

COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY  
OFFICE OF CHIEF ENGINEER

AMENDMENTS TO THE STANDARD SPECIFICATIONS  
FOR PUBLIC WORKS CONSTRUCTION  
2009 EDITION

- A. Provisions contained in this document amend the "Standard Specifications For Public Works Construction" (SSPWC), 2009 Edition.
- B. The provisions have been arranged in a format and sequence that parallels the SSPWC. As a reference convenience, page numbers of the sections and subsections in the SSPWC to be amended are provided. These page numbers indicate the page on which a particular section or subsection begins and may not necessarily be the page on which the amendment occurs. An amendment may occur on a page subsequent to that referenced if the section or subsection being amended appears on multiple pages of the SSPWC.
- C. A vertical line in the margin denotes a change in the text adopted by the Board of Directors of the District since 2006 Edition Amendments. This is done as a courtesy to the user of this document. The District does not guarantee that all changes are marked. The user should compare these Amendments with the previous edition and should not rely on the accuracy of the lines in the margins. The District disclaims any responsibility or liability for any errors or omissions.

Approved Stephen R. Maguin  
STEPHEN R. MAGUIN  
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C.E. NO. 23089

Whenever any one or more of the County Sanitation Districts of Los Angeles County construction projects are to be constructed pursuant to "Standard Specifications for Public Works Construction," the amendments herein contained shall apply to said Standard Specifications. Reference to "Standard Specifications for Public Works Construction" is the 2009 Edition of said specifications.

The section numbering used herein is identical to that in said Standard Specifications.

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IN **1-2 TERMS AND DEFINITIONS, Agency**, DELETE THE SENTENCE AND REPLACE WITH THE FOLLOWING:

"The District or Districts for which the Work is being performed. The discretion conferred upon the Agency by the Specifications or District Amendments, whether designated Agency, District or Districts, may be exercised by the Engineer."

IN **1-2 TERMS AND DEFINITIONS, Contractor**, ADD THE FOLLOWING TO THE END:

"The term "General Contractor" shall mean Contractor."

IN **1-2 TERMS AND DEFINITIONS, Plans**, ADD THE FOLLOWING TO THE END:

"The term "Drawings" shall mean Plans.

IN **1-2 TERMS AND DEFINITIONS, Service Connection**, ADD THE FOLLOWING TO THE END:

", including House Connection Sewer"

IN **1-2 TERMS AND DEFINITIONS**, ADD THE FOLLOWING TO THE LIST:

**"District or Districts - See Agency.**

**Equipment Manufacturer, Vendor, Equipment Supplier or Supplier** - Any person, firm, corporation, partnership, or any combination thereof, which enters into a Contract with the Contractor to supply specified materials or equipment and/or install equipment, or provide services as part of the Work of the Contract.

**Major Bid Item** - A single Contract item constituting 10 percent or more of the original Contract Price."

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IN **1-3.2 Common Usage**, ADD THE FOLLOWING TERMS TO THE LIST:

"CMP ..... Corrugated Metal Pipe.

FRP ..... Fiberglass Reinforced Plastic.

ESRP ..... Emergency Spill Response Plan.

FRPM..... Fiberglass Reinforced Plastic Mortar.

LCRS ..... Leachate Collection and Removal System

RGRCP ..Rubber Gasket Reinforced Concrete Pipe

SDIs. .... Storm Drain Inlets"

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IN **1-3.3 Institutions**, ADD THE FOLLOWING TO THE LIST:

"ACI.....American Concrete Institute"

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IN **2-1 AWARD AND EXECUTION OF THE CONTRACT**, DELETE THE PARAGRAPH AND REPLACE WITH THE FOLLOWING:

"Proposals shall be submitted on the proposal forms prepared and furnished for the purpose, which may be obtained at the office of the Engineer at the address indicated on the Notice Inviting Bids. When presented they must be completely made out in the manner and form indicated therein, showing the proposed prices clearly and legibly, and must be properly signed by the bidder, whose address, telephone number, and California Contractor's license number shall also be shown.

Each proposal submitted, together with the required proposal guaranty prescribed, shall be presented under sealed cover and must be filed prior to the time, and at the place, designated in the Notice Inviting Bids. A proposal may be withdrawn by the bidder, provided the request therefore is made in writing and is filed with the Board Secretary prior to the time fixed for the opening of bids. No proposals received after the time set for opening of the proposals will be considered. All proposals will be publicly opened and read at the time and place indicated in the Notice Inviting Bids.

The Plans and Specifications to which the proposal forms refer are on file and open to inspection in the office of the Engineer. Copies of the Plans, Standard Drawings, amendments to the Standard Specifications for Public Works Construction, Special Provisions, and Subsurface Investigation Report, if any, may be obtained at said office without cost unless a non-refundable fee is specified in the Notice Inviting Bids.

The quantities shown on the proposal form are to provide a basis for comparison of bids; they are based on the Plans and Specifications and on other information which is also available to the bidder. They are in some cases estimates and do not necessarily indicate the exact quantities that may be involved.

Each proposal submitted must be accompanied either by a certified or cashier's check, or a surety bond with an approved surety company as surety, payable to the District, in an amount equivalent to at least ten percent of the total aggregate bid price of such proposal, as a guarantee that the bidder, if successful, will enter into and execute the awarded Contract; and no proposal will be accepted unless such check or surety bond is enclosed therewith. If the bidder desires to submit a bond with a proposal instead of a certified or cashier's check, the bidder must comply with all applicable laws including Code of Civil Procedure, Section 995.630.

Should any bidder to whom an award is made fail to properly enter into and execute the awarded Contract, the amount of the check or bond submitted shall be presumed to be the amount of damage sustained by the District by reason thereof and shall be retained by, or the security shall inure to the benefit of the District. In such case, it is recognized that actual damage would be impracticable or extremely difficult to fix.

More than one proposal for the same work from any individual, firm, partnership, corporation or association under the same or different name will not be accepted, and reasonable ground for believing that any bidder is interested as a prime contractor in more than one (1) proposal for the work will be cause for rejecting all proposals in which such bidder is interested. Apparent collusion among the bidders will

likewise be sufficient cause for rejecting any or all bids, and the participants in collusion may be barred from future bidding.

In the proposal, the Contractor shall accurately price each item of work. Proposals in which the prices are unbalanced, and those which are incomplete or show any alteration of form, erasures, or irregularities of any kind, or contain any additions of conditional or alternate bids that are not called for or otherwise permitted, may be rejected.

Bidders must be thoroughly competent and capable of satisfactorily performing the work covered by the proposal; and when requested, shall furnish such statements relative to previous experience on similar work, and plan of procedure proposed, and the organization, machinery, plant and other equipment, available for the contemplated work, and the financial condition and resources of the bidder, as may be deemed necessary by the District in determining such competence and capability.

The right is reserved to reject all bids and to waive technical defects as the interest of the District may require. In the event of any such rejection, the District shall not be liable for any costs incurred in connection with the preparation and submittal of a bid.

Proposals will not be accepted from bidders who are not licensed as Contractors under the provisions of Chapter 9 of Division 3 of the Business and Professions Code at the time of bid, unless legally exempted from such requirement.

If an award is made, it will be to the responsible bidder submitting the lowest responsive bid. If this proposal is accepted by the Board of Directors of the District and the work is awarded to the bidder, the District will mail or deliver to the bidder an agreement for the performance of the work. Unless otherwise provided in the bid documents, the bidder shall sign, date, and return the agreement along with the other documents identified below to the District within fifteen (15) calendar days after the agreement has been received by the bidder or bidder's authorized agent. The bidder shall return the signed agreement to the District, together with evidence of all insurance required and all bonds required for the faithful performance of the agreement and for the payment of all labor performed and materials used on the work. Bonds will be subject to the approval of the District, as described below. The agreement will become effective on the date the bonds are approved by the District. Bonds for the faithful performance of the Contract and for the payment of laborers and materialmen that are issued by sureties that are listed in the latest version of the U.S. Department of Treasury Circular 570 and that are authorized to issue bonds in the State of California, and whose bonding limitation shown in the circular is sufficient to provide bonds in the amount of the Contract, will be deemed approved unless specifically rejected. Bonds issued by all other sureties are subject to approval by the Board of Directors and shall be accompanied by all of the documents enumerated in the California Code of Civil Procedure §995.660(a), as amended. If the bidder does not return the signed Agreement, bonds, and evidence of insurance postmarked or presented in person within the calendar days set forth above, one (1) day will be subtracted from the completion time specified above for each working day beyond the fifteen (15) calendar days, until the agreement and bonds are executed, dated, and returned. Alternatively unless otherwise provided in the Special Provisions, the District may at any time after fifteen (15) calendar days after the agreement has been received by the bidder or bidder's authorized agent but not signed and returned to the District, give written notice to the bidder that it is in default. Unless the bidder within five (5) days of its receipt or its authorized agent's receipt of said notice, signs, dates and returns to the District the agreement and required bonds, the bid bond or other form of bid security shall be paid to the District as liquidated damages."

DELETE **2-3.2 Self Performance** in its entirety.

IN **2-3.3 Status of Subcontractors**, DELETE THE THIRD PARAGRAPH.

IN **2-4 CONTRACT BONDS**, FIRST PARAGRAPH, FIRST SENTENCE, AND SIXTH PARAGRAPH, FIRST AND SECOND SENTENCES, DELETE "Board" AND REPLACE WITH "Agency".

IN **2-4 CONTRACT BONDS**, FOURTH PARAGRAPH, DELETE THE LAST SENTENCE AND REPLACE WITH THE FOLLOWING:

"The "Performance Bond" shall remain in full force and effect through the guarantee period."

IN **2-4 CONTRACT BONDS**, SIXTH PARAGRAPH, FIRST AND SECOND SENTENCE, DELETE THE WORD "Board" AND REPLACE WITH THE WORD "Agency".

IN **2-5.1 General**, AFTER THE SECOND PARAGRAPH, ADD THE FOLLOWING:

"Every part of the work as specified and shown in the Contract Documents shall be completed and approved. The Engineer has the right to reject any deviation or exception to the Plans, Specifications or related documents proposed by the Contractor or equipment manufacturers. The Plans have been drawn to the indicated scales, except where otherwise noted. Dimensions indicated by figures or numerals shall govern in all cases whether drawn to scale or not. On any drawings where a portion of the work is drawn out or detailed and the remainder is indicated in outline, the drawn out or detailed parts shall apply in all cases. Where ornament or other detail is partially indicated by starting to draw the ornament or other detail in one area, such detail shall be continued throughout the courses or parts in which it occurs and shall apply to all other similar parts in the work, unless otherwise noted. Any bills of material, material take-offs, or lists of bulk material quantities as listed in the Contract Documents are estimated quantities subject to final take-offs by the Contractor. Changes in these quantities due to final definitive take-offs by the Contractor shall not be grounds for an extra work request.

The Contractor is responsible for verifying the location, size, and equipment anchor bolt layout; size of equipment pad; location of equipment support beams and piers and any other information that affects equipment supports prior to fabrication of structural steel or reinforcement and placement of concrete. "

IN **2-5.1 General**, AFTER THE FIFTH PARAGRAPH, ADD THE FOLLOWING:

"Each bidder shall be responsible for visiting the site of the Work prior to submitting a bid, examining all the existing conditions and ascertaining all necessary work entailed by the Plans and Specifications. By submitting a bid for this Work, the bidder shall be deemed to have made such examination, and that it is familiar with and accepts all conditions of the jobsite.

The dimensions and elevations of existing structures and locations of existing equipment, pipelines and grades shown on the Plans were taken, for the most part, from original Plans and are not guaranteed for accuracy. It shall be the responsibility of the Contractor to check dimensions and elevations of existing structures, pipelines, grades or other existing items affected by or affecting the work under this Contract, prior to the start of construction or ordering of materials and equipment affected thereby. Delay or extra expense to the Contractor which is due to encountering construction, piping, or grades not shown or in locations different from those indicated on the Plans, and which could have been avoided by the required field check, shall not constitute a claim for extra work, additional payment, time extension, or damages. The Contractor shall be solely responsible for determining the extent and cost of removal and salvage operations.

Existing improvements visible at the Work site, for which no specific disposition is made on the Plans, but which interfere with the completion of the Work, shall be removed and disposed by the Contractor as directed by the Engineer. "

IN **2-5.1 General**, LAST PARAGRAPH, LAST SENTENCE, ADD THE FOLLOWING TO THE END:

"who will issue instructions on the method to proceed. If the Contractor proceeds with the work so affected, without instructions from the Engineer, the incorrect work shall be removed at no cost to the District, and such an action shall not be grounds for delay or time extension claims by the Contractor. The necessary corrections shall be made to comply with the Engineer's instructions. Except for the foregoing, compensation will be made for legitimate extra work.

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IN **2-5.2 Precedence of Contract Documents**, FIRST PARAGRAPH, FIRST SUBPARAGRAPH, DELETE THE WORD "regulatory".

IN **2-5.2 Precedence of Contract Documents**, LAST PARAGRAPH, DELETE THE LAST SENTENCE AND REPLACE WITH THE FOLLOWING:

"Detailed Plans and detailed notes on Plans shall have precedence over general Plans and general requirements of the Special Provisions. Within each category of the documents, if there is any conflict, the most stringent requirement shall control. Changes made by the District to the document that is highest in priority shall be considered adequate to convey scope of work since lower priority documents may not be changed by the District. The Contractor shall be responsible for all necessary cross-checking."

IN **2-5.3 Submittals**, DELETE ALL PARAGRAPHS AND REPLACE WITH THE FOLLOWING:

"If required by the Special Provisions, the Contractor shall utilize a Web-based project management application called Unifier™ for project communications, including transmission of submittals electronically between the Contractor and the District via workflows customized by the District as specified in 2-13. The following sets forth the requirements on submittals.

Shop drawings shall be prepared by the manufacturer, fabricator, or Subcontractor and submitted by the Contractor. Shop drawings are drawings showing details of manufactured or assembled or shop fabricated products to be incorporated into the Work. Where the manufactured item is designed by the manufacturer, fabricator, Subcontractor, consultant or designee, the drawings and supporting calculations shall be stamped by an engineer registered by the State of California executing the design within the scope of his or her registration. Working drawings are drawings showing details not shown on the Plans, which are required to be designed by the Contractor. Working drawings shall be of a size and scale to clearly show all necessary details.

When working drawings, shop drawings, other drawings, or submittals are required by the Plans or Specifications, or requested by the Engineer, they shall be prepared in accordance with current modern engineering practice at the Contractor's expense. Drawings shall be of size and scale to show clearly all necessary details. Materials shall not be furnished or fabricated nor any work done for which drawings or submittals are required, before approval of the drawings or submittals. Any submittals reviewed and processed by the District prior to issuance of the Notice to Proceed are done to expedite the schedule and as a courtesy to the Contractor. The Contractor shall assume full responsibility and risks should it decide to proceed with the ordering and/or purchasing of any of the approved materials prior to the District's issuance of the Notice to Proceed.

Engineering data covering all equipment and fabricated materials to be furnished shall be submitted to the District for approval. Working drawings, shop drawings or other drawings and supporting calculations are required in, but not limited to, the sections shown in Table 2-5.3(A):

**TABLE 2-5.3 (A)**

<b>Item</b>	<b>Section Number</b>	<b>Title</b>	<b>Subject</b>
1	7-10.4.1	Safety Orders	Shoring and Excavation Plan
2	207-2.1	General	Reinforced Concrete Pipe
3	207-2.5	Joints	Reinforced Concrete Pipe
4	207-8.4	Joints	Vitrified Clay Pipe
5	207-10.2	Fabricated Steel Pipe	Steel Pipe
6	207-25	Precast Manhole Shafting	Precast Manholes
7	300-3.2	Cofferdams	Structure Excavation and Backfill
8	303-1.7	Placing Reinforcement	Concrete Structures - Working or Shop*
9	303-3.1	General	Prestressed Concrete Construction
10	304-1.1.1	Shop Drawings	Structural Steel
11	304-2.1	Metal Hand Railings	Metal Railings
12	306-1.1.8	Dewatering	Dewatering Plan
13	306-2	Jacking Operations	Underground Conduit Construction
14	306-3	Tunneling Operations	Underground Conduit Construction
15	306-3.4	Tunnel Supports	Tunneling Operations
16	306-8	Microtunneling Operations	Underground Conduit Construction
17	500-1.1.7(f)	Bypassing Requirements	Flow Bypass Plan

\*Drawings, Bend and Bar Lists

Working or shop drawings and calculations for Items 1, 7, 9, 10, 11, 12, 13, 14, 15, and 16 listed above shall be prepared, stamped, and signed by a Civil or Structural Engineer currently registered by the State of California. In addition, dewatering plan shall be reviewed and stamped by a Geotechnical Engineer currently registered by the State of California.

Unless otherwise approved by the Engineer, data shall be submitted only by the prime Contractor who shall indicate by a signed stamp on the drawings, or other approved means, that he (the Contractor) has checked the data, and that the work shown is in accordance with Contract requirements and has been checked for dimensions and relationship with work of all other trades involved. The practice of submitting incomplete or unchecked data to the Engineer for approval will not be acceptable. The data which, in the opinion of the Engineer, are incomplete or have not been checked by the Contractor or are illegible will be considered as not complying with Contract requirements and will be returned to the Contractor for resubmittal in the proper form. The District may make this determination at any time during the review period. The Contractor shall be responsible for all delays to the project schedule due to incomplete submittals, submittals returned marked NOT APPROVED or submittals returned without review for not complying with the requirements above or the correct format defined below.

Engineering data shall be submitted in a format similar to the arrangement of the applicable section(s) of the Specifications unless otherwise specified in the individual section(s). Any submittal not following the format specified or submittal numbering system specified, and not conforming with the requirements listed below, will be returned for resubmittal without review.

- 1) Data shall include drawings and descriptive information in sufficient detail to show the kind, size, arrangement, and operation of component materials and devices; the external connections, anchorages, and supports required; performance characteristics; dimensions needed for installation and correlation with other materials and equipment, and all additional information as required in the detailed section(s) of the Specifications.
- 2) Calculations to support the adequacy of the design in meeting specified performance ratings or requirements shall be submitted when required by the Specifications.
- 3) Each drawing or data sheet shall be clearly marked with the name of the project, the Contractor's name, and references to applicable Specification paragraphs and Plan sheets. Submittals containing multiple drawings or data sheets shall be collated prior to submittal for approval.
- 4) Data sheets, catalog cuts or drawings showing more than the particular item under consideration shall be marked to cross out all but the applicable information.
- 5) Data submitted shall include drawings showing wiring and piping layouts. Any changes proposed by the Contractor shall be stated in a cover letter and essential details of such changes shall be clearly shown in the data submitted.

Submittals shall be accompanied by a standard District's transmittal form. The District will furnish one copy of the transmittal form to the Contractor and the Contractor shall be responsible for reproducing any additional copies required. Any submittal not accompanied by such a form, or where all applicable items on the form are not completed, will be returned for resubmittal. A separate transmittal form shall be used for each specific item or class of material or equipment for which a submittal is required. Transmittal of shop drawings on various items using a single transmittal form will be permitted only when the items taken together constitute a manufacturer's "package" or are so functionally related that expediency indicates review of the group or package as a whole. Submittals transmitted by a facsimile machine will not be accepted.

The Contractor shall assign a unique and individual sequential number on each submittal package. The submittal number shall be clearly written in the space provided on the transmittal form. The Contractor shall use the individual submittal number in all correspondence to the District in reference to a particular submittal. The Contractor shall be responsible for not assigning the same submittal number to different submittal packages. Resubmittals shall incorporate the original submittal number followed by the revision number. Submittals improperly numbered will be returned without review.

The Contractor shall indicate by checking the appropriate box on the transmittal form that either no exceptions to the Specifications are taken or deviations are submitted. If deviations are indicated, then all deviations shall be listed with the transmittal form. Failure to list all deviations shall be grounds for rejection of a submittal or return of the submittal without review, at the District's option. The Contractor shall be solely responsible for any deviations not listed. Any transmittal form not conforming with this requirement will be returned with the engineering data for resubmittal without review. Consequences of resulting delays shall be borne fully by the Contractor.

Unless otherwise specified, the total number of copies submitted shall be four plus the number the Contractor desires to be returned stamped with the Engineer's approval. Four copies will be retained for the District's use.



The Engineer's review of drawings and data submitted by the Contractor will cover only general conformity to the Plans and Specifications. The Engineer's approval of drawings returned marked APPROVED or APPROVED SUBJECT TO CORRECTIONS SHOWN IN RED will not constitute a blanket approval of dimensions, quantities, and details of the material, equipment, device, or item shown, and does not relieve the Contractor from any responsibility for errors, omissions or deviations from the Contract requirements. The Contractor shall be responsible for the correctness of the drawings, for shop fits and field connections, and for the results obtained by use of such drawings. The District reserves the right to subsequently reject any previously approved equipment, material, and/or construction method which deviates from the Contract Documents when said deviations were not listed in the transmittal form for the approved submittal. When the drawings and data are returned marked NOT APPROVED or RESUBMITTAL REQUIRED, the corrections shall be made as noted thereon and as instructed by the Engineer; resubmittal shall be made in the same manner as the original submittal.

The Contractor shall allow twenty (20) working days for the District to review each required submittal or resubmittal. For hard copy submittals, the review period shall begin on the following working day after the date the submittal is received at the address shown on the transmittal form and end on the date the District mails its response. For hard copy submittals the Contractor shall make allowances for the time required for mail delivery to and from the District. The District will notify the Contractor in writing if a longer period is required to review complicated submittals and this shall not be the basis for a claim for extra time or monetary compensation by the Contractor. Except when a submittal review is specifically requested by the District elsewhere in the Specifications or Special Provisions, the District will not begin review of any submittal or reply to any correspondence prior to the date in the Notice to Proceed. If submittals are rejected by the District, the Contractor is responsible for any subsequent time delays without any additional compensation from the District. Any submittal which contains the same equipment, valve, piping, or item of the same kind for the same specification section, made by a different manufacturer than the original submittal previously approved by the District shall be returned without review.

When the Contractor submits supplemental information for a submittal under review by the District and that supplemental submittal information is necessary either for the review to proceed or for the submittal to be acceptable, then the District will require the same review period specified above, which will begin on the following working day after the associated date of receipt of the supplemental submittal information. The Contractor shall be liable for all impacts to the work due to its failure to submit all information in the original submittal. A transmittal form shall accompany all supplemental submittals.

Subject to the requirements above, drawings and data, after final processing by the Engineer, shall become a part of the Contract Documents, and the work shown or described thereby shall be performed in conformity therewith unless otherwise required by the Engineer. In the event of conflict between approved submittal and the other Contract Documents, the most stringent requirements shall apply unless the District has agreed to a reduction in requirements in response to a deviation listed on a submittal transmittal form.

In addition to shop drawings and working drawings, the Contractor shall submit the following information along with submittals or as separate submittals when applicable:

- 1) Certification per 4-1.5.
- 2) Construction Schedule per 6-1.
- 3) Confined Space Entry Program per 7-10.4.4
- 4) Concrete mix designs per 201-1.1.
- 5) Asphalt concrete mix designs per 203-6.2.

- 6) Data, including, but not limited to, catalog sheets, manufacturer's brochures, technical bulletins, specifications, diagrams, product samples, and other information necessary to describe a system, product or item. This information is required for irrigation systems, street lighting systems, and traffic signals, and may also be required for any product, manufactured item, or system.
- 7) Equipment anchorage details and supporting calculations prepared, stamped, and signed by a Civil or Structural Engineer currently registered by the State of California executing the design within the scope of his or her registration.
- 8) Dewatering plan, including but not limited to procedures, plan and section drawings, location of wells, piping and routing, pumping equipment, metering, silt removal, water quality monitoring, discharge and necessary permits.

All resubmittals shall include a copy of the District's response letter to the previous submittal. The Contractor shall place a check mark (√) next to each comment on the District's response letter where the resubmittal is in full compliance. The Contractor shall underline each comment on the District's response letter where the resubmittal still has deviations or missing information. The Contractor shall sequentially number each underlined comment in the right hand margin, and shall include in the resubmittal a corresponding detailed written justification for each deviation or missing information. Failure to include a copy of the District's response letter properly marked up along with a justification for each deviation or missing information will result in the resubmittal being returned without review. Consequences of resulting delays shall be borne fully by the Contractor."

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IN **2-7 SUBSURFACE DATA**, first paragraph, delete the second sentence and replace with the following:

"Copies of soil test reports for test holes which have been drilled will be made available to bidders upon request."

IN **2-8 RIGHT OF WAY**, AFTER THE FIRST SENTENCE, ADD THE FOLLOWING:

"Unless otherwise approved by the Engineer, the Contractor shall limit construction activities and storage of equipment and materials, and parking of vehicles including employees' private vehicles to within the limits of the District's easements and occupational right of ways. The equipment and materials to be stored at a location are limited to those that will be in actual and immediate use for work within that location. In addition, if the Contractor elects not to use the occupational right of way area provided at a location, the Contractor shall be deemed to have waived its rights to the occupational right of way obtained for that location. Unless otherwise specified or directed by the Engineer, construction within private properties shall be restricted to the hours between 7:00 a.m. and 3:30 p.m., Monday through Friday, no holidays. The Contractor shall be solely responsible for the protection and safekeeping of its equipment and materials and shall make no claim against the property owner or lessee by reason of any act of an employer or trespasser. Any existing fence or gate disturbed shall be restored and/or replaced during the same day. The Contractor shall, as the first order of work, install a temporary 6-foot high chain link fence to isolate the occupational right of way from the remainder of the property. The time accounting for work in a right of way shall start with the erection of the temporary fence. In the event that the District is unable to secure the easement or occupational right of way from the property owner, the District shall have the authority to direct the Contractor to proceed with the remaining Contract work and reschedule and complete the work at that property at a later date. If rescheduling of the work delays the overall project completion, the District may extend the working days allowed. However, no additional monetary compensation will be granted due to such directive. When authorized in writing by the Engineer, the Contractor at its expense may remove improvements within the right of way (either through private right of way or District's property) shown on the Plans, but it shall replace same to their

original condition at its expense. Payment for losses or damages to crops, within the occupational right of way shown on the Plans, will be made by the District unless otherwise stated. Upon completion of work within a location, the Contractor shall remove all the equipment and materials, including all temporary facilities, off that location and restore and resurface all disturbed areas in accordance with 7-9."

IN **2-9.1 Permanent Survey Markers**, FIRST PARAGRAPH, THIRD SENTENCE, AFTER THE WORDS "lot stakes", ADD THE WORDS "or marks".

IN **2-9.1 Permanent Survey Markers**, FIRST PARAGRAPH, DELETE THE LAST SENTENCE AND REPLACE WITH THE FOLLOWING:

"Replacement will be performed by the Engineer, but the Engineer may direct the Contractor to replace monuments removed during construction, with the District providing the necessary survey. If the District directs the Contractor to remove and replace a survey monument, the Contractor shall file a Corner Record Form with the Office of the County Surveyor prior to removal of the monument. The Contractor shall file a new Corner Record Form with the County Surveyor office for each monument disturbed during construction. The Contractor shall invoice the District for this cost and the Contractor will be paid by purchase order."

IN **2-9.2 Survey Service**, FIRST PARAGRAPH, FIRST SENTENCE, DELETE THE WORDS "adequate for construction" AND REPLACE WITH THE WORDS "which will be provided as described below".

IN **2-9.2 Survey Service**, SECOND PARAGRAPH, FIRST SENTENCE, DELETE THE NUMBER "2" AND REPLACE WITH THE NUMBER "5".

IN **2-9.2 Survey Service**, SECOND PARAGRAPH, LAST SENTENCE, DELETE THE WORDS "line and grade stakes" AND REPLACE WITH THE WORDS "the required survey".

IN **2-9.2 Survey Service**, DELETE THE LAST PARAGRAPH AND REPLACE WITH THE FOLLOWING:

"Stakes will be set and stationed by the Engineer for curbs and headers; sewers, storm drains and all other underground conduits 3 inches and larger; rough grade and a corresponding cut or fill to finish grade on 50 foot centers for both earthwork and paving indicated on a grade sheet; and cut or fill to finish grade for flow lines indicated on a grade sheet. The Engineer will furnish boundary surveys and establish major exterior wall lines in the areas of buildings and establish major exterior and major interior wall lines in the areas of structures and will provide a minimum of two bench marks and a maximum number of bench marks as determined by the Engineer adjacent to the work site."

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IN **2-10 AUTHORITY OF THE BOARD AND THE ENGINEER**, LAST PARAGRAPH, FIRST SENTENCE, DELETE THE WORDS "execution," AND "or sequence".

AFTER **2-11 INSPECTION**, ADD THE FOLLOWING:

**"2-12 CORRESPONDENCE.** The use of facsimile (fax) machines for the transmittal of routine correspondence, including submittals, shall not be allowed except when specifically requested by the Engineer. The use of electronic mail (e-mail) will not be allowed for the transmittal of any correspondence. The District will allow the use of fax machines for urgent matters such as notification of changed conditions. Unless otherwise allowed by the Engineer, all faxes shall be directed to the District's Field Engineering Section to the attention of the Resident Engineer. The fax number for the Field Engineering Section will be provided to the Contractor at the pre-construction meeting or upon request by the Contractor. Faxes sent to fax numbers other than those designated by the Engineer will not be accepted. Faxes received after 2:00 p.m. shall be considered as being received the following working day.

All faxes shall be followed up with a copy that is mailed to the District on the same day that the fax is forwarded. The District will not accept any illegible faxed correspondence."

## **2-13 WEB-BASED PROJECT MANAGEMENT**

**2-13.1 General.** This Section sets forth the requirements for the Web-based project management application called Unifier™, by Skire, Inc. (<http://www.skire.com>). Unifier™ facilitates the transmission of information electronically between the Contractor and the District via workflows customized by the District. All project communications shall be transmitted between the Contractor and the District as specified in 2-13.4 unless otherwise specified in the Special Provisions.

Some documents to be submitted by the Contractor **shall not use** the Web-based project management protocol specified herein. The Contractor shall submit the following documents in hard copy form only:

- a. The Contractor's sealed bid (also known as a proposal) and all other information required as part of the Proposal Form.
- b. The signed Agreement and bonds, evidence of insurance and any other required information.
- c. All forms and documentation required as part of the Federal Grant and State Loan Requirements if specified in the Special Provisions.
- d. All required Escrow Bid Documents if specified in the Special Provisions.
- e. All forms and documentation required as part of the Outreach Program Provisions specified in the Special Provisions.
- f. All information specified or directed by the Engineer to be submitted to the District prior to the Contractor's receipt of Unifier™ training specified in 2-13.2.2.

All documentation required in Items a, b, and c shall be submitted in accordance with the Proposal Form. All documentation required in Items d, e, and f shall be delivered to the address specified in 2-13.5.1.b.

**2-13.2 Application.** The most recent commercially available release of Unifier™ shall be used.

**2-13.2.1 License.** The District will provide a maximum of two (2) Unifier™ Named User licenses to the Contractor for the purpose of transmitting and receiving documents and information to and from the District via the Web. The Contractor shall be responsible for all additional Unifier™ licenses it deems necessary for its purposes. Additional licenses may be obtained from Skire at 111 Independence Drive, Menlo Park, California 94025. The point of contact is Mr. Sateez Kadivar, who can be reached by telephone at: (650) 289-2603 or e-mail at: [skadivar@skire.com](mailto:skadivar@skire.com).

**2-13.2.2 Personnel and Training.** The Contractor shall designate one (1) person to be its Unifier™ administrator and one (1) person to serve as a proxy to the administrator. The Contractor's designated Unifier™ administrator and proxy shall attend a training course in the use of Unifier™ specifically as applied to the administration of this project. The training course will be conducted by the District at its Joint Administration Office (JAO) located at 1955 Workman Mill Road, Whittier, California 90601. The Contractor shall allocate a minimum of four (4) hours and a maximum of eight (8) hours for the training course. The Contractor shall send a minimum of two (2) and a maximum of three (3) personnel to the training course.

The Contractor's personnel shall be available to attend the training course upon receipt of ten (10) working day's written notice from the District at any time after the date of award of the Contract. If the Contractor has previously been trained in the use of Unifier™ by the District, the Contractor may submit to the District a request in writing to be exempt from the training course. The request shall include the date of the training course attended, the project name, and a statement certifying the Contractor's competency in the use of Unifier™. In the event that the Contractor does not attend the Unifier™ training course by the date specified in the District's notice, a day will be subtracted from the Contract Time specified in the Special Provisions for each working day beyond the date specified, until the Contractor has attended the Unifier™ training course.

Upon completion of Unifier™ training, the Contractor shall maintain a trained Unifier™ administrator on this project at all times and until such time as: (i) the Contract has been completed and accepted by the District's Board; (ii) there are no outstanding claims; and (iii) all applicable limitation periods for the filing of new claims or the opening of new disputes have expired. After such time, the Contractor will lose access to the two (2) District-furnished Unifier™ Named User licenses.

**2-13.2.3 Technical Support.** The District will provide technical support to the Contractor specifically as necessary for the administration of this project in accordance with the Contract Documents. Only the Contractor's personnel who have attended the Unifier™ training course for this project shall be eligible to receive the District's technical support.

**2-13.2.4 Upgrades.** During the course of this project, Skire may issue new releases and updates of Unifier™. The District will provide training for all new or modified features that affect the administration of this project. The Contractor shall attend the District's training within ten (10) working days of receipt of notice via Unifier™ or hard copy form from the District and shall utilize said new or modified features immediately upon receipt of training.

**2-13.2.5 Computer System.** The Contractor's computer system shall be complete and shall afford the capacity for the Contractor to electronically send and receive all project communications to and from the District, including the capacity to scan, print, and plot documents at a speed and quality consistent with the administrative needs of this project. The Contractor shall provide and maintain a computer system consisting of all hardware, software, and services necessary to access the Internet and utilize Unifier™ in accordance with the manufacturer's then-current recommendations and with the requirements below.

Minimum computer system requirements as of October 1, 2008 include:

- a. Web Browser: Internet Explorer 6.0 SP2 or 7.0.
- b. Operating System: Windows XP SP2 or Vista.
- c. Display: 1024 × 768 resolution.
- d. CPU: 1.4 GHz or greater.
- e. Internet Connection: ISDN, T1, or DSL.
- f. RAM: 1024 MB (1 GB) or higher.
- g. Adobe Acrobat Standard or Professional 6.0 or higher.
- h. Scanner capable of scanning at a minimum resolution of 300 dpi with optical character recognition (OCR) or paper captures.
- i. Capacity to print and plot.

Additional information may be found at Skire's website: <http://www.skire.com>. At the home page, in the "Customer Login" field, select "Unifier" and click "Go". In the pop-up window, in the lower left corner, select "1st Time Users Click Here".

**2-13.2.6 Documents.** All portable document format (PDF) files shall be in text-searchable PDF file type generated using only Adobe Acrobat Standard or Professional software. When possible, all documents shall be transferred to the PDF file type from its native application. If this is not possible, then the documents shall be scanned as a PDF file type.

All documents shall be scanned at a minimum resolution of 300 dpi. For color text, charts, drawings, graphs and/or photographs, the images shall be scanned using a color scanner. Black and white charts, drawings, graphs and/or photographs shall be scanned in black and white, unless gray line is necessary to achieve a superior quality image. Under no circumstances is the grayscale to be used for the entire document.

All scanning shall conform with the following ANSI/AIIM standards: ANSI/AIIM MS44-1988 (R1993), Recommended Practice for Quality Control of Image Scanners, and AIIM TR38-1996, Compilation of Test Targets for Document Imaging Systems.

**2-13.2.7 Contractor Responsibilities.** The Contractor's use of Unifier™ software shall at all times comply with all applicable law and with all requirements of the Attachment at the end of this section. Execution of the Construction Contract for this project with the District constitutes the Contractor's acknowledgement of and agreement to comply with these requirements.

### **2-13.3 Administration.**

**2-13.3.1 Workflow and Record.** Unifier™ allows electronic documents to be routed via custom workflows. Each time a workflow is initiated, pertinent information will be entered into an associated electronic form. Information, such as review comments, can be added to the electronic form (as well as annotated on attached electronic documents, similar to "redline markups"). The same blank or draft form appears each time the same workflow is initiated. Each completed form, including comments and attached documentation, represents a unique record. This record changes as information is added or edited at each step of the workflow. All review comments are saved separately from the Contractor's initial submittal information.

At the Unifier™ training course, which is specified in 2-13.2.2, the Contractor will be instructed as to which workflow to utilize for each type of project communication specified in 2-13.4. See 2-13.5 regarding the processing of project communications.

**2-13.3.2 Signatures.** Unifier™ automatically maintains an uneditable audit log of each record, allowing all parties to verify the status of a record at any time. The audit log, which identifies the acting party and the date on which action was taken, serves in lieu of a written signature. For example, a typical hard copy submittal transmittal form requires the Contractor's authorizing signature at the bottom of the form. Similarly, the District places written signatures on all hard copy submittal responses. No such signatures will be provided in the electronic form associated with the Unifier™ workflow. The Contractor's act of electronically initiating a workflow and transmitting a record to the District constitutes the Contractor's authorizing signature. Similarly, the District's act of electronically transmitting a record to the Contractor constitutes the District's authorizing signature. Authorizing signatures can always be verified in the Unifier™ audit log and represent the acting party's warranty of the accuracy/correctness of the contents of the form.

The Contractor will have authorization to run reports regarding all communications between the Contractor and the District. The reports will provide the following information: date of transmission of communication from Contractor to District, date of transmission of communication from District to

Contractor, and the current status of each record. The Contractor will have authorization to download from Unifier™ closed records of communications between the Contractor and District.

The use of Unifier™ to transmit project communications does not eliminate the need for actual signatures to be affixed to the individual documents that are attached to a workflow. All electronic attachments requiring signatures and/or stamps must first exist as hard copy documents with "wet" signatures/stamps. The signed and/or stamped documents shall be scanned into an acceptable electronic format and attached to the Unifier™ workflow. The affixing of electronic signatures to documents attached to Unifier™ workflows is not permitted.

**2-13.4 Project Communications.** Project communications between the Contractor and the District may include: "Submittal", "Request for Information", "Contractor to Office Engineering Correspondence", "Contractor to Field Engineering Correspondence", "Notice to Contractor" and "District to Contractor Correspondence". Unless otherwise specified or instructed in the Unifier™ training course, each type of project communication shall be transmitted electronically between the Contractor and the District using the following corresponding Unifier™ workflow and all attachments to Unifier™ workflows shall be electronic and shall be in PDF file type.

**2-13.4.1 Submittal.** This workflow shall be used by the Contractor for the transmission of engineering data covering all equipment, materials, etc. to be furnished on this project. The information to be submitted as part of this workflow shall conform to the applicable requirements of 2-5.3.

**2-13.4.1.1 Electronic.** In the case of one hundred percent electronic submittals, the date of receipt and review period shall be per 2-13.5.3.

**2-13.4.1.2 Hard Copy.** Hard copy submittals are submittals whose content is completely non-electronic; however, the electronic form associated with this workflow shall be completed and submitted with the hard copy submittal. The date of receipt and review period shall be per 2-13.5.3.

The Contractor's submission of hard copy submittals shall be limited to, unless specifically approved in advance by the Engineer, the following items:

- a. Material or product samples.
- b. Information specified to be submitted in electronic format on CD or DVD.
- c. Any information specified or directed by the Engineer to be submitted in hard copy form.

Any information that is submitted in hard copy form without prior approval of the Engineer will be returned to the Contractor without review.

**2-13.4.2 Request for Information (RFI).** This workflow shall be used by the Contractor to request an interpretation or clarification of a requirement of the Contract Documents. Requests for Information (RFIs) shall conform to the applicable requirements of the Special Provisions. RFIs shall be one hundred percent electronic; hard copy information will not be accepted as part of an RFI. The date of receipt and review period shall be per 2-13.5.3.

**2-13.4.3 Contractor to Office Engineering Correspondence.** This workflow shall be used by the Contractor to transmit information to the District's Office Engineering Section. Information to be submitted via this workflow shall include, but not necessarily be limited to, the following: all project correspondence (except for information specified or directed by the Engineer to be transmitted as part of the "Submittal", "RFI" or "Contractor to Field Engineering Correspondence" workflows) after award of the Contract; amendments to the Contract; change orders; extra work claims; requests for time extensions;

changes to the Contractor's project supervisory staff or mailing address; and any other items directed by the Engineer.

**2-13.4.3.1 Electronic.** In the case of one hundred percent electronic correspondence, the date of receipt shall be per 2-13.5.3.

**2-13.4.3.2 Hard Copy.** Hard copy correspondence from the Contractor shall be correspondence whose content is completely non-electronic; however the electronic form associated with this workflow shall be completed and submitted with the hard copy correspondence. The date of receipt shall be per 2-13.5.3.

The Contractor's submission of hard copy correspondence shall be limited to, unless specifically approved in advance by the Engineer, the following items:

- a. Any amendments to the Contract (i.e., Supplemental Agreements, Settlement Agreements, etc.) that are signed by the Contractor.
- b. Change orders that are signed by the Contractor.
- c. Information specified or directed by the Engineer to be submitted in hard copy form.

Any information that is submitted in hard copy form without prior approval of the Engineer will be returned to the Contractor without review.

**2-13.4.4 Contractor to Field Engineering Correspondence.** This workflow shall be used by the Contractor to submit information to the District's Field Engineering Section. Field-related submittals shall be submitted by the Contractor using this workflow in lieu of the "Submittal" workflow specified in 2-13.4.1. Field-related submittals shall include, but not necessarily be limited to, the following: test reports for concrete, coatings and paint; mill certificates; soil compaction test reports; schedule updates; operation and maintenance manuals; as-built information specified to be submitted in electronic format; field performance test results; training outlines and schedules; special inspection reports (e.g., anchor bolts, rebar, welding); soil testing laboratory/inspection firm proposed by the Contractor; special inspector qualifications; permits and licenses obtained by the Contractor; shutdown requests; and other items as directed by the Engineer.

**2-13.4.4.1 Electronic.** In the case of 100 percent electronic correspondence, the date of receipt shall be per 2-13.5.3.

**2-13.4.4.2 Hard Copy.** Hard copy correspondence from the Contractor shall be correspondence whose content is completely non-electronic; however the electronic form associated with this workflow shall be completed and submitted with the hard copy correspondence. The date of receipt shall be per 2-13.5.3.

The Contractor's submission of hard copy correspondence shall be limited to, unless specifically approved in advance by the Engineer, the following items:

- a. Completed full-size as-built drawings and all other as-built information specified to be submitted in hard copy format.
- b. Material or product samples.
- c. Information specified to be submitted in electronic format on CD or DVD.
- d. Information specified or directed by the Engineer to be submitted in hard copy form.



Any information that is submitted in hard copy form without prior approval of the Engineer will be returned to the Contractor without review.

**2-13.4.5 Notice to Contractor (NTC).** This workflow will be used exclusively by the District's Field Engineering Section to transmit information to the Contractor regarding construction related issues. Notices to Contractor (NTCs) shall be one hundred percent electronic. The date of receipt shall be per 2-13.5.3.

**2-13.4.6 District to Contractor Correspondence.** This workflow will be used primarily by the District's Office Engineering Section to transmit project related information to the Contractor.

**2-13.4.6.1 Electronic.** In the case of one hundred percent electronic correspondence, the date of receipt and, if applicable, review period shall be per 2-13.5.3.

**2-13.4.6.2 Hard Copy.** Hard copy correspondence from the District shall be correspondence whose content is completely non-electronic. The date of receipt and, if applicable, review period shall be per 2-13.5.3.

### **2-13.5 Processing of Project Communications.**

**2-13.5.1 Hard Copy Delivery to District.** Hard copy communications shall be delivered to the District at the following addresses:

- a. All hard copy communications submitted as part of the "Contractor to Field Engineering Correspondence" workflow shall be delivered to the District's Field Engineer; address will be provided prior to issuance of the Notice to Proceed.
- b. Unless otherwise specified or directed by the Engineer, all other hard copy communications shall be delivered to the District's Joint Administration Office (JAO) located at 1955 Workman Mill Road, Whittier, California 90601.
- c. District delivery addresses may be changed by the District via written communication at any time and shall be honored by the Contractor upon receipt.

**2-13.5.2 Hard Copy Delivery to Contractor.** The Contractor shall provide the address to which it desires hard copy material to be delivered. If multiple addresses are provided, the Contractor shall distinguish which types of communications are to be delivered to each address. Address information shall be provided in writing by the Contractor no later than the date of the Unifier™ training course specified in 2-13.2.2. All changes to Contractor delivery addresses shall be in writing and will be honored by the District upon receipt.

**2-13.5.3 Date of Receipt and Review Period.** It is the responsibility of all parties to adequately staff the project to ensure that tasks associated with Unifier™ workflows are completed in a timely manner.

The date of receipt of 100 percent electronic information by the receiving party shall be the date that the sending party transmits the information via Unifier™. The date of receipt of hard copy information by the receiving party shall be the date that the hard copy information is received at the appropriate receiving party's address.

The submission of certain project communications via Unifier™ on this project will initiate a review period by the receiving party. These project communications shall have a review period as specified in the Special Provisions and these Specifications. The actual review period for one hundred percent electronic information submitted via a Unifier™ workflow shall begin on the following working day after the associated date of receipt. The actual review period for hard copy information submitted via

mail shall begin on the following working day after the associated date of receipt. The review period for both electronic and hard copy information shall end on the date that the receiving party transmits its response via the corresponding workflow. All hand deliveries of hard copy information shall be considered equivalent to "mail". Working days and holidays shall be as defined in the Special Provisions.

**2-13.5.3 Delays Due To Downtime.** The Contractor shall be responsible for all delays due to downtime of its computer system, which shall be per 2-13.2.5. Similarly, the District will be responsible for all delays due to downtime of its computer system. The District will be responsible for all delays due to downtime of Unifier™ except for scheduled maintenance periods for which one (1) week advance notice is provided on the Unifier™ website (<http://www.skire.com>).

In the event that the Contractor's work on this project is adversely affected by a downtime of Unifier™ that exceeds eight (8) consecutive hours, the Contractor shall notify the District within one (1) working day of such an occurrence via the "Contractor to Office Engineering Correspondence" and "Contractor to Field Engineering Correspondence" workflows in Unifier™ or fax transmittal if Unifier™ is unavailable. Also, the Contractor shall submit a schedule analysis which demonstrates the impact of the delay as part of the next monthly schedule update. Any Unifier™ downtimes, which the Contractor claims has adversely affected its work on this project, will be verified with Skire.

If the total downtime of Unifier™ for the duration of the project is less than five percent of the Contract Time specified in the Special Provisions, then, regardless of the impact of any downtime, the impacts, if any, of all such downtime shall be considered non-compensable, excusable delays.

**2-13.6 E-Mail.** The use of e-mail for the transmittal of official correspondence shall not be allowed. The use of the "u-mail" feature within Unifier™ for the transmittal of official correspondence shall not be allowed.

### **2-13.7 Protocol.**

**2-13.7.1 Precedence of Protocol.** The Web-based project management protocol as specified takes precedence over conflicting protocol specified elsewhere in the Contract Documents. In particular, these requirements take precedence over conflicting aspects of 2-5.3 and 2-12, titled *Submittals* and *Correspondence*, respectively, and *Requests for Information* in the Special Provisions.

**2-13.7.2 Change of Protocol.** The District may suspend the use of all or part of the Web-based protocol and revert to the conventional project management protocol specified elsewhere in the Contract Documents, particularly, in 2-5.3 and 2-12. Within one (1) working day of receipt of such written notice from the District, the Contractor shall administer all or part of the project communications in accordance with the conventional protocol. A "Shop Drawing Transmittal Form", and/or a "Request for Information Form", as appropriate, will be mailed to the Contractor for its use. Similarly, the District may reinstate all or part of the Web-based protocol and within one (1) working day of receipt of such written notice from the District, the Contractor shall administer all or part of the project communications in accordance with these requirements.

### **2-13.8 Cost.**

**2-13.8.1 Bid Price.** The cost of administering all project communications shall be considered part of the Contractor's project indirect cost and has been included in the mobilization bid item. The Contractor shall be prepared to administer project communications in accordance with these requirements and, as requested by the District, via conventional protocol as specified in 2-13.7 at no additional cost to the District.

**2-13.8.2 Refinements of Web-Based Approach.** The Contractor shall not be eligible for extra compensation due to minor changes that constitute refinements of the Web-based approach including, but not necessarily limited to the following:

- a. Adapting to new releases and upgrades of Unifier™ as specified in 2-13.2, including, but not necessarily limited to, attending associated trainings.
- b. Adapting to changes in nomenclature associated with Unifier™, and/or District-defined workflows, forms, and records.
- c. Adapting to changes in District-defined workflows, including, but not necessarily limited to, the addition or deletion of fields in workflow forms; modification of workflow form layouts; addition of new workflows; modification or deletion of existing workflows.

The District will provide written documentation of all refinements of the Web-based approach that affect the Contractor. When necessary, training will be provided by the District.

**2-13.8.3 Protocol Change.** In the event that the District directs a full or partial change in the project management protocol from Web-based to conventional, or vice versa, as specified in 2-13.7, the Contractor shall participate in the protocol change at no additional cost to the District.

## ATTACHMENT

Whereas, the District has entered into an Agreement with Skire, Inc. to procure Web-based project management software hosted by Skire via the Internet.

Whereas, said software is to be used in the administration of this project.

Whereas, the District is providing software licenses to the Contractor for use in the administration of this project.

In consideration of the foregoing, therefore, the Contractor agrees that its execution of the Construction Contract for this project with the District constitutes the Contractor's acknowledgement of and agreement to comply with all of the requirements contained in 2-13, including this Attachment.

### 1. Definitions

- a. "Applicable Law" shall mean all applicable laws, ordinances, rules, regulations or requirements of any governmental agency, body or sub-division, including, without limitation, the actions of any court claiming to have jurisdiction over the subject matter, including, without limitation, the California Public Records Act, California Government Codes Section 6250 *et seq.*
- b. "Application" shall mean the specific Skire proprietary software application(s), Unifier™, as described in the Documentation, any Updates thereof, and custom features developed specifically for the District.
- c. "Confidential Information" shall mean the Application, Services, Deliverables and all software, source code, inventions, ideas, know-how, approaches, methodologies, concepts, skills, tools, techniques, expressions, processes, and documentation relating thereto constitutes Confidential Information of Skire.
- d. "Documentation" shall mean user guides and installation instructions.
- e. "Named User" shall mean a named or specified (by password or other user identification) individual authorized by Contractor to use the Application, regardless of whether such individual is actively using the Application at any given time.
- f. "Project" shall mean PROJECT NAME.
- g. "Third Party" shall mean any third party vendor, consultant, or contractor to the Contractor.
- h. "Updates" shall mean subsequent releases, fixes, and modifications of the Application.

### 2. License Grant

#### a. Licensed User

All Named Users accessing the software via a District-granted license shall be internal to the Contractor's organization, shall have completed District's training in the use of Unifier™ software as specified in 2-13, and shall be authorized Named Users by the District.

b. Restrictions

The Contractor shall not: (i) use any reverse compilation, decompilation or disassembly techniques or other methods to determine any source code, design structure, concepts and construction method of the Application or replicate the functionality of the Application for any purpose or create derivative works based on the Application for any purpose; (ii) remove any proprietary notices, labels, or marks in or on the Application or Documentation; (iii) reproduce, distribute, transfer, publicly display, resell, lease, sublicense or loan the Application or Documentation to any other party; (iv) use the Application or Documentation for any purpose other than to support Contractor's own business operations for the management of this project as specified in 2-13; (v) authorize any individual employed by, or acting under the direction or control of, a direct competitor of Skire to be a Named User; (vi) make any copy of the Documentation; or (vii) make any copy of the Application.

c. Reservation of Rights

All rights to the Application and Documentation are expressly reserved to Skire.

3. Contractor Responsibilities

a. Access

The Contractor may grant access to the Application to Named Users to the extent such usage does not cause use of the Application in excess of the license granted or as required by Applicable Law.

b. Password Security

Contractor shall ensure that only authorized individuals within Contractor's organization have access to usernames and passwords providing access to the Application and shall not disclose such usernames and passwords to any other individual unless required to do so by Applicable Law. Contractor agrees to be responsible for strictly maintaining the confidentiality and integrity of such usernames and passwords related to Contractor use. Contractor shall notify the District immediately if the security or integrity of a username or password is compromised by Contractor.

4. Title and Copyrights

Contractor shall obtain no ownership rights, express or implied, or any other rights in the Application and/or Documentation. Contractor does not obtain any right in the programs, systems, data or materials utilized or provided by Skire. All data, files, input materials and output materials, and all other materials which are placed on the Application by Contractor shall be public records in accordance with the California Public Records Act, California Government Codes Section 6250 *et seq.*

5. Contractor Indemnification

Except to the extent of liability solely the fault of Skire or of the District, Contractor agrees to indemnify, defend, and hold harmless Skire and the District and their subsidiaries, affiliates, officers, employees, and agents from and against any losses, costs, damages, liabilities, and expenses (including reasonable attorneys' fees), arising out of, or related to a third-party claim, action or allegation based on or related to: (i) any transaction or dispute between Contractor and any Third Party; (ii) any unauthorized access to the Application through Contractor's account due to Customer's fault or negligence; (iii) facts or alleged facts that would constitute a breach of any of Contractor's

representations, warranties, or covenants under the terms of this Attachment, or (iv) any data or content placed on or used in conjunction with the Application by Contractor or Third Party. Contractor agrees to diligently conduct the defense of any third party action arising as described herein. In no event shall the District or Skire be liable to the Contractor for the payment of any consequential damages regardless of whether said parties have been informed of the possibility or likelihood of such damages.

6. Confidentiality/Confidential Information

a. Disclosure and Use

The Confidential Information disclosed by Skire to the Contractor constitutes the confidential and proprietary information of Skire and the Contractor agrees to treat all Confidential Information of Skire in the same manner as it treats its own similar proprietary information, but in no case shall the degree of care be less than reasonable care. The Contractor shall use Confidential Information of Skire only in performing its obligations under this Agreement and shall retain the Confidential Information in confidence and not disclose to any third party (except as authorized under this Agreement) without Skire's express written consent. The Contractor shall disclose Skire's Confidential Information only to those employees and Contractors of the Contractor who have a need to know such information for the purposes of managing this project, and such employees and Contractors must be bound by this Attachment or have entered into agreements with the Contractor containing confidentiality provisions covering the Confidential Information with terms and conditions at least as restrictive as those set forth herein. Notwithstanding anything to the contrary set forth herein, it is hereby acknowledged and agreed that the ability to maintain confidentiality of Confidential Information is subject to the requirements of Applicable Law.

b. Exceptions

Notwithstanding the foregoing, the Contractor's confidentiality obligations hereunder shall not apply to information which: (i) is already known to the Contractor prior to disclosure by Skire; (ii) becomes publicly available without fault of the Contractor; (iii) is rightfully obtained by the Contractor from a third party without restriction as to disclosure; (iv) is approved for release by written authorization of Skire; (v) is developed independently by the Contractor without use of or access to Skire's Confidential Information; or (vi) is required to be disclosed by Applicable Law, provided that the Contractor provides reasonable notice to Skire of such required disclosure and reasonably cooperates with Skire in limiting such disclosure.

c. Ownership of Deliverables

Skire shall retain all right, title and interest in all of Skire's Confidential Information irrespective of whether possessed by Skire prior to, or acquired, developed or refined by Skire, either independently or in concert with Contractor, during the course of Contractor's use of the software.

7. General Provisions

a. Compliance Audit

Skire may, at its expense, perform an audit of Contractor and/or any Third Party use of the Application. Any such audit shall be made upon five (5) business days notice and during regular business hours at Contractor and/or any Third Party facilities and will be accomplished in a manner so as not to interfere with Contractor's use of the Application or Contractor's Operations.

If such audit reveals Contractor and/or any Third Party use of Application beyond any material terms of this Agreement, Contractor shall pay Skire's reasonable expenses associated with such audit. These remedies shall be in addition to, and shall not limit, Skire's ability to pursue any other remedies available.

b. Compliance with Laws

Contractor agrees to use the Application, Deliverables and Documentation in compliance with all Applicable Laws.

c. Compliance with Attachment

Nothing contained herein shall prevent, prohibit or limit the Contractor's direct purchase of additional software licenses from Skire for its own purposes and under such terms as it may negotiate directly with Skire. However, all terms contained herein shall apply to all use of the software by the Contractor for the purposes of managing this project as specified in 2-13, regardless of whether or not such use is attained through a District-granted license."

IN **3-1 CHANGES REQUESTED BY THE CONTRACTOR**, DELETE ALL PARAGRAPHS AND REPLACE WITH THE FOLLOWING:

**"3-1.1 General.** Changes in specific methods of construction may be made at the Contractor's request when approved in writing by the Engineer.

Changes in the Plans and Specifications requested by the Contractor shall be in writing. Changes in the Plans and Specifications that do not materially affect the Work and are not detrimental to the Work or to the interests of the District, may be granted to facilitate the Work, when approved in writing by the Engineer. The Contractor shall allow a minimum of twenty (20) working days for the District to review such changes. Regardless of whether a requested change is approved or not approved by the Engineer, the Contractor shall not be excused from any scheduled completion date provided by the Contract and shall proceed with all work to be performed under the Contract.

**3-1.2 Payment for Changes Requested by the Contractor.** If such changes are granted, they shall be made at a reduction in cost or at no additional cost to the District. Nothing herein shall be construed as granting a right to the Contractor to demand such changes."

IN **3-2.1 General**, AFTER THE FIRST PARAGRAPH, ADD THE FOLLOWING:

"For changes involving specialized type of work, the Engineer shall have the authority to direct the Contractor to use a Subcontractor specializing in that type of work.

Nothing herein shall be construed as granting a right to the Contractor to stop work or refuse to perform work, irrespective of the total arithmetic dollar value of all changes. Under no circumstances will the District pay additional compensation for costs incurred as a result of the Contractor's failure to proceed with the work in a timely manner."

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IN **3-2.2.1 General**, SECOND PARAGRAPH, FIRST SENTENCE, IN THE FIRST LINE, DELETE THE WORDS "Contract Unit Price" AND REPLACE WITH "Major Bid Item".

IN **3-2.2.1 General**, AFTER THE SECOND PARAGRAPH, ADD THE FOLLOWING:

"Changes in quantities for those bid items including Major Bid Items, for which quantities could not be accurately estimated prior to construction, including bid items for unsuitable subbedding, unsuitable backfill, relaying and/or protection and support of house connection sewers, temporary resurfacing, placement of slurry seal, drilling of wells, construction of subsurface barriers, removal and replacement of unsuitable foundation materials, removal of concrete overpours, removal of debris from sewer, etc., shall not be considered as changes initiated by the District and the limitation of 25 percent indicated in the above paragraph shall not apply or constitute extra work under 3-3. The District reserves the right to adjust payment per 3-2.4 when the total of a bid item listed in this paragraph increases by more than 25 percent relative to the original quantity."

IN **3-2.2.2 Increases of More Than 25 Percent**, FIRST PARAGRAPH, FIRST SENTENCE, DELETE THE WORDS "Contract Unit Price" AND REPLACE WITH "Major Bid Item".

IN **3-2.2.3 Decreases of More Than 25 Percent**, FIRST SENTENCE, DELETE THE WORDS "Contract Unit Price" AND REPLACE WITH "Major Bid Item".

IN **3-2.3 Stipulated Unit Prices**, DELETE THE WORDS "when so specified in the Special Provisions".



IN **3-2.4 Agreed Prices**, BEFORE THE FIRST SENTENCE, ADD THE FOLLOWING:

"The Contractor shall submit to the Engineer a detailed breakdown of all costs attributable to the change in work and a schedule analysis. The cost breakdown shall include unit costs for each separate work item showing quantities of material, manhours of labor, rental of equipment and other expenditures contributing to the cost. In the event that extra work which is most appropriately performed on a lump sum basis, as determined by the Engineer, must be started before a cost breakdown can be prepared by the Contractor, the District may direct the work to be performed on a time-and-material basis in accordance with 3-3 until such time that a lump sum cost breakdown is submitted by the Contractor and approved by the District."

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IN **3-3.2.2 Basis For Establishing Costs, a) Labor**, LAST PARAGRAPH, AFTER THE WORD "superintendence", ADD THE WORDS "(including, but not limited to, Superintendent, Project Manager, Project Engineer, Estimator, Scheduler, etc.)".

IN **3-3.2.2 Basis For Establishing Costs, a) Labor**, LAST PARAGRAPH, ADD THE FOLLOWING TO THE END:

"Costs to prepare claims for extra work shall be considered non-direct labor costs. "

IN **3-3.2.2 Basis For Establishing Costs, c) Tool and Equipment Rental**, DELETE THE SECOND PARAGRAPH AND REPLACE WITH THE FOLLOWING:

"Regardless of ownership, the rates to be used in determining equipment rental costs shall not exceed those listed in the current edition of the Rental Rate Blue Book for Construction Equipment (published by Dataquest) at the time the work is performed. The hourly rate allowed shall be calculated by dividing the listed monthly rental rate by 176 and adding the estimated operating cost/hour (if listed). The listed monthly, daily and hourly rates, rate adjustment tables and regional adjustment maps shall not be utilized. Payment for multiple shifts shall not exceed 75 percent of the calculated hourly rate for double shifts sixteen (16) hours and 67 percent of the calculated hourly rate for triple shifts twenty-four (24) hours. Standby rates shall be 50 percent of the calculated hourly rate, less the estimated operating cost/hour. Payment for standby shall not exceed eight (8) hours per day, forty (40) hours per week and one hundred seventy-six (176) hours per month. In addition, the cumulative standby payment for each item of equipment shall not exceed the current market value of the equipment. If the equipment is not listed, the rate allowed shall be that calculated for a comparable item."

IN **3-3.2.2 Basis for Establishing Costs, e) Invoices**, LAST SENTENCE, ADD THE FOLLOWING TO THE END:

"except equipment rental which will be calculated per 3-3.2.2c)".

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IN **3-3.2.3 Markup**, DELETE ALL PARAGRAPHS AND REPLACE WITH THE FOLLOWING:

"a) **Work by Contractor.** The following percentages shall be added to the Contractor's costs and shall constitute the markup for all overhead, insurance, interest, and profits:

Work by Contractor	Percent
1) Labor	20
2) Materials	15
3) Equipment Rental	15
4) Other Items and Expenditures	15

To the sum of the costs and markups provided for in this subsection, 1 percent shall be added as compensation for bonding to the extent actually paid. The 1 percent shall be the maximum total compensation for both the Contractors' and Subcontractors' bonding cost.

- b) **Work by Subcontractor.** When all or any part of the extra work is performed by a Subcontractor, the markup established in 3-3.2.3a) shall be applied to the Subcontractor's actual cost of such work. A markup of 10 percent on the first Ten thousand dollars (\$10,000) of the subcontracted portion of the extra work and a markup of 5 percent on work added in excess of Ten thousand dollars (\$10,000) of the subcontracted portion of the extra work may be added by the Contractor.
- c) In the case of a joint venturer acting as a Subcontractor and regardless of the arrangements among the joint venturers themselves, each joint venturer is considered a Prime Contractor; therefore, negotiated direct expenses, overhead and profit shall be allowed only once on subcontract work undertaken by a joint venturer.
- d) For a change in work that includes both additions and deletions and which result in a net price increase, markup values shall be applied on the net increase.
- e) Should work be deleted which is not covered by a contract unit price, the credit due to the District shall be established by the fair value of the work at the time the Contract was bid and shall include markup and bonding, minus actual costs incurred by the Contractor prior to notification of such deletion. The Contractor shall submit a clear and complete cost breakdown in order to establish the fair value of any credit. Fair value shall include the direct expenses which will not be incurred as a result of the deletion and all anticipated profit attributable to the deleted work. The same markups for Contract increases shall be applied to any credit due to the District."

IN **3-3.3 Daily Reports by Contractor**, FIRST PARAGRAPH, ADD THE FOLLOWING TO THE END:

"District's failure to attempt reconciliation or to prepare notes regarding disagreements is not a waiver of the District's right to dispute the accuracy of the Contractor's report. The Contractor shall maintain records in sufficient detail to distinguish the cost of extra work from the cost of other operations."

AFTER **3-3.3 Daily Reports by Contractor**, ADD THE FOLLOWING:

**"3-3.4 Notification by Contractor.** The Contractor shall inform the Engineer(s) prior to performing any work the Contractor considers extra work. The Contractor shall submit daily reports in accordance with 3-3.3."

IN **3-4 CHANGED CONDITIONS**, AFTER THE FOURTH PARAGRAPH, ADD THE FOLLOWING:

"Under no circumstances will the District pay additional compensation based on a claim that the Contractor incurred additional cost because it encountered soil conditions different from those anticipated at the time of bid submittal. This paragraph does not apply to changed condition 3) noted above."

AFTER **3-5 DISPUTED WORK**, ADD THE FOLLOWING:

**"3-6 APPLICABLE PORTION OF PUBLIC CONTRACT CODE 20104-20104.6**

Article 1.5 Resolution of Construction Claims

- 20104. (a) (1) This article applies to all public works claims of three hundred seventy-five thousand dollars (\$375,000) or less which arise between a contractor and a local agency.
- (2) This article shall not apply to any claims resulting from a contract between a contractor and a public agency when the public agency has elected to resolve any disputes pursuant to Article 7.1 (commencing with Section 10240) of Chapter 1 of Part 2.
- (b) (1) "Public work" has the same meaning as in Sections 3100 and 3106 of the Civil Code, except that "public work" does not include any work or improvement contracted for by the state or the Regents of the University of California.
- (2) "Claim" means a separate demand by the contractor for (A) a time extension, (B) payment of money or damages arising from work done by or on behalf of the contractor pursuant to the contract for a public work and payment of which is not otherwise expressly provided for or the claimant is not otherwise entitled to, or (C) an amount the payment of which is disputed by the local agency.
- (c) The provisions of this article or a summary thereof shall be set forth in the plans or specifications for any work which may give rise to a claim under this article.
- (d) This article applies only to contracts entered into on or after January 1, 1991.
- 20104.2. For any claim subject to this article, the following requirements apply:
  - (a) The claim shall be in writing and include the documents necessary to substantiate the claim. Claims must be filed on or before the date of final payment. Nothing in this subdivision is intended to extend the time limit or supersede notice requirements otherwise provided by contract for the filing of claims.
  - (b) (1) For claims of less than fifty thousand dollars (\$50,000), the local agency shall respond in writing to any written claim within 45 days of receipt of the claim, or may request, in writing, within 30 days of receipt of the claim, any additional documentation supporting the claim or relating to defenses to the claim the local agency may have against the claimant.
  - (2) If additional information is thereafter required, it shall be requested and provided pursuant to this subdivision, upon mutual agreement of the local agency and the claimant.
  - (3) The local agency's written response to the claim, as further documented, shall be submitted to the claimant within 15 days after receipt of the further documentation or within a period of time no greater than that taken by the claimant in producing the additional information, whichever is greater.
  - (c) (1) For claims of over fifty thousand dollars (\$50,000) and less than or equal to three hundred seventy-five thousand dollars (\$375,000), the local agency shall respond in writing to all written claims within 60 days of receipt of the claim, or may request, in writing, within 30 days of receipt of the claim, any additional documentation supporting the claim or relating to defenses to the claim the local agency may have against the claimant.
  - (2) If additional information is thereafter required, it shall be requested and provided pursuant to this subdivision, upon mutual agreement of the local agency and the claimant.

(3) The local agency's written response to the claim, as further documented, shall be submitted to the claimant within 30 days after receipt of the further documentation, or within a period of time no greater than that taken by the claimant in producing the additional information or requested documentation, whichever is greater.

- (d) If the claimant disputes the local agency's written response, or the local agency fails to respond within the time prescribed, the claimant may so notify the local agency, in writing, either within 15 days of receipt of the local agency's response or within 15 days of the local agency's failure to respond within the time prescribed, respectively, and demand an informal conference to meet and confer for settlement of the issues in dispute. Upon a demand, the local agency shall schedule a meet and confer conference within 30 days for settlement of the dispute.
- (e) Following the meet and confer conference, if the claim or any portion remains in dispute, the claimant may file a claim as provided in Chapter 1 (commencing with Section 900) and Chapter 2 (commencing with Section 910) of Part 3 of Division 3.6 of Title 1 of the Government Code. For purposes of those provisions, the running of the period of time within which a claim must be filed shall be tolled from the time the claimant submits his or her written claim pursuant to subdivision (a) until the time that claim is denied as a result of the meet and confer process, including any period of time utilized by the meet and confer conference.
- (f) This article does not apply to tort claims and nothing in this article is intended nor shall be construed to change the time periods for filing tort claims or actions specified by Chapter 1 (commencing with Section 900) and Chapter 2 (commencing with Section 910) of Part 3 of Division 3.6 of Title 1 of the Government Code.

20104.4. The following procedures are established for all civil actions filed to resolve claims subject to this article:

- (a) Within 60 days, but no earlier than 30 days, following the filing or responsive pleadings, the court shall submit the matter to nonbinding mediation unless waived by mutual stipulation of both parties. The mediation process shall provide for the selection within 15 days by both parties of a disinterested third person as mediator, shall be commenced within 30 days of the submittal, and shall be concluded within 15 days from the commencement of the mediation unless a time requirement is extended upon a good cause showing to the court or by stipulation of both parties. If the parties fail to select a mediator within the 15-day period, any party may petition the court to appoint the mediator.
- (b) (1) If the matter remains in dispute, the case shall be submitted to judicial arbitration pursuant to Chapter 2.5 (commencing with Section 1141.10) of Title 3 of Part 3 of the Code of Civil Procedure, notwithstanding Section 1141.11 of that code. The Civil Discovery Act of 1986 (Article 3 (commencing with Section 2016) of Chapter 3 of Title 3 of Part 4 of the Code of Civil Procedure) shall apply to any proceeding brought under this subdivision consistent with the rules pertaining to judicial arbitration.  
(2) Notwithstanding any other provision of law, upon stipulation of the parties, arbitrators appointed for purposes of this article shall be experienced in construction law, and, upon stipulation of the parties, mediators and arbitrators shall be paid necessary and reasonable hourly rates of pay not to exceed their customary rate, and such fees and expenses shall be paid equally by the parties, except in the case of arbitration where the arbitrator, for good cause, determines a

different division. In no event shall these fees or expenses be paid by state or county funds.

(3) In addition to Chapter 2.5 (commencing with Section 1141.10) of Title 3 of Part 3 of the Code of Civil Procedure, any party who after receiving an arbitration award requests a trial de novo but does not obtain a more favorable judgment shall, in addition to payment of costs and fees under that chapter, pay the attorney's fees of the other party arising out of the trial de novo.

(c) The court may, upon request by any party, order any witnesses to participate in the mediation or arbitration process.

20104.6.(a) No local agency shall fail to pay money as to any portion of a claim which is undisputed except as otherwise provided in the contract.

(b) In any suit filed under Section 20104.4, the local agency shall pay interest at the legal rate on any arbitration award or judgment. The interest shall begin to accrue on the date the suit is filed in a court of law."

IN **4-1.1 General**, FIRST PARAGRAPH, ADD THE FOLLOWING TO THE END:

"No repairs shall be made unless approved by the Engineer."

IN **4-1.1 General**, SECOND PARAGRAPH, SECOND SENTENCE, ADD THE WORDS "Plans and" BETWEEN THE WORDS "the" AND "Specifications".

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IN **4-1.3.1 General**, FIRST PARAGRAPH, FIRST SENTENCE, AFTER THE WORDS "protective coating application," ADD THE WORDS "plastic liner, fiberglass tanks, plastic liner pipe,".

IN **4-1.3.1 General**, ADD THE FOLLOWING TO THE END:

"The Contractor shall notify the Engineer at least forty-eight (48) hours prior to materials manufacture."

IN **4-1.3.2 Inspection of Materials Not Locally Produced**, ADD THE FOLLOWING TO THE END:

"In lieu of approving an inspector, or accredited testing laboratory, the Engineer may elect to have the inspection performed by a District's representative. All costs for transportation, meals and lodging shall be borne by the Contractor."

IN **4-1.3.3 Inspection by the Agency**, FIRST SENTENCE, DELETE THE WORDS "and testing laboratory".

IN **4-1.4 Test of Materials**, FIRST PARAGRAPH, DELETE THE THIRD, FOURTH AND FIFTH SENTENCES AND REPLACE WITH THE FOLLOWING:

"All initial testing and a reasonable amount of retesting shall be performed under the direction of the Engineer, and at no expense to the Contractor except for the construction soils testing and concrete strength testing for concrete poured at the project site. The Contractor shall provide an independent accredited testing laboratory approved by the Engineer to perform all required soils testing and concrete strength testing. The costs shall be borne by the Contractor. If the Contractor is to provide any additional testing and pay for that testing, the Contract Documents will so state. Frequency of soils testing shall be as specified in 211-1."

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IN **4-1.6 Trade Names or Equals**, SECOND PARAGRAPH, LAST SENTENCE, DELETE THE WORDS "as provided in the Contract Documents", AND REPLACE WITH THE WORDS "within thirty-five (35) days from the award of the Contract".

IN **4-1.6 Trade Names or Equals**, AFTER THE FIFTH PARAGRAPH, ADD THE FOLLOWING:

"If the Contractor is authorized to substitute an equivalent item or material, it shall be with the understanding that there will be no increase in Contract price due to the substitution.

If a substitute requested by the Contractor is approved by the Engineer and is subsequently found to be not equal to the specified item or material, the Contractor shall remove and dispose of the substitute at its expense and it shall furnish and install the specified item or material or approved equal. No additional compensation will be made to the Contractor for furnishing and installing the specified item or material."

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IN **5-1 LOCATION**, FOURTH PARAGRAPH, ADD THE FOLLOWING TO THE END:

"In addition, the Contractor shall be aware that nonpressurized sewer lines, nonpressurized storm drains, and other nonpressurized drain lines are not required to be marked by the respective owners."

IN **5-1 LOCATION**, DELETE THE LAST PARAGRAPH AND REPLACE WITH THE FOLLOWING:

"It shall be the Contractor's responsibility to determine the location and depth of all utilities, including service connections, which are shown on the Plans or have been marked by the respective owners and which it believes may affect or be affected by its operations. If no pay item is provided in the Contract for this work, full compensation for such work shall be considered as included in prices bid for other items of work. Under no circumstances will the District pay additional compensation based on a claim that the owner mismarked or failed to mark utilities, including service connections.

Substructures identified on the Plans as "possible pipes" may exist at those locations. The Contractor shall include in the appropriate bid items costs for crossing, supporting, protecting, and costs for constructing temporary and permanent supports under all possible substructures."

IN **5-2 PROTECTION**, FIRST PARAGRAPH, AFTER THE FIRST SENTENCE, ADD THE FOLLOWING:

"The Contractor shall assume that thrust blocks exist on water lines at all locations where there are changes in direction, branches, or valves."

IN **5-2 PROTECTION**, FIRST PARAGRAPH, ADD THE FOLLOWING TO THE END:

"Requirements and payment for protection of house connection sewers shall be in accordance with 306-1.1.7."

IN **5-2 PROTECTION**, SECOND PARAGRAPH, ADD THE WORD "substantially" BETWEEN THE WORDS "located" AND "as."

IN **5-2 PROTECTION**, AFTER THE SIXTH PARAGRAPH, ADD THE FOLLOWING:

"The Contractor shall provide temporary and permanent supports under all existing concrete, asbestos cement, clay, telephone, and power conduits. The Contractor shall also provide temporary and permanent supports under all other conduits where required on the Plans. The supports shall conform with supports detailed on Districts' Standard Drawings or to other standards as directed by the Engineer. Costs for supports shall be absorbed in the Contractor's bid items for the pipeline construction. The Contractor shall not tunnel under conduits unless approved by the Engineer. All voids within the tunnel limits shall be filled with a 1-sack cement/sand slurry."

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IN **5-4 RELOCATION**, FIRST PARAGRAPH, AFTER THE SECOND SENTENCE, ADD THE FOLLOWING:

"In the event that the District is unable to have the utility relocated prior to when the Contractor is scheduled and ready to start work in an area, the District shall have the authority to direct the Contractor to proceed with the remaining Contract work and reschedule and complete the work at a later date. If rescheduling of the work delays the overall project completion, the District may extend the working days allowed. However, no additional monetary compensation will be granted due to such directive."

IN **5-4 RELOCATION**, FIRST PARAGRAPH, ADD THE FOLLOWING TO THE END:

"In addition, the Contractor shall include in its bid the cost for removing the interfering portions of the existing utility that has been left in place after the relocation."

IN **5-4 RELOCATION**, DELETE THE SECOND PARAGRAPH AND REPLACE WITH THE FOLLOWING:

"The Contractor shall pothole and verify the location and elevation of all existing sewer pipes and utilities shown at the locations of the proposed structures including all jacking, tunneling and receiving pits to verify the locations of the existing sewer pipes and utilities shown and explore and identify if any additional utilities are located within the area. The Contractor shall incorporate the actual locations of the existing sewer pipes and utilities in the design of the shoring system and submit to the District for review. If any interfering utilities are found and if the utilities are not shown on the Plans, the District may either arrange to have the utilities relocated by others or direct the Contractor to relocate the utilities. If the Contractor is directed to relocate the utilities, the Contractor shall keep track of the costs and submit daily reports per 3-3.3 and will be reimbursed by purchase order. If the utilities are substantially as shