



STATE OF CALIFORNIA

**CITY OF PLACERVILLE
ENGINEERING DEPARTMENT**

SPECIAL PROVISIONS

BOOK 2 OF 2

FOR CONSTRUCTION OF

MEASURE L PROJECT

BROADWAY MAINTENANCE CIP# 42003

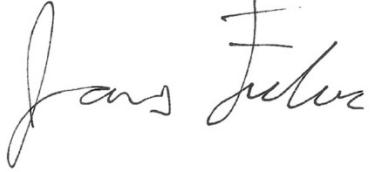
SEPTEMBER 2023

For use in Connection with California Department of Transportation, Standard Specifications Dated **2018** and Revised Standard Specifications current as of September 1st, 2019, Caltrans Standard Plans Dated **2018**, City of Placerville Standard Plans, State of California Labor Surcharge and Equipment Rental Rates, and Director of Industrial Relations General Prevailing Wage Rates.

**CITY OF PLACERVILLE, CALIFORNIA
ENGINEERING DEPARTMENT**

**BROADWAY MAINTENANCE
CIP NO. 42003**

The Special Provisions contained herein have been prepared by or under the direction of the following Registered Persons:



Registered Professional Engineer (Civil)



CITY OF PLACERVILLE, CALIFORNIA
ENGINEERING DEPARTMENT

BROADWAY MAINTENANCE PROJECT
CIP# 42003

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APPENDIX A – GEOTECHNICAL REPORT

Contractor: Person of business or its legal representative approved by the City Council and entering into a Contract with the City of Placerville for performance of the work.

Department: The City of Placerville except that any reference to the Department's forms, websites, manuals, guides, and test methods. These shall be defined as forms, websites, manuals, guides, and test methods of Caltrans.

Design Engineer: R.E.Y. Engineers, Inc. and their subconsulting engineers.

Director: The City Engineer for the City of Placerville.

EID: El Dorado Irrigation District.

Engineer: The Resident Engineer of the City acting either directly or through properly authorized agents; such agents acting within the scope of the particular duties delegated to them.

Inspector or City Inspector: An authorized agent acting on behalf of the City Engineer and within the scope of the particular duties delegated to him/her.

Plans: The Plans are specific details and dimensions particular to the work and are supplemented by the Standard Plans insofar as they may apply. This term is used interchangeably for the Broadway Sidewalks CIP# 41606 plans.

Project Plans: The Project Plans are specific details and dimensions particular to the work and are supplemented by the Standard Plans insofar as they may apply. This term is used interchangeably for the Broadway Maintenance CIP# 42003 plans..

Special Provisions: The Special Provisions are specific clauses required by the City setting forth conditions of requirements peculiar to the work and supplementary to the Standard Specifications of the State of California.

Standard Plans: 2018 Standard Plans of the State of California, Department of Transportation and the current Revised Standard Plans as of September 1st, 2019.

Standard Specifications: 2018 Standard Specifications of the State of California, Department of Transportation (Caltrans) and the current Revised Standard Specifications as of September 1st, 2019.

State: The State of California, including its agencies, departments or divisions whose conduct or action is related to the work or when referenced in the Standard Specifications "State" shall mean the City of Placerville, including its authorized officers, agents, consultants, and volunteers.

Project: The work as contemplated in these documents and Project Plans.

Proposal: The un-approved offer as submitted to the City for contemplation for the completion of the Project.

USDOT: The United States of America Department of Transportation.

Add to section 1-1.09:

This project is in a freeze-thaw area.

2. The Contractor must obtain a water use permit for construction water. Construction meters require a one-thousand dollars (\$1,000) deposit. The monthly rental fee for the construction meter is one-hundred dollars (\$100) per month and is billed bimonthly. The usage fee is a tiered rate as shown in the table below.

Water Usage	Price per 100 Cubic Feet
0-4000 cubic feet	\$2.94
4001-20,000 cubic feet	\$3.52
Over 20,000 cubic feet	\$3.81

The payment for the cost for this permit and water usage shall be included with the various items of the proposal and no separate payment will be made.

Replace the paragraphs in section 5-1.23A with:

5-1.23A GENERAL

5-1.23A(1) Submittal Procedure

Section 5-1.23 includes specifications for action and informational submittals.

Any submittal not specified as an informational submittal is an action submittal.

Accompany each submittal with a Submittal form, which contains the following information:

1. Contractor's name and the name of Subcontractor or supplier who prepared the submittal.
2. The project name and identifying number.
3. Description of the submittal and reference to the Contract requirement or technical specification section and paragraph number being addressed.

Electronic submittals are preferred. Provide original hard copies to the Engineer upon request. If hard copies are submitted in lieu of an electronic submittal, submit the number and type of copies for each submittal and follow the procedures described below or in other paragraphs in this Section. Submit three copies of submittals not covered in this Section.

1. Designation of Superintendent: Submit three copies for information. Include name, address, home telephone number, and a brief resume.
2. List of Subcontractors and Major Suppliers: Submit three copies for information. Include address, telephone number, and name of responsible party.
3. Subcontractors'/Suppliers'/Manufacturers' Affidavits. Submit three copies for items specified in the Technical Specifications.

The City or Engineer rejects a submittal if it has any error or any omission.

Failure to provide submittals requested by the Engineer constitutes contract noncompliance on that item of work and may be deducted in accordance with Sections 5-1.30 and 9-1.16E.

Convert foreign language documents to English and U.S. customary units.

5-1.23A(2) Schedule of Submittals

Submit three (3) copies for information. No copy will be returned.

At the pre-construction meeting, submit a Schedule of Submittals showing the date by which each submittal required for Product Review or Product Information will be made. Identify the items that will be included in each submittal by listing the item or group of items and the Specification Section and paragraph number under which they are specified. Indicate whether the submittal is required for Product Review of Proposed Equivalents, Shop Drawings, Product Data or Samples or required for Product Information only.

5-1.23A(3) Plan of Operations

Submit three (3) copies.

Before beginning on site work, submit a plan showing Contractor's intended use of the Work site, including on site storage of materials, on site handling of materials, and field offices.

5-1.23A(5) Shop Drawing, Product Data and Sample Submitted for Product Review

This paragraph covers submittal of Shop Drawings, Product Data and Samples required for the Engineer's review referred to as Product Review submittals for the Technical Specifications of the contract documents. Submittals required for information only are referred to as Product Information submittals in the Technical Specifications and are covered in section 5-1.23A(7).

Number and type of submittals:

1. Shop Drawings: Submit three (3) clear, sharp high contrast copies one of which will be marked, stamped and returned to the Contractor. The Contractor shall make and distribute the required number of additional copies to its superintendent, subcontractors and suppliers. Shop drawings must comply with section 5-1.23B(2).
2. Product Data: Submit three (3) clear copies. One copy will be marked, stamped and returned. The Contractor shall make and distribute the required number of additional copies to its superintendent, subcontractors and suppliers.

The Contractor shall make all Product Review submittals early enough to allow adequate time for the Engineer's review, for manufacture and for delivery at the construction site without causing delay to the Work. Submittals shall be made early enough to allow for unforeseen delays such as:

- 1 Failure to obtain Favorable Review because of inadequate or incomplete submittal or because the item submitted does not meet the requirements of the Contract Documents.
- 2 Delays in manufacture.
- 3 Delays in delivery.

Content of Submittals:

1. Each submittal shall include all of the items and material required for a complete assembly, system or Specification Section.
2. Submittals shall contain all of the physical, technical and performance data required by the specifications or necessary to demonstrate conclusively that the items comply with the requirements of the Contract Documents.
3. Provide verification that the physical characteristics of items submitted, including size, configuration, clearances, mounting points, utility connection points and service access points, are suitable for the space provided and are compatible with other interrelated items that are existing or have or will be submitted.
4. Label each Product Data Submittal, Shop Drawing and Sample with the information required in paragraph 5-1.23A(1)1. of this Section. Highlight or mark every page of every copy of all
5. Product Data submittals to show the specific items being submitted and all options included or choices offered.
6. Additional requirements for Product Review submittals are contained in the Technical Specification sections.
7. Designation of work as "by others," shown on Shop Drawings, shall mean that the work will be the responsibility of the Contractor rather than the subcontractor or supplier who has prepared the Shop Drawings.

Requirements for Contractor Designed Items:

Verify that products delivered meet requirements of Contract Documents.

Compatibility of Equipment and Material:

1. Similar items, equipment, devices or products furnished under a single specification section shall all be made by the same maker and have interchangeable parts.
2. In addition, but only if so stated in each affected Specification Section, similar items furnished under two or more Specification Sections shall be made by the same maker and have interchangeable parts.
3. All similar materials or products that are interrelated or used together in an assembly shall be compatible with each other.

Requirements for the Contractor's review and stamping of submittals prepared by the Contractor or by Subcontractors or suppliers prior to submitting them to the Engineer. The Contractor warrants:

1. Work or items submitted are complete, accurate and meet the requirements of the Contract Documents, or else any deviations are identified and described in a separate letter accompanying the submittal form.
2. Work or items submitted have been coordinated with and meet the requirements of other submittals, field conditions and the Work as a whole and quantities and dimensions are correct.
3. Proposed Equivalent items are at least equal in quality, utility and appearance to the first specified item, or else any deviations are identified in a separate letter accompanying the submittal form.
4. Adjustments to other work required to accommodate Proposed Equivalent items including second named items have been delineated on the submittal and will be made at the Contractor's expense.
5. This submittal includes all items needed for a particular specification section or assembly for which submittals are required.

Submittals that contain deviations from the requirements of the Contract Documents shall be accompanied by a separate letter explaining the deviations. The Contractor's letter shall:

1. Cite the specific Contract requirement including the Specification Section and paragraph number for which approval of a deviation is sought.
2. Describe the proposed alternate material, item or construction and explain its advantages and/or disadvantages to the Owner.
3. State the reduction in Contract Price if any that is offered to the Owner.

Engineer's Review Procedure and Meaning:

The Engineer will stamp and mark each Product Review submittal prior to returning it to the Contractor. The stamp will indicate whether or not the review was favorable and what action is required of the Contractor. Review categories "Approved" and "Approved as Corrected" both indicate Favorable Review.

The Engineer's Favorable Review is contingent on the Contractor's warranties. Favorable Review is also contingent on:

1. The compatibility of items included in a submittal with other related or interdependent items included in previous or future submittals.
2. Future submittal of items related to or required to be part of this submittal that were not included with this submittal.

Favorable Review of a submittal does not constitute approval or deletion of items required as part of the submittal but not included with the submittal. Favorable Review of items included in the submittal does not constitute deletion of specified features, options or accessories that were not included in the submittal or that are included as part of the contract.

The action required by the Contractor for each category of review is as follows:

1. **APPROVED. NO RESUBMITTAL REQUIRED.**
2. **APPROVED AS CORRECTED.** The submittal is approved as corrected by the reviewer. The contractor is responsible for incorporating the reviewer's corrections. The corrected submittal complies with the Contract Documents.
3. **REVISE & RESUBMIT.** The Contractor shall revise and resubmit the submittal as noted or required to comply with the Contract Documents.

4. **REJECTED.** The item submitted does not comply with the Contract Documents in a major way. Resubmit items that comply with the requirements of the Contract Documents.

The letter of transmittal accompanying the returned Product Review submittal may contain numbered notes. Marking a corresponding number on a Shop Drawing or Product Data submittal shall have the same effect as applying the entire note to the submittal.

Re-submittals that contain changes that were not requested by the Engineer on the previous submittal shall be accompanied by a letter explaining the revised items.

Favorable Review required prior to proceeding. Proceeding without a Favorable Review will be considered unauthorized work per section 5-1.30.

Do not proceed with manufacture, fabrication, delivery or installation of items prior to obtaining the Engineers Favorable Review of Product Review submittals.

Any work performed by the Contractor in advance of an approved submittal for said work is done so at the Contractor's sole risk.

Intent and Limitation on Engineer's Review:

The Contractor has primary responsibility for submitting and providing work that complies with the requirements of the Contract Documents. That responsibility cannot be delegated in whole or in part to subcontractors or suppliers. Neither the Engineer's Favorable Review nor the Engineer's failure to notice or comment on deficiencies in the Contractor's submittals shall relieve the Contractor from the duty to provide work, which complies with the requirements of the Contract Documents.

5-1.23A(6) Proposed Equivalents

Submittal for Proposed Equivalent products or materials shall comply with the submittal requirements for Shop Drawings, Product Data, and Samples submitted for Product Review in this Section. Bidders wanting to use "or approved equal items" may submit a Substitution Request Form no later than five (5) days after the issuance of the Notice to Proceed.

Time of Submittal:

1. Submittal of Proposed Equivalents shall be received within five (5) days of the Notice to Proceed. The Engineer may agree to a later submittal date if requested in writing within five (5) days of the Notice to Proceed. The request shall identify the item, providing the Specification reference, and proposed manufacturer and model number of the item that will be submitted and the proposed submittal date.
2. The Engineer's agreement to a later submittal date shall be in writing and shall not be construed as Favorable Review or acceptance of the manufacturer or item proposed.

Content of submittals shall be the same as that required for Product Data, Shop Drawings and Samples submitted for Product Review in another paragraph of this Section. In addition, the Contractor shall provide information on several recent similar installations of the item to verify its suitability. The information shall include the project name and location, the Owner's name, address, telephone number and name of a knowledgeable person to contact for information on performance of the product.

When the Contractor has listed specific maker's products submitted with its Bid no changes will be permitted without submittal of acceptable evidence justifying the change and the Engineer's written approval.

If a non-equivalent substitute is submitted for review, it shall be accompanied by a proposed reduction in Contract Price which shall include the increased cost of Engineering service required to evaluate the proposed substitute (which shall be paid to the Owner whether or not the substitute is accepted) plus the greater of 1) the difference in price between the first specified item and the item submitted and 2) the difference in value to the Owner between the two items.

5-1.23A(7) Product Information Submittals

1. Submit three (3) copies. No copies will be returned.
2. Product Information submittals are required for the Owner's permanent records and will be used for future maintenance, repair, modification or replacement work. Product Information submittals will be examined only to verify that the required submittals have been made; they will NOT be reviewed for compliance with the Contract Documents.
3. Make Product Information submittals prior to delivering material, products or items for which Product Information submittals are required.
4. The Contractor has the sole and exclusive responsibility for furnishing products and work that meets the requirements of the Contract Documents.
5. The Engineer reserves the right to comment on any submittal and to reject any product or work delivered, installed or otherwise at any time that the Engineer become aware that it is defective or does not meet the requirements of the Contract Document.

5-1.23A(8) Manufacture Certificates

1. Submit three (3) copies.
2. When specified in Technical Specification section, submit manufacturers' certificate to Engineer for review. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate. Certificates may be recent or previous test results on material or Product, but must be acceptable to the Engineer.

Replace Section 5-1.26 with:

5-1.26 CONSTRUCTION SURVEYS

5-1.26A General

The contractor must set construction stakes and markers to establish the lines and grades required for the completion of the work on the plans and as specified in the Standard Specifications and these Special Provisions and as necessary for the Engineer to check lines, grades, alignment and elevations.

All procedures, methods, and typical stake markings shall be in accordance with Chapter 12, Construction Surveys, of the Caltrans "Survey Manual." Copies of the "Survey Manual" may be purchased from Caltrans Publications Unit, 1900 Royal Oaks Drive, Sacramento, and California 95815, (916) 445-3520.

Staking must be performed under the direction of a licensed surveyor or registered civil engineer with the authority to perform land surveying.

5-1.26B Grade Quality Control

Use a GNSS rover, robotic total station equipment, or a level to check the grades at the frequencies shown in the following table: **Grade Checking Requirements**

Type of work	Area or distance represented by the grade checking	Frequency (number of grade points)
Earthwork for cut and fill slopes ≤15 feet	200 feet	2
Earthwork for cut and fill slopes >15 feet	1,000 sq yd	1
Rough grading	1,000 sq yd	1
Trenching	100 feet	6
Subgrade	1 mi	30
Subbase layer	1 mi	50
Base layer	1 mi	100
Curb and gutter	100 feet	6
Concrete barrier	100 feet	5
Finishing roadway	1,000 sq yd	2

Increase the frequency of grade checking of a roadway:

- 1. Wherever its curve radius is 500 feet or less
- 2. In areas of a superelevation transition
- 3. At intersections

Notify the Engineer when an area is ready for line and grade inspection. Submit the grade checking results on a Grade Checking Report form as an informational submittal.

5-1.26C Payment

Construction surveys (contractor provided construction staking) shall be paid for under the Construction Staking bid item. Progress payments will be made based upon the percentage of work items requiring staking staked by that point. No additional compensation will be made for resetting stakes.

Replace the paragraphs in section 5-1.27E with:

Maintain separate records for change order work costs.

Submit change order bills to the Engineer.

Add to the end of section 5-1.32:

Personal vehicles of the Contractor's employees must not be parked on the traveled way or shoulders, including sections closed to traffic.

Add between the 2nd and 3rd paragraphs of section 5-1.36C(3):

Utilities shown on the Project Plans as being relocated or rearranged by others will be relocated or rearranged by others, but the Contractor shall coordinate those efforts with the utility owner(s) to ensure no schedule impacts or delays. Contact information for those utility purveyors are as follows:

- 1. PG&E: Josh Berger (209) 986-0184
- 2. AT&T: Darren Mortensen (530) 621-6926
- 3. Comcast: Cameron Alves (916) 200-9060

Replace the paragraphs in section 5-1.46 with:

When you complete the work, request the Engineer's final inspection. You will be notified, in writing, of any defects or deficiencies to be remedied. Correct all defects and deficiencies within 5 working days of notification and notify the Engineer all defects and deficiencies have been addressed. When notified that the work is complete, the Engineer will again inspect the work to ensure compliance with the Contract Documents.

If the Engineer determines that the work is complete, the Engineer recommends to the City Council that the Contract be accepted and the Notice of Completion be recorded to accept the Contract. Immediately after Contract acceptance, you are relieved from:

- 1. Maintenance and protection duties
- 2. Responsibility for injury to persons or property or damage to the work occurring after Contract acceptance expect as specified in section 6-3.06.

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6 CONTROL OF MATERIALS

Add to section 6-1.01:

No materials are allowed to be stockpiled in the State or City Right of Way unless a written request is made to Caltrans or the City in advance. The Contractor is responsible for maintaining and final cleaning after work and restoring the Right of Way to its original condition.

The Contractor shall provide a list of all hazardous materials to be used within the State Right of Way to Caltrans before materials are used.

The Contractor shall provide a list of all hazardous materials to be used within the City Right of Way to the City before materials are used.

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7 LEGAL RELATIONS AND RESPONSIBILITY TO THE PUBLIC

Replace the 11th paragraph of section 7-1.02K(3) with:

Submit certified payroll records to the Engineer and upload to the Department of Industrial Relations.

Add to section 7-1.02K(6)(a):

All Personnel shall wear hard hats and ANSI Class II or higher visibility garments as appropriate.

Add to section 7- 1.02K(6)(j)(ii):

The contractor will prepare a Lead Compliance Plan (consistent with CCR Title 8, §1532.1, "Lead in Construction" standard) to minimize worker exposure to lead-containing soil and residue resulting from paint removal work.

The payment quantity for the Lead Compliance Plan bid item is paid for by lump sum.

Add to section 7- 1.02K(6)(j)(iii):

The contractor will prepare a Lead Compliance Plan (consistent with CCR Title 8, §1532.1, "Lead in Construction" standard) to minimize worker exposure to lead-containing soil. The Lead Compliance Plan should include protocols for environmental and personnel monitoring, requirements for personal protective equipment, and other health and safety protocols and procedures for the handling of lead-containing soil.

Add to section 7-1.03:

Contractor to pay special attention to any scheduled events in the Project area. Contractor to coordinate with the Highway 50 Association Wagon Train event (www.hwy50wagontrain.com) and ensure Project area is clean, safe, and available for the scheduled event which occurred in early June in previous years. The Highway 50 Association's contact number is (530) 677-2871.

Contractor shall notify the City, El Dorado Disposal, El Dorado County Fire District, Placerville Police Department, Placerville Downtown Association, El Dorado County Transit Authority, Placerville Union School District, and local US Post Office three (3) weeks prior to start of construction and two (2) weeks prior to any partial road closures. Notifications shall be by E-mail and copies of the notifications shall be provided to the City.

Any interruption of a transit route or temporary relocation of a transit stop shall be coordinated with applicable operator (El Dorado Transit Authority, Placerville Union School District, etc.) one (1) week prior.

Each day, the Contractor is to leave the site in a condition that is acceptable as directed by the Engineer.

10 GENERAL

Replace “RESERVED” in section 10-1.05 with the following:

10-1.05A COORDINATION AND JOINING OF WORK

Prior to and during construction for this Project, there may be another project under construction on Broadway under a separate contractor. This section describes the coordination to take place with the adjacent project.

The Contractor shall be responsible for coordinating the work of the various contractors, subcontractors, and trades employed on the work. He shall adjust, correct, and coordinate his work with the work of others so that no discrepancies will result or unnecessary delays occur.

If completion is delayed because of any acts of omissions of any other contractors or subcontractors, the Contractor shall on that account have no claim against the City for extra compensation or time.

Where work of one trade or subcontractor joins or is installed upon the work of another trade or subcontractor, there shall be no discrepancy in mating or joining such work, which shall be done and finished in a good and workmanlike manner. In joining one kind of work with another, the marring or damaging of either shall be corrected at no expense to the City.

Should improper work of any trade be covered by that of another, it shall be the Contractor’s responsibility to correct the improper work and to adjust costs between the various contractors or subcontractors, without cost to the City.

The City shall not be responsible for any damages suffered or costs incurred by the Contractor or any other contractor, subcontractor, or worker, resulting directly or indirectly from the award or performance or attempted performance of any other contract or contracts on the work, or caused by any decision by the City respecting the order of precedence in the performance of the contracts awarded for the completions of the work.

The Contractor shall be responsible to other contractors or City forces engaged in work on the site or adjacent thereto for all damages to their work, or persons employed thereon, or delays to their work, resulting from Contractor’s failure to complete the work within the time for completion. Contractor shall adjust and coordinate his work with that of others so that no discrepancies result in the whole work, and shall defend and indemnify the City from all claims arising therefrom.

12 TEMPORARY TRAFFIC CONTROL

Add to the section 12-1.01:

Along with the project schedule, the Contractor shall submit a construction staging/sequencing plan for review and obtain approval by the Engineer prior to the start of construction.

The staging/sequencing plan must:

1. Take into account material ordering and lead times.
2. Break work impacting the flow of traffic and/or access to residents or businesses into stages.
3. Only allow one stage to be under active construction at a time.
4. Identify any impacted bicycle or pedestrian facilities/circulation.
5. Identify any impacted driveways, businesses, or residences.
6. Ensure a minimum of one driveway to each parking lot or parcel remains open at all times.
7. Ensure a minimum of one-half of a driveway remains open at all times where only one driveway to a business or residence exists, unless otherwise approved by the Engineer.
8. Require notice to parcel owners, businesses, and residents ten (10) working days in advance of when vehicle access will be altered or utility outages are to take place. Notice to parcel owners must include

details of work, start date, and duration of work to take place in front of their property. This notice may be in the form of door-hangers, flyers, or other format deemed acceptable by the Engineer.

9. Require coordination with any gas station affected so that their scheduled refueling trucks maintain access to the tanks on the property. Access to all gas pumps shall be maintained between the hours of 6:00 AM and 9:00 PM.
10. Require any lane closures, if needed, to take place between the hours of 8:30 am – 3:00 pm and 8:00 pm – 5:00 am.
11. Require all HMA work to be performed at night between 8:00 pm and 5:00 am.

The Contractor shall submit traffic control plans, including closure plans, for review and obtain approval prior to any construction activities requiring temporary traffic control. The Engineer shall review and approve all traffic control systems, including hardware and location/placement, prior to beginning construction activities each workday. Public traffic shall be allowed to pass through the work area at all times unless a full road closure plan has been previously approved.

The contractor's bid shall include a per month cost per Portable Changeable Message Sign (PCMS). The Engineer will work with the Contractor to determine the appropriate location, message, and duration of use for each PCMS during construction.

Full road closures will only be allowed during normal working hours, unless otherwise approved by the Engineer. The roadway must be re-opened at the end of each day of construction. Full road closures must be approved a minimum of 15 working days in advance and each approval will only last for a maximum of ten (10) consecutive working days. Full road closure plans shall include a detour plan, a bicycle and pedestrian circulation plan, hours in which the closure will take place, and any other pertinent information.

Half road closures, up to a maximum length of 1,000 feet measured parallel to the ground surface along the centerline of the road, are permitted for this project and must comply with Caltrans 2018 Standard Plan T13, unless otherwise approved by the Engineer. Only one (1) half road closure will be allowed at a time, unless otherwise approved by the Engineer. Allowances will be made for the final HMA paving lift and permanent striping and pavement marking activities which may require longer half road closures to improve efficiency and quality of final product. Half road closures must be approved a minimum of ten (10) working days in advance. Should the Contractor desire to leave the half road closure up outside of normal working hours, a temporary signal or full-time flaggers must be employed at all times. A half road closure at a single location must not extend longer than four (4) consecutive weeks, including no more than three (3) consecutive weekends.

Contractor shall provide and maintain traffic control devices, flaggers and all other necessary items per this section, the Caltrans Traffic Manual, and California MUTCD where applicable. The Contractor will be responsible for the maintenance of all traffic control items and equipment during and outside of working hours.

When practical, the full width of the roadway must be open to pedestrian, bicycle and vehicular traffic outside of working hours. When not practical, the Contractor must make every effort to open the maximum number of lanes possible. The full width of the roadway must be open for all planned City of Placerville Events and holidays. At the completion of each workday, all existing lanes of traffic shall be opened to traffic unless advanced approval is given to the Contractor by the City. Provisions must be made for the uninterrupted passage of emergency vehicles through the project limits at all times, regardless of the controlled traffic conditions existing at that time. Additionally, provisions shall be in place to allow residents to have safe access to their houses at all times.

The Contractor must provide a bicycle and pedestrian circulation plan along with the staging/sequencing plan and all traffic control plans as a submittal for approval by the Engineer. Pedestrians regularly use the existing roadway shoulders and may continue to travel through this area during construction. The expectation is that the pre-construction bicycle and pedestrian circulation will be maintained during construction and any temporary facilities implemented by the contractor to accommodate the flow of bicyclists and pedestrians during construction will be equal to or better than the existing conditions.

Temporary pedestrian access routes per section 12-4 are only required where existing pedestrian facilities that meet those requirements are being affected by construction. Should the Engineer request a temporary access route per section 12-4 where none currently exists, that work is change order work and will be compensated per section 9.

It is the responsibility of the Contractor to install and coordinate their Traffic Control Plan with other Contractors and utility companies working on the same and/or adjacent roadways so as to avoid delays and conflicts to either project. It is anticipated that the Broadway Sidewalks Project, a sidewalk, road rehabilitation and utility project, will be in construction at the same time and within the same limits as the Broadway Maintenance Project. The Mosquito Road Bridge Project may also be in construction at the same time and the Contractor should expect heavy truck traffic on Broadway as a result. The City's Placerville Station II Park-N-Bus Improvement Project, located at 2990 Mosquito Road, may also be under construction at the same time.

Replace the paragraph in section 12-1.04 with:

There is no separate bid item for flagging, so that work shall be included within the Traffic Control System bid item and no additional compensation will be allowed therefore. The Contractor shall be responsible for the entire cost of flagging and is responsible for including that cost in the Traffic Control System bid item.

A minimum of two (2) Portable Changeable Message Signs (PCMS) will be required for the duration of construction. There is no separate bid item for the PCMS. The work involved with PCMS shall be included within the Traffic Control System bid item and no additional compensation will be allowed therefore. The Contractor shall be responsible for the entire cost of PCMS and is responsible for including that cost in the Traffic Control System bid item. The cost to relocate the sign and/or change the message during the month shall be included in this bid item and no additional compensation will be allowed therefore.

The development of all staging/sequencing plans, traffic control plans, and bicycle and pedestrian handling plans shall be paid for under the Traffic Control System bid item and no additional compensation will be allowed therefore.

The Traffic Control System bid item includes all tools, equipment, materials, and labor necessary to implement the contractor-developed traffic control plan(s) and bicycle and pedestrian circulation plan(s), and install and remove all temporary construction area signage. This includes, but is not limited to, all temporary and semi-permanent construction area signs, temporary signals, flaggers, temporary signal control and maintenance, barricades, cones, and K-rail concrete barriers used in the implementation of the traffic control plans and bicycle and pedestrian circulation plans and all other incidental work associated with the Traffic Control System.

Replace the paragraph in section 12-3.11D with:

There is no separate bid item for construction area signs. Payment for all construction area signs shall be included in the Traffic Control System bid item and no additional compensation will be allowed therefore.

Add to section 12-4.02A(2):

Martin Luther King Jr. Day is a designated holiday that is observed on the 3rd Monday in January. The day after Thanksgiving is a designated holiday that is observed the day after Thanksgiving Day. Christmas Eve is a designated holiday that is observed on December 24th.

Replace "Reserved" in section 12-5 with:

12-5.01 GENERAL

Contractor shall notify the City, El Dorado Disposal, El Dorado County Fire District, Placerville Police Department, Placerville Downtown Association, El Dorado County Transit Authority, the local US Post Office and Placerville Union School District Transportation Division 48 hours prior to any lane closures, including partial road closures.

Replace “Reserved” in section 12-6.03D(1) with:

Temporary markers and/or markings shall be installed by the Contractor for any existing crosswalk line, limit line, arrow, and other legend or traffic lane line removed or damaged by the work activity prior to the end of the work shift and before opening the lanes for traffic.

Requirements for Placing Temporary Pavement Markings and Striping

Existing Striping	Temporary Striping
12-inch crosswalk line	3 – 4 inch white stripes appearing as 1– 12 inch stripe
8-inch solid line	1 – 4 inch white solid stripe
4-inch broken white	1 – 4 inch white stripe (typically 7’ long, 17’ gaps*)
4-inch broken yellow	1 – 4 inch yellow stripe (typically 7’ long, 17’ gaps*)
Double yellow	2 – 4 inch yellow solid stripes 3 inches apart

* Consult Chapter 3 of the California MUTCD for further details. The dimensions for broken lines apply for streets with posted speed limits of 35 MPH or less. For speed limits of 40 MPH or more, the dimensions are for 12’ long stripes with 36’ gaps.

