowing consistency. Potable water shall be added (not to exceed 5% by volume) to obtain a semi-fluid consistency. In exceptionally hot weather (95 degrees Fahrenheit or greater), potable water addition may be increased up to as much as 10% by volume. The sealer shall be applied to the pavement in continuous parallel lines and spread immediately ahead by use of rubber faced squeegees and/or mechanized spreading equipment.

No excessive build-up or unsightly appearance shall be permitted on longitudinal or transverse joints.

Approved squeegees shall be used to spread emulsion seal in areas non-accessible to the treatment seal spreader. Care shall be exercised in leaving no unsightly appearance from hand work.

Surface preparation and sealer application shall not be performed if rain is forecast within 48 hours after application. Surface preparation and sealer application shall not be performed during or just prior to freezing weather conditions. Surface temperature shall be at least 55° F and rising during

application.

It shall be the responsibility of the Contractor to protect the seal coat during drying. After application of the sealer is complete, traffic shall be excluded from the area until the sealer is completely dry and won't scuff under tires. This drying time shall be a minimum of 24 hours.

Any surface or facility damaged by over-spray shall be cleaned or replaced to the satisfaction of the Engineer at the Contractor's expense.

37-2.04 Payment: Seal Coat - UFO shall be paid for at the contract price per **square foot** as measured in the field. Payment shall include full compensation for doing all work involved installing seal coat including, but not limited to, pavement marking removal; environmental protection; cleaning and removing grease and oil deposits; oil seal application; root pruning labor; materials; tools and equipment and no additional compensation will be made therefor.

SECTION 39

HOT MIX ASPHALT

39-1.01A Summary:

Section 39-1 includes general specifications for producing and placing HMA by mixing aggregate and asphalt binder at a mixing plant and spreading and compacting the HMA mixture.

At the Contractor's option, and at no additional expense to the City, a Cal-trans approved Warm Mix Asphalt (WMA) technology may be added to the HMA. However, the asphalt concrete shall be manufactured at HMA temperatures (300F +/- 25F) at a dosage rate approved by the Engineer. All other HMA project specifications shall be adhered to.

Use Section 39-3 Method construction process of these specifications for HMA production and construction.

39-1.01C Description: Permanent paving shall not take place until all underground work is finished, except as otherwise noted in these Special Provisions, and the City has given written notice of acceptance to the Contractor.

Asphalt concrete shall be placed on the same day the area is excavated so that all areas will either have existing asphalt surface or new asphalt concrete base by the end of each working day. No subgrade areas shall be exposed or open to traffic during non-working hours.

The basis for compaction approval shall be the attainment of 97% relative compaction and satisfactory surface condition following final rolling. The number of coverages required shall be the minimum number required to obtain 97% relative compaction.

A tack coat of SS-1h or SS-1 emulsified asphalt shall be applied to the entire asphalt concrete base surface immediately in advance of placing the asphalt concrete surface lift. A tack coat shall also be applied to all vertical mating surfaces and conforms to existing pavement, curbs, gutters, and construction joints prior to placement of new asphalt concrete surface or base, unless otherwise shown on the Project Exhibits. The tack coat shall be allowed to break before placing the subsequent lift of asphalt concrete.

The asphalt concrete base and asphalt concrete surface courses shall be allowed to cool to 160° F at mid depth before the roadway is opened to traffic each day.

At the end of each working day the Contractor shall place retro-reflectorized signs and delineators, as required for night time use in accordance with the Standard Specifications and Section 12 of these Special Provisions to warn the public of the existing conditions.

At the end of each work day during paving operations the location of all valves, manholes, monuments and any other facility overlaid with asphalt concrete and required to be raised to grade shall be marked in white paint.

All ground edges adjacent to curb ramps and driveways shall have temporary asphalt concrete ramps (tapers) installed if the asphalt concrete surfacing cannot be placed back the same day the existing pavement is removed. Kraft paper or other bond breaker shall be placed under the conform ramps to facilitate removal when paving operations start.

39-1.02 Materials:

39-1.02B Tack Coat:

Tack coat must comply with the specifications for asphaltic emulsion or asphalts. Tack coat shall be diluted SS1 or SS1h.

Notify the Engineer if you dilute asphaltic emulsion with water. The weight ratio of added water to asphaltic emulsion must not exceed 1 to 1.

39-1.02C Asphalt Binder:

Asphalt binder in HMA must comply with the specifications for asphalts.

Asphalt binder to be mixed with aggregate for asphalt concrete surface, leveling and base shall be PG64-16 grade paving asphalt.

The amount of asphalt binder to be mixed with the aggregate shall be specified by the Engineer at the time of paving. Different asphalt binder content may be specified for each lift and each location.

Liquid anti-stripping agent (LAS) shall be added to the asphalt binder at a rate of 0.5% by weight of asphalt binder. The LAS shall be AD-here LOF 65-00 or equivalent, and shall be stored, measured, and blended with the asphalt binder in accordance with the anti-stripping agent manufacture's recommended practice. The LAS can be added at the asphalt plant or at the refinery. When added at the asphalt plant, the equipment shall indicate and record the amount of LAS added. If added at the refinery, the shipping ticket from the refinery shall certify the type and amount of LAS added.

39-1.02E Aggregate:

The aggregate grading of the various types of asphalt concrete shall conform to one of the following as directed by the Engineer:

Surface or Leveling Course.....3/4-inch HMA Type A, or 1/2-inch Coarse HMA Type A,
or 1/2-inch Medium HMA Type A Base
Course.....3/4-inch HMA Type A

Aggregate must be clean and free from deleterious substances. Aggregates should be of high abrasion resistance and durability. Excessively soft and friable aggregates are not allowed. The specified aggregate gradation must be determined before the addition of asphalt binder and includes supplemental fine aggregate.

Choose sieve size TV within each TV limit presented in the aggregate gradation tables.

The proposed aggregate gradation must be within the TV limits for the specified sieve sizes shown in the following tables:

Aggregate Gradation (Percentage Passing) HMA Types A 3/4-inch HMA Type A		
Sieve sizes	TV limits	Allowable tolerance
1"	100	--
3/4"	95–100	TV ± 5
3/8"	65–80	TV ± 5
No. 4	49–54	TV ± 5

No. 8	36–40	TV \pm 5
No. 30	18–21	TV \pm 5
No. 200	2.0–8.0	--

1/2-inch Coarse HMA Type
A

Sieve sizes	TV limits	Allowable tolerance
3/4"	100	—
1/2"	94–100	--
3/8"	70–90	--
No. 4	55–61	TV \pm 5
No. 8	40–45	TV \pm 5
No. 30	20–25	TV \pm 5
No. 200	2.0–8.0	--

1/2-inch Medium HMA Type
A

Sieve sizes	TV limits	Allowable tolerance
3/4"	100	--
1/2"	95–100	--
3/8"	80–95	--
No. 4	59–66	TV \pm 5
No. 8	43–49	TV \pm 5
No. 30	22–27	TV \pm 5
No. 200	2.0–8.0	--

Before the addition of asphalt binder and lime treatment, aggregate must have the values for the quality characteristics shown in the following table:

Quality characteristic	Test method	HMA Type A
Percent of crushed particles Coarse aggregate (% min.) One fractured face Two fractured faces Fine aggregate (% min) (Passing no. 4 sieve and retained on no. 8 sieve.) One fractured face	California Test 205	90 75 70
Los Angeles Rattler (% max.) Loss at 100 rev. Loss at 500 rev.	California Test 211	10 45
Sand Equivalent (min.) ^a	California Test 217	50 ^b
Fine aggregate angularity (% min.)	California Test 234	45
Flat and elongated particles (% max. by weight @ 5:1)	California Test 235	10

^a Reported value must be the average of 3 tests from a single sample.

^b Minimum Sand Equivalent of 45 for asphalt concrete base.

39-1.02F Reclaimed Asphalt Pavement:

Reclaimed Asphalt Pavement (RAP) may be used at the Contractor's option. If RAP is used, the Contractor shall provide the proposed mix design and the quality control for all HMA that includes RAP, in accordance with the following requirements:

1. Contractor shall provide City with a mix design per California Test 384 for the proposed RAP HMA.
2. As part of City's evaluation of RAP HMA, Contractor and City shall perform bitumen ratio tests on at least six split samples of Contractor's RAP to establish correlation between respective binder ignition ovens.
3. RAP shall be processed from reclaimed Asphalt Concrete pavement only.
4. RAP pile(s) shall be separate from the stacker pile, not intermingled with other materials, and stored on smooth surfaces free from debris and organic material.
5. The project RAP pile shall be processed and mixed, identified, and of adequate quantity for the proposed project. "Live" piles shall not be permitted.
6. Contractor shall sample the RAP pile and determine the bitumen ratio (using same binder ignition oven used in #2 above) and provide the test results to the City at least one week prior to producing RAP HMA.
7. A minimum of three samples shall be tested for bitumen ratio for RAP pile of 1500 tons, or portion thereof.
8. RAP pile shall be mixed such that individual bitumen ratio test results of RAP pile so not vary more than +/- 0.5%.
9. During RAP HMA production, RAP shall be sampled by the Contractor off of the belt (into the batch plant), per method established by the City, and samples provided to the City.
10. Bitumen ratio of RAP sampled off of the belt shall be 4.0% minimum, as determined by City binder ignition oven. City shall select binder content for RAP HMA mix per Specifications.
11. RAP content shall be no more than 20% by dry aggregate mass in the HMA. If proposing a change in the RAP content, the Contractor shall notify the Engineer. If the content changes more than 5%, the Contractor shall submit a new mix design.
12. Moisture content of RAP pile shall be 4.0% maximum and shall be tested the day prior to the day of paving and tested/monitored during each day of HMA production.
13. RAP pile(s) shall be protected from exposure to moisture.
14. RAP HMA shall comply with all the specifications for HMA.
15. If batch mixing is used, RAP shall be kept separate from the virgin aggregate until both ingredients enter the weighhopper or pugmill. After introduction to the pugmill and before asphalt binder is added, the mixing time for the virgin aggregate and RAP shall not be less than five seconds. After asphalt binder is added, the mixing time shall not be less than 30 seconds.
16. If continuous mixing is used, the RAP shall be protected from direct contact with the burner flame with a device such as a shield, separator, or second drum.
17. If any of the above criteria are not satisfied, or if the RAP HMA test result determined

by the City are inconsistent, RAP HMA production shall stop for City projects until the issue(s) are corrected.

39-1.03 HOT MIX ASPHALT MIX DESIGN REQUIREMENTS:

39-1.03E Job Mix Formula Verification: (Not Applicable)

39-1.08 Production

39-1.08A General: During production, with approval of the Engineer, you may adjust hot or cold feed proportion controls for virgin aggregate and RAP.

39-1.12 Smoothness

39-1.12A General: Determine HMA smoothness with a straightedge. The completed surfacing shall be thoroughly compacted, smooth and free from ruts, humps, depressions or irregularities. Any ridges, indentations or other objectionable marks left in the surface of the asphalt concrete by blading or other equipment shall be eliminated by rolling or other means. The use of any equipment that leaves ridges, indentations or other objectionable marks in the asphalt concrete shall be discontinued, and acceptable equipment shall be furnished by the Contractor.

39-1.13 Hot Mix Asphalt On Bridge Decks: The aggregate grading of the asphalt concrete shall be as directed by the Engineer.

39-1.14 Miscellaneous Areas and Dikes: The aggregate grading for asphalt concrete placed on miscellaneous areas shall conform to that specified for the asphalt concrete placed on the traveled way, unless otherwise directed by the Engineer.

Dikes shall be shaped and compacted with an extrusion machine or other equipment capable of shaping and compacting the material to the required cross section.

39-1.15 Minor Hot Mix Asphalt: (Not Applicable)

39-3.02 Acceptance Criteria

39-3.02A Testing: The acceptance testing requirement for Sand Equivalent shall be 50 (minimum) for asphalt concrete surface and 45 (minimum) for asphalt concrete base. HMA shall meet the following requirements.

Aggregate Micro-Deval (ASTM D6928-10) ¹	Tensile Strength Ratio, TSR (ASTM D7870) ²
≤16.0%	Not Required
16.1-18.0%	70 (minimum)
18.1-21.0%	80 (minimum)

¹ Asphalt concrete with an aggregate Micro-Deval loss greater than 21.0% shall be removed and replaced at the Contractor's expense. In addition, no single source of asphalt concrete aggregate shall have a Micro-Deval loss greater than 21.0%.

² TSR testing shall be performed on re-compacted asphalt concrete (per ASTM D7870), obtained from field cores, and tested within 30 days of asphalt concrete placement. Specimens tested shall include 1 unconditioned sample, and 2 conditioned samples as follows:

- a) 20.0 hour Adhesion cycle @ 60°C
- b) 3500 cycles @ 40 psi and 60°C

A single TSR test shall not represent more than 750 tons of asphalt concrete. Asphalt concrete not meeting the above requirements shall be removed and replaced at the Contractor's expense.

39-3.04 Transporting, Spreading, and Compacting: Numbers of coverages.

Test sections shall be approved on the basis of the attainment of 93% relative compaction and a satisfactory surface condition following final rolling. The number of coverages required shall be the minimum number required to obtain 93% relative compaction. Relative density shall be the ratio of in-place density (ASTM Test Method D2950) to test maximum density (California Test 309, Method of Test for Determining Theoretical Maximum Specific Gravity and Density of Hot Mix Asphalt) determined during production paving.

The HMA may be cored during paving of the test sections, and the in-place density for each test section shall be the average of three core densities determined per California Test 308.

39-5 Measurement: Asphalt concrete and asphalt concrete base will be measured by weight. The quantity to be paid for shall be the combined weight of the mixture. All weights shall be supported by State Certificates of Weights and Measures furnished by the Contractor.

39-6 Payment: Full compensation for furnishing and installing temporary and permanent hot mix asphalt shall be considered as included in the prices paid for the **various contract items** of work and no additional allowance will be made therefor.

[Revised: 11/20/14 Lab]

SECTION 39A

ASPHALT CONCRETE TRENCH PAVING

39A-1.01 Description: Asphalt concrete surfacing and asphalt concrete base and the placing thereof shall conform to the requirements of the Standard Specifications, Section 39 of the City Specifications and these Special Provisions.

39A-2.01 Asphalts: Temporary paving on all utility trenches and any other excavated areas shall be ½-inch maximum, medium grade aggregate hot mix asphalt concrete installed a minimum of two inches thick **placed each day** over the work.

Temporary paving around edges of steel plates shall be a hot mix ½-inch maximum, medium graded aggregate and SC 3000 asphalt binder for use the same day or SC 250 asphalt binder for use over a one-week period.

The amount of asphalt binder to be mixed with the aggregate will be specified by the Engineer at the time of paving. Different asphalt binder content may be specified for each lift and each location.

Cutback shall not be stockpiled or used anywhere on the job site.

39A-5.01 Spreading Equipment: When trench width is three feet or less, the asphalt concrete used for trench paving may be deposited directly from the haul vehicle into the trench. The asphalt shall then be raked smooth prior to compaction.

39A-6.01 General Requirements: Permanent trench paving shall conform to City of Santa Rosa STD 215 and shall have a minimum A.C. thickness of **0.45 feet**.

Contractor shall not be allowed to trench across travelled lanes within a roadway perpendicular to traffic flow. All trenching shall be completed so that it is at an angle to traffic flow within the roadway.

The use of 6 inches of asphalt concrete base per Note 1 of City STD-215 is **not** permitted without written approval from the Engineer in a No Cost Change Order.

The Contractor shall provide compaction of backfill and base material as the job progresses. Temporary paving, as specified in Section 39A-2.01, shall be placed over the work each day, leaving not more than 25 feet unpaved. This temporary paving shall be removed for final street reconstruction and/or trench paving. The 25 feet of unpaved trench shall be covered with skid resistant steel plates (with a coefficient of friction of 0.35 or greater per CTM342), capable of sustaining normal (H20) traffic loads without shifting or bouncing and shall be secured per Caltrans requirements. Plates that have areas where the skid resistant material is missing shall not be used and must be removed from the job site. Hot mix asphalt concrete shall be placed and compacted around all edges of steel plates with a sufficient width and gradual slope in order to provide a smooth transition to existing pavement. The Contractor shall only be allowed to plate one lateral trench at a time.

Temporary and permanent asphalt trench paving shall be even and smooth riding.

The Contractor shall monitor and maintain all temporary paving to the satisfaction of the Engineer.

Asphalt concrete used for temporary trench paving shall be removed and disposed of in accordance with the Standard Specifications, Section 7-1.13 "Disposal of Materials Outside the Highway Right- of-Way".

Any existing manholes or valves that are encountered within the trench paving limits must be adjusted to grade per the requirements of Section 15 of these Special Provisions. The Contractor is responsible for all coordination with the various utility company owners and their representatives, as well as the cost to adjust the various utilities to grade.

39A-6.03 Compacting: Compaction shall be in accordance with Section 39-6.03 of the City Specifications, reprinted here for clarity.

The basis for approval shall be the attainment of 97% relative compaction and satisfactory surface condition following final rolling. The number of coverages required shall be the minimum number required to obtain 97% relative compaction.

39A-8.01 Payment: Full compensation for furnishing and installing temporary trench paving shall be considered as included in the prices paid for the **various contract items** of work and no additional allowance will be made therefor.

Permanent Trench Paving shall be paid for at the contract price per **ton** as measured in the field for each phase. Price shall include full compensation for asphalt concrete base; surface preparation; compaction; hot mix asphalt concrete surfacing; and doing all work involved in permanent trench paving as specified herein including labor; materials; tools and equipment; and excavation, and no additional allowance will be made therefor.

Class 2 Aggregate Base and Asphalt Concrete Base used in the Permanent Trench Paving structural section is considered as included in the prices paid for various contract items of work and no additional allowance will be made therefore.

In the event of an increase or a decrease in the amount of the engineer's estimated quantity of Permanent Trench Paving, such increase or decrease shall not be considered an alteration in excess of the 25 percent of the contract amount of such items under provisions of Section 4-1.05 of the Standard Specifications and no adjustment of the contract unit price for Trench Paving will be made.

Full compensation for furnishing and installing permanent hot mix asphalt in all other areas besides work associated with trench paving shall be considered as included in the prices paid for in the **various contract items** of work and no additional allowance will be made therefor.

[Revised: 8/28/13]

SECTION 44

EPOXY LINING MANHOLE REHABILITATION

44-1.01 Description: It is the intent of this Specification Section to provide for the rehabilitation of existing sanitary sewer main manholes by the installation of epoxy lining system. Work shall be in accordance with these Special Provisions, the Project Exhibits, the City Standards and the latest version of the Standard Specifications.

Manholes to receive epoxy coating are those as indicated on the exhibits. The scope of work for epoxy lining shall be the entire interior surface of existing manhole, including grade rings, cones, reducing slab (ceiling), the full height of the barrel, base, shelf, and channel sections unless otherwise noted on the Project Exhibits. Channels previously lined with CIPP will not require epoxy lining. Epoxy lining work shall include, but not limited to, dewatering, cleaning and surface preparation, liner application, touch-up, protection of previously lined and unlined surfaces, containment of debris, waste disposal, cleanup and all appurtenant work.

An epoxy lining system consists of a trowelable epoxy filler, a high tensile elongation elastomeric grout, and an epoxy liner. All references to epoxy lining system within this Section apply to NeoPox NeoPox NPR-5300 Series "PureEpoxy" manufactured by NeoPox International, Inc. or approved equivalent. Alternative material submitted shall comply with Standard Specifications Section 6-4.03 "Trade Names and Alternatives".

44-1.02 Submittals: Attention is directed to Section 6-3.01A, "Material Submittals" of these Special Provisions.

The following items shall be submitted:

- A. Technical data sheet on each product used, including required independent third party commercially tested physical and corrosion resistance properties, compressive strength, tensile elongation, flexural modulus, shore hardness, adhesive strength to damp concrete and 10,000-hour flexural creep results. Epoxy manufacturer's certification that the product conforms to and is suitable for its intended use per these specifications.
- B. Material Safety Data Sheets (MSDS) for each product used.
- C. Project specific guidelines and recommendations.
- D. Qualification of Applicator:
 - 1. Manufacturer certification that applicator has been trained and approved in the handling, mixing and application of the products to be used. Applicator must provide current manufacturers signed Certified Applicator certifications or re-certifications shall be considered current when issued within the previous 365 days.
 - 2. Certification that the equipment to be used for applying the products has been manufactured or approved by the epoxy lining material manufacturer and applicator

personnel have been trained and certified for the proper use of the equipment and materials.

3. Three references which verify that the lining applicator has demonstrated successful application of the specified lining systems in the past 3 years. Provide the size (area of lining), time of completion, name, the owner's address and telephone number for each installation referenced.
 4. A written certification from the contractor stating that they are qualified and experienced in the application of the specified lining system.
- E. Design details for any additional ancillary systems and equipment to be used on site and surface preparation, application and testing.
- F. Complete contractor plan for cleaning and other surface preparation prior to lining as well as application and testing of the lining after it is installed. Plan shall include materials and equipment to be used, exact steps to be taken, and quality control procedures to be implemented. This plan shall also include minimum time requirements for coating, recoating, and surface patches.
- G. Abrasive Blast Material Data: For each abrasive blast material to be used, the Contractor shall submit the manufacturer's catalog containing the following data:
1. Technical data sheet for each product used, including statements on the suitability of the material to produce the required surface profile and the percentage mixture of grit/shot, and sieve size.
 2. Material safety data sheet for each product used.
 3. Country and state of origin.

44-1.03 Quality Assurance:

- A. Contractor shall allow and support the Engineer to access and inspect SSMH structures at any time.
- B. Applicator shall initiate and enforce quality control procedures consistent with applicable ASTM, NACE and SSPC standards and the protective coating manufacturer's recommendations.
- C. Epoxy applicator shall label two standard 3"X5" brush steel paint test coupons with pertinent and unique identification for each structure being lined. The minimum acceptable information will include owner name, project designations, dates, and contractor's project engineer or superintendent's name and signature. The non-data containing side of the coupon shall be sprayed with the specified epoxy immediately prior to application to the target surface. One cured coupon shall be submitted to the Engineer. The contractor as part of the project record shall keep the remaining coupon.

44-1.04 Delivery, Storage and Handling:

- A. Lining materials shall be sealed in containers that plainly show the designated name, formula or specification number, batch number, color, date of manufacture, manufacturer's directions, and name of manufacturer, all of which shall be plainly legible at the time of use. Any products exceeding the manufacturer's recommended shelf life shall not be used.

- B. Materials are to be kept dry, protected from weather and stored under cover.
- C. Protective lining materials are to be stored between 32° F and 110° F. Do not store near flame, heat or strong oxidants.
- D. Lining materials are to be handled according to their material safety data sheets.

44-1.05 Conditions:

- A. Applicator shall conform to all local, state and federal regulations including those set forth by Cal/OSHA, RCRA and the EPA and any other applicable authorities.
- B. All work shall be executed in a workmanlike manner by skilled personnel and shall present a neat appearance when completed.
- C. Any labor, materials, equipment, and apparatus not specifically mentioned herein or shown on the drawings, which may be necessary to complete any portion of the work in a substantial manner and in compliance with the requirements stated or implied by the contract documents, shall be furnished by the Applicator without additional compensation.

44-2.01 Materials:

- A. All epoxy spray lining to be installed shall be Neopoxy NPR-5304, High Viscosity Modified Structural Epoxy System, or approved equivalent. Neopoxy NPR-5305 trowelable epoxy filler, grout and sealant shall be applied to surfaces that have defects that may interfere with the proper preparation or application of epoxy liner, or approved equivalent.
- B. Neopoxy NPR-3501 high tensile elongation epoxy elastomeric grout and sealant shall be applied to areas that exhibit movement or cracking due to expansion and contraction, such as joints and manhole adjustment rings, or approved equivalent

44-2.02 Manufacturer:

- A. NeoPoxy International, Inc. Hayward, CA. 510-782-1290, Fax 510-782-1292, Internet address <http://www.neopoxy.us>, or approved equivalent.
- B. The manufacturer shall have directly employed, full time, on-staff chemists that interface directly with the in-house manufacturing personnel. The chemists interfacing with the production personnel shall be available to the agency and contractor for technical support.
- C. A record of all quality control tests shall be maintained, and the finished production lot shall meet the manufacturer's standards prior to shipment. A certificate of compliance (C of C) certifying that the production lot meets the manufacturer's specifications and standards at the time of shipment shall be provided with each lot shipment.
- D. A liquid retain shall be maintained by the manufacturer for each production lot. Each retain shall be properly identified, labeled and stored for future reference. Retains may be properly disposed of six months from the production date.

