CITY OF MANHATTAN BEACH

BID DOCUMENTS

PROJECT NO. W-671

WATER INFRASTRUCTURE IMPROVEMENTS AND RESURFACING PROJECT - CYCLE 2

SEPTEMBER 2023

CITY OF MANHATTAN BEACH
DEPARTMENT OF PUBLIC WORKS
PROJECT MANAGER: TIM BIRTHISEL, PE
1400 HIGHLAND AVENUE
MANHATTAN BEACH, CA 90266

REGISTERED PROFESSIONAL ENGINEER
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CIVIL
STATE OF CALIFORNIA

8/17/2023

Katherine Doherty, City Engineer C76589

Engineer/Architect of Record Approval

NOTICE INVITING BIDS NIB-1

INSTRUCTIONS TO BIDDERS I-1

CHECKLIST FOR BIDDERS I-6

BID B-1

CONTRACT C-1

PAYMENT BOND (LABOR AND MATERIALS) C-5

PERFORMANCE BOND C-7

WARRANTY BOND C-9

GENERAL PROVISIONS GP-1

SECTION 0. GENERAL PROVISIONS DEFINED GP-1

SECTION 1. TERMS, DEFINITIONS, ABBREVIATIONS, UNITS OF MEASURE, AND SYMBOLS GP-1

SECTION 2. SCOPE AND CONTROL OF THE WORK GP-3

SECTION 3. CHANGES IN WORK GP-8

SECTION 4. CONTROL OF MATERIALS GP-29

SECTION 5 UTILITIES GP-30

SECTION 6. PROSECUTION, PROGRESS AND ACCEPTANCE OF THE WORK GP-33

SECTION 7. RESPONSIBILITIES OF THE CONTRACTOR GP-39

SECTION 8. FACILITIES FOR AGENCY PERSONNEL GP-49

SECTION 9. MEASUREMENT AND PAYMENT GP-50

SECTION 10. CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT PLAN GP-54

SECTION 11. ADDITIONAL TERMS GP-61

SPECIAL PROVISIONS

PART I: SPECIAL INSTRUCTIONS.....SI-1

PART II: STANDARD AND SPECIAL TECHNICAL PROVISIONS.....ST-1

APPENDIX I PROGRESS PAYMENT REQUEST FORM

APPENDIX II DAILY REPORT (TO BE COMPLETED AND SUBMITTED BY CONTRACTOR)

APPENDIX III APPLICABLE CITY STANDARD PLANS

APPENDIX IV GEOTECHNICAL REPORT

APPENDIX V ADA RAMP AND DRIVEWAY COMPLIANCE MEMORANDUM - TEMPLATE

APPENDIX VI HERRIN AVE PAVING PLAN SCOPE OF WORK

APPENDIX VII PAVEMENT GRIND AND OVERLAY DETAIL

APPENDIX VIII PERVIOUS CONCRETE PAVEMENT REQUIREMENTS

NOTICE INVITING BIDS

FOR

WATER INFRASTRUCTURE IMPROVEMENTS AND RESURFACING PROJECT - CYCLE 2

Project number: W-671

NOTICE IS HEREBY GIVEN that the City of Manhattan Beach, California ("City") invites sealed Bids for the Project. The City will receive **ELECTRONIC BIDS ONLY** up to 11:00 a.m. on October 18th, 2023, at which time the **ELECTRONIC** bids will be opened and posted on PlanetBids. The deadline to submit questions related to the bid documents is October 4th, October 4th, 2023, at 11:00 a.m.

Bids shall be received electronically only on the PlanetBids Portal accessible through the City of Manhattan Beach Public Works Department Bid Opportunities webpage at https://manhattanbeach.gov/businesses/bid-oppurtunities. To submit your bid electronically and to review Bid tabulation results ("Bid Opening"), please visit the following link: https://pbsystem.planetbids.com/portal/48136/bo/bo-detail/84326.

Contract Documents in PDF format (including City Special Provisions and Project Plans, but not including Standard Plans, Standard Specifications, or Reference Specifications) shall be obtained from the link/website above.

Total Cost per set: $106.00

All fees listed above are non-refundable. The Contract Documents must be purchased online; they cannot be purchased or mailed from City Hall. Bidders are solely responsible for on time submission of their electronic bid. The City will only consider bids that have been transmitted successfully and have been issued an ebid confirmation number with a time stamp from the bid management system indicating that the bid was submitted successfully. Transmission of bids by any other means will not be accepted. Bidders shall be solely responsible for informing themselves with respect to the proper utilization of the bid management system, for ensuring the capability of their computer system to upload the required documents, and for the stability of their internet service. Failure of the bidders to successfully submit electronic bids shall be at the bidders' sole risk and no relief will be given for late and/or improperly submitted bids. Bidders experiencing any technical difficulties with the bid submission process may contact PlanetBids at (818) 992-1771. Neither the City, nor PlanetBids, makes any guarantee as to the timely availability of assistance, or assurance that any given problem will be resolved by the bid submission deadline.

Bids must remain valid and shall not be subject to withdrawal for 90 calendar days after the Bid opening date.

SCOPE OF WORK. The Project includes, without limitation, furnishing all necessary labor, materials, equipment and other incidental and appurtenant Work necessary to satisfactorily complete the Project, as more specifically described in the Contract Documents. This Work will be performed in strict conformance with the Contract Documents, permits from regulatory agencies with jurisdiction, and applicable regulations. The quantity of Work to be performed and

materials to be furnished are approximations only, being given as a basis for the comparison of Bids. Actual quantities of Work to be performed may vary at the discretion of the City Engineer. Time for completion of the Work for the Base Bid Schedules is 120 total Working Days from the date specified in the Notice to Proceed to Fulfill Preconstruction Requirements and Order Materials. Additional Working Days may be granted for Additive Bid Schedule A (50 total Working Days) and/or Additive Bid Schedule B (30 total Working Days). Working Days for additive bid schedules, if awarded, are in addition to the Base Bid Working Days.

REGISTRATION WITH THE DEPARTMENT OF INDUSTRIAL RELATIONS. In accordance with Labor Code Sections 1725.5 and 1771.1, no contractor or subcontractor shall be qualified to bid on, be listed in a bid proposal, subject to the requirements of Section 4104 of the Public Contract Code, or engage in the performance of any contract for public work, unless currently registered and qualified to perform public work pursuant to Section 1725.5 [with limited exceptions for bid purposes only under Labor Code Section 1771.1(a)].

PREVAILING WAGES. In accordance with Labor Code Section 1770 *et seq*., the Project is a "public work." The selected Bidder (Contractor) and any Subcontractors shall pay wages in accordance with the determination of the Director of the Department of Industrial Relations ("DIR") regarding the prevailing rate of per diem wages. Copies of those rates are on file with the Director of Public Works and are available to any interested party upon request. The Contractor shall post a copy of the DIR's determination of the prevailing rate of per diem wages at each job site. This Project is subject to compliance monitoring and enforcement by the DIR.

BONDS. Each Bid must be accompanied by a cash deposit, cashier's check, certified check or Bidder's Bond issued by a Surety insurer, made payable to the City and in an amount not less than ten percent of the total Bid submitted. Personal or company checks are not acceptable. Upon Contract award, the Contractor shall provide faithful performance and payment Bonds, each in a sum equal to the Contract Price, as well as a warranty or maintenance Bond that is valid for one year from Project acceptance in the amount of ten percent of the Contract Price. All Bonds must be issued by a California admitted Surety insurer using the forms set forth in the Contract Documents, or in any other form approved by the City Attorney. Failure to enter into the Contract with the City, including the submission of all required Bonds and insurance coverages, within ten calendar days after the date of the mailing of written notice of contract award to the Bidder, shall subject the Bid security to forfeiture to the extent provided by law.

LICENSES. Each Bidder shall possess a valid Class A Contractor's license issued by the California State Contractors License Board at the time of the Bid submission, unless this Project has any federal funding, in which case the successful Bidder must possess such a license at the time of Contract award. The successful Contractor must also possess a current City business license.

RETENTION SUBSTITUTION. Five percent of any progress payment will be withheld as retention. In accordance with Public Contract Code Section 22300 and at the request and expense of the Contractor, securities equivalent to the amount withheld may be deposited with the City or with a State or federally chartered bank as escrow agent, which shall then pay such moneys to the Contractor. Upon satisfactory completion of the Project, the securities shall be returned to the Contractor. Alternatively, the Contractor may request that the City make payments of earned retentions directly to an escrow agent at the Contractor's expense. No such substitutions shall be accepted until all related documents are approved by the City Attorney.

BIDDING PROCESS. The City reserves the right to reject any Bid or all Bids, and to waive any irregularities or informalities in any Bid or in the bidding, as deemed to be in its best interest.

By: _____ _____

Katherine Doherty, City Engineer Date

INSTRUCTIONS TO BIDDERS

FORM OF BID. Bids shall be made on the Bid forms found herein. Bidders shall include all forms and fill in all blank spaces, including inserting "N/A" (for not applicable) where necessary.

The Bid Schedule, Subcontractor Designation Form, and acknowledgement of receipt of Addenda, if any, shall be submitted using only the online electronic forms through the City of Manhattan Beach Public Works Department Bid Opportunities webpage link to the PlanetBids portal at https://www.citymb.info/departments/public-works/bid-opportunities. Paper copies will not be accepted. The unit prices for each Bid Item shall be properly entered in the online electronic Bid Schedule.

In addition, each Bidder must scan and submit the following documents with its electronic bid on the City's Bid Forms.

1. Completed and Signed Contractor's Statement
2. Completed References Form
3. Completed, Signed and Notarized Bid Bond
4. Signed and Notarized Noncollusion Declaration Form
5. Evidence satisfactory to the City indicating the capacity of the person(s) signing the Bid to bind the Bidder

Any Bid not accompanied by a Contractor's Statement completed with all information required and bearing the signature of the Bidder's duly authorized representative under penalty of perjury may be deemed non-responsive and rejected. If the City determines that any information provided by a Bidder in the Contractor's Statement is false or misleading, or is so incomplete as to be false or misleading, the City may reject the Bid submitted by such Bidder as being non-responsive.

DELIVERY OF BIDS. The Bid shall be delivered by the time and date specified in the Notice Inviting Bid, through the City of Manhattan Beach Public Works Department Bid Opportunities webpage link to the PlanetBids portal at https://www.citymb.info/departments/public-works/bid-opportunities. Paper copies will not be accepted. Bidders are solely responsible for ensuring that their Bids are received in proper time. Accepted Bids shall become the property of the City.

AMENDED BIDS. Unauthorized conditions, limitations or provisos attached to a Bid may cause the Bid to be deemed incomplete and non-responsive.

WITHDRAWAL OF BID. A Bid may be withdrawn electronically on the PlanetBids Vendor Portal prior to the Bid submission deadline. Bids must remain valid and shall not be subject to withdrawal for 90 Days after the Bid opening date.

SUBCONTRACTORS. Each Bidder shall submit, in the electronic Bid Form provided in the City of Manhattan Beach's Public Works Department Bid Opportunities webpage link to the PlanetBids portal at https://www.citymb.info/departments/public-works/bid-opportunities, a list of Subcontractors to be used on this Project (for work in excess of ½ of one-percent of the total bid)

as required by the Subletting and Subcontracting Fair Practices Act, California Public Contract Code Section 4100 et seq.

BIDDER'S SECURITY. Each Bid shall be accompanied by cash, a certified or cashier's check payable to the City, or a satisfactory Bid Bond in favor of the City executed by the Bidder as principal and an admitted surety insurer as Surety, in an amount not less than ten percent of the amount set forth in the Bid. The cash, check or Bid Bond shall be given as a guarantee that, if selected, the Bidder will execute the Contract in conformity with the Contract Documents, and will provide the evidence of insurance and furnish the specified Bonds, within ten calendar days after the date of delivery of the Contract Documents to the Bidder. In case of the Bidder's refusal or failure to do so, the City may award the Contract to the next lowest responsible bidder, and the cash, check, or Bond (as applicable) of the lowest Bidder shall be forfeited to the City to the extent permitted by law. No Bid Bond will be accepted unless it conforms substantially to the form provided in these Contract Documents.

QUANTITIES APPROXIMATE. Any quantities shown in the Bid form or elsewhere herein shall be considered as approximations listed to serve as a general indication of the amount of Work or materials to be performed or furnished, and as basis for the Bid comparison. The City does not guarantee that the actual amounts required will correspond with those shown. As deemed necessary or convenient, the City may increase or decrease the amount of any item or portion of Work or material to be performed or furnished or omit any such item or portion, in accordance with the Contract Documents.

ADDENDA. Each Bidder shall register to become a Registered Bidder via the City of Manhattan Beach Public Works Department Bid Opportunities webpage link to the PlanetBids portal at https://www.citymb.info/departments/public-works/bid-opportunities. Addenda, if any, shall be issued via email through the PlanetBids Vendor Portal. It is the Contractor's responsibility to ensure the email address utilized in the Planet Bids Vendor Portal is current and accurate and it is further the Contractor's responsibility to actively check the Portal and email for the issuance of Addenda. Bidders are responsible for ensuring that they have received any and all Addenda. It is the Bidder's responsibility to actively check PlanetBids for Addenda or bulletin updates. Each Bidder is responsible for verifying that it has received all Addenda issued. Bidders must acknowledge receipt of all Addenda, if any. Failure to acknowledge receipt of all Addenda may cause a Bid to be deemed incomplete and non-responsive.

DISCREPANCIES IN BIDS. Each Bidder shall set forth as to each item of Work, in clearly legible words and figures, a unit or line item Bid amount for the item in the respective spaces provided for this purpose.

In case of discrepancy between the unit price and the extended amount set forth for the item, the unit price shall prevail. However, if the amount set forth as a unit price is ambiguous, unintelligible or uncertain for any cause, or is omitted, or if the unit price is the same amount as the entry in the "extended amount" column, then the amount set forth in the "extended amount" column for the item shall prevail in accordance with the following:

(1) As to lump sum items, the amount set forth in the "extended amount" column shall be the unit price.

(2) As to unit price items, the amount set forth in the "extended amount" column shall be divided by the estimated quantity for the item set forth in the Bid documents, and the price thus obtained shall be the unit price.

In case of discrepancy between words and figures, the words shall prevail.

COMPETENCY OF BIDDERS. In evaluating Bidder responsibility, consideration will be given not only to the financial standing, but also to the general competency of the Bidder for the performance of the Project. Each Bidder shall set forth in the designated area of the Bid form a statement of its experience. No Contract will be executed with a Bidder that is not licensed and registered with the DIR in accordance with State law, and with any applicable specific licensing requirements specified in these Contract Documents. These licensing and registration requirements for Contractors shall also apply to all Subcontractors.

BIDDER'S EXAMINATION OF SITE AND CONTRACT DOCUMENTS. The Bidder, at its sole cost and expense, is required to carefully examine the Contract Documents and the Project site to become fully acquainted with the conditions affecting the Work. The failure of a Bidder to receive or examine any of the Contract Documents or to inspect the site shall not relieve such Bidder from any obligation relating to the Bid, the Contract, or the Work required under the Contract Documents. The City assumes no responsibility or liability to any Bidder for, nor shall the City be bound by, any understandings, oral representations or oral agreements of the City's agents, employees or officers concerning the Contract Documents or the Work made prior to execution of the Contract. By submitting a Bid, Bidder represents: (1) that Bidder has read and understands the Contract Documents; (2) the Bid is made in compliance with the Contract Documents and is based upon the labor, materials, equipment, and systems required by the Contract Documents; (3) that Bidder understands that all labor, materials, equipment, and systems to be furnished for the Work shall be furnished for the prices bid; (4) that it has visited the Project site, familiarized itself with the local conditions under which the Work is to be performed; (5) that it is fully experienced, qualified and competent to perform the Work set forth in the Contract Documents; (6) that it shall not damage or endanger and shall preserve and protect adjacent properties; (7) that it is properly equipped, organized, and financed to perform the Work; (8) that it is properly permitted and licensed by the California Contractors State Licensing Board to perform the Work; (9) that it has familiarized itself with all conditions bearing upon transportation, disposal, handling, and storage of materials; (10) that it has familiarized itself with the availability of labor, water, electric power, and roads; (11) that it has familiarized itself with uncertainties of weather, or similar physical conditions at the Project site; (12) that it has familiarized itself with the character of equipment and facilities needed preliminary to and during performance of the Work; (13) that it has familiarized itself with the staging and material storage constraints of the Project site and surrounding buildings and will confine its staging and storage operations to approved areas; and (14) that it will coordinate its construction activities with the other contractors performing work on the Project site, if any, including, but not limited to, any separate contractor retained by the City.

No information derived from an inspection of records or investigation will in any way relieve the Contractor from its obligations under the Contract Documents nor entitle the Contractor to any additional compensation. The Contractor shall not make any claim against the City based upon ignorance or misunderstanding of any condition of the Project site or of the requirements set forth in the Contract Documents. No claim for additional compensation will be allowed which is based on a lack of knowledge of the above items. Bidders assume all risks in connection with performance of the Work in accordance with the Contract Documents, regardless of actual conditions encountered, and waive and release the City with respect to any and all claims and liabilities in connection therewith, to the extent permitted by law.

The omission of any portion or item of Work from the Bid that is reasonably inferable from the Contract Documents is not a basis for adjustment of the Contract Price or the Contract Time.

DISQUALIFICATION OF BIDDERS. No Person shall be allowed to make, file or be interested in more than one Bid for the Project. A Person that has submitted a sub-bid to a Bidder, or that has quoted prices of materials to a Bidder, is not thereby disqualified from submitting a sub-proposal or quoting prices to other Bidders or from making a prime Bid. If there is a reason to believe that collusion exists among the Bidders, all affected Bids will be rejected.

RETURN OF BID SECURITY. The successful Bidder's Bid security shall be held until the Contract is executed. Bid security shall be returned to the unsuccessful Bidders within a reasonable time, which in any case shall not exceed 90 Days after the successful Bidder has signed the Contract.

AWARD OF CONTRACT. The City reserves the right to reject any or all Bids or any parts thereof or to waive any irregularities or informalities in any Bid or in the bidding. The Contract award, if made, will be to the lowest responsible, responsive Bidder and is anticipated to occur within 90 calendar Days after the Bid opening. The Contract award may be made after that period if the selected Bidder has not given the City written notice of the withdrawal of its Bid.

DETERMINATION OF LOWEST BIDDER IF ADDITIVE OR DEDUCTIVE ITEMS. In accordance with Public Contract Code Section 20103.8, the lowest Bid shall be determined by comparing the total Bid price of all Base Bid Items and Additive Alternate Bid Items, using the Engineer's estimate of quantities for the Work as set forth in the Bidder's Proposal. The amount of the contract award will be based on the available budget for the project. It may be only for the Base Bid or if the budget allows, include Additive Bid Items. In the event that any or all of the Alternate Bid Items are not awarded as part of the Contract, the City reserves the right to add any or all of the Alternate Bid Items by Change Order or Construction Change Directive at the prices set forth in the Bid.

TRENCHING. If the Project involves the construction of a pipeline, sewer, sewage disposal system, boring and jacking pits, or similar trenches or open excavations, which are five feet deep or more, then each Bidder must submit, as a Bid item, adequate sheeting, shoring, and bracing, or an equivalent method, for the protection of life or limb, which shall conform to applicable safety orders. This final submission must be accepted by the City in advance of excavation and must include a detailed plan showing the design of shoring, bracing, sloping, or other provisions to be made for worker protection from caving ground during the excavation Work. If such plan varies from the shoring system standards, the plan shall be prepared by a registered civil or structural engineer.

LISTING SUBCONTRACTORS. Each Bidder shall submit a list of the proposed Subcontractors on the Project, as required by the Subletting and Subcontracting Fair Practices Act (Public Contract Code Section 4100, *et seq*.).

WORK OF SUBCONTRACTORS. All Bidders are encouraged to disseminate all of the Specifications, Drawings, and other Contract Documents to all persons or entities submitting sub-bids to the Bidder.

INELIGIBLE SUBCONTRACTORS. The successful Bidder is prohibited from performing Work on the Project with any Subcontractor who is ineligible to perform work on a public works project pursuant to Sections 1777.1 or 1777.7 of the California Labor Code. By submitting a Bid, each Bidder certifies that it has investigated the eligibility of each and every listed Subcontractor and has determined that none is ineligible to perform Work pursuant to the Labor Code.

EXECUTION OF CONTRACT. The selected Bidder shall execute the Contract in the form included in these Contract Documents within ten calendar days from the date of delivery of the Contract Documents to the Bidder. Additionally, the selected Bidder shall also secure all insurance and Bonds as herein specified, and provide copies to the City, within ten calendar days from the date of delivery of the Contract Documents to the Bidder. Failure or refusal to execute the Contract or to conform to any of the stipulated requirements shall be just cause for the annulment of the award and forfeiture of the Bidder's security. In such event, the City may declare the Bidder's security forfeited to the extent permitted by law, and the City may award the Contract to the next lowest responsible Bidder or may reject all bids.

SIGNATURES. The Bidder shall execute all documents requiring signatures, and shall cause to be notarized all documents that indicate such a requirement. The Bidder shall provide evidence satisfactory to the City, such as an authenticated resolution of its board of directors or a power of attorney, indicating the capacity of the person(s) signing the Bid to bind the Bidder to the Bid and any Contract arising therefrom.

INSURANCE AND BONDS. The Contractor shall not begin Work until it has given the City evidence of all required insurance coverage (including all additional insured endorsements), a Bond guaranteeing the Contractor's faithful performance of the Contract, and a Bond securing the payment of claims for labor and materials. Where a Contractor has entered into an agreement with a Professional Employment Organization (PEO) to provide human resources, workers' compensation insurance, or other benefits to the Contractor's employees, the Contractor must also submit the agreement with the PEO for review by the City.

INTERPRETATION OF CONTRACT DOCUMENTS. Any Bidder that is in doubt as to the intended meaning of any part of the Contract Documents, or that finds discrepancies in or omissions from the Contract Documents, may submit to the City Engineer a written request for an interpretation or correction (Request for Information or RFI) not later than the date specified in the Notice Inviting Bids. Any RFI received after this date will be disregarded. All RFI's must be submitted via the City of Manhattan Beach Public Works Department Bid Opportunities webpage link to the PlanetBids portal at https://www.citymb.info/departments/public-works/bid-opportunities. Any interpretation or correction of the Contract Documents will be made only by a written Addendum. No oral interpretation of any provision in the Contract Documents shall be binding.

TRADE NAMES OR EQUALS. Requests to substitute an equivalent item for a brand or trade name item must be made by written request submitted no later than ten calendar days after the award of contract. Requests received after this time shall not be considered. Requests shall clearly describe the product for which approval is requested, including all data necessary to demonstrate acceptability.

TAXES. Except as may be otherwise specifically provided herein, all sales and/or use taxes assessed by federal, State or local authorities on materials used or furnished by the Contractor in performing the Work shall be paid by the Contractor. The Bidder shall calculate payment for all sales, unemployment, pension and other taxes imposed by federal, State, and local law and shall include these payments in computing the Bid.

PROTESTS. Any protest of the award of a bid to the apparent lowest responsive and responsible bidder or other bidders must be submitted in accordance with the provisions of the City of Manhattan Beach Public Works Department Bid Protest Procedure Policy 2020-1, available on the City of Manhattan Beach Public Works Department Bid Opportunities webpage at

https://www.manhattanbeach.gov/businesses/bid-opportunities

CHECKLIST FOR BIDDERS

The following information is required of all Bidders at the time of Bid submission:

____ Completed and Signed Bid Schedule, including cover sheet (page B-1)

____ Completed and Signed Contractor's Statement

____ Completed References Form

____ Completed Subcontractor Designation Form

____ Completed, Signed and Notarized Bid Bond or Other Security Form

____ Signed Noncollusion Declaration Form

____ Signed copies of all Addenda (if any)

____ Evidence satisfactory to the City indicating the capacity of the person(s) signing the Bid to bind the Bidder

Failure of the Bidder to provide all required information in a complete and accurate manner may cause the Bid to be considered non-responsive.

BID SCHEDULE NOTICE

Registered Bidders shall utilize the electronic Bid Schedule on the City of Manhattan Beach Bid Portal with PlanetBids to enter Bid Item prices, Subcontractor List information, to acknowledge receipt of Addenda, if any, and to upload scanned copies of other required Bid Forms for submittal

The link to register to become a Registered Bidder and electronically bid on this Project can be found at the following address:

https://www.manhattanbeach.gov/businesses/bid-opportunities

BID

CITY OF MANHATTAN BEACH

WATER INFRASTRUCTURE IMPROVEMENTS AND RESURFACING PROJECT - CYCLE 2

TO THE HONORABLE MAYOR AND CITY COUNCIL OF THE CITY OF MANHATTAN BEACH:

The undersigned, as Bidder, declares that: (1) this Bid is made without collusion with any other person and that the only persons or parties interested as principals are those named herein; (2) the undersigned has carefully examined the Contract Documents (including all Addenda) and the Project site; and (3) the undersigned has investigated and is satisfied as to the conditions to be encountered, the character, quality and quantities of Work to be performed, and the materials to be furnished. Furthermore, the undersigned agrees that submission of this Bid shall be conclusive evidence that such examination and investigation have been made and agrees, in the event the Contract be awarded to it, to execute the Contract with the City of Manhattan Beach to perform the Project in accordance with the Contract Documents in the time and manner therein prescribed, and to furnish or provide all materials, labor, tools, equipment, apparatus and other means necessary so to do, except as may otherwise be furnished or provided under the terms of the Contract Documents, for the following stated unit prices or lump-sum price as submitted on the Bid herein.

This Bid is made with the full knowledge of the kind, quantity, and quality of the materials and Work required and, if it is accepted by the City, the Bidder shall enter into a Contract and furnish the bonds, insurance, and other documents as required by the Contract Documents within ten calendar days after award of the Contract. The Bidder agrees that failure to execute and return the Contract or the required faithful performance bond, labor and materials payment bond, warranty bond, and insurance certificates to the City within the ten calendar day period shall be sufficient cause for the rescission of the award and forfeiture of the Bid Security to the City to the extent permitted by law.

Accompanying this Bid is cash, a cashier's check, a certified check or a Bid Bond in an amount equal to at least ten percent of the total aggregate Bid price based on the quantities shown and the unit prices quoted. The undersigned further agrees that, should it be awarded the Contract and thereafter fail or refuse to execute the Contract and provide the required evidence of insurance and Bonds within ten calendar days after delivery of the Contract to the undersigned, then the cash, check or Bid Bond shall be forfeited to the City to the extent permitted by law.

CITY OF MANHATTAN BEACH

BID SCHEDULE FOR

WATER INFRASTRUCTURE IMPROVEMENTS AND RESURFACING PROJECT - CYCLE 2

Bidder's Name: _____

Bidder's Address: _____

To the Honorable Mayor and Members of the City Council:

In compliance with the Notice Inviting Bids, the undersigned hereby agrees to execute the Contract to furnish all labor, materials, equipment and supplies for the Project in accordance with the Contract Documents to the satisfaction and under the direction of the City Engineer, at the following prices:

Base Bid Items as Follows:

SEGMENT P-10-1 (21ST ST) BASE BID SCHEDULE:
(SEE SHEET 9 ON PLANS)

ITEM NO.	CODE	DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT PRICES	EXTENDED AMOUNT
1	%	Mobilization (10% maximum of Total Bid Price)	LS	1	N/A	$
2	%	Special Project Site Maintenance and Public Convenience and Safety	LS	1	$ 10,000	$10,000
3	S	Monument Preservation, Restoration, and Survey	LS	1	N/A	$
4	S,%	Traffic Control	LS	1	N/A	$
5	S,%	Water Pollution Control Plan (BMPs)	LS	1	N/A	$
6		6-inch Ductile Iron Pipe Installation	LF	681	$	$
7		6-inch Gate Valve Installation	EA	6	$	$
8		3-inch Conduit Installation	LF	1,120	$	$

ITEM NO.	CODE	DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT PRICES	EXTENDED AMOUNT
9		Fiber Optic Pull Box	EA	4	$	$
10		Pipeline Pressure Testing, Disinfection, and Bac-T Testing	LS	1	N/A	$
11		Residential Service Connections	EA	22	$	$
12		Remove Existing and Construct New 4" Thick PCC Sidewalk	SF	100	$	$
13		Remove Existing and Construct new 6" Curb and 12" Gutter	LF	10	$	$
14		Air Release Valve Assembly Installation	EA	2	$	$
15		Scan Street to Locate any Buried Water Valves and/or Manhole Covers	LS	1	$	$
16		Trench Surface Repair –	SY	115	$	$
17		Tensar GLASPAVE25	SY	1,860	$	$
18		Asphalt Concrete Pavement Overlay	SY	1,860	$	$
19		Asphalt Concrete Milling	SY	1,860	$	$
20	S	Adjust Storm Drain Manhole to Grade	LS	1	$	$
21	S	Adjust Sewer Manhole to Grade	LS	1	$	$
22	S	Adjust Water Valve Cover to Grade	LS	1	$	$
23	F	Field Walk with City, Clean-up Debris in water valves and manhole.	LS	1	$	$

ITEM NO.	CODE	DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT PRICES	EXTENDED AMOUNT
24		ADA Ramp Replacement	EA	4	$	$
25	S,%	Hazardous Waste Abatement	LS	1	N/A	$
26	%	Shoring	LS	1	N/A	$
27		Anchor Walls	EA	2	$	$
28		Thrust Blocks	EA	2	$	$
29	S	Signing and Striping	LS	1	$	$
		TOTAL SEGMENT P-10-1 BASE BID SCHEDULE:				$_____

SEGMENT P-10-2 (19TH ST) BASE BID SCHEDULE:
(SEE SHEET 10 ON PLANS)

ITEM NO.	CODE	DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT PRICES	EXTENDED AMOUNT
1	%	Mobilization (10% maximum of Total Bid Price)	LS	1	N/A	$
2	%	Special Project Site Maintenance and Public Convenience and Safety	LS	1	$ 10,000	$10,000
3	S	Monument Preservation, Restoration, and Survey	LS	1	N/A	$
4	S,%	Traffic Control	LS	1	N/A	$
5	S,%	Water Pollution Control Plan (BMPs)	LS	1	N/A	$
6		6-inch Ductile Iron Pipe Installation	LF	904	$	$

ITEM NO.	CODE	DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT PRICES	EXTENDED AMOUNT
7		6-inch Gate Valve Installation	EA	5	$	$
8		8-inch Gate Valve Installation	EA	2	$	$
9		3-inch Conduit Installation	LF	1,555	$	$
10		Fiber Optic Pull Box	EA	5	$	$
11		Pipeline Pressure Testing, Disinfection, and Bac-T Testing	LS	1	N/A	$
12		Residential Service Connections	EA	22	$	$
13		Remove Existing and Construct New 4” Thick PCC Sidewalk	SF	100	$	$
14		Remove Existing and Construct new 6” Curb and 12” Gutter	LF	10	$	$
15		Fire Hydrant Assembly Installation	EA	2	$	$
16		Air Release Valve Assembly Installation	EA	2	$	$
17		Pipeline Blow-off Assembly Installation	EA	2	$	$
18		Scan Street to Locate any Buried Water Valves and/or Manhole Covers	LS	1	$	$
19		Trench Surface Repair –	SY	80	$	$

ITEM NO.	CODE	DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT PRICES	EXTENDED AMOUNT
20		Tensar GLASPAVE25	SY	2,800	$	$
21		Asphalt Concrete Pavement Overlay	SY	2,800	$	$
22		Asphalt Concrete Milling	SY	2,800	$	$
23	S	Adjust Storm Drain Manhole to Grade	LS	1	$	$
24	S	Adjust Sewer Manhole to Grade	LS	1	$	$
25	S	Adjust Water Valve Cover to Grade	LS	1	$	$
26	F	Field Walk with City, Clean-up Debris in water valves and manhole.	LS	1	$	$
27		ADA Ramp Replacement	EA	5	$	$
28	S,%	Hazardous Waste Abatement	LS	1	N/A	$
29	%	Shoring	LS	1	N/A	$
30		Anchor Walls	EA	2	$	$
31		Thrust Blocks	EA	4	$	$
32	S	Signing and Striping	LS	1	$	$
		TOTAL SEGMENT P-10-2 BASE BID SCHEDULE:				$_____

HERRIN AVE PAVING BASE BID SCHEDULE:
(SEE APPENDIX VI)

ITEM NO.	CODE	DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT PRICES	EXTENDED AMOUNT
1		Scan Street to Locate any Buried Water Valves and/or Manhole Covers	LS	1	$	$
2		Tensar GLASPAVE25	SY	1,310	$	$
3		Asphalt Concrete Pavement Overlay	SY	1,310	$	$
4		Asphalt Concrete Milling	SY	1,310	$	$
5	S	Adjust Storm Drain Manhole to Grade	LS	1	$	$
6	S	Adjust Sewer Manhole to Grade	LS	1	$	$
7	S	Adjust Water Valve Cover to Grade	LS	1	$	$
8	F	Field Walk with City, Clean-up Debris in water valves and manhole.	LS	1	$	$
9		ADA Ramp Replacement	EA	1	$	$
10	S,%	Hazardous Waste Abatement	LS	1	N/A	$
11	%	Pervious Gutter	LF	124	N/A	$
12	S	Signing and Striping	LS	1	$	$
		TOTAL HERRIN AVE PAVING BASE BID SCHEDULE:				$_____

SEGMENT P-7 (14TH ST) ADDITIVE BID SCHEDULE A:
(SEE SHEET 6 ON PLANS)

ITEM NO.	CODE	DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT PRICES	EXTENDED AMOUNT
1	%	Mobilization (10% maximum of Total Bid Price)	LS	1	N/A	$
2	%	Special Project Site Maintenance and Public Convenience and Safety	LS	1	$ 10,000	$10,000
3	S	Monument Preservation, Restoration, and Survey	LS	1	N/A	$
4	S,%	Traffic Control	LS	1	N/A	$
5	S,%	Water Pollution Control Plan (BMPs)	LS	1	N/A	$
6		6-inch Ductile Iron Pipe Installation	LF	560	$	$
7		6-inch Gate Valve Installation	EA	3	$	$
8		3-inch Conduit Installation	LF	1,120	$	$
9		Fiber Optic Pull Box	EA	4	$	$
10		Pipeline Pressure Testing, Disinfection, and Bac-T Testing	LS	1	N/A	$
11		Residential Service Connections	EA	22	$	$
12		Remove Existing and Construct New 4” Thick PCC Sidewalk	SF	100	$	$
13		Remove Existing and Construct new 6” Curb and 12” Gutter	LF	10	$	$

ITEM NO.	CODE	DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT PRICES	EXTENDED AMOUNT
14		Fire Hydrant Assembly Installation	EA	1	$	$
15		Air Release Valve Assembly Installation	EA	1	$	$
16		Scan Street to Locate any Buried Water Valves and/or Manhole Covers	LS	1	$	$
17		Trench Surface Repair	SY	400	$	$
18	S	Adjust Water Valve Cover to Grade	LS	1	$	$
19	F	Field Walk with City, Clean-up Debris in water valves and manhole.	LS	1	$	$
20		ADA Ramp Replacement	EA	2	$	$
21	S,%	Hazardous Waste Abatement	LS	1	N/A	$
22	%	Shoring	LS	1	N/A	$
23		Anchor Walls	EA	2	$	$
24		Thrust Blocks	EA	2	$	$
25	S	Signing and Striping	LS	1	$	$
		TOTAL SEGMENT P-7 BASE BID SCHEDULE:				$_____

SEGMENT P-8 (AGNES RD. AND FLOURNOY RD.) ADDITIVE BID SCHEDULE B:
(SEE SHEETS 7 AND 8 ON PLANS)

ITEM NO.	CODE	DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT PRICES	EXTENDED AMOUNT
1	%	Mobilization (10% maximum of Total Bid Price)	LS	1	N/A	$
2	%	Special Project Site Maintenance and Public Convenience and Safety	LS	1	$ 10,000	$10,000
3	S	Monument Preservation, Restoration, and Survey	LS	1	N/A	$
4	S,%	Traffic Control	LS	1	N/A	$
5	S,%	Water Pollution Control Plan (BMPs)	LS	1	N/A	$
6		6-inch Ductile Iron Pipe Installation	LF	1,210	$	$
7		6-inch Gate Valve Installation	EA	12	$	$
8		12-in Ductile Iron Gate Valve Installation	EA	2	$	$
9		3-inch Conduit Installation	LF	1,050	$	$
10		Fiber Optic Pull Box	EA	8	$	$
11		Pipeline Pressure Testing, Disinfection, and Bac-T Testing	LS	1	N/A	$
12		Residential Service Connections	EA	41	$	$
13		Remove Existing and Construct New 4” Thick PCC Sidewalk	SF	100	$	$

ITEM NO.	CODE	DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT PRICES	EXTENDED AMOUNT
14		Remove Existing and Construct new 6” Curb and 12” Gutter	LF	10	$	$
15		Air Release Valve Assembly Installation	EA	1	$	$
16		Pipeline Blow-off Assembly Installation	EA	2	$	$
17		Scan Street to Locate any Buried Water Valves and/or Manhole Covers	LS	1	$	$
18		Trench Surface Repair	SY	100	$	$
19		Tensar GLASPAVE25 – Flournoy St	SY	930	$	$
20		Asphalt Concrete Pavement Overlay (ARHM) – Flournoy St	SY	930	$	$
20		Asphalt Concrete Pavement Overlay (HMA) – Agnes Rd	SY	2,280	$	$
21		Asphalt Concrete Milling (1.5”) – Flournoy St	SY	930	$	$
22		Asphalt Concrete Milling (2”) – Agnes Rd	SY	2,280	$	$
23	S	Adjust Sewer Manhole to Grade	LS	1	$	$
24	S	Adjust Water Valve Cover to Grade	LS	1	$	$
25	F	Field Walk with City, Clean-up Debris in water valves and manhole.	LS	1	$	$
26		ADA Ramp Replacement	EA	3	$	$

ITEM NO.	CODE	DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT PRICES	EXTENDED AMOUNT
27	S,%	Hazardous Waste Abatement	LS	1	N/A	$
28	%	Shoring	LS	1	N/A	$
29		Anchor Walls	EA	8	$	$
30		Thrust Blocks	EA	2	$	$
31	S	Signing and Striping	LS	1	$	$
32		Decorative/Colored Concrete Replacement	SY	106	$	$
		TOTAL SEGMENT P-8 BASE BID SCHEDULE:				$_____

NOTES:

1) In the CODE column (S) denotes a specialty item, (%) denotes progress payments for that lump sum item will be allowed based on the percentage of completion in each pay period, and (F) denotes final pay items. See Subsection 9-2.1 of the General Provisions for details.

2) In the UNIT column (LS) denotes a lump sum item. See Section 9 of the General Provisions for details.

3) Estimated quantities are for the purpose of Bid comparison only; payments will be made on the basis of actual measurement of Work completed, except for lump sum (LS) items and final pay (F) quantities. For lump sum items, see Note 1. The Bid Price shall include, but not limited to, sales tax and all other applicable taxes and fees.

4) Items may be adjusted or deleted. Therefore, regardless of total actual volume (percentage) compared to estimated quantities, the unit prices provided above by the Bidder shall be applied to the final quantity when payment is calculated for these items. No adjustment in the unit prices will be allowed. The City reserves the right to not use any of the estimated quantities; and if this right is exercised, the Contractor will not be entitled to any additional compensation. Cost of all export of material shall be included in the above unit costs; no additional compensation will be granted for such expenses.

Total Bid Price = Base Bid Schedule Amount Plus (+) All Additive Bid Schedule Amounts

TOTAL BID PRICE IN DIGITS: $_____

TOTAL BID PRICE IN WORDS: _____

The undersigned certifies to have a minimum of three consecutive years of current experience in the type of Work related to the Project and that this experience is in actual operation of the firm with permanent employees performing a part of the Work as distinct from a firm operating entirely by subcontracting all phases of the Work. The undersigned also certifies to be properly licensed by the State as a contractor to perform this type of Work. The undersigned possesses California Contractor's License

Number _____, Class _____, which expires on _____.

Signature: _____ Title: _____ Date: _____

Signature: _____ Title: _____ Date: _____

BIDDER'S PROPOSAL – CONTRACTOR'S STATEMENT

WATER INFRASTRUCTURE IMPROVEMENTS AND RESURFACING PROJECT - CYCLE 2

Fill out all of the following information. Attach additional sheets if necessary.

(1) Bidder's Name: _____

(2) If the Bidder's name is a fictitious name, who or what is the full name of the registered owner? If the Bidder's name is not a fictitious name, write "N/A" in the response to this question. If you are doing business under a fictitious name, provide a copy of the filed valid Fictitious Business Name Statement.

_____

(3) Business Address: _____

(4) Telephone: _____ Email: _____

(5) Type of Firm – Individual, Partnership, LLC or Corporation: _____

(6) Corporation organized under the laws of the State of: _____

(7) California State Contractor's License Number and Class: _____

Original Date Issued: _____ Expiration Date: _____

(8) DIR Contractor Registration Number: _____

(9) List the name and title of the person(s) who inspected the Project site for your firm:

_____

(10) Number of years experience the company has as a contractor in construction work: ____

(11) List the names, titles, addresses and telephone numbers of all individuals, firm members, partners, joint venturers, and company or corporate officers having a principal interest in this Bid:

_____

_____

_____

(12) List all current and prior D.B.A.'s, aliases, and fictitious business names for any principal having interest in this Bid:

_____

_____

_____

(13) List the dates of any voluntary or involuntary bankruptcy judgments against any principal having an interest in this Bid:

_____

_____

_____

(14) For all arbitrations, lawsuits, settlements and the like (in or out of court) that the company or any principal having an interest in this Bid has been involved with in the past five years:

a. List the names, addresses and telephone numbers of contact persons for the parties:

_____

_____

_____

b. Briefly summarize the parties' claims and defenses:

_____

_____

_____

c. State the tribunal (e.g., Superior Court, American Arbitration Association, etc.), the matter number, and the outcome:

_____

_____

_____

(15) Has the company or any principal having an interest in this Bid ever had a contract terminated by the owner or agency? If yes, explain.

_____

_____

_____

(16) Has the company or any principal having an interest in this Bid ever failed to complete a project? If yes, explain.

_____

_____

_____

(17) Has the company or any principal having an interest in this Bid ever been terminated for cause, even if it was converted to a "termination of convenience"? If yes, explain.

_____

_____

_____

(18) For projects that the company or any principal having an interest in this Bid has been involved with in the last five years, did you have any claims or actions:

a. By you against the owner? Circle one: Yes No

b. By the owner against you? Circle one: Yes No

c. By any outside agency or individual for labor compliance?
Circle one: Yes No

d. By Subcontractors? Circle one: Yes No

e. Are any of these claims or actions unresolved or outstanding?
Circle one: Yes No

If your answer is "yes" to any part or parts of this question, explain.

_____

_____

_____

(19) Has the company or any of its principals ever been debarred by any agencies? Is yes, please explain.

_____

_____

_____

(21) For all public agency projects in excess of $15,000.00 that you are currently working on or have worked on in the past two years, provide the following information:

Project 1 Name/Number _____

Project Description _____

Approximate Construction Dates From: _____ To: _____

Agency Name: _____

Contact Person: _____Telephone: _____

Address: _____

Original Contract Amount: $_____ Final Contract Amount: $_____

If final amount is different from original amount, please explain (change orders, extra work, etc.).

_____

_____

Did you or any Subcontractor, file any claims against the Agency?
Circle one: Yes No

Did the Agency file any claims against you? Circle one: Yes No

If you answered yes to either of the above two questions, please explain and indicate outcome of claims.

_____

_____

Project 2 Name/Number _____

Project Description _____

Approximate Construction Date From: _____ To: _____

Agency Name: _____

Contact Person: _____Telephone: _____

Address: _____

Original Contract Amount: $_____ Final Contract Amount: $_____

If final amount is different from original amount, please explain (change orders, extra work, etc.).

_____

_____

Did you or any Subcontractor, file any claims against the Agency?
Circle one: Yes No

Did the Agency file any claims against you? Circle one: Yes No

If you answered yes to either of the above two questions, please explain and indicate outcome of claims.

_____

_____

Project 3 Name/Number _____

Project Description _____

Approximate Construction Dates From: _____ To: _____

Agency Name: _____

Contact Person: _____ Telephone: _____

Address: _____

Original Contract Amount: $_____ Final Contract Amount: $_____

If final amount is different from original amount, please explain (change orders, extra work, etc.).

_____

_____

Did you or any Subcontractor, file any claims against the Agency?
Circle one: Yes No

Did the Agency file any claims against you? Circle one: Yes No

If you answered yes to either of the above two questions, please explain and indicate outcome of claims.

_____

_____

Project 4 Name/Number _____

Project Description _____

Approximate Construction Dates From: _____ To _____

Agency Name: _____

Contact Person: _____ Telephone: _____

Address: _____

Original Contract Amount: $_____ Final Contract Amount: $_____

If final amount is different from original amount, please explain (change orders, extra work, etc.).

_____

_____

Did you or any Subcontractor, file any claims against the Agency?
Circle one: Yes No

Did the Agency file any claims against you? Circle one: Yes No

If you answered yes to either of the above two questions, please explain and indicate outcome of claims.

_____

_____

Project 5 Name/Number _____

Project Description _____

Approximate Construction Dates From: _____ To: _____

Agency Name: _____

Contact Person: _____ Telephone: _____

Address: _____

Original Contract Amount: $_____ Final Contract Amount: $_____

If final amount is different from original amount, please explain (change orders, extra work, etc.).

_____

_____

Did you or any Subcontractor, file any claims against the Agency?
Circle one: Yes No

Did the Agency file any claims against you? Circle one: Yes No

If you answered yes to either of the above two questions, please explain and indicate outcome of claims.

_____

_____

Project 6 Name/Number _____

Project Description _____

Approximate Construction Dates From: _____ To: _____

Agency Name: _____

Contact Person: _____ Telephone: _____

Address: _____

Original Contract Amount: $_____ Final Contract Amount: $_____

If final amount is different from original amount, please explain (change orders, extra work, etc.).

_____

_____

Did you or any Subcontractor, file any claims against the Agency?
Circle one: Yes No

Did the Agency file any claims against you? Circle one: Yes No

If you answered yes to either of the above two questions, please explain and indicate outcome of claims.

_____

_____

[Continue to Next Page]

Upon request of the City, the Bidder shall furnish evidence showing a notarized financial statement, financial data, construction experience, or other additional information.

Failure to provide truthful answers to the questions above or in the following References Form may result in the Bid being deemed non-responsive.

Urban Runoff Certification. The Bidder certifies to the City that he/she has trained his/her employees and Subcontractors, if any, for Urban Runoff management and has included sufficient sums in the Bid Price to cover such costs of training as stipulated in the most current Regional Water Quality Control Board requirements, including the Municipal Separate Storm Sewer System NPDES Permit. The Contractor is responsible for all clean up and payment of all fines levied as a result of any illegal discharge (as defined in NPDES permit) occurring as a result of the Contractor's Work and/or operations.

I, the undersigned, certify and declare that I have read all the foregoing answers to the Bidder's Proposal – Contractor's Statement and know their contents. The matters stated in the Bidder's Proposal – Contractor's Statement answers are true of my own knowledge and belief, except as to those matters stated on information and belief, and as to those matters I believe them to be true. I declare under penalty of perjury under the laws of the State of California that the foregoing is correct.

Company

Signature: _____

Name: _____

Title: _____

Date: _____

Signature: _____

Name: _____

Title: _____

Date: _____

DESIGNATION OF SUBCONTRACTORS
[Public Contract Code Section 4104]

WATER INFRASTRUCTURE IMPROVEMENTS AND RESURFACING PROJECT - CYCLE 2

List all Subcontractors who will perform Work or labor or render service 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 Plans and Specifications, in an amount in excess of one-half percent of the Contractor's total Bid or, in the case of bids or offers for the construction of streets or highways, including bridges, in excess of one-half percent of the Contractor's total Bid or $10,000.00, whichever is greater. If all Subcontractors do not fit on this page, attach another page listing all information for all other Subcontractors.

Name under which Subcontractor is Licensed and Registered	CSLB License Number(s) and Class(es)	DIR Contractor Registration Number	Address and Phone Number	Type of Work (e.g., Electrical)	Percentage of Total Bid (e.g., 10%)*

*The percentage of the total Bid shall represent the "portion of the work" for the purposes of Public Contract Code Section 4104(b).

Bond No. _____

BID BOND

WATER INFRASTRUCTURE IMPROVEMENTS AND RESURFACING PROJECT - CYCLE 2

KNOW ALL PERSONS BY THESE PRESENTS that:

WHEREAS the City of Manhattan Beach ("City"), has issued an invitation for Bids for the Work described as follows: _____

WHEREAS _____
(Name and address of Bidder)

("Principal"), desires to submit a Bid to City for the Work.

WHEREAS, Bidders are required to furnish a form of Bidder's security with their Bids.

NOW, THEREFORE, we, the undersigned Principal, and _____

_____
(Name and address of Surety)

("Surety"), a duly admitted surety insurer under the laws of the State of California, as Surety, are held and firmly bound unto the City in the penal sum of _____ Dollars ($_____), being not less than ten percent of the total Bid price, in lawful money of the United States of America, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH THAT, if the hereby bounded Principal is awarded the Contract for the Work by the City and, within the time and in the manner required by the bidding specifications, enters into the written form of Contract included with the bidding specifications, furnishes the required Bonds (one to guarantee faithful performance and the other to guarantee payment for labor and materials), and furnishes the required insurance coverage, then this obligation shall become null and void; otherwise, it shall be and remain in full force and effect.

In case suit is brought upon this instrument, Surety further agrees to pay all court costs incurred by the City in the suit and reasonable attorneys' fees in an amount fixed by the court. Surety hereby waives the provisions of Civil Code Section 2845.

IN WITNESS WHEREOF, this instrument has been duly executed by Principal and Surety, on the date set forth below, the name of each corporate party being hereto affixed and these presents duly signed by its undersigned representative(s) pursuant to authority of its governing body.

Dated: _____

"Principal"

Name: _____
Address: _____
_____
Telephone No.: _____

Signature: _____
_____
Print Name: _____
Title: _____
Date: _____
_____

Signature: _____
_____
Print Name: _____
Title: _____
Date: _____

"Surety"

Company Name: _____
Address: _____
_____
Telephone No.: _____

Signature: _____
_____
Print Name: _____
Title: _____
Date: _____

NOTE: *This Bond must be dated, all signatures must be notarized, and evidence of the authority of any person signing as attorney-in-fact must be attached.*

NONCOLLUSION DECLARATION FORM
TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID
[Public Contract Code Section 7106]

WATER INFRASTRUCTURE IMPROVEMENTS AND RESURFACING PROJECT - CYCLE 2

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].

Signature:	_____	Signature:	_____
Printed Name:	_____	Printed Name:	_____
Date:	_____	Date:	_____

This form must be notarized.

ADDENDA ACKNOWLEDGMENT FORM

WATER INFRASTRUCTURE IMPROVEMENTS AND RESURFACING PROJECT - CYCLE 2

Bidder's Name: _____

The Bidder shall signify receipt of all Addenda here, if any:

Addendum Number	Date Received	Signature

If there are more Addenda than there is room in the chart above, attach another page acknowledging receipt of the Addenda.

CONTRACT

CITY OF MANHATTAN BEACH CONTRACT FOR

WATER INFRASTRUCTURE IMPROVEMENTS AND RESURFACING PROJECT - CYCLE 2

THIS CONTRACT ("Contract") is made and entered this _____ day of _____, 20___ ("Effective Date"), by and between the CITY OF MANHATTAN BEACH, a California municipal corporation ("City") and _____, a _____ [Legal Form of Entity and state of formation, e.g., California corporation, limited partnership, limited liability company] ("Contractor"). The Contractor's California State Contractor's license number is _____.

In consideration of the mutual covenants hereinafter set forth, the parties hereto agree as follows:

1. Contract Documents. The Contract Documents consist of this Contract, the Notice Inviting Bids, Instructions to Bidders, Bid (including documentation accompanying the Bid and any post-Bid documentation submitted before the Notice of Award), the Bonds, permits from regulatory agencies with jurisdiction, General Provisions, Special Provisions, Plans, Standard Plans, Standard Specifications, Reference Specifications, Addenda, Change Orders, and Supplemental Agreements. The Contract Documents are attached hereto and incorporated herein by reference.

2. Scope of Services. The Contractor shall perform and provide all materials, tools, equipment, labor, and services necessary to complete the Work in a good and workmanlike manner for the project identified as **Cycle 2 Water Infrastructure Improvements Project** ("Project"), as described in the Contract Documents.

3. Compensation.

3.1 Contract Price and Basis for Payment. In consideration for the Contractor's full, complete, and timely performance of the Work required by the Contract Documents, the City shall pay the Contractor for the actual quantity of Work required under the Bid Items awarded by the City performed in accordance with the lump sum prices and unit prices for Bid Items, set forth in the Bidder's Proposal submitted with the Bid. The sum of the unit prices and lump sum prices for the Bid Items, awarded by the City is $_____ ("Contract Price"). It is understood and agreed that the quantities set forth in the Bidder's Proposal for which unit prices are fixed are estimates only and that the City will pay and the Contractor will accept, as full payment for these items of work, the unit prices set forth in the Bidder's Proposal multiplied by the actual number of units performed, constructed, or completed as directed by the Engineer.

3.2 Payment Procedures. Based upon applications for payment submitted by the Contractor to the City, the City shall make payments to the Contractor in accordance with Section 9 of the Standard Specifications, as modified by Section 9 of the General Provisions.

4. Contract Time.

4.1 Initial Notice to Proceed. The City shall issue the "Notice to Proceed to Fulfill Preconstruction Requirements and Order Materials." The date specified in the Notice to Proceed to Fulfill Preconstruction Requirements and Order Materials constitutes the date of commencement of the Contract Time of 120 Working Days for Base Bid Items [number of working days may change if one or more of the Additive Bid Items are awarded]. The Contract Time

includes the time necessary to fulfill preconstruction requirements, place the order for materials, and to complete construction of the Project (except as adjusted by subsequent Change Orders).

The Notice to Proceed to Fulfill Preconstruction Requirements and Order Materials shall further specify that the Contractor must complete the preconstruction requirements and order materials within **10 Working Days** after the date of commencement of the Contract Time; this duration is part of the Contract Time.

Preconstruction requirements include, but are not limited to, the following:

- Submitting and obtaining approval of Baseline Schedule
- Submitting and obtaining approval of Traffic Control Plans
- Submitting and obtaining approval of the Stormwater Pollution Prevention Plan (SWPPP)/Water Pollution Control Plan (WPCP)
- Submitting and obtaining approval of critical required submittals
- Installation of the approved Project Identification Signs
- Obtaining approved Permits from all applicable agencies
- Obtaining a Temporary Use Permit for a construction yard, if applicable
- Notifying all agencies, utilities, residents, etc., as outlined in the Contract Documents
- Submitting and obtaining approval of a Project Staffing List with contact information and a Project Emergency Contact List.

4.4 Notice to Proceed with Construction. After all preconstruction requirements are met and materials have been ordered in accordance with the Notice to Proceed to Fulfill Preconstruction Requirements and Order Materials, the City shall issue the "Notice to Proceed with Construction," at which time the Contractor shall diligently prosecute the Work, including corrective items of Work, day to day thereafter, within the remaining Contract Time.

5. Liquidated Damages for Delay and Control of Work.

5.1 Liquidated Damages. The Contractor and the City have agreed to liquidate damages pursuant to Section 6-9 of the General Provisions.

7. Work after Stop Work Notice. Any work completed by the Contractor after the issuance of a Stop Work Notice by the City shall be rejected and/or removed and replaced as specified in the applicable Section of the Special Provisions.

8. Antitrust Claims. In entering into this Contract, the Contractor offers and agrees to assign to the City all rights, title, and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. Sec.§ 15) or under the Cartwright Act (Business and Professions Code Section 16700 *et seq*.) arising from purchases of goods, services, or materials pursuant to the Contract. This assignment shall be made and become effective at the time the City tenders final payment to the Contractor without further acknowledgment by the parties.

9. Prevailing Wages. The City and the Contractor acknowledge that the Project is a public work to which prevailing wages apply.

10. Workers' Compensation. Labor Code Sections 1860 and 3700 provide that every contractor will be required to secure the payment of compensation to its employees. In accordance with the provisions of Labor Code Section 1861, by signing this Contract, the Contractor certifies as follows:

> "I am aware of the provisions of Section 3700 of the Labor Code which require every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that Code, and I will comply with such provisions before commencing the performance of the Work of this Contract."

11. Titles. The titles used in this Contract are for convenience only and shall in no way define, limit or describe the scope or intent of this Contract or any part of it.

12. Authority. Any person executing this Contract on behalf of the Contractor warrants and represents that he or she has the authority to execute this Contract on behalf of the Contractor and has the authority to bind the Contractor to the performance of its obligations hereunder.

13. Entire Agreement. This Contract, including the Contract Documents and any other documents incorporated herein by specific reference, represents the entire and integrated Contract between the City and the Contractor. This Contract supersedes all prior oral or written negotiations, representations or agreements. This Contract may not be modified or amended, nor any provision or breach waived, except in a writing signed by both parties that expressly refers to this Contract.

14. Counterparts. This Contract may be executed in counterpart originals, duplicate originals, or both, each of which is deemed to be an original for all purposes.

IN WITNESS WHEREOF, the parties hereto have executed this Contract the day and year first above written.

CITY:
CITY OF MANHATTAN BEACH
a California Municipal Corporation

By: _____
Bruce Moe, City Manager

ATTEST:

By: _____
Liza Tamura, City Clerk

APPROVED AS TO FORM:

By: _____
Quinn M. Barrow, City Attorney

APPROVED AS TO FISCAL IMPACT:

By: _____
Steve S. Charelian

APPROVED AS TO CONTENT:

By: _____
Erick Lee, Public Works Director

CONTRACTOR:

By: _____
Contractor, President

Bond No. _____

PAYMENT BOND
(LABOR AND MATERIALS)

KNOW ALL PERSONS BY THESE PRESENTS that:

WHEREAS the City of Manhattan Beach ("City"), State of California, has awarded to _____
_____
_____ ("Principal")
(Name and address of Contractor)

a contract (the "Contract") for the Work described as follows:

_____

Water Infrastructure Improvements and Resurfacing Project - Cycle 2

WHEREAS, under the terms of the Contract, the Principal is required before entering upon the performance of the Work, to file a good and sufficient payment Bond with the City to secure the claims to which reference is made in Title 3 (commencing with Section 9000) of Part 6 of Division 4 of the Civil Code.

NOW, THEREFORE, we, the undersigned Principal, and _____
_____
_____
(Name and address of Surety)

("Surety") a duly admitted surety insurer under the laws of the State of California, as Surety, are held and firmly bound unto the City and all contractors, subcontractors, laborers, material suppliers, and other persons employed in the performance of the Contract and referred to in Title 3 (commencing with Section 9000) of Part 6 of Division 4 of the Civil Code in the penal sum of _____ Dollars ($_____), for materials furnished or labor thereon of any kind, or for amounts due under the Unemployment Insurance Act with respect to this Work or labor, that the Surety will pay the same in an amount not exceeding the amount hereinabove set forth, and also in case suit is brought upon this Bond, will pay, in addition to the face amount thereof, costs and reasonable expenses and fees, including reasonable attorneys' fees, incurred by City in successfully enforcing this obligation, to be awarded and fixed by the court, and to be taxed as costs and to be included in the judgment therein rendered.

It is hereby expressly stipulated and agreed that this Bond shall inure to the benefit of any and all persons, companies, and corporations entitled to file claims under Title 3 (commencing with Section 9000) of Part 6 of Division 4 of the Civil Code, so as to give a right of action to them or their assigns in any suit brought upon this Bond.

Upon expiration of the time within which the California Labor Commissioner may serve a civil wage and penalty assessment against the principal, any of its subcontractors, or both the principal and its subcontractors pursuant to Labor Code Section 1741, and upon expiration of the time within which a joint labor management committee may commence an action against the principal, any of its subcontractors, or both the principal and its subcontractors pursuant to Labor Code Section 1771.2, if the condition of this Bond be fully performed, then this obligation shall become null and void; otherwise, it shall be and remain in full force and effect.

The Surety hereby stipulates and agrees that no change, extension of time, alteration, or addition to the terms of the Contract or the Specifications accompanying the same shall in any manner affect its obligations on this Bond, and it does hereby waive notice of any such change, extension, alteration, or addition.

IN WITNESS WHEREOF, two identical counterparts of this instrument, each of which shall for all purposes be deemed an original hereof, have been duly executed by Principal and Surety, on the date set forth below, the name of each corporate party being hereto affixed and these presents duly signed by its undersigned representative(s) pursuant to authority of its governing body.

Dated: _____

"Principal"

_____

_____

Signature: _____

_____

Print Name: _____
Title: _____
Date: _____

Signature: _____

_____

Print Name: _____
Title: _____
Date: _____

(Seal)

"Surety"

_____

_____

Signature: _____

_____

Print Name: _____
Title: _____
Date: _____

(Seal)

NOTE: *This Bond must be executed in duplicate and dated, all signatures must be notarized, and evidence of the authority of any person signing as attorney-in-fact must be attached.* *DATE OF BOND MUST NOT BE BEFORE DATE OF CONTRACT.* Surety companies executing Bonds must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the State where the project is located.

Bond No. _____

PERFORMANCE BOND

KNOW ALL PERSONS BY THESE PRESENTS that:

WHEREAS the City of Manhattan Beach ("City"), has awarded to _____

_____

_____ ("Principal")

(Name and address of Contractor)

a contract (the "Contract") for the Work described as follows:

_____

Water Infrastructure Improvements and Resurfacing Project - Cycle 2

WHEREAS, Principal is required under the terms of the Contract to furnish a Bond for the faithful performance of the Contract.

NOW, THEREFORE, we, the undersigned Principal, and _____

_____

_____,

(Name and address of Surety)

("Surety") a duly admitted surety insurer under the laws of the State of California, as Surety, are held and firmly bound unto the City in the penal sum of _____ Dollars ($_____), this amount being not less than the total Contract Price, in lawful money of the United States of America, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, successors executors and administrators, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH THAT, if the hereby bounded Principal, his, her or its heirs, executors, administrators, successors or assigns, shall in all things stand to and abide by, and well and truly keep and perform the covenants, conditions and provisions in the Contract and any alteration thereof made as therein provided, on the Principal's part, to be kept and performed at the time and in the manner therein specified, and in all respects according to their true intent and meaning, and shall indemnify and save harmless the City, its officers, agents and employees, as therein stipulated, then this obligation shall become null and void; otherwise, it shall be and remain in full force and effect.

As a part of the obligation secured hereby and in addition to the face amount specified therefor, there shall be included costs and reasonable expenses and fees, including reasonable attorneys' fees, incurred by City in successfully enforcing such obligation, all to be taxed as costs and included in any judgment rendered. Surety hereby waives any statute of limitations as it applies to an action on this Bond.

The Surety hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract or of the Work to be performed thereunder or the specifications accompanying the same shall in anywise affect its obligations under this Bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Contract or to the Work or to the specifications. Surety hereby waives the provisions of California Civil Code Sections 2845 and 2849. The City is the principal beneficiary of this Bond and has all rights of a party hereto.

IN WITNESS WHEREOF, two identical counterparts of this instrument, each of which shall for all purposes be deemed an original hereof, have been duly executed by Principal and Surety, on the date set forth below, the name of each corporate party being hereto affixed and these presents duly signed by its undersigned representative(s) pursuant to authority of its governing body.

Dated: _____

"Principal"

_____

_____

Signature: _____

_____

Print Name: _____
Title: _____
Date: _____

Signature: _____

_____

Print Name: _____
Title: _____
Date: _____

(Seal)

"Surety"

_____

_____

Signature: _____

_____

Print Name: _____
Title: _____
Date: _____

(Seal)

NOTE: *This Bond must be executed in duplicate and dated, all signatures must be notarized, and evidence of the authority of any person signing as attorney-in-fact must be attached.* *DATE OF BOND MUST NOT BE BEFORE DATE OF CONTRACT.* Surety companies executing Bonds must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the State where the project is located.

Bond No. _____

WARRANTY BOND

KNOW ALL PERSONS BY THESE PRESENTS that:

WHEREAS the City of Manhattan Beach ("City"), State of California, has awarded to_____
_____
_____ ("Principal")
(Name and address of Contractor)

a contract (the "Contract") for the Work described as follows:

_____

Water Infrastructure Improvements and Resurfacing Project - Cycle 2

WHEREAS, under the terms of the Contract, the Principal is required before entering upon the performance of the Work to file a good and sufficient warranty Bond with the City.

NOW, THEREFORE, we, the undersigned Principal, and _____
_____
_____
(Name and address of Surety)

("Surety") a duly admitted surety insurer under the laws of the State of California, as Surety, are held and firmly bound unto the City in the penal sum of _____ Dollars ($_____) this amount being not less than 10% of the total Contract Price, lawful money of the United States of America, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH THAT, if the hereby bounded Principal, his, her or its heirs, executors, administrators, successors or assigns, shall remedy, without cost to the City, any defects which may develop during a period of one year from the date of completion and acceptance of the work performed under the Contract, caused by defective or inferior materials or workmanship, and shall indemnify, defend and hold harmless the City, its officers, agents, and employees for any and all claims, demands, causes of action, damages, injuries, liabilities, losses, costs or expenses, including attorneys' fees and costs of defense, which arise out of, pertain to, or relate to such defects or to the Principal's actions or inactions in remedying such defects, then this obligation shall become null and void; otherwise it shall be and remain in full force and effect.

In case suit is brought upon this bond, Surety further agrees to pay, in addition to the Penal Sum, all costs and reasonable expenses and fees, including reasonable attorneys' fees, incurred by the City in successfully enforcing such obligation, all to be taxed as costs and included in any judgment rendered.

FURTHER, Surety hereby waives the provisions of California Civil Code sections 2845 and 2849. The City is the principal beneficiary of this bond and has all rights of a party hereto.

The Surety hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract or to the work to be performed thereunder or the specifications accompanying the same shall in anywise affect its obligations on this bond, and it does hereby

waive notice of any such change, extension of time, alteration or addition to the terms of the Contract or to the work or to the specifications.

IN WITNESS WHEREOF, two identical counterparts of this instrument, each of which shall for all purposes be deemed an original hereof, have been duly executed by Principal and Surety, on the date set forth below, the name of each corporate party being hereto affixed and these presents duly signed by its undersigned representative(s) pursuant to authority of its governing body.

Dated: _____

"Principal"

_____

_____

Signature: _____

_____

Print Name: _____
Title: _____
Date: _____

Signature: _____

_____

Print Name: _____
Title: _____
Date: _____

(Seal)

"Surety"

_____

_____

Signature: _____

_____

Print Name: _____
Title: _____
Date: _____

(Seal)

NOTE: *This Bond must be executed in duplicate and dated, all signatures must be notarized, and evidence of the authority of any person signing as attorney-in-fact must be attached. DATE OF BOND MUST NOT BE BEFORE DATE OF CONTRACT.* Surety companies executing Bonds must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the State where the project is located.

CHECKLIST FOR EXECUTION OF CONTRACT

TO BE SUBMITTED BY SUCCESSFUL BIDDER:

____ Two executed copies of the Contract

____ Completed, signed and notarized Payment Bond (original) in amount of the Contract

____ Completed, signed and notarized Performance Bond (original) in amount of the Contract

____ Completed, signed and notarized Warranty Bond (original) in the amount of 10% of the Contract

____ Workers' Compensation Certificate with attached Certificate of Insurance

____ General Liability insurance certificate naming the City as a co-insured

____ Automobile insurance naming the City as a co-insured

____ Umbrella/Excess Liability (General aggregate) insurance certificate naming the City as a co-insured, if applicable

____ Copy of City business license, if applicable

____ Additional insured endorsement – comprehensive general liability

____ Additional insured endorsement – automobile liability

____ Additional insured endorsement – excess liability

____ Primary and Non-Contributory Endorsement- General Liability Policy

____ Waiver of Subrogation - general liability

____ Waiver of Subrogation - Worker's Compensation

ALL SUBMITTALS WILL BE RETAINED BY CITY, EXCEPT FOR ONE COPY OF THE FULLY EXECUTED CONTRACT

GENERAL PROVISIONS

SECTION 0. GENERAL PROVISIONS DEFINED

0-1 *STANDARD SPECIFICATIONS*

The 2015 edition of "Standard Specifications for Public Works Construction", including the 2016 Supplement ("Standard Specifications"), as amended by the Contract Documents, is incorporated into the Contract Documents by this reference. The Work described herein shall be done in accordance with the provisions of the Standard Specifications, as amended by the Contract Documents.

0-2 *NUMBERING OF* SECTIONS

The number of sections and subsections in these General Provisions are compatible with the numbering in the Standard Specifications. Subsections of architectural and/or other work may be numbered according to the Construction Specifications Institute (CSI) format.

0-3 *SUPPLEMENTATION OF STANDARD SPECIFICATIONS*

The Sections that follow supplement, but do not replace, the Standard Specifications, except as otherwise indicated herein. In the event of any conflict between the Standard Specifications and these General Provisions, these General Provisions shall control.

SECTION 1. TERMS, DEFINITIONS, ABBREVIATIONS, UNITS OF MEASURE, AND SYMBOLS

The provisions below shall supplement, but not replace, those provisions in Section 1 of the Standard Specifications.

1-2 *TERMS AND DEFINITIONS*

Whenever in the Standard Specifications or in the Contract Documents the following terms are used, they shall be understood to mean the following:

Agency – The City of Manhattan Beach.

Applicable Law – All State, federal, and local laws, statutes, ordinances, codes, rules, and regulations governing the Work.

Bid Item – An item of Work listed on the Bid Schedule.

Board – The City Council of the City of Manhattan Beach.

City – The City of Manhattan Beach

City Council – The City Council of the City of Manhattan Beach

Contract Documents – As defined in Section 1 of the Contract.

Contract Time – The number of Working Days stated in the Contract for the completion of the Work.

County – County of Los Angeles, California

Detour – A temporary route for traffic (vehicular or pedestrian) around a closed portion of a road or travelway.

Engineer – The City Engineer, acting either directly or through properly authorized agents. Such agents shall act within the scope of the particular duties entrusted to them.

Estimated Quantities – The quantities of Work anticipated to be performed, as set forth in the Bid Schedule, designated as units or a lump sum.

Excavation – Any operation in which earth, rock, or other material in the ground is moved, removed, or otherwise displaced by means of tools, equipment, or explosives in any of the following ways: grading, trenching, digging, ditching, drilling, auguring, tunneling, scraping, cable or pipe plowing and driving, or any other way (Cal. Gov. Code § 4216).

Final Acceptance- acceptance of the Work by the City Council and direction to staff to cause recordation of the Notice of Completion, pursuant to Section 6-8.2 of these General Provisions.

Inspector – An authorized representative of the City, assigned by the City to make inspections of Work performed by or materials supplied by the Contractor.

Major Item of Work – A bid item amount that is at least 10% of the total contract award amount.

Minor Item of Work - A bid item amount that is less than 10% of the total contract award amount.

Notice of Completion – The notice authorized by Civil Code Section 9204.

Notice to Proceed or Notice to Proceed with Construction – A written notice issued by the City to the Contractor that authorizes the Contractor to perform the Work.

Notice to Proceed to Fulfill Preconstruction Requirements and Order Materials – A written notice issued by the City to the Contractor that authorizes the Contractor to proceed with preconstruction requirements and the acquisition or purchase of materials that are to be incorporated into the Work and establishes the date of commencement of the Contract Time.

Project – See Work.

Punch List – A list of items of Work to be completed or corrected by the Contractor in order to complete the Work as specified in the Contract Documents.

Shop Drawings – All drawings, diagrams, illustrations, brochures, schedules and other data which are prepared by the Contractor, a Subcontractor, manufacturer, supplier, or distributor, which illustrate how specific portions of the Work shall be fabricated or installed.

State – The State of California.

Submittal – Any drawing, calculation, specification, product data, samples, manuals, requests for substitutes, spare parts, photographs, survey data, traffic control plans, record drawings, Bonds or similar items required to be submitted to the City under the terms of the Contract.

Work – The construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment, services provided or to be provided by the Contractor to fulfill the Contractor's obligations.

Working Day – See Subsection 6-7.2 of the General Provisions.

Work Directive – A unilateral written order issued by the City directing the Contractor to continue performance of the Work or a disputed item of Work pending resolution of a claim or dispute concerning the scope of Work.

1-3.3 Institutions

The institutions listed in Section 1-3.3 of the Standard Specifications shall be supplemented by the list below:

Abbreviation	**Word or Words**
AAN	American Association of Nurserymen
ACI	American Concrete Institute
AGCA	Associated General Contractors of America
APWA	American Public Works Association
ASME	American Society of Mechanical Engineers
CRSI	Concrete Reinforcing Steel Institute
CSI	Construction Specifications Institute
IEEE	Institute of Electric and Electronic Engineers
NEC	National Electric Code
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
SSS	State of California Standard Specifications, Latest edition, Department of Transportation
SSP	State of California Standard Plans, Latest edition, Department of Transportation

SECTION 2. SCOPE AND CONTROL OF THE WORK

The provisions below shall supplement but not replace those provisions in Section 2 of the Standard Specifications, unless specifically noted below.

2-2 ASSIGNMENT

Any purported assignment without written consent of the City shall be null, void, and of no effect, and the Contractor shall hold harmless, defend and indemnify the City and its officers, officials, employees, agents and representatives with respect to any claim, demand or action arising from or relating to any unauthorized assignment.

If the City opts to consent to assignment, the City's consent shall be contingent upon: (1) a letter from the Surety agreeing to the assignment and assigning all of the Bonds to the assignee without any reduction, or the assignee supplying all new Bonds in the amounts originally required under the Contract Documents; and (2) the assignee supplying all of the required insurance in the amounts required in the Contract Documents. Until the Surety assigns all of the Bonds or the assignee supplies all of the new Bonds, and until the assignee supplies all of the required insurance, an assignment otherwise consented to in writing by the City shall not be effective. Even if the City consents to assignment, no assignment shall relieve the Contractor of liability under the Contract.

2-3 *SUBCONTRACTORS*

2-3.1.1 Subcontractors. Add the following sections:

Subcontractors shall be listed by the Bidder in accordance with these specifications and must be properly licensed under the laws of the State of California for the type of work which they are to perform. Copies of all Subcontracts shall be made available to the Engineer, upon request.

2-3.1.2 A Subcontractor whose prosecution of the work is not satisfactory shall be terminated immediately by the Contractor upon the receipt of a written notice by the Engineer. Subcontractors whose work was determined to be unsatisfactory shall not be allowed to perform any work on the job site.

2-3.2 Self Performance.

The following shall replace Section 2-3.2:

The Contractor shall perform, with its own organization, Contract work amounting to at least 50 percent of the Contract Price except that any designated "Specialty Items" may be performed by subcontract and the amount of any such "Specialty Items" so performed will be deducted from the Contract Price before computing the amount required to be performed by the Contractor with its own organization. "Specialty Items" will be identified by the Agency in the Bid or in the Special Provisions. Where an entire item is subcontracted, the value of work subcontracted will be based on the Contract Unit Price. When a portion of an item is subcontracted, the value of work subcontracted will be based on the estimated percentage of the Contract Unit Price. This will be determined from information submitted by the Contractor, and subject to approval by the Engineer.

2-4 CONTRACT BONDS

The Faithful Performance Bond shall remain in force until the date of recordation of the Notice of Completion. The Labor and Materials Bond shall remain in force until expiration of the time within which the California Labor Commissioner may serve a civil wage and penalty assessment against the principal, any of its Subcontractors, or both the principal and its Subcontractors pursuant to Labor Code Section 1741, and until the expiration of the time within which a joint labor management committee may commence an action against the principal, any of its Subcontractors, or both the principal and its Subcontractors pursuant to Labor Code Section 1771.2.

The warranty or maintenance Bond shall be valid for one year from the date of recordation of Notice of Completion by the County Recorder, in the amount of ten percent of the Contract Price.

Other than the details listed herein, the warranty or maintenance Bond shall adhere to the requirements for Bonds in Section 2-4 of the Standard Specifications. Nothing herein shall abridge or amend Section 6-8.3 of the Standard Specifications or the related provisions in these Contract Documents.

All Bonds must be submitted using the required forms, which are in the Contract Documents, or on any other form approved by the City Attorney.

2-5 PLANS AND SPECIFICATIONS

2-5.1 General

In addition to the requirements under Section 2-5.1 in the Standard Specifications, the Contractor shall maintain a control set of Plans and Specifications on the Project site at all times. All final locations determined in the field, and any deviations from the Plans and Specifications, shall be marked in red on the control set to show the as-built conditions. This control set of Plans shall also be edited for all Addenda, Requests for Information, Change Orders, field changes not involving cost, and any other variation that occurred during construction. Upon completion of all Work, the Contractor shall return the control set to the Engineer. Final payment will not be made until this requirement is met.

Where a work feature is shown on the drawings or identified in the Specifications but is not specifically indicated as an item in the Bid Schedule, and there is no ambiguity regarding the requirement to construct, install, or construct and install that work feature, the Contractor is required to complete the work feature. All costs to the Contractor for constructing, installing, or both constructing and installing such a work feature shall be included in the Bid.

2-5.2 Precedence of the Contract Documents

The following shall replace Section 2-5.2:

With regard to Section 2-5.2 in the Standard Specifications, the Special Provisions shall control over the General Provisions, and the Notice Inviting Bids and Instructions to Bidders (in that order) shall control over the Bid, such that the order of precedence shall be as follows:

1. Requirements of law.
2. Permits issued by regulatory agencies with jurisdiction.
3. Change Orders and Supplemental Agreements, whichever occurs last.
4. Contract.
5. Addenda.
6. Notice Inviting Bids.
7. Instructions to Bidders.
8. Bid/Proposal.
9. Special Provisions
10. General Provisions
11. Plans.
12. Standard Plans.
13. Standard Specifications.
14. Reference Specifications.

2-5.2.1 Traffic Signal Work

Except as otherwise specified in the General Provisions or on the Plans, all Work relating to traffic signals and incidental illuminated street name signs and safety lighting, including all equipment, materials, components, and the installation thereof, shall be in accordance with the City's Technical Provisions for traffic signals, latest edition of the State Standard Plans (SSP) in effect and published at the Bid Deadline and Section 86 "Signals, Lighting and Electrical Systems" of the latest edition of the State Standard Specifications (SSS) in effect and published at the Bid Deadline, unless otherwise indicated in the Technical Provisions. With respect to traffic signal Work, the order of precedence, from highest to lowest, shall be: City Technical Provisions, Plans, Section 86 of the State Standard Specifications, State Standard Plans, Standard Plans, and Standard Specifications.

2-5.3 Submittals

2-5.3.1 General

The following paragraphs shall be added following the third paragraph:

The Contractor shall, at its own expense, transmit to the Engineer for review and acceptance, working drawings, shop drawings, supporting information, and/or other available instructive and descriptive information from the manufacturer, when and as required by the Plans or General Provisions or requested by the Engineer. Shop drawings will not be required for standard items in common use for which adequate manufacturers' literature is available unless otherwise required by the Engineer.

The Contractor shall consecutively number, thoroughly check, approve and sign each submittal and transmit the submittals to the Engineer for review. In the event that certain submittals are submitted without the Contractor's approval signature or are unacceptable to the City, they shall be rejected by the Engineer. The Contractor shall thereafter correct the submittals and resubmit.

In the event that in the process of development of the submittals it is discovered that there are defects and/or errors on the Plans that result in conflict between the Plans and the submittals, or if the submittals show variation from the Plans or other Contract Documents, the Contractor shall thoroughly describe and explain any defects and/or conflicts in its transmittal letter to the Engineer.

The Engineer's review of the submittals will be for general design and arrangement only, and shall not relieve the Contractor from responsibility for errors of any sort in the submittals or of the responsibility for executing the work in accordance with the Contract Documents. The Contractor shall allow a minimum of 20 Working Days for review of submittals. The Contractor shall be solely responsible for the correctness of the submittals, for shop fits and field connections, and for the results obtained by use of such submittals. The Contractor shall verify and be fully responsible for all dimensions and job-site conditions affecting the Work and shall be responsible for furnishing and installing the proper materials required by the Contract Documents.

The Contract Time will not be extended due to the failure of the Contractor to provide submittals as required by the Contract Documents in a timely manner.

2-6 WORK TO BE DONE

The following paragraphs shall be added following paragraph one:

All work which is defective in its construction or deficient in any of the requirements of the Plans and Specifications shall be remedied or removed and replaced by the Contractor in an acceptable manner at his own expense. No compensation will be allowed for any work done beyond the lines and grades shown on the Plans or established by the Engineer. Upon failure on the part of the Contractor to comply with any order of the Engineer made under the provisions of this article, the Engineer and the City may cause the defective work to be remedied or removed and replaced at the expense of the Contractor.

Any unauthorized or defective work, defective material or workmanship or any unfaithful or imperfect work that may be discovered before Final Acceptance of work by the Board shall be corrected immediately with no extra charge even though it may have been overlooked in previous inspections and estimates or may have been caused due to failure to inspect the work.

2-7 SUBSURFACE DATA

If the City or its consultants have made investigations of subsurface conditions in areas where the Work is to be performed, such investigations shall be deemed made only for the purpose of study and design. If a geotechnical or other report has been prepared for the Project, the Contractor may inspect the records pertaining to such investigations subject to and upon the conditions hereinafter set forth. The inspection of the records shall be made in the office of the Engineer. It is the Contractor's sole responsibility to determine whether such investigations exist, and the City makes no affirmative or negative representation concerning the existence of such investigations.

The records of any such investigations are made available solely for the convenience of the Contractor. It is expressly understood and agreed that the City, the Engineer, their agents, consultants or employees assume no responsibility whatsoever with respect to the sufficiency or accuracy of any investigations, the records thereof, and the interpretations set forth therein. No warranty or guarantee is expressed or implied that the conditions indicated by any such investigations or records are representative of those existing in the Project area. The Contractor agrees to make such independent investigations and examination as necessary to be satisfied of the conditions to be encountered in the performance of the Work.

The Contractor represents that it has studied the Plans, Specifications and other Contract Documents, and all surveys and investigation reports of subsurface and latent physical conditions, has made such additional surveys and investigations as necessary for the performance of the Work at the Contract Price in accordance with the requirements of the Contract Documents, and that it has correlated the results of all such data with the requirements of the Contract Documents. No claim of any kind shall be made or allowed for any error, omission or claimed error or omission, in whole or in part, of any geotechnical exploration or any other report or data furnished or not furnished by the City.

2-9 SURVEYING

The Contractor shall verify all dimensions on the drawings and shall report to the City any discrepancies before proceeding with related Work. The Contractor shall perform all survey and layout Work per the benchmark information on the Project Plans. All surveying Work must

conform to the Professional Land Surveyors' Act (Business and Professions Code Section 8700 *et seq*). All Project surveying notes and "cut-sheets" are to be provided to the City after the completion of each surveying activity and all final surveying notes shall be provided before final payment to the Contractor.

The Contractor is responsible for hiring a Surveyor to set survey points to be used for re-establishments of disturbed monuments and submit Corner Records to the County Surveyor. Copy of the submitted Corner Records must be provided to the City prior to actual disturbance of the monuments. The Contractor shall also cause all disturbed survey monuments within the project work area to be re-established at the end of the project. This also includes filing Corner Records and Record of Survey with the County Surveyor within 7 days of substantial completion of the construction work and submitting a copy to the City of the filed paperwork receipt within 2 days of submission. The Contractor is required to provide a copy of the County Surveyor's acceptance within 2 days of receipt from the County Surveyor.

Construction stakes shall be set and stationed by the Contractor at its expense. Unless otherwise indicated in the Special Provisions, surveying costs shall be included in the price of items bid. No separate payment will be made. Re-staking and replacement of construction survey markers damaged as a result of the Work, vandalism, or accident shall be at the Contractor's expense.

2-11 INSPECTION

The Contractor shall arrange and pay for all off-site inspection of the Work required by any ordinance or governing authorities. The Contractor shall also arrange and pay for other inspections, including tests in connection therewith, as may be assigned or required.

Add the following paragraphs:

2-11.1 Inspection

An inspector shall in no case act as foreman or perform other duties for the Contractor, nor interfere with the Contractor's management of the Work. Any advice which an inspector may give the Contractor shall not be binding to the Engineer or to the City, or release the Contractor from fulfilling all the terms of the Contract.

No partial payment, inspection, taking possession of, or other act made or done by the Engineer or the City with respect to the work prior to final completion and acceptance thereof shall affect or prejudice the right of the Engineer or the City to reject any defective work or material or to require the complete fulfillment of all the provisions of the Contract.

If the Engineer deems it expedient and not in the best interest of the City to correct work injured or done not in accordance with the Contract, the defective work may be accepted subject to an equitable deduction from the Contract Price which may be made therefor by the City upon certification from the Engineer.

Reexamination of any work may be ordered by the Engineer at any time prior to Final Acceptance and, if so ordered, the work must be uncovered by the Contractor. If such work be found in accordance with the Contract, the City will pay the cost of reexamination and replacement. If such work be found defective or not in accordance with the Contract, the Contractor shall pay such costs.

SECTION 3. CHANGES IN WORK

3-1 CHANGES REQUESTED BY THE CONTRACTOR

3-1.1 General

Add the following paragraph to the end of Subsection 3-1.1:

If the Contractor alleges that instructions issued after the date of the Contract will result in increases to the Contract Price or Contract Time, if latent or unforeseen conditions require modification of the Contract Documents, or the Contractor otherwise becomes aware of the need for or desirability of a change in the Work, a Change Order Proposal ("COP") may be submitted to the City in writing, using the forms provided herein in Subsection 3-6.2 of the General Provisions, and must specify the reasons for such change, including relevant circumstances and impacts on the construction schedule. The Contractor may request additional compensation and/or time through a COP but not for instances that occurred more than ten calendar days prior to the COP. The Contractor's failure to initiate a COP within such period shall be deemed a waiver of the right to adjustment of the Contract Price or the Contract Time for the alleged change, unless such waiver is prohibited under state law. Any COP that is approved by the City will be incorporated in a Change Order or Construction Change Directive. If the City determines that the Work in question is not a change, the City shall issue a Work Directive, ordering the Contractor to proceed with the Work without delay. If the COP is denied but the Contractor believes that it does have merit, the Contractor may submit a claim to the City.

3-2 CHANGES INITIATED BY THE AGENCY

The City reserves the right, without notice to the Surety, to increase or decrease the quantity of any item or portion of the Work described in the Contract Documents or to alter or omit portions of the Work so described, as may be deemed necessary or expedient by the Engineer, without in any way making the Contract void. Such increases, alterations or decreases of Work shall be considered and treated as though originally contracted for, and shall be subject to all the terms, conditions and provisions of the original Contract. The Contractor shall not claim or bring suit for damages, whether for loss of profits or otherwise, on account of any decrease, alteration or omission of any kind of Work to be done.

3-2.1 General

Add the following paragraphs at the end of Subsection 3-2.1:

The City reserves the right to make changes in the Work, including the elimination of any Bid Item, after execution of the Contract and without invalidating the Contract by:

A. Change Order approved by the City Council, City Manager, Public Works Director, or City Engineer (dollar value of approval authority for each as per City policy); or

B. Construction Change Directive approved by the City Council, City Manager, Public Works Director, or City Engineer (dollar value of approval authority for each as per City policy);

A change that causes the total value of all changes to exceed the Contract contingency amount established at the time of award of the Contract must be approved by the City Council. No payments in excess of the original Contract Price will be made until a Change Order is

approved in the normal course of business. The City may, at any time, without notice to the Contractor's surety(ies), order changes in the Work within the general scope of the Contract. Such changes in the Work shall not relieve or release the surety(ies) of its(their) obligations under the Performance and Payment Bonds issued for the Project. Changes in the Work made pursuant to this Article 3 shall in no way release any guarantee or warranty provided by the Contractor.

The City may issue a Change Order Proposal Request ("COPR"), in writing, to the Contractor, describing a proposed change to the Work and requesting that the Contractor submit an itemized Change Order Proposal ("COP") to the City, using the forms provided herein in Subsection 3-6.2 of the General Provisions, within ten calendar days after the City's issuance of the COPR. If the Contractor fails to submit a COP within such period of time, it shall be presumed that the change described in the City's COPR will not result in an increase to the Contract Price or Contract Time and the change shall be performed by the Contractor without such increases. A COPR does not authorize the Contractor to commence performance of the changed work. The Contractor shall not perform any change until receipt of the City's written approval. If the City approves the Contractor's COP, City shall issue a Change Order.

Whenever a change is pending, the Contractor shall notify the City if it is necessary to halt other Work in the area of the change that would be affected thereby, until such time as the change is authorized.

Any change to the Contract Price shall be in a sum mutually agreed to by the Contractor and the City. When the cost for Extra Work cannot be agreed upon, the City will pay for Extra Work based on the accumulation of costs as provided for in Subsection 3-3, "Extra Work," of the Standard Specifications and the General Provisions.

3-2.1.1 Change Order

A Change Order is a written instrument prepared by the City and signed by the City and the Contractor, stating their agreement upon all of the following:

A. The scope of the change in the Work;

B. The amount of the adjustment, if any, in the Contract Price; and

C. The extent of the adjustment, if any, in the Contract Time.

3-2.1.1.1 Accord and Satisfaction

The Contractor's agreement on any Change Order shall be a full compromise and settlement of all adjustments to the Contract Time and Contract Price, and compensation for any and all delay, extended or additional field and home office overhead, disruption, acceleration, inefficiencies, lost labor or equipment productivity, differing site conditions, construction interferences, and other extraordinary or consequential damages (hereinafter called "Impacts"), including any ripple or cumulative effect of the Impacts on the overall Work under the Contract arising directly or indirectly from the performance of Work described in the Change Order. By execution of any Change Order, the Contractor agrees that the Change Order constitutes a complete accord and satisfaction with respect to all claims for schedule extension, Impacts, or any costs of whatsoever nature, character or kind arising out of or incidental to the Change Order. No action, conduct, omission, product failure, or course of dealing by the City shall act to waive, modify, change, or alter the requirement that Change Orders must be in writing, signed by the City and the

Contractor, and that such written Change Orders are the exclusive method for effectuating any change to the Contract Sum and/or Contract Time.

3-2.1.2 Construction Change Directive

A Construction Change Directive is a written order prepared and signed by the City, directing a change in the Work prior to the Contractor's agreement on adjustment, if any, in the Contract Price or Contract Time, or both. The City may, by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions or other revisions, the Contract Price and Contract Time being adjusted accordingly. Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved. A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order. The City's form of Construction Change directive is provided in Subsection 3-6.2 of the General Provisions.

3-2.2.2 Increases of More than 25 Percent

Delete Subsection 3-2.2.2 in its entirety and substitute the following:

Should the actual quantity of a Major Item of Work covered by a Contract Unit Price and constructed in conformance with the Plans and Specifications exceed the Bid quantity by more than 25%, a Change Order will be issued and payment for the quantity in excess of 25% of the Bid quantity will be made on the basis of an adjustment to the Contract Unit price mutually agreed to by the City and the Contractor or pursuant to Subsection 3-2.4 "Agreed Prices."

For Minor Items of Work, the Contractor will be paid using the Contract Unit Price, regardless of whether the actual quantity of the Minor Item of Work covered by a Contract Unit Price exceeds the bid quantity by more than 25%.

3-2.2.3 Decreases of More than 25 Percent

Delete Subsection 3-2.2.3 in its entirety and substitute the following:

Should the actual quantity of a Major Item of Work covered by a Contract Unit Price and constructed in conformance with the Plans and Specifications be less than 75% of the Bid quantity, an adjustment in payment will not be made unless so requested in writing by the Contractor. If the Contractor so requests, a Change Order shall be issued and payment shall be made on the basis of an adjustment to the Contract Unit Price mutually agreed to by the City and the Contractor, or pursuant to Subsection 3-2.4 "Agreed Prices"; however, in no case will payment be less than would be made for the actual quantity at the Contract Unit Price.

For Minor Items of Work, the Contractor will be paid using the Contract Unit Price, regardless of whether the actual quantity of the Minor Item of Work covered by a Contract Unit Price is less than 75% of the Bid quantity.

3-2.2.4 Changes for Items Not Covered by Unit Prices

Payment for any change for an Item of Work not covered by a Contract Unit Price shall be made pursuant to Subsection 3-3 "Extra Work."

3-3 EXTRA WORK

New and unforeseen work will be classified as Extra Work only when the Work is not covered and cannot be paid for under any of the various items or combination of items for which a Bid price appears on the Bid. The Contractor shall not do any Extra Work except upon written order from the Engineer.

3-3.1 General

Add the following at the end of Subsection 3-3.1:

All Extra Work shall conform to the Plans and Specifications.

The Contractor shall furnish to the Engineer each Subcontractor's signed and detailed estimate of the cost for labor, materials, and equipment, including the markup by such Subcontractor for overhead and profit for Work added or deducted to a Subcontractor's scope of Work. The Contractor shall furnish to the Engineer the sub-Subcontractor's signed detailed estimate of the cost for labor, materials, and equipment, including the markup by such sub-Subcontractor for overhead and profit for Work added or deducted to a sub-Subcontractor's scope of Work. The Contractor shall furnish to the Engineer the vendor or supplier's signed detailed estimate or quotation of the cost to the Contractor for Work added or deducted from a vendor or suppliers scope of Work.

3-3.2.1 General

Add the following at the end of Subsection 3-3.2.1

Any change in the Work for an Item of Work not covered by a Contract Unit Price that involves both added and deleted Work shall be paid on the basis of the net total cost. The cost of deleted Work not covered by a Contract Unit Price shall be determined by the Engineer based on the schedule of lump sum prices submitted by the Contractor in accordance with Subsection 9-2, "Lump Sum Work," of the Standard Specifications and the General Provisions.

3-3.2.2.1 Labor

Delete Subsection 3-3.2.2.1 in its entirety and substitute the following:

The cost of labor will be the actual cost for wages prevailing locally for each craft or type of worker (including foreman when authorized by the Engineer) performing the Extra Work at the time the Extra Work is done, plus liability insurance, health and welfare, pension, vacation, apprenticeship funds, and other direct costs, as well as assessments or benefits required by lawful collective bargaining agreements.

To the actual wages, as defined above, will be added a labor surcharge set forth in the California Department of Transportation publication entitled "Labor Surcharge and Equipment Rental Rates" that is in effect on the date upon which the Extra Work is performed. The labor surcharge shall constitute full compensation for all payments imposed by State and federal laws and for all other payments made to, or on behalf of, the workers, other than actual wages, subsistence and travel paid to the workers. The labor surcharge includes Workers' Compensation, Social Security, Medicare, Federal Unemployment, State Unemployment, and State Training taxes.

Except when direct supervision is provided by working foremen whose time is included in accordance with Subsection 3-2.2.2, the cost of direct supervision of Extra Work, when such direct supervision is provided exclusively for the Extra Work and not in conjunction with or at the same time as supervision for other Work, and when approved in advance in writing by the Engineer, may be charged to the Extra Work. Such cost includes only the actual cost of supervision labor, plus payroll taxes, insurance, and pension costs. The cost of transportation, use of vehicle, and other costs incurred by supervision will not be allowed.

3-3.2.2.2 Materials

Add the following to Subsection 3-3.2.2.2:

If the Contractor does not furnish satisfactory evidence of the cost of the materials from the actual supplier thereof within 10 days following delivery of materials to the Work site, the Engineer reserves the right to establish the cost of the materials at the lowest current wholesale prices at which the materials were available, in the quantities concerned, delivered to the location of the Work site, less any discounts.

3-3.2.2.3 Tool and Equipment Rental

Delete Subsection 3-3.2.2.3 in its entirety and substitute the following:

No payment will be made for individual pieces of equipment or tools not listed in the California Department of Transportation publication entitled “Labor Surcharge and Equipment Rental Rates” that is in effect on the date upon which the Extra Work is performed and that have a replacement value of $200.00 or less, whether or not consumed by use. Such equipment or tools shall be considered to be small tools.

The Contractor will be paid for the use of equipment at the rental rates listed for such equipment in the Labor Surcharge and Equipment Rental Rates publication that is in effect on the date upon which the Extra Work is performed.

Move in and out, or minimum charges other than the hourly rate, shall not apply to equipment available from the force already on the Project site.

For equipment that is rented from a local equipment agency, the Contractor will be paid at the hourly rate shown on the rental agency invoice or agreement for the time the equipment is used on Extra Work. If a minimum equipment rental amount is required by the local equipment rental agency, the actual amount charged will be paid to the Contractor.

If it is deemed necessary by the Engineer to use equipment not listed in the Labor Surcharge and Equipment Rental Rates publication, a suitable rental rate for that equipment will be established by the Engineer. The Contractor may furnish any cost data that might assist the Engineer in the establishment of the rental rate. If the rental rate established by the Engineer is $10.00 per hour or less, the provisions above concerning rental of equipment from a local equipment agency shall apply.

Rental time will not be allowed while equipment is inoperative due to breakdowns.

When owner operated equipment is used to perform Extra Work to be paid on a force account basis, the Contractor will be paid for the equipment and operator as follows:

1. Payment for the equipment will be made at the rental rates listed for such equipment in the Labor Surcharge and Equipment Rental Rates publication that is in effect on the date upon which the Extra Work is performed.

2. Payment for the cost of labor will be made in conformance with the provisions in Subsection 3-3.2.2.1 “Labor” of the General Provisions.

3-3.2.3 Markup

Delete Subsection 3-3.2.3 in its entirety and substitute the following:

The markup for overhead and profit on Extra Work shall be in accordance with the following schedule.

3-3.2.3.1 Work by Contractor.

The following percentages shall be added to the Contractor’s costs and shall constitute the markup for all overhead and profit:

1) Labor 20

2) Materials 15

3) Equipment Rental 15

4) Other Items and Expenditures.....15

To the sum of the costs and markups provided for in this subsection, one percent shall be added as compensation for bonding.

3-3.2.3.2 Work by Subcontractor.

For Extra Work performed by a Subcontractor, the markup established in Subsection 3-3.2.3.1 of the General Provisions shall be applied to the Subcontractor’s costs. An additional five percent shall be added to the Subcontractor’s final cost, which shall reimburse the Contractor for administrative costs, including overhead and profit.

3-3.2.3.3 Work by Sub-Subcontractor.

For Extra Work performed by a sub-Subcontractor, the markup established in Subsection 3-3.2.3.1 of the General Provisions shall be applied to the sub-Subcontractor’s costs. An additional ten percent shall be added to the sub-Subcontractor’s final cost, five percent of which shall reimburse the Contractor for administrative costs, including overhead and profit, and five percent of which shall reimburse the Subcontractor for administrative costs, including overhead and profit.

3-3.2.3.4 Work by Specialist.

If the Engineer and the Contractor agree that a service or an item of Extra Work cannot be performed by the forces of the Contractor or those of any of its Subcontractors or sub-Subcontractors, such service or Extra Work item may be performed by a specialist. Invoices for such services or items of Extra Work calculated on the basis of current market prices may be

accepted without complete itemization of labor, material, and equipment rental costs when it is impracticable and not in accordance with the established practice of the special service industry to provide such complete itemization.

If the Contractor is required to perform Extra Work that requires a fabrication or matching process in a fabrication or machine shop facilities away from the Project site, the charges for that portion of the Extra Work performed in such facility may, by agreement between the Contractor and Engineer, be accepted as a specialist billing.

For Extra Work performed by a specialist, 15% shall be added to the specialist's invoice price less a credit to the City for any cash or trade discount offered or available, whether or not such discount may have been taken; such percentage shall reimburse the Contractor for administrative costs, including overhead and profit.

3-3.2.3.5 Work not Covered by Unit Prices.

Markup for overhead and profit on any change in the Work for an Item of Work not covered by a Contract Unit Price that involves both added and deleted Work shall be paid, in accordance with this Subsection 3-3.2.3 of the General Provisions, only if the net cost increases the Contract Price (i.e., if the cost for added Work exceeds the cost for deleted Work).

3-3.3 Daily Reports by Contractor

Delete the first sentence of Subsection 3-3.3 and substitute the following:

The Contractor shall submit daily reports for Extra Work showing all labor, material, and equipment costs incurred.

Add the following at the end of Subsection 3-3.3:

The daily reports shall describe in detail the Extra Work that was performed and the location (station, etc.). Separate daily reports shall be submitted for Extra Work that is performed for more than one location and for different tasks that are performed on the same day. Material charges shall be substantiated by valid copies of vendor's invoices. Such invoices shall be submitted with the daily reports, or if not available, they shall be submitted with subsequent daily reports. The Contractor shall maintain the Contractor's records in such a manner as to provide a clear accounting of the costs.