For Temporary Marking and Temporary Striping materials, refer to the “*Temporary (Removable) Striping and Pavement Marking Tape (180 days or less)*” section of the Authorized Materials List for Signing and Delineation Materials from Caltrans.

Replace the 1st Paragraph of section 12-6.04 with:

There is no specific bid item for temporary traffic striping or pavement markings. The work shall be considered included in all other bid items and no additional compensation will be made therefore.

Replace Section 12-8 with:

12-8 CONSTRUCTION ZONE STANDARDS

12-8.01 GENERAL

12-8.01A Summary

Contractor is responsible for maintaining a safe work area during and after working hours.

12-8.02 Maintaining Traffic

12-8.02A Tow-Away Lanes

Contractor shall be responsible for keeping “Tow-Away No Stopping” traffic lanes clear during the effective hours posted.

12-8.02B Metal Plating

Any temporary metal plating and metal bridging shall be coated with a non-skid and rust inhibitive product. Examples of non-skid metal plating are surfaces with waffle or herringbone pattern undulations. Plating shall be installed with no edges or corners sticking up and with no bouncing or shifting. Plates shall be secured against shifting by tack welding, or fasteners. Any non-skid product shall have a friction factor of 0.35 or greater as measured by the California Test 342.

Plates shall be free of any openings greater than ¼ inch.

12-8.02C Transitioning (Ramping)

Whenever the grade difference between the existing pavement and the excavated area is greater than ¼ inch, Contractor shall provide longitudinal and transverse transitions prior to opening the lanes to traffic. The maximum slope on these transitions shall be 1:18. Transitions shall be installed with hot mix asphalt. This section applies to newly constructed roadway base, manholes, metal plating, bridging, trenching etc.

Cold mix asphalt may be used in lieu of hot mix asphalt for temporary ramping. The contractor is responsible for maintaining cold mix asphalt at all times and complying with ADA regulations if applicable. Cold mix shall comply with Sections 4-1.13 and 7-1.04.

Add to section 15-1.03A:

Any existing improvements, drainage facilities, sanitary sewage facilities, water facilities, landscaped areas, etc., damaged as a result of the Contractor's construction activities shall be replaced by the Contractor at no cost to the City. Any utilities damaged during the removal of the pipes indicated in the Project Plans must be repaired to the satisfaction of the utility owner.

The existing underground pipes proposed to be removed shall be removed completely and excess material shall be disposed of off-site in a safe and legal manner. The Contractor shall backfill and compact the trench as required immediately after completing removal of the existing underground facilities to the subgrade level to minimize hazardous conditions.

Add to end of section 15-1.03C Salvaging Facilities:

Contractor shall coordinate with El Dorado Transit (530) 642-5383 regarding removal of the existing bus shelter at the location indicated on the Project Plans. Contractor to return the bus shelter to the location indicated by El Dorado Transit. Contractor must construct and put into service the new transit stop location in front of 1361 Broadway prior to removing the existing bus shelter.

Bolt holes and post holes in concrete incidental to removal of bus shelter shall be grout filled and flush with the adjacent concrete. Contractor shall ensure the existing concrete pad is free of debris incidental to removal.

15-1.03C(1) PAYMENT

The payment quantity for the Remove Bus Shelter bid item is on a lump sum basis. The contract unit price for Remove Bus Shelter shall include full compensation for labor, coordination, materials, tools and equipment and for doing all work for the complete removal and transport of the bus shelter, including concrete restoration, complete in place, all as specified in the Standard Specifications, these special provisions, and as directed by the Engineer, and no additional compensation will be allowed.

The payment quantity for the Remove (E)Pipe bid item is the length of removed pipe measured parallel to the ground surface along the centerline of the trench at the finished grade.

Replace section 15-1.03D with:

15-1.03D Adjust Frames, Covers, Grates, and Manholes

Adjust frames, covers, grates and manholes by lowering before cold planing and raising after final paving or surfacing. Before opening the lane to traffic, either (1) complete permanent paving or surfacing or (2) temporarily fill any depressions with HMA or cold mix asphalt.

Where paving or surfacing work is shown, do not adjust to final grade until the adjacent pavement or surfacing is complete. For a structure that is to be raised, remove the cover or frame and trim the top of the structure to provide a suitable foundation for the new material. Instead of using new materials similar in character to those in the existing structure, you may use raising devices to adjust a manhole to grade. Before starting paving work, measure, fabricate, and install raising devices. Raising devices must:

1. Comply with the specifications for section 75 except that galvanizing is not required
2. Have a shape and size that matches the existing frame
3. Be match marked by painting identification numbers on the device and corresponding structure
4. Result in an installation that is equal to or better than the existing one in stability, support, and nonrocking characteristics
5. Be fastened securely to the existing frame without projections above the surface of the road or into the clear opening

Manholes, valve boxes, monument boxes, etc., shall be brought to grade, as shown on the plans, after final pavement lift has been placed.

All existing manhole frames, lids or gates, valve boxes, monument boxes, and any other style of box or lid shall be reused. If any damages occur in the process of adjusting iron to grade then at Contractor's expense must supply new manhole frames, lids or gates, valve boxes, monument boxes, and any other style of box or lid.

Concrete collars must comply with section 90 and the Project Plans.

Replace section 15-1.03E with:

15-1.03E Remove, Relocate, or Abandon Water Appurtenances

Existing water meters indicated on the Project Plans for removal, relocation, or abandonment are to be disconnected from the existing water main by closing the service at the corp stop and then the service line is to be capped as close to the corp stop as possible. If there is no corp stop on the service, the adapter is to be removed and a brass plug is to be installed in the service saddle. Once plugged, the remaining service line piping and existing water meter is to be removed and disposed of.

Replace section 15-1.03F with:

15-1.03F Relocate Utilities

Existing water appurtenances indicated on the Project Plans for relocation are to be isolated from the water system and relocated to the new location the same working day it is removed. The items to be relocated shall be cleaned of all earth and other foreign materials. Water appurtenance components that are to be relocated and which are damaged as a result of the Contractor's operations shall be repaired by the Contractor at his expense. Lateral water line shall be extended to the necessary length to locate the appurtenance at the location shown on the plans.

Contractor is to coordinate with property owner prior to working on the existing irrigation boxes indicated on the Project Plans for relocation to shut off the water supply to the irrigation box. Once isolated from the existing water system, the irrigation box to be disconnected, relocated and reconnected to the existing irrigation system in a manner similar to or better than the original condition.

Replace section 15-1.03G with:

15-1.03G Connection and Abandonment Plan (Shut Down Plan)

The Contractor shall prepare a Connection and Abandonment Plan (Shut Down Plan) for City approval. The plan shall show how and where the Contractor will make all tie-ins, abandonments, and shut-downs. All existing pipelines, fire hydrants, air/vacuum release valves, and services shall remain active during construction of the new water system. The Contractor is responsible to review each tie-in and abandonment location to determine the material, labor, and equipment requirements for each tie-in and abandonment. The Contractor is responsible for determining and obtaining approval from the City Engineer for the tie-in, abandonment, and outage sequencing; and includes all costs in their bid for any temporary and permanent facilities necessary to execute the plan. The Contractor shall provide the City a schedule of the proposed work and coordinate with the City on all water system outages. The Contractor is responsible for developing shut down notices (subject to review and approval by the City) which will be delivered to customers affected by the outage. The shutdown notices must be capable of being attached to the door and are not allowed to be placed under the doormat. The Contractor is responsible for delivering the shutdown notices to the City customers no less than 72 working hours before the anticipated shutdown date, with confirmed delivery by the inspector.

The Connection and Abandonment Plan shall include the following items:

- Sequence of connections and outages
- Duration of each outage – note that max outage shall be 8 hours
- Valves isolated for each outage – City will provide approval within 72 hours for existing system upon request from contractor
- Extent of outages and customers affected by each outage – City will provide approval within 72 hours from request by contractor
- Shut down notices to deliver to customers affected by each outage
- Anticipated dates of outages and connections

Aggregate used in final surface paving must comply with the ½" HMA Type A gradation.

Replace section 39-3.04B with:

Temporary tapers must be either HMA or CMA. No additional payment will be made for the placement of temporary tapers.

Replace section 39-3.04C(1) with:

The Contractor shall follow the order of work shown on the Plans for the 2" AC Grind, AC Grind (Conform), and 4" Digouts. Digouts shall only be completed after the Contractor has cold planed 2" off the existing AC surface.

The depth for 4" Digouts is measured from the top of the cold planed surface and are not measured from the top of the existing AC surface. The 4" Digouts bid item does not include the HMA. The HMA used to fill the 4" Digouts shall be paid for under the HMA bid item.

Do not use a heating device to soften the pavement.

The cold planing machine must be:

1. Equipped with a cutter head width that matches the planing width unless a wider cutter head is authorized.
2. Equipped with automatic controls for the longitudinal grade and transverse slope of the cutter head and:
 - 2.1. If a ski device is used, it must be at least 30 feet long, rigid, and a 1-piece unit. The entire length must be used in activating the sensor.
 - 2.2. If referencing from existing pavement, the cold planing machine must be controlled by a self-contained grade reference system. The system must be used at or near the centerline of the roadway. On the adjacent pass with the cold planing machine, a joint-matching shoe may be used.
3. Equipped to effectively control dust generated by the planing operation
4. Operated such that no fumes or smoke is produced.

Replace broken, missing, or worn machine teeth.

If contractor does not complete placing the HMA surfacing before opening the area to traffic, contractor must:

1. Ensure the surface is safe for vehicular, bicycle, and pedestrian travel, as applicable.
2. Construct a temporary HMA or CMA taper to the level of the existing pavement.

Replace the 2nd paragraph of 39-3.04A with:

Cold plane asphalt concrete pavement includes the removal of pavement markers, traffic stripes, pavement markings, and any encountered paving fabric within the area of cold planing.

Add to section 39-3.04C(3):

Remove, transport, and appropriately dispose of cold planed material.

Replace the paragraph in section 39-3.04D with:

Payment for cold planing asphalt concrete or 2" AC Grind as shown on the Project Plans will be paid for under the 2" AC Grind bid item. The payment quantity for the 2" AC Grind bid item is the area measured parallel to the ground surface in square feet.

Payment for conform grind of asphalt concrete or AC Grind (Conform) as shown on the Project Plans will be paid for under the AC Grind (Conform) bid item. The payment quantity for AC Grind (Conform) bid item is the horizontal length of conform measured along the edge of conform in linear feet.

No additional payment will be made for cold planing depths different from what are shown on the Project Plans or the discovery and/or removal of paving fabric.

62-1.04 PAYMENT

Not Used

62-2 ULTRAVIOLET CURED IN PLACE PIPE (UV CIPP)

62-2.01 GENERAL

62-2.01A Summary

Section 62-2 includes the use of fiberglass reinforced Cured In Place Pipe (CIPP) cured via exposure to ultraviolet (UV) light in the rehabilitation of storm drain pipe and related structures, subject to the limitations of the individual City approved products.

This is a rehabilitation system consisting of a resin impregnated, fiberglass reinforced fabric tube (liner) which is pulled in place into a host conduit. The liner is subsequently inflated with compressed air and cured by lamps emitting ultraviolet light.

The resins use ultraviolet initiators for curing. Complete curing only occurs after receiving a sufficient amount of ultraviolet radiation. Resins cannot be cured by applying heat.

62-2.01B Definitions

calibration hose: An impermeable bladder installed inside the fabric tube. It is inflated with air to press the tube firmly against the wall of the existing pipe until the resin is cured with ultraviolet light.

delamination: Separation of the layers in the sandwich constructed CIPP.

dry spot: An area of the fabric tube where the finished CIPP is deficient or devoid of resin.

sliding foil: A plastic foil installed prior to the fabric tube covering the lower of the circumference of the existing pipe to reduce friction and to protect the fabric tube while being drawn into the host conduit.

62-2.01C Submittals

Product Data, which specifies:

1. Manufacturer's product information.
2. Manufacturer's handling and storage recommendations.
3. Identification of the resin.
4. Material safety data sheets for all materials making up the pipe.

Submit verification test data, including material certification and testing data

Submit a certificate of compliance with reference standards.

All information shall be provided using either English units or dual English/metric units.

An independent laboratory to be used for the testing of field samples. This laboratory is subject to the approval of the Engineer of Design. If the laboratory is unable to prepare test specimens from the field samples, submit the water jet cutting service or other machining service to be used to prepare specimens. All expenses related to the testing of samples shall be borne by the contractor.

Shop Drawings, which specifies:

1. Product Data Information
2. Product Description: Total thickness of the liner. Composition of each layer of the liner, starting from the external foils and ending at the calibration hose. Include thickness and number of fiberglass layers and veil/fleece layers (if any).
3. Manufacturer's recommended maximum pulling force for each size of liner.
4. Model number and maximum pulling force of the winch used for inserting the liner into the host pipe.

5. Curing Protocols: Light train configuration including number of lamps and rated power per lamp. Curing speeds, installation pressures, temperature limitations, and any post curing procedures.
6. Method and product used to seal the annulus.

The contractor shall submit a bypass and pumping plan a minimum of 7 days prior to installation.

62-2.01D Quality Assurance

Provide the INSPECTOR and the ENGINEER a DVD or USB storage device with the unedited curing data and pre- and post- installation video. Provide any software which may be necessary to analyze the data.

Test specimens shall be prepared from the samples collected in section 62-2.03B(4) and tested at a laboratory approved by the Engineer of Design. Five ASTM D790 specimens shall be tested. If any sample fails to meet the specified material properties, an additional five samples shall be tested. If any of these subsequent specimens fail to meet the required material properties, the product is considered unacceptable. The contractor shall take remedial action at his own expense, subject to the approval of the City Engineer. All costs of specimen preparation and testing shall be borne by the contractor.

62-2.01E Delivery, Storage, and Handling

Comply with manufacturer's recommendations. Liner older than six (6) months from the date of manufacture shall not be installed.

62-2.02 MATERIALS

62-2.02A Summary

The UV CIPP liner shall be manufactured in conformance with the latest version of ASTM F 2019 and the SSPWC as modified by the current version of the Brown Book.

Only UV CIPP pipe products, as approved by the City Engineer, shall be used or granted an explicit project specific approval before the contract, subject to the limitations and requirements of each individual product and the Contract Documents of this project. Composition shall match the composition of the liner qualified during the product approval process. Material that does not conform to the approved physical properties shall be removed and replaced at no additional cost to the CITY. A time extension will not be granted to rectify the noncompliance.

The minimum installed thickness of the UV CIPP liner shall be as shown on the Contract Documents. The CONTRACTOR shall be fully responsible for the sufficiency of the liner provided and may select a greater thickness for the method of work, site conditions, or other possible interferences, with the approval of the City Engineer at no additional cost to the CITY, provided it does not impact the installation or serviceability requirements. Remove any inner or outer foils prior to measuring liner thickness. Liner thickness measurements shall be made in accordance with 8.1.2 of ASTM D5813. No measurement shall be less than 87.5% of the required mean value as specified in the approved submittal.

The tube shall be sized such that when installed, it will fit tightly against the host conduit. The outside diameter of the tube shall be at least 95% of the inner diameter of the host conduit. The tube shall be constructed to withstand installation pressures and have sufficient strength to bridge missing pipe.

Resin Systems: The manufacturer shall only use the resin systems which were approved during the product's qualification testing for the particular use authorized during the approval process.

Glass Reinforcement: The reinforcing glass fiber shall be corrosion resistant E-CR glass conforming to ASTM D578. All layers of glass reinforcement shall be fully wet out with resin.

Calibration Hose (Internal Foil): The calibration hose shall consist of a plastic foil which is impermeable to moisture and styrene. It shall be able to stretch to fit an irregular host conduit and be capable of resisting the air pressures and high temperatures encountered during installation. Unless it is a permanent part of the liner system and is an integral part of the carrier tube, the calibration hose shall release easily and be removed from the liner after curing is completed.

External Foil: The external foil shall be impermeable to moisture and styrene. It shall also be opaque to the spectrum of light used for curing.

Sliding Foil: A sliding foil shall be used between the liner and the host to protect the liner from any imperfections in the host.

62-2.03 CONSTRUCTION

62-2.03A Manufacturing

62-2.03A(1) Submittals

All required submittals must be accepted by the CITY prior to commencing any manufacturing.

62-2.03A(2) Assembly

All liner assembly and wet-out shall be performed in a City-approved facility.

62-2.03A(3) Quality Assurance

A sample shall be taken from the liner and tested for conformance to the project specifications before leaving the production facility. A copy of the test report shall be transmitted to the City before the liner is transported to the project site.

62-2.03B Installation

62-2.03B(1) Cleaning and Void Repair

1. Assess the site and determine the appropriate pipeline cleaning equipment.
2. Pipeline cleaning operations: Protect the existing pipeline, maintenance hole, and other improvements from damage. In particular, metallic parts of cleaning equipment may not come in direct contact with pipe or maintenance hole shafts that are plastic, plastic-lined, or plastic-coated. Cleaning operations may not surcharge laterals or otherwise cause flow or gasses to enter service connections.
3. Pipeline cleaning equipment: Use equipment that can be quickly dismantled during an emergency and allow pipe flow to resume.
4. Clean and remove all debris from pipelines. Use water jets, hydro flushers, root cutters, grinders, buckets or other approved methods to remove protruding laterals, roots, grease, sludge, organic matter, grit, aggregate, bricks and other debris from the entire pipeline circumference along the intended reach. Continue with additional cleaning passes until debris is no longer generated. Through a maintenance hole or other access, retrieve and properly dispose of roots, root balls, grease, grit accumulations, rags, pipe fragments, bricks and other debris. Excavate to remove blockages and debris that remain from unsuccessful pipeline cleaning operations. Apply a remedial Point Repair and complete cleaning operations.
5. Verify the cleaned pipeline condition and dimensions.
6. The contractor shall grout and repair any voids along the flowline of the existing pipe prior to installation of the liner.

62-2.03B(2) Bypass and Pumping

The contractor shall perform bypass and pumping operations per the Bypass and Pumping Plan approved by the City.

62-2.03B(3) Operational Control

The contractor shall provide and monitor calibrated gauges and valves to maintain temperatures and pressures within the manufacturer's recommendations.

62-2.03B(4) Field Sampling

Pre-construction Conference: 15 days prior to installation of liner, the Contractor shall conduct a meeting with the Engineer, including the Engineer of Design, to discuss installation, sampling and testing.

Replace “Not Used” in section 71-1.04 with:

There is no separate bid item for the material used to backfill the trenches, holes, depressions, pits, etc. caused by removing, salvaging, reconstructing, abandoning, destroying, modifying, resetting, relocating, adjusting, relaying, remodeling, and rehabilitating existing drainage facilities and no additional compensation will be allowed therefore.

Add to section 71-2.04:

The payment quantity for the Remove (E) Pipe bid item is the length of removed pipe measured parallel to the ground surface along the centerline of the trench at the finished grade.

The payment quantity for the Remove Drainage Structure bid item is the number of drainage structures removed per the Project Plans based on actual count. The Contractor shall return the drainage inlet frame and grate to the City if requested by the Engineer. This work includes all items necessary for the execution and completion of this work including, but not limited to, sawcutting of existing surfacing, excavation, cutting of existing pipes, backfill, including imported backfill, and aggregate base material backfill, compaction of backfill, temporary surface pavement, permanent surface pavement or concrete, and disposal of removed structure.

The Investigate SD Pipe bid item shall be paid for on a lump sum basis and includes all work involved to determine if the pipe in question is active. If the pipe is active, the resulting cleaning and flushing of the storm drain pipe will be paid for as a change order. If the pipe is inactive, the resulting filling of the pipe will be paid for as a change order.

Replace the last paragraph in section 71-3.01C(2) with:

Clean and flush the storm drain pipe with high-velocity cleaning equipment and air mover or mechanically powered equipment. If human entry is possible, you may use nonmechanically powered cleaning equipment.

Add to section 71-3.01D:

Cleaning and flushing storm drain pipes as shown on the Project Plans shall be paid for under the Clean & Flush SD Pipe bid item shall be paid for on a per linear foot basis.

Replace RESERVED in section 71-6.03 with:

71-6.03A General

This section governs abandonment of culverts and pipelines.

71-6.03B Submittals

Upon request, schedules and method of abandonment shall be submitted to the Engineer for approval.

71-6.03C Materials

Pipe fill material may consist of the following:

1. Controlled low-strength material under section 19-3.02G
2. Slurry cement backfill under section 19-3.02E
3. Foam concrete.

The water line to be abandoned on Mosquito Road noted as “Abandon (E)Water Pipe with Slurry” in the Project Plans shall use slurry as noted above. Storm drain pipes noted as “Abandon and Fill (E)Storm Drain Pipe” in the Project Plans may use any of the materials listed above.

71-6.03D Construction

Pipelines are to be abandoned in place by either plugging the ends or filling the entire pipeline with the material noted on the Plans and listed in section 71-6.03C, above.

No pipeline shall be abandoned until the new pipeline and all services, if applicable, are installed, tested, and in service.

Pipelines to be abandoned shall be securely closed at all pipe ends by an approved cap, blind flange, or, at manhole entries, by a watertight plug of concrete, or brick and cement mortar, not less than 2-feet thick.

When laterals are abandoned, they shall be capped with an approved fitting at the property line.

73 CONCRETE CURBS AND SIDEWALKS

Add to section 73-1.01:

Project is in a freeze thaw area and requires air entrained concrete.

Add to section 73-1.02A:

Recycled AB and/or appropriately ground and blended material generated from Remove Base and Surfacing activities can be used in lieu of Class 2 AB under the minor concrete items, as approved by the Engineer.

Material generated from Remove Base and Surfacing activities can be used in lieu of Class 2 AB under the minor concrete items as long as the material meets the grading requirements shown in the following table:

Sieve Size	Percent Passing
3"	100
3/4"	>45

Replace paragraph in section 73-1.02B with:

Detectable warning surface shall be Armor Tile Brick Red (Federal Color No. 22144) or approved equal unless otherwise shown on the Project Plans.

If a utility box is located within detectable warning surface, detectable warning surface shall be neatly trimmed around utility box to allow access to utility. Contractor is responsible for maintaining ADA compliance.

Detectable warning surfaces shall be wet-set in concrete. Surface applied Detectable Warning Surfaces, such as those attached by adhesives, are not authorized.

Add to Section 73-1.03A:

Detectable Warning Surfaces shall be installed per the manufacturer's specifications.

Replace paragraph in section 73-2.04 with:

Minor concrete for curbs shall be paid under the Minor Concrete types shown on the Bid Item List. The payment quantity for minor concrete curbs shall be linear feet as measured along the curb face. Class 2 aggregate base (or approved recycled material) required for the construction of Minor Concrete types shown on the Bid Item List shall be included in the unit price for each type. Recompaction of the existing base and/or subbase material below the Class 2 aggregate base required for the construction of Minor Concrete types shown on the Bid Item List shall be included in the unit price for each type. The various Minor Concrete bid items shall include all tools, equipment, materials, and labor necessary to construct the Minor Concrete curbs including, but not limited to, concrete, reinforcing bars (if necessary), and all other incidental work for constructing the various Minor Concrete curbs.

Add to section 73-3.03:

All concrete used for curb ramps, driveways, sidewalks, and landings shall be broom finished.

Replace paragraph in section 73-3.04 with:

Minor concrete for sidewalk, seatwall and stairs shall be paid under the appropriate Minor Concrete types shown on the Bid Item List. The payment quantity for the Minor Concrete (Sidewalk) bid item is the area of sidewalk installed measured parallel to the ground surface in square feet. The payment quantity for the Minor Concrete (Seatwall) bid item is the length of seatwall installed measured parallel to the ground surface along the top of seatwall in linear feet. The payment quantity for the Minor Concrete (Stairs) bid item is the volume

Excavation is unclassified. The Contractor shall complete all excavations regardless of the type of materials encountered. The Contractor shall make his own estimate of the kind and extent of the various materials which will be encountered in the excavation.

77-1.02B Pipe Zone

Material for the pipe zone shall be 3/8 inch Class II Aggregate Base. The aggregate size gradation shall comply with Caltrans Specifications. The sand equivalent shall be 30 minimum. The durability index shall be 35 minimum.

77-1.02C Backfill

Material for the initial backfill from 12 inches above the top of the pipe to subgrade shall be 3/4 inch Class 2 Aggregate Base. The aggregate size gradation shall comply with Caltrans Specifications. The sand equivalent shall be 30 minimum. The durability index shall be 35 minimum.

77-1.03 CONSTRUCTION

77-1.03A Excavation

77-1.03A(1) General

Excavation for pipelines, fittings, and appurtenances shall be open trench to the depth and in the direction necessary for the proper installation of the same as shown on the contract drawings or as otherwise approved by the Engineer. Excavation shall only proceed when the necessary materials have been delivered to the site.

The Contractor shall bear all costs of disposing of roots and all other waste materials from the excavation. Material shall be disposed of in such a manner as to meet all requirements of the state, county, and local regulations regarding health, safety, and public welfare. Non-flammable material and flammable material, when burning is not permitted, shall be disposed of off the construction site in an approved location at the Contractor's expense.

The Contractor shall remove obstructions within the trench area or adjacent thereto, such as abandoned concrete structures, logs, and debris of all types, without additional compensation. The Engineer may, if requested, make changes in the trench alignment to avoid major obstructions, if such alignment can be made without adversely affecting the intended function of the facility.

77-1.03A(2) Existing Pavement Removal

Pavement to be removed shall be removed and replaced in the manner prescribed by the Standard Specifications.

Existing pavement, curbs, gutters, sidewalks and driveways to be removed in connection with construction shall be neatly saw cut prior to removal. Saw cuts shall have a minimum depth of one inch in concrete sidewalk.

If the saw cut in a sidewalk or driveway would fall within 12 inches of a construction joint, expansion joint, or edge, the concrete shall be removed and replaced to the joint or edge. If the saw cut would fall within 6 inches of a score mark, the concrete shall be removed and replaced to the score mark. Concrete shall be removed by jackhammer.

77-1.03A(3) Grading and Stockpiling

The Contractor shall control grading in a manner to prevent water running into excavations. Obstructions of surface drainage shall be avoided and means shall be provided whereby storm and wastewater can be uninterrupted in existing gutters, other surface drains, or temporary drains. Material for backfill or for protection of excavation in public roads from surface drainage shall be neatly placed and kept shaped so as to cause the least possible interference with public travel. Free access must be provided to all fire hydrants, water valves, meters and private drives.

77-1.03A(4) Line and Grade

The Contractor shall excavate the trench to the lines and grades shown on the plans. Any deviations shall first be approved by the Engineer.

The trench shall be excavated to a minimum depth of 6 inches below the bottom of the pipe. The sides of the trench shall be excavated and maintained as nearly vertical as is practical.

77-1.03A(5) Trench Support

The trench shall be adequately supported and the safety of workers provided for as required by the standard of the appropriate regulatory agency.

All shoring for open excavations shall conform to the State of California, Department of Industrial Relations, Division of Industrial Safety "Construction Safety Orders."

The Contractor shall be responsible for adequately shored and braced excavations so that the earth will not slide, move or settle, and so that all existing improvements of any kind will be fully protected from damage.

No shoring once installed, shall be removed until the trench has been approved for backfill operations. Removal of shoring shall only be accomplished during backfill operations and in such a manner as to prevent any movement of the ground or damage to the pipe or other structures.

The Contractor shall obtain all permits for any excavations over five feet in depth into which a person is required to descend or any excavation less than five feet in depth in soils where hazardous ground movement may be expected and into which a person is required to descend.

Excavated material shall not be placed closer than two feet from the top edge of the trench. Heavy equipment should not be used or placed near the sides of the trench unless the trench is adequately braced.

77-1.03A(6) Use of Explosives

Blasting is not permitted.

77-1.03A(7) Preservation of Trees

Excavation within the dripline of any tree shall conform to the following. Trees shall not be removed outside of fill or excavated areas, except as authorized by the Engineer.

Tree roots larger than 2 inches in diameter shall not be cut and shall be kept moist during exposure. For damaged or severed root systems, trees shall be trimmed to compensate for the decreased root system. Trimming shall be done to the satisfaction of the Inspector. All roots shall be neatly cut with saw or sharp cutter.

77-1.03A(8) Dewatering

The Contractor shall provide and maintain, at all times during construction, ample means and devices with which to promptly remove and properly dispose of all water from any source entering the excavations or other parts of the work. 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. Said methods may include well points, cofferdams, sump pumps, suitable rock or gravel placed below the required bedding for drainage and pumping purposes, temporary pipelines and other means, all subject to the approval of the Engineer.

Dewatering for the structures and pipelines shall commence when groundwater is first encountered and shall continue until the backfill at the pipe zone has been completed.

The Contractor shall dispose of the water from the work in a suitable manner without damage to adjacent property. No water shall be drained into work built or under construction without prior consent of the Engineer. Water shall be disposed in such a manner as not to be a menace to public health.

The Contractor shall be responsible to obtain all required Local and State Permits.

Dewatering is incidental to other items of work and no additional compensation will be allowed for dewatering.

77-1.03A(9) Correction of Faulty Grades

Any over-excavation carried below the grade as specified or shown, shall be rectified by backfilling with approved sand and/or graded gravel, and shall be compacted to provide a firm and unyielding subgrade and/or foundation, as directed by the Engineer.

77-1.03A(10) Structure Protection

Temporary support, adequate protection, and maintenance of all underground and surface structures, drains, sewers, and other obstructions encountered in the progress of the work shall be furnished by the Contractor at his expense and subject to the approval of the Engineer. Any structure that has been disturbed shall be restored upon completion of the work.

77-1.03A(11) Trench Width and Grade

The width of the trench within the pipe zone shall be such that the clear space between the barrel of the pipe and the trench wall shall not exceed the amount shown in the standard details. In general, the following shall be adhered to:

Nominal Pipe Diameter	Trench Width Minimum	Trench Width Maximum
12" or less	O.D. + 12"	O.D. + 18"
greater than 12"	O.D. + 18"	O.D. + 24"

Trench widths in excess of those specified must have prior written approval.

77-1.03A(12) Maximum Length of Open Trench

Unless otherwise specified or directed by the Engineer, the maximum length of open trench during working hours shall be 500 feet, or the distance necessary to accommodate twice the amount of pipe installed in a single day, whichever is greater. The maximum length of open trench appropriately covered during non-working hours is the distance necessary to accommodate the amount of pipe installed in a single day. The distance is the collective length of any location, including open excavation, pipe laying and appurtenant construction, and backfill, which has not been temporarily resurfaced. Failure by the Contractor to comply with the limitations specified herein may result in an order to halt progress of the work until compliance has been achieved. The Contractor shall provide proper barricades for excavated areas.

Open trenches must be appropriately covered during non-working hours. Open trenches are not allowed during the scheduled events listed in section 7-1.03. Prior to those events, all trenches must be temporarily resurfaced to the satisfaction of the Engineer.

77-1.03A(13) Rock Excavation

Excavation of unrippable rock requiring a larger excavator and/or hydraulic hammering will be paid for as an additional cost above and beyond the cost for excavation and trenching for ordinary excavation. The City Engineer will determine when rock excavation for unrippable rock is required per the definition below.

Definition of Rock: Rock encountered during the course of excavation which is sufficiently hard that it cannot be removed using a Caterpillar 320 class excavator or equivalent using conventional methods shall be deemed inexcavatable. Rock deemed inexcavatable shall be removed by substantial means such as reciprocating hydraulic hammers and shall conform to this specification.

77-1.03A(14) Payment:

There is no separate bid item for trench excavation. Trench excavation shall be considered incidental to other items of work and no additional compensation will be allowed therefore.

77-1.03B Trench Foundation

77-1.03B(1) General

The trench bottom shall be graded to provide a smooth, firm and stable foundation at every point throughout the length of the pipe. Should large gravel and cobbles be encountered at the trench bottom or pipe subgrade, they shall be removed from beneath the pipe and replaced with clean imported sand which shall be compacted to provide uniform support and a firm foundation.

77-1.03B(2) Foundations in Poor Soil

If excessively wet, soft, spongy, unstable, or similarly unsuitable material is encountered at the surface upon which the bedding material is to be placed, the unsuitable material shall be removed to a depth as determined in the field by the Engineer. The Contractor's attention is called to section 77-7.03A(8), regarding his/her responsibilities in maintaining adequate dewatering procedures to ensure that an otherwise stable foundation will not be rendered unfit due to accumulation of water.

77-1.03C Backfill and Compaction

77-1.03C(1) General

Backfill shall be completed within the shortest possible time so that the construction area or street can be opened to traffic. If for any reason construction of the pipeline or appurtenances thereto is delayed, the City may require that the trench be backfilled and such areas or streets opened to traffic.

77-1.03C(2) Pipe Zone

After completion of the trench excavation and proper preparation of the foundation, 6 inches of bedding material shall be placed on the trench bottom for support under the pipe. Bell holes shall be dug to provide adequate clearance between the pipe bell and the bedding material. All pipes shall be installed in such a manner as to insure full support of the pipe barrel over its entire length. After the pipe is adjusted for line and grade and the joint is made, the remainder of the pipe bedding shall be placed to the limits as shown on the Drawings. All bedding material shall be compacted 90% as measured by Test Method California 231, prior to placement of subsequent backfill.

When bedding material is selected material or imported sand, the pipe bedding backfill shall be brought to optimum moisture content and shall be placed by hand in layers not exceeding 3 inches in thickness to the centerline (string line) of the pipe and each layer shall be solidly tamped with the proper tools so as not to injure, damage, or disturb the pipe. Backfilling shall be carried on simultaneously on each side of the pipe to assure proper protection of the pipe.

Each lift shall be "walked in" and supplemented by slicing with a shovel to ensure that all voids around the pipe have been completely filled. Mechanical compaction such as "pogo sticks" or "wackers", as approved, shall be used for compaction of pipe zone.

77-1.03C(3) Initial Backfill

The remaining portion of the trench shall be backfilled, compacted, and/or consolidated by approved methods to obtain a 90% compaction as measured by CTM 231. Backfill shall be good sound earth, sand or gravel. Bituminous pavement, concrete, rock, or other lumpy material shall not be used in the backfill unless these materials are scattered and do not exceed 6 inches in any dimension and are not placed within 1½ feet of the surface. Material of perishable, organic matter, spongy or otherwise improper nature, shall not be used.

When backfill is placed mechanically, the backfill material shall be pushed onto the slope of the backfill previously placed and allowed to slide down into the trench. The Contractor shall not push backfill into the trench in such a way as to permit free fall of the material until at least 18 inches of cover is provided over the top of the pipe. Under no circumstances shall sharp, heavy pieces of materials be allowed to be dropped directly onto the pipe or the tamped material around the pipe. Backfill shall be placed in layers not exceeding 8 inches and compacted by an approved method.

Heavy duty compacting equipment having an overall weight in excess of 125 pounds shall not be used until backfill has been completed to a depth of 2 feet over the top of the pipe.

If hydro-hammer is used for compaction of overlying materials, at least 4 feet of backfill must be placed over the top of pipe prior to its use. This is required to ensure that the pipe is not damaged.

77-1.03C(4) Final Backfill

Final backfill placed in trenches shall be compacted to a density of not less than 95%.

Backfill shall be placed in layers not exceeding 8 inches, compacted and brought up to the subgrade.

77-1.03D Excess Excavated Material

The Contractor shall make the necessary arrangements for, and shall remove and dispose of all excess excavated material. All surplus material not required for backfill or fill shall be disposed of by the Contractor outside the limits of the public right-of-way and/or easements at no liability to the City. Excess material becomes property of the Contractor and is incidental to other items of work.

No excavated material shall be deposited on private property unless written permission from the owner thereof is secured by the Contractor. Before the City will accept the work as being completed, the Contractor shall file a written release signed by all property owners with whom he has entered into agreements for disposal of excess excavated material absolving the District from any liability connected therewith.

Full compensation for haul-off and disposal of native trench material is included in the prices paid per linear foot of the respective sizes, grades, and types of pipes listed in the contract, and no additional compensation will be paid.

77-1.03E Restoration of Damaged Surfaces or Property

If any pavement, trees, shrubbery, landscaping, fences, poles, or other property and surface structures have been damaged, removed, or disturbed by the Contractor, whether deliberately or through failure to carry out the requirements of the contract documents, state laws, municipal ordinances, or the specific direction of the City, or through failure to employ usual and reasonable safeguards, such property and surface structures shall be replaced or repaired in-kind at the expense of the Contractor.

77-1.03F Final Clean-Up

After backfill has been completed, the right-of-way shall be dressed smooth and left in a neat and presentable condition to the satisfaction of the Engineer.

77-1.04 PAYMENT

There is no separate bid item for the material, equipment, or labor used to backfill the trenches, holes, depressions, pits, etc. or restoration of surfaces caused by removing, salvaging, abandoning, destroying, modifying, adjusting, rehabilitating existing or installing new drainage or water facilities and no additional compensation will be allowed therefore. Backfill of trenches and restoration of surfaces shall be considered incidental to other items of work.

77-2 TAPPING VALVES AND SLEEVES

77-2.01 GENERAL

77-2.01A Summary

This section governs materials and installation of tapping valves and sleeves. Valves shall be furnished and installed by the Contractor at the locations shown on the Approved Plans, or as required by the Engineer.

77-2.01B Submittals

Prior to the purchase of tapping valves and sleeves to be used in the City's system, the following items shall be submitted to and approved by the Engineer:

1. Manufacturer's catalog data and detail construction sheets showing the size to be used, valve and sleeve dimensions, pressure rating and materials of construction.
2. Manufacturer's catalog data and NSF certification seal on the lining to be used.

77-2.02 MATERIALS

77-2.02A Tapping Valves

Tapping valves shall be of the double disc or resilient seat type conforming to all requirements for gate valves in Section 77-4. Valves shall be furnished with a flanged end with centering ring on the tapping sleeve side. The outlet side of valve shall have a mechanical joint, except as otherwise approved. Seat rings shall be oversized to permit the use of full-size cutters.

77-2.02B Tapping Sleeves

Sleeves shall be 304 stainless steel or cast iron conforming to ASTM-A-126 Class B. Bolts, nuts, and washers shall be type 304 Stainless Steel. Gaskets shall be Buna-N rubber at each end of the sleeve. Sleeves shall have a ¾-inch NPT plug for air test.

77-2.02C Coating and Linings

Valves shall be coated and lined per Section 77-4. Cast iron sleeves shall be coated with two coats of asphalt varnish conforming to AWWA C504, except for face of flanges, bolts and nuts. Face of flanges shall be shop coated with a rust preventive compound.

77-2.03 CONSTRUCTION

77-2.03A Installation

Surface preparation, sleeve placement, and connection of valve shall be in accordance with manufacturer's recommendations. Method of installation may vary depending on type of pipe being tapped.

77-2.03B Testing

Valve and sleeve shall be air tested prior to pipe cutting. Valve and sleeve shall sustain an air pressure of 30 psi for 5 minutes. After acceptance of the air test the pipe can be tapped.

77-2.03C Tapping

Tapping shall only be done in the presence of the Inspector. The tapping mechanism shall be of the self-purging type so that cutting chips are removed from the tapping machine and do not enter the pipeline.

77-2.03D Size

The diameter of the tap shall be less than the diameter of the main being tapped.

77-2.04 PAYMENT

The tapping of valves and sleeves is considered incidental to other items of work and no additional compensation will be allowed therefore.

77-3 WATER SERVICE LINES AND APPURTENANCES

77-3.01 GENERAL

77-3.01A Summary

This section governs materials and installation of service line materials and fittings.

77-3.01B Submittals

Prior to the purchase of the material to be used in the City's system, the manufacturer's catalog data showing model, part number, pressure ratings, and materials of construction shall be submitted to and approved by the Engineer.

77-3.02 MATERIALS

77-3.02A Service Line Materials and Fittings

77-3.02A(1) General

Service line materials and fittings include service line pipe, service saddles, service fittings, meter stops, corporation stops, curb stops, and ball valves.

77-3.02A(2) Polyethylene Tubing (PE)

PE tubing shall be in accordance with AWWA C901 and correspond to iron pipe size (IPS). The tubing shall be marked with the following:

1. Nominal size,
2. Material code; i.e., PE 3406,
3. The word "Tubing" and dimension ratio,
4. AWWA pressure class; i.e., PC 160

5. AWWA designation AWWA C901,
6. Manufacturer's name or trademark,
7. Seal of testing agency.

The polyethylene material shall be type "3408" conforming to ASTM D3350. The pressure class shall be a minimum of 200 psi.

Stainless steel liners or inserts shall be used with PE tubing when compression type connections are specified or shown.

77-3.02A(3) Fittings

Fittings including PE tubing couplings, bends, unions, and adapters shall be constructed of bronze and shall be designed to join to IPS polyethylene tubing using a "stab type" connection (Mueller or approved equal) in ¾-inch and 1-inch sizes and compression type connections in 1½-inch and 2-inch sizes. Fittings shall also have male or female iron pipe-size-threaded ends and/or meter coupling nut or meter flange as required.

77-3.03 CONSTRUCTION

77-3.03A Polyethylene Tubing

Tubing and fittings should be stored in a way that prevents damage due to crushing or piercing, excessive heat, harmful chemicals, or exposure to sunlight for prolonged periods. The manufacturer's recommendations regarding storage should be followed.

Handling operations and trench installation and backfill shall be performed with reasonable care to prevent scratches, nicks, and gouges in the conduit.

Pipe excessively cut or kinked shall not be used.

Bends in PE tubing shall not occur closer than 10 diameters from any fitting or valve. The minimum radius of curvature is 30 diameters or the coil radius when bending with the coil. Bending of coiled tubing against the coil shall not go beyond straight. Polyethylene tubing that becomes kinked during handling or installation shall not be used, and care should be taken to ensure that kinking does not develop after installation. Service line from the main line tap to the angle meter stop shall be one continuous length of tubing.

PE tubing shall be installed in trench bottoms with 6-inches of bedding material to provide continuous and uniform support. The initial backfill shall be 6 inches above the tubing and shall be materials free from rock, stones, and debris.

77-3.03B Fittings

Installation of fittings shall be as recommended by the manufacturer. Pipe or fittings made of nonferrous metals (bronze) shall be isolated from ferrous metals with insulating unions or couplings.

77-3.03D Hydrostatic Testing

The Contractor shall hydrostatic test all appurtenances in place with the pipe being tested.

77-3.03E Fire Hydrant Assembly and Lateral

Under this item, the Contractor shall provide all labor and material necessary to install fire hydrant assembly and corresponding lateral as shown on the plans or specified herein. Fire Hydrant assembly shall be installed per section 3.7 in El Dorado Irrigation District Design Standards and per El Dorado Irrigation District Standard Drawing No. W17. Fire hydrant shall be of the dry barrel type and have a 4 ½ inch connection and 2 – 2 1/2 inch hose nozzles.

77-3.04 PAYMENT

Measurement and payment for the Replace Water Service Line and 1" Water Service Line bid items shall be full compensation by each, as shown on the Project Plans. Work shall include all work required to hot tap the service (if necessary), installation of new service line, connection to existing water meter, cutting and capping

old water service line, if applicable, and any other work incidental to replacing and/or installing the water services as shown on the Project Plans.

Measurement and payment for the Remove and Relocate Water Meter bid item shall be full compensation by each, as shown on the Project Plans. Work shall include all work required to disconnect, remove and relocate the existing water meter and existing meter box to the proposed location, and any other work incidental to relocating the water meter as shown on the Project Plans.

Measurement and payment for the Water Meter and Box bid item shall be full compensation by each, as shown on the Project Plans. Contract price shall include all labor and equipment necessary to connect the new meter to the water service line at the location shown on the Project Plans. City is to provide the new water meter and meter box and lid. Contractor shall place new meter per the locations shown on the project plans or coordinate new meter placement with City inspector prior to excavation.

The Contractor shall be responsible for examining all specified properties to determine all labor, materials, and equipment necessary to install a new 1-inch polyethylene water service; removing existing 1-inch meter, meter box and service line; and complete the installation of the new meter, and meter boxes as specified in the project plans. This includes, but not limited to, furnishing valve(s), service saddle, corp stop, curb stop, pipe, fittings, couplings, excavation, drain rock, backfill and compaction, furnishing and installing new in-tract line, tie-in to existing in-tract line, temporary and permanent surface restoration and all other incidentals necessary to complete the item. No additional compensation will be made if wet connections are required.

Fire Hydrant Assembly & Lateral shall be paid for on a per unit basis. Measurement shall be based on the actual number of fire hydrants installed. The contract price for installing Fire Hydrant Assembly & Lateral bid item shall include full compensation for all labor, materials, tools, equipment and incidentals for doing all work involved in furnishing and installing the Fire Hydrant Assembly & Lateral as specified per Section 3 of the El Dorado Irrigation District Design and Construction Standards, as shown on the plans and these Special Provisions, and as directed by the City Engineer.

77-4 WATER MAIN CONSTRUCTION

77-4.01 GENERAL

77-4.01A Summary

This section governs materials and installation of water main line materials and fittings; including laying, jointing, bedding, testing and approvals. All incidentals and appurtenant operations necessary for the construction of pipelines shall be done in strict accordance with the drawings and other terms and conditions of the contract.

The contractor shall also furnish all equipment, tools, labor and materials required to rearrange sewers, conduits, ducts, pipes, or other structures as may be necessary to provide installation as shown and specified.

All standard specifications, i.e., ASTM, etc., made a portion of these specifications by reference shall be the latest edition and revision thereof.

The contractor shall be responsible for all material furnished by him and shall replace it at his own expense, should the material be defective in manufacture or damaged in handling after delivery by the manufacturer. This shall include the furnishing of all material and labor required to replace defective material discovered prior to final acceptance of the work.

Pipe surfaces shall be free from nicks, scratches and other blemishes. The joining surfaces of pipe spigots and of integral bell and sleeve reinforced bell sockets shall be free from gouges or other imperfections that might cause leakage.

77-4.01A(1) Connection to Existing System

Includes all tools, equipment, materials, and labor necessary to connect the proposed water system to the existing water system and abandon the existing mainline, including but not limited to coordination with the

City; temporary shut-down of the water system where required; development of groundwater and pipeline dewatering; potholing, removal and disposal of the existing pipe as needed to make the connection; sawcutting, excavation, spoiling, shoring, temporary plating, bedding, placement, couplings, bends, thrust blocking, restraints, backfill, compaction of backfill, temporary surface pavement, temporary and permanent surface pavement, concrete restoration, landscaping restoration, and striping required that is above and beyond what is needed to install the new waterline; cutting the existing pipe; removing portions of the existing pipe; safely and properly disposing of removed pipe; concrete caps; fittings required for the abandonment and connection; and all incidental work in the Connect to Existing Water System bid item. This item includes the removal and disposal of up to 20 linear feet of existing water pipe per connection location.

Connect to Existing Water System includes all labor, equipment, materials, preparation of a Connection and Abandonment Plan and coordination necessary to complete the mainline connections, abandonments, and outages. The proposed water system is to be isolated from the existing City system until pressure testing and bacteriological sampling has passed. The Contractor shall designate the method and sequence of connecting to existing mains for the City Engineer's approval to minimize contamination danger. Connections to existing facilities shall not be made prior to obtaining satisfactory tests required by these Special Provisions.

All demolished materials shall be removed from the Site and disposed of by the Contractor. The Contractor shall exercise extreme care and meet all safety requirements of OSHA when working, handling, removing, and disposing asbestos cement pipe. The Contractor shall be solely responsible for all injuries, damages, or liabilities of any kind, caused by working, removing, and handling of such material or equipment.

The Contractor shall provide the City a schedule of the proposed work and coordinate with the City on all water system outages. The Contractor shall determine the extents of the outages and the effected parcel required during connections to the existing system and service switch-overs.

The Contractor will be responsible for notifying the City and property owners 72 hours prior to any shut-down planned to occur to change over services to the new line or to connect to the existing system. Manipulation of existing valves shall only be done by the City utility personnel.

Transition coupling shall be installed when connecting the new water pipe to the existing pipe.

77-4.01B Storage and Care

The Contractor shall be responsible for the safe storage of material until it has been incorporated into the completed project. The interior of all pipe and fittings shall covered or capped to be kept free from dirt and foreign matter at all times

Pipe shall be stored at the job site in unit packages provided by the manufacturer. Caution shall be exercised to avoid compression, damage or deformation to bell ends of the pipe. If pipe is to be exposed to direct sunlight for more than 14 days, pipe must be covered with an opaque material while permitting adequate air circulation above and around the pipe to prevent excessive heat accumulation. Gaskets shall be protected from excessive exposure to heat, direct sunlight, ozone, oil and grease.

77-4.01B Submittals

Submittals shall be provided for the following items plus all additional items required in the specifications for the particular type of pipe:

1. Pipe and jointing material
2. Fittings
3. Specialties

77-4.02 MATERIALS

77-4.02A Main Line Materials and Fittings

77-4.02A(1) General

Water main line materials shall be either:

- PVC pipe conforming to AWWA C-900, Class 235 (DR-18), or Class 305 (DR-14) or
- Ductile Iron Pipe conforming to AWWA C-151, Pressure Class 350

Steel pipe for waterline encasement shall be:

- Welded steel encasement pipe. The encasement pipe shall meet the requirements of ASTM A139, Grade B, and shall be bituminous coated on the outside. All joints shall be fully welded on the circumference.

Water main line shall as specified in the plans, and shall have the same outside diameter (O.D.) as that of cast iron pipe (C.I.P.O.D.) in the sizes furnished.

- a. Markings - Each standard or random length of pipe shall be clearly marked with the following:
 - i. Nominal size and O.D. base
 - ii. Material code "PVC 1120" or "DI" or "Ductile"
 - iii. Dimensional ratio; i.e., DR 18 where DR is equal to thickness "divided by" diameter
 - iv. AWWA pressure class; i.e., PC 150
 - v. AWWA designation "AWWA C-900"
 - vi. Manufacturer's trade name and production record code
 - vii. Seal (mark) of testing agency
- b. Pressure Class - PVC C-900, Class 235 (DR-18), or Class 305 (DR-14), or DIP Class 350, as specified in the Project Plans, will be installed for typical pipe installation.
- c. Laying Length - The standard laying length shall be 20 feet (plus or minus 1 inch) in all classes. A maximum of 15 percent may be furnished in random lengths of not less than 10 feet each. At locations where the water main crosses the sewer main, the water pipe shall be installed such that an 18' minimum length stick of pipe is centered at the crossing,
- d. Joint Type - Pipe joints shall be made using an integral bell with an elastomeric gasket push-on type joint or using machined couplings of a sleeve type with rubber ring gaskets and machined pipe ends to form a push-on type joint.

Solvent cement joints are strictly prohibited.

One coupling complete with one gasket each shall be factory assembled to each length of standard length pipe furnished. The companion gasket for each coupling will be packaged separately for shipment. Couplings shall be the same class as the pipe. Manufacturer shall furnish gasket lubricant for each quantity of pipe furnished. When additional couplings are furnished as separate items, two gaskets shall be furnished and installed in the gasket recess of each coupling.

- i. Couplings - Where couplings are used, they shall meet the requirements of AWWA C-900. Couplings shall be as furnished by the manufacturer. Couplings shall be marked with same information as the pipe.
- e. Physical Test Requirements - Hydrostatic burst and sustained pressure and crushing tests shall be conducted at the factory in accordance with AWWA C-900. All testing shall be subject to inspection by the District. If required, the manufacturer shall supply a letter of certification attesting to their pipe meeting these specifications.
 - f. Lining and Coating of DIP pipe – The exterior shall be epoxy enamel coated.
 - g. Polyethylene Encasement of DIP Pipe - Pipe and fittings shall be wrapped in polyethylene. Polyethylene wrapping shall be in accordance to AWWA C-105, latest revision. Minimum thickness shall be 0.008 inch (8 mils).
 - h. Locating Wire - Locating wire shall be single strand, 10-gauge copper wire, with solid thermoplastic insulation.
 - i. Warning Tape - Warning tape shall be 2-inch-wide non-metallic tape marked "waterline."

77-4.02A(2) Fittings

- a. Ductile Iron Fittings – All fittings 11-1/4 degrees and greater shall be ductile iron per this specification unless otherwise noted on the contract plans
- b. All fittings shall be rated equally to the class of pipe. End connections may be push-on, mechanical, or flanged joints except where specifically shown otherwise on the plans or Standard Drawings.
- c. All fittings shall be restrained and require thrust blocking per this specification.
- d. Ductile Iron Mechanical Joint Sleeve - Mechanical Joint sleeves shall be allowed for vertical angles equal to or less than 1 1/2 degrees. Fitting angle shall be as specified on the plans or as necessary to achieve the desired minimum cover based on field conditions.
- e. Ductile Iron High Deflection Coupling - High deflection couplings shall be allowed for horizontal angles equal to or less than 1/2 the manufacturers recommendation. Fitting angle is specified on the plans equal to or less than 5 degrees.
- f. Ductile iron compact fittings, per AWWA C153, are allowed.
 - i. Flanges, Bolts and Gaskets - Flanges shall be flat-faced and meet either the requirements of AWWA C-207 for steel hub type flange fittings, or AWWA C-110 Section 10-18 for ductile iron fittings. The flanges shall be marked with the size, name or trademark of the manufacturer and with the AWWA Class; i.e., "E", or pressure rating.
Bolts and nuts shall be cadmium plated, A307, Grade B of domestic origin. Cadmium plating shall conform to Federal Specification QQ-P-415-1956, Type 1, Class 1.

Gaskets shall be 1/8-inch thick and be of the full face self centered cloth impregnated type. The following table shows the bolt pattern for ASME/ANSI 16.1 Class 125 cast iron flange. This pattern is rated at 275 psi for Class E steel pipe flanges and 250 psi for ductile iron pipe fittings.

Bolt Hole			
Pipe Size	Diameter (Inches)	Bolt Diameter & Length (Inches)	Number of Bolts
6"	7/8	3/4 x 3 1/2	8
8"	7/8	3/4 x 3 1/2	8
10"	1	7/8 x 4	12
12"	1	7/8 x 4	12
14"	1 1/8	1 x 4 1/2	12
16"	1 1/8	1 x 4 1/2	16
18"	1 1/4	1 1/8 x 5	16
20"	1 1/4	1 1/8 x 5 1/2	20

The contractor shall uniformly tighten the bolts and prevent bending or torsional strains. Proper anchorage shall be provided.

- ii. Mechanical Joint Fittings - The mechanical joints shall meet AWWA C111. That standard covers the joint as well as gaskets and bolts.

T-bolts and nuts shall be manufactured of corrosion-resistant high- strength low-alloy Cor-Ten steel or equal. Number and length of bolts shall be as follows:

Pipe Size	Number of Bolts	Bolt Diameter & Length (Inches)
6"	6	$\frac{3}{4}$ x 3 $\frac{1}{2}$
8"	6	$\frac{3}{4}$ x 4
10"	8	$\frac{3}{4}$ x 4
12"	8	$\frac{3}{4}$ x 4
14"	10	$\frac{3}{4}$ x 4
16"	12	$\frac{3}{4}$ x 4 $\frac{1}{2}$
18"	12	$\frac{3}{4}$ x 4 $\frac{1}{2}$
20"	16	$\frac{3}{4}$ x 4 $\frac{1}{2}$

3. Coatings and Linings – All fittings shall be bituminous lined and coating per AWWA C110. Threaded holes and mating surfaces shall not be coated. Flange faces shall be coated with asphaltic varnish only. There shall be no coating materials or mortar in gasket grooves.
4. Mechanical Couplings - Couplings include transition couplings, flanged coupling adapters, flexible and insulated couplings.
 - a. Coupling Sleeves and Flanges - Coupling sleeves and flanges may be of gray iron or carbon steel.
 - b. Bolts and Nuts for Flanges - Bolts and nuts for buried and submerged flanges, flanges in underground vaults and structures, and flanges located outdoors above ground shall be cadmium plated, A307, Grade B. Provide one washer for each nut. Each washer shall be of the same material as the nut.

77-4.02A(3) Transition Coupling

The following governs the furnishing and installation of transition couplings. Transition couplings shall be Romac 501, Smith-Blair Omni 441, Rockwell 433, or Ford FC1.

77-4.02A(4) Flexible Coupling

The following governs the furnishing and installation of flexible couplings. Flexible couplings shall be APAC, Baker 200 series, JCM, Rockwell 400 series or Romac.

77-4.02A(4) Flanged Coupling Adaptors

The following governs the furnishing and installation of flange coupling adapters. Flanged coupling adapters shall be Romac FC400 Series, APAC, Baker, JCM, or Rockwell equal. Pipe restraining systems shall be Romac 600 Series, APAC, Baker, JCM, or Rockwell equal.

77-4.02A(5) Joint Restraint

For bends less than 45 degrees, restrained pipe joints shall be installed per manufacturer's recommendations and conform to requirements in the EID Technical Specifications Section 33 11 13. Restrained joints shall be installed at no extra cost to the City. Custom PVC fittings per this specification shall be restrained using an EBAA Series 2500 joint restraint or approved equal.

Restrained length shall be as required per manufacturer's recommendations and shall be a minimum of 18-feet of restrained pipe into the fitting from all directions.

Mechanically restrained joints shall be required along water pipe where less than 10' horizontal separation and 1' vertical separation for any parallel sewer pipeline cannot be met.

Mechanically restrained joints shall be required along water pipe within 10' of the outside edge of the crossing sewer pipe where less than 1' vertical separation above the sewer pipe cannot be met.

Mechanically restrained joints shall be required along water pipe within 5' of the outside edge of the crossing storm drain pipe where less than 1' vertical separation above the sewer pipe cannot be met.

77-4.02A(6) Thrust Blocking

Thrust blocks shall be installed at all tees, bends (45 degrees or greater), and dead ends, even if they are not shown on the plans. Thrust blocks shall conform to the requirements of these Special Provisions and EID Technical Specifications Section 33 11 13, EID Design and Construction Standards and EID Standard Drawing W11 and W11A. Thrust blocks shall be installed at no extra cost to the City.

77-4.02B Execution

77-4.02B(1) Handling and Transportation

Handling and transportation of pipe shall be in accordance with the pipe manufacturer's published instructions. Heavy canvas, or nylon slings of suitable strength shall be used for lifting and supporting materials. Chains or cables shall not be used. Pipe and fittings shall not be stored on rocks or gravel, or other hard material which might damage the pipe. All rubber gaskets shall be stored in a cool, well-ventilated place and should not be exposed to the direct rays of the sun. Gaskets shall not be allowed in contact with oils, fuels, petroleum, or solvents.

77-4.02B(2) Pipe Laying

Pipe shall be laid in accordance with the pipe manufacturer's published instructions, as complimented and modified herein and in the plans.

1. Cleanliness - The interior of pipes shall be clean of foreign materials before sections of pipe are installed and shall be protected to prevent entry of foreign materials after installation.

Open ends of installed pipe shall be sealed with watertight plugs or other approved means at times when pipe installation is not in progress.

Ground water shall not be allowed to enter the pipe.

2. Inspection Before Installation - All pipe and fittings shall be carefully examined for cracks and other defects just prior to installation. Spigot ends shall be examined with particular care as this area is the most vulnerable to damage from handling.

Defective pipe or fittings shall be laid aside for inspection by the City, who will prescribe corrective repairs or rejection.

3. Lowering of Pipe Material into Trench - Proper implements, tools, and equipment, satisfactory to the City, shall be provided and used by the Contractor, for the safe and convenient performance of the work. All pipe, fittings, valves, and hydrants shall be carefully lowered into the trench piece by piece in such a manner as to prevent damage to the water main materials and protective coatings and linings.

Under no circumstances shall water main materials be dropped or dumped into the trench. If damage occurs to any pipe, fittings, valves, hydrants or water main accessories in handling, the damage shall be immediately brought to the City's attention.

4. Laying of Pipe - Pipe shall be laid in trenches to the line and grade indicated on the plans and as specified.

Every precaution shall be taken to prevent foreign material from entering the pipe while it is being placed in the trench. If the pipe laying crew cannot install the pipe into the trench without getting earth into it, the City Inspector may require a heavy tightly-woven-canvas bag of suitable size, or plastic caps to be placed over each end of the pipe prior to installation and left there until the connection is made to the adjacent pipe. During laying operations, no debris, tools, clothing or other material shall be placed in the pipe.

As each length of pipe is placed in the trench, the spigot end shall be centered in the bell or coupling, and the pipe forced home and brought to correct line and grade. The pipe shall be secured in place with approved backfill material tamped under it, except at the bells or couplings. Precautions shall be taken to prevent dirt from entering the joint space.

Joints shall be assembled in accordance with the manufacturer's instructions.

Each joint shall be checked with a feeler gauge to assure proper seating of the gasket.

5. Cutting of Pipe - Field cuts and connections shall be in accordance with the pipe manufacturer's published instructions.