44-2.03 Repair Materials:

- A. Repair materials shall be used to fill void(s), structurally reinforce and/or rebuild surfaces, etc. Repair materials shall be 100% solids epoxy compatible with the specified lining epoxy and shall be applied in accordance with the manufacturer's recommendations. Epoxy repair materials shall be certified compatible with the epoxy liner material and suitable for municipal sewer use and are preferred over non-epoxy repair materials.
- B. The epoxy manufacturer shall provide instructions for proper application of the repair materials.

44-2.04 Liner Material:

- A. Neopoxy NPR-5300 Series "PureEpoxy", or approved equivalent, a series of rapid curing reactive epoxy polymers made up of a variety of viscosities based upon identical reactive ingredients which exhibit excellent cure properties at low temperatures, in the presence of moisture and underwater. Develops a hard surface in about one hour, or less, under typical ground temperature conditions of 65°F at a liner thickness of **250mils**. Longer cure time will be allowed for lower surface temperatures or underwater conditions. The epoxy manufacturer shall prove cure guidelines to the contractor for lower temperature conditions. The specified physical and chemical properties shall have been demonstrated by independent third-party testing to be resistance to acids, caustics, gasoline and other normal municipal sewage chemicals, biological agents and their byproducts. The product must be resistant to saturated hydrogen sulfide gas as found in municipal sewer systems. The product may either be trowel or spray applied and shall be color-coded light green, similar to what is generally accepted as "sewer pipe green".

Product type	Polyamine cured epoxy resin
Component Colors	Contrasting colors from part A & B
Mixed Color	Light Green
Solids (vol.%)	100
Solvent Content (vol.%)	0
Compressive Strength, psi.	>10,000
Tensile Elongation, %	>4
Flexural Modulus, psi.	>450,000
Shore Hardness, Type D	>80
Bond Strength – Concrete than be of >Tensile	200 psi and not less 80% of the break shall a cohesive nature. strength of concrete.
Primer required:	None (self-priming)
	Chemical Resistance: City of Los Angeles, Standard Specifications for Public Works Construction, Section 210-2.3.3 and ASTM F1216-98, Table X2.1

44-2.05 Epoxy Liner Application Equipment:

- A. Equipment shall be specifically designed temperature controlled plural component spray equipment for use in the application of the specified epoxy. Equipment may be either high- pressure low-volume airless (HPLV), or low-pressure high-volume air assisted (HVLP). Equipment must be approved for use by the epoxy manufacturer. Air assisted spray application equipment atomization air must be filtered to adequately remove compressor oil and extraneous water.
- B. Standard plastic or metal cement working tools of the contractor's may be used if trowel applied.
- C. Wet film thickness gage shall be 10-500 mil range, similar to Paul N. Gardner Company Item Number WF-790020, 800-762-2478.

44-3.01 Execution:

- A. Prep, repair, and lining work shall be completed after CIPP lining of adjacent upstream and downstream trunk sewers has been completed.
- B. Prep, repair, and lining work shall be completed while the sewer bypass system is operational and running. Lining shall be applied under dry and dust-free conditions and bypass operations shall continue until epoxy liner is fully cured.
- C. Lining shall be applied all at one time for each manhole being rehabilitated. Starting and stopping of work within one manhole shall not be allowed.
- D. Lining shall be done in a workmanlike manner so as to produce an even film of uniform thickness. Edges, corners, crevices, and joints shall receive special attention to ensure that they have been thoroughly cleaned and that they receive an adequate thickness of lining material. The finished surfaces shall be free from runs, ridges, waves, laps, brush marks, roller marks, and variations in color, texture, and finish.

44-3.02 Acceptable Applicators:

- A. Epoxy liner material must be applied by a Certified Applicator of the epoxy manufacturer.

44-3.03 Records:

- A. The contractor shall maintain an accurate, written record of the quantity of lining material applied and the corresponding surface area covered, a description of the area coated, the batch number, surface temperature, ambient temperature, relative humidity, dewpoint, and applicator on a daily basis. The contractor shall furnish a signed copy of said record to the inspector at the beginning of the next working day. These quantities shall be independently verified by the inspector and reported on the inspector's log. The inspector shall immediately investigate and resolve any discrepancies between these reported quantities and the inspector's log.

44-3.04 Examination:

- A. The Applicator shall comply with local, state and federal regulatory and other applicable agencies with regard to environment, health and safety.
- B. All extraneous flows into the manhole or structure, at or above the area to be lined, shall be stopped, plugged and/or diverted until the epoxy has developed and evolved from a liquid to a solid phase. After reaching the solid phase, heat may be added to accelerate the cure.
- C. Temperature of the surface to be coated should be between 45°F and 90°F during application. Prior to and during application, care should be taken to avoid exposure of the uncured liner to any heat source capable of causing the uncured epoxy to exceed 90°F. Where varying surface temperatures exist, care should be taken to apply the coating when the temperature is falling versus rising.

44-3.05 Preparation:

- A. Applicator shall inspect all surfaces specified to receive a protective lining prior to surface preparation. Applicator shall notify Engineer of any noticeable disparity in the surfaces that may interfere with the proper preparation or application of any repair mortar and epoxy liner.
- B. Prior to the start of any work, the contractor shall establish with the inspector, schedules and notification procedures to ensure all surface preparation work has been inspected prior to the application of any lining.
- C. Surfaces shall be repaired by methods required by the epoxy system manufacturer for the intended service and substrate materials.
- D. Covers shall be placed over all pipe opening to prevent extraneous material from entering sewer system.
- E. Infiltration shall be stopped by using chemical grouts or cementitious hydraulic plug material certified compatible with the epoxy repair mortar and liner epoxy.
- F. Loose or unsound concrete or masonry or existing coatings must be removed. Unsound concrete shall be determined by lightly tapping with a hammer and shall be removed to sound, hard concrete. Masonry materials may be thoroughly cleaned out and then re-mortared with epoxy or rapid setting cement and used to fill the area from which they came.
- G. Surface shall be cleaned by removing any laitance, dust, unsound or contaminated materials, plaster, oil, paint, grease, corrosion deposits or bacteriological growths. Chemical cleaning aids may be used with water blast equipment; however, Engineer must approve detergents or degreasers proposed by the contractor and they must be suitable for the water temperature used in any pressure washer system employed. Where breaking out mortar is not required, roughen the surface and remove any laitance by mechanical means, low-pressure hot water blast (minimum 2500 psi. pump pressure at 4 gpm), or high-pressure cold-water blast (>3000 psi. pump pressure at 4gpm) with or without sand injection as is appropriate, abrasive (sand) blasting, acid etching and water cleaning, or shot-blasting to a sound profile surface.

- H. Acceptable surface pH for epoxy grouting repairs and lining shall be not less than six or more than nine.
- I. Prior to lining, surfaces shall be dried by forced air to observe possible infiltration. In the event methods noted within the specification are ineffective stopping infiltration, the Contractor shall immediately notify the Engineer for direction.
- J. Metal components shall, at the Engineer's option and at the Contractor's expense, be sandblasted to a NACE No. 2 "Near White Blast Cleaning", or high pressure (>5000 psi. pump pressure) water blast, or water with sand injection. Minimum surface profile shall be CSP 3. Residual penetrating oil and grease deposits shall be removed by steam cleaning, detergent scrubbing or by the use of degreaser to ensure optimum epoxy adhesion.
- K. For new concrete surfaces, epoxy lining may not commence until moisture content is 80%, or less, by hygrometer test, or; "no visible moisture" by ASTM D4263-85, or; 15g/24 hr./m (3lb/24hr/1000 ft.) maximum by calcium chloride test. For existing concrete surfaces, see Item I above.
- L. Epoxy lining may not commence until concrete has cured sufficiently to prevent pinholes in the liner due to outgassing. Concrete surfaces that have cured for 28 days or more may be considered sufficiently cured. In lieu of curing for 28 days prior to application of epoxy lining, the Contractor may submit a sample of cement being used on the project to the epoxy manufacturer for adhesion testing and recommendations on a reduced curing time.
- M. Remove standing water and blow hot air for 15 to 30 minutes to dry the top surface prior to application of epoxy lining.
- N. Fill any voids with epoxy filler and/or grout according to the manufacture's recommendations. For flowing or weeping water conditions, rapid setting cementitious "plug" materials may be used instead of epoxy grouts.
- O. Determination of adequacy of preparation and substrate integrity may be made by ASTM D4541, with scoring.

44-3.06 Application of Epoxy Lining:

- A. Application procedures shall conform to the recommendations of the epoxy lining manufacturer, including material handling, mixing, environmental controls during application, safety, and spray equipment.
- B. Spray equipment shall be specifically designed to accurately ratio and apply the specified epoxy lining materials and shall be regularly maintained and in proper working order.
- C. Areas that exhibit movement or cracking due to expansion and contraction, such as joints and manhole adjustment rings, shall be grouted and sealed with a high tensile elongation epoxy Neopoxy NPR-3501, or equivalent, specifically designed and suitable for the service. Prior to placing the grout, surfaces within the joint shall be sealed to a minimum depth of one-half inch with the specified epoxy liner. Subsequently to

placement of the epoxy grout, a bond breaker shall be used to prevent adhesion between the flexible grout and the specified epoxy liner material. If the flexible grout and sealant is to be applied to manhole adjusting rings, no bond breaker or topcoat will be applied.

- D. Specified surfaces shall be coated by trowel or spray application. Minimum application thickness shall be not less than **250 mils** above the aggregate topmost surface. A monolithic single wet film application is preferred over multiple thin layers. The epoxy lining shall be applied such that the total specified surfaces can be completed in one day. If sprayed, and cosmetically smoother appearance is specified, the initial application shall be sprayed and troweled level to aggregate tops with sufficient epoxy to completely fill interstitial voids. A subsequent application will be made to achieve the minimum above-aggregate specified thickness. When trowel applied, a single application may be made. The Contractor may elect to first perform the aggregated interstitial filling followed by the final above aggregate lining after the epoxy transition from liquid to solid phase.
- E. Thickness measurement shall be made at the aggregate peaks on three-foot centers, vertically and horizontally, in a grid pattern. A wet film thickness gauge shall be used to ensure that the minimum thickness is applied. See Section 44-2.05.
- F. After the specified lining is applied, cured and spark tested, a thin layer of epoxy shall be applied to the bottom of the structures and a broadcasting of sand (i.e., oven dried 20 to 30 gradation) shall be applied in horizontal regions to provide a slip resistant surface.

44-3.07 Testing and Inspection:

- A. When the epoxy liner has cured sufficiently to allow physical contact by applicator personnel, the surface shall be visually inspected for discontinuities. Visible discontinuities shall be marked for subsequent repair. After visible discontinuities are repaired, secondary discontinuity testing will be performed per ASTM D4787 at an inspection voltage of 90 volts per mil to allow for irregularities in the original host surface profile, host surface material and moisture permeation from groundwater or other sources. Care must be exercised, as excessive voltage will spark through the epoxy causing damage to an otherwise sound lining. Discontinuities shall be mechanically abraded and repaired with the specified lining epoxy. If during spark testing it is determined that excessive voltage has burned holes in the lining, and the liner thickness is of the specified thickness, the voltage may be reduced in increments of 5 volts per mil until burn-through ceases. Burn through is indicated by very small brown-black colored holes that penetrate through to the base material and are generally visible only with optical magnification. Repair of burn holes shall be the Contractors expense.
- B. As an acceptance criterion, measurement of bond strength of the protective coating to the substrate shall be measured in accordance with ASTM D7234..

- C. Visual and bond strength tests as described in paragraph A and B shall be taken from 1 of the 2 fully epoxy lined sewer structures. The Engineer shall choose the lined structures to test. If deficiencies are found, then all lined structures shall be tested at the Contractors expense. Each testing point shall be repaired with the specified lining material. Additional testing may be performed to determine the extent of any potential deficiently bonded area and repairs shall be made by applicator in strict accordance with manufacturer's recommendations.

44-3.08 Payment:

Manhole Rehabilitation - Epoxy Lining shall be paid for at the contract unit price per **each** for each phase. Price shall include full compensation for furnishing all labor, materials, tools and equipment, testing and measuring, confined space entry, and doing all the work involved in dewatering the existing manhole; cleaning; surface preparation and repair on all vertical and horizontal surfaces; furnishing and installing epoxy lining system as described herein on all vertical and horizontal surfaces; testing; and any other items necessary for epoxy lining not specifically enumerated in the Standard Specifications and Special Provisions, and no additional allowance will be made therefor. Lining the manhole barrel transition segments transitioning the manhole barrel from 60" diameter to 24" diameter will be also be paid for under this unit price.

SECTION 45

POLYURETHANE MANHOLE REHABILITATION

45-1.01 Description: It is the intent of this Specification Section to provide for the reconstruction of existing sanitary sewer main manholes with the installation of a polyurethane liner. The polyurethane liner shall be designed to eliminate infiltration, provide corrosion protection, chemical resistance, repair voids and enhance the structural integrity of an existing manhole. Work shall be in accordance with these Special Provisions, the Project Exhibits, the City Standards and the latest version of the Standard Specifications.

The scope of work for polyurethane lining applies to Manholes I12712MH1 and I12712MH3 as shown on the Project Exhibits. Work shall include the entire interior surface of existing manhole, including grade rings, cones, reducing slab (ceiling), the full height of the barrel, base, shelf, and channel sections using a monolithic method. Polyurethane lining work shall also include, but not limited to, dewatering, cleaning and surface preparation, installation of grout in void spaces, liner application, touch-up, protection of previously lined and unlined surfaces, containment of debris, waste disposal, cleanup and all appurtenant work.

45-1.02 References: The polyurethane liner system shall be manufactured and installed in compliance with the listed minimum values of the applicable ASTM testing requirements.

ASTM D-638 Tensile Strength and Tensile

Modulus ASTM D-695 Compressive Strength

ASTM D-790 Flexural Strength and Flexural

Modulus ASTM D-2240 Hardness

45-1.03 Submittals:

1. The Contractor shall submit the suppliers warranty for all materials furnished under this section.
2. Technical data sheet on each product used, including ASTM test results indicating the product conforms to and is suitable for its intended use per these specifications.
3. Material Safety Data Sheets (MSDS) for each product used.
4. Applicator Qualifications:
 - a. Manufacturer certification that Applicator has been trained and approved in the handling, mixing and application of the products to be used. Certification letter shall be dated within six months of bid date.

- b. The Applicator shall provide reference(s) which demonstrate previous successful installation of the specified structural protective coating system in at least 100 manholes during the last two (2) years.
 - c. Certification that the equipment to be used for applying the products has been manufactured or approved by the protective coating manufacturer and applicator personnel have been trained and certified for proper use of the equipment. Certification letter shall be dated within six months of bid date.
- 5. Proof of any necessary federal, state or local permits or licenses necessary for the project.
- 6. Upon timely request, the Contractor shall submit the manufacturer's certification of testing, with the accompanying test data, for the following:
 - a. Third party testing verifying the short-term Modulus of Elasticity used on this project, minimum of 735,000 psi.
 - b. Third party testing verifying Flexural Strength used on this project, minimum 14,000 psi.
 - c. Third party testing verifying long-term Flexural Modulus of Elasticity, minimum of 529,000 psi. This third-party testing will verify the long-term reduction factor (Creep Analysis) of a minimum of 50%. This long-term reduction factor verification shall be conducted utilizing ASTM D2990-01 via a third party, independently certified laboratory.
- 7. Submit Engineering calculations for the design of the liner thickness. Design calculations shall be checked and approved by a Registered Civil Engineer in the State of California. Liner design calculations shall be supported by field analysis, technical assumptions, requirements of these Special Provisions, and ASTM F1216.

The design shall be based on the following structure conditions, service requirements, and physical conditions:

- a. Assume groundwater is at ground surface.
 - b. All structures subject to soil load of 120 lb./cu.ft. and AASHTO-HS-20-44 Highway traffic load.
 - c. Factor of safety (N) is 2.
 - d. Modulus of passive soil reaction is 1,000 psi.
 - e. External Buckling Design – Acceptable third-party testing and verification of the design analysis techniques (ASTM F1216, Section X1.2.2)
 - f. A minimum service life of 50 years.
 - g. Fully deteriorated structure condition.
 - h. Ovality is less than or equal to 5%.
- 8. Product specific strength values, including the short-term flexural modulus and the long-term flexural modulus strength, must be substantiated by third party testing which will be submitted with all qualified bids. 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 and the long-term reduction factor used in design.

9. Design details for any additional ancillary systems and equipment to be used on site and surface preparation, application and testing.
10. Complete contractor plan for cleaning and other surface preparation prior to lining as well as application and testing of the lining after it is installed. Plan shall include materials and equipment to be used, exact steps to be taken, and quality control procedures to be implemented. This plan shall also include minimum time requirements for coating, recoating, and surface patches.
11. Submit both estimated and actual quantity of grout material used to fill void space.

45-1.04 Quality Assurance:

Contractor shall submit the following:

1. The manufacturer of the polyurethane lining material shall furnish an affidavit attesting to successful use of their materials as a structural lining for concrete and brick structures in wastewater conditions recognized as corrosive or otherwise detrimental to concrete.
2. Supplier shall warrant the performance of the polyurethane liner for 10 years and shall include 5 years warranty for materials and labor to repair or replace any failing conditions of the liner in the structure.

45-1.05 Delivery, Storage and Handling:

1. Lining materials shall be sealed in containers that plainly show the designated name, formula or specification number, batch number, color, date of manufacture, manufacturer's directions, and name of manufacturer, all of which shall be plainly legible at the time of use. Any products exceeding the manufacturer's recommended shelf life shall not be used.
2. Materials are to be kept dry, protected from weather and stored under cover.
3. Protective lining materials are to be stored between 32° F and 110° F. Do not store near flame, heat or strong oxidants.
4. Lining materials are to be handled according to their material safety data sheets.

45-1.06 Conditions:

1. Applicator shall conform to all local, state and federal regulations including those set forth by Cal/OSHA, RCRA and the EPA and any other applicable authorities.
2. All work shall be executed in a workmanlike manner by skilled personnel and shall present a neat appearance when completed.
3. Any labor, materials, equipment, and apparatus not specifically mentioned herein or shown on the drawings, which may be necessary to complete any portion of the work in a substantial

manner and in compliance with the requirements stated or implied by the contract documents, shall be furnished by the Applicator without additional compensation.

45-2.01 Repair Materials:

1. Repair materials shall be used to fill voids, structurally reinforce and/or rebuild surfaces, etc. as determined necessary by the engineer and protective coating applicator. Repair materials must be compatible with the specified coating and shall be applied in accordance with the manufacturer's recommendations.
2. The following products may be accepted and approved as compatible repair basecoat materials for approved polyurethane lining for use within the specifications:
 - a. 100% solids, solvent-free grout specifically formulated for approved polyurethane lining compatibility. The grout manufacturer shall provide instructions for trowel or spray application.
 - b. In the case of excessive infiltration, a hydraulic cement or plug may be used to stop the flow of the infiltration. The hydraulic cement shall be compatible with the spray applied resin coating.

45-2.01 Polyurethane Liner Material:

SprayWall® from Sprayroq, Inc., or approved equivalent. The polyurethane liner shall be a high- build, rigid, solvent-free, resin-based material. The product shall be self-priming and spray-applied forming a structurally enhanced monolithic liner. Material shall begin to gel in about 8 seconds and achieve a tack-free condition after 2 minutes, under typical ground temperature conditions of 72°F at a liner thickness of 250mils. The polyurethane manufacturer shall prove cure guidelines to the contractor for lower temperature conditions. The liner shall be capable of conforming to offset bricks and/or grade rings, missing mortar gaps, and other disfigured and deteriorated materials.

The liner shall be installed to the thickness necessary to qualify as a monolithic (void free) liner per the design standards as provided in Section 45-1.03, 7. The roughness of the substrate will dictate the thickness needed to create the monolithic liner and eliminate any opportunity for voids in the lining. The design calculations will dictate the required final thickness of the liner.

Flat Wall surfaces to receive protective coating shall be prepared with a series of grooves cut into the substrate at a spacing and depth determined by the "Flat Wall" design formula, developed by the Sprayroq manufacturer, to key or lock the protective coating to the substrate. The grooves shall be a minimum ¼" w x ¼" d x 45° (60° maximum), cut into the substrate at opposing angles. The grooves shall be cut: horizontally and vertically (walls), longitudinal and latitudinal (floors and ceilings) where applicable.

The specified physical and chemical properties shall have been demonstrated by independent third- party testing to be resistance to acids, caustics, gasoline and other normal municipal sewage chemicals, biological agents and their byproducts. The product must be resistant to saturated hydrogen sulfide gas as found in municipal sewer systems.

45-2.03 Polyurethane Liner Physical Properties:

Flexural Modulus (initial)	ASTM-D-790	>735,000 psi
Compressive Strength	ASTM-D-695	>18,000 psi
Tensile Strength	ASTM-D-638	>7,450 psi
Shore Hardness, Type D	ASTM-D-2240	>85
Concrete Bond	ASTM-D-7234	>200 lbs.
Density		87 pcf
Solids		100%
Solvent Content		0%
Primer Required		None (self-priming)
Installation Warranty		5 Years
Product Warranty		10 Years

44-2.05 Polyurethane Liner Application Equipment:

1. Equipment shall be specifically designed temperature controlled plural component spray equipment for use in the application of the specified polyurethane lining. Equipment may be either high-pressure low-volume airless (HPLV), or low-pressure high-volume air assisted (HVLP).
2. Equipment must be approved for use by the polyurethane manufacturer. Air assisted spray application equipment atomization air must be filtered to adequately remove compressor oil and extraneous water.

45-3.01 Execution:

1. Prep, repair, and lining work shall be completed after CIPP lining of adjacent upstream and downstream trunk sewers has been completed.
2. Prep, repair, and lining work shall be completed while the sewer bypass system is operational and running. Lining shall be applied under dry and dust-free conditions and bypass operations shall continue until polyurethane liner is fully cured.
3. Lining shall be applied all at one time for each manhole being rehabilitated. Starting and stopping of work within one manhole shall not be allowed.
4. Lining shall be done in a workmanlike manner so as to produce an even film of uniform thickness. Edges, corners, crevices, and joints shall receive special attention to ensure that they have been thoroughly cleaned and that they receive an adequate thickness of lining material. The finished surfaces shall be free from runs, ridges, waves, laps, brush marks, roller marks, and variations in color, texture, and finish.
5. All structures to be coated shall be readily accessible to Applicator.