Upon completion of the Extra Work, the Contractor shall submit a summary of costs, including markup for overhead and profit. All costs shall be in accordance with Subsection 3-3.2, "Payment," of the Standard Specifications and the General Provisions. The signature of the City's Inspector on a daily report shall indicate agreement with the information reflected therein, not that the Contractor is entitled to payment of the costs in the report. The Engineer shall review the daily reports. The Engineer shall compare the Inspector's records with the completed daily reports furnished by the Contractor and make any necessary adjustments. When the daily reports are agreed upon and signed by both parties, these reports shall become the basis of payment for the Extra Work performed.

3-3.4 Extension of Time

Add the following as Subsection 3-3.4:

If the Contractor is delayed in completing the Extra Work due to a change ordered by the City, the time for completion of Work will be extended in accordance with Subsection 6-6.1 of these General Provisions.

3-5 DISPUTED WORK

Delete Subsection 3-5 in its entirety and substitute the following:

In the event of disputed Work, the City shall have the right to unilaterally issue a written Work Directive; and the Contractor shall continue performance pending resolution of the dispute and shall maintain cost data described in Subsection 3-3 of the Standard Specifications and the General Provisions. The City's form of Work Directive is provided in Subsection 3-6 of the General Provisions. Payment shall be made for such disputed Work as is later determined by negotiation between the parties or as is fixed by a court of law.

3-6 FORMS

Add Section 3-6 to incorporate the following forms, which appear in the succeeding pages.

3-6.1 Change Order Form

3-6.2 Change Order Proposal Forms

(a) Change Order Proposal Summary Report

(b) Labor Cost Report

(c) Labor Rates Report

(d) Material Cost Report

(e) Equipment Cost Report

(f) Special Forces/Services Cost Report

3-6.3 Construction Change Directive Form

3-6.4 Work Directive Form

CITY OF MANHATTAN BEACH
PUBLIC WORKS DEPARTMENT
Engineering Division

CONTRACT CHANGE ORDER NO. 1 (Final)

PROJECT NO.:

DESCRIPTION:

TO: Construction Company, Inc.

You are hereby instructed to comply with the following changes from the Contract Plans and Specifications:

SUMMARY OF CHANGES			
Description (Detailed Explanation Attached)		**Change in Contract Price[1]**	**Change in Work Days**
1.		$0.00	
2.	Adjustment in Final Bid Quantities	$0.00	
Net Change in Contract Price and Work Days		$0.00	

[1]Deduction or decrease in Contract Price is denoted in parentheses.

The following change is hereby made a part of the Contract Documents and shall be performed under the same terms and conditions as required by the original Contract Documents. Except as modified herein, the original Contract Documents and all prior amendments shall remain in full force and effect and all of the terms of the Contract Documents are hereby incorporated in this Change Order.

SUMMARY OF ALL CHANGE ORDERS

ORIGINAL CONTRACT AMOUNT.....$000,000.00
CCO1 (FINAL) $0.00
TOTAL.....$000,000.00

<u>SUMMARY OF WORKING DAYS</u>

FIRST DAY OF WORK:.....Date
CONTRACT WORKING DAYS:.....X
TIME EXTENSION: CCO 1 (Final).....Y
NEW TOTAL WORKING DAYS: .....X+Y
LAST DAY OF WORK: .....New Date

CHANGE ORDER DETAIL

Change Order No.: 1 (Final)

Project No.: Description:

The changes or interpretations described and noted herein are hereby authorized. The signed original of this order is on file in the Department of Public Works. Shown as separate paragraphs: (A) Reason for Change; (B) Description of Change; (C) Change in Contract Costs; and (D) Change in Completion Date.

Item No. 1:

A. Reason for Change:

B. Description of Change:

ITEM	DESCRIPTION	UNIT	UNIT PRICE	BID OR CURRENT APPROVED QTY	FINAL QTY	CHANGE	CHANGE IN COST[1]
New Item				0	0	0	0.00

[1]Deduction or decrease in Contract Price is denoted in parentheses.

C. Change in Contract Cost:
Add $0.00

D. Change in Completion Date:
Add Y Working Days

Item No. 2: Adjustment in Final Bid Quantities:

A. Reason for Change:
Due to conditions encountered during construction, modifications to the amount of Work were determined to be appropriate, and the changes were addressed by means of adjusting applicable contract quantities, as outlined below.

B. Description of Change:

ITEM	DESCRIPTION	UNIT	UNIT PRICE	BID OR CURRENT APPROVED QTY	FINAL QTY	CHANGE	CHANGE IN COST[1]
New Item				0	0	0	0.00

[1]Deduction or decrease in Contract Price is denoted in parentheses.

C. Change in Contract Cost:
Add $0.00

D. Change in Completion Date:
No Change.

SIGNATURE PAGE TO FOLLOW:

The original Contract Price was ($0.00). Contract Change Order No. 1 (Final) increased the Contract Price by ($0.00). The new Contract Price will be $00/100, resulting in an increase of approximately 0.00% to the original Contract.

The original Contract Time of X Working Days was extended by Y Working Days per Change Order No. 1 (Final). The last contract Working Day is new Date.

Ordered: _____ Date: _____
Public Works Director

Concurred by: _____ Date: _____
City Engineer

Concurred by: _____
Project Manager

Acceptance by the Contractor:

This Change Order is in full compromise and settlement of all adjustments to Contract Time and Contract Price, and compensation for any and all delay, extended or additional field and home office overhead, disruption, acceleration, inefficiencies, lost labor or equipment productivity, differing site conditions, construction interferences and other extraordinary or consequential damages (hereinafter called “Impacts”), including any ripple or cumulative effect of these Impacts on the overall Work under the Contract arising directly or indirectly from the performance of Work described in this Change Order. By execution of this Change Order, the Contractor agrees that this Change Order constitutes a complete accord and satisfaction with respect to all claims for schedule extension, Impacts, or any costs of any nature, character or kind arising out of or incidental to this Change Order.

Name: _____ Date: _____

Title: _____

CHANGE ORDER PROPOSAL FORM

3-6.2(a) CONTRACT CHANGE ORDER PROPOSAL SUMMARY REPORT

Date _____

CCO Proposal No. _____ Contractor _____

Item No. _____ Location _____

AMOUNT

General Contractor

1. Labor Cost: .....$_____

2. Material Cost:.....$_____

3. Equipment Cost: .....$_____

4. Special Forces/Services: .....$_____

Subtotal Contractor Cost• .....$_____

5. Subcontractor/Sub-Subcontractor Name_____

   Labor Cost.....$_____

   Material Cost .....$_____

   Equipment Cost.....$_____

   Subtotal Subcontractor/Sub-Subcontractor Cost

6. Subcontractor/Sub-Subcontractor Name

   Labor Cost.....$_____

   Material Cost .....$_____

   Equipment Cost.....$_____

Subtotal Subcontractor/Sub-Subcontractor Cost .....$_____

TOTAL CONTRACT CHANGE ORDER COSTS .....$_____

CHANGE ORDER PROPOSAL FORM

3-6.2(b) LABOR COST REPORT Date

Date _____

CCO Proposal No. _____ Contractor or Subcontractor _____

Item No. _____ Location _____

CLASSIFICATION AND NAME	HOURS	HOURLY RATE	EXTENDED AMOUNTS
Classification: Name:	OT REG	$ $	$ $
Classification: Name:	OT REG	$ $	$ $
Classification: Name:	OT REG	$ $	$ $
Classification: Name:	OT REG	$ $	$ $
Classification: Name:	OT REG	$ $	$ $
Classification: Name:	OT REG	$ $	$ $
TOTAL LABOR			$

Overhead/profit 20%.....$_____

Total labor/overhead/profit.....$_____

Subcontractor's mark-up of total Sub-Subcontractor
labor/overhead/profit (if applicable) 5%.....$_____

General contractor's mark-up of total Subcontractor
or Sub-Subcontractor labor/overhead/profit (if applicable) 5%.....$_____

Total.....$_____

CHANGE ORDER PROPOSAL FORM

3-6.2(c) LABOR RATES REPORT Date

Date _____

CCO Proposal No. _____ Contractor or Subcontractor _____

Item No. _____ Location _____

CLASSIFICATION:		
TAXABLE BASE:		AMOUNT
Base Hourly Pay		$
Vacation		$
TOTAL TAXABLE BASE		**$**
TAXES & INSURANCE	PERCENT	AMOUNT
Social Security Tax		$
State Unemployment Tax		$
Federal Unemployment Tax		$
Workmen's Compensation		$
Liability & Umbrella Insurance		$
TOTAL TAXES & INSURANCE		$
FRINGE BENEFITS	AMOUNT	
Pension	$	
Health & Welfare	$	
Training	$	
Other Fringe Benefits	$	
TOTAL FRINGE BENEFITS	$	
AMOUNT	$	

CHANGE ORDER PROPOSAL FORM

3-6.2(d) MATERIAL COST REPORT

Date _____

CCO Proposal No. _____ Contractor or Subcontractor _____

Item No. _____ Location _____

INVOICE NO.	DESCRIPTION	AMOUNT
1.	Material	$
	Sales Tax (Prevailing Tax Rate) 7.75%	$
	Subtotal	$
2.	Material	$
	Sales Tax (Prevailing Tax Rate) 7.75%	$
	Subtotal	$
3.	Material	$
	Sales Tax (Prevailing Tax Rate) 7.75%	$
	Subtotal	$
SUBTOTAL MATERIAL COST		$

NOTE: An itemized list of materials, manufacturers, serial numbers, invoices, and other pertinent date shall be submitted along with the material cost report.

Overhead/profit 15%.....$_____

Total material/overhead/profit.....$_____

Subcontractor's mark-up of total Sub-Subcontractor
material/overhead/profit (if applicable) 5% .....$_____

General contractor's mark-up of total Subcontractor
or Sub-Subcontractor labor/overhead/profit (if applicable) 5%.....$_____

Total.....$_____

CHANGE ORDER PROPOSAL FORM

3-6.2(e) EQUIPMENT COST REPORT

Date _____

CCO Proposal No. _____ Contractor or Subcontractor _____

Item No. _____ Location _____

EQUIPMENT NO. (Description, Type, Size)	HOURS	HOURLY RATE	EXTENDED AMOUNTS
SUBTOTAL EQUIPMENT COST			$

Overhead/profit 15%.....$_____

Total equipment/overhead/profit.....$_____

Subcontractor's mark-up of total Sub-Subcontractor equipment/overhead/profit (if applicable) 5% .....$_____

General contractor's mark-up of total Subcontractor or Sub-Subcontractor equipment/overhead/profit (if applicable) 5% .....$_____

Total.....$_____

CHANGE ORDER PROPOSAL FORM

3-6.2 (f) SPECIAL FORCES/SERVICES COST REPORT

Date _____

CCO Proposal No. _____ Contractor or Subcontractor _____

Item No. _____ Location _____

INVOICE NO.	DESCRIPTION	AMOUNT
1.		$
		$
	Subtotal	$
2.		$
		$
	Subtotal	$
3.		$
		$
	Subtotal	$
SUBTOTAL MATERIAL COST		$

NOTE: An itemized list of materials, manufacturers, serial numbers, invoices, and other pertinent date shall be submitted along with the special forces/services cost report.

Overhead/profit 15%.....$_____

Total Special Forces/Services/Overhead/Profit.....$_____

3-6.3 CONSTRUCTION CHANGE DIRECTIVE

Distribution to: CITY☐ CONTRACTOR☐ OTHER☐ PROJECT MANAGER☐

PROJECT:	DIRECTIVE NO.:
	DATE:
	CONTRACT DATE:
TO CONTRACTOR:	CONTRACT FOR:

You are hereby directed to make the following change(s) to this Contract:

PROPOSED ADJUSTMENTS

1. The proposed basis of adjustment to the Contract Price is:
   [ ] Lump Sum (increase) (decrease) of $_____
   [ ] Unit Price of $_____ per _____
   [ ] Daily time and materials records of actual costs plus a overhead and profit, as provided in Subsection 3-3, "Extra Work," the Standard Specifications and the General Provisions, [subject to a Not-To-Exceed Amount of $_____].\
   [ ] as follows:

2. The Contract Time is proposed to (be adjusted) (remain unchanged). The proposed adjustment, if any, is (an increase of ____ days) (a decrease of ____ days).

If the Contractor disagrees with the proposed adjustments, it must submit its own proposal within ten days of the date of this Construction Change Directive pursuant to Contract Documents or the proposed adjustment will become final and binding on the Contractor.

When signed by the City and received by the Contractor, this document becomes effective IMMEDIATELY as a Construction Change Directive (CCD), and the Contractor shall proceed with the change(s) described above.

Ordered: _____ Date: _____
Public Works Director

Concurred by: _____ Date: _____
City Engineer

Concurred by: _____ Date: _____
Project Manager

3-6.4 WORK DIRECTIVE

Distribution to: CITY☐ CONTRACTOR☐ FIELD☐ OTHER☐ PROJECT MANAGER☐

PROJECT:	WORK DIRECTIVE NO.:
	DATE:
	CONTRACT DATE:
TO CONTRACTOR:	CONTRACT FOR:

You are hereby directed to continue performance of the following Work, without delay, pending resolution of the dispute concerning such Work and maintain the cost data described in Subsection 3-3, "Extra Work," of the Standard Specifications and the **General Provisions** to the Contract for the performance of such Work:

Neither the issuance of this Work Directive nor the requirement for the Contractor to maintain cost data constitutes approval by the City of a change in the Work or modification of the Contract Documents.

Ordered: _____ Date: _____
Public Works Director

Concurred by: _____ Date: _____
City Engineer

Concurred by: _____ Date: _____
Project Manager

SECTION 4. CONTROL OF MATERIALS

4-1 MATERIALS AND WORKMANSHIP

The provisions below shall supplement but not replace those provisions in Section 4-1 of the Standard Specifications, except that Subsection 4-1.4 shall be replaced in its entirety.

The first paragraph of Section 4-1 is replaced with the following:

Wherever applicable, materials shall conform to the latest Standards of the American Society for Testing Materials. All workmanship in the fabrication, assembly and construction of materials and equipment shall be neat and workmanlike in every respect. All equipment offered shall be of the manufacturer's latest design.

The Contractor and all Subcontractors, suppliers, and vendors shall guarantee that the Work will meet all requirements of this Contract as to the quality of materials, equipment, and workmanship.

4.1.1.1 Property Rights in Materials

Nothing in the Contract shall be construed as vesting in the Contractor any right, title, or interest in material used in the Work after it has been attached or affixed to the Work or the soil. All such material shall become the property of the City upon being so attached or affixed.

4-1.2 Protection of Work and Materials

Add the following at the end of Subsection 4-1.2:

Materials shall not be stored in the right-of-way unless written permission is given by the Engineer.

4-1.6 Trade Names or Equals

If the Contractor requests to substitute an equivalent item for a brand or trade name item, the burden of proof as to the comparative quality and suitability of alternative equipment or articles or materials shall be upon the Contractor, and the Contractor shall furnish, at its own expense, all information necessary or related thereto as required by the Engineer. All requests for substitution shall be submitted, together with all documentation necessary for the Engineer to determine equivalence, no later than ten calendar days after the award of the Contract, unless a different deadline is listed in the Special Provisions.

SECTION 5 UTILITIES

The provisions below shall supplement but not replace those provisions in Section 5 of the Standard Specifications.

5-1 LOCATION

The location and existence of any underground Utility or substructure has not been obtained. The methods used and costs involved to locate existing elements, points of connection and all construction methods are the Contractor's sole responsibility. Accuracy of information furnished, as to existing conditions, is not guaranteed by the City. The Contractor, at its sole expense, must make all investigations necessary to determine locations of existing elements, which may include

contacting Underground Service Alert and other private underground locating firm(s), utilizing specialized locating equipment, hand trenching, or both. For every Dig Alert Identification Number issued by Underground Service Alert during the course of the Project, the Contractor must submit to the City the following form. The Contractor shall be responsible for preserving the integrity of the existing underground utilities at the site.

UNDERGROUND SERVICE ALERT IDENTIFICATION NUMBER FORM

WATER INFRASTRUCTURE IMPROVEMENTS AND RESURFACING PROJECT - CYCLE 2

No excavation will be permitted until this form is completed and returned to the City.

Government Code Section 4216 *et seq*. requires a Dig Alert Identification Number to be issued before a permit to excavate will be valid.

To obtain a Dig Alert Identification Number, call Underground Service Alert at **811** a minimum of three Working Days before scheduled excavation. For best response, provide as much notice as possible up to ten Working Days.

Dig Alert Identification Number: _____

Dated: _____

_____
("CONTRACTOR")

By: _____

Printed Name: _____

Title: _____

By: _____

Printed Name: _____

Title: _____

NOTE: This form is required for every Dig Alert Identification Number issued by Underground Service during the course of the Work. Additional forms may be obtained from the City upon request.

5-1.3 Entry by Utility Owners

The right is reserved to the owners of public Utilities or franchises to enter the Project site for the purpose of making repairs or changes in their property that may be necessary as a result of the Work as well as any other reason authorized by the City. When the Contract Documents provide for the Utility owners to alter, relocate or reconstruct a Utility, or when the Contract Documents are silent in this regard and it is determined by the Engineer that the Utility owners must alter, relocate or reconstruct a Utility, the Contractor shall schedule and allow adequate time for those alterations, relocations or reconstructions by the respective Utility owners. City employees and agents shall likewise have the right to enter upon the Project site at any time and for any reason or no reason at all.

5-2 PROTECTION

If Contractor damages or breaks the Utilities, it will be the Contractor's responsibility to repair the Utility at no cost to the utility company or the City. If not fixed in a timely manner as deemed by the City Engineer, the utility company has the right to complete the repairs and assess the Contractor for all applicable costs.

Add the following paragraphs at the end of Subsection 5-2:

At least two Working Days prior to commencing work within the area, the Contractor shall request the utility owners to identify or otherwise indicate the location of their subsurface facilities. It shall be the Contractor's responsibility to determine the location and depth of all utilities including service connections which have been marked by the representative owners and which he believes may affect or be affected by the work. Full compensation for the ascertainment of utility locations and depths shall be considered included in the prices bid for the other items of work.

All utilities shall be notified by the Contractor in advance, according to their respective advance notice requirements, prior to excavating adjacent to, altering, or in any way modifying their facilities. The Contractor, at his expense, shall maintain in service all existing utilities. Should interruption of such utilities become necessary, the property owners and residents affected shall be notified 48 hours before the interruption.

The Contractor shall protect, support, or perform any other work necessary in order to maintain the operation of utilities in the proximity of the work area. The Contractor shall inform the Engineer in writing of all utilities omitted from or shown incorrectly on the contract plans. The Contractor shall not be entitled to damages or additional payment for delays attributable to utility relocations or alterations not shown or incorrectly delineated on the contract plans. The Contractor shall conduct his operations so as to permit access to the work site by any affected utility necessary for the relocation or modification to the utility system at no cost to the City.

Any interference by the Contractor with City-owned facilities such as, but not limited to, sewer, water, or storm drain that, in the opinion of the Engineer, creates a safety or health hazard and is not quickly repaired, the damaged facilities may be repaired by City forces and all costs of repairs will be deducted from contract payments.

5-3 REMOVAL

Facilities encountered during the prosecution of the Work that are determined to be abandoned shall be removed by the Contractor as required for the Work, unless directed otherwise by the

Engineer. The remaining portion of the existing Utility which is left in place shall be accurately recorded, in elevation and plan, on the control set of Contract drawings.

5-4 RELOCATION

The Contractor shall cooperate fully with all Utility forces of the City or forces of other public or private agencies engaged in the relocation, altering, or otherwise rearranging of any facilities that interfere with the progress of the Work. The Contractor shall schedule the Work so as to minimize interference with the relocation, altering, or other rearranging of facilities.

5-6 COOPERATION

The Contractor's attention is directed to the fact that Work may be conducted at or adjacent to the site by other contractors during the performance of the Work under the Contract. The Contractor shall conduct its operations so as to cause a minimum of interference with the work of such other contractors, and shall cooperate fully with such contractors to provide continued safe access to their respective portions of the site, as required to perform work under their respective contracts. Compensation for compliance shall be included in the various items of the Work, and no additional compensation shall be allowed therefor.

5-7 NOTIFICATION

The Contractor shall notify the Engineer and the owners of all Utilities and substructures not less than 48 hours before starting construction. The following list of names and telephone numbers is intended for the convenience of the Contractor and is not guaranteed to be complete or accurate:

Agency: _____
Phone Number: _____
Contact Person: _____

Agency: _____
Phone Number: _____
Contact Person: _____

Agency: _____
Phone Number: _____
Contact Person: _____

SECTION 6. PROSECUTION, PROGRESS AND ACCEPTANCE OF THE WORK

The provisions below shall supplement but not replace those provisions in Section 6 of the Standard Specifications.

6-1 CONSTRUCTION SCHEDULE AND COMMENCEMENT OF THE WORK

6-1.1 Construction Schedule

In addition to the construction schedule required pursuant to Section 6-1.1 of the Standard Specifications after notification of the Contract award and before any start of the Project, as well as the revised construction schedule in advance of beginning revised operations, the Contractor

shall submit an updated construction schedule with its monthly invoice every month. Progress payments shall be contingent upon the receipt of monthly updated construction schedules.

One week before the scheduled pre-construction meeting, the Contractor must submit a construction schedule to the Engineer for review and approval. The Contractor shall make revisions as required by the Engineer. The schedule must account for all subcontract work, as well as the work of the Contractor, submittals, coordination with the other contractors performing concurrent work and the Traffic Control Plan. The Contractor shall update this Construction Schedule when directed by the Engineer, or when:

a. A Change Order significantly affects the Contract completion date or the sequence of construction approach or activities; or

b. The actual sequence of the Work, or the planned sequence of the Work, is changed and does not conform to the Contractor's current accepted Project construction schedule.

6-1.1.1 Pre-Construction Conference

Approximately five Days before the commencement of Work at the site, a pre-construction conference will be held at the City and shall be attended by the Contractor's Project manager, its on-site field superintendent, and any Subcontractors that the Contractor deems appropriate. Attendance by the Contractor and any Subcontractors designated is mandatory.

Contractor shall submit its 24-hour emergency telephone numbers to the Engineer for approval a minimum of two Working Days before the pre-construction conference. Unless previously submitted to the Engineer, the Contractor shall bring to the pre-construction conference copies of each of the following:

1) Construction Schedule.
2) Procurement schedule of major equipment and materials and items requiring long lead time.
3) Shop drawing/sample submittal schedule.
4) Preliminary schedule of values (lump sum price breakdown) for progress payment purposes.
5) Written designation of the on-site field superintendent and the Project manager. Both daytime and emergency telephone numbers shall be included in the written designation.

The purpose of the conference is to designate responsible personnel and establish a working relationship. The parties will discuss matters requiring coordination and establish procedures for handling such matters. The complete agenda will be furnished to the Contractor before the meeting date. The Contractor shall be prepared to discuss all of the items listed below.

1) The Contractor's construction schedule.
2) Notification of local residents before starting any Work and keeping them informed throughout the Project.
3) Procedures for transmittal, review, and distribution of the Contractor's submittals.
4) Processing applications for payment.
5) Maintaining record documents.
6) Critical Work sequencing.

7) Maintaining sewage service during construction, including proposed by-passes.
8) NPDES requirements, if any.
9) Field decisions and Change Orders.
10) Use of Project site, office and storage areas, security, housekeeping, and the City's needs.
11) Major equipment deliveries and priorities.
12) Traffic control.
13) Any other item that the City representative states is relevant to the meeting.

6-1.1.2 Weekly Progress Meetings

Progress meetings will be held each week during the course of the Project. The meeting location, day of the week and time of day will be mutually agreed to by the City and the Contractor. The Contractor shall provide a two-week "look ahead" schedule for each meeting. The construction manager will preside at these meetings and will prepare the meeting agenda, meeting minutes and will distribute minutes to all persons in attendance. As the Work progresses, if it is determined by agreement of the attendees, that weekly meetings are not necessary, the weekly progress meetings may be changed to bi-weekly progress meetings.

Add the following to section 6-2:

6-2.1 Excess Cost of City Personnel and Inspection Personnel

For any overtime or emergency work beyond a regular eight-hour day and for any work performed on Saturday, Sunday, or holidays, the charges for City personnel, including inspection, required on the job site shall be the responsibility of the Contractor and all costs therefor shall be deducted from the payments due the Contractor. The cost of City personnel shall be computed pursuant to adopted City salary schedules, overtime policies, fringe benefits, and overhead costs.

6-3.1 General

Add the following paragraph following paragraph one:

In the event a suspension of work is ordered because of failure on the part of the Contractor to carry out orders given or to perform any provisions of the Work, such suspension of work shall not relieve the Contractor of its responsibility to complete the work within the time limit set forth herein and shall not be considered cause for extension of the time for completion, and further, such suspension of work shall not entitle the Contractor to any additional compensation.

6-5 TERMINATION OF THE CONTRACT FOR CONVENIENCE

In addition to the reasons for termination listed in Section 6-5 of the Standard Specifications, which allow termination upon any written notice, the City may cancel the Contract for any other reason or for no reason upon 30 Days' written notice. The rest of the procedure outlined in Section 6-5 shall apply to such situation, including the Contractor's required immediate notification of Subcontractors and suppliers and the payment. In no event (including termination for impossibility or impracticability, due to conditions or events beyond the control of the City, for any other reason

or for no reason) shall the total amount of money to Contractor exceed the amount which would have been paid to the Contractor for the full performance of the services described in the Contract.

Furthermore, some of the City's projects are funded in whole or in part by funds other than the City's General Fund. If this Project is funded by such external funds in whole or in part, or if those external funds are terminated or reduced at any time and for any reason or for no reason at all, and the City determines at its discretion that no other funding is available for continuation of this Project, the City will not be obligated to continue funding for the services contained in these Contract Documents and may terminate the Project immediately. The City shall reimburse the Contractor for its work satisfactorily completed until the termination date. In no event shall the total amount of money to the Contractor exceed the amount which the City has received in funding from its external source. The Special Provisions may include further details in this regard.

6-6 DELAYS AND EXTENSIONS OF TIME

Unless otherwise agreed in writing, an adjustment to the Contract time by reason of a Change Order shall be agreed to at the time the Change Order is issued and accepted by the Contractor. If the Change Order does not reserve the right of the parties, or either of them, to seek an adjustment to the Contract time, then the parties forever relinquish and waive such right and there shall be no further adjustments to the Contract time.

6-6.1 Extensions of Time

In the event it is deemed appropriate by the City to extend the time for completion of the Work, any such extension shall not release any guarantee for the Work required by the Contract Documents, nor shall any such extension of time relieve or release the Sureties on the Bonds executed. In executing such Bonds, the Sureties shall be deemed to have expressly agreed to any such extensions of time. The amount of time allowed by an extension of time shall be limited to the period of the delay giving rise to the same as determined by the City. Notwithstanding any dispute which may arise in connection with a claim for adjustment of the Contract time, the Contractor shall promptly proceed with the Work.

6-6.2 Payment for Delays

Notwithstanding any other terms and conditions of the Contract Documents, the City shall have no obligation whatsoever to increase the Contract Price or extend the time for delays.

Unless compensation and/or mark up is agreed upon by the City, the Contractor agrees that no payment of compensation of any kind shall be made to the Contractor for damages or increased overhead costs caused by any delays in the progress of the Contract, whether such delays are avoidable or unavoidable or caused by any act or omission of the City or its agents. Any accepted delay claim shall be fully compensated for by an extension of time to complete the performance of the Work.

This Section shall not apply to compensable delays caused solely by the City. If a compensable delay is caused solely by the City, the Contractor shall be entitled to a Change Order that: (1) extends the time for completion of the Contract by the amount of delay caused by the City; and (2) provides equitable adjustment, as determined by the City, to the Contractor.

Add the following as section 6-7.2:

6-7.2 Working Day

The term "Working Day" shall mean any calendar day except Saturdays, Sundays, and the following holidays:

New Year's Day .....January 1

Martin Luther King, Jr. Day .....3rd Monday in January

Presidents' Day .....3rd Monday in February

Memorial Day .....Last Monday in May

Independence Day .....July 4

Labor Day .....1st Monday in September

Columbus Day .....2nd Monday in October

Veterans' Day .....November 11

Thanksgiving .....4th Thursday in November

Friday after Thanksgiving .....4th Friday in November

Christmas Day .....December 25

If a holiday falls upon a Sunday, the following Monday shall be the day the holiday is observed, and if a holiday falls upon a Saturday, the preceding Friday shall be the day the holiday is observed.

In addition to the holidays identified above, no Working Days will be permitted November 22, 2023 through November 24, 2023 and December 20, 2023 through December 21, 2023.

6-7.3 Contract Time Accounting

Add the following at the end of Subsection 6-7.3:

The Contract Time for completion of the Work, including corrective items of Work, shall be in accordance with Section 4 of the Contract. Contract Time extensions, when granted by the Engineer, will be in Working Days and in accordance with the Contract Documents, and will be set forth in writing via Change Order.

6-8 COMPLETION, ACCEPTANCE AND WARRANTY

The Contractor shall complete all Work under the Contract within the stipulated Working Days from the Notice to Proceed to Fulfill Preconstruction Requirements and Order Materials, as stated in the Contract. The Contractor shall not be allowed to begin any construction activity at the site before the issuance of the Notice to Proceed with Construction.

6-8.2 Acceptance

The Project will not be considered complete and ready for City Council direction to staff regarding recordation of the Notice of Completion until all Work required by the Contract Documents has been fully completed in compliance with the Contract Documents and all Applicable Laws including, but not limited to, correction or completion of all punch list items, the Work site is cleaned up in accordance with Section 7-8 of the Standard Specifications, the General Provisions, and the Special Provisions, and all of the following items have been received by the Engineer:

1. A form of Notice of Completion, with all information required by the California Civil Code;

2. All written guarantees, warranties, and special warranties if applicable;

3. All "as-built" and record drawings;

4. Duly completed and executed forms of Conditional Waiver and Release On Final Payment from the Contractor, Subcontractors of any tier, suppliers, and other person eligible to file stop notices in connection with the Work; and

5. Duplicate copies of all operating instructions and manufacturer's operating catalogs and data, together with such field instructions as necessary to fully instruct City personnel in correct operation and maintenance procedures for all equipment installed listed under the electrical, air conditioning, heating, ventilating and other trades. This data and instructions shall be furnished for all equipment requiring periodic adjustments, maintenance or other operation procedures.

6. The Contractor shall allow at least seven Working Days' notice for final inspection. Such notice shall be submitted to the Engineer in writing.

6-8.3 Warranty

For the purposes of the calculation of the start of the warranty period, the Work shall be deemed to be completed upon the date of recordation of the Notice of Completion. If that direction is contingent on the completion of any items remaining on a punchlist, the Work shall be deemed to be completed upon the date of the Engineer's acceptance of the final item(s) on that punchlist.

The Contractor shall repair or replace defective materials and workmanship as required in Section 6-8.3 of the Standard Specification at its own expense. Additionally, the Contractor agrees to defend, indemnify and hold the City harmless from claims of any kind arising from damage, injury or death due to such defects.

The parties agree that no certificate given shall be conclusive evidence of the faithful performance of the Contract, either in whole or in part, and that no payment shall be construed to be in acceptance of any defective Work or improper materials. Further, the certificate or final payment shall not terminate the Contractor's obligations under the warranty herein. The Contractor agrees that payment of the amount due under the Contract and the adjustments and payments due for any Work done in accordance with any alterations of the same, shall release the City, the City Council and its officers and employees from any and all claims or liability on account of Work performed under the Contract or any alteration thereof.

6-9 LIQUIDATED DAMAGES

For the purposes of the calculation of the start of the liquidated damages, the Work shall be deemed to be completed when the same has been completed in accordance with the Plans and Specifications therefor and to the satisfaction of the Engineer, and the Engineer has certified such completion in accordance with Section 6-8.1 of the Standard Specifications. The liquidated damages value is hereby amended to be $880 per day.

SECTION 7. RESPONSIBILITIES OF THE CONTRACTOR

The first paragraph of Section 7-3.1 of the Standard Specifications shall not be incorporated and shall instead be replaced with the following:

> The Contractor shall provide and maintain insurance naming the City, its elected and appointed officials, officers, employees, attorneys, agents, designated volunteers, and independent contractors in the role of City officials as insureds or additional insureds regardless of any inconsistent statement in the policy or any subsequent endorsement whether liability is attributable to the Contractor or the City. The insurance provisions shall not be construed to limit the Contractor's indemnity obligations contained in the Contract. The City will not be liable for any accident, loss, or damage to the Work before completion, except as otherwise specified in Section 6-10.

The first sentence of Section 7-8.4.2 shall not be incorporated, and shall instead be replaced with the following:

> Construction materials and equipment shall not be stored in Streets, roads, or highways unless otherwise specified in the Special Provisions or approved by the Engineer.

The first sentence of the second paragraph of Section 7-9 of the Standard Specifications shall not be incorporated, and shall instead be replaced with the following:

> The Contractor shall relocate, repair, replace, or reestablish all existing improvements within the Project limits which are not designated for removal (e.g., curbs, sidewalks, driveways, signal loops, fences, walls, sprinkler systems, signs, Utility installations, pavements, structures, etc.) which are damaged or removed as a result of the Contractor's or the Subcontractors' operations or as required by the Plans and Specifications.

The last paragraph of Subsection 7-9 of the Standard Specifications shall not be incorporated, and shall instead be replaced with the following:

> All costs to the Contractor for protecting, removing, restoring, relocating, repairing, replacing, or reestablishing existing improvements shall be included in the Bid.

Section 7-12 of the Standard Specifications shall not be incorporated, and shall instead be replaced with the following:

> The names, addresses and specialties of the Contractor, Subcontractors, architects or engineers may <u>not</u> be displayed on any signage within the public right-

of-way. This signage prohibition includes advertising banners hung from truck beds or other equipment.

Otherwise, the provisions below shall supplement but not replace those provisions in Section 7 of the Standard Specifications.

7-1 THE CONTRACTOR'S EQUIPMENT AND FACILITIES

The use of excessively loud equipment and warning signals shall be avoided, except in those cases required for the protection of personnel.

7-2 LABOR

7-2.2.1 Public Work

The Contractor acknowledges that the Project is a "public work" as defined in Labor Code Section 1720 *et seq*. ("Chapter 1"), and that this Project is subject to (a) Chapter 1, including without limitation Labor Code Section 1771 and (b) the rules and regulations established by the Director of Industrial Relations ("DIR") implementing such statutes. The Contractor shall perform all Work on the Project as a public work. The Contractor shall comply with and be bound by all the terms, rules and regulations described in (a) and (b) as though set forth in full herein.

7-2.2.2 Copies of Wage Rates

Pursuant to Labor Code Section 1773.2, copies of the prevailing rate of per diem wages for each craft, classification, or type of worker needed to perform the Project are on file at City Hall and will be made available to any interested party on request. By initiating any Work on this Project, the Contractor acknowledges receipt of a copy of the DIR determination of such prevailing rate of per diem wages, and the Contractor shall post such rates at each job site covered by these Contract Documents.

7-2.2.3 Failure to Pay Prevailing Rates

The Contractor shall comply with and be bound by the provisions of Labor Code Sections 1774 and 1775 concerning the payment of prevailing rates of wages to workers and the penalties for failure to pay prevailing wages. The Contractor shall, as a penalty paid to the City, forfeit $200.00 for each calendar day, or portion thereof, for each worker paid less than the prevailing rates as determined by the DIR for the work or craft in which the worker is employed for any public work done pursuant to these Contract Documents by the Contractor or by any Subcontractor.

7-2.2.4 Apprentices

The Contractor shall comply with and be bound by the provisions of Labor Code Sections 1777.5, 1777.6 and 1777.7 and California Code of Regulations Title 8, Section 200 *et seq*. concerning the employment of apprentices on public works projects. The Contractor shall be responsible for compliance with these Sections for all apprenticeable occupations. Before commencing Work on this Project, the Contractor shall provide the City with a copy of the information submitted to any applicable apprenticeship program. Within 60 Days after concluding Work, Contractor and each of its Subcontractors shall submit to the City a verified statement of the journeyman and apprentice hours performed under this Contract.

7-2.2.5 Debarment or Suspension

The Contractor shall not perform Work with any Subcontractor that has been debarred or suspended pursuant to California Labor Code Section 1777.1 or any other federal or State law providing for the debarment of contractors from public works. The Contractor and Subcontractors shall not be debarred or suspended throughout the duration of the Contract pursuant to Labor Code Section 1777.1 or any other federal or State law providing for the debarment of contractors from public works. If the Contractor or any Subcontractor becomes debarred or suspended during the duration of the Project, the Contractor shall immediately notify the City.

7-2.3 Payroll Records

The Contractor shall comply with and be bound by the provisions of Labor Code Section 1776, which requires the Contractor and each Subcontractor to (1) keep accurate payroll records and verify such records in writing under penalty of perjury, as specified in Section 1776, (2) certify and make such payroll records available for inspection as provided by Section 1776, and (3) inform the City of the location of the records. The Contractor has ten days in which to comply subsequent to receipt of a written notice requesting these records, or as a penalty to the City, the Contractor shall forfeit $100.00 for each Day, or portion thereof, for each worker, until strict compliance is effectuated. Upon the request of the Division of Labor Standards Enforcement, these penalties shall be withheld from progress payments then due.

7-2.4 Hours of Labor

The Contractor acknowledges that eight hours labor constitutes a legal day's work. The Contractor shall comply with and be bound by Labor Code Section 1810. The Contractor shall comply with and be bound by the provisions of Labor Code Section 1813 concerning penalties for workers who work excess hours. The Contractor shall, as a penalty paid to the City, forfeit $25.00 for each worker employed in the performance of this Project by the Contractor or by any Subcontractor for each calendar day during which such worker is required or permitted to work more than eight hours in any one calendar day and 40 hours in any one calendar week in violation of the provisions of Division 2, Part 7, Chapter 1, Article 3 of the Labor Code. Pursuant to Labor Code Section 1815, work performed by employees of the Contractor in excess of eight hours per day, and 40 hours during any one week shall be permitted upon public work upon compensation for all hours worked in excess of eight hours per day at not less than one and one-half times the basic rate of pay.

7-2.5 Registration with the DIR

In accordance with Labor Code Sections 1725.5 and 1771.1, no contractor or Subcontractor shall be qualified to bid on, be listed in a bid proposal, subject to the requirements of Section 4104 of the Public Contract Code, or engage in the performance of any contract for public work, unless currently registered and qualified to perform public work pursuant to Section 1725.5.

7-2.6 Compliance Monitoring and Posting Job Sites

This Project is subject to compliance monitoring and enforcement by the DIR. The Contractor shall post job site notices, as prescribed by regulation.

7-2.7 Subcontractors

For every Subcontractor who will perform Work on the Project, the Contractor shall be responsible for such Subcontractor's compliance with Chapter 1 and Labor Code Sections 1860 and 3700, and the Contractor shall include in the written Contract between it and each Subcontractor a copy of the provisions in this Section 7-2 of the General Provisions and a requirement that each Subcontractor shall comply with those provisions. The Contractor shall be required to take all actions necessary to enforce such contractual provisions and ensure Subcontractor's compliance, including without limitation, conducting a periodic review of the certified payroll records of the Subcontractor and upon becoming aware of the failure of the Subcontractor to pay its workers the specified prevailing rate of wages. The Contractor shall diligently take corrective action to halt or rectify any failure.

7-2.9 Prevailing Wage Indemnity

To the maximum extent permitted by law, the Contractor shall indemnify, hold harmless and defend (at the Contractor's expense with counsel reasonably acceptable to the City) the City, its officials, officers, employees, agents and independent contractors serving in the role of City officials, and volunteers from and against any demand or claim for damages, compensation, fines, penalties or other amounts arising out of or incidental to any acts or omissions listed in Section 7-2 of the General Provisions by any Person (including the Contractor, its Subcontractors, and each of their officials, officers, employees and agents) in connection with any Work undertaken or in connection with the Contract Documents, including without limitation the payment of all consequential damages, attorneys' fees, and other related costs and expenses. All duties of the Contractor under this Section 7-2.9 shall survive expiration or termination of the Contract.

7-3 INSURANCE

The Contractor shall at all times during the term of the Contract carry, maintain, and keep in full force and effect the insurance referenced in Section 7-3 of the Standard Specifications, as modified below.

7-3.1.1 Acceptability of Insurers.

The insurance policies required under this Section 7-3 shall be issued by an insurer authorized or admitted to write insurance in the State of California with a rating of A:VII or better in the latest edition of the A.M. Best Insurance Rating Guide. Self insurance shall not be considered to comply with the insurance requirements under this Section 7-3.

7-3.1.2 Additional Insured.

The City, its elected and appointed officials, officers, employees, attorneys, agents, designated volunteers, and independent contractors in the role of City officials, shall be the insured or named as additional insureds covering the Work, regardless of any inconsistent statement in the policy or any subsequent endorsement, whether liability is attributable to the Contractor or the City. The commercial general and automobile liability policies shall contain an endorsement naming City, its officers, employees, agents and volunteers as additional insureds. This provision shall also apply to any excess/umbrella liability policies.

7-3.1.3 Primary and Non-Contributing.

The insurance policies required under this Section 7-3 shall apply on a primary non-contributing basis in relation to any other insurance or self-insurance available to the City. Any insurance or self-insurance maintained by the City, its officers, employees, agents or volunteers, shall be in excess of the Contractor's insurance and shall not contribute with it. This provision shall also apply to any excess/umbrella liability policies.

7-3.1.4 Contractor's Waiver of Subrogation.

The insurance policies required under this Section 7-3 shall not prohibit the Contractor and the Contractor's employees, agents or Subcontractors from waiving the right of subrogation prior to a loss. The Contractor hereby waives all rights of subrogation against the City.

7-3.1.5 Deductibles and Self-Insured Retentions.

Any deductibles or self-insured retentions must be declared to and approved by the City. At the City's option, the Contractor shall either reduce or eliminate the deductibles or self-insured retentions with respect to the City, or the Contractor shall procure a bond guaranteeing payment of losses and expenses.

7-3.1.6 Cancellations or Modifications to Coverage.

The Contractor shall not cancel, reduce or otherwise modify the insurance policies required by this Section 7-3 during the term of the Contract. The commercial general and automobile liability policies required under the Contract shall be endorsed to state that should the issuing insurer cancel the policy before the expiration date, the issuing insurer will endeavor to mail 30 days' prior written notice to the City. If any insurance policy required under this Section 7-3 is canceled or reduced in coverage or limits, the Contractor shall, within two business days of notice from the insurer, phone, fax or notify the City via certified mail, return receipt requested, of the cancellation of or changes to the policy

7-3.1.7 City Remedy for Noncompliance.

If the Contractor does not maintain the policies of insurance required under this Section 7-3 in full force and effect during the term of the Contract, or in the event any of the Contractor's policies do not comply with the requirements under this Section 7-3, the City may either immediately terminate the Contract or, if insurance is available at a reasonable cost, the City may, but has no duty to, take out the necessary insurance and pay, at the Contractor's expense, the premium thereon. The Contractor shall promptly reimburse the City for any premium paid by the City or the City may withhold amounts sufficient to pay the premiums from payments due to the Contractor.

7-3.1.8 Evidence of Insurance.

At least two Working Days prior to the performance of Services under the Contract, the Contractor shall furnish the City's Risk Manager with a certificate or certificates of insurance and all original endorsements (both of which must reference the same Policy number), evidencing and effecting the coverages required under Section 7-3 of the Standard Specifications, as modified by this Section 7-3. The endorsements are subject to approval by the City's Risk Manager. The Contractor may provide complete, certified copies of all required insurance policies to the City.

The Contractor shall provide proof to the City's Risk Manager that insurance policies expiring during the term of the Contract have been renewed or replaced with other policies providing at least the same coverage. The Contractor shall furnish such proof at least two weeks prior to the expiration of the coverages.

The endorsements are to be signed by a person authorized by that insurer to bind coverage on its behalf. The endorsements must specifically name the City of Manhattan Beach and its elected and appointed officials, officers, employees, attorneys, agents, designated volunteers, and independent contractors in the role of City officials as insureds or additional insureds. The Contractor shall maintain current insurance certificates and endorsements on file with the City's Risk Manager at all times during the term of this Contract. The City reserves the right to require complete, certified copies of all required insurance policies at any time.

Where the Contractor has entered into an agreement with a Professional Employment Organization (PEO) to provide human resources, workers' compensation insurance, or other benefits to the Contractor's employees, the Contractor must also submit the agreement with the PEO. If the evidence of insurance submitted by the Contractor pursuant to this Section 7-3 evidences that the insurance is provided by the PEO, all such PEO-provided insurance coverages and indemnities must comply with the requirements of these Contract Documents.

7-3.1.9 Indemnity Requirements not Limiting.

Procurement of insurance by the Contractor shall not be construed as a limitation of Contractor's liability or as full performance of the Contractor's duty to indemnify the City under Section 7-4 of the Contract.

7-3.1.10 Subcontractor Insurance Requirements.

The Contractor shall require each of its Subcontractors that perform Services under the Contract to maintain insurance coverage that meets all of the requirements of this Section 7-3.

7-3.1.11 Replacement Insurance

The Contractor agrees that it will not cancel, reduce or otherwise modify the insurance coverage. The Contractor agrees that if it does not keep the required insurance in full force and effect, and such insurance is available at a reasonable cost, the City may take out the necessary insurance and pay the premium thereon, and the repayment thereof shall be deemed an obligation of the Contractor and the cost of such insurance may be deducted, at the option of the City, from payments due the Contractor. This shall be in addition to all other legal options available to the City to enforce the insurance requirements.

7-3.2 General Liability Insurance

Instead of the minimum limits listed in Section 7-3.2 of the Standard Specifications, the Contractor shall procure and at all times during the term of the Contract carry, maintain, and keep in full force and effect Commercial General Liability Insurance with a minimum limit of $2,000,000.00 per occurrence for bodily injury, personal injury and property damage and a general aggregate limit of $2,000,000.00 per project or location. If the Contractor is a limited liability company, the commercial general liability coverage shall be amended so that the Contractor and its managers, affiliates, employees, agents and other persons necessary or incidental to its operation are insureds.

7-3.3 Workers' Compensation Insurance

Workers' Compensation Insurance as required by the State of California and Employer's Liability Insurance with a minimum limit of $1,000,000.00 per accident for bodily injury or disease. If the Contractor has no employees while performing the Work under the Contract, a Workers' Compensation policy is not required, but the Contractor shall execute a declaration that it has no employees.

7-3.4 Automobile Insurance

Instead of the minimum limits listed in Section 7-3.4 of the Standard Specifications, the Contractor shall procure and at all times during the term of the Contract carry, maintain, and keep in full force and effect Automobile Liability Insurance for any owned, non-owned or hired vehicle used in connection with the performance of the Contract with a combined single limit of $2,000,000.00 per accident for bodily injury and property damage. If the Contractor does not use any owned, non-owned or hired vehicles in the performance of the Work under this Contract, the Contractor shall obtain a non-owned auto endorsement to the Commercial General Liability policy required by Subsection 7-3.2.

7-3.5 Insurance Requirements not Limiting

If the Contractor maintains broader coverage and/or higher limits than the minimums required above, the City requires and shall be entitled to the broader coverage and/or the higher limits maintained by the Contractor. Any available insurance proceeds in excess of the specified minimum limits of insurance and coverage shall be available to the City.

7-4 *INDEMNIFICATION*

The following indemnity provisions shall supersede the indemnity in Section 7-3.1 of the Standard Specifications.

7-4.1 Indemnities for Third Party Claims.

To the fullest extent permitted by law, the Contractor shall, at its sole cost and expense, defend, hold harmless and indemnify the City and its elected officials, officers, attorneys, agents, employees, designated volunteers, successors, assigns and those City agents serving as independent contractors in the role of City officials (collectively "Indemnitees"), from and against any and all damages, costs, expenses, liabilities, claims, demands, causes of action, proceedings, expenses, judgments, penalties, liens, and losses of any nature whatsoever, including fees of accountants, attorneys, or other professionals and all costs associated therewith and the payment of all consequential damages (collectively "Liabilities"), in law or equity, whether actual, alleged or threatened, which arise out of, are claimed to arise out of, pertain to, or relate to the acts or omissions of the Contractor, its officers, agents, servants, employees, Subcontractors, materialmen, contractors or their officers, agents, servants or employees (or any entity or individual that the Contractor shall bear the legal liability thereof) in the performance of the Contract, including the Indemnitees' active or passive negligence, except for Liabilities arising from the sole negligence or willful misconduct of the Indemnitees, as determined by final arbitration or court decision or by the agreement of the Parties. The Contractor shall defend the Indemnitees in any action or actions filed in connection with any Liabilities with counsel of the Indemnitees' choice, and shall pay all costs and expenses, including all attorneys' fees and experts' costs actually incurred in connection with such defense. The Contractor shall reimburse

the Indemnitees for any and all legal expenses and costs incurred by Indemnitees in connection therewith.

7-4.1.1 Taxes and Workers' Compensation

The Contractor shall pay all required taxes on amounts paid to the Contractor under the Contract, and indemnify and hold the City harmless from any and all taxes, assessments, penalties, and interest asserted against the City by reason of the independent contractor relationship created by the Contract. The Contractor shall fully comply with the Workers' Compensation law regarding the Contractor and the Contractor's employees. The Contractor shall indemnify and hold the City harmless from any failure of the Contractor to comply with applicable Workers' Compensation laws. The City may offset against the amount of any fees due to the Contractor under the Contract any amount due to the City from the Contractor as a result of the Contractor's failure to promptly pay to the City any reimbursement or indemnification arising under this Subsection 7-4.1.1.

7-4.1.2 Subcontractor Indemnity Agreements

The Contractor shall obtain executed indemnity agreements with provisions identical to those in this Section 7-4 from each and every Subcontractor or any other person or entity involved by, for, with or on behalf of the Contractor in the performance of the Contract. If the Contractor fails to obtain such indemnity obligations, the Contractor shall be fully responsible and indemnify, hold harmless and defend the Indemnitees from and against any and all Liabilities at law or in equity, whether actual, alleged or threatened, which arise out of, are claimed to arise out of, pertain to, or relate to the acts or omissions of the Contractor's Subcontractor, its officers, agents, servants, employees, Subcontractors, materialmen, contractors or their officers, agents, servants or employees (or any entity or individual that the Contractor's Subcontractor shall bear the legal liability thereof) in the performance of the Contract, including the Indemnitees' active or passive negligence, except for Liabilities arising from the sole negligence or willful misconduct of the Indemnitees, as determined by final arbitration or court decision or by the agreement of the Parties.

7-4.2 Workers' Compensation Acts not Limiting.

The Contractor's indemnifications and obligations under this Section 7-4, or any other provision of the Contract, shall not be limited by the provisions of any Workers' Compensation act or similar act. The Contractor expressly waives its statutory immunity under such statutes or laws as to the City, its officers, agents, employees and volunteers.

7-4.3 Insurance Requirements not Limiting.

The City does not, and shall not, waive any rights that it may possess against the Contractor because of the acceptance by the City, or the deposit with the City, of any insurance policy or certificate required pursuant to the Contract. The indemnities in this Section 7-4 shall apply regardless of whether or not any insurance policies are determined to be applicable to the Liabilities, tax, assessment, penalty or interest asserted against the City.

7-4.4 Survival of Terms.

The Contractor's indemnifications and obligations under this Section 7-4 shall survive the expiration or termination of the Contract.

7-4.5 Civil Code Exception.

Nothing in this Section 7-4 shall be construed to encompass Indemnitees' sole negligence or willful misconduct to the limited extent that the underlying Contract is subject to Civil Code Section 2782(a) or the City's active negligence to the limited extent that the underlying Contract Documents are subject to Civil Code Section 2782(b), provided such sole negligence, willful misconduct or active negligence is determined by agreement between the parties or by the findings of a court of competent jurisdiction.

7-4.6 Nonwaiver of Rights.

Indemnitees do not and shall not waive any rights that they may possess against the Contractor because the acceptance by the City, or the deposit with the City, of any insurance policy or certificate required pursuant to these Contract Documents. This indemnity provision is effective regardless of any prior, concurrent, or subsequent active or passive negligence by Indemnitees and shall operate to fully indemnify Indemnitees against any such negligence.

7-4.7 Waiver of Right of Subrogation.

The Contractor, on behalf of itself and all parties claiming under or through it, hereby waives all rights of subrogation and contribution against the Indemnitees, while acting within the scope of their duties, from all Claims arising out of or incident to the activities or operations performed by or on behalf of the Contractor regardless of any prior, concurrent or subsequent active or passive negligence by Indemnitees.

7-5 *PERMITS*

Before starting any construction work, the Contractor will be required to obtain all necessary permits from the City, which may include obtaining a no fee right-of-way permit for Work within the public right-of-way, as well as all other permits required from all other agencies. Should this Project require construction of trenches or excavations which are five feet or deeper and into which a person is required to descend, the Contractor shall obtain a Cal/OSHA permit and furnish the City with a copy before Work can commence on this Project. The Contractor shall bear all cost for fees for all agencies except for the City's permit fees.

The Contractor shall procure all permits and licenses (including a City of Manhattan Beach business license), pay all charges and fees, and give all notices necessary and incidental to the due and lawful prosecution of the work. All City of Manhattan Beach permits required for the performance of the Contract shall be issued on a "no fee" basis. Permits required by other agencies shall be obtained by the Contractor for all work within the City of Manhattan Beach.

7-7 COOPERATION AND COLLATERAL WORK

The Contractor shall be responsible for coordinating all Work with the City's street sweeping, trash pick-up, and street maintenance contractors, emergency services departments, utility companies' crews, and others when necessary. Payment for conforming to these requirements shall be included in other items of Work, and no additional payment shall be made thereof.

7-8 WORKSITE MAINTENANCE

Clean-up shall be done as Work progresses at the end of each day and thoroughly before weekends. The Contractor shall not allow the Work site to become littered with trash and waste material, but shall maintain the same in a neat and orderly condition throughout the construction operation. Materials which need to be disposed shall not be stored at the Project site, but shall be removed by the end of each Working Day. If the job site is not cleaned to the satisfaction of the Engineer, the cleaning will be done or contracted by the City and shall be back-charged to the Contractor and deducted from the Contract Price.

The Contractor shall make arrangements for storing its equipment and materials. The Contractor shall make its own arrangements for any necessary off-site storage or shop areas necessary for the proper execution of the Work. Approved areas within Work site may be used for temporary storage; however, the Contractor shall be responsible for obtaining any necessary permits from the City. In any case, the Contractor's equipment and personal vehicles of the Contractor's employees shall not be parked on the traveled way or on any section where traffic is restricted at any time.

The Contractor shall deliver, handle, and store products in accordance with the manufacturer's written recommendations and by methods and means that will prevent damage, deterioration, and loss including theft. Delivery schedules shall be controlled to minimize long-term storage of products at the Project site and overcrowding of construction spaces. In particular, the Contractor shall provide delivery and installation coordination to ensure minimum holding or storage times for products recognized to be flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other sources of loss.

Storage shall be arranged to provide access for inspection. The Contractor shall periodically inspect to ensure products are undamaged and are maintained under required conditions.

The Contractor shall promptly remove from the vicinity of the completed Work, all rubbish, debris, unused materials, concrete forms, construction equipment, and temporary structures and facilities used during construction. Final Acceptance of the Work by the City will be withheld until the Contractor has satisfactorily complied with the foregoing requirements for final clean-up of the Project site.

All costs associated with the clean-up and storage required to complete the Project shall be the sole responsibility of the Contractor.

Pursuant to the provisions of Section 7-8 and Section 7-10 of the Standard Specifications and these General Provisions, the Contractor is responsible for Project site maintenance and for public convenience and safety. Payment for compliance with these provisions is considered as included in the prices bid for other contract items.

The City, however, to maintain good public relations, may deem it necessary to require special Project site maintenance and public convenience and safety actions and work to be performed by the Contractor that are over and above those required by the provisions of Section 7-8 and Section 7-10 of the Standard Specifications and these General Provisions.

These actions and work shall be as directed by the Engineer in writing and payment for compliance therewith shall be on a cost plus basis for extra work per Section 3-3 of the Standard

Specifications and applied against the not-to-exceed bid item for "Special Project Site Maintenance and Public Convenience and Safety."

7-10 SAFETY

The provisions below shall supplement but not replace those provisions in Subsection 7-10 of the Standard Specifications.

7-10.2 Haul Routes

Subsection 7-10.3 of the Standard Specifications shall be deleted and replaced as follows:

> The Contractor must obtain the Engineer's approval before using any haul routes. Further detail requirements for haul traffic are delineated in the Special Provisions.

7-10.5.3 Steel Plate Covers

The Contractor shall cover all openings, trenches and excavations at the end of each Work Day with steel plate covers.

7-15 *RECYCLING OF MATERIALS*

Subsection 7-15 is hereby added to the Standard Specifications as follows:

7-15.1 Recycling of Asphalt Concrete, Portland Cement Concrete, Aggregate Base, and Green Waste are Required

The records of disposal, including scale tonnages, shall be furnished to the City on a monthly basis. Failure to comply with the requirements of this Section will result in delay of progress payment.

7-15.2 Contractor's Obligation

The City is committed to a recycling program. If available, it is the obligation of the Contractor, under the Contract, to recycle the waste material through an approved recycling plant. Records and reports of waste recycle will be submitted to the City on a regular monthly basis.

SECTION 8. FACILITIES FOR AGENCY PERSONNEL

The provisions of Section 8 of the Standard Specifications shall apply except as modified herein. No field offices for City personnel shall be required; however, City personnel shall have the right to enter upon the Project at all times and shall be admitted to the offices of the Contractor to use the telephone, desk and sanitary facilities provided by the Contractor for its own personnel.

SECTION 9. MEASUREMENT AND PAYMENT

The provisions below shall supplement but not replace those provisions in Section 9 of the Standard Specifications.

9-1.1 General

Add the following at the end of Subsection 9-1.1:

All items of Work which are not designated on the Bid Schedule by the letters “F” or “LS” or words “Final” or “Lump Sum” shall have final pay quantities measured and paid for in accordance with the Standard Specifications and these General Provisions.

9-1.2 Methods of Measurement

The Contract Price shall constitute full compensation for all labor, equipment, materials, tools and incidentals required to complete the Project as outlined in these Contract Documents and as directed by the Engineer.

9-2 LUMP SUM WORK

Delete the first sentence of Subsection 9-2 and substitute the following:

Items of Work which are designated by the letters “LS” or the words “Lump Sum” in the Unit column of the Bid Schedule shall be paid for at the price indicated in the Bid, unless the dimensions of the Work, as shown on the Plans, are revised by the Engineer. If such dimensions are revised and such revisions result in an increase or decrease in the quantity of such Work, the final payment for the lump sum item will be revised in proportion to the change in dimensions authorized by Change Order.

Delete the second paragraph of Subsection 9-2 and substitute the following:

The Contractor shall submit a Work item breakdown (Schedule of Values) of the Bid within ten Working Days after award of the Contract and/or at any other time as required by the Engineer to be used as a basis for determining progress payments for desginated lump sum Bid Items. The schedule shall equal the Contract Price and shall be sufficiently detailed as to astisfy the Engineer that it correctly represents a reasonable apportionment of the lump sum.

No guarantee is made regarding the amount of Work required to complete a lump sum item of Work.

9-2.1 Progress Payments for Lump Sum Items of Work

The “%” symbol in the Code column of the Bid Schedule for a lump sum item of Work shall mean that progress payments for that item will be allowed based on the percentage of completion as determined by the Engineer in each pay period, typically every 30 days. (See Subsection 9-3.2 of the Standard Specifications and these General Provisions.)

9-3 PAYMENT

9-3.1 General

In accordance with Public Contract Code Section 7107, if no claims have been filed and are still pending, the amount deducted from the final estimate and retained by the City will be paid to the Contractor except such amounts as are required by law to be withheld by properly executed and filed notices to stop payment, or as may be withheld for any other lawful purposes.

Whenever the Contractor is required to perform work or furnish equipment, labor, tools, and materials of any class for which no price is fixed in the proposal, it shall be understood that such work, equipment, labor, tools, and materials shall be provided without extra charge, allowance, or direct payment of any kind. The cost of performing such work or furnishing such equipment, labor, tools, and materials shall be included in the unit bid prices in the proposal most closely related to the work and no additional compensation will be made thereof.

If any portion of the work done or materials furnished under the Contract shall prove defective or not in accordance with the Specifications and Contract drawings, and if the imperfection in the same is not of sufficient magnitude or importance to make the work dangerous or undesirable, the Engineer shall have the right and authority to retain the work instead of requiring it to be removed and reconstructed, but he shall make such deductions therefor in the payment due the Contractor as may be just and reasonable.

Delete the tenth paragraph of Subsection 9-3.1 and substitute the following:

Not later than 60 days from the date of Final Acceptance, the five percent deducted and retained from each progress estimate (see Subsection 9-3.2 of the Standard Specifications and these General Provisions) by the City will be paid to the Contractor except such amounts as are required by law to be withheld by properly executed and filed notices to stop payment, or as may be authorized by the Contract to be further retained.

9-3.2 Partial and Final Payment

9-3.2.1 Monthly Closure Date and Invoice Date

The Contractor shall prepare and submit the form attached herewith (see Appendices I and II), or its own form in an identical format, to the Engineer for all requests for progress payments for the work performed in accordance with the provisions of the Contract during the preceding month. The progress payment request shall be submitted monthly, and a maximum of one progress payment request may be submitted each month. The Contractor shall submit a Conditional Waiver and Release form (Civil Code Section 8132) with the applicable monthly progress payment request. Progress payment requests associated with work completed prior to June 30th (the end of the City's fiscal year), must be submitted no later than July 30th.

9-3.2.2 Payments

The City shall make payments within 30 Days after receipt of the Contractor's undisputed and properly submitted payment request, including an updated construction schedule pursuant to Section 6-1.1 of the General Provisions. The City shall return to the Contractor any payment request determined not to be a proper payment request as soon as practicable, but not later than seven Days after receipt, and shall explain in writing the reasons why the payment request is not proper. Acceptance by the Contractor of the payment made in accordance with the final estimate shall be a release to the City, its officers, agents, and employees excepting only claims against the City for any amount withheld by it at the time of such payment.

9-3.2.3 Retention

The City shall withhold not less than five percent from each progress payment. The City shall withhold not less than five percent of the Contract Price from the Final Payment Amount (defined in Section 9-3.2.4) until at least 35 days after recordation of the Notice of Completion, or

recordation of a notice of cessation, but not longer than the period permitted by Public Contract Code Section 7107.

In addition to retained percentage and liquidated damages, the City may withhold payments to the Contractor including for defective work not remedied and other valid claims against the Contractor.

9-3.2.4 Final Invoice and Payment

Whenever the Contractor shall have completely performed the Contract in the opinion of the Engineer, the Contractor shall submit to the Engineer a written statement of the final quantities of Contract items in the form of the final invoice, which must have an identical format to the progress payment request form attached herewith (see Appendix I). Upon receipt of the final payment request, the Engineer shall check the quantities included therein and shall authorize a payment amount, which in the Engineer's opinion shall be just and fair, covering the value of the total amount of Work done by the Contractor, less all previous payments and all amounts to be retained under the provisions of the Contract Documents ("Final Payment Amount"). The Contractor shall submit a Conditional Waiver and Release form (Civil Code Section 8136) with the Final Payment request. The Engineer shall then request that the City accept the Work and that the City Clerk be authorized to file, on behalf of the City in the office of the County Recorder, a Notice of Completion of the Work herein agreed to be done by the Contractor. In addition, the final payment will not be released until the Contractor returns the control set of Plans and Specifications showing the redlined as-built conditions.

Final payment requests associated with work completed prior to June 30th (the end of the City's fiscal year), must be submitted no later than July 30th.

9-3.2.5 Substitute Security

In accordance with Public Contract Code Section 22300, the Contractor may request that it be permitted to substitute securities in lieu of having retention withheld by the City from progress payments when such payments become due or, in the alternative, the Contractor may request that the City make payments of earned retentions directly to an agreed upon designated escrow agent at the Contractor's expense. If the Contractor selects either one of these alternatives, the following shall control.

9-3.2.5.1 Substitution of Securities for Performance Retention

At some reasonable time before any progress payment would otherwise be due and payable to the Contractor in the performance of Work under these Contract Documents, the Contractor may submit a request to the City in writing to permit the substitution of retentions with securities equivalent to the amount estimated by the City ("estimated amount of retention") to be withheld. The Contractor shall deposit such securities with the City or may, in the alternative, deposit such securities in escrow with a State or federally chartered bank in California, as the escrow agent, at the Contractor's expense. Such securities will be the equivalent or greater in value of the estimated amount of retention. If the Contract is modified by written Modifications or Change Orders or the Contractor otherwise becomes entitled to receive an amount more than the Contract Price at the time the securities are deposited, the Contractor shall, at the request of the City, deposit with the City or escrow agent, whichever is applicable, additional securities within a reasonable time so that the amount of securities on deposit with the City or escrow agent is equivalent or greater in value than the amount of retention the City would otherwise be entitled to

withhold from progress payments due or to become due to the Contractor as the Work progresses. The City shall withhold any retention amount that exceeds the security amount until the additional securities are deposited and, if the deposit is with an escrow agent, the City has confirmation from that escrow agent of the new total value of securities. Upon satisfactory completion of the Contract, which shall mean, among other things, that the City is not otherwise entitled to retain proceeds from progress payments as elsewhere provided in the Contract or under applicable law, the securities shall be returned to the Contractor. The City shall, within its sole discretion, determine whether the amount of the securities on deposit with the City or escrow agent is equal to or greater than the amount of estimated retention of progress payments that could otherwise be held by the City if the Contractor had not elected to substitute same with securities.

9-3.2.5.2 Deposit of Retention Proceeds with an Escrow Agent

As an alternative to the substitution of securities, as provided above, or the City otherwise retaining and holding retention proceeds from progress payments, the Contractor may request the City to make payments of retentions earned directly to an escrow agent with the same qualifications as required in Section 9-3.2.5.1 above and at the expense of the Contractor. At its sole expense, the Contractor may direct the investment of such retention payments into only such securities as mentioned in Section 9-3.2.5.3 below and shall be entitled to interest earned on such investments on the same terms provided for securities deposited by the Contractor. Upon satisfactory completion of the Contract, which shall mean when the City would not otherwise be entitled to withhold retention proceeds from progress payments had the Contractor not elected to have such proceeds deposited into escrow, the Contractor shall be allowed to receive from the escrow agent all securities, interest and payments deposited into escrow pursuant to the terms of this Section. The Contractor shall pay to each Subcontractor, not later than ten Days of receipt of payment, the respective amount of interest earned, net of costs attributed to retention withheld from each Subcontractor, on the amount withheld to ensure performance of the Contractor.

9-3.2.5.3 Subcontractor Entitlement to Interest

If the Contractor elects to receive interest on any moneys withheld in retention by the City, then the Subcontractor shall receive the identical rate of interest received by the Contractor on any retention moneys withheld from the Subcontractor by the Contractor, less any actual pro rata costs associated with administering and calculating that interest. In the event that the interest rate is a fluctuating rate, the rate for the Subcontractor shall be determined by calculating the interest rate paid during the time that retentions were withheld from the Subcontractor. If the Contractor elects to substitute securities in lieu of retention, then, by mutual consent of the Contractor and the Subcontractor, the Subcontractor may substitute securities in exchange for the release of moneys held in retention by the Contractor. The Contractor shall pay each Subcontractor, not later than ten Days after receipt of escrow moneys, the amount owed to each Subcontractor from the moneys plus the respective amount of interest earned, net of costs attributed to the retention held from each Subcontractor, on the amount of retention withheld to ensure performance of the Subcontractor.

9-3.2.5.4 Securities Eligible for Investment

Securities eligible for investment 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 upon between the Contractor and the City. The Contractor shall be the beneficial owner of any securities substituted for any monies withheld and shall receive any interest thereon.

9-3.2.5.5 Escrow Agreement for Security Deposits in Lieu of Retention

The escrow agreement that shall be used for the deposit of securities in lieu of retention shall substantially conform to the form prescribed in Public Contract Code Section 22300(f).

9-3.2.5.6 Inconsistencies with Prevailing Statutory Requirements

If there is any inconsistency between or differences in Public Contract Code Section 22300 and the terms of this provision, or any future amendments thereto, Section 22300 shall control.

9-4 AUDIT

The City or its representative shall have the option of inspecting and/or auditing all records and other written materials used by the Contractor in preparing its billings to the City as a condition precedent to any payment to the Contractor or in response to a construction claim or a Public Records Act (Government Code Section 6250 *et seq.*) request. The Contractor will promptly furnish documents requested by the City at no cost. Additionally, the Contractor shall be subject to State Auditor examination and audit at the request of the City or as part of any audit of the City, for a period of three and one-half years after Final Acceptance under the Contract. The Contractor shall include a copy of this Section 9-4 in all contracts with its Subcontractors, and the Contractor shall be responsible for immediately obtaining those records or other written material from its Subcontractors upon a request by the State Auditor or the City. If the Project includes other auditing requirements, those additional requirements will be listed in the Special Provisions.

SECTION 10. CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT PLAN

10.1 GENERAL

To ensure that solid waste generated in the City is reduced, reused or recycled, the Contractor shall submit a “Waste Management Plan” (WMP) to the Engineer for review and approval, using the form found at the end of this Section 10. After the WMP has been reviewed by the Engineer, it will be returned to the Contractor in one of the following four status conditions:

- “Approved”
- “Further Explanation Required”: The Engineer will return the WMP to the Contractor with questions about the WMP. The Contractor shall resubmit plan with each of the City’s questions answered thoroughly.
- “Denied”: The Engineer will indicate the reasons for denial. The Contractor shall then re-submit a new WMP that complies with the requirements of this Section or request an Infeasibility Exemption.
- “Infeasibility Exemption Approved”

The Contractor shall follow the WMP and document results during demolition and construction. Final documentation shall be submitted at the end of the project to the Engineer for review of compliance with the original WMP. The amount deducted from the final estimate and retained by the City in accordance with Section 9.3.1 and 9.3.2 shall be withheld until final WMP is submitted to the City and approved by the City.

10-2 DEFINITIONS

a) "Construction" means the building of any facility or structure or any portion thereof including any tenant improvements to an existing facility or structure.

b) "Construction and Demolition Debris" means used or discarded materials removed from premises during construction of the Project.

c) "Conversion Rate" means the rate set forth in the standardized Conversion Rate Table approved by the City Council pursuant to this Section for use in estimating the volume or weight of materials identified in a Construction and Demolition Waste Reduction and Recycling Plan.

d) "Divert" means to use material for any purpose other than disposal in a landfill. Diversion credit is given for source reduction (waste reduction), recycling, and composting.

e) "Diversion Requirement" means the diversion of at least 65% of the total Construction and Demolition Debris generated by a Project via reduction (source reduction), reuse or recycling, unless the Contractor has been granted an Infeasibility Exemption, in which case the Diversion Requirement shall be the maximum feasible diversion rate established by the Engineer.

f) "Recycling" means the process of collecting, sorting, cleansing, treating, and reconstituting materials that would otherwise become solid waste, and returning them to the economic mainstream in the form of raw material for new, reused, or reconstituted products which meet the quality standards necessary to be used in the marketplace.

g) "Renovation" means any change, addition, or modification in an existing structure.

h) "Reuse" means further or repeated use of Construction or Demolition Debris. An example is the reuse of crushed concrete as road base or as aggregate on the construction site.

i) "Salvage" means the controlled removal of Construction or Demolition Debris from project for the purpose of recycling, reuse, or storage for later recycling or reuse.

j) "Construction and Demolition Waste Management Plan" means a completed form, approved by the Engineer for the purpose of compliance with this Section, submitted by the Contractor/Contractor for any Covered or Noncovered Project that indicates the estimated diversion that the Contractor/Contractor anticipates in diverting from disposal.

k) "Construction and Demolition Waste Management Report" means a completed form, approved by the Engineer for the purpose of compliance with this Section, submitted by the Contractor for any Project that documents the disposal and diversion tonnages and destinations.

10-3 INFEASIBILITY EXEMPTION

a) Application. If the Contractor experiences unique circumstances that the Contractor believes make it infeasible to comply with the Diversion Requirement, the Contractor shall apply for an exemption at the time that it submits the WMP. The Contractor shall indicate on the WMP the maximum rate of diversion the Contractor believes is feasible for each material and the

specific circumstances that the Contractor believes make it infeasible to comply with the Diversion Requirement.

b) The Engineer shall review the information supplied by the Contractor and may meet with the Contractor to discuss possible ways of meeting the Diversion Requirement. Based on the information supplied by the Contractor, the Engineer shall determine whether it is possible for the Contractor to meet the Diversion Requirement.

c) If the Engineer determines that it is infeasible for the Contractor to meet the Diversion Requirement due to unique circumstances, the Engineer shall determine the maximum feasible diversion rate for each material and shall indicate this rate on the WMP submitted by the Contractor. The Engineer shall return a copy of the WMP to the Contractor marked "Infeasibility Exemption Approved."

d) Denial of Exemption. If the Engineer determines that it is possible for the Contractor to meet the Diversion Requirement, the Engineer shall so inform the Contractor in writing. The Contractor will have 15 days to resubmit a new WMP. If the Contractor fails to resubmit a new WMP, or if the resubmitted WMP does not comply with the requirements of the plan, the Engineer shall deny the WMP.

10-4 DIVERSION PROGRAM

The methodology used to calculate diversion is based on the Title 14, California Code of Regulations, Article 6.1 Solid Waste Generation Study, Section 18722 et seq, and is consistent with California Integrated Waste Management Board measurement protocols. The following equation defines the "Generation-Based Diversion Quantification Methodology":

$$\text{Generation} = \text{Disposal} + \text{Diversion}$$

$$\text{Diversion Rate (\%)} = \frac{\text{Diversion Tons}}{\text{Generation Tons}}$$

10-5 ADDITIONAL INFORMATION

Other materials to assist the Contractor in completing the WMP can be found on the City's website at *www.citymb.info*.

- Construction and Demolition Debris Recycling Guide
- Construction and Demolition Recycling Brochure

The California Integrated Waste Management Board has also developed Technical Assistance Literature regarding construction and demolition waste reduction and recycling, which is available on-line at *http://www.ciwmb.ca.gov/ConDemo/*.

CITY OF MANHATTAN BEACH

Construction & Demolition Waste Management Plan

Manhattan Beach Municipal Code 5.26 requires construction projects to reuse or recycle 65% of all construction site waste (All Demo & Roof tear-off projects, and All construction with a total value of $100,000+). All haulers and contractors MUST have a business license in the City of Manhattan Beach.

REQUIRED GOAL: REUSE OR RECYCLE A MINIMUM OF 65% OF ALL PROJECT WASTE

Instructions:

1. Complete entire WMP & submit to the Project Manager as a project submittal.
2. Reuse and/or recycle at least 65% of all construction site waste and keep good records of all facility waste tickets.
3. Submit a copy of this WMP and ALL recycling and landfill facility weight tickets before Final Inspection to the Project Manager as a new project submittal. ***A COPY OF THIS WMP AND RECEIPTS OF ALL RECYCLING AND DISPOSAL SHALL BE SUBMITTED BEFORE FINAL PAYMENT WILL BE MADE BY THE CITY.***

Fines for Non-Compliance (MBMC 5.26.020): Demo projects up to $5,000 and Construction projects up to $10,000

Project Name: _____

Project Address: _____

Type of Project: [ ] Street Improvement [ ] Water Main [ ] Sewer Main
[ ] Storm Drain [ ] Other

Total Bid Price: $_____

Requesting Infeasibility Exemption: **[ ] Yes** **[ ] No**

Contractor Name: _____ **Contact Name:** _____

Address: _____ **Contact Phone:** _____

Recycler: _____ **Recycler Contact:** _____

Recycler Address: _____ **Recycler Contact Phone:** _____

	CITY USE ONLY	
	Application (Date)	**Final (Date)**
Approved		
Further explanation needed (see attached)		
Denied		
Infeasibility Exemption Approved		
Reviewed By		

Submit this form and the attached Waste Management Plan Table to:

Engineering Division
City of Manhattan Beach
3621 Bell Avenue
Manhattan Beach, CA 90266

CITY OF MANHATTAN BEACH

Construction & Demolition Waste Management Plan Table

Project Name: _____

Total Estimated Waste Generated by Project: _____ (***IN TONS***).
(Ask your hauler, recycler or site cleanup vendor to assist you. Use receipts from your previous jobs for estimates.)

Complete and return with Building Permit Application				**Complete and return with receipts prior to final building approval**		
Material Type	Estimated Reused/ Recycled	Estimated Disposed/ Landfilled	Vendor or Facility to be Used (Destination)	Actual Reused/ Recycled	Actual Disposed/ Landfilled	Vendor or Facility Used (Destination)
Asphalt & Concrete						
Bricks/Masonry/Tiles						
Building Materials (doors, windows, fixtures, etc.)						
Cardboard						
Concrete Pavement and Grindings						
Drywall (new, unpainted)						
Asphalt Pavement Grindings						
Landscape Debris (Plant & Tree Trimmings)						
Scrap Metal						
Unpainted Wood & Pallets						
Other (painted wood & drywall, roofing, etc.)						
Mixed C&D*						
Trash/Garbage						
TOTAL						

**Mixed C&D* is defined as a mixture of three or more materials (e.g., wood, drywall, roofing, etc.) from construction or demolition sites that will be taken to a *"qualified"* facility for recycling. (See C&D Debris Recycling Guide.)

If you are requesting an infeasibility exemption and the estimated amount reused/recycled is less than 65%, please explain why (attach additional sheets if necessary):

_____

If the actual amount reused/recycled is less than 65%, please explain why:

_____

Prepared by (please print): _____ Date: _____

Contractor Signature: _____ Phone Number: _____

Conversion Rates

The following conversion rates are estimates. The ranges vary widely, depending on how the materials are handled (compacted, loose, chipped, etc.). Use the conversion factors and receipts from any previous projects to help you estimate the potential amount of materials and diversion. Take into consideration the type and load of vehicles that will be used to haul the materials. Ask your hauler or recycler to assist you in estimating these numbers.

Material	Lbs/cy	Tons/cy
Asphalt	1,400 lbs/cy	0.7 tons/cy
Brick	2,430 lbs/cy	1.21 tons/cy
Cardboard	100 lbs/cy	0.05 tons/cy
Concrete	2,600 lbs/cy (Sources range from1,000 to 4,000)	1.3 tons/cy
Dirt/Soils	2,660 lbs/cy	1.33 tons/cy
Drywall	700 lbs/cy	0.35 tons/cy
Wood (chipped)	300 – 650 lbs/cy	0.15 – 0.3 tons/cy
Mixed C&D Debris	900 lbs/cy	0.45 tons/cy
Mixed Waste/Trash	100 – 350 lbs/cy	0.5 – 0.175 tons/cy

SECTION 11. ADDITIONAL TERMS

11-1 NONDISCRIMINATORY EMPLOYMENT

The Contractor shall not unlawfully discriminate against any individual based on race, religious creed, color, national origin, ancestry, physical disability, mental disability, medical condition, genetic information, marital status, sex, gender, gender identity, gender expression, age, sexual orientation or military and veteran status. The Contractor understands and agrees that it is bound by and will comply with the nondiscrimination mandates of all statutes and local ordinances and regulations.

11-2 NOTICE TO PROCEED

Upon award of the Contract and signing the Contract Documents, the City shall issue the Contractor a Notice to Proceed, as specified in Section 4 of the Contract. The City will not authorize any Work to be done under these Contract Documents before the Contract has been fully executed. Any Work that is done by the Contractor in advance of the Notice to Proceed to Fulfill Preconstruction Requirements and Order Materials, or the Notice to Proceed with Construction (whichever is applicable), shall be considered as being done at the Contractor's own risk and responsibility, and as a consequence will be subject to rejection.

11-3 CONTRACTOR'S RESPONSIBILITY FOR WORK

Until the final acceptance of the Work by the City as defined in Section 6-8.2 of the General Provisions, by written action of the Engineer, the Contractor shall have the charge and care thereof and shall bear the risk of injury or damage to any part of the Work by the action of the elements, criminal acts, or any other cause. The Contractor shall rebuild, repair, restore and make good all injuries or damages to any portion of the Work occasioned by any cause before its completion and acceptance and shall bear the expense thereof, except for such injuries or damages arising from the sole negligence or willful misconduct of the City, its officers, agents or employees. In the case of suspension of Work from any cause whatever, the Contractor shall be responsible for all materials and the protection of Work already completed, shall properly store and protect them if necessary, and shall provide suitable drainage and erect temporary structures where necessary.

11-4 PROCEDURE IN CASE OF DAMAGE TO PUBLIC PROPERTY

Any portions of curb, gutter, sidewalk or any other City improvement damaged by the Contractor during the course of construction shall be replaced by the Contractor at its own cost. The cost of additional replacement of curb, gutter or sidewalk in excess of the estimated quantities shown in the Bid form and Specifications, and found necessary during the process of construction (but not due to damage resulting from carelessness on the part of the Contractor during its operation), shall be paid to the Contractor at the unit prices submitted in its Bid.

11-5 REMOVAL OF INTERFERING OBSTRUCTIONS

The Contractor shall remove and dispose of all debris, abandoned structures, tree roots and obstructions of any character encountered during the process of excavation. It is understood that the cost of any such removals are made a part of the unit price bid by the Contractor under the item for excavation or removal of existing Work.

11-6 SOILS ENGINEERING AND TESTING

An independent certified materials testing firm must be retained by the Contractor to perform materials tests and applicable special inspections during the Contractor's entire operation to ascertain compliance with the Contract requirements. If the initial tests do not meet the Contract requirements, the Contractor shall bear the cost of all subsequent tests.

The Contractor shall provide a copy of the testing and inspection reports to the Engineer within 24 hours upon receipt.

If the City requires other tests or more specific requirements for testing regarding this Project, those details will be included in the Special Provisions.

11-7 ACCESS TO PRIVATE PROPERTY

Unless otherwise stated in the Special Provisions, the Contractor shall be responsible for all fees and costs associated with securing permission to access private property for any portion of the Project.

11-8 WORKING DAYS AND HOURS

The Contractor shall do all Work between the hours of 7:30 a.m. to 4:30 p.m., Monday through Friday. No Work will be allowed on Saturday, Sunday or City holidays listed on the City's website unless specifically mentioned in the Contract Documents or authorized by the City Engineer.

A permit may have other hours or Days for the Contractor to do the Work, and those hours and Days shall supersede any hours and Days written in this Section.

Whenever the Contractor is permitted or directed to perform night Work or to vary the period during which Work is performed during the Working Day, the Contractor shall give 24 hours' notice to the Engineer so that inspection may be provided. Also, a charge may be made to the Contractor for approved overtime or weekend inspections requested by the Contractor.

In the event that the Contractor exceeds the hours of work requirement without prior approval from the City Engineer, the City Engineer will issue a verbal warning. A second violation will result in a written warning. Thereafter, any subsequent exceedance of authorized work hours will result in the Contractor being assessed liquidated damages in the amount of $200.00 per occurrence, which will be deducted from the Contract amount.

11-9 CLAIM DISPUTE RESOLUTION

In the event of any dispute or controversy with the City over any matter whatsoever, the Contractor shall not cause any delay or cessation in or of Work, but shall proceed with the performance of the Work in dispute. The Contractor shall retain any and all rights provided that pertain to the resolution of disputes and protests between the parties. The Disputed Work will be categorized as an "unresolved dispute" and payment, if any, shall be as later determined by mutual agreement or a court of law. The Contractor shall keep accurate, detailed records of all Disputed Work, claims and other disputed matters.

All claims arising out of or related to the Contract Documents or the Project, and the consideration and payment of such claims, are subject to the Government Claims Act (Government Code

Section 810 *et seq*.) with regard to filing claims. All such claims are also subject to Public Contract Code Section 9204 and Public Contract Code Section 20104 *et seq*. (Article 1.5), where applicable. The Contract hereby incorporates those provisions as though fully set forth herein. Thus, the Contractor or any Subcontractor must file a claim in accordance with the Government Claims Act as a prerequisite to filing a construction claim in compliance with Section 9204 and Article 1.5 (if applicable), and must then adhere to Article 1.5 and Section 9204, as applicable, pursuant to the definition of "claim" as individually defined therein.

11-10 THIRD PARTY CLAIMS

The City shall have full authority to compromise or otherwise settle any claim relating to the Project at any time. The City shall timely notify the Contractor of the receipt of any third-party claim relating to the Project. The City shall be entitled to recover its reasonable costs incurred in providing this notice.

11-11 COMPLIANCE WITH LAWS

The Contractor shall comply with all applicable federal, State and local laws, ordinances, codes and regulations in force at the time the Contractor performs pursuant to the Contract Documents.

11-12 REQUIREMENT TO MITIGATE THE SPREAD OF COVID-19. The Contractor and all subcontractors for the Work shall comply with all applicable Federal, State, Los Angeles County, and City of Manhattan Beach statutes, regulations, orders, and ordinances regarding COVID-19 Infection Prevention. This requirement specifically includes, without limitation, compliance with (i) the "Safety and Health Guidance COVID-19 Infection Prevention in Construction" issued by the California Department of Industrial Relations, Division of Occupational Safety and Health and Safety on October 27, 2020 and as may be amended from time to time by the Department, (ii) the Reopening Safer at Work and in the Community for Control of COVID-19 Revised Order issued by the Los Angeles County Health Officer on January 29, 2021, as may be amended from time to time, and (iii) City of Manhattan Beach Director of Emergency Services Order No. 1, issued April 3, 2020, as may be amended from time to time.

Prior to the pre-construction meeting, the Contractor shall submit to the City a "COVID-19 Mitigation Program" implementing these requirements and shall post the COVID-19 Mitigation Program on the project site in a manner designated by the City's Project Manager. The failure of employees or workers of the Contractor and all subcontractors on the Work to comply with these requirements shall be a default per Section 6-4.1, and may also result in a suspension of the Work pursuant to Section 6-3. Contractor acknowledges that, in the event that the Engineer suspends the Work as a result of such failure by Contractor or one of its subcontractors to comply with these requirements, City is not responsible for the delay, and that pursuant to Section 6-6.3 the Contractor is not entitled to compensation. The Contractor shall also pay to the City the costs and expenses incurred by the City resulting from the failure of employees of the Contractor and all subcontractors on the Work to comply with these requirements including, but not limited to, the salaries and benefits for City employees who are unable to work due to exposure to COVID-19 as a resuilt of such failure, and workers compensation benefits and expenses. Delays in the Work resulting from Contractor's or its subcontractor's failure to comply with these regulations shall not be considered an unforeseen event entitling Contractor to an extension of time or payment for delay pursuant to Section 6-6 of the Standard Specifications.

11-13 CONTRACTOR'S REPRESENTATIONS

By signing the Contract, the Contractor represents, covenants, agrees, and declares under penalty of perjury under the laws of the State of California that: (a) the Contractor is licensed, qualified, and capable of furnishing the labor, materials, and expertise necessary to perform the services in accordance with the terms and conditions set forth in the Contract Documents; (b) there are no obligations, commitments, or impediments of any kind that will limit or prevent its full performance under the Contract Documents; (c) there is no litigation pending against the Contractor that could adversely affect its performance of the Contract, and the Contractor is not the subject of any criminal investigation or proceeding; and (d) to the Contractor's actual knowledge, neither the Contractor nor its personnel have been convicted of a felony.

11-14 CONFLICTS OF INTEREST

The Contractor agrees not to accept any employment or representation during the term of the Contract or within 12 months after acceptance as defined in Section 6-8.2 of the General Provisions that is or may likely make the Contractor "financially interested," as provided in Government Code Sections 1090 and 87100, in any decisions made by the City on any matter in connection with which the Contractor has been retained pursuant to the Contract Documents.

11-15 APPLICABLE LAW

The validity, interpretation, and performance of these Contract Documents shall be controlled by and construed under the laws of the State of California, excluding California's choice of law rules. Venue for any such action relating to the Contract shall be in the Los Angeles County Superior Court.

11-16 TIME

Time is of the essence in these Contract Documents.

11-17 INDEPENDENT CONTRACTOR

The Contractor and Subcontractors shall at all times remain, as to the City, wholly independent contractors. Neither the City nor any of its officials, officers, employees or agents shall have control over the conduct of the Contractor, Subcontractors, or any of their officers, employees, or agents, except as herein set forth, and the Contractor and Subcontractors are free to dispose of all portions of their time and activities that they are not obligated to devote to the City in such a manner and to such Persons that the Contractor or Subcontractors wish except as expressly provided in these Contract Documents. The Contractor and Subcontractors shall have no power to incur any debt, obligation, or liability on behalf of the City, bind the City in any manner, or otherwise act on behalf of the City as agents. The Contractor and Subcontractors shall not, at any time or in any manner, represent that they or any of their agents, servants or employees, are in any manner agents, servants or employees of the City. The Contractor and Subcontractors agree to pay all required taxes on amounts paid to them under the Contract, and to indemnify and hold the City harmless from any and all taxes, assessments, penalties, and interest asserted against the City by reason of the independent contractor relationship created by the Contract Documents. The Contractor shall include this provision in all contracts with all Subcontractors.

11-18 CONSTRUCTION

In the event of any asserted ambiguity in, or dispute regarding the interpretation of any matter herein, the interpretation of these Contract Documents shall not be resolved by any rules of interpretation providing for interpretation against the party who causes the uncertainty to exist or against the party who drafted the Contract Documents or who drafted that portion of the Contract Documents.

11-19 NON-WAIVER OF TERMS, RIGHTS AND REMEDIES

Waiver by either party of any one or more of the conditions of performance under these Contract Documents shall not be a waiver of any other condition of performance under these Contract Documents. In no event shall the making by the City of any payment to the Contractor constitute or be construed as a waiver by the City of any breach of covenant, or any default that may then exist on the part of the Contractor, and the making of any such payment by the City shall in no way impair or prejudice any right or remedy available to the City with regard to such breach or default.

11-20 TERM

The Contract is effective as of the Effective Date listed, and shall remain in full force and effect until the Contractor has fully rendered the services required by the Contract Documents or the Contract has been otherwise terminated by the City. However, some provisions may survive the term listed within this Section, as stated in those provisions.

11-21 NOTICE

Except as otherwise required by law, any notice or other communication authorized or required by these Contract Documents shall be in writing and shall be deemed received on (a) the day of delivery if delivered by hand or overnight courier service during the City's regular business hours or (b) on the third business day following deposit in the United States mail, postage prepaid, to the addresses listed on the Contractor's Bid and City Hall, or at such other address as one party may notify the other.

11-22 SEVERABILITY

If any term or portion of these Contract Documents is held to be invalid, illegal, or otherwise unenforceable by a court of competent jurisdiction, the remaining provisions of these Contract Documents shall continue in full force and effect.

SPECIAL PROVISIONS

PART I: SPECIAL INSTRUCTIONS

These Special Instructions take precedence over the requirements set forth in the Technical Specifications. The Contractor shall notify the Engineer immediately regarding any conflicts.

I. CONSTRUCTION STAGING AREA

Contractor shall be responsible for securing a construction staging area for this project.

The cost of securing a staging area shall be considered as included in the Contract Prices paid for the various items of work involved and no additional compensation will be allowed therefor.

II. DRIVEWAY ACCESS

All driveway access must remain open at all times although flagging operations may be required during work hours. Outside work hours steel plates or other measures may be put in place to facilitate full unrestricted access.

The contractor shall minimize impacts to nearby driveway approaches and intersection traffic in the vicinity of the work. All open trenches shall be either backfilled or the work area shall be adequately covered with steel plates at the end of each working day. All loose gravel from the plate being secured by temporary AC must be swept and cleaned up to ensure a clean and tidy environment on a daily basis.

III. WORK SITE CLEANLINESS OUTSIDE OF THE WORK AREA

The Contractor is required to keep the pavement in the area around the project area acceptably clean daily. Engineer may require the use of a self-loading motor sweeper with spray nozzles to meet this performance requirement. Full compensation for compliance with this requirement shall be included in the Contract prices paid for the various items of work involved and no additional compensation will be allowed therefor.

Spoils from excavation shall be immediately removed from the project site. Overnight storage of materials removed or to be incorporated into the construction, shall not be permitted on the traveled roadway surface.

Full compensation for compliance with these requirements shall be considered as included in the appropriate bid items, except as otherwise noted.

IV. ORDER OF WORK

The work to be completed at each project location as defined in the Contract Documents and shall be completed starting with segments which do not conflict with school and/or City events with remaining segments being completed in an order or precedence as may be required by the Contractor to expedite the completion of the project and meet the Project Milestones, but not without due consideration of the City's operations and approval.

Work shall be in accordance with the sequence in the approved phasing plan and as described in Paragraph IV of this section. After work has begun on any portion or designated part of the Project, it shall be carried forward to its final completion. The City has the right to change the precedence of work as needed to maintain the City's operation.

V. SHUTDOWNS

Any proposed shutdowns must be indicated on the Contractor's preliminary schedule to be submitted for review by the City and Engineer at the Pre-Construction meeting. The actual allowable durations of the shutdowns will be determined during the preparation of the detailed construction schedule, unless otherwise noted in the plans and/or these specifications.

The Contractor shall compile a detailed list of all items of work, which must be accomplished during any shutdown. The Contractor shall coordinate his work to minimize the required number of shutdowns by accomplishing as many tasks as possible during each shutdown period. The Contractor shall submit the list of items to the Engineer for his review as a part of the construction schedule defined within Section 01300. The schedule shall indicate all periods and duration of each proposed shutdown and the items of work that will be accomplished. The schedule shall also include time required for hydrostatic testing if Specified, disinfection procedures and required testing.

The Contractor shall make specific written requests for all shutdowns five (5) working days in advance of the proposed shutdown for review and approval by the City. The written request shall include a complete detailed plan of the Contractor's proposed activities including schedule, manpower, equipment, materials and methods that will be utilized to perform the required work, and disinfection procedures during the proposed shutdown.

Should the City determine that the Contractor’s proposed plan is insufficient to successfully complete the required work during the period of the shutdown, the Contractor shall make the appropriate revisions in his proposed plan to the satisfaction of the City. The City has right to change date and time of requested shutdown. The City also has the right to perform work associated with the shutdown. The Contractor shall credit the City for any work not performed as bid.

All materials and equipment (including emergency equipment) necessary to expedite tie-ins shall be on hand prior to the shutdown of existing services or utilities.

At no time shall the Contractor undertake to close off any lines or open valves or take any other action which would affect the operation of the existing system, except as specifically required by the drawings and after approval is granted by the City.

The Contractor shall plan all work such that it can be completed with minimal disruption of the existing facilities operation. Prior to the start of any work, Contractor shall coordinate with the City to develop an approved schedule that will allow for a continued normal operation of all existing facilities. It may be necessary to do certain parts of the construction work outside normal working hours in order to avoid undesirable conditions. The Contractor shall do this work at such times and at no additional cost to the City.

Work on existing structures and facilities shall be performed on a schedule and in a manner that will permit the existing facility to operate continuously, unless otherwise approved in writing by the City of the existing utility and/or facility affected.

VI. CONSTRUCTION PHASING

Prior to commencement of work and no less than 21 days prior to starting Work for each segment, the Contractor shall submit to the City and Engineer for review and approval a detailed staging plan describing the sequencing of the installation, operation, and removal of all temporary and permanent facilities as required to complete the work as show on the Contract Documents and shall provide notification a minimum of 72 hours in advance to all residences impacted by shutdown operations. The staging plan shall at a minimum include the following information:

1. Schematic and written description of each phase of work for each Segment.
2. Detailed method for addressing field sampling requirements (Bac T), including location of each sample.
3. Location and size of any temporary facilities including but not limited to temporary pipelines, service lines, hydrants, valves.
4. Hydrant connection schematic.
5. Required valve closures/opening by City.
6. System connection schematics, including cutting and capping and thrust restraints.
7. Short-term shutdowns (shutdowns lasting no more than 4 hours in duration)
8. Long-term shutdowns (shutdowns lasting more than 4 hours in duration).
9. Measures to maintain resident driveway access.
10. Schedule including activity durations.

The Contractor shall be responsible for maintaining existing fire service. A temporary hydrant shall be provided for any hydrant to be taken out of service longer than a short-term shutdown. No more than two hydrants shall be taken out of service at any one time.

No more than 25 water services shall be out of service during a short-term shutdown, or highlined for long-term service interruption at any one time and Contractor shall notify a minimum of 72 hours in advance, all residences impacted by shutdown. For any interrupted service, service shall be restored by the end of the working day via permanent or highline connection.

No more than two water line connections shall be allowed per working day. The City requires a day between connection work to prepare the system. Allowable days for water line connections are Tuesdays through Thursdays.

All new pipelines shall be installed, tested, and disinfected prior to making connections to existing pipe.

VII. TEMPORARY TRAFFIC CONTROL/NOTIFICATION

Temporary traffic control and/or the queuing of construction vehicles (including delivery trucks) will be prohibited prior to the start of the permitted work day (7:30am-4:30pm)

Contractor work hours are restricted to 9am to 3pm for any travel lane impacts along street blocks adjacent to schools and street corridors directly leading to a school.

VIII. RIGHT-OF-WAY

It shall be the responsibility of the contractor to conduct all Work activities and operations within the rights-of-way provided by the City and within the confines of the work site.

If, for any reason, the contractor encroaches upon other lands adjoining rights-of-way or adjoining the work site, such as the private patios located on walkways being affected by work, he/she shall first obtain written permission from the owner thereof and provide evidence of such permission in writing to the Engineer prior to entering upon such lands.

The contractor shall be responsible for documenting existing improvements via photo and video, to notify, coordinate and schedule the work with the property owner and tenant at the appropriate time and, to complete the work and restore the existing surface improvements in pre-work condition to the maximum extent possible.

The contractor shall indemnify and hold the City harmless from all claims for damages occasioned by such work or activity, whether done in compliance with this section and with permission or in violation of this section and without permission.

IX. DEWATERING, DUST, AND SOUND CONTROL REQUIREMENTS

Dewatering

It is anticipated that storm, surface, ground water or other water may be encountered at various locations during the work and require dewatering. The Contractor, by submitting a bid, acknowledges that he/she has investigated the risks arising from surface, ground or other waters, and acknowledges that his/her bid was prepared assuming that water is present and the dewatering work will be conducted accordingly. The contractor, by submitting a bid, assumes all of the said risk and payment for dewatering shall be considered as included in the various contract items of work. No separate payment will be allowed.

When water is encountered, the contractor shall provide and maintain dewatering during construction in accordance with the technical specifications and requirements of the Order No. R4-2018-0125,NPDES No. CAG994004 issued by the Los Angeles Regional Water Quality Control Board (LARWQCB).

The Contractor shall provide and maintain ample means and devices with which to promptly remove and properly dispose of water entering the excavations or other parts of the work at all times during construction. Dewatering shall be accomplished by methods, which will ensure a dry excavation and preservation of the final lines and grades of the bottoms of excavations. The chosen method that may include sump pumps, deep wells, well points, temporary pipelines and other means shall be designed by the contractor’s civil engineer and shall be the sole responsibility of the contractor.

The contractor shall dispose of the water from the work in accordance with the Water Pollution Control Act without damaging or soiling adjacent City, County, State, or private property. Water shall be disposed of in such a manner as not to be a menace to the public health and such disposal shall be performed in accordance with Environmental Protection Agency and State Water Quality Control Board Standards (NPDES permit). Any testing and reports required under NPDES permit shall be performed by the contractor and submitted to the appropriate agency and the Engineer for approval at no additional cost to the CITY.

Conveyance of the water shall not interfere with traffic flow or sewer treatment facilities operations. No water shall be drained into the work under construction without prior consent of the Engineer

The contractor shall conduct his/her operation such that storm or other waters may proceed uninterrupted along their existing street or drainage courses. Diversion of water for short reaches to protect construction in progress will be permitted if in the opinion of the Engineer, public or private properties are not subject to damage. The contractor shall obtain and submit to the City written permission from the applicable public agency or property owner before the Engineer will permit any diversion of water outside the right-of-way.

It shall be the contractor's responsibility to control the surface water entering the work area at no additional cost to the City. The contractor shall correct damage to the work area as the result of surface water at no cost to the City.

If groundwater testing during construction is found to be contaminated, the Contractor shall provide, install, maintain, and operate the equipment necessary to treat the contaminated groundwater to bring it to compliance with the dewatering and discharging permits from the California Regional Water Quality Control Board.

Full compensation for dewatering and conforming to the requirements of this Article shall be considered as included in the prices paid for the various items of work and shall include all related materials, labor, tools, equipment, standby pump, coordination and approval processing. No separate payment will be allowed.

Dust Control

Dust control shall consist of applying water in conformance with Section 7-8 of the Standard Specifications, with the following modification: The contractor shall furnish and operate a water truck and self-loading motor vacuum sweeper with spray nozzles applied at least twice each calendar day (including holidays and weekends), first during construction to keep paved areas reasonably clean, and second at the end of day. The contractor shall never leave the construction premises dirty or dusty.