The cutting of pipe for inserting valves, fittings, or closure pieces shall be done in a neat and workmanlike manner without damage to the pipe so as to leave a smooth end at right angles to the axis of the pipe. The pipe shall be marked around its entire circumference prior to cutting to assure a square cut. A factory finished beveled end shall be used as a guide for proper bevel angle (15deg) and depth of bevel plus the distance to the insertion reference mark. The end shall be beveled using a PVC pipe beveling tool. Round off any sharp edges on the leading edge of the bevel with a pocket knife or a file.

When installing 8, 10 and 12-inch PVC pipe, mechanical joint or push-on type fittings designed for ductile iron pipe shall be used. When connecting PVC pipe into the bell end of cast iron pipe or into push-on type fittings, the end should be rebeveled, similar to the bevel on ductile iron pipe. When connecting to mechanical joint fittings, the end of the PVC pipe should not be beveled.

6. Allowable Deflection - The maximum allowable angular deflection at each joint shall be zero (0) degrees in any direction. Twelve (12) inch PVC pipe can be joined with high-deflection couplings shall not exceed 5-degree total deflection per coupling. The pipe shall not be deflected at the joints to a lesser radius than the minimum shown below:

Size, Inches	Minimum Radius of Curvature, Ft.
6	200
8	250
12	Fitting Required

7. Locating wire and warning tape shall be placed on top of pipe zone backfill centered over pipe as shown on the Plans.

77-4.02B(3) Fittings

Fittings shall be installed in the manner specified herein for cleaning, laying and joining pipe.

1. Coat and wrap fittings.
2. Anchorage for Fittings - All fittings, unless otherwise specified, shall be provided with a mechanically restrained joint constructed against undisturbed soil as shown on the Standard Drawings.
3. Thrust Blocks – Care shall be taken not to obstruct the outlets of tees or crosses which are intended for future connections. A waterproof paper or plastic bond-breaker shall be placed between plugs and caps and the concrete thrust block to facilitate their removal of the concrete in the future. Thrust blocks shall be poured against undisturbed earth and shall have at least the minimum dimensions shown on the Standard Drawings.
4. Mechanical Couplings - Oil, scale, rust, and dirt shall be cleaned from pipe ends. The Contractor shall clean gaskets in couplings prior to installing the coupling in accordance with the manufacturer's recommendations:

a. Bolt threads shall be lubricated with graphite and oil prior to installation.

1) Painting and Coating

a) The Contractor shall coat buried flexible pipe couplings, transition couplings, and flanged coupling adapters per Section 09900 and then wrap the couplings with polyethylene wrap per AWWA C-105.

b) The Contractor shall coat flexible pipe couplings (including joint harness assemblies), transition couplings, and flanged coupling adapters located indoors, in vaults and structures, and above-ground with the same coating system as specified for the adjacent pipe. A prime coat shall be applied at the factory.

5. Polyethylene Wrap - All ferrous metal shall be protected with polyethylene wrap. When it is not practical to wrap tees, crosses, and other odd-shaped pieces in a tube the item shall be wrapped with a flat sheet or split length of polyethylene tube by passing the sheet under the appurtenance and bringing it up around the body. Seams shall be made by bringing the edges together,

folding over twice, and taping down. Polyethylene shall be taped securely in place. Cuts, tears, punctures, or damage to polyethylene shall be repaired with adhesive tape, or with polyethylene sheet secured in place with adhesive tape.

77-4.02B(4) Testing

All completed waterlines, as well as the service assemblies and appurtenant structures, shall be tested by the Contractor in the inspector's presence prior to field acceptance of the work. The Contractor shall correct all defects in workmanship or materials which become evident by inspection or testing at any time during the work. Unless otherwise stated in this standard, all material utilized in the installation of new water mains shall comply with the California Waterworks Standard as currently amended and meet all AWWA standards that are hereby incorporated by reference.

Testing shall be done after the complete installation and compaction of all underground utilities, except as modified below:

Multiple pressure tests and disinfection operations are expected to be required as segments of new main are ready to be placed into service. The contractor may segment pressure testing of the new main into phases treating each as an independent main and tie-in.

The Contractor shall furnish all pipe and fittings for connection to the main, pumps, a calibrated water storage tank, disinfectant, and all other materials, fittings and pipelines required to perform the tests and make the necessary repairs. All equipment required for testing purposes that comes into contact with drinking water must be NSF 61 approved. All chemicals used for the construction, testing and disinfection of water mains shall be NSF/ANSI 60 approved.

When lines to be tested are in areas that will be paved, testing shall be done after subgrade is placed and compacted. At Engineer's discretion, testing may be performed after subgrade has been accepted. No lines eligible for final testing shall be accepted as passing until all underground construction that may disturb the waterline is compacted.

Pressure testing the new waterline shall conform (at a minimum) to the applicable AWWA standard for the pipe material being installed as required by the California Code of Regulations, Title 22.

Testing shall not commence until the water main (or water main segment) and all appurtenances have been completely installed. The Contractor may, at any time and at his expense, perform his own pressure and leak test; however these tests will in no way offset the requirement for a final pressure and leak test.

Technical Specification **77-4.02B(5)** covers the disinfection process. All pressure pipelines shall be hydrostatically tested prior to introducing chlorine to the new pipeline.

General - All test equipment, temporary valves, bulkheads, or other water control equipment and materials shall be determined and furnished by the Contractor, subject to the District's review. No materials shall be used which would be injurious to the construction or its future function.

Hydrostatic Testing Equipment - The Contractor shall be responsible for supplying and operating all testing equipment. In general, the testing equipment configuration shall consist of a pump receiving water from a calibrated storage tank. The pump discharge shall enter the water main through a tap or appurtenance. A pressure sustaining valve shall be placed on a tee located in the pump discharge line. Discharge from the pressure sustaining valve shall return to the calibrated storage tank. Other types or configurations of testing equipment shall be subject to District approval. The pressure pump shall operate continuous throughout the testing period. If the pump is stopped, the pressure shall not be allowed to drop more than two psi below test pressure before starting the pump.

The Contractor shall make all necessary provisions for conveying the water from the City designated source to the points of use at the Contractor's own cost.

Release of water from pipelines, after testing and disinfecting have been completed, shall be in accordance with a written disposal plan reviewed by the Engineer.

Hydrostatic Testing - The purpose of the hydrostatic test is both to test the ability of the pipeline to withstand pressure and test for allowable leakage. All hydrostatic testing shall follow the test setup and pressurization procedures as described in AWWA C600, C604, and C605. The following exceptions shall be incorporated into the testing procedure as outlined below:

A. Preparation - The line shall be filled with water at least 24 hours prior to testing when the pipeline has a mortar lining, thus allowing the lining material to become saturated. Water for testing shall be introduced at the low end of the section being tested to facilitate the elimination of air in the pipeline prior to testing. All pressure gauges used for determining hydrostatic testing shall be liquid filled and shall be capable of operating above the prescribed line test pressure. Gauges shall provide adequate visible ranges to allow accurate measurement for allowable leakage calculation. The Engineer reserves the right to reject provided gauge that does not meet this specification.

B. Test Section Length - The length of pipe being tested at any one time shall not exceed 2,000 linear feet unless otherwise approved by the City.

Test Pressure – The test pressure shall be 200 PSI or as outlined in C600, C604, or C605, whichever is greater, measured at the lowest point of the section of the pressure zone being tested.

D. Test Duration - Pressure in the water main shall be maintained within two psi of the calculated test pressure for a minimum of 2 hours.

E. Allowable Leakage - The allowable leakage per test section shall be calculated from the formula contained in this subsection. Different sized water mains that might be contained within the same test section shall be calculated separately and then added together.

$$L = \left(SD \frac{\sqrt{P}}{148,00} \right) \times 2$$

WHERE:

L = Testing allowance in Gallons (For a 2 Hour Test).

S = Length of pipeline tested in Feet.

D = Nominal diameter in Inches.

P = Average test pressure during the hydrostatic test in PSI.

Repairs - During the pressure and leakage test, all accessible appurtenances shall be inspected for visual signs of leakage. All visual leaks shall be corrected immediately, regardless of the amount of leakage, and the test shall be run again for its full duration. All leaks detected shall be repaired to a water tight condition. All repairs made shall be retested in accordance with the specifications. All repairs shall be made and a successful test accomplished prior to taking base bacteriological samples for the Disinfection Process.

77-4.02B(5) Disinfection

All completed waterlines, as well as the service assemblies and appurtenant structures, shall be tested by the Contractor in the inspector's presence prior to field acceptance of the work. In compliance with the California Code of Regulations, Title 22, only certified Distribution Operators are allowed to make decisions addressing the following:

1. Install, tap, re-line, disinfect, test and connect water mains and appurtenances.
2. Shutdown, repair, disinfect and test broken water mains.
3. Oversee the flushing, cleaning, and pigging of existing water mains.
4. Pull, reset, rehabilitate, disinfect and test domestic water wells.

5. Drain, clean, disinfect, and maintain distribution reservoirs

The Contractor shall correct all defects in workmanship or materials which become evident by inspection or testing at any time during the work. Unless otherwise stated in this standard, all material utilized in the installation of new water mains shall comply with the California Waterworks Standard as currently amended and meet all AWWA standards that are hereby incorporated by reference.

Testing shall be done after the complete installation and compaction of all underground utilities. However, multiple pressure tests and disinfection operations are expected to be required as segments of new main are ready to be placed into service. The contractor may segment disinfection operations and testing of the new main into phases treating each as an independent main and tie-in.

The pipeline must be hydrostatically tested, per the Technical Specification 77-4.02B(4) above prior to disinfection except as modified below: The Contractor shall furnish all pipe and fittings for connection to the main, pumps, a calibrated water storage tank, disinfectant, and all other materials, fittings and pipelines required to perform the tests and make the necessary repairs. All equipment required for testing purposes that comes into contact with drinking water must be NSF 61 approved. All chemicals used for the construction, testing and disinfection of water mains shall be NSF/ANSI 60 approved.

When lines to be tested are in areas that will be paved, testing shall be done after subgrade is placed and compacted. At Engineer's discretion, testing may be performed after subgrade has been accepted. No lines (eligible for final testing) shall be accepted as passing until all underground construction that may disturb the waterline is completed.

All waterlines shall follow the procedure outlined below:

A. Prevent contaminating materials from entering the water main during storage, construction, or repair. All materials that are stored shall have covered ends prior to being installed. All pipelines shall be swabbed to remove any debris that may have come into contact with the pipe during transportation. The swab shall be a dry or damp cloth, and shall not under any circumstances be saturated with a chlorine mix. The purpose for the swab is solely to remove debris and is in no way a form of disinfection.

B. Fill the new waterline slowly to remove all air pockets followed by flushing at a minimum of 3 feet per second or an approved velocity or volume to remove any material that may have entered the water main during construction.

C. Pressure test the new waterline to Technical Specification 02660 and conforming (at a minimum) to the applicable AWWA standard for the pipe material being installed as required by the California Code of Regulations, Title 22. Testing shall not commence until the water main and all appurtenances have been completely installed and are set to final grade. The Contractor may, at any time and at his expense, perform his own pressure and leak test; however these tests will in no way offset the requirement for a final pressure and leak test.

D. Prior to disinfection, a sampling plan for the bacteria and standard heterotrophic plate count (HPC) must be created by a licensed Distribution Operator and submitted to the Engineer for review. The samples can be collected at the approved representative locations.

The new pipeline shall be chlorinated utilizing an AWWA approved method only. After chlorination residuals have been verified the superchlorinated water shall be flushed from the main following all AWWA procedures.

F. After the new pipeline has been qualified by City staff, the Contractor can schedule a tie-in to the City system. The Contractor shall provide a written or e-mail notice to the Engineer a minimum of 5 working days before the proposed scheduled tie-in. City approved tie-in days are Tuesday- Thursday. Requests for exceptions shall be provided to the City for review. The City reserves the right to adjust tie-in days based on system operation.

Submittals - The Contractor shall notify the City a minimum of three business days in advance of its proposed testing schedule for review and concurrence. The Contractor's proposed plans for water conveyance, disinfection, control, and disposal, shall also be submitted in writing.

MATERIALS

General - All test equipment, chemicals for chlorination, temporary valves, bulkheads, or other water control equipment and materials shall be determined and furnished by the Contractor, subject to City review. No materials shall be used which would be injurious to the construction or its future function.

Chlorine - Chlorine for disinfection shall be in the form of liquid chlorine, sodium hypochlorite solution only. Sodium hypochlorite shall be in accordance with requirements of AWWA B300. Sodium hypochlorite shall be certified as suitable for contact with or treatment of drinking water in accordance with NSF 60, Drinking Water Treatment Chemicals-Health Effects. Liquid chlorine shall be used only:

1. Under the direct supervision of a licensed Distribution Operator.
2. When appropriate safety practices are observed.

EXECUTION

General - The Contractor shall make all necessary provisions for conveying the water from the City designated source to the points of use.

All pressure pipelines shall be hydrostatically tested prior to introducing chlorine to the new pipeline. Disinfection shall be accomplished by chlorination and shall be completed by the Contractor. All chlorinating and testing operations shall be performed in the presence of the City. Per California Title 22, water systems shall utilize only certified Distribution Operators to make decisions addressing the disinfection, testing, and tie-in of new water mains and appurtenances to existing systems.

Disinfection operations shall be scheduled by the Contractor as late as possible during the contract time period so as to assure the maximum degree of sterility of the facilities before the work is accepted by the City. A bacteriological test and a standard heterotrophic plate count shall be performed by the City. However, it is acceptable to the City that the Contractor tie-in segments of new water main as they are ready for service.

Release of water from pipelines, after testing and disinfecting have been completed, shall be in accordance with a written disposal plan reviewed by the Engineer. All dechlorination equipment shall be capable of handling high flows with high levels of chlorine as required for adequate flushing of the new pipeline. The Contractor shall provide all documentation for acceptable reagents that will be used during the dechlorination process for review a minimum of 4 days prior. Discharges of highly chlorinated water that can make it to waters of the state or waters of the US are not allowed. Chlorinated water may only be discharged from a sampling apparatus (service line sample point, blow off sample point, fire hydrant sample point, air release valve sample point, etc.) of less than five gallons during disinfection verification only as approved by the licensed Distribution Operator.

Disinfecting - After completion of pressure testing operations, the Contractor shall flush and then sterilize all water mains, services, and appurtenances. All sterilization shall follow the procedures as described in AWWA C651. The following exceptions shall be incorporated into the testing procedure as outlined below:

A. Flushing – Where flow rates are not possible, flushing at the maximum expected flow rate for the pipeline for 4 volumes can be approved by the Engineer.

B. Disinfection Methods - Disinfection shall only consist of the continuous feed method or the slug method. No tablet or granule methods are allowed for disinfection of City waterlines.

C. Filling and Contact - Potable water shall be supplied from a temporary backflow connection to the existing system. The Contractor has two options when connecting to fill the new pipeline.

-Option one the Contractor can check out a City owned temporary water use meter and backflow device that will be tested and placed into service by the City.

-Option two the Contractor can provide a backflow for the temporary connection to be tested by City staff before the device can be placed into service. Precautions shall be taken to assure that air pockets are eliminated.

All appurtenances shall be sampled for both methods to verify that adequate disinfection has been met. This testing includes all verifications for the 3 hour or 24 hour chlorination procedures. These samples include but are not limited to all service lines, hydrants, water quality sampling stations, blow offs, and air releases. Sampling small diameter lines including services and air releases shall be completed within 10-15 seconds under a pencil sized flow. The service shall not be flushed as to take a sample from the main, but rather verify that the service line is completely disinfected. Fire hydrants and blow offs shall be sampled within 20 seconds of initializing a low flow. All water discharged shall be adequately de-chlorinated or control land applied as to not have any run off. Control land applies to less than five gallons at one location during testing verification only.

Final Flushing - Per the City's statewide National Pollutant Discharge Elimination System (NPDES) permit, no super-chlorinated water shall be discharged without proper notification and an appropriate neutralizing agent. The environment to which the chlorinated water is to be discharged shall be inspected then a reducing agent shall be applied to the water to be wasted to thoroughly neutralize the chlorine residual remaining in the water. The NPDES permit requires that the City notification for planned large discharges be submitted a minimum of 72 hours prior. The Contractor is required to provide the City a minimum of 4 days notification for any planned large water discharges. For any development projects related to final flushing all work shall be completed under the project specific NPDES permit. The Contractor is made aware to refer to the project specific NPDES permit prior to commencing flushing activities.

The system shall be flushed until chlorine levels of discharged flushing water are determined to be identical as the chlorine level of the potable water supplied from the temporary backflow connection from the existing system. This residual chlorine reading shall be recorded by the City and used as a baseline for residual chlorine testing which shall be performed 16 hours after final flushing.

Residual Chlorine Testing – 16 hours after final flushing and prior to bacteriological testing, residual chlorine samples shall be collected by a certified City distribution system operator at all appurtenances including residential services. If any residual chlorine sample is found to have dropped below 0.10 mg/l, or dropped $\geq 40\%$, the Contractor will be required to flush the new pipeline again, and re-sample after another 16 hour period. The Contractor may be required to re-chlorinate and re-disinfect if the pipeline fails residual chlorine testing a second time. The determination of the extent of the flush or re-chlorination shall be determined by licensed City operator based on the sample results.

E. Bacteriological Tests – After residual chlorine levels have been confirmed to be compliant, an HPC and total coliform test shall be collected. If the HPC is greater than 500 CFU/mL then the Contractor will be required to flush the new pipeline again, or re-disinfect, and re-sample until no coliform are present and the HPC is <500 CFU/mL per AWWA standard C651-14. The determination of the extent of the flush or re-chlorination shall be determined by licensed City staff based on the sample results.

Should any of the samples fail to meet minimum State of California, Department of Public Health requirements, the Contractor shall continue to chlorinate and flush the system, as directed, until a satisfactory sample is obtained. The Contractor is responsible for all costs associated with additional flushing and/or re-chlorination of the new pipeline. NOTE: High velocities in the existing system, resulting from flushing the new main, may disturb sediment that has accumulated in the existing mains. When check samples are taken, it is well advised to also sample water entering the new main.

77-4.02B(6) Gate Valves

77-4.02B(6)(1) GENERAL

This specification governs materials and installation of gate valves. Valves shall be furnished and installed by the Contractor at the locations shown on the approved Plans, or as required by the Engineer.

77-4.02B(6)(2) Submittals

Prior to the purchase of gate valves to be used in the City's system, the following items shall be submitted and approved by the Engineer:

1. Manufacturer's catalog data and detail construction sheets showing the size to be used, valve dimensions, pressure rating, and materials of construction.
2. Manufacturer's catalog data and NSF certification seal on the lining to be used.

77-4.02B(6)(3) MATERIALS

General

Gate valves 3 inches and larger, shall be resilient-seated suitable for buried service and meet the requirements of AWWA C-509, manually operated. All such valves shall be of the non-rising stem type, with double o-ring seal and shall turn to the left in a counter-clockwise direction to open the valve.

All valves shall be suitable for frequent operation as well as service involving long periods of inactivity. Valves shall be capable of operating satisfactorily with flows in either direction and shall provide zero leakage past the seat.

Valve Body

Body, bonnet, operating nut, and stuffing box shall be of iron with internal working parts of solid bronze. Exposed capscrews, bolts and nuts shall be stainless steel type 304.

The word "open" and an arrow indicating the direction to open, shall be cast on each valve body or operator.

Valve Operator

Valve operators shall be equipped with a 2-inch AWWA square operating nut. They shall be sealed and gasketed and lubricated for underground service. The operator shall be capable of withstanding an input torque of 450 ft. lbs. at extreme operator position without damage.

Coating and Lining

Interior surfaces, excluding seating areas, bronze, and stainless steel pieces, shall be epoxy lined to a dry film thickness of 12 mils. Liquid epoxy linings shall be applied in two coats. Liquid epoxy coating materials shall be listed in the NSF Listing for Drinking Water Additives, Standard 61, as certified for use in contact with potable water. Powder epoxy coating materials shall contain 100 percent solids. Surface preparation shall include White Metal Blast Cleaning.

Exterior surfaces shall be shop coated with two coats of asphalt varnish conforming to AWWA C-509. Flange faces shall be coated with a rust preventive compound.

Marking

The manufacturer shall show on the valve the size, manufacturer, class and year.

Gate

Gate shall be cast or ductile iron encapsulated in Buna-N rubber or nitrile elastomer.

Types of End Connection

End connections may be either flanged, push-on, or mechanical joint type per Section 77-2 or Section 77-3.

77-4.03 CONSTRUCTION

77-4.03A Storage

Valves shall be delivered and stored in the field with the port openings covered with plastic, cardboard or wood. These covers shall remain in place until the valve is ready to be installed. Valves shall not be stored in contact with bare ground. Valves shall not be stacked on top of one another.

77-4.03B Installation

77-4.03B(1) General

The weight of the valve shall be supported by firm ground or concrete blocking and not by the pipe. Buried valves having the top of the operating nut greater than three feet below the finished surface shall be provided with shaft extensions.

77-4.03B(2) Flanged Connection

Boltholes of flanged valves shall straddle the horizontal and vertical axis of the pipe to which the valves are attached. Flanges, bolts and nuts shall be cleaned by wire brushing before installing flanged valves. Threads on nuts and bolts shall be lubricated with oil and graphite. Nuts and bolts shall be tightened uniformly and progressively. If flanges leak under pressure testing, the Contractor shall loosen or remove the nuts and bolts, reseal or replace the gasket, reinstall or retighten the bolts, and retest the joints. Joints shall be watertight.

Bolts shall be tightened in an even manner by a series of steps until the torque required by the manufacturer is reached.

77-4.03B(3) Threaded Connection

Threaded joints shall be cleaned by wire brushing or swabbing. Teflon joint compound or Teflon tape shall be applied to pipe threads before installing threaded valves. Joints shall be watertight.

77-4.03B(4) Push-on Connection

Rubber ring grooves of joints shall be inspected before installation by the Contractor for ridges or holes that would interfere with the rubber ring. Interferences with the rubber rings shall be corrected to a satisfactory condition or the valve replaced, as required by the Engineer.

The pipe to be stabbed into the valve shall be beveled. Pipe shall be stabbed into the valve to the "Insertion Depth" as specified by the manufacturer.

77-4.03B(5) Mechanical Joint

Valve socket, gland, and pipe plain end shall be wiped clean of all sand, dirt and other foreign material prior to valve installation. Bolts shall be tightened in a manner by a series of steps until the torque required by the manufacturer is reached.

77-4.03B(6) Polyethylene Encasement

Valves and all bolted connections shall be encased with 10 mil polyethylene plastic film wrap installed as follows: The valves shall be wrapped by passing the flat sheet of film under the valve bottom and bringing the ends up around the body to the stem and securing it in place with 2-inch strips of the plastic adhesive tape. The polyethylene shall be secured around the valve stem in such a manner as to leave the stem free to operate. The film shall be brought completely around the flanges and secured to the pipe with a plastic adhesive tape on either side of the valve, flange or fitting.

77-4.03B(7) Operation

Immediately before installation, each valve shall be operated through one complete open-close cycle and visually checked for proper operation. Boxing of valves shall begin immediately after pipe sections containing the valve have been installed. All valve boxes, paving rings, and lids shall be brought to grade after pavement has been constructed.

77-4.03C Cut and Cap (E)Pipe

Under this item, the Contractor shall provide all labor and material necessary to cut and plug (cap) existing pipes as shown on the plans or specified herein.

Cut the existing pipe at the point designated on the plans or by the Engineer. Use a cutting method approved by the Engineer. Plugs and/or caps shall be concrete as shown on the Project Plans. Backfill the hole as specified in section 77-1 of these Special Provisions and per the requirements of El Dorado Irrigation District.

77-4.04 PAYMENT

The payment quantity for the various PVC C-900 Water Pipe and DIP Class 350 Water Pipe bid items is the length of the pipe installed measured parallel to the ground surface along the centerline of the trench at the finished grade in linear feet. The various PVC C-900 Water Pipe bid items shall include all tools, equipment, materials, and labor necessary to install the pipe including, but not limited to freighting, and furnishing of the pipe; sawcutting; excavation; spoiling; dewatering; shoring; removal and disposal of the existing trench material; temporary plating; bedding; placement; fittings and flanges; connecting to the system; restrained

joints; backfilling; compacting of backfill; temporary and permanent surface restoration, as necessary; and all incidental work in the installation of the new pipeline.

The payment quantity for the 14" Steel Casing Pipe bid items is the length of the pipe installed measured parallel to the ground surface along the centerline of the trench at the finished grade in linear feet. The 14" Steel Casing Pipe bid item shall include all tools, equipment, materials, and labor necessary to install the casing pipe including, but not limited to freighting and furnishing of the pipe; placement; fittings; and all incidental work in the installation of the new pipeline.

Connect to Existing Water System shall be paid for on a per unit basis. Measurement shall be based on the actual number of connection locations as identified on the plans. The contract unit price paid for each Connect to Existing Water System location shall include full compensation for all labor, materials, tools, equipment and incidentals, and for doing all the work involved, complete and in place, as specified in these Special Provisions, and as directed by the City Engineer, and no additional compensation will be allowed.

The various Gate Valve bid items shall be paid for on a per unit basis. Measurement shall be based on the actual number of Gate Valves installed. The contract unit price paid for each Gate Valve shall include full compensation for all labor, materials, tools, equipment and incidentals, and for doing all the work involved, complete and in place, as specified per Section 3.6 and EID Standard Drawing W12 of the El Dorado Irrigation District Design Standards and as directed by the City Engineer and Department of Public Works, and no additional compensation will be allowed.

The 2" Combination Blow Off and 1" Combination Air Valve bid item shall be paid for on a per unit basis. Measurement shall be based on the actual number of combination blow off and air valve assemblies installed. The contract unit price paid for each 2" Combination Blow Off and 1" Combination Air Valve shall include full compensation for all labor, materials, tools, equipment and incidentals, and for doing all the work involved, complete and in place, as specified per Section 3.8 and EID Standard Drawing W15D of the El Dorado Irrigation District Design Standards and as directed by the City Engineer and Department of Public Works, and no additional compensation will be allowed.

The various Tee bid items shall be paid for on a per unit basis. Measurement shall be based on the actual number of Tees installed. The contract unit price paid for each of these items shall include full compensation for all labor, materials, tools, equipment and incidentals, and for furnishing each item and doing all the work involved, complete and in place, as specified per the El Dorado Irrigation District Design Standards and as directed by the City Engineer and Department of Public Works, and no additional compensation will be allowed.

Cut & Cap (E)Pipe shall be paid on a per unit basis. Measurement shall be based on the actual number of locations where the main is to be cut and capped. The contract unit price paid per unit for Cut & Cap (E)Pipe shall include full compensation for all the labor, materials, tools, equipment, and incidentals for doing all the work involved in cutting, plugging, removing and disposing of existing pipe, backfilling and surface restoration as indicated on the plans, specified in the Standard Specifications, these Special Provisions, and as directed by the City Engineer, and no additional compensation will be allowed.

Testing, Disinfection, and Flushing shall be paid for on a lump sum basis. Measurement will be based on the percentage of work completed as determined by the City Engineer. The contract lump price paid for Testing, Disinfection, and Flushing shall include full compensation for all labor, materials, tools, equipment and incidentals, and for doing all the work involved, complete and in place, as specified per 02660 of the El Dorado Irrigation District's Technical Specifications, these Special Provisions and as directed by the City, and no additional compensation will be allowed.

77-5 SANITARY SEWER

77-5.01 PVC PIPE AND FITTINGS (GRAVITY SEWER)

This section of the specifications will govern the furnishing and installation of PVC pipe material and fittings; including laying, jointing, bedding, testing and approvals. All incidentals and appurtenant operations necessary for the construction of pipelines shall be done in strict accordance with the drawings and other terms and conditions of the contract.

The contractor shall also furnish all equipment, tools, labor and materials required to rearrange sewers, conduits, ducts, pipes, or other structures as may be necessary to provide installation as shown and specified.

All standard specifications, i.e., ASTM, etc., made a portion of these specifications by reference shall be the latest edition and revision thereof.

The contractor shall be responsible for all material furnished by him and shall replace it at his own expense, should the material be defective in manufacture or damaged in handling after delivery by the manufacturer. This shall include the furnishing of all material and labor required to replace defective material discovered prior to final acceptance of the work.

Pipe surfaces shall be free from nicks, scratches and other blemishes. The joining surfaces of pipe spigots and of integral bell and sleeve reinforced bell sockets shall be free from gouges or other imperfections that might cause leakage.

77-5.02 Storage and Care

The contractor shall be responsible for the safe storage of material furnished by or to him and accepted by him, and intended for the work, until it has been incorporated in the completed project. The interior of all pipe and fittings shall be kept free from dirt and foreign matter at all times.

Pipe shall be stored at the job site in unit packages provided by the manufacturer. Caution shall be exercised to avoid compression, damage or deformation to bell ends of the pipe. If pipe is to be exposed to direct sunlight for more than 14 days, pipe must be covered with an opaque material while permitting adequate air circulation above and around the pipe to prevent excessive heat accumulation.

Gaskets shall be protected from excessive exposure to heat, direct sunlight, ozone, oil and grease. Solvent cement when used shall be stored in tightly sealed containers away from excessive heat.

77-5.03 Submittals

Submittals shall be provided for the following items plus all additional items required in the specifications for the particular type of pipe:

1. Pipe and jointing material
2. Fittings
3. Specialties

77-5.04 MATERIALS

Polyvinyl Chloride (PVC) Pipe

PVC pipe and fittings shall be made in accordance to ASTM D-3034 or ASTM F679, and ASTM D1784 in both physical, dimensional and chemical requirements. Pipe shall be green unless otherwise approved.

Each standard or random length of pipe shall be clearly marked with the following:

1. Manufacturer's name
2. Nominal pipe size, i.e. 6-inch
3. Cell classification or material code; i.e. 12454-B
4. Dimension ratio; i.e. SDR35
5. Product type; i.e. Type PSM
6. Standard specification designation; i.e. 03034
7. Production code

The SDR shall be 26, unless otherwise stated on the Project Plans.

The standard laying length shall be 20 feet (plus/minus) 1 inch. A maximum of 15% may be furnished in

random lengths of not less than 10 feet each. At locations where the water main crosses the sewer main, the sewer pipe shall be installed such that an 18' minimum length stick of pipe is centered at the crossing.

Pipe joints shall be constructed with an integral bell and spigot with an elastomeric gasket push-on-type joint. Each spigot shall have a reference mark to facilitate pipe assembly. The gasket shall be contained in a machined groove on the pipe spigot such that when compressed the gasket will not displace and will form a positive, water tight seal. The gasket shall meet all requirements of ASTM F-477; pipe lubricant shall be listed with NSF (National Sanitation Foundation). Solvent cement joints are strictly prohibited.

Material samples shall be taken at the beginning of production and tested for compliance to ASTM D-3034 or ASTM F794.

Product Quality - The following tests shall be performed on a sample of pipe.

1. Flattening - Three specimens of pipe per pipe size furnished, minimum of 6 inches long, shall be flattened between parallel plates in a suitable press until the distance between the plates is 40% of the outside diameter of the pipe. The rate of loading shall be uniform and such that the compression is completed within 2-5 minutes. Remove the load, and examine the specimens for splitting, cracking, or breaking.
2. Pipe Stiffness - The pipe stiffness shall be determined utilizing procedures similar to those outlined in ASTM D2412. The stiffness of pipe shall be determined at a 5% deflection datum. Test specimens shall be a minimum of two pipe diameters or 4 feet in length, whichever is less.
3. Joint Tightness - Joint tightness shall be tested in accordance with ASTM D3212. The manufacturer shall provide a certificate of conformance for the above tests. Tests shall be performed on materials and products from the same lot of those furnished to the project.
4. Plant Inspection - The District may require inspection of production of the pipe. When requested, the manufacturer shall provide advance notice of when and where production of materials will begin.

Warning tape shall be two-inch wide green non-metallic tape marked "sewerline."

All fittings shall be as manufactured and furnished by the pipe supplier or approved equal and have bell and/or spigot configurations compatible with the pipe.

77-5.05 CONSTRUCTION

Handling and transportation of pipe shall be in accordance with the pipe manufacturer's published instructions.

Heavy canvas or nylon slings of suitable strength shall be used for lifting and supporting materials. Chains or cables shall not be used.

Pipe and fittings shall not be stored on rocks or gravel, or other hard material which might damage the pipe.

All rubber gaskets shall be stored in a cool, well-ventilated place and should not be exposed to the direct rays of the sun. Gaskets shall not be allowed in contact with oils, fuels, petroleum, or solvents.

Pipe shall be laid in accordance with the pipe manufacturer's published instructions, as complimented and modified herein and in the Project Plans.

The interior of pipes shall be clean of foreign materials before sections of pipe are installed and shall be protected to prevent entry of foreign materials after installation.

Open ends of installed pipe shall be sealed with watertight plugs or other approved means at times when pipe installation is not in progress.

Ground water shall not be allowed to enter the pipe.

All pipe and fittings shall be carefully examined for cracks and other defects just prior to installation. Spigot ends shall be examined with particular care as this area is the most vulnerable to damage from handling.

Defective pipe or fittings shall be laid aside for inspection by the Engineer, who will prescribe corrective repairs or rejection.

Proper implements, tools, and equipment, satisfactory to the City, shall be provided and used by the Contractor, for the safe and convenient performance of the work. All pipe, fittings, valves, and hydrants shall be carefully lowered into the trench piece by piece in such a manner as to prevent damage to the water main materials and protective coatings and linings. Under no circumstances shall water main materials be dropped or dumped into the trench. If damage occurs to any pipe, fittings, valves, hydrants or water main accessories in handling, the damage shall be immediately brought to the Engineer's attention.

Pipe laying shall proceed upgrade with spigot ends pointing in the direction of flow. After a section of pipe has been lowered into the prepared trench, the Contractor shall clean the end of the pipe to be joined, the inside of the joint, and the rubber ring immediately before joining the pipe. The assembly of the joint shall be made in accordance with the recommendations of the manufacturer of the type of joint used. The bell and spigot joint shall be pushed "home" in line with the installation band. If a piece has been cut, the usable end shall be clearly marked to show the proper amount of installation distance. All special tools and appliances required for jointing assembly shall be provided by the Contractor.

After the joint has been made, the Contractor shall check pipe for alignment and grade. The trench bottom shall form a continuous and uniform bearing and support along the length of the pipe between joints. Sufficient pressure in making the joint shall be applied to assure proper pipe alignment and joint makeup. Sufficient pipe zone material shall be placed to secure the pipe and prevent movement before the next joint is installed.

When pipe is laid within a movable trench shield, all necessary precautions shall be taken to prevent pipe joints from pulling apart when moving the shield ahead.

Precautions shall be taken to prevent excavated or other foreign material from getting into the pipe during the laying operation. At all times, when laying operations are not in progress, or whenever the workers are absent from the job, the Contractor shall close and block the open end of the last laid section of pipe to prevent entry of foreign material or creep of the gasketed joints.

Pipes which are stubbed off for manhole construction or for connection by others shall be plugged or closed off with temporary plugs as specified in the manhole specifications.

The Contractor shall take all precautions necessary to prevent the "uplift" or floating of the line prior to the completion of the backfilling operation.

Sewer pipe is to connect to manholes with a water tight boot or approved water tight ring.

Where pipe is connected to manholes or concrete structures, connections shall be made so that the standard pipe joint is located not more than 2 feet from the outside edge of the structure unless otherwise shown.

Field cuts and connections shall be in accordance with the pipe manufacturer's published instructions.

The cutting of pipe for fittings or closure pieces shall be done in a neat and workmanlike manner without damage to the pipe so as to leave a smooth end at right angles to the axis of the pipe. The pipe shall be marked around its entire circumference prior to cutting to assure a square cut. A factory-finished beveled end shall be used as a guide for proper bevel angle and depth of bevel plus the distance to the insertion reference mark. The end shall be beveled using manufacturer recommendations. Sharp edges on the leading edge of the bevel shall be rounded off with a file.

Sewer services shall be installed as shown on the Project Plans and per section 3.12 of the El Dorado Irrigation District Sewer Design Standards. Construction of sewer services includes all items necessary for the execution and completion of this work including, but not limited to sawcutting of existing surfacing, excavation, hand excavation including potholing to determine the location of existing sewer laterals before trenching, restoration of existing improvements (such as landscaping and hardscape, etc.), locating wire, connection to

existing structures, dewatering, pipe provision and installation, bedding, backfill, including imported backfill, aggregate base material, compaction of bedding material beneath and around the main and at the locations of active lateral connections, pipe cleaning, and installation, temporary and permanent resurfacing as needed, testing of new sewer line, and all other work necessary to install the sewer service pipe complete and in place. Connection of new service laterals to existing services shall be done in such a way that sewer services are not interrupted for more than two hours to any property or user.

This method includes the excavation of trenches large enough to remove the existing pipe and accommodate the installation of new service line in-place.

Any utilities damaged during the removal and replacement of sewer laterals must be repaired to the satisfaction of the utility owner.

The Contractor will restore all landscaped areas to their original condition or better as shown on the Plans and to the satisfaction of the Engineer. Any landscaped areas that were damaged by the Contractor and not shown for replacement on the Plans will be restored to the satisfaction of the Engineer at the Contractor's expense. While restoring the landscape, the Contractor will take care to protect the existing landscape.

The proposed sewer services connecting to existing services will include all work involved in excavating, exposing, cutting and connecting to the existing sewer service at the locations shown on the Project Plans.

Connect to Existing Sanitary Sewer Manhole includes all items necessary for the execution and completion of this work including, but not limited to, sawcutting of existing surfacing, excavation, coring into the existing manhole, connecting the new pipe to the new core in the manhole with a flexible rubber boot or approved watertight ring, watertight mechanical plugs, backfill, including imported backfill, and aggregate base material backfill, compaction of backfill, temporary surface pavement, permanent surface pavement or concrete. Contractor is to cut, shape and slope the new invert channel in the existing concrete bench for smooth flow from new sanitary sewer connection. Connect to Existing Sewer Manhole shall be made in accordance to the improvement plans and requirements of El Dorado Irrigation District.

Sewer manholes and cleanouts shall be constructed per details shown on the Project Plans and per Section 3.10 and 3.11, respectively, of the El Dorado Irrigation District Sewer Design Standards. Manhole plugs are to be constructed per the Project Plans.

77-5.06 PAYMENT

The payment quantity for 18" PVC SDR-26 Sanitary Sewer Pipe bid item is the length of the pipe installed measured parallel to the ground surface along the centerline of the trench at the finished grade in linear feet. The bid item for 18" PVC SDR-26 Sanitary Sewer Pipe include all tools, equipment, materials, and labor necessary to remove the existing pipe and install the pipe including, but not limited to, fabrication, freighting, and furnishing of the pipe; sawcutting; excavation; spoiling; dewatering; shoring; removal and disposal of the existing pipe and trench material; temporary plating; bedding; placement; fittings; connecting to the existing sanitary sewer system (service line, pipe, manhole, etc.); restrained joints; backfilling; compacting of backfill; testing; temporary surface restoration, as necessary; and all incidental work in the installation of the new pipeline.

Connect to (E)Sanitary Sewer Manhole bid item shall be paid for on a per unit basis. Measurement will be based on the actual number of connections made to existing sanitary sewer manholes as determined by actual count.

48" Sanitary Sewer Manhole bid item shall be paid for on a per unit basis, as one complete installed unit, including manhole base, cast iron ring, frame and cover. Measurement will be based on the actual number of manholes installed as determined by actual count. The contract unit price per each Sanitary Sewer Manhole shall include full compensation for labor, materials, tools and equipment and for doing all work for the removal and complete installation of the sanitary sewer manhole, including excavation, backfill and compaction, and temporary surface restoration, complete in place, all as specified in the Standard Specifications, these special provisions, El Dorado Irrigation District Sewer Design Standards and as directed by the Engineer, and no additional compensation will be allowed.

Cleanout shall be paid for on a per unit basis, as one complete installed unit. Measurement will be based on the actual number of cleanouts installed as determined by actual count. The contract unit price per each Cleanout shall include full compensation for labor, materials, tools and equipment and for doing all work for the removal and complete installation of the cleanout, including excavation, backfill and compaction, and temporary surface restoration, complete in place, all as specified in the Standard Specifications, these special provisions, El Dorado Irrigation District Sewer Design Standards and as directed by the Engineer, and no additional compensation will be allowed.

Manhole Plug shall be paid for on a per unit basis, as one complete installed unit. Measurement will be based on the actual number of plugs installed as determined by actual count. The contract unit price per each plug shall include full compensation for labor, materials, tools and equipment and for doing all work for manhole plug per the Project Plans and as directed by the Engineer, and no additional compensation will be allowed.

4" Sanitary Sewer Service bid item and 4" Sanitary Sewer Service Connection to (E)Sanitary Sewer Service bid item shall be paid for on a per unit basis.. Measurement shall be based on the service locations identified on the plans. The contract unit price paid for the various 4" Sewer Service bid items shall include full compensation for all labor, materials, tools, equipment and incidentals, and for doing all the work involved, and in place, as specified per section 3.12 of the El Dorado Irrigation District Sewer Design Standards, these Special Provisions, and as directed by the City Engineer, and no additional compensation will be allowed.

77-6 TRANSIT FACILITIES

77-6A GENERAL

This section of the specifications will govern the installation of simme seat furnished by El Dorado Transit at the location indicated on the Project Plans. All incidentals and appurtenant operations necessary for the installation of the simme seat shall be done in strict accordance with the Project Plans and per manufacturer's specifications. Simme seat manufacturer's specifications to be provided to Contractor by El Dorado Transit.

77-6B PAYMENT

Install Simme Seat shall be paid for on a per unit basis, as one complete installed unit. Measurement will be based on the actual number of simme seats installed as determined by actual count. The contract unit price per each simme seat shall include full compensation for labor, materials, tools and equipment and for doing all work for the complete installation of the simme seat, including coordination with El Dorado Transit to obtain the simme-seat, excavation, backfill and compaction, and temporary surface restoration, complete in place, all as specified in the simme seat manufacturer's specifications, these special provisions, El Dorado County Transit Authority Transit Design Manual and as directed by the Engineer, and no additional compensation will be allowed.

77-7 BROADBAND FACILITIES

77-7A GENERAL

This section of the specifications will govern the installation of broadband conduit and vaults at the locations indicated on the Project Plans.

77-7B MATERIALS

Materials shall be as stated below and per the sizes indicated on the Project Plans:

Conduit:

1. Schedule 40 electrical conduit.

Vaults:

1. Oldcastle Polymer boxes (formerly "H-Series") with solid steel lids.

77-7C CONSTRUCTION

Conduits shall be installed as shown on the Project Plans. Contractor to install long sweeps as needed to achieve the alignment shown on the plans as 90-degree elbows and angles are not permitted.

Vaults are to be constructed per manufacturer's specifications.

Add to section 84-2.02B:

Green Bike Lane Markings shall conform to the California Manual on Uniform Traffic Control Devices 2014 Edition Revision 4 (Mach 29, 2019), including the Interim Approval for Optional Use of Green Colored Pavement for Bike Lanes (IA-14) which specifies design parameters for the green color.

Add to section 84-2.04:

The payment quantity for the Green Bike Lane Stripe bid item is the length measured along the line of the green stripe.

Green bike lane marking covering the width of the bike lane as shown on the Project Plans shall be paid for under the Green Bike Lane Marking bid item. The payment quantity for the Green Bike Lane Marking bid item is the area measured parallel to the ground surface, not including the additional quantity used for overlap.

The payment quantity for the Curb Paint Green bid item is the length measured along the top of the curb being painted in linear feet. The payment quantity for Curb Paint Green includes the white paint stenciled letters as indicated in the Project Plans.

Replace section 84-9.04 with:

Pavement striping to be removed as shown on the Project Plans shall be paid for under the Remove Striping bid item. The payment quantity for Remove Striping bid item is the length in feet of the striping removed measured parallel to the ground. The payment quantity for Remove Striping does not include the gaps in broken traffic stripes.

Pavement markings to be removed as shown on the Project Plans shall be paid for under the Remove Pavement Markings bid item. The payment quantity for Remove Pavement Markings bid item is the area in square feet of the striping area removed measured parallel to the ground.

Replace section 84-9.10 RESERVED with 84-9.10 STAMPED CROSSWALK:

84-9.10A GENERAL

This section of the specifications will govern the construction of stamped crosswalks at the locations indicated on the Project Plans.

84-9.10B MATERIALS

Stamped crosswalk shall be pre-formed thermoplastic TrafficPatterns XD Impressed Surface System by Ennis-Flint. The area between the crosswalk stripes shall have the "Slate" standard pattern stamped at a 45 degree angle to the direction of pedestrian travel. The color for the crosswalk area between the stripes shall be "Brick Red". The border of the crosswalk shall be 12 inches wide and have score marks spaced 6 inches apart. The color for the crosswalk border shall be Tan. See below for excerpt from Ennis-Flint brochure:



Technical Memorandum

Date: February 14, 2020
To: Jim Fisher
R.E.Y Engineers
From: David Kitzmann, PG, CEG, PE
Subject: **Broadway Sidewalks and Retaining Walls Geotechnical Study
Preliminary Evaluation Memorandum**

Introduction

The Broadway Sidewalks Project (Project) consists of priority sidewalk gap closures along Broadway between Mosquito Road and the westerly driveway of 1426 Broadway (Grocery Outlet) in Placerville, California. The Project is fully funded by Cycle 7 of the Highway Safety Improvement Program (HSIP), the local match required by the HSIP, a Street Frontage Improvement Agreement (SFIA), and a future agreement with El Dorado Transit Authority (EDCTA). By constructing sidewalks on both ends of Broadway Street, the city of Placerville will expect a decrease in accidents involving pedestrians and bicyclists.

The purpose of this memorandum is to provide a preliminary evaluation of the feasibility of the proposed sidewalks and retaining wall. For this study, readily available geotechnical data, geotechnical reports, as-built plans, and geologic maps were reviewed. A visual field reconnaissance and exploration was conducted on October 19, 2018 to assess the existing conditions in the vicinity of the Project site.

Geology

The Project site is located within the physiographic unit referred to as the Sierra Nevada Geomorphic Province (Norris, R.M. and Webb, R.W., 1990). This province encompasses the Sierra Nevada Mountains and foothills which surround an area approximately 400 miles long bounded by the Basin and Range to the east, Cascade Range to the north, Great Valley to the west, and Mojave Desert to the south. The Coast Ranges and Transverse Ranges meet at the southernmost extremity of the Sierra Nevada. The Sierra Nevada is composed of a tilted fault block with a high and rugged eastern scarp and a gentle western slope that extends under the sediments of the Great Valley. Deep river canyons dissect the western slope and the higher Sierra have been sculpted by glacial activity.

The geology of the Sierra Nevada records four distinct periods as the west coast of North America grew westward. The oldest rocks were formed in a stable marine environment west of the North American Coast and are now found as metamorphosed pendants above younger Sierra Nevada granite.



- Approximately 400 million years ago, a sequence of island arcs was accreted onto the margin of North America and are now found within the Sierra Foothills including the Mother Lode belt.
- From approximately 210 to 90 million years ago, subduction west of the Sierra resulted in the emplacement of massive amounts of intrusive granitic rocks forming the Sierra Nevada Batholith and metamorphosing overlying rocks.
- Granitic intrusion shifted eastward beginning around 80 to 90 million years ago and the Sierra eroded to low mountains.
- Beginning around 20 million years ago, transform motion began along the plate boundary west of the Sierra resulting in extension of the Basin and Range west of the Sierra Nevada and tilting of the Sierra Nevada block forming the modern Sierra Nevada Range.

Extensive volcanism associated with extension of the Basin and Range mantled portions of the Sierra and filled many of the river drainages with lava and volcanic debris. Erosion of the uplifted Sierra Nevada block removed most of the overlying metamorphic rocks, covering the massive Sierra Nevada Batholith and leaving isolated areas of metamorphic rocks including pendants in the High Sierra and the Foothills Metamorphic Belt on the western side of the province in the north.

The Project is located within the Foothills Metamorphic Belt. Based on the Geologic Map of the Sacramento Quadrangle California Geological Survey, Regional Geologic Map No. 1A, 1:250,000 scale, by G. J. Saucedo and D.L. Wagner, 1992, the Project site is underlain by the Paleozoic metasedimentary rocks of the Calaveras Complex (Pzcc). Rocks of the Calaveras complex consists mainly black and green slate, schist, and greenstone which accumulated in the subduction zone present west of the continental margin. Rock outcroppings near the Project site and recovered from the test borings for adjacent projects generally match this description.

Field Reconnaissance

A visual field reconnaissance and exploration was conducted on October 19, 2018 to assess the existing conditions in the vicinity of the Project site. No subsurface exploration, sampling, or testing was performed during the field reconnaissance. A summary of the site observations is given below.

Broadway within the Project limits rises slowly to the east with no abrupt elevation changes along the road. The adjacent land is generally nearly level to very gently sloping downward to the south of Broadway and rises slowly to the north. The street is bordered predominately by commercial properties including stores and gas stations with associated parking lots. Several residential properties were noted between Carson Road and Blairs Lane on the north side of Broadway. The residential properties are several feet higher than Broadway and have a low retaining wall running along the southern limits of the properties. The road was busy with vehicular traffic during the time of visit.

Narrow sidewalks exist along the southern side of Broadway for the majority of the Project alignment, except for an approximately 300-foot section extending east from Blairs Lane. On the north side of Broadway, sidewalks are intermittent with variable size gaps between segments.

Existing sidewalks on the north side of Broadway include:

- Approximately 110-foot section extending east from Carson Road.
- Approximately 150-foot section between Carson Road and Blairs Lane that is in front of two residential properties.
- Several short (less than 30 feet in length) discontinuous sidewalk sections on the north side of Broadway near the intersection with Blairs Lane.
- An approximately 470-foot section extending from Schnell School Road west.

From Carson Road to Schnell School Road there is significant cracking in the existing asphalt concrete (AC) pavement. At least three generations of AC pavement have been exposed along the edge of road. The severity of cracking increases at the parking lot entrances. The westbound lanes of Broadway west of Carson Road appeared to be in better condition than the remaining pavement. Along the eastbound side of Broadway, significant cracking was observed in the pavement at the gas station near the intersection between Blairs Lane and Broadway.

Water, electric, and communication lines are present along this alignment based on observed utility covers and existing Underground Services Alert markings. Based on these observations, electric, water, sewer, and communication utilities exist below the roadway and portions of the existing sidewalks. It can be assumed that utility laterals cross the Project alignment at numerous locations.

Underground storage tanks are likely located below the gas stations at the intersection with Blairs Lane and east of the intersection of Mosquito Road and Broadway.

Review of Past As-Built Plans and Reports

A foundation report (Taber 2007) for the nearby Blairs Lane Bridge over Hangtown Creek was obtained. Blairs Lane intersects Broadway Street within the vicinity of the Project and Blairs Lane Bridge is approximately 250 feet southeast of the proposed Project. The borings drilled in 2007 indicate a 0- to 10-foot-thick layer of clayey silt to silty clay underlain by silty sand with patches of clay. The top of rock was reported to be at a depth of approximately 0 to 10 feet and was described as hard to very hard, moderately weathered to decomposed metasedimentary rock. Groundwater was reported at approximate elevation 1918 to 1914 feet (approximately 6.5 to 10.0 feet in depth).

A draft geotechnical report (Parikh, 2010) for the Placerville Station II, located approximately 600 feet north of the Project was reviewed. The report indicates the presence of medium dense to dense sands and gravels underlain by medium dense to dense gravels/very stiff to hard weathered shale. The report states that groundwater was not encountered during drilling. The R-values from the parking lot native soil ranged from 60 to 68.

A Log of Test Borings (LOTB) was obtained for the Schnell School Road undercrossing at State Route 50, titled Wiltse Road Undercrossing (Caltrans, 1960). Schnell School Road intersects Broadway and is also the eastern Project limit boundary. The undercrossing is located approximately 250 feet north of the intersection. The LOTB indicates 1 to 15 feet of very loose silt and sand over weathered slate was encountered. Groundwater was encountered in boring B-7 at approximately 1.7 feet in depth and in boring B-4 at approximately 9 feet in depth.

The LOTB for the Mosquito Road Undercrossing titled Washington Street Overhead was reviewed (Caltrans, 1954). Mosquito Road intersects Broadway and is the western most boundary of the Project. The undercrossing is approximately 200 feet north of the intersection between Mosquito Road and Broadway. The logs indicate that a 2 to 10-foot layer of clayey silt and clay overlies weathered and decomposed rock at this location. Groundwater was reported at approximately 5 feet in depth in the borings.

The geotechnical borings made for the adjacent Upper Broadway Bike Lanes Project included a boring (A-18-001) approximately 900 feet east of the intersection with Schnell School Road (WRECO, 2018). This boring indicated approximately 5 feet of medium dense silty sand with gravel over decomposed rock which was described as very dense silty sand with gravel. The soil returned a lab tested R-value of 48. Groundwater was encountered at approximately 10.0 feet in depth (July 2018).

Subsurface Conditions

Based on the available as-built boring logs, the Project alignment is likely underlain by a thin layer of soil/fill over decomposed to weathered rock. Soils are likely sands and silty sands, though silts and clays might be encountered. The soil/fill layer is likely on the order of 2 to 10 feet in thickness, likely becoming thicker towards Hangtown Creek. It is known that random fill, including concrete debris and cobbles has been encountered under Main Street west of the Project alignment. As there have been several generations of construction along the alignment and Hangtown Creek may have been realigned, the presence of undocumented fills should be expected.

Groundwater

Based on the available as-built data, groundwater likely is within 5 to 10 feet of the ground surface in the vicinity of the Project. Groundwater can vary with the amount of precipitation, irrigation, and other factors. Infiltrated water typically accumulates along the top of rock surface and perched groundwater conditions are common, even though it was not observed in all of the borings reviewed for this report. It can be expected that groundwater is seasonally present during wetter portions of the year and the groundwater table be close to the water surface within channels adjacent to the Project.

Corrosion Evaluation

The Caltrans *Corrosion Guidelines*, version 3.0 dated March 2018, has the following definition of corrosive soils:

“For structural elements, the Department considers a site to be corrosive if one or more of the following conditions exists for the representative soil and/or water samples taken at the site:

- Chloride concentration is 500 ppm or greater,
- Sulfate Concentration is 1500 ppm or greater,
- pH is 5.5 or less.”

In addition to the conditions listed above, the California Amendments to Section 10.7.5 of the American Association of State Highway and Transportation Officials (AASHTO) *Load and Resistance Factor Design (LRFD) Bridge Design Specifications (BDS)*, 6th Edition (AASHTO 2012), considers a site corrosive if the additional condition listed below exists for the representative soil and/or water samples taken at the site:

- Minimum resistivity of 1000 ohm-cm or less.

Corrosivity screening was conducted for the adjacent Upper Broadway Bike Lanes and Blairs Lane Bridge at Hangtown Creek projects which is underlain by similar soils. Table 1 below lists the soil corrosion data from the projects.

Table 1. Soil Corrosion Data

Boring ID	Depth (ft)	Minimum Resistivity (ohm-cm)	Soil pH	Chloride Content (ppm)	Sulfate Content (ppm)
A-18-001 (WRECO, 2018)	0-5	7240	6.23	2.7	43.6
B-1 (Taber 2006)	0-5	1610	7.39	122.8	48.9
B-4 (Taber 2006)	0-5	3480	7.45	9.0	25.7

Based on the corrosive potential testing results for the adjacent sites, the soil at the Project site is likely non-corrosive to buried metal and concrete as defined by Caltrans *Corrosion Guidelines* and AASHTO *LRFD Bridge Design Specifications*. The corrosivity potential of the soils along the Project alignment should be tested prior to construction.

Discussion and Recommendations

The conclusions in this memorandum are preliminary and may change when additional information becomes available. A summary of the conclusions for each site are given below.

Retaining Walls

Based on the review of available subsurface data and the site review, there appears to be few constraints for the type of suitable wall types. The proposed cut is low and the resulting bearing pressures would be low. Typical Caltrans *Standard Plan* cantilever retaining walls, Mechanically Stabilized Earth (MSE), and block walls all appear suitable and would generally be easy to construct. The low height of the required wall and ease of access to the wall location would tend to make soldier pile uneconomical.

For the preliminary design, it is assumed that the retaining wall will bear on existing soil/fill approximately 2 feet below existing sidewalk grade. For the preliminary design, a presumptive bearing resistance of 4 ksf can be used for spread footings bearing on suitably prepared subgrade soil.

Concrete Flatwork

Sidewalk and flatwork sections for areas exposed to pedestrian traffic and infrequent light truck loading (maintenance vehicles) is recommended to be a minimum of 4 inches of concrete supported on 4 inches of compacted Class 2 Aggregate Base.

Concrete flatwork should be provided a thickened perimeter if placed on sloping ground. This thickened perimeter should extend downwards and be a minimum of 4 inches deeper than the main flatwork slab.

Asphalt Pavement

The existing roadway appears to have had several generations of Asphalt Concrete (AC) pavement. Existing pavement thickness was reported as 3 to 4 inches AC over 4 to 6 inches of aggregate base along the adjacent Upper Broadway Bike Lanes Project alignment (WRECO, 2018). None of the other available reports provided pavement section thicknesses along Broadway in the vicinity of the Project.

New structural pavement sections were recommended for the Upper Broadway Bike Lanes Project, which is immediately east of the Project. It is understood that the Project will use the same pavement section. The following table, Table 2, provides the design Traffic Indices' (TI) provided by the County, the design R-value, and the structural pavement Hot Mix Asphalt (HMA) and Class 2 Aggregate Base (AB) thicknesses.

Table 2. New HMA-AB Flexible Structural Pavement Sections

Design TI	Design R-value	HMA Thickness (ft)	Class 2 AB Thickness (ft)
6.0	30	0.25	0.70
6.5	30	0.30	0.70
7.0	30	0.35	0.75
7.5	30	0.35	0.85
8.0	30	0.40	0.90
Notes: TI=Traffic Index; HMA=Hot Mix Asphalt; AB=Aggregate Base			

Pavement design and construction should conform to the requirements of the Caltrans Standard Specifications, 2018 edition. All native material or import fill used below the new pavement sections should possess an R-value equivalent to or greater than the design R-value (30). All trench backfill for utilities and pipes underlying paved areas should be properly placed and compacted to at least 95 percent compaction (CTM 216 or ASTM D1557) to provide a stable pavement subgrade. The upper 30 inches of all pavement subgrades should be moisture conditioned and compacted to at least 95 percent relative compaction (CTM 216 or ASTM D1557), per Caltrans Standard Specifications (2018).

Subgrade Preparation

All subgrade should be free of organics, debris, trash, or other deleterious materials prior to preparation for construction of concrete flatwork. The upper 6 inches of subgrade should be scarified and compacted to 95% relative compaction per ASTM 1557 or CTM 216. Areas of subgrade composed of native clays or areas of subgrade failing to meet the compaction requirement should be over-excavated a minimum of 1 foot and replaced with Class 2 Aggregate Base compacted to 95% relative compaction or ¾ inch crushed rock prior to construction of flatwork and pavement.

Driveway Recommendations

Driveway entrances are recommended to be designed per the requirements of sheet A87A of the 2018 Caltrans *Standard Plans*. Sidewalk and ramp concrete thickness at the driveways should be a minimum of 6 inches to account for commercial use.

Excavation and Shoring

All excavation and backfill work shall be performed in accordance with Section 19, “Earthwork,” of the Caltrans *Standard Specifications* (2018 or latest edition). Based on site review and available boring logs, the fill and soil materials likely to be encountered are expected to be generally “rippable” by typical heavy excavation equipment, such as a Caterpillar D8 with a single-shank ripping bar. However, some cobbles were observed in borings near the site and likely will be encountered in

excavations. Areas of harder, less-weathered rock may be encountered along the alignment which may require the use of air tools, hydraulic breakers, or other means to allow excavation.

Based on the available boring logs, soil types per Cal/OSHA guidelines likely range from Type B to Type C. All soils below groundwater would be considered Type C at this site. The Contractor is responsible for design and construction of excavation sloping/shoring in accordance with Cal/OSHA requirements.

Temporary erosion control measures, such as a flash coating, may be required for excavations open for extended periods. It is also the Contractor's responsibility to assess the actual conditions in the field at the time of construction and to his/her own interpretation of the Cal/OSHA soil/rock type for design of the excavation and trench slopes or the need for excavation shoring.

Footing Construction

Footing concrete should be placed at the limits and strengths shown on the contract plans, in the contract documents, and in accordance with the Caltrans 2018 *Standard Specifications*. Concrete shall also be cast neat against undisturbed materials. Footing concrete should only be placed in a dry excavation on undisturbed native materials free from loose and otherwise disturbed materials.

The completed footing excavation bottom should be reviewed by a representative of WRECO to evaluate the condition of the subgrade and to provide supplemental recommendations. Excavation for the footings may require slight over-excavation to remove either a localized area of soft/unsuitable material or to remove a small piece of intact, hard, fresh, and unweathered metamorphic rock. Soils at the bottom of excavation should be scarified 6 inches, moisture conditioned, and compacted to 95% relative compaction (per ASTM 1557 or CTM 216).

Dewatering

For the proposed low retaining walls and sidewalk improvements would require only shallow excavations and dewatering is not expected to be required. The proposed retaining wall border residential properties and minor seepage from irrigation may be present. This nuisance water is expected to be controlled by diversion or sump pumping. Excavations below groundwater would be expected to encounter heavy seepage.

Existing Structures

Numerous underground utilities cross below or near the Project alignment. Prior to construction, the utilities should be relocated and moved or protected during construction. In addition, numerous buildings, signs, light poles and other structures exist along the Project alignment and will require protection during construction.

Future Investigation

It is recommended that a subsurface investigation be conducted to confirm the conditions from the as-builts and reports. It is proposed that three borings be performed at both ends of the Project vicinity



along Broadway and near the proposed retaining wall to confirm the retaining wall footing conditions, evaluate subgrade conditions, and to perform R-value testing for design of the proposed pavement sections.

Limitations

The conclusions in this memorandum are preliminary and based on a brief site review and available geologic/geotechnical data available for the general Project vicinity. There is the potential for significant variation in the subsurface that are not evident in the available data.

Attachments:

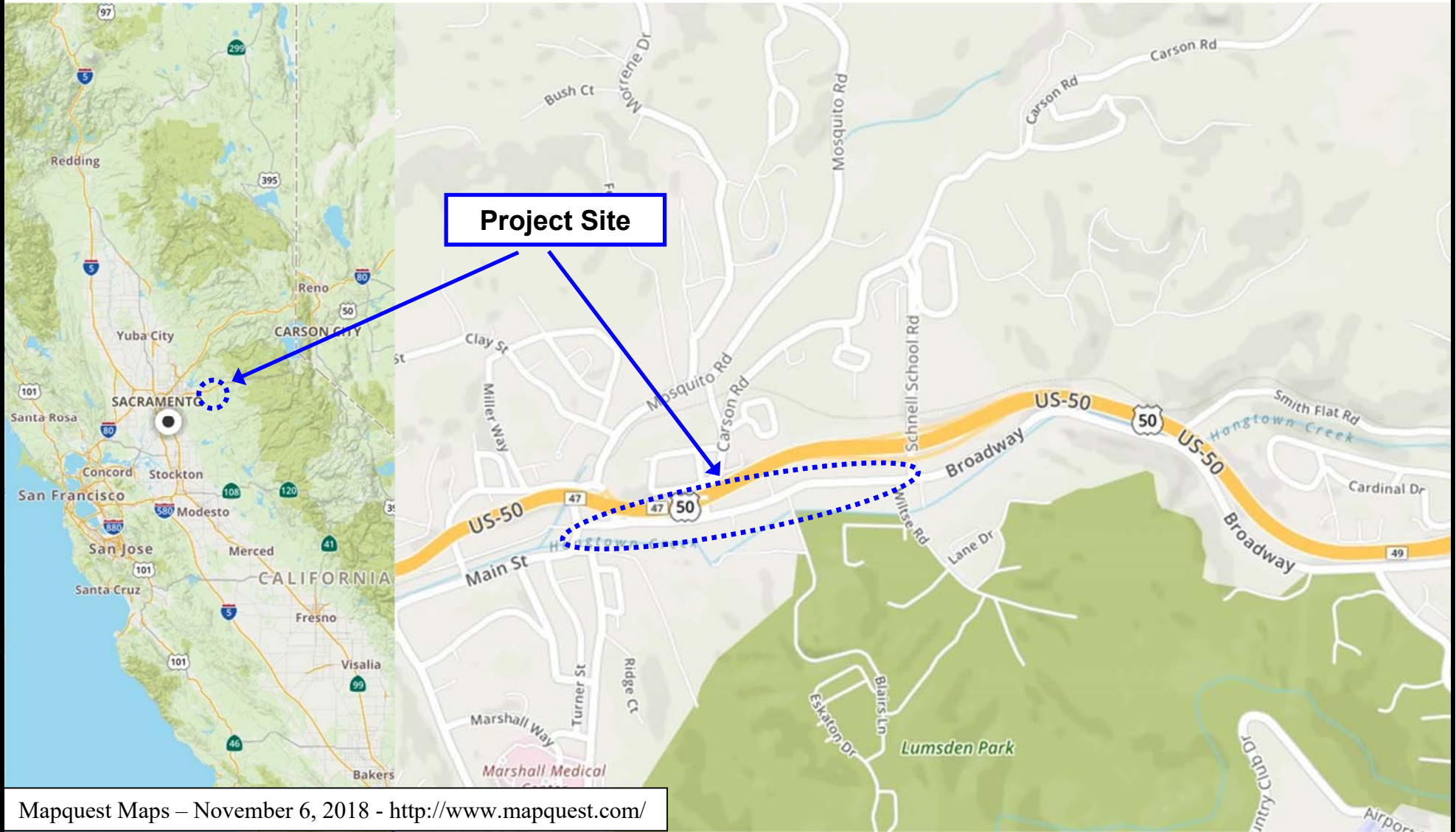
Figure 1 Vicinity Map

Figure 2 Geology Map

As-built LOTBs and Boring Records

References

- Caltrans. *Washington Street Overhead, Log of Test Borings*, As-built stamp dated April 15, 1954
- Caltrans. *Wiltse Road Undercrossing, Log of Test Borings*, August 9, 1960
- Caltrans. *Standard Plans 2018 Edition*
- Caltrans. *Standard Specifications 2018 Edition*
- Norris, R.M. and Webb, R.W., 1990. *Geology of California, Second Edition*, 1990
- G. J. Saucedo and D.L. Wagner, 1992. *Geologic Map of the Sacramento Quadrangle California Geological Survey, Regional Geologic Map No. 1A*, 1:250,000 scale
- Parikh Consultants, Inc. *Geotechnical Report, Placerville Station II – Park And Bus Expansion* Placerville, California, September 1, 2010
- Taber Consultants. *Foundation Report, Blairs Lane Bridge at Hangtown Creek, Placerville, California*, May 30, 2007
- WRECO. *Upper Broadway Bike Lanes Retaining Walls Type Selection*, September 26, 2018

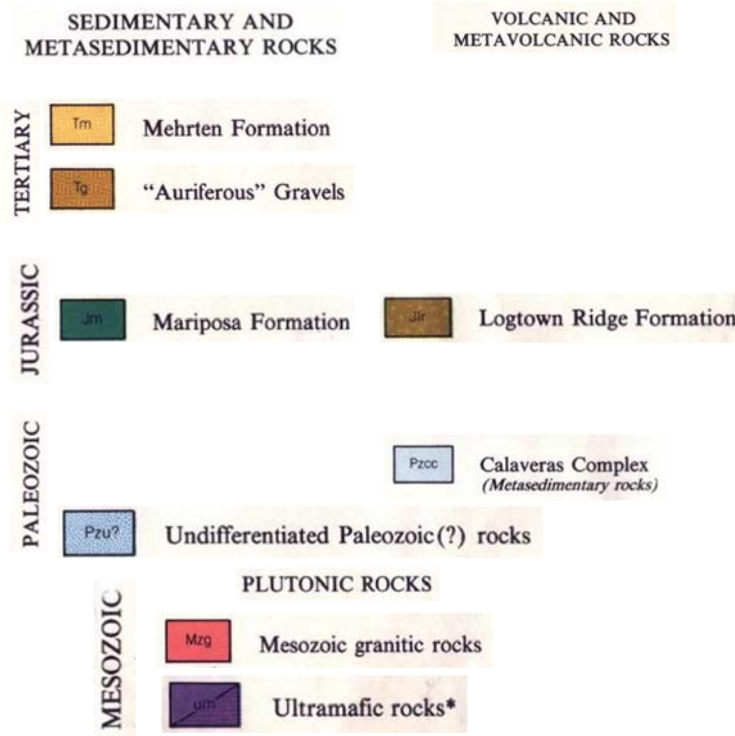
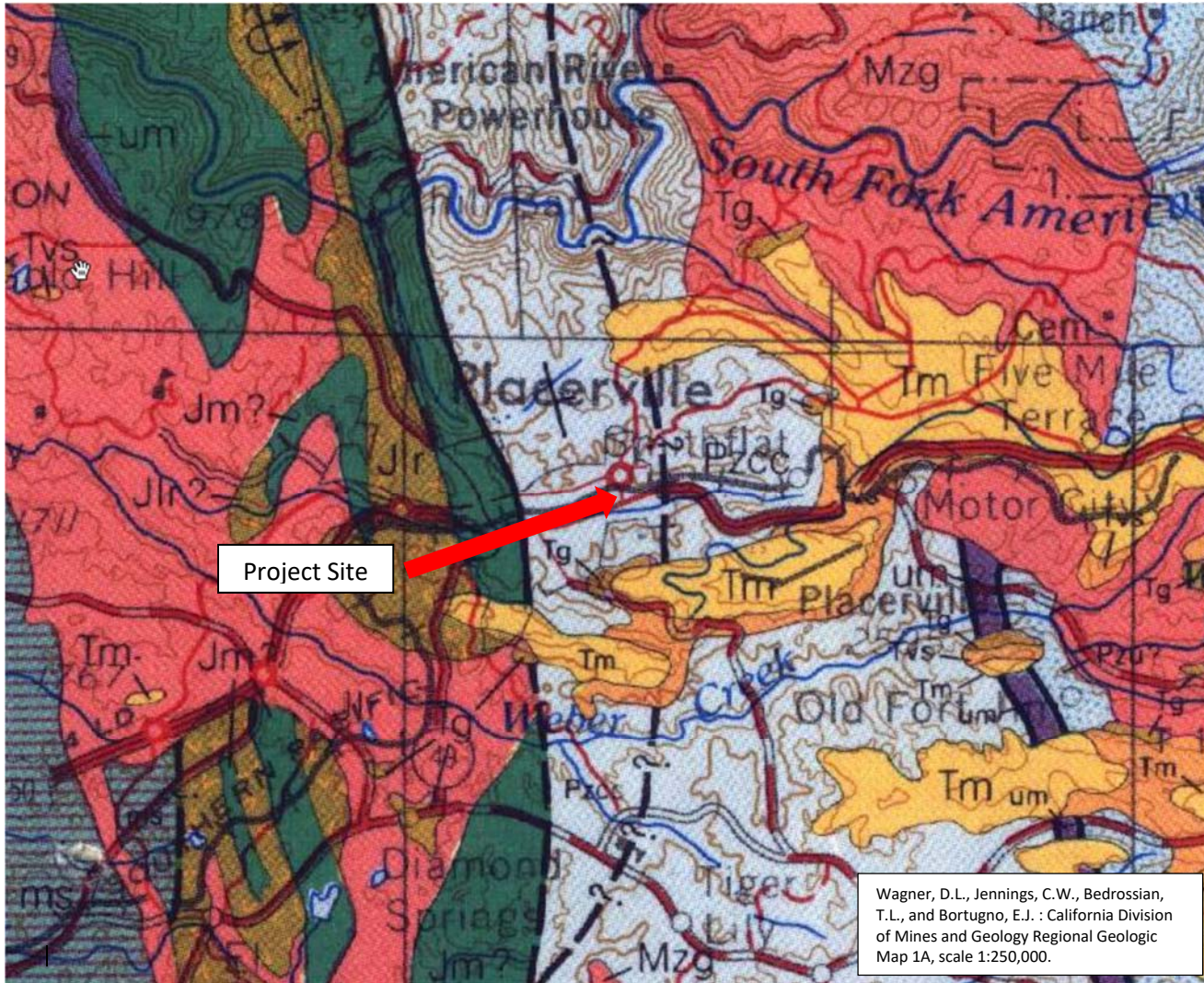


Project Site

Mapquest Maps – November 6, 2018 - <http://www.mapquest.com/>



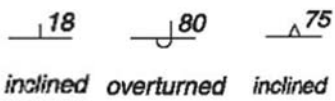
Figure 1
Vicinity Map
 Broadway Sidewalks Project
 City of Placerville, California
 WRECO Project No. P18096



Wagner, D.L., Jennings, C.W., Bedrossian, T.L., and Bortugno, E.J. : California Division of Mines and Geology Regional Geologic Map 1A, scale 1:250,000.

Map Symbols

Strike and dip of sedimentary rocks:



— — — — Formation contact, dashed where Inferred or indefinite, dotted where concealed

— — — — Fault contact, dashed where inferred or Indefinite, dotted where concealed



Figure 3
Geologic Map

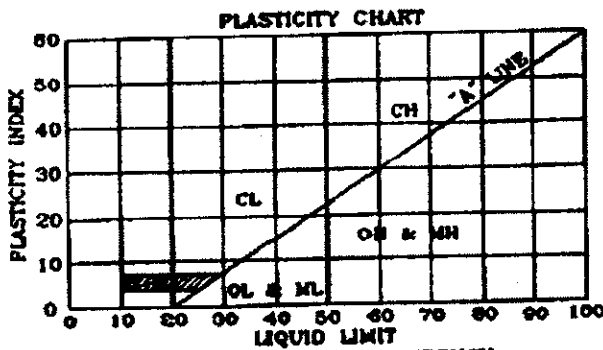
Broadway Sidewalks Project
City of Placerville, California
WRECO Project No. P18096

UNIFIED SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS			GROUP SYMBOLS	ILLUSTRATIVE GROUP NAMES	
COARSE-GRAINED SOILS <small>More than 50% retained on No. 200 sieve</small>	GRAVELS <small>More than 50% of coarse fraction retained on No. 4 sieve</small>	CLEAN GRAVELS <small>Less than 5% fines</small>	GW	Well graded gravel, Well graded gravel with sand	
		GRAVELS WITH FINES <small>More than 5% fines</small>	GP	Poorly graded gravel, Poorly graded gravel with sand	
		CLEAN SANDS <small>Less than 5% fines</small>	GM	Silty gravel, Silty gravel with sand	
		SANDS WITH FINES <small>More than 5% fines</small>	GC	Clayey gravel, Clayey gravel with sand	
	SANDS <small>50% or more of coarse fraction passing No. 4 sieve</small>	CLEAN SANDS <small>Less than 5% fines</small>	SW	Well graded sand, Well graded sand with gravel	
		SANDS WITH FINES <small>More than 5% fines</small>	SP	Poorly graded sand, Poorly graded sand with gravel	
		SANDS WITH FINES <small>More than 12% fines</small>	SM	Silty sand, Silty sand with gravel	
		SANDS WITH FINES <small>More than 12% fines</small>	SC	Clayey sand, Clayey sand with gravel	
		SILTS AND CLAYS <small>Liquid Limit less than 50%</small>		ML	Silt, Sandy silt with gravel
		SILTS AND CLAYS <small>Liquid Limit more than 50%</small>		CL	Lean clay, Sandy lean clay with gravel
SILTS AND CLAYS <small>Liquid Limit less than 50%</small>		OL	Organic clay, Sandy organic clay with gravel		
SILTS AND CLAYS <small>Liquid Limit more than 50%</small>		MH	Elastic silt, Sandy elastic silt with gravel		
SILTS AND CLAYS <small>Liquid Limit more than 50%</small>		CH	Fat clay, Sandy fat clay with gravel		
SILTS AND CLAYS <small>Liquid Limit more than 50%</small>		OH	Organic clay, Sandy organic clay with gravel		
HIGHLY ORGANIC			PT	Peat, Highly organic silt	

NOTE: 1. Coarse-grained soils receive dual symbols if: (a) their fines are CL-ML (e.g. SC-SM or GC-GM) or (b) they contain 5-12% fines (e.g. SW-SM, GP-GC, etc.). Fine-grained soils receive dual symbols if their limits plot in the hatched zone of the Plasticity Chart (CL-ML).

2. The table lists 30 out of a possible 110 Group Names, all of which are assigned to unique proportions of the constituent soils. Flow charts in ASTM D 2487-93 aid assignment of the Group Names.



GRAIN SIZE CLASSIFICATION

CLASSIFICATION	US STANDARD SIEVE SIZE
BOULDER	Above 12"
COBBLES	12" to 3"
GRAVEL Coarse Fine	3" to 3/4" 3/4" to No. 4
SAND Coarse Medium Fine	No. 4 to No. 10 No. 10 to No. 40 No. 40 to No. 200
SILT & CLAY	Below No. 200

COHESIVE SOIL CONSISTENCY

CLASSIFICATION	UNCONFINED COMP. STRENGTH (psf)
Very Soft	< 500
Soft	500 - 1000
Medium(Firm)	1000 - 2000
Stiff	2000 - 4000
Very Stiff	4000 - 8000
Hard	> 8000

COHESIONLESS SOIL RELATIVE DENSITY

CLASSIFICATION	SPT BLOW COUNTS (Blows/ft)
Very Loose	< 4
Loose	4 to 10
Medium Dense	11 to 30
Dense	31 to 60
Very Dense	> 60



PARIKH CONSULTANTS, INC.
 GEOTECHNICAL CONSULTANTS
 MATERIALS TESTING

PLACERVILLE STATION II - PARK AND BUS EXPANSION
 PLACERVILLE, CALIFORNIA

JOB NO.: 210124.10

PLATE NO.: A-1A

Boring Location, Elevation & Date Drilled:					Drilling Method:		BORING NUMBER	
Sample Type & No.	Dry Density (pcf)	Water Content (%)	Blows Per Foot	Compress. Strength (tsf)	Depth (ft) Soil Graph & U.S.C.S.	Sampling Method:		LEGEND
								Sheet 1 of 1
					0			
							Compressive strength as measured by Pocket Penetrometer, in tsf.	pp=1.0tsf
C-1			22				2 inch I.D. California Sampler (C).	
MC-2	110	12	23	1.2	5		2-1/2 inch I.D. Modified California Sampler (MC).	
SH-3	98	28	100 psi	0.8			3.5-inch I.D. Pitcher Tube Sampler (Cored).	
SPT-4	-	10	35	-			1-3/8 inch I.D. Standard Splitspoon Sampler (SPT).	
HS-5	95	20		0.7	15		1.9 inch I.D. Hand Sampler driven with a slide hammer.	
							Groundwater level first encountered during drilling	
					20		Groundwater level at completion of boring	
BULK-6	-	12					Bulk sample stored in plastic bag.	
							Liquid Limit (LL), in percent	LL=30
							Plasticity Index (PI), in percent	PI=10
NX-3	-	-		12.0	25		NX Core.	
							Consolidation Test	CN
							Percent gravel and coarser in sample, (+#4)	+ #4=20%
							Percent fines (silt/clay) in sample, (-#200)	- #200=50%
							Triaxial Test	TX
					30			

LEGEND FOR LOG OF BORING




PLACERVILLE STATION II - PARK AND BUS EXPANSION
PLACERVILLE, CALIFORNIA

Date: 8/2010 Job No.: 210124.10

This log is part of the report prepared by Parikh Consultants, Inc. for the named project and should be read together with that report for complete interpretation. This summary applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.

Plate:
A-1B

LEGEND, LEGEND.GPJ 8-10-10

Boring Location, Elevation & Date Drilled: See site plan; Elev. approx. ft.; drilled on 6-14-10					Drilling Method: 8-inch dia. HOLLOW STEM B-53		BORING NUMBER B-1		
Sample Type & No.	Dry Density (pcf)	Water Content (%)	Blows Per Foot	Compress. Strength (tsf)	Depth (ft) Soil Graph & U.S.C.S.	Sampling Method: 2 1/2" I.D. Mod. Cal. (MC)/2" I.D. Cal. (C)/1 3/8" I.D. Std. Pen., 140 lbs hammer, 30 inch drop.		Sheet 1 of 1	
					0	SP	SAND with GRAVEL, medium dense, moist, orange brown		
							weathered SHALE (MSH) slightly hydrothermally altered, hard, moist, mottled, orange gray		
1			27						
					5		META SHALE (MSH) hydrothermally altered, moderately weathered, hard, moist, mottled orange gray		
2			51-5.5				LL=33, PI=6		
							No groundwater was encountered during drilling		
					10				
					15				
					20				
					25				
					30				
LOG OF BORING					PLACERVILLE STATION II - PARK AND BUS EXPANSION PLACERVILLE, CALIFORNIA				
 PARIKH CONSULTANTS, INC. <i>Geotechnical & Materials Engineering</i>					Date: 06/28/10		Job No.: 210124.10		
This log is part of the report prepared by Parikh Consultants, Inc. for the named project and should be read together with that report for complete interpretation. This summary applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.								Plate: A-2	

LB 210124.10.GPJ 6-10-10

Boring Location, Elevation & Date Drilled: See site plan; Elev. approx. ft.; drilled on 6-14-10					Drilling Method: 8-inch dia. HOLLOWSTEM B-53		BORING NUMBER B-2	
Sample Type & No.	Dry Density (pcf)	Water Content (%)	Blows Per Foot	Compress. Strength (tsf)	Depth (ft) Soil Graph & U.S.C.S.	Sampling Method: 2 1/2" I.D. Mod. Cal. (MC)/2" I.D. Cal. (C)/1 3/8" I.D. Std. Pen., 140 lbs hammer, 30 inch drop.		Sheet 1 of 1
					0	GP	GRAVEL, poorly sorted from metashale weathering, loose, moist, mottled, dark brown	
1			15					
					5		weathered SHALE (MSH) hard, moist, mottled, dark brown	
2			96					
							No groundwater was encountered during drilling	
					10			
					15			
					20			
					25			
					30			

LOG OF BORING



PARIKH CONSULTANTS, INC.
Geotechnical & Materials Engineering

PLACERVILLE STATION II - PARK AND BUS EXPANSION
PLACERVILLE, CALIFORNIA

Date: 06/28/10

Job No.: 210124.10

This log is part of the report prepared by Parikh Consultants, Inc. for the named project and should be read together with that report for complete interpretation. This summary applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.

Plate:

A-3

Boring Location, Elevation & Date Drilled: See site plan; Elev. approx. ft.; drilled on 8-14-10					Drilling Method: 8-inch dia. HOLLOW STEM B-53		BORING NUMBER B-3	
Sample Type & No.	Dry Density (pcf)	Water Content (%)	Blows Per Foot	Compress. Strength (tsf)	Depth (ft) Soil Graph & U.S.C.S.	Sampling Method: 2 1/2" I.D. Mod. Cal. (MC)/2" I.D. Cal. (C)/1 3/8" I.D. Std. Pen., 140 lbs hammer, 30 inch drop.		Sheet 1 of 1
					0	SP	SAND, poorly sorted with gravel, loose, dry, orange brown	
							meta SHALE (MSH) medium dense, moist, mottled reddish brown	
1			31					
					5		GRAVEL poorly sorted from metashale, medium dense, moist, mottled orange and gray	
2			39					
							No groundwater was encountered during drilling	
					10			
					15			
					20			
					25			
					30			

LOG OF BORING

PLACERVILLE STATION II - PARK AND BUS EXPANSION
PLACERVILLE, CALIFORNIA



PARIKH CONSULTANTS, INC.
Geotechnical & Materials Engineering

Date: 06/28/10


Job No.: 210124.10

This log is part of the report prepared by Parikh Consultants, Inc. for the named project and should be read together with that report for complete interpretation. This summary applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.

Plate:

A-4

LB 210124.10.GPJ 8-10-10

Boring Location, Elevation & Date Drilled: See site plan; Elev. approx. ft.; drilled on 6-14-10					Drilling Method: 8-inch dia. HOLLOW STEM B-53		BORING NUMBER B-4	
Sample Type & No.	Dry Density (pcf)	Water Content (%)	Blows Per Foot	Compress. Strength (tsf)	Depth (ft) Soil Graph & U.S.C.S.	Sampling Method: 2 1/2" I.D. Mod. Cal. (MC)/2" I.D. Cal. (C)/1 3/8" I.D. Std. Pen., 140 lbs hammer, 30 inch drop.		Sheet 1 of 1
					0	AB SP	Aggregate Base SAND poorly sorted, moist, orange brown	LL=25, PI=4
1			28			GP	GRAVEL poorly sorted, medium dense, moist, dark gray with white mottling	
					5		- reddish brown	
2			11					
							No groundwater was encountered during drilling	
					10			
					15			
					20			
					25			
					30			
LOG OF BORING						PLACERVILLE STATION II - PARK AND BUS EXPANSION PLACERVILLE, CALIFORNIA		
 PARIKH CONSULTANTS, INC. <i>Geotechnical & Materials Engineering</i>						Date: 06/28/10		Job No.: 210124.10
This log is part of the report prepared by Parikh Consultants, Inc. for the named project and should be read together with that report for complete interpretation. This summary applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.								Plate: A-5

LB 210124.10.GPJ 8-10-10

Boring Location, Elevation & Date Drilled: See site plan; Elev. approx. ft.; drilled on 6-14-10					Drilling Method: 8-inch dia. HOLLOW STEM B-53		BORING NUMBER B-5	
Sample Type & No.	Dry Density (pcf)	Water Content (%)	Blows Per Foot	Compress. Strength (tsf)	Depth (ft) Soil Graph & U.S.C.S.	Sampling Method: 2 1/2" I.D. Mod. Cal. (MC)/2" I.D. Cal. (C)/1 3/8" I.D. Std. Pen., 140 lbs hammer, 30 inch drop.		Sheet 1 of 1
					0	GP	GRAVEL poorly sorted, medium dense, moist, orange brown	
1			68			GP	GRAVEL poorly sorted from weathered meta shale, dense, moist, mottled dark gray and reddish brown	
2			19		5	SC	CLAYEY SAND with GRAVEL, loose, moist, reddish brown	
							No groundwater was encountered during drilling	
					10			
					15			
					20			
					25			
					30			

LOG OF BORING



PLACERVILLE STATION II - PARK AND BUS EXPANSION
PLACERVILLE, CALIFORNIA

Date: 06/28/10 Job No.: 210124.10

This log is part of the report prepared by Parikh Consultants, Inc. for the named project and should be read together with that report for complete interpretation. This summary applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.

Plate:
A-6

LB 210124.10.GPJ B-10-10

APPENDIX B

LABORATORY TESTS

Atterberg Limits

The Atterberg Limits were determined for selected sample of the fine-grained materials. The result was used to classify the soils, as well as to obtain an indication of the expansion potential with variations in moisture content. The Atterberg Limits were determined in general accordance with ASTM Test Method D 4318-00. The result of the test is presented on Plate B-2, "Plasticity Chart".

R-value Test

R-value tests were performed on bulk samples for pavement design. The tests were performed according to California Test Method 301. The test results are presented on Plates B-3A through B-3C.

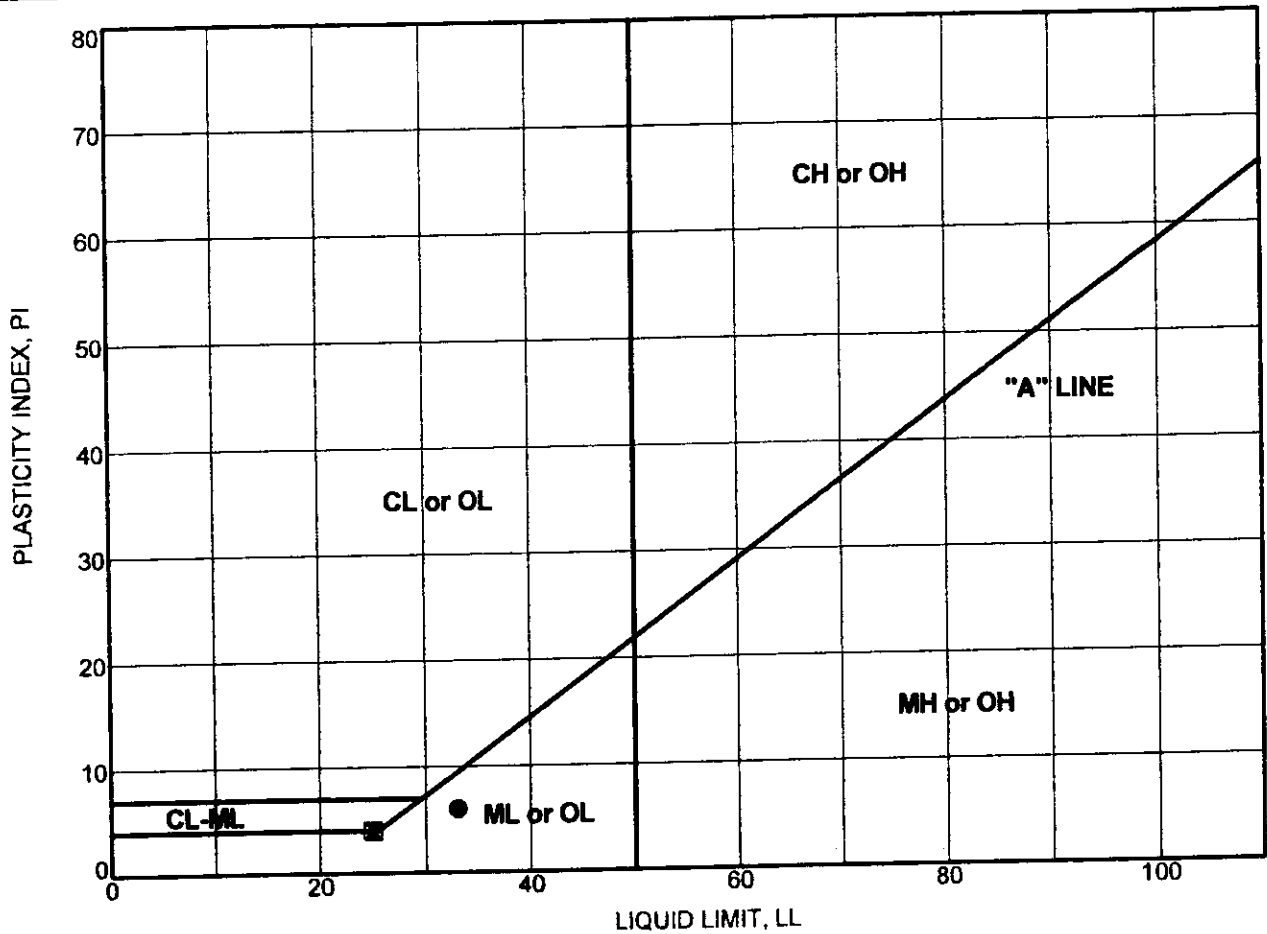


PARIKH CONSULTANTS, INC.
GEOTECHNICAL CONSULTANTS
MATERIALS TESTING

PLACERVILLE STATION II – PARK AND BUS EXPANSION
PLACERVILLE, CALIFORNIA

JOB NO.: 210124.10

PLATE NO.: B-1



PLASTICITY CHART

Boring Number	Sample Number	Depth (feet)	Test Symbol	Moisture Content (%)	LL	PL	PI	Description
B-1	Bag-1	5.0	●		33	27	6	SILT (ML)
B-4	Bag-1	5.0	☒		25	21	4	SILT (ML)



PARIKH CONSULTANTS, INC.
 GEOTECHNICAL CONSULTANTS
 MATERIALS ENGINEERING

PLACERVILLE STATION II - PARK AND BUS EXPANSION
 PLACERVILLE, CALIFORNIA

JOB NO: 210124.10

PLATE NO: B-2



R-VALUE REPORT

Parikh Consultants, Inc.

ASTM D2844 or CTM 301

(408) 452-9000

Project Name: Placerville Station II – Bus and Park Expansion

Date: 6/28/10

Client: Omni Means

Project #: 210124.10

Sample #: B-1 Depth: 0'-5'

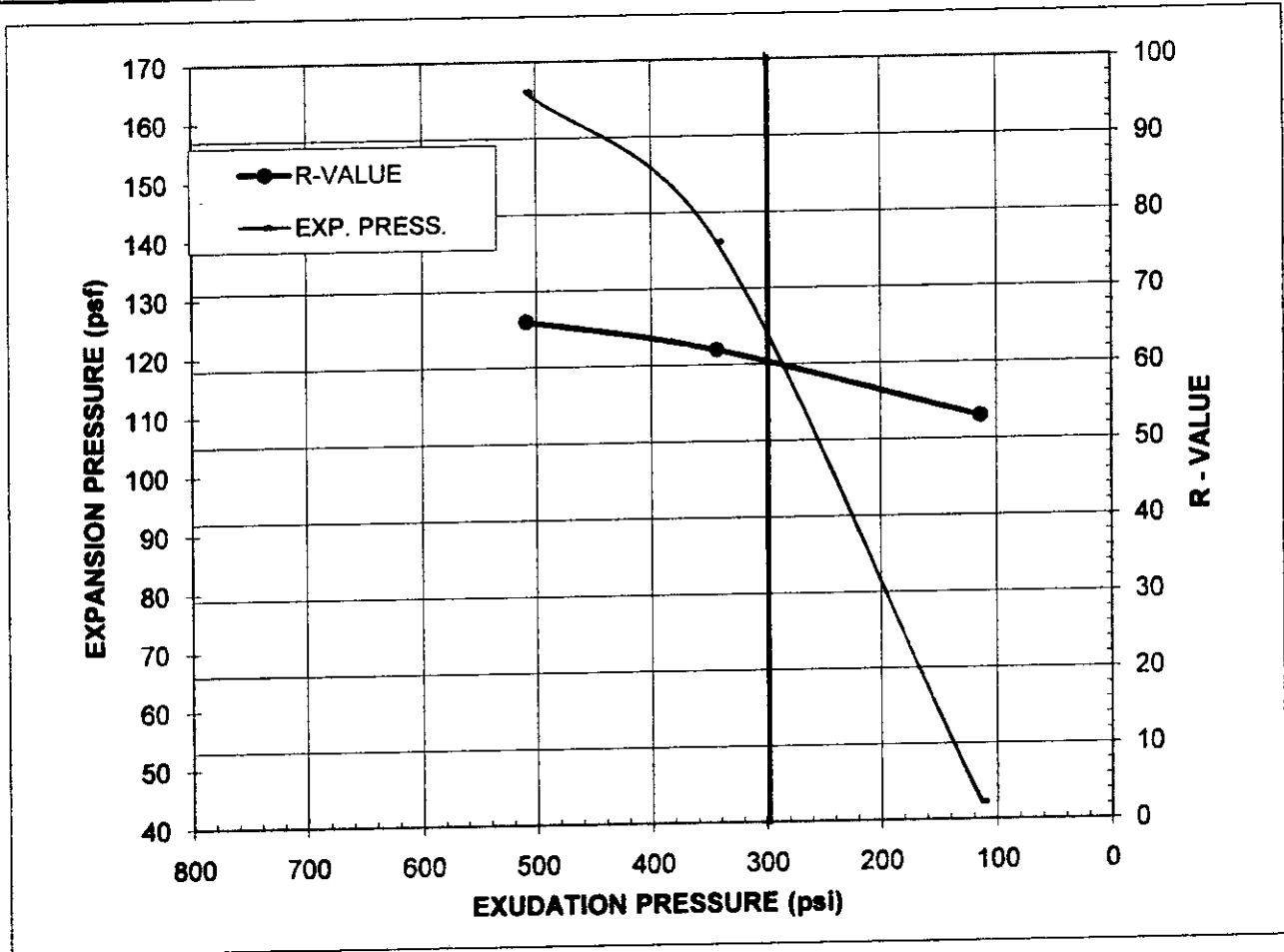
Lab #: M783

Location / Source: Native / Placerville

Sample Date:

Material: Silt with Gravel and trace of Sand, olive brown

Sampled By:



Specimen No.	A	B	C
Exudation Pressure, psi	114	343	509
Expansion Pressure, psf	43	139	165
R-Value	53	62	66
Moisture Content at Test, %	12.4	12.0	11.5
Dry Density at Test, pcf	119.8	120.7	121.1
R-Value @ 300 psi Exudation Pressure =	60		Expansion Pressure @300 psi Exudation, psf = 123
Minimum R-Value Requirement:			
Comments:			
Report By: Prav Dayah			

RVALUE with calcs pdp



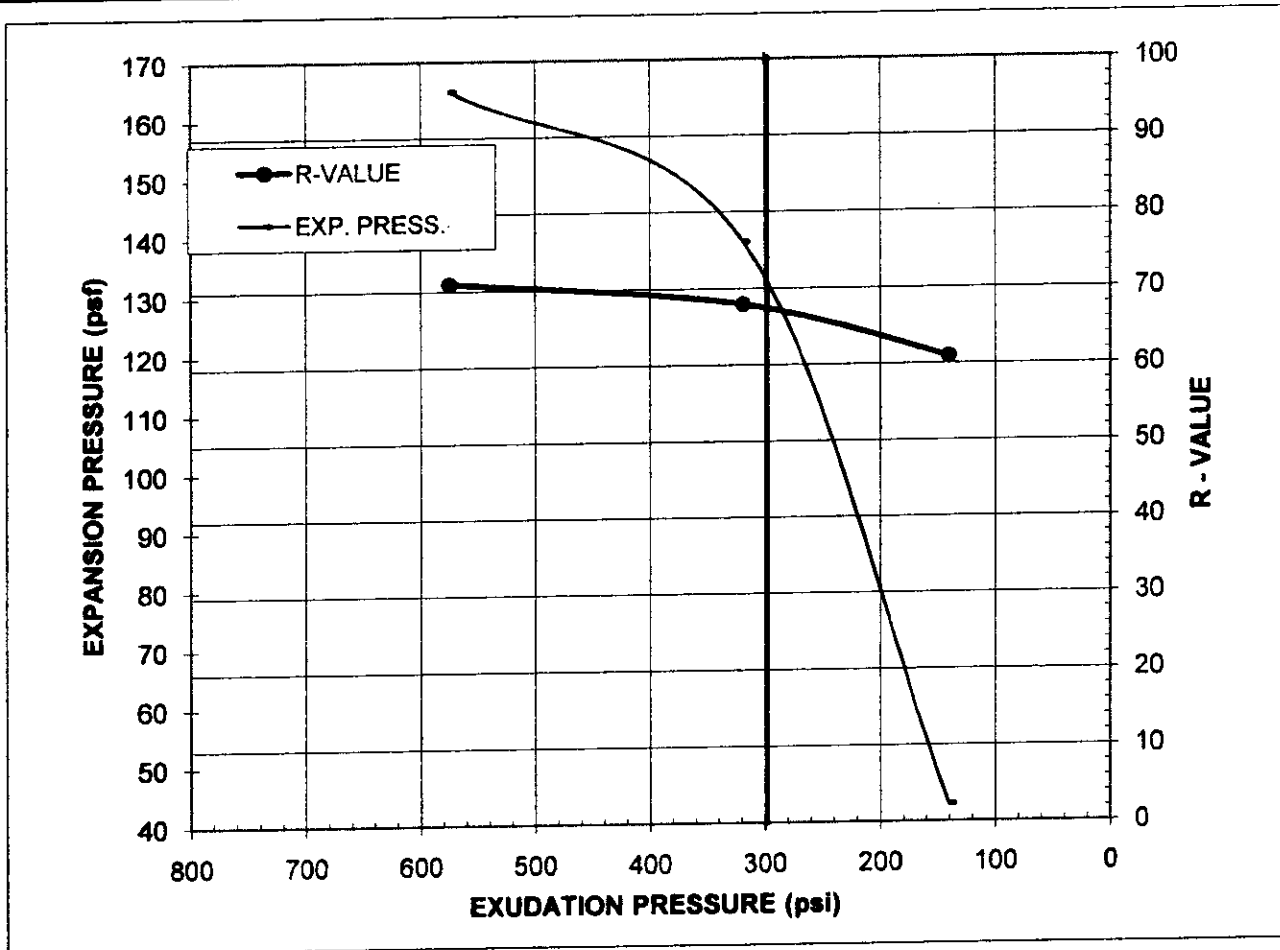
R-VALUE REPORT

Parikh Consultants, Inc.

ASTM D2944 or CTM 301

(408) 452-9000

Project Name: Placerville Station II – Bus and Park Expansion	Date: 6/22/10
Client: Omni Means	Project #: 210124.10
Sample #: B-2	Depth: 0'-5'
Location / Source: Native / Placerville	Lab #: M783
Material: Clayey Gravel with some Sand, strong brown	Sample Date:
	Sampled By:



	A	B	C
Specimen No.			
Exudation Pressure, psi	141	319	575
Expansion Pressure, psf	43	139	165
R-Value	61	68	71
Moisture Content at Test, %	11.9	11.0	10.5
Dry Density at Test, pcf	117.8	123.0	124.8
R-Value @ 300 psi Exudation Pressure =	68	Expansion Pressure @300 psi Exudation, psf = 132	
Minimum R-Value Requirement:			
Comments:			
Report By: Pray Dayah			

RVALUE with calcs pdp



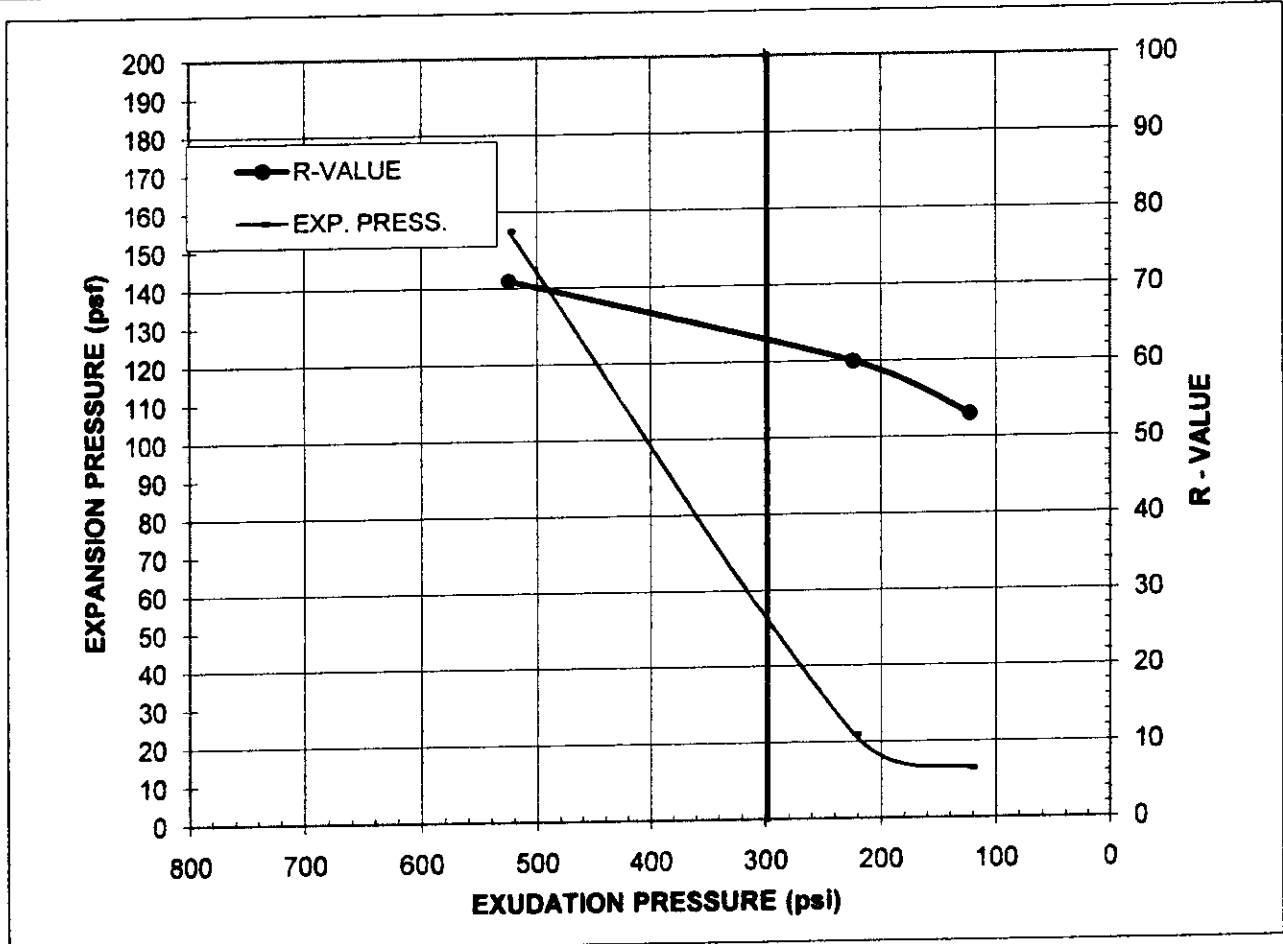
R-VALUE REPORT

Parikh Consultants, Inc.

ASTM D2844 or CTM 301

(408) 452-9000

Project Name: Placerville Station II – Bus and Park Expansion	Date: 6/28/10
Client: Omni Means	Project #: 210124.10
Sample #: B-4	Depth: 0'-5'
Lab #: M783	Sample Date:
Location / Source: Native / Placerville	Sampled By:
Material: Silty Sand with Gravel, reddish brown	



Specimen No.	A	B	C
Exudation Pressure, psi	123	224	525
Expansion Pressure, psf	13	22	155
R-Value	53	60	71
Moisture Content at Test, %	13.3	12.8	12.3
Dry Density at Test, pcf	116.1	120.3	120.5

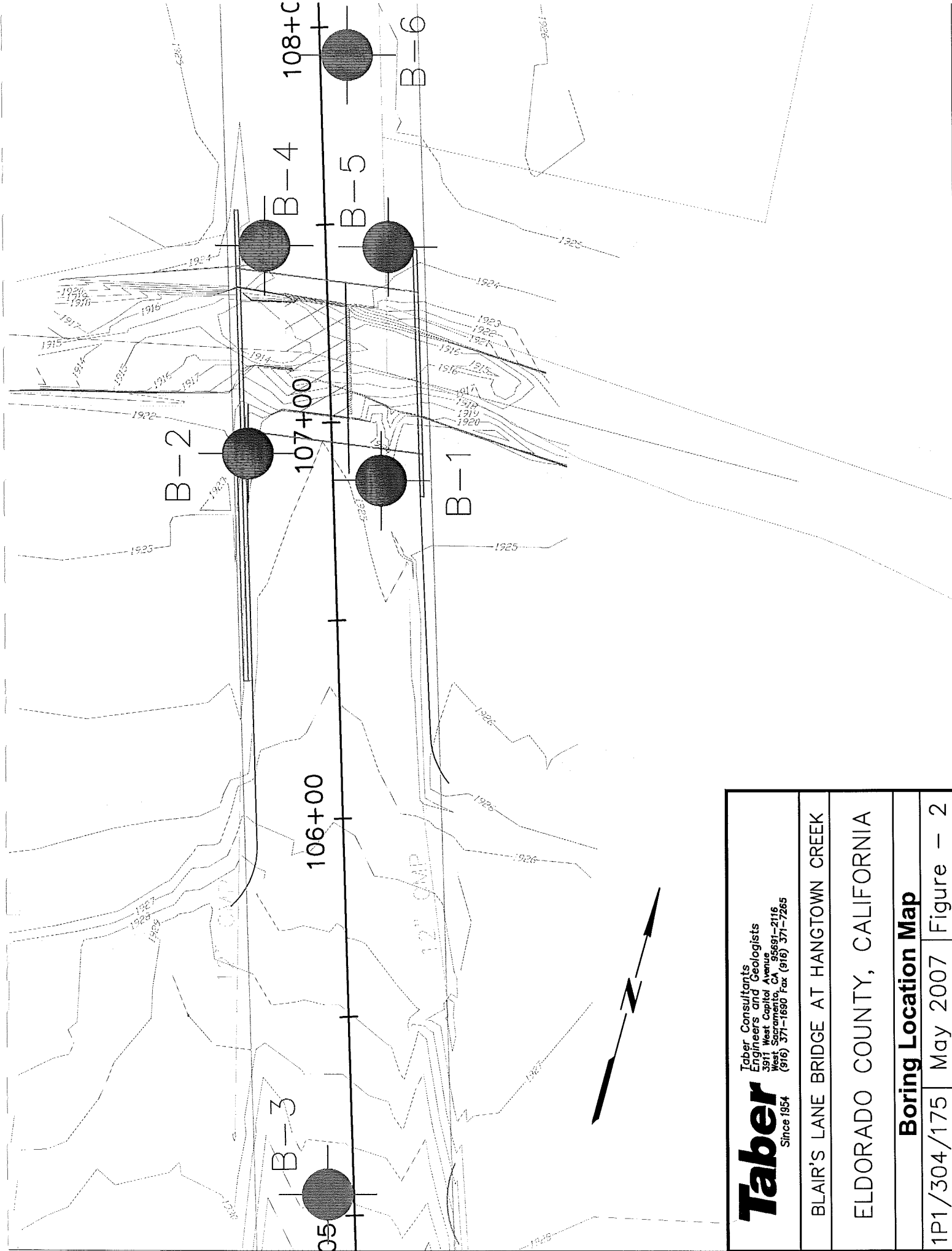
R-Value @ 300 psi Exudation Pressure = 63 **Expansion Pressure @300 psi Exudation, psf = 50**

Minimum R-Value Requirement:

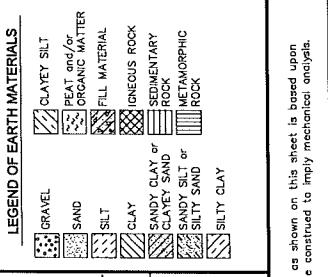
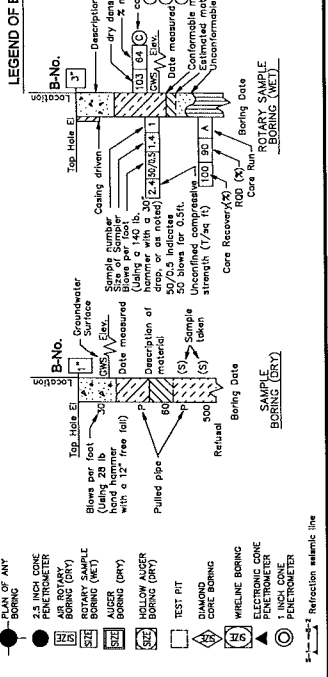
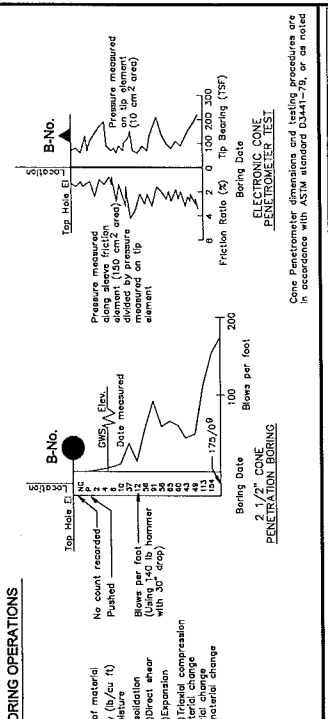
Comments:

Report By: Prav Dayah

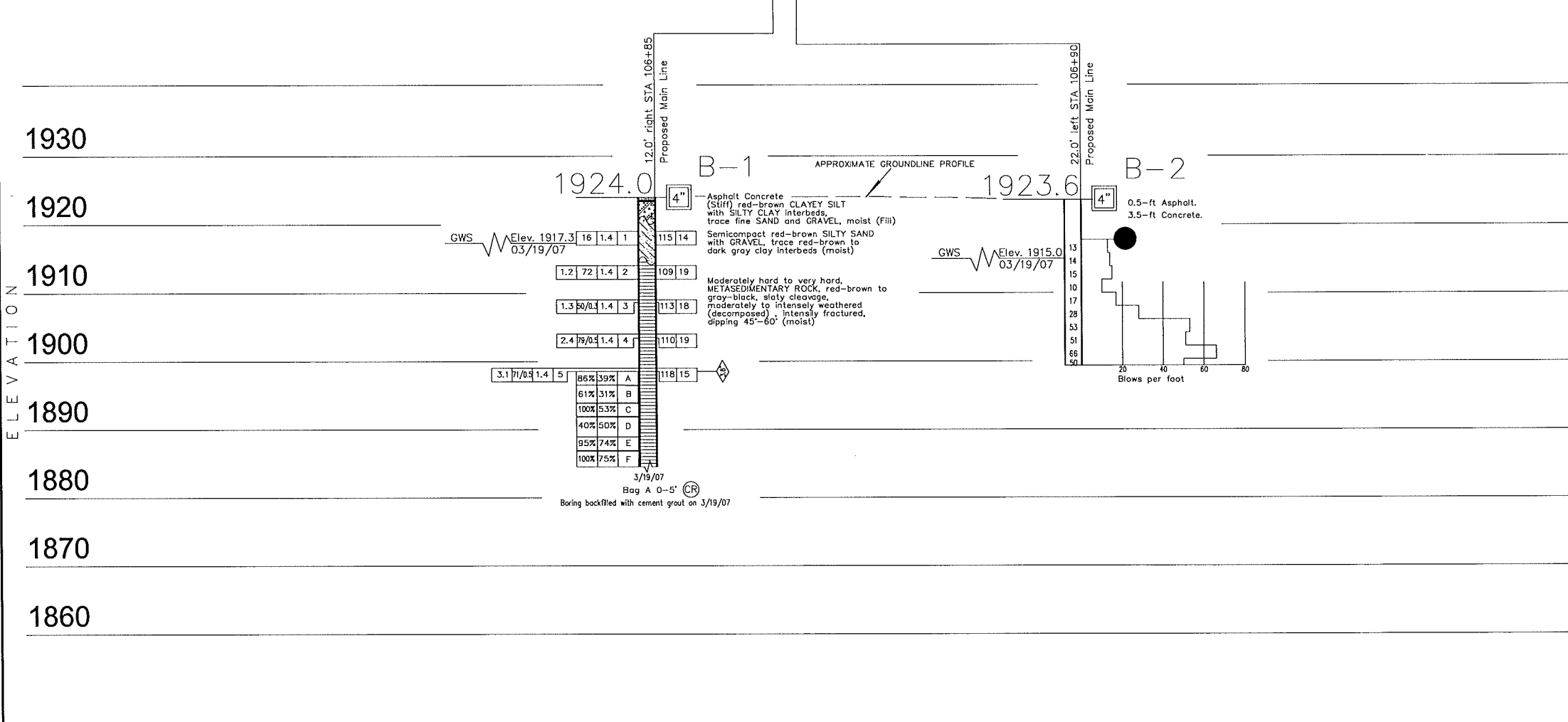
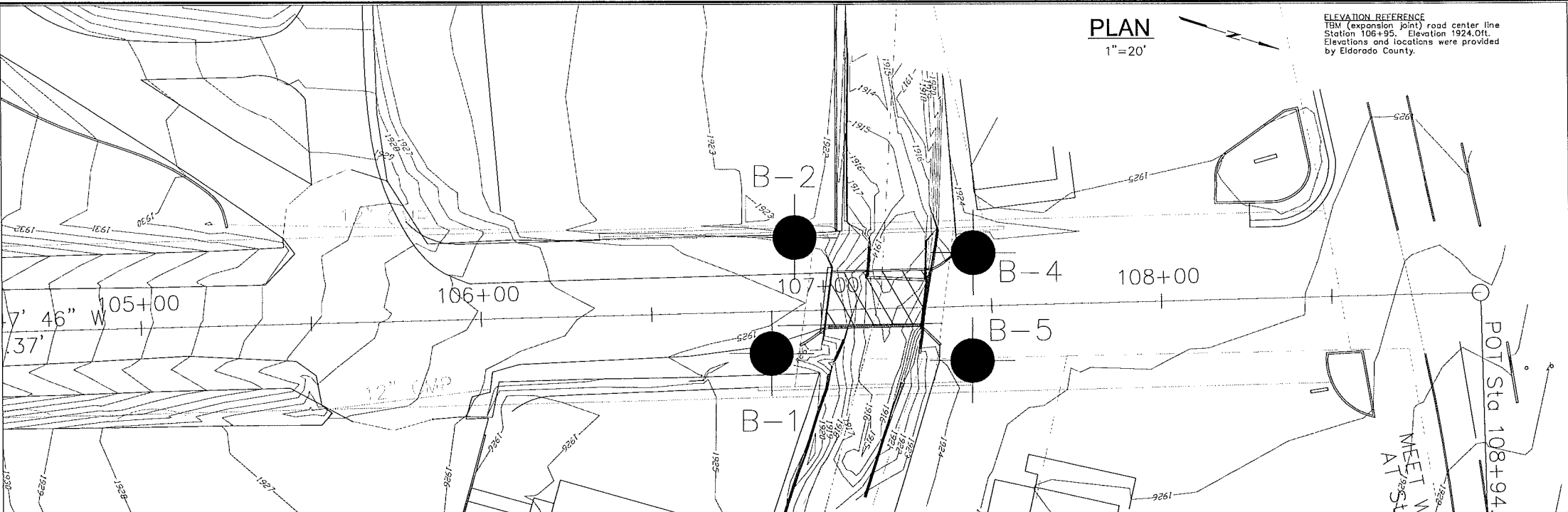
RVALUE with calcs pdp



<p>Taber Since 1954 Taber Consultants Engineers and Geologists 301 West Capitol Avenue West Sacramento, CA 95691-2116 (916) 371-1680 Fax (916) 371-7265</p>	<p>BLAIR'S LANE BRIDGE AT HANGTOWN CREEK</p>	<p>ELDORADO COUNTY, CALIFORNIA</p>	<p>Boring Location Map</p>	<p>1P1/304/175 May 2007 Figure - 2</p>
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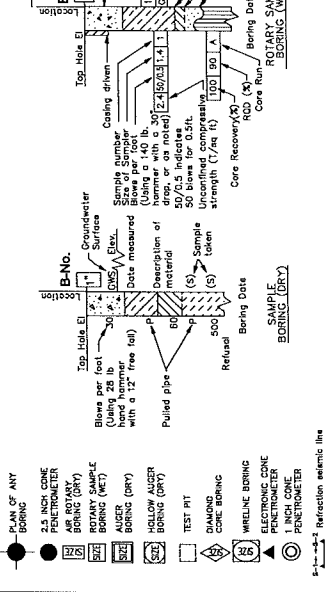
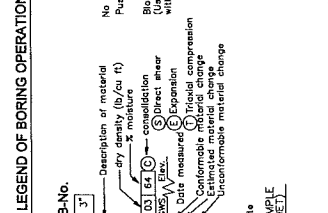
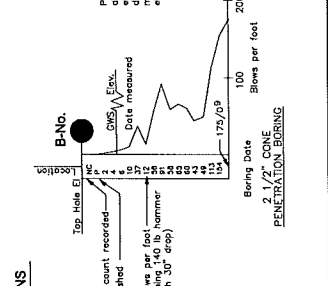
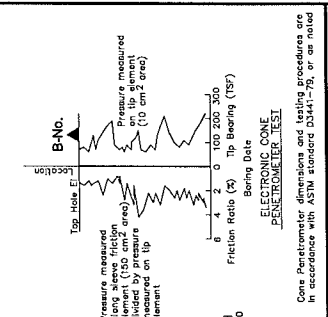
CONSISTENCY CLASSIFICATION FOR SOILS	
According to the Standard Penetration Test	
Standard Penetration N-value	Cohesive
0-5	Very soft
6-10	Soft
11-20	Stiff
21-35	Very stiff
36-70	Hard
>70	Very hard



DESIGN OVERSIGHT	DRAWN BY X. NGUYEN	EVAN HOPSON FIELD INVESTIGATOR	BRIDGE NO.	BLAIR'S LANE BRIDGE AT HANGTOWN CREEK
SIGN OFF DATE	CHECKED BY DAVE KITZMAN	DATE MARCH 2007	POST MILE	LOG OF TEST BORINGS

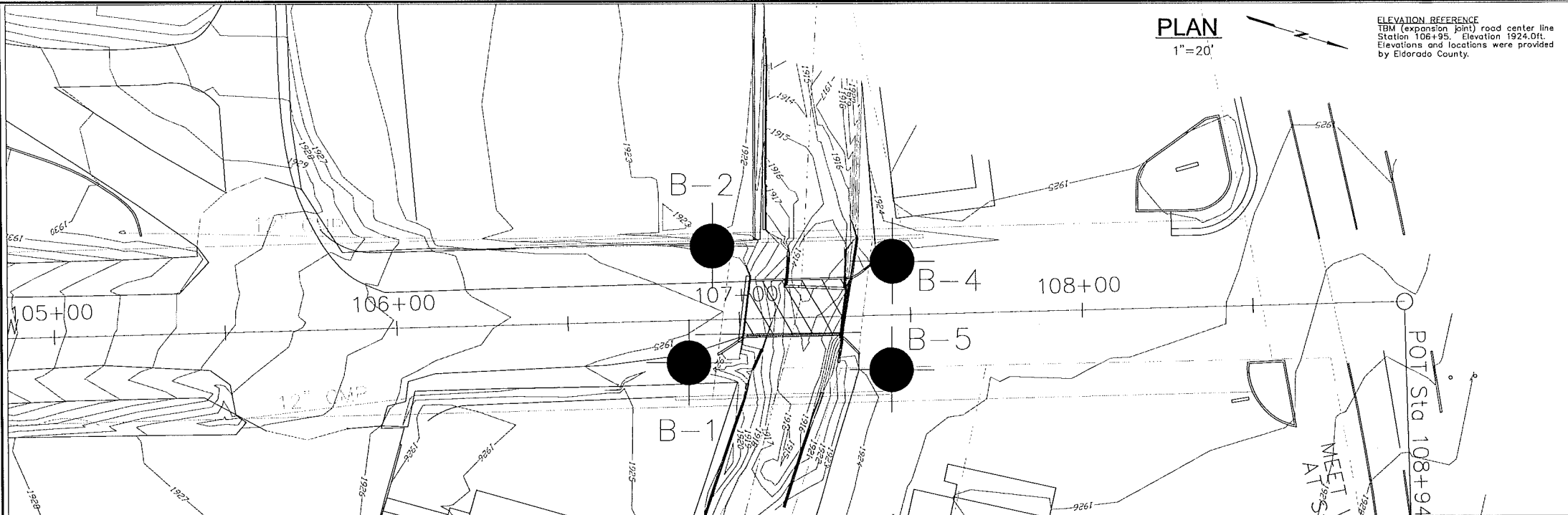
DIST. 03	COUNTY ELD	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
REGISTERED ENGINEERING GEOLOGIST 5/30/07 PLANS APPROVAL DATE TABER CONSULTANTS 3911 West Capitol Avenue West Sacramento, CA 95691-2116 JOB No. 1P1/304/175 LOCATION: 38120-F7: 368N:175W QUINCY ENGINEERING, INC. 3247 Ramos Circle Sacramento, CA 95827					

- NOTES:
- Field classification of soils was in accordance with ASTM D 2488-00 "Description and Identification of Soils (Visual-Manual Procedure)".
 - Standard Penetration tests were performed in accordance with ASTM D 1586-99 using a hammer operated with an automated drop system. Drill rods were 1.5/8-inch diameter "A"-rods; sampler was driven with brass liners.
 - The length of each sampled interval is shown graphically on the boring log. Whole number blow counts ("N") represent the "standard penetration resistance" interval in accordance with ASTM D1586-99. Where less than 1 foot of penetration is achieved, the blow count shown is for that fraction of the "standard penetration resistance" interval actually penetrated.
 - Consistency of soils shown in () where estimated.
 - Rock Quality Designation (RQD), Weathering, Rock Hardness/Strength, Bedding, and Fracture Density, as shown on this sheet, were used to describe all rock core from borings drilled in 2003. Descriptors were determined in the field.
 - REC = Core Recovered (percent).
 - RQD = Rock Quality Designation (percent).
 - Groundwater surface (GWS) elevations in the borings indicated on the Log of Test Boring Sheets reflect the fluid level in the borings on the specified date.
 - Groundwater surface elevations are subject to seasonal fluctuations and may occur at higher or lower elevations depending on the conditions at any particular time.



CONSISTENCY CLASSIFICATION FOR SOILS	
According to the Standard Penetration Test	
Standard Penetration Test "N"-Value	Cohesive
0-5	Very soft
6-10	Soft
11-20	Stiff
21-35	Very stiff
36-50	Hard
51-70	Very hard

Cone Penetrometer dimensions and testing procedures are in accordance with ASTM standard D3441-79, or as noted.



DIST.	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
03	ELD				

REGISTERED ENGINEERING GEOLOGIST
 No. 2412
 EXP. 12-31-07
 CERTIFIED ENGINEERING GEOLOGIST
 STATE OF CALIFORNIA

5-30-07
 PLANS APPROVAL DATE

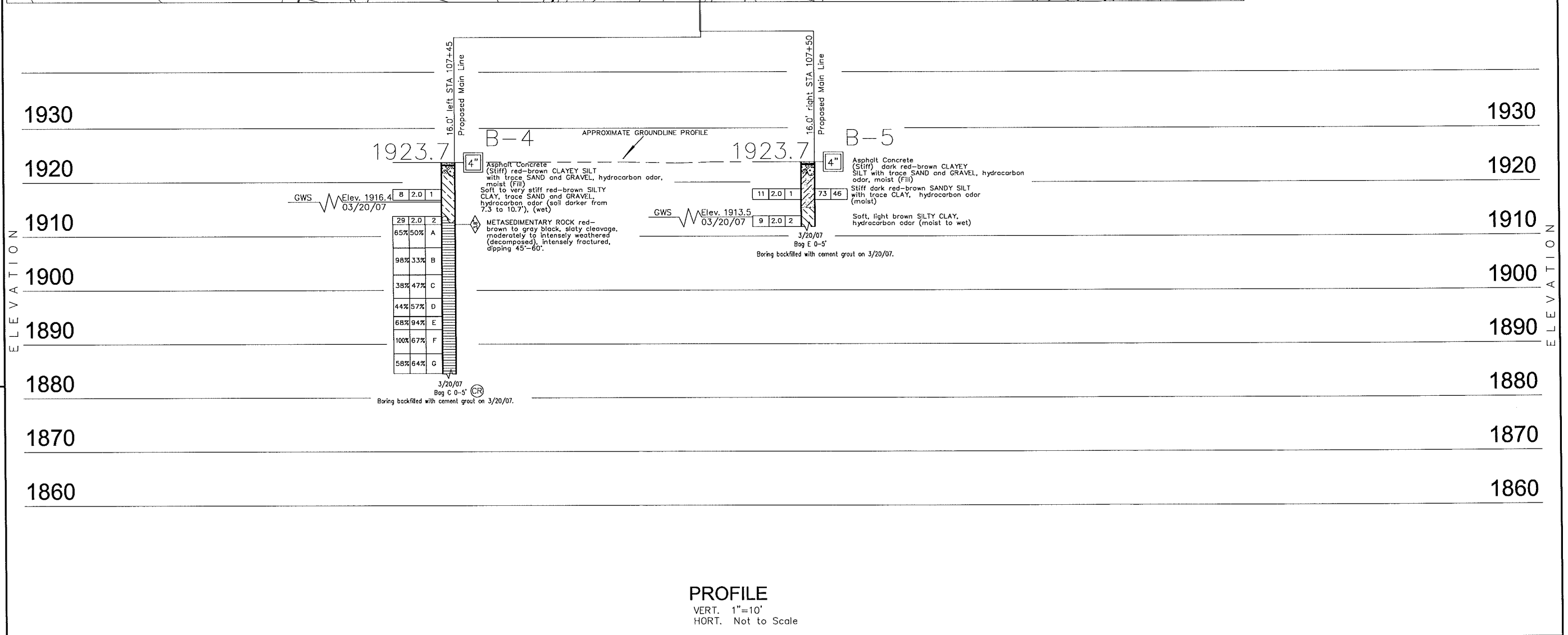
TABER CONSULTANTS
 3911 West Capitol Avenue
 West Sacramento, CA 95691-2116

JOB No. 1P1/304/175 LOCATION: 38120-F7:368N:175W

QUINCY ENGINEERING, INC.
 3247 Ramos Circle
 Sacramento, CA 95827

NOTES:

- Field classification of soils was in accordance with ASTM D 2488-00 "Description and Identification of Soils (Visual-Manual Procedure)".
- Standard Penetration tests were performed in accordance with ASTM D 1586-99 using a hammer operated with an automated drop system. Drill rods were 1 5/8-inch diameter "A"-rods; sampler was driven with brass liners.
- The length of each sampled interval is shown graphically on the boring log. Whole number blow counts ("N") represent the "standard penetration resistance interval" in accordance with ASTM D1586-99. Where less than 1 foot of penetration is achieved, the blow count shown is for that fraction of the "standard penetration resistance" interval actually penetrated.
- Consistency of soils shown in () where estimated.
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- REC = Core Recovered (percent).
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- Groundwater surface (GWS) elevations in the borings indicated on the Log of Test Boring Sheets reflect the fluid level in the borings on the specified date.
- Groundwater surface elevations are subject to seasonal fluctuations and may occur at higher or lower elevations depending on the conditions at any particular time.



DESIGN OVERSIGHT	DRAWN BY X. NGUYEN	EVAN HOPSON FIELD INVESTIGATOR	BRIDGE NO.	BLAIR'S LANE BRIDGE AT HANGTOWN CREEK
SIGN OFF DATE	CHECKED BY DAVE KITZMAN	DATE MARCH 2007	POST MILE	

TEST BORING LOG

Job No. 1P2/304/175

TYPE: 4-INCH AUGER

ELEVATION: 1929.6'

BORING NO 3

UNCONFINED COMPRESSIVE STRENGTH (tsf)					B			Asphalt Concrete Very stiff red brown CLAYEY SILT with GRAVEL, moist (Fill)
	110	5	30	1.4	1			
OTHER TESTS								
DRY DENSITY (lbs/cu. ft.)								
Moisture (%)								
BLOWS/FOOT 350 ft-lb								
SAMPLE SIZE (inches)								
SAMPLE No.								
DEPTH IN FEET								
MATERIAL SYMBOL								
UNIFIED SOIL CLASS								
Bottom of hole at 10.0 feet. Boring backfilled with cement grout on 3/7/07.								
THE BORING LOGS SHOW SUBSURFACE CONDITIONS AT THE DATES AND LOCATIONS INDICATED AND IT IS NOT WARRANTED THAT THEY ARE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.								
LOGGED BY: EMH							DATE: 03-19-2007	

LOG OF BORING (SOILS ONLY) 1P2.304.175 BLAIR'S LANE.GPJ LIBRARY.GLB DATATEMPLATE.GDT 5/30/07

TEST BORING LOG

Job No. 1P2/304/175

TYPE: 4-INCH AUGER

ELEVATION: 1924.4'

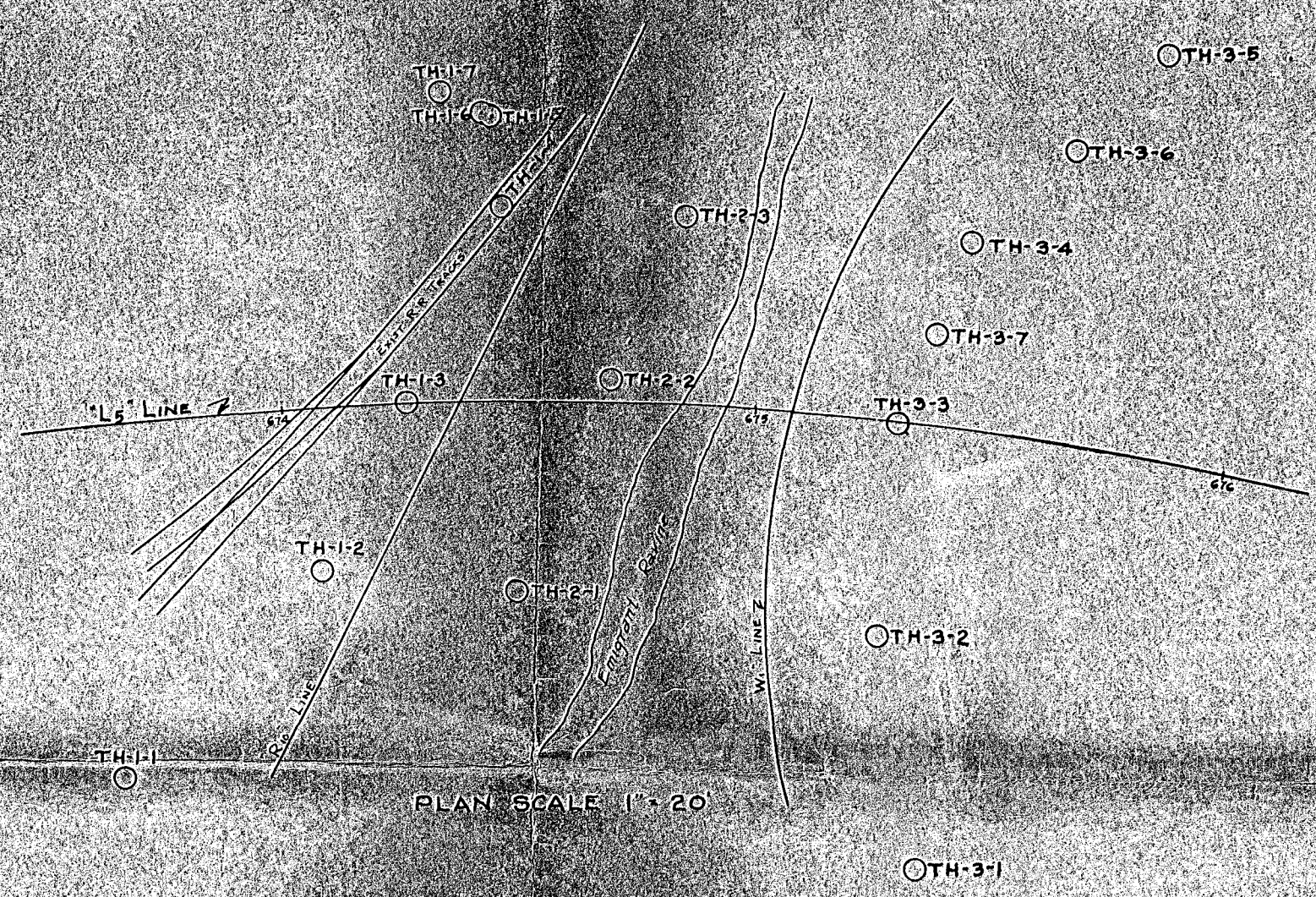
BORING NO 6

LOG OF BORING (SOILS ONLY) 1P2 304 175 BLAIR'S LANE.GPJ LIBRARY.GLB DATATEMPLATE.GDT 5/30/07	UNCONFINED COMPRESSIVE STRENGTH (tsf)	OTHER TESTS	DRY DENSITY (lb/cu. ft.)	Moisture (%)	BLOWS/FOOT 350 ft-lb	SAMPLE SIZE (inches)	SAMPLE No.	DEPTH IN FEET	MATERIAL SYMBOL	UNIFIED SOIL CLASS	Asphalt Concrete (Stiff) gray CLAYEY SILT with GRAVEL, hydrocarbon odor, moist (Fill)
											GM- ML
							D	5			
								10			Bottom of hole at 5.0 feet. Boring backfilled with cement grout on 3/9/07.
								15			
								20			
								25			
								30			
								35			
								40			
											THE BORING LOGS SHOW SUBSURFACE CONDITIONS AT THE DATES AND LOCATIONS INDICATED AND IT IS NOT WARRANTED THAT THEY ARE REPRE- SENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.
											LOGGED BY: EMH
											DATE: 03-20-2007

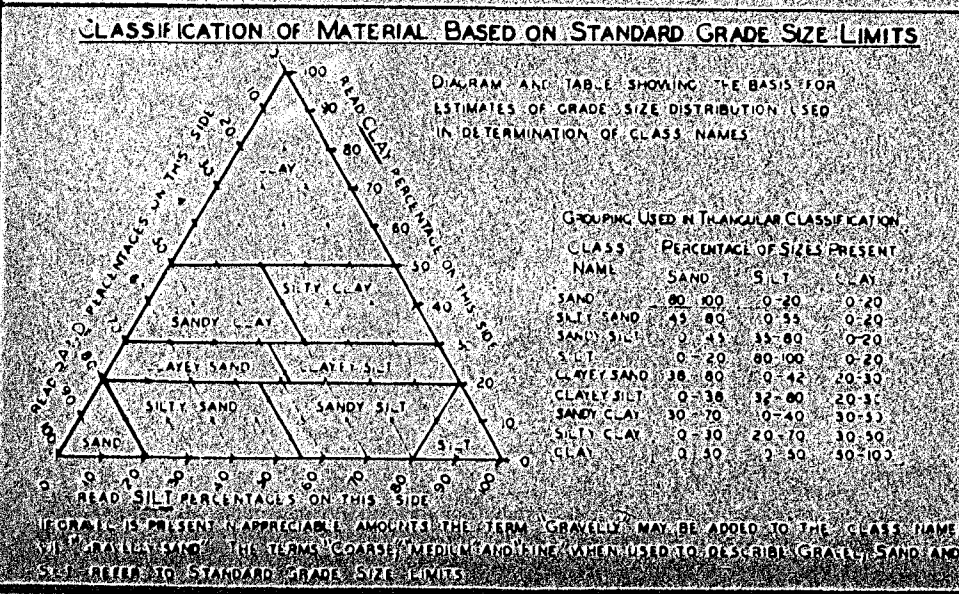
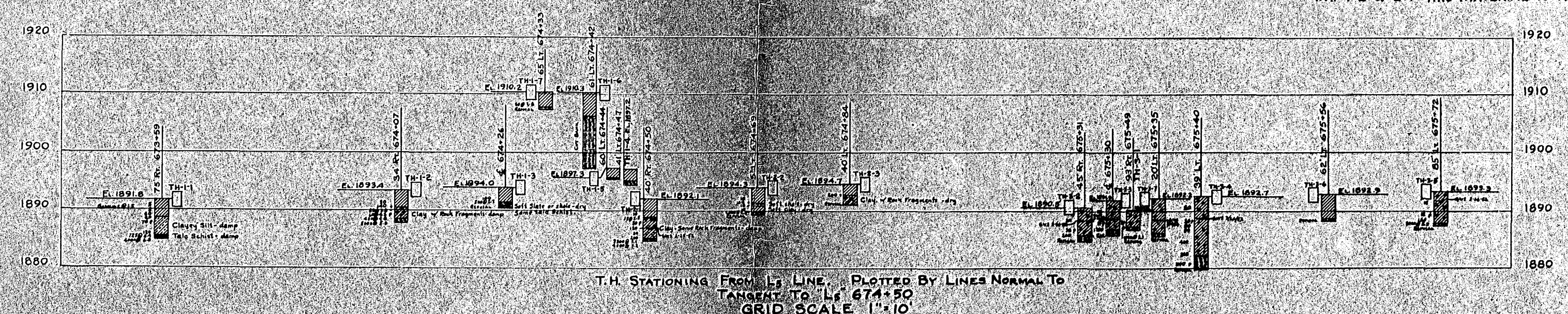
APPENDIX A
Laboratory Test Results

Chloride/ Sulfate & pH/Min. Resistivity

<u>Boring/ Sample</u>	<u>Depth (ft)</u>	<u>Description</u>	<u>Chloride (ppm)</u>	<u>Sulfate (ppm)</u>	<u>pH</u>	<u>Minimum Resistivity (ohm-cm x 1000)</u>
B-1/Bag A	0-5	Clayey Silt	122.8	48.9	7.39	1.61
B-4/Bag C	0-5	Clayey Silt	9.0	25.7	7.45	3.48



NOTE
 AT ALL TEST HOLES THE UPPER STRATUM IS CLAY. AT TH. 3-1, 3-2, 3-3, 3-4, 3-5 & 3-7 ROCK FRAGMENTS ARE MIXED WITH THE CLAY. AT TH. 2-2, 2-3 & 3-4 IT IS DAMP. AT TH. 1-1, 1-4, 1-7, 2-1, 3-1 & 3-5 IT IS MOIST. AT TH. 1-2, 2-2 & 3-7 IT IS WET. EXCEPT WHERE NOTED, THE LOWEST MATERIAL ENCOUNTERED IS A SOFT SHALE OR SLATE. AT TH. 1-7, 2-2, 2-3 & 3-5 IT IS DRY. AT TH. 1-2 & 2-1 THIS MATERIAL IS WET.



- LEGEND OF BORING OPERATIONS**
- PLAN OF ANY BORING
 - 1" SAMPLER BORING
 - ROTARY WASH BORING
 - 1" CLOSED SAMPLER DRIVEN
 - CORE BORING
 - 2 1/2" PENETROMETER DRIVEN
 - 1 1/8" SAMPLER BORING
 - 2" TO 5" AUGER BORING
 - 6" TO 20" AUGER BORING
- LEGEND OF EARTH MATERIALS**
- GRAVEL - G
 - SAND - S
 - SILT - SI
 - CLAY - C
 - SANDY SAND - S-S
 - CLAYEY SAND - C-S
 - SANDY SILT - S-SI
 - CLAYEY SILT - C-SI
 - SILT CLAY - S-C
 - CLAY - C
 - CASING DRIVEN
 - JET BORING
 - SAMPLE TAKEN
 - 1/4" A-ROD DRIVEN
- THE APPROPRIATE BORING SYMBOLS DESIGNATING THE METHOD OF OPERATION ARE SHOWN AT THE UPPER RIGHT HAND CORNER OF THE RESPECTIVE BORING. WHERE TOO CHANGES WERE MADE DURING THE BORING OPERATION SYMBOLS ARE SHOWN AT THE POINT OF CHANGE.

- LEGEND OF EARTH MATERIALS**
- SILT CLAY - SI-C
 - PEAT AND ORGANIC CLAY - O
 - SANDSTONE - SS
 - SHALE - SH
 - BROKEN ROCK (FRAGMENTS) - BR
 - ROCK - R
 - FILL MATERIAL

- ABBREVIATIONS**
- EL. 69.4 ELEVATION OF GROUND AT TEST HOLE
 - b.p.f. BLOWS PER FOOT - (SEE NOTE ABOVE)
 - P. FILLED PIPE
 - M MOISTURE AS % DRY WEIGHT
 - W.G. ELEVATION OF GROUND WATER AND DATE
- No Changes This Sheet
AS BUILT
 CORRECTIONS BY: *J.H. Horn*
 DATE: 4-15-54

NOTES

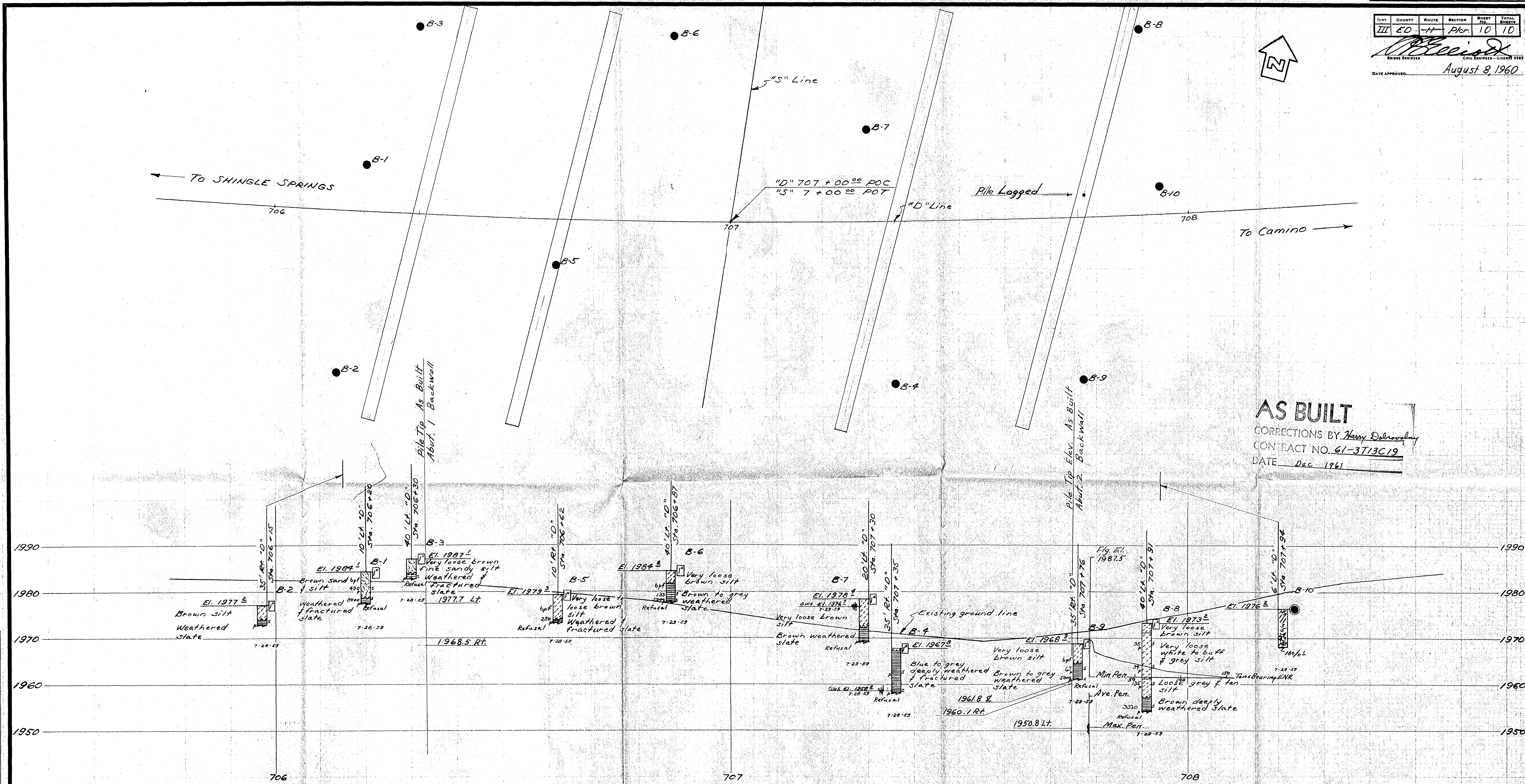
THE CONTRACTOR'S ATTENTION IS DIRECTED TO SECTION 2, ARTICLE (c) OF THE STANDARD SPECIFICATIONS AND TO THE SPECIAL PROVISIONS ACCOMPANYING THIS SET OF PLANS.

CLASSIFICATION OF EARTH MATERIAL AS SHOWN ON THIS SHEET IS BASED UPON FIELD INSPECTION AND IS NOT TO BE CONSTRUED TO IMPLY MECHANICAL ANALYSIS.

MICROFILMED

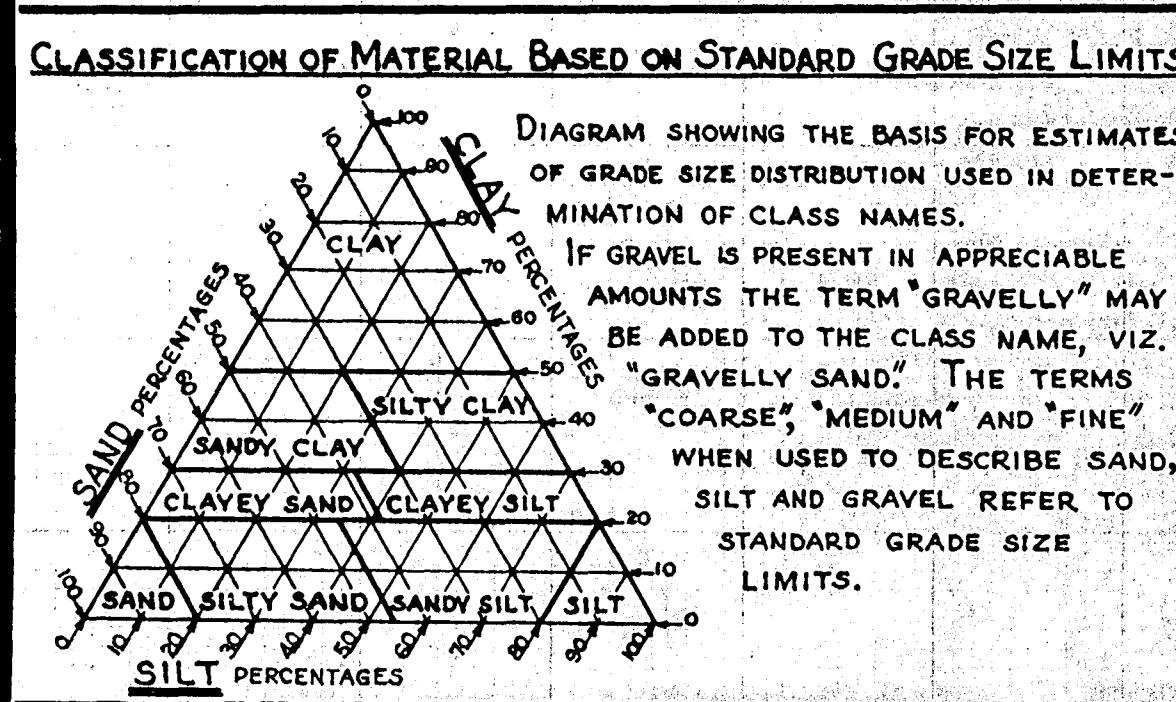
WASHINGTON STREET OVERHEAD
LOG OF TEST BORINGS

SCALE: As Shown
 BRIDGE NO. 25-53
 DRAWING NO. 1-2867-13



AS BUILT
 CORRECTIONS BY *Harry DeRosier*
 CONTRACT NO. 61-3T13C19
 DATE Dec 1961

FIELD STUDY BY: G. Miller
 DRAWN BY: M. H. New, B-11-53
 CHECKED BY: G. Miller, B-17-53
 APPROVAL RECOMMENDED BY: *[Signature]*
 APPROVED BY: *[Signature]*



LEGEND OF EARTH MATERIALS

	GRAVEL		SILTY CLAY OR CLAYEY SILT
	SAND		PEAT AND/OR ORGANIC MATTER
	SILT		FILL MATERIAL
	CLAY		IGNEOUS ROCK
	SANDY CLAY OR CLAYEY SAND		SEDIMENTARY ROCK
	SANDY SILT OR SILTY SAND		METAMORPHIC ROCK

LEGEND OF BORING OPERATIONS

- PLAN OF ANY BORING
- ⊙ PENETROMETER
- ⊙ 2 1/4" CONE PENETROMETER
- ⊙ SAMPLER BORING (DRY)
- ⊙ ROTARY BORING (WET)
- ⊙ AUGER BORING (DRY)
- ⊙ JET BORING
- ⊙ CORE BORING
- ⊙ TEST PIT

NOTES

The contractor's attention is directed to Section 2-1.03 of the Standard Specifications and to the Special Provisions accompanying this set of plans.

Classification of earth material as shown on this sheet is based upon field inspection and is not to be construed to imply mechanical analysis.

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS

WILTSE ROAD UNDERCROSSING

LOG OF TEST BORINGS

SCALE 1" = 10' BRIDGE 25-63 R/L FILE E-25 DRAWING C-6542-10