6. Appropriate actions shall be taken to comply with local, state and federal regulatory and other applicable agencies with regard to environment, health and safety.
7. Installation of the protective coating shall not commence until the concrete or metal substrate has properly cured in accordance with these specifications.
8. Temperature of the surface to be coated should be maintained between 70°F and 110°F during application. Prior to and during application, care should be taken to avoid exposure of direct sunlight or other intense heat source to the structure being coated

45-3.02 Acceptable Applicators:

1. Polyurethane liner material must be applied by a Certified Applicator of the polyurethane manufacturer.

45-3.03 Surface Preparation:

1. Applicator shall inspect all surfaces specified to receive a protective coating prior to surface preparation. Applicator shall notify Owner of any noticeable disparity in the surfaces which may interfere with the proper preparation or application of the repair mortar and protective coating.
2. All contaminants including: oils, grease, incompatible existing coatings, waxes, form release, curing compounds, efflorescence, sealers, salts, or other contaminants shall be removed.
3. All concrete or metal that is not sound or has been damaged by chemical exposure shall be removed to a sound surface or replaced.
4. Surface preparation method(s) should be based upon the conditions of the substrate, service environment and the requirements of the protective lining to be applied.
5. Surfaces to receive protective lining shall be cleaned and abraded to produce a sound surface with profile to meet as a minimum ICRI CSP4 –CSP6 profile and porosity to provide a strong bond between the protective lining and the substrate. Generally, this can be achieved with a high-pressure water cleaning using equipment capable of a minimum 4,000 psi at 3.5 gpm with a turbo head jet nozzle. Other methods such as high-pressure water jetting (refer to SSPC-SP 13/NACE No.6), abrasive blasting, shot-blasting, grinding, scarifying or acid etching may also be used. Detergent water cleaning and hot water blasting may be necessary to remove oils, grease or other hydrocarbon residues from the concrete. Whichever method(s) are used, they shall be performed in a manner that provides a uniform, sound clean neutralized surface that is not excessively damaged.
6. Infiltration shall be stopped by using a material which is compatible with the specified protective coating.

7. The area between the manhole and the manhole ring and any other area that might exhibit movement or cracking due to expansion and contraction, shall be grouted with a flexible grout or gel. A termination groove "key" cut into the substrate between the bottom of the manhole frame and concrete is required for placement of the flexible grout or gel. The "key" shall be a minimum ¼" w x ¼" d, cut at a minimum 45° angle (60° maximum).
8. Surfaces to receive protective lining shall be dry to the touch and or with no visible dampness. This is to insure maximum adhesion to the substrate. If required, drying may be accomplished by a minimum of 20 minutes of a heated, forced air blower. The drying shall be to the specification dictated by the resin manufacturer and its trained applicator.
9. All surfaces should be inspected by the Inspector during and after preparation and before the repair material is applied

45-3.04 Application of Protective Lining

1. Application procedures shall conform to the recommendations of the protective lining manufacturer, including material handling, mixing, environmental controls during application, safety, and spray equipment.
2. The spray equipment shall be specifically designed to accurately ratio and apply the specified protective lining materials and shall be regularly maintained and in proper working order.
3. The protective lining material must be spray applied by a Certified Applicator of the protective lining manufacturer.
4. Specified surfaces shall be coated by spray application of a solvent-free, 100% solids, rigid polyurethane structural lining as further described herein.
5. Airless spray application equipment approved by the lining manufacturer shall be used to apply each coat of the protective lining. The air source is to be filtered to completely remove all oil and water.
6. If necessary, subsequent top-coating or additional coats of the protective lining should occur as soon as the basecoat becomes tack free, no later than the recoat window for the specified products. Additional surface preparation procedures will be required if this recoat window is exceeded.

45-3.05 Testing and Inspection

1. High Voltage Spark Test. After the protective lining has set hard to the touch it shall be inspected with high-voltage holiday detection equipment. Surface shall first be dried; an induced holiday shall then be made on to the coated concrete or metal surface and shall serve to determine the minimum/maximum voltage to be used to test the lining for holidays at that particular area. The spark tester shall be initially set at 100 volts per 1 mil (25 microns) of film thickness applied but may be adjusted as necessary to detect the induced holiday (refer to NACE RPO188-99 or ASTM D4787 Continuity Testing of Liquid or Sheet Liners on Concrete -Holidays). All detected holidays shall be marked and repaired by

abrading the lining surface with grit disk paper or other hand tooling method. After abrading and cleaning, additional protective lining material can be hand applied to the repair area. All touch-up/repair procedures shall follow the protective lining manufacturer's recommendations.

2. Adhesion Testing. The adhesion tests shall be performed on each rehabilitated manhole and every 200 square feet of large structures or as shown on the Project Exhibits and/or specified in the Special Provisions. Adhesion testing shall be conducted after the lining or coating system has cured per manufacturer instruction and in accordance with ASTM D4541(Steel) or ASTM 7234(Concrete). Adhesion is critical for proper performance. A minimum of one 20 mm dolly shall be affixed to the lined surface of the structure at the upper section or cone area, mid-section and at the bottom, unless otherwise specified in the Special Provisions. Each testing location shall be identified by the Engineer. The adhesive used to attach the dollies to the liner shall be a two-part 100% solids epoxy adhesive with a tensile strength greater than the tensile strength of the lining system. Affix the 20 mm dollies to the lining surfaces and allow it to cure in accordance with the manufacturer's instructions. The lining material and dollies shall be adequately prepared to receive the adhesive. Prior to pull test, the Contractor shall utilize a scoring device to cut through the coating until the substrate is reached. Extreme care shall be required while scoring to prevent micro cracking in the coating, since cracks may cause failures at diminished strengths. Failure due to improper dolly adhesive or scoring shall require retesting. The pull tests in each area shall meet or exceed 200 psi. and shall include subbase adhered to the back of the dolly or no visual signs of coating material in the test hole. Pull tests with results between a minimum 150 psi and 200 psi shall be acceptable if more than 50% of the subsurface is adhered to the back of the dolly. A test result can be discarded, as determined by the Engineer, if there is a valid non-statistical reason for discarding the test results as directed by Sections 8.4 and 8.5 of ASTM D4541 and ASTM D7234. If any test fails, a minimum of three additional locations in the section of the failure shall be tested, as directed by the Engineer. If any of the retests fail, all loosely adhered or unadhered liner in the failed area, as determined by the Engineer, shall be removed and replaced at the Contractor's expense. All touch-up/repair procedures shall follow the protective lining manufacturer's recommendations.

NOTE: The mil thickness will be measured and confirmed with the scored and pulled test samples. In structural repairs (partially or fully deteriorated design assumptions), it is critical to confirm the design thickness with the pulled sample.

3. A final visual inspection shall be made by the Inspector and manufacturer's representative. Any deficiencies in the finished lining shall be marked and repaired according to the procedures set forth herein by Applicator.
4. The municipal sewer system may be put back into non-severe operational service as soon as the final inspection has taken place. However, for severe corrosion duty such as high concentrations of acids, bases or solvents, 4 to 8 hours may be necessary prior to returning to service. Consult lining manufacturer for further details.

45-3.06 Payment:

Junction Structure Rehabilitation - Polyurethane Lining - UFO shall be paid for at the contract unit price per **each**, which price shall include full compensation for furnishing all labor, materials, tools and equipment, testing and measuring, confined space entry, and doing all the work involved in dewatering the existing structure; cleaning; surface preparation and repair; furnishing and installing a polyurethane lining

system as described herein; manhole testing per Special Provisions Sections 45-3.05 and 130-1.07; and any other items necessary for polyurethane lining not specifically enumerated in the Standard Specifications and Special Provisions, and no additional allowance will be made therefor.

Manhole Rehabilitation - Polyurethane Lining - North Fulton shall be paid for at the contract unit price per **each**, which price shall include full compensation for furnishing all labor, materials, tools and equipment, testing and measuring, confined space entry, and doing all the work involved in dewatering the existing manhole; cleaning; surface preparation and repair; furnishing and installing a polyurethane lining system as described herein; manhole testing per Special Provisions Sections 45-3.05 and 130-1.07; and any other items necessary for polyurethane lining not specifically enumerated in the Standard Specifications and Special Provisions, and no additional allowance will be made therefor.

SECTION 73 CONCRETE CURBS AND SIDEWALKS

73-1.01A Summary: This work shall consist of curbs, gutters, sidewalks, driveways, island paving, curb ramps, and gutter depressions and shall be constructed in accordance with the details and at the location shown on the Project Exhibits and in conformance to the requirements of Section 73 of the City Specifications, and Standard Specifications.

73-1.01E Color: A colored pigment designed for the integral coloring of concrete shall be added to the concrete mix. The pigment shall contain pure concentrated mineral pigments specifically processed for mixing into concrete and complying with ASTM C979. The colored pigment shall be Davis Colors color #860, applied in a dosage of 1 pound per 94-pound sack of cement (approximately 6 pounds per cubic yard of concrete for a 6-sack mix), or L. M. Scofield color #SG860 applied in a dosage to produce an equivalent color, or an approved equal.

73-2.03 Construction: Curb construction shall be in accordance with Section 73-1.05 of the City Standards. Curb construction shall be in conformance to the details and at the locations shown on the Project Exhibits and in accordance with City Specifications.

Curb and gutter shall be constructed in conformance to City STD-241, the details and locations shown on the Project Exhibits and in accordance with the City Specifications.

Curb openings, for driveways, shall be constructed at existing driveways, and at locations indicated on the Project Exhibits or directed by the Engineer.

All concrete which is to be removed from curb, gutter, and driveway areas shall be removed to the nearest construction joint or as directed by the Engineer.

Median curb per City STD-242 shall be constructed in conformance to the details and at the locations shown on the Project Exhibits and in accordance with the City Specifications.

Curb and gutter and median curb shall be cured in accordance with the requirements of Section 90- 7 of the Standard Specifications except that the Contractor may substitute other than a pigmented sealer upon the approval in writing of such substituted sealer by the Engineer.

All oil, paint, tire marks, and other discoloring shall be removed from the sidewalk, curb and gutter by sandblasting prior to acceptance by the Engineer. Cement mortar will not be an acceptable substitute for sandblasting. Vandalism to uncured concrete surface shall be removed. If it cannot be removed from the surface, then the vandalized concrete shall be removed and replaced to the nearest score mark.

Curb Ramp shall be constructed in accordance with the details and at the locations shown on the Project Exhibits per Caltrans Standard plan A88A except the thickness shall be 4" minimum. For purposes of payment, curb ramp will be measured between the outside border of the ramp and landing and exclude the curb and gutter. The area of concrete beneath the detectable warning surface shall be paid for at the contract price per square foot of curb ramp.

No deduction in measured length of curb and gutter to be paid for will be made for curb openings for driveways.

73-3.03 Curb, Sidewalk, Gutter Depression, Island Paving, Driveway, and Curb Ramp

Construction: Curb, sidewalk, gutter depression, island paving, driveway, and curb ramp shall be constructed in accordance with the details and at the location shown on the Project Exhibits and in conformance to the requirements of Section 73 of the City Specifications with the following modifications and additional requirements.

All concrete which is to be removed from sidewalk and driveway areas shall be removed to the nearest transverse score mark across the full width of sidewalk or construction joint as directed by the Engineer.

Soft or spongy material shall be removed and replaced with suitable material as required by the Engineer.

Sidewalk, driveway, island paving, curb ramp, and gutter depression shall be cured in accordance with the requirements of Section 90-7 of the Standard Specifications except that the Contractor may substitute other than pigmented sealer upon approval in writing of such substituted sealer by the Engineer.

All oil, paint, tire marks, and other discoloring shall be removed from the driveway, island paving, curb ramp, and gutter depression by sandblasting prior to acceptance by the Engineer. Cement mortar will not be an acceptable substitute for sandblasting. Vandalism to uncured concrete surface shall be removed. If it cannot be removed from the surface, then the vandalized concrete shall be removed and replaced to the nearest score mark.

Curb Ramp shall be constructed in accordance with the details and at the locations shown on the Project Exhibits per City STD.-232.

Gutter Depression shall be constructed in accordance with the details and at the location shown on the Project Exhibits and in conformance to the requirements of City STD-243 Standard Valley Gutter.

73-3.04 Payment: Curb and gutter, median curb, curb ramp, sidewalk, driveway, island paving, and valley gutter shall be considered included in the prices paid for the **various contract items** of work involved and no additional compensation will be allowed therefor.

SECTION 80 FENCES

80-1.01 Description: All fence shall be constructed in accordance with Section 80 of the Standard Specifications, these Special Provisions, and as directed by the Engineer.

Where removal of existing fencing is required, temporary fencing shall be put in place to maintain site security and prevent pedestrian access and/or agricultural activities through the Project site. Upon completion of work the temporary fencing shall be removed and the fence shall be restored to its original condition. Removal and installation of fence (temporary or permanent) shall take place in the same day.

80-1.02 Connections: Existing cross fences shall be connected to the new fence. Corner posts with braces for every direction of strain shall be placed at the junction with existing fences. The wire in the new and existing fences shall be fastened to the posts.

80-1.03 Materials: Fencing materials shall conform to Section 80-3.01 of the Standard Specifications.

80-2.01 Construction: Fence construction shall be in accordance with Section 80-3.02 of the Standard Specifications, these Special Provisions, and as directed by the Engineer.

80-3.01 Payment: Full compensation for fences shall be considered included in the prices paid for the **various contract items** of work involved and no additional compensation will be allowed therefor.

SECTION 90 CONCRETE

90-1.01C (6) Mix Design: The proportions of the water, sand and aggregate shall be regulated so as to produce a plastic, workable and cohesive mixture.

90-1.01D (2) Cementitious Material Content: Concrete shall contain a minimum of 564 pounds of cementitious material per cubic yard. The amount of cement by weight of the specified cementitious material shall be 75 to 85 percent.

90-1.01D (5) Compressive Strength: The 28-day compressive strength of concrete shall be 4000 pounds per square inch (psi) or greater.

90-1.01D (6) Curing Compound: Concrete shall be cured per Section 90-1.03B of the Standard Specifications. Pigmented curing compound or any other material that will leave a noticeable residue shall not be allowed.

90-1.02E (2) Chemical Admixtures: An admixture shall not be used to reduce the amount of cementitious material content.

90-1.03 Payment: Full compensation for conforming to the provisions of this section shall be considered as included in the prices paid for the **various contract items** of work involved and no additional compensation will be made therefor.

SECTION 121

NOTIFICATION

121-1.01 Description: The Contractor shall notify the Engineer of any work to be performed on any given work day either on the afternoon of the prior working day or before 8:30 AM on the given working day. Any work completed for which the Project Engineer has not received prior written notification of its scheduling MAY NOT BE ACCEPTED FOR PAYMENT.

The Contractor shall provide a written notice of pending construction to all residents and businesses in the vicinity fourteen calendar days prior to the start of work. The notice shall inform the resident or business of the type of work, the scheduled date(s) and time of the work and the potential impacts to the resident or business, including time frame during which vehicle access will be interrupted.

All written notices shall be submitted to the City for approval prior to distribution. The City may take up to three calendar days to review notices.

121-1.02 Payment: Full compensation for conforming to the provisions of this section shall be considered as included in the prices paid for the **various contract items** of work involved and no additional compensation will be made therefor.

SECTION 124

MATERIAL RECYCLING

124-1.01 Description: The Contractor shall dispose of all Portland cement concrete and asphalt concrete, generated from removal or demolition activities on the project, at a recycler for these materials. The Contractor shall provide receipts verifying delivery and approximate quantity (in tons) of the material delivered to a material recycler.

All other excess materials from the project shall become the property of the Contractor and shall be disposed of by him, at his expense.

124-1.02 Payment: Full compensation for material recycling as specified herein shall be considered as included in the contract prices paid for **various items** of work, and no additional compensation will be allowed therefor.

SECTION 130

SANITARY SEWER SYSTEM

130-1.01 Description: Sanitary sewer system components and related appurtenances shall conform to the requirements as specified in the City of Santa Rosa Sanitary Sewer Standards Specifications Section 130, the Exhibits, and modifications herein.

130-1.06 Sewer Laterals: If the proposed sewer main invert(s) are at a higher elevation than the existing invert(s), the Contractor shall submit a temporary connection plan to the Engineer for approval a minimum of 5 working days prior to start of work. The temporary connection plan shall include a schedule of work. The Contractor shall continuously monitor the upstream manhole of any temporary connection.

130-1.02 Materials: Manhole inside drop connection shall be per modified City Standard Plan 503 as shown on the Project Exhibits.

130-1.03 Excavation and Backfill: Contractor shall remove and dispose of manhole cones and grade rings as necessary for the installation of the new sewer main lining system and manholes lining systems as shown on the Project Exhibits.

Removal, disposal, and replacement of manhole cones and grade rings for installation of new sewer main lining system shall be considered included in the prices paid for the various contract items of work involved and no additional compensation will be allowed therefor. Reinforcing steel may be encountered in portions of concrete to be removed and no additional allowance will be made for the removal of such steel.

130-1.09 Television Inspection: The television inspection shall be in accordance with these Special Provisions and Section 130-1.09 of the City Standards.

Television Inspection shall occur:

1. Prior to the start of construction (and before the bypass pumping system has been installed),
2. After the bypass system has been set up and the pipe has been cleaned and prior to the start of lining operations, and
3. Again, when a sanitary sewer main rehabilitation segment has been completed and inspected, except as otherwise noted in these Special Provisions or the City Standards

130-1.09A Payment:

Bracing and Shoring shall be paid for at the contract unit price of **lump sum** for each phase, which price shall include full compensation for furnishing all labor, materials, tools and equipment; testing and measuring; and doing all the work involved in installation, maintenance, and removal of sheeting, shoring, and bracing for required excavations per City standards, and any other items necessary not specifically enumerated in the Standard Specifications and Special Provisions, and no additional allowance will be made therefor.

Manhole Frame and Bolt-Down Lid shall be paid for at the contract unit price per **each** for each phase, which price shall include full compensation for furnishing all labor, materials, tools and equipment and incidentals, and doing all work involved for installation of a new manhole frame and bolt-down lid, including but not limited to, excavation and disposal of excavated materials; any necessary hand digging; dewatering; disposal of soil in conformance with City

requirements as well as State and Federal regulations; contamination awareness; removing and disposal of the existing manhole frame and cover; surface preparation and repair of the existing manhole; sealing of penetrations water tight; coating and patching; supporting or removal and disposal as necessary of existing utilities in the same excavation; placing and compacting all required bedding and backfill; trench plates as needed; installing and adjusting new grade rings as required; furnishing and installing a new manhole frame and bolt-down lid with concrete collar and temporary and permanent asphalt concrete paving around frame per City standards; ensuring that the new manhole frame and cover are properly set to the correct height in the roadway as specified by the Engineer; manhole testing per these Special Provisions; and any other items necessary not specifically enumerated in the Standard Specifications and Special Provisions, and no additional allowance will be made therefor.

Manhole Grade Rings, Frame and Bolt-Down Lid shall be paid for at the contract unit price per **each** for each phase, which price shall include full compensation for furnishing all labor, materials, tools and equipment and incidentals, and doing all work involved for installation of a new manhole grade rings, frame and cover, including but not limited to, excavation and disposal of excavated materials; any necessary hand digging; dewatering; disposal of soil in conformance with City requirements as well as State and Federal regulations; contamination awareness; removing and disposal of the existing manhole grade rings, frame and cover; surface preparation and repair of the existing manhole; sealing of penetrations water tight; coating and patching; supporting or removal and disposal as necessary of existing utilities in the same excavation; placing and compacting all required bedding and backfill; trench plates as needed; installing and adjusting new grade rings; furnishing and installing a new manhole frame and bolt-down lid with concrete collar and temporary and permanent asphalt concrete paving around frame per City standards; ensuring that the new manhole frame and cover are properly set to the correct height in the roadway as specified by the Engineer; manhole testing per these Special

Provisions; and any other items necessary not specifically enumerated in the Standard Specifications and Special Provisions, and no additional allowance will be made therefor.

Full compensation for materials shall be considered included in the prices paid for the above bid items and no additional compensation will be allowed therefor.

36" Pre-CIPP Rehabilitation CCTV Inspection shall be paid for at the contract unit price of **linear foot**, which price shall include full compensation for furnishing all labor, materials, tools and equipment, testing and measuring, and doing all the work involved in CCTV inspection of the 36" sewers both in live flow and then again after bypass has been set-up and is running prior to CIPP lining per City Standards and these specifications, and any other items necessary not specifically enumerated in the Standard Specifications and Special Provisions, and no additional allowance will be made therefor. This bid item includes as many passes as necessary to get a complete CCTV inspection as per written acceptance by the Engineer for the entire sewer segment from manhole to manhole both in live flow and then again after bypass has been set-up, pipe has been cleaned, but prior to CIPP lining.

48" Pre-CIPP Rehabilitation CCTV Inspection shall be paid for at the contract unit price of **linear foot**, which price shall include full compensation for furnishing all labor, materials, tools and equipment, testing and measuring, and doing all the work involved in CCTV inspection of the 48" sewers both in live flow and then again after bypass has been set-up and is running prior to CIPP lining per City Standards and these specifications, and any other items necessary not specifically enumerated in the Standard Specifications and Special Provisions, and no additional

allowance will be made therefor. This bid item includes as many passes as necessary to get a complete CCTV inspection as per written acceptance by the Engineer for the entire sewer segment from manhole to manhole both in live flow and then again after bypass has been set-up, pipe has been cleaned, but prior to CIPP lining.

36" Post-CIPP Rehabilitation CCTV Inspection shall be paid for at the contract unit price of **linear foot**, which price shall include full compensation for furnishing all labor, materials, tools and equipment, testing and measuring, and doing all the work involved in CCTV inspection of the 36" sewers after CIPP lining and while sewer bypass is still running per City Standards and these specifications, and any other items necessary not specifically enumerated in the Standard Specifications and Special Provisions, and no additional allowance will be made therefor. This bid item includes as many passes as necessary to get a complete CCTTV inspection as per written acceptance by the Engineer for the entire sewer segment from manhole to manhole.

48" Post-CIPP Rehabilitation CCTV Inspection - UFO shall be paid for at the contract unit price of **linear foot**, which price shall include full compensation for furnishing all labor, materials, tools and equipment, testing and measuring, and doing all the work involved in CCTV inspection of the 48" sewers associated with rehabilitation after CIPP lining and while sewer bypass is still running per City Standards and these specifications, and any other items necessary not specifically enumerated in the Standard Specifications and Special Provisions, and no additional allowance will be made therefor. This bid item includes as many passes as necessary to get a complete CCTTV inspection as per written acceptance by the Engineer for the entire sewer segment from manhole to manhole.

48" Post-CIPP Rehabilitation CCTV Inspection – North Fulton shall be paid for at the contract unit price of **linear foot**, which price shall include full compensation for furnishing all labor, materials, tools and equipment, testing and measuring, and doing all the work involved in CCTV inspection of the 48" sewers associated with rehabilitation after CIPP lining and while sewer bypass is still running per City Standards and these specifications, and any other items necessary not specifically enumerated in the Standard Specifications and Special Provisions, and no additional allowance will be made therefor. This bid item includes as many passes as necessary to get a complete CCTTV inspection as per written acceptance by the Engineer for the entire sewer segment from manhole to manhole.

SECTION 130-2

CURED-IN-PLACE PIPE LINING

130-2.01 Description: It is the intent of this Specification Section to provide for the rehabilitation of sanitary sewer mains by the installation of a CIPP liner into the existing gravity sewer line. When formed, the liner shall extend over the length of the pipe indicated in the Project Exhibits from manhole to manhole in a continuous, tight fitting, smooth, hard, strong, chemically inert, and watertight pipe- within-a-pipe closely following the contours of the host pipe. The liner shall be installed using "Trenchless Technology", i.e., no excavation is necessary for this item of work except for that potentially required to gain access at diameter constrained manholes. **The thickness of the CIPP liner shall be designed assuming a fully deteriorated pipe.**

The Contractor shall furnish all labor, equipment and materials necessary to complete the cured-in-place pipe (CIPP) lining of sanitary sewers as specified herein and as shown on the Project Exhibits. This Contract shall include the preparation of the construction site, including delivery of all materials to the site, all equipment and materials required for either remote or on-site impregnation of lining, cleaning, flushing and pre-television inspection of sewer to be lined; protection of existing conditions during installation work, existing lateral location and identification, infiltration repairs and other point repairs as needed prior to lining, pre-liner and/or liner installation, lateral reinstatement, pipe sealing at manholes, final television inspection and testing of the lined pipe sewer system, and other accessories as required for the proper installation; protection of the site during the life of the Contract, including protection of inspection personnel, warning lights, barricades, traffic control, dust control and maintenance of detours, as required; the cleanup of the work site, including maintenance and replacement of features such as paving, curb and gutter, seeding, sodding and graveling, if damaged. The Contractor is advised that this lining project is required due to deterioration of the reinforced concrete pipe and shall be prepared to respond to complications due to pipe deterioration and issues associated with infiltration.