All spillage and any excessive dirt or debris resulting from hauling operations, moving of equipment along or across any private or public property or public traveled way, shall be removed immediately at the contractor's expense. Whenever the contractor fails to control dust resulting from the performance of the work, the Engineer may cause such dust to be controlled. The costs of controlling dust shall be deducted from moneys due or to become due the contractor.

No separate payment will be made for any work performed or material used to control dust resulting from the contractor's performance of the work, or by public traffic, either inside or

outside the right-of-way. Full compensation for such dust control will be considered as included in the price paid for the various items of work involved.

Sound Control

The contractor shall comply with all local sound control and noise level rules, regulations, and ordinances, which apply to any work performed pursuant to the contract.

Each internal combustion engine, used for any purpose on the job or related to the job, shall be equipped with a muffler of a type recommended by the manufacturer. No internal combustion engine shall be operated on the project without said muffler.

The noise level from the contractor's operations shall not exceed 86 DBA at a distance of fifty feet (50'). This requirement in no way relieves the contractor from responsibility for complying with local ordinances regulating noise level.

Said noise level requirement shall apply to all equipment on the job or related to the job, including but not limited to trucks, transit mixers or transient equipment that may or may not be owned by the contractor. The use of loud sound signals shall be avoided in favor of light warnings except those required by safety laws for the protection of personnel.

Full compensation for conforming to the requirements of sound control shall be considered as included in the prices paid for the various contract items of work involved and no additional compensation will be allowed.

X. CONSTRUCTION WATER

Construction water may be taken only at locations approved by the City. The City will install a construction meter and eddy valve at these locations at the Contractor's expense. This valve shall be operated when taking construction water with the fire hydrant remaining open during the day. Contractor will be charged for construction water on an as-used basis.

The contractor shall make application to the City for installation of a fire hydrant water meter for his construction water and shall make appropriate meter deposits to cover cost of relocation or damage to the meter.

Water shall be applied in the amounts, at the locations, and for the purposes designated in these specifications and as ordered by the Engineer.

Water for compacting embankment material, subbase, base and surfacing material, and for laying dust shall be applied by means of pressure-type distributors or pipelines equipped with a spray system or hoses with nozzles that will ensure a uniform application of water.

Equipment used for the application of water shall be equipped with a positive means of shut-off. Unless otherwise permitted by the Engineer or unless all the water is applied by means of pipelines, at least one mobile unit with a minimum capacity of 1,000 gallons shall be available for applying water on the project all times.

Payment for applying water, including all labor, tools, equipment, and incidentals required for the application of water shall be considered as included in the various contract items of work involving the use of water, and no additional compensation will be allowed.

XI. GEOTECHNICAL INVESTIGATION AND TESTING

The City conducted a geotechnical investigation (See appendix IV) where the project work is to be performed. Each prospective bidder shall carefully review this document to familiarize himself with existing soil conditions and recommendations. Any information obtained from such report as to subsurface soil condition, or to elevations of existing grades or elevations of underlying rock, is approximate only and is not guaranteed. Contractor acknowledges that any soils investigation report (including any borings) was prepared for purposes of design only and Contractor is required to examine the site before submitting its bid and must make whatever test it deems appropriate to determine the underground condition of the soil.

Contractor shall be aware that the soil conditions in the project area are very sandy and collapsible. Contractor shall use appropriate construction methods for this soil type when installing all pipe and any other below-ground appurtenances.

By submitting a bid, the contractor acknowledges that he/she has satisfied himself/herself as to the nature of the work, including but not restricted to the conditions affecting handling and storage of materials, disposal of excess material, level and amount of groundwater, and ascertaining existing conditions that affect labor, materials and equipment costs.

All costs for geotechnical testing shall be considered as included in the price paid for the various contract items of work involved and no additional compensation will be allowed.

XII. ADA CURB RAMP/DRIVEWAY COMPLIANCE AND INSTALLATION

The Work under “ADA Ramp Replacement” shall be for the number and type of ramp listed for the specific Bid Schedule. If ramp type listed does not achieve ADA compliance, contractor shall immediately notify the City and extend ramp slope a maximum of 15 feet from the edge of landing to end of curb return to attempt to achieve ADA compliance. Landing shall be 5% slope or less as required by ADA. The Contractor shall hire a registered civil engineer to sign and stamp the ADA memo included in Appendix V for any ramps that do not achieve ADA compliance.

Work under bid item, sawcut, remove, & replace existing curb ramp with ADA compliant curb ramp shall include full compensation for furnishing labor, materials, tools and incidentals, and for performing all work involved in the construction of new ADA curb ramps, complete as specified herein; including but not limited to, mobilization, traffic control, construction survey, saw-cutting, removal and disposal, excavation, forming, pavement restoration, detectable warning surface, support of adjacent structures including (protection, restoration, grading, irrigation turf replacement), furnish and install concrete to construct new ADA ramp, backfill and compaction to the satisfaction of the Engineer. Payment for each ramp is each upon full completion of all work associated with the ramp.

XIII. EXISTING SURFACE IMPROVEMENTS

Portions of proposed water main replacements, namely service connections and meters are located in City of Manhattan Beach’s right-of-way (encroachment area). Contractor shall note existing encroachment areas include private improvements and appurtenance including but not limited to, AC/PCC pavement, decorative or integral-colored stamped paving, pavers, bricks,

stone tile, wood, stones/rocks, fencing, finished walls & footings (retaining or otherwise), stairs, various landscaping and irrigation, synthetic lawns, etc.

Contractor shall support and protect in place existing improvements. Where the contractor's activities damage or adversely affect any private improvements, the contractor shall provide an acceptable solution to the satisfaction of the affected property owner(s).

XIV. SUBMITTAL BY CONTRACTOR OF DAILY REPORT

Contractor is required to submit a completed "Contractor's daily report to City" form to the City every working day by 5:30 p.m. See the following page for the form to be submitted by Contractor.

XV. SPECIAL WORKING HOURS

The Contractor is advised that most of the work for this contract will be carried out during daytime hours; however, if coordination with schools or City and Neighborhood events as outlined in Section 01040 necessitates Work to be performed outside of daytime hours, the Contractor shall notify the City and Engineer immediately and prior to performing any work.

XVI. SCHEDULE

The Contractor shall note the Holiday schedule outlined in Section 6-7.2 including additional periods of no Working Days and obtain the school schedule and coordinate directly with the principals for the schools in the projects area and shall plan work accordingly to minimize disruptions and always provide adequate access to residences during Holidays. Contractor shall provide adequate access or make accommodations for trash pickup on Wednesday, or other day as dictated by the trash collection schedule for the specific project area during construction.

PART II: STANDARD AND SPECIAL TECHNICAL PROVISIONS

TECHNICAL SPECIFICATIONS

TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

01010 Summary of Work
01040 Coordination
01200 Project Meetings
01300 Submittals
01400 Quality Control
01510 Temporary Construction Facilities
01520 Maintenance of Utility Operations During Construction
01530 Protection of Existing Facilities
01540 Demolition
01570 Traffic Regulations
01600 Materials and Equipment
01700 Project Closeout

DIVISION 02 – SITE WORK

02200 Earthwork
02223 Trench Backfill
02510 Paving and Surfacing

DIVISION 03 – CONCRETE

03100 Concrete Formwork
03200 Reinforcing Steel
03300 Cast-In-Place Concrete

DIVISION 09 – FINISHES

09900 Painting

DIVISION 13 – SPECIAL CONSTRUCTION

13280 Asbestos Abatement and Related Disturbance

DIVISION 15 – MECHANICAL

15000 Basic Mechanical Requirements
15006 Ductile Iron Pipe
15010 Copper Pipe
15107 Fire Hydrants
15108 Gate Valves

SECTION 01010

SUMMARY OF WORK

PART 1 -- GENERAL

1.01 THE REQUIREMENT

A. The Work to be done under this Contract and in accordance with these Specifications consists of furnishing all equipment, superintendence, labor, skill, material and all other items necessary for the construction of the City of Manhattan Beach – Water Infrastructure Improvement Projects – Cycle 2.

The Contractor shall perform all work required for such construction in accordance with the Contract Documents and subject to the terms and conditions of the Contract, complete and ready for use.

B. The principal features of the Work to be performed under these Contracts includes:

SINGLE PRIME CONTRACT: Includes furnishing and installing facilities as described under Contract No. 1A - General Construction hereafter.

CONTRACT NO. 1A - GENERAL CONSTRUCTION: The Contract includes water distribution main replacement in up to five (5) different segments, two (2) base bid schedules (P-10-1 and P-10-2) and two (2) additive bid schedules (P-7, P-8-Agnes/Fluornoy) in up to five (5) different locations. The Contract includes one (1) base bid schedule (Herrin Ave Paving) for pavement restoration and complete overlay for one additional location outside of the distribution main replacement locations.

Each segment includes furnishing and installing 6-inch or 8-inch Ductile Iron distribution pipelines and appurtenances including blow-off valves and air-release valves, associated residential services, installation of new and replacement of existing fire hydrants, valves and fittings required for connection to existing distribution pipelines, and abandonment of existing distribution pipelines. The Contract also includes partial grinding and complete full width overlay, striping, pavement marking restoration and ADA ramp replacement of certain Contract segments. Where complete overlay is not required the trench shall be restored in accordance with these specifications and Drawing Details.

C. The foregoing description(s) shall not be construed as a complete description of all work required.

1.02 CONTRACT DOCUMENTS

A. The Work to be done is shown on the set of Drawings entitled “Water Infrastructure Improvement Projects – Cycle 2 and dated July 2023. The numbers and titles of all

Drawings appear on the index sheet of the Drawings, Sheet 1. All drawings so enumerated shall be considered an integral part of the Contract Documents as defined herein.

B. Certain Document Sections refer to Divisions of the Contract Specifications. Sections are each individually numbered portions of the Specifications (numerically) such as 08110, 13182, 15206, etc. The term Division is used as a convenience term meaning all Sections within a numerical grouping. Division 16 would thus include Sections 16000 through 16902.

C. Where references in the Contract Documents are made to Contractors for specific disciplines of work (i.e. Electrical Contractor, etc.), these references shall be interpreted to be the single prime Contractor when the project is bid or awarded as a single prime contract.

1.03 GENERAL ARRANGEMENT

A. Drawings indicate the extent and general arrangement of the work. If any departures from the Drawings are deemed necessary by the Contractor to accommodate the materials and equipment he proposes to furnish, details of such departures and reasons therefore shall be submitted as soon as practicable to the Engineer for approval. No such departures shall be made without the prior written approval of the Engineer. Approved changes shall be made without additional cost to the City for this work or related work under other Contracts of the Project.

B. The specific equipment proposed for use by the Contractor on the project may require changes, in structures, auxiliary equipment, piping, mechanical or other work to provide a complete satisfactory operating installation. The Contractor shall submit to the Engineer, for approval, all necessary Drawings and details showing such changes to verify conformance with the overall project structural and architectural requirements and overall project operating performance. The Bid Price shall include all costs in connection with the preparation of new drawings and details and all changes to construction work to accommodate the proposed equipment, including increases in the costs of other Contracts.

1.04 CONSTRUCTION PERMITS, EASEMENTS AND ENCROACHMENTS

A. The City shall obtain or cause to be obtained all permanent and temporary construction easements as shown on the Drawings.

B. The Contractor shall obtain, keep current and pay all fees for any necessary construction permits from those authorities, agencies, or municipalities having jurisdiction over land areas, utilities, or structures which are located within the Contract limits and which will be occupied, encountered, used, or temporarily interrupted by the Contractor's operations unless otherwise stated. Record copies of all permits shall be furnished to the Engineer.

C. When construction permits are accompanied by regulations or requirements issued by a particular authority, agency or municipality, it shall be the Contractor's responsibility to familiarize himself and comply with such regulations or requirements as they apply to his operations on this Project.

D. Excavation equipment is prohibited from being stored within the right-of-way outside of working hours.

1.05 ADDITIONAL ENGINEERING SERVICES

A. In the event that the Engineer is required to provide additional engineering services as a result of substitution of materials or equipment which are not "or equal" by the Contractor, or if the Engineer is required to examine and evaluate any changes proposed by the Contractor for the convenience of the Contractor, then the Engineer's charges in connection with such additional services shall be charged to the Contractor by the City.

B. In the event that the Engineer is required to provide additional engineering services as a result of Contractor's errors, omissions, or failure to conform to the requirements of the Contract Documents, or if the Engineer is required to examine and evaluate any changes proposed by the Contractor solely for the convenience of the Contractor, then the Engineer's charges in connection with such additional services shall be charged to the Contractor by the City.

1.06 SURVEYS AND LAYOUT

A. All work under this Contract shall be constructed in accordance with the lines and grades shown on the Drawings or as directed by the Engineer. Elevation of existing ground and appurtenances are believed to be reasonably correct but are not guaranteed to be absolute and therefore are presented only as an approximation. Any error or apparent discrepancy in the data shown or omissions of data required for accurately accomplishing the stake out survey shall be referred immediately to the Engineer for interpretation or correction.

B. The Engineer may check all or any portion of the work and the Contractor shall afford all necessary assistance to the Engineer in carrying out such checks. Any necessary corrections to the work shall be immediately made by the Contractor. Such checking by the Engineer shall not relieve the Contractor of any responsibilities for the accuracy or completeness of his work.

C. At completion of the work, the Contractor shall furnish Record Drawings indicating the final layout of all structures, roads, all structures, existing benchmarks, etc. The Record Drawings shall indicate all critical elevations of piping, structures, finish grades, etc.

1.07 FIRE PROTECTION

A. Contractor shall take all necessary precautions to prevent fires at or adjacent to the work, buildings, etc., and shall provide adequate facilities for extinguishing fires which do occur.

B. When fire or explosion hazards are created in the vicinity of the work as a result of the locations of fuel tanks, or similar hazardous utilities or devices, the Contractor shall immediately alert the Manhattan Beach Fire Department, the Engineer, and the City of such tank or device. The Contractor shall exercise all safety precautions and shall comply with all

instructions issued by the Manhattan Beach Fire Department and will work with the City to address concerns regarding the tank or device to prevent the occurrence of fire or explosion.

1.08 CHEMICALS

A. All chemicals used during project construction or furnished for project operation shall be submitted to the City for approval prior to use on the project. Use of all such chemicals and disposal of residues shall be in strict conformance with all applicable rules and regulations.

1.09 FIRST AID FACILITIES AND ACCIDENTS

A. First Aid Facilities

1. The Contractor shall provide at the site such equipment and facilities as are necessary to supply first aid to any of his personnel who may be injured in connection with the work.

B. Accidents

1. The Contractor shall promptly report, in writing, to the Engineer all accidents whatsoever out of, or in connection with, the performance of the work, whether on or adjacent to the site, which cause death, personal injury or property damage, giving full details and statements of witnesses.

2. If death, serious injuries, or serious damages are caused, the accident shall be reported immediately by telephone or messenger to both the City and the Engineer.

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

1.10 ULTIMATE DISPOSITION OF CLAIMS BY ONE CONTRACTOR ARISING FROM ALLEGED DAMAGE BY ANOTHER CONTRACTOR

A. During the progress of the work, other Contractors may be engaged in performing other work or may be awarded other Contracts for additional work on this project. In that event, the Contractor shall coordinate the work to be done hereunder with the work of such other Contractors and the Contractor shall fully cooperate with such other Contractors and carefully fit its own work to that provided under other Contracts as may be directed by the Engineer. The Contractor shall not commit or permit any act which will interfere with the performance of work by any other Contractor.

B. If the Engineer shall determine that the Contractor is failing to coordinate his work with the work of the other Contractors as the Engineer directed, then the City shall have the right to withhold any payments otherwise due hereunder until the Contractor completely complies with the Engineer's directions.

C. If the Contractor notifies the Engineer in writing that another Contractor is failing to coordinate his work with the work of this Contract as directed, the Engineer will promptly investigate the charge. If the Engineer finds it to be true, he will promptly issue such directions to the other Contractor with respect thereto as the situation may require. The City, the Engineer, nor any of their agents shall not, however, be liable for any damages suffered by the Contractor by reason of the other Contractor's failure to promptly comply with the directions so issued by the Engineer, or by reason of another Contractor's default in performance, it being understood that the City does not guarantee the responsibility or continued efficiency of any Contractor.

D. The Contractor shall indemnify and hold harmless the Engineer, City and its elected officials, officers, attorneys, agents, employees, designated volunteers, successors, assigns and those City agents serving as independent contractors in the role of City officials (collectively “Indemnitees”) from any and all claims of judgments for damages and from costs and expenses to which the City may be subjected or which it may suffer or incur by reason of the Contractor's failure to comply with the Engineer's directions promptly.

E. Should the Contractor sustain any damage through any act or omission of any other Contractor having a Contract with the City for the performance of work upon the site or of work which may be necessary to be performed for the proper execution of the work to be performed hereunder, or through any act or omission of a Subcontractor of such Contract, the Contractor shall have no claim against the City or the Engineer for such damage, but shall have a right to recover such damage from the other Contractor under the provision similar to the following provisions which have been or will be inserted in the Contracts with such other Contractors.

F. Should any other Contractor having or who shall hereafter have a Contract with the City for the performance of work upon the site sustain any damage through any act or omission of the Contractor hereunder or through any act or omission of any Subcontractor of the Contractor, the Contractor agrees to reimburse such other Contractor for all such damages and to defend at his own expense any suit based upon such claim and if any judgment or claims against the City shall be allowed, the Contractor shall pay or satisfy such judgment or claim and pay all costs and expenses in connection therewith and shall indemnify and hold the City harmless from all such claims.

G. The City's right to indemnification hereunder shall in no way be diminished, waived or discharged, by its recourse to assessment of liquidated damages as provided in the Contract, or by the exercise of any other remedy provided for by Contract Documents or by law.

1.11 LIMITS OF WORK AREA

A. The Contractor shall confine his construction operations within the Contract limits shown on the Drawings and/or City right-of-way lines. Storage of equipment and materials, or erection and use of sheds outside of the Contract limits, if such areas are the property of the City, shall be used only with the City's approval. Such storage or temporary structures, even

within the Contract's limits, shall be confined to the City's property and shall not be placed on properties designated as easements or rights-of-way unless specifically permitted elsewhere in the Contract Documents. Contractor is advised, the City does not permit overnight storage of equipment or materials in the public right-of-way.

1.12 WEATHER CONDITIONS

A. No work shall be done when the weather is unsuitable. The Contractor shall take necessary precautions (in the event of impending storms) to protect all work, materials, or equipment from damage or deterioration due to floods, driving rain, or wind. The City reserves the right, through the opinion of the Engineer, to order that additional protection measures over and beyond those proposed by the Contractor, be taken to safeguard all components of the Project. The Contractor shall not claim any compensation for such precautionary measures so ordered, nor claim any compensation from the City for damage to the work from weather elements.

B. The mixing and placing of concrete or pavement courses, the laying of masonry, and installation of sewers and water mains shall be stopped during rainstorms, if ordered by the Engineer; and all freshly placed work shall be protected by canvas or other suitable covering in such manner as to prevent running water from coming in contact with it. Sufficient coverings shall be provided and kept ready at hand for this purpose.

1.13 CONSTRUCTION VIDEO

A. The Contractor shall video the entire project site including all concrete and asphalt pavements, curb and gutter, fencing to remain, planting areas, structures to be demolished, and existing structures that are to be modified. The original video image shall be turned over to the Engineer prior to beginning construction activities. The video shall be provided as an Audio Video Interleave File (.avi) and shall be provided on external USB memory device (“thumbdrive”, etc.). The video shall clearly identify existing site and structural conditions prior to construction.

PART 2 – PRODUCT
(NOT USED)

PART 3 -- EXECUTION

(NOT USED)

- END OF SECTION -

SECTION 01040

COORDINATION

PART 1 -- GENERAL

1.01 THE REQUIREMENT

A. The Contractor shall allow the City or his agents, and other project Contractors or their agents, to enter upon the work for the purpose of constructing, operating, maintaining, removing, repairing, altering, or replacing such pipes, sewers, conduits, manholes, wires, poles, or other structures and appliances which may be required to be installed at or in the work. The Contractor shall cooperate with all aforesaid parties and shall allow reasonable provisions for the prosecution of any other work by the Owner, or others, to be done in connection with his work, separate projects, or in connection with normal use of the facilities.

B. The Contractor shall cooperate fully with the City, the Engineer, and all other Contractors employed on the work, to effect proper coordination and progress to complete the project on schedule and in proper sequence. Insofar as possible, decisions of all kinds required from the Engineer shall be anticipated by the Contractor to provide ample time for inspection, or the preparation of instructions.

C. Periodic coordinating conferences shall be held per Section 01200, Project Meetings, of these Contract Documents.

1.02 UTILITY NOTIFICATION AND COORDINATION

A. Coordinate the Work with various utilities within the Project limits. Notify applicable utilities prior to commencing Work, if damage occurs, or if conflicts or emergencies arise during the Work.

B. Utility contact information is provided on the Contract Drawings.

1.03 PECK RESERVOIR REPLACEMENT

A. Concurrent with the work included in this Contract, a separate contract for the “Peck Reservoir Replacement” (Peck Reservoir) will be ongoing or near completion. Most of the work for Peck Reservoir is outside this Project’s limits or will be completed prior to or after the work for this project is completed; however, the Contractor shall coordinate with the Peck Reservoir contractor and the City to coordinate construction activities and ensure there are no conflicts between the two projects.

B. The Contractor shall schedule and facilitate a project coordination meeting within 15 days of Notice of Award with the Peck Reservoir contractor to discuss coordination of work activities. At a minimum the Contractor shall include the City, Engineer, and contractor Superintendents for both projects.

C. Throughout the construction contract even when working on segments other than that which overlaps with the Peck Reservoir, the Contractor shall maintain communication and coordination with the Peck Reservoir contractor to coordinate construction activities for both projects. The Contractor shall coordinate changes in schedule with the Peck Reservoir contractor such that the overlapping work is completed in a manner that does not impact City utility operations including water, sewer and storm drain, service to local residents nor does the Project Work reasonably inconvenience local residents.

1.04 SCHOOLS

A. Certain segments of the Work are near or adjacent to schools. The Contractor shall ensure unimpeded access to the schools during morning and afternoon drop of and pickup and while in session. The Contractor shall be responsible for coordinating with the schools to notify all school faculty, parents, guardians, students, or others accessing the schools of the scope, duration, and impact the Project Work will have on traffic flow to and from the schools. If the Project Work cannot take place during the morning and afternoon pickup and drop off periods, the Contractor shall plan to work only while school is in session.

B. Contractor work hours are restricted to 9am to 3pm for any travel lane impacts along street blocks adjacent to schools and street corridors directly leading to a school.

C. Contractor shall notify the principal of impacted schools and Meadows Avenue Elementary School of the start of paving operations at least five (5) working days before paving begins.

D. In addition to normal school hours, after hours activities and special events will be taking place during the Project Work. The Contractor shall coordinate with each school as necessary to obtain calendars and other information as necessary to plan the Work to ensure unimpeded access to the schools during such events.

1.05 CITY AND NEIGHBORHOOD EVENTS

A. Certain segments of the Work are in locations near or adjacent to public areas where activities and special events will be taking place during the Project Work. The Contractor shall obtain the most current Special Events calendar from the Engineer and coordinate with stakeholders as necessary to plan the Work to ensure unimpeded access to the public areas during such events.

1.06 WORK SEQUENCING/CONSTRAINTS

A. The Contractor shall schedule their work sequence to complete work of segments as they come in the order of the segment label.

PART 2 -- PRODUCTS

(NOT USED)

PART 3 -- EXECUTION

(NOT USED)

- END OF SECTION -

SECTION 01200

PROJECT MEETINGS

PART 1 -- GENERAL

1.01 GENERAL

A. The Engineer will schedule arrangements for meetings throughout progress of the Work, prepare meeting agenda with regular participant input, and distribute with written notice of each meeting and preside at meetings.

1.02 PRE-CONSTRUCTION CONFERENCE

A. In accordance with Section 6 of the General Provisions.

1.03 PROGRESS MEETING

A. In accordance with Section 6 of the General Provisions.

1.04 SEGMENT TIE-IN MEETINGS

A. A minimum of one working week prior to connecting new pipeline to existing distribution pipeline and connection of services, Contractor shall request, schedule, and attend segment tie-in meetings. An individual meeting shall be held for each segment unless otherwise allowed by Engineer.

B. Agenda items shall include, but not be limited to sequence of tie-in(s) and service connections, coordination needed between various parties in attendance, and potential problems associated with startup.

C. Attendance:
   1. Contractor
   2. Contractor's designated quality control representative
   3. Subcontractors
   4. Engineer
   5. City's operations personnel
   6. Others as required by Contract Documents or as deemed necessary by Contractor.

1.05 OTHER MEETINGS

A. In accordance with Contract Documents and as may be required by City and/or Engineer.

PART 2 -- PRODUCTS

(NOT USED)

PART 3 -- EXECUTION

(NOT USED)

- END OF SECTION -

SECTION 01300

SUBMITTALS

PART 1 -- GENERAL

1.01 PROCEDURES

A. Direct submittals to Engineer at the following, unless specified otherwise.

1. Email: Available at preconstruction meeting.

B. Electronic Submittals:

1. Each submittal shall be an electronic file in Adobe Acrobat Portable Document Format (PDF). Use the latest version available at time of execution of the Agreement.

2. Electronic files that contain more than 10 pages in PDF format shall contain internal bookmarking from an index page to major sections of the document.

3. PDF files shall be set to open “Bookmarks and Page” view.

4. Add general information to each PDF file, including title, subject, author, and keywords.

5. PDF files shall be set up to print legibly at 8.5-inch by 11-inch, 11-inch by 17-inch. No other paper sizes will be accepted.

6. Submit new electronic files for each resubmittal.

7. Include a copy of the Transmittal of Contractor’s Submittal form, located at end of section, with each electronic file.

8. Engineer will reject submittals that are not electronically submitted, unless specifically accepted.

9. Provide Engineer with authorization to reproduce and distribute each file as many times as necessary for Project Documentation.

10. Detailed procedures for handling electronic submittals will be discussed at the preconstruction meeting.

C. Transmittal of Submittal:

1. Contractor:

a. All submittals from subcontractors, manufacturers or suppliers shall be sent directly to the Contractor for checking. Contractor shall thoroughly check all Drawings for accuracy and conformance to the intent of the Contract Documents. Drawings found

to be inaccurate or otherwise in error shall be returned to the subcontractors, manufacturers, or suppliers by the Contractor for correction before submitting them to the Engineer.

b. All submittals shall be dated, properly labeled, and consecutively numbered. Information on any labels shall indicate Specification Section, drawing number, subcontractor's, manufacturer's or supplier's name and the name or type of item the submittal covers. Each part of a submittal shall be marked and tabulated for the selected indicating the exact product being proposed.

c. Working Drawings shall be submitted as a single complete package including all associated drawings relating to a complete assembly of the various parts necessary for a complete unit or system.

d. Shop Drawings shall be submitted as a single complete package for any operating system and shall include all items of equipment and any mechanical units involved or necessary for the functioning of such system.

e. All submittals shall be thoroughly checked by the Contractor for accuracy and conformance to the intent of the Contract Documents before being submitted to the Engineer and shall bear the Contractor's stamp of approval certifying that they have been so checked. Submittals without the Contractor's stamp of approval will not be reviewed by the Engineer and will be returned to the Contractor.

f. If the submittals contain any departures from the Contract Documents, specific mention thereof shall be made in the Contractor's letter of transmittal. Otherwise, the review of such submittals shall not constitute approval of the departure.

g. No materials or equipment shall be ordered, fabricated, shipped or any work performed until the Engineer returns to the Contractor the submittals, herein required, annotated "Furnish as Submitted", "Furnish as Corrected", or "Furnish as Corrected – Confirm." If a submittal is returned "Furnish as Corrected – Confirm" the portions of work covered by the submittal that require confirmation by the Engineer shall not be ordered, fabricated, shipped, or any work performed until those portions are approved in a subsequent submittal either "Furnish as Submitted" or "Furnish as Corrected".

h. Where errors, deviations, and/or omissions are discovered at a later date in any of the submittals, the Engineer's prior review of the submittals does not relieve the Contractor of the responsibility for correcting all errors, deviations, and/or omissions.

D. Format:

1. Package submittal information by individual Specification section. Do not combine different Specification sections together in submittal package, unless otherwise directed in specifications.

2. Present in a clear and thorough manner and in sufficient detail to show kind, size, arrangement, and function of components, materials, and devices, and compliance with Contract Documents.

E. Review:

1. Submittals shall be transmitted in sufficient time to allow the Engineer at least ten (10) working days for review and processing prior to incorporating into Work.

2. Submittal shall be accompanied by a letter of transmittal containing date, project title, Contractor's name, number and titles of submittals, a list of relevant specification sections, notification of departures from any Contract requirement, and any other pertinent data to facilitate review.

3. Submittals will be annotated by the Engineer in one of the following ways:

   a. "Furnish as Submitted" (FAS) – no exceptions are taken
   b. "Furnish as Corrected" (FAC) – minor corrections are noted and shall be made.
   c. "Furnish as Corrected – Confirm" (FACC) – some corrections are noted and a partial resubmittal or additional information are required as specifically requested.
   d. "Revise and Resubmit" (R&R) – major corrections are noted and a full resubmittal is required.
   e. "For Information Only – Not Reviewed" (FIO) – submittal was received and was distributed for record purposes without review.

4. If a submittal is satisfactory to the Engineer in full or in part, the Engineer will annotate the submittal "Furnish as Submitted", "Furnish as Corrected", or "Furnish as Corrected – Confirm", and return to the Contractor. In the case of "Furnish as Corrected – Confirm" a partial resubmittal or additional information are required as specifically requested.

5. Contractor shall continue to resubmit submittals in part if they are returned "Furnish as Corrected – Confirm" or in full if they are returned "Revise and Resubmit" as required by the Engineer until submittals are acceptable to the Engineer. It is understood by the Contractor that City may charge the Contractor the Engineer's charges for review in the event a submittal is not approved (either "Furnish as Submitted" or "Furnish as Corrected") by the third submittal for a system or piece of equipment. These charges shall be for all costs associated with engineering review, meetings with the Contractor or manufacturer, etc., commencing with the fourth submittal of a system or type of equipment submitted for a particular Specification Section.

6. Acceptance of a Working Drawing by the Engineer will constitute acceptance of the subject matter for which the Drawing was submitted and not for any other structure, material, equipment or appurtenances indicated or shown.

F. Engineer's Review

1. Engineer's review of the Contractor's submittals shall in no way relieve the Contractor of any of his responsibilities under the Contract. An acceptance of a submittal shall be interpreted to mean that the Engineer has no specific objections to the submitted material, subject to conformance with the Contract Drawings and Specifications.

2. Engineer's review will be confined to general arrangement and compliance with the Contract Drawings and Specifications only, and will not be for the purpose of checking dimensions, weights, clearances, fittings, tolerances, interferences, coordination of trades, etc.

1.02 THE REQUIREMENT

A. Progress Schedule

1. As specified in the General Provisions.

B. Shop Drawings

1. Contractor shall submit for review by the Engineer Shop Drawings for all fabricated work and for all manufactured items required to be furnished by the Contract Documents.

2. Structural and all other layout Drawings prepared specifically for the Project shall have a plan scale of not less than 1/4-inch = 1 foot.

3. Where manufacturer's publications in the form of catalogs, brochures, illustrations or other data sheets are submitted in lieu of prepared Shop Drawings, such submittals shall specifically indicate the item for which approval is requested. Identification of items shall be made in ink, and submittals showing only general information are not acceptable.

C. Layout and Installation Drawings

1. Contractor shall prepare and submit for review by the Engineer layout and installation drawings for all pipes, valves, fittings, sewers, drains, all electrical conduits, etc., under this Contract. The final dimensions, elevation, location, etc., of pipe, valves, fittings, sewers, conduits, equipment, etc., may depend upon the dimensions of equipment and valves to be furnished by the Contractor.

2. Layout and installation drawings are required for all piping (including tie-in connections), valves, fittings, sewers, drains, conduits, etc.

3. Layout and installation Drawings shall show connections to existing pipelines, valves, fittings, etc as shown on the Contract Documents.

4. Drawings shall show the location and type of all supports, foundations, etc., and the required clearances to operate valves, equipment, etc.

5. The Drawings for pipes, conduits, etc., shall show all electrical conduits and pressure piping, structure, manholes or any other feature within four (4) feet (measured as the clear dimension) from the pipe or conduit, etc., for which the profile is drawn.

D. Record Working Drawings

1. Contractor shall maintain current record drawings onsite for the Engineer's review. Record drawings shall be updated monthly at a minimum.

2. Prior to final payment, the Contractor shall furnish the one complete set of all accepted Working Drawings, including Shop Drawings, for equipment, piping, electrical work, etc.

3. Working Drawings furnished shall be corrected to include any departures from previously accepted Drawings.

E. Samples

1. Contractor shall furnish for review all samples as required by the Contract Documents or requested by the Engineer.

2. Samples shall be of sufficient size or quantity to clearly illustrate the quality, type, range of color, finish or texture and shall be properly labeled to show the nature of the material, trade name of manufacturer and location of the work where the material represented by the sample will be used.

3. Samples shall be checked by the Contractor for conformance to the Contract Documents before being submitted to the Engineer and shall bear the Contractor's stamp of approval certifying that they have been so checked. Transportation charges on samples submitted to the Engineer shall be prepaid by the Contractor.

4. Engineer's review will be for compliance with the Contract Documents and his comments will be transmitted to the Contractor with reasonable promptness.

5. Accepted samples will establish the standards by which the completed work will be judged.

F. Submittals Required by Laws, Regulations, and Governing Agencies

1. Promptly submit notifications, reports, certifications, payrolls, and otherwise as may be required, directly to the applicable federal, state, or local governing agency or their representative and as specified in the General Provisions.

2. Transmit to Engineer for City's records one copy of correspondence and transmittals (to include enclosures and attachments) between Contractor and governing agency.

G. Construction Photographs

1. The Contractor shall engage a competent photographer to take photographs at the locations and at such stages of the construction as directed by the Engineer.

2. Photographically document all phases of the Project including preconstruction, construction progress, and post-construction.

3. Provide minimum of 4 photographs per day per Site for the duration of the Contract time. When directed by the Engineer, frequency of photographs may be increased to weekly sessions provided that the equivalent number of exposures is not exceeded. Engineer may waive requirements for photographs during inactive construction periods in favor of increased photographs during active construction sequences.

4. After Effective Date of the Agreement and before Work at any Site is started, and again upon issuance of Substantial Completes, take a minimum of 48 photographs of Site and property adjacent to perimeter of all Sites. Photos of each Site shall be taken immediately prior to the start of the Work without resident vehicles or contractor vehicles or equipment blocking the image.

H. Submittal Requirements

1. Format: Digital, minimum resolution of 1832 by 3264.

a. Electronic images shall have date takenk embedded into image.

b. Submit electronic images on external storage device utilized solely for the Project and on CD/DVD. Label both media with the Project and Citys Name, and the specific project site (P7, P8, etc.).

c. At completion of the work, all electronic files shall be turned over to the City on the external storage device that will become property of the City.

H. Construction Phasing: As required in Section 01520, Maintenance of Utility Operations During Construction.

I. Test, Evaluation, and Inspection Reports:

1. General: Shall contain signature of person responsible for test or report.
2. Field:
    a. As a minimum, include the following:
        1) Project title and number.
        2) Specific project site (P7, P8, etc.)
        3) Date and time.
        4) Record of temperature and weather conditions.
        5) Identification of product and Specification section.
        6) Type and location of test, or inspection, including referenced standard or code.
        7) Date issued, testing laboratory name, address, and telephone number, and name and signature of laboratory inspector.
        8) If test or inspection deems material or equipment not incompliance with Contract Documents, identify corrective action necessary to bring into compliance.
        9) Other items as identified in individual Specification sections.

PART 2 -- PRODUCTS

(NOT USED)

PART 3 -- EXECUTION

(NOT USED)

- END OF SECTION -

SECTION 01400

QUALITY CONTROL

PART 1 -- GENERAL

1.01 THE REQUIREMENT

A. Field and Laboratory Services

1. Field and laboratory testing and checking required by the Specifications, including the cost of transporting all samples and test specimens, shall be provided and paid for by the Contractor unless otherwise indicated in the Specifications.

2. Materials to be tested include but are not necessarily limited to the following: concrete, bituminous paving materials, select backfill, crushed stone or gravel and sand.

3. Tests required by the City shall not relieve the Contractor from the responsibility of supplying test results and certificates from manufacturers or suppliers to demonstrate conformance with the Specifications.

4. Procedure

   a. The Contractor shall plan and conduct his operations to permit taking of field samples and test specimens, as required, and to allow adequate time for laboratory tests.

   b. The collection, field preparation and storage of field samples and test specimens shall be as directed by the Engineer with the cooperation of the Contractor.

5. Significance of Tests

   a. Test results shall be binding on both the Contractor and the City and shall be considered irrefutable evidence of compliance or noncompliance with the Specification requirements, unless supplementary testing shall prove, to the satisfaction of the City, that the initial samples were not representative of actual conditions.

6. Supplementary and Other Testing

   a. Nothing shall restrict the Contractor from conducting tests he may require. Should the Contractor at any time request the City to consider such test results, the test reports shall be certified by an independent testing laboratory acceptable to the City. Testing of this nature shall be conducted at the Contractor's expense.

1.02 INSPECTION AND TESTS

A. The Contractor must anticipate possible delays that may be caused in the execution of his work due to the necessity of materials and equipment being inspected and accepted for use. The Contractor shall furnish, at his own expense, all samples of materials required by the Engineer for testing, and shall make his own arrangements for providing water, electric power, or fuel for the various inspections and tests of structures and equipment.

B. The Contractor shall furnish the services of representatives of the manufacturers of certain equipment, as prescribed in other Sections of the Specifications. The Contractor shall also place his orders for such equipment on the basis that, after the equipment has been tested prior to final acceptance of the work, the manufacturer will furnish the City with certified statements that the equipment has been installed properly and is ready to be placed in functional operation. Tests and analyses required of equipment shall be paid for by the Contractor, unless specified otherwise in the Section which covers a particular piece of equipment.

C. Where other tests or analyses are specifically required in other Sections of these Specifications, the cost thereof shall be borne by the party Contractor. The City will bear the cost of all tests, inspections, or investigations undertaken by the order of the Engineer for the purpose of determining conformance with the Contract Documents if such tests, inspection, or investigations are not specifically required by the Contract Documents, and if conformance is ascertained thereby. Whenever nonconformance is determined by the Engineer as a result of such tests, inspections, or investigations, the Contractor shall bear the full cost thereof or shall reimburse the City for said cost. In this connection, the cost of any additional tests and investigations, which are ordered by the Engineer to ascertain subsequent conformance with the Contract Documents, shall be borne by the Contractor.

PART 2 -- PRODUCTS

(NOT USED)

PART 3 -- EXECUTION

(NOT USED)

- END OF SECTION -

SECTION 01510

TEMPORARY CONSTRUCTION FACILITIES

PART 1 -- GENERAL

1.01 THE REQUIREMENT

A. The Contractor shall provide temporary light and power, heating, water service and sanitary facilities for his operations, for the construction operations of the other Contractors of this Project at the site. The temporary services shall be provided for use throughout the construction period.

B. The Contractor shall coordinate and install all temporary services in accordance with the requirements of the utility companies having jurisdiction and as required by applicable codes and regulations.

C. At the completion of the work, or when the temporary services are no longer required, the facilities shall be restored to their original conditions.

D. All costs in connection with the temporary services including, but not limited to, installation, utility company service charges, maintenance, relocation and removal shall be borne by the Contractor at no additional cost to the City.

E. Some temporary facilities that may be required may be indicated on the Drawings; however, the Drawings do not necessarily show any or all of the temporary facilities that the Contractor ultimately uses to complete the work.

F. Temporary Light and Power

1. The Contractor shall make all necessary arrangements, and pay for all permits, inspections, and power company charges for all temporary service installations. All temporary systems shall comply with and meet the approval of the local authorities having jurisdiction. All temporary electrical systems shall consist of wiring, switches, necessary insulated supports, poles, fixtures, sockets, receptacles, lamps, guards, cutouts, and fuses as required to complete such installations. The Contractor shall furnish lamps and fuses for all temporary systems furnished by him and shall replace broken and burned out lamps, blown fuses, damaged wiring and as required to maintain these systems in adequate and safe operating condition. All such temporary light and power system shall be installed without interfering with the work of the other Contractors.

   When it is necessary during the progress of construction that a temporary electrical facility installed under this Division interferes with construction operations, the Contractor shall relocate the temporary electrical facilities to maintain temporary power as required at no additional cost to the City. The Contractor shall be responsible at all times for any damage or injury to equipment, materials, or personnel caused by improperly protected or installed temporary installations and equipment.

2. Any Sub-Contractors doing work at the site shall be permitted to connect into the temporary general lighting system small hand tools, such as drills, hammers, and grinders, provided that:

   a. Equipment and tools are suitable for the service provided.

   b. In case of overloading of circuits, the Contractor will restrict use of equipment and tools as required for correct loading.

3. Any additional power and lighting requirements other than that specified herein (including power for temporary heating equipment to be provided by the Contractor) shall be furnished complete with all fuses, cutouts, wiring and other material and equipment necessary for a complete system between the service point and the additional power consumers and shall install his own metering equipment in accordance with the requirements of the servicing power company.

4. Upon completion of the work, but prior to acceptance by the City, the Contractor shall remove all temporary services, security lighting systems, temporary general lighting systems and all temporary electrical work from the premises.

G. Temporary Heating

1. The Contractor shall provide temporary heating, ventilation coverings and enclosures necessary to properly protect all work and materials against damage by dampness and cold, to dry out the work and to facilitate work.

2. The equipment, fuel, materials, operating personnel and methods used shall be at all times satisfactory and adequate to maintain critical installation temperatures and ventilation for all work in those areas where the same is required.

3. Any work damaged by dampness or insufficient or abnormal heating shall be replaced by the Contractor at no additional cost to the City.

H. Temporary Sanitary Service

1. Sanitary conveniences, in sufficient numbers, for the use of all persons employed on the work and properly screened from public observation, shall be provided and maintained at suitable locations by the Contractor, all as prescribed by State Regulations and local ordinances. The contents of same shall be removed and disposed of in a manner consistent with local and state regulations, as the occasion requires. The Contractor shall rigorously prohibit the committing of nuisances within, on, or about the work. Sanitary facilities shall be removed from the site when no longer required.

I. Temporary Construction Water

1. Water is available at the project site through city fire hydrants. The Contractor shall make all arrangements with the City for obtaining the water, making connection with the water source, transporting the water, and all other arrangements concerning water to be used by the contractor. Construction water will be provided by the City at the City's expense. Water will be furnished subject to the conditions of current City Code of Ordinances and as specified herein.

2. If the meter is connected to a hydrant, use only special hydrant-operating wrenches to open hydrants. Make certain that the hydrant valve is open "full" since "cracking" the valve causes damage to the hydrant. If any hydrants are damaged, the Contractor will be held responsible and shall notify the City so that all damage can be repaired as quickly as possible. Fire hydrants shall be completely accessible to the Fire Department at all times. Upon completion of the work, the Contractor shall remove all temporary piping and facilities.

3. If necessary, the Contractor must provide means, at his sole expense, for boosting the water pressure at the project site to meet all requirements, including disinfection.

4. The Contractor shall supply potable water for his employees either by portable containers or drinking fountains.

5. An adequate number of hose bibbs, hoses, and watertight barrels shall be provided for the distribution of water.

6. Water service shall be protected from freezing and the service shall be extended and relocated as necessary to meet temporary water requirements.

J. Temporary Residential Water Service (Highline)

1. If an above ground temporary service pipeline (highline) is required as part of construction phasing as specified in Section 01520, the Contractor shall submit to the Engineer for approval a detailed plan showing all proposed materials and connection details required for the highline.

2. The highline shall be subject to all testing requirements including hydrostatic and bacteria testing as required of the permanent Work included in the Contract Documents prior to being placed into service.

3. The layout of the highline and temporary services shall be as such to be protected from vandalism and to prevent exposure to inadvertent or directed damage. The highline layout shall allow for unrestricted access to individual residences.

K. Storage of Equipment and Materials

1. Contractor shall store his equipment and materials at the job site (inclusive of Peck Reservoir parking lot if confirmed with Owner at the start of the project) in accordance with the requirements of Section 7-8 of the General Provisions, and as hereinafter specified. All equipment and materials shall be stored in accordance with manufacturer's recommendations and as directed by the City or Engineer.

2. Contractor shall enforce the instructions of City and Engineer regarding the posting of regulatory signs for loadings on structures and fire safety.

3. Contractor shall not store materials or encroach upon private property without the written consent of the Owner's of such private property.

4. Contractor shall not store unnecessary materials or equipment on the job site and shall take care to prevent any structure from being loaded with a weight which will endanger its security or the safety of persons.

5. Materials shall not be placed within ten (10) feet of fire hydrants. Gutters, drainage channels and inlets shall be kept unobstructed at all times.

7. No temporary facilities or temporary construction easements are provided. Contractor shall provide adequate temporary storage buildings/facilities, if required, to protect materials or equipment on the job site.

K. Dust Control

1. Contractor shall take all necessary measures to control dust from his operations, and to prevent spillage of excavated materials on public roads.

2. Contractor shall remove all spillage of excavated materials, debris or dust from public roads by methods approved by the Engineer.

3. Contractor shall sprinkle water at locations and in such quantities and at such frequencies as may be required by the Engineer to control dust and prevent it from becoming a nuisance to the surrounding area.

4. Dust control and cleaning measures shall be provided at no additional cost to the City.

L. SWPPP

1. Contractor shall follow the requirements of the State Water Resources Control Board National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction Activity Water Quality Order 2009-0009-DWQ (General Permit) as required for the project. .

2. If required, the Contractor's SWPPP shall be submitted to Engineer in full conformance with Section 1300, Submittals, and shall be accepted by Engineer before onset of any construction activities. Engineer's review and acceptance will be for general conformance with the requirements of the SWPPP in accordance with the General Permit. Contractor shall be solely responsible for the application and effectiveness for all materials, workmanship, procedures, actions, and other provisions included in the SWPPP.

PART 2 -- PRODUCTS

(NOT USED)

PART 3 -- EXECUTION

3.01 TEMPORARY CONTROLS

A. Water Pollution Control:

1. Divert sanitary sewage and non-storm waste flow interfering with construction and requiring diversion to sanitary sewers. Do not cause or permit action to occur which would cause an overflow to existing waterway.

2. Prior to commencing excavation and construction, obtain Engineer's agreement with detailed plans showing procedures intended to handle and dispose of sewage, groundwater, and dewatering pump discharges.

3. Comply with approved SWPPP for stormwater flow and surface runoff.

4. Do not dispose of volatile wastes such as mineral spirits, oil, chemicals, or paint thinner in storm or sanitary drains. Disposal of wastes into streams or waterways is prohibited. Provide acceptable container for collection and disposal of waste materials, debris, and rubbish.

B. Erosion, Sediment, and Flood Control: Provide, maintain, and operate temporary facilities required by approved SWPPP to control erosion and sediment releases, and to protect the Work and existing facilities from flooding during construction period.

- END OF SECTION -

SECTION 01520

MAINTENANCE OF UTILITY OPERATIONS DURING CONSTRUCTION

PART 1 -- GENERAL

1.01 MAINTAINING OPERATION OF EXISTING FACILITIES

A. The Contractor will be performing work contained in these drawings and specifications. Under these conditions, precautions will be necessary to assure that no damage or unscheduled shutdowns occur to any facilities, including piping, utilities, roads, and structures, that are to remain in operation and are not to be modified or replaced as part of this Work. Any temporary facilities, materials, equipment and labor required to achieve this objective shall be provided by the Contractor at his own expense. At the completion of work, all such temporary facilities, materials and equipment remaining shall be removed from the work area.

B. At the connection of this Work to existing buried piping (tie-ins) the Contractor shall uncover and verify the location, elevation, material, and dimensions of the existing buried piping and facilities prior to beginning construction or fabrication of any new materials or facilities which are dependent on the location of existing facilities.

1.02 ORDER OF THE WORK

A. The work to be completed at each project location as defined in the Contract Documents shall be completed in an order or precedence as may be required by the Contractor to expedite the completion of the project and meet the Project Milestones, but not without due consideration of the City's operations and approval. Work shall be in accordance with the sequence in the approved phasing plan and as described in Paragraph 1.5 of this section. After work has begun on any portion or designated part of the Project, it shall be carried forward to its final completion. The City has the right to change the precedence of work as needed to maintain the City's operation.

1.03 SHUTDOWNS

A. Any proposed shutdowns must be indicated on the Contractor's preliminary schedule to be submitted for review by the City and Engineer at the Pre-Construction meeting. The actual allowable durations of any shutdowns will be determined during the preparation of the detailed construction schedule, unless otherwise noted in the plans and/or these specifications.

B. The Contractor shall compile a detailed list of all items of work, which must be accomplished during any shutdown. The Contractor shall coordinate his work to minimize the required number of shutdowns by accomplishing as many tasks as possible during each shutdown period.

C. The Contractor shall submit a list of items to the Engineer for review as a part of the construction schedule defined within Section 01300. The schedule shall indicate all periods and duration of each proposed shutdown and the items of work that will be accomplished. The schedule shall also include time required for hydrostatic testing, disinfection procedures and required disinfection testing.

D. The Contractor shall make specific written requests for all shutdowns five (5) working days in advance of the proposed shutdown for review and approval by the City.

E. The written request shall include a complete detailed plan of the Contractor's proposed activities including schedule, manpower, equipment, materials and methods that will be utilized to perform the required work, and disinfection procedures during the proposed shutdown.

F. Should the City determine that the Contractor’s proposed plan is insufficient to successfully complete the required work during the period of the shutdown, the Contractor shall make the appropriate revisions in his proposed plan to the satisfaction of the City. The City has right to change date and time of requested shutdown. The City also has the right to perform work associated with the shutdown. The Contractor shall credit the City for any work not performed as bid.

G. All materials and equipment (including emergency equipment) necessary to expedite tie-ins shall be on hand prior to the shutdown of existing services or utilities.

H. At no time shall the Contractor undertake to close off any pipelines or open valves or take any other action which would affect the operation of the existing system, except as specifically required by the drawings and after approval is granted by the City.

I. The Contractor shall plan all work such that it can be completed with minimal disruption of the existing facilities operation. Prior to the start of any work, the Contractor shall coordinate with the City to develop an approved schedule that will allow for a continued normal operation of all existing facilities. It may be necessary to complete or perform certain parts of the construction work outside normal working hours in order to avoid undesirable conditions. The Contractor shall do this work at such times and at no additional cost to the City.

J. Work on existing structures and facilities shall be performed on a schedule and in a manner that will permit the existing facility to operate continuously, unless otherwise approved in writing by the City of the existing utility and/or facility affected.

1.04 OPERATION OF EXISTING WATER SYSTEM PROHIBITED

A. The Contractor shall at no time undertake to close off any pipelines, open any valves or take any other action which would affect the operation of the existing water system, except as specifically required by the Contract Documents and after approval is granted by the City. Request approval five (5) working days in advance of the time that interruption of the existing system is required.

B. Work on existing structures and facilities shall be performed on a schedule and in a manner that will permit the existing facility to operate continuously, unless otherwise approved in writing by the City of the existing utility and/or facility affected.

1.05 CONSTRUCTION PHASING

A. Prior to commencement of work, the Contractor shall submit to the City and Engineer for review and approval a detailed staging plan describing the sequencing of the installation, operation, and removal of all temporary and permanent facilities as required to complete the work as show on the Contract Documents and shall provide notification a minimum of 72 hours in advance to all residences impacted by shutdown operations. The staging plan shall at a minimum include the following information:

1. Schematic and written description of each phase of work for each Segment.
2. Detailed method for addressing field sampling requirements (Bac T), including location of each sample.
3. Location and size of any temporary facilities including but not limited to temporary pipelines, service lines, hydrants, valves.
4. Hydrant connection schematic.
5. Required valve closures/opening by City.
6. System connection schematics, including cutting and capping and thrust restraints.
7. Short-term shutdowns (shutdowns lasting no more than 4 hours in duration)
8. Long-term shutdowns (shutdowns lasting more than 4 hours in duration).
9. Measures to maintain resident driveway access.
10. Schedule including activity durations.

B. The Contractor shall be responsible for maintaining existing fire service. A temporary hydrant shall be provided for any hydrant to be taken out of service longer than a short-term shutdown. No more than two hydrants shall be taken out of service at any one time.

C. No more than 25 water services shall be out of service during a short-term shutdown, or highlined for long-term service interruption at any one time. Contractor shall notify a minimum of 72 hours in advance all residences impacted by shutdown.

D. For any interrupted service, service shall be restored by the end of the working day via permanent or highline connection.

E. No more than two water line connections shall be allowed per working day. The City requires a day between connection work to prepare the system. Allowable days for water line connections are Tuesdays through Thursdays.

F. All new pipelines shall be installed, tested, and disinfected prior to making connections to existing pipe.

PART 2 -- PRODUCTS

(NOT USED)

PART 3 -- EXECUTION

(NOT USED)

- END OF SECTION -

SECTION 01530

PROTECTION OF EXISTING FACILITIES

PART 1 -- GENERAL

1.01 THE REQUIREMENT

A. Contractor shall be responsible for the preservation and protection of property adjacent to the work site against damage or injury as a result of his operations under this Contract. Any damage or injury occurring on account of any act, omission or neglect on the part of the Contractor shall be restored in a proper and satisfactory manner or replaced by and at the expense of the Contractor to an equal or superior condition than previously existed.

B. Contractor shall comply promptly with such safety regulations as may be prescribed by the City or the local authorities having jurisdiction and shall, when so directed, properly correct any unsafe conditions created by, or unsafe practices on the part of, his employees. In the event of the Contractor's failure to comply, the City may take the necessary measures to correct the conditions or practices complained of, and all costs thereof will be deducted from any monies due the Contractor. Failure of the Engineer to direct the correction of unsafe conditions or practices shall not relieve the Contractor of his responsibility hereunder.

C. In the event of any claims for damage or alleged damage to property as a result of work under this Contract, the Contractor shall be responsible for all costs in connection with the settlement of or defense against such claims. Prior to commencement of work in the vicinity of property adjacent to the work site, the Contractor, at his own expense, shall take such surveys and photos as may be necessary to establish the existing condition of the property. Before final payment can be made, the Contractor shall furnish satisfactory evidence that all claims for damage have been legally settled or sufficient funds to cover such claims have been placed in escrow, or that an adequate bond to cover such claims has been obtained.

D. Contractor shall not, except after written consent from authorized parties, enter or occupy privately owned land with men, tools, materials or equipment except on easements provided herein.

1.02 PROTECTION OF WORK AND MATERIAL

A. During the progress of the work and up to the date of final payment, the Contractor shall be solely responsible for the care and protection of all work and materials covered by the Contract, except as provided for in the General Provisions.

B. All work and materials shall be protected against damage, injury or loss from any cause whatsoever, and the Contractor shall make good any such damage or loss at his own expense. Protection measures shall be subject to the approval of the Engineer and shall include but not be limited to the following:

1. Store apparatus, materials, supplies, and equipment in an orderly safe manner that will not unduly interfere with the progress of the work or the work of any other contractor or utility service company. Excavation equipment is prohibited from being stored within the right-of-way outside of working hours.

2. Provide suitable storage facilities for all materials, which are subject to injury by exposure to weather, theft, breakage, or otherwise.

3. Place upon the work or any part thereof only such loads as are consistent with the safety of that portion of the work.

4. Clean up frequently all refuse, rubbish, scrap materials, and debris caused by his operations, to the end that at all times the site of the work shall present a safe, orderly and workmanlike appearance.

5. Provide barricades and guard rails around openings, for scaffolding, for temporary stairs and ramps, around excavations, elevated walkways and other hazardous areas.

6. Provide District pre-construction photos of existing site conditions as required in this Section and Section 01300).

7. Take work progress photos and submit monthly to the Engineer as specified in Section 01300.

1.03 BARRICADES, WARNING SIGNS AND LIGHTS

A. The Contractor shall provide, erect and maintain as necessary, strong and suitable barricades, danger signs and warning lights along all roads accessible to the public, as required by the City, to ensure safety to the public. All barricades and obstructions along public roads shall be illuminated at night and all lights for this purpose shall be kept burning from sunset to sunrise.

B. The Contractor shall provide and maintain such other warning signs and barricades in areas of and around their respective work as may be required for the safety of all those employed in the work, the City's operating personnel, or those visiting the site.

1.04 EXISTING UTILITIES AND STRUCTURES

A. The Contractor shall call Underground Service Alert (DIGALERT) at 1-800-227-2600 a minimum (2) working days not including the date of notification prior to any excavation.

B. The term existing utilities shall be deemed to refer to both publicly-owned and privately-owned utilities such as electric power and lighting, telephone, water, gas, storm drains, process lines, sanitary sewers and all appurtenant structures.

C. Where existing utilities and structures are indicated on the Drawings, it shall be understood that all of the existing utilities and structures affecting the work may not be shown and that

the locations of those shown are approximate only. It shall be the responsibility of the Contractor to ascertain the actual extent and exact location of existing utilities and structures. In every instance, the Contractor shall notify the proper authority having jurisdiction and obtain all necessary directions and approvals before performing any work in the vicinity of existing utilities.

D. Prior to beginning any excavation work, the Contractor shall, through field investigations, determine any conflicts or interferences between existing utilities and new utilities to be constructed under this project. This determination shall be based on the actual locations, elevations, slopes, etc., of existing utilities as determined in the field investigations, and locations, elevation, slope, etc. of new utilities as shown on the Drawings. If an interference exists, the Contractor shall bring it to the attention of the Engineer as soon as possible. If the Engineer agrees that an interference exists, he shall modify the design as required. Additional costs to the Contractor for this change shall be processed through a Change Order or Construction Change Directive as specified in Section 3-2 of the General Provisions. In the event the Contractor fails to bring a potential conflict or interference to the attention of the Engineer prior to beginning excavation work, any actual conflict or interference which does arise during the Project shall be corrected by the Contractor, as directed by the Engineer, at no additional expense to the City.

E. The work shall be carried out in a manner to prevent disruption of existing services and to avoid damage to the existing utilities. Temporary connections shall be provided, as required, to insure uninterruption of existing services. Any damage resulting from the work of this Contract shall be promptly repaired by the Contractor at his own expense in a manner approved by the Engineer and further subject to the requirements of any authority having jurisdiction. Where it is required by the authority having jurisdiction that they perform their own repairs or have them done by others, the Contractor shall be responsible for all costs thereof.

F. Where excavations by the Contractor require any utility lines or appurtenant structures to be temporarily supported and otherwise protected during the construction work, such support and protection shall be provided by the Contractor. All such work shall be performed in a manner satisfactory to the Engineer and the respective authority having jurisdiction over such work. In the event the Contractor fails to provide proper support or protection to any existing utility, the Engineer may, at his discretion, have the respective authority to provide such support or protection as may be necessary to ensure the safety of such utility, and the costs of such measures shall be paid by the Contractor.

G. Without additional compensation, the Contractor may remove and replace in a condition as good as or better than original, such small miscellaneous structures as fences, mailboxes, and signposts, etc. that interfere with the Contractor's operations.

H. All underground structures known to Engineer except sewer, electric, inert gas, and telephone service connections are shown. This information is shown for the assistance of Contractor in accordance with the best information available, but is not guaranteed to be correct or complete.

1.05 PROTECTION OF INSTALLED PRODUCTS

A. Provide protection of installed products to prevent damage from subsequent operations. Remove protection facilities when no longer needed, prior to completion of work.

B. Control traffic to prevent damage to equipment, materials and surfaces.

1.06 PROTECTION OF SURVEY OR ROADWAY MARKERS

A. The Contractor shall not destroy, remove, or otherwise disturb any existing survey markers or other existing street or roadway markers without proper authorization. No pavement breaking or excavation shall be started until all survey or other permanent marker points that will be disturbed by the construction operations have been properly referenced for accurate restoration. It shall be the Contractor's responsibility to notify the City of the time and location that work will be done. Such notification shall be sufficiently in advance of construction so that there will be no delay due to waiting for survey points to be satisfactorily referenced for restoration. All survey markers, roadway markings, reflectors, stopbars, or other points disturbed will be accurately restored by the Contractor at the Contractor's expense after all street or roadway resurfacing has been completed. All restoration of survey monuments shall be a Licensed Land Surveyor registered by the state of California.

1.07 TEMPORARY RESURFACING

A. The Contractor shall promptly place temporary surfacing on all areas where existing surfacing has been disturbed and shall maintain such surfacing for the period of time required by the Engineer. Temporary resurfacing shall be constructed in accordance with the following requirements.

1. The subgrade shall be uniformly watered sufficiently to eliminate all dust, but not to such extent as to form mud or pools of water. The street and surrounding area shall be cleared of rubbish and debris. The street shall be swept and the surrounding area shall be cleaned thoroughly, on a daily basis.

2. The temporary resurfacing shall then be spread over the prepared foundation material and rolled with an 8-ton tandem roller in such a manner that after rolling, the temporary resurfacing shall present a smooth surface for traffic, shall not be less than 1-1/2 inches in compacted thickness and shall be maintained free from bumps and depressions until permanent resurfacing is placed. The finished surface of said temporary resurfacing shall be flush with the adjoining pavement grade.

3. The Contractor shall ensure enough temporary resurfacing material is available for delivery to the project sites at the end of each workday for necessary repairs to the temporary resurfacing already placed.

4. The temporary resurfacing shall be left in place until permanent resurfacing is constructed.

5. No separate payment will be allowed for temporary resurfacing and all costs therefore shall be included with the associated items of contract work.

6. The Contractor shall take precautions to prevent damage to all pavement and road edge surfaces at the project site and at the access road junctions with the existing roadways. All pavement and surfaces within the City rights-of-way that are damaged by the Contractor shall be replaced or repaired by him. For the purpose of this Article, the terms "pavement" and "surfaces" shall be deemed to include base materials.

1.08 PROTECTION OF TREES AND LANDSCAPING

A. The Contractor shall exercise all necessary precautions so as not to damage or destroy any trees, shrubs, or other existing landscaping, including those lying within or beyond street rights-of-way and project limits, and shall not trim or remove any trees unless such trees have been approved for trimming or removal by the Engineer and the City. All existing trees and landscaping which are damaged during the construction shall be trimmed or replaced by the Contractor or a certified landscape maintenance company under permit from the City and to the satisfaction of the City. All costs shall be borne by the Contractor.

1.09 CONTRACTOR’S RESPONSIBILITY FOR UTILITY PROPERTIES AND SERVICE

A. Where the Contractor's operations could cause damage or inconvenience to railway, telegraph, telephone, television, power, oil, gas, water, sewer, or irrigation systems, the operations shall be suspended until all arrangements necessary for the protection of these utilities and services have been made by the Contractor.

B. Under no circumstances expose any utility without first obtaining permission from the appropriate agency. Once permission has been granted, locate, expose, and provide temporary support for all existing underground utilities.

C. The Contractor shall be solely and directly responsible for the City and operators of such properties for any damage, injury, expense, loss, inconvenience, delay, suits, actions, or claims of any character brought because of any injuries or damage which may result from the construction operations under this contract.

D. In the event of interruption to domestic water, sewer, storm drain, or other utility services as a result of accidental breakage due to construction operations, promptly notify the proper authority. Cooperate with said authority in restoration of service as promptly as possible and bear all costs of repair. In no case shall interruption of any water or utility service be allowed to exist outside working hours unless prior approval is granted.

E. In the event the Contractor encounters water service lines that interfere with trenching, he may, by obtaining prior approval of the property City, or Fire Department as applicable, and the Engineer, cut the service, dig through, and restore the service with similar and equal materials at the Contractor's expense.

F. The Contractor shall replace, at his own expense, any and all other existing utilities or structures removed or damaged during construction, unless otherwise provided for in these Contract Documents or ordered by the Engineer.

1.10 FIELD RELOCATION

A. During the progress of construction, it is expected that minor relocations of the work will be necessary. Such relocations shall be made only by direction of the Engineer. If existing structures are encountered which prevent the construction, and which are not properly shown on the Drawings, notify the Engineer before continuing with the construction in order that the Engineer may make such field revisions as necessary to avoid conflict with the existing structures. If the Contractor shall fail to so notify the Engineer when an existing structure is encountered, and shall proceed with the construction despite this interference, he shall do so at his own risk.

PART 2 -- PRODUCTS

(NOT USED)

PART 3 -- EXECUTION

(NOT USED)

- END OF SECTION -

SECTION 01540

DEMOLITION AND REMOVAL OF EXISTING STRUCTURES AND EQUIPMENT

PART 1 -- GENERAL

1.01 THE REQUIREMENT

A. This Section covers the demolition, removal, and disposal of, excavated material, contaminated soil, pavement, curbs, sidewalk, and removal and disposal of asbestos materials. The Contractor shall furnish all labor, materials and equipment to demolish and to remove spoil materials, piping and accessories designated to be removed on the Drawings.

B. The Contractor shall follow the requirements of Sections 7-15 and 10 of the General Provisions.

1.02 TITLE TO EQUIPMENT AND MATERIALS

A. Contractor shall have no right or title to any of the equipment, materials or other items to be removed from the Project unless and until said equipment, materials and other items have been removed from the premises. The Contractor shall not sell or assign or attempt to sell or assign any interest in the said equipment, materials or other items until the said equipment, materials or other items have been removed.

B. Contractor shall have no claim against the City because of the absence of such fixtures and materials.

1.03 CONDITION OF STRUCTURES AND EQUIPMENT

A. The City does not assume responsibility for the actual condition of structures and equipment to be demolished and removed.

B. Conditions existing at the time of inspection for bidding purposes will be maintained by the City so far as practicable.

PART 2 -- PRODUCTS

(NOT USED)

PART 3 -- EXECUTION

3.01 DEMOLITION AND REMOVALS

A. Contractor shall demolish or dismantle and remove all items scheduled for demolition and removal as shown on the drawings and as specified herein that will interfere with the planned construction, or as otherwise directed by Engineer. Contractor shall comply with all

pertinent regulations of OSHA and local codes and practices. The site shall be kept neat and orderly during the demolition. Adjacent public right-of-way and private property shall be kept free of debris at all times. Stockpiles of items or materials to be removed shall be removed from the site daily, or stored in a dumpster or other portable trash receptacle, which shall be emptied on a weekly basis. Accumulations of flammable material shall not be permitted.

B. All items not part of the Diversion Requirement and removed from the site shall be transported in a legal manner and disposed of at a legal disposal site. Concrete and asphalt pavement debris shall be transported to an appropriate recycler of such materials. All disposal sites and recycling facilities shall be approved by the City prior to initiation of the work. Hazardous or contaminated materials shall be handled and disposed of in accordance with all applicable laws, codes, and regulations.

C. Any equipment piping and appurtenances removed without proper authorization, which are necessary for the operation of the existing facilities shall be replaced to the satisfaction of the Engineer at no cost to the City.

D. Excavation caused by demolitions shall be backfilled with fill free from rubbish and debris and in accordance with Section 02200.

E. Asbestos Cement Pipe: Refer to Section 13280 for the handling of asbestos cement pipe.

3.02 DISPOSAL AND RECYCLING

A. All items removed from the site shall be transported in a legal manner and disposed of at a legal disposal site. Concrete and asphalt pavement debris shall be transported to an appropriate recycler of such materials. All disposal sites and recycling facilities shall be approved by the City prior to initiation of the work. Hazardous materials shall be handled and disposed of in accordance with all applicable laws, codes, and regulations.

3.03 PROTECTION

A. Demolition and removal work shall be performed by competent experienced workmen for the various type of demolition and removal work and shall be carried out through to completion with due regard to the safety of City employees, workmen on-site and the public. The work shall be performed with as little nuisance as possible.

B. The work shall comply with the applicable provisions and recommendation of ANSI A10.2, Safety Code for Building Construction, all governing codes, and as hereinafter specified.

C. The Contractor shall make such investigations, explorations and probes as are necessary to ascertain any required protective measures before proceeding with demolition and removal. The Contractor shall give particular attention to shoring and bracing requirements so as to prevent any damage to new or existing construction.

D. The Contractor shall provide, erect, and maintain catch platforms, lights, barriers, weather protection, warning signs and other items as required for proper protection of the public, workmen engaged in demolition operations, and adjacent construction.

E. The Contractor shall provide and maintain temporary protection of existing utilities or structures designated to remain where demolition, removal and new work is being done, connections made, materials handled, or equipment moved.

F. Preservation of Property: Existing improvement in areas adjoining the property whereon demolition and removal is being performed shall be protected from injury or damage resulting from operations of the Contractor and the Contractor shall be responsible for such damage. In like manner, any building, structure, tree, shrub, or other existing item in the bid item where demolition and removal are being performed shall be similarly protected and preserved.

G. The Contractor shall be responsible for any damage to the existing utilities or contents by reason of the insufficiency of protection provided.

3.04 ABANDONMENT

A. Except where designated for removal for installation of new pipe and connections, the existing water distribution pipeline shall be abandoned in place.

B. Existing pipe pipeline shall be cut using tools or equipment to ensure a clean and square end to allow installation of a plug. Clean cut end to remove all metal burrs to prevent accidental injury when working with the end of the pipe.

C. Using approved plug, see Section 15000, the abandoned pipe shall be temporarily plugged for future use by securely placing PVC or Ductile Iron cap on the end of the abandon pipe where pipe was removed for installation or new pipe and connections per the details shown on the Drawings.

D. The remaining pipe and service laterals shall remain in place except where in conflict with the proposed Work, in which case the existing pipe or service lateral shall be removed to allow installation of the Contract Work.

E. Salvage to City all existing valves on abandoned pipelines.

3.05 WORKMANSHIP

A. The demolition and removal work shall be performed as described in the Contract Documents. The work required shall be done with care, and shall include all required shoring, bracing, etc. The Contractor shall be responsible for any damage which may be caused by demolition and removal work to any part or parts of existing utilities, structures, or items designated for reuse or to remain. The Contractor shall perform patching, restoration and new work in accordance with applicable Sections of the Specifications and in accordance with the details shown on the Drawings. Prior to starting of work, the Contractor shall submit in accordance with Section 1300, Submittals, a detailed description of methods and equipment to be used for each operation and the sequence thereof for review by the Engineer.

B. Materials or items designated to remain the property of the City shall be as hereinafter tabulated. Such items shall be removed with care and stored at a location at the site to be designated by the City.

C. Materials or items demolished and not designated to become the property of the City or to be reinstalled shall become the property of the Contractor and shall be removed from the property and legally disposed of.

D. The Contractor shall execute the work in a careful and orderly manner, with the least possible disturbance to the public.

E. The Contractor shall remove temporary work, such as enclosures, signs, guards, and the like when such temporary work is no longer required or when directed at the completion of the work.

3.04 MAINTENANCE

A. The Contractor shall maintain worksite in accordance with Section 7-8 of the General Provisions.

- END OF SECTION -

SECTION 01570

TRAFFIC REGULATIONS

PART 1 -- GENERAL

1.01 THE REQUIREMENT

A. Contractor shall comply with the guidance provided by the City, the state Department of Transportation, Specification requirements, permit restrictions, and any other governing source, when regulating traffic on public roads.

B. Contractor shall prepare a traffic control plan stamped by a Registered California Engineer. The traffic control plan shall be submitted to Engineer in full conformance with Section 1300, Submittals, and shall be accepted by Engineer before onset of any construction activities. Engineer's review and acceptance will be for general conformance with the requirements of the City and any other public road traffic regulating governing source.

C. Contractor shall maintain a minimum of one (1) lane of traffic at all times during construction.

D. Provide notice to residents in Project area at two weeks, one week, and two days prior to commencing construction activities in specific Segment neighborhood. Notice shall be provided to residents on the same street as the Work to be completed and in a two-block radius on all sides of the Work. Notice shall consist of door hangers and at a minimum shall include:

1. Dates and hours of anticipated work.
2. City contact information (phone and email)
3. Contractor contact information (phone and email)

1.02 CONSTRUCTION PARKING CONTROL

A. Control vehicular parking to prevent interference with public traffic and parking, access by emergency vehicles, and owner's operations.

B. Monitor parking of construction personnel's vehicles. No personal vehicles will be permitted beyond the designated construction parking area. Maintain vehicular access to and through parking areas.

C. Prevent parking in front of residential driveways.

PART 2 -- PRODUCTS

2.01 SIGNS, SIGNALS, AND DEVICES

A. Traffic Control Signals: As approved by City.

B. Traffic Cones and Drums, Flares, and Lights: As approved by City.

C. Flag Person Equipment: As required by City.

PART 3 -- EXECUTION

3.01 FLAGPERSONS

A. Provide trained and equipped flag persons to regulate traffic when construction operations or traffic encroach on public traffic lanes or outside of designated work area.

3.02 FLARES AND LIGHTS.

A. Use flares and lights during hours of low visibility to delineate traffic lanes and to guide traffic.

3.03 HAUL ROUTES AND SITE ACCESS

A. Confine construction traffic to designated haul routes as determined by the City during construction kick-off

B. Provide traffic control at critical areas of haul routes to regulate traffic and minimize interference with public traffic.

3.04 TRAFFIC SIGNS AND SIGNALS

A. Install traffic signs and operate traffic control signals to direct and maintain orderly flow of traffic in areas under contractor's control, and areas affected by contractor's operations.

B. Relocate as the work progresses to maintain effective traffic control.

3.05 REMOVAL

A. Remove equipment and devices when no longer required.

B. Repair damage caused by installation.

C. Remove post settings.

- END OF SECTION -

SECTION 01600

MATERIALS AND EQUIPMENT

PART 1 -- GENERAL

1.01 THE REQUIREMENT

A. Furnish and Install

1. Where the words "furnish", "provide", "supply", "replace", or "install" are used, whether singularly or in combination, they shall mean to furnish and install, unless specifically stated otherwise.

2. In the interest of brevity, the explicit direction "to furnish and install" has sometimes been omitted in specifying materials and/or equipment herein. Unless specifically noted otherwise, it shall be understood that all equipment and/or materials specified or shown on the Drawings shall be furnished and installed under the Contract as designated on the Drawings.

1.02 EQUIPMENT AND MATERIALS

A. All equipment, materials, instruments or devices incorporated in this project shall be new and unused, unless indicated otherwise in the Contract Documents. Equipment and materials to be incorporated into the work shall be delivered sufficiently in advance of their installation and use to prevent delay in the execution of the work, and they shall be delivered as nearly as feasible in the order required for executing the work.

B. The Contractor shall protect all equipment and materials from deterioration and damage, including provisions for temporary storage buildings as needed and as specified in Section 01510, Temporary Construction Facilities. Storage of equipment and materials shall be in locations completely protected from flooding, standing water, excessive dust, falling rock, brush fire, etc. Storage areas shall be located in accordance with the General Provisions and sufficiently distant from all construction activities and the movement of construction vehicles to minimize the potential for accidental damage. Any equipment or materials of whatever kind which may have become damaged or deteriorated from any cause shall be removed and replaced by good and satisfactory items at the Contractor's expense for both labor and materials.

1.03 INSTALLATION OF EQUIPMENT

A. Equipment and materials shall be installed in accordance with the requirements of the individual Specification Sections and the Manufacture’s recommendations.

1.05 SUBSTITUTIONS

A. Requests for substitutions of equipment or materials shall conform to the requirements of the General Provisions and as hereinafter specified.

1. Contractor shall submit for each proposed substitution sufficient details, complete descriptive literature and performance data together with samples of the materials, where feasible, to enable the City and Engineer to determine if the proposed substitution is equal.

2. Contractor shall submit certified tests, where applicable, by an independent laboratory attesting that the proposed substitution is equal.

3. A list of installations where the proposed substitution is equal.

4. Requests for substitutions shall include full information concerning differences in cost, and any savings in cost resulting from such substitutions shall be passed on to the City.

B. Where the approval of a substitution requires revision or redesign of any part of the work, including that of other Contracts, all such revision and redesign, and all new drawings and details therefore, shall be provided by the Contractor at his own cost and expense, and shall be subject to the approval of the City and Engineer.

C. In the event that the Engineer is required to provide additional Engineering services, then the Engineer's charges for such additional services shall be charged to the Contractor by the City in accordance with the requirements of the General Conditions, and the Supplemental Conditions.

D. In all cases the City and Engineer shall be the judge as to whether a proposed substitution is to be approved. The Contractor shall abide by their decision when proposed substitute items are judged to be unacceptable and shall in such instances furnish the item specified or indicated. No substitute items shall be used in the work without written approval of the City and Engineer.

E. Contractor shall have and make no claim for an extension of time or for damages by reason of the time taken by the Engineer in considering a substitution proposed by the Contractor or by reason of the failure of the Engineer to approve a substitution proposed by the Contractor.

F. Acceptance of any proposed substitution shall in no way release the Contractor from any of the provisions of the Contract Documents.

PART 2 -- PRODUCTS

(NOT USED)

PART 3 -- EXECUTION

(NOT USED)

- END OF SECTION -

SECTION 01700

PROJECT CLOSEOUT

PART 1 -- GENERAL

1.01 THE REQUIREMENT

A. The Contractor shall thoroughly clean the project site, as described herein prior to final acceptance of the work by the City.

B. Contractor shall keep accurate and legible records on a single set of full size project prints of the drawings. Additional record drawing requirements are identified in Subsection 1.5, Record Drawings.

1.02 SUBMITTALS

A. Submit prior to application for final payment.

1. "As-Built" and record drawings: As required in Paragraph 1.02, Record Documents and Paragraph 3.01, Maintenance of Record Documents.

2. Special bonds, Special Guarantees, and Service Agreements.

3. Consent of Surety to Final Payment: As required in General Provisions.

4. Releases or Waivers of Liens and Claims: As required in General Provisions.

5. Releases from Agreements.

6. Final Application for Payment: Submit in accordance with procedures and requirements stated in Section 1025, Measurement and Payment.

7. Extra Materials: As required by individual Specification sections.

1.02 RECORD DOCUMENTS

A. Quality Assurance:

1. Furnish qualified and experienced person, whose duty and responsibility shall be to maintain record documents.

2. Accuracy of Records:

i. Coordinate changes within record documents, making legible and accurate entries on each sheet of Drawings and other documents where such entry is required to show change.

ii. The purpose of the Project record documents is to document factual information regarding aspects of the Work, both concealed and visible, to enable future modification of the Work to proceed without lengthy and expensive Site measurement, investigation, and examination.

3. Make entries within 24 hours after receipt of information that a change in the Work has occurred.

4. Prior to submitting each request for progress payment, request Engineer's review and approval of current status of record documents. Failure to properly maintain, update, and submit record documents may result in a deferral by Engineer to recommend whole or any part of Contractor's Application for Payment, either partial or final.

1.03 RELEASES FROM AGREEMENTS

A. Furnish Owner written releases from property owners or public agencies where side agreements or special easements have been made, or where Contractor's operations have not been kept within the Owner's construction right-of-way.

B. In the event Contractor is unable to secure written releases:

1. Inform Owner of the reasons.

2. Owner or its representatives will examine the Site, and Owner will direct Contractor to complete the Work that may be necessary to satisfy terms of the side agreement or special easement.

3. Should Contractor refuse to perform this Work, Owner reserves right to have it done by separate contract and deduct cost of same from Contract Price, or require Contractor to furnish a satisfactory bond in a sum to cover legal Claims for damages.

4. When Owner is satisfied that the Work has been completed in agreement with Contract Documents and terms of side agreement or special easement, right is reserved to waive requirement for written release if: (i) Contractor's failure to obtain such statement is due to grantor's refusal to sign, and this refusal is not based upon any legitimate Claims that Contractor has failed to fulfill terms of side agreement or special easement, or (ii) Contractor is unable to contact or has had undue hardship in contacting grantor.

PART 2 -- PRODUCTS

(NOT USED)

PART 3 -- EXECUTION

3.01 MAINTENANCE OF RECORD DOCUMENTS

A. General:

1. Promptly following commencement of Contract Times, secure from Engineer at no cost to Contractor, one complete set of Contract Documents.

2. Label or stamp each record document with title, “RECORD DOCUMENTS,” in neat large printed letters.

B. Preservation:

1. Maintain documents in a clean, dry, legible condition and in good order. Do not use record documents for construction purposes.

2. Make documents and Samples available at all times for observation by Engineer.

C. Making Entries on Drawings:

1. Using an erasable colored pencil (not ink or indelible pencil), clearly describe change by graphic line and note as required.

   i. Color Coding:

      1. Green when showing information deleted from Drawings.
      2. Red when showing information added to Drawings.
      3. Blue and circled in blue to show notes.

2. Date entries.

3. Call attention to entry by “cloud” drawn around area or affected areas.

4. Legibly mark to record actual changes made during construction, including, but not limited to:

   i. Horizontal and vertical locations of existing and new Underground Facilities and appurtenances, and other underground structures, equipment, or Work. Reference to at least two measurements to permanent surface improvements.

   ii. Locate existing facilities, piping, equipment, and items critical to the interface between existing physical conditions or construction and new construction.

   iii. Changes made by Addenda and Field Orders, Work Change Directive, Change Order, and Engineer’s written interpretation and clarification using consistent symbols for each and showing appropriate document tracking number.

3.02 FINAL CLEANING

A. At completion of the Work or of a part thereof and immediately prior to Contractor's request for certificate of Substantial Completion; or if no certificate is issued, immediately prior to Contractor's notice of completion, clean entire Site or parts thereof, as applicable.

   a. Leave the Work and adjacent areas affected in a cleaned condition satisfactory to Owner.

   b. Remove grease, dirt, dust, paint or plaster splatter, stains, labels, fingerprints, and other foreign materials from exposed surfaces.

   c. Repair, patch, and touch up marred surfaces to specified finish and match adjacent surfaces.

   d. Hose clean sidewalks, loading areas, and others contiguous with principal structures.

   e. Rake clean all other surfaces.

   f. Leave water courses, gutters, and ditches open and clean.

B. Use only cleaning materials recommended by manufacturer of surfaces to be cleaned.

- END OF SECTION -

SECTION 02200

EARTHWORK

PART 1 -- GENERAL

1.01 THE REQUIREMENT

A. Furnish all labor, equipment and materials required to complete all work associated with excavation, including off-site borrow excavation, dewatering, backfill, stockpiling topsoil and any excess suitable material in designated areas, in place compaction of backfill and subgrades beneath roadways, excavation support, disposing from the site all unsuitable and contaminated materials, site grading and preparation of pavement and structure subgrade, and other related and incidental work as required to complete the work shown on the Drawings and specified herein. The Contractor shall be responsible for all excavation, including backfilling and conduit encasement.

B. All excavations shall be in conformity with the lines, grades, and cross sections shown on the Drawings or established by the Engineer.

C. It is the intent of this Specification that the Contractor conduct the construction activities in such a manner that erosion of disturbed areas and off-site sedimentation be minimized.

D. All fill material, processed stone, topsoil, etc. imported to the site and onsite material requested to be used shall be subjected to the testing requirements contained in Part 3 of this section. An independent testing laboratory retained by the Contractor shall perform all testing. Certified test results will determine if a material meets the specifications. The Contractor shall furnish all necessary samples for laboratory test and shall provide assistance and cooperation during field tests. The Contractor shall plan his operations to allow adequate time for laboratory tests and to permit taking of field density tests during compaction. Any costs of retesting required as a result of failure to meet compaction requirements shall be borne by the Contractor.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Requirements of related work are included in Division 1 and Division 2 of these Specifications.

1.03 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

A. Without limiting the generality of the other requirements of the Specifications, all work herein shall conform to the applicable requirements of the following documents. All referenced Specifications, codes, and standards refer to the most current issue available at the time of Bid.

1. American Society for Testing and Materials (ASTM):

ASTM C127 Test for Specific Gravity and Absorption of Coarse Aggregate.

ASTM C136	Test for Sieve Analysis of Fine and Coarse Aggregates. ASTM D422 Particle Size Analysis of Soils.
ASTM D423	Test for Liquid Limit of Soils.
ASTM D424	Test for Plastic Limit and Plasticity Index of Soils.
ASTM C535	Test for Resistance to Degradation of Large Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
ASTM D698	Standard Method of Test for the Moisture - Density Relations of Soils Using a 5.5 lb. (2.5 kg) Rammer and a 12-inch (305 mm) Drop.
ASTM D1556	Test for Density of Soil in Place by the Sand-Cone Method.
ASTM D1557	Test for Moisture-Density Relations of Soils and Soil Aggregate Mixtures Using 10-lbs. (4.5 kg) Rammer and 18-inch (457 mm) Drop.
ASTM D2049	Test Method for Relative Density of Cohesionless Soils.
ASTM D2167	Test for Density of Soil in Place by the Rubber-Balloon Method.
ASTM D2216	Test for Laboratory Determination of Water (Moisture) Content of Soil, Rock, and Soil Aggregate Mixtures.
ASTM D2487	Test for Classification of Soils for Engineering Purposes.
ASTM D6938	Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)

1.04 SUBSURFACE CONDITIONS

A. Information on subsurface conditions is referenced under Division 1, General Requirements.

B. Attention is directed to the fact that there may be water pipes, storm drains and other utilities located in the area of proposed excavation. Perform all repairs to same in the event that excavation activities disrupt service. The Contractor shall contact Underground Service Alert (USA, 811) prior to the beginning of excavation.

1.05 SUBMITTALS

A. In accordance with the procedures and requirements set forth in Section 01300 - Submittals, the Contractor shall submit the following:

1. Name and location of all material suppliers.

2. Certificate of compliance with the standards specified above for each source of each material.

3. List of disposal sites for waste, unsuitable, and contaminated materials and all required permits for use of those sites.

4. Plans and cross sections of open cut excavations showing side slopes and limits of the excavation at grade.

5. Construction drawings and structural calculations for any types of excavation support required. Drawings and calculations shall be sealed by a currently registered Professional Engineer in the State of California.

6. Monitoring plan and pre-construction condition inspection and documentation of all adjacent structures, utilities, and roadways near proposed installation of excavation support systems.

7. Dewatering procedures, in accordance with the Special Instructions and Section 3.06 of this Specification.

8. The Contractor shall notify the Engineer of the off-site or on-site sources of structural fill and submit to the Engineer a representative sample weighing approximately 50 lbs. The sample shall be delivered to a location designated by the Engineer.

1.06 PRODUCT HANDLING

A. Soil and rock material shall be excavated, transported, placed, and stored in a manner to prevent contamination, segregation and excessive wetting. Materials which have become contaminated or segregated will not be permitted in the performance of the work and shall be removed from the site.

PART 2 -- PRODUCTS

2.01 EARTH FILL

A. Soils from the excavations free from rocks larger than 3 inches, from roots and other organic matter, ashes, cinders, trash, debris, and other deleterious materials.

B. Regardless of material used as Earth Fill, Earth Fill materials shall be compacted at a moisture content satisfactory to the Engineer, which shall be approximately that required to produce the maximum density of 98% of the Standard Proctor maximum dry density at a moisture content satisfactory to the Engineer, except that the moisture content shall not be more than 1% below nor more than 3% above the optimum moisture content for the particular material tested in accordance with the ASTM D698.

C. Where excavated material does not meet requirements for Earth Fill, Contractor shall furnish off-site borrow material of equivalent quality. Determination of whether the borrow material will be paid for as an extra cost will be made based on the contract documents.

E. When the excavated material from required excavations is suitable for use as Earth Fill, but is replaced with off-site borrow material for the Contractor's convenience, the costs associated with such work and material shall be borne by the Contractor.

F. Stockpiling of excavated material is not permitted. All excavated material shall be hauled offsite by the end of the workday.

2.02 TOPSOIL

A Topsoil shall have at least 6 percent by weight of fine textured stable organic material, and no greater than 20 percent. Muck soil shall not be considered topsoil.

B. Topsoil shall have not less than 20 percent fine textured material (passing the NO. 200 sieve) and not more than 15 percent clay.

C Topsoil treated with soil sterilant or herbicides shall be so identified to the purchaser.

D. Topsoil shall be relatively free of stones over 1 1/2 inches in diameter, trash, noxious weeds, and will have less than 10 percent gravel.

E. Topsoil containing soluble salts greater than 500 parts per million shall not be used.

PART 3 -- EXECUTION

3.01 STRIPPING OF TOPSOIL

A. In all areas to be excavated, filled, paved, or graveled the topsoil shall be stripped to its full depth, not less than four (4) inches below the ground surface, and shall be deposited in storage piles on the site, at locations designated by the Engineer, for subsequent reuse. Topsoil shall be kept separated from other excavated materials and shall be piled free of roots and other undesirable materials. Topsoil shall not be stored in areas where it will interfere with surface drainage or with the conservation of trees, shrubs and other vegetation that are to remain.

3.02 EXCAVATION

A. All material excavated, regardless of its nature or composition, shall be classified as UNCLASSIFIED EXCAVATION. Excavation shall include the removal of all soil, rock, weathered rock, rocks of all types, boulders, conduits, pipe, buried concrete, brick, and all other obstacles encountered and shown to be removed within the limits of excavation shown on the Drawings or specified herein. The cost of excavation shall be included in the Contractor's Bid Price and no additional payment will be made for the removal of obstacles encountered within the excavation limits shown on the Drawings and specified herein.

B. All suitable material removed in the excavation shall be used as far as practicable in the formation of subgrades, as trench backfill, and at such other places as may be indicated on the Drawings or indicated by the Engineer. No excavation shall be wasted except as

may be permitted by the Engineer. THE ENGINEER WILL DESIGNATE MATERIALS THAT ARE UNSUITABLE. The Contractor shall furnish off-site disposal areas for the unsuitable material.

C. All excavations shall be made in the dry and in such a manner and to such widths as will give ample room for properly constructing and inspecting the structures and/or piping and for such excavation support, pumping and drainage as may be required. Excavation shall be made in accordance with the grades and details shown on the Drawings and as specified herein.

D. The bottom of all excavations for structures and pipes shall be examined by the Engineer for bearing value and the presence of unsuitable material. If, in the opinion of the Engineer, additional excavation is required due to the low bearing value of the subgrade material, or if the in-place soils are soft, yielding, pumping and wet, the Contractor shall remove such material to the required width and depth and replace it with thoroughly compacted select fill, and/or crushed stone or screened gravel as indicated by the Drawings or Engineer. Payment for such additional work ordered by the Engineer shall be made as a Change Order or Construction Change Directive in accordance with the General Provisions. No payment will be made for subgrade disturbance caused by inadequate dewatering or improper construction methods.

E. All cuts shall be brought to the grade shown on the Drawings, or established by the Engineer, prior to final inspection and acceptance by the Engineer.

F. Where the excavation exposes sludge, sludge contaminated soil or other odorous materials, the Contractor shall cover such material at the end of each workday with a minimum of 6-inches and a maximum of 24-inches of clean fill. The work shall be an odor abatement measure and the material shall be placed to the depth deemed satisfactory by the Engineer for this purpose.

3.03 UNAUTHORIZED EXCAVATION

A. Excavation carried outside of the work limits required by the Contract Documents shall be at the Contractor's expense and shall be backfilled by the Contractor at its own expense with suitable material, as directed by the Engineer. Where, in the judgment of the Engineer, such over-excavation requires use of lean concrete or crushed stone, the Contractor, at its expense shall furnish and place such materials.

3.04 EXCAVATION SUPPORT

A. The Contractor shall furnish, place, and maintain such excavation support which may be required to support sides of excavation or to protect structures, pipes, and utilities from possible damage and to provide safe working conditions. The Contractor shall be exclusively responsible for maintaining structure integrity without overstressing and damaging existing structures, pipes, and utilities resulting from the Contractor’s desires to temporarily place, move, or remove loads on or adjacent to existing structures, pipes, and utilities. If the Engineer is of the opinion that at any point sufficient or proper supports have not been provided, he may order additional supports put in at the expense of the Contractor. The Contractor shall be responsible for the adequacy of all supports used and

for all damage resulting from failure of support system or from placing, maintaining and removing it.

B. Selection of and design of any proposed excavation support systems is exclusively the responsibility of the Contractor. Contractor shall submit drawings and calculations on proposed systems sealed by a Professional Engineer currently registered in the State of California.

C. The Contractor shall exercise caution in the installation and removal of supports to insure no excessive or unusual loadings or vibrations are transmitted to any new or existing structure. The Contractor shall promptly repair at his expense any and all damage that can be reasonably attributed to installation or removal of excavation support system.

D. All excavation supports shall be removed upon completion of the work except as indicated herein. The Engineer may permit supports to be left in place at the request and expense of the Contractor. The Engineer may order certain supports left permanently in place in addition to that required by the Contract. The cost of the materials so ordered left in place, less a reasonable amount for the eliminated expense of the removal work omitted, will be paid as an extra by a Change Order or Construction Change Directive in accordance with the General Provisions. Any excavation supports left in place shall be cut off at least two (2) feet below the finished ground surface or as directed by the Engineer.

3.05 PROTECTION OF SUBGRADE

A. To minimize the disturbance of bearing materials and provide a firm foundation, the Contractor shall comply with the following requirements:

1. Subgrade soils disturbed through the operations of the Contractor shall be excavated and replaced with compacted select fill or crushed stone at the Contractor's expense as directed by the Engineer.

3.06 DEWATERING

A. The Contractor shall perform all dewatering as required for the completion of the work. Procedures for dewatering proposed by the Contractor shall be submitted to the Engineer for review prior to any earthwork operations. All water removed by dewatering operations shall be disposed of in accordance with the National Pollutant Discharge Elimination System (NPDES) program.

B. The dewatering system shall be of sufficient size and capacity as required to control groundwater or seepage to permit proper excavation operations, embankment construction and reconstruction, subgrade preparation, and to allow concrete to be placed in a dry condition. The system shall include a sump system or other equipment, appurtenances and other related earthwork necessary for the required control of water. The Contractor shall drawdown groundwater to at least 3 feet below the bottom of excavations (subgrade) at all times in order to maintain a dry and undisturbed condition.

C. The Contractor shall control, by acceptable means, all water regardless of source. Water shall be controlled, and its disposal provided for at each berm, structure, etc. The

Contractor shall be fully responsible for disposal of the water and shall provide all necessary means at no additional expense to the City. The Contractor shall be solely responsible for proper design, installation, proper operation, maintenance, and any failure of any component of the system.

D. The Contractor shall be responsible for and shall repair without cost to the City, any damage to work in place and the excavation, including damage to the bottom due to heave and including removal of material and pumping out of the excavated area. The Contractor shall be responsible for damages to any other area or structure caused by his failure to maintain and operate the dewatering system proposed and installed by the Contractor.

E. The Contractor shall take all the steps that he considers necessary to familiarize himself with the surface and subsurface site conditions, and shall obtain the data that is required to analyze the water and soil environment at the site and to assure that the materials used for the dewatering systems will not erode, deteriorate, or clog to the extent that the dewatering systems will not perform properly during the period of dewatering. Copies of logs of borings and laboratory test results are available to the Contractor. This data is furnished for information only, and it is expressly understood that the City and Engineer will not be held responsible for any interpretations or conclusions drawn therefrom by the Contractor.

3.07 BACKFILLING

A. All structures and pipes shall be backfilled with the type of materials shown on the Drawings and specified herein. Select fill shall be deposited in successive, uniform, approximately horizontal layers not exceeding 8-inches in compacted depth for the full width. Stones or fragmentary rock larger than 4-inches in their greatest dimension will not be allowed within the top 6-inches of the ground nor within 6 inches of pipes. No stone or fragmentary rock larger than 12-inches in their greatest dimension will be allowed for any portion of backfill. Compaction shall be in accordance with the requirements of Paragraph 3.07, COMPACTION.

B. Where excavation support is used, the Contractor shall take all reasonable measures to prevent loss of support beneath and adjacent to pipes and existing structures when supports are removed. If significant volumes of soil cannot be prevented from clinging to the extracted supports, the voids shall be continuously backfilled as rapidly as possible. The Contractor shall thereafter limit the depth below subgrade that supports will be installed in similar soil conditions or employ other appropriate means to prevent loss of support.

C. Backfill against concrete or masonry structure shall not be performed until the Work has been reviewed and backfilling permitted. Backfill against walls shall also be deferred until the structural slab for floors above the top fill line have been placed and attained design strength or earlier at the discretion of the Engineer. Partial backfilling against adequately braced wall may be considered by the Engineer on an individual situation basis. Where walls are to be waterproofed, all Work shall be completed and membrane materials dried or cured according to the manufacturer's instructions before backfilling.

3.08 COMPACTION

A. The Contractor shall compact embankments, backfill, crushed stone, aggregate base, and in place subgrade in accordance with the requirements of this Section. The densities specified herein refer to percentages of maximum density as determined by the noted test methods. Compaction of materials on the project shall be in accordance with the following schedule:

	Density % Std. Proctor (D698)	Density % Mod. Proctor (D1557)	Max. Lift Thickness as Compacted Inches
Backfill Around Structures	95	92	8
Backfill in Pipe Trenches	95	92	8
Crushed Stone Beneath Structures	**	**	12
Select Sand	--	98	8
Crushed Stone Pipe Bedding	**	**	12
In place Subgrade Beneath Structures	98	95	Top 12-inches

** The aggregate shall be compacted to a degree acceptable to the Engineer by use of a vibratory compactor and/or crawler tractor.

B. Compaction Near Existing Structures:

1. Vibratory equipment shall not be used within 25 feet of any existing structure.

2. Within 25 feet of any existing structure, non-vibratory compaction equipment such as a drum roller with a maximum weight of 4 tons should be used. Within 5 feet of any existing structure, a walk behind vibratory sled or roller shall be used.

C. Field density tests will be made by Materials Testing Consultant retained by the Contractor to determine if the specified densities have been achieved. In-place density tests will be performed in accordance with ASTM D1556, ASTM D2167, or ASTM D6938. The Engineer will be the sole judge as to which test method will be the most appropriate. Failure to achieve the specified densities shall require the Contractor to re-compact the material or remove it as required. The Contractor shall, if necessary, increase his compactive effort by increasing the number of passes, using heavier or more suitable compaction equipment, or by reducing the layer thickness. The Contractor shall adjust the moisture content of the soils to bring them within the optimum range by drying them or adding water as required.

D. Testing shall be performed at a minimum frequency of one in-place density test for each 500 cubic yards of backfill placed or one test performed each day.

3.09 REMOVAL OF EXCESS AND UNSUITABLE MATERIALS

A. The Contractor shall remove and dispose of off-site all unsuitable materials. Within thirty (30) consecutive days after Notice to Proceed, the Contractor shall submit to the Engineer for review all required permits and a list of disposal sites for the unsuitable materials. If the disposal site is located on private property, the submittal shall also include written permission from the City of record.

B. All unsuitable materials shall be disposed of in locations and under conditions that comply with federal, state and local laws and regulations.

C. The Contractor shall obtain an off-site disposal area prior to beginning demolition or excavation operations.

D. All excess and unsuitable materials shall be hauled in trucks of sufficient capacity and tight construction to prevent spillage. Trucks shall be covered to prevent the propagation of dust.

E. When all excess and unsuitable material disposal operations are completed, the Contractor shall leave the disposal sites in a condition acceptable to the City and City(s) of the disposal site(s).

- END OF SECTION -

SECTION 02223

TRENCH BACKFILL

PART 1 -- GENERAL

1.01 THE REQUIREMENT

A. The Contractor shall furnish all labor, materials, testing and installation for trench backfill, and compaction of trench backfill materials as shown on the Drawings or specified herein.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 2200 – Earthwork
B. Section 2510 – Paving and Surfacing

1.03 SUBMITTALS

A. Shop Drawings: Manufacturer's descriptive literature for marking tapes.

B. Catalog and manufacturer's data sheets for compaction equipment.

C. Certified Gradation Analysis: Submit not less than 30 days prior to delivery for imported materials or anticipated use for excavated materials, except for trench stabilization material that will be submitted prior to material delivery to Site.

D. Controlled Low Strength Material: Certified mix design and test results include material types and weight per cubic yard for each component of mix.

PART 2 -- PRODUCTS

2.01 DETECTABLE MARKING TAPE

A. Solid aluminum foil, visible on unprinted side, encased in protective high visibility, inert polyethylene plastic jacket.

B. Foil Thickness: Minimum 0.35 mils

C. Laminate Thickness: Minimum 5 mils

D. Width: 3 inches

E. Identifying Lettering: Minimum 1-inch high, permanent black lettering imprinted continuously over entire length.

F. Jointing Clips: Tin or nickel coated furnished by tape manufacturer.

G. Color: In accordance with APWA Uniform Color Code.

2.02 TRENCH STABILIZATION MATERIAL

A. Granular Backfill:

1. Clean gravel or crushed rock, reasonably well-graded from coarse to fine.

2. Maximum Particle Size: 3-inches.

2.03 BEDDING MATERIAL AND PIPE ZONE MATERIAL

A. Unfrozen, friable, and no clay balls, roots, or other organic material.

B. Clean or gravelly sand with less than 5 percent passing No. 200 sieve, as determined in accordance with ASTM D1140.

C. CLSM shall be used for pipe zone where indicated on drawings.

2.04 BACKFILL

A. Earth fill as specified in Section 2200, Earthwork.

2.05 CONTROLLED LOW STRENGTH MATERIAL (CLSM)

A. Select and proportion ingredients to obtain compressive strength between 50 psi and 150 psi at 28 days in accordance with ASTM D4832.

B. Materials:

1. Cement: ASTM C150/C150M, Type I or Type II.
2. Aggregate: ASTM C33/C33M, Size 7.
3. Fly Ash (Pozzolan): Class F fly ash in accordance with ASTM C618, except as modified herein:
    a. ASTM C618, Table 1, Loss on Ignition: Unless permitted otherwise, maximum 3 percent.
4. Water: Clean, potable, containing less than 500 ppm of chlorides.

2.06 CONCRETE ENCASEMENT

A. Class B concrete as specified in Section 3300, Cast-in-Place Concrete.

2.07 SOURCE QUALITY CONTROL

A. Perform gradation analysis in accordance with ASTM C136 for:

1. Earth backfill, including specified class.
2. Trench stabilization material.
3. Bedding and pipe zone material.

B. Certify Laboratory Performance of Mix Designs:
   1. Controlled low strength material.
   2. Concrete.

PART 3 -- EXECUTION

3.01 TRENCH PREPARATION

A. Water Control:

   1. As specified in Section 2200, Earthwork.
   2. Remove water in a manner that minimizes soil erosion from trench sides and bottom.
   3. Provide continuous water control until trench backfill is complete.

B. Remove foreign material and backfill contaminated with foreign material that falls into trench.

3.02 TRENCH BOTTOM

A. Firm Subgrade: Grade with hand tools, remove loose and disturbed material, and trim off high areas and ridges left by excavating bucket teeth. Allow space for bedding material if shown or specified.

B. Soft Subgrade: If subgrade is encountered that may require removal to prevent pipe settlement, notify Engineer. Engineer will determine depth of overexcavation and use of Trench Stabilization Material, if any required.

3.03 TRENCH STABILIZATION MATERIAL INSTALLATION

A. Rebuild trench bottom with trench stabilization material.

B. Place material over full width of trench in 6-inch lifts to required grade, providing allowance for bedding thickness.

C. Compact each lift to provide a firm, unyielding support for bedding material prior to placing succeeding lifts.

3.04 BEDDING

A. Furnish imported bedding material as specified herein.

B. Place over full width of prepared trench bottom in two equal lifts when required depth exceeds 8 inches.

C. Hand grade and compact each lift to provide a firm, unyielding surface.

D. Check grade and correct irregularities in bedding material. Loosen top 1 to 2 inches of compacted bedding material with rake or by other means to provide a cushion before laying each section of pipe or conduit.

E. Install to form continuous and uniform support except at bell holes, if applicable, or minor disturbances resulting from removal of lifting tackle.

F. Bell or Coupling Holes: Excavate in bedding at each joint to permit proper assembly and inspection of joint and to provide uniform bearing along barrel of pipe or conduit.

3.05 BACKFILL PIPE ZONE

A. Upper limit of pipe zone shall not be less than 6 inches above top of pipe, unless shown otherwise.

B. Restrain pipe and conduit as necessary to prevent their movement during backfill operations.

C. Place material simultaneously in lifts on both sides of pipe, and if applicable, between pipes and conduit installed in the same trench. The first lift shall be less than or equal to 1/2 pipe diameter.

D. Thoroughly tamp each lift, including area under haunches, with handheld tamping bars supplemented by “walking in” and slicing material under haunches with a shovel, taking care not to damage pipe bagging, to ensure voids are completely filled before placing each succeeding lift.

E. Controlled Low Strength Material:

a. Discharge from truck mounted drum type mixer into trench.
b. Place in lifts as necessary to prevent uplift (floatation) of new and existing facilities.

3.06 MARKING TAPE INSTALLATION

A. Continuously install marking tape along centerline of buried piping and conduit as shown on Drawings.

3.07 BACKFILL ABOVE PIPE ZONE

A. General:

1. Process excavated material to meet specified gradation requirements.

2. Adjust moisture content as necessary to obtain specified compaction.

3. Do not allow backfill to free fall into trench or allow heavy, sharp pieces of material to be placed as backfill until after at least 2 feet of backfill has been provided over top of pipe.

4. Do not use power driven impact type compactors for compaction until at least 2 feet of backfill is placed over top of pipe.

5. Backfill to grade with proper allowances for topsoil, crushed rock surfacing, and pavement thicknesses, wherever applicable.

6. Backfill around structures with same class backfill as specified for adjacent trench, unless otherwise shown or specified.

B. Earth Backfill and Aggregate Base Course:

1. Place in lifts not exceeding thickness of 6 inches.

2. Mechanically compact each lift to a minimum of 95 percent relative compaction prior to placing succeeding lifts.

3.08 MAINTENANCE OF TRENCH BACKFILL

A. After each section of trench is backfilled, provide temporary asphalt concrete, thickness of which shall match existing asphalt or provide anchored trench plates. On arterial streets, the trench plates shall be recessed such that it is even with the adjacent surface and provides a smooth transition from the existing street surface across the trench plate.

3.09 SETTLEMENT OF BACKFILL

A. Settlement of trench backfill, or of fill, will be considered a result of defective compaction of trench backfill. Contractor will be responsible for removal, replacement, and recompacting of backfill.

- END OF SECTION -

SECTION 02510

PAVING AND SURFACING

PART 1 -- GENERAL

1.01 THE REQUIREMENT

A. The Contractor shall furnish all labor, equipment and materials and perform all operations in connection with the construction of asphalt concrete pavement, asphalt concrete overlay, reinforced concrete pavement, concrete curb and gutter, repair and reconstruction of existing asphalt concrete pavement, and pavement markings complete as specified herein and as detailed on the Drawings.

B. All new roads including the replacement of portions of the existing roads shall be to the limits, grades, thicknesses and types as shown on the Drawings. Patches for pipe crossings and areas damaged during the construction work shall be asphalt and/or gravel, depending upon the material encountered, unless otherwise indicated.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Requirements of related work are included in Division 1, Division 2 and Division 3 of these Specifications.

1.03 RELATED SECTIONS

A. Section 02200 - Earthwork

B. Section 03300 - Cast-In-Place Concrete

1.04 STANDARD SPECIFICATIONS

A. Except as otherwise provided in the Specifications or on the plans, all work shall be in accordance with the Standard Specifications, edition as specified in the General Provisions Section 0, except that any reference to “Greenbook”, "Department" or "Unit" shall mean the "City". When reference to these Specifications is intended, the description will be “Greenbook” Section 302 or Standard Specifications.

B. Materials shall be in accordance with the Standard Specifications for Public Works Construction edition as specified in the General Provisions Section 0.

C. Except with the approval of the Engineer, the placing of concrete or asphalt concrete surface paving shall be subject to the requirements for “Placing Concrete Under Averse Weather Conditions” set forth in the Standard Specifications.

PART 2 -- MATERIALS

2.01 SELECT FILL

A. The Contractor shall place select fill as necessary to complete the embankments, shoulders, subgrade foundation and replacement for removed unsuitable material in accordance with Standard Specifications Section 300 – Earthwork and Section 02200 - Earthwork of these specifications.

2.02 MATERIALS FOR SUBGRADE

A. All work, including materials, associated with subgrades shall be in accordance with Standard Specifications Section 301-1 – Subgrade Preparation, except Article 301-5.10 shall be deleted.

B. Replace the second and third paragraph of Subsection 301-1.2, “Preparation of Subgrade,” with the following:

1. The site soils shall be removed to the subgrade level as shown on the plans in the areas to receive the pavement structural section. After rough grading has been completed, the exposed subgrade shall be scarified to a depth of 8 to 12 inches. The loosened material shall then be worked to a finely divided condition and all rocks larger than 3 inches in diameter shall be removed. The moisture content shall be brought to minus 1 percent of optimum or wetter by the addition of water, by the addition and blending of dry suitable material, or by the drying of existing material. The material shall then be compacted by approved equipment to the specified relative compaction.

2. Replace the first paragraph of Subsection 301-1.3, "Relative Compaction," with the following:

3. The subgrade soils shall be compacted to 90 percent of the maximum dry density (ASTM D1557). The upper six inches of the subgrade soils shall be compacted to 95 percent relative compaction (ASTM D1557) and should be well moisture conditioned to near optimum and kept in this condition until the pavement section is constructed.

4. Subgrade will be certified by the City’s surveyor prior to placement of aggregate base.

C. Aggregate base shall conform to the requirements of Subsection 200-2.2, "Crushed Aggregate Base," or Subsection 200-2.4, "Crushed Miscellaneous Base," and Subsection 301-2, "Untreated Base" of the Standard Specifications and these Special Provisions.

2.03 PAVING MAT

A. Where existing pavement is to be cold milled, the streets will be cleaned prior to the placement of the GlasPave25 Paving Mat (or approved equal). The contract unit price

paid per square yard shall include full compensation for, but not limited to, furnishing all labor, materials, tools, equipment, surface preparation and installation of the paving mat, no additional compensation will be allowed therefore.

2.04 CEMENT TREATED BASES

A. All work, including materials, associated with cement treating of bases for stabilization shall be in accordance with Standard Specifications Section 301-3 - Portland Cement Treated Mixtures, except Article 301-5.10 shall be deleted.

2.05 ASPHALT BASE COURSE (HOT MIX ASPHALT CONCRETE)

A. Hot mix asphalt concrete (HMA) shall meet the requirements of Section 400 of the Standard Specifications and these Technical Provisions:

i. Asphalt concrete shall be Type III-C3-PG64-10 for the base course or as specified herein.

ii. The Engineer may substitute Type III-D-PG64-10 in place of Type III-C3-PG64-10 for feathering and for "thin" overlays equal to or less than 0.15’ in thickness.

B. Delete Item 3, "Crushed Slag," of Subsection 400-1.2, "Asphalt Concrete Aggregates," of the Standard Specifications. The use of slag aggregate for asphalt concrete is expressly prohibited.

C. Coarse aggregate shall consist of material of which at least seventy-five percent (75%) by weight shall be crushed particles in lieu of the requirements of Subsection 400-4.2.3, "Coarse Aggregate."

D. The individual test result requirements shall be as specified in Subsection 400-4.3, "Combined Aggregates" of the Standard Specifications:

E. Add to Subsection 302-5.1, "General," of the Standard Specifications, the following:

The combined aggregate grading for asphalt concrete placed on miscellaneous areas shall conform to the gradation for the asphalt concrete placed on the traveled way, unless otherwise directed by the Engineer. The amount of asphalt binder used in the asphalt concrete placed in dikes, gutters, gutter flares, oversize drains and aprons at the ends of drainage structures, unless otherwise directed by the Engineer, shall be increased one per cent (1%) by weight of the aggregate over the amount of asphalt binder used in the asphalt concrete placed on the traveled way.

2.06 ASPHALT SURFACE COURSE (OVERLAY or ASPHALT SURFACE COURSE)

A. Asphalt Rubber Hot Mix (ARHM) shall be ARHM-GG-C, conforming to the provisions of subsection 203-11 of the Greenbook. The viscosity grade of paving asphalt shall be PG 64-16 per Section 203-1 of the Greenbook or as determined by the Engineer. The Contractor shall only use the “Wet Process” in the manufacture of rubberized asphalt in accordance with Section 203-11 of the Greenbook.

B. Composition and Grading shall be per Section 203-11.3 of the Standard Specifications. The Contractor shall submit a copy of the asphalt concrete mix design, a sample of the asphalt concrete, a sample of the aggregate, and a sample of the paving asphalt PG 64-16 to the Engineer or its designated laboratory.

2.07 JOB MIX FORMULAS

A. The job mix formulas (JMF) shall be delivered to the Engineer at least two (2) weeks prior to beginning paving operations. The JMF submitted for asphalt concrete pavement shall be dated to within 12 months of asphalt placement.

2.08 PORTLAND CEMENT CONCRETE PAVEMENT

A. All work, including materials associated with Portland Cement Concrete Pavement shall be in accordance with Section 03300 - Cast-In-Place Concrete. Class A concrete shall be used. Placement shall be in accordance with Standard Specifications Section 302-6 and Section 03300 – Cast-In-Place Concrete, except that Article 302-6.8 shall be deleted.

2.09 CONCRETE PAVEMENT REINFORCING

A. Reinforcing, if specified, shall be as shown on the Structural Drawings and as specified under Section 03200 - Reinforcing Steel.

2.10 CONCRETE CURB AND GUTTERS

A. Concrete shall be Class B in accordance with the requirements of Section 03300 - Cast-In-Place Concrete, except that concrete shall be air-entrained to provide an air content of 6% ± 1.5%.

B. Premolded expansion joint filler for expansion joints shall conform to ASTM D 1751 and shall be 1/2-inch thick, minimum.

2.11 ASPHALT TACK COAT

A. Asphalt Tack Coat shall be SS-1h Type asphaltic emulsion conforming to Section 2.03 of the Standard Specifications. All work associated with asphalt tack coat shall be in accordance with Standard Specifications Section 302-5.4, Tack Coat.

PART 3 -- EXECUTION

3.01 EMBANKMENT

A. The embankment shall be constructed in accordance with Section 02200 - Earthwork.

3.02 SUBGRADE

A. The subgrade, where shown on the Drawings, shall be aggregate stabilized by the addition and mixing of coarse aggregate with the top 3-inches of subgrade in accordance with Standard Specifications Section 301-1 – Subgrade Preparation. Aggregate stabilization shall be according to Standard Specifications Section 301-3.3 – Cement-Treated Bases. Following the application of stabilizer aggregate, the subgrade shall be spread and compacted as per Section 301-3.3.4 – Placing, Compacting, and Finishing, and formed true to crown and grade as per the Contract Drawings,

3.03 BASE COURSE

A. The finished base course of all paving shall be Standard Specifications Section 301-2 - Untreated Base and shall be of the thickness shown on the Drawings, formed true to crown and grade. No fill material except new Untreated Base shall be placed on top of existing gravel.

3.04 COLD MILLING OF EXISTING PAVEMENT

A. The Contractor shall cold mill existing pavement as shown on the Contract Drawings in accordance with the requirements of Standard Specifications Section 302-1 – Cold Milling of Existing pavement, except Sections 302-1.11 and 302-1.12 shall be deleted.

B. Add to Subsection 302-1.2, "Milling Machine," the following:

> At least two full time flag persons shall be assigned to the milling machine for traffic control when working on streets open to traffic.

C. The Contractor shall take care not to contaminate the millings with non-aggregate base material, including disintegrated granite.

D. The asphalt concrete, including aggregate base, shall be disposed of at a recycling plant. The Contractor shall provide the City with the weight certification of recycling in tons of asphalt concrete and the required monthly Solid Waste Disposal and Recycling Reports.

E. Asphalt concrete removal associated with curb and gutter, cross gutter and local depression, sidewalk and driveway work will be considered as miscellaneous removals and payment will be considered as included in the price paid for Clearing, Grubbing, and Removals.

F. Existing asphalt concrete pavement shall be cold milled, crushed and screened to conform to the following gradation before mixing with emulsified recycling agent:

Sieve Sizes	Percentage RAP Passing
1-inch	100

Graded millings/reclaimed asphalt pavement (RAP) shall uniformly be incorporated into the recycled pavement mixture and oversized or deleterious material shall be disposed of.

Rubberized crack filler, pavement markers, loop wires, thermoplastic markers, fabric and other like materials that may be incorporated into the RAP as it is removed from the roadway shall be removed by the screening process. A minor amount of these residual materials that cannot be completely removed from the processed RAP may be incorporated into the recycled mix if the Contractor can demonstrate that those added materials will not adversely affect the performance of the recycled asphalt pavement. Any such materials retained in the mix shall be appropriately sized and blended so as not to adversely affect the appearance or strength of the recycled pavement.

G. The contract unit price paid per square foot of Asphalt Concrete Milling shall include full compensation for, but not limited to, furnishing all labor, materials, tools, equipment, saw cutting, loading, hauling, recycling, providing recycling weight certification, reports, and incidentals, for doing all work involved in asphalt concrete removal and recycling, and no additional compensation will be allowed therefor. If the Contractor does not provide the weight certification of recycling and the required monthly Solid Waste Disposal and Recycling Reports, then payment will be withheld until the weight certification and reports are provided.

3.05 ASPHALT PAVEMENT

A. Asphalt Concrete courses shall be placed and compacted in accordance with Standard Specifications, Section 302.5 – Asphalt Pavement. Thicknesses shall be as shown on the Drawings.

B. If more than one course of asphalt pavement is required by the Contract Drawings, the asphalt tack coat shall be applied to the surface of the approved lower pavement course, before application of the surface course as described in Standard Specifications Section 302-5.4.

C. Asphalt pavement shall be placed according to the requirements of Standard Specifications.

3.06 ASPHALT CONCRETE PAVEMENT COMPACTION

A. Asphalt concrete pavement compaction shall be performed as per Standard Specifications Section 302-5.6 - Rolling.

B. Contractor shall provide Quality Control (QC) for proper asphalt concrete pavement placement and compaction using equipment in good working order which has been

properly calibrated at the start of each round of testing. Quality Assurance (QA) of paving operations will be performed by an independent third-party representative hired by Contractor.

C. Immediately after the asphalt mixture has been spread, struck off and surface and edge irregularities adjusted, thoroughly and uniformly compact the pavement. Compact the mix to 91.0 to 97.0 of the maximum theoretical density according to California Test 304, as noted in the Standard Specifications Section 302-5.6.2 - Density and Smoothness. Asphalt Pavement determined by field testing to not meet the density requirements noted above, shall be removed and replaced or paid for at a reduced rate. Paved areas not to be subject to vehicular traffic shall be compacted to 90 percent of California Test 304.

3.07 ASPHALT CONCRETE PAVEMENT PHASING

A. Contractor shall be responsible for phasing the placement of asphalt surface course overlay on the same day as the asphalt grinding/cold planning is completed. Contractor may temporarily repair or plate trenches in accordance with Section 02223 for up to one week prior to completing asphalt grinding/cold planning and overlay.

3.08 RIGID PORTLAND CEMENT CONCRETE

A. The subgrade and base course beneath portland cement concrete pavement shall be prepared in accordance with the applicable Sections of these Specifications and referenced Standard Specifications, except that the Contractor shall use an approved automatically controlled fine grading machine to produce final subgrade and base surfaces meeting the lines, grades, and cross sections (thicknesses) shown on the Drawings or established by the Engineer.

B. The surface of the base shall be damp at the time the concrete is placed. The Contractor shall sprinkle the base when necessary to provide a damp surface. The Contractor shall satisfactorily correct all soft areas in the subgrade or base prior to placing concrete.

C. Hauling over the base course shall not be allowed except where specifically permitted by and in writing by the Engineer. The Engineer may allow equipment dumping concrete to operate on the base to the extent and under the conditions the Engineer deems necessary to facilitate placing and spreading the concrete.

D. Installation of the rigid concrete pavement shall be in accordance with the details shown on the Drawings and –Section 03300. The rigid concrete pavement shall cure a minimum of ten (10) calendar days and until the concrete has attained a minimum flexural strength of 550 psi as indicated by flexural strength testing. The Contractor shall coordinate and pay for all flexural strength testing with a minimum of four (4) 6-inch by 6-inch by 20-inch beams for every fifty (50) cubic yards of pavement concrete installed.

E. Transverse and longitudinal joints shall be spaced at intervals as shown on the Drawings and installed as per the requirements of Standard Specifications Standard Specification for Road and Structures Section 302-6.5.3 – Transverse Expansion Joints. Transverse contraction joints shall be formed by an approved joint insert. Longitudinal joints shall be formed by allowing the paver to deposit the mixture adjacent to the joint to such depth that

maximum compaction can be obtained along the joint. Pinch the joint by rolling immediately behind the paver. Expansion joints shall be placed when the pavement abuts a structure using 1-inch expansion joint material (filler) and sealant as specified herein.

3.09 ASPHALT CONCRETE DENSITY ACCEPTANCE

A. The Engineer will evaluate the asphalt pavement for density acceptance after the asphalt mix has been placed and compacted using the Contractor's QC test results, the City's QA test results (including verification samples) and by observation of the Contractor's density QC process conducted in accordance with Standard Specifications Section 302-5.6.2.

B. Minimum density requirements for all mixes will be as specified in Section 3.05. Density acceptance will be as provided herein. Densities will be determined by use of the requirements as outlined in the Standard Specifications Section 302-5.6.2.

C. A failing lot for density acceptance purposes is defined as a lot for which the average of all test sections, and portions thereof, fails to meet the minimum specification requirement. A lot will consist of one day's production of a given JMF, for each layer of asphalt concrete placed. If additional density sampling and testing, beyond the minimum requirement, is performed and additional test sections are thereby created, then all test results shall be included in the lot average.

D. Any lot or portion of a lot deemed obviously unacceptable by the City or Engineer will be rejected for use in the work. If the Engineer determines that a given lot of mix does not meet the minimum specification requirements, but the work is reasonably acceptable, the lot will be accepted at a reduced pay factor in accordance with the following formula. The reduced pay factor will apply only to the contractor's schedule of values.

Table 3-1
Reduced Payment Factors for Percent of Maximum Theoretical Density

HMA percent of maximum theoretical density	Reduced payment factor	HMA percent of maximum theoretical density	Reduced payment factor
91.0	0.0000	97.0	0.0000
90.9	0.0125	97.1	0.0125
90.8	0.0250	97.2	0.0250
90.7	0.0375	97.3	0.0375
90.6	0.0500	97.4	0.0500
90.5	0.0625	97.5	0.0625
90.4	0.0750	97.6	0.0750
90.3	0.0875	97.7	0.0875
90.2	0.1000	97.8	0.1000
90.1	0.1125	97.9	0.1125
90.0	0.1250	98.0	0.1250
89.9	0.1375	98.1	0.1375

89.8	0.1500	98.2	0.1500
89.7	0.1625	98.3	0.1625
89.6	0.1750	98.4	0.1750
89.5	0.1875	98.5	0.1875
89.4	0.2000	98.6	0.2000
89.3	0.2125	98.7	0.2125
89.2	0.2250	98.8	0.2250
89.1	0.2375	98.9	0.2375
89.0	0.2500	99.0	0.2500
<89.0	Remove and replace	>99.0	Remove and replace

3.10 CONCRETE CURB AND GUTTER

A. The expansion joint filler for concrete curb and gutters shall be cut to conform to the cross section of the curb. Expansion joints shall be spaced at intervals of not more than 30-feet. Formed control joints shall be installed at intervals not exceeding 10 feet, or 15 feet if a machine is used for installation. Depth of joint shall be 1/3 the thickness. Curved forms shall be used where radii are indicated; straight segments shall not be permitted. Upon removal of the forms, exposed curb faces shall be immediately rubbed down to a smooth and uniform surface. No plastering shall be permitted.

3.11 UNDERGROUND UTILITY LINES

A. Where an underground utility line is beneath the new roadway, the backfilling shall be carried out with special care, and the final consolidation shall be accomplished by a vibratory roller. Construction of the roadway over the trench shall be deferred as long as practicable.

3.12 JUNCTION WITH OTHER PAVING

A. Where new asphalt concrete pavement abuts existing asphalt concrete pavement, the existing pavement shall be cut back to insure obtaining the specified compaction of the new pavement courses and interlocking adjoining courses. Existing subbase courses shall be cut back from the subgrade level of the new pavement on a one-on-one slope into the existing pavement, and the asphalt courses of the existing pavement shall be removed for an additional 6-inches back from the slope. The edge of the existing asphalt courses shall be saw cut straight and true. The faces between new and existing asphalt courses shall receive an application of tack coat.

B. Where new rigid concrete pavement abuts existing rigid concrete or asphalt concrete paving, the existing paving shall be saw cut straight and true. An expansion joint of a 1/2-inch minimum thickness with filler material and sealant shall be placed between the new concrete pavement and the existing rigid concrete or asphalt concrete paving.

3.13 ASPHALT CONCRETE OVERLAY

A. Where asphalt concrete is proposed to be placed over an existing asphalt or rigid concrete surface, the surfaces shall be thoroughly cleaned by power brooming and a tack coat shall be applied in accordance with Standard Specifications Section 302-5.4, prior to installing the overlay. The overlay shall be applied in accordance with the Standard Details shown on the Contract Drawings.

B. Contractor shall place Paving Mat in accordance with manufacturer's recommendations prior to placing.

C. Add to Subsection 302-5.5, "Distribution and Spreading," of the Standard Specifications, the following:

> In advance of spreading asphalt concrete over asphalt concrete base course, or asphalt concrete surface, asphalt concrete leveling course shall be spread by any mechanical means that will produce a uniform smoothness and texture. Asphalt concrete leveling shall include, but is not limited to, the filling and leveling of irregularities and ruts. Asphalt concrete used to change the cross slope or profile of an existing surface shall not be considered as asphalt concrete leveling.
>
> Unless otherwise permitted by the Engineer, the top layer of asphalt concrete for shoulders, tapers, transitions, road connections, private drives, curve widening, turnouts, left-turn pockets, and other such areas, shall not be spread before the top layer of asphalt concrete for the adjoining through lane has been spread and compacted. At locations where the number of lanes are changed, the top layer for the through lanes shall be paved first. Tracks or wheels of spreading equipment shall not be operated on the top layer of asphalt concrete in any area until final compaction has been completed or unless directed by the Engineer.
>
> The base layer of asphalt concrete shall not be less than 0.20 feet and the top layer of asphalt concrete shall not exceed 0.20 feet in compacted thickness. Each lane of the top layer, once commenced, shall be placed without interruption.
>
> All screed extensions for paving machines shall be provided with a tamper, roller, or other suitable compacting devices.
>
> Asphalt pavers shall be equipped with automatic screed controls and a sensing device or devices. Automatic grade and slope control shall be used for overlays.
>
> All joints shall be sealed after rolling.

D. When placing asphalt concrete to the lines and grades noted in the plans or as approved by the Engineer, the automatic screed controls shall control the longitudinal grade and

transverse slope of the screed. Grade and slope references shall be furnished, installed, and maintained by the Contractor. The Contractor shall use a ski device, the minimum length of the ski device shall be 30 feet. The ski device shall be a rigid one-piece unit and the entire length shall be utilized in activating the sensor. The Contractor may use a laser to control the screed.

E. When placing the initial mat of asphalt concrete on existing pavement, the end of the screed nearest the center line shall be controlled by a sensor activated by a ski device not less than 30 feet long. The end of the screed farthest from center line shall be controlled by an automatic transverse slope device set to reproduce the cross slope approved by the Engineer.

F. When paving contiguously with previously placed mats, the end of the screed adjacent to the previously placed mat shall be controlled by a sensor that responds to the grade of the previously placed mat and will reproduce the grade in the new mat within a 0.01 feet tolerance. The end of the screed farthest from the previously placed mat shall be controlled in the same manner as when placing the initial mat.

G. Should the automatic screed controls fail to operate properly during any day's work, the Contractor may use manual control of the spreading equipment for the remainder of that day; however, the equipment shall be corrected or replaced with alternative automatically controlled equipment conforming to the requirements in this section before starting the next day's work.

H. Should the methods and equipment furnished by the Contractor fail to produce a layer of asphalt concrete conforming to the requirements, including straightedge tolerance, of Subsection 302-5.6.2, "Density and Smoothness," of the Standard Specifications, the paving operation shall be discontinued, and the Contractor shall modify his equipment or furnish substitute equipment.

I. A drop-off of more than 0.15 feet will not be allowed at any time between adjacent lanes open to public traffic.

J. Add to Subsection 302-5.6.1, "General (Rolling)," of the Standard Specifications, the following:

> The Contractor shall furnish a sufficient number of rollers to obtain the specified compaction and surface finish required by the Standard Specifications and these Special Provisions.
>
> Initial breakdown compaction shall consist of a minimum of three (3) coverages of a layer of asphalt mixture. A pass shall be a movement of rolling in both directions over the same path. Coverage shall consist of as many passes as are necessary to cover the entire width being paved. Overlap between passes during coverage, made to ensure compaction without displacement of material in accordance with good rolling practice, shall be considered to be part of the coverage being made and not part of a subsequent coverage.

Each coverage shall be completed before subsequent coverages are started.

K. Add to Subsection 302-5.7, "Joints," of the Standard Specifications, the following:

Before placing the top layer adjacent to cold transverse construction joints, the joints shall be trimmed to a vertical face and to a neat line. Longitudinal joints shall be trimmed to a vertical face and to a neat line if the edges of the previously laid surfacing are, in the opinion of the Engineer, in such condition that the quality of the completed joint will be affected. Longitudinal and transverse joints shall be tested with a 3 m (10') straightedge and shall be cut back as required to conform to the provisions in Subsection 302-5.6.2, "Density and Smoothness," for surface smoothness. Connections to existing surfacing shall be feathered to conform to the provisions for smoothness.

Longitudinal joints in the top layer shall correspond with the edges of proposed traffic lanes (striping). Longitudinal joints in all other layers shall be offset not less than 0.5 feet alternately each side of the edges of traffic lanes.

All feathered joints shall be sealed after rolling.

L. Replace the third paragraph of Subsection 302-5.8, "Manholes," of the Standard Specifications, with the following:

Manholes, water valve and survey monument covers shall be adjusted to grade in accordance with the plans, and Subsection 301-1.6, "Adjustment of Manhole Frame and Cover Set to Grade," of the Standard Specifications.

After the pavement has been completed, the necessary portions of the sub-grade, base, and pavement shall be neatly removed, the structure built up, and the manhole frame set to be backfilled with Type III-C3-PG64-10 asphalt concrete. The asphalt concrete shall be placed and compacted in a workmanlike manner to conform to the appearance of the surrounding pavement, within two days of raising the manhole to grade.

All new and/or existing valve and survey monument covers shall be adjusted to grade during paving. When required, the Contractor shall install survey monument covers before paving. The Contractor shall furnish all slip sleeves or cans where none exist. The Contractor shall loosen and paint blue all water valve covers immediately after paving.

N. Construction will not be allowed before the completion and approval of all pavement preparation work including, but not limited to, cold milling, asphalt concrete deep lift repair and removal of old pavement markers and sweeping of pavement.

O. All surfaces to be paved shall be cleaned by the use of a broom and a vacuum sweeper to the satisfaction of the Engineer. The AC surface shall be free of water, dust, or foreign

material before tack is applied. All raised pavement markers shall be removed prior to the placement of any ARHM. Removal of all AC slurry seal reside form gutter lip should be completed prior to paving.

P. The surface course shall be spread in one layer with the use of a self-propelled paving machine and shall be spread to the after compaction thickness as shown on the Plans.

Q. The existing surface to receive the ARHM surface course shall be clean, to the satisfaction of the Engineer and paint binder (tack coat) shall be applied at the rate of 0.10 gallons per square yard conforming to the provisions of Section 302-5.4 of the Greenbook. Similarly, paint binder (tack coat) shall be applied to all vertical surfaces to be joined.

R. The completed asphalt rubber resurfacing shall be thoroughly compacted to be free from humps, depressions or irregularities. Any ridges, indentations or other objectionable marks left on the surface of the asphalt rubber shall be eliminated by roller or other means.

S. The longitudinal and transverse joints shall be constructed to have a uniform finished surface throughout. The joints shall be constructed straight, neat, smooth, tight and seamless, irregular joints will not be accepted. Any finished surface with rugged appearance will be rejected.

T. Tarpaulins shall be used to cover all loads from plant to project.

U. ARHM surface course shall be thoroughly compacted by rolling. The number of rollers necessary will be established in accordance with Section 302-9.4 of the Standard Specifications. All compacted ARHM surface course shall have a relative compaction of not less than 95 percent in accordance with Section 302-5.6.2 of the Greenbook Specifications.

V. Rolling along a joint shall be such that the widest part of the roller is on the hot side of the joint. Join lines between successive runs shall be within 5 inches of lane lines or a minimum of 12 feet outside of the outer most lane line.

W. Lots consisting of 500 tons will be established for ARHM surface course areas to be tested. The Contractor's or its designated laboratory shall perform density testing utilizing a properly calibrated nuclear asphalt-testing device. The Contractor shall pay for all initial testing and reasonable amount of retesting utilizing the nuclear asphalt-testing device. If the test results for any lot of ARHM surface course indicate that the relative compaction is below 95 percent, the Contractor will be advised that he is not attaining the required relative compaction and that his materials or his procedures, or both, need adjustment. ARHM-GG spreading operations shall not continue until the Contractor has notified the Engineer of the adjustment that will be made in order to meet the required compaction. Core testing of areas not meeting the 95 percent requirement will be conducted by the Contractor's designated lab. Any and all testing will be at the sole expense of the Contractor.

If the test results for any lot of ARHM surface course continue to indicate that the relative

compaction is less than 95 percent after adjustments have been made, the ARHM represented by that lot may be required to be removed and replaced at the Contractor's expense and the Contractor shall suspend all further paving operations until the Contractor can demonstrate to the City that relative compactions of 95 percent can be obtained. It shall be the sole judgment of the City Engineer to determine adequate remedy and/or a reduction in compensation for any lot failing to meet 95 percent relative compaction.

X. The Contractor shall provide for adequate quality control measures to insure that delivery of asphalt rubber shall be neither too slow nor too fast to prevent stopping of the paving operation and/or cooling of the asphalt rubber material. Material delivery scheduling and handling is critical to provide for optimum compaction opportunity and maximize ride quality performance.

3.14 ROCK DUST BLOTTER

A. Where traffic will have access to rubberized asphalt concrete prior to complete cooling, a rock dust blotter shall be placed as directed by the Engineer to avoid tracking per Section 302-9.6 of the Greenbook. Rock dust blotter shall be uniformly applied using a mechanical spreader at a rate of two pounds minimum and four pounds maximum per square yard.

3.15 ADJUST MANHOLE RINGS AND COVERS AND WATER VALVE COVERS TO GRADE

A. Adjustment of storm drain/sewer manhole covers, water valve, and survey monument covers to grade shall be in accordance with the plans and Subsection 301-1.6, "Adjustment of Manhole Frame and Cover Sets to Grade," of the Standard Specifications and the agency or utility standards and policies that owns or has control of the manhole.

B. The Contractor shall have the option of installing American Highway Products Ltd. (or approved equal) Pivoted Turnbuckle Manhole Riser Rings and Water Gas Valve Riser Rings. Contact information: American Highway Products Ltd., 11723 Strasburg Bolivar Rd. N.W., Bolivar, OH 44612, Office: (888) 272.2397, Fax: (330) 874.3800, Web Site: www.ahpl.com, Email: sales@ahpl.com. This usage is applicable to City-owned storm drain manholes only. The contractor is responsible for obtaining timely written approval from other applicable agencies who have jurisdiction over other manhole and valve covers found within the work area for the usage of the pivoted turnbuckle manhole and valve cover riser rings.

C. For all new manhole rings and covers furnished by the Contractor, certification shall include the test results from test Method B as called for in Subsection 206-3 “Gray Iron Castings,” of the Standard Specifications.

D. Raised manhole rings and covers shall have a Type II barricade with two flashing lights placed over each manhole until it is paved.

E. After the pavement has been completed, the necessary portions of the sub-grade, base, and pavement shall be neatly removed, the structure built-up, and the manhole frame set to be backfilled with PCC concrete and Type III-C3-PG 64-10 asphalt concrete. The asphalt concrete shall be placed and compacted in a workmanlike manner to conform to the

appearance of the surrounding pavement. The asphalt concrete shall be placed within two (2) days after the manhole ring and cover has been adjusted to final grade, unless otherwise approved by the Engineer. The Contractor shall so schedule this work that adjusted manholes and rings shall not remain unpaved over holidays and weekends.

F. All new and existing water valve and gas valve covers shall be adjusted to grade during paving. The Contractor shall furnish all slip sleeves or cans where none exist. The Contractor shall loosen all valve covers immediately after paving. The Contractor shall paint all water valve covers blue.

G. The Contractor shall also be responsible for locating any buried water valve, storm drain and/or sewer manhole covers by means of scanning, prior to the milling operations. The locations shall be noted and covers exposed prior to the milling operations. The covers will be adjusted to finish grade after final paving. The Contract unit price paid per lump sum for "Scan Street to Locate any Buried Water Valves and/or Manhole Covers" shall include providing all the necessary scanning equipment, labor, materials, locating of buried water vales and/or manhole covers and no additional compensation will be allowed therefore. Payment for adjusting buried water valve and/or manhole covers will be at the unit price paid for Additive Bid Item "Adjust Water Valve Cover to Grade."

H. Contractor is responsible for clean-up of any debris within the manholes or valve covers. Contractor shall walk with the Inspector to inspect each manhole and water valve at the end of the project to ensure compliance. Contractor shall remedy any deficiencies noted by the Inspector. Payment for coordination with Inspector and valve/manhole clean-up shall be per the bid for "Field Walk with City, Clean-up Debris in water valves and manhole." Payment shall include the field walk and subsequent field walks, furnishing all labor, tools, and materials, and no additional compensation will be allowed, therefore.

3.16 PROTECT AND ADJUST SURVEY MONUMENT FRAMES, COVERS, AND SLEEVES

A. The Contractor is responsible for hiring an independent surveyor to tie-out all monuments before construction work begins and re-establish those monuments after work is done. Work shall include the filing of corner records at the County Surveyor's Office with copies sent to the City. Additionally, the Contractor's Survey shall provide any necessary construction staking associated with the plans.

B. Existing survey markers, monuments, and benchmarks shall be protected in place. Monument frames, covers, and sleeves shall be furnished and adjusted to finished grade.

C. Existing survey markers, monuments, and benchmarks not conforming to the proposed roadway finish surface shall remain accessible by means of an approved sleeve and lid per City of Manhattan Beach Standard Drawing MBSI-170A-0 ST-4, or by other methods approved by the Engineer.

The Contract unit price paid per each for adjusting monument frames, covers, and sleeves to finished grade shall be measured in accordance with "Monument Preservation, Restoration and Survey" Lump Sum Bid Item, per Standard Specifications, and shall include full compensation for furnishing all labor, materials, tools, and equipment, and for

doing all the work involved in adjusting monument frames, covers, and sleeves to finished grade, complete in place, and no additional compensation will be allowed therefor.

-END OF SECTION-

SECTION 03100

CONCRETE FORMWORK

PART 1 -- GENERAL

1.01 THE REQUIREMENT

A. Provide materials, labor, and equipment required for the design and construction of all concrete formwork, bracing, shoring and supports in accordance with the provisions of the Contract Documents.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 03200 - Reinforcing Steel

B. Section 03300 - Cast-in-Place Concrete

1.03 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. Without limiting the generality of the other requirements of the specifications, all work herein shall conform to the applicable requirements of the following documents. All referenced specifications, codes, and standards refer to the most current issue available at the time of Bid.

2. ACI 318 - Building Code Requirements for Structural Concrete

4. ACI 347 - Recommended Practice for Concrete Formwork

5. U.S. Product Standard for Concrete Forms, Class I, PS 1

6. ACI 117 - Standard Specifications for Tolerances for Concrete Construction and Materials

1.04 QUALITY ASSURANCE

A. Concrete formwork shall be in accordance with ACI 301, ACI 318, and ACI 347.

PART 2 -- PRODUCTS

2.01 FORMS AND FALSEWORK

A. All forms shall be smooth surface forms unless otherwise specified.

B. Other form materials such as metal, fiberglass, or other acceptable material that will not adversely affect the concrete and will facilitate placement of concrete to the shape, form, line and grade indicated may be submitted to the Engineer for approval, but only materials that will produce a smooth form finish equal or better than the wood materials specified will be considered.

2.02 FORMWORK ACCESSORIES

A. Form release agent shall be a blend of natural and synthetic chemicals that employs a chemical reaction to provide quick, easy and clean release of concrete from forms. It shall not stain the concrete and shall leave the concrete with a paintable surface. Formulation of the form release agent shall be such that it would minimize formation of "bug holes" in cast-in-place concrete.

PART 3 -- EXECUTION

3.01 CONSTRUCTION

A. The type, size, quality, and strength of all materials from which forms are made shall be subject to the approval of the Engineer.

B. Forms shall be smooth and free from surface irregularities. Suitable and effective means shall be provided on all forms for holding adjacent edges and ends of panels and sections tightly together and in accurate alignment so as to prevent the formation of ridges, fins, offsets, or similar surface defects in the finished concrete. Joints between the forms shall be sealed to eliminate any irregularities. The arrangement of the facing material shall be orderly and symmetrical, with the number of seams kept to a practical minimum.

C. Forms shall be true to line and grade and shall be sufficiently rigid to prevent displacement and sagging between supports. Curved forms shall be used for curved and circular structures. Straight panels joined at angles will not be acceptable for forming curved structures. Forms shall be properly braced or tied together to maintain their position and shape under a load of freshly-placed concrete. Facing material shall be supported with studs or other backing which shall prevent both visible deflection marks in the concrete and deflections beyond the tolerances specified.

D. Forms shall be mortar tight so as to prevent the loss of water, cement and fines during placing and vibrating of the concrete.

E. All forms shall be constructed in such a manner that they can be removed without hammering or prying against the concrete.

F. Construction joints shall not be permitted at locations other than those shown or specified, except as may be acceptable to the Engineer.

3.02 TOLERANCES

A. Unless otherwise indicated in the Contract Documents, formwork shall be constructed so that the concrete surfaces will conform to the tolerance limits listed in ACI 117.

3.03 FORM ACCESSORIES

A. Suitable moldings shall be placed to bevel or round all exposed corners and edges of slabs, and equipment pads. Chamfers shall be 3/4 inch unless otherwise noted.

3.04 APPLICATION - FORM RELEASE AGENT

A. Forms for concrete surfaces that will not be subsequently waterproofed shall be coated with a form release agent. Form release agent shall be applied on formwork in accordance with manufacturer's recommendations.

3.06 INSERTS AND EMBEDDED ITEMS

A. Sleeves, pipe stubs, inserts, anchors, expansion joint material, waterstops, and other embedded items shall be positioned accurately and supported against displacement prior to concreting. Voids in sleeves, inserts, and anchor slots shall be filled temporarily with readily removable material to prevent the entry of concrete into the voids.

3.07 FORM CLEANING AND REUSE

A. The inner faces of all forms shall be thoroughly cleaned prior to concreting. Forms may be reused only if in good condition and only if acceptable to the Engineer. Light sanding between uses will be required wherever necessary to obtain uniform surface texture. Unused tie rod holes in forms shall be covered with metal caps or shall be filled by other methods acceptable to the Engineer.

3.08 FORM REMOVAL AND SHORING

A. Forms shall not be disturbed until the concrete has attained sufficient strength. Sufficient strength shall be demonstrated by structural analysis considering proposed loads, strength of forming and shoring system, and concrete strength data. All concrete to be exposed by form removal shall have sufficient strength not to be damaged thereby.

D. An accurate record shall be maintained by the Contractor of the dates of concrete placings and the exact location thereof and the dates of removal of forms. These records shall be available for inspection at all times at the site, and two copies shall be furnished the Engineer upon completion of the concrete work.

- END OF SECTION -

SECTION 03200

REINFORCING STEEL

PART 1 -- GENERAL

1.01 THE REQUIREMENTS

A. Provide all concrete reinforcing including all cutting, bending, fastening and any special work necessary to hold the reinforcing steel in place and protect it from injury and corrosion in accordance with the requirements of this section.

B. Provide deformed reinforcing bars to be grouted into reinforced concrete masonry walls.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 03100 - Concrete Formwork

B. Section 03300 - Cast-in-Place Concrete

1.03 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

A. Without limiting the generality of the other requirements of the specifications, all work herein shall conform to the applicable requirements of the following documents. All referenced specifications, codes, and standards refer to the most current issue available at the time of Bid.

1. CRSI - Concrete Reinforcing Institute Manual of Standard Practice
2. ACI SP66 - ACI Detailing Manual
3. ACI 315 - Details and Detailing of Concrete Reinforcing
4. ACI 318 - Building Code Requirements for Structural Concrete
5. ASTM A 1064 - Standard Specification for Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete

1.04 SUBMITTALS

A. Submit the following in accordance with Section 01300, Submittals.

1. Detailed placing and shop fabricating drawings, prepared in accordance with ACI 315 and ACI Detailing Manual - (SP66), shall be furnished for all concrete reinforcing. These drawings shall be made to such a scale as to clearly show joint locations, openings, and the arrangement, spacing and splicing of the bars.

2. Description of the reinforcing steel manufacturer's marking pattern.

3. Requests to relocate any bars that cause interferences or that cause placing tolerances to be violated.

4. Proposed supports for each type of reinforcing.

5. Request to use splices not shown on the Drawings.

6. Request and procedure to field bend or straighten partially embedded reinforcing.

1.05 QUALITY ASSURANCE

A. If requested by the Engineer, the Contractor shall provide samples from each load of reinforcing steel delivered in a quantity adequate for testing. Costs of initial tests will be paid by the City. Costs of additional tests due to material failing initial tests shall be paid by the Contractor.

PART 2 -- PRODUCTS

2.01 REINFORCING STEEL

A. Bar reinforcing shall conform to the requirements of ASTM A 615 for Grade 60 Billet Steel reinforcing. All reinforcing steel shall be from domestic mills and shall have the manufacturer's mill marking rolled into the bar which shall indicate the producer, size, type and grade. All reinforcing bars shall be deformed bars. Smooth reinforcing bars shall not be used unless specifically called for on Drawings.

B. Welded wire fabric reinforcing shall conform to the requirements of ASTM A 1064 and the details shown on the Drawings.

C. A certified copy of the mill test on each load of reinforcing steel delivered showing physical and chemical analysis shall be provided, prior to shipment. The Engineer reserves the right to require the Contractor to obtain separate test results from an independent testing laboratory in the event of any questionable steel. When such tests are necessary because of failure to comply with this Specification, such as improper identification, the cost of such tests shall be borne by the Contractor.

2.02 ACCESSORIES

A. Accessories shall include all necessary chairs, slab bolsters, concrete blocks, tie wires, dips, supports, spacers and other devices to position reinforcing during concrete placement.

B. Concrete blocks (dobies), used to support and position bottom reinforcing steel, shall have the same or higher compressive strength as specified for the concrete in which it is located.

2.04 DOWEL ADHESIVE SYSTEM

A. Where shown on the Drawings, reinforcing bars anchored into hardened concrete with a dowel adhesive system shall use a two-component adhesive mix which shall be injected with a static mixing nozzle following manufacturer's instructions.

B. All holes shall be drilled in accordance with the manufacturer's instructions except that core drilled holes shall not be permitted unless specifically allowed by the Engineer. Cored holes, if allowed by the manufacturer and approved by the Engineer, shall be roughened in accordance with manufacturer's requirements.

C. Thoroughly clean drill holes of all debris, drill dust, and water in accordance with manufacturer's instructions prior to installation of adhesive and reinforcing bar.

D. Degree of hole dampness shall be in strict accordance with manufacturer recommendations. Installation conditions shall be either dry or water saturated. Water filled or submerged holes shall not be permitted unless specifically approved by the Engineer.

E. Injection of adhesive into the hole shall be performed in a manner to minimize the formation of air pockets in accordance with the manufacturer's instructions.

F. Embedment Depth:

1. The embedment depth of the bar shall be as shown on the Drawings.

2. Where the embedment depth is not shown on the Drawings, the embedment depth shall be determined to provide the minimum allowable bond strength equal to the tensile strength of the rebar according to the manufacturer's ICC-ES ESR.

3. The embedment depth shall be determined using the actual concrete compressive strength, a cracked concrete state, maximum long term temperature of 110 degrees F, and maximum short term temperature of 140 degrees F. In no case shall the embedment depth be less than the minimum, or more than the maximum, embedment depths stated in the manufacturer's ICC-ES ESR.

G. Engineer's approval is required for use of this system in locations other than those shown on the Drawings.

H. The adhesive system shall be IBC compliant for use in both cracked and uncracked concrete in all Seismic Design Categories and shall be "Epcon C6+ Adhesive Anchoring System" as manufactured by ITW Redhead, " HIT-HY 200 Adhesive Anchoring System" as manufactured by Hilti, Inc. "SET-XP Epoxy Adhesive Anchors" as manufactured by Simpson Strong-Tie Co. or "Pure 110+ Epoxy Adhesive Anchor System" by DeWalt. Fast-set epoxy formulations shall not be acceptable. No or equal products will be considered, unless pre-qualified and approved.

I. All individuals installing dowel adhesive system shall be certified as an Adhesive Anchor Installer in accordance with the ACI-CRSI Anchor Installation Certification Program.

PART 3 – EXECUTION

3.01 TEMPERATURE REINFORCING

A. Unless otherwise shown on the Drawings or in the absence of the concrete reinforcing being shown, the minimum cross sectional area of horizontal and vertical concrete reinforcing in walls shall be 0.0033 times the gross concrete area and the minimum cross sectional area of reinforcing perpendicular to the principal reinforcing in slabs shall be 0.0020 times the gross concrete area. Temperature reinforcing shall not be spaced further apart than five times the slab or wall thickness, nor more than 18 inches.

3.02 FABRICATION

A. Reinforcing steel shall be accurately formed to the dimensions and shapes shown on the Drawings and the fabricating details shall be prepared in accordance with ACI 315 and ACI 318, except as modified by the Drawings.

B. The Contractor shall fabricate reinforcing bars for structures in accordance with the bending diagrams, placing lists and placing Drawings.

C. No fabrication shall commence until approval of Shop Drawings has been obtained. All reinforcing bars shall be shop fabricated unless approved to be bent in the field. Reinforcing bars shall not be straightened or rebent in a manner that will injure the material. Heating of bars will not be permitted.

D. Welded wire fabric with longitudinal wire of W9.5 size or smaller shall be either furnished in flat sheets or in rolls with a core diameter of not less than 10 inches. Welded wire fabric with longitudinal wires larger than W9.5 size shall be furnished in flat sheets only.

3.03 DELIVERY, STORAGE AND HANDLING

A. All reinforcing shall be neatly bundled and tagged for placement when delivered to the job site. Bundles shall be properly identified for coordination with mill test reports.

B. Reinforcing steel shall be stored above ground on platforms or other supports and shall be protected from the weather at all times by suitable covering. It shall be stored in an orderly manner and plainly marked to facilitate identification.

C. Reinforcing steel shall at all times be protected from conditions conducive to corrosion until concrete is placed around it.

D. The surfaces of all reinforcing steel and other metalwork to be in contact with concrete shall be thoroughly cleaned of all dirt, grease, loose scale and rust, grout, mortar and other foreign substances immediately before the concrete is placed. Where there is delay in depositing concrete, reinforcing shall be reinspected and if necessary recleaned.

3.04 PLACING

A. Reinforcing steel shall be accurately positioned as shown on the Drawings and shall be supported and wired together to prevent displacement, using annealed iron wire ties or suitable clips at intersections. All reinforcing steel shall be supported by concrete, plastic or plastic protected (CRSI Class 1) metal supports, spacers or metal hangers which are strong and rigid enough to prevent any displacement of the reinforcing steel. Where concrete is to be placed on the ground, supporting concrete blocks (or dobies) shall be used in sufficient numbers to support the reinforcing bars without settlement. In no case shall concrete block supports be continuous.

B. The portions of all accessories in contact with the formwork shall be made of plastic or steel coated with a 1/8 inch minimum thickness of plastic which extends at least 1/2 inch from the concrete surface. Plastic shall be gray in color.

C. Tie wires shall be bent away from the forms in order to provide the specified concrete coverage.

D. Reinforcing bars additional to those shown on the Drawings, which may be found necessary or desirable by the Contractor for the purpose of securing reinforcing in position, shall be provided by the Contractor at no additional cost to the City.

E. Reinforcing placing, spacing, and protection tolerances shall be within the limits specified in ACI 318 except where in conflict with the Building Code, unless otherwise specified.

F. Reinforcing bars may be moved within one bar diameter as necessary to avoid interference with other concrete reinforcing, conduits, or embedded items. If bars are moved more than one bar diameter, or enough to exceed placing tolerances, the resulting arrangement of bars shall be as acceptable to the Engineer.

G. Welded wire fabric shall be supported on slab bolsters spaced not less than 30 inches on centers, extending continuously across the entire width of the reinforcing mat and supporting the reinforcing mat in the plane shown on the Drawings.

H. Reinforcing shall not be straightened or rebent unless specifically shown on the drawings. Bars with kinks or bends not shown on the Drawings shall not be used. Coiled reinforcement shall not be used.

I. Dowel Adhesive System shall be installed in strict conformance with the manufacturer's recommendations and as required in Article 2.04 above. A representative of the manufacturer must be on site prior to adhesive dowel installation to provide instruction on proper installation procedures for all adhesive dowel installers. Testing of adhesive dowels shall be as indicated below. If the dowels have a hook at the end to be embedded in subsequent work, an approved mechanical coupler shall be provided at a convenient distance from the face of existing concrete to facilitate adhesive dowel testing while maintaining required hook embedment in subsequent work.

J. All adhesive dowel installations in the horizontal or overhead orientation shall be conducted by a certified Adhesive Anchor Installer as certified by ACI/CSRI per ACI 318-11 9.2.2. Current AAI Certificated must be submitted to the Engineer of Record for approval prior to

commencement of any adhesive anchor installations.

3.05 SPLICING

A. Reinforcing bar splices shall only be used at locations shown on the Drawings. When it is necessary to splice reinforcing at points other than where shown, the splice shall be as acceptable to the Engineer.

B. The length of lap for reinforcing bars, unless otherwise shown on the Drawings shall be in accordance with ACI 318 for a class B splice.

C. Laps of welded wire fabric shall be in accordance with ACI 318. Adjoining sheets shall be securely tied together with No. 14 tie wire, one tie for each 2 running feet. Wires shall be staggered and tied in such a manner that they cannot slip.

D. Couplers which are located at a joint face shall be a type which can be set either flush or recessed from the face as shown on the Drawings. The couplers shall be sealed during concrete placement to completely eliminate concrete or cement paste from entering. After the concrete is placed, couplers intended for future connections shall be plugged and sealed to prevent any contact with water or other corrosive materials. Threaded couplers shall be plugged with plastic plugs which have an O-ring seal.

3.06 INSPECTION

A. The Contractor shall advise the Engineer of his intentions to place concrete and shall allow him adequate time to inspect all reinforcing steel before concrete is placed.

3.07 CUTTING OF EMBEDDED REBAR

A. The Contractor shall not cut embedded rebar cast into structural concrete without prior approval.

- END OF SECTION -

SECTION 03300

CAST-IN-PLACE CONCRETE

PART 1 -- GENERAL

1.01 THE REQUIREMENT

A. Provide all labor, equipment, materials and services necessary for the manufacture, transportation and placement of all plain and reinforced concrete work, as shown on the Drawings or as ordered by the Engineer.

B. The requirements in this section shall apply to the following types of concrete:

1. Standard Specification Class 520-C-2500P for sidewalks, curb, and gutters.

2. Class B Concrete: Normal weight structural concrete used for encasements, catch basins, fence and guard post embedment, concrete fill, and other areas where specifically noted on Contract Drawings.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 03100 - Concrete Formwork

B. Section 03200 - Reinforcing Steel

1.03 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. Without limiting the generality of the Specifications, all work herein shall conform to or exceed the applicable requirements of the following documents. All referenced specifications, codes, and standards refer to the most current issue available at the time of Bid.

1.	ACI 214	Guide to Evaluation of Strength Test Results of Concrete
2.	ACI 301	Specifications for Structural Concrete
3.	ACI 304	Guide for Measuring, Mixing, Transporting, and Placing Concrete
4.	ACI 305	Guide to Hot Weather Concreting
5.	ACI 306	Guide to Cold Weather Concreting
6.	ACI 309	Guide for Consolidation of Concrete
7.	ACI 318	Building Code Requirements for Structural Concrete and Commentary

8.	ASTM C 31	Standard Practice for Making and Curing Concrete Test Specimens in the Field
9.	ASTM C 33	Standard Specification for Concrete Aggregates
10.	ASTM C 39	Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
11.	ASTM C 94	Standard Specification for Ready-Mixed Concrete
12.	ASTM C 136	Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
13.	ASTM C 138	Standard Test Method for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete
14.	ASTM C 150	Standard Specification for Portland Cement
15.	ASTM C 172	Standard Practice for Sampling Freshly Mixed Concrete
16.	ASTM C 192	Standard Practice for Making and Curing Concrete Test Specimens in the Laboratory
17.	ASTM C 231	Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method
18.	ASTM C 618	Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete
19.	ASTM C 989	Standard Specification for Slag Cement for Use in Concrete and Mortars
20.	ASTM C 1077	Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation
21.	ASTM C 1260	Test Method for Potential Alkali Reactivity of Aggregates (Mortar Bar Method)
22.	ASTM C 1567	Standard Test Method for Determining the Potential Alkali-Silica Reactivity of Combinations of Cementitious Materials and Aggregate (Accelerated Mortar-Bar Method)
23.	ASTM C 1602	Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete
24.	ASTM C 1778	Reducing the Risk of Deleterious Alkali – Aggregate Reaction in Concrete

1.04 SUBMITTALS

A. Submit the following in accordance with Section 01300, Submittals.

1. Certified current (less than 1 year old) chemical analysis of the Portland Cement or Blended Cement to be used.

2. Certified current (less than 1 year old) chemical analysis of fly ash or slag cement to be used.

3. Aggregate test results showing compliance with required standards, i.e., sieve analysis, potential reactivity, aggregate soundness tests, petrographic analysis, mortar bar expansion testing, etc.

4. Manufacturer's data on all admixtures stating compliance with required standards.

5. Concrete mix design for each class of concrete specified herein.

1.05 QUALITY ASSURANCE

A. Tests on materials used in the production of concrete shall be required as specified in PART 2 -- PRODUCTS. These tests shall be performed by an independent testing laboratory approved by the Engineer at no additional cost to the City.

B. Trial concrete mixes shall be tested when required in accordance with this Section at no additional cost to the City.

C. Field quality control tests, as specified in this Section, unless otherwise stated, will be performed by a materials testing consultant retained by the contractor. The Contractor shall be charged for the cost of any additional tests and investigation on work performed which does not meet the Specifications. Any individual who samples and tests concrete to determine if the concrete is being produced in accordance with this Specification shall be certified as a Concrete Field Testing Technician, Grade I, in accordance with ACI CP-2. Testing laboratory shall conform to requirements of ASTM C-1077.

PART 2 -- PRODUCTS

2.01 HYDRAULIC CEMENT

A. Portland Cement

1. Portland Cement shall be Type II conforming to ASTM C 150. Type I cement may be used provided either fly ash or slag cement is also included in the mix in accordance with Articles 2.02 or 2.03 respectively.

2. When potentially reactive aggregates as defined in Article 2.05 are to be used in concrete mix, cement shall meet the following requirements:

a. For concrete mixed with only Portland Cement, the total alkalies in the cement (calculated as the percentage of NA_2O plus 0.658 times the percentage of K_2O) shall not exceed 0.40%.

b. For concrete mixed with Portland Cement and an appropriate amount of fly ash (Article 2.02) or slag cement (Article 2.03) the total alkalies in the Portland Cement (calculated as the percentage of NA_2O plus 0.658 times the percentage of K_2O) shall not exceed 0.85%.

3. When non-reactive aggregates as defined in Article 2.05 are used in concrete mix, total alkalies in the cement shall not exceed 1.0%.

4. The proposed Portland Cement shall not contain more than 8% tricalcium aluminate and more than 12% tetracalcium aluminoferrite.

B. Blended Cement

1. Blended cements shall be Type IP (Portland Fly Ash Cement) or Type IS (Portland Slag Cement) conforming to ASTM C 595.

2. Type IP cement shall be an interground blend of Portland Cement and fly ash in which the fly ash constituent is between 15% and 25% of the weight of the total blend.

3. Type IS cement shall be an interground blend of Portland Cement and slag cement in which the slag constituent is between 35% and 50% of the weight of the total blend.

4. Fly ash and slag cement used in the production of blended cements shall meet the requirements of Articles 2.02 and 2.03, respectively.

5. When reactive aggregates as defined in Article 2.05 are used in concrete mix, the total alkalies in the Portland Cement (calculated as the percentage of Na_2O plus 0.658 times the percentage of K_2O) shall not exceed 0.85%. The percentage of fly ash or slag cement shall be set to meet provisions of Article 2.05.G.2.

C. Different types of cement shall not be mixed nor shall they be used alternately except when authorized in writing by the Engineer. Different brands of cement or the same brand from different mills may be used alternately. A resubmittal will be required if different cements are proposed during the Project.

D. Cement shall be stored in a suitable weather-tight building so as to prevent deterioration or contamination. Cement which has become caked, partially hydrated, or otherwise damaged will be rejected.

2.02 FLY ASH

A. Fly ash shall meet the requirements of ASTM C 618 for Class F, except that the loss on ignition shall not exceed 4%. Fly ash shall also meet the optional physical requirements for uniformity as shown in Table 3 of ASTM C 618.

B. For fly ash to be used in the production of type IP cement, the Pozzolan Activity Index shall be greater than 75% as specified in Table 3 of ASTM C 595.

C. Where reactive aggregates as defined in Article 2.05 are used in concrete mix, the fly ash constituent shall be between 15% and 25% of the total weight of the combined Portland Cement and fly ash. The percentage of fly ash shall provisions of Article 2.05.G.2.

D. For Type A1 concrete as required for use in environmental concrete structures, i.e. process structures or fluid containing structures, inclusion of fly ash or slag cement in the concrete mix, is mandatory.

E. Additional fly ash shall not be included in concrete mixed with Type IS or IP cement.

2.03 SLAG CEMENT

A. Slag cement shall meet the requirements of ASTM C 989 including tests for effectiveness of slag in preventing excessive expansion due to alkali-aggregate reactivity as described in Appendix X-3 of ASTM C 989.

B. Where reactive aggregates are used in concrete mix, the slag cement constituent shall be between 35% and 40% of the total weight of the combined Portland Cement and slag. The percentage of slag cement shall be set to meet the mean mortar bar expansion requirements in provisions of Article 2.05.G.2.

C. For Type A1 concrete as required for use in environmental concrete structures, i.e. process structures or fluid containing structures, inclusion of fly ash or slag cement in the concrete mix, is mandatory.

D. Additional slag cement shall not be included in concrete mixed with type IS or IP cement.

2.04 WATER

A. Water used for mixing concrete shall be clear, potable and free from deleterious substances such as objectionable quantities of silty organic matter, alkali, salts and other impurities.

B. Water shall not contain more than 100 PPM chloride.

C. Water shall not contain more than 500 PPM dissolved solids.

D. Water shall have a pH in the range of 4.5 to 8.5.

E. Water shall meet requirements of ASTM C 1602.

2.05 AGGREGATES

A. All aggregates used in normal weight concrete shall conform to ASTM C 33.

B. Fine Aggregate (Sand) in the various concrete mixes shall consist of natural or manufactured siliceous sand, clean and free from deleterious substances, and graded within the limits of ASTM C 33.

C. Coarse aggregates shall consist of hard, clean, durable gravel, crushed gravel or crushed rock. Coarse aggregate shall be size #57 or #67 as graded within the limits given in ASTM C 33 unless otherwise specified.

D. For Class A4 concrete, coarse aggregate shall be Size #8 in accordance with ASTM C33.

E. Aggregates shall be tested for gradation by sieve analysis tests in conformance with ASTM C 136.

F. Aggregates shall be tested for soundness in accordance with ASTM C 88. The loss resulting after five cycles shall not exceed 10 percent for fine or coarse aggregate when using either magnesium sulfate or sodium sulfate.

G. All aggregates shall be evaluated in accordance with ASTM C 1778 to determine potential reactivity. All aggregates shall be considered reactive unless they meet the requirements below for non-reactive aggregates. Aggregates with a lithology essentially similar to sources in the same region found to be reactive in service shall be considered reactive regardless of the results of the tests above.

1. Non-reactive aggregates shall meet the following requirements:

   A petrographic analysis in accordance with ASTM C295 shall be performed to identify the constituents of the fine and coarse aggregate. Non-reactive aggregates shall meet the following limitations:

   (a) Optically strained, microfractured, or microcrystalline quartz, 5.0%, maximum.

   (b) Chert or chalcedony, 3.0%, maximum.

   (c) Tridymite or cristobalite, 1.0%, maximum.

   (d) Opal, 0.5%, maximum.

   e) Natural volcanic glass in volcanic rocks, 3.0%, maximum.

2. Concrete mixed with reactive aggregates shall meet the following requirements:

   (a) If aggregates are deemed potentially reactive as per ASTM C-1778 and fly ash or slag cement is included in proposed concrete mix design, proposed concrete mix including proposed aggregates shall be evaluated by ASTM C-1567. Mean mortar bar expansions at 16 days shall be less than 0.08%. Tests shall be made using exact proportion of all materials proposed for use on the job in design mix submitted.

   (b) If aggregates are deemed potentially reactive as per ASTM C-1778 and a straight cement mix without fly ash or slag cement is proposed for concrete mix design, aggregates shall be evaluated by ASTM C-1260. Mean mortar bar expansions at 16 days shall be less than 0.08%.

H. Contractor shall submit a new trial mix to the Engineer for approval whenever a different aggregate or gradation is proposed.

2.06 ADMIXTURES

A. Air entraining agent shall be added to all concrete unless noted otherwise. The agent shall consist of a neutralized vinsol resin solution or a purified hydrocarbon with a cement catalyst which will provide entrained air in the concrete in accordance with ASTM C 260. The admixture proposed shall be selected in advance so that adequate samples may be obtained and the required tests made. Air content of concrete, when placed, shall be within the ranges given in the concrete mix design.

B. The following admixtures are required or used for water reduction, slump increase, and/or adjustment of initial set. Admixtures permitted shall confirm to the requirements of ASTM C 494. Admixtures shall be non-toxic after 30 days and shall be compatible with and made by the same manufacturer as the air-entraining admixtures.

1. Water reducing admixture shall conform to ASTM C 494, Type A and shall contain no more than 0.05% chloride ions. Acceptable products are “Eucon Series” by the Euclid Chemical Company, “Master Pozzolith Series” by BASF, and “Plastocrete Series” by Sika Corporation.

2. High range water reducer shall be sulfonated polymer conforming to ASTM C 494, Type F or G. The high range water reducer shall be added to the concrete at either the batch plant or at the job site and may be used in conjunction with a water reducing admixture. The high range water reducer shall be accurately measured and pressure injected into the mixer as a single dose by an experienced technician. A standby system shall be provided and tested prior to each day’s operation of the job site system. Concrete shall be mixed at mixing speed for a minimum of 100 mixer revolutions after the addition of the high range water reducer. Acceptable products are “Eucon 37” or Plastol 5000 by the Euclid Chemical Company, “Master Rheobuild 1000 or Master Glenium Series” by BASF, and “Daracem 100 or Advaflow Series” by W.R. Grace.

3. A non-chloride, non-corrosive accelerating admixture may be used where specifically approved by the Engineer. The admixture shall conform to ASTM C 494, Type C or E, and shall not contain more chloride ions than are present in municipal drinking water. The admixture manufacturer must have long-term non-corrosive test data from an independent testing laboratory (of at least a year’s duration) using an acceptable accelerated corrosion test method such as that using electrical potential measures. Acceptable products are “Accelguard 80/90 or NCA” by the Euclid Chemical Company and “Daraset” by W.R. Grace.

4. A water reducing retarding admixture may be used where specifically approved by the Engineer. The admixture shall conform to ASTM C494, Type D and shall not contain more than 0.05% chloride ions. Acceptable products are “Eucon NR or Eucon Retarder 100” by the Euclid Chemical Company, “Pozzolith Retarder” by BASF, and “Plastiment” by Sika Corporation.

C. Admixtures containing calcium chloride, thiocyanate or more than 0.05 percent chloride ions are not permitted. The addition of admixtures to prevent freezing is not permitted.

D. The Contractor shall submit manufacturer's data including the chloride ion content of each admixture and certification from the admixture manufacturer that all admixtures utilized in the design mix are compatible with one another and properly proportioned prior to mix design review.

2.07 CONCRETE MIX DESIGN

A. The proportions of cement, aggregates, admixtures and water used in the concrete mixes shall be based on the results of field experience or preferably laboratory trial mixes in conformance with Section 5.3. "Proportioning on the Basis of Field Experience and/or Trial Mixtures" of ACI 318 and ACI 350. When trial mixes are used they shall also conform to Article 3.01 of this Section of the Specifications. If field experience records are used, concrete strength results shall be from concrete mixed with all of the ingredients proposed for use on job used in similar proportions to mix proposed for use on job. Contractor shall submit verification confirming this stipulation has been followed. Field experience records and/or trial mix data used as the basis for the proposed concrete mix design shall be submitted to the Engineer along with the proposed mix.

B. Structural concrete shall conform to the following requirements. Cementitious materials refer to the total combined weight of all cement, fly ash, and slag cement contained in the mix.

1. Compressive Strength (28-Day)

   a. Concrete Class B — 3,000 psi (minimum)

2. Water/cementitious materials ratio, by weight

	Maximum	Minimum
a. Concrete Class B	0.50	0.39

3. Slump range — 4" nominal unless high range water reducing admixture is used.
   8" max if high range water reducing admixture is used.

4. Air Content

   a. Class B — 3% Max (non air-entrained)

PART 3 -- EXECUTION

3.01 PRODUCTION OF CONCRETE

A. All concrete shall be machine mixed. Hand mixing of concrete will not be permitted. The Contractor may supply concrete from a ready mix plant or from a site mixed plant. In selecting the source for concrete production the Contractor shall carefully consider its

capability for providing quality concrete at a rate commensurate with the requirements of the placements so that well bonded, homogenous concrete, free of cold joints, is assured.

B. Ready-Mixed Concrete

1. At the Contractor's option, ready-mixed concrete may be used meeting the requirements for materials, batching, mixing, transporting, and placing as specified herein and in accordance with ASTM C 94.

2. Truck mixers shall be equipped with electrically-actuated counters by which the number of revolutions of the drum or blades may be readily verified. The counter shall be of the resettable, recording type, and shall be mounted in the driver's cab. The counters shall be actuated at the time of starting mixers at mixing speeds.

3. Each batch of concrete shall be mixed in a truck mixer for not less than 100 revolutions of the drum or blades at the rate of rotation designated by the manufacturer of equipment. Additional mixing, if any, shall be at the speed designated by the manufacturer of the equipment as agitating speed. All materials including mixing water shall be in the mixer drum before actuating the revolution counter for determining the number of revolutions of mixing.

4. Truck mixers and their operation shall be such that the concrete throughout the mixed batch, as discharged, is within acceptable limits of uniformity with respect to consistency, mix and grading. If slump tests taken at approximately the 1/4 and 3/4 points of the load during discharge give slumps differing by more than one inch when the specified slump is 3 inches or less, or if they differ by more than 2 inches when the specified slump is more than 3 inches, the mixer shall not be used on the work unless the causing condition is corrected and satisfactory performance is verified by additional slump tests. All mechanical details of the mixer, such as water measuring and discharge apparatus, condition of the blades, speed of rotation, general mechanical condition of the unit and clearance of the drum, shall be checked before a further attempt to use the unit will be permitted.

5. Ready-mixed concrete shall be delivered to the site for the work and discharge shall be completed before the drum has been revolved 300 revolutions and within the time requirements stated in this Section.

6. Each and every concrete delivery shall be accompanied by a delivery ticket containing at least the following information:

   a. Date and truck number
   b. Ticket number
   c. Mix designation of concrete
   d. Cubic yards of concrete
   e. Cement brand, type and weight in pounds
   f. Weight in pounds of fine aggregate (sand)
   g. Weight in pounds of coarse aggregate (stone)
   h. Air entraining agent, brand, and weight in pounds and ounces
   i. Other admixtures, brand, and weight in pounds and ounces
   j. Water, in gallons, stored in attached tank

k. Water, in gallons, maximum that can be added without exceeding design water/cementitious materials ratio
l. Water, in gallons, actually used (by truck driver)
m. Time of loading
n. Time of delivery to job (by truck driver)

7. Any truck delivering concrete to the job site, which is not accompanied by a delivery ticket showing the above information will be rejected and such truck shall immediately depart from the job site.

8. The use of non-agitating equipment for transporting ready-mixed concrete will not be permitted. Combination truck and trailer equipment for transporting ready-mixed concrete will not be permitted. The quality and quantity of materials used in ready-mixed concrete and in batch aggregates shall be subject to continuous inspection at the batching plant by the Engineer.

C. Site Mixed Concrete

1. Scales for weighing concrete ingredients shall be accurate when in use within ±0.4 percent of their total capacities. Standard test weights shall be available to permit checking scale accuracy.

2. Operation of batching equipment shall be such that the concrete ingredients are consistently measured within the following tolerances:

a.	Cement, fly ash, or slag cement	± 1 percent
b.	Water	± 1 percent
c.	Aggregates	± 2 percent
d.	Admixtures	± 3 percent

3. Each batch shall be so charged into the mixer that some water will enter in advance of the cement and aggregates. Water shall continue for a period which may extend to the end of the first 25 percent of the specified mixing time. Controls shall be provided to prevent batched ingredients from entering the mixer before the previous batch has been completely discharged.

4. The concrete shall be mixed in a batch mixer capable of thoroughly combining the aggregates, cement, and water into a uniform mass within the specified mixing time, and of discharging the concrete without harmful segregation. The mixer shall bear a manufacturer's rating plate indicating the rate capacity and the recommended revolutions per minute and shall be operated in accordance therewith.

5. Mixers with a rate capacity of 1 cu.yd. or larger shall conform to the requirements of the Plant Mixer Manufacturers' Division of the Concrete Plant Manufacturers' Bureau.

6. Except as provided below, batches of 1 cu. yd. or less shall be mixed for not less than 1 minute. The mixing time shall be increased 15 seconds for each cubic yard or fraction thereof of additional capacity.

7. Shorter mixing time may be permitted provided performance tests made in accordance with of ASTM C 94 indicate that the time is sufficient to produce uniform concrete.

8. Controls shall be provided to insure that the batch cannot be discharged until the required mixing time has elapsed. At least three-quarters of the required mixing time shall take place after the last of the mixing water has been added.

9. The interior of the mixer shall be free of accumulations that will interfere with mixing action. Mixer blades shall be replaced when they have lost 10 percent of their original height.

10. Air-entraining admixtures and other chemical admixtures shall be charged into the mixer as solutions and shall be measured by means of an approved mechanical dispensing device. The liquid shall be considered a part of the mixing water. Admixtures that cannot be added in solution may be weighed or may be measured by volume if so recommended by the manufacturer.

11. If two or more admixtures are used in the concrete, they shall be added separately to avoid possible interaction that might interfere with the efficiency of either admixture or adversely affect the concrete.

12. Addition of retarding admixtures shall be completed within 1 minute after addition of water to the cement has been completed, or prior to the beginning of the last three-quarters of the required mixing, whichever occurs first. Retarding admixtures shall not be used unless approved by the Engineer.

13. Concrete shall be mixed only in quantities for immediate use and within the time and mixing requirements of ASTM C 94.

3.02 CONCRETE PLACEMENT

A. No concrete shall be placed prior to approval of the concrete mix design. Concrete placement shall conform to the recommendations of ACI 304.

B. Prior to concrete placement, all reinforcement shall be securely and properly fastened in its correct position. Formwork shall be clean, oiled and form ties at construction joints shall be retightened. All bucks, sleeves, castings, hangers, pipe, conduits, bolts, anchors, wire, and any other fixtures required to be embedded therein shall be in place. Forms for openings to be left in the concrete shall be in place and anchored by the Contractor. All loose debris in bottoms of forms or in keyways shall be removed and all debris, water, snow, ice and foreign matter shall be removed from the space to be occupied by the concrete. The Contractor shall notify the Engineer in advance of placement, allowing sufficient time for a concurrent inspection and for any corrective measures which are subsequently required.

C. All concrete shall be placed during the daylight hours except with the consent of the Engineer. If special permission is obtained to carry on work during the night, adequate lighting must be provided.

D. When concrete arrives at the project with slump below that suitable for placing, as indicated by the Specifications, water may be added to bring the concrete within the specified slump range provided that the design water-cementitious materials ratio is not exceeded. The water shall be incorporated by additional mixing equal to at least half of the total mixing required. Water may be added only to full trucks. On-site tempering shall not relieve the Contractor from furnishing a concrete mix that meets all specified requirements.

E. Concrete shall be conveyed as rapidly as practicable to the point of deposit by methods which prevent the separation or loss of the ingredients. It shall be so deposited that rehandling will be unnecessary. Discharge of the concrete to its point of deposit shall be completed within 90 minutes after the addition of the cement to the aggregates. In hot weather, or under conditions contributing to quick stiffening of the concrete, the time between the introduction of the cement to the aggregates and discharge shall not exceed the requirements stated in this Section.

F. Where concrete is conveyed to position by chutes, a practically continuous flow in the chute shall be maintained. The angle and discharge arrangement of the chute shall be such as to prevent segregation of the concrete ingredients. The delivery end of the chute shall be as close as possible to the point of deposit and in no case shall the free pour from the delivery end of the chute exceed five feet, unless approved otherwise.

G. Special care shall be exercised to prevent splashing of forms or reinforcement with concrete, and any such splashes or accumulations of hardened or partially hardened concrete on the forms or reinforcement above the general level of the concrete already in place must be removed before the work proceeds. Concrete shall be placed in all forms in such way as to prevent any segregation.

H. Placing of concrete shall be so regulated that the pressure caused by the wet concrete shall not exceed that used in the design of the forms.

I. Concrete shall be placed so as to thoroughly embed all reinforcement, inserts, and fixtures.

J. When forms are removed, surfaces shall be even and dense, free from aggregate pockets or honeycomb. To achieve this, concrete shall be consolidated using mechanical vibration, supplemented by forking and spading by hand in the corners and angle of forms and along form surfaces while the concrete is plastic under the vibratory action. Consolidation shall conform to ACI 309.

K. Mechanical vibration shall be applied directly to the concrete, unless otherwise approved by the Engineer. The bottom of vibrators used on floor slabs must not be permitted to ride the form supporting the slab. Vibration shall be applied at the point of deposit and in the area of freshly placed concrete by a vertical penetration of the vibrator. Vibrators shall not be used to move concrete laterally within the forms.

L. The intensity of vibration shall be sufficient to cause settlement of the concrete into place and to produce monolithic joining with the preceding layer. It shall be of sufficient duration to accomplish thorough compaction and complete embedment of reinforcement and fixtures with a vibrator transmitting not less than 7,500 impulses per minute. Since the duration of vibration per square foot of surface is dependent on the frequency (impulses per minute), size of vibrator, and slump of concrete, the length of time must therefore be determined in

the field. Vibration, however, shall not be continued in any one location to the extent that pools of grout are formed.

M. To prevent featheredges, construction joints located at the tops of horizontal lifts near sloping exposed concrete surfaces shall be inclined near the exposed surface, so the angle between such inclined surface and the exposed concrete surface will be not less than 50°.

N. In placing unformed concrete on slopes, the concrete shall be placed ahead of a non-vibrated slip-form screed extending approximately 2-1/2 feet back from its leading edge. The method of placement shall provide a uniform finished surface with the deviation from the straight line less than 1/8 inch in any concrete placement. Concrete ahead of the slip-form screed shall be consolidated by internal vibrators so as to ensure complete filling under the slip-form. Prior to placement of concrete on sloped walls or slabs, the Contractor shall submit a plan specifically detailing methods and sequence of placements, proposed concrete screed equipment, location of construction joints and waterstop, and/or any proposed deviations from the aforementioned to the Engineer for review and approval.

O. Concrete shall not be placed during rains sufficiently heavy or prolonged to wash mortar from coarse aggregate on the forward slopes of the placement. Once placement of concrete has commenced in a block, placement shall not be interrupted by diverting the placing equipment to other uses.

P. Replace the last paragraph, Subsection 303-5.1.1, "General," of the Standard Specifications, with the following:

> When removals of curb and/or sidewalk are located at curb return, the Contractor shall install access ramps with cast in place American Disability Act (ADA) Standards / California Code of Regulations (CCR) Title 24 – Accessibility Regulations approved detectable warning panels (truncated domes) and per the latest edition of applicable City Standard Plans.
>
> The Contractor is to construct all sidewalks, access ramps, and gutters in accordance with ADA Standards / CCR Title 24 – Accessibility Regulations and the latest edition of applicable City Standard Plans. The Contractor shall ensure that all newly constructed PCC improvements comply with ADA Standards / CCR Title 24 – Accessibility Regulations and the latest edition of applicable City Standard Plans for cross slope and slope percentage requirements. The Contractor shall measure access ramps, sidewalks, curb and gutter, etc. for compliance using a digital level, also known as an electronic level or “smart level” of two feet (2’) in length.
>
> Access ramp cross slope shall be checked for the entire ramp width from back of curb to top of landing. Sidewalk cross slope shall be checked for entire sidewalk width, as well as longitudinally.
>
> If the sidewalks, access ramps, and gutters constructed by the Contractor are found to be in non-compliance with ADA Standards / CCR Title 24 – Accessibility Regulations, the Contractor will be required to remove and

replace the sidewalks, access ramps, and gutters to ADA Standards / CCR Title 24 – Accessibility Regulations at the Contractor's expense.

All removed curb and gutter, cross gutters, spandrels, driveway approaches, and sidewalks shall be replaced within three (3) calendar days, unless the contractor provides reasonable documentation to exceed the three (3) day limit five (5) working days before removal and approved in writing by the Engineer. The Asphalt Concrete patch shall be placed within five (5) working days after the curb and gutters and cross gutter and spandrels are replaced.

No PCC shall be ordered and/or placed until the forms and subgrade have been inspected and approved by the Engineer in the field.

All traffic signal pull boxes, water meter boxes, water valve covers, street light boxes, and other utility boxes shall be adjusted to proposed finish grade and approved by the Engineer in the field prior to placement of the PCC.

Integral color PCC placed for sidewalk construction shall be continuous pours from the same daily batch. No cold joint between daily pours of PCC will be allowed.

Q. Add to the first paragraph of Subsection 303-5.1.2, "Drainage Outlets Through Curb," of the Standard Specifications, the following:

Coring shall be required for all drains through existing curbs.

R. Replace the last paragraph of Subsection 303-5.1.3, "Driveway Entrances," of the Standard Specifications, with the following:

Driveway approaches including walk shall be 6 in. thick for single family residential areas and 8 in. thick with a minimum of 6 in thick aggregate base for commercial driveways.

S. Revise Subsection 303-5.5.2, "Curb," of the Standard Specifications, as follows:

Delete the first sentence in Paragraph 1 and add the following:

The curb and gutter surface shall not vary more than 0.01 ft. from 10 ft. straightedge except at the grade changes. Prior to the removal of the forms, the surface shall be finished true to grade by means of a straightedge float of not less than 10 ft. in length, and operated longitudinally over the surface of the concrete. Form clamps shall be so constructed as not to interfere with the operation of the float. The form on the front of the curbs shall not be removed less than one (1) hour, or more than six (6) hours after the concrete has been placed. In no event shall forms be removed while the concrete is sufficiently plastic to slump. The top and face of the finished curb shall be true and straight and top surface of curbs shall be of uniform width, free from humps, sags, blemishes, or other irregularities.

T. Add to Subsection 303-5.5.2, “Curb” of the Standard Specifications, the following:

Two component construction grade structural epoxy adhesive shall be used to bond fresh PCC curb to existing asphalt concrete or PCC.

All surfaces to be bonded must be free of standing water, moisture, completely clean of dirt, curing compounds, grease, oil, paint, and unsound materials, which would prevent a solid bond. Smooth surfaces shall be sand blasted or mechanically abraded. All dust shall be vacuumed or swept.

Epoxy components shall be stored at 65° F - 85° F for 24 hours prior to use. The mixed epoxy shall be uniform in color, not show streaks, and not have air entrapment. The Contractor shall mix only the amount of epoxy that can be applied within the product’s pot life. Pot life will decrease as the ambient temperature and/or mass size increases.

U. Add to Subsection 303-5.5.3, "Walk," of the Standard Specifications, the following:

The sidewalk surface shall not exceed one and one-half percent (1.5%) cross fall and not vary more than 0.01 ft. from the 10 ft. straightedge except at grade changes, and the finished surface shall be free from humps, sags, blemishes or other irregularities. All sidewalks shall be a minimum of 4 in. thick, except at driveways where the sidewalks shall be a minimum of 6 in. thick for single family residential areas and 8 in. thick for all other areas and 6 in. thick for curb return landings including access ramps.

V. Add to Subsection 303-5.5.4, “Gutter,” of the Standard Specifications, the following:

A Water Test shall be performed for all new gutter/spandrels and at joins with existing gutter/spandrels to ensure positive flow. The test shall be performed in the presence of a City representative and within 48 hours of the gutter/spandrels being placed. Any sections of gutter/spandrel that do not exhibit positive flow (i.e. ponding, spillover onto AC Pavement, etc.) shall be removed and replaced by the Contractor prior to paving at no cost to the City, and no additional time shall be allowed.

3.03 CONCRETE WORK IN HOT WEATHER

A. Hot weather concreting procedures shall conform to the requirements of ACI 305.

B. When air temperatures exceed 85°F., or when extremely dry conditions exist even at lower temperatures, particularly if accompanied by high winds, the Contractor and his concrete supplier shall exercise special and precautionary measures in preparing, delivering, placing, finishing, curing and protecting the concrete mix. The Contractor shall consult with the Engineer regarding such measures prior to each day's placing operation and the Engineer reserves the right to modify the proposed measures consistent with the requirements of this Section of the Specifications. All necessary materials and equipment shall be on hand an in position prior to each placing operation.

C. Preparatory work at the job site shall include thorough wetting of all forms, reinforcing steel and, in the case of slab pours on ground or subgrade, spraying the ground surface on the preceding evening and again just prior to placing. No standing puddles of water shall be permitted in those areas which are to receive the concrete.

D. The temperature of the concrete mix when placed shall not exceed 90°F.

E. Temperature of mixing water and aggregates shall be carefully controlled and monitored at the supplier's plant, with haul distance to the job site being taken into account. Stockpiled aggregates shall, if necessary, be shaded from the sun and sprinkled intermittently with water. If ice is used in the mixing water for cooling purposes, it must be entirely melted prior to addition of the water to the dry mix.

F. Delivery schedules shall be carefully planned in advance so that concrete is placed as soon as practical after it is properly mixed. For hot weather concrete work (air temperature greater than 85°F), discharge of the concrete to its point of deposit shall be completed within 60 minutes from the time the concrete is batched.

G. The Contractor shall arrange for an ample work force to be on hand to accomplish transporting, vibrating, finishing, and covering of the fresh concrete as rapidly as possible.

3.04 QUALITY CONTROL

A. Field Testing of Concrete

1. The Contractor shall coordinate with the Engineer's project representative the on-site scheduling of the materials testing consultant personnel as required for concrete testing.

2. Concrete for testing shall be supplied by the Contractor at no additional cost to the City, and the Contractor shall provide assistance to the materials testing consultant in obtaining samples. The Contractor shall dispose of and clean up all excess material.

B. Consistency

1. The consistency of the concrete will be checked by the materials testing consultant by standard slump cone tests. The Contractor shall make any necessary adjustments in the mix as the Engineer and/or the materials testing consultant may direct and shall upon written order suspend all placing operations in the event the consistency does not meet the intent of the specifications. No payment shall be made for any delays, material or labor costs due to such eventualities.

2. Slump tests shall be made in accordance with ASTM C 143. Slump tests will be performed as deemed necessary by the materials testing consultant and each time compressive strength samples are taken.

3. Concrete with a specified nominal slump shall be placed having a slump within 1" (higher or lower) of the specified slump. Concrete with a specified maximum slump shall be placed having a slump less than the specified slump.

C. Unit Weight

1. Samples of freshly mixed concrete shall be tested for unit weight by the materials testing consultant in accordance with ASTM C 138.

2. Unit weight tests will be performed as deemed necessary by the Engineer and each time compressive strength samples are taken.

D. Air Content

1. Samples of freshly mixed concrete will be tested for entrained air content by the materials testing consultant in accordance with ASTM C 231.

2. Air content tests will be performed as deemed necessary by the materials testing consultant and each time compressive strength samples are taken.

3. In the event test results are outside the limits specified, additional testing shall occur. Admixture quantity adjustments shall be made immediately upon discovery of incorrect air entrainment.

E. Compressive Strength

1. Samples of freshly mixed concrete will be taken by the materials testing consultant and tested for compressive strength in accordance with ASTM C 172, C 31 and C 39, except as modified herein.

2. In general, one sampling shall be taken for each placement in excess of five (5) cubic yards, with a minimum of one (1) sampling for each day of concrete placement operations, or for each one hundred (100) cubic yards of concrete, or for each 5,000 square feet of surface area for slabs or walls, whichever is greater.

3. Each sampling shall consist of at least five (5) 6x12 cylinders or (8) 4x8 cylinders. Each cylinder shall be identified by a tag, which shall be hooked or wired to the side of the container. The materials testing consultant will fill out the required information on the tag, and the Contractor shall satisfy himself that such information shown is correct.

4. The Contractor shall be required to furnish labor to the City for assisting in preparing test cylinders for testing. The Contractor shall provide approved curing boxes for storage of cylinders on site. The insulated curing box shall be of sufficient size and strength to contain all the specimens made in any four consecutive working days and to protect the specimens from falling over, being jarred or otherwise disturbed during the period of initial curing. The box shall be erected, furnished and maintained by the Contractor. Such box shall be equipped to provide the moisture and to regulate the temperature necessary to maintain the proper curing conditions required by ASTM C 31. Such box shall be located in an area free from vibration

such as pile driving and traffic of all kinds and such that all specimen are shielded from direct sunlight and/or radiant heating sources. No concrete requiring inspection shall be delivered to the site until such storage curing box has been provided. Specimens shall remain undisturbed in the curing box until ready for delivery to the testing laboratory but not less than sixteen hours.

5. The Contractor shall be responsible for maintaining the temperatures of the curing box during the initial curing of test specimens with the temperature preserved between 60°F and 80°F as measured by a maximum-minimum thermometer. The Contractor shall maintain a written record of curing box temperatures for each day curing box contains test specimens. Temperature shall be recorded a minimum of three times a day with one recording at the start of the work day and one recording at the end of the work day.

6. When transported, the cylinders shall not be thrown, dropped, allowed to roll, or be damaged in any way.

7. Compression tests shall be performed in accordance with ASTM C 39. For 6x12 cylinders, two test cylinders will be tested at seven days and two at 28 days. For 4x8 cylinders, three test cylinders will be tested at seven days, three at 28 days. The remaining cylinders will be held to verify test results, if needed.

F. Evaluation and Acceptance of Concrete

1. Evaluation and acceptance of the compressive strength of concrete shall be according to the requirements of ACI 214, ACI 318, and ACI 350.

2. The strength level of concrete will be considered satisfactory if all of the following conditions are satisfied.

   a. Every arithmetic average of any three consecutive strength tests equals or exceeds the minimum specified 28-day compressive strength for the mix (see Article 2.08).

   b. No individual compressive strength test results falls below the minimum specified strength by more than 500 psi.

3. In the event any of the conditions listed above are not met, the mix proportions shall be corrected for the next concrete placing operation.

4. In the event that condition 2B is not met, additional tests in accordance with Article 3.10, paragraph H shall be performed.

5. When a ratio between 7-day and 28-day strengths has been established by these tests, the 7-day strengths shall subsequently be taken as a preliminary indication of the 28-day strengths. Should the 7-day test strength from any sampling be more than 10% below the established minimum strength, the Contractor shall:

a. Immediately provide additional periods of curing in the affected area from which the deficient test cylinders were taken.

b. Maintain or add temporary structural support as required.

c. Correct the mix for the next concrete placement operation, if required to remedy the situation.

6. All concrete which fails to meet the ACI requirements and these specifications is subject to removal and replacement at no additional cost to the City.

G. When non-compliant concrete is identified, test reports shall be sent immediately to the Engineer for review.

H. Additional Tests

1. When ordered by the Engineer, additional tests on in-place concrete shall be provided and paid for by the Contractor.

2. In the event the 28-day test cylinders fail to meet the minimum strength requirements, the Contractor shall have concrete core specimens obtained and tested from the affected area immediately.

a. Three cores shall be taken for each sample in which the strength requirements were not met.

b. The drilled cores shall be obtained and tested in conformance with ASTM C 42. The tests shall be conducted by a materials testing consultant approved by the Engineer.

c. The location from which each core is taken shall be approved by the Engineer. Each core specimen shall be located, when possible, so its axis is perpendicular to the concrete surface and not near formed joints or obvious edges of a unit of deposit.

d. The core specimens shall be taken, if possible, so no reinforcing steel is within the confines of the core.

e. The diameter of core specimens should be at least 3 times the maximum nominal size of the course aggregate used in the concrete, but must be at least 2-inches in diameter.

f. The length of specimen, when capped, shall be at least twice the diameter of the specimen.

g. The core specimens shall be taken to the laboratory and when transported, shall not be thrown, dropped, allowed to roll, or damaged in any way.

h. Two (2) copies of test results shall be mailed directly to the Engineer. The concrete in question will be considered acceptable if the average

compressive strength of a minimum of three test core specimens taken from a given area equal or exceed 85% of the specified 28-day strength and if the lowest core strength is greater than 75% of the specified 28-day strength.

3. In the event that concrete placed by the Contractor is suspected of not having proper air content, the Contractor shall engage a materials testing consultant approved by the Engineer, to obtain and test samples for air content in accordance with ASTM Specification C 457.

3.05 CARE AND REPAIR OF CONCRETE

A. The Contractor shall protect all concrete against injury or damage from excessive heat, lack of moisture, overstress, vandalism during curing, or any other cause until final acceptance by the City. Particular care shall be taken to prevent the drying of concrete and to avoid roughening or otherwise damaging the surface. Care shall be exercised to avoid jarring forms or placing any strain on the ends of projecting reinforcing bars. Any concrete found to be damaged, or which may have been originally defective, or which becomes defective at any time prior to the final acceptance of the completed work, or which departs from the established line or grade, or which, for any other reason, does not conform to the requirements of the Contract Documents, shall be satisfactorily repaired or removed and replaced with acceptable concrete at no additional cost to the City.

B. Areas of honeycomb shall be chipped back to sound concrete and repaired as directed.

C. Concrete formwork blowouts or unacceptable deviations in tolerances for formed surfaces due to improperly constructed or misaligned formwork shall be repaired as directed. Bulging or protruding areas, which result from slipping or deflecting forms shall be ground flush or chipped out and redressed as directed.

D. Areas of concrete in which cracking, spalling, or other signs of deterioration develop prior to final acceptance shall be removed and replaced, or repaired as directed. This stipulation includes concrete that has experienced cracking due to drying or thermal shrinkage of the concrete. Structural cracks shall be repaired using an approved epoxy injection system. Non-structural cracks shall be repaired using an approved hydrophilic resin pressure injected grout system, unless other means of repair are deemed necessary and approved. All repair work shall be performed at no additional cost to the City.

E. Concrete which fails to meet the strength requirements, will be analyzed as to its adequacy based upon loading conditions, resultant stresses and exposure conditions for the particular area of concrete in question. If the concrete in question is found unacceptable based upon this analysis, that portion of the structure shall be strengthened or replaced by the Contractor at no additional cost to the City. The method of strengthening or extent of replacement shall be as directed by the Engineer.

- END OF SECTION -

SECTION 09900

PAINTING

PART 1 -- GENERAL

1.01 THE REQUIREMENT

A. Furnish labor, materials, equipment and appliances required for complete execution of Work shown on Drawings and Specified herein.

B. Section Includes:

1. Paint Materials

2. Field Painting

a. Surface Preparation

b. Piping and Equipment Identification

c. Schedule of Colors

d. Work in Confined Spaces

e. OSHA Safety Colors

1.02 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. Without limiting the generality of these specifications, the Work shall conform to the applicable requirements of the following documents:

1. SSPC – The Society for Protective Coatings Standards

a.	SSPC-Vis 1	Pictorial Surface Preparation Standards for Painting Steel Structures
b.	SSPC-SP2	Hand Tool Cleaning
c.	SSPC-SP3	Power Tool Cleaning
d.	SSPC-SP5	White Metal Blast Cleaning
e.	SSPC-SP6	Commercial Blast Cleaning
f.	SSPC-SP10	Near-White Metal Blast
g.	SSPC-SP13/NACE6	Surface Preparation of Concrete

2. NACE - National Association of Corrosion Engineers

3. ASTM D1737 - Test Method for Elongation of Attached Organic Coatings with Cylindrical Mandrel Apparatus

4. ASTM B117 - Method of Salt Spray (Fog) Testing

5. ASTM D4060 - Test Method for Abrasion Resistance of Organic Coating by the Taber Abraser

6. ASTM D3359 - Method for Measuring Adhesion by Tape Test

1.04 SUBMITTALS

A. In accordance with the procedures and requirements set forth in Section 01300 - Submittals, submit the following:

1. Manufacturer's literature and Material Safety Data Sheets for each product.

2. Painting schedule identifying surface preparation and paint systems proposed. Cross-reference with Tables 9-1 and 9-2. Provide the name of the paint manufacturer, and name, address, and telephone number of manufacturer's representative who will inspect the work. Submit schedule for approval as soon as possible following the Award of Contract, so approved schedule may be used to identify colors and specify shop paint systems for fabricated items.

1.05 SYSTEM DESCRIPTION

A. Work shall include surface preparation, paint application, inspection of painted surfaces and corrective action required, protection of adjacent surfaces, cleanup and appurtenant work required for the proper painting of all surfaces to be painted. Surfaces to be painted are designated within the Painting Schedule.

B. Perform Work in strict accordance with manufacturer's published recommendations and instructions, unless the Engineer stipulates that deviations will be for the benefit of the project.

C. Paint surfaces which are customarily painted, whether indicated to be painted or not, with painting system applied to similar surfaces, areas and environments, and as approved by Engineer.

1.06 QUALITY ASSURANCE

A. Painting operations shall be accomplished by skilled craftsman and licensed by the state to perform painting work.

B. Provide a letter indicating that the painting applicator has five years of experience, and 3 references which show previously successful application of the specified or comparable painting systems. Include the name, address, and the telephone number for the Owner of each installation for which the painting applicator provided services.

1.07 STORAGE AND DELIVERY

A. Bring materials to the job site in the original sealed and labeled containers.

B. Container label to include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.

C. Store paint materials at minimum ambient temperature of 45 degrees F (7 degrees C) and a maximum of 90 degrees F (32 degrees C), in ventilated area, and as required by manufacturer's instructions.

PART 2 -- MATERIALS

2.01 GENERAL INFORMATION

A. The term "paint" is defined as both paints and coatings including emulsions, enamels, stains, varnishes, sealers, and other coatings whether organic or inorganic and whether used as prime, intermediate, or finish coats.

B. Provide primers and intermediate coats produced by same manufacturer as finish coat. Use only thinners approved by paint manufacturer, and only within manufacturer's recommended limits.

C. Ensure compatibility of total paint system for each substrate. Test shop primed equipment delivered to the site for compatibility with final paint system. Provide an acceptable barrier coat or totally remove shop applied paint system when incompatible with system specified, and repaint with specified paint system.

D. Use painting materials suitable for the intended use and recommended by paint manufacturer for the intended use.

E. Personnel shall perform work in strict accordance with the latest requirements of OSHA Safety and Health Standards for construction. Meet or exceed requirements of regulatory agencies having jurisdiction and the manufacturer's published instructions and recommendations. Maintain a copy of all Material Safety Data Sheets at the job site of each product being used prior to commencement of work. Provide and require that personnel use protective and safety equipment in or about the project site. Provide respiratory devices, eye and face protection, ventilation, ear protection, illumination and other safety devices required to provide a safe work environment.

2.02 ACCEPTABLE MANUFACTURERS

A. Subject to compliance with the Specifications, provide products from one of the following manufacturers:

1. Tnemec Company Inc.

2. Ameron

3. Carboline

4. Sherwin-Williams

PART 3 -- EXECUTION

3.01 SURFACE PREPARATION

A. General

1. Surfaces to be painted shall be clean and dry, and free of dust, rust, scale, and foreign matter. No solvent cleaning, power or hand tool cleaning shall be permitted unless approved by the Engineer.

2. Examine surfaces to be coated to determine that surfaces are suitable for specified surface preparation and painting. Report to Engineer surfaces found to be unsuitable in writing. Do not start surface preparation until unsuitable surfaces have been corrected. Starting surface preparation precludes subsequent claim that such surfaces were unsuitable for the specified surface preparation or painting.

3. Surface preparation shall be in accordance with specifications and manufacturer's recommendations. Provide additional surface preparation, and fill coats where manufacturer recommends additional surface preparation, in addition to requirements of specification.

4. Touch-up shop or field applied coatings damaged by surface preparation or any other activity, with the same shop or field applied coating; even to the extent of applying an entire coat when required to correct damage prior to application of the next coating. Touch-up coats are in addition to the specified applied systems, and not considered a field coat.

5. Field paint shop painted equipment in compliance with Color Coding and as approved by Engineer.

B. Metal Surface Preparation

1. Conform to current The Society for Protective Coatings Standards (SSPC) Specifications for metal surface preparation. Use SSPC-Vis-1 pictorial standards or NACE visual standards TM-01-70 or TM-01-75 to determine cleanliness of abrasive blast cleaned steel.

2. Clean nonferrous metals, copper, or galvanized metal surfaces in accordance to SSPC-SP1, Solvent Cleaning, or give one coat of metal passivator or metal conditioner compatible with the complete paint system.

3. Clean shop coated materials or equipment to SSPC-SP 2, Hand Tool Cleaning: Removal of loose rust, loose mill scale, loose paint, and other loose detrimental foreign matter, using nonpower hand tools.

4. Prime cleaned metals immediately after cleaning to prevent rusting.

3.02 APPLICATION OF PAINT

A. Apply paint by experienced painters with brushes or other applicators approved by the Engineer, and paint manufacturer.

B. Apply paint without runs, sags, thin spots, or unacceptable marks.

C. Apply at rate specified by the manufacturer to achieve at least the minimum dry mil thickness specified. Apply additional coats, if necessary, to obtain thickness.

D. Special attention shall be given to nuts, bolts, edges, angles, flanges, etc., where insufficient film thicknesses are likely. Stripe paint prior to applying prime coat. Stripe painting shall be in addition to coats specified.

E. Perform thinning in strict accordance with the manufacturer's instructions, and with the full knowledge and approval of the Engineer and paint manufacturer.

F. Allow paint to dry a minimum of twenty-four hours between application of any two coats of paint on a particular surface, unless shorter time periods are a requirement by the manufacturer. Longer drying times may be required for abnormal conditions as defined by the Engineer and paint manufacturer. Do not exceed manufacturer's recommended drying time between coats.

G. Suspend painting when any of the following conditions exist:

1. Rainy or excessively damp weather.

2. Relative humidity exceeds 85%.

3. General air temperature cannot be maintained at 50°F or above through the drying period, except on approval by the Engineer and paint manufacturer.

4. Relative humidity will exceed 85% or air temperature will drop below 40°F within 18 hours after application of paint.

5. Surface temperature of item is within 5 degrees of dewpoint.

6. Dew or moisture condensation are anticipated.

7. Surface temperature exceeds the manufacturer's recommendations.

3.03 INSPECTION

A. Each field coat of paint will be inspected and approved by the Engineer or his authorized representative before succeeding coat is applied. Tint successive coats so that no two coats for a given surface are exactly the same color. Tick-mark surfaces to receive black paint in white between coats

3.04 PROTECTION OF ADJACENT PAINT AND FINISHED SURFACES

A. Use covers, masking tape, other method when protection is necessary, or requested by Owner or Engineer. Remove unwanted paint carefully without damage to finished paint or surface. If damage does occur, repair the entire surface adjacent to and including the damaged area without visible lapmarks and without additional cost to the Owner.

B. Take all necessary precautions to contain dispersion of paint to the limits of the work. Take into account the effect of wind and other factors which may cause dispersion of the paint. Suspend painting operations when paint cannot be properly confined. Assume all responsibilities and cost associated with damage to adjacent structures, vehicles, or surfaces caused by the surface preparation and painting operations.

3.05 SCHEDULE OF COLORS

A. Match colors indicated. No variation shall be made in colors without the Engineer's approval. Color names and numbers shall be identified according to the appropriate color chart issued by the manufacturer of the particular product in question.

a. Water Line Valve Box Covers: Blue
b. Fire Hydrant Valves Box Covers: Not painted
c. Fire Hydrants: Safety Yellow
d. Recycled Water Valve Box Covers: Purple (pantone 512)

TABLE 9-1
PAINTING SCHEDULE

SURFACE	APPLICATION	PAINTING SYSTEM & NO. OF COATS	PRODUCT REFERENCE (TABLE 9-2)	TOTAL MIN. DRY FILM THICKNESS (MILS)
Metals				
Interior and exterior nonsubmerged (gloss)	All new piping, fire hydrants, valve lids, etc.	1 coat epoxy polyamide primer	104	4-6
		1 coat epoxy polyamide	102	4-6
		1 coat aliphatic polyurethane	115	3-5

1. Painting manufacturer shall verify compatibility of containment liner and chemical to be contained. Where incompatible substitute a compatible coating system.

TABLE 9-2

PRODUCT LISTING

REF.	SYSTEM	PURPOSE	PRODUCT			
			Tnemec Series	PPG/AMERON	CARBOLINE	Sherwin-Williams
101	Acrylic filler	Primer-sealer	130-6601	BLOXFIL 4000	Sanitile 100	Cement-Plex 875
102	Epoxy polyamide	Finish coat semi-gloss or gloss	N69	AMERLOCK 2	Carboguard 890	Dura-Plate 235
103	Acrylic latex	Sealer	1028/1029	PITT TECH PLUS	Carbocrylic 3359DTM	DTM Acrylic Primer/Finish
104	Epoxy Polyamide – metal	Primer	66	AMERCOAT 385	Carboguard 893SG	Macropoxy 646
105	Epoxy	Primer/Finish	20	AMERLOCK 2	Carboguard 561/56LT	Macropoxy 646 PW
106	Coal tar epoxy	Finish high-coat build	46H-413	AMERCOAT 78HB	Bitumastic 300M	Hi-Mil Sher Tar Epoxy
107	Coal tar	Sealer	46-465	AMERCOAT 78HB	Bitumastic 300M	Hi-Mil Sher Tar Epoxy
108	Alkyd-medium oil	Finish coat	2H	DEVGUARD 4308	Carbocoat 8215	Industrial Enamel
109	Alkyd-long oil	Finish coat	1029	DEVGUARD 4308	Carbocoat 8215	Industrial Enamel
110	Epoxy polyamide	Primer	66-1211	AMERCOAT 385	Carboguard 893SG	Macropoxy 646
112	Epoxy polyamide	Sealer	66-1211	AMERCOAT 385	Carboguard 893SG	Macropoxy 920 Pre-Prime
113	Urethane	Barrier coat	530	AMERLOCK SEALER	Rustbond	--
114	Polyamine Epoxy	Intermediate coat	27	AMERLOCK 385	Carboguard 893SG	--
115	Aliphatic Polyurethane	Finish coat	1074 or 1075	AMERCOAT 450 HS	Carbothane 134HG	Acrolon 218HS
116	Acrylic epoxy	Finish coat	113 or 114	AQUAPON WB	Sanitile 255	Water-Based Catalyzed Epoxy
117	Epoxy block filler	Sealer	1254	AMERLOCK 114	Sanitile 600	Kem Cati-Coat HS Epoxy Filler
118	Catalyzed epoxy	Finish coat	84	AMERLOCK 2/400	Carboguard 890	Macropoxy 646
119	High solids epoxy	Finish coat	104	AMERLOCK 400	Carboguard 890	Dura-Plate 235
120	Epoxy	Top coat	N69	AMERLOCK 2/400	Carboguard 890	--

- END OF SECTION -

SECTION 13280

ASBESTOS ABATEMENT & ASBESTOS RELATED DISTURBANCE

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work Included:

1. The work includes permits, notifications, abatement and removal, stockpiling for characterization and disposal of all asbestos-containing materials (ACMs), asbestos-containing construction materials (ACCMs), including waterlines and asbestos-contaminated items, as specified, shown or reasonably implied on the construction drawings and documents or discovered during demolition and renovation activities.

1.02 REFERENCES

A. General - Codes, regulations and references applicable to asbestos abatement work include, but are not limited to the following:

1. American National Standards Institute (ANSI) publications;

Z87.1-2003	Occupational and Educational Eye and Face Protection
Z88.2-92	Practices for Respiratory Protection
Z89.1-86	Requirements for Protective Headgear for Industrial Workers
Z41-91	Personal Protection - Protective Footwear
Z88.6-84	Respiratory Protection - Respiratory Use Physical Qualifications for Personnel

2. American Society for Testing and Materials (ASTM) publications;

D1331-89	Surface and Interfacial Tensions of Solutions of Surface Active Agents
E849-86	Safety and Health Requirement Relating to Occupational Exposure to Asbestos
E1494-92	Specifications for Encapsulants for Friable Asbestos-Containing Building Materials

3. Code of Federal Regulations (CFR);

29 CFR 1926	Safety and Health Regulations for Construction
29 CFR 1910	General Safety and Health Regulations
29 CFR 1910.1020	Access to Employee Exposure and Medical Records
29 CFR 1910.134	Respiratory Protective Equipment
29 CFR 1910.145	Specifications for Accident Prevention Signs and tags
29 CFR 1910.1001	Asbestos – General Industry
29 CFR 1926.1101	Asbestos – Construction Industry
40 CFR 61	Subpart A and Subpart M, USEPA, National Emission Standards for Hazardous Air Pollutants (NESHAPS)

4. Compressed Gas Association, Inc.:

G-7.1	Commodity Specification for Air (1990)

5. National Fire Protection Association (NFPA):

No. 70.1984	National Electrical Code

6. Underwriters Laboratories, Inc.

UL 586-96 (R1996)	Test Performance of High Efficiency Particulate Air Filter Units (8th Ed.; Rev. 1996)

7. National Institute for Occupation Safety and Health (NIOSH):

4th. Ed., Vol. 1, Manual of Analytical Methods, Method 7400 Fibers

8. Environmental Protection Agency Documents:

EPA 530-SW-85-007	Asbestos Waste Management Guidance, May 1985
EPA 560/5-85-024	Guidance for Controlling Asbestos-Containing Material in Buildings, June 1985
EPA 600/4-85-049	Measuring Airborne Asbestos Following an Abatement Action, November 1985
EPA 560 OPTS-86.001	Guide to Respiratory Protection for the Asbestos Abatement Industry, April 1986

9. California Code of Regulations (CCR):

Title 8, Section 1523	Illumination
Title 8, Section 1529	Asbestos in the Construction Industry
Title 8, Section 5144	Respiratory Protective Equipment
Title 8, Section 1531	Construction Respiratory Protective Equipment
Title 8, Section 3204	Access to Employee Exposure and Medical Records
Title 8, Section 5194	Hazard Communication
Title 8, Section 3203	Injury and Illness Prevention Program
Title 8, Article 2.5	Registration Asbestos-Related Work Section 341.6 through 341.14.
Title 8, Section 5208	General Industry Safety Orders, Asbestos Regulations.
Title 22, Division 4,	Minimum Standards for Management of hazardous and extremely hazardous waste
Title 24, Part 9,	California Fire Code Section 8707 - Asbestos Removal.

10. Local Air Pollution Control District (SCAQMD) Regulations (rule 361.140 - 361.156, paying close attention to sections 141, 145 and 150)

11. Other Local Regulations

    California Health and Safety Code 25249-25249.13
    California Health and Safety Code 25915-25919.7

12. General Provisions – Section 10

1.03 DEFINITIONS

A. Definitions specific to work of this section:

1. Abatement: Procedures to control fiber release from ACMs and ACCMs. Includes abatement and removal for pre-demolition purposes.

2. Air Monitoring: The process of measuring the fiber content of a specific volume of air in a stated period of time.

3. Air Sampling Professional: The California Certified Asbestos Consultant (CAC) professional contracted by Contractor to conduct air monitoring and

analysis schemes. This individual is also responsible for recognition of technical deficiencies in worker protection equipment and procedures during both planning and on-site phases of an abatement project, including air sampling related to the contaminated areas prior to, during and upon completion (clearance) of abatement activities.

4. Amended Water: Water to which a surfactant has been added.

5. Asbestos: The term asbestos includes chrysotile, amosite, crocidolite, tremolite, anthophyllite, and actinolite.

6. Asbestos-Containing Construction Material (ACCM): Any manufactured construction material that contains more than one-tenth of one percent but less than one percent (>0.1% but <1.0%) asbestos by weight.

7. Asbestos-Containing Material (ACM): Any material containing more than one percent (>1.0%) asbestos.

8. Asbestos Fibers: This definition refers to asbestos fibers longer than 5 micrometers (also known as microns) with an aspect ratio of 3:1 or larger under phase contrast microscopy (PCM) analytical procedures.

9. Asbestos Structure: The type of asbestos morphology that is counted during an analysis. The four types of asbestos structures are: Fiber, Bundle, Matrix, and Cluster.

10. Encapsulant (sealant): A liquid material which can be applied to asbestos containing material and which controls the possible release of asbestos fiber from the material either by creating a membrane over the surface (bridging encapsulant) or by penetrating into the material and binding its components together (penetrating encapsulant).

11. Encapsulation: Procedures necessary to apply an encapsulant to asbestos containing building materials to control the possible release of asbestos fibers into the ambient air.

12. Enclosure: Procedures necessary to completely enclose asbestos containing material behind airtight, impermeable, permanent barriers.

13. Equipment Decontamination Enclosure: That portion of a decontamination enclosure system designed for controlled transfer of materials and equipment typically consisting of an equipment room, a washroom, and a holding area.

14. Excursion Limit: A limit of 1.0 fibers per cubic centimeter (f/cc) over a 30 minute sampling period to which employees may not be exposed in excess of, without appropriate respiratory protection.

15. Friable Asbestos-Containing Material: Material that contains more than one percent asbestos by weight and that can be crumbled, pulverized, or reduced to powder by hand pressure when dry.

16. HEPA Filter: A high efficiency particulate absolute (HEPA) filter capable of trapping and retaining 99.97 percent of particles (asbestos fibers) greater than 0.3 micrometers in mass median aerodynamic equivalent diameter.

17. HEPA Vacuum Equipment: Vacuuming equipment with a HEPA (UL 586 labeled) filter system.

18. Non-Friable Asbestos-Containing Material: Material that contains (>1%) asbestos in which the fibers have been locked in by a bonding agent, coating, binder, or other material so that the asbestos is well bound and will not release fibers in excess of the asbestos control limit during any appropriate use, handling, demolition, storage, transportation, processing or disposal.

19. Permissible Exposure Limit: An exposure of airborne concentrations of asbestos fibers in excess of 0.10 fibers per cubic centimeter of air as calculated over an 8 hour TWA.

20. Personnel Monitoring: Sampling of airborne asbestos fiber concentrations within the breathing zone of an asbestos worker.

21. Plasticize: To cover building surfaces with plastic sheeting as herein specified.

22. Removal: Procedures necessary to remove asbestos-containing materials from designated areas and to dispose of these materials at an acceptable waste disposal site or treatment facility.

23. Surfactant: A chemical wetting agent added to water to improve penetration and improve control of airborne fiber concentration.

24. Wet Cleaning: The process of eliminating asbestos contamination from building surfaces and objects by using cloths, mops, or other cleaning tools which have been dampened with water, and by afterwards disposing of these cleaning tools as asbestos-contaminated waste.

25. Work Area: Designated rooms, spaces, or areas of the project in which asbestos abatement actions are to be undertaken or which may become regulated as a result of such abatement actions. A contained work area is a work area, which has been sealed and equipped with a decontamination enclosure system. A non-contained work area is an isolated or controlled-access work area, which has not been sealed nor equipped with a decontamination enclosure system.

26. Worker Decontamination Enclosure: That portion of a decontamination enclosure system designed for controlled passage of workers, other personnel, and authorized visitors. It typically consists of a clean room, a shower room, and an equipment room (changing room).

1.04 SUBMITTALS

A. Requirements are as set forth in Section 01300, Submittals for items required to be submitted under this section.

B. Quality Assurance Submittals: Refer to Part 1.05, Quality Assurance, of this Specification.

C. Submit Asbestos Work Plan as specified in Attachment A of this Section 30 days prior to the start of work.

1.05 QUALITY ASSURANCE

A. Qualification: Submit the following documents for asbestos work:

1. Registration: Submit copy of the registration for Asbestos-Related Work from the Division of Occupational Safety and Health in accordance with Title 8, Article 2.5 of the California Code of Regulations.

2. Personnel Training for Superintendent and Foreman: Submit copy of current certificates which verifies that each superintendent and foreman has successfully completed an EPA approved Asbestos Abatement Contractor/Supervisor Course.

3. Personnel Training for Workers: Submit copy of the asbestos abatement employee training program, and current certificates which verify that each employee has successfully completed an EPA approved Asbestos Abatement Worker Course.

4. Respirators: Submit a written standard operating procedure (SOP) governing selection, fit-testing (submit fit-tests for each person wearing a respirator in work area), and use of respirators in accordance with 29 CFR 1910.134, 29 CFR 1926.1101, CGAI Standard G7.1, ANSI Z88.2, and Z88.6. Also submit manufacturer's certification that the respirators to be used in this project comply with these regulatory requirements.

5. Medical Examination: Submit proof that personnel who will work with and will be in contact with ACCM or ACM have had medical examinations, and submit the results of said exam signed by the medical examiner to the City. Comply with 29 CFR 1910.1020 for access to employee exposure and medical records, and make available to the City upon request.

a. Before exposure to airborne asbestos, provide each employee with a comprehensive medical exam meeting the general definition outlined in Title 8 CCR Section 1529.

b. Submit an employee roster to the Engineer for each work shift and confirm in writing within 24 hours of commencement of shift.

c. Submit a signed and notarized "Certificate of Worker's Acknowledgement", for each personnel entering contaminated work areas at any time for the duration of work.

6. Submit a detailed plan of the work procedures for abatement of asbestos materials. (Attachment A – Asbestos Work Plan Outline)

B. Notifications, Communications and Postings: Notify the Engineer at the same time each notification is issued; properly identify each notification for the Engineer.

1. Submit copies of notifications to all appropriate government agencies, including the following, if applicable:

a. California Occupational Safety and Health Administration

b. Asbestos NESHAPS Coordinator
Air Management Division, USEPA
215 Fremont
San Francisco, CA 94105

c. South Coast Air Quality Management District (SCAQMD)

d. Copies of government agency correspondence shall be included in the submittals.

e. Secure approval of local police and fire departments having jurisdiction of the proposed security and safety plans for the work prior to submittal to the Engineer. Contact both departments for the requirements of the approval process.

f. Notify local police and fire departments having jurisdiction prior to commencement and closure of abatement activities in compliance with Part 3 Paragraph Emergency Precautions and Procedures below.

2. Safety Compliance: In addition to detailed requirements of this specification, comply with laws, ordinances, rules, and regulations of federal, state, regional, and local authorities regarding handling, storing, transporting, and disposing of asbestos waste materials. Comply with applicable requirements of the current issue of 29 CFR 1910.1101, and 40 CFR 61, Subparts A, & M, 40 CFR 61.152, and 8 CCR Section 1529. Submit matters of interpretation of standards to the appropriate administrative agency for resolution before starting work. Where requirements of this specification and reference documents vary, the most stringent requirement shall apply.

3. The Contractor shall have at least one copy each of 29 CFR 1910, Subpart I, 29 CFR.1910.1101; 40 CFR Part 61, Subparts A & M; and 8 CCR 1529, at his office and also at the job site.

4. Before the commencement of any work at the site, post bilingual EPA and CAL/OSHA caution signs in and around the work area to comply with EPA and OSHA regulations.

C. Air Monitoring: Personnel monitoring and other monitoring which is required by law or considered necessary by the Contractor for worker protection shall be the responsibility of the Contractor and performed by the Contractor's Air Sampling Professional. The Contractor shall disclose any interest in the firm or laboratory performing the Air Monitoring or analysis.

D. Certifications:

1. Equipment Certification: Submit manufacturer's certification that vacuums, differential pressure equipment filters, and other local exhaust ventilation equipment conform to ANSI Z9.2.

2. Rental Equipment: When rental equipment is to be used in removal areas or to transport waste materials, a copy of the written notification provided to the rental company informing them of the nature of use of the rented equipment shall be submitted to the Engineer and signed by the rental company.

3. Land Disposal Restrictions: Submit a copy of the completed Notice and Certification with each Hazardous Waste Manifest for wastes intended for land disposal pursuant to Section 67740 of 22 CCR, to the Engineer and signed by the generator.

PART 2 - PRODUCTS

2.01 GENERAL

A. Submit manufacturer's product data in accordance with Section 1300, Submittals.

2.02 TAPE, ADHESIVE, SEALANTS

A. Duct tape two inches or wider, or equal, capable of sealing joints of adjacent sheets of plastic sheets and for attachment of plastic sheet to finished or unfinished surfaces of dissimilar materials and capable of adhering under both dry and wet conditions, including use of amended water.

B. Spray adhesive for sealing polyethylene to polyethylene shall contain no methylene chloride compounds.

2.03 PROTECTIVE PACKAGING

A. Appropriately labeled 6 mil (or double 3 mil) sealable polyethylene bags as a minimum.

B. Bilingual labels (English and Spanish) on containment glove bags, waste packages, contaminated material packages and other containers shall be in accordance with EPA or OSHA standards.

2.04 WARNING LABELS AND SIGNS

A. As required by Title 8 CCR Section 1529, 29 CFR 1926.1101 and 29 CFR 1910.145.

2.05 ENCAPSULANTS

A. For bridging encapsulant use:

1. International Protective Coatings Corporation "Serpliflex Concentrate";

2. American Coatings Corporation "Cable Coating 2 B";

3. Stinnes-Western Chemical Corporation "Wedco Wedbestos Acri Seal";

4. Mateson Chemical Corporation "Cover-Up"; or

5. Approved equal.

B. After removal use clear encapsulant as follows:

1. American Coatings Corporation "Cable Coating 22 P";

2. Better Working Environments "BWE 3000";

3. Mateson Chemical Corporation "Cover-Al";

4. Stinnes-Western Chemical Corporation "Wedco Wedbestos Primer"; or

5. Approved equal.

2.06 PERSONAL PROTECTIVE EQUIPMENT

A. Personal Protective Equipment shall comply with the requirements of 29 CFR 1910, Subpart I, 8 CCR 1529 and 8 CCR Division 1, Chapter 4.

B. Work clothes shall consist of fire retardant, disposable, full-body coveralls, head covers, boots and rubber gloves, or equivalent in accordance with 29 CFR 1926.1101, and ANSI Z41. Sleeves at wrists and cuffs at ankles shall be secure.

C. Eye protection and hard hats shall be available as required by applicable safety regulations and shall conform to ANSI 87.1 and 89.1.

D. Provide authorized visitors with suitable protective clothing, headgear, eye protection, and footwear whenever they are required to enter work area.

2.07 RESPIRATORS

A. Provide all workers, foremen, superintendents, authorized visitors, and inspectors personally issued and marked respiratory equipment jointly approved by

NIOSH/MSHA, as required by the applicable regulations. When respirators with disposable filters are employed, provide sufficient filters for replacement as recommended by manufacturers or this specification. Selection of respirators shall be made according to the guidance of Title 8 CCR Section 1529, 29 CFR 1926.1101; ANSI Z88.2; CGAI G7.1; EPA 560 OPTS-86.001; and Table I of this section.

B. When positive pressure supplied air Type "C" equipped with full-face piece respirators are employed, the Air Supply System shall provide Grade "D" breathing air in accordance with OSHA 29 CFR 1910.134 and ANSI Z88.2 and CGAI G7.1.

C. The Compressed Air System for Type "C" Respirators shall be high pressure (nominal 100 psi), with a compressor capacity to satisfy the respirator manufacturer's recommendations. The receiver shall have sufficient capacity to allow a 15 minute escape time for the respirator wearers in the event of compressor failure or malfunction. Type C supplied air respirators with HEPA filter disconnect may be used as an alternate to the 15 minute escape time required with event of compressor failure for Type "C" respirators. The Compressed Air System shall have compressor failure alarm, high temperature alarm, carbon monoxide alarm, and suitable in-line air purifying sorbent beds and filters to assure Grade "D" breathing air.

D. The minimum respiratory protection required for this project is as follows (See also Table I of this section):

1. Use either full face or half face negative pressured air purifying respirators for the following tasks:

   a. Pre-construction sealing of openings and penetrations to the work areas with plastic sheeting.

   b. Decontamination of removables.

   c. Loading asbestos-containing drums on truck for transportation and unloading bags at approved landfill.

   d. During final wipe down of workspace

   e. City and the Contractor's Environmental Monitor will consider alternate respiratory protection systems proposed by the Contractor. The Contractor shall provide documentation that asbestos levels during previous, comparable jobs were within the protection factors of the respirators to be used as outlined in Table I. The use of the following type of respirators is contingent upon approval by City and the Contractor’s Environmental Monitor.

TABLE I		
Maximum Airborne Fiber Concentration Outside Respirator*	Protection Factor	Minimum Acceptable Respirator**
0.1 fiber/cc	10	Half-mask air purifying respirator, other than a disposable respirator, equipped with high efficiency filters
0.5 fibers/cc	50	Full facepiece air-purifying respirator equipped with high efficiency filters.
1.0 fibers/cc	100	Any powered air-purifying respirator equipped with high efficiency filters or any supplied air respirator operated in continuous flow mode.
10.0 fibers/cc	1,000	Type "C" supplied air respirators, full face piece, pressure demand mode.
Over 10.0 fibers/cc	1,000	Type "C" supplied air respirators, full face piece, pressure demand mode, equipped with an auxiliary positive pressure, self-contained breathing apparatus.

Disposable single use respirators are not to be worn for protection against asbestos.

*Must demonstrate that the fiber levels will not exceed 0.01 f/cc inside the respirator based on quantitative mask fit testing for each individual using the respirator protection factor formula.
**Greater respiratory protection is always acceptable regardless of asbestos concentrations.

2. Use high efficiency powered air-purifying respirators (PAPR) for the following provided maximum airborne fiber concentration outside the respirator is at or below 1.0 fibers/cc:

    a. During use of glovebag technique.

    b. During limited use of glovebag technique and removal of piping with asbestos insulation intact.

3. Use Type "C" respirators for the following (follow guidelines set forth in Table I):

    a. At the start of glovebag removal procedures until personal air monitoring indicates fiber levels acceptable for lesser respiratory protection.

    b. Any situation where gross contamination has occurred because of a tear or rupture in the glovebag and air sampling indicates airborne fiber levels have exceeded 1.0 fibers/cc. Use full face piece, supplied air Type "C" respirator, in pressure demand mode, equipped with an auxiliary positive pressure self-contained breathing apparatus.

    c. During removal and encapsulation, use supplied-air, full face piece, Type "C" pressure demand for fiber levels at or below 10.0 fibers/cc

or pressure demand with auxiliary positive pressure self-contained breathing apparatus for fiber levels over 10.0 fibers/cc. When exposure limits are established, respirators presented in Table I that afford adequate protection for the maximum concentrations of airborne asbestos may be used. If respirators other than a Type "C" pressure-demand, supplied-air respirator, are provided, determine the exposure of each employee to airborne asbestos during each type of removal operation. Determine both the excursion limit and the eight hour, time-weighted average concentration of asbestos fibers to which each of the employees is exposed during each type of removal operation.

d. Type "C" Respirators shall be worn with belt to minimize possibility of dislodging facemask when hose becomes snagged in the Work Area.

e. Provide a minimum of two spare hoses to be available at any time to the City and their authorized visitors and inspectors to connect to their assigned clean Type "C" respirator without having to displace worker from abatement area to obtain a hose connection if use of Type "C" becomes necessary.

4. Alternate respiratory protection systems proposed by the Contractor will be considered by the Contractor's Environmental Monitor. Documentation shall be provided by the Contractor that asbestos levels during previous, comparable jobs were within the protection factors of the respirators to be used as outlined in Table I. The use of the following type of respirators is contingent upon approval by the Contractor's Environmental Monitor.

5. When Type "C" respirators are not required according to the OSHA standard (29 CFR 1926.1101, Title 8CCR 1529 or this specification, whichever is more stringent), provide workers with approved, permanent, personally-issued and marked respirators with replaceable filters. Provide sufficient quantity of filters jointly approved by NIOSH/MSHA for use in asbestos environments so that workers can change filters as required by manufacturer during the workday. Filters shall not be used any longer than one workday. Respirator filters shall be stored at job site in Clean Room and shall be totally protected from exposure to asbestos prior to their use.

E. Compressors shall meet the requirements of 29 CFR 1910.134 and 29 CFR 1910 Subpart I. Periodic inspection of the carbon monoxide monitor shall be evidenced. Documentation of adequacy of compressed air system/respiratory protection system shall be retained on-site. Documentation shall include a list of compatible components with the maximum number and type of respirators that may be used with the system. Periodic testing of compressed air shall insure that systems provide air of sufficient quality.

PART 3 - EXECUTION

3.01 PROJECT PROCEDURES:

A. Abatement Procedure Plans: Submit a detailed plan of the work procedures for abatement of asbestos materials 30 days prior to the start of work. At a minimum include the following and as specified in Attachment A – Asbestos Work Plan Outline:

1. Pothole and sample under supervision of a City Representative any water mains, steam lines, or natural gas mains to be demolished.

2. Personnel monitoring procedures in accordance with 29 CFR 1926.1101 and 8CCR 1529.

3. Phasing of abatement work indicating daily roster of workers for each phase.

4. Security system warning signs locations in accordance with 29 CFR 1926.58

5. Standard procedures for protecting workers, visitors, and employees and protection of spaces outside Work Area from contamination.

B. Emergency Precautions and Procedures: Submit a detailed plan of Emergency Precautions and Procedures. At a minimum include the following:

1. Local medical emergency personnel, both ambulance crews and hospital emergency room staff, shall be notified prior to commencement of abatement operations as to the possibility of having to handle contaminated or injured workers, and shall be advised on safe decontamination.

2. The Contractor shall be prepared to administer first aid to injured personnel after decontamination. Seriously injured personnel shall be treated immediately or evacuated without delay for decontamination. When an injury occurs, the Contractor shall stop Work and implement fiber reduction techniques (e.g., water spraying) until the injured person has been removed from the work area.

3.02 PREPARATION

A. Exposing Existing Pipe:

1. When making connections to existing Asbestos Cement (AC) pipe, the Contractor shall take every precaution to minimize the potential for causing asbestos fibers from becoming airborne, including but not limited to:

a. When within approximately one foot of existing AC pipe excavate and expose by hand.

3.03 CONNECTIONS

A. Once existing AC pipe has been exposed, the Contractor shall identify the most appropriate location for connection in accordance with the Contract Drawings. Contractor shall mark the existing AC pipe for sawcut at the proposed location of connection.

B. Cutting the existing AC pipe shall be performed using methods such as wet saw cutting or saw cutting while using HEPA filtered vacuum equipment that maintain fiber levels at or below 0.01f/cc, as required by the applicable regulations. Methods that raise dust, such as dry saw cutting without HEPA filtered vacuum equipment shall not be used.

C. Notify the Engineer 48 hours in advance of marking the pipe for removal. Engineer shall approve extent of pipe to be removed prior to cutting and removing pipe.

D. Workers performing the cutting, removal, and loading of existing AC pipe shall wear the required PPE at all times.

3.04 ENCAPSULATION OF ASBESTOS

A. Remove pipe segments and damaged, loose or hanging asbestos material as required. Pack in labeled, sealable plastic bags, 6 mil minimum thickness and place in labeled containers for transport.

B. Seal filled containers. Place caution labels on containers in accordance with OSHA regulation 29 CFR 1910.1101(g)(2) and 8 CCR 1529. Disposal procedure and clean up shall be in accordance with 29 CFR 1926.1101and 8CCR 1529. Store filled containers in container area.

C. Clean external surfaces of containers thoroughly by wet sponging in the designated wet sponge area which is part of Decontamination Enclosure System. Ensure the contaminated workers dispose of their contaminated coveralls in the shower room except respirators; after wet cleaning the containers and moving them to the holding area, still wearing the respirator, proceed naked to the showers; then follow the procedure of respirator washing, showering, drying off, and dressing in clean clothes as outlined under Article 3.01 (C) Worker Protection Procedures (Bilingual), of this section.

3.05 DISPOSAL

A. Waste Transportation: Submit the method of transport of hazardous waste including name, address, EPA I.D. number and telephone number of transporter.

B. Hazardous Waste Site: Submit for approval the name, class, address, EPA I.D. number and telephone number of hazardous waste site(s) to be utilized for disposal.

C. Waste Manifest: Submit for approval a filled out Waste Manifest form. For Waste Manifest purposes the Generator is the facility of the subject work. Obtain necessary information for this purpose from the Engineer. Give a copy of the Waste Manifest to the Engineer for each required shipment.

D. Containers to be loaded for transportation from the holding area shall be removed by workers dressed in clean overalls.

E. The sealed asbestos containers shall be delivered to the Contractor's pre-designated approved Hazardous Waste Site for burial; in accordance with Title 22, CCR, EPA guidelines and 40 CFR 61.156 and the South Coast Air Quality Management District Regulations.

F. Notify the Engineer 48 hours in advance of the time when contaminated materials are to be removed from the site.

G. The Contractor shall be responsible for safe handling and transportation of hazardous waste generated by this contract to the designated Hazardous Waste Site.

3.06 AIR MONITORING

A. Area Air Monitoring: The Contractor’s Air Sampling Professional shall conduct area air monitoring which shall be witnessed by the Engineer and shall be scheduled 48 hours prior to any testing or inspection. If area air monitoring outside the work area is in excess of 0.01 f/cc the Contractor shall make changes in work procedures to assure compliance with minimum standards. Unsatisfactory results are fiber counts in excess of 0.01 fibers/cc by PCM using the NIOSH 7400 Method outside the work area for area air monitoring.

B. The Contractor shall submit written report to the Engineer of the Contractor's personnel monitoring before the start of work on the following day. Personnel air monitoring shall not exceed the levels recommended for the type of respiratory gear in use.

3.07 CLEAN UP

A. Maintain a clean project site during and upon completion of work of this Section. Cleaning shall be in accordance with the General Requirements and Technical Specifications.

ATTACHMENT A
ASBESTOS WORK PLAN OUTLINE

In accordance with Contract Documents, the Contractor is required to prepare a written (typed or word-processed), site-specific Asbestos Work Plan, and submit to the Engineer prior to start of work. This plan is required for the Contractor to meet OSHA requirements as well as the Contract Documents, and shall describe work procedures and control methods that will protect City facilities, and staff.

The Contractor shall prepare the Asbestos Work Plan to include, at a minimum, the following information:

I. Location of Work

The work to be completed under this Asbestos Work Plan will be completed at _____, Manhattan Beach, California.

Previous hazardous materials inspections or surveys have found that asbestos-containing materials are present at the following locations:
A. _____
B. _____

The presence of asbestos represents a hazard to workers who may disturb these materials during the course of this work.

II. Description of Work

Describe the anticipated work scope, including:
A. Removal *(list materials and locations)*
B. Encapsulation *(list materials and locations)*
C. Repair *(list materials and locations)*
D. Decontamination *(list materials and locations)*
E. Any other activities that will or may result in worker exposures to asbestos.

III. Schedule

A. General
Start Date:
Completion Date:

The competent person, _____, will conduct worksite visual inspections on a daily basis, or more often as necessary.

IV. Equipment and Materials

List all equipment and materials to be used, such as the following. List trade names or types where known.

HEPA vacuums

Scrapers
Power saws
Hammers
Screwdrivers
Pry bars
Cutting shears
Other hand tools

Negative air filtration units
Manometers
Airless sprayers/compressors
Cleaning detergents
Solvents (must be approved by the City)

Paints/sealants/encapsulants (must be approved by the City)
Rollers/brushes

Butyl rubber gloves
Disposable coveralls
Respiratory protection

Cotton work gloves
Leather work gloves

V. Crew

List all workers and supervisors, with emergency contact names and pagers.

Clearly identify the supervisor and competent person who has authority for all safety and health.

VI. Control Measures and Work Procedures

Describe, in a narrative format, specific work procedures, exposure / contamination controls, and engineering controls. This description should include, but not be limited to, the following types of information:

OSHA Class I, II, III, IV
Negative pressure enclosure
Wet methods
Glovebagging
Respiratory Protection
HEPA vacuums
Containment (polyethylene barriers) without negative pressure
Solvent removal of mastic
Other procedures *(list)*

VII. Respiratory Protection and Protective Clothing/Personal Protective Equipment

List all respiratory protection, including types and manufacturers, which are anticipated for this project. Identify the phases of the project for which respirators will be required or likely to be required.

List all personal protective equipment anticipated to be used on the project.

VIII. Decontamination/Hygiene Facilities

Identify the types and locations of decontamination or hygiene facilities to be used on this project. Specify use of disposable towels, soap, hot and cold water, and other supplies, all to be provided by the Subcontractor.

Specify the required use of the facilities, including use of the facilities prior to eating, drinking, and smoking, and before leaving the project site.

Describe handling or treatment of asbestos-contaminated solid waste and wastewater.

IX. Air Monitoring Data

Identify general worker air monitoring protocol to be followed on this project, including worker category classifications, frequency of monitoring, anticipated laboratory to be used for sample analysis, and how pumps are calibrated and worn by employees. Identify competent person who will oversee Subcontractor's air monitoring.

X. Worker Training and Qualifications

Provide the Subcontractor's worker documents as an attachment to the asbestos work plan. Include each worker's current AHERA training records, respiratory protection training and fit-testing certification, and asbestos and respiratory protection medical clearances.

XI. Notification

Describe all arrangements made on multi-employer work sites to inform affected employers about the asbestos project. Attach copies of any notifications.

XII. Containment Diagram

Include a diagram (either neatly and legibly hand-drawn, or generated on a word processor or CAD program) of the containment showing the containment perimeter in relation to surrounding areas, locations of negative air machines, direction of air flow, decontamination chamber, bag out area, exhaust points to exterior of building, etc.

XIII. Waste

Describe how all waste generated on this project will be packaged, labeled, stored, transported, manifested, and disposed of.

XIV. Preparation of Asbestos Work Plan

Date Prepared:

Prepared By *(signature, name, title and DOSH Certified Asbestos Consultant number)*

END OF SECTION

SECTION 15000

BASIC MECHANICAL REQUIREMENTS

PART 1 -- GENERAL

1.01 THE REQUIREMENT

A. The Contractor shall furnish and install to the required line and grade, all piping together with all fittings and appurtenances, required for a complete installation.

B. The Contractor shall furnish and install fittings, couplings, connections, sleeves, adapters, harness rods and closure pieces as required to connect pipelines of dissimilar materials and/or sizes herein included under this Section and other concurrent Contracts for a complete installation.

C. The Contractor shall furnish all labor, materials, equipment, tools, and services required for the furnishing, installation and testing of all piping as shown on the Drawings, specified in this Section and required for the Work. Piping shall be furnished and installed of the material, sizes, classes, and at the locations shown on the Drawings and/or designated in this Section. Piping shall include all fittings, adapter pieces, couplings, closure pieces, harnessing rods, hardware, bolts, gaskets, and other associated appurtenances for required connections to equipment, valves, or structures for a complete installation.

D. In accordance with the most current version of AWWA C651 and these specifications, the Contractor shall furnish all labor, materials, equipment, tools, and services required for the disinfection, bacteriological testing, re-disinfection as necessary, and disposal of chlorinated water of all water mains and appurtenances taken out of service, all new water mains and temporary pipelines, and components incorporated into a connection to the City's existing system prior to installation. Submit Field Disinfection Plan at least 15 days prior to starting the work.

E. The Contractor shall furnish all labor, materials, equipment, tools, and services required for hydrostatic testing of new water mains. Submit Field Hydrostatic Testing Plan at least 15 days prior to starting the work and at a minimum, include the following:

1. Testing dates
2. Sections to be tested
3. Method of isolation
4. Method of conveying the water from source to section begin tested
5. Method of disposal of test water
6. Calculation of maximum allowable leakage for section being tested

F. The work shall include, but not be limited to, the following:

1. Connections to existing pipelines.

2. Test excavations necessary to locate or verify existing pipe and appurtenances.

3. Installation of all new pipe and materials required for a complete installation.

4. Cleaning, testing and disinfecting as required.

1.03 MATERIAL CERTIFICATION AND SHOP DRAWINGS

A. The Contractor shall furnish to the City (through the Engineer) a Material Certification stating that the pipe materials and specials furnished under this Section conform to all applicable provisions of the corresponding Specifications. Specifically, the Certification shall state compliance with the applicable standards (ASTM, AWWA, etc.) for fabrication and testing.

B. Shop Drawings for major piping (2-inches in diameter and greater) shall be prepared and submitted in accordance with Section 01300 – Submittals. In addition to the requirements of Section 01300 – Submittals, the Contractor shall submit laying schedules and detailed Drawings in plan and profile for all piping as specified and shown on the Drawings.

C. Shop Drawings shall include, but not be limited to, complete piping layout, pipe material, sizes, class, locations, necessary dimensions, elevations, pipe joints, and the details of fittings including methods of joint restraint. No fabrication or installation shall begin until Shop Drawings are approved by the Engineer.

PART 2 -- PRODUCTS

2.01 GENERAL

A. All specials and every length of pipe shall be marked with the manufacturer's name or trademark, size, class, and the date of manufacture. Special care in handling shall be exercised during delivery, distribution, and storage of pipe to avoid damage and unnecessary stresses. Damaged pipe will be rejected and shall be replaced at the Contractor's expense. Pipe and specials stored prior to use shall be stored in such a manner as to keep the interior free from dirt and foreign matter.

B. Testing of pipe before installation shall be as described in the corresponding ASTM or AWWA Specifications and in the applicable standard specifications listed in the following sections. Testing after the pipe is installed shall be as specified in Section 3.09.

C. Restrained joints shall be as specified in Section 15006, Ductile Iron Pipe.

D. The Drawings indicate work affecting existing piping and appurtenances. The Contractor shall excavate test pits as required of all connections and crossings which may affect the Contractor's work prior to ordering pipe and fittings to determine sufficient information for ordering materials. The Contractor shall take whatever measurements that are required to complete the work as shown or specified.

E. The Contractor shall maintain on hand at all active construction locations an adequate supply of fittings and fitting hardware to complete the work as approved in the pipe lay submittal. The Contractor shall also maintain extra fittings at all active construction locations such that if field adjustments to the horizontal or vertical alignment of the pipe it can be accomplished without stopping work.

2.02 AIR RELEASE VALVES

A. Air Release Valves shall be compound lever type conforming to AWWA C-512 with stainless steel internal components.

B. Air Release Valves shall be Crispin UL Model, or approved equal. Size shall be as identified on the drawings.

2.03 COUPLINGS

A. Sleeve type, flexible couplings shall be furnished and installed where shown on the Drawings or otherwise required to resist internal operating pressures. In addition to that specified herein, harnessed, sleeve type flexible couplings shall be provided on all exposed pipe 3 inches and larger in diameter that spans any expansion joint in a building or structure.

B. Materials shall be of high strength steel and couplings shall be rated for the same pressures as the connecting piping.

C. Gaskets shall be rubber. Bolts and nuts shall be alloy steel, corrosion-resistant and prime coated.

D. Harnessing for exposed applications shall be by rodding across the sleeve type coupling to the nearest pipe joint on either side of the coupling using threaded rods and rod tabs unless otherwise approved by the Engineer.

E. Couplings shall be as manufactured by Smith-Blair Model 461, Romac Industries Model 501, Dresser Industries Style 38 or 138, or equal as required and shown on the Drawings. All couplings shall be provided without interior pipe stop.

F. Couplings shall be provided with manufacturer's fusion bonded epoxy painting system.

2.04 FLANGED COUPLING ADAPTERS

A. Flanged coupling adapters shall be furnished as required and as shown on the Drawings.

B. Flanged coupling adapters shall be of ductile iron or carbon steel construction and shall be rated for the same pressure as the connected piping.

C. All flanged coupling adapters shall be harnessed by tying the adapter to the nearest pipe joint flange using threaded rods and rod tabs unless otherwise approved by the Engineer.

D. Flanged coupling adapters shall be manufactured by Smith-Blair Model 920, Romac Industries Model FCG, or approved equal.

E. Flanged coupling adapters shall be provided with manufacturer's fusion bonded epoxy painting system.

2.05 TAPPING SLEEVES AND TAPPING SADDLES

A. Tapping sleeves shall be similar to Mueller Outlet Seal, American Uniseal or Kennedy Square Seal. All sleeves shall have a minimum working pressure of 150 psi. All sleeves larger than twelve (12) inches shall be ductile iron.

B. Tapping saddles may be used on mains sixteen (16) inches and larger where the required tap size does not exceed one-half the size of the main (i.e. 8-inch tapping saddle for use on a 16-inch main). Tapping saddles shall be manufactured of ductile iron providing a factor of safety of at least 2.5 at a working pressure of 250 psi. Saddles shall be equipped with a standard AWWA C-110-77 flange connection on the branch. Sealing gaskets shall be "O" ring type, high quality molded rubber having an approximate seventy durometer hardness, placed into a groove on the curved surface of the tapping saddles. Straps shall be of alloy steel. The tapping saddle shall be the American tapping saddle, U.S. Pipe tapping saddle, or equal.

C. All taps shall be machine drilled; no burned taps will be allowed.

2.06 COUPLING JOINT RESTRAINT

A. Restrainer for use over coupling between asbestos cement pipe and ductile iron pipe consisting of two multi-piece wide saddles, one for each side of the coupling and tie-rods.

B. Restrainers shall secure around the pipe by tightening bolts such that an even pressure is provided around the circumference of the pipe as to not produce any point or concentrated loads on either pipe.

C. Restrainers shall be epoxy coated. Tie-rods and hardware shall be stainless steel.

D. Restrainers shall be provided with taller restraint batwings for clearance over coupling.

E. Asbestos cement pipe to ductile iron pipe joint restraint shall be JMC Industries JMC-630/JCM-610, or approved equal.

2.07 SERVICE SADDLES

A. Service saddles shall be double strap, bronze body, with AWWA taper (CC) thread for use with ductile iron pipe, NSF 61 approved. Approved saddles are Mueller Series BR2B, or approved equal.

2.08 CAPS AND PLUGS

A. Ductile iron cap, plastic, or rubber expansion that fits within the inside diameter or over the outside diameter of the pipe being plugged to prevent backfill material from entering the abandon pipe.

PART 3 -- EXECUTION

3.01 INSTALLATION

A. All piping shall be installed by skilled workers and in accordance with the applicable standard practice for piping installation as shown on the Drawings, specified or recommended by the pipe manufacturer. Proper tools and appliances for the safe and convenient handling and installing of the pipe and fittings shall be used. Great care shall be taken to prevent any pipe coating from being damaged on the inside or outside of the pipe and fittings. All pieces shall be carefully examined for defects, and no piece shall be installed which is known to be cracked, damaged, or otherwise defective. If any defective pieces should be discovered after having been installed, it shall be removed and replaced with a sound one in a satisfactory manner by the Contractor and at his own expense.

B. Pipe and fittings shall be thoroughly cleaned before they are installed and shall be kept clean until they are accepted in the complete work.

C. All piping connections to equipment shall be provided with unions or coupling flanges located so that piping may be readily dismantled from the equipment. At certain applications, Dresser, Victaulic, or equal, couplings may also be used.

D. All piping shall be erected to accurate lines and grades with no abrupt changes in line or grade and shall be supported and braced against movement, temporary, or permanent. All exposed piping shall be installed with vertical and horizontal angles properly related to adjoining surfaces or pipes to give the appearance of good workmanship.

E. All excavation shall be made in such a manner and to such widths as will provide ample room for properly installing the pipe and permit thorough compaction of backfill around the pipe. The minimum trench widths shall be in accordance with the Drawings. All excavation and trenching shall be done in strict accordance with these specifications and all applicable parts of the OSHA Regulations, 29CFR 1926, Subpart P.

F. All excavation required by this contract shall be unclassified. Contractor shall excavate to the grades shown on the drawings with no additional payment.

G. Enlargements of the trench shall be made as needed to give ample space for operations at pipe joints. The width of the trench shall be limited to the maximum dimensions shown on the Drawings, except where a wider trench is needed for the installation of and work within sheeting and bracing. Except where otherwise specified, excavation slopes shall be flat enough to avoid slides which will cause disturbance of the subgrade, damage to adjacent areas, or endanger the lives or safety of persons in the vicinity.

H. Hand excavation shall be employed wherever, in the opinion of the Engineer, it is necessary for the protection of existing utilities, poles, trees, pavements, or obstructions.

I. No greater length of trench in any location shall be left open, in advance of pipe laying, than shall be authorized or directed by the Engineer and, in general, such length shall be limited to approximately one hundred (100) feet. The Contractor shall excavate the trenches to the full depth, width and grade indicated on the Drawings including the relevant requirements for bedding. The trench bottoms shall then be examined by the Engineer as to the condition and bearing value before any pipe is laid or bedding is placed.

J. No pressure testing shall be performed until the pipe has been properly backfilled in place.

K. Joint Deflection shall not exceed 80 percent of the manufacturers recommended deflection.

L. Excavation and backfilling shall conform to the requirements of Section 02200 – Earthwork, Section 2223 – Trench Backfill, the Drawings, and as specified herein. All exposed, submerged, and buried piping shall be adequately supported and braced by means of hangers, concrete piers, pipe supports, or otherwise as may be required by the location.

M. Following proper preparation of the trench subgrade, pipe and fittings shall be carefully lowered into the trench so as to prevent dirt and other foreign substances from gaining entrance into the pipe and fittings. Proper facilities shall be provided for lowering sections of pipe into trenches. Under no circumstances shall any of the materials be dropped or dumped into the trench.

N. Water shall be kept out of the trench until jointing and backfilling are completed. When work is not in progress, open ends of pipe, fittings, and valves shall be securely closed so that no water, earth, or other substance will enter the pipes, fitting, or valves. Pipe ends left for future connections shall be valved, plugged, or capped, and anchored as shown on the Drawings.

O. Pipes crossing within a vertical distance of less than or equal to one (1) foot shall be encased and supported with concrete at the point of crossing to prevent damage to the adjacent pipes as shown on the Drawings.

P. The full length of each section of pipe shall rest solidly upon the bed of the trench, with recesses excavated to accommodate bells, couplings, joints, and fittings. Before joints are made, each pipe shall be well bedded on a solid foundation; and no pipe shall be brought into position until the preceding length has been thoroughly bedded and secured in place. Pipe that has the grade or joint disturbed after laying shall be taken up and re-laid by the Contractor at his own expense. Pipe shall not be laid in water or when trench conditions are unsuitable for work.

Q. Proper and suitable tools and appliances for the safe convenient handling and laying of pipe shall be used and shall in general agree with manufacturer's recommendations.

R. At the close of each workday, the end of the pipeline shall be tightly sealed with a cap or plug so that no water, dirt, or other foreign substance may enter the pipeline. This plug shall be kept in place until pipe laying is resumed.

S. During the laying of pipe, each pipe manufacturer shall provide his own supervisor to instruct the Contractor's pipe laying personnel in the correct procedure to be followed.

T. Ordinarily only full lengths of pipe (as furnished by the pipe manufacturer) shall be used, except where closure pieces at tie-ins, between fittings, and areas where joint deflection is required.

U. For gravity sewer installations, the Contractor shall use a laser device to maintain the trench and pipe alignment. The laser device shall be re-checked for correct elevation and pipe alignment prior to pipe installation if the device is left in the pipe overnight. Corrected invert elevations at each manhole and any adjustments will be coordinated and approved by the Engineer.

V. Detector tape shall be as specified in Section 2223 – Trench Backfill.

W. At the close of each workday pipeline trenches shall be completely backfilled or plated with steel trench plates.

3.02 DUCTILE IRON PIPE

A. Ductile Iron Pipe shall be as specified in Section 15006.

B. Ductile iron pipe shall be installed in accordance with the requirements of the Ductile Iron Pipe Handbook published by the Ductile Iron Pipe Research Association, and AWWA C600.

B. Where it is necessary to cut ductile iron pipe in the field, such cuts shall be made carefully in a neat workmanlike manner using approved methods to produce a clean square cut. The outside of the cut end shall be conditioned for use by filing or grinding a small taper, at an angle of approximately 30 degrees.

C. Unless otherwise approved by the Engineer, field welding of Ductile Iron Pipe will not be permitted.

3.07 COPPER PIPE

A. Installation of copper pipe shall be by skilled workman in accordance with the manufacturer's recommendations. Use Teflon tape at all fittings unless otherwise required for intended service. Install unions at the connections to each piece of equipment to allow removal of equipment without dismantling connecting piping.

B. All branches shall be pitched at least one (1) inch in twenty-five (25) feet toward fixtures. The piping installation shall be arranged so that the entire system can be drained through fixture supply connections.

C. Unions shall be installed at the connections to each piece of equipment to allow for removal of equipment without dismantling connecting piping.

D. Joints 1-1/4 inches and larger shall be made with silver solder. For joints less than 1-1/4 inches and all valves (regardless of size) use 95/5 solder. Soldered joints shall be prepared with a non-corrosive paste flux in accordance with manufacturer's instructions. All joints shall be thoroughly cleaned with emery cloth and reamed out before assembly. Acid core solder will not be permitted.

3.09 SERVICE SADDLES

A. Service saddles shall be made to the main pipeline after it has been installed with dual Polyethylene Encasement layers by applying three wraps of polyethylene adhesive tape completely around the pipe to cover the area where the tapping and required equipment for tapping will be attached.

B. Locate saddles a minimum of 24-inches away from any pipe joint, fitting, or other service saddles.

C. Multiple service saddles installed on the same side of a single pipe spool shall be alternated at 10 degrees and 30 degrees above horizontal.

3.10 JOINTS IN PIPING

A. Unless noted otherwise, all joints shall be restrained joints as specified herein and shown on the Drawings.

B. Push-on joints include a single rubber gasket which fits into the bell end of the pipe. The gasket shall be wiped clean, flexed and then placed in the socket. Any bulges in the gasket which might interfere with the entry of the plain end of the pipe shall be removed. A thin film of lubricant shall be applied to the gasket surface which will come into contact with the spigot end of the pipe. The lubricant shall be furnished by the pipe manufacturer. The plain end of the pipe shall be wiped clean and a thick film of lubricant applied to the outside. The pipe shall be aligned and carefully entered into the socket until it just makes contact with the gasket. The joint assembly shall be completed by entering the pipe past the gasket until it makes contact with the bottom of the socket. The pipe shall be pulled "home" with an approved jack assembly as recommended by the pipe manufacturer. If assembly is not accomplished by reasonable force, the plain end shall be removed, and the condition corrected.

C. Flanged joints shall be brought to exact alignment and all gaskets and bolts or studs inserted in their proper places. Bolts or studs shall be uniformly tightened around the joints. Where stud bolts are used, the bolts shall be uniformly centered in the connections and equal pressure applied to each nut on the stud. Pipes in all lines subject to temperature changes shall be cut short and cold sprung into place to compensate for expansion when hot.

D. Mechanical joints shall be made up with gaskets, glands and bolts. When a joint is to be made up, the bell or socket and plain end shall be cleaned and washed with a solution of mild soap in water; the gland and gasket shall be slid onto the plain end and the end then entered into the socket until it is fully "home" on the centering ring. The gasket shall then be painted with soapy water and slid into position, followed by the gland. All bolts shall be inserted and made up hand tight and then tightened alternately to bring the gland into position evenly. Excessive tightening of the bolts shall be avoided. All nuts shall be pulled up using a torque wrench which will not permit unequal stresses in the bolts. Torque shall not exceed the recommendations of the manufacturer of the pipe and bolts for the various sizes. Care shall be taken to assure that the pipe remains fully "home" while the joint is being made. Joints shall conform to the applicable AWWA Specifications.

E. Threaded and/or screwed joints shall have long tapered full depth threads to be made with the appropriate paste or jointing compound, depending on the type of fluid to be processed through the pipe. All pipe up to, and including 1-1/2-inches, shall be reamed to remove burr and stood on end and well pounded to remove scale and dirt. Wrenches on valves and fittings shall be applied directly over the joint being tightened. Not more than three pipe threads shall be exposed at each connection. Pipe, in all lines subject to temperature changes shall be cut short and cold sprung into place to compensate for expansion when hot. Joints in plastic piping (PVC/CPVC) shall be laid and joints made with compounds recommended by the manufacturer. Installation shall conform to the requirements of ASTM D2774 and ASTM D2855. Unions required adjacent to valves and equipment.

F. Soldered joints shall have the burrs removed and both the outside of pipe and the inside of fittings shall be thoroughly cleaned by proper tools recommended for that purpose. Flux shall be applied to both pipe and inside of fittings and the pipe placed into fittings and rotated to insure equal distribution of flux. Joints shall be heated and solder applied until it shows uniformly around the end of joints between fitting and pipe. All joints shall be allowed to self-cool to prevent the chilling of solder. Combination flux and solder paste manufactured by a reputable manufacturer is acceptable. Unions required adjacent to valves and equipment.

G. Copper joints shall be thoroughly cleaned, and the end of pipes uniformly flared by a suitable tool to the bevels of the fittings used. Wrenches shall be applied to the bodies of fittings where the joint is being made and in no case to a joint previously made. Dimensions of tubing and copper piping shall be in complete accordance with the fittings used. No flare joints shall be made on piping not suited for flare joints. Installations for propane gas shall be in accordance with NFPA 54 and/or 58.

H. Dielectric isolation such as flange isolation kits, dielectric unions, or similar, shall be installed wherever dissimilar metals are connected according to the following table.

	Zinc	Galvanized Steel	Aluminum	Cast Iron	Ductile Iron	Mild Steel/ Carbon Steel	Copper	Brass	Stainless Steel
Zinc			●	●	●	●	●	●	●
Galvanized Steel			●	●	●	●	●	●	●
Aluminum	●	●		●	●	●	●	●	●
Cast Iron	●	●	●				●	●	●
Ductile Iron	●	●	●				●	●	●
Mild Steel/ Carbon Steel	●	●	●				●	●	●
Copper	●	●	●	●	●	●			●

Brass	●	●	●	●	●	●			●
Stainless Steel	●	●	●	●	●	●	●	●	

1. "●" signifies dielectric isolation is required between the two materials noted.
2. Consult Engineer for items not listed in table.
3. Provide flange isolation kits for all flanged connections of dissimilar metals and hardware including connections to equipment.
4. Contractor shall include all isolation descriptions with piping submittals.

I. Eccentric reducers shall be installed where air or water pockets would otherwise occur in mains because of a reduction in pipe size.

3.11 FLUSHING AND TESTING

A. All piping shall be properly flushed and tested unless specifically exempt elsewhere in the Specifications or otherwise approved by the Engineer. All other liquid conveying pipelines shall be flushed and tested with water. The Contractor shall furnish and install all means and apparatus necessary for getting the water into the pipeline for flushing and testing including pumps, gauges, and meters, any necessary plugs and caps, and any required blow-off piping and fittings, etc., complete with any necessary reaction blocking to prevent pipe movement during the flushing and testing. All pipelines shall be flushed and tested in such lengths or sections as agreed upon among the City, Engineer, and Contractor. Test pressures shall be as specified herein. The Contractor shall give the City and Engineer minimum two weeks' notice of the time when he intends to test portions of the pipelines. The Engineer reserves the right, within reason, to request flushing and testing of any section or portion of a pipeline.

B. If after this cleaning any obstructions remain, they shall be corrected by the Contractor, at his own expense, to the satisfaction of the Engineer. Liquid conveying pipelines shall be flushed at the rate of at least 2.5 feet per second for a duration suitable to the Engineer or shall be flushed by other methods approved by the Engineer.

C. After flushing, all pipelines shall be hydrostatically tested at the test pressure specified herein. The procedure used for the hydrostatic test shall be in accordance with the requirements of AWWA C600. Maximum filling velocity shall not exceed 0.25 feet per second and all air shall be expelled from the pipe during filling through air release valve(s) or through corporation stop installed at high points and other strategic locations. Each pipeline shall be filled with water for a period sufficient to allow for pipeline movement and water absorption by pipe lining and maintain stabilized working pressure and then subjected to the specified test pressure for 2 hours. During this test, exposed piping shall show no leakage. Allowable leakage in buried piping shall be in accordance with AWWA C600.

D. Contractor shall leave service taps exposed during testing for visual confirmation of zero leakage from service taps by Engineer. The Contractor is responsible for ensuring remaining pipeline is sufficiently backfilled to prevent pipe movement or damage to new pipe or existing facilities during testing. Backfill and compaction of exposed service laterals shall be in accordance with Section 2223, Trench Backfill.

E. Hydrostatic Testing Pressure shall be 150 psi measured at the highest elevation along the test section.

F. During testing the piping shall show no leakage. Any leaks or defective piping disclosed by the leakage test shall be repaired or replaced by the Contractor, at his own expense, and the test repeated until all such piping shows tight.

G. The Contractor shall provide water for all flushing and testing of liquid conveying pipelines. Raw water or non-potable water may be used for flushing and testing liquid pipelines not connected to the potable water system. Only potable water shall be used for flushing and testing the potable water system.

H. At the conclusion of the installation work, the Contractor shall thoroughly clean all new liquid conveying pipe by flushing with water or other means to remove all dirt, stones, pieces of wood, etc., which may have entered the pipe during the construction period.

3.12 DISINFECTION

A. All pipe and fitting connected to and forming a part of a potable water supply shall be disinfected in accordance with the procedures described in AWWA C 651. Disinfection shall also be in accordance with the requirements outlined herein.

B. In accordance with the procedures described in AWWA C 651 and Section 01300, Submittals, the Contractor shall submit a written disinfection and dichlorination plan, including all methods and equipment to be used. The plan shall be signed by the person responsible for performing the work and shall be approved prior to beginning the Work.

C. Disinfection shall be accomplished after the pipe has passed the hydrostatic test. Such piping shall be filled with 50 parts per million (PPM) of chlorine and held in contact for not less than 24 hours. Final tests after 24 hours contact time shall show a minimum residual chlorine content of 10 ppm in all parts of the system. Disinfection shall be repeated as often as necessary, and as directed by the Engineer and/or the City until the minimum residual chlorine content of 10 ppm has been reached. The Contractor shall obtain certificates of satisfactory bacteriological tests and furnish them to the City before the request is made for acceptance of the work and connection to the potable water system. The Contractor shall furnish and install, at his own expense, all means and apparatus necessary for performing the disinfection. The chlorine solution shall be thoroughly flushed out prior to placing the new sections of pipe in service.

D. The Contractor is cautioned that the spent chlorine solution must be disposed of in such a way as not to be detrimental to animal, plant, or fish life. Chlorine residual tests will be made after flushing to assure that residual is not in excess of 1 ppm at any point in system.

- END OF SECTION -

SECTION 15006

DUCTILE IRON PIPE

PART 1 -- GENERAL

1.01 THE REQUIREMENT

A. All ductile iron pipe and specials shall be marked with the manufacturer's name or trademark, size, weight, thickness class, the date of manufacture, and the word "Ductile".

B. Ductile iron pipe (DIP) of the sizes shown or specified shall conform to ANSI A21.51 (AWWA C151), Grade 60-42-10 for ductile iron pipe centrifugally cast in metal molds or sand-lined molds. All ductile iron pipe shall conform to ANSI A21.50 (AWWA C150) for thickness design and shall be supplied in 18 or 20 foot nominal lengths or as required to meet the requirements of the Drawings. Fittings and specials shall be cast iron or ductile iron, conforming to the requirements of ANSI A21.10 (AWWA C110) or ANSI A21.53 (AWWA C153).

C. Minimum Class 53 pipe shall be used for flanged spools.

D. Reference Section 15000, Basic Mechanical Requirements

PART 2 -- PRODUCT

2.01 DUCTILE IRON PIPE AND FITTINGS

A. All pipe and fittings shall be cement mortar lined. Linings shall conform to American Standard Specifications for Cement Mortar Lining for Cast Iron Pipe and Ductile Iron Pipe and Fittings, ANSI A21.4 (AWWA C104) and shall be standard thickness. The mortar lining shall be protected with the bituminous seal coat. All buried DIP and fittings shall have a bituminous coating on the exterior surfaces in accordance with ANSI A21.51 (AWWA C151).

B. The exterior of the pipe shall be coated with a layer of arc-sprayed zinc per ISO 8179. The mass of zinc applied shall be 200 g/sqft. A finishing layer topcoat shall be applied to the zinc

C. Flanged joints and fittings shall have a minimum pressure rating of 250 psi with 125 lb. American Standard flanges. All flanges and fittings shall conform to the requirements of ANSI B16.1. Flanges shall be ductile iron and shall be of the threaded or screw on type. The face of the flanges shall be machined after installation of the flange to the pipe. No raised surface shall be allowed on flanges. Flanged pipe shall conform to the requirements of ANSI Specification A21.15, (AWWA C115).

D. Gaskets shall be the "Ring Gasket" type, 1/8-inch minimum thickness, cloth inserted rubber, red rubber or neoprene and shall be suitable for the service intended. Gaskets for glass lined pipe shall be TORUSEAL flange gasket, or equal.

E. Bolts shall be of the size and length called for and in accordance with the "American Standard" and comply with the requirements of the ANSI/AWWA Standards. The bolts for flanged joints shall be a minimum ASTM A307; Grade B carbon steel and be in accordance with ANSI A21.10, (AWWA C110). The bolts shall have hexagonal heads and nuts, no washers shall be used.

F. Bell and spigot pipe shall be provided with factory manufactured rubber gaskets with stainless steel locking segments molded into the gasket. Approved gaskets: Amarillo Fast-Grip or Fast-Grip gaskets as manufactured by American Cast Iron Pipe Company, Field Lok 350 – Red or Field Lok 350 gaskets as manufactured by US Pipe, or approved equal.

G. Fittings and specials shall be supplied with mechanical joints as specified for mechanical joint pipe. If required by installation conditions, pipe shall have cast-on lugs for adequately tying it together.

H. Mechanical joints and fittings shall conform to the requirements of ANSI A21.11, (AWWA C111). Joints shall be made employing a tapered rubber gasket forced into a tapered groove with a ductile iron follower ring. If required by installation conditions, pipe and fittings shall have cast-on lugs for adequately tying the pipe and fittings together. These shall be in conformance with standard practice and as outlined under the appropriate AWWA Specifications.

I. Bolts for mechanical joints shall be high strength corrosion resistant low-alloy steel tee-head bolts with hexagonal nuts.

J. Mechanical couplings joint pipe and fittings shall be split type, shouldered end. Coupling materials shall be malleable iron. Couplings shall have a minimum pressure rating and service equal to that of the connected piping. Gaskets shall be of rubber. Bolts and nuts shall be heat treated carbon steel track bolts and shall be plated. After installation, buried couplings shall receive two heavy coats of coal tar epoxy (min. 24 mil thickness) which is compatible with the finish of the couplings. Couplings shall be as manufactured by Victaulic Company of America Style 31, or equal.

K. Restrained fittings for pipe systems 14-inches in diameter and smaller shall be Mechanical Joint fittings with restraint assemblies such as Mega Lug by EBAA Iron, Grip Ring or RomaGrip by Romac, or approved equal. Where threaded-rods are allowed, the rods and tabs shall be designed for the specified restraint system design pressure, shall have lengths less than 10 feet between fittings, and shall be painted with two heavy coats of coal tar epoxy after installation.

L. The manufactured systems for thrust restraint indicated above shall be used where restrained joint ductile iron pipe and fittings are specified or indicated on the drawings. Thrust restraint and harnessing systems such as threaded-rods, friction clamps, retainer glands shall be used only where specifically specified herein, indicated on the drawings or if allowed by the Engineer in isolated applications where conditions warrant and necessitate their use. Concrete thrust blocks may be used where shown on the drawings and in accordance with the schedule indicated on the drawings, if applicable.

2.02 POLYETHYLENE ENCASEMENT

A. Polyethylene shall be tube form 8-millimeter-thick virgin raw material conforming to ASTM D4976 with a minimum tensile strength of 3,600 psi.

PART 3 – EXECUTION

3.01 INSTALLATION

A. Contractor shall install ductile iron pipe in accordance with Section 15000, Basic Mechanical Requirements and Section 2223, Trench Backfill.

B. Polyethylene Encasement

1. Encase pipe, fittings, and valves in accordance with AWWA C105/A21.5, Method A.

2. Provide double (two) bag wrapping for all pipelines. Cut polyethylene tube approximately 2 feet longer than pipe length. Slip tube around pipe, centering to provide 1-foot overlap on each adjacent section. Wrap and tape encasement around fittings and valves.

3.02 HYDROSTATIC TESTING

A. In accordance with Section 15000, Basic Mechanical Requirements.

- END OF SECTION -

SECTION 15010

COPPER PIPE

PART 1 -- GENERAL

1.01 THE REQUIREMENT

A. Reference Section 15000, Basic Mechanical Requirements.

PART 2 -- PRODUCTS

2.01 TYPE K COPPER PIPE AND FITTINGS

A. Type K copper piping shall be seamless, soft temper and shall conform to ASTM B 88. Fittings used with this pipe shall be flare or compression type fittings as manufactured by Swagelok, or equal, and shall conform to ANSI B16.26. All buried copper pipe and fittings shall be Type K.

2.03 SOLDER

A. Solder shall consist of 95 percent tin and 5 percent antimony. Silver solder shall consist of 15 percent silver, 80 percent copper, and 5 percent phosphorous in accordance with ASTM B260-62T. Soldering shall be in conformance with Section 3 of the C.A.B.R.A. Copper Tube Handbook.

PART 3 -- EXECUTION

3.01 INSTALLATION

A. Contractor shall install copper pipe for services and pipeline appurtenances in accordance with Section 15000, Basic Mechanical Requirements and Section 2223, Trench Backfill and the Drawings.

B. Cut pipe true and square and remove burrs.

C. Copper pipe shall be installed perpendicular to water mains. Horizontal bends or curves in copper tubing are not allowed unless otherwise approved by the Engineer. Vertical bends shall be in accordance with the Drawings. Shape vertical bends with shaping tools and form bends without flattening, buckling, or thinning the pipe wall at any point.

D. Assemble copper pipe and fittings per the manufacturer's recommendations.

- END OF SECTION -

SECTION 15107

FIRE HYDRANTS

PART 1 -- GENERAL

1.01 THE REQUIREMENT

A. Reference Section 15000, Basic Mechanical Requirements.

1.02 SUBMITTALS

A. Shop Drawings conforming to the requirements of Section 01300, Submittals, are required for all valves, and accessories. Submittals shall include all layout dimensions, size and materials of construction for all components.

B. Certificate of Compliance: Upon completion of the system installation, verify all fire department hose connections to ensure their readiness for emergency connection and operation.

PART 2 -- PRODUCTS

2.01 FIRE HYDRANTS

A. All fire hydrants shall be hub end, triple nozzle, approved AWWA type with two (2) 2-1/2-inch hose nozzles and one (1) 4-inch steamer nozzle with American National Standard hose threads and have a 6-inch bottom mechanical connection.

B. Hydrants shall have a 5-1/4-inch valve opening and shall be built in accordance with AWWA C503. Hydrants shall open left and have a National Standard Pentagon type operating nut (1-1/2-inch point to flat). Hydrants shall have a safety flange and a safety coupling on the valve stem. All hydrants shall be the Clow 2060, Jones 4060, or approved equal with minimum 3'-0" bury depth.

C. Hydrants shall be supplied with breakaway bolts as required for proper installation of the specified breakaway hydrant check valve.

2.02 BREAK AWAY CHECK VALVE

A. AVK – Wet Barrel Hydrant, Bi-Directional Check Valve, or approved equal.

2.04 PRECAST CONCRETE PIER BLOCK

A. Nominal dimensions of 8-inch thickness by 16-inch square base with compressive strength of 3,000 psi at 28 days.

2.05 CONCRETE FOR THRUST BLOCKING

A. Ready-mix meeting ASTM C94, Alternative 2 with compressive strength of 3,000 psi at 28 days.

PART 3 -- EXECUTION

3.01 GENERAL

A. Install hydrants in accordance with AWWA C600.

B. Excavation and backfill shall be in accordance with Section 02200 – Earthwork and Section 02233 – Trench Backfill.

C. Locate hydrants as shown on the Drawings.

D. Set hydrants so break away check valve flange is a minimum of 2-inches above finish ground or sidewalk level.

E. Maintain hydrant in a plumb position during subsequent Work.

- END OF SECTION -

SECTION 15108

GATE VALVES

PART 1 -- GENERAL

1.01 THE REQUIREMENT

A. Reference Section 15000, Basic Mechanical Requirements.

B. The Contractor shall furnish and install, complete with all assemblies and accessories, all valves shown on the Drawings and specified herein including all fittings, appurtenances and transition pieces required for a complete and operable installation.

1.02 SUBMITTALS

A. The Contractor shall furnish to the Engineer, a Performance Affidavit in accordance with the requirements of Section 01300, Submittals. Performance tests shall be conducted in accordance with the latest revision of AWWA C500 and affidavits shall conform to the requirements of the Specifications

B. Shop Drawings conforming to the requirements of Section 01300, Submittals, are required for all valves, and accessories. Submittals shall include all layout dimensions, size and materials of construction for all components, information on support and anchoring where necessary, pneumatic and hydraulic characteristics and complete descriptive information to demonstrate full compliance with the Documents.

C. Operation manuals and installation instructions shall be submitted for all valves and accessories in accordance with the Specifications. The manufacturer(s) shall delete all information which does not apply to the equipment being furnished.

PART 2 -- PRODUCTS

2.01 GATE VALVES

A. All valves shall be constructed in accordance with the standards and have the strength, wearing, and corrosion resistance characteristics entirely suitable for the types of service for which the individual valves are designated. Except where noted otherwise, valves designated for water service shall conform to pertinent sections of the latest revision of AWWA C500 Specifications. Cast iron valve bodies and parts shall meet the requirements of the latest revision of ASTM Designation A-126, "Standard Specifications for Gray Iron Castings for Valves, Flanges, and Pipe Fittings." Valve shall have resilient seat gate and O-ring seals. The gate shall be cast iron with a vulcanized rubber coating with no metal to metal contact when in the fully closed position and a smooth unobstructed waterway when in the fully opened position.

B. All valve body castings shall be clean, sound, and without defects of any kind. No plugging, welding, or repairing of defects will be allowed.

C. Valves shall have flanged ends, unless otherwise shown on the Drawings or specified herein. Flanged ends shall be flat-faced, 125 lb. American Standard unless otherwise shown or specified in accordance with ANSI B16.1. All bolt heads and nuts shall be hexagonal of American Standard size. The Contractor shall be responsible for coordinating connecting piping.

D. All gate valves between 2 inches and less than 4 inches shall be iron body, bronze trimmed, wedge disc, and minimum 150 psi non-shock cold water pressure rating. Exposed valves shall be of the outside screw and yoke (OS&Y), ANSI B-16.1, 125 pound flanges and shall be as manufactured by the Crane Company, Jenkins Bros. Corp., or equal.

E. Valves less than 2 inches shall be of bronze body, rising stem, wedge disc and minimum 300 psi non-shock cold water pressure rating. Valves shall have screwed ends or as specified otherwise.

F. Gate valves 4 inches through 16 inches shall be of the non-rising stem design with a 2-inch square standard operating nut, shall fully comply with the requirements of AWWA C509 for resilient-seated gate valves and shall be Mueller 2362 or approved equal. Gate valves shall be designed for a minimum working pressure of 250 psi and a test pressure of 500 psi.

I. All internal ferrous components and surfaces of the valves, with the exception of stainless steel and finished or bearing surfaces, shall be shop painted with two coats (10 mils min. dry film thickness) of the manufacturer's premium epoxy for corrosion resistance. Damaged surfaces shall be repaired in accordance with the manufacturer's recommendations.

2.02 MANUAL OPERATORS

A. Unless otherwise specified or shown on the Drawings, manual operator type shall be as follows:

1. Buried valves shall be equipped with nut operators, extended stems, and valve boxes. Where the depth of the operating nut is more than 4 feet below finish grade, a valve operator extension shall be provided to bring the operating nut to within 18-24 inches of the surface.

B. All operators shall turn counter-clockwise to open and shall have the open direction clearly and permanently marked.

C. Nut operators shall have standard 2-inch square AWWA operating nuts designed in accordance with AWWA C504-94.

2.03 VALVE BOXES

A. The Contractor shall furnish and install valve boxes as shown on the Drawings and specified herein.

B. All valve boxes shall be placed so as not to transmit shock or stress to the valve and shall be centered and plumb over the operating nut of the valve. The ground in the trench upon which the valve boxes rest shall be thoroughly compacted to prevent settlement. The boxes shall be fitted together securely and set so that the cover is flush with the finished grade of the adjacent surface. A concrete pad as detailed on the Drawings shall be provided around the valve box, sloped outwards, when valve can is to be placed in a non-paved area.

C. All valve boxes shall be 2-piece cast iron, sliding type, with heavy duty traffic weight collar and the lid marked with the appropriate carrier product (i.e.: WATER) per CMB Standard Detail MBWS-708A-0 and MBWS-710A-0. Boxes shall be as manufactured by James B. Clow & Sons, Kennedy Valve Mfg. Co., Charlotte Pipe and Foundry Company, or equal.

PART 3 -- EXECUTION

3.01 INSTALLATION

A. Except where noted otherwise herein, all valves shall be installing and tested in accordance with the latest revision of AWWA C500. Before installation, all valves shall be lubricated, manually opened and closed to check their operation and the interior of the valves shall be thoroughly cleaned. Valves shall be placed in the positions shown on the Drawings.

B. Provide valves in quantity, size, and type with all required accessories as shown on the Drawings.

D. Install all valves and appurtenances in accordance with manufacturer's instructions. Unless otherwise approved, install all valves plumb and level. Valves shall be installed free from distortion and strain caused by misaligned piping, equipment, or other causes.

E. Valve boxes shall be set plumb and centered with the bodies directly over the valves so that traffic loads are not transmitted to the valve. Backfill in accordance with Section 02223, Trench Backfill shall be carefully tamped around each valve box to 4 feet on all sides of the box, or to the undisturbed trench face, if less than 4 feet.

- END OF SECTION -

APPENDIX I
PROGRESS PAYMENT REQUEST FORM

TO: CITY OF MANHATTAN BEACH
Engineering Division, 1400 Highland Avenue, Manhattan Beach, CA 90266
PROJECT TITLE _____
PROJECT NO. _____
FROM: CONTRACTOR _____ Date _____
Address _____
Telephone _____ Progress Estimate # _____
Submitted by _____ Contract Award Amount $_____

No.	Description	Contract Quantity	Previous Quantity	Quantity This Estimate	Unit Price	Amount This Estimate	Total Quantity to Date	Total Amount to Date
1.								
2.								
3.								
4.								
5.								
6.								
7.								
8.								
9.								
10.								
11.								
12.								
13.								
14.								
	Total							
	Less Retention							
	Less Previous Billing(s)							
	Total Amount Due							

City Approval: _____ Date: _____

NOTE: An updated Project Schedule must be provided with each monthly progress payment in accordance with Section 6-1 of the General Provisions in addition to a Conditional Waiver and Release form per Section 9 -3.2.1

APPENDIX II

CONTRACTOR'S DAILY REPORT TO THE CITY

(Only the Contractor's Foreman and Superintendent is authorized to complete this form.)

Project Name: _____ **Project Location:** _____
Date: _____ **Report No.:** _____ **Start Time:** _____ **End Time:** _____
Contractor's Company Name: _____

Contractor's Foreman/Superintendent: _____ _____
Name **Signature**

Work Accomplished

Equipment on Site	Hours

Workers on Site	Classification	Hours	Company

Note: It is the responsibility of the Contractor to provide this completed form to the City every working day by 5:30 PM, without fail. Failure to do so may result in the corresponding monthly progress payment to be delayed.

APPENDIX III

APPLICABLE CITY STANDARD PLANS

See Design Drawings

APPENDIX IV

GEOTECHNICAL

KOURY
ENGINEERING
& TESTING, INC.

GEOTECHNICAL & SEISMIC ENGINEERING, CONSTRUCTION INSPECTION & MATERIALS TESTING SERVICES

LIMITED GEOTECHNICAL STUDY REPORT

WATER PIPELINES REPLACEMENT PROJECT

VARIOUS STREETS

CITY OF MANHATTAN BEACH, CALIFORNIA

PREPARED FOR:

HAZEN & SAWYER
7700 IRVINE CENTER DRIVE
IRVINE, CA 92618

PREPARED BY:

KOURY ENGINEERING & TESTING, INC.
14280 EUCLID AVENUE
CHINO, CALIFORNIA 91710

PROJECT NO. 19-0527
OCTOBER 18, 2019

TABLE OF CONTENTS

1. INTRODUCTION 1
   1.1 Proposed Construction 2
   1.2 Scope of Study 2

2. FIELD EXPLORATION 2

3. LABORATORY TESTING 3

4. SITE CONDITIONS 4

5. GEOLOGIC INFORMATION 4

6. SOIL CONDITIONS 5

7. ENVIRONMENTAL TESTING 7

8. GROUNDWATER 8

9. CONCLUSIONS AND RECOMMENDATIONS 9
   9.1 Pipe design 9
   9.2 Temporary Excavation 9
   9.3 Temporary Shoring 10
   9.4 Settlement Consideration Due to Trenching 11
   9.5 Trench Backfill 11
   9.6 Lateral Earth Pressure Resistance 13
   9.7 Soil Corrosivity 14
   9.8 Pavement Restoration 15
   9.9 General Grading Requirements 15

10. OBSERVATION AND TESTING DURING CONSTRUCTION 16

11. CLOSURE 16

APPENDICES 17

REFERENCES 18

October 18, 2019
Project No. 19-0527

Mr. Mirko Maher, P.E., Senior Associates
Hazen & Sawyer
7700 Irvine Center Drive, Suite 200
Irvine, CA 92618

Subject: Limited Geotechnical Study
Water Pipelines Replacement
City of Manhattan Beach, California

1. INTRODUCTION

This report presents the results of a limited geotechnical study, laboratory testing and engineering analysis performed for the Water Pipelines Replacement project for various streets within the City of Manhattan Beach as shown on the Vicinity Map, Figure A-1, presented in Appendix A. The purpose of this geotechnical study was to evaluate the subsurface soil and groundwater conditions along the pipeline alignment in order to provide geotechnical recommendations for design and construction of the new water pipelines within various streets.

The recommendations provided within this submittal are based on the results of our field exploration, laboratory testing, and engineering analyses. Our services were performed in general accordance with our Proposal No. 19-0527, dated April 18, 2019.

Our professional services have been performed using the degree of care and skill ordinarily exercised, under similar circumstances, by reputable geotechnical consultants practicing in this or similar localities. No other warranty, expressed or implied, is made as to the professional advice included in this report. This report has been prepared exclusively for use by Hazen & Sawyer and Associates and the City of Manhattan Beach for application to the subject project. The report has not been prepared for use by other parties and may not contain sufficient information for the purposes of other parties or other uses.

1.1 Proposed Construction

Koury understands the proposed project consists of improving its water infrastructure through a three-year program by replacing the existing pressurized water pipelines within various streets within the City of Manhattan Beach. The location of each roadway and pipeline segment is identified on the attached Figure A-2. Based on the 60% design plans provided by Hazen and Sawyer, the proposed waterlines will consist mainly of 6 or 8-inch Ductile Iron Pipes (DIP), to be embedded approximately 3 feet below grade.

1.2 Scope of Study

The scope of our study consisted of a literature review, subsurface exploration, geotechnical laboratory testing, analytical laboratory testing, engineering analysis and evaluation, and preparation of this report which includes our findings, conclusions and recommendations for the subject project. We also obtained an encroachment permit and license from the City of Manhattan Beach and notified Underground Service Alert several days prior to the subsurface exploration.

2. FIELD EXPLORATION

The field exploration program consisted of drilling twelve soil test borings over two separate days; namely September 11 and 12, 2019 using track-mounted hollow-stem auger equipment. The hollow stem auger borings were drilled to a maximum depth of about 11½ feet below the existing ground surface. The boring locations are shown on the Boring Location Maps, Figure A-2, A-2a through A-2d, in Appendix A.

Standard penetration test samples, California ring samples, and bulk samples were obtained at close intervals from the borings for laboratory testing. In addition, soil samples were collected in accordance with EPA Method 5035 using the EncoreTM sampler for VOCs and sealed glass jars for TPH-CC, organic lead, and California Title 22 heavy metal testing. The depths, blow counts, and description of the samples are shown on the attached boring logs, B-1 through B-12, presented in Appendix B of this report.

As part of the investigation, we have also identified existing pavement sections, underlying subgrade material, and in-place moisture contents of the observed subgrade within each boring and summarized the data in the following Table 1.

Table 1 - Existing Pavement Sections and Subgrade Material

Segment No.	Location	Boring	Asphalt Layer (in)	Base Layer (in)	Subgrade Material	Subgrade Moisture (%)
P9	1634 23rd St.	B-1	3	4	SP-SM	5.3
P9	1631 22nd St.	B-2	3	4½	SP-SM	4.0
P10	1617 21st St.	B-3	3½	4	SM	8.5
P10	1607 19th St.	B-4	4	4	SM	5.3
P2	1467 12th St.	B-5	3	4	SM	4.9
P1	1407 17th St.	B-6	3½	4	SP-SM	4.9
P3	1401 12th St.	B-7	3	5	SM	8.9
P12	1600 Mathews Ave	B-8	4	0	SM	4.3
P7	634 14th St.	B-9	3½	2	SP-SM	4.5
P8	1822 Flournoy Rd.	B-10	8	0	SP-SM	4.7
P8	1816 Agnes St.	B-11	3½	0	SP-SM	3.8
P12	401-499 S Herrin St	B-12	4	0	SP-SM	3.8

3. LABORATORY TESTING

Laboratory tests, including moisture content, dry unit weight, #200 sieve wash, sand equivalent, direct shear and maximum dry density were performed on samples obtained from the borings to aid in the classification of the materials encountered and to evaluate their engineering properties. The tests were selected to represent the soil variations encountered. Sulfates, chlorides, resistivity, and PH tests (corrosivity) were also performed on the different materials.

In addition to the geotechnical tests, samples were collected at each boring for determining if environmental contaminant are present in the soil in significant concentrations. Environmental testing included TPH, VOCs, and CAM 17 Metals. The results of the laboratory tests are presented on the boring logs in Appendix B, and/or in Appendix C.

4. SITE CONDITIONS

The subject project is located within residential areas and includes the following roadway limits. The pipelines will be constructed within existing public asphalt paved roadway.

Table 2 – Roadway Segments

Segment No.	Segment	Approx. Length (ft)
P12	Herrin Street, from Curtis Ave to Artesia Blvd	1,710
P3	12th Street	1,325
P2	Rock Covenant Church	590
P1	17th Street	870
P10	21st & 19 Street	1,515
P9	23rd & 22nd Street	1,525
P8	Agnes Road	775
----	Flournoy Road	345
P7	14th Street	385
P11	Artesia Boulevard	2,085
P14	Mira Costa High School	1,300
P15	Valley Drive	1,955

Koury understand that except for segments P11, P14, and P15, the water pipelines will be replaced starting in 2019 and extending through 2020. The second and third-year programs consist of water line replacement for segments P11, P14 and P15 during 2020 through 2022. All the proposed planned work for 2019 through 2020 is located within residential streets that have parking lanes along both sides of the street curbs.

5. GEOLOGIC INFORMATION

The site is located within the Los Angeles physiographic basin. The Los Angeles basin is bounded on the north by the Santa Monica and San Gabriel Mountains, on the east and southeast by the Santa Ana Mountains and the San Joaquin Hills, and on the west and south by the Pacific Ocean. The Los Angeles basin represents a down-warped block of basement rock overlain by approximately 31,000 feet of sediment.

The Los Angeles physiographic basin is part of the Peninsular Ranges Geomorphic Province. The Peninsular Ranges extend north to the San Gabriel Mountains and south into Mexico to the tip of Baja California. The Peninsular Ranges Province is characterized by alluviated basins, elevated erosion surfaces, and northwest-trending mountain ranges bounded by northwest trending faults.

Dibblee (1999) showed most of the site to be underlain by older stabilized dune and drift sand materials consisting mostly of unconsolidated fine-grained sand of Holocene age. The Geologic Map of the Los Angeles Quadrangle (2005) shows the site to be underlain by eolian and dune deposits consisting of poorly consolidated and poorly sorted sandy soils (see Figure A-3, Appendix A for Geologic Map). The borings drilled during our investigation in September 2019 encountered similar materials consisting of mostly of poorly graded sand and silty sand, consistent with regional mapping; however, these soils were found to be generally loose to medium dense.

6. SOIL CONDITIONS

The borings drilled in the pavement areas indicated 3 to 4 inches of asphalt concrete with exception at Flournoy Road where about 8 inches of asphalt concrete was encountered. The aggregate base thickness varies from 0 to 5 inches.

The fill thickness, including the pavement sections, encountered in the borings range from about 2 to 5 feet. Deeper fill should be anticipated at utility locations. The subsurface soils below the pavement sections consist predominantly of loose to medium dense silty sand and poorly graded sand with exception at Boring B-5 where clayey sand with higher fine contents and moisture content was encountered. The laboratory data indicates moisture contents in the range of 2.4 to 12.1 percent with an average of about 5.7. The dry unit weights range between about 94 and 124 pcf with an average of approximately 107 pcf (pounds per cubic foot). The fines contents of the sand range from about 2 to 33 percent with an average of approximately 13 percent.

The 8 gradation tests performed for this study indicated predominantly poorly graded fine to medium grained sand and silty sand (see Appendix C for gradation plots). The eight sand

equivalent tests indicated values ranging between 18 and 69 with an average of approximately 11 percent. The results of sand equivalent tests are summarized in the following Table 3.

Table 3 - Sand Equivalent and #200 Wash Tests

Segment No.	Street Location	Boring No. & Depth (ft)	Sand Equivalent	Percentage of Fines	Soil Type
P9	1634 23rd St.	B-1 @ 2-3.5	22	9	SP-SM
P10	1617 21st St.	B-3 @ 0.5-2	18	16	SM
P2	1467 17th St.	B-5 @ 2-3.5	25	12	SP-SM
P1	1407 17th St.	B-6 @ 5	18	15	SM
P12	1600 Matthews Ave.	B-8 @ 7-8	30	9	SP-SM
P7	634 14th St.	B-9 @ 5-6.5	69	8	SP-SM
P8	1822 Flournoy Rd.	B-10 @ 2-3.5	44	8	SP-SM
P12	401-499 S. Herrin St.	B-12 @ 5–6.5	27	8	SP-SM

To further evaluate the properties of onsite soils, maximum dry density tests were performed using the ASTM D1557 testing method. The test results indicated maximum dry densities ranging between about 111 and 131 pcf with an average of approximately 124 pcf. The optimum moisture contents range from about 7.4 to 12.4 percent with an average of approximately 9 percent. The following Table 4 summarizes the test results.

Table 4 - Maximum Dry Density and Optimum Moisture Content

Segment No.	Street Location	Boring No. & Depth (ft)	Max Dry Density(pcf)	Optimum Moisture	Soil Type
P9	1634 23rd St.	B-1 @ 0.5-2	111.6	12.4	SP-SM
P9	1631 22nd St.	B-2 @ 0.5-2	108.0	11.9	SM
P10	1617 21st St.	B-3 @ 0.5-2	126.5	9.3	SM
P10	1607 19th St.	B-4 @ 0.5-2	126.5	9.3	SM
P2	1467 12th St.	B-5 @ 0.5-2	130.3	8.1	SM
P	1407 17th St.	B-6 @ 0.5-2	130.3	8.1	SM
P-3	1401 12th St.	B-7 @ 0.5-2	130.7	7.5	SM
P	1822 Flournoy Rd.	B-10 @ 0.5-2	124.0	7.4	SM
P8	1816 Agnes St.	B-11 @ 0.5-2	124.0	7.4	SM
P12	401-499 S. Herrin St.	B-12 @ 0.5-2	124.2	8.7	SM

Direct shear tests were also conducted to evaluate the shear strength parameters of the onsite soils. The test results are presented in Appendix C of this report.

The soil conditions described in this report are based on the soils observed in the test borings drilled for this study and the laboratory test results. Variations between and beyond the borings should be anticipated. Detailed descriptions of soils encountered, and conditions observed during the subsurface investigation are shown on the boring logs in the Appendix B, together with soils classification, blow counts, moisture contents, and field dry densities.

7. ENVIRONMENTAL TESTING

A total of 12 soil samples (one from each boring) were collected and delivered to Positive Lab Services (PLS) for analytical laboratory analyses. The test reports are presented in the Appendix C and the test results are summarized in Table 5 below.

Table 5 – Summary of Concentration Level of Contaminant Detected

	Street Location and Depth											
	*1/8.5'	2/5.5'	3/6.5'	4/9'	5/5.5'	6/6'	7/11'	8/5'	9/3'	10/8.6'	11/11.5'	12/10.5'
Metal	23 St	22 St	21 St	19 St	N.Peck	17 St	12 St	Herrin	12-14St	Fluornoy	Agnes	Ruhland
Antimony	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	2.35	3.48	2.40	3.21	ND	ND	2.47	ND	ND	ND
Barium	16.8	14.7	24.2	62.5	22.2	35.3	36.0	22.8	22.6	24.0	14.7	18.8
Beryllium	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chromium	3.64	3.11	6.23	15.4	21.2	27.6	11.2	7.71	9.47	11.1	13.5	9.17
Cobalt	1.18	1.03	1.81	10.2	4.28	5.76	5.28	2.53	2.63	3.05	2.98	3.28
Copper	31.0	1.48	22.8	14.7	9.24	5.18	4.95	15.8	8.03	5.94	3.00	2.81
Lead	1.14	ND	1.93	3.93	2.38	3.10	2.64	1.93	2.07	6.82	2.13	1.64
Molybden	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel	3.55	2.65	4.80	9.28	9.05	11.1	5.65	3.63	6.70	5.54	4.71	4.81
Selenium	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vanandiu	4.78	4.32	8.21	28.5	21.4	27.9	17.6	12.1	19.0	18.6	18.4	10.3
Zinc	39.2	5.70	20.3	32.1	20.8	14.6	18.6	19.1	19.2	20.5	10.3	8.31
Mercury	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Lead Org	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TPH	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
VOCs	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

*Sample number, which corresponds to the boring number, and depth; ND for non-detect

The analytical results for CAM 17 metals and VOCs were compared to the California EPA Region Preliminary Remedial Goals (PRGs) for residential and industrial site soils (Reference 9 Title 22 CCR). The metal concentrations were also compared to generic residential criteria for Total Threshold Limit Concentration (TTLCs) and the Soluble Threshold Limit Concentrations (STLC). If a metal concentration exceeds its respective TTLC or STLC, the soil sample would be considered a California Hazardous Waste. The analytical results of the soil samples tested are summarized below.

- TPHs were not detected in the soil samples;
- VOCs were not detected in the soil samples;
- Detectable metal concentration were below EPA Region 9 PRGs; and
- The metal concentrations in the samples analyzed did not exceed the TTLCs, as summarized in Table 5 above and PLS' reports and included Appendix C, and are therefore, the soils are not classified as California hazardous waste based on published information.

8. GROUNDWATER

No groundwater was encountered during our subsurface exploration in September 2019. Based on the groundwater data presented in the Public Works Los Angeles County Website, groundwater monitoring wells located throughout the area of work show groundwater levels ranging from 108 to 166 feet below surface grade. Groundwater wells located less than one mile away from segment numbers P7 and P8 have water depth of 108.6 feet BGS recorded in October 2008. From segments P1, P2, P3, P9 and P10, a groundwater well located less than one mile away indicates a water depth of 110.3 feet BGS recorded in October 2008. For segment P12, a groundwater monitoring well located ¼ mile away indicates a water depth of 164.2 feet BGS recorded in April 2008.

Based on our field exploration and available well data, groundwater is not anticipated to impact the proposed improvements except for perched water or trapped water at shallow depth below the pavement surface or at creek or drainage channel crossings. Long-term fluctuations of groundwater may occur as a result of variations in subsurface conditions, rainfall, irrigation, run-off conditions and other factors.

Because of the burial depth of the waterline and relatively small diameter pipes, pipe buoyancy is not considered a major concern at this time. The depth of cover can be increased in localized areas to counteract buoyancy, if needed.

9. CONCLUSIONS AND RECOMMENDATIONS

Based on the field exploration data, results of laboratory testing, engineering analysis, and similar project experience, it is Koury's geotechnical opinion that the proposed water lines replacement are feasible provided the recommendations in this report are incorporated into the project design and construction.

9.1 Pipe design

Pipes should be designed for all loads applied by surrounding soils, including dead load from soils, loads applied at the ground surface, uplift loads, and earthquake loads. Soil loading may be estimated by assuming a total unit weight of 130 pounds per cubic foot (pcf) for the backfill materials. Simplified methods for estimating the additional soil pressure that will act on pipes during earthquake loading are not available. To reduce the risk of pipe damage that could occur as a result of earthquake loading, we suggest that the design vertical and horizontal loads on pipes that result from soil dead loads be increased by 50 percent. The effects of live loads due to traffic need to be considered also.

9.2 Temporary Excavation

We understand that pipe invert depths may be generally 3 to 3½ feet below the pavement surface along the alignment. Based on the borings drilled along the alignment, the soils at the pipe invert

depth will generally include medium dense poorly graded sand to silty sands except for localized areas were loose sand may be encountered. Because of the limited number of borings, soil conditions other than shown on the boring logs should be anticipated. Medium dense silty sands conditions will normally permit vertical excavation to depths of 3 feet for unsurcharged cut. However, the poorly graded sands are likely to be unstable. Sloughing and/or caving should be anticipated.

Excavations should be performed in accordance with all applicable excavation safety requirements and regulations, including Cal-OSHA requirements. The contractor should exercise special care when excavating next to existing utilities, particularly those that run parallel to the proposed water line. Based on our experience, backfill within existing utility trenches may contain bedding sand or gravel around the utility. Such non-cohesive material is prone to sloughing or raveling when cut steeply and not supported. The stability of backfill within existing utilities trenches, including the bedding that supports the utility, may be jeopardized if suitable mitigation measures are not taken when trenching close to existing utilities. Special precautions should be taken or engineered shoring should be used when trenches are close to and extend below existing utilities.

9.3 Temporary Shoring

Depending upon the depth and soil conditions, temporary shoring may be required in areas of vertical cuts during construction of the pipeline. Temporary shoring should be used for all depths exceeding 4 feet where sufficient space does not allow for sloped excavations. "Caving and running" of the sandy soils should be anticipated locally. Where caving occurs, shoring should be used at depths of 3 feet where sufficient space does not allow for sloped excavations; the decision to shore at that depth should be based on observed field conditions. Because of the limited lateral dimensions of the proposed excavations, the use of braced sheeting with hydraulic jack is anticipated. If used, braced sheeting should be designed using an equivalent fluid pressure of 40 pcf or greater and all the surcharges discussed in the following paragraph should be accounted for. The structural design of the shoring system should be provided by a civil engineer registered in the State of California and experienced in the design and construction of shoring under similar conditions. Once the final excavation and shoring plans are complete,

Koury should review the plans and design for conformance with the design intent and geotechnical recommendations.

Lateral surcharge loads (e.g., traffic, structures, etc.) located within a 1½:1 (H:V) plane drawn upward from the base of the excavation should be added to the lateral earth pressures. The lateral contribution of a uniform surcharge load located immediately behind the shoring may be calculated by multiplying the surcharge by 0.35 for active conditions and 0.5 for at-rest conditions. Lateral load contributions of surcharges located at various distances behind the shoring may be provided once the load configurations and layouts are known. As a minimum, a surcharge of 300 pcf is recommended to account for traffic and nominal construction loads.

9.4 Settlement Consideration Due to Trenching

To reduce the potential for damage, settlement should be minimized near existing utilities that cannot tolerate more than ¼ inch of movement. Settlement of existing improvements and/or utilities adjacent to shoring may occur, with maximum settlements directly adjacent to the shoring system and decreasing with increasing distance from the shoring. We estimate that ground surface settlements may approach zero at a distance equal to approximately 1½ times the depth of the excavation. Vertical settlement is estimated to be on the order of 75 percent of the horizontal deflection of the shoring system or side of the trench prior to installation of the shoring. It is recommended that shoring be designed and installed accordingly to limit the maximum horizontal deflection to ½-inch or less where structures or utilities are supported.

Settlement can be minimized by preventing caving and installing the shoring immediately behind the excavator in short segments (slot cuts) not exceeding 8 feet and by placing the jacks under pressure immediately. The backfilling, also to be performed in short segments, should proceed immediately upon removal of the jacks.

9.5 Trench Backfill

Trench backfill may be performed per City Standard Plan MBSI-132A. The lower portion of the trench width is anticipated to be equal to the pipe diameter plus 12 to 20 inches. The trench

width within the pavement zone will extend an additional 12 inches on each side. At the pavement surface level, the pavement surface should be cold milled 1.5 inches over a width equal to the trench width at pipe level plus 4 feet on each side.

Prior to backfilling, the trench bottom should be determined to be firm and unyielding. The native undisturbed alluvium soils are expected to have an in situ relative compaction near 85%. Where excessively loose soils are encountered, the upper 8 inches should be recompacted to 90 percent relative compaction. If yielding subgrade is encountered due to high moisture, the yielding soils should be over excavated 8 to 12 inches depending upon the degree of yielding and replaced with bedding material or ¾-inch crushed rock wrapped with geosynthethic (e.g. Mirafi 500 X or equivalent).

The pipe invert should be underlain with at least 4 inches of bedding material consisting of select sandy soils with a sand equivalent (SE) of 30 or greater. Bedding material below the pipe invert should be compacted to at least 90 percent relative compaction as determined by ASTM D1557.

The pipe zone backfill normally extends from the invert of the pipe to 12 inches above the pipe. This zone should also be backfilled with sand material similar to the bedding and mechanically compacted to 90 percent relative compaction.

Above the pipe zone (one foot above the pipe), the trench backfill may consist of the excavated onsite soils, less any contaminated soil, debris, organic matter, or other deleterious materials. The onsite soils may be used to backfill above the pipe zone; however, some of these soils are not suitable for bedding and shading due to their low sand equivalent (less than 300. Rock or other soil fragments greater than 4 inches in size should not be used in the fills.

Some of the soils at depths have moisture that are significantly above optimum and are more likely to require processing (moisture reduction) prior to placement as engineered fill. Processing may require ripping the material, drying back, and blending to attain uniform moisture contents necessary for compaction. The drier soils will need additional moisture.

Backfill, including the bedding material, should be compacted to at least 90 percent of the maximum dry unit weight (ASTM D1557) at moisture contents above optimum. The upper 12 inches of trench backfill below pavements should be compacted to at least 95 percent of the maximum dry unit weight. Fill should be placed in loose horizontal lifts not more than 8 inches thick (loose measurement) for trench backfill and 6 inches thick for pipe bedding. Jetting or flooding is not recommended as a compaction method.

Unspecified import materials, if required, should have an expansion index of less than 12, no more than 30 percent of the particles passing the No. 200 sieve, and no particles greater than 3 inches in maximum dimension. Koury should evaluate the proposed import materials prior to their transportation on site.

The excavation and backfilling of onsite soil will induce shrinkage. The amount of shrinkage cannot be calculated exactly; however, we estimated the shrinkage to be on the order of 10 percent depending upon the relative compaction achieved.

9.6 Lateral Earth Pressure Resistance

In a pressurized buried pipeline such as a water main, thrust forces act on the pipe where changes in fluid velocity, in pipe size or in pipe direction occur, which is often at plugs, caps, valves, tees, bends and reducers. The most frequently used approach to resist a thrust force is to install a non-reinforced cast-in-place concrete block at the fitting.

There are two methodologies commonly used to calculate the lateral resistance of soils; namely the bearing capacity concept and passive pressure/active pressure/and friction approach. The bearing capacity is simpler but less accurate. For this method, we recommend a lateral bearing pressure not exceeding 1000 psf. No other resisting factor should be used with that method.

Lateral load resistance may be derived from passive resistance along the vertical sides of the pipe or thrust block, friction acting at the base of the thrust block, or a combination of the two. A coefficient of friction of 0.3 may be used between a thrust block and supporting soils comprised of compacted soils, respectively. The passive resistance of level properly compacted fill soils in

direct contact with the foundations may be assumed to be equal to the pressure developed by a fluid with a density of 200 pcf, to a maximum pressure of 2,000 psf. An equivalent fluid pressure of 40 pcf may be used for the active soil pressure. A soil wet unit weight of 125 pcf and an internal friction of 30 degrees may also be used for the sandy soils in general. However, the Geotechnical Engineer should be consulted for site specific application because of the wide variation of the material in situ conditions. We recommend a minimum soil cover of 2 feet over thrust blocks. A safety factor of at least 1.5 should be used.

9.7 Soil Corrosivity

The corrosion potential of the onsite materials to steel and buried concrete was preliminarily evaluated. Laboratory testing was performed on the different soil types encountered in the borings to evaluate pH, minimum resistivity, chloride and soluble sulfate content. The test results are summarized in the following Table 6.

Table 6 – Summary of Corrosion Test Results

Segment No.	Boring	Depth (ft)	Minimum Resistivity (ohm-cm)	pH	Soluble Sulfate (ppm)	Soluble Chloride (ppm)
P9	B-1	2 – 3.5	3800	7.5	72	40
P10	B-4	5 – 6.5	2820	7.3	161	35
P2	B-5	0.5 - 2.0	12200	7.0	25	30
P3	B-7	5.0	30900	6.8	11	ND
P12	B-12	0.5 – 5.0	3200	7.4	145	40
P12	B-8	2.0 – 3.5	1390	7.0	263	20
P7	B-9	5 – 6.5	2920	6.2	209	25
P8	B-10	2.0 – 3.5	29900	7.3	12	ND

These tests are only an indicator of soil corrosivity for the samples tested. Other soils found on site may be more, less, or of a similar corrosive nature. Imported fill materials should be tested to confirm their corrosion potential. Based on the minimum resistivity results from the soil tested, some of the near-surface site soils may be considered moderately to severely corrosive towards buried ferrous metals. The concentrations of soluble sulfates indicate that the potential

of sulfate attack on concrete in contact with onsite soils is "negligible" based on ACI 318 Table 19.3.1.1. Cement Type II/V may be used in the concrete. Maximum water-cement ratios are not specified for the sulfate concentrations. Further interpretation of the corrosivity test results, including the resistivity values, and providing corrosion design and construction recommendations are the purview of corrosion specialists/consultants.

9.8 Pavement Restoration

The existing pavement sections will be replaced in areas where the pavement is excavated for construction of the proposed pipeline. As a minimum, the excavated pavement section should be replaced with the same pavement structural section plus one inch per City Standard Plan MBSI-132A.

9.9 General Grading Requirements

Locally earth works or grading may be conducted as following;

1. All fills, unless otherwise specifically stated in the report, should be compacted to at least 90 percent of the maximum dry density as determined by ASTM D1557 Method of Soil Compaction. The upper 12 inches of subgrade should be compacted to at least 95 percent relative compaction.

2. No fill should be placed until the area to receive the fill has been adequately prepared and approved by the Geotechnical Consultant.

3. Fill soils should be kept free of debris and organic material.

4. Rocks or hard fragments larger than 3 inches may not be placed in the fill without approval of the Geotechnical Consultant or his representative, and in a manner specified for each occurrence.

5. The fill material should be placed in lifts which, when loose, should not exceed 8 inches per lift. Each lift should be spread evenly and should be thoroughly mixed during the spreading to obtain uniformity of material and moisture.

6. When the moisture content of the fill material is too low to obtain adequate compaction, water should be added and thoroughly dispersed until the soil has a moisture within 2½ percent of optimum moisture content for sandy soils and at least 1½ percent above optimum for clayey soils.

7. When the moisture content of the fill material is too high to obtain adequate compaction, the fill material should be aerated by blading or other satisfactory methods until the soil has a moisture content as specified herein.

8. Permanent fill and cut slopes should not be constructed at gradients steeper than 2:1(H: V).

10. OBSERVATION AND TESTING DURING CONSTRUCTION

This report has been prepared assuming that Koury Engineering & Testing, Inc. will perform all geotechnical-related field observation and testing during backfilling and compaction operations. If the recommendations presented in this report are utilized, and observation of the geotechnical work is performed by others, the party performing the observation must review this report and assume responsibility for the recommendations contained herein. That party would then assume the title of "Geotechnical Consultant of Record". A report presenting the results of these observations and related testing should be issued upon completion of these operations.

11. CLOSURE

Our conclusions, opinions and recommendations are based on the field data obtained, the data provided to us, past experience with similar projects and engineering judgment. Our services were performed in a manner consistent with that level of care and skill ordinarily exercised by other members of Koury's profession practicing in the same locality, under similar conditions and at the date the services are provided. We make no other warranty, either expressed or implied. Samples obtained during this investigation will be retained in our laboratory for a period of 45 days from the date of this report and will be disposed after this period.

We thank you for the opportunity to provide Koury's professional engineering services. If you have any questions, please contact us.

Respectfully Submitted,

KOURY ENGINEERING & TESTING, INC.

REGISTERED PROFESSIONAL ENGINEER
PAO-LIN CHANG
2181
Exp. 3-31-2020
GEOTECHNICAL
STATE OF CALIFORNIA

Paul P. Chang, P.E., G.E.
Geotechnical Engineer

Distribution: 1. Addressee (pdf copy via e-mail)
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APPENDICES

Appendix A: Maps
Vicinity Map - Figure A-1
Boring Location Maps – Figures A-2, and A-2a through A-2d
Geology Map – Figure A-3
Fault Map – Figure A-4
Seismic Hazard Zone Map – Figure A-5

Appendix B: Boring Logs
Borings B-1 through B-12

Appendix C: Laboratory Test Results
Particle Size Distribution Reports
Maximum Density & Optimum Moisture
Sand Equivalent Reports
Direct Shear
Analytical Testing Results (Positive Lab Services)

Appendix D: City Standard Plan MBSI-132A.

REFERENCES

1. ASTM International, 2007, Standard Practice for Roads and Parking Lots Pavement Condition Index Surveys, December 1, 2007.

2. Caltrans Highway Design Manual, 2012, prepared by the Division of Design for use on the California State Highway System.

3. Dibblee, Thomas, W. Jr., 1999, Geologic Map of the Palos Verdes Peninsula and Vicinity, Redondo Beach, Torrance, and San Pedro Quadrangles, Los Angeles County, California, Dibblee Geological Foundation Map #DF-70.

4. Fault Activity map of California, 2010, California Geological Survey. Department of Conservation We Site @ http:/maps.conservation.ca.gov/cgs/fam/

5. Preliminary Geologic Map of the Los Angeles 30'X60' Quadrangle, Southern California, Version 1.0, Complied by Robert F. Yerkes & Russell H. Campbell, Open File Report 2005-1019

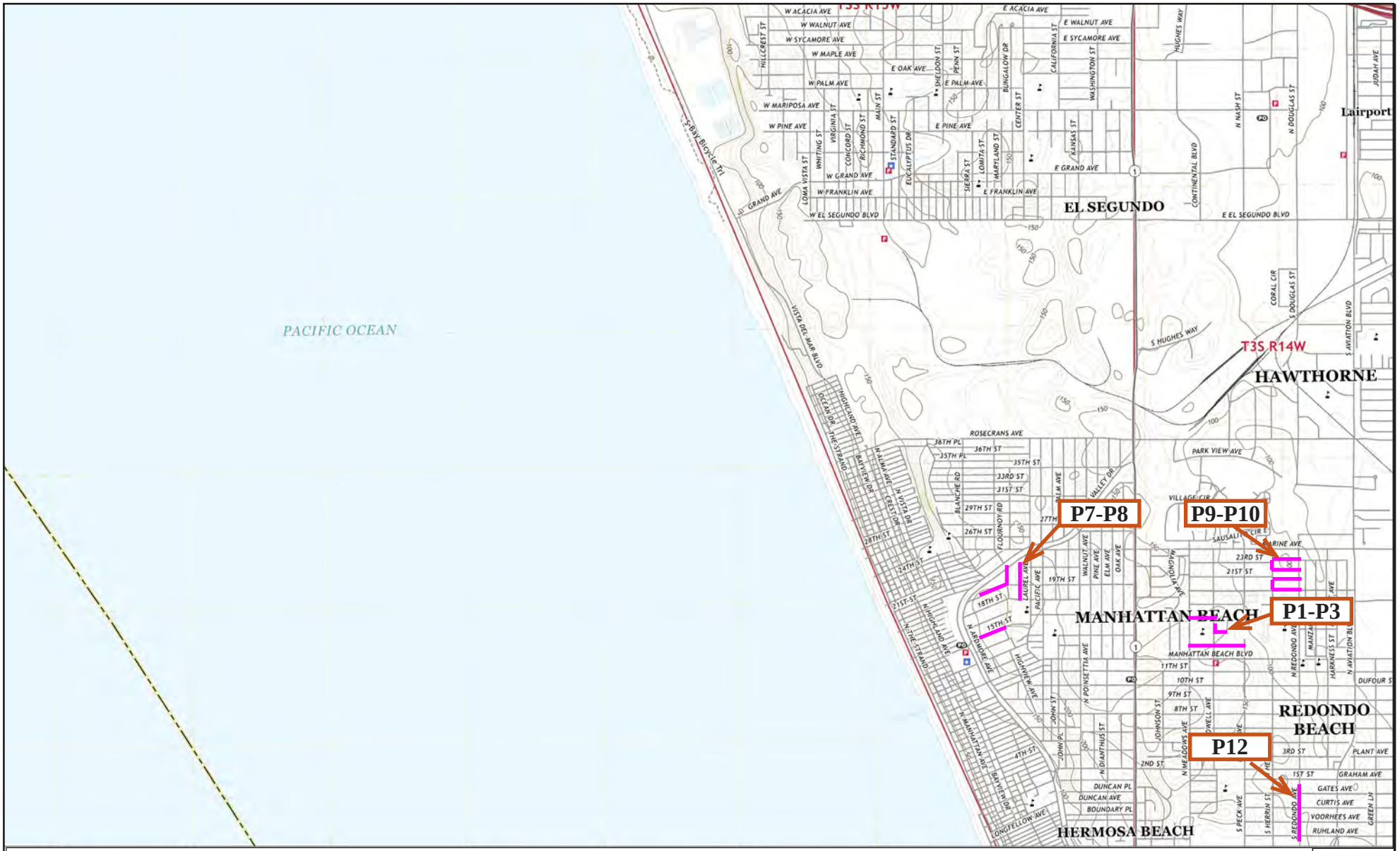
6. Public Works Los Angeles County, Map data Web Site: http://dwp.lacounty/general/wells/#

7. Standard Specifications for Public Works Construction, by Public Works Standards, Inc., 2018, The Greenbook 2018 Edition.

8. U.S. Geological Survey Topographic Map, Venice Quadrangle, California-Los Angeles County, 7.5-Minute Series, 2015.

APPENDIX A

Maps and Figures

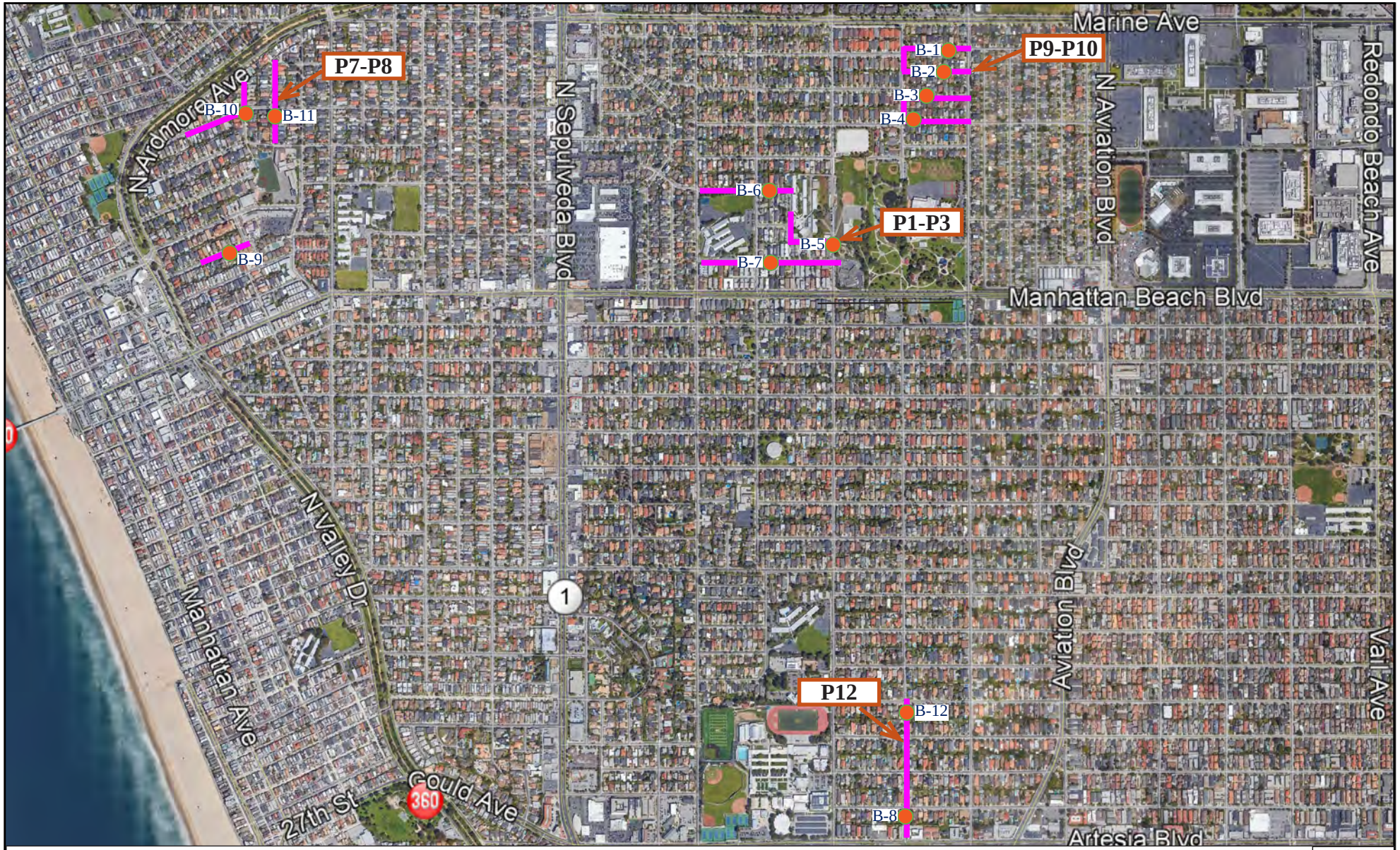


Reference: USGS Topographic Map, Venice Quadrangles, California Los Angeles County
7.5 Minute Series 2015 - Contour Interval 20 feet, NAVD 1988

0 1 2km

N

KOURY ENGINEERING & TESTING, INC.	Project Name: City of Manhattan Beach Water Line	Project No.: 19-0527 Date: Sept. 2019	Drawing Title: Vicinity Map	Figure: A-1



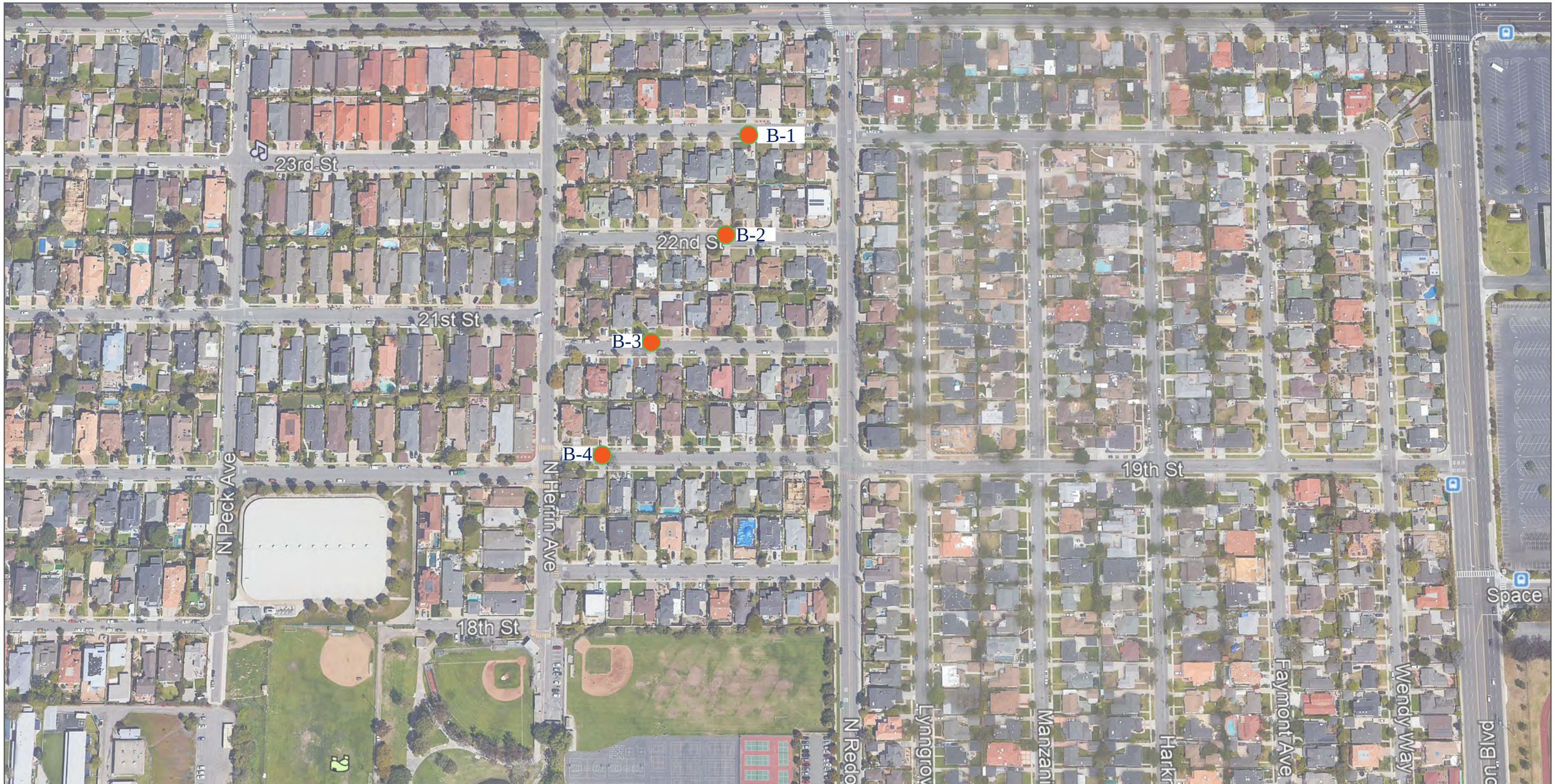
LEGEND

B-12 Approximate Boring Location & Number By Koury

0 1/4 mi 1/2 mi

N

KOURY ENGINEERING & TESTING, INC.	Project Name: City of Manhattan Beach Water Line	Project No.: 19-0527 Date: Sept. 2019	Drawing Title: Boring Location Map	Figure: A-2



LEGEND

B-4 Approximate Boring Location & Number By Koury

0 100' 200'

N

KOURY ENGINEERING & TESTING, INC.	Project Name: City of Manhattan Beach Water Line	Project No.: 19-0527 Date: Sept. 2019	Drawing Title: Boring Location Map	Figure: A-2a

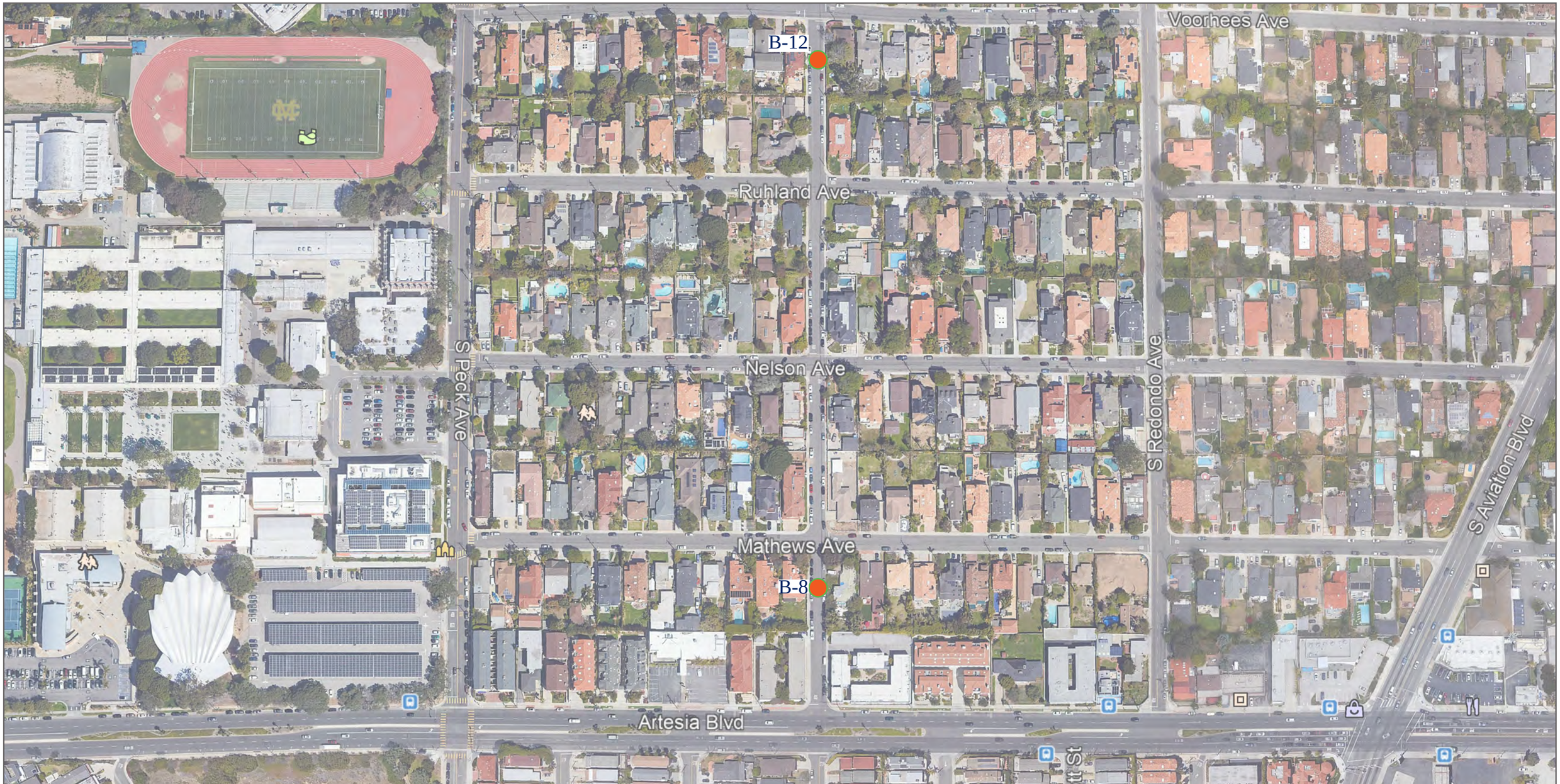
LEGEND

B-7 Approximate Boring Location & Number By Koury

0 100' 200'

N

KOURY ENGINEERING & TESTING, INC.	Project Name: City of Manhattan Beach Water Line	Project No.: 19-0527 Date: Sept. 2019	Drawing Title: Boring Location Map	Figure: A-2b



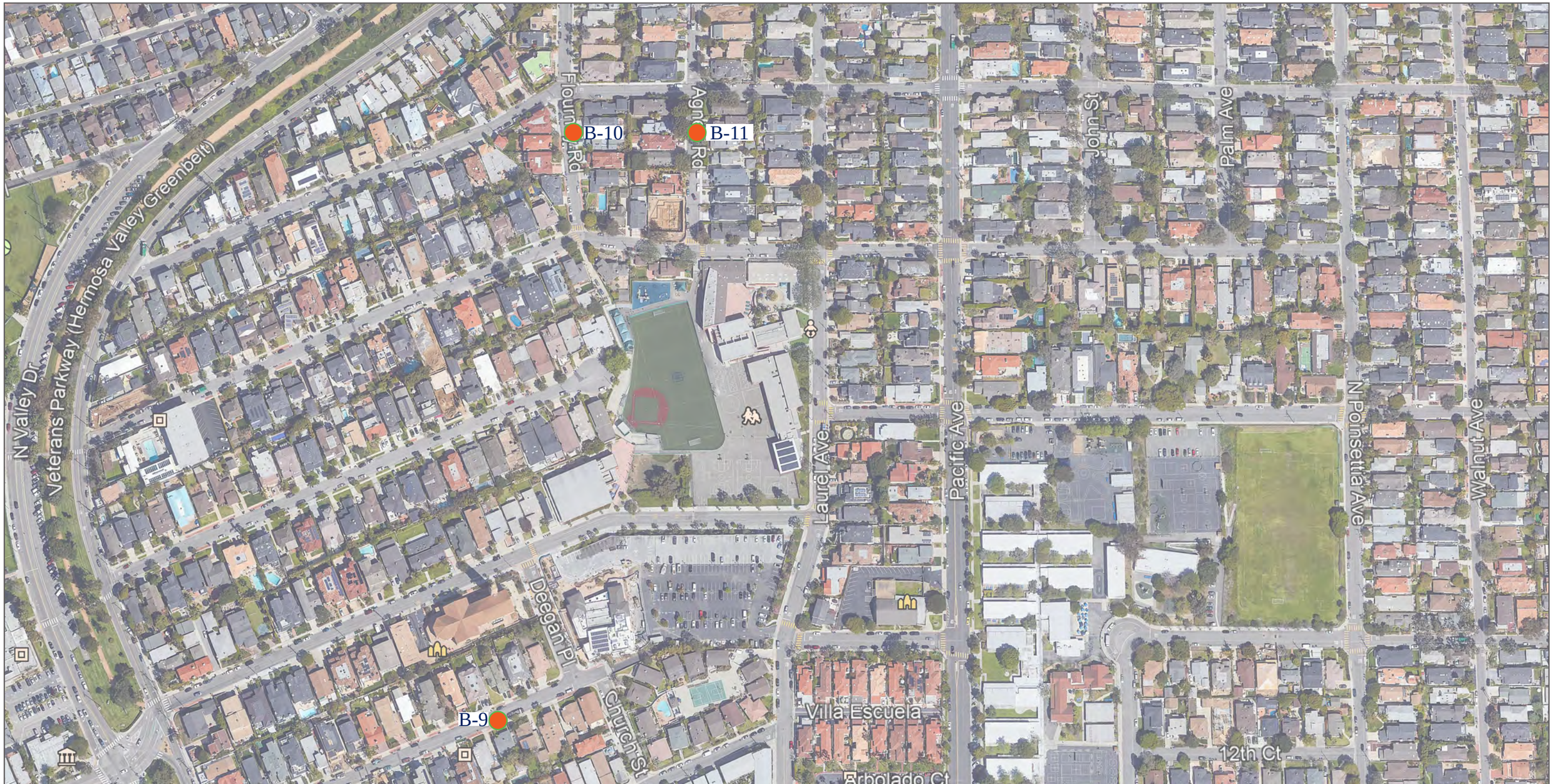
LEGEND

B-12 Approximate Boring Location & Number By Koury

0 100' 200'

N

KOURY ENGINEERING & TESTING, INC.	Project Name: City of Manhattan Beach Water Line	Project No.: 19-0527 Date: Sept. 2019	Drawing Title: Boring Location Map	Figure: A-2c



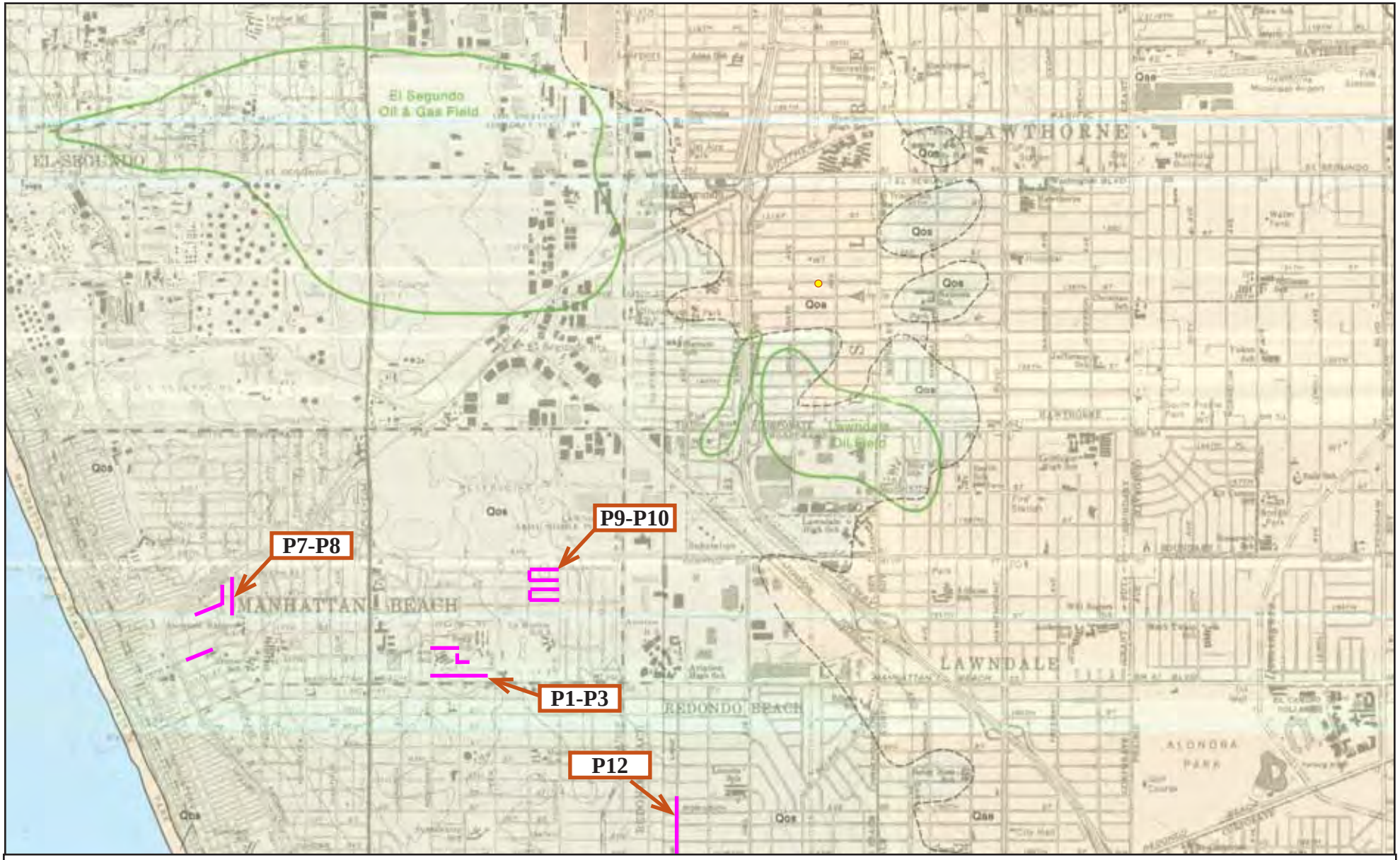
LEGEND

B-11 Approximate Boring Location & Number By Koury

0 100' 200'

N

KOURY ENGINEERING & TESTING, INC.	Project Name: City of Manhattan Beach Water Line	Project No.: 19-0527 Date: Sept. 2019	Drawing Title: Boring Location Map	Figure: A-2d



LEGEND

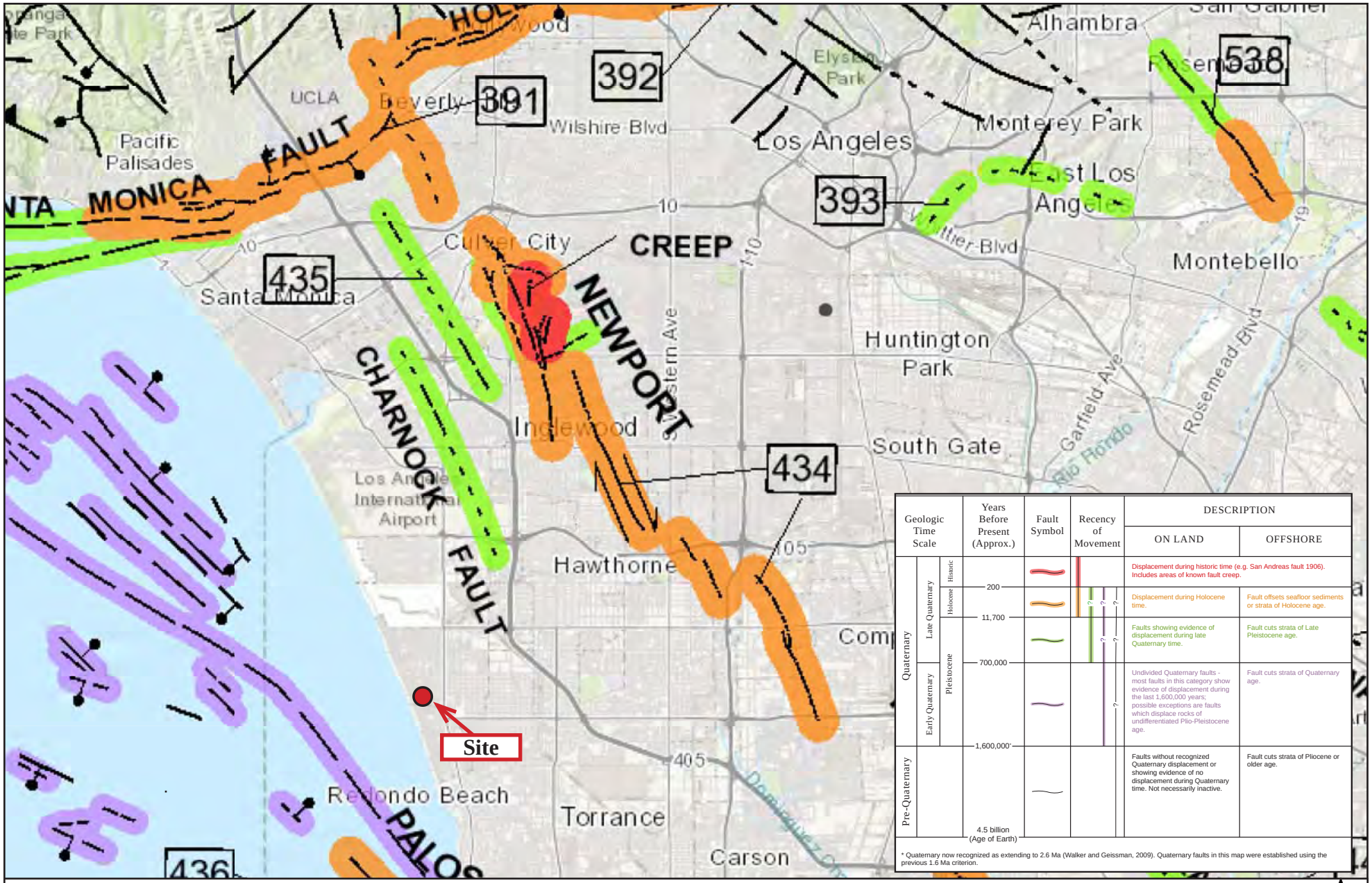
Qos **Old Sand Dune Deposits**

0 0.5 1 Mile

N

Reference: Preliminary Geologic Map of the Los Angeles 30'x60' Quadrangle, Southern California, Version 1.0, Compiled by Robert F. Yerkes & Russell H. Campbell, Open File Report 2005-1019

KOURY ENGINEERING & TESTING, INC.	Project Name:	Project No.: 19-0527	Drawing Title:	Figure:
	City of Manhattan Beach Water Line	Date: Sept. 2019	Geology Map	A-3

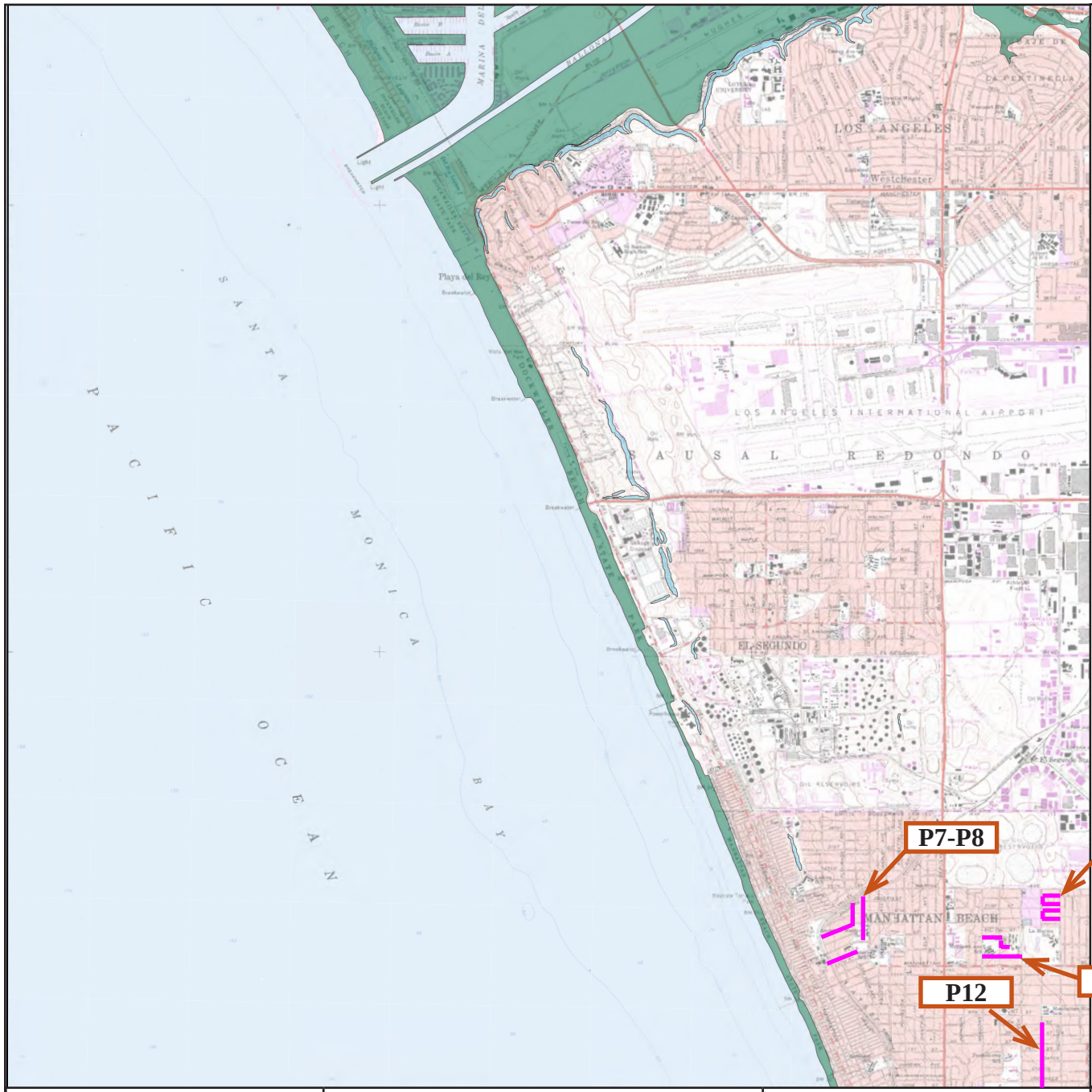


Reference: Fault Activity Map of California (2010) - California Geological Survey
Department of Conservation Web Site @ http://maps.conservation.ca.gov/cgs/fam/ - See Figure A-4a, for explanation

0 — 4 Mile

N

KOURY ENGINEERING & TESTING, INC.	Project Name: City of Manhattan Beach Water Line	Project No.: 19-0527 Date: Sept. 2019	Drawing Title: Fault Map	Figure: A-4



Earthquake Zones of Required Investigation
Los Angeles Quadrangle

California Geological Survey

This Map Shows Both Alquist-Priolo Earthquake Fault Zones And Seismic Hazard Zones Issued For The Los Angeles Quadrangle

This map shows the location of Alquist-Priolo (AP) Earthquake Fault Zones and Seismic Hazard Zones, collectively referred to here as Earthquake Zones of Required Investigation. The Geographic Information System (GIS) digital files of these regulatory zones released by the California Geological Survey (CGS) are the "Official Maps." GIS files are available at the CGS website http://maps.conservation.ca.gov/cgs/informationwarehouse/. These zones will assist cities and counties in fulfilling their responsibilities for protecting the public from the effects of surface fault rupture and earthquake-triggered ground failure as required by the AP Earthquake Fault Zoning Act (Public Resources Code Sections 2621-2630) and the Seismic Hazards Mapping Act (Public Resources Code Sections 2690-2699.6). For information regarding the general approach and recommended methods for preparing these zones, see CGS Special Publication 42, *Earthquake Fault Zones, a Guide for Government Agencies, Property Owners/Developers, and Geoscience Practitioners for Assessing Fault Rupture Hazards in California*, Appendix C, and CGS Special Publication 118, *Recommended Criteria for Delineating Seismic Hazard Zones in California*.

For information regarding the scope and recommended methods to be used in conducting required site investigations refer to CGS Special Publication 42, and CGS Special Publication 117A, *Guidelines for Evaluating and Mitigating Seismic Hazards in California*. For a general description of the AP and Seismic Hazards Mapping acts, the zonation programs, and related information, please refer to the website at www.conservation.ca.gov/cgs/.

MAP EXPLANATION

EARTHQUAKE FAULT ZONES

Earthquake Fault Zones
Zone boundaries are delineated by straight-line segments; the boundaries define the zone encompassing active faults that constitute a potential hazard to structures from surface faulting or fault creep such that avoidance as described in Public Resources Code Section 2621.5(a) would be required.

Active Fault Traces
Faults considered to have been active during Holocene time and to have potential for surface rupture: Solid Line in Black or Red where Accurately Located; Long Dash in Black or Solid Line in Purple where Approximately Located; Short Dash in Black or Solid Line in Orange where Inferred; Dotted Line in Black or Solid Line in Rose where Concealed; Query (?) indicates additional uncertainty. Evidence of historic offset indicated by year of earthquake-associated event or C for displacement caused by fault creep.

SEISMIC HAZARD ZONES

Liquefaction Zones
Areas where historical occurrence of liquefaction, or local geological, geotechnical and ground water conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required.

Earthquake-Induced Landslide Zones
Areas where previous occurrence of landslide movement, or local topographic, geological, geotechnical and subsurface water conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required.

OVERLAPPING EARTHQUAKE FAULT AND SEISMIC HAZARD ZONES

Overlap of Earthquake Fault Zone and Liquefaction Zone
Areas that are covered by both Earthquake Fault Zone and Liquefaction Zone.

Overlap of Earthquake Fault Zone and Earthquake-Induced Landslide Zone
Areas that are covered by both Earthquake Fault Zone and Earthquake-Induced Landslide Zone.

Note: Mitigation methods differ for each zone – AP Act only allows avoidance; Seismic Hazard Mapping Act allows mitigation by engineering/geotechnical design as well as avoidance.

ADDITIONAL INFORMATION

For additional information on the zones of required investigation presented on this map, the data and methodology used to prepare them, and additional references consulted, please refer to the following:

The Hollywood and Raymond Faults in the Los Angeles 7.5-Minute Quadrangle, Los Angeles County, California. California Geological Survey, Fault Evaluation Report FER-260.
http://gmw.conservation.ca.gov/SHP/EZRIM/Reports/FER/260

For more information on the Alquist-Priolo Earthquake Fault Zoning Act please refer to:
http://www.conservation.ca.gov/cgs/rghm/ap/Pages/main.aspx

Seismic Hazard Zone Report for the Los Angeles 7.5-Minute Quadrangle, Los Angeles County, California. California Geological Survey, Seismic Hazard Zone Report 029.
http://gmw.conservation.ca.gov/SHP/EZRIM/Reports/SHZR/SHZR_029_Los_Angeles.pdf

For more information on the Seismic Hazards Mapping Act please refer to:
http://www.conservation.ca.gov/cgs/shzp/Pages/SHMPbgminfo.aspx

Click the link below to learn how to take greater advantage of the GeoPDF format of this map after downloading.
http://gmw.conservation.ca.gov/SHP/EZRIM/Docs/TerragoUserGuide.pdf

LOS ANGELES QUADRANGLE

EARTHQUAKE FAULT ZONES	SEISMIC HAZARD ZONES
Delineated in compliance with Chapter 7.5, Division 2 of the California Public Resources Code *(Alquist-Priolo Earthquake Fault Zoning Act)*	Delineated in compliance with Chapter 7.8, Division 2 of the California Public Resources Code *(Seismic Hazards Mapping Act)*
REVISED OFFICIAL MAP	**OFFICIAL MAP**
Released: June 15, 2017	Released: March 25, 1999
STATE GEOLOGIST	STATE GEOLOGIST

PROFESSIONAL GEOLOGIST — JOHN G. PARRISH — No. 4757 — STATE OF CALIFORNIA

0 0.5 1 Mile

N

KOURY ENGINEERING & TESTING, INC.	Project Name: City of Manhattan Beach Water Line	Project No.: 19-0527 Date: Sept. 2019	Drawing Title: Seismic Hazard Zones Map	Figure: A-5

APPENDIX B

Field Exploratory Boring Logs

KEY TO LOGS

SOILS CLASSIFICATION					
MAJOR DIVISIONS			GRAPHIC LOG	USCS SYMBOL	TYPICAL NAMES
COARSE GRAINED SOILS MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVELS MORE THAN 50% OF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE	CLEAN GRAVELS LESS THAN 5% FINES		GW	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
				GP	POORLY-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES MORE THAN 12% FINES		GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES
	SANDS 50% OR MORE OF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE	CLEAN SANDS LESS THAN 5% FINES		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				SP	POORLY-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
		SANDS WITH FINES MORE THAN 12% FINES		SM	SILTY SANDS, SAND-SILT MIXTURES
				SC	CLAYEY SANDS, SAND-CLAY MIXTURES
FINE GRAINED SOILS 50% OR MORE OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS LIQUID LIMIT IS LESS THAN 50			ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS LIQUID LIMIT IS 50 OR MORE			MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SANDY OR GRAVELLY ELASTIC SILTS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT AND OTHER HIGHLY ORGANIC SOILS

GRAIN SIZES							
SILT AND CLAY	SAND			GRAVEL		COBBLES	BOULDERS
	FINE	MEDIUM	COARSE	FINE	COARSE		
	#200	#40	#10	#4	3/4"	3"	12"
SIEVE SIZES							

KEY TO LOGS (continued)

SPT/CD BLOW COUNTS VS. CONSISTENCY/DENSITY					
FINE-GRAINED SOILS (SILTS, CLAYS, etc.)			GRANULAR SOILS (SANDS, GRAVELS, etc.)		
CONSISTENCY	*BLOWS/FOOT		RELATIVE DENSITY	*BLOWS/FOOT	
	SPT	CD		SPT	CD
SOFT	0-4	0-4	VERY LOOSE	0-4	0-8
FIRM	5-8	5-9	LOOSE	5-10	9-18
STIFF	9-15	10-18	MEDIUM DENSE	11-30	19-54
VERY STIFF	16-30	19-39	DENSE	31-50	55-90
HARD	over 30	over 39	VERY DENSE	over 50	over 90

* CONVERSION BETWEEN CALIFORNIA DRIVE SAMPLERS (CD) AND STANDARD PENETRATION TEST (SPT) BLOW COUNT HAS BEEN CALCULATED USING "FOUNDATION ENGINEERING HAND BOOK" BY H.Y. FANG. (**VALUES ARE FOR 140 Lbs HAMMER WEIGHT ONLY**)

DESCRIPTIVE ADJECTIVE VS. PERCENTAGE	
DESCRIPTIVE ADJECTIVE	PERCENTAGE REQUIREMENT
TRACE	1 - 10%
LITTLE	10 - 20%
SOME	20 - 35%
AND	35 - 50%

*THE FOLLOWING "DESCRIPTIVE TERMINOLOGY/ RANGES OF MOISTURE CONTENTS" HAVE BEEN USED FOR MOISTURE CLASSIFICATION IN THE LOGS.

APPROXIMATE MOISTURE CONTENT DEFINITION	
DEFINITION	DESCRIPTION
DRY	Dry to the touch; no observable moisture
SLIGHTLY MOIST	Some moisture but still a dry appearance
MOIST	Damp, but no visible water
VERY MOIST	Enough moisture to wet the hands
WET	Almost saturated; visible free water

Boring Log

KOURY ENGINEERING & TESTING, INC.

Project No. : 19-0527
Project Name : Manhattan Beach

Boring No. : B-1

Sheet : 1 of : 1

Drilling Method : Hollow Stem 6" Auger
Sampling Method : Bulk - CD - SPT
Hammer Weight : 140 lbs Drop Height : 30"
Location : 1634 23rd Street, See Figure A-2a

Ground Elevation:
Drilling Co. : Hamilton
Date Drilled : 9/11/19

Sample No.	Moisture Content (%)	Dry Unit Weight (pcf)	Blows per 6"	Depth (ft)	Sample Location	Graphic Log	Soil Type (USCS)	Description	Additional Tests
				0			AC/AB	3" of asphalt concrete over 4" of aggregate base	
1	5.3							**FILL: Poorly Graded SAND with SILT;** fine to medium, medium dense, moist, strong brown	Fines = 8% Corrosivity
2	7.6		4 6 8					Maximum Density = 111.6 pcf Optimum Moisture = 12.4%	#200 Wash Fines = 9% SE = 22
				5					
3	4.2	101	6 11 17				SP-SM	**ALLUVIUM:** **Poorly Graded SAND with SILT;** fine to medium, medium dense, slightly moist, light yellowish brown	
4	3.5	100	8 15 20						#200 Wash Fines = 6%
				10					
5	3.2		5 8 12						
								End of Boring @ 11' 6" No groundwater encountered Environmental sample @ 8' 6"	
				15					
				20					
				25					
				30					
				35					
				40					

Bulk ☒ CD ■ SPT ☒

Boring Log

KOURY ENGINEERING & TESTING, INC.

Project No. : 19-0527
Project Name : Manhattan Beach

Boring No. : B-2

Sheet : 1 of : 1

Drilling Method : Hollow Stem 6" Auger
Sampling Method : Bulk - CD - SPT
Hammer Weight : 140 lbs Drop Height : 30"
Location : 1631 22nd Street, See Figure A-2a

Ground Elevation:
Drilling Co. : Hamilton
Date Drilled : 9/11/19

Sample No.	Moisture Content (%)	Dry Unit Weight (pcf)	Blows per 6"	Depth (ft)	Sample Location	Graphic Log	Soil Type (USCS)	Description	Additional Tests
				0			AC/AB	2.75" of asphalt concrete over 4,5" of aggregate base	
1	4.0						SP-SM	**Poorly Graded SAND with SILT;** fine to medium, medium dense, slightly moist, light yellowish brown	#200 Wash Fines = 3%
2	3.9	95	3 6 9					Max Density = 108 pcf, Optimum Moisture = 11.9%	#200 Wash Fines = 9%
				5					
3	3.9		4 5 7				SP	**ALLUVIUM:** **Poorly Graded SAND;** fine to medium, medium dense, slightly moist, light yellowish brown	#200 Wash Fines = 2%
4	4.9	94	6 9 17						
				10					
5	4.0		5 8 11						
								End of Boring @ 11' 6" No groundwater encountered Environmental sample @ 5' 6"	
				15					
				20					
				25					
				30					
				35					
				40					

Bulk ☒ CD ■ SPT ☒

Boring Log

KOURY ENGINEERING & TESTING, INC.

Project No. : 19-0527
Project Name : Manhattan Beach

Boring No. : B-3

Sheet : 1 of : 1

Drilling Method : Hollow Stem 6" Auger
Sampling Method : Bulk - CD - SPT
Hammer Weight : 140 lbs Drop Height : 30"
Location : 1617 21st Street, See Figure A-2a

Ground Elevation:
Drilling Co. : Hamilton
Date Drilled : 9/11/19

Sample No.	Moisture Content (%)	Dry Unit Weight (pcf)	Blows per 6"	Depth (ft)	Sample Location	Graphic Log	Soil Type (USCS)	Description	Additional Tests
				0			AC/AB	3.5" of asphalt concrete over 4" of aggregate base	
1	8.5						SM	**FILL: SILTY SAND;** fine to medium, medium dense, moist, strong brown to reddish brown	#200 Wash Fines = 16% SE = 18
2	8.3		4 6 8					Max Density=126.5 pcf, Opt Moisture=9.3%	
				5					
3	7.9	108	9 5 12					**ALLUVIUM:** **Poorly Graded SAND with SILT;** fine to medium, medium dense, slightly moist to moist, light yellowish brown with strong brown layers	#200 Wash Fines = 8%
4	6.3						SP-SM		#200 Wash Fines = 6%
5	3.8		6 8 11						
				10					
6	8.7	109	9 16 28						
								End of Boring @ 11' 6" No groundwater encountered	
								Environmental sample @ 6' 6'	
				15				Maximum Density = 126.5 pcf Optimum Moisture = 9.3%	
				20					
				25					
				30					
				35					
				40					

Bulk ☒ CD ■ SPT ☒

Boring Log

KOURY ENGINEERING & TESTING, INC.

Project No. : 19-0527
Project Name : Manhattan Beach

Boring No. : B-4

Sheet : 1 of : 1

Drilling Method : Hollow Stem 6" Auger
Sampling Method : Bulk - CD - SPT
Hammer Weight : 140 lbs Drop Height : 30"
Location : 1607 19th Street, See Figure A-2a

Ground Elevation:
Drilling Co. : Hamilton
Date Drilled : 9/11/19

Sample No.	Moisture Content (%)	Dry Unit Weight (pcf)	Blows per 6"	Depth (ft)	Sample Location	Graphic Log	Soil Type (USCS)	Description	Additional Tests
				0			AC/AB	4" of asphalt concrete over 4" of aggregate base	
1	5.3						SM	Maximum Density = 126.5 pcf Optimum Moisture = 9.3% **FILL:** **SILTY SAND;** fine to medium, medium dense, moist, strong brown to reddish brown	#200 Wash Fines = 24%
2	8.0	124	7 10 11						Direct Shear
				5					
3	9.9		4 5 6				SP-SM	**ALLUVIUM:** **CLAYEY SAND;** fine to medium, loose, moist, dark brown to reddish brown	#200 Wash Fines = 33% Corrosivity
4	12.1								
5	11.2	119	4 4 6						
				10			SM	**SILTY SAND;** fine to medium, loose, moist, brown to reddish brown	#200 Wash Fines = 16%
6	7.8		2 3 5						
								End of Boring @ 11' 6" No groundwater encountered Environmental sample @ 9'	
				15					
				20					
				25					
				30					
				35					
				40					

Bulk ☒ CD ■ SPT ☒

Boring Log

KOURY ENGINEERING & TESTING, INC.

Project No. : 19-0527
Project Name : Manhattan Beach

Boring No. : B-5

Sheet : 1 of : 1

Drilling Method : Hollow Stem 6" Auger
Sampling Method : Bulk - CD - SPT
Hammer Weight : 140 lbs Drop Height : 30"
Location : N. Peck Ave. & 12th Street, See Figure A-

Ground Elevation:
Drilling Co. : Hamilton
Date Drilled : 9/11/19

Sample No.	Moisture Content (%)	Dry Unit Weight (pcf)	Blows per 6"	Depth (ft)	Sample Location	Graphic Log	Soil Type (USCS)	Description	Additional Tests
				0			AC/AB	3" of asphalt concrete over 4" of aggregate base	
1	4.9						SM	**FILL: SILTY SAND;** fine to medium, loose, slightly moist, reddish brown Maximum Density = 130.3 pcf Optimum Moisture= 8.1%	#200 Wash Fines = 17% Corrosivity
2	5.9		3 3 4				SP-SM	**Poorly Graded SAND with SILT;** fine to medium, loose, moist, brown to reddish brown	#200 Wash Fines = 12% SE = 25
3	8.4	111	6 12 16	5				**ALLUVIUM:** **Poorly Graded SAND with SILT;** fine to medium, loose to medium dense, moist, dark yellowish brown with reddish brown inclusions	#200 Wash Fines = 11% Direct Shear
4	7.1		4 4 4					loose and dark yellowish brown	
5	4.1	104	3 4 9	10				slightly moist, yellowish brown to dark yellowish brown	#200 Wash Fines = 3%
				15				End of Boring @ 11' 6" No groundwater encountered Environmental sample @ 5' 6"	
				20					
				25					
				30					
				35					
				40					

Bulk ☒ CD ■ SPT ☒

Boring Log

KOURY ENGINEERING & TESTING, INC.

Project No. : 19-0527
Project Name : Manhattan Beach

Boring No. : B-6

Sheet : 1 of : 1

Drilling Method : Hollow Stem 6" Auger
Sampling Method : Bulk - CD - SPT
Hammer Weight : 140 lbs Drop Height : 30"
Location : 17th St. and Rowell, See Figure A-2a

Ground Elevation:
Drilling Co. : Hamilton
Date Drilled : 9/11/19

Sample No.	Moisture Content (%)	Dry Unit Weight (pcf)	Blows per 6"	Depth (ft)	Sample Location	Graphic Log	Soil Type (USCS)	Description	Additional Tests
				0			AC/AB	3.5" of asphalt concrete over 4" of aggregate base	
1	4.9						SP-SM	**FILL:** **Poorly Graded SAND with SILT;** fine to medium, medium dense, slightly moist, reddish brown	#200 Wash Fines = 20%
2	4.7	106	4 6 8					brown to yellowish Maximum Density = 130.3 pcf Optimum Moisture = 8.1%	
				5					
3	7.0		4 6 9				SM	**ALLUVIUM:** **SILTY SAND;** fine to medium, medium dense, moist, reddish brown with yellowish brown inclusions	Gradation Fines = 15% SE = 18
4	7.9	111	7 16 27						
				10				**Poorly Graded SAND with SILT**; fine to medium, medium dense, moist, reddish brown	
5	7.5		8 9 10						#200 Wash Fines = 11%
								End of Boring @ 11' 6" No groundwater encountered Environmental sample @ 6'	
				15					
				20					
				25					
				30					
				35					
				40					

Bulk ☒ CD ■ SPT ☒

Boring Log

KOURY ENGINEERING & TESTING, INC.

Project No. : 19-0527
Project Name : Manhattan Beach

Boring No. : B-7

Sheet : 1 of : 1

Drilling Method : Hollow Stem 6" Auger
Sampling Method : Bulk - CD - SPT
Hammer Weight : 140 lbs Drop Height : 30"
Location : 12th St. and Rowell, See Figure A-2a

Ground Elevation:
Drilling Co. : Hamilton
Date Drilled : 9/11/19

Sample No.	Moisture Content (%)	Dry Unit Weight (pcf)	Blows per 6"	Depth (ft)	Sample Location	Graphic Log	Soil Type (USCS)	Description	Additional Tests
				0			AC/AB	3" of asphalt concrete over 5" of aggregate base	
1	8.9						SM	**FILL:** **SILTY SAND;** fine to medium, loose, moist, dark brown to dark reddish brown Maximum Density = 130.7 pcf Optimum Moisture = 7.5%	#200 Wash Fines = 25%
2	8.9			5					
3	8.2		2 2 3					**ALLUVIUM:** **SILTY SAND;** fine to medium, loose to medium dense, moist, dark brown	#200 Wash Fines = 28% Corrosivity
4	6.9	119	6 9 13						#200 Wash Fines = 22%
5	7.2		5 5 6	10				layers of light brown	
								End of Boring @ 11' 6" No groundwater encountered Environmental sample @ 11'	
				15					
				20					
				25					
				30					
				35					
				40					

Bulk ☒ CD ■ SPT ☒

Boring Log

KOURY ENGINEERING & TESTING, INC.

Project No. : 19-0527
Project Name : Manhattan Beach

Boring No. : B-8

Sheet : 1 of : 1

Drilling Method : Hollow Stem 6" Auger
Sampling Method : Bulk - CD - SPT
Hammer Weight : 140 lbs Drop Height : 30"
Location: Mathews & Herrin Street, See Figure A-2a

Ground Elevation:
Drilling Co. : Hamilton
Date Drilled : 9/11/19

Sample No.	Moisture Content (%)	Dry Unit Weight (pcf)	Blows per 6"	Depth (ft)	Sample Location	Graphic Log	Soil Type (USCS)	Description	Additional Tests
				0			AC	4" of asphalt concrete	
1	4.3						SM	**FILL: SILTY SAND;** fine to medium, loose, slightly moist, dark brown to dark reddish brown	#200 Wash Fines = 26% Corrosivity
2	5.1		4 4 5					brown	
				5			SP-SM	**ALLUVIUM:** **Poorly Graded SAND with SILT;** fine to medium, medium dense, slightly moist, strong brown	
3	2.4	108	6 7 14						#200 Wash Fines = 10% SE = 30
4	3.0							dark brown	
5	3.0		8 8 11					yellowish brown	Gradation Fines = 9%
6	4.2	110	11 16 29	10					
								End of Boring @ 11' 6" No groundwater encountered Environmental sample @ 5'	
				15					
				20					
				25					
				30					
				35					
				40					

Bulk ☒ CD ■ SPT ☒

Boring Log

KOURY ENGINEERING & TESTING, INC.

Project No. : 19-0527
Project Name : Manhattan Beach

Boring No. : B-9

Sheet : 1 of : 1

Drilling Method : Hollow Stem 6" Auger
Sampling Method : Bulk - CD - SPT
Hammer Weight : 140 lbs Drop Height : 30"
Location : 634 14th Street, See Figure A-2a

Ground Elevation:
Drilling Co. : Hamilton
Date Drilled : 9/11/19

Sample No.	Moisture Content (%)	Dry Unit Weight (pcf)	Blows per 6"	Depth (ft)	Sample Location	Graphic Log	Soil Type (USCS)	Description	Additional Tests
				0			AC/AB	3.5" of asphalt concrete over 2" of aggregate base	
1	4.5							**FILL:** **Poorly Graded SAND with SILT;** fine to medium, loose to medium dense, slightly moist, brown to strong brown	Gradation Fines = 6%
2	4.2	107	3 5 9					"similar as above" but dark reddish brown	
				5					
3	4.8		3 4 6				SP-SM	**ALLUVIUM:** **Poorly Graded SAND with SILT;** fine to medium, loose to medium dense, slightly moist, dark reddish brown	Fines = 8% Corrosivity SE = 69
4	5.2	106	6 9 12					brown to strong brown	#200 Wash Fines = 7%
				10					
5	5.3		3 4 5						
								End of Boring @ 11' 6" No groundwater encountered Environmental sample @ 3'	
				15					
				20					
				25					
				30					
				35					
				40					

Bulk ☒ CD ■ SPT ☒

Boring Log

KOURY ENGINEERING & TESTING, INC.

Project No. : 19-0527
Project Name : Manhattan Beach

Boring No. : B-10

Sheet : 1 of : 1

Drilling Method : Hollow Stem 6" Auger
Sampling Method : Bulk - CD - SPT
Hammer Weight : 140 lbs Drop Height : 30"
Location : 1818 Fluornoy Road, See Figure A-2a

Ground Elevation:
Drilling Co. : Hamilton
Date Drilled : 9/11/19

Sample No.	Moisture Content (%)	Dry Unit Weight (pcf)	Blows per 6"	Depth (ft)	Sample Location	Graphic Log	Soil Type (USCS)	Description	Additional Tests
				0			AC	8" of asphalt concrete	
1	4.7							Maximum Density = 124.0 pcf Optimum Moisture = 7.4 %	#200 Wash Fines = 8% Corrosivity SE = 44
2	5.3		2 2 3					**FILL: Poorly Graded SAND with SILT;** fine to medium, loose, slightly moist, dark reddish brown	
				5					
3	5.3	100	2 2 2				SP-SM	**ALLUVIUM:** **Poorly Graded SAND with SILT;** fine to medium, loose, slightly moist, inclusions of dark yellowish brown	#200 Wash Fines = 9%
4	3.8		1 1 2						#200 Wash Fines = 4%
				10					
5	5.5	103	2 3 3						
								End of Boring @ 11' 6" No groundwater encountered Environmental sample @ 8' 6"	
				15					
				20					
				25					
				30					
				35					
				40					

Bulk ☒ CD ■ SPT ☒

Boring Log

KOURY ENGINEERING & TESTING, INC.

Project No. : 19-0527
Project Name : Manhattan Beach

Boring No. : B-11

Sheet : 1 of : 1

Drilling Method : Hollow Stem 6" Auger
Sampling Method : Bulk - CD - SPT
Hammer Weight : 140 lbs Drop Height : 30"
Location : 1816 Agnes Street, See Figure A-2a

Ground Elevation:
Drilling Co. : Hamilton
Date Drilled : 9/11/19

Sample No.	Moisture Content (%)	Dry Unit Weight (pcf)	Blows per 6"	Depth (ft)	Sample Location	Graphic Log	Soil Type (USCS)	Description	Additional Tests
				0			AC	3.5" of asphalt concrete	
1	3.8						SP-SM	Maximum Density: 124.0 pcf Optimum Moisture = 7.4% **FILL:** **Silty SAND;** fine to medium, medium dense, slightly moist, dark reddish brown	Gradation Fines = 15%
2	4.9	111	4 7 12	5				**ALLUVIUM:** **Silty SAND;** fine to medium, loose to medium dense, slightly moist, brown	#200 Wash Fines = 18%
3	4.7		5 4 5						
4	4.1	105	5 8 12	10				strong brown to dark brown	
								End of Boring @ 11' 6" No groundwater encountered Environmental sample @ 8' 6"	
				15					
				20					
				25					
				30					
				35					
				40					

Bulk ☒ CD ■ SPT ☒

Boring Log

KOURY ENGINEERING & TESTING, INC.

Project No. : 19-0527
Project Name : Manhattan Beach

Boring No. : B-12

Sheet : 1 of : 1

Drilling Method : Hollow Stem 6" Auger
Sampling Method : Bulk - CD - SPT
Hammer Weight : 140 lbs Drop Height : 30"
Location : Ruhland and Herrin Street, See Figure A-2

Ground Elevation:
Drilling Co. : Hamilton
Date Drilled : 9/11/19

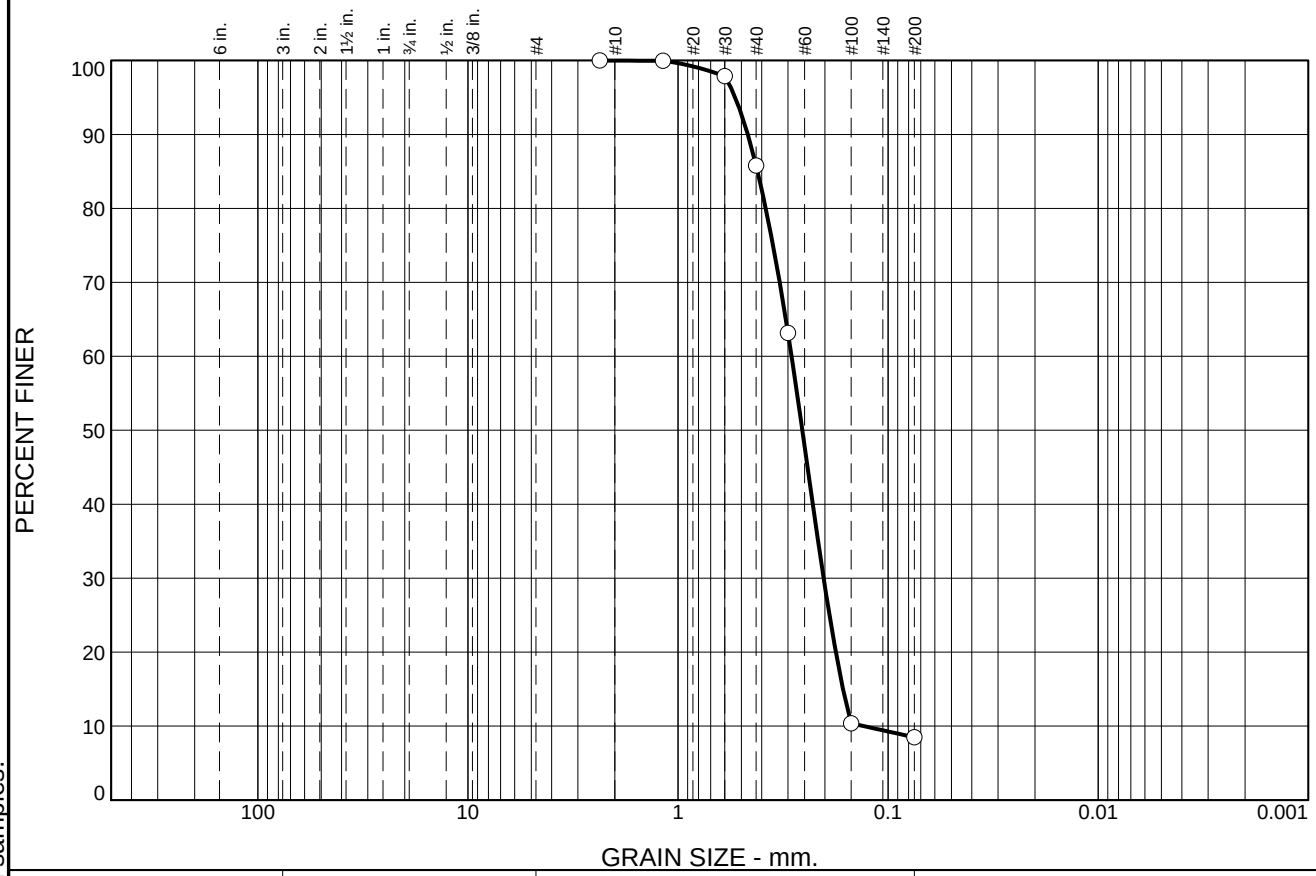
Sample No.	Moisture Content (%)	Dry Unit Weight (pcf)	Blows per 6"	Depth (ft)	Sample Location	Graphic Log	Soil Type (USCS)	Description	Additional Tests
				0			AC	4" of asphalt concrete	
1	3.8							**FILL: Poorly Graded SAND with SILT;** fine to medium, medium dense, slightly moist, dark reddish brown	Gradation Fines = 16% Corrosivity
2	5.0	109	3 4 5						Fines = 17%
				5				**ALLUVIUM:** **Poorly Graded SAND with SILT;** fine to medium, loose to medium dense, slightly moist, strong brown	
3	2.9		3 5 7				SP-SM		#200 Wash Fines = 8% SE = 27
4	5.0	106	12 16 25						#200 Wash Fines = 12%
				10					
5	3.7		7 9 11						
								End of Boring @ 11' 6" No groundwater encountered Environmental sample @ 10' 6" @ 0.5 - 2' Maximum Density = 124.2 pcf Optimum Moisture = 8.7%	
				15					
				20					
				25					
				30					
				35					
				40					

Bulk ☒ CD ■ SPT ☒

APPENDIX C

Particle Size Distribution Reports
Maximum Density & Optimum Moisture
Sand Equivalent Reports
Direct Shear Test Reports
Analytical Testing Results (Positive Lab Services)

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	14.2	77.3	8.5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#8	100.0		
#16	100.0		
#30	97.9		
#40	85.8		
#50	63.2		
#100	10.4		
#200	8.5		

* (no specification provided)

Material Description

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 0.4656 D_{85}= 0.4184 D_{60}= 0.2884
D_{50}= 0.2562 D_{30}= 0.2027 D_{15}= 0.1641
D_{10}= 0.1308 C_u= 2.21 C_c= 1.09

Classification

USCS= AASHTO=

Remarks

Lab #6226.

Location: B1 @ 2' - 3.5'
Sample Number: 2019-474 Series

Date: 9/17/19

Koury Engineering & Testing, Inc.

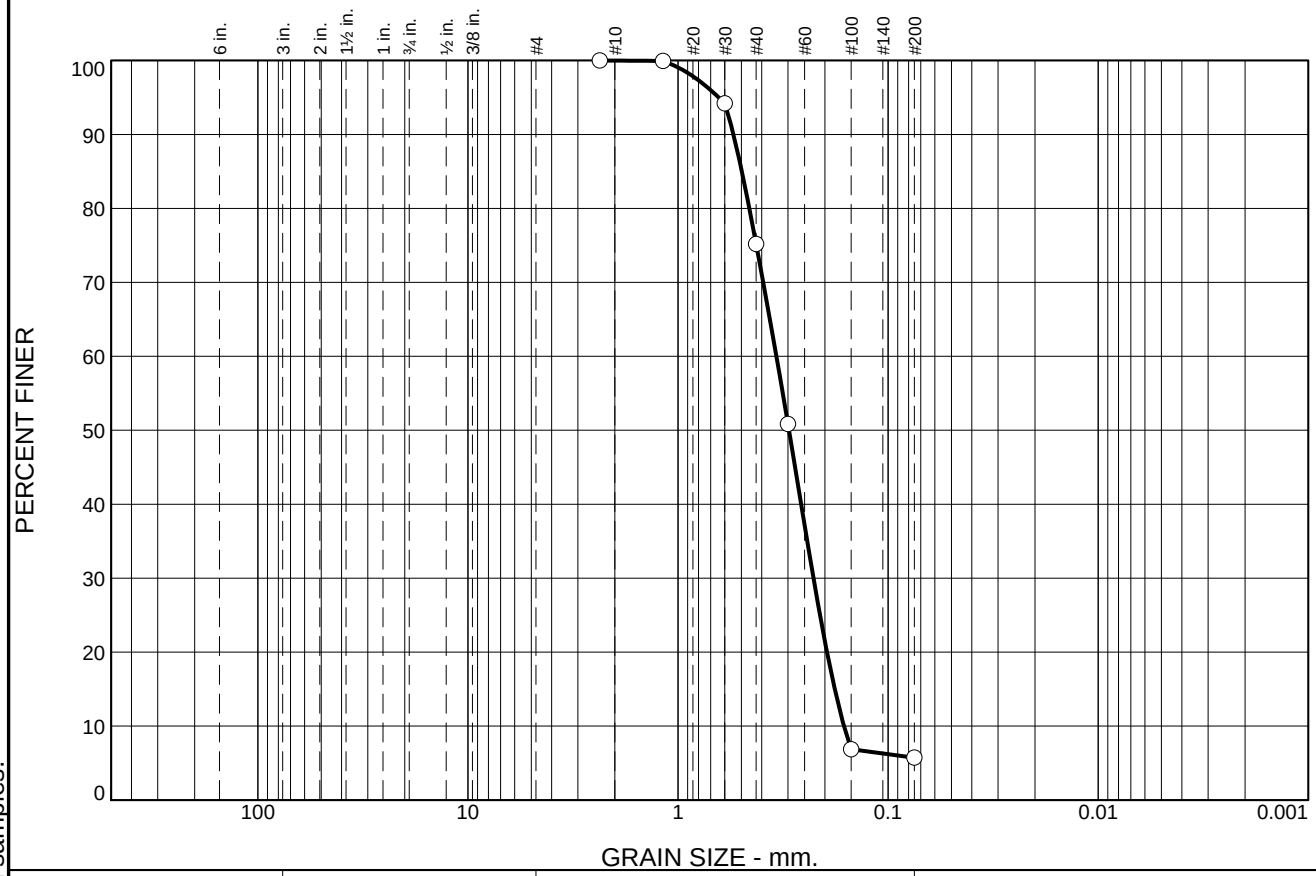
Chino, CA

Client:
Project: City of Manhattan Beach - Waterline Replacement
Project No: 19-0527 **Figure**

Tested By: J.Roy/MF Perry **Checked By:** _____

These results are for the exclusive use of the client for whom they were obtained. They apply only to the samples tested and are not indicitive of apparently identical samples.

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	24.8	69.5	5.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#8	100.0		
#16	99.9		
#30	94.2		
#40	75.2		
#50	50.8		
#100	6.9		
#200	5.7		

* (no specification provided)

Material Description

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 0.5453 D_{85}= 0.4971 D_{60}= 0.3403
D_{50}= 0.2966 D_{30}= 0.2266 D_{15}= 0.1796
D_{10}= 0.1625 C_u= 2.09 C_c= 0.93

Classification

USCS= AASHTO=

Remarks

Lab #6226.

Location: B3 @ 7' - 8'
Sample Number: 2019-474 Series

Date: 9/17/19

Koury Engineering & Testing, Inc.

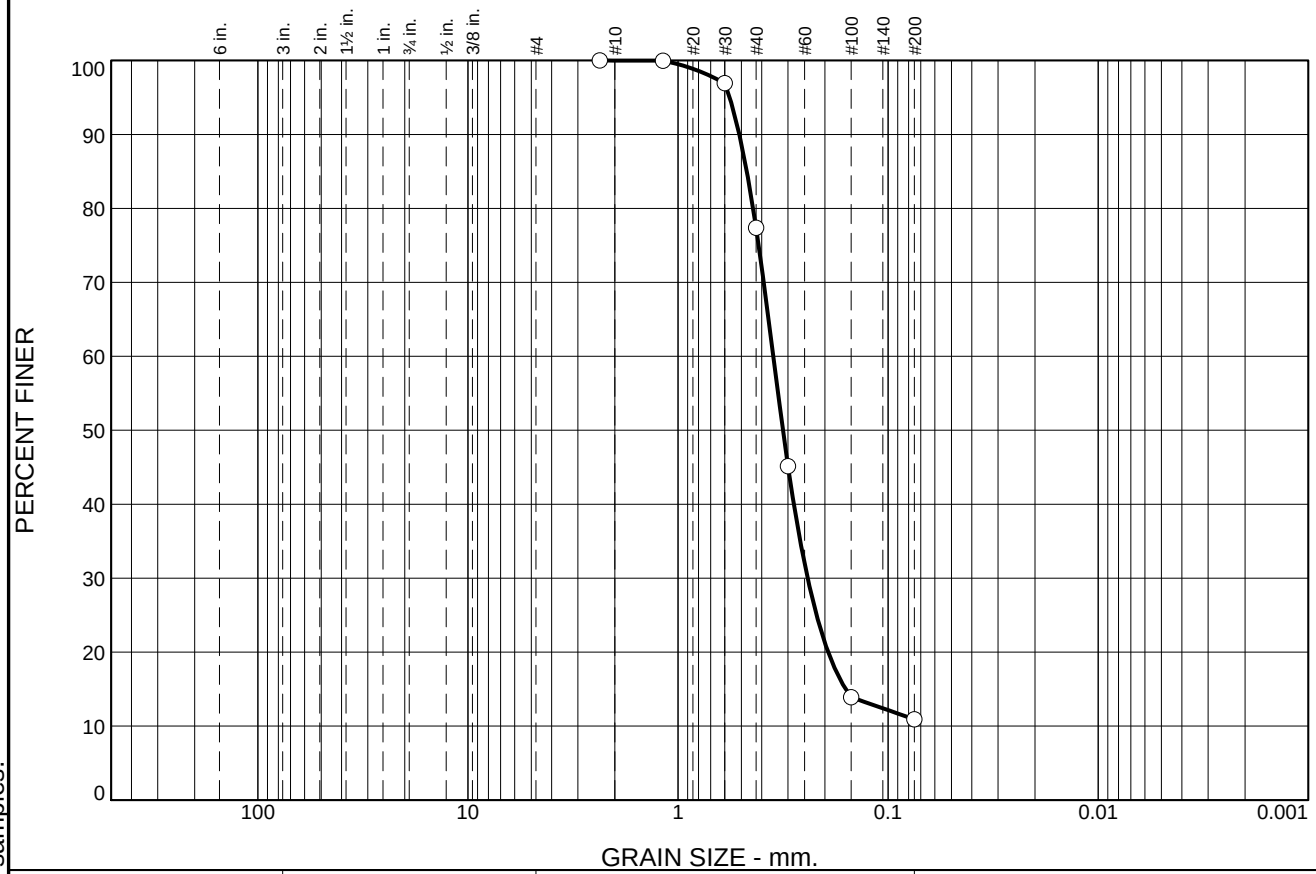
Chino, CA

Client:
Project: City of Manhattan Beach - Waterline Replacement
Project No: 19-0527 **Figure**

Tested By: J.Roy/MF Perry **Checked By:** _____

These results are for the exclusive use of the client for whom they were obtained. They apply only to the samples tested and are not indicitive of apparently identical samples.

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	22.6	66.5	10.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#8	100.0		
#16	100.0		
#30	96.9		
#40	77.4		
#50	45.1		
#100	13.9		
#200	10.9		

* (no specification provided)

Material Description

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 0.5111 D_{85}= 0.4707 D_{60}= 0.3521
D_{50}= 0.3170 D_{30}= 0.2417 D_{15}= 0.1595
D_{10}= C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Lab #6226.

Location: B5 @ 6'
Sample Number: 2019-474 Series

Date: 9/17/19

Koury Engineering & Testing, Inc.

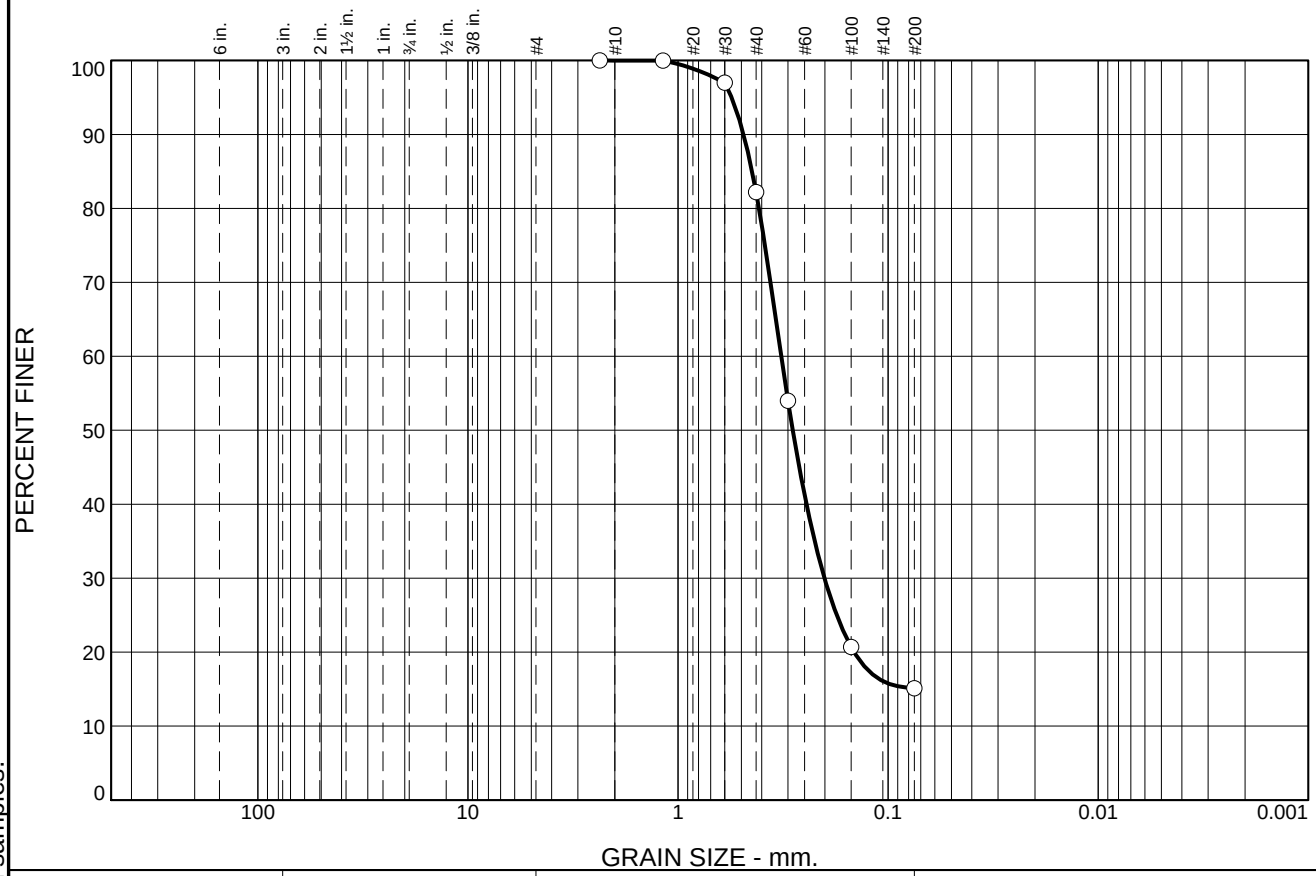
Chino, CA

Client:
Project: City of Manhattan Beach - Waterline Replacement
Project No: 19-0527 **Figure**

Tested By: J.Roy/MF Perry **Checked By:** _____

These results are for the exclusive use of the client for whom they were obtained. They apply only to the samples tested and are not indicitive of apparently identical samples.

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	17.8	67.1	15.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#8	100.0		
#16	100.0		
#30	97.0		
#40	82.2		
#50	54.0		
#100	20.7		
#200	15.1		

* (no specification provided)

Material Description

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 0.4879 D_{85}= 0.4440 D_{60}= 0.3228
D_{50}= 0.2847 D_{30}= 0.2009 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Lab #6232.

Location: B6 @ 5' - 6.5'
Sample Number: 2019-474 Series

Date: 9/19/19

Koury Engineering & Testing, Inc.

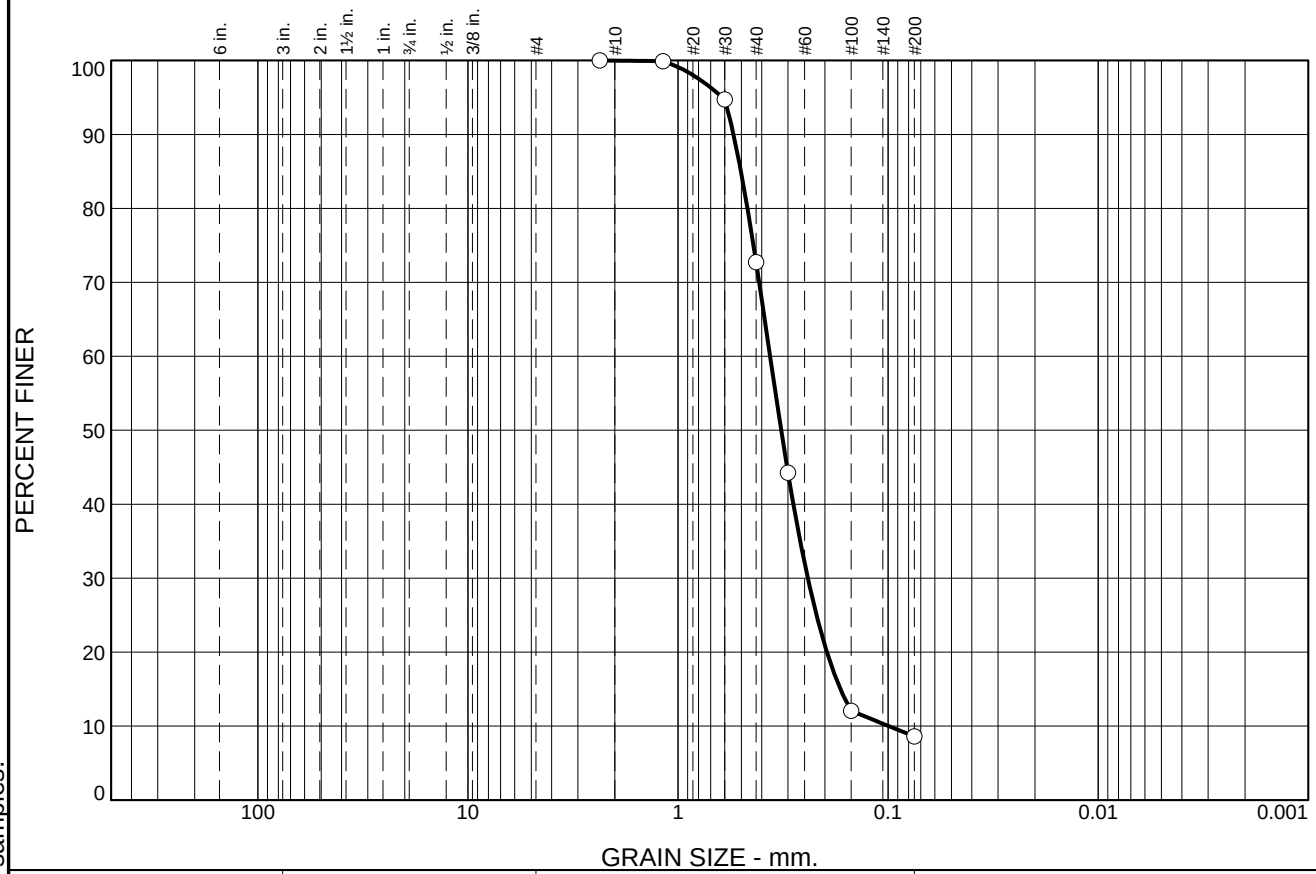
Chino, CA

Client: Hazen And Sawyer
Project: City of Manhattan Beach - Waterline Replacement Replacement SI
Project No: 19-0527 **Figure**

Tested By: J.Roy/MF Perry **Checked By:** _____

These results are for the exclusive use of the client for whom they were obtained. They apply only to the samples tested and are not indicitive of apparently identical samples.

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	27.3	64.1	8.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#8	100.0		
#16	99.9		
#30	94.7		
#40	72.7		
#50	44.3		
#100	12.1		
#200	8.6		

* (no specification provided)

Material Description

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 0.5449 D_{85}= 0.5021 D_{60}= 0.3645
D_{50}= 0.3230 D_{30}= 0.2412 D_{15}= 0.1689
D_{10}= 0.0993 C_u= 3.67 C_c= 1.61

Classification

USCS= AASHTO=

Remarks

Lab #6232.

Location: B8 @ 8' - 9.5'
Sample Number: 2019-474 Series

Date: 9/19/19

Koury Engineering & Testing, Inc.

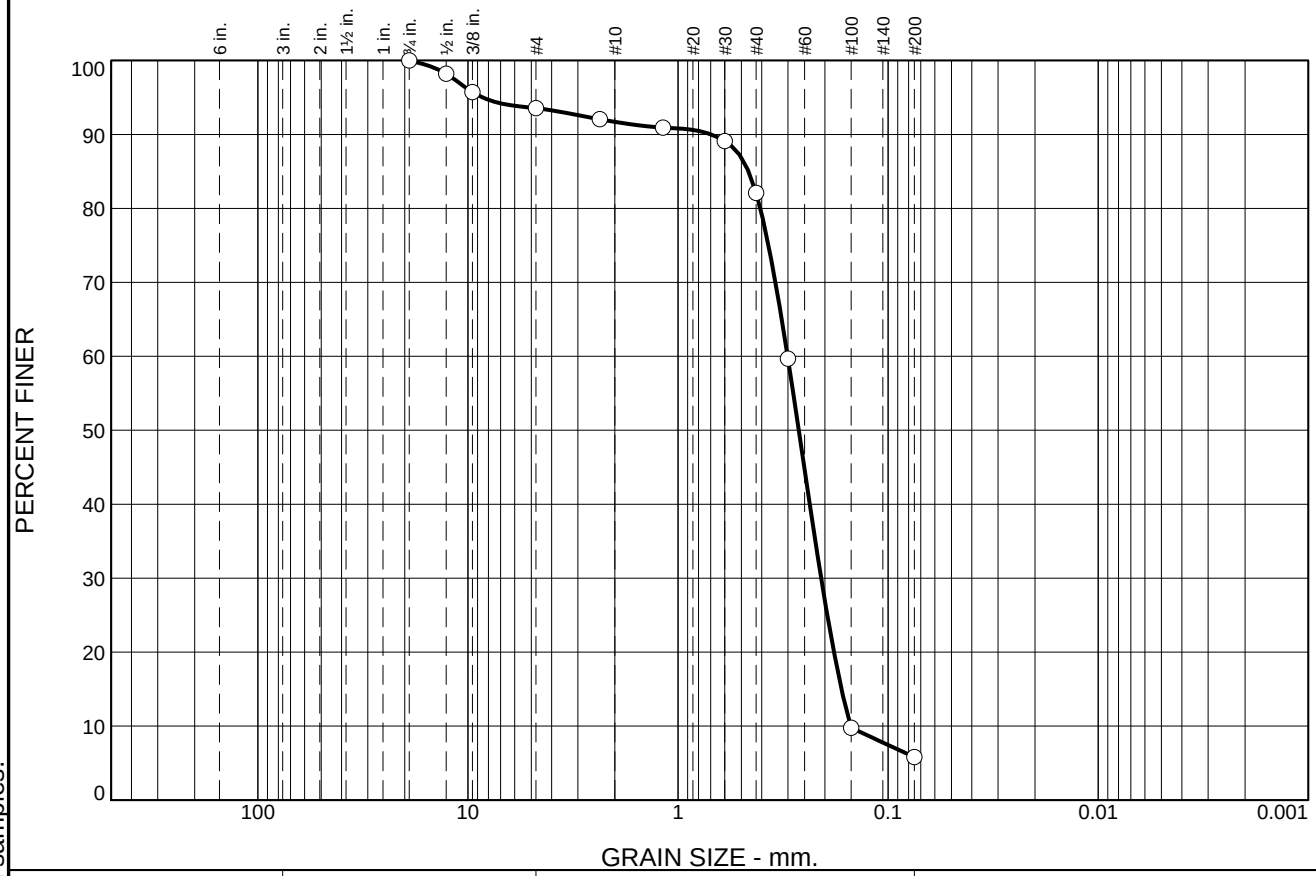
Chino, CA

Client: Hazen And Sawyer
Project: City of Manhattan Beach - Waterline Replacement Replacement SI
Project No: 19-0527 **Figure**

Tested By: J.Roy/MF Perry **Checked By:** _____

These results are for the exclusive use of the client for whom they were obtained. They apply only to the samples tested and are not indicitive of apparently identical samples.

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	6.4	1.9	9.6	76.3	5.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/4	100.0		
1/2	98.2		
3/8	95.7		
#4	93.6		
#8	92.1		
#16	90.9		
#30	89.1		
#40	82.1		
#50	59.7		
#100	9.8		
#200	5.8		

* (no specification provided)

Material Description

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 0.6967 D_{85}= 0.4618 D_{60}= 0.3012
D_{50}= 0.2664 D_{30}= 0.2083 D_{15}= 0.1669
D_{10}= 0.1508 C_u= 2.00 C_c= 0.95

Classification

USCS= AASHTO=

Remarks

Lab #6232.

Location: B9 @ 0.5' - 2'
Sample Number: 2019-474 Series
Date: 9/19/19

Koury Engineering & Testing, Inc.

Chino, CA

Client: Hazen And Sawyer
Project: City of Manhattan Beach - Waterline Replacement Replacement SI
Project No: 19-0527
Figure

Tested By: J.Roy/MF Perry **Checked By:** _____

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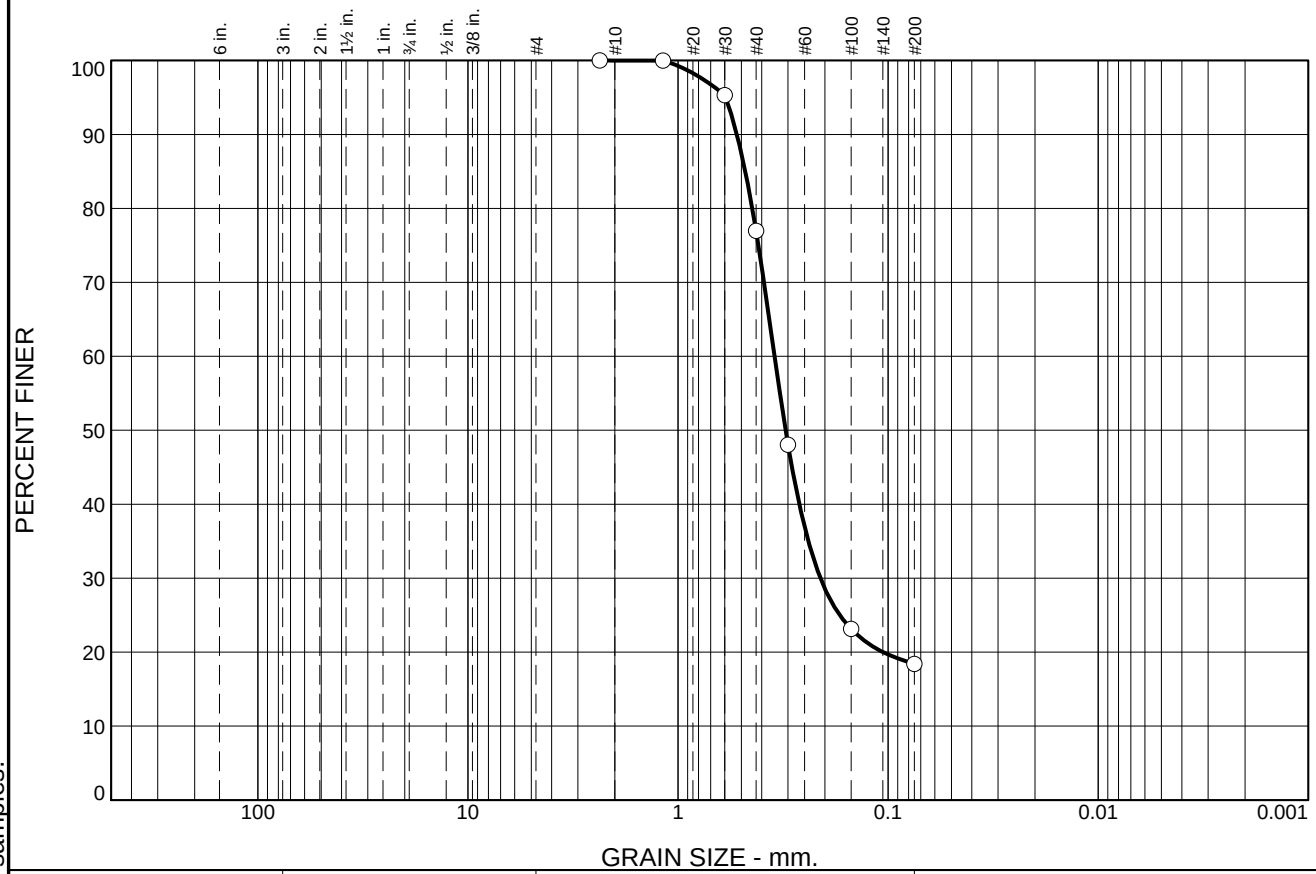
Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	23.0	58.6	18.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#8	100.0		
#16	100.0		
#30	95.3		
#40	77.0		
#50	48.0		
#100	23.1		
#200	18.4		

* (no specification provided)

Material Description

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 0.5250 D_{85}= 0.4785 D_{60}= 0.3473
D_{50}= 0.3079 D_{30}= 0.2100 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Lab #6232.

Location: B11 @ 5' - 6.5'
Sample Number: 2019-474 Series

Date: 9/19/19

Koury Engineering & Testing, Inc.

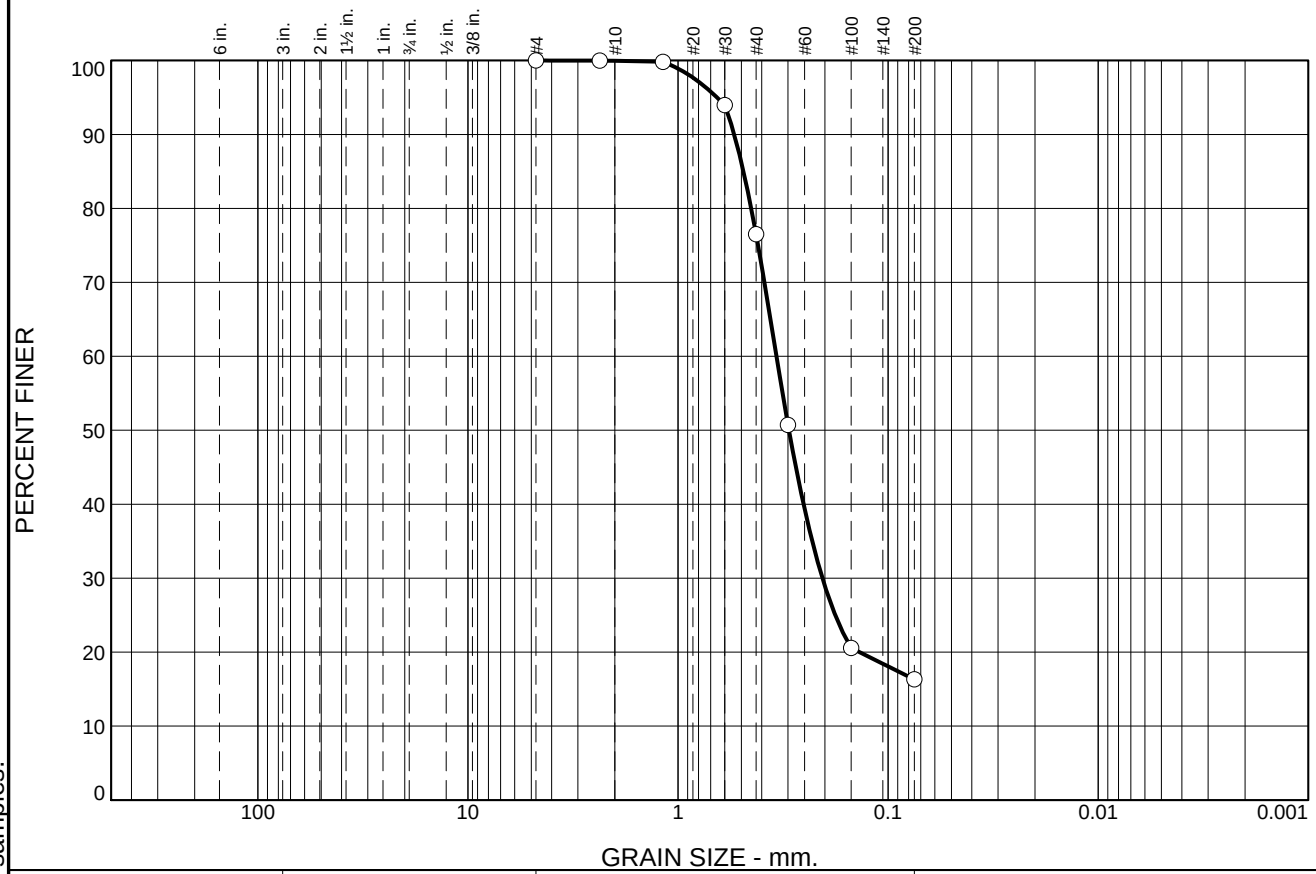
Chino, CA

Client: Hazen And Sawyer
Project: City of Manhattan Beach - Waterline Replacement Replacement SI
Project No: 19-0527 **Figure**

Tested By: J.Roy/MF Perry **Checked By:** _____

These results are for the exclusive use of the client for whom they were obtained. They apply only to the samples tested and are not indicitive of apparently identical samples.

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	23.5	60.2	16.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#8	100.0		
#16	99.8		
#30	94.0		
#40	76.5		
#50	50.7		
#100	20.6		
#200	16.3		

* (no specification provided)

Material Description

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 0.5408 D_{85}= 0.4883 D_{60}= 0.3402
D_{50}= 0.2968 D_{30}= 0.2054 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Lab #6232.

Location: B12 @ 0.5' - 2'
Sample Number: 2019-474 Series

Date: 9/19/19

Koury Engineering & Testing, Inc.

Chino, CA

Client: Hazen And Sawyer
Project: City of Manhattan Beach - Waterline Replacement Replacement SI
Project No: 19-0527 **Figure**

Tested By: J.Roy/MF Perry **Checked By:** _____

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Maximum Density & Optimum Moisture

Curve No.: 6230

Project No.: 19-0527 **Date:** 09/18/2019

Project: City of Manhattan Beach - Waterline Replacement Replacement SI

Client: Hazen And Sawyer

Location: B1 @ 0.5' - 2'

Sample Number: 2019-474 Series

Remarks: Less than 5% Retained on 3/8" Sieve.

MATERIAL DESCRIPTION

Description: Observed as : Strong Brown Poorly Graded Sand with Silt

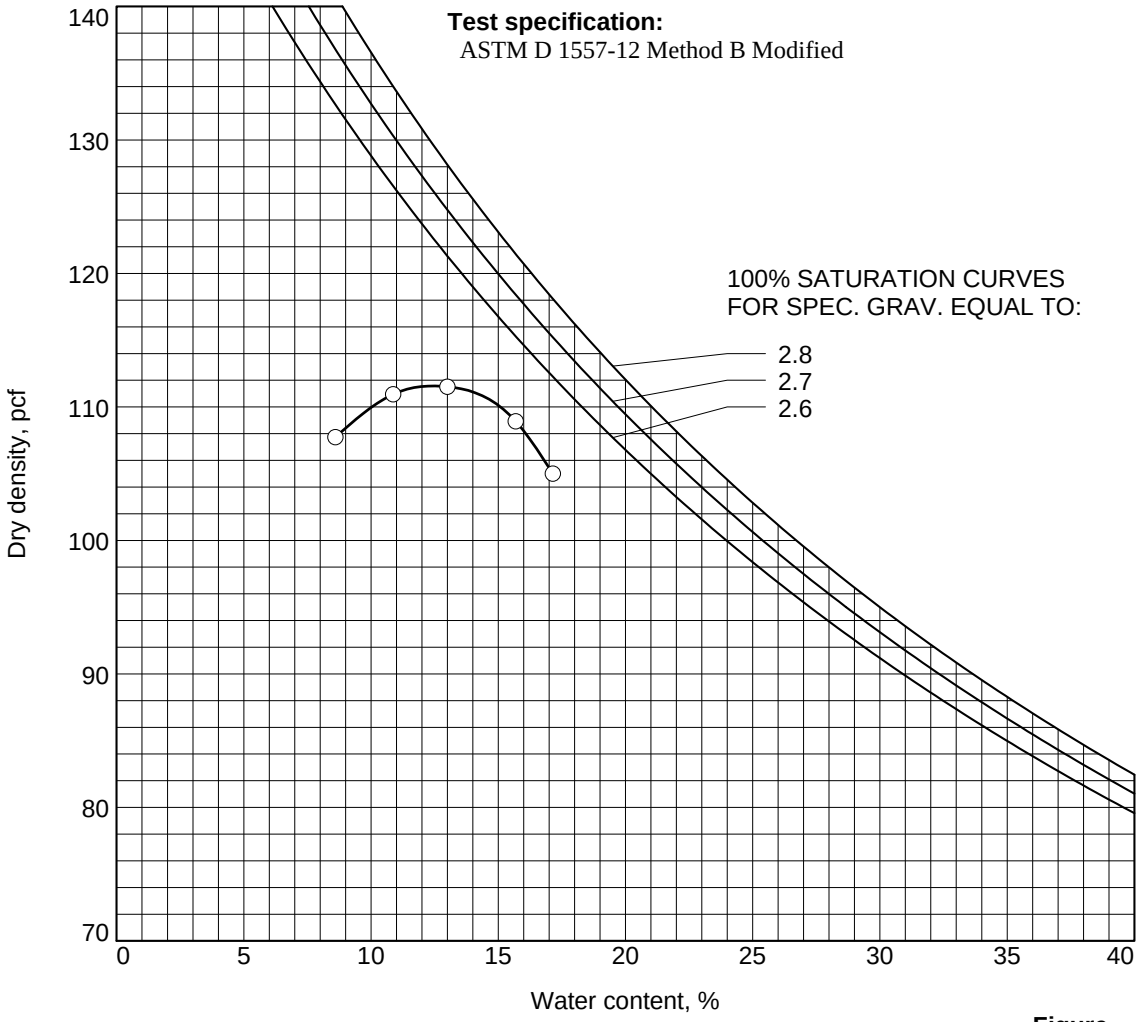
Classifications - **USCS:** Observed as: SP-SM **AASHTO:**

Nat. Moist. = 7.6 % **Sp.G. =**

Liquid Limit = **Plasticity Index =**

% < No.200 = 10 %

TEST RESULTS
Maximum dry density = 111.6 pcf
Optimum moisture = 12.4 %



Figure

Koury Engineering & Testing, Inc.

These results are for the exclusive use of the client for whom they were obtained. They apply only to the samples tested and are not indicitive of apparently identical samples.

Tested By: M.Robles **Checked By:** _____

Maximum Density & Optimum Moisture

Curve No.: 6238

Project No.: 19-0527 **Date:** 9/26/19

Project: City of Manhattan Beach - Waterline Replacement Replacement SI

Client: Hazen And Sawyer

Location: B2 @ 0.5' - 2'

Sample Number: 2019-474 Series

Remarks: Less than 5% Material retained on the 3/8" Sieve.

MATERIAL DESCRIPTION

Description: Observed as: Dark Yellowish Brown Silty Sand

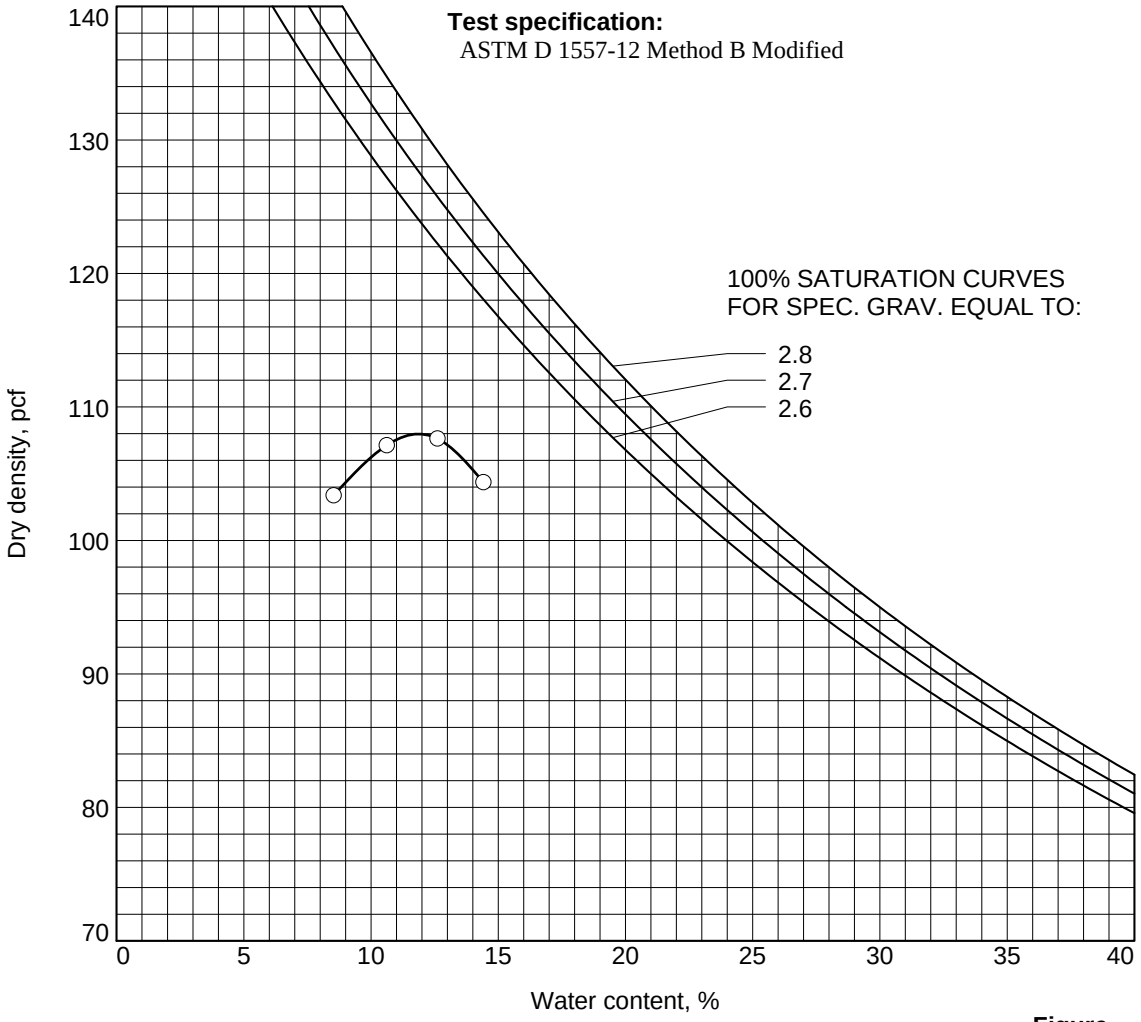
Classifications - **USCS:** Observed as: SM **AASHTO:**

Nat. Moist. = **Sp.G. =**

Liquid Limit = **Plasticity Index =**

% < No.200 =

TEST RESULTS
Maximum dry density = 108.0 pcf
Optimum moisture = 11.9 %



Figure

Koury Engineering & Testing, Inc.

These results are for the exclusive use of the client for whom they were obtained. They apply only to the samples tested and are not indicitive of apparently identical samples.

Tested By: Mathew F. Perry **Checked By:** _____

Maximum Density & Optimum Moisture

Curve No.: 6238

Project No.: 19-0527 **Date:** 09/24/2019

Project: City of Manhattan Beach - Waterline Replacement Replacement SI

Client: Hazen And Sawyer

Location: B-3 & B-4 @ .5-2' Bulk

Sample Number: 2019-474 Series

Remarks: Less than 5 % Retained on the 3/8" Sieve.

MATERIAL DESCRIPTION

Description: Observed as: Yellowish Brown Silty Sand

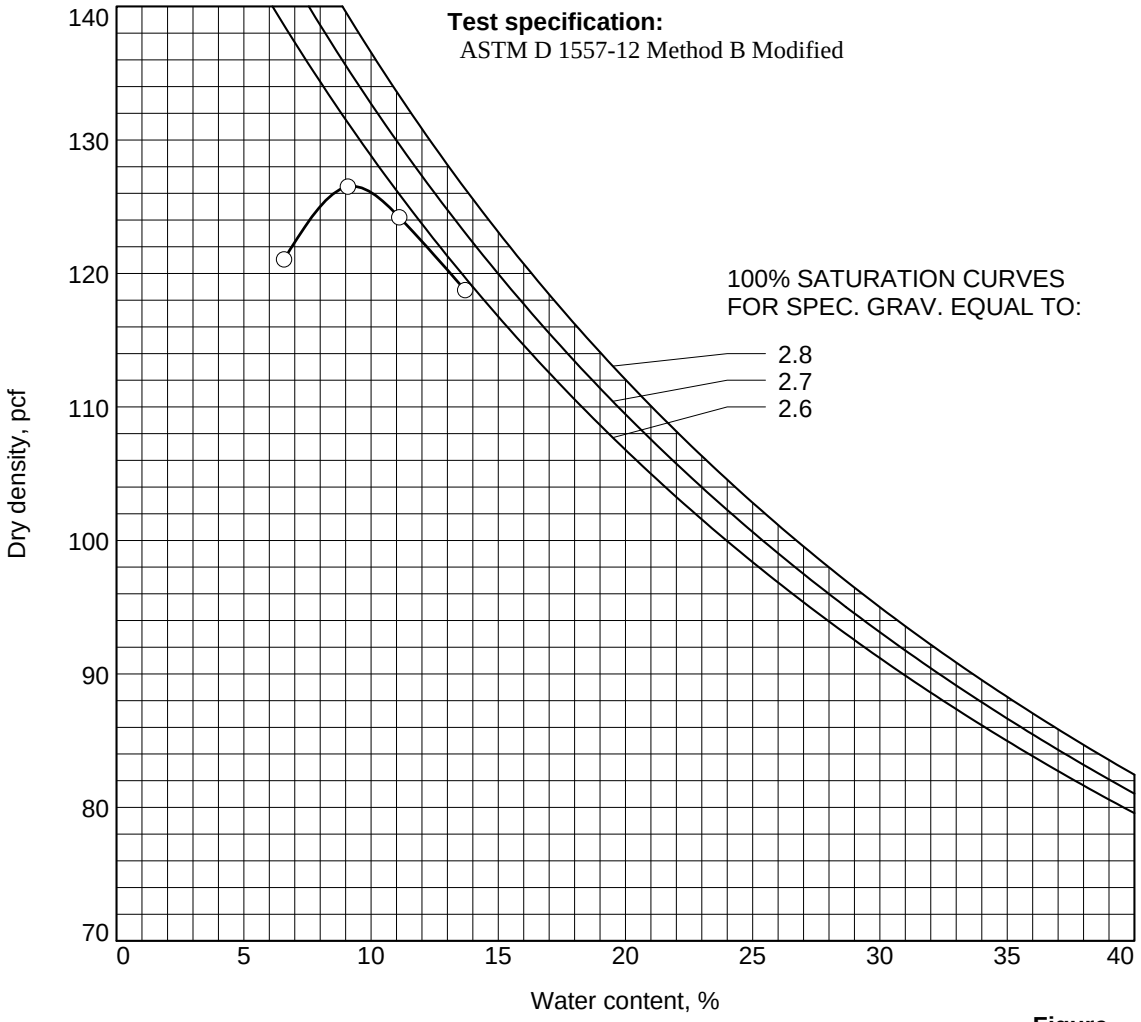
Classifications - **USCS:** Observed as: SM **AASHTO:**

Nat. Moist. = 6.9 % **Sp.G. =**

Liquid Limit = **Plasticity Index =**

% < No.200 = 20 %

TEST RESULTS
Maximum dry density = 126.5 pcf
Optimum moisture = 9.3 %



Figure

Koury Engineering & Testing, Inc.

These results are for the exclusive use of the client for whom they were obtained. They apply only to the samples tested and are not indicitive of apparently identical samples.

Tested By: M. Robles **Checked By:** _____

Maximum Density & Optimum Moisture

Curve No.: 6238

Project No.: 19-0527 **Date:** 09/24/2019

Project: City of Manhattan Beach - Waterline Replacement Replacement SI

Client: Hazen And Sawyer

Location: B-5 & B-6 @ .5-2' Bulk

Sample Number: 2019-474 Series

Remarks: Less than 5% Retained on the 3/8" Sieve.

MATERIAL DESCRIPTION

Description: Observed as: Olive Brown Silty Sand

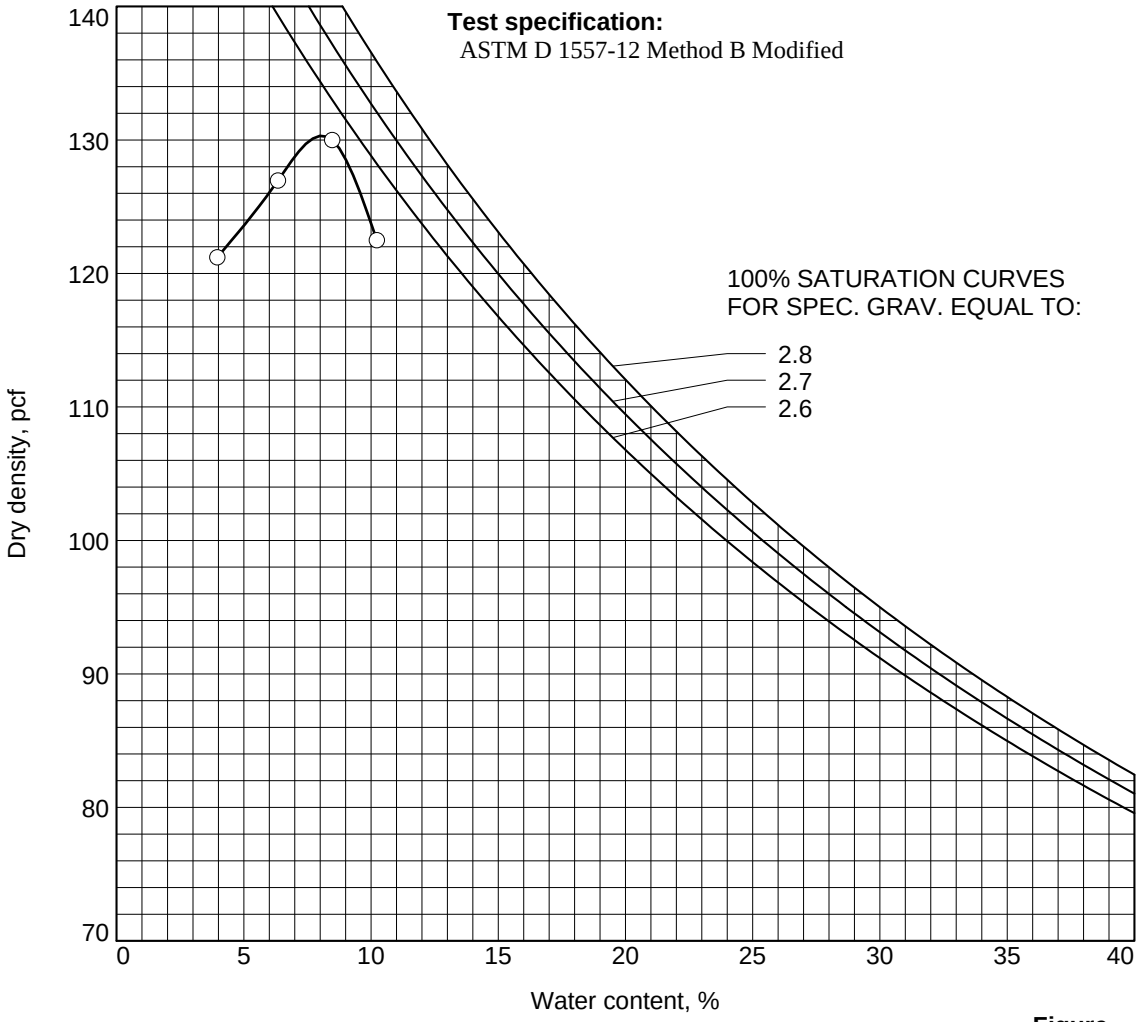
Classifications - **USCS:** Observed as: SM **AASHTO:**

Nat. Moist. = 4.0 % **Sp.G. =**

Liquid Limit = **Plasticity Index =**

% < No.200 = 20 %

TEST RESULTS
Maximum dry density = 130.3 pcf
Optimum moisture = 8.1 %



Figure

Koury Engineering & Testing, Inc.

These results are for the exclusive use of the client for whom they were obtained. They apply only to the samples tested and are not indicitive of apparently identical samples.

Tested By: M.Robles **Checked By:** _____

Maximum Density & Optimum Moisture

Curve No.: 6231

Project No.: 19-0527 **Date:** 09/18/19

Project: City of Manhattan Beach - Waterline Replacement Replacement SI

Client: Hazen And Sawyer

Location: B7 @ 0.5' to 2' / 12th & Rowell

Sample Number: 2019-474 Series

Remarks: Less than 5% Retained on 3/8" Sieve.

MATERIAL DESCRIPTION

Description: Observed as: Dark Brown Silty Sand

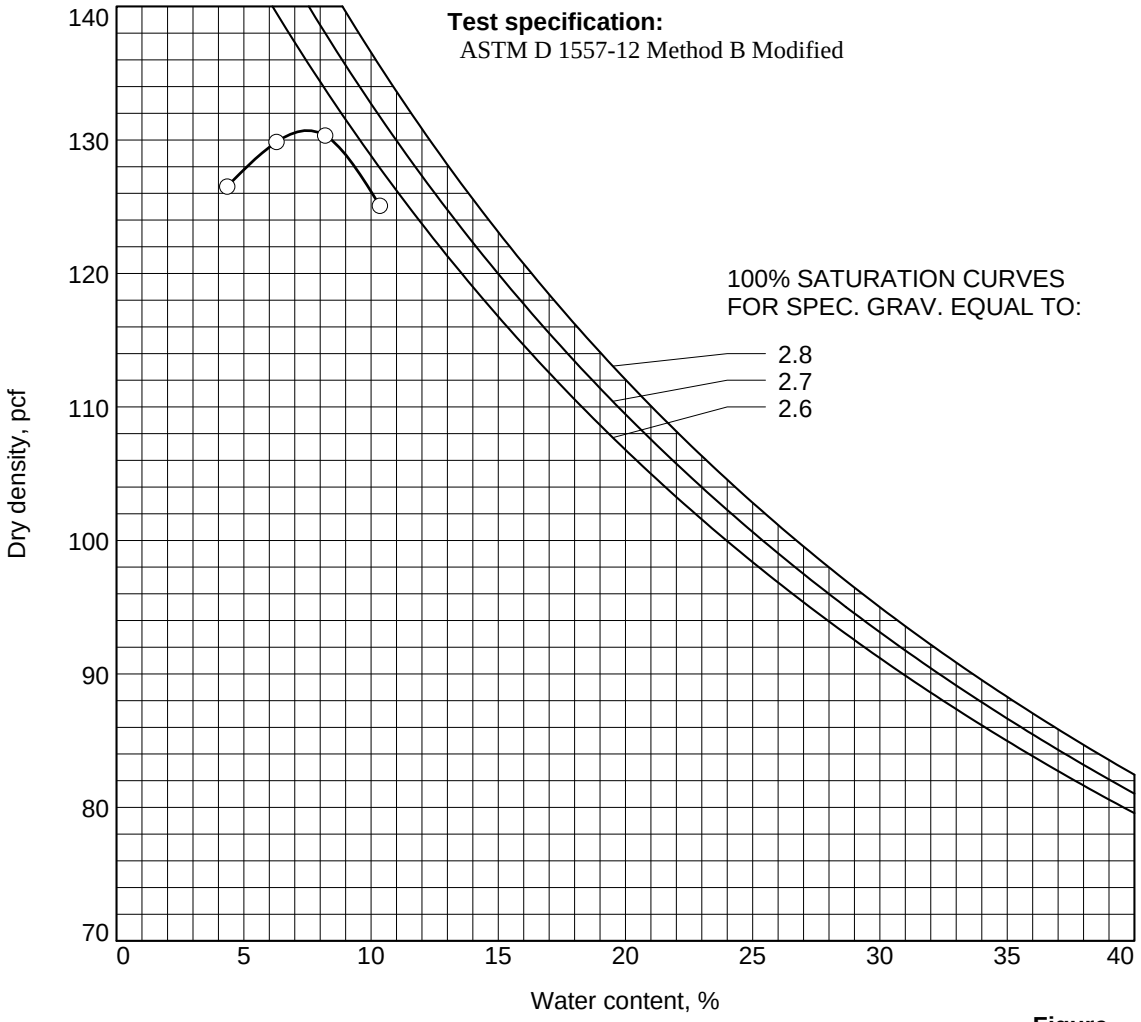
Classifications - **USCS:** Observed as: SM **AASHTO:**

Nat. Moist. = 6.7 % **Sp.G. =**

Liquid Limit = **Plasticity Index =**

% < No.200 = 26 %

TEST RESULTS
Maximum dry density = 130.7 pcf
Optimum moisture = 7.5 %



Figure

Koury Engineering & Testing, Inc.

These results are for the exclusive use of the client for whom they were obtained. They apply only to the samples tested and are not indicitive of apparently identical samples.

Tested By: M.Robles **Checked By:** _____

Maximum Density & Optimum Moisture

Curve No.: 6238

Project No.: 19-0527 **Date:** 9/26/19

Project: City of Manhattan Beach - Waterline Replacement Replacement SI

Client: Hazen And Sawyer

Location: B10/B11 @ 0.5' - 2'

Sample Number: 2019-474 Series

Remarks: Less than 5% Material retained on the 3/8" Sieve.

MATERIAL DESCRIPTION

Description: Observed as: Dark Olive Brown Silty Sand

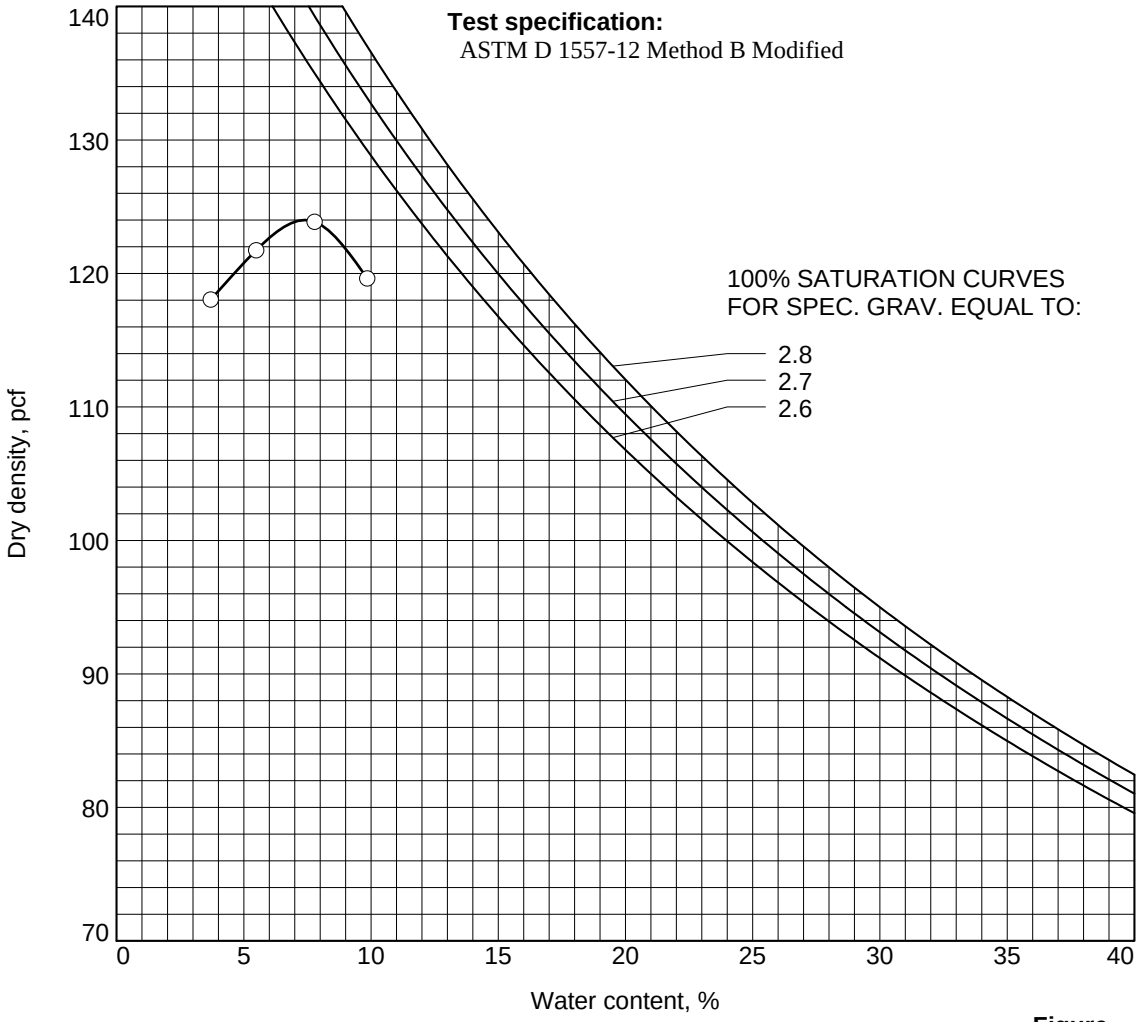
Classifications - **USCS:** Observed as: SM **AASHTO:**

Nat. Moist. = **Sp.G. =**

Liquid Limit = **Plasticity Index =**

% < No.200 =

TEST RESULTS
Maximum dry density = 124.0 pcf
Optimum moisture = 7.4 %



Figure

Koury Engineering & Testing, Inc.

These results are for the exclusive use of the client for whom they were obtained. They apply only to the samples tested and are not indicitive of apparently identical samples.

Tested By: Mathew F.Perry **Checked By:** _____

Maximum Density & Optimum Moisture

Curve No.: 6238

Project No.: 19-0527 **Date:** 9/26/19

Project: City of Manhattan Beach - Waterline Replacement Replacement SI

Client: Hazen And Sawyer

Location: B12 @ 0.5' - 2'

Sample Number: 2019-474 Series

Remarks: Less than 5% Material retained on the 3/8" Sieve.

MATERIAL DESCRIPTION

Description: Observed as: Dark Brown Silty Sand

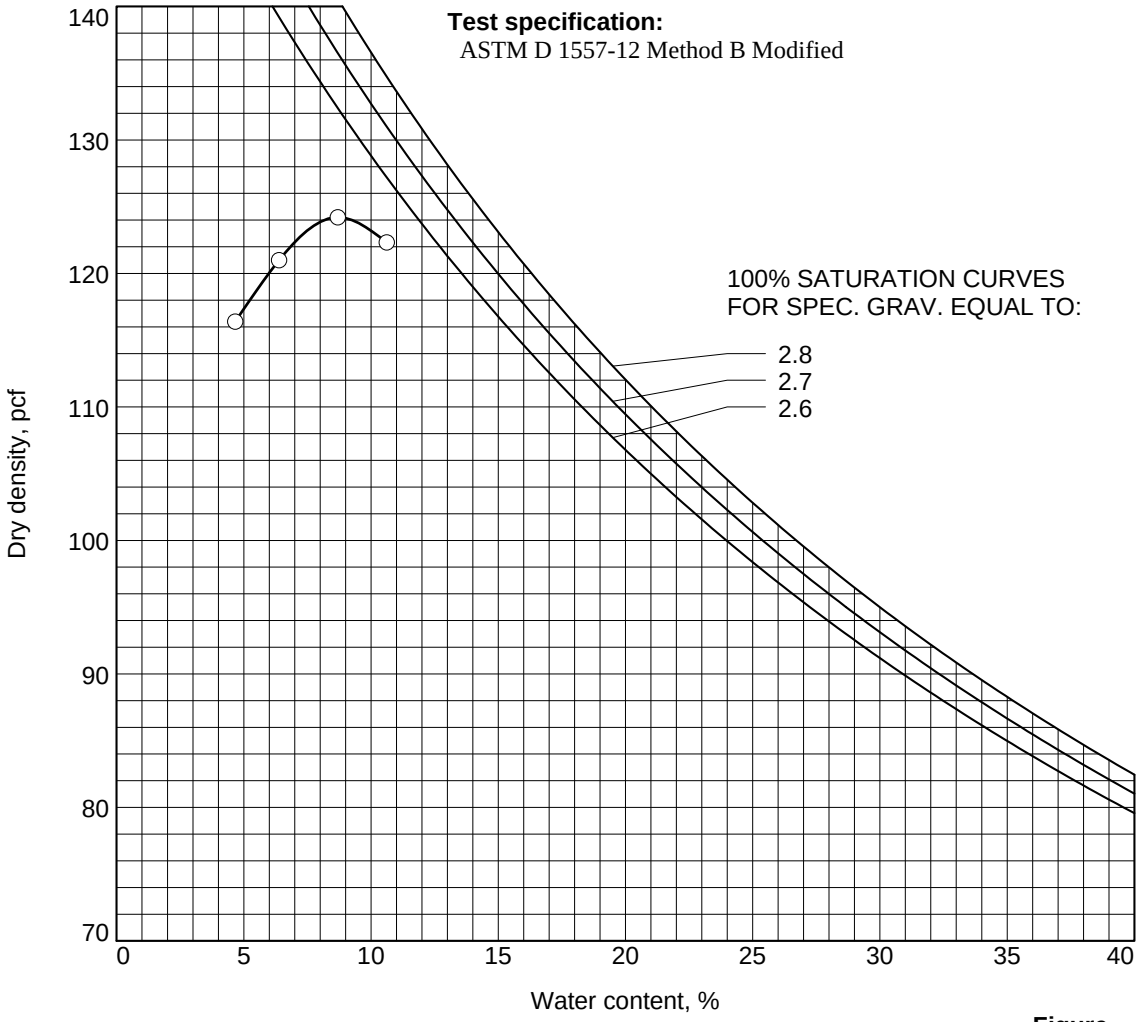
Classifications - **USCS:** Observed as: SM **AASHTO:**

Nat. Moist. = **Sp.G. =**

Liquid Limit = **Plasticity Index =**

% < No.200 =

TEST RESULTS
Maximum dry density = 124.2 pcf
Optimum moisture = 8.7 %



Figure

Koury Engineering & Testing, Inc.

These results are for the exclusive use of the client for whom they were obtained. They apply only to the samples tested and are not indicitive of apparently identical samples.

Tested By: Mathew F. Perry **Checked By:** _____

Sand Equivalent Test - CT-217/ASTM D2419

	Actual Clay Reading:	Actual Sand Reading:	Sand Equivalent: Intial:	Sand Equivalent: Rounded:
Sample 1	13	2.7	20.8	21.0
Sample 2	13.1	2.8	21.4	22.0
Sample 3	13	2.8	21.5	22.0
Sample 4	13.1	2.8	21.4	22.0

Average Sand Equivalent: **22**

Location &/or Source: B1 @ 2' - 3.5'

Visual Classification: Dark Yelloiwsh Brown Silty Sand

Specification Requirement : NP

(NP = None Provided)

KOURY PASSION INTEGRITY QUALITY	**Project Name:** City of Manhattan Beach - Waterline Replacement	**Project No.: 19-0527** Date: 9/18/19	**Lab #: 6229** By: MFP

Sand Equivalent Test - CT-217/ASTM D2419

	Actual Clay Reading:	Actual Sand Reading:	Sand Equivalent: Intial:	Sand Equivalent: Rounded:
Sample 1	13.7	2.4	17.5	18.0
Sample 2	13.5	2.4	17.8	18.0
Sample 3	13.4	2.3	17.2	18.0
Sample 4	13.6	2.4	17.6	18.0

Average Sand Equivalent: **18**

Location &/or Source: B3 @ 0.5' - 2'

Visual Classification: Dark Yelloiwsh Brown Silty Sand

Specification Requirement : NP

(NP = None Provided)

KOURY PASSION INTEGRITY QUALITY	**Project Name:** City of Manhattan Beach - Waterline Replacement	**Project No.: 19-0527** Date: 9/18/19	**Lab #: 6229** By: MFP

Sand Equivalent Test - CT-217/ASTM D2419

	Actual Clay Reading:	Actual Sand Reading:	Sand Equivalent: Intial:	Sand Equivalent: Rounded:
Sample 1	10.8	2.5	23.1	24.0
Sample 2	10.4	2.5	24.0	24.0
Sample 3	10.7	2.6	24.3	25.0
Sample 4	10.4	2.5	24.0	24.0

Average Sand Equivalent: **25**

Location &/or Source: B5 @ 2' - 3.5'

Visual Classification: Dark Yellowish Brown to Yellowish Brown Silty Sand

Specification Requirement : NP

(NP = None Provided)

KOURY PASSION INTEGRITY QUALITY	**Project Name:** City of Manhattan Beach - Waterline Replacement	**Project No.: 19-0527** Date: 9/20/19	**Lab #: 6233** By: MFP

Sand Equivalent Test - CT-217/ASTM D2419

	Actual Clay Reading:	Actual Sand Reading:	Sand Equivalent: Intial:	Sand Equivalent: Rounded:
Sample 1	13.5	2.3	17.0	17.0
Sample 2	13.4	2.3	17.2	18.0
Sample 3	13.5	2.2	16.3	17.0

Average Sand Equivalent: **18**

Location &/or Source: B6 @ 5'

Visual Classification: Brown Silty Sand

Specification Requirement : NP

(NP = None Provided)

KOURY PASSION INTEGRITY QUALITY	**Project Name:** City of Manhattan Beach - Waterline Replacement	**Project No.: 19-0527** Date: 9/18/19	**Lab #: 6229** By: MFP

Sand Equivalent Test - CT-217/ASTM D2419

	Actual Clay Reading:	Actual Sand Reading:	Sand Equivalent: Intial:	Sand Equivalent: Rounded:
Sample 1	11.3	3.3	29.2	30.0
Sample 2	11.4	3.2	28.1	29.0
Sample 3	11.3	3.3	29.2	30.0
Sample 4	11.5	3.2	27.8	28.0

Average Sand Equivalent: **30**

Location &/or Source: B8 @ 7' - 8'

Visual Classification: Dark Yellowish Brown Silty Sand

Specification Requirement : NP

(NP = None Provided)

KOURY PASSION INTEGRITY QUALITY	**Project Name:** City of Manhattan Beach - Waterline Replacement	**Project No.: 19-0527** Date: 9/20/19	**Lab #: 6233** By: MFP

Sand Equivalent Test - CT-217/ASTM D2419

Sample 1		Sand Equivalent:	
Actual Clay Reading:	Actual Sand Reading:	Intial:	Rounded:
3.5	2.4	68.6	69.0

Sample 2		Sand Equivalent:	
Actual Clay Reading:	Actual Sand Reading:	Intial:	Rounded:
3.6	2.4	66.7	67.0

Sample 3		Sand Equivalent:	
Actual Clay Reading:	Actual Sand Reading:	Intial:	Rounded:
3.5	2.4	68.6	69.0

Average Sand Equivalent: **69**

Location &/or Source: B9 @ 5' - 6.5'

Visual Classification: Dark Brown Silty Sand

Specification Requirement : NP

(NP = None Provided)

KOURY PASSION INTEGRITY QUALITY	**Project Name:** City of Manhattan Beach - Waterline Replacement	**Project No.: 19-0527** Date: 9/20/19	**Lab #: 6233** By: MFP

Sand Equivalent Test - CT-217/ASTM D2419

	Actual Clay Reading:	Actual Sand Reading:	Sand Equivalent: Intial:	Sand Equivalent: Rounded:
Sample 1	6.2	2.5	40.3	41.0
Sample 2	6	2.7	45.0	45.0
Sample 3	6	2.6	43.3	44.0

Average Sand Equivalent: **44**

Location &/or Source: B10 @ 2' - 3.5'

Visual Classification: Dark Brown Silty Sand

Specification Requirement : NP

(NP = None Provided)

KOURY PASSION INTEGRITY QUALITY	**Project Name:** City of Manhattan Beach - Waterline Replacement	**Project No.: 19-0527** Date: 9/23/19	**Lab #: 6235** By: MFP

Sand Equivalent Test - CT-217/ASTM D2419

	Actual Clay Reading:	Actual Sand Reading:	Sand Equivalent: Intial:	Sand Equivalent: Rounded:
Sample 1	11.5	3	26.1	27.0
Sample 2	12.2	3.3	27.0	27.0
Sample 3	11.2	2.9	25.9	26.0
Sample 4	11	2.8	25.5	26.0

Average Sand Equivalent: **27**

Location &/or Source: B12 @ 5' - 6.5'

Visual Classification: Dark Yelloiwsh Brown Silty Sand

Specification Requirement : NP

(NP = None Provided)

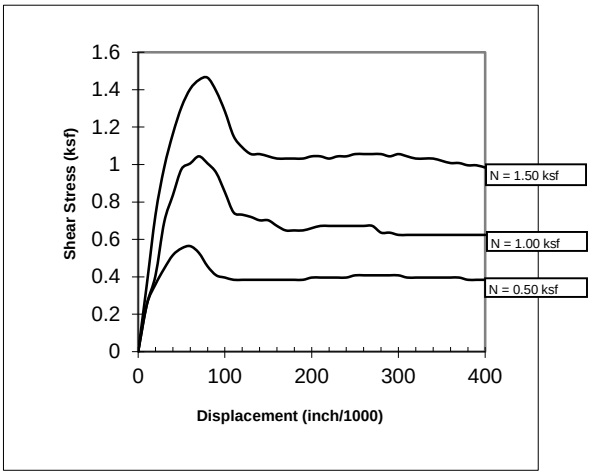
KOURY PASSION INTEGRITY QUALITY	**Project Name:** City of Manhattan Beach - Waterline Replacement	**Project No.: 19-0527** Date: 9/25/19	**Lab #: 6237** By: MFP

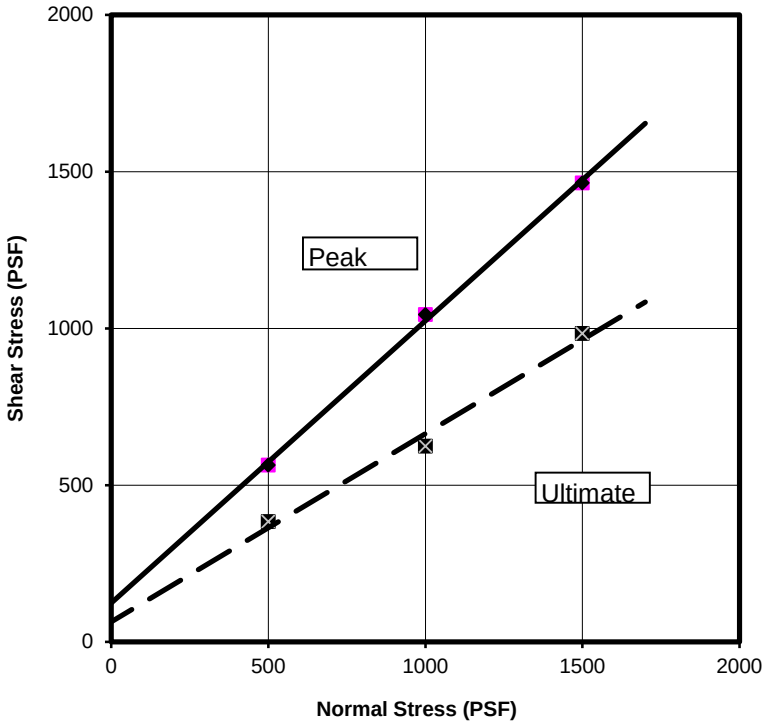
Direct Shear Test Report

Sample Identification	Sample Description	Sample Test State
B4 @ 3'	Dark Brown Silty Sand	Saturated-Consolidated

Peak:	**Phi (Degrees)**	**42.0**	(Avg.Dry Dens. = 119.7 pcf)
	Cohesion (PSF)	**124.0**	(Avg.Moist. = 8.78 %)
Ultimate:	**Phi (Degrees)**	**31.0**	
	Cohesion (PSF)	**64.0**	

☑ **Relatively Undisturbed**
☐ **Remolded**





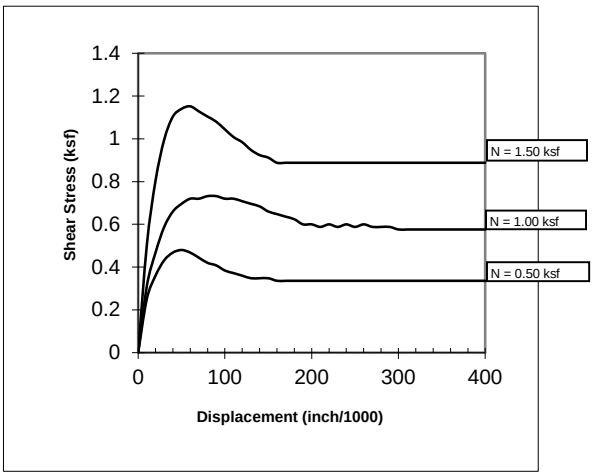
KOURY PASSION INTEGRITY QUALITY	**Project Name:** City of Manhattan Beach - Waterline Replacement	**Project No.: 19-0527** Date: 9/20/19	**Lab #** 6234

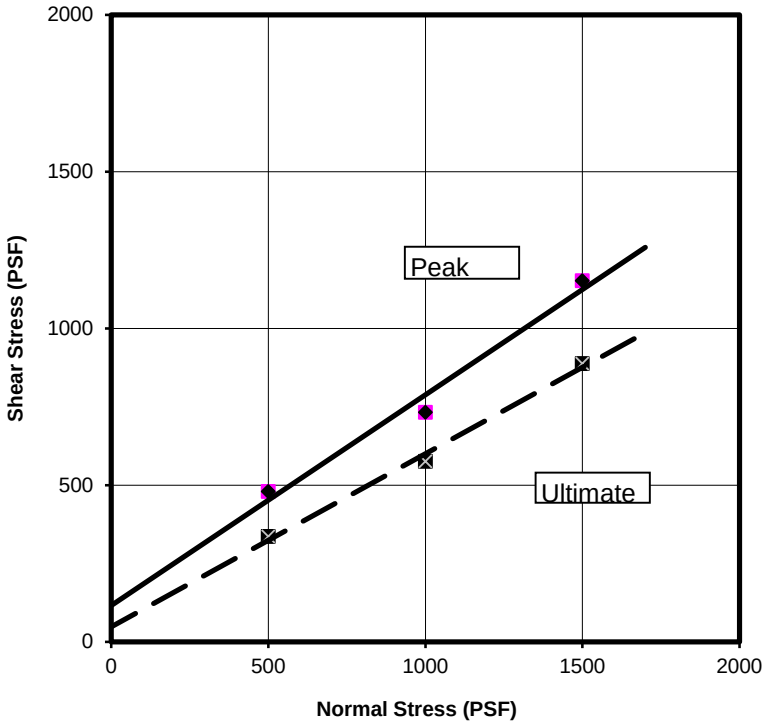
Direct Shear Test Report

Sample Identification	Sample Description	Sample Test State
B5 @ 6'	Dark Yellowish Brown Silty Sand	Saturated-Consolidated

Peak:	**Phi (Degrees)**	**33.9**	(Avg.Dry Dens. = 104.9 pcf) (Avg.Moist. = 10.1 %)
	Cohesion (PSF)	**116.0**	
Ultimate:	**Phi (Degrees)**	**28.9**	
	Cohesion (PSF)	**48.0**	

☑ **Relatively Undisturbed**
☐ **Remolded**





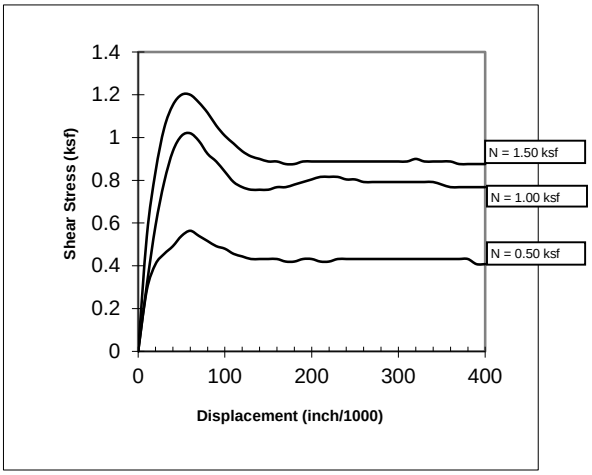
KOURY PASSION INTEGRITY QUALITY	**Project Name:** City of Manhattan Beach - Waterline Replacement	**Project No.: 19-0527** Date: 9/27/19	**Lab #** 6242

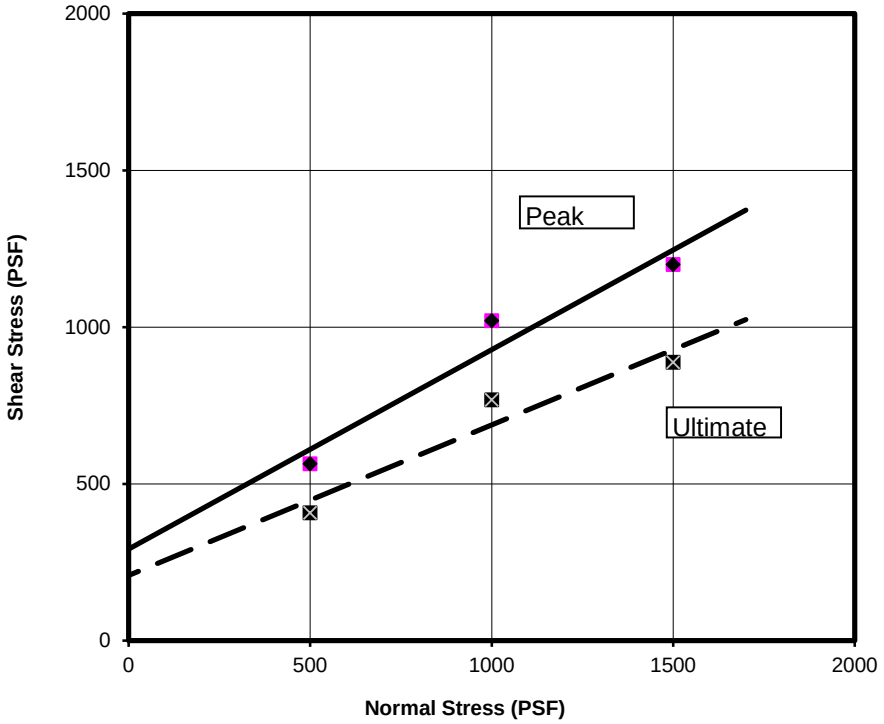
Direct Shear Test Report

Sample Identification	Sample Description	Sample Test State
B7 @ 9'	Brown Silty Sand	Saturated-Consolidated

Peak:	**Phi (Degrees)**	**32.5**	(Avg.Dry Dens. = 109.7 pcf)
	Cohesion (PSF)	**292.0**	(Avg.Moist. = 11.6 %)
Ultimate:	**Phi (Degrees)**	**25.6**	
	Cohesion (PSF)	**208.0**	

☑ **Relatively Undisturbed**
☐ **Remolded**





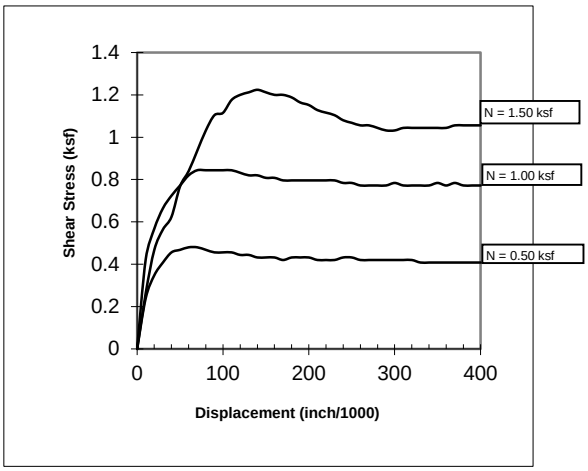
KOURY PASSION. INTEGRITY. QUALITY	**Project Name:** City of Manhattan Beach - Waterline Replacement	**Project No.: 19-0527** Date: 10/21/19	**Lab #** 6266

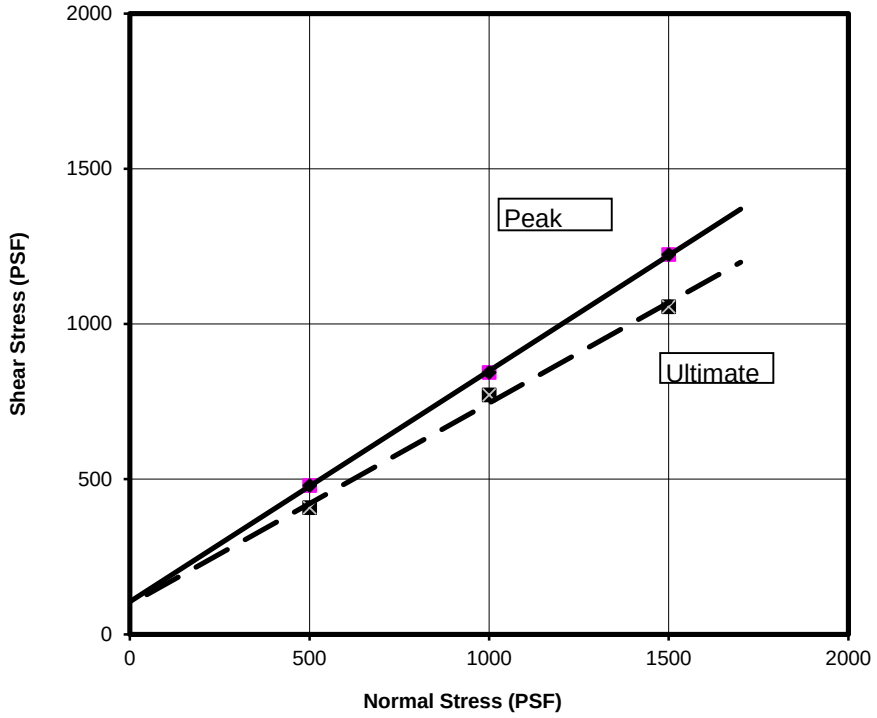
Direct Shear Test Report

Sample Identification	Sample Description	Sample Test State
B11 @ 6'	Brown Silty Sand	Saturated-Consolidated

Peak:	**Phi (Degrees)**	**36.6**	(Avg.Dry Dens. = 104.8 pcf)
	Cohesion (PSF)	**105.3**	(Avg.Moist. = 5.3 %)
Ultimate:	**Phi (Degrees)**	**32.9**	
	Cohesion (PSF)	**97.3**	

☑ **Relatively Undisturbed**
☐ **Remolded**





KOURY PASSION INTEGRITY QUALITY	**Project Name:** City of Manhattan Beach - Waterline Replacement	**Project No.: 19-0527** Date: 10/18/19	**Lab #** 6264

POSITIVE
LAB SERVICE

781 East Washington Blvd., Los Angeles, CA 90021
(213) 745-5312 FAX (213) 745-6372

September 20, 2019

Mr. Albert Buffet
Koury Engineering and Testing Services, Inc.
17800 South Main Street, Suite 303
Gardena, CA 90248

Report No.: 1909151
Project Name: City of Manhattan Beach - Water Pipeline Replacement Project

Dear Mr. Albert Buffet,

This report contains the analytical results for the sample(s) received under chain of custody(s) by Positive Lab Service on September 13, 2019.

The test results in this report are performed in compliance with ELAP accreditation requirements for the certified parameters. The laboratory report may not be produced, except in full, without the written approval of the laboratory.

The issuance of the final Certificate of Analysis takes precedence over any previous Preliminary Report. Preliminary data should not be used for regulatory purposes. Authorized signature(s) is provided on final report only.

If you have any questions in reference to this report, please contact your Positive Lab Service coordinator.

D Sanchez
Project Manager

POSITIVE LAB SERVICE

781 East Washington Blvd., Los Angeles, CA 90021
(213) 745-5312 FAX (213) 745-6372

Certificate of Analysis

File #:74350
Report Date: 09/20/19
Submitted: 09/13/19
PLS Report No.: 1909151

Koury Engineering and Testing Services, Inc.
17800 South Main Street, Suite 303
Gardena, CA 90248

Attn: Mr. Albert Buffet Phone: (310) 851-8685 FAX:(310) 851-8692

Project: City of Manhattan Beach - Water Pipeline Replacement Project

Sample ID: 1 - 23rd St. @ 8.5' Soil (1909151-01) Sampled: 09/11/19 08:00 Received: 09/13/19 16:45

Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
TPH C4 - C12	ND		1	mg/kg	0.500	EPA 5030B	EPA 8015M	09/16/19	09/16/19	lk	BI91615
Surrogate: a,a,a-Trifluorotoluene	*115 %*			*70-148*		*EPA 5030B*	*EPA 8015M*	*09/16/19*	*09/16/19*	*lk*	*BI91615*
Analyte	**Results**	**Flag**	**D.F.**	**Units**	**PQL**	**Prep/Test Method**		**Prepared**	**Analyzed**	**By**	**Batch**
TPH C13 - C22	ND		1	mg/kg	2.50	EPA 3550C	EPA 8015M	09/18/19	09/19/19	lk	BI91906
TPH C23 - C32	ND		1	mg/kg	100	EPA 3550C	EPA 8015M	09/18/19	09/19/19	lk	BI91906
TPH C33 - C36	ND		1	mg/kg	100	EPA 3550C	EPA 8015M	09/18/19	09/19/19	lk	BI91906
Surrogate: n-Tetracosane	*101 %*			*64-139*		*EPA 3550C*	*EPA 8015M*	*09/18/19*	*09/19/19*	*lk*	*BI91906*
Analyte	**Results**	**Flag**	**D.F.**	**Units**	**PQL**	**Prep/Test Method**		**Prepared**	**Analyzed**	**By**	**Batch**
Dichlorodifluoromethane (FC-12)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Chloromethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Vinyl chloride (Chloroethylene)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Bromomethane (Methyl bromide)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Chloroethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Trichlorofluoromethane (FC-11)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Acetone	ND		1	ug/kg	80.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Carbon disulfide	ND		1	ug/kg	40.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1-Dichloroethene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Methylene chloride (Dichloromethane)	ND		1	ug/kg	20.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Tert-butyl alcohol	ND		1	ug/kg	20.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
trans-1,2-Dichloroethene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Methyl tert-butyl ether (MTBE)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1-Dichloroethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Di-isopropyl ether	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Vinyl acetate	ND		1	ug/kg	40.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Ethyl tert-butyl ether	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
2,2-Dichloropropane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
cis-1,2-Dichloroethene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
2-Butanone (MEK)	ND		1	ug/kg	40.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Bromochloromethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Chloroform	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1,1-Trichloroethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Tert-amyl methyl ether	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Carbon tetrachloride	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1-Dichloropropene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Benzene	ND		1	ug/kg	2.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2-Dichloroethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Trichloroethene (TCE)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2-Dichloropropane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Dibromomethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,4-Dioxane	ND		1	ug/kg	80.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Bromodichloromethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
2-Chloroethyl vinyl ether	ND		1	ug/kg	40.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
cis-1,3-Dichloropropene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
4-Methyl-2-pentanone (MIBK)	ND		1	ug/kg	40.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Toluene	ND		1	ug/kg	2.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
trans-1,3-Dichloropropene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1,2-Trichloroethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320

POSITIVE LAB SERVICE

781 East Washington Blvd., Los Angeles, CA 90021
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Certificate of Analysis

File #:74350
Report Date: 09/20/19
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PLS Report No.: 1909151

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Attn: Mr. Albert Buffet Phone: (310) 851-8685 FAX:(310) 851-8692

Project: City of Manhattan Beach - Water Pipeline Replacement Project

Sample ID: 1 - 23rd St. @ 8.5' Soil (1909151-01) Sampled: 09/11/19 08:00 Received: 09/13/19 16:45

Tetrachloroethene (PCE)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,3-Dichloropropane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
2-Hexanone (MBK)	ND		1	ug/kg	40.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Dibromochloromethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2-Dibromoethane (EDB)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Chlorobenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1,1,2-Tetrachloroethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Ethylbenzene	ND		1	ug/kg	2.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
m,p-Xylene	ND		1	ug/kg	2.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
o-Xylene	ND		1	ug/kg	2.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Styrene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Bromoform (Tribromomethane)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Isopropylbenzene (Cumene)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Bromobenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1,2,2-Tetrachloroethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2,3-Trichloropropane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
n-Propylbenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
2-Chlorotoluene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
4-Chlorotoluene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,3,5-Trimethylbenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
tert-Butylbenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2,4-Trimethylbenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
sec-Butylbenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,3-Dichlorobenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
4-Isopropyltoluene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,4-Dichlorobenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2-Dichlorobenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
n-Butylbenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2-Dibromo-3-chloropropane (DBCP)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2,4-Trichlorobenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Hexachlorobutadiene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Naphthalene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2,3-Trichlorobenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Surrogate: Dibromofluoromethane	*95.1 %*			*70-138*		*EPA 5035*	*EPA 8260B*	*09/13/19*	*09/13/19*	*mb*	*BI91320*
Surrogate: Toluene-d8	*99.5 %*			*80-121*		*EPA 5035*	*EPA 8260B*	*09/13/19*	*09/13/19*	*mb*	*BI91320*
Surrogate: 4-Bromofluorobenzene	*96.5 %*			*70-122*		*EPA 5035*	*EPA 8260B*	*09/13/19*	*09/13/19*	*mb*	*BI91320*

Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
Antimony	ND		1	mg/kg	2.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Arsenic	ND		1	mg/kg	2.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Barium	**16.8**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Beryllium	ND		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Cadmium	ND		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Chromium	**3.64**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Cobalt	**1.18**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Copper	**31.0**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Lead	**1.14**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Molybdenum	ND		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Nickel	**3.55**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Selenium	ND		1	mg/kg	2.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012

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781 East Washington Blvd., Los Angeles, CA 90021
(213) 745-5312 FAX (213) 745-6372

Certificate of Analysis

File #:74350
Report Date: 09/20/19
Submitted: 09/13/19
PLS Report No.: 1909151

Koury Engineering and Testing Services, Inc.
17800 South Main Street, Suite 303
Gardena, CA 90248

Attn: Mr. Albert Buffet Phone: (310) 851-8685 FAX:(310) 851-8692

Project: City of Manhattan Beach - Water Pipeline Replacement Project

Sample ID: 1 - 23rd St. @ 8.5' Soil (1909151-01) Sampled: 09/11/19 08:00 Received: 09/13/19 16:45

Silver	ND		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Thallium	ND		1	mg/kg	2.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Vanadium	**4.78**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Zinc	**39.2**		1	mg/kg	5.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
Mercury	ND		1	mg/kg	0.100	EPA 7471A	EPA 7471A	09/19/19	09/20/19	cg	BI92018
Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
Lead, Organic	See Attachment										

Sample ID: 2 - 22nd St. @ 5.5' Soil (1909151-02) Sampled: 09/11/19 09:00 Received: 09/13/19 16:45

Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
TPH C4 - C12	ND		1	mg/kg	0.500	EPA 5030B	EPA 8015M	09/16/19	09/16/19	lk	BI91615
Surrogate: a,a,a-Trifluorotoluene	*118 %*			*70-148*		*EPA 5030B*	*EPA 8015M*	*09/16/19*	*09/16/19*	*lk*	*BI91615*
Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
TPH C13 - C22	ND		1	mg/kg	2.50	EPA 3550C	EPA 8015M	09/18/19	09/19/19	lk	BI91906
TPH C23 - C32	ND		1	mg/kg	100	EPA 3550C	EPA 8015M	09/18/19	09/19/19	lk	BI91906
TPH C33 - C36	ND		1	mg/kg	100	EPA 3550C	EPA 8015M	09/18/19	09/19/19	lk	BI91906
Surrogate: n-Tetracosane	*96.3 %*			*64-139*		*EPA 3550C*	*EPA 8015M*	*09/18/19*	*09/19/19*	*lk*	*BI91906*
Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
Dichlorodifluoromethane (FC-12)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Chloromethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Vinyl chloride (Chloroethylene)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Bromomethane (Methyl bromide)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Chloroethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Trichlorofluoromethane (FC-11)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Acetone	ND		1	ug/kg	80.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Carbon disulfide	ND		1	ug/kg	40.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1-Dichloroethene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Methylene chloride (Dichloromethane)	ND		1	ug/kg	20.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Tert-butyl alcohol	ND		1	ug/kg	20.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
trans-1,2-Dichloroethene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Methyl tert-butyl ether (MTBE)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1-Dichloroethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Di-isopropyl ether	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Vinyl acetate	ND		1	ug/kg	40.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Ethyl tert-butyl ether	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
2,2-Dichloropropane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
cis-1,2-Dichloroethene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
2-Butanone (MEK)	ND		1	ug/kg	40.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Bromochloromethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Chloroform	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1,1-Trichloroethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Tert-amyl methyl ether	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Carbon tetrachloride	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1-Dichloropropene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Benzene	ND		1	ug/kg	2.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2-Dichloroethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320

POSITIVE LAB SERVICE

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Certificate of Analysis

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Gardena, CA 90248

File #:74350
Report Date: 09/20/19
Submitted: 09/13/19
PLS Report No.: 1909151

Attn: Mr. Albert Buffet Phone: (310) 851-8685 FAX:(310) 851-8692

Project: City of Manhattan Beach - Water Pipeline Replacement Project

Sample ID: 2 - 22nd St. @ 5.5' Soil (1909151-02) Sampled: 09/11/19 09:00 Received: 09/13/19 16:45

Trichloroethene (TCE)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2-Dichloropropane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Dibromomethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,4-Dioxane	ND		1	ug/kg	80.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Bromodichloromethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
2-Chloroethyl vinyl ether	ND		1	ug/kg	40.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
cis-1,3-Dichloropropene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
4-Methyl-2-pentanone (MIBK)	ND		1	ug/kg	40.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Toluene	ND		1	ug/kg	2.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
trans-1,3-Dichloropropene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1,2-Trichloroethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Tetrachloroethene (PCE)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,3-Dichloropropane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
2-Hexanone (MBK)	ND		1	ug/kg	40.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Dibromochloromethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2-Dibromoethane (EDB)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Chlorobenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1,1,2-Tetrachloroethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Ethylbenzene	ND		1	ug/kg	2.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
m,p-Xylene	ND		1	ug/kg	2.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
o-Xylene	ND		1	ug/kg	2.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Styrene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Bromoform (Tribromomethane)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Isopropylbenzene (Cumene)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Bromobenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1,2,2-Tetrachloroethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2,3-Trichloropropane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
n-Propylbenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
2-Chlorotoluene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
4-Chlorotoluene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,3,5-Trimethylbenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
tert-Butylbenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2,4-Trimethylbenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
sec-Butylbenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,3-Dichlorobenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
4-Isopropyltoluene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,4-Dichlorobenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2-Dichlorobenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
n-Butylbenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2-Dibromo-3-chloropropane (DBCP)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2,4-Trichlorobenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Hexachlorobutadiene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Naphthalene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2,3-Trichlorobenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Surrogate: Dibromofluoromethane	*97.9 %*			*70-138*		*EPA 5035*	*EPA 8260B*	*09/13/19*	*09/13/19*	*mb*	*BI91320*
Surrogate: Toluene-d8	*101 %*			*80-121*		*EPA 5035*	*EPA 8260B*	*09/13/19*	*09/13/19*	*mb*	*BI91320*
Surrogate: 4-Bromofluorobenzene	*97.7 %*			*70-122*		*EPA 5035*	*EPA 8260B*	*09/13/19*	*09/13/19*	*mb*	*BI91320*

Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
Antimony	ND		1	mg/kg	2.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012

POSITIVE LAB SERVICE

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17800 South Main Street, Suite 303
Gardena, CA 90248

Attn: Mr. Albert Buffet Phone: (310) 851-8685 FAX:(310) 851-8692

Project: City of Manhattan Beach - Water Pipeline Replacement Project

Sample ID: 2 - 22nd St. @ 5.5' Soil (1909151-02) Sampled: 09/11/19 09:00 Received: 09/13/19 16:45

Arsenic	ND		1	mg/kg	2.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Barium	**14.7**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Beryllium	ND		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Cadmium	ND		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Chromium	**3.11**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Cobalt	**1.03**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Copper	**1.48**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Lead	ND		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Molybdenum	ND		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Nickel	**2.65**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Selenium	ND		1	mg/kg	2.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Silver	ND		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Thallium	ND		1	mg/kg	2.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Vanadium	**4.32**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Zinc	**5.70**		1	mg/kg	5.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
Mercury	ND		1	mg/kg	0.100	EPA 7471A	EPA 7471A	09/19/19	09/20/19	cg	BI92018
Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
Lead, Organic	See Attachment										

Sample ID: 3 - 21st St. @ 6.5' Soil (1909151-03) Sampled: 09/11/19 10:00 Received: 09/13/19 16:45

Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
TPH C4 - C12	ND		1	mg/kg	0.500	EPA 5030B	EPA 8015M	09/16/19	09/16/19	lk	BI91615
Surrogate: a,a,a-Trifluorotoluene	*124 %*			*70-148*		*EPA 5030B*	*EPA 8015M*	*09/16/19*	*09/16/19*	*lk*	*BI91615*
Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
TPH C13 - C22	ND		1	mg/kg	2.50	EPA 3550C	EPA 8015M	09/18/19	09/19/19	lk	BI91906
TPH C23 - C32	ND		1	mg/kg	100	EPA 3550C	EPA 8015M	09/18/19	09/19/19	lk	BI91906
TPH C33 - C36	ND		1	mg/kg	100	EPA 3550C	EPA 8015M	09/18/19	09/19/19	lk	BI91906
Surrogate: n-Tetracosane	*107 %*			*64-139*		*EPA 3550C*	*EPA 8015M*	*09/18/19*	*09/19/19*	*lk*	*BI91906*
Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
Dichlorodifluoromethane (FC-12)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Chloromethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Vinyl chloride (Chloroethylene)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Bromomethane (Methyl bromide)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Chloroethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Trichlorofluoromethane (FC-11)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Acetone	ND		1	ug/kg	80.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Carbon disulfide	ND		1	ug/kg	40.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1-Dichloroethene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Methylene chloride (Dichloromethane)	ND		1	ug/kg	20.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Tert-butyl alcohol	ND		1	ug/kg	20.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
trans-1,2-Dichloroethene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Methyl tert-butyl ether (MTBE)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1-Dichloroethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Di-isopropyl ether	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Vinyl acetate	ND		1	ug/kg	40.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Ethyl tert-butyl ether	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320

POSITIVE LAB SERVICE

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Attn: Mr. Albert Buffet Phone: (310) 851-8685 FAX:(310) 851-8692

Project: City of Manhattan Beach - Water Pipeline Replacement Project

Sample ID: 3 - 21st St. @ 6.5' Soil (1909151-03) Sampled: 09/11/19 10:00 Received: 09/13/19 16:45

2,2-Dichloropropane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
cis-1,2-Dichloroethene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
2-Butanone (MEK)	ND	1	ug/kg	40.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Bromochloromethane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Chloroform	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1,1-Trichloroethane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Tert-amyl methyl ether	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Carbon tetrachloride	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1-Dichloropropene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Benzene	ND	1	ug/kg	2.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2-Dichloroethane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Trichloroethene (TCE)	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2-Dichloropropane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Dibromomethane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,4-Dioxane	ND	1	ug/kg	80.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Bromodichloromethane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
2-Chloroethyl vinyl ether	ND	1	ug/kg	40.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
cis-1,3-Dichloropropene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
4-Methyl-2-pentanone (MIBK)	ND	1	ug/kg	40.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Toluene	ND	1	ug/kg	2.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
trans-1,3-Dichloropropene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1,2-Trichloroethane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Tetrachloroethene (PCE)	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,3-Dichloropropane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
2-Hexanone (MBK)	ND	1	ug/kg	40.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Dibromochloromethane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2-Dibromoethane (EDB)	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Chlorobenzene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1,1,2-Tetrachloroethane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Ethylbenzene	ND	1	ug/kg	2.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
m,p-Xylene	ND	1	ug/kg	2.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
o-Xylene	ND	1	ug/kg	2.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Styrene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Bromoform (Tribromomethane)	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Isopropylbenzene (Cumene)	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Bromobenzene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1,2,2-Tetrachloroethane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2,3-Trichloropropane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
n-Propylbenzene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
2-Chlorotoluene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
4-Chlorotoluene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,3,5-Trimethylbenzene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
tert-Butylbenzene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2,4-Trimethylbenzene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
sec-Butylbenzene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,3-Dichlorobenzene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
4-Isopropyltoluene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,4-Dichlorobenzene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2-Dichlorobenzene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
n-Butylbenzene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320

POSITIVE LAB SERVICE

781 East Washington Blvd., Los Angeles, CA 90021
(213) 745-5312 FAX (213) 745-6372

Certificate of Analysis

File #:74350
Report Date: 09/20/19
Submitted: 09/13/19
PLS Report No.: 1909151

Koury Engineering and Testing Services, Inc.
17800 South Main Street, Suite 303
Gardena, CA 90248

Attn: Mr. Albert Buffet Phone: (310) 851-8685 FAX:(310) 851-8692

Project: City of Manhattan Beach - Water Pipeline Replacement Project

Sample ID: 3 - 21st St. @ 6.5' Soil (1909151-03) Sampled: 09/11/19 10:00 Received: 09/13/19 16:45

1,2-Dibromo-3-chloropropane (DBCP)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2,4-Trichlorobenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Hexachlorobutadiene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Naphthalene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2,3-Trichlorobenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Surrogate: Dibromofluoromethane	*95.4 %*			*70-138*		*EPA 5035*	*EPA 8260B*	*09/13/19*	*09/13/19*	*mb*	*BI91320*
Surrogate: Toluene-d8	*102 %*			*80-121*		*EPA 5035*	*EPA 8260B*	*09/13/19*	*09/13/19*	*mb*	*BI91320*
Surrogate: 4-Bromofluorobenzene	*94.1 %*			*70-122*		*EPA 5035*	*EPA 8260B*	*09/13/19*	*09/13/19*	*mb*	*BI91320*

Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test	Method	Prepared	Analyzed	By	Batch
Antimony	ND		1	mg/kg	2.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Arsenic	**2.35**		1	mg/kg	2.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Barium	**24.2**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Beryllium	ND		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Cadmium	ND		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Chromium	**6.23**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Cobalt	**1.81**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Copper	**22.8**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Lead	**1.93**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Molybdenum	ND		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Nickel	**4.80**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Selenium	ND		1	mg/kg	2.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Silver	ND		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Thallium	ND		1	mg/kg	2.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Vanadium	**8.21**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Zinc	**20.3**		1	mg/kg	5.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012

Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test	Method	Prepared	Analyzed	By	Batch
Mercury	ND		1	mg/kg	0.100	EPA 7471A	EPA 7471A	09/19/19	09/20/19	cg	BI92018

Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test	Method	Prepared	Analyzed	By	Batch
Lead, Organic	See Attachment										

Sample ID: 4 - 19th St. @ 9.0' Soil (1909151-04) Sampled: 09/11/19 11:30 Received: 09/13/19 16:45

Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test	Method	Prepared	Analyzed	By	Batch
TPH C4 - C12	ND		1	mg/kg	0.500	EPA 5030B	EPA 8015M	09/16/19	09/16/19	lk	BI91615
Surrogate: a,a,a-Trifluorotoluene	*120 %*			*70-148*		*EPA 5030B*	*EPA 8015M*	*09/16/19*	*09/16/19*	*lk*	*BI91615*

Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test	Method	Prepared	Analyzed	By	Batch
TPH C13 - C22	ND		1	mg/kg	2.50	EPA 3550C	EPA 8015M	09/18/19	09/19/19	lk	BI91906
TPH C23 - C32	ND		1	mg/kg	100	EPA 3550C	EPA 8015M	09/18/19	09/19/19	lk	BI91906
TPH C33 - C36	ND		1	mg/kg	100	EPA 3550C	EPA 8015M	09/18/19	09/19/19	lk	BI91906
Surrogate: n-Tetracosane	*99.6 %*			*64-139*		*EPA 3550C*	*EPA 8015M*	*09/18/19*	*09/19/19*	*lk*	*BI91906*

Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test	Method	Prepared	Analyzed	By	Batch
Dichlorodifluoromethane (FC-12)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Chloromethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Vinyl chloride (Chloroethylene)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Bromomethane (Methyl bromide)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Chloroethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Trichlorofluoromethane (FC-11)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320

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Certificate of Analysis

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Gardena, CA 90248

File #:74350
Report Date: 09/20/19
Submitted: 09/13/19
PLS Report No.: 1909151

Attn: Mr. Albert Buffet Phone: (310) 851-8685 FAX:(310) 851-8692

Project: City of Manhattan Beach - Water Pipeline Replacement Project

Sample ID: 4 - 19th St. @ 9.0' Soil (1909151-04) Sampled: 09/11/19 11:30 Received: 09/13/19 16:45

Acetone	ND	1	ug/kg	80.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Carbon disulfide	ND	1	ug/kg	40.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1-Dichloroethene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Methylene chloride (Dichloromethane)	ND	1	ug/kg	20.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Tert-butyl alcohol	ND	1	ug/kg	20.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
trans-1,2-Dichloroethene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Methyl tert-butyl ether (MTBE)	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1-Dichloroethane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Di-isopropyl ether	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Vinyl acetate	ND	1	ug/kg	40.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Ethyl tert-butyl ether	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
2,2-Dichloropropane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
cis-1,2-Dichloroethene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
2-Butanone (MEK)	ND	1	ug/kg	40.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Bromochloromethane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Chloroform	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1,1-Trichloroethane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Tert-amyl methyl ether	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Carbon tetrachloride	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1-Dichloropropene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Benzene	ND	1	ug/kg	2.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2-Dichloroethane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Trichloroethene (TCE)	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2-Dichloropropane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Dibromomethane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,4-Dioxane	ND	1	ug/kg	80.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Bromodichloromethane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
2-Chloroethyl vinyl ether	ND	1	ug/kg	40.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
cis-1,3-Dichloropropene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
4-Methyl-2-pentanone (MIBK)	ND	1	ug/kg	40.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Toluene	ND	1	ug/kg	2.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
trans-1,3-Dichloropropene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1,2-Trichloroethane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Tetrachloroethene (PCE)	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,3-Dichloropropane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
2-Hexanone (MBK)	ND	1	ug/kg	40.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Dibromochloromethane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2-Dibromoethane (EDB)	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Chlorobenzene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1,1,2-Tetrachloroethane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Ethylbenzene	ND	1	ug/kg	2.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
m,p-Xylene	ND	1	ug/kg	2.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
o-Xylene	ND	1	ug/kg	2.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Styrene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Bromoform (Tribromomethane)	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Isopropylbenzene (Cumene)	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Bromobenzene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1,2,2-Tetrachloroethane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2,3-Trichloropropane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
n-Propylbenzene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320

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Certificate of Analysis

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File #:74350
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PLS Report No.: 1909151

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Project: City of Manhattan Beach - Water Pipeline Replacement Project

Sample ID: 4 - 19th St. @ 9.0' Soil (1909151-04) Sampled: 09/11/19 11:30 Received: 09/13/19 16:45

2-Chlorotoluene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
4-Chlorotoluene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,3,5-Trimethylbenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
tert-Butylbenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2,4-Trimethylbenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
sec-Butylbenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,3-Dichlorobenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
4-Isopropyltoluene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,4-Dichlorobenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2-Dichlorobenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
n-Butylbenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2-Dibromo-3-chloropropane (DBCP)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2,4-Trichlorobenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Hexachlorobutadiene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Naphthalene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2,3-Trichlorobenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Surrogate: Dibromofluoromethane	*97.7 %*			*70-138*		*EPA 5035*	*EPA 8260B*	*09/13/19*	*09/13/19*	*mb*	*BI91320*
Surrogate: Toluene-d8	*101 %*			*80-121*		*EPA 5035*	*EPA 8260B*	*09/13/19*	*09/13/19*	*mb*	*BI91320*
Surrogate: 4-Bromofluorobenzene	*95.9 %*			*70-122*		*EPA 5035*	*EPA 8260B*	*09/13/19*	*09/13/19*	*mb*	*BI91320*

Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test	Method	Prepared	Analyzed	By	Batch
Antimony	ND		1	mg/kg	2.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Arsenic	**3.48**		1	mg/kg	2.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Barium	**62.5**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Beryllium	ND		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Cadmium	ND		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Chromium	**15.4**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Cobalt	**10.2**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Copper	**14.7**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Lead	**3.93**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Molybdenum	ND		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Nickel	**9.28**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Selenium	ND		1	mg/kg	2.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Silver	ND		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Thallium	ND		1	mg/kg	2.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Vanadium	**28.5**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Zinc	**32.1**		1	mg/kg	5.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012

Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test	Method	Prepared	Analyzed	By	Batch
Mercury	ND		1	mg/kg	0.100	EPA 7471A	EPA 7471A	09/19/19	09/20/19	cg	BI92018

Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test	Method	Prepared	Analyzed	By	Batch
Lead, Organic	See Attachment										

Sample ID: 5 - Rock Covenant Church @ 5.5' Soil (1909151-05) Sampled: 09/11/19 12:45 Received: 09/13/19 16:45

Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test	Method	Prepared	Analyzed	By	Batch
TPH C4 - C12	ND		1	mg/kg	0.500	EPA 5030B	EPA 8015M	09/16/19	09/16/19	lk	BI91615
Surrogate: a,a,a-Trifluorotoluene	*120 %*			*70-148*		*EPA 5030B*	*EPA 8015M*	*09/16/19*	*09/16/19*	*lk*	*BI91615*

Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test	Method	Prepared	Analyzed	By	Batch
TPH C13 - C22	ND		1	mg/kg	2.50	EPA 3550C	EPA 8015M	09/18/19	09/19/19	lk	BI91906

POSITIVE LAB SERVICE

781 East Washington Blvd., Los Angeles, CA 90021
(213) 745-5312 FAX (213) 745-6372

Certificate of Analysis

File #:74350
Report Date: 09/20/19
Submitted: 09/13/19
PLS Report No.: 1909151

Koury Engineering and Testing Services, Inc.
17800 South Main Street, Suite 303
Gardena, CA 90248

Attn: Mr. Albert Buffet Phone: (310) 851-8685 FAX:(310) 851-8692

Project: City of Manhattan Beach - Water Pipeline Replacement Project

Sample ID: 5 - Rock Covenant Church @ 5.5' Soil (1909151-05) Sampled: 09/11/19 12:45 Received: 09/13/19 16:45

TPH C23 - C32	ND		1	mg/kg	100	EPA 3550C	EPA 8015M	09/18/19	09/19/19	lk	BI91906
TPH C33 - C36	ND		1	mg/kg	100	EPA 3550C	EPA 8015M	09/18/19	09/19/19	lk	BI91906
Surrogate: n-Tetracosane	*96.5 %*			*64-139*		*EPA 3550C*	*EPA 8015M*	*09/18/19*	*09/19/19*	*lk*	*BI91906*

Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test	Method	Prepared	Analyzed	By	Batch
Dichlorodifluoromethane (FC-12)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Chloromethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Vinyl chloride (Chloroethylene)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Bromomethane (Methyl bromide)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Chloroethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Trichlorofluoromethane (FC-11)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Acetone	ND		1	ug/kg	80.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Carbon disulfide	ND		1	ug/kg	40.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1-Dichloroethene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Methylene chloride (Dichloromethane)	ND		1	ug/kg	20.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Tert-butyl alcohol	ND		1	ug/kg	20.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
trans-1,2-Dichloroethene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Methyl tert-butyl ether (MTBE)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1-Dichloroethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Di-isopropyl ether	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Vinyl acetate	ND		1	ug/kg	40.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Ethyl tert-butyl ether	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
2,2-Dichloropropane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
cis-1,2-Dichloroethene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
2-Butanone (MEK)	ND		1	ug/kg	40.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Bromochloromethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Chloroform	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1,1-Trichloroethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Tert-amyl methyl ether	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Carbon tetrachloride	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1-Dichloropropene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Benzene	ND		1	ug/kg	2.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2-Dichloroethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Trichloroethene (TCE)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2-Dichloropropane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Dibromomethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,4-Dioxane	ND		1	ug/kg	80.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Bromodichloromethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
2-Chloroethyl vinyl ether	ND		1	ug/kg	40.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
cis-1,3-Dichloropropene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
4-Methyl-2-pentanone (MIBK)	ND		1	ug/kg	40.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Toluene	ND		1	ug/kg	2.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
trans-1,3-Dichloropropene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1,2-Trichloroethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Tetrachloroethene (PCE)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,3-Dichloropropane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
2-Hexanone (MBK)	ND		1	ug/kg	40.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Dibromochloromethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2-Dibromoethane (EDB)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Chlorobenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320

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Project: City of Manhattan Beach - Water Pipeline Replacement Project

Sample ID: 5 - Rock Covenant Church @ 5.5' Soil (1909151-05) Sampled: 09/11/19 12:45 Received: 09/13/19 16:45

1,1,1,2-Tetrachloroethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Ethylbenzene	ND		1	ug/kg	2.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
m,p-Xylene	ND		1	ug/kg	2.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
o-Xylene	ND		1	ug/kg	2.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Styrene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Bromoform (Tribromomethane)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Isopropylbenzene (Cumene)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Bromobenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1,2,2-Tetrachloroethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2,3-Trichloropropane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
n-Propylbenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
2-Chlorotoluene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
4-Chlorotoluene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,3,5-Trimethylbenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
tert-Butylbenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2,4-Trimethylbenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
sec-Butylbenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,3-Dichlorobenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
4-Isopropyltoluene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,4-Dichlorobenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2-Dichlorobenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
n-Butylbenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2-Dibromo-3-chloropropane (DBCP)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2,4-Trichlorobenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Hexachlorobutadiene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Naphthalene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2,3-Trichlorobenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Surrogate: Dibromofluoromethane	*98.4 %*			*70-138*		*EPA 5035*	*EPA 8260B*	*09/13/19*	*09/13/19*	*mb*	*BI91320*
Surrogate: Toluene-d8	*99.1 %*			*80-121*		*EPA 5035*	*EPA 8260B*	*09/13/19*	*09/13/19*	*mb*	*BI91320*
Surrogate: 4-Bromofluorobenzene	*97.9 %*			*70-122*		*EPA 5035*	*EPA 8260B*	*09/13/19*	*09/13/19*	*mb*	*BI91320*
Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test	Method	Prepared	Analyzed	By	Batch
Antimony	ND		1	mg/kg	2.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Arsenic	**2.40**		1	mg/kg	2.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Barium	**22.2**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Beryllium	ND		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Cadmium	ND		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Chromium	**21.2**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Cobalt	**4.28**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Copper	**9.24**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Lead	**2.38**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Molybdenum	ND		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Nickel	**9.05**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Selenium	ND		1	mg/kg	2.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Silver	ND		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Thallium	ND		1	mg/kg	2.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Vanadium	**21.4**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Zinc	**20.8**		1	mg/kg	5.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test	Method	Prepared	Analyzed	By	Batch

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Project: City of Manhattan Beach - Water Pipeline Replacement Project

Sample ID: 5 - Rock Covenant Church @ 5.5' Soil (1909151-05) Sampled: 09/11/19 12:45 Received: 09/13/19 16:45

Mercury	ND		1	mg/kg	0.100	EPA 7471A	EPA 7471A	09/19/19	09/20/19	cg	BI92018
Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
Lead, Organic	See Attachment										

Sample ID: 6 - 17th St. @ 6.0' Soil (1909151-06) Sampled: 09/11/19 14:00 Received: 09/13/19 16:45

Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
TPH C4 - C12	ND		1	mg/kg	0.500	EPA 5030B	EPA 8015M	09/16/19	09/16/19	lk	BI91615
Surrogate: a,a,a-Trifluorotoluene	*121 %*			*70-148*		*EPA 5030B*	*EPA 8015M*	*09/16/19*	*09/16/19*	*lk*	*BI91615*
Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
TPH C13 - C22	ND		1	mg/kg	2.50	EPA 3550C	EPA 8015M	09/18/19	09/19/19	lk	BI91906
TPH C23 - C32	ND		1	mg/kg	100	EPA 3550C	EPA 8015M	09/18/19	09/19/19	lk	BI91906
TPH C33 - C36	ND		1	mg/kg	100	EPA 3550C	EPA 8015M	09/18/19	09/19/19	lk	BI91906
Surrogate: n-Tetracosane	*103 %*			*64-139*		*EPA 3550C*	*EPA 8015M*	*09/18/19*	*09/19/19*	*lk*	*BI91906*
Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
Dichlorodifluoromethane (FC-12)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Chloromethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Vinyl chloride (Chloroethylene)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Bromomethane (Methyl bromide)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Chloroethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Trichlorofluoromethane (FC-11)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Acetone	ND		1	ug/kg	80.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Carbon disulfide	ND		1	ug/kg	40.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1-Dichloroethene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Methylene chloride (Dichloromethane)	ND		1	ug/kg	20.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Tert-butyl alcohol	ND		1	ug/kg	20.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
trans-1,2-Dichloroethene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Methyl tert-butyl ether (MTBE)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1-Dichloroethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Di-isopropyl ether	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Vinyl acetate	ND		1	ug/kg	40.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Ethyl tert-butyl ether	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
2,2-Dichloropropane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
cis-1,2-Dichloroethene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
2-Butanone (MEK)	ND		1	ug/kg	40.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Bromochloromethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Chloroform	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1,1-Trichloroethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Tert-amyl methyl ether	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Carbon tetrachloride	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1-Dichloropropene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Benzene	ND		1	ug/kg	2.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2-Dichloroethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Trichloroethene (TCE)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2-Dichloropropane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Dibromomethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,4-Dioxane	ND		1	ug/kg	80.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Bromodichloromethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320

POSITIVE LAB SERVICE

781 East Washington Blvd., Los Angeles, CA 90021
(213) 745-5312 FAX (213) 745-6372

Certificate of Analysis

File #:74350
Report Date: 09/20/19
Submitted: 09/13/19
PLS Report No.: 1909151

Koury Engineering and Testing Services, Inc.
17800 South Main Street, Suite 303
Gardena, CA 90248

Attn: Mr. Albert Buffet Phone: (310) 851-8685 FAX:(310) 851-8692

Project: City of Manhattan Beach - Water Pipeline Replacement Project

Sample ID: 6 - 17th St. @ 6.0' Soil (1909151-06) Sampled: 09/11/19 14:00 Received: 09/13/19 16:45

2-Chloroethyl vinyl ether	ND		1	ug/kg	40.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
cis-1,3-Dichloropropene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
4-Methyl-2-pentanone (MIBK)	ND		1	ug/kg	40.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Toluene	ND		1	ug/kg	2.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
trans-1,3-Dichloropropene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1,2-Trichloroethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Tetrachloroethene (PCE)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,3-Dichloropropane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
2-Hexanone (MBK)	ND		1	ug/kg	40.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Dibromochloromethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2-Dibromoethane (EDB)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Chlorobenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1,1,2-Tetrachloroethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Ethylbenzene	ND		1	ug/kg	2.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
m,p-Xylene	ND		1	ug/kg	2.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
o-Xylene	ND		1	ug/kg	2.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Styrene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Bromoform (Tribromomethane)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Isopropylbenzene (Cumene)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Bromobenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1,2,2-Tetrachloroethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2,3-Trichloropropane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
n-Propylbenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
2-Chlorotoluene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
4-Chlorotoluene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,3,5-Trimethylbenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
tert-Butylbenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2,4-Trimethylbenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
sec-Butylbenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,3-Dichlorobenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
4-Isopropyltoluene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,4-Dichlorobenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2-Dichlorobenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
n-Butylbenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2-Dibromo-3-chloropropane (DBCP)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2,4-Trichlorobenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Hexachlorobutadiene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Naphthalene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2,3-Trichlorobenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Surrogate: Dibromofluoromethane	*95.1 %*			*70-138*		*EPA 5035*	*EPA 8260B*	*09/13/19*	*09/13/19*	*mb*	*BI91320*
Surrogate: Toluene-d8	*98.5 %*			*80-121*		*EPA 5035*	*EPA 8260B*	*09/13/19*	*09/13/19*	*mb*	*BI91320*
Surrogate: 4-Bromofluorobenzene	*96.3 %*			*70-122*		*EPA 5035*	*EPA 8260B*	*09/13/19*	*09/13/19*	*mb*	*BI91320*

Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test	Method	Prepared	Analyzed	By	Batch
Antimony	ND		1	mg/kg	2.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Arsenic	**3.21**		1	mg/kg	2.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Barium	**35.3**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Beryllium	ND		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Cadmium	ND		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Chromium	**27.6**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012

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Certificate of Analysis

File #:74350
Report Date: 09/20/19
Submitted: 09/13/19
PLS Report No.: 1909151

Koury Engineering and Testing Services, Inc.
17800 South Main Street, Suite 303
Gardena, CA 90248

Attn: Mr. Albert Buffet Phone: (310) 851-8685 FAX:(310) 851-8692

Project: City of Manhattan Beach - Water Pipeline Replacement Project

Sample ID: 6 - 17th St. @ 6.0' Soil (1909151-06) Sampled: 09/11/19 14:00 Received: 09/13/19 16:45

Cobalt	**5.76**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Copper	**5.18**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Lead	**3.10**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Molybdenum	ND		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Nickel	**11.1**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Selenium	ND		1	mg/kg	2.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Silver	ND		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Thallium	ND		1	mg/kg	2.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Vanadium	**27.9**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Zinc	**14.6**		1	mg/kg	5.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
Mercury	ND		1	mg/kg	0.100	EPA 7471A	EPA 7471A	09/19/19	09/20/19	cg	BI92018
Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
Lead, Organic	See Attachment										

Sample ID: 7 - 12th St. & Rowell @ 11.0' Soil (1909151-07) Sampled: 09/11/19 15:30 Received: 09/13/19 16:45

Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
TPH C4 - C12	ND		1	mg/kg	0.500	EPA 5030B	EPA 8015M	09/17/19	09/17/19	lk	BI91615
Surrogate: a,a,a-Trifluorotoluene	*119 %*			*70-148*		*EPA 5030B*	*EPA 8015M*	*09/17/19*	*09/17/19*	*lk*	*BI91615*
Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
TPH C13 - C22	ND		1	mg/kg	2.50	EPA 3550C	EPA 8015M	09/18/19	09/19/19	lk	BI91906
TPH C23 - C32	ND		1	mg/kg	100	EPA 3550C	EPA 8015M	09/18/19	09/19/19	lk	BI91906
TPH C33 - C36	ND		1	mg/kg	100	EPA 3550C	EPA 8015M	09/18/19	09/19/19	lk	BI91906
Surrogate: n-Tetracosane	*95.5 %*			*64-139*		*EPA 3550C*	*EPA 8015M*	*09/18/19*	*09/19/19*	*lk*	*BI91906*
Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
Dichlorodifluoromethane (FC-12)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Chloromethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Vinyl chloride (Chloroethylene)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Bromomethane (Methyl bromide)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Chloroethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Trichlorofluoromethane (FC-11)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Acetone	ND		1	ug/kg	80.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Carbon disulfide	ND		1	ug/kg	40.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1-Dichloroethene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Methylene chloride (Dichloromethane)	ND		1	ug/kg	20.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Tert-butyl alcohol	ND		1	ug/kg	20.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
trans-1,2-Dichloroethene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Methyl tert-butyl ether (MTBE)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1-Dichloroethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Di-isopropyl ether	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Vinyl acetate	ND		1	ug/kg	40.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Ethyl tert-butyl ether	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
2,2-Dichloropropane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
cis-1,2-Dichloroethene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
2-Butanone (MEK)	ND		1	ug/kg	40.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Bromochloromethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Chloroform	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320

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File #:74350
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Attn: Mr. Albert Buffet Phone: (310) 851-8685 FAX:(310) 851-8692

Project: City of Manhattan Beach - Water Pipeline Replacement Project

Sample ID: 7 - 12th St. & Rowell @ 11.0' Soil (1909151-07) Sampled: 09/11/19 15:30 Received: 09/13/19 16:45

1,1,1-Trichloroethane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Tert-amyl methyl ether	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Carbon tetrachloride	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1-Dichloropropene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Benzene	ND	1	ug/kg	2.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2-Dichloroethane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Trichloroethene (TCE)	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2-Dichloropropane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Dibromomethane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,4-Dioxane	ND	1	ug/kg	80.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Bromodichloromethane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
2-Chloroethyl vinyl ether	ND	1	ug/kg	40.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
cis-1,3-Dichloropropene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
4-Methyl-2-pentanone (MIBK)	ND	1	ug/kg	40.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Toluene	ND	1	ug/kg	2.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
trans-1,3-Dichloropropene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1,2-Trichloroethane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Tetrachloroethene (PCE)	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,3-Dichloropropane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
2-Hexanone (MBK)	ND	1	ug/kg	40.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Dibromochloromethane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2-Dibromoethane (EDB)	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Chlorobenzene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1,1,2-Tetrachloroethane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Ethylbenzene	ND	1	ug/kg	2.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
m,p-Xylene	ND	1	ug/kg	2.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
o-Xylene	ND	1	ug/kg	2.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Styrene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Bromoform (Tribromomethane)	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Isopropylbenzene (Cumene)	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Bromobenzene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1,2,2-Tetrachloroethane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2,3-Trichloropropane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
n-Propylbenzene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
2-Chlorotoluene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
4-Chlorotoluene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,3,5-Trimethylbenzene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
tert-Butylbenzene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2,4-Trimethylbenzene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
sec-Butylbenzene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,3-Dichlorobenzene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
4-Isopropyltoluene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,4-Dichlorobenzene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2-Dichlorobenzene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
n-Butylbenzene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2-Dibromo-3-chloropropane (DBCP)	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2,4-Trichlorobenzene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Hexachlorobutadiene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Naphthalene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2,3-Trichlorobenzene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320

POSITIVE LAB SERVICE

781 East Washington Blvd., Los Angeles, CA 90021
(213) 745-5312 FAX (213) 745-6372

Certificate of Analysis

Koury Engineering and Testing Services, Inc.
17800 South Main Street, Suite 303
Gardena, CA 90248

File #:74350
Report Date: 09/20/19
Submitted: 09/13/19
PLS Report No.: 1909151

Attn: Mr. Albert Buffet Phone: (310) 851-8685 FAX:(310) 851-8692

Project: City of Manhattan Beach - Water Pipeline Replacement Project

Sample ID: 7 - 12th St. & Rowell @ 11.0' Soil (1909151-07) Sampled: 09/11/19 15:30 Received: 09/13/19 16:45

Surrogate: Dibromofluoromethane	*97.7 %*			*70-138*		*EPA 5035*	*EPA 8260B*	*09/13/19*	*09/13/19*	*mb*	*BI91320*
Surrogate: Toluene-d8	*97.6 %*			*80-121*		*EPA 5035*	*EPA 8260B*	*09/13/19*	*09/13/19*	*mb*	*BI91320*
Surrogate: 4-Bromofluorobenzene	*95.2 %*			*70-122*		*EPA 5035*	*EPA 8260B*	*09/13/19*	*09/13/19*	*mb*	*BI91320*
Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test	Method	Prepared	Analyzed	By	Batch
Antimony	ND		1	mg/kg	2.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Arsenic	ND		1	mg/kg	2.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Barium	**36.0**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Beryllium	ND		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Cadmium	ND		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Chromium	**11.2**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Cobalt	**5.28**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Copper	**4.95**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Lead	**2.64**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Molybdenum	ND		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Nickel	**5.65**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Selenium	ND		1	mg/kg	2.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Silver	ND		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Thallium	ND		1	mg/kg	2.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Vanadium	**17.6**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Zinc	**18.6**		1	mg/kg	5.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test	Method	Prepared	Analyzed	By	Batch
Mercury	ND		1	mg/kg	0.100	EPA 7471A	EPA 7471A	09/19/19	09/20/19	cg	BI92018
Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test	Method	Prepared	Analyzed	By	Batch
Lead, Organic	See Attachment										

Sample ID: 8 - Herrin & Mathews @ 5.0' Soil (1909151-08) Sampled: 09/12/19 08:00 Received: 09/13/19 16:45

Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test	Method	Prepared	Analyzed	By	Batch
TPH C4 - C12	ND		1	mg/kg	0.500	EPA 5030B	EPA 8015M	09/17/19	09/17/19	lk	BI91615
Surrogate: a,a,a-Trifluorotoluene	*121 %*			*70-148*		*EPA 5030B*	*EPA 8015M*	*09/17/19*	*09/17/19*	*lk*	*BI91615*
Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test	Method	Prepared	Analyzed	By	Batch
TPH C13 - C22	ND		1	mg/kg	2.50	EPA 3550C	EPA 8015M	09/18/19	09/19/19	lk	BI91906
TPH C23 - C32	ND		1	mg/kg	100	EPA 3550C	EPA 8015M	09/18/19	09/19/19	lk	BI91906
TPH C33 - C36	ND		1	mg/kg	100	EPA 3550C	EPA 8015M	09/18/19	09/19/19	lk	BI91906
Surrogate: n-Tetracosane	*106 %*			*64-139*		*EPA 3550C*	*EPA 8015M*	*09/18/19*	*09/19/19*	*lk*	*BI91906*
Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test	Method	Prepared	Analyzed	By	Batch
Dichlorodifluoromethane (FC-12)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Chloromethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Vinyl chloride (Chloroethylene)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Bromomethane (Methyl bromide)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Chloroethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Trichlorofluoromethane (FC-11)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Acetone	ND		1	ug/kg	80.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Carbon disulfide	ND		1	ug/kg	40.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1-Dichloroethene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Methylene chloride (Dichloromethane)	ND		1	ug/kg	20.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Tert-butyl alcohol	ND		1	ug/kg	20.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320

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Certificate of Analysis

Koury Engineering and Testing Services, Inc.
17800 South Main Street, Suite 303
Gardena, CA 90248

File #:74350
Report Date: 09/20/19
Submitted: 09/13/19
PLS Report No.: 1909151

Attn: Mr. Albert Buffet Phone: (310) 851-8685 FAX:(310) 851-8692

Project: City of Manhattan Beach - Water Pipeline Replacement Project

Sample ID: 8 - Herrin & Mathews @ 5.0' Soil (1909151-08) Sampled: 09/12/19 08:00 Received: 09/13/19 16:45

trans-1,2-Dichloroethene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Methyl tert-butyl ether (MTBE)	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1-Dichloroethane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Di-isopropyl ether	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Vinyl acetate	ND	1	ug/kg	40.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Ethyl tert-butyl ether	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
2,2-Dichloropropane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
cis-1,2-Dichloroethene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
2-Butanone (MEK)	ND	1	ug/kg	40.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Bromochloromethane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Chloroform	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1,1-Trichloroethane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Tert-amyl methyl ether	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Carbon tetrachloride	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1-Dichloropropene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Benzene	ND	1	ug/kg	2.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2-Dichloroethane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Trichloroethene (TCE)	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2-Dichloropropane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Dibromomethane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,4-Dioxane	ND	1	ug/kg	80.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Bromodichloromethane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
2-Chloroethyl vinyl ether	ND	1	ug/kg	40.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
cis-1,3-Dichloropropene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
4-Methyl-2-pentanone (MIBK)	ND	1	ug/kg	40.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Toluene	ND	1	ug/kg	2.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
trans-1,3-Dichloropropene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1,2-Trichloroethane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Tetrachloroethene (PCE)	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,3-Dichloropropane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
2-Hexanone (MBK)	ND	1	ug/kg	40.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Dibromochloromethane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2-Dibromoethane (EDB)	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Chlorobenzene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1,1,2-Tetrachloroethane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Ethylbenzene	ND	1	ug/kg	2.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
m,p-Xylene	ND	1	ug/kg	2.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
o-Xylene	ND	1	ug/kg	2.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Styrene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Bromoform (Tribromomethane)	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Isopropylbenzene (Cumene)	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Bromobenzene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1,2,2-Tetrachloroethane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2,3-Trichloropropane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
n-Propylbenzene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
2-Chlorotoluene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
4-Chlorotoluene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,3,5-Trimethylbenzene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
tert-Butylbenzene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2,4-Trimethylbenzene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320

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(213) 745-5312 FAX (213) 745-6372

Certificate of Analysis

File #:74350
Report Date: 09/20/19
Submitted: 09/13/19
PLS Report No.: 1909151

Koury Engineering and Testing Services, Inc.
17800 South Main Street, Suite 303
Gardena, CA 90248

Attn: Mr. Albert Buffet Phone: (310) 851-8685 FAX:(310) 851-8692

Project: City of Manhattan Beach - Water Pipeline Replacement Project

Sample ID: 8 - Herrin & Mathews @ 5.0' Soil (1909151-08) Sampled: 09/12/19 08:00 Received: 09/13/19 16:45

sec-Butylbenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,3-Dichlorobenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
4-Isopropyltoluene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,4-Dichlorobenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2-Dichlorobenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
n-Butylbenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2-Dibromo-3-chloropropane (DBCP)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2,4-Trichlorobenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Hexachlorobutadiene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Naphthalene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2,3-Trichlorobenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Surrogate: Dibromofluoromethane	*98.3 %*			*70-138*		*EPA 5035*	*EPA 8260B*	*09/13/19*	*09/13/19*	*mb*	*BI91320*
Surrogate: Toluene-d8	*101 %*			*80-121*		*EPA 5035*	*EPA 8260B*	*09/13/19*	*09/13/19*	*mb*	*BI91320*
Surrogate: 4-Bromofluorobenzene	*94.7 %*			*70-122*		*EPA 5035*	*EPA 8260B*	*09/13/19*	*09/13/19*	*mb*	*BI91320*
Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
Antimony	ND		1	mg/kg	2.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Arsenic	ND		1	mg/kg	2.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Barium	**22.8**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Beryllium	ND		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Cadmium	ND		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Chromium	**7.71**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Cobalt	**2.53**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Copper	**15.8**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Lead	**1.93**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Molybdenum	ND		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Nickel	**3.63**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Selenium	ND		1	mg/kg	2.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Silver	ND		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Thallium	ND		1	mg/kg	2.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Vanadium	**12.1**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Zinc	**19.1**		1	mg/kg	5.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
Mercury	ND		1	mg/kg	0.100	EPA 7471A	EPA 7471A	09/19/19	09/20/19	cg	BI92018
Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
Lead, Organic	See Attachment										

Sample ID: 9 - 12th St. @ 3.0' Soil (1909151-09) Sampled: 09/12/19 09:30 Received: 09/13/19 16:45

Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
TPH C4 - C12	ND		1	mg/kg	0.500	EPA 5030B	EPA 8015M	09/17/19	09/17/19	lk	BI91720
Surrogate: a,a,a-Trifluorotoluene	*113 %*			*70-148*		*EPA 5030B*	*EPA 8015M*	*09/17/19*	*09/17/19*	*lk*	*BI91720*
Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
TPH C13 - C22	ND		1	mg/kg	2.50	EPA 3550C	EPA 8015M	09/18/19	09/19/19	lk	BI91906
TPH C23 - C32	ND		1	mg/kg	100	EPA 3550C	EPA 8015M	09/18/19	09/19/19	lk	BI91906
TPH C33 - C36	ND		1	mg/kg	100	EPA 3550C	EPA 8015M	09/18/19	09/19/19	lk	BI91906
Surrogate: n-Tetracosane	*104 %*			*64-139*		*EPA 3550C*	*EPA 8015M*	*09/18/19*	*09/19/19*	*lk*	*BI91906*
Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch

POSITIVE LAB SERVICE

781 East Washington Blvd., Los Angeles, CA 90021
(213) 745-5312 FAX (213) 745-6372

Certificate of Analysis

File #:74350
Report Date: 09/20/19
Submitted: 09/13/19
PLS Report No.: 1909151

Koury Engineering and Testing Services, Inc.
17800 South Main Street, Suite 303
Gardena, CA 90248

Attn: Mr. Albert Buffet Phone: (310) 851-8685 FAX:(310) 851-8692

Project: City of Manhattan Beach - Water Pipeline Replacement Project

Sample ID: 9 - 12th St. @ 3.0' Soil (1909151-09) Sampled: 09/12/19 09:30 Received: 09/13/19 16:45

Dichlorodifluoromethane (FC-12)	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Chloromethane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Vinyl chloride (Chloroethylene)	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Bromomethane (Methyl bromide)	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Chloroethane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Trichlorofluoromethane (FC-11)	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Acetone	ND	1	ug/kg	80.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Carbon disulfide	ND	1	ug/kg	40.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1-Dichloroethene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Methylene chloride (Dichloromethane)	ND	1	ug/kg	20.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Tert-butyl alcohol	ND	1	ug/kg	20.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
trans-1,2-Dichloroethene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Methyl tert-butyl ether (MTBE)	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1-Dichloroethane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Di-isopropyl ether	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Vinyl acetate	ND	1	ug/kg	40.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Ethyl tert-butyl ether	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
2,2-Dichloropropane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
cis-1,2-Dichloroethene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
2-Butanone (MEK)	ND	1	ug/kg	40.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Bromochloromethane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Chloroform	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1,1-Trichloroethane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Tert-amyl methyl ether	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Carbon tetrachloride	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1-Dichloropropene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Benzene	ND	1	ug/kg	2.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2-Dichloroethane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Trichloroethene (TCE)	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2-Dichloropropane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Dibromomethane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,4-Dioxane	ND	1	ug/kg	80.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Bromodichloromethane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
2-Chloroethyl vinyl ether	ND	1	ug/kg	40.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
cis-1,3-Dichloropropene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
4-Methyl-2-pentanone (MIBK)	ND	1	ug/kg	40.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Toluene	ND	1	ug/kg	2.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
trans-1,3-Dichloropropene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1,2-Trichloroethane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Tetrachloroethene (PCE)	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,3-Dichloropropane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
2-Hexanone (MBK)	ND	1	ug/kg	40.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Dibromochloromethane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2-Dibromoethane (EDB)	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Chlorobenzene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1,1,2-Tetrachloroethane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Ethylbenzene	ND	1	ug/kg	2.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
m,p-Xylene	ND	1	ug/kg	2.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
o-Xylene	ND	1	ug/kg	2.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Styrene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320

POSITIVE LAB SERVICE

781 East Washington Blvd., Los Angeles, CA 90021
(213) 745-5312 FAX (213) 745-6372

Certificate of Analysis

File #:74350
Report Date: 09/20/19
Submitted: 09/13/19
PLS Report No.: 1909151

Koury Engineering and Testing Services, Inc.
17800 South Main Street, Suite 303
Gardena, CA 90248

Attn: Mr. Albert Buffet Phone: (310) 851-8685 FAX:(310) 851-8692

Project: City of Manhattan Beach - Water Pipeline Replacement Project

Sample ID: 9 - 12th St. @ 3.0' Soil (1909151-09) Sampled: 09/12/19 09:30 Received: 09/13/19 16:45

Bromoform (Tribromomethane)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Isopropylbenzene (Cumene)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Bromobenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1,2,2-Tetrachloroethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2,3-Trichloropropane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
n-Propylbenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
2-Chlorotoluene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
4-Chlorotoluene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,3,5-Trimethylbenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
tert-Butylbenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2,4-Trimethylbenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
sec-Butylbenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,3-Dichlorobenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
4-Isopropyltoluene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,4-Dichlorobenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2-Dichlorobenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
n-Butylbenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2-Dibromo-3-chloropropane (DBCP)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2,4-Trichlorobenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Hexachlorobutadiene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Naphthalene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2,3-Trichlorobenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Surrogate: Dibromofluoromethane	*95.1 %*			*70-138*		*EPA 5035*	*EPA 8260B*	*09/13/19*	*09/13/19*	*mb*	*BI91320*
Surrogate: Toluene-d8	*97.9 %*			*80-121*		*EPA 5035*	*EPA 8260B*	*09/13/19*	*09/13/19*	*mb*	*BI91320*
Surrogate: 4-Bromofluorobenzene	*96.0 %*			*70-122*		*EPA 5035*	*EPA 8260B*	*09/13/19*	*09/13/19*	*mb*	*BI91320*

Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
Antimony	ND		1	mg/kg	2.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Arsenic	**2.47**		1	mg/kg	2.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Barium	**22.6**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Beryllium	ND		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Cadmium	ND		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Chromium	**9.47**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Cobalt	**2.63**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Copper	**8.03**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Lead	**2.07**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Molybdenum	ND		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Nickel	**6.70**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Selenium	ND		1	mg/kg	2.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Silver	ND		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Thallium	ND		1	mg/kg	2.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Vanadium	**19.0**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Zinc	**19.2**		1	mg/kg	5.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012

Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
Mercury	ND		1	mg/kg	0.100	EPA 7471A	EPA 7471A	09/19/19	09/20/19	cg	BI92018

Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
Lead, Organic	See Attachment										

Sample ID: 10 - Flournoy St. @ 8.5' Soil (1909151-10) Sampled: 09/12/19 11:00 Received: 09/13/19 16:45

POSITIVE LAB SERVICE

781 East Washington Blvd., Los Angeles, CA 90021
(213) 745-5312 FAX (213) 745-6372

Certificate of Analysis

Koury Engineering and Testing Services, Inc.
17800 South Main Street, Suite 303
Gardena, CA 90248

File #:74350
Report Date: 09/20/19
Submitted: 09/13/19
PLS Report No.: 1909151

Attn: Mr. Albert Buffet Phone: (310) 851-8685 FAX:(310) 851-8692

Project: City of Manhattan Beach - Water Pipeline Replacement Project

Sample ID: 10 - Flournoy St. @ 8.5' Soil (1909151-10) Sampled: 09/12/19 11:00 Received: 09/13/19 16:45

Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test	Method	Prepared	Analyzed	By	Batch
TPH C4 - C12	ND		1	mg/kg	0.500	EPA 5030B	EPA 8015M	09/17/19	09/17/19	lk	BI91720
Surrogate: a,a,a-Trifluorotoluene	*116 %*			*70-148*		*EPA 5030B*	*EPA 8015M*	*09/17/19*	*09/17/19*	*lk*	*BI91720*

Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test	Method	Prepared	Analyzed	By	Batch
TPH C13 - C22	ND		1	mg/kg	2.50	EPA 3550C	EPA 8015M	09/18/19	09/20/19	lk	BI91906
TPH C23 - C32	ND		1	mg/kg	100	EPA 3550C	EPA 8015M	09/18/19	09/20/19	lk	BI91906
TPH C33 - C36	ND		1	mg/kg	100	EPA 3550C	EPA 8015M	09/18/19	09/20/19	lk	BI91906
Surrogate: n-Tetracosane	*103 %*			*64-139*		*EPA 3550C*	*EPA 8015M*	*09/18/19*	*09/20/19*	*lk*	*BI91906*

Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test	Method	Prepared	Analyzed	By	Batch
Dichlorodifluoromethane (FC-12)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Chloromethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Vinyl chloride (Chloroethylene)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Bromomethane (Methyl bromide)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Chloroethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Trichlorofluoromethane (FC-11)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Acetone	ND		1	ug/kg	80.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Carbon disulfide	ND		1	ug/kg	40.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1-Dichloroethene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Methylene chloride (Dichloromethane)	ND		1	ug/kg	20.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Tert-butyl alcohol	ND		1	ug/kg	20.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
trans-1,2-Dichloroethene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Methyl tert-butyl ether (MTBE)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1-Dichloroethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Di-isopropyl ether	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Vinyl acetate	ND		1	ug/kg	40.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Ethyl tert-butyl ether	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
2,2-Dichloropropane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
cis-1,2-Dichloroethene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
2-Butanone (MEK)	ND		1	ug/kg	40.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Bromochloromethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Chloroform	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1,1-Trichloroethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Tert-amyl methyl ether	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Carbon tetrachloride	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1-Dichloropropene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Benzene	ND		1	ug/kg	2.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2-Dichloroethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Trichloroethene (TCE)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2-Dichloropropane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Dibromomethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,4-Dioxane	ND		1	ug/kg	80.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Bromodichloromethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
2-Chloroethyl vinyl ether	ND		1	ug/kg	40.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
cis-1,3-Dichloropropene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
4-Methyl-2-pentanone (MIBK)	ND		1	ug/kg	40.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Toluene	ND		1	ug/kg	2.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
trans-1,3-Dichloropropene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1,2-Trichloroethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320

POSITIVE LAB SERVICE

781 East Washington Blvd., Los Angeles, CA 90021
(213) 745-5312 FAX (213) 745-6372

Certificate of Analysis

File #:74350
Report Date: 09/20/19
Submitted: 09/13/19
PLS Report No.: 1909151

Koury Engineering and Testing Services, Inc.
17800 South Main Street, Suite 303
Gardena, CA 90248

Attn: Mr. Albert Buffet Phone: (310) 851-8685 FAX:(310) 851-8692

Project: City of Manhattan Beach - Water Pipeline Replacement Project

Sample ID: 10 - Flournoy St. @ 8.5' Soil (1909151-10) Sampled: 09/12/19 11:00 Received: 09/13/19 16:45

Tetrachloroethene (PCE)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,3-Dichloropropane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
2-Hexanone (MBK)	ND		1	ug/kg	40.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Dibromochloromethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2-Dibromoethane (EDB)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Chlorobenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1,1,2-Tetrachloroethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Ethylbenzene	ND		1	ug/kg	2.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
m,p-Xylene	ND		1	ug/kg	2.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
o-Xylene	ND		1	ug/kg	2.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Styrene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Bromoform (Tribromomethane)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Isopropylbenzene (Cumene)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Bromobenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1,2,2-Tetrachloroethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2,3-Trichloropropane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
n-Propylbenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
2-Chlorotoluene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
4-Chlorotoluene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,3,5-Trimethylbenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
tert-Butylbenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2,4-Trimethylbenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
sec-Butylbenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,3-Dichlorobenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
4-Isopropyltoluene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,4-Dichlorobenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2-Dichlorobenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
n-Butylbenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2-Dibromo-3-chloropropane (DBCP)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2,4-Trichlorobenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Hexachlorobutadiene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Naphthalene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2,3-Trichlorobenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Surrogate: Dibromofluoromethane	*97.2 %*			*70-138*		*EPA 5035*	*EPA 8260B*	*09/13/19*	*09/13/19*	*mb*	*BI91320*
Surrogate: Toluene-d8	*98.2 %*			*80-121*		*EPA 5035*	*EPA 8260B*	*09/13/19*	*09/13/19*	*mb*	*BI91320*
Surrogate: 4-Bromofluorobenzene	*93.7 %*			*70-122*		*EPA 5035*	*EPA 8260B*	*09/13/19*	*09/13/19*	*mb*	*BI91320*

Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test	Method	Prepared	Analyzed	By	Batch
Antimony	ND		1	mg/kg	2.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Arsenic	ND		1	mg/kg	2.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Barium	**24.0**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Beryllium	ND		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Cadmium	ND		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Chromium	**11.1**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Cobalt	**3.05**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Copper	**5.94**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Lead	**6.82**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Molybdenum	ND		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Nickel	**5.54**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Selenium	ND		1	mg/kg	2.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012

POSITIVE LAB SERVICE

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(213) 745-5312 FAX (213) 745-6372

Certificate of Analysis

File #:74350
Report Date: 09/20/19
Submitted: 09/13/19
PLS Report No.: 1909151

Koury Engineering and Testing Services, Inc.
17800 South Main Street, Suite 303
Gardena, CA 90248

Attn: Mr. Albert Buffet Phone: (310) 851-8685 FAX:(310) 851-8692

Project: City of Manhattan Beach - Water Pipeline Replacement Project

Sample ID: 10 - Flournoy St. @ 8.5' Soil (1909151-10) Sampled: 09/12/19 11:00 Received: 09/13/19 16:45

Silver	ND		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Thallium	ND		1	mg/kg	2.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Vanadium	**18.6**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Zinc	**20.5**		1	mg/kg	5.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
Mercury	ND		1	mg/kg	0.100	EPA 7471A	EPA 7471A	09/19/19	09/20/19	cg	BI92018
Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
Lead, Organic	See Attachment										

Sample ID: 11 - Agnes Rt @ 11.5' Soil (1909151-11) Sampled: 09/12/19 12:00 Received: 09/13/19 16:45

Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
TPH C4 - C12	ND		1	mg/kg	0.500	EPA 5030B	EPA 8015M	09/17/19	09/17/19	lk	BI91720
Surrogate: a,a,a-Trifluorotoluene	*115 %*			*70-148*		*EPA 5030B*	*EPA 8015M*	*09/17/19*	*09/17/19*	*lk*	*BI91720*
Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
TPH C13 - C22	ND		1	mg/kg	2.50	EPA 3550C	EPA 8015M	09/18/19	09/20/19	lk	BI91906
TPH C23 - C32	ND		1	mg/kg	100	EPA 3550C	EPA 8015M	09/18/19	09/20/19	lk	BI91906
TPH C33 - C36	ND		1	mg/kg	100	EPA 3550C	EPA 8015M	09/18/19	09/20/19	lk	BI91906
Surrogate: n-Tetracosane	*103 %*			*64-139*		*EPA 3550C*	*EPA 8015M*	*09/18/19*	*09/20/19*	*lk*	*BI91906*
Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
Dichlorodifluoromethane (FC-12)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Chloromethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Vinyl chloride (Chloroethylene)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Bromomethane (Methyl bromide)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Chloroethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Trichlorofluoromethane (FC-11)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Acetone	ND		1	ug/kg	80.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Carbon disulfide	ND		1	ug/kg	40.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1-Dichloroethene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Methylene chloride (Dichloromethane)	ND		1	ug/kg	20.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Tert-butyl alcohol	ND		1	ug/kg	20.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
trans-1,2-Dichloroethene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Methyl tert-butyl ether (MTBE)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1-Dichloroethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Di-isopropyl ether	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Vinyl acetate	ND		1	ug/kg	40.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Ethyl tert-butyl ether	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
2,2-Dichloropropane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
cis-1,2-Dichloroethene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
2-Butanone (MEK)	ND		1	ug/kg	40.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Bromochloromethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Chloroform	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1,1-Trichloroethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Tert-amyl methyl ether	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Carbon tetrachloride	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1-Dichloropropene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Benzene	ND		1	ug/kg	2.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2-Dichloroethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320

POSITIVE LAB SERVICE

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Report Date: 09/20/19
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Koury Engineering and Testing Services, Inc.
17800 South Main Street, Suite 303
Gardena, CA 90248

Attn: Mr. Albert Buffet Phone: (310) 851-8685 FAX:(310) 851-8692

Project: City of Manhattan Beach - Water Pipeline Replacement Project

Sample ID: 11 - Agnes Rt @ 11.5' Soil (1909151-11) Sampled: 09/12/19 12:00 Received: 09/13/19 16:45

Trichloroethene (TCE)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2-Dichloropropane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Dibromomethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,4-Dioxane	ND		1	ug/kg	80.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Bromodichloromethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
2-Chloroethyl vinyl ether	ND		1	ug/kg	40.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
cis-1,3-Dichloropropene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
4-Methyl-2-pentanone (MIBK)	ND		1	ug/kg	40.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Toluene	ND		1	ug/kg	2.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
trans-1,3-Dichloropropene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1,2-Trichloroethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Tetrachloroethene (PCE)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,3-Dichloropropane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
2-Hexanone (MBK)	ND		1	ug/kg	40.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Dibromochloromethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2-Dibromoethane (EDB)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Chlorobenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1,1,2-Tetrachloroethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Ethylbenzene	ND		1	ug/kg	2.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
m,p-Xylene	ND		1	ug/kg	2.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
o-Xylene	ND		1	ug/kg	2.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Styrene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Bromoform (Tribromomethane)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Isopropylbenzene (Cumene)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Bromobenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1,2,2-Tetrachloroethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2,3-Trichloropropane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
n-Propylbenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
2-Chlorotoluene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
4-Chlorotoluene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,3,5-Trimethylbenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
tert-Butylbenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2,4-Trimethylbenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
sec-Butylbenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,3-Dichlorobenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
4-Isopropyltoluene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,4-Dichlorobenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2-Dichlorobenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
n-Butylbenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2-Dibromo-3-chloropropane (DBCP)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2,4-Trichlorobenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Hexachlorobutadiene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Naphthalene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2,3-Trichlorobenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Surrogate: Dibromofluoromethane	*95.1 %*			*70-138*		*EPA 5035*	*EPA 8260B*	*09/13/19*	*09/13/19*	*mb*	*BI91320*
Surrogate: Toluene-d8	*100 %*			*80-121*		*EPA 5035*	*EPA 8260B*	*09/13/19*	*09/13/19*	*mb*	*BI91320*
Surrogate: 4-Bromofluorobenzene	*94.1 %*			*70-122*		*EPA 5035*	*EPA 8260B*	*09/13/19*	*09/13/19*	*mb*	*BI91320*

Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
Antimony	ND		1	mg/kg	2.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012

POSITIVE LAB SERVICE

781 East Washington Blvd., Los Angeles, CA 90021
(213) 745-5312 FAX (213) 745-6372

Certificate of Analysis

File #:74350
Report Date: 09/20/19
Submitted: 09/13/19
PLS Report No.: 1909151

Koury Engineering and Testing Services, Inc.
17800 South Main Street, Suite 303
Gardena, CA 90248

Attn: Mr. Albert Buffet Phone: (310) 851-8685 FAX:(310) 851-8692

Project: City of Manhattan Beach - Water Pipeline Replacement Project

Sample ID: 11 - Agnes Rt @ 11.5' Soil (1909151-11) Sampled: 09/12/19 12:00 Received: 09/13/19 16:45

Arsenic	ND		1	mg/kg	2.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Barium	**14.7**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Beryllium	ND		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Cadmium	ND		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Chromium	**13.5**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Cobalt	**2.98**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Copper	**3.00**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Lead	**2.13**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Molybdenum	ND		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Nickel	**4.71**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Selenium	ND		1	mg/kg	2.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Silver	ND		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Thallium	ND		1	mg/kg	2.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Vanadium	**18.4**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Zinc	**10.3**		1	mg/kg	5.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
Mercury	ND		1	mg/kg	0.100	EPA 7471A	EPA 7471A	09/19/19	09/20/19	cg	BI92018
Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
Lead, Organic	See Attachment										

Sample ID: 12 - Herrin St. & Runland @ 10.5' Soil (1909151-12) Sampled: 09/12/19 13:30 Received: 09/13/19 16:45

Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
TPH C4 - C12	ND		1	mg/kg	0.500	EPA 5030B	EPA 8015M	09/17/19	09/17/19	lk	BI91720
Surrogate: a,a,a-Trifluorotoluene	*118 %*			*70-148*		*EPA 5030B*	*EPA 8015M*	*09/17/19*	*09/17/19*	*lk*	*BI91720*
Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
TPH C13 - C22	ND		1	mg/kg	2.50	EPA 3550C	EPA 8015M	09/18/19	09/20/19	lk	BI91906
TPH C23 - C32	ND		1	mg/kg	100	EPA 3550C	EPA 8015M	09/18/19	09/20/19	lk	BI91906
TPH C33 - C36	ND		1	mg/kg	100	EPA 3550C	EPA 8015M	09/18/19	09/20/19	lk	BI91906
Surrogate: n-Tetracosane	*111 %*			*64-139*		*EPA 3550C*	*EPA 8015M*	*09/18/19*	*09/20/19*	*lk*	*BI91906*
Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test Method		Prepared	Analyzed	By	Batch
Dichlorodifluoromethane (FC-12)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Chloromethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Vinyl chloride (Chloroethylene)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Bromomethane (Methyl bromide)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Chloroethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Trichlorofluoromethane (FC-11)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Acetone	ND		1	ug/kg	80.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Carbon disulfide	ND		1	ug/kg	40.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1-Dichloroethene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Methylene chloride (Dichloromethane)	ND		1	ug/kg	20.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Tert-butyl alcohol	ND		1	ug/kg	20.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
trans-1,2-Dichloroethene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Methyl tert-butyl ether (MTBE)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1-Dichloroethane	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Di-isopropyl ether	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Vinyl acetate	ND		1	ug/kg	40.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Ethyl tert-butyl ether	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320

POSITIVE LAB SERVICE

781 East Washington Blvd., Los Angeles, CA 90021
(213) 745-5312 FAX (213) 745-6372

Certificate of Analysis

File #:74350
Report Date: 09/20/19
Submitted: 09/13/19
PLS Report No.: 1909151

Koury Engineering and Testing Services, Inc.
17800 South Main Street, Suite 303
Gardena, CA 90248

Attn: Mr. Albert Buffet Phone: (310) 851-8685 FAX:(310) 851-8692

Project: City of Manhattan Beach - Water Pipeline Replacement Project

Sample ID: 12 - Herrin St. & Runland @ 10.5' Soil (1909151-12) Sampled: 09/12/19 13:30 Received: 09/13/19 16:45

2,2-Dichloropropane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
cis-1,2-Dichloroethene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
2-Butanone (MEK)	ND	1	ug/kg	40.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Bromochloromethane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Chloroform	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1,1-Trichloroethane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Tert-amyl methyl ether	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Carbon tetrachloride	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1-Dichloropropene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Benzene	ND	1	ug/kg	2.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2-Dichloroethane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Trichloroethene (TCE)	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2-Dichloropropane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Dibromomethane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,4-Dioxane	ND	1	ug/kg	80.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Bromodichloromethane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
2-Chloroethyl vinyl ether	ND	1	ug/kg	40.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
cis-1,3-Dichloropropene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
4-Methyl-2-pentanone (MIBK)	ND	1	ug/kg	40.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Toluene	ND	1	ug/kg	2.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
trans-1,3-Dichloropropene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1,2-Trichloroethane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Tetrachloroethene (PCE)	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,3-Dichloropropane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
2-Hexanone (MBK)	ND	1	ug/kg	40.0	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Dibromochloromethane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2-Dibromoethane (EDB)	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Chlorobenzene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1,1,2-Tetrachloroethane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Ethylbenzene	ND	1	ug/kg	2.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
m,p-Xylene	ND	1	ug/kg	2.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
o-Xylene	ND	1	ug/kg	2.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Styrene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Bromoform (Tribromomethane)	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Isopropylbenzene (Cumene)	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Bromobenzene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,1,2,2-Tetrachloroethane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2,3-Trichloropropane	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
n-Propylbenzene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
2-Chlorotoluene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
4-Chlorotoluene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,3,5-Trimethylbenzene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
tert-Butylbenzene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2,4-Trimethylbenzene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
sec-Butylbenzene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,3-Dichlorobenzene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
4-Isopropyltoluene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,4-Dichlorobenzene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2-Dichlorobenzene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
n-Butylbenzene	ND	1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320

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Certificate of Analysis

File #:74350
Report Date: 09/20/19
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PLS Report No.: 1909151

Koury Engineering and Testing Services, Inc.
17800 South Main Street, Suite 303
Gardena, CA 90248

Attn: Mr. Albert Buffet Phone: (310) 851-8685 FAX:(310) 851-8692

Project: City of Manhattan Beach - Water Pipeline Replacement Project

Sample ID: 12 - Herrin St. & Runland @ 10.5' Soil (1909151-12) Sampled: 09/12/19 13:30 Received: 09/13/19 16:45

1,2-Dibromo-3-chloropropane (DBCP)	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2,4-Trichlorobenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Hexachlorobutadiene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Naphthalene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
1,2,3-Trichlorobenzene	ND		1	ug/kg	4.00	EPA 5035	EPA 8260B	09/13/19	09/13/19	mb	BI91320
Surrogate: Dibromofluoromethane	*96.5 %*			*70-138*		*EPA 5035*	*EPA 8260B*	*09/13/19*	*09/13/19*	*mb*	*BI91320*
Surrogate: Toluene-d8	*99.6 %*			*80-121*		*EPA 5035*	*EPA 8260B*	*09/13/19*	*09/13/19*	*mb*	*BI91320*
Surrogate: 4-Bromofluorobenzene	*93.3 %*			*70-122*		*EPA 5035*	*EPA 8260B*	*09/13/19*	*09/13/19*	*mb*	*BI91320*

Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test	Method	Prepared	Analyzed	By	Batch
Antimony	ND		1	mg/kg	2.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Arsenic	ND		1	mg/kg	2.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Barium	**18.8**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Beryllium	ND		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Cadmium	ND		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Chromium	**9.17**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Cobalt	**3.28**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Copper	**2.81**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Lead	**1.64**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Molybdenum	ND		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Nickel	**4.81**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Selenium	ND		1	mg/kg	2.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Silver	ND		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Thallium	ND		1	mg/kg	2.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Vanadium	**10.3**		1	mg/kg	1.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012
Zinc	**8.31**		1	mg/kg	5.00	EPA 3050B	EPA 6010B	09/19/19	09/19/19	CG	BI92012

Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test	Method	Prepared	Analyzed	By	Batch
Mercury	ND		1	mg/kg	0.100	EPA 7471A	EPA 7471A	09/19/19	09/20/19	cg	BI92018

Analyte	Results	Flag	D.F.	Units	PQL	Prep/Test	Method	Prepared	Analyzed	By	Batch
Lead, Organic	See Attachment										

POSITIVE LAB SERVICE

781 East Washington Blvd., Los Angeles, CA 90021
(213) 745-5312 FAX (213) 745-6372

Certificate of Analysis

Koury Engineering and Testing Services, Inc.
17800 South Main Street, Suite 303
Gardena, CA 90248

File #:74350
Report Date: 09/20/19
Submitted: 09/13/19
PLS Report No.: 1909151

Attn: Mr. Albert Buffet Phone: (310) 851-8685 FAX:(310) 851-8692

Project: City of Manhattan Beach - Water Pipeline Replacement Project

Quality Control Data

Analyte		Result	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch BI91615 - EPA 5030B											
Blank		**Prepared & Analyzed: 09/16/19**									
TPH C4 - C12		ND	0.500	mg/kg							
Surrogate: a,a,a-Trifluorotoluene		*0.0336*		mg/kg	*0.03000*		*112*	*70-148*			
LCS		**Prepared & Analyzed: 09/16/19**									
Gasoline		0.759	0.500	mg/kg	0.9096		83.4	69-120			
Matrix Spike	**Source: 1909127-05**	**Prepared & Analyzed: 09/16/19**									
Gasoline		1.41	0.500	mg/kg	1.819	ND	77.5	60-132			
Matrix Spike Dup	**Source: 1909127-05**	**Prepared & Analyzed: 09/16/19**									
Gasoline		1.45	0.500	mg/kg	1.819	ND	79.5	60-132	2.57	30	
Batch BI91720 - EPA 5030B											
Blank		**Prepared & Analyzed: 09/17/19**									
TPH C4 - C12		ND	0.500	mg/kg							
Surrogate: a,a,a-Trifluorotoluene		*0.0360*		mg/kg	*0.03000*		*120*	*70-148*			
LCS		**Prepared & Analyzed: 09/17/19**									
Gasoline		0.873	0.500	mg/kg	0.9096		96.0	69-120			
Matrix Spike	**Source: 1909151-12**	**Prepared & Analyzed: 09/17/19**									
Gasoline		1.31	0.500	mg/kg	1.819	ND	72.1	60-132			
Matrix Spike Dup	**Source: 1909151-12**	**Prepared & Analyzed: 09/17/19**									
Gasoline		1.23	0.500	mg/kg	1.819	ND	67.8	60-132	6.12	30	
Batch BI91906 - EPA 3550C											
Blank		**Prepared: 09/18/19 Analyzed: 09/19/19**									
TPH C13 - C22		ND	2.50	mg/kg							
TPH C23 - C32		ND	100	mg/kg							
TPH C33 - C36		ND	100	mg/kg							
Surrogate: n-Tetracosane		*21.9*		mg/kg	*20.83*		*105*	*64-139*			
LCS		**Prepared: 09/18/19 Analyzed: 09/19/19**									
Diesel		562	12.5	mg/kg	554.7		101	74-154			
Surrogate: n-Tetracosane		*21.4*		mg/kg	*20.83*		*103*	*64-140*			
Matrix Spike	**Source: 1909151-01**	**Prepared: 09/18/19 Analyzed: 09/19/19**									
Diesel		129	2.50	mg/kg	110.9	ND	116	53-138			
Surrogate: n-Tetracosane		*27.6*		mg/kg	*20.83*		*133*	*64-139*			
Matrix Spike Dup	**Source: 1909151-01**	**Prepared: 09/18/19 Analyzed: 09/19/19**									
Diesel		101	2.50	mg/kg	110.9	ND	91.5	53-138	24.0	30	
Surrogate: n-Tetracosane		*22.9*		mg/kg	*20.83*		*110*	*64-139*			
Batch BI91320 - EPA 5035											

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17800 South Main Street, Suite 303
Gardena, CA 90248

File #:74350
Report Date: 09/20/19
Submitted: 09/13/19
PLS Report No.: 1909151

Attn: Mr. Albert Buffet Phone: (310) 851-8685 FAX:(310) 851-8692

Project: City of Manhattan Beach - Water Pipeline Replacement Project

Quality Control Data

Analyte	Result	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch BI91320 - EPA 5035										
Blank	**Prepared & Analyzed: 09/13/19**									
Dichlorodifluoromethane (FC-12)	ND	4.00	ug/kg							
Chloromethane	ND	4.00	ug/kg							
Vinyl chloride (Chloroethylene)	ND	4.00	ug/kg							
Bromomethane (Methyl bromide)	ND	4.00	ug/kg							
Chloroethane	ND	4.00	ug/kg							
Trichlorofluoromethane (FC-11)	ND	4.00	ug/kg							
Acetone	ND	80.0	ug/kg							
Carbon disulfide	ND	40.0	ug/kg							
1,1-Dichloroethene	ND	4.00	ug/kg							
Methylene chloride (Dichloromethane)	ND	20.0	ug/kg							
Tert-butyl alcohol	ND	20.0	ug/kg							
trans-1,2-Dichloroethene	ND	4.00	ug/kg							
Methyl tert-butyl ether (MTBE)	ND	4.00	ug/kg							
1,1-Dichloroethane	ND	4.00	ug/kg							
Di-isopropyl ether	ND	4.00	ug/kg							
Vinyl acetate	ND	40.0	ug/kg							
Ethyl tert-butyl ether	ND	4.00	ug/kg							
2,2-Dichloropropane	ND	4.00	ug/kg							
cis-1,2-Dichloroethene	ND	4.00	ug/kg							
2-Butanone (MEK)	ND	40.0	ug/kg							
Bromochloromethane	ND	4.00	ug/kg							
Chloroform	ND	4.00	ug/kg							
1,1,1-Trichloroethane	ND	4.00	ug/kg							
Tert-amyl methyl ether	ND	4.00	ug/kg							
Carbon tetrachloride	ND	4.00	ug/kg							
1,1-Dichloropropene	ND	4.00	ug/kg							
Benzene	ND	2.00	ug/kg							
1,2-Dichloroethane	ND	4.00	ug/kg							
Trichloroethene (TCE)	ND	4.00	ug/kg							
1,2-Dichloropropane	ND	4.00	ug/kg							
Dibromomethane	ND	4.00	ug/kg							
1,4-Dioxane	ND	80.0	ug/kg							
Bromodichloromethane	ND	4.00	ug/kg							
2-Chloroethyl vinyl ether	ND	40.0	ug/kg							
cis-1,3-Dichloropropene	ND	4.00	ug/kg							
4-Methyl-2-pentanone (MIBK)	ND	40.0	ug/kg							
Toluene	ND	2.00	ug/kg							
trans-1,3-Dichloropropene	ND	4.00	ug/kg							
1,1,2-Trichloroethane	ND	4.00	ug/kg							
Tetrachloroethene (PCE)	ND	4.00	ug/kg							

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Koury Engineering and Testing Services, Inc.
17800 South Main Street, Suite 303
Gardena, CA 90248

Attn: Mr. Albert Buffet Phone: (310) 851-8685 FAX:(310) 851-8692

Project: City of Manhattan Beach - Water Pipeline Replacement Project

Quality Control Data

Analyte	Result	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch BI91320 - EPA 5035										
1,3-Dichloropropane	ND	4.00	ug/kg							
2-Hexanone (MBK)	ND	40.0	ug/kg							
Dibromochloromethane	ND	4.00	ug/kg							
1,2-Dibromoethane (EDB)	ND	4.00	ug/kg							
Chlorobenzene	ND	4.00	ug/kg							
1,1,1,2-Tetrachloroethane	ND	4.00	ug/kg							
Ethylbenzene	ND	2.00	ug/kg							
m,p-Xylene	ND	2.00	ug/kg							
o-Xylene	ND	2.00	ug/kg							
Styrene	ND	4.00	ug/kg							
Bromoform (Tribromomethane)	ND	4.00	ug/kg							
Isopropylbenzene (Cumene)	ND	4.00	ug/kg							
Bromobenzene	ND	4.00	ug/kg							
1,1,2,2-Tetrachloroethane	ND	4.00	ug/kg							
1,2,3-Trichloropropane	ND	4.00	ug/kg							
n-Propylbenzene	ND	4.00	ug/kg							
2-Chlorotoluene	ND	4.00	ug/kg							
4-Chlorotoluene	ND	4.00	ug/kg							
1,3,5-Trimethylbenzene	ND	4.00	ug/kg							
tert-Butylbenzene	ND	4.00	ug/kg							
1,2,4-Trimethylbenzene	ND	4.00	ug/kg							
sec-Butylbenzene	ND	4.00	ug/kg							
1,3-Dichlorobenzene	ND	4.00	ug/kg							
4-Isopropyltoluene	ND	4.00	ug/kg							
1,4-Dichlorobenzene	ND	4.00	ug/kg							
1,2-Dichlorobenzene	ND	4.00	ug/kg							
n-Butylbenzene	ND	4.00	ug/kg							
1,2-Dibromo-3-chloropropane (DBCP)	ND	4.00	ug/kg							
1,2,4-Trichlorobenzene	ND	4.00	ug/kg							
Hexachlorobutadiene	ND	4.00	ug/kg							
Naphthalene	ND	4.00	ug/kg							
1,2,3-Trichlorobenzene	ND	4.00	ug/kg							
Surrogate: Dibromofluoromethane	*15.0*		ug/kg	*15.00*		*99.7*	*70-138*			
Surrogate: Toluene-d8	*14.9*		ug/kg	*15.00*		*99.2*	*80-121*			
Surrogate: 4-Bromofluorobenzene	*14.2*		ug/kg	*15.00*		*94.6*	*70-122*			
LCS	**Prepared & Analyzed: 09/13/19**									
1,1-Dichloroethene	19.6	4.00	ug/kg	20.00		97.8	63-137			
Methyl tert-butyl ether (MTBE)	20.5	4.00	ug/kg	20.00		103	70-127			
Benzene	19.2	2.00	ug/kg	20.00		96.0	71-120			
Trichloroethene (TCE)	18.7	4.00	ug/kg	20.00		93.4	72-120			
Toluene	19.0	2.00	ug/kg	20.00		94.8	66-122			

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Submitted: 09/13/19
PLS Report No.: 1909151

Koury Engineering and Testing Services, Inc.
17800 South Main Street, Suite 303
Gardena, CA 90248

Attn: Mr. Albert Buffet Phone: (310) 851-8685 FAX:(310) 851-8692

Project: City of Manhattan Beach - Water Pipeline Replacement Project

Quality Control Data

Analyte	Result	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch BI91320 - EPA 5035										
Chlorobenzene	18.2	4.00	ug/kg	20.00		91.0	72-120			
Surrogate: Dibromofluoromethane	*15.2*		ug/kg	*15.00*		*101*	*80-120*			
Surrogate: Toluene-d8	*14.9*		ug/kg	*15.00*		*99.3*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*14.9*		ug/kg	*15.00*		*99.5*	*80-120*			
Matrix Spike **Source: 1909139-01**	**Prepared & Analyzed: 09/13/19**									
1,1-Dichloroethene	20.9	4.00	ug/kg	20.00	ND	104	61-136			
Benzene	20.2	2.00	ug/kg	20.00	ND	101	65-123			
Trichloroethene (TCE)	19.8	4.00	ug/kg	20.00	ND	99.2	65-120			
Toluene	19.8	2.00	ug/kg	20.00	ND	99.2	59-120			
Chlorobenzene	18.8	4.00	ug/kg	20.00	ND	94.0	56-123			
Surrogate: Dibromofluoromethane	*15.6*		ug/kg	*15.00*		*104*	*80-126*			
Surrogate: Toluene-d8	*14.9*		ug/kg	*15.00*		*99.5*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*15.1*		ug/kg	*15.00*		*100*	*80-120*			
Matrix Spike Dup **Source: 1909139-01**	**Prepared & Analyzed: 09/13/19**									
1,1-Dichloroethene	20.4	4.00	ug/kg	20.00	ND	102	61-136	2.33	30	
Benzene	19.3	2.00	ug/kg	20.00	ND	96.4	65-123	4.71	30	
Trichloroethene (TCE)	19.5	4.00	ug/kg	20.00	ND	97.6	65-120	1.63	30	
Toluene	19.2	2.00	ug/kg	20.00	ND	96.2	59-120	3.07	30	
Chlorobenzene	18.0	4.00	ug/kg	20.00	ND	90.0	56-123	4.35	30	
Surrogate: Dibromofluoromethane	*15.4*		ug/kg	*15.00*		*103*	*80-126*			
Surrogate: Toluene-d8	*15.2*		ug/kg	*15.00*		*101*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*15.5*		ug/kg	*15.00*		*103*	*80-120*			
Batch BI92012 - EPA 3050B										
Blank	**Prepared & Analyzed: 09/19/19**									
Antimony	ND	2.00	mg/kg							
Arsenic	ND	2.00	mg/kg							
Barium	ND	1.00	mg/kg							
Beryllium	ND	1.00	mg/kg							
Cadmium	ND	1.00	mg/kg							
Chromium	ND	1.00	mg/kg							
Cobalt	ND	1.00	mg/kg							
Copper	ND	1.00	mg/kg							
Lead	ND	1.00	mg/kg							
Molybdenum	ND	1.00	mg/kg							
Nickel	ND	1.00	mg/kg							
Selenium	ND	2.00	mg/kg							
Silver	ND	1.00	mg/kg							
Thallium	ND	2.00	mg/kg							
Vanadium	ND	1.00	mg/kg							

POSITIVE LAB SERVICE

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Certificate of Analysis

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17800 South Main Street, Suite 303
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File #:74350
Report Date: 09/20/19
Submitted: 09/13/19
PLS Report No.: 1909151

Attn: Mr. Albert Buffet Phone: (310) 851-8685 FAX:(310) 851-8692

Project: City of Manhattan Beach - Water Pipeline Replacement Project

Quality Control Data

Analyte		Result	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch BI92012 - EPA 3050B											
Zinc		ND	5.00	mg/kg							
LCS		**Prepared & Analyzed: 09/19/19**									
Antimony		48.2	2.00	mg/kg	49.83		96.7	60-140			
Arsenic		48.7	2.00	mg/kg	50.20		96.9	80-120			
Barium		204	1.00	mg/kg	201.1		102	80-120			
Beryllium		4.71	1.00	mg/kg	5.020		93.7	80-120			
Cadmium		5.17	1.00	mg/kg	4.990		104	80-120			
Chromium		19.9	1.00	mg/kg	19.98		99.7	80-120			
Cobalt		52.1	1.00	mg/kg	50.20		104	80-120			
Copper		25.1	1.00	mg/kg	24.98		101	80-120			
Lead		52.8	1.00	mg/kg	50.00		106	80-120			
Molybdenum		45.9	1.00	mg/kg	49.50		92.8	80-120			
Nickel		52.9	1.00	mg/kg	50.30		105	80-120			
Selenium		47.3	2.00	mg/kg	49.98		94.7	80-120			
Silver		5.12	1.00	mg/kg	5.030		102	80-120			
Thallium		51.2	2.00	mg/kg	49.88		103	80-120			
Vanadium		47.7	1.00	mg/kg	50.30		94.8	80-120			
Zinc		50.7	5.00	mg/kg	50.20		101	80-120			
Matrix Spike	**Source: 1909151-01**	**Prepared & Analyzed: 09/19/19**									
Antimony		47.3	2.00	mg/kg	49.83	ND	95.0	60-140			
Arsenic		49.6	2.00	mg/kg	50.20	1.70	95.4	75-125			
Barium		214	1.00	mg/kg	201.1	16.8	98.3	75-125			
Beryllium		4.78	1.00	mg/kg	5.020	ND	95.3	75-125			
Cadmium		4.95	1.00	mg/kg	4.990	ND	99.2	75-125			
Chromium		23.2	1.00	mg/kg	19.98	3.64	97.7	75-125			
Cobalt		50.8	1.00	mg/kg	50.20	1.18	98.8	75-125			
Copper		50.7	1.00	mg/kg	24.98	31.0	79.2	75-125			
Lead		51.0	1.00	mg/kg	50.00	1.14	99.7	75-125			
Molybdenum		44.7	1.00	mg/kg	49.50	ND	90.4	75-125			
Nickel		53.9	1.00	mg/kg	50.30	3.55	100	75-125			
Selenium		47.1	2.00	mg/kg	49.98	ND	94.2	75-125			
Silver		4.99	1.00	mg/kg	5.030	ND	99.1	75-125			
Thallium		50.4	2.00	mg/kg	49.88	ND	101	75-125			
Vanadium		51.6	1.00	mg/kg	50.30	4.78	93.1	75-125			
Zinc		88.3	5.00	mg/kg	50.20	39.2	97.8	75-125			
Matrix Spike Dup	**Source: 1909151-01**	**Prepared & Analyzed: 09/19/19**									
Antimony		47.3	2.00	mg/kg	49.83	ND	94.9	60-140	0.0636	30	
Arsenic		49.2	2.00	mg/kg	50.20	1.70	94.7	75-125	0.770	30	
Barium		212	1.00	mg/kg	201.1	16.8	97.0	75-125	1.24	30	
Beryllium		4.76	1.00	mg/kg	5.020	ND	94.9	75-125	0.408	30	

POSITIVE LAB SERVICE

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Certificate of Analysis

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File #:74350
Report Date: 09/20/19
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Attn: Mr. Albert Buffet Phone: (310) 851-8685 FAX:(310) 851-8692

Project: City of Manhattan Beach - Water Pipeline Replacement Project

Quality Control Data

Analyte	Result	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch BI92012 - EPA 3050B										
Cadmium	4.90	1.00	mg/kg	4.990	ND	98.1	75-125	1.16	30	
Chromium	23.1	1.00	mg/kg	19.98	3.64	97.3	75-125	0.452	30	
Cobalt	50.3	1.00	mg/kg	50.20	1.18	97.8	75-125	1.02	30	
Copper	48.1	1.00	mg/kg	24.98	31.0	68.8	75-125	14.1	30	V-2
Lead	50.4	1.00	mg/kg	50.00	1.14	98.5	75-125	1.18	30	
Molybdenum	43.9	1.00	mg/kg	49.50	ND	88.7	75-125	1.83	30	
Nickel	53.0	1.00	mg/kg	50.30	3.55	98.3	75-125	1.86	30	
Selenium	46.4	2.00	mg/kg	49.98	ND	92.9	75-125	1.32	30	
Silver	4.93	1.00	mg/kg	5.030	ND	98.0	75-125	1.21	30	
Thallium	48.9	2.00	mg/kg	49.88	ND	98.0	75-125	3.16	30	
Vanadium	50.6	1.00	mg/kg	50.30	4.78	91.2	75-125	2.14	30	
Zinc	91.5	5.00	mg/kg	50.20	39.2	104	75-125	6.41	30	
Batch BI92018 - EPA 7471A										
Blank	**Prepared: 09/19/19 Analyzed: 09/20/19**									
Mercury	ND	0.100	mg/kg							
LCS	**Prepared: 09/19/19 Analyzed: 09/20/19**									
Mercury	0.787	0.100	mg/kg	0.8392		93.8	80-120			
Matrix Spike **Source: 1909151-01**	**Prepared: 09/19/19 Analyzed: 09/20/19**									
Mercury	0.776	0.100	mg/kg	0.8392	ND	92.5	75-125			
Matrix Spike Dup **Source: 1909151-01**	**Prepared: 09/19/19 Analyzed: 09/20/19**									
Mercury	0.782	0.100	mg/kg	0.8392	ND	93.2	75-125	0.772	30	

Notes and Definitions

V-2	Out-of-Range recovery was due to sample Heterogeneity.
NA	Not Applicable
ND	Analyte NOT DETECTED at or above the detection limit
NR	Not Reported
MDL	Method Detection Limit
PQL	Practical Quantitation Limit

Environmental Laboratory Accreditation Program Certificate No. 1131, Mobile Lab No. 2534, LACSD No. 10138

Authorized Signature(s)

107203

POSITIVE LAB SERVICE

CHAIN OF CUSTODY AND ANALYSIS REQUEST

781 East Washington Blvd., Los Angeles, CA 90021
(213) 745-5312 FAX (213) 745-6372

DATE: 09-13-19 PAGE 1 OF 2

LOG BOOK NO. _____ FILE NO. _____ LAB NO. 1909151

CLIENT NAME: Koury Engineering & Testing

Project Name/No. City of Manhattan beach water pipelines Replacement Project

P.O. NO.

AIRBILL NO: _____

ADDRESS: 14280 Euclid AVE Chino, 91710 CA

COOLER TEMP: 0-1°

PROJECT MANAGER: Albert Buffet PHONE NO: 909-606-6111 FAX NO:

PRESERVATIVE:

SAMPLER NAME: Albert Buffet (Printed) (Signature)

REMARKS:

TAT (Analytical Turn Around Time): 0 = Same Day; 1 = 1 Day; 2 = 2 Days; 3 = 3 Days; N = Normal (5-7 Working Days)

CONTAINER TYPES: B = Brass, E = Encore, G = Glass, P = Plastic, V = VOA Vial, O = Other:

UST Project: Y N - Global ID# ___ ___ ___ ___ ___ ___ ___ ___ ___ ___

ANALYSES REQUESTED:

	SAMPLE NO.	DATE SAMPLED	TIME SAMPLED	SAMPLE DESCRIPTION	MATRIX: WATER	MATRIX: SOIL	MATRIX: SLUDGE	MATRIX: OTHER	TAT	CONTAINER #	CONTAINER TYPE	EPA 8015B TPH CC	EPA 8260B VOCs	EPA 6010B/7471A CAM	DHS					SAMPLE CONDITION/ CONTAINER /COMMENTS:
1	1	9-11	8:00 AM	23rd st @8.5'		X			N	2/1	E/G	X	X	X	X					
2	2	9-11	9:00 AM	22nd st e 5.5'		X			↓	2/1	↓	X	X	X	X					
3	3	9-11	10:00 AM	21st st e 6.5'		X				2/1		X	X	X	X					
4	4	9-11	11:30 AM	19th st e 9.0'		X				2/1		X	X	X	X					
5	5	9-11	12:45 PM	Back covenant church e 5.5'		X				2/1		X	X	X	X					
6	6	9-11	14:00	17th st. e 6.0'		X				2/1		X	X	X	X					
7	7	9-11	15:30	12th st & Rowell e 11.0'		X				2/1		X	X	X	X					
8	8	9-12	8:00	Herrin & Mathews e 5.0'		X				2/1		X	X	X	X					
9	9	9-12	9:30	12th st e 3.0'		X				2/1		X	X	X	X					
10	10	9-12	11:00	Flournoy st @8.5		X			↓	2/1	↓	X	X	X	X					

Relinquished By: (Signature and Printed Name)	Received By: (Signature and Printed Name)	Date:	Time:
Albert Buffet		9/13/19	4:45
		9/13/19	4:45

SAMPLE DISPOSITION:
1. Samples returned to client? YES NO
2. Samples will not be stored over 30 days, unless additional storage time is requested.
3. Storage time requested: _____ days

By _____ Date _____

SPECIAL INSTRUCTIONS:

PRESERVATIVE: 1-HNO_3, 2-H_2SO_4, 3-HCL, 4-Zinc Acetate, 5-NaOH, 6-NH_4 Buffer, 7-Other

LAB COPY

107204

POSITIVE LAB SERVICE

CHAIN OF CUSTODY AND ANALYSIS REQUEST

781 East Washington Blvd., Los Angeles, CA 90021
(213) 745-5312 FAX (213) 745-6372

DATE: 09-13-19 PAGE 2 OF 2

LOG BOOK NO. _____ FILE NO. _____ LAB NO. 1909151

CLIENT NAME: Koury Engineering & Testing

Project Name/No. City of Manhatta Beach Water pipelines Replacement

P.O. NO.

AIRBILL NO: _____

ADDRESS:

ANALYSES REQUESTED:

COOLER TEMP: 0.1°

PROJECT MANAGER: Albert B.

PHONE NO:

FAX NO:

PRESERVATIVE:

SAMPLER NAME: Albert B. (Printed) (Signature)

REMARKS:

TAT (Analytical Turn Around Time): 0 = Same Day; 1 = 1 Day; 2 = 2 Days; 3 = 3 Days; N = Normal (5-7 Working Days)

CONTAINER TYPES: B = Brass, E = Encore, G = Glass, P = Plastic, V = VOA Vial, O = Other:

UST Project: Y N - Global ID# ____ ____ ____ ____ ____ ____ ____ ____ ____ ____

	SAMPLE NO.	DATE SAMPLED	TIME SAMPLED	SAMPLE DESCRIPTION	MATRIX: WATER	MATRIX: SOIL	MATRIX: SLUDGE	MATRIX: OTHER	TAT	CONTAINER #	CONTAINER TYPE	EPA 8015B	EPA 8260B	EPA 6010B	DHS					SAMPLE CONDITION/ CONTAINER /COMMENTS:
1	11	9-12	12:00	Agnes St @ 11.5'		X			N	2/1	E/6	x	x	x	x					
2	12	9-12	13:30	HERBINST & Bunland @ 10.5'		X			N	2/1	↓	x	x	x	x					
3																				
4																				
5																				
6																				
7																				
8																				
9																				
10																				

Relinquished By: (Signature and Printed Name)	Received By: (Signature and Printed Name)	Date:	Time:
Albert Buffet		9/13/19	4:45
		9/13/19	4:45

SAMPLE DISPOSITION:
1. Samples returned to client? YES NO
2. Samples will not be stored over 30 days, unless additional storage time is requested.
3. Storage time requested: _____ days

By _____ Date _____

SPECIAL INSTRUCTIONS: Email. Blancah@koureyengineering.com

PRESERVATIVE: 1-HNO_3, 2-H_2SO_4, 3-HCL, 4-Zinc Acetate, 5-NaOH, 6-NH_4 Buffer, 7-Other

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American Environmental Testing Laboratory Inc.

2834 & 2908 North Naomi Street Burbank, CA 91504 • DOHS NO: 1541, LACSD NO: 10181
Tel: (888) 288-AETL • (818) 845-8200 • Fax: (818) 845-8840 • www.aetlab.com

Ordered By

Positive Lab Services
781 East Washington Blvd.
Los Angeles, CA 90021-3043

Number of Pages	5
Date Received	09/17/2019
Date Reported	09/25/2019

Telephone: (213)745-5312
Attention: John Schmidt

Job Number	Order Date	Client
101063	09/17/2019	POSLAB

Project ID: 1909151
Project Name: PO# 17379

Enclosed please find results of analyses of 12 soil samples which were analyzed as specified on the attached chain of custody. If there are any questions, please do not hesitate to call.

Checked By: _____ Approved By: _____

Joe Sevrean
Laboratory Director

AETL

109935

POSITIVE LAB SERVICE

CHAIN OF CUSTODY AND ANALYSIS REQUEST

781 East Washington Blvd., Los Angeles, CA 90021
(213) 745-5312 FAX (213) 745-6372

DATE: _____ PAGE 1 OF 2

LOG BOOK NO. _____ FILE NO. _____ LAB NO. 101063

CLIENT NAME: Positive Lab Service Project Name/No. 1909151 P.O. NO. 17379 AIRBILL NO: _____

ADDRESS: 781 E. Washington Blvd., LA CA 90021 ANALYSES REQUESTED: COOLER TEMP: _____

PROJECT MANAGER: John Schmidt PHONE NO: 213. 745-5312 FAX NO: PRESERVATIVE:

SAMPLER NAME: Client (Printed) (Signature) REMARKS:

TAT (Analytical Turn Around Time): 0 = Same Day; 1 = 1 Day; 2 = 2 Days; 3 = 3 Days; N = Normal (5-7 Working Days)

CONTAINER TYPES: B = Brass, E = Encore, G = Glass, P = Plastic, V = VOA Vial, O = Other:

UST Project: Y N - Global ID# ___ ___ ___ ___ ___ ___ ___ ___ ___ ___

	SAMPLE NO.	DATE SAMPLED	TIME SAMPLED	SAMPLE DESCRIPTION	MATRIX WATER	MATRIX SOIL	MATRIX SLUDGE	MATRIX OTHER	TAT	CONTAINER #	CONTAINER TYPE	DHS Organic Lead							SAMPLE CONDITION/ CONTAINER /COMMENTS:
1		9.11.19	800	1 - 23rd St. @ 8.5'		✓			N	1	G	✓							101063.01
2		↓	900	2 - 22nd St. @ 5.5'		✓			↓	↓	↓	✓							101063.02
3		↓	1000	3 - 21st St. @ 6.5'		✓			↓	↓	↓	✓							101063.03
4		↓	1130	4 - 19th St. @ 9.0'		✓			↓	↓	↓	✓							101063.04
5		↓	1245	5 - Rock Covenant Church @ 5.5'		✓			↓	↓	↓	✓							101063.05
6		↓	1400	6 - 17th St. @ 6.0'		✓			↓	↓	↓	✓							101063.06
7		↓	1530	7 - 12th St. & Dowell @ 11.0'		✓			↓	↓	↓	✓							101063.07
8		9.12.19	800	8 - Herrin & Mathews @ 5.0'		✓			↓	↓	↓	✓							101063.08
9		↓	930	9 - 12th St. @ 3.0'		✓			↓	↓	↓	✓							101063.09
10		↓	1100	10 - Flournoy St. @ 8.5'		✓			↓	↓	↓	✓							101063.10

Relinquished By: (Signature and Printed Name)	Received By: (Signature and Printed Name)	Date:	Time:
[signature]	[signature]	9/17/19	1300
Relinquished By: (Signature and Printed Name)	Received By: (Signature and Printed Name)	Date:	Time:
[signature]	[signature]	9/17/19	1340

SPECIAL INSTRUCTIONS:

SAMPLE DISPOSITION:
1. Samples returned to client? YES NO
2. Samples will not be stored over 30 days, unless additional storage time is requested.
3. Storage time requested: _____ days

By _____ Date _____

PRESERVATIVE: 1-HNO_3, 2-H_2SO_4, 3-HCL, 4-Zinc Acetate, 5-NaOH, 6-NH_4 Buffer, 7-Other

LAB COPY

109937

POSITIVE LAB SERVICE

CHAIN OF CUSTODY AND ANALYSIS REQUEST

781 East Washington Blvd., Los Angeles, CA 90021
(213) 745-5312 FAX (213) 745-6372

DATE: _____ PAGE 2 OF 2

LOG BOOK NO. _____ FILE NO. _____ LAB NO. 101063

CLIENT NAME: Positive Lab Service Project Name/No. 1909151 P.O. NO. 17374

AIRBILL NO: _____

ADDRESS: 781 E. Washington Blvd., L.A. CA 90021

COOLER TEMP: _____

PROJECT MANAGER: John Schmidt PHONE NO: 213 745.5312 FAX NO:

PRESERVATIVE:

SAMPLER NAME: Client (Printed) (Signature)

REMARKS:

TAT (Analytical Turn Around Time): 0 = Same Day; 1 = 1 Day; 2 = 2 Days; 3 = 3 Days; N = Normal (5-7 Working Days)

CONTAINER TYPES: B = Brass, E = Encore, G = Glass, P = Plastic, V = VOA Vial, O = Other:

UST Project: Y N - Global ID# _____

ANALYSES REQUESTED: DHS Organic Lead

	SAMPLE NO.	DATE SAMPLED	TIME SAMPLED	SAMPLE DESCRIPTION	MATRIX WATER	MATRIX SOIL	MATRIX SLUDGE	MATRIX OTHER	TAT	CONTAINER #	CONTAINER TYPE	DHS Organic Lead	SAMPLE CONDITION/ CONTAINER /COMMENTS:
1		9.12.19	1200	11 - Agnes Pl @ 11.5'		✓			N	1	G	✓	101063 - 11
2		9.12.19	13:30	12 - Herrin St & Runland @ 10.5'		✓			N	1	G	✓	101063 - 12
3													
4													
5													
6													
7													
8													
9													
10													

Relinquished By: (Signature and Printed Name) [signature] Received By: (Signature and Printed Name) [signature] Date: 9/12/19 Time: 1300

Relinquished By: (Signature and Printed Name) Received By: (Signature and Printed Name) Date: Time:

Relinquished By: (Signature and Printed Name) [signature] Received By: (Signature and Printed Name) [signature] Date: 9/12/19 Time: 1340

SPECIAL INSTRUCTIONS:

SAMPLE DISPOSITION:
1. Samples returned to client? YES NO
2. Samples will not be stored over 30 days, unless additional storage time is requested.
3. Storage time requested: _____ days

By _____ Date _____

PRESERVATIVE: 1-HNO_3, 2-H_2SO_4, 3-HCL, 4-Zinc Acetate, 5-NaOH, 6-NH_4 Buffer, 7-Other

LAB COPY

AMERICAN ENVIRONMENTAL TESTING LABORATORY
2834 NORTH NAOMI ST. BURBANK, CALIFORNIA 91504 DHS # 1541 LACSD# 10181
TEL (888) 288-AETL (818) 845-8200 FAX (818) 845-8840 www.aetlab.com

COOLER RECEIPT FORM

Client Name: Positive lab
Project Name:
AETL Job Number: 101063
Date Received: 09/17/19 Received by: [illegible]
Carrier: ☒ AETL Courier ☐ Client ☐ GSO ☐ FedEx ☐ UPS
☐ Others:

Samples were received in: ☒ Cooler (1) ☐ Other (Specify):
Inside temperature of shipping container No 1: 3.4°C, No 2: , No 3:
Type of sample containers: ☐ VOA, ☐ Glass bottles, ☒ Wide mouth jars, ☐ HDPE bottles, ☐ Metal sleeves, ☐ Others (Specify):
How are samples preserved: ☐ None, ☐ Ice , ☒ Blue Ice, ☐ Dry Ice
☒ None, ☐ HNO_3, ☐ NaOH, ☐ ZnOAc, ☐ HCl, ☐ $Na_2S_2O_3$, ☐ MeOH
☐ Other (Specify):

	Yes	No, explain below	Name, if client was notified.
1. Are the COCs Correct?	✓		
2. Are the Sample labels legible?	✓		
3. Do samples match the COC?	✓		
4. Are the required analyses clear?	✓		
5. Is there enough samples for required analysis?	✓		
6. Are samples sealed with evidence tape?		✓	
7. Are sample containers in good condition?	✓		
8. Are samples preserved?	✓		
9. Are samples preserved properly for the intended analysis?	✓		
10. Are the VOAs free of headspace?	N/A		
11. Are the jars free of headspace?	✓		

PLEASE NOTE ALL SAMPLES WILL BE DISPOSED OF 90 DAYS AFTER RECEIVING DATE. IF AETL IS INFORMED OTHERWISE, THERE WILL BE A STORAGE CHARGE PER SAMPLE PER MONTH FOR ANY SAMPLE HELD BEYOND 90 DAYS.

Explain all "No" answers for above questions:

American Environmental Testing Laboratory Inc.
2834 & 2908 North Naomi Street Burbank, CA 91504 • DOHS NO: 1541, LACSD NO: 10181
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Ordered By

Positive Lab Services
781 East Washington Blvd.
Los Angeles, CA 90021-3043

Telephone: (213)745-5312
Attention: John Schmidt

Project ID: 1909151
Date Received 09/17/2019
Date Reported 09/25/2019

Job Number	Order Date	Client
101063	09/17/2019	POSLAB

CERTIFICATE OF ANALYSIS
CASE NARRATIVE

AETL received 12 samples with the following specification on 09/17/2019.

Lab ID	Sample ID	Sample Date	Matrix	Quantity Of Containers
101063.01	1-23rd St.@8.5'	09/11/2019	Soil	1
101063.02	2-22nd St.@5.5'	09/11/2019	Soil	1
101063.03	3-21st St.@6.5'	09/11/2019	Soil	1
101063.04	4-19th St.@9.0'	09/11/2019	Soil	1
101063.05	5-Rock Covenant Church@5.5'	09/11/2019	Soil	1
101063.06	6-17th St.@6.0'	09/11/2019	Soil	1
101063.07	7-12th St.&Rowell@11.0'	09/11/2019	Soil	1
101063.08	8-Herrin&Mathews@5.0'	09/12/2019	Soil	1
101063.09	9-12th St.@3.0'	09/12/2019	Soil	1
101063.10	10-Flournoy St.@8.5'	09/12/2019	Soil	1
101063.11	11-Agnes Rt@11.5'	09/12/2019	Soil	1
101063.12	12-Herrin St.&Runland@10.5'	09/12/2019	Soil	1

Method ^ Submethod	Req Date	Priority	TAT	Units
(HMU-900)	09/24/2019	2	Normal	mg/Kg

The samples were analyzed as specified on the enclosed chain of custody.
No analytical non-conformances were encountered.

Unless otherwise noted, all results of soil and solid samples are based on wet weight.

Checked By: _____ Approved By: _____

Joe Sevrean
Laboratory Director

American Environmental Testing Laboratory Inc.

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ANALYTICAL RESULTS

Ordered By

Positive Lab Services
781 East Washington Blvd.
Los Angeles, CA 90021-3043

Telephone: (213)745-5312
Attn: John Schmidt
Page: 2

Project ID: 1909151
Project Name: PO# 17379

AETL Job Number	Submitted	Client
101063	09/17/2019	POSLAB

Method: (HMU-900), Organic Lead

QC Batch No: 0918192C5

Our Lab I.D.			Method Blank	101063.01	101063.02	101063.03	101063.04
Client Sample I.D.				1-23rd St.@8.5'	2-22nd St.@5.5'	3-21st St.@6.5'	4-19th St.@9.0'
Date Sampled				09/11/2019	09/11/2019	09/11/2019	09/11/2019
Date Prepared			09/18/2019	09/18/2019	09/18/2019	09/18/2019	09/18/2019
Preparation Method			HMU-900	HMU-900	HMU-900	HMU-900	HMU-900
Date Analyzed			09/20/2019	09/20/2019	09/20/2019	09/20/2019	09/20/2019
Matrix			Soil	Soil	Soil	Soil	Soil
Units			mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Dilution Factor			1	1	1	1	1
Analytes	**MDL**	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
Lead, Organic	0.5	1.0	ND	ND	ND	ND	ND

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ANALYTICAL RESULTS

Ordered By

Positive Lab Services
781 East Washington Blvd.
Los Angeles, CA 90021-3043

Telephone: (213)745-5312
Attn: John Schmidt
Page: 3

Project ID: 1909151
Project Name: PO# 17379

AETL Job Number	Submitted	Client
101063	09/17/2019	POSLAB

Method: (HMU-900), Organic Lead

QC Batch No: 0918192C5

Our Lab I.D.			101063.05	101063.06	101063.07	101063.08	101063.09
Client Sample I.D.			5-Rock Covenant Church@5.5'	6-17th St.@6.0'	7-12th St.&Rowell@ 11.0'	8-Herrin&Mathews@5.0'	9-12th St.@3.0'
Date Sampled			09/11/2019	09/11/2019	09/11/2019	09/12/2019	09/12/2019
Date Prepared			09/18/2019	09/18/2019	09/18/2019	09/18/2019	09/18/2019
Preparation Method			HMU-900	HMU-900	HMU-900	HMU-900	HMU-900
Date Analyzed			09/20/2019	09/20/2019	09/20/2019	09/20/2019	09/20/2019
Matrix			Soil	Soil	Soil	Soil	Soil
Units			mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Dilution Factor			1	1	1	1	1
Analytes	**MDL**	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
Lead, Organic	0.5	1.0	ND	ND	ND	ND	ND

American Environmental Testing Laboratory Inc.

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ANALYTICAL RESULTS

Ordered By

Positive Lab Services
781 East Washington Blvd.
Los Angeles, CA 90021-3043

Telephone: (213)745-5312
Attn: John Schmidt
Page: 4

Project ID: 1909151
Project Name: PO# 17379

AETL Job Number	Submitted	Client
101063	09/17/2019	POSLAB

Method: (HMU-900), Organic Lead

QC Batch No: 0918192C5

Our Lab I.D.			101063.10	101063.11	101063.12		
Client Sample I.D.			10-Flournoy St.@8.5'	11-Agnes Rt@11.5'	12-Herrin St.&Runland @10.5'		
Date Sampled			09/12/2019	09/12/2019	09/12/2019		
Date Prepared			09/18/2019	09/18/2019	09/18/2019		
Preparation Method			HMU-900	HMU-900	HMU-900		
Date Analyzed			09/20/2019	09/20/2019	09/20/2019		
Matrix			Soil	Soil	Soil		
Units			mg/Kg	mg/Kg	mg/Kg		
Dilution Factor			1	1	1		
Analytes	**MDL**	**PQL**	**Results**	**Results**	**Results**		
Lead, Organic	0.5	1.0	ND	ND	ND		

American Environmental Testing Laboratory Inc.

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QUALITY CONTROL RESULTS

Ordered By

Positive Lab Services
781 East Washington Blvd.
Los Angeles, CA 90021-3043

Telephone: (213)745-5312
Attn: John Schmidt
Page: 5

Project ID: 1909151
Project Name: PO# 17379

AETL Job Number	Submitted	Client
101063	09/17/2019	POSLAB

Method: (HMU-900), Organic Lead

QC Batch No: 0918192C5; Dup or Spiked Sample: 101063.01; LCS: Clean Sand; QC Prepared: 09/18/2019; QC Analyzed: 09/20/2019; Units: mg/Kg

Analytes	Sample Result	MS Concen	MS Recov	MS % REC	MS DUP Concen	MS DUP Recov	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit
Lead, Organic	0.00	16.0	14.7	91.9	16.0	14.7	91.9	<1	80-120	<15

QC Batch No: 0918192C5; Dup or Spiked Sample: 101063.01; LCS: Clean Sand; QC Prepared: 09/18/2019; QC Analyzed: 09/20/2019; Units: mg/Kg

Analytes	LCS Concen	LCS Recov	LCS % REC	LCS DUP Concen	LCS DUP Recov	LCS DUP % REC	LCS RPD % REC	LCS/LCSD % Limit	LCS RPD % Limit	
Lead, Organic	16.0	14.7	91.9	16.0	14.8	92.5	<1	80-120	<15	

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Data Qualifiers and Descriptors

Data Qualifier:

#:	Recovery is not within acceptable control limits.
*:	In the QC section, sample results have been taken directly from the ICP reading. No preparation factor has been applied.
B:	Analyte was present in the Method Blank.
D:	Result is from a diluted analysis.
E:	Result is beyond calibration limits and is estimated.
H:	Analysis was performed over the allowed holding time due to circumstances which were beyond laboratory control.
J:	Analyte was detected . However, the analyte concentration is an estimated value, which is between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL).
M:	Matrix spike recovery is outside control limits due to matrix interference. Laboratory Control Sample recovery was acceptable.
MCL:	Maximum Contaminant Level
NS:	No Standard Available
S6:	Surrogate recovery is outside control limits due to matrix interference.
S8:	The analysis of the sample required a dilution such that the surrogate concentration was diluted below the method acceptance criteria.
X:	Results represent LCS and LCSD data.

Definition:

%Limi:	Percent acceptable limits.
%REC:	Percent recovery.
Con.L:	Acceptable Control Limits
Conce:	Added concentration to the sample.
LCS:	Laboratory Control Sample
MDL:	Method Detection Limit is a statistically derived number which is specific for each instrument, each method, and each compound. It indicates a distinctively detectable quantity with 99% probability.

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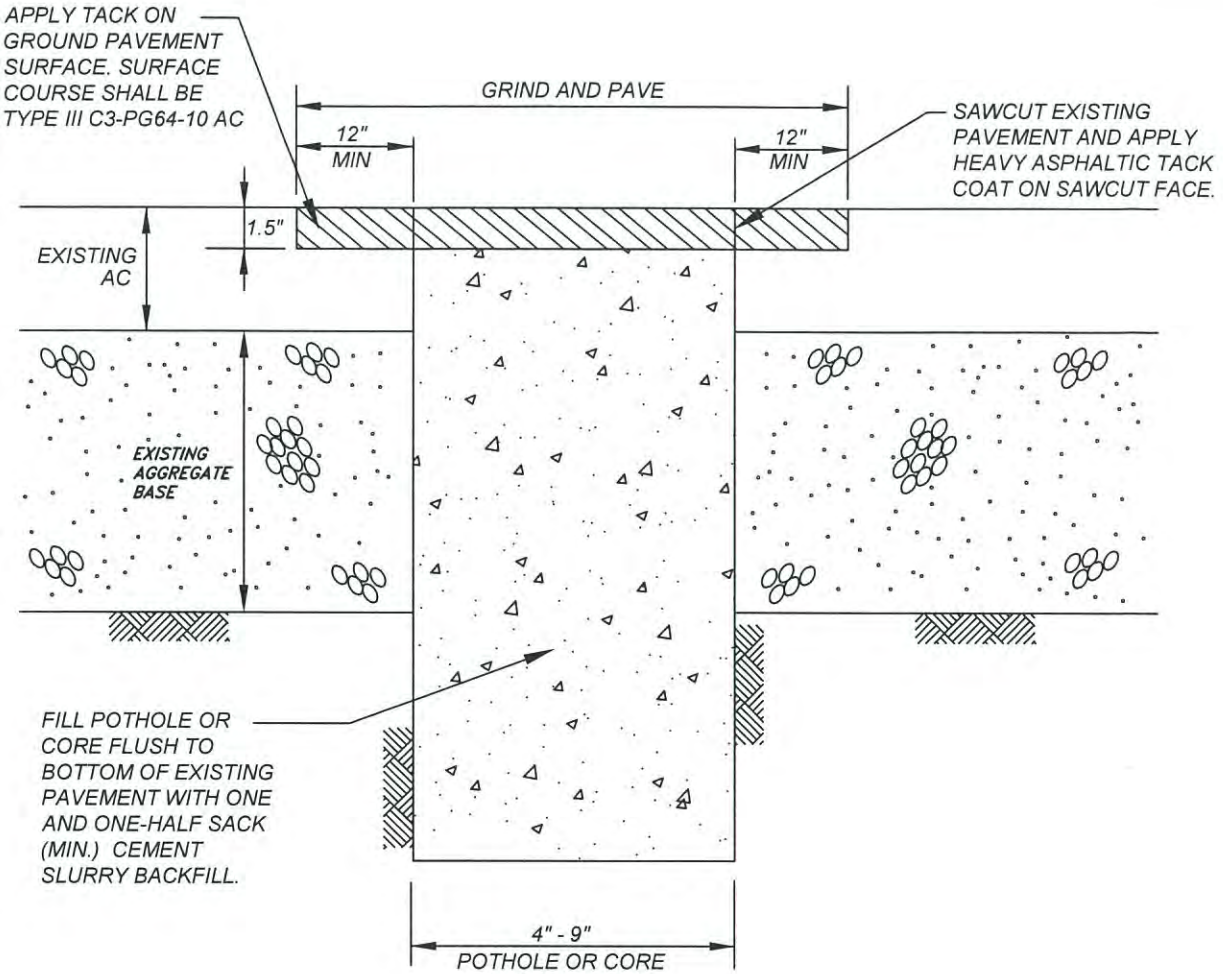
Data Qualifiers and Descriptors

MS:	Matrix Spike
MS DU:	Matrix Spike Duplicate
ND:	Analyte was not detected in the sample at or above MDL.
PQL:	Practical Quantitation Limit or ML (Minimum Level as per RWQCB) is the minimum concentration that can be quantified with more than 99% confidence. Taking into account all aspects of the entire analytical instrumentation and practice.
Recov:	Recovered concentration in the sample.
RPD:	Relative Percent Difference

APPENDIX D

City Standard Plan MBSI-132A



NOTE:

WHEN MULTIPLE POTHOLES SPACED 24" OR LESS ARE RUN PARALLEL TO THE TRAFFIC LANE, STANDARD PLAN MBSI-132A SHALL BE USED.

DATE REVISED	CITY OF MANHATTAN BEACH DEPARTMENT OF PUBLIC WORKS	
02-07-2019 07-24-2019	UTILITY POTHOLE OR PAVEMENT CORE REPAIR	
	APPROVED BY PREM KUMAR, CITY ENGINEER — DATE 7/24/19	STANDARD PLAN NUMBER **MBSI-131A-1** SHEET 1 OF 1

We are a key member of the construction team while safeguarding the public. We improve operational logistics and provide superior quality control through the continuing development of our engineering staff and technical expertise, utilization of classroom training and field supervisors, thus defining the industry standard.

KOURY ENGINEERING & TESTING, INC.

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P: 909•606•6111
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APPENDIX V

ADA RAMP AND DRIVEWAY COMPLIANCE MEMORANDUM - TEMPLATE

MEMORANDUM

DATE: xxxxxx, xx 2023

TO: KATHERINE DOHERTY, P.E., ENV SP, CITY ENGINEER

FROM:

SUBJECT: CURB RAMPS CONSTRUCTION PROJECT – "AS-BUILT" MEMO WITH CERTIFICATE OF COMPLIANCE
PROJECT NUMBER
RAMP LOCATION -

The installation of Americans with Disabilities Act (ADA) curb ramps followed the Caltrans 2015 Revised Standard Plan RSP A88A, City of Manhattan Beach Standard Curb Ramp Removal Limits, Sheet D and Sheet E. Normal circumstances allow application of the design parameters of the standard plans without deviation from the printed standard plans.

Several items can impact the design parameters of the standard plans which are street slopes, site conditions and other factors. For this ramp location, the following Items describe their impacts of deviations from the standard plans.

Item 1 – Street Slopes

The above referenced project is located in the City of Manhattan Beach, in several hillside neighborhoods that have street slopes greater than 5%. It was mutually agreed upon and determined to use the Standard Plans for Public Works Construction, Standard Plan 111-5, Sheet 9 of 10, Table 2, Slope Adjustments to address the ramp conditions with street slopes in excess of 5%. . In order to address street slope values larger than the 5%, engineering judgement, site conditions, constructability and ADA compliance are factored into the following recommended implementation methodology for constructing ADA compliant ramps.

For streets with a slope greater than 5%, application of the Street Slope Adjustment shall be as follows;

> "X" Up Dimension shall the End of Curb Return (EC). This complies with City of Manhattan Beach Standard Curb Ramp Removal Limits, Sheet D and Sheet E.

All other standards identified in the Standard Plans shall be implemented to the greatest extent practicle during construction as applicable.

This recommendation provides compliance with the intent of the ADA Curb Ramp Standards and a provides a logical termination for the ramp construction where the street slope exceeds 5%.

Item 2 – Site Conditions

The street slopes for the site are as follows:

Chestnut slopes away from the Ramp at 1.4% and 21St slopes down and away at 7.5%

The street slope is in excess of the 5% on the 21St side and the slopes are shown accordingly. This allowed a ramp slope of 7.5% or less, the gutter plate slope less than 5% and the sidewalk ramp slope of .8% along Chestnut are in compliance with the standard. The sidewalk ramp slope along Chestnut is in excess of the standard due to the transition from the flat intersection to the downhill slope of 7.5%. The as-built field conditions and actual slopes provides compliance with the intent of the ADA Curb Ramp Standards and a logical termination to address the site conditions.

Item 3 – Other Factors

One additional factor that was accommodated for was joining the sidewalk elevation with the private property walkway. The elevations matched and a step was not required.

These as-built field conditions provides compliance with the intent of the ADA Curb Ramp Standards and to address other factors.

Conclusion:

The street slopes, site conditions and other factors contribute to the constructed ramp meeting the intent of the ADA Curb Ramp Standard by allowing access from the sidewalk to the roadway and that are not in compliance with maximum slope values noted on the standard plans due to the documents items.

Certificate of Compliance:

This Certificate of Compliance is prepared after completion of construction activities for the Ramp located at xxxxxxxxxxxxxxxxxxxxx, that created, altered, or affected pedestrian facilities constructed in accordance with the policies, standards and project specifications in compliance with the intent of the standards of the ADA.

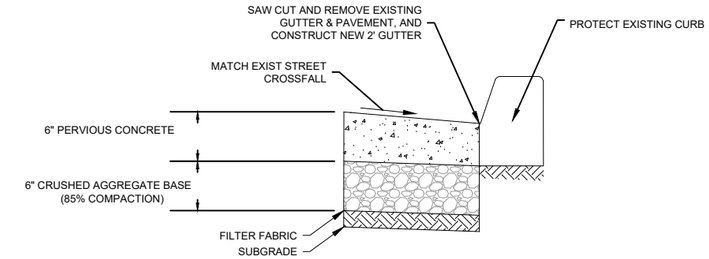
I, (Project Engineer), a California Licensed Professional Engineer do hereby certify that the project has been constructed in accordance with the project specifications, standard plans, “As-Built” Memorandum describing construction exceptions due to the individual site conditions.

[Engineer’s Stamp]

Project Engineer,
No. C xxxxx, Exp Date

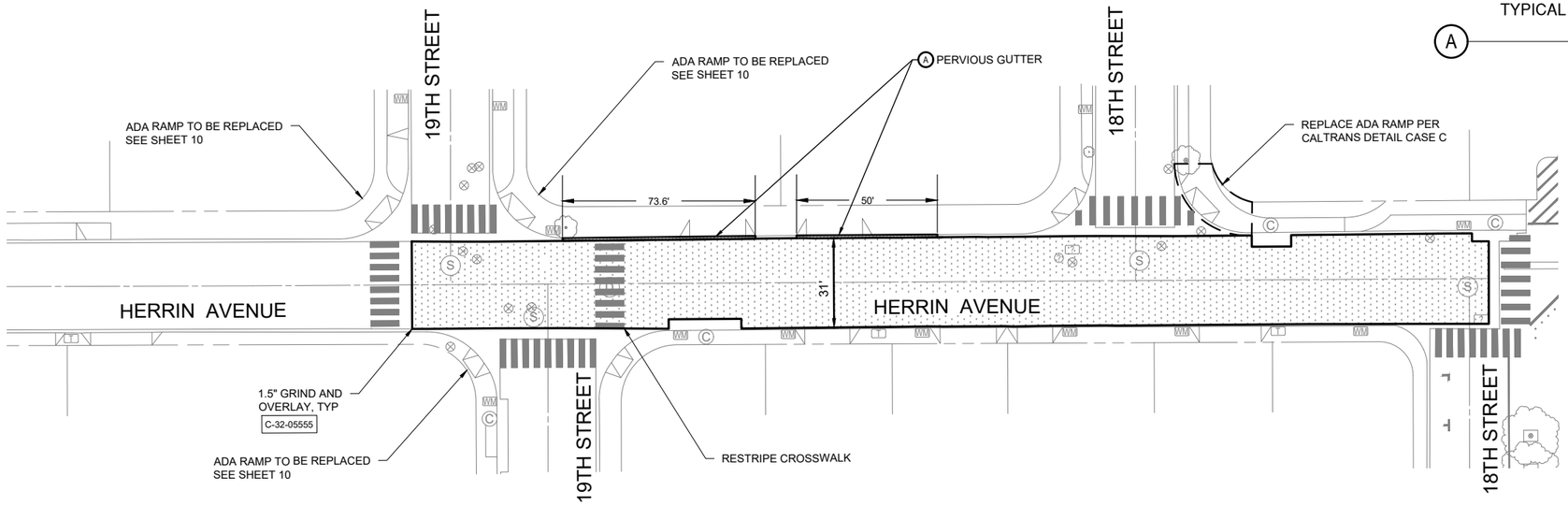
APPENDIX VI

HERRIN AVENUE PAVING PROJECT



A TYPICAL PERVIOUS CONCRETE PAVEMENT CROSS SECTION

NTS



PLAN
SCALE: 1"=50'

NOTES:

1. CONTRACTOR SHALL COORDINATE WORK INCLUDED IN THIS CONTRACT WITH FUTURE PUBLIC WORK PROJECTS.
2. SEE SHEET 5 FOR ADA RAMP REPLACEMENT REQUIREMENTS.

ASPHALT OVERLAY

LIMITS OF CONC. REMOVAL

PLAN SCALE: 1" = 50'

50 25 0 50'

SIGNATURE DATE

NO WORK SHALL BE DONE ON THIS SITE UNTIL USA AGENCY IS NOTIFIED OF INTENTION TO GRADE OR EXCAVATE, TWO WORKING DAYS BEFORE YOU DIG.

SUPPLEMENTAL NOTES:

1. THE CONTRACTOR SHALL LOCATE, VERIFY AND PROTECT ALL EXISTING UNDERGROUND UTILITIES. DAMAGED UTILITIES SHALL BE REPLACED IN KIND AT THE CONTRACTOR'S EXPENSE.
2. DUE TO INDIVIDUAL LOT IMPROVEMENTS, THE EXISTING WATER, SEWER AND/OR GAS LATERALS MAY NOT BE AT THE LOCATIONS SHOWN OR SHOWN IN THEIR ENTIRETY. THE CONTRACTOR SHALL EXERCISE CAUTION WHEN EXCAVATING.
3. THE CONTRACTOR SHALL DETERMINE THE DEPTH OF THE GAS SCE, CABLE, SEWER, STORM DRAIN AND WATER AT ALL INTERSECTIONS AND INTERFERENCES PRIOR TO CONSTRUCTION AND AS NOTED ON PLANS.

ENGINEER/ARCHITECT OF RECORD STAMP

DATE SIGNED

DESIGN FIRM NAME, ADDRESS, PHONE NUMBER

REVIEWED BY	DATE

CITY OF MANHATTAN BEACH
PUBLIC WORKS DEPARTMENT – ENGINEERING DIVISION

REVISIONS			
NO.	DESCRIPTION	BY	DATE

REFERENCES

WATER INFRASTRUCTURE IMPROVEMENTS AND RESURFACING PROJECT - CYCLE 2
HERRIN AVE PAVING PLAN

REVIEWED BY
PROJECT MANAGER (NAME) DATE

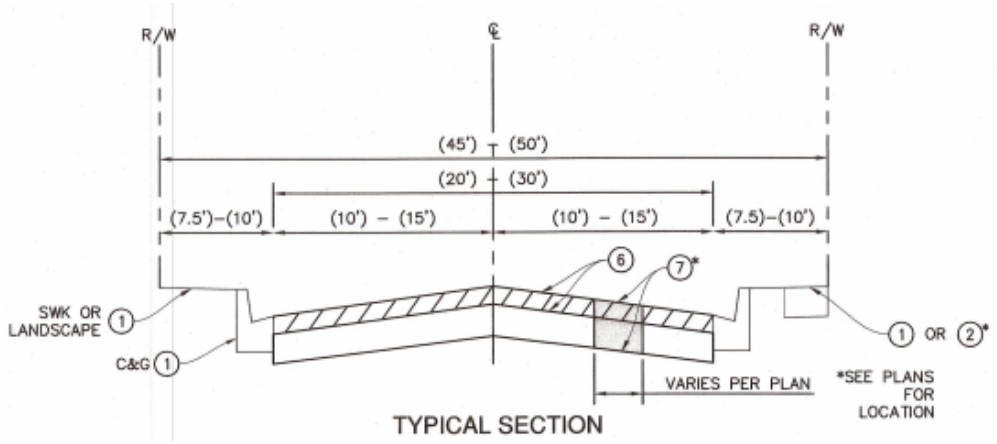
RECOMMENDED BY
CITY ENGINEER KATHERINE DOHERTY DATE

DESIGNED BY
(DESIGNER TITLE) (NAME) DATE

SCALE 1"=30'
DATE JULY 2023
SHEET 19A OF 19
DRAWING NO. W-671

APPENDIX VII

PAVEMENT GRIND AND OVERLAY DETAIL



1. PROTECT IN PLACE OR CONTRACTOR RESPONSIBLE FOR RESTORING ANY AND ALL EXISTING FEATURE DAMAGED.
2. REMOVE EXISTING AND CONSTRUCT NEW 4" THICK PCC SIDEWALK PER MANHATTAN BEACH STANDARD DRAWING MBSI–112A–0 (ST–2).
6. COLD MILL 1–1/2" EXISTING PAVEMENT AND INSTALL 1–1/2" ARHM OVERLAY OVER TENSAR GLASPAVE25 OR APPROVED EQUAL.
7. REMOVE EXISTING ASPHALT CONCRETE PAVEMENT 3" AND PLACE 1.5" ARHM OVER 1.5" TYPE III C3–PG64–10 OVER TENSAR GLASPAVE25 OR APPROVED EQUAL.

APPENDIX VIII

PERVIOUS CONCRETE PAVEMENT REQUIREMENTS

201-1.1.6 Pervious Concrete.

201-1.1.6.1 General. Pervious concrete shall consist of Portland cement, coarse concrete aggregate, water, and when approved by the Engineer or specified in the Special Provisions, chemical admixtures, fly ash, sand, or reclaimed concrete material.

201-1.1.6.2 Materials. Materials shall consist of:

a) Type II or Type V Portland cement conforming to 201-1.2.1, a, Type II, unless otherwise specified in the Special Provisions;

b) coarse concrete aggregate conforming to 200-1.4, No. 4, unless otherwise specified in the Special Provisions;

c) water conforming to 201-1.2.3;

d) hydration stabilizing (Type B or D), air-entraining, and/or specific performance chemical admixtures conforming to 201-1.2.4;

e) fly ash conforming to 201-1.2.5.3, the content shall be less than 25 percent;

f) sand for Portland cement concrete conforming to 200-1.5.3; and

g) reclaimed concrete material conforming to 201-1.2.6.

201-1.1.6.3 Mix Design. A mix design shall be submitted in accordance with 3-8.4. The minimum cementitious material content shall be 540 pounds per cubic yard (320 kg/m^3). The fly ash content shall not be greater than 25 percent of the total weight of cementitious materials.

The mix design shall show the mix identification number and the applicable proportions, weights, and quantities of Portland cement, aggregate, water, and when specified or approved, fly ash, chemical admixtures, sand, and reclaimed concrete material. The mix design submittal shall also include the size and source of concrete aggregates, the type and source of Portland cement and fly ash, the brand and designation of chemical admixtures, the percent voids, and the intended type of construction.

303-8 PERVIOUS CONCRETE.

303-8.1 General. Pervious concrete shall conform to 201-1.1.6. Pervious concrete shall be constructed a minimum of 6 inches (150 mm) thick unless otherwise shown on the Plans.

303-8.2 Test Section. The Contractor shall construct a test section using the same equipment and placing crew as it proposes to use for the remainder of the pervious concrete work. The test section shall be a minimum of 225 square feet (21 m^2). The test section(s) may be incorporated into the Work if so approved by the Engineer.

303-8.3 Subgrade. The subgrade shall be compacted to a relative compaction between the minimum specified in the Special Provisions and a maximum of 96 percent. The subgrade shall not be treated or stabilized with Portland cement or lime.

303-8.4 Forms. Forms shall conform to 302-6.2. Forms shall be placed for the full-depth of the thickness of pervious concrete to be constructed and be capable of supporting mechanical equipment without deformation during or following placement operations.

303-8.5 Placement. Prior to placement, plastic pervious concrete shall have a density within ± 5 pounds per cubic foot (80 kg/m^3) of that shown on the approved mix design when tested in accordance with ASTM C1688. Placement shall conform to the lines, grades, and cross sections shown on the Plans. Placement operations shall not result in the voids becoming sealed.

Pervious concrete shall be uniformly deposited over the entire formed area. A self-propelled roller screed shall be used for strike-off, spreading, and compaction. Hand-rodding may be used in areas inaccessible to the roller-screed if so approved by the Engineer. Adjacent to the edge of each form, hand tampers shall be used for compaction.

The finished surface shall not deviate more than 3/8 inch (9.5 mm) from a 10 foot (3 m) straightedge laid on the surface. Surface depressions shall be corrected immediately after compaction by placing fresh pervious concrete in the depressions and compacting using a hand tamper.

After compaction, the surface shall be protected from rapid evaporation by water fogging, covering with 1 mil polyethylene sheeting, or the application of a chemical evaporation retardant approved by the Engineer.

303-8.6 Joints.

303-8.6.1 Weakened-Plane Joints.

303-8.6.1.1 General. Weakened-plane joints shall be constructed at the locations shown on the Plans or at regular intervals not to exceed 2 times the width of the placement or 15 feet (4.6 m) on-center, whichever is less. Joints shall be constructed to a depth of 1/4 of the thickness, or a minimum of 1-1/2 inches (38 mm), whichever is greater.

303-8.6.1.2 Construction Methods. Unless otherwise specified, weakened-plane joints shall be constructed by one of the following methods:

a) Rolling with a roller equipped with a circumferential beveled fin immediately after compaction and prior to curing.

b) Saw cutting as soon as the pervious concrete can be saw cut without causing raveling along the joint edges. Only the area occupied by the concrete saw shall be uncovered and exposed. Immediately after sawing each joint, the exposed area shall be fogged with water and re-covered in accordance with 302-8.7.

303-8.6.2 Transverse Construction Joints. Transverse construction joints shall be constructed whenever placement is suspended for more than 20 minutes.

303-8.7 Curing. Curing shall consist of covering the surface and, as necessary, the application of water. Curing shall begin within 20 minutes of placement. The surface shall be securely covered with polyethylene sheeting having a minimum thickness of 6 mils (150 µm). The cover shall be checked daily to verify that it has not been displaced or damaged, and that condensation is evident underneath the sheeting. Damaged sheeting shall be repaired. Displaced sheeting shall be replaced. When there is no observable condensation, 1.5 gallons of water per square yard (5.7 L/m^2) shall be applied to the surface.

303-8.8 Acceptance. Pervious concrete shall have a consistent, uniform surface with no visible excess cement paste, tears, or gouges. Roller-constructed joints shall have smooth, rounded, and uniformly compacted edges. Saw-cut joints shall not contain cement paste or dust nor exhibit evidence of spalling. Unless otherwise specified in the Special Provisions, pervious concrete shall have a minimum infiltration rate of 100 inches per hour (2540 mm/hr) when tested in accordance with ASTM C1701.

303-8.9 Measurement. Pervious concrete will be measured by the square foot (m^2) for each thickness shown on the Plans, or by the cubic yard (m^3).

303-8.10 Payment. Payment for pervious concrete will be made at the Contract Unit Price per square foot (m^2) for each thickness shown on the Plans, or per cubic yard (m^3), as shown in the Bid.