Contractor CIPP operations shall comply with noise ordinance requirements per Special Provisions Section 130-3.02A.

Only water or steam cure method is acceptable for this project.

48" CIPP Liner Rehabilitation - II2712MH1 to II2712MH3 work shall only commence at the direction of the Engineer, pursuant to inspection results per Section 130-2.11 'Preparation'. Attention is directed to Standard Specifications Section 9-1.06D 'Eliminated Items'.

130-2.02 Quality Assurance:

1. Work performed under this Section shall conform to the Drawings and Specifications and shall comply with all standards, rules and regulations, laws and ordinances of the City and all other authorities having jurisdiction, as amended. That which is necessary to make the work comply with the above requirements shall be provided without additional cost to the City.
2. Contractor Qualifications:

- a. The Contractor shall have the following minimum qualifications for each method of installation and curing used on this project:
 1. The Contractor shall have previous experience with 'On-site wet out' operations on at least 3 different projects of minimum 54" CIPP lining in sewer mainlines.
 2. Field Supervisor Experience: The lining field supervisor (defined as the person who is supervising in the field during all phases of the lining) must have the following experience:
 - i. **CIPP Lining:** Installed at least 3,000 feet of minimum 39" CIPP lining in sewer mainlines as part of a lining crew (includes both non-supervisory and supervisory work).
 - ii. **CIPP Lining Supervision:** As lining field supervisor, installed at least 1,500 feet of min 39" CIPP lining in sewer mainlines.
 - iii. **CIPP Lining Project Supervision:** As lining field supervisor, installed CIPP lining in sewer mainlines on at least four different projects, a minimum of two of these projects being 36" or larger.
 3. Technician Experience: At least one of the crew members must have the following experience:
 - i. **CIPP Lining:** Installed at least 1,500 feet of min 36" CIPP lining in sewer mainlines as part of a lining crew.
 - ii. **CIPP Lining Projects:** Installed CIPP lining in sewer mainlines on at least two different projects as part of a lining crew.
 - b. The final decision to accept or reject the product, manufacturer, and/or installer lies solely with the City. The named Manufacturer, Field Superintendent, CIPP Installer, Lateral Cutter, and Boiler Technician must be employed to perform the work, unless changes are specifically authorized by the City.
3. Correction of failed liner or liner pipe deemed unacceptable, as a result of the post video inspection and/or test reports for structural values, thickness, chemical resistance, etc., shall be the responsibility of the Contractor, at no extra cost to the City. Method of correction/repair must be approved by the City with prior field demonstration, if requested by the Engineer. If deemed necessary by the Engineer, corrective actions may include full liner removal and replacement at no additional cost to the City. Once corrections/repairs are completed a new video inspection will be required at the Contractor's expense.
 4. The finished liner shall be continuous over the entire length of runs (from manhole to manhole) and shall be free from visual defects. The finished liner shall meet or exceed the requirements of this specification.
 5. The Contractor shall televise the pipe after the liner has been installed, all laterals have been reinstated, all sewer reconnections have been made, and manhole work has been completed as necessary. The original television inspection video tape shall be provided to the Engineer. The Contractor shall repair all damage found during the reviewing of these final TV inspection video tapes at no additional cost to the City. Damage shall be defined as any leaks, cracks, loose joints, visual defects, and other defects which in the opinion of the Engineer are not acceptable and would impair the serviceability of the new piping system.
 6. All materials and work supplied under this section shall be warranted for a period of two years by the manufacturer and the Contractor. Warranty period shall commence upon written notice of completion by the City. The materials shall be warranted to be free

from defects in workmanship, design, and materials. If the materials should fail during the warranty period, it shall be replaced or restored to service at no expense to the City.

130-2.03 Submittals: The Contractor shall submit to the Engineer a complete list of all materials proposed to be furnished and installed before materials are delivered to the job site. The Contractor shall not permit any sewer lining component to be brought onto the job site until the following has been reviewed and approved by the Engineer.

1. Contractor qualifications per Special Provisions Section 130-2.02. Field Supervisor's and technician's resume/experience list to demonstrate that experience requirements listed in Item 130-2.02 are met. Information to include project name, project location, date, contact name with organization, size and footage of pipe lined, and the lining product(s) used.
2. Television inspection reports and video tapes made in live flow prior to ordering CIPP lining per Special Provisions Section 130 or City Standards Section 130.
3. Television inspection reports and video tapes made after the bypass system has been set up and is running and the pipes have been cleaned but prior to pipe liner insertion per Special Provisions Section 130 or City Standards Section 130.
4. Sewage bypass pumping and/or diversion plan per Special Provisions Section 130-3 shall be submitted to the Engineer for review at least ten days prior to planned bypass set-up.
5. Contractor's plan for ensuring compliance with State of California Air Quality requirements. Plan shall include Contractor's means for air quality testing to ensure compliance.
6. Contractor's plan for ensuring compliance with City of Santa Rosa Noise Ordinance during both lining and bypass activities.
7. Contractor's plan for procuring water for water cure.
8. Information on all CIPP materials and resins, including CIPP pre-liner as required.
9. Preliner description, preliner splicing recommendations, and identification of supplier as required.
10. Certificate of Compliance from the Manufacturer certifying compliance with the applicable specifications and standards. The manufacturing date of lining materials shall be included in the certification. The batch number of the resin to be used shall also be included in this submittal. Certification shall be signed by an authorized agent of the manufacturer.
11. Technical data sheets from resin manufacturer. Technical data sheets to include quality control values for viscosity and gel time. Technical data sheets also to include average values for flexural modulus and flexural strength.
12. Certified copies of quality control resin batch test reports. Report to include measured values for viscosity and gel time.
13. Manufacturer's installation instructions and product data.
14. If on-site wet out is used, provide a map showing anticipated location of wet-out

plant, and information regarding on-site wet out procedures including all equipment to be used, all chemicals that will be stored and used on the property, and details regarding spill protection as outlined in these specifications.

15. For factory wet-out, Contractor shall provide proof that the quality management system for the wet-out facility is registered in accordance with and conforms to the current ISO 9001 standard. The management system must ensure that proper materials and amounts are used in the resin saturation process and in liner shipping and storage. At a minimum, the quality control documentation shall include resin lot numbers, volumes of resin, catalyst, enhancers, date of wet-out, storage/transportation controls, and quality assurance procedures.
16. Contractor's procedures including the duration of service shutdown, complete manufacturer's recommendations for storage procedures, resin application, curing process details and cure schedules (including heat up, hold, and cool down cycles and temperature control for each diameter and CIPP thickness, trimming and finishing at manhole walls, and lateral reinstatement methods.
17. Data, measurements, assumptions and calculations for sizing liners and preliners. Data shall include CCTV of the existing condition of the pipe as taken in live flow prior to set-up of the bypass system per Special Provisions Section 130. Measurements shall include direct measurements of the diameter of the existing pipe as far into the existing pipe as can be accessed from the existing manholes. Diameter measurements shall be taken from at least two different locations along an existing pipe segment. This information shall be provided prior to: completing any design calculations, ordering any lining materials, or fabricating any liner materials.
18. Engineering calculations for the design of the liner thickness. Design calculations shall be checked and approved by a Registered Civil Engineer in the State of California. Liner design calculations shall be supported by field analysis, technical assumptions, requirements of these Special Provisions, and ASTM F1216. Final approval of the design calculations shall be given by the Engineer.
19. Verification of product conformance by third party testing for the chemical resistance and physical testing requirements along with the report of test results.
20. HEAT CURE RESIN: The proposed heating equipment and boiler management operational safety systems for use with the cure process of CIPP along with proof of ownership or executed lease agreements that cover the duration of the contract term. A list of certified boiler technicians approved as operators by the manufacturer or an independent testing agency.
21. Thermocouple sensors and cable that will allow for temperature to be measured at least every three (3) inches along liner during the curing process. Also submit information on software that will be used to record temperature continuously during the curing process.
22. Certification from the manufacturer that the resin/catalyst and tube material comply with the required application, meets the intended service condition and the physical requirements set forth in this specification.
23. Methods, materials, equipment, and procedures to stop existing infiltration into the host pipe prior to lining.
24. Methods, materials, equipment, and procedures to seal annular space between the CIPP

and the existing pipe at the manholes (also referred to as the “end seal”) and at all internally reinstated services connections. End seals are required at every manhole including the manholes that are lined through. If a different product is used at manholes that are lined through, submit information on this product also.

25. Sampling procedures and locations for obtaining representative samples of the finished liner.
26. Literature and background information on the independent third-party testing laboratory proposed for testing the physical properties of the installed pipe.
27. Volume of resin required per unit length (gal/foot or liters/meter) to fill the volume of air voids in the tube plus the additional allowance for polymerization shrinkage for each diameter and thickness to be installed on the project.
28. After each impregnation of a tube for an installation, a process record that verifies that the resin impregnation yield matches the required quantity for the diameters and thicknesses.
29. Method for CIPP liner repair (i.e. vacuum holes, etc.).
30. Cure records including the temperatures measured at each thermocouple/sensor. Temperature measurements shall be recorded continuously during the curing process.
31. Proposed hydrostatic head required for insertion of the liner with associated calculations (for water inversion method).
32. Traffic control information.
33. Door hanger and other public notification information.
34. Spill Contingency Plan outlining the steps the contractor will take and the equipment that will be used in the event of a sewage spill during bypass activities.
35. Schedule. Overall project schedule submitted within three days of Notice to Proceed. Updated overall project schedule submitted two days before lining crew arrival on the jobsite.
36. Upon approval of the Engineer, the manufacturer’s recommendations shall become the basis for acceptance or rejection of actual methods of installation used in the work.
37. Color CCTV video of the pipeline after complete cure of the liner (electronic format) and completion of rehabilitation of each adjacent manhole as required and prior to taking the bypass system offline per Special Provisions (or City Standards) Section 130.

130-2.04 Product Handling:

1. Liner pipes shall be properly stored and handled to prevent damage in accordance with the manufacturer’s recommendations and as approved by the Engineer. Damage includes, but is not limited to, gouging, abrasion, flattening, cutting, puncturing, or ultra-violet (UV) degradation. All damaged materials and pipe rejected by the Engineer shall

be promptly removed from the project site at the Contractor's expense and disposed of in accordance with current applicable regulations.

2. Protection: The Contractor shall use all means necessary to protect sewer lining materials before, during and after installation and to protect the installed work and materials of all other trades.
3. Replacement: In the event of damage, the Contractor shall immediately make all repairs and/or replacements necessary to the satisfaction of the Engineer, at no additional cost to the City.

130-2.05 Existing Sewer System:

1. Active Sewers: The Contractor shall maintain in operating condition all active sanitary sewers encountered in the sewer lining installation.
2. Connections to Existing Sewers and Manholes: The Contractor shall make all required connections to existing sewers and manholes and carry out such work in accordance with local standards and requirements and as directed by the Engineer. Extreme care to prevent debris from entering into existing sewers shall be exercised.
3. The Contractor shall furnish, prior to use of the materials, satisfactory written certification of their compliance with the manufacturer's standards for all materials and conformance with the methods of the manufacturer and ASTM requirements.

130-2.06 Cured-In-Place Pipe Lining:

1. The liner pipe material shall be designed for use in gravity sanitary sewers and shall be in strict conformance with all applicable sections of ASTM F1216 specifications. All materials and procedures used in the cured-in-place pipe rehabilitation process shall be equal to or exceed the manufacturer's standards. The CIPP design shall assume no bonding to the original pipe wall. The hydraulic capacity of the lined section shall be maintained as large as possible. The pipe liner shall have at a minimum 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.
2. Preliner Tube: Contractor shall use a preliner tube sized to fit host pipe in areas where active infiltration is present and cannot otherwise be arrested by other means (see Specification Section 130-2.11, H). Preliner tube must be composed of 3-ply laminate sheet combining two layers of polyethylene film and high strength nylon cord grid formed into a tube sized to fit host pipe and must be continuous for the entire length of host pipe.
3. CIPP Tube: The tube shall be fabricated to meet the requirements of ASTM F1216 or ASTM F1743, Section 5 and the performance requirements as specified herein. The tube shall be constructed to withstand installation pressures, have sufficient strength to bridge missing pipe, and be capable of stretching to fit irregular pipe sections. Two different types of systems shall be considered for CIPP: Fiber Felt Tube System or Fiberglass Mat System or approved equivalent. The Engineer shall make any determination of equivalency after being presented with relevant documentation published by the manufacturer of proposed substitution materials. Tubes reinforced with glass or carbon fibers shall be allowed by written permission by the Engineer.
 - a. The tube shall have a uniform thickness that when compressed at installation pressures will meet or exceed the Design thickness.

- b. The tube shall be free of tears, holes, cuts, foreign materials, abrasions or other defects and will be subject to inspection by the City.
- c. Contractor shall determine the minimum tube length necessary to effectively span the designated run between manholes, unless otherwise specified. Contractor shall field verify the lengths of existing sewer to be lined in the field prior to impregnation of the tube with resin, to ensure that the tube will have sufficient length to extend the entire length of run.
- d. The minimum length of the flexible tube shall have allowance for proper stretching or shrinkage due to pressure or expansion.
- e. Due to corrosion, the existing pipes may have an irregular shape. Before ordering the liner materials, the Contractor shall measure the inside diameter of the existing pipelines in the field so that the liner tube can be custom fabricated to be installed in a tight-fitted condition in the existing pipes. The liner tube shall be sized so as to stretch to fit irregular pipe sections and negotiate bends.
- f. 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 delamination in the cured CIPP. No dry or unsaturated layers shall be evident. It shall not be possible to separate any layers with a probe or knife blade such that the layers separate cleanly or the probe or knife blade moves freely between the layers.
- g. The outside of 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.
- h. Fiber Felt Tube System
 - 1. The felt tube shall be a sewn thermoplastic polyester or acrylic tube consisting of one or more layers of flexible needled felt or an equivalent woven and/or non-woven material capable of carrying resin, and with sufficient needling and cross-lapping and strength to withstand the installation pressures and curing temperatures. The felt tube to be furnished shall be compatible with the resin and catalyst systems to be utilized.
 - 2. The finished lining shall consist of an inner polyurethane and an outer polyester felt layer (or layers) impregnated with a thermosetting resin and fabricated to fit tight against the existing pipe wall. An allowance shall be made for circumferential stretching during inversion.
 - 3. The tube shall be sewn 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.
 - 4. The outside layer of the tube (before wet-out) shall be coated with an impermeable, flexible membrane that will contain the resin and facilitate monitoring of resin saturation during the resin impregnation (wet-out) procedure.
 - 5. Seams in the tube shall be stronger than the non-seamed felt.

OR

i. Fiberglass Mat System

Fiberglass Mat System: The tube shall be composed of a high strength, fiberglass mat system capable of retaining resin, contained within a system of polyethylene film on both the interior and exterior. The tube shall have sufficient needling and cross lapping to yield a minimum burst strength of 800

pounds per square inch in transverse directions (hoop stress), and strength to withstand the installation pressures and curing temperatures. The tube shall be free from tears, holes cuts, foreign materials and other defects, and will be subject to inspection by the City.

4. Resin/Catalyst: The resin system shall be a corrosion resistant polyester, vinyl ester, or epoxy and catalyst system that when properly cured within the tube composite meets 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 CIPP which will comply with the structural and chemical resistance requirements of this specification.
 - a. The resin used shall be resistant to abrasion from solids, grit, and sand and be compatible with the rehabilitation process used and designed for a wastewater environment. The resin shall be able to cure in the presence or absence of water, and the initiation temperature for cure shall be as recommended by the resin manufacturer and approved by the Engineer. The resin shall have sufficient properties to obtain non-draining characteristics when impregnated into the fiber fabric.
 - b. The Engineer shall also be informed in advance, for verification and inspection of the resin material at the "wet out" of the tube. The inspection shall be at the discretion of the Engineer, which shall not relieve the Contractor of their responsibilities. The wet-out procedure shall utilize the resin and catalyst in sufficient quantities to ensure complete impregnation of the liner and provide the properties specified herein.
 - c. If resin enhancers are proposed for use, the Contractor shall provide testing data to indicate that the enhanced resins meet the requirements for the project. The Engineer can disallow the use of enhancers at no additional cost to the City.
 - d. The catalyst system shall be compatible with the resin and other materials to be utilized in the rehabilitation process. Quantity and type of catalyst shall be selected based on the curing conditions and recommendations of the resin manufacturer.
 - e. The chemical resistance of the resin system selected shall have been tested by the resin manufacturer in accordance with ASTM F1216. Exposure to the chemical solution listed below shall result in a loss of not more than twenty percent of the initial physical properties when tested in accordance with ASTM D543 for a period of not less than one month.

CHEMICAL SOLUTION	CONCENTRATION, %
Tap Water (pH 6-9)	100
Nitric Acid	5
Phosphoric Acid	10
Sulfuric Acid	10
Gasoline	100
Vegetable Oil	100
Detergent	0.1
Soap	0.1

- f. The resin system shall be manufactured by a company selected by the CIPP

supplier. Only polyester and vinyl ester resins complying with the following requirements shall be used.

1. Polyester Resin. A resin created by reaction products between isophthalic/terathalic acid, maleic anhydride, and a glycol characterized by reactive unsaturation located along the molecular chain. This resin is compounded with a reactive styrene monomer and reacted together with initiators/promoters to produce cross-linked copolymer matrices.
2. Vinyl Ester Resin. A resin created by reaction products of epoxy resins with methacrylic acid and characterized by reactive unsaturation located in terminal positions of the molecular chain. This resin is compounded with a reactive styrene monomer and reacted together with initiators/promoters to produce cross-linked copolymer matrices.
- g. The initiation temperature or UV exposure intensity and duration for cure shall be as recommended by the resin manufacturer. Temperature monitoring devices shall be installed at all exposed portions of the pipe (beginning and end of run- no intermediate manholes shall be allowed) for each inversion or run of installed liner pipe between the host pipe and the CIPP liner. The resin shall have sufficient thixotropic properties to obtain non-draining characteristics when impregnated into the fiber fabric.
- h. The catalyst system shall be compatible with the resin and other materials to be utilized in the rehabilitation process. Quantity and type of catalyst shall be selected based on the curing conditions and recommendations of the resin manufacturer.
- i. The wet-out procedure for the tube shall utilize the resin and catalyst in sufficient quantities to ensure complete impregnation of the liner and provide the properties as specified in this Specification.

5. CIPP Liner Design Criteria

- a. The liner material and thickness shall be calculated and designed for use in gravity sanitary sewers and must be in strict conformance with all applicable sections of ASTM F1216 and D5813.
- b. The Cured-In-Place Pipe thickness shall be calculated and designed upon the following physical conditions of the existing pipe to be rehabilitated:
 1. All pipes shall be considered fully deteriorated.
 2. All pipes shall be subjected to a soil load of 120 lbs./cu. ft., with applicable live load.
 3. Pipes in good condition shall have a minimum of 2% ovality in the circumference. A higher value of ovality shall be used if the pipe is deteriorated.
 4. Factor of safety (N) of 2.0 shall be used for calculations.
 5. Hydraulic Capacity:

Overall, the hydraulic profile shall be maintained as large as possible. The pipe liner shall have at a minimum 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.
 6. Inside diameter of the existing pipe used in calculating liner thickness shall be as measured in the field, by the Contractor, prior to producing pipe calcs and ordering lining materials so that the liner can be lined

in a tight fitted condition. See Section 130-2.08.A.

7. A Modulus of Soil Reaction (E) of 1000 psi shall be used.
8. Assume that groundwater level is at ground surface.
9. H20 highway live loads.
10. External Buckling Design – Acceptable third-party testing and verification of the design analysis techniques (ASTM F1216, Section X1.2.2)
11. The pipe liner shall be designed to bear full pipe loading. Host pipe shall be assumed not to provide any structural support.
12. Minimum service life of 50 years.

c. Finished and Cured Liner Properties

1. 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 separation of the layers occurs during testing of field samples, new samples will be cut from the work. Any reoccurrence may cause rejection of the work and liner will have to be removed and replaced at no additional cost to the City.
2. The finished cured-in-place pipe liner shall fit tightly and neatly against the existing pipe walls.
3. The liner shall be fabricated from materials which, when cured, will be suitable for continuous service in sewerage environments containing hydrogen sulfide, carbon monoxide, carbon dioxide, methane, dilute (10%) sulfuric acid at an average wastewater temperature of 80°F, dilute (10%) phosphoric acid, petroleum hydrocarbons, gasoline, vegetable oil, tap water (pH 6.5 - 9), up to 1 hour per day exposure to 5 percent sodium hydroxide up to a pH of 11, moisture saturation, and external exposure to soil bacteria and chemical attack which may be due to materials in the surrounding ground or sewage within.
4. The physical properties of the cured liner shall meet the minimum chemical resistance requirements of ASTM F1216, shall conform to the structural standards as listed in Section 76-2.01 D, and with the minimum standard physical properties as follows:

MINIMUM PHYSICAL PROPERTIES

PROPERTY	REFERENCE	MINIMUM VALUE	
		Short Term	Long Term
Wall Thickness	ASTM D 2122	As calculated	N/A
Flexural Strength	ASTM D 790	4,500 psi (polyester) 5,000 psi (vinyl ester)	N/A

Flexural Modulus of Elasticity	ASTM D 790	400,000 psi (polyester)	200,000 psi (polyester)
		450,000 psi (vinylester)	225,000 psi (vinylester)

Liner shall be homogenous throughout and free of:

- a. Serious abrasion, cutting, or gouging of the outside surface extending to more than 10 percent of the wall thickness in depth.
 - b. Cracks
 - c. Kinking (generally due to excessive or abrupt bending)
 - d. Flattening
 - e. Holes
 - f. Blisters
 - g. Other injurious defects
5. Liner shall be uniform in color, opacity, density, and other physical properties. Any lining not meeting these criteria shall be repaired to the satisfaction of the Engineer or rejected at the Engineer's option.
6. Liner Color: Liner shall conform to the following:

Inside: The interior of the liner shall be light in color. Light blue is acceptable. Proposed color(s) shall be submitted for review and approval prior to the Contractor ordering the liner.

13-2.07 Execution:

This section is intended to provide the Contractor with general guidance on the methods to be used to install the sewer pipe using the CIPP liner method. Nothing contained herein shall relieve the Contractor from completing the pipe rehabilitation in the most feasible, efficient and safe manner, using required materials to the lines and grades shown on the Project Exhibits and to the requirements of these specifications.

130-2.08 Existing Conditions:

A. Site Review

1. Prior to ordering any lining materials, fabrication of any lining materials, the commencement of bypass pumping operations, or the commencement of lining any pipes, the contractor shall:
 - a. Perform a site review and CCTV video inspection of all pipe segments in live flow per Special Provisions Section 130 .
 - b. Measure the internal diameter of the pipe at two locations along each pipe segment and at locations of active connections and/or any irregularities of the existing pipeline in live flow to verify existing internal pipe diameter.
2. The liner shall be fabricated to a size which, when installed, will neatly fit the internal circumference of the conduit shown on the Project Exhibits. Allowance for circumference expansion during installation shall be made.
3. The Contractor shall verify that the sewer line shall be installed in strict accordance with all pertinent codes and regulations, the original design, the referenced standards and the manufacturer's recommendations.

4. The sections of pipelines to be rehabilitated have been previously inspected by CCTV. An electronic copy of the video may be obtained from the City by request. This information is **not** considered part of the contract documents.

B. **Discrepancies**

1. In the event of discrepancy, the Contractor shall immediately notify the Engineer.
2. The Contractor shall not proceed with the installation in areas of discrepancy until all such discrepancies have been fully resolved with the Engineer and noted in that day's log.

130-2.09 Field Measurements: The Contractor shall make all necessary measurements in the field to ensure precise fit of items in accordance with the drawings. See Section 130-2.08 of these Special Provisions.

130-2.10 Inspection of Pipe Liner: No pipe shall be lined without proper notification of the Engineer. Each pipe liner shall be subject to inspection by the Engineer immediately prior to installation. Defective liner will be rejected and replaced at the Contractor's expense.

130-2.11 Preparation: The following installation procedures shall be adhered to unless otherwise approved by the Engineer.

A. **Safety**

The Contractor shall carry out their operations in strict accordance with all OSHA and manufacturer's safety requirements. Particular attention is drawn to those safety requirements working with hazardous/combustible materials, scaffolding and entering confined spaces.

B. **Air Quality**

The Contractor shall carry out their operations in strict accordance with all State and Federal Air Quality requirements.

C. **Noise**

The Contractor shall comply with the City of Santa Rosa noise ordinance during installation of the CIPP liner. See Special Provisions Section 130-3.01.

D. **Cleaning of Sewer Line**

1. **Standard Cleaning:** Prior to pipe rehabilitation and after the bypass system has been set up, the Contractor shall perform an initial sewer cleaning of all silt, debris, grease, roots and other materials that would prevent the proper installation of the liner as defined and accepted by the Engineer. Several passes, if necessary and at no additional cost to the City, with high-pressure jet cleaning equipment shall be performed until all debris is removed from the pipe to the written satisfaction of the Engineer. If roots are present, root cutters or mechanical brushes shall be attached to the jet nozzle and sent through the line to remove all root intrusions. All spoils shall be removed from the pipe and shall be properly disposed of by the Contractor at the City's Wastewater Treatment Plant.

2. Heavy Cleaning: After standard cleaning has been completed and accepted by the Engineer, heavy cleaning shall be performed on the 48" diameter North Fulton Trunk Sewer pipe to remove as much of the existing liner as is practical without damaging the existing RCP pipe. At a minimum, any existing liner that is not adhered to the existing sewer shall be removed as part of the heavy cleaning process. Heavy cleaning shall consist of the use of as many passes of high- pressure jet cleaning equipment and/or use of mechanical brushes or scrapers as is necessary to complete the work to the written satisfaction of the Engineer. All spoils shall be removed from the pipe and shall be properly disposed of by the Contractor at the City's Wastewater Treatment Plant.

Any additional efforts required to fully remove the existing liner that is adhered to the host pipe and is beyond Standard and Heavy Cleaning, as prescribed herein, will be at the direction of the Engineer and is considered as Extra Work.

E. Inspection of Pipelines

1. CCTV Inspection: After bypass pumping has been set up and is in operation and the sewers have been cleaned to the written satisfaction of the Engineer, the Contractor shall provide experienced personnel trained in locating infiltration, breaks, obstacles and service connections to inspect the pipes via closed circuit color television. The interior of the pipelines shall be carefully inspected to determine the location of any condition which may prevent the proper installation of the liner into the pipeline. It shall be verified in writing to the City so that these conditions can be corrected. A DVD or flash drive, and a suitable legible log shall be kept for later reference by the City. See Section 130 of these Special Provisions.
2. Man-Entry Inspection and Reporting (48" diameter North Fulton Trunk Sewer - I12712MH1 to I12712MH3): After bypass pumping has been set up and is in operation, the pipeline has been cleaned (both Standard and Heavy Cleaning) to the written satisfaction of the Engineer, and a pre-CIPP lining CCTV inspection has been completed on the North Fulton Trunk Sewer, the Contractor shall conduct a man-entry inspection of the pipeline. As part of the man-entry inspection, Contractor shall:
 - a. Probe for and identify areas of soft concrete. Probes shall be completed at 8 points along the circumference of the sewer (12:00, 1:30, 3:00, 4:30, 6:00, 7:30, 9:00, and 10:30 o'clock positions) at a minimum of every 10 feet.
 - b. Identify areas of exposed aggregate and/or rebar through visual inspection.
 - c. Document their finding of soft concrete or other defect with photographs and detailed notes describing defect found and indicating location of defect by length along the pipeline from a designated manhole as well as clock position within the pipe with 12 O'clock being the crown of the pipeline. Contractor shall also provide repair recommendations for each defect located within the pipeline.
 - d. Report the findings to the Engineer. The Engineer will provide feedback regarding next steps for the pipeline within 5 working days.

- e. Contractor shall not order CIPP liner associated with the '48" CIPP Liner Rehabilitation - I12712MH1 to I12712MH3 – North Fulton' work until the Engineer has approved the project, reviewed the liner design, and provided direction to proceed with ordering the liner in writing.

F. Bypassing flow

See Section 130-3 of these Special Provisions.

G. Line Obstruction

It shall be the responsibility of the Contractor to clear the line of obstructions or collapsed pipe that will prevent the insertion of the liner or closed-circuit television camera. If inspection reveals an obstruction that cannot be removed by conventional sewer cleaning equipment or by remotely performed point repair methods acceptable to the Engineer, then the Contractor shall make a point repair by either man-entry methods or excavation to uncover and remove or repair the obstruction via Change Order. Before any point repair via man-entry or excavation is pursued, the Contractor shall give the Engineer three (3) working days-notice. Point repair via man-entry or excavation shall proceed only with the Engineer's written authorization. Protruding laterals shall be removed either internally with a hydro jet cutter or by external point repair, via Change Order. The City may direct additional point repair and obstruction removal based on the pre-installation television inspection above. Point repairs and obstruction removal directed by the City will be added to the work of this Section by Change Order.

H. Existing Pipeline Infiltration and Inflow

It is the responsibility of the Contractor to plug or otherwise stop existing active inflow and/or infiltration in the existing pipeline prior to lining. The Contractor shall demonstrate that inflow and/or infiltration has been arrested by providing CCTV footage of a clean and dry host pipe prior to beginning any lining per Special Provisions Section 130. All work associated with plugging or otherwise stopping existing active inflow and/or infiltration in the existing pipe prior to lining shall be considered as part of the price for CIPP lining. No extra payment shall be provided to the Contractor for this work.

I. Manhole Protection

The Contractor shall protect the manholes to withstand forces generated by equipment, water or air pressure used while inserting the liner. The Contractor shall be fully responsible for any damages to existing structures or utilities caused by the Contractor's operations.

J. Service Connections

The Contractor shall be responsible for confirming the locations of all branch service connections prior to installing the pipe liner. Only active connections shall be reinstated. The determination of whether or not a lateral is active will be as determined by the Engineer.

K. Delivery, Storage, and Handling

- 1. If the flexible tube is impregnated with resin at the factory, it shall be transported, installed, and cured before expiration of the shelf life.

2. Impregnated tube shall be stored and transported under refrigerated, ultraviolet light-free conditions. Light-cure CIPP shall be transported in a manner that does not allow for premature curing before installation is performed.
3. No cuts, tears, or abrasions shall occur during handling. The Engineer may inspect the tube before it is placed into the host pipe.

130-2.12 Installation:

A. General

1. The Contractor shall be an approved manufacturer's licensed installer of the proposed pipe liner system.
2. The liner shall be installed through the existing manholes, in accordance with the manufacturer's recommendations and procedures. The finished pipe on mainline reaches shall be continuous over the entire length between manholes as shown on the exhibits and be free from visual defects such as foreign inclusions and pin holes. The ends of the pipe lining shall be cut flush at the outlet point in the manhole by using a rotary cutter, and the ends shall be sealed to the rehabilitated pipeline. Any annular space between the CIPP liner and the rehabilitated pipe shall be filled with the same material as was used to seal the ends of the liner. The sealing material shall be compatible with the pipe liner, host pipe and field conditions (water, humidity etc.), and shall provide a watertight seal.
3. CIPP installation shall be in accordance with ASTM F1216, Section 7, or ASTM F1743, Section 6, with modifications as outlined in this specification.

B. Preliner Installation (as required)

1. The Engineer must witness the installation of each preliner tube. A preliner tube complying with these special provisions must be used to protect against uncontrolled infiltration and to control resin loss, liner thickness, and prevent blocked laterals. For long segments, several sections of preliner tube may be spliced together under preliner manufacturer's recommendations to form a tube of adequate length.
2. If the Contractor fails to install the required preliner tube over the entire segment as required by the Engineer (regardless of physical tests and thickness test results), the Contractor must remove the CIPP from the host pipe, dispose of it at, and install a new preliner and CIPP liner no additional cost to the City.

C. Preparation and Protection of Existing Facilities

1. The Contractor shall protect all existing landscaping, roadways, piping, and any other existing feature of the work area from damage. Any and all required repairs will be made by the Contractor at no additional cost to the City.
2. On site wet out facilities (as necessary) shall be fully contained. A liner or other spill prevention exclusionary material shall be used beneath all wet-out facility equipment, chemicals, and materials so as to prevent any spills.
3. The Contractor shall provide insulation protection from boiler hoses as necessary.

In particular, where boiler hoses are in contact with grass or other landscaping the hoses shall be insulated, elevated, or separated in a manner such that the vegetation will not be damaged by the heat.

D. Wet Out

1. Wet out shall be done either on-site or off-site with the fully impregnated liner trucked to the site. If wet out is done off-site and impregnated liner is trucked to the site, Contractor shall comply with all City and County road ordinances and requirements related to roadway maximum bearing capacity and weight limits.
2. The fiber-felt tube shall be fully impregnated with resin by vacuum. The resin and catalyst systems that are compatible with the requirements of the method shall be used. The quantity of resin used for tube impregnation shall be sufficient to fill the volume of air voids in the tube with additional allowance for polymerization shrinkage and the loss of resin through cracks and irregularities in the original pipe wall.
3. The impregnated liner bag shall be transported to and stored at the site as needed and stored in such a manner that it will not be damaged, exposed to heat and/or direct sunlight, or result in any public safety hazard. All materials shall be subject to inspection and review prior to installation. The impregnated liner bag must be installed prior to exceeding the resin pot life.

E. Installation of temperature measuring sensors

1. Temperature monitoring devices shall be installed at all exposed portions of the pipe (beginning of run, end of run, and intermediate manholes) for each inversion or run of installed liner pipe between the host pipe and the CIPP liner.
2. Temperature monitoring sensors shall also be installed at least every three (3) inches between the outside of the liner and the host pipe.
 - a. The temperature gradient across the CIPP liner material, the temperature of the exotherm shall be monitored by remote temperature sensors placed at the interface of the host pipe and the CIPP.

F. Liner Insertion

1. The impregnated tube shall be inserted through an existing manhole or other access approved by the Engineer by means of the installation process. The application of hydrostatic head, compressed air, or other means shall fully extend the tube to the next designated manhole or termination point and inflate and firmly adhere the liner to the pipe wall until the pipe has been fully cured.
2. A liner shall not be installed and terminate at a "blind end" (i.e. in a location other than at an existing manhole). No overlap shall be allowed between two existing manhole structures.
3. The liner shall be installed at a rate less than 10 feet per minute at all times.
4. Where water is used for the liner installation method, the Contractor is responsible for obtaining and paying for the water used. Potable or recycled water may be used for water cure.

G. Curing

1. After liner placement is completed, a suitable heat source and distribution equipment shall be provided. The equipment shall be capable of circulating hot water, air, and/or steam throughout the section by means of a pre-strung hose which has been perforated in accordance with the manufacturer's recommendations or other methods acceptable by the Engineer to raise the temperature uniformly above the temperature required to affect a resin cure. This temperature shall be determined by the manufacturer based on the resin/catalyst system employed. The curing of the CIPP must take into account the existing pipe material, the resin system, and the ground conditions (temperature, moisture level, and thermal conductivity of the soil).
2. The heat source piping shall be fitted with continuous monitoring thermocouples to gauge the temperature of the incoming and outgoing water, steam, and/or air supply. Water, steam, or air temperature during the cure period shall meet the requirements of the resin manufacturer as measured at the heat source inflow and outflow return lines. At the direction of the Engineer, the Contractor shall provide standby equipment to maintain the heat source supply. An additional continuous monitoring thermocouple shall be placed per Section 130-2.12, E to determine the temperature during the cure. The temperature during the cure shall be in accordance with the manufacturer's recommendation.
3. The initial cure shall be deemed to be completed when inspection of the exposed portions of the CIPP appear hard and sound and the remote temperature sensors indicate that an exotherm has occurred. The cure period shall be of duration recommended by the resin manufacturer during which time the recirculation of the water and cycling of the heat exchanger continuously maintain the required temperature.
4. Temperature shall be maintained during the curing period as recommended by the resin manufacturer and shall follow the heating schedule supplied by the manufacturer and reviewed by the Engineer. During the cure process, the Contractor shall keep logs, charts, and/or graphs of the liner temperatures at the specified locations along the liner to ensure that proper temperatures and cure times have been achieved. The documents may be required by the City at any time during and after the cure process.

H. Cool Down

1. The hardened CIPP shall be cooled to a temperature below 100 degrees F before relieving the static head or pressure in the lined pipe and returning normal flow back into the system. The cool down may be accomplished by introducing cool water into the CIPP. Cool down shall be at a uniform and steadily declining rate. Care shall be taken in the release of the static head or pressure so that a vacuum will not develop which could damage the newly installed CIPP.
2. Contractor shall install vertical stand pipe to direct cure off-gas discharge to the highest elevation possible so as to dissipate odors.

I. Finished Pipe

1. The finished product shall be continuous over the length of the pipe

reconstructed and be free from dry spots, delamination, and lifts. If these conditions are present, the Contractor shall remove and replace the CIPP at no additional cost to the City.

2. If the finished product has defects that are deemed repairable by the Engineer, the Contractor may repair these defects at their own expense. See Special Provisions Section 130-2.16.
3. At the manhole walls, a seal shall be applied per Special Provisions Section 130-2.13 and in accordance with manufacturer specifications and approved by the Engineer.

130-2.13 Sealing Liner at Manholes:

- A. The manhole connection shall also be sealed with a compression hydrophilic end seal gasket compatible with the installed CIPP liner. When the hydrophilic gasket comes in contact with water it must swell to create a 360-degree compression seal between the host pipe and the newly installed CIPP liner at all manhole connections. The swelling that occurs to create the seal between the liner and the host pipe shall not in any way deform the liner in such a manner that, in the opinion of the Engineer, an obstruction in the flow is created. End Seals shall be Insignia End Seal Sleeves or an approved equivalent. End Seals shall be installed in accordance with the Manufacturer's recommendations. Due to potential inconsistencies during the application of chemical grout, hydrophilic caulks or hydrophilic paste, these sealing methods shall not be considered an acceptable alternative.
- B. The beginning and end of the CIPP shall be cut flush at the inlet and outlet points in the manhole or at least 3-inches inside the elbow of the rodding inlet, and the ends shall be permanently sealed to the rehabilitated pipeline to prevent any infiltration between the CIPP and the host pipe. Pipe terminations into each manhole or rodding inlet shall be sealed with a resin mixture that is recommended by the liner manufacturer that is compatible with the liner/resin system, host pipe, field conditions and provides a watertight seal, and is approved by the Engineer prior to start of construction. Hydraulic cements and quick-set cement products are not acceptable. Acceptable materials shall be approved epoxy type products that will bond, not crack, dry up, slough off, or shrink in time, and provide a good transition in the manholes. A bladder or other means shall be relied upon to seal the tapered end of the liner to the host pipe. Sealing shall be performed at no additional cost to the City.
- C. Restore manhole bottom and invert.
- D. If, due to a broken or offset pipe at the manhole wall, the liner fails to make a tight seal, the Contractor shall apply a seal at that point. The seal shall be a resin mixture compatible with the liner material. The cost for furnishing all labor, materials, tools, equipment and incidentals, and for doing all work involved in providing a water tight seal between the liner and the manhole shall be considered as included in the contract prices paid for sanitary sewer main pipe liner installation and no additional compensation will be allowed therefore.

130-2.14 Field Testing:

- A. Unless an alternative test method is approved by the Engineer prior to lining, the Contractor shall test the new liner via the following methods.

Obtain samples of the installed cured liner according to ASTM F 1216 for short term flexural strength and short-term flexural modulus of elasticity. Analyze according to ASTM D 790. All materials testing shall be performed at the Contractor's expense and by an independent third-party laboratory recommended by the manufacturer and pre-approved by the City. Test shall be conducted at a minimum of one location per CIPP inversion. Test samples shall be taken from the downstream manhole. Flat plate samples per ASTM F1216 are acceptable for this project.

- B. The Contractor shall also remove a sample from each pipe to be used to check the liner thickness, by core drilling 2-inch diameter test plugs at locations specified by the Engineer. The Contractor shall repair sample holes per manufacturer's recommendations.
- C. A sample of cured liner from the testing shall be subject to delamination tests by aggressively prying and separation into layers with a knife or sharp-edged instrument. No separation shall be possible. Results shall be included in the report above.
- D. The laboratory results shall identify the test sample location as referenced to the nearest manhole. Final payment for the project shall be withheld pending receipt and approval of the test results. If properties tested do not meet minimum requirements, the CIPP shall be removed and replaced at no additional cost to the City.

130-2.15 Post-Televising of Completed Work:

- A. Submit to the Engineer a color CCTV video showing completed work (electronic format) per Special Provisions Section 130.
- B. Correction of failed CIPP or CIPP deemed defective by the Engineer from post-installation television inspection shall be repaired at no extra cost to the City. Method of repair, which may require field or workshop demonstration, shall be approved by the Engineer.
- C. If the liner fails to install properly, the Contractor shall remove the failed liner and replace it with a new liner. This work shall be performed at the Contractor's expense without additional cost to the City. The new liner shall also meet the testing requirements as specified herein.
- D. Any defects which will affect the integrity or strength of the liner shall be repaired at the Contractor's expense. Allowance shall be given for the excess pipe when the cross-sectional area has been reduced due to offset joints, partial collapse, out-of-round sections, etc.

130-2.16 Repair Procedures: Prior to any required repairs taking place, proposed means and methods for the repair shall be submitted by the Contractor to the Engineer for review and approval. The repair plan must include information adequate to describe repair methods in the same way as described in pre-installation information submittal. The Contractor may submit to use one or more of the following repair methods or submit their own repair method for review and approval by the Engineer:

- 1. If concentrated wrinkles/ridges fall outside the 120-degree invert arc and the Contractor demonstrates that grinding does not compromise CIPP structural integrity or reduce CIPP thickness below submitted calculated

minimum thickness, the Contractor may grind concentrated ridges to required tolerance. After grinding to required tolerance, coat the ground area with manufacturer's approved resin. At the end of each work day dispose of any residue generated from grinding.

2. If the Engineer approves, the Contractor may make internal spot repairs to CIPP. Internal spot repairs may be made using the approved fabric and resins compatible with CIPP to restore strength and integrity.
3. If CIPP does not fit tightly against host pipe at termination point, fill space between CIPP and host pipe with any of these:
 - a. Quick-set epoxy mortar
 - b. High viscosity epoxy
 - c. Hydrophilic vulcanized expansive rubber strip

Material(s) used shall be compatible with CIPP, host pipe and field conditions. Any CIPP that, in the opinion of the Engineer, may affect the flow at or near the invert shall be corrected to the satisfaction of the Engineer.

4. If the Engineer orders, the Contractor must use repair methods in Table 2 at their own expense.

Table 2

Defect	Repair Method
Wrinkles or ridges exceeding 5% and up to 8% of pipe diameter outside of 120-degree invert arc. Wrinkles or ridges exceeding 2% and up to 8% of pipe diameter inside of 120-degree invert arc (except corrugations in CMP).	Grind to required tolerance. Grind to required tolerance within the lower 120 degrees of pipe to remove and point repair where needed to maintain minimum thickness, or else use procedure in accepted repair plan. If wrinkles or ridges exceed 8% of pipe diameter, you must remove CIPP.
Holes, tears, soft spots, and lifts up to 6 inches in major dimension. Delaminated areas up to 12 inches in major dimension; blistering or bubbling of the coating on CIPP surface present over a maximum of 5% of surface area.	Make point repair under manufacturer's recommendations. If defect covers a larger area, you must remove CIPP.
CIPP thickness less than calculated minimum thickness.	You must remove CIPP. If groundwater conditions allow, you may install a second CIPP within the first CIPP that produces a similar dimension ratio to the first CIPP, or else use procedure in accepted repair plan.
Annular space at lateral connection or at end of CIPP or infiltration at lateral opening.	Seal with quick-set epoxy mortar, high viscosity epoxy or a hydrophilic vulcanized expansive rubber strip.

5. For existing manhole I12717MH56 which is currently lined with CIPML, the contractor shall complete the following:
 - a. Clean existing CIPML with detergents that will not harm or otherwise affect the existing CIPML. Cleaning shall remove existing debris, dirt, and grease.

- b. Locate areas along the surface of the existing manhole liner that are gouged or otherwise damaged. Document locations with photographs.
- c. Abrade surface of damaged areas.
- d. Coat abraded/damaged areas with epoxy that is compatible with CIPML material.
- e. Document repair with photographs (before and after).

130-2.17 Final Clean-up:

A. Clean-up

- 1. The Contractor shall restore or replace all removed or damaged SSMHs cones, paving, curbing, sidewalks, gutters, street median, landscaping, fences, sod and any other disturbed surfaces or structures to a condition equal to that before the work began, to the satisfaction of the Engineer and appropriate property owner and shall furnish all labor and material incidentals as necessary.
- 2. Surplus liner material, tools and temporary structures shall be removed by the Contractor. All dirt, rubbish and excess earth from operation shall be legally disposed of by the Contractor and the construction site shall be left clean to the satisfaction of the Engineer.

130-2.18 Payment:

The actual quantity of CIPP cleaning and installation to be paid for will be the length measured from center of manhole to center of manhole along the finished grade to the nearest foot. CIPP purchased and/or installed by the Contractor in excess of the measured amount will not be paid for by the City.

36" Pre-CIPP Sewer Cleaning shall be paid for at the contract **linear foot price**, which price shall include full compensation for furnishing all labor, materials, tools, and equipment, and doing all the work involved as described herein, including but not limited to, sewer cleaning of the 36" pipe to remove all debris, grease, roots, and other materials that would prevent the proper installation of the liner (as defined and accepted by the Engineer); several passes, if necessary, with high-pressure jet cleaning equipment; use of root cutters or mechanical brushes attached to the jet nozzle and sent through the line to remove all root intrusions (as necessary); all spoils removal from the pipe; and all spoils disposal.

48" Pre-CIPP Sewer Cleaning shall be paid for at the contract **linear foot price**, which price shall include full compensation for furnishing all labor, materials, tools, and equipment, and doing all the work involved as described herein, including but not limited to, sewer cleaning of the 48" pipe to remove all debris, grease, roots, and other materials that would prevent the proper installation of the liner (as defined and accepted by the Engineer); several passes, if necessary, with high-pressure jet cleaning equipment; use of root cutters or mechanical brushes attached to the jet nozzle and sent through the line to remove all root intrusions (as necessary); all spoils removal from the pipe; and all spoils disposal.

48" Pre-CIPP Sewer Heavy Cleaning - North Fulton shall be paid for at the contract **linear foot price**, which price shall include full compensation for furnishing all labor, materials, tools, and equipment, and doing all the work involved as described herein, including but not limited to, heavy sewer cleaning of the 48" North Fulton Trunk Sewer pipe to remove as much of

the existing liner within the pipe as is practical (as defined and accepted by the Engineer). At a minimum, any liner that is not adhered to the existing sewer shall be removed as part of the heavy cleaning process. Heavy cleaning shall consist of the use of as many passes of high-pressure jet cleaning equipment and/or use of mechanical brushes or scrapers as is necessary to complete the work to the written satisfaction of the Engineer, and all spoils removal from the pipe, and all spoils disposal. This bid item is meant in addition to the initial cleaning of the 48" pipe as is covered under the Bid Item: **48" Pre-CIPP Sewer Cleaning**.

48" Pre-CIPP Man Entry Inspection and Reporting - North Fulton shall be paid for at the contract **lump sum** price, which price shall include full compensation for furnishing all labor, materials, tools, and equipment, and doing all work involved as described herein, including but not limited to, man entry inspection of the pipeline via concrete probe and visual inspection; all safety equipment and procedures for safe man-entry inspection; photographs; and written reporting.

36" CIPP Liner Rehabilitation - I12717MH3 to I12717MH58 - UFO shall be paid for at the contract **linear foot** price, which price shall include full compensation for furnishing all labor, materials, tools and equipment, and doing all the work involved as described herein, including but not limited to, manhole removal; modification and reconstruction (if required to gain access to the pipe); temporary and permanent paving; testing; repair; and any other items necessary for sewer lining not specifically enumerated in these specifications, and no additional allowance will be made therefor.

48" CIPP Liner Rehabilitation - I12717MH3 to I12712MH1 - UFO shall be paid for at the contract **linear foot** price, which price shall include full compensation for furnishing all labor, materials, tools and equipment, and doing all the work involved as described herein, including but not limited to, manhole removal, modification and reconstruction (if required to gain access to the pipe); temporary and permanent paving; testing; repair; and any other items necessary for sewer lining not specifically enumerated in these specifications, and no additional allowance will be made therefor.

48" CIPP Liner Rehabilitation - I12712MH1 to I12712MH3 – North Fulton shall be paid for at the contract **linear foot** price, which price shall include full compensation for furnishing all labor, materials, tools and equipment, and doing all the work involved as described herein, including but not limited to, manhole removal, modification and reconstruction (if required to gain access to the pipe); temporary and permanent paving; testing; repair; and any other items necessary for sewer lining not specifically enumerated in these specifications, and no additional allowance will be made therefor.

SECTION 130-3

BYPASS PUMPING

130-3.01 Description: The Contractor shall provide bypass pumping and/or diversion and continue until sewer manhole rehabilitation and CIPP lining work is complete. Bypass pumping shall consist of furnishing, installing, and maintaining all equipment, tools, power, piping and anything else required to maintain existing flows and services without interruption.

Anticipated peak **dry** weather flows are as follows:

- 48-inch N. Fulton Trunk at I12712MH3: 5.5 MGD
- 30-inch SS at I12712MH4: 2.7 MGD
- 8-inch SS at I12712MH98: 0.19 MGD
- 14-inch SS at I12712MH88: 1.94 MGD
- 10-inch SS at I12712MH96: 92,000 GPD
- 4-inch SS at cleanout: 62,000 GPD

Wet weather (defined as pre-April 15th and post October 15th) peak flows are anticipated to be approximately five times the peak dry weather flows. The Contractor shall use due diligence to complete the work on time and within schedule (outside of the wet weather period). If the Contractor's work goes beyond the October 15th deadline, then Contractor shall be liable for any additional costs associated with bypass pumping wet weather peak flows. If unanticipated rain results in increased flows during the bypass pumping operation within dry weather period between April 15 and October 15, the Contractor shall be responsible for accommodating all increased flows with the bypass system. Augmentation to the bypass pumping operation to accommodate unanticipated wet weather flows after April 15th and prior to October 15th will be paid for as extra work.

130-3.02 General Requirements: The following requirements shall be incorporated in the submitted bypass plan:

1. Bypass piping shall be laid above ground unless otherwise specified herein or in the attached exhibits.
2. Surcharge of existing sewer pipes shall not exceed two feet above the pipe crown.
3. Bypass pumping suction operations for the 48-inch Llano Trunk Sewer at Utilities Field Office and North Fulton Trunk Sewer shall occur upstream of (E) I12712MH3, located within City of Santa Rosa property adjacent to the Utilities Field Office, as indicated in the Project Exhibits. The Contractor shall excavate a temporary excavation to the crown of the 48-inch RCP, remove the top half of the pipe, and install a temporary plug downstream of the opening and upstream of (E) I12712MH3. Contractor shall bypass flow from the excavation as well as from (E) I12712MH4 and discharge via bypass piping downstream to (E) I12717MH67. Length of pipe opening at MH 3 shall be determined by the Contractor.

For bypass pumping work operations upstream of (E) I12712MH3, Contractor may move bypass suction location as necessary to complete the work as efficiently as possible with consideration to existing utilities. Excavation must remain within the work area shown.

Contractor is required to pothole existing utilities within the vicinity of excavation work prior to start of the work, per Section 15. Dealing with conflicts with existing utilities as clearly shown on the plans (including coordination with PG&E) shall be included as part of the work, no extra work charges shall be allowed.

After bypass operation has been dismantled, the top half of the pipe shall be replaced and repaired, and the pipe shall be encased in concrete for the length of the excavation from the invert of the pipe to one foot above the pipe crown.

4. Where the Contractor must cross bypass piping along Utilities Field Office vehicle and/or pedestrian pathways, Contractor must build ramp system aboveground to protect the bypass pipes in place or shallow bury the bypass pipeline, as specified on Exhibits. Ramps at the UFO site shall be heavy duty vehicle ramps capable of supporting the weight of fully loaded full-size dump trucks. Ramps at the UFO site shall be constructed so as to maximize the slope climb and minimize the travelled width of the ramps. For pipeline specified for shallow bury, the Contractor may elect to either use skid resistant trench plating or temporary backfill and paving. It is the responsibility of the Contractor to ensure all the bypass components are capable of sustaining heavy duty traffic loads at the UFO site and normal (H20) traffic loads elsewhere.
5. Contractor shall provide 100% redundant bypass piping on all aboveground road or driveway crossings for bypass operations where any traffic will cross the pipe.
6. Contractor is responsible for ensuring that all lateral flow into the existing trunk sewer system to be bypassed has been intercepted and handled by the bypass system.
7. Where required for bypass pumping operations, the Contractor shall remove and replace concrete work. A smooth, ADA compliant, temporary AC patch shall be provided where necessary and as shown on the exhibits during construction. New concrete work shall conform to existing AC pavement. Sidewalk and ramps shall be four-inch Class A P.C.C on 2 inches of sand.
8. 100% redundancy is required for all pumps and power sources, and temporary plug applications. The quantity of backup pumps must equal the quantity of primary pumps in the system.
9. Plugs shall be pressure rated to withstand the pressure head in the system. Plugs shall be provided with a retrieval tag line. Upon completion, installed temporary plugs shall be removed gradually and sequentially at one location per day to control reintroduction of flow and facilitate maintenance and overall system functionality. Bypass plan shall include detail for removal of plugs. Plugs shall be selected and installed according to size of line to be plugged, pipe and manhole configurations, based on specific rehabilitation area. Additional plugs shall be available on site in the event a plug fails.
10. Air release valves shall be set into and surrounded by a double spill containment system.
11. Bypass pumping shall be done 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.

12. Bypass piping material shall be either fused HDPE DR17 or new aluminum pipe with new Victaulic fittings.
13. Discharge and suction pipes shall be sized according to flow calculations, system operation, pump size and manhole depths following manufacturer's specifications and recommendations.
14. HDPE fittings shall be fully pressure rated to match the pipe DR pressure rating.
15. Flexible hoses, couplings and connectors, shall be abrasion resistant and rated for external and internal loads anticipated, including pressure tests.
16. Pumps shall be fully automatic self-priming units that do not require the use of foot-valves or vacuum pumps in priming system.
17. Provide necessary start/stop controls for each pump. Pumps shall be able to allow dry running for long periods of time to accommodate cyclical nature of effluent flows.
18. Contractor shall perform leakage and pressure test of the bypass piping system using clean water prior to start-up of the bypass system. Test shall be conducted at one and a half times the maximum pressure the system will be subjected to based on approved bypass pumping plan for a period of 2 hours. No leakage is permitted during the test.
19. Upon an approved work schedule depicting that all work at the UFO site will be completed by the specified Contract time, the contractor may elect to shut-down the bypass system during the Engineer's evaluation period (see Section 130-2.11.E).

130-3.02A Noise Attenuation: Bypass equipment and operations shall not exceed noise decibel limits per City Code 17-16.030. Ambient base noise level criteria in the R1 zone and Industrial zone are defined below. R1 zone criteria shall apply to bypass suction manholes MH 3 and MH 4. Industrial zone criteria shall apply to the remaining bypass manholes. Decibel level limitations shall be achieved at City ROW or utility easement line.

Zone	Time	Sound Level A (decibels) Community Environment Classification
R1	10 p.m. to 7 a.m.	45
R1	7 p.m. to 10 p.m.	50
R1	7 a.m. to 7 p.m.	55
Industrial	Anytime	70

130-3.03 Submittals:

1. The Contractor shall submit bypass pumping and/or diversion plans, schedule and design flow calculations for review by the Engineer at least ten (10) working days prior to planned commencement of bypass or diversion.
2. The sewage bypass pumping and/or diversion plan shall include an emergency response plan to be followed in the event of a failure of the bypass pumping and/or diversion

system. The Contractor shall notify the Engineer 24 hours prior to commencing the bypass pumping operation.

3. Flow bypass system design as provided by the Contractor shall be a depiction of the bypass system to be actually constructed in the field including all suction elevations, grade changes, etc. and shall be designed by a CA registered professional engineer.
4. The Contractor shall notify the Engineer 24 hours prior to commencing with the bypass pumping operation. The Contractor's plan for bypass pumping shall be approved by the Engineer before the Contractor will be allowed to commence bypass pumping and shall include documentation of pump and discharge line capacities, manufacturer, and age. Location of air release valves shall be depicted on the bypass plan. Sound attenuation measures shall also be included in the plan.
5. The Contractor shall submit a traffic control plan that shows adequate protection of the proposed bypass equipment from vehicular and foot traffic within or adjacent to the travelled way.
6. The Contractor shall submit shop drawings that identify the bypass pumping locations and methods with sufficient detail to assure that the work can be accomplished without sewage spill. The bypass pumping plan shall include an emergency discharge response plan to be followed in the event of a failure of the bypass pumping system which shall include standby pumps.
7. The Contractor shall be responsible for determining the required quantity, location and types of temporary plugs to fulfill the requirements of the Specifications. The Contractor shall submit a plan, describing said requirements, at least ten working days prior to installation for review by the Engineer.
8. The Contractor shall provide a sewer spill prevention plan for disassembling, handling and removal of bypass system.
9. The City will contract with a third-party CA registered professional engineer representative to review the bypass pumping plan.

130-3.04 Preparation: Bypass pumping shall consist of furnishing, installing, and maintaining all power, plugs, primary and standby pumps, appurtenances and bypass piping required to maintain **maximum** flows and services.

All bypass pumping components and sound attenuation components shall be installed and maintained in such a manner so as not to damage private or public property or create a nuisance or public menace. This includes erosion or scouring of the receiving manhole. The pumped sewage shall be in an enclosed hose or pipe that is adequately protected from traffic and shall be redirected into the sanitary sewer system. Dumping, leaks or free flow of sewage on private or public property, gutters, streets, sidewalks, creeks, streams or into storm sewers is expressly prohibited.

All pumps shall be set into or surrounded by spill containment devices manufactured for this purpose. Existing drain boxes shall be protected by sandbags to prevent flow entering storm drain.

Provide onsite portable lights for emergency use only.

Provide standby power facilities for emergency use if pumps are equipped with electric motors.

The Contractor shall take all necessary precautions, including constant 24-hour manned monitoring during bypass pumping operations, to ensure that no private residences or properties are subjected to a sewage backup or spill and to ensure that the bypass system is secure. The Contractor shall be responsible for providing the appropriate and required amount of personnel for monitoring of entire bypass system. Monitoring personnel shall be qualified with a minimum 3 years of experience in the specified bypass pumping operations. The Contractor shall be liable for all cleanup, damages, and resultant fines in the event of a spill. The Contractor shall supply a written emergency response plan to the Engineer prior to initiation of bypass pumping efforts. Said plan shall address what courses of action will be taken should failure of the bypass pumping system occur. After the work is completed, flow shall be restored to normal.

130-3.05 Payment:

Sanitary Sewer Bypass - shall be paid for at the contract **lump sum** price, which price shall include full compensation for furnishing all labor, materials, tools and equipment, and doing all the work involved in setting up and dismantling a bypass pumping system as described herein and shown on the Project Exhibits, including but not limited to notification; development of emergency plans; plugs (as required); standby pump(s); above and below ground discharge installations; excavation; manhole components removal and replacement per City Standard 500; (E) 48" SS RCP trunk modification and repair per City Std. 500 (as required to gain access to the pipe); spoils disposal; trenching; steel plating (if needed); temporary ramps for driveway and sidewalk/path crossings; temporary trench paving associated with bypass pumping efforts; installation of ramp or other means with which to protect existing bypass pipe at traffic crossing location(s); curb and gutter, curb ramp, median, landscaping, driveway and sidewalk replacement; temporary and permanent traffic stripes; permanent markings; temporary fencing; removal and reinstatement of existing fencing as necessary; sand bags; ***existing utility coordination and temporary support of existing utilities (as required)***; and all efforts required to return surface conditions to pre-project condition, any other items necessary for a Bypass Pumping system not specifically enumerated in these specifications, and no additional allowance will be made therefor.

70% of this bid item will be paid when set-up is complete and 30% of this bid item will be paid when the system is dismantled and removed, and the area restored.

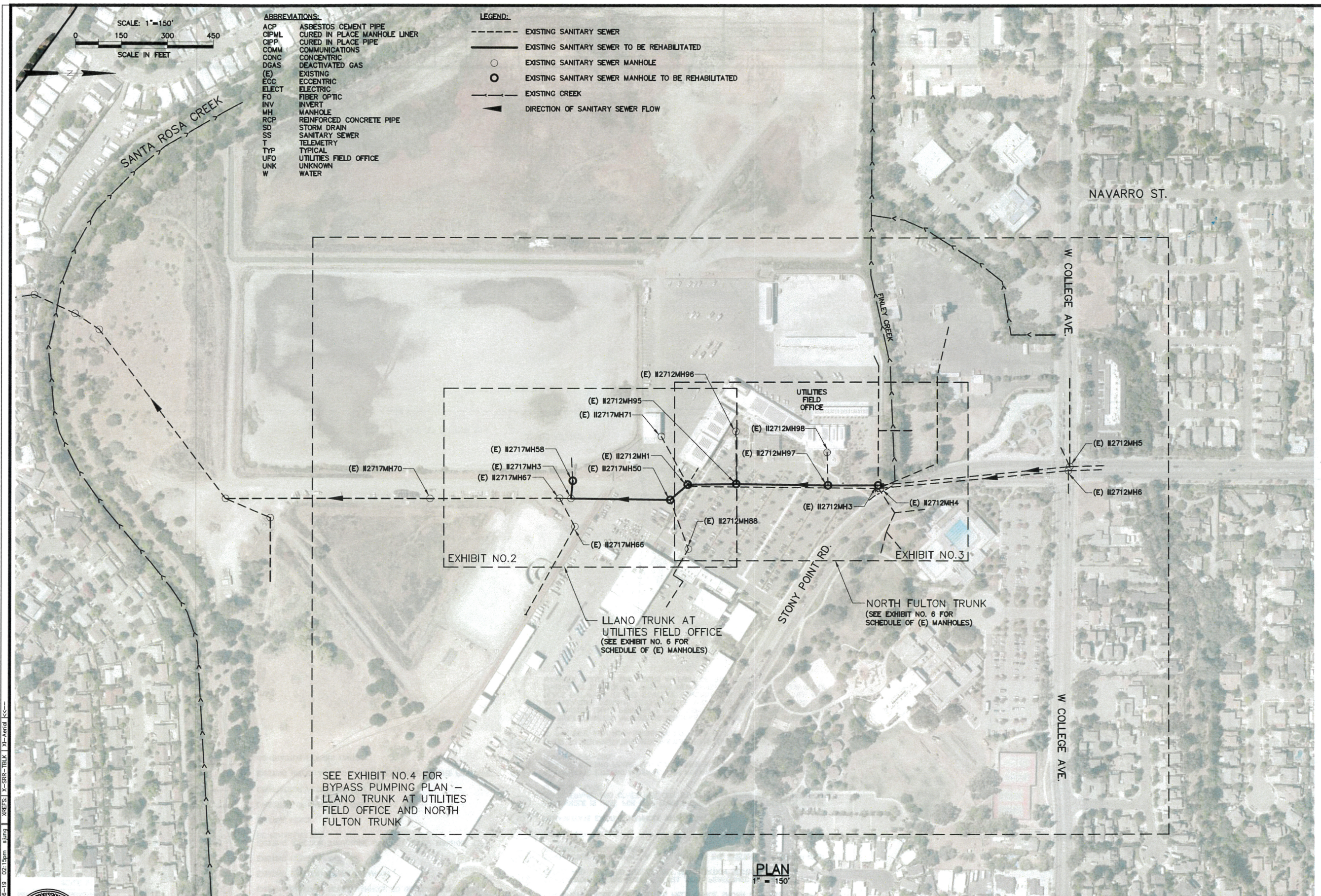
SECTION A

FEES AND PERMITS

Fees and Permits: The Contractor shall obtain all necessary and required permits for completion of this project. All required permits, except the One-Time Discharge Permit, shall be obtained at the Contractor's expense.

The Contractor shall obtain the following permits unless otherwise noted:

- A permit for excavating and shoring trenches in excess of five feet or more in depth will be required from the State of California Division of Industrial Safety.



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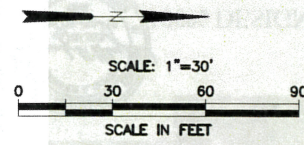
DESIGNED J. KRAETSCH
DRAWN S. JUNG
CHECKED G. HERMANSON

SUBMITTED:
J. GLYNN, WOODARD & CURRAN
PROJECT MANAGER
APPROVED:
D. RICHARDSON, WOODARD & CURRAN
PRINCIPAL



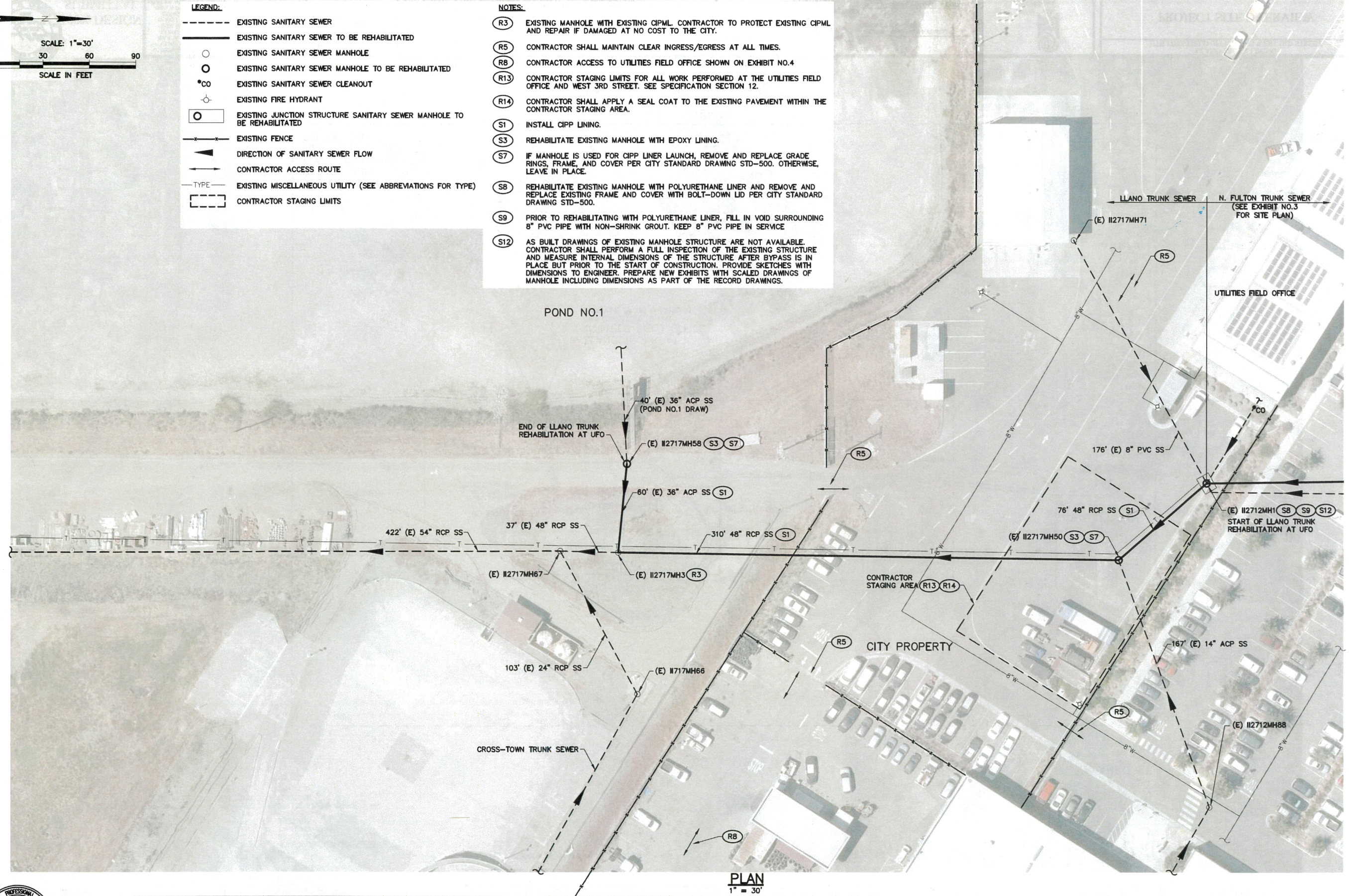
LLANO TRUNK LINING
UTILITIES FIELD OFFICE AND WEST 3RD STREET
PROJECT SITE OVERVIEW

EXHIBIT NO 1
SHEET NO 1 OF 6
PROJ NO 0075-017
DATE MAY 2019



- LEGEND:**
- EXISTING SANITARY SEWER
 - EXISTING SANITARY SEWER TO BE REHABILITATED
 - EXISTING SANITARY SEWER MANHOLE
 - EXISTING SANITARY SEWER MANHOLE TO BE REHABILITATED
 - CO EXISTING SANITARY SEWER CLEANOUT
 - EXISTING FIRE HYDRANT
 - EXISTING JUNCTION STRUCTURE SANITARY SEWER MANHOLE TO BE REHABILITATED
 - EXISTING FENCE
 - DIRECTION OF SANITARY SEWER FLOW
 - CONTRACTOR ACCESS ROUTE
 - TYPE --- EXISTING MISCELLANEOUS UTILITY (SEE ABBREVIATIONS FOR TYPE)
 - CONTRACTOR STAGING LIMITS

- NOTES:**
- (R3) EXISTING MANHOLE WITH EXISTING CIPML. CONTRACTOR TO PROTECT EXISTING CIPML AND REPAIR IF DAMAGED AT NO COST TO THE CITY.
 - (R5) CONTRACTOR SHALL MAINTAIN CLEAR INGRESS/EGRESS AT ALL TIMES.
 - (R8) CONTRACTOR ACCESS TO UTILITIES FIELD OFFICE SHOWN ON EXHIBIT NO.4
 - (R13) CONTRACTOR STAGING LIMITS FOR ALL WORK PERFORMED AT THE UTILITIES FIELD OFFICE AND WEST 3RD STREET. SEE SPECIFICATION SECTION 12.
 - (R14) CONTRACTOR SHALL APPLY A SEAL COAT TO THE EXISTING PAVEMENT WITHIN THE CONTRACTOR STAGING AREA.
 - (S1) INSTALL CIPP LINING.
 - (S3) REHABILITATE EXISTING MANHOLE WITH EPOXY LINING.
 - (S7) IF MANHOLE IS USED FOR CIPP LINER LAUNCH, REMOVE AND REPLACE GRADE RINGS, FRAME, AND COVER PER CITY STANDARD DRAWING STD-500. OTHERWISE, LEAVE IN PLACE.
 - (S8) REHABILITATE EXISTING MANHOLE WITH POLYURETHANE LINER AND REMOVE AND REPLACE EXISTING FRAME AND COVER WITH BOLT-DOWN LID PER CITY STANDARD DRAWING STD-500.
 - (S9) PRIOR TO REHABILITATING WITH POLYURETHANE LINER, FILL IN VOID SURROUNDING 8" PVC PIPE WITH NON-SHRINK GROUT. KEEP 8" PVC PIPE IN SERVICE
 - (S12) AS BUILT DRAWINGS OF EXISTING MANHOLE STRUCTURE ARE NOT AVAILABLE, CONTRACTOR SHALL PERFORM A FULL INSPECTION OF THE EXISTING STRUCTURE AND MEASURE INTERNAL DIMENSIONS OF THE STRUCTURE AFTER BYPASS IS IN PLACE BUT PRIOR TO THE START OF CONSTRUCTION. PROVIDE SKETCHES WITH DIMENSIONS TO ENGINEER. PREPARE NEW EXHIBITS WITH SCALED DRAWINGS OF MANHOLE INCLUDING DIMENSIONS AS PART OF THE RECORD DRAWINGS.



PLAN
1" = 30'



100% DESIGN
SUBMITTAL

0" = 1" SCALE
VERIFY SCALES
BAR IS ONE INCH
LONG ON FULL
SIZE DRAWING.
IF NOT ONE INCH
LONG ON THIS
DRAWING, ADJUST
SCALES ACCORDINGLY



REV	DATE	BY	APVD	DESCRIPTION

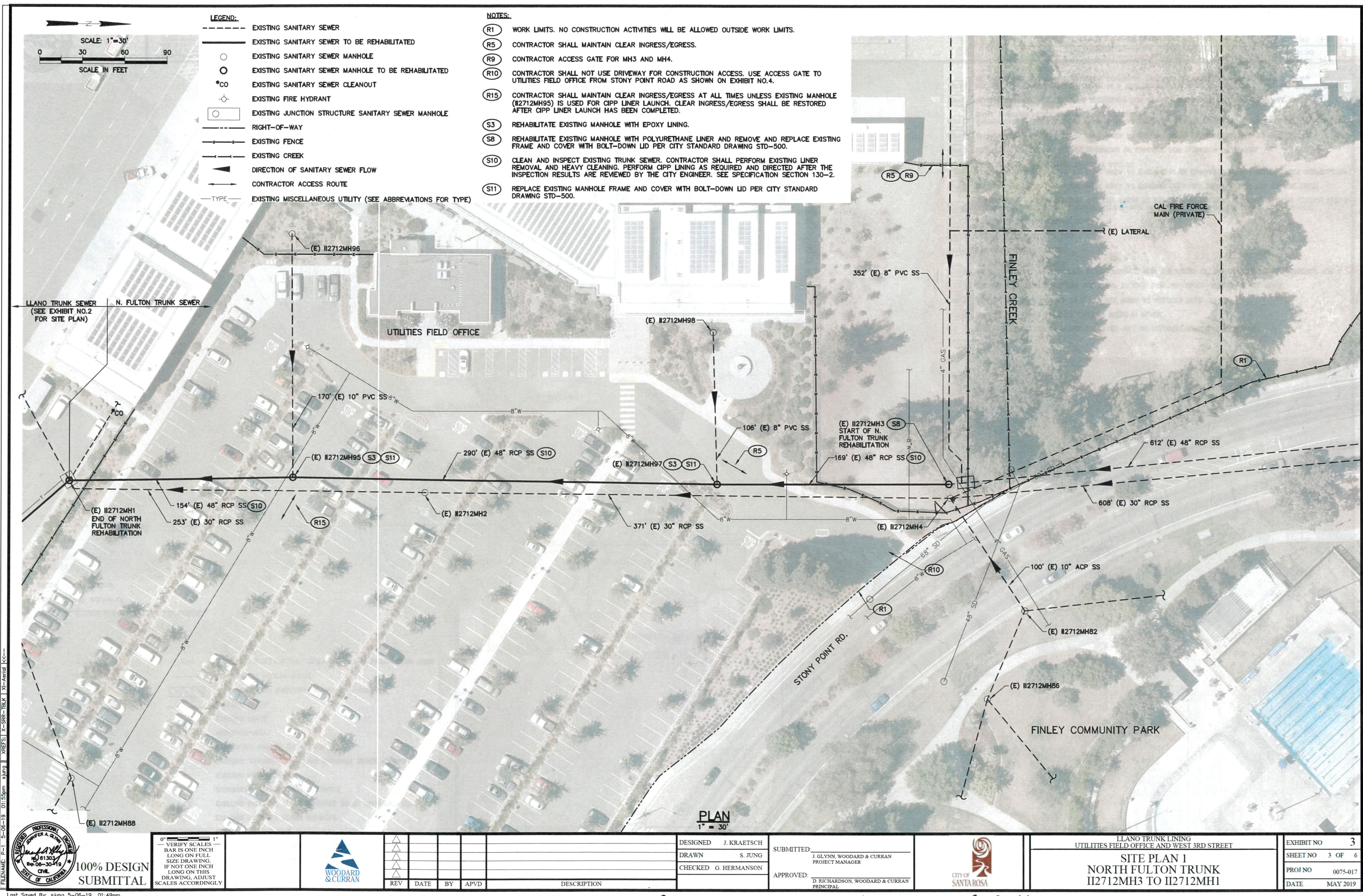
DESIGNED J. KRAETSCH
DRAWN S. JUNG
CHECKED G. HERMANSON

SUBMITTED:
J. GLYNN, WOODARD & CURRAN
PROJECT MANAGER
APPROVED:
D. RICHARDSON, WOODARD & CURRAN
PRINCIPAL



LLANO TRUNK LINING
UTILITIES FIELD OFFICE AND WEST 3RD STREET
SITE PLAN 1
LLANO TRUNK AT UTILITIES FIELD OFFICE
112712MH1 TO 112717MH58

EXHIBIT NO 2
SHEET NO 2 OF 6
PROJ NO 0075-017
DATE MAY 2019



FILENAME: P-1 5-06-19 01:55pm sjung XREFS: X-SUR-TBLK X-Aerial Kc--



100% DESIGN
SUBMITTAL

0" = 1" SCALE
VERIFY SCALES -
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LONG ON FULL
SIZE DRAWING.
IF NOT ONE INCH
LONG ON THIS
DRAWING, ADJUST
SCALES ACCORDINGLY



REV	DATE	BY	APVD	DESCRIPTION

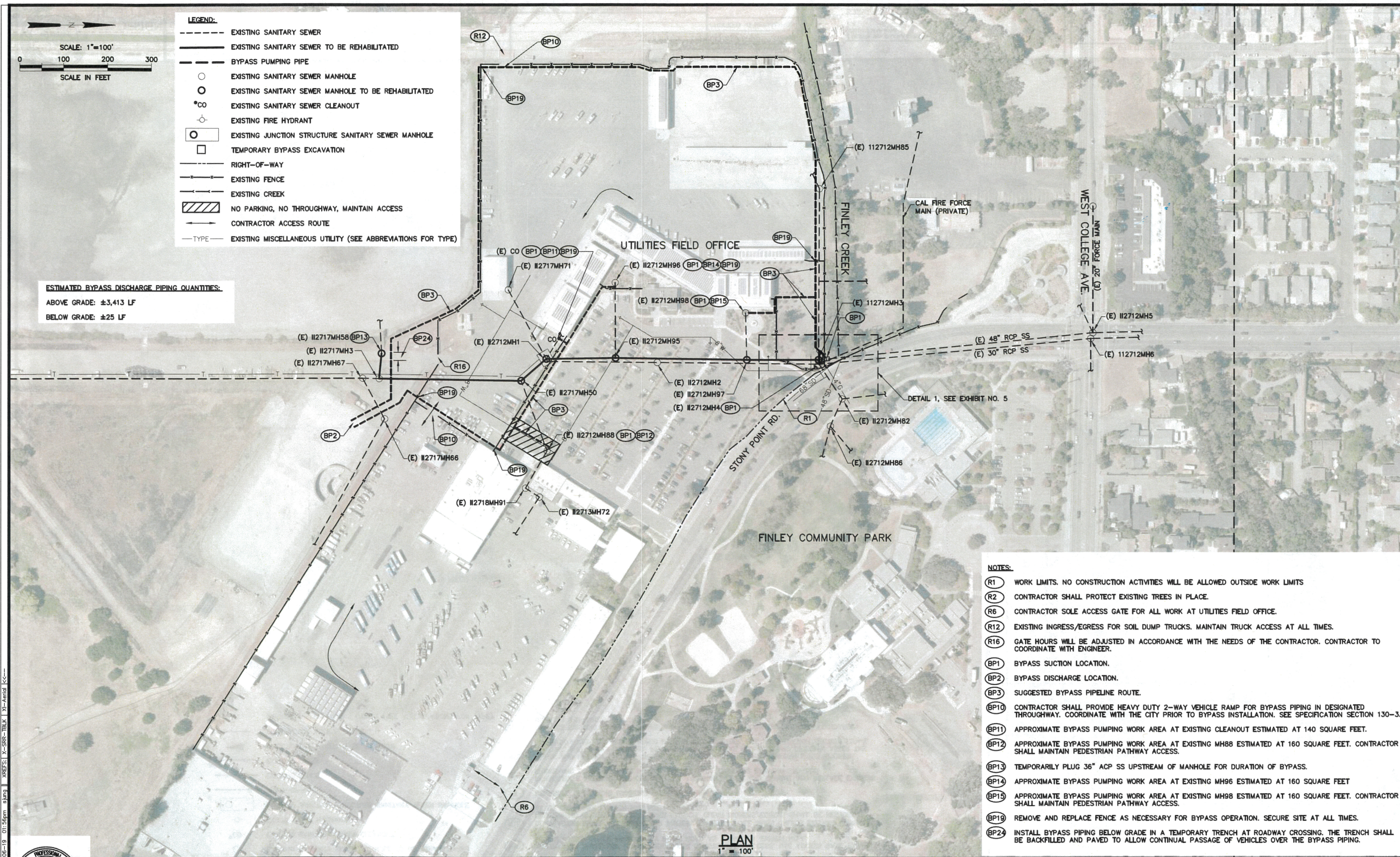
DESIGNED J. KRAETSCH
DRAWN S. JUNG
CHECKED G. HERMANSON

SUBMITTED:
J. GLYNN, WOODARD & CURRAN
PROJECT MANAGER
APPROVED:
D. RICHARDSON, WOODARD & CURRAN
PRINCIPAL



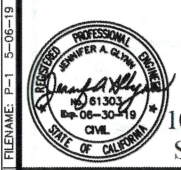
LLANO TRUNK LINING
UTILITIES FIELD OFFICE AND WEST 3RD STREET
SITE PLAN 1
NORTH FULTON TRUNK
II2712MH3 TO II2712MH1

EXHIBIT NO 3
SHEET NO 3 OF 6
PROJ NO 0075-017
DATE MAY 2019



ESTIMATED BYPASS DISCHARGE PIPING QUANTITIES:
ABOVE GRADE: ±3,413 LF
BELOW GRADE: ±25 LF

- NOTES:
- (R1) WORK LIMITS. NO CONSTRUCTION ACTIVITIES WILL BE ALLOWED OUTSIDE WORK LIMITS
 - (R2) CONTRACTOR SHALL PROTECT EXISTING TREES IN PLACE.
 - (R6) CONTRACTOR SOLE ACCESS GATE FOR ALL WORK AT UTILITIES FIELD OFFICE.
 - (R12) EXISTING INGRESS/EGRESS FOR SOIL DUMP TRUCKS. MAINTAIN TRUCK ACCESS AT ALL TIMES.
 - (R16) GATE HOURS WILL BE ADJUSTED IN ACCORDANCE WITH THE NEEDS OF THE CONTRACTOR. CONTRACTOR TO COORDINATE WITH ENGINEER.
 - (BP1) BYPASS SUCTION LOCATION.
 - (BP2) BYPASS DISCHARGE LOCATION.
 - (BP3) SUGGESTED BYPASS PIPELINE ROUTE.
 - (BP10) CONTRACTOR SHALL PROVIDE HEAVY DUTY 2-WAY VEHICLE RAMP FOR BYPASS PIPING IN DESIGNATED THROUGHWAY. COORDINATE WITH THE CITY PRIOR TO BYPASS INSTALLATION. SEE SPECIFICATION SECTION 130-3.
 - (BP11) APPROXIMATE BYPASS PUMPING WORK AREA AT EXISTING CLEANOUT ESTIMATED AT 140 SQUARE FEET.
 - (BP12) APPROXIMATE BYPASS PUMPING WORK AREA AT EXISTING MH88 ESTIMATED AT 160 SQUARE FEET. CONTRACTOR SHALL MAINTAIN PEDESTRIAN PATHWAY ACCESS.
 - (BP13) TEMPORARILY PLUG 36" ACP SS UPSTREAM OF MANHOLE FOR DURATION OF BYPASS.
 - (BP14) APPROXIMATE BYPASS PUMPING WORK AREA AT EXISTING MH96 ESTIMATED AT 160 SQUARE FEET
 - (BP15) APPROXIMATE BYPASS PUMPING WORK AREA AT EXISTING MH98 ESTIMATED AT 160 SQUARE FEET. CONTRACTOR SHALL MAINTAIN PEDESTRIAN PATHWAY ACCESS.
 - (BP19) REMOVE AND REPLACE FENCE AS NECESSARY FOR BYPASS OPERATION. SECURE SITE AT ALL TIMES.
 - (BP24) INSTALL BYPASS PIPING BELOW GRADE IN A TEMPORARY TRENCH AT ROADWAY CROSSING. THE TRENCH SHALL BE BACKFILLED AND PAVED TO ALLOW CONTINUAL PASSAGE OF VEHICLES OVER THE BYPASS PIPING.



100% DESIGN
SUBMITTAL

VERIFY SCALES -
BAR IS ONE INCH
LONG ON FULL
SIZE DRAWING.
IF NOT ONE INCH
LONG ON THIS
DRAWING, ADJUST
SCALES ACCORDINGLY



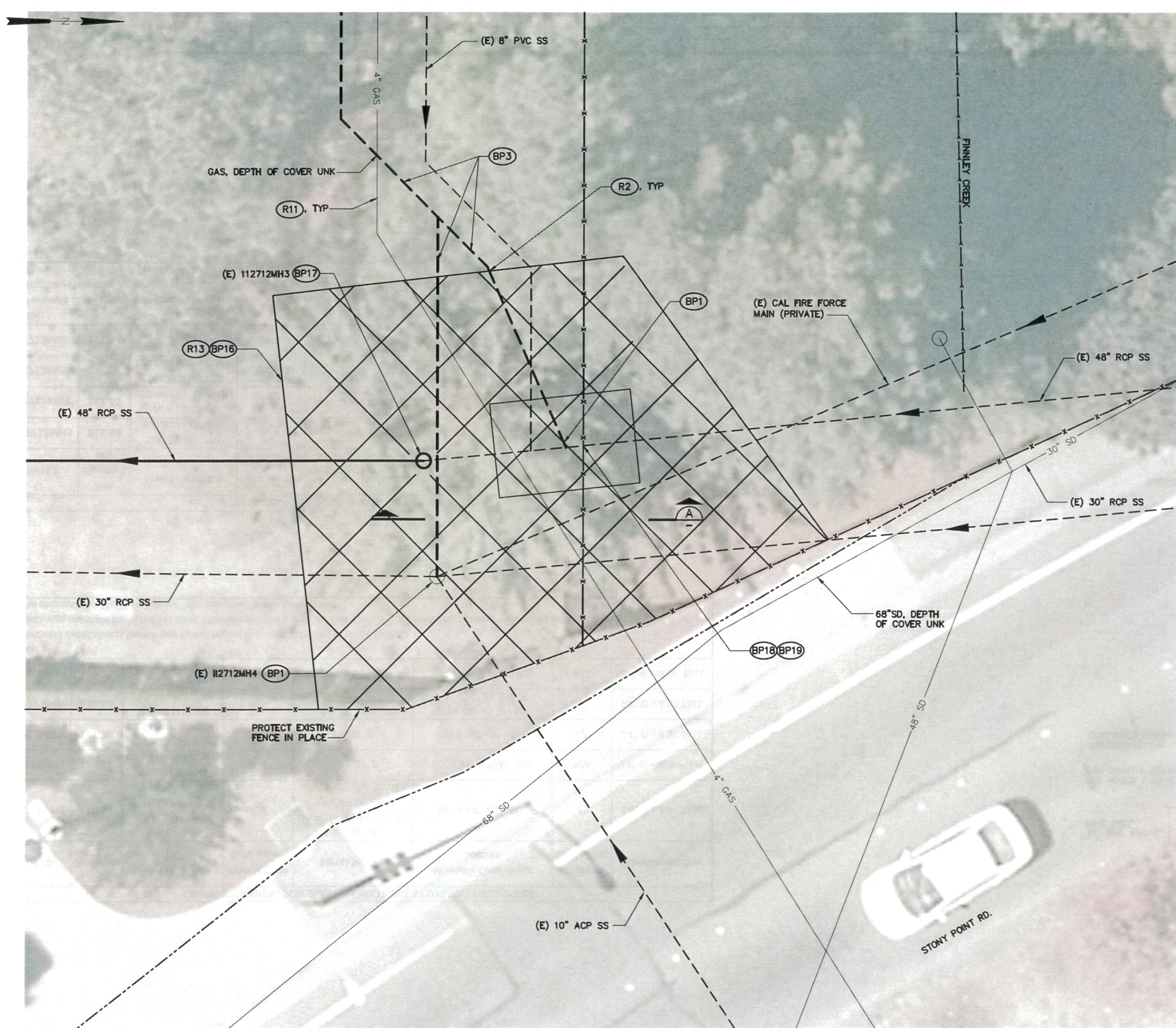
REV	DATE	BY	APVD	DESCRIPTION

DESIGNED	J. KRAETSCH
DRAWN	S. JUNG
CHECKED	G. HERMANSON
APPROVED:	D. RICHARDSON, WOODARD & CURRAN PRINCIPAL



LLANO TRUNK LINING
UTILITIES FIELD OFFICE AND WEST 3RD STREET
BYPASS PUMPING PLAN
LLANO TRUNK AT UTILITIES FIELD OFFICE
AND NORTH FULTON TRUNK

EXHIBIT NO	4
SHEET NO	4 OF 6
PROJ NO	0075-017
DATE	MAY 2019

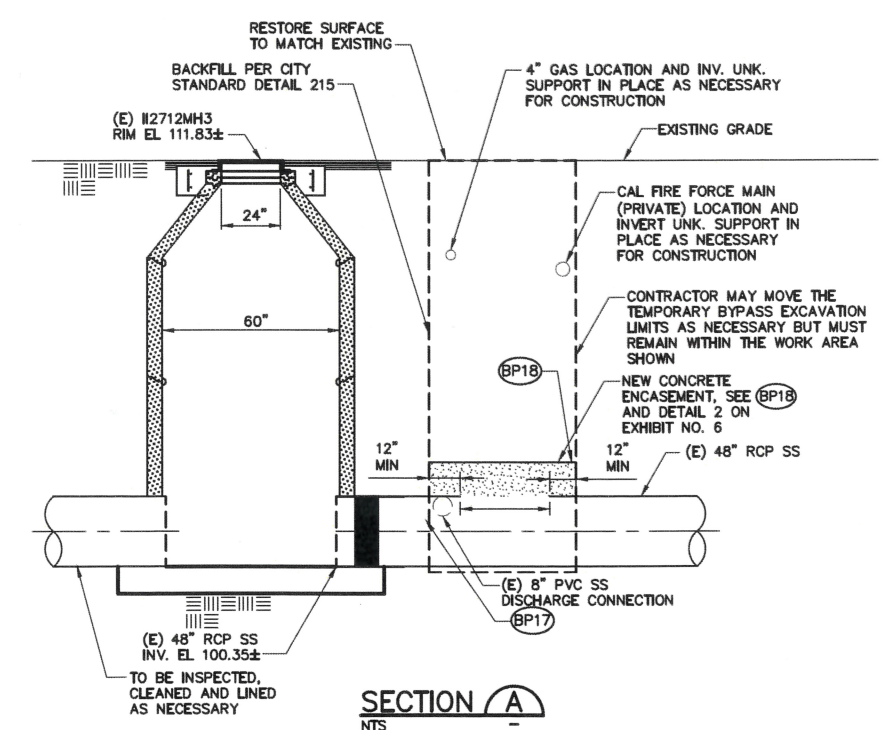


NOTES:

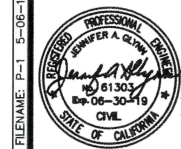
- (R2) CONTRACTOR SHALL PROTECT EXISTING TREES IN PLACE, UNLESS OTHERWISE INDICATED. REPLACE EXISTING LANDSCAPING IN KIND WHEN BYPASS WORK IS COMPLETE.
- (R11) LOCATIONS OF EXISTING UTILITIES SHOWN SHALL BE FOR REFERENCE USE ONLY AND SHALL NOT BE CONSIDERED ACCURATE INFORMATION. PLANS MAY NOT SHOW ALL EXISTING UTILITIES IN THE PROJECT AREA. CONTRACTOR SHALL POTHOLE ALL UTILITIES AS A FIRST ORDER OF WORK WHERE BYPASS PIPE WILL BE INSTALLED BELOW GRADE TO VERIFY EXISTING UTILITY CLEARANCES. SEE SPECIFICATION SECTION 15.
- (R13) REFER TO EXHIBIT NO. 4 FOR CONTRACTOR ACCESS GATE TO UTILITIES FIELD OFFICE AND EXHIBIT NO. 3 FOR CONTRACTOR ACCESS GATE TO MH3 AND MH4.
- (BP1) APPROXIMATE BYPASS SUCTION LOCATION. FOR BYPASS PUMPING WORK OPERATIONS UPSTREAM OF (E) 112712MH3, CONTRACTOR MAY MOVE BYPASS SUCTION LOCATION AS NECESSARY TO COMPLETE THE WORK AS EFFICIENTLY AS POSSIBLE WITH CONSIDERATION TO EXISTING UTILITIES. EXCAVATION MUST REMAIN WITHIN THE WORK AREA SHOWN.
- (BP3) SUGGESTED BYPASS PIPELINE ROUTE.
- (BP16) APPROXIMATE BYPASS PUMPING WORK AREA AT EXISTING MH3 AND MH4 ESTIMATED AT 750 SQUARE FEET.
- (BP17) INSTALL A 48\"/>

LEGEND

- EXISTING SANITARY SEWER
- EXISTING SANITARY SEWER TO BE REHABILITATED
- BYPASS PUMPING PIPE
- EXISTING SANITARY SEWER MANHOLE
- EXISTING SANITARY SEWER MANHOLE TO BE REHABILITATED
- ▲ DIRECTION OF SANITARY SEWER FLOW
- TEMPORARY BYPASS EXCAVATION
- RIGHT-OF-WAY
- EXISTING FENCE
- EXISTING CREEK
- ▤ APPROXIMATE BYPASS PUMPING WORK LIMITS
- TYPE --- EXISTING MISCELLANEOUS UTILITY (SEE ABBREVIATIONS FOR TYPE)
- PIPE PLUG



DETAIL 1
1\"/>



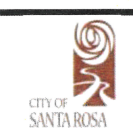
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REV	DATE	BY	APVD	DESCRIPTION

DESIGNED	J. KRAETSCH
DRAWN	S. JUNG
CHECKED	G. HERMANSON
APPROVED:	D. RICHARDSON, WOODARD & CURRAN PRINCIPAL

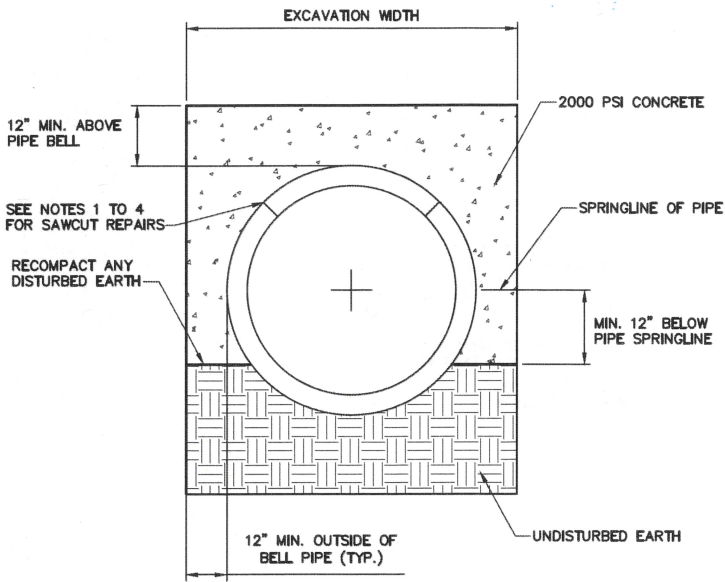


LLANO TRUNK LING
UTILITIES FIELD OFFICE AND WEST 3RD STREET
BYPASS PUMPING DETAILS
NORTH FULTON TRUNK

EXHIBIT NO	5
SHEET NO	5 OF 6
PROJ NO	0075-017
DATE	MAY 2019

EXISTING MANHOLE SCHEDULE - LLANO TRUNK AT UTILITIES FIELD OFFICE							
MH I.D.	Rim Elevation (ft)	Invert Elevation (ft)	Base Section Reference ¹	Barrel Section	Manhole Cone Cross Section	Height of Grade Ring	Frame and Cover
I12712MH1	110.54	N/A (4" IN) 103.22 (8" IN) N/A (30" IN) 99.82 (48" IN/OUT)	N/A	1.5' - 60" Ø - ON TOP OF APPROX. 6" THICK ROOF OF JUNCTION STRUCTURE	60" X 24" x 4' - ECC	3"	24" Ø x 4.5" TALL
I12717MH3	118.25	99.60 (36" IN) 98.63 (48" IN/OUT)	N/A	N/A - 60" Ø	60" X 24" x N/A - ECC	N/A	24" Ø x N/A" TALL
I12717MH50	111.70	102.78 (14" IN) 99.34 (48" IN/OUT)	N/A	3' - 60" Ø	60" X 24" x 4' - ECC	12"	24" Ø x 4.5" TALL
I12717MH58	120.00	101.60 (36" IN) 100.20 (36" OUT)	N/A	13' - 60" Ø	60" X 48" x 1.5' - ECC 48" x 24" x 1.5' ECC	3"	24" Ø x 4.5" TALL
I12717MH67 ²	119.79	N/A (24" IN) 97.89 (48" IN/OUT)	N/A	N/A - 60" Ø	60" X 24" x N/A - ECC	N/A	24" Ø x N/A" TALL
Notes: 1. Pertinent detail sheets from trunk sewer record drawings attached to these exhibits. 2. Discharge manhole for bypass system. Manhole will not be rehabilitated and is not connected to Llano trunk to be rehabilitated. 3. The abbreviation "N/A" stands for "not available" in this table.							

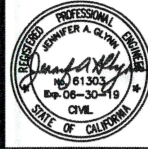
EXISTING MANHOLE SCHEDULE - NORTH FULTON TRUNK							
MH I.D.	Rim Elevation (ft)	Invert Elevation (ft)	Base Section Reference ¹	Barrel Section	Manhole Cone Cross Section	Height of Grade Ring	Frame and Cover
I12712MH3	111.83	100.35 (48" IN) 100.31 (48" OUT)	N/A	2' - 60" Ø	60" X 24" x 4' - ECC	12"	24" Ø x 4.5" TALL
I12712MH4 ²	112.65	N/A (10" IN) 100.69 (30" IN/OUT)	N/A	N/A' - 48" Ø	48" X 24" x N/A	N/A	24" Ø x N/A" TALL
I12712MH95	110.00	104.00 (10" IN) 100.06 (48" IN/OUT)	N/A	0' - 60" Ø	60" X 24" x 4' - ECC	12"	24" Ø x 4.5" TALL
I12712MH97	111.14	103.70 (8" IN) 100.37 (48" IN/OUT)	N/A	1.5' - 60" Ø	60" X 24" x 4' - ECC	3"	24" Ø x 4.5" TALL
Notes: 1. Pertinent detail sheets from trunk sewer record drawings attached to these exhibits. 2. Discharge manhole for bypass system. Manhole will not be rehabilitated and is not connected to Llano trunk to be rehabilitated. 3. The abbreviation "N/A" stands for "not available" in this table.							



- NOTES:
- AT THE SAWCUT LOCATIONS, GRIND OFF CUT REBAR TO A DEPTH OF 0.25 INCHES.
 - IT IS EXPECTED THAT CUTS FROM THE SAW CUTTING OPERATION WILL EXTEND A SHORT DISTANCE BEYOND THE EDGE OF THE PORTION REMOVED. THESE CUTS SHALL BE REPAIRED. REPAIR THESE CUTS USING THE FOLLOWING STEPS: STEP 1 CLEAN CUTS AND REMOVED DUST AND DEBRIS. STEP 2: INJECT SIKA CORPORATION'S SIKADUR 35 HI-MOD LV EPOXY ADHESIVE (OR EQUAL).
 - REPLACE THE PORTION OF THE PIPE THAT WAS REMOVED USING THE FOLLOWING STEPS: STEP 1: APPLY ONE BEAD OF HYDROPHILIC WATERSTOP (ADEKA P-201 OR EQUAL) AROUND ENTIRE OPENING. STEP 2: APPLY SIKA CORPORATION'S SIKADUR 31 SBA STRUCTURAL EPOXY RESIN ADHESIVE TO SURFACES.
 - IT IS ASSUMED THAT BEFORE THE PIPE TOP WAS REMOVED, ANCHOR BOLTS WERE INSTALLED IN THE PIPE TOP TO ALLOW THE PIPE TOP TO BE LIFTED. AFTER THE PIPE TOP HAS BEEN REPLACED, THESE ANCHOR BOLTS DO NOT NEED TO BE REPLACED AS LONG AS THEY ARE ENCASED IN CONCRETE.

CONCRETE ENCASEMENT ON
EXISTING 48" RCP SS
DETAIL 2
NTS EXHIBIT NO.11

FILENAME: P-1 5-06-19 02:32pm sjung XREFS: Y-SRR-TBLX X-Aerial K<<--



100% DESIGN
SUBMITTAL

0" = 1' -
VERIFY SCALES -
BAR IS ONE INCH
LONG ON FULL
SIZE DRAWING.
IF NOT ONE INCH
LONG ON THIS
DRAWING, ADJUST
SCALES ACCORDINGLY



REV	DATE	BY	APVD	DESCRIPTION

DESIGNED	J. KRAETSCH
DRAWN	S. JUNG
CHECKED	G. HERMANSON

SUBMITTED:	J. GLYNN, WOODARD & CURRAN PROJECT MANAGER
APPROVED:	D. RICHARDSON, WOODARD & CURRAN PRINCIPAL



LLANO TRUNK LINING
UTILITIES FIELD OFFICE AND WEST 3RD STREET
**MANHOLE SCHEDULES
AND MISCELLANEOUS DETAILS**

EXHIBIT NO	6
SHEET NO	6 OF 6
PROJ NO	0075-017
DATE	MAY 2019

BID FORMS

CITY OF SANTA ROSA

STATE OF CALIFORNIA

LLANO TRUNK LINING – W COLLEGE UTILITIES FACILITY

The work to be performed and referred to herein is in the City of Santa Rosa, California and consists of improvements to be constructed in accordance with the provisions of the Invitation for Bids, containing the Notice to Bidders, the Special Provisions, the Project Plan(s), the Bid Forms and the Contract, all of which are by reference incorporated herein, and each Addendum, if any is issued, to any of the above which is also incorporated by reference herein.

TO THE AWARD AUTHORITY OF THE CITY OF SANTA ROSA

The undersigned, as bidder, declares that the only person or parties interested in this bid as principals are those named herein; that this bid is made without collusion with any other person, firm, or corporation; that Contractor has carefully examined the Project Plans, Invitation for Bids and conditions therefor, and is familiar with all bid requirements, that Contractor has examined this Contract and the provisions incorporated by reference herein, and Contractor hereby proposes, and agrees that if its bid is accepted by the City, Contractor will provide all necessary machinery, tools, apparatuses, and other means of construction, and to do all the work and furnish all the materials and services required to complete the construction in accordance with the Contract, the Special Provisions, the Project Plan(s), and Addenda to any of the above as incorporated by reference, in the time stated herein, for the unit prices and/or lump sum prices as follows:

NAME OF BIDDER:

**CITY OF SANTA ROSA
UNIT PRICE SCHEDULE
LLANO TRUNK LINING - W COLLEGE UTILITIES FACILITY**

Item No.	Description	Quantity	Units	Unit Price	Total Price
1	CONTRACT EXECUTION INCENTIVE (I)	1	LS	\$ <u>1,000.00</u>	\$ <u>1,000.00</u>
2	MOBILIZATION AND DEMOBILIZATION	1	LS	\$ _____	\$ _____
3	TRAFFIC CONTROL	1	LS	\$ _____	\$ _____
4	POTHOLING	1	LS	\$ _____	\$ _____
5	UTILITY CONFLICT RESOLUTION	1	FA	\$ <u>10,000.00</u>	\$ <u>10,000.00</u>
6	SEAL COAT- UFO	11,830	SF	\$ _____	\$ _____
7	PERMANENT TRENCH PAVING	27	TON	\$ _____	\$ _____
8	MANHOLE REHABILITATION - EPOXY LINING	4	EA	\$ _____	\$ _____
9	JUNCTION STRUCTURE REHABILITATION - POLYURETHANE LINING - UFO	1	EA	\$ _____	\$ _____
10	MANHOLE REHABILITATION - POLYURETHANE LINING - NORTH FULTON	1	EA	\$ _____	\$ _____
11	BRACING AND SHORING	1	LS	\$ _____	\$ _____
12	MANHOLE FRAME AND BOLT-DOWN LID	4	EA	\$ _____	\$ _____
13	MANHOLE GRADE RINGS, FRAME AND BOLT - DOWN LID	2	EA	\$ _____	\$ _____
14	36" PRE-CIPP REHABILITATION CCTV INSPECTION	120	LF	\$ _____	\$ _____
15	48" PRE-CIPP REHABILITATION CCTV INSPECTION	1,998	LF	\$ _____	\$ _____
16	36" POST-CIPP REHABILITATION CCTV INSPECTION	60	LF	\$ _____	\$ _____
17	48" POST-CIPP REHABILITATION CCTV INSPECTION - UFO	386	LF	\$ _____	\$ _____
18	48" POST-CIPP REHABILITATION CCTV INSPECTION - NORTH FULTON	613	LF	\$ _____	\$ _____
19	36" PRE-CIPP SEWER CLEANING	60	LF	\$ _____	\$ _____
20	48" PRE-CIPP SEWER CLEANING	999	LF	\$ _____	\$ _____
21	48" PRE-CIPP SEWER HEAVY CLEANING - NORTH FULTON	613	LF	\$ _____	\$ _____
22	48" PRE-CIPP MAN ENTRY INSPECTION AND REPORTING- NORTH FULTON	1	LS	\$ _____	\$ _____
23	36" CIPP LINER REHABILITATION - II2717MH3 TO II2717MH58 - UFO	60	LF	\$ _____	\$ _____
24	48" CIPP LINER REHABILITATION - II2717MH3 TO II2712MH1 - UFO	386	LF	\$ _____	\$ _____
25	48" CIPP LINER REHABILITATION - II2712MH1 TO II2712MH3 - NORTH FULTON	613	LF	\$ _____	\$ _____
26	SANITARY SEWER BYPASS	1	LS	\$ _____	\$ _____
GRAND TOTAL BID					\$ _____

In the case of any discrepancy between the unit price and the total set forth for the item, the unit price shall prevail; provided, however, that if the amount set forth as a unit price is ambiguous, unintelligible or uncertain for any reason, or is omitted, or in the case of lump sum items, is not the same amount as the entry in the "Total" column, then the amount set forth in the "Total" column for the item shall prevail in accordance with the following:

1. As to lump sum items, the amount set forth in the "Total" column shall be the unit price;
2. As to unit basis items, the amount set forth in the "Total" column shall be divided by the estimated quantity for the item and the price thus obtained shall be the unit price.

The Total Base Bid shall be the sum of the "Total" column. In case of discrepancy between the sum of the "Total" column and the amount entered as Total Base Bid, the sum of the "Total" column shall prevail. The bid comparison will be based on the sum of the "Total" column for each bidder. The lowest bid shall be the lowest total of the bid prices on the base contract total.

If this Contract Bid is accepted by the City and the undersigned fails to execute the Contract and to give all the bonds required under the Contract, with a surety satisfactory to the Award Authority of the City of Santa Rosa, within ten calendar days after bidder has received the Notice of Award from the Engineer, then the Award Authority may, at its option, determine that the bidder has abandoned the Contract, and thereupon this bid and the acceptance thereof shall be null and void, and the forfeiture of the security accompanying this bid shall be in accordance with California Public Contract Code section 20172.

The undersigned understands and agrees that the City is not responsible for any error or omissions on the part of the undersigned in making this bid.

The bidder to whom the Contract is awarded agrees to execute the Contract in favor of the City, in the form attached, and to deliver any and all required bond(s) and insurance certificates within ten calendar days from the date of Contractor's receipt of the Notice of Award. Following the award of the Contract, Contractor shall commence work within ten calendar days from the day authorized in the Notice to Proceed and diligently prosecute the same to completion in accordance with Section 8-1.04.

LIST OF SUBCONTRACTORS

NAME OF BIDDER: _____

The following is a list of each subcontractor who will perform work or labor or render services to the undersigned for the construction of the project in an amount in excess of ½ of 1% of the total amount of this bid.

The undersigned agrees that any portion of the work in excess of ½ of 1% of the total amount of this bid and for which no subcontractor is designated herein will be performed by the undersigned.

SUBCONTRACTOR NAME	SUBCONTRACTOR LICENSE NUMBER	SUBCONTRACTOR DIR REGISTRATION NUMBER	SUBCONTRACTOR BUSINESS ADDRESS	DESCRIPTION OF WORK (ITEM NO.)

SAFETY PROGRAM QUALIFICATION CRITERIA

Experience Modification Rate

The following information will be used to determine if you meet the minimum safety requirements for this project. To qualify, you must not have a three-year average* Workers' Compensation Experience Modification Rate greater than **1.0**. This form shall be submitted by the primary contractor.

Enter your Experience Modification Rate for the last five complete years (available from your insurance carrier):

20_____ EMR = _____

20_____ EMR = _____

20_____ EMR = _____

20_____ EMR = _____

20_____ EMR = _____

Lowest Three-Year Average* = _____

* - Calculated as the average of the lowest three consecutive years within the past five year duration

Company Name _____

Contact Name _____ Telephone _____

To verify the above information, we will contact your workers' compensation insurance carrier. Please authorize your carrier to release this information. Failure to do so will result in automatic disqualification.

Workers' Compensation Insurance Company _____

Contact Person _____ Telephone _____

Qualified []

Do not write in this space

Not qualified []

EMR information verified []

SAFETY PROGRAM QUALIFICATION CRITERIA

Recordable Incident Rate

The following information will be used to determine if you meet the minimum safety requirements for this project. To qualify, you must not have a three-year average* Recordable Incident Rate greater than **3.0**. Incident rate information is on your OSHA Log 300. Please calculate the RIR for the last three complete years as follows. This form shall be submitted by the primary contractor.

$$\frac{\text{Total number of recordable incidents} \times 200,000}{\text{Total employees hours worked}} = \text{RIR}$$

Recordable incidents		Total Employee Hours Worked	
Year	Number	Year	Number
20____	_____	20____	_____
20____	_____	20____	_____
20____	_____	20____	_____
20____	_____	20____	_____
20____	_____	20____	_____

Enter your Total Recordable Incident Rate for each of the last five complete years:

20____	RIR = _____
20____	RIR = _____
20____	RIR = _____
20____	RIR = _____
20____	RIR = _____
Lowest Three-Year Average* = _____	

* - Calculated as the average of the lowest three consecutive years within the past five year duration

Company Name _____

Contact Name _____ Telephone _____

To verify the above information, we will contact your workers' compensation insurance carrier. Please authorize your carrier to release information on recordable incidents for the years indicated in your calculations. Failure to do so will result in automatic disqualification.

Workers' Compensation Insurance Company _____

Contact Person _____ Telephone _____

Qualified []	Do not write in this space Not qualified []	RIR information verified []
------------------------	---	---------------------------------------

SAFETY PROGRAM QUALIFICATION CRITERIA

Lost Time Incident Rate

The following information will be used to determine if you meet the minimum safety requirements for this project. To qualify, you must not have a three-year average* Lost Time Incident Rate greater than **1.1**. Incident rate information is on your OSHA Log 300. Please calculate the LTIR for the last three complete years as follows. This form shall be submitted by the primary contractor.

$$\frac{\text{Total number of lost-time incidents} \times 200,000}{\text{Total employees hours worked}} = \text{LTIR}$$

Lost-time Incidents		Total Employee Hours Worked	
Year	Number	Year	Number
20____	_____	20____	_____
20____	_____	20____	_____
20____	_____	20____	_____
20____	_____	20____	_____
20____	_____	20____	_____

Enter your Lost Time Incident Rate for each of the last five complete years:

20____	RIR = _____
20____	RIR = _____
20____	RIR = _____
20____	RIR = _____
20____	RIR = _____
Lowest Three-Year Average* = _____	

* - Calculated as the average of the lowest three consecutive years within the past five year duration

Company Name _____

Contact Name _____ Telephone _____

To verify the above information, we will contact your workers' compensation insurance carrier. Please authorize your carrier to release information on lost-time incidents for the years indicated in your calculations. Failure to do so will result in automatic disqualification.

Workers' Compensation Insurance Company _____

Contact Person _____ Telephone _____

Do not write in this space		
Qualified []	Not qualified []	LTIR information verified []

LIST OF PREVIOUS SIMILAR JOBS

NAME OF BIDDER: _____

[illegible]

NONCOLLUSION DECLARATION
TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID

The undersigned declares:

I am the _____ of _____, 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.

Any person executing this declaration on behalf of a bidder that is a corporation, partnership, joint venture, limited liability company, limited liability partnership, or any other entity, hereby represents that he or she has full power to execute, and does execute, this declaration on behalf of the bidder.

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].

NOTE: The above Noncollusion Declaration is part of the Contract Bid. Signing this Bid on the signature portion thereof shall also constitute signature of this Noncollusion Declaration.

BID BOND AFFIDAVIT AND BIDDER'S SIGNATURE PAGE

Accompanying this bid is a guaranty in the form of (Notice: Insert the words "cash \$," "Cashier's Check," "Certified Check," or "Bidder's Bond" as the case may be):

in an amount equal to at least ten percent of the total of this bid.

The undersigned further agrees that if Contractor does not execute the Contract and deliver the necessary bonds to the City within the period of time specified in this Invitation for Bids, the proceeds of the security accompanying this bid shall become the property of the City of Santa Rosa, California, and this bid and the acceptance thereof may, at the option of the City, be considered null and void.

The undersigned is licensed in accordance with an act providing for the registration of Contractors, License No. _____, Class _____, expiration date _____.

The undersigned is registered with the Department of Industrial Relations, Registration No. _____.

IMPORTANT NOTICE: If bidder or other interested person is a corporation, state legal name of corporation, also names of the president, secretary, treasurer, and manager of the corporation; if a partnership, state true name of partnership, also the names of all partners in the partnership; if the bidder is a sole proprietor, state the business name and the proprietor's name in full.

Secretary of State Business Entity Number: _____.

Business Address

Telephone Number

I declare under penalty of perjury that the foregoing is true and correct.

BIDDER'S SIGNATURE: _____

TITLE: _____

DATE: _____

CONTRACT

CITY OF SANTA ROSA

CALIFORNIA

CONTRACT NO. C02042

LLANO TRUNK LINING – W COLLEGE UTILITIES FACILITY

This Contract is made and entered into as of date to be added upon award at Santa Rosa, California, between the City of Santa Rosa ("City") and _____ of _____ ("Contractor").

ARTICLE I - For and in consideration of the payment and agreement hereinafter mentioned, to be made and performed by City, and under the conditions expressed in the required bonds hereunto annexed, Contractor agrees that for the benefit of City, at its own cost and expense, to do all the work and furnish all the materials, except such as are mentioned in the Special Provisions to be furnished by City, necessary to construct and complete the work herein described in a good, workmanlike, and substantial manner. The work embraced herein shall be done in accordance with the Standard Specifications of the State of California Department of Transportation, dated 2010, insofar as the same may apply (Standard Specifications); in accordance with the City of Santa Rosa Construction Specifications for Public Improvements (City Specifications); in accordance with the City of Santa Rosa Design and Construction Standards, (City Standards); in accordance with the State of California Department of Transportation Standard Plans, dated 2010 (Standard Plans), (collectively, "Contract Documents") and in accordance with the Special Provisions hereinabove set forth, all of which are hereby incorporated into and made part of this Contract.

The work to be performed is further shown upon an exhibit consisting of 6 sheets entitled, Llano Trunk Lining – W College Utilities Facility, File Number 2019-0025, approved by the Deputy Director of Transportation and Public Works, hereinafter referred to as the Project Plan(s).

ARTICLE II - Contractor agrees to receive and accept the following prices as full compensation for furnishing all materials and doing all the work contemplated and embraced in this Contract; also for all loss or damages arising out of the nature of the work aforesaid, or from the acts of the elements, or from any unforeseen difficulties or obstructions which may arise or be encountered in the prosecution of the work until its acceptance by City and for all expenses incurred by or in consequence of the suspension or discontinuance of work, and for well and faithfully completing the work, and the whole thereof in the manner and according to the Project Plans and Invitation for Bids therefor, and the requirements of the Engineer under them to wit:

ITEM NUMBER	QUANTITY	DESCRIPTION	UNIT PRICE	TOTAL
			\$ _____	\$ _____
TOTAL BASE BID (SUM OF "TOTAL" COLUMN)			\$ _____	

**BID ITEMS IN THIS SECTION WILL BE INSERTED
UPON AWARD OF THE CONTRACT AND SHALL BE
THE SAME AS THOSE BID UPON.**

ARTICLE III - City and Contractor hereby promise and agree that Contractor shall provide the materials and do the work according to the terms and conditions herein contained and referred to, for the prices aforesaid, and City hereby agrees to pay for the same at the time, in the manner, and upon the conditions set forth; and the parties for themselves, their heirs, executors, administrators, successors, and assigns, do hereby agree to full performance of the covenants herein stated.

ARTICLE IV - By execution of this Contract, Contractor hereby represents and certifies that Contractor is 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 Contractor hereby agrees to comply with such provisions before commencing the performance of the work of this Contract.

ARTICLE V - It is further expressly agreed by and between the parties hereto that the Invitation for Bids, containing the Notice to Bidders including any required Bonds, the Contract Documents, and any Addenda are all essential parts of this Contract and are specially referred to and by such reference made a part hereof. In the event of any conflict in the provisions thereof, the terms of said documents shall control each over the other, in the following order:

1. Special Provisions
2. Project Plans
3. City Standards
4. City Specifications
5. Standard Specifications
6. Standard Plans

ARTICLE VI - Contractor agrees to commence work pursuant to this Contract within ten calendar days from the date authorized in the Notice to Proceed and to diligently prosecute the same to completion in accordance with Section 8-1.04C of the Special Provisions.

This Contract shall not be transferred or assigned without the prior written consent of City, which may be withheld by City in its sole and absolute discretion.

If Contractor is a corporation, two corporate officers of Contractor, one from each of the following two groups shall execute this Contract: a) the chairman of the board, president or any vice-president; b) the secretary, any assistant secretary, chief financial officer, or any assistant treasurer. The name and title of the corporate officers shall be printed under the signature.

In witness whereof, the parties hereto have executed this Contract as of the date first written above.

City:

City of Santa Rosa,
a Municipal corporation

By: _____

Title: _____

ATTEST:

By: _____

Title: _____

Approved as to form:

By: _____

Office of City Attorney

Contractor:

Name of Contractor,
Type of entity

By: _____

Name: _____

Title: _____

By: _____

Name: _____

Title: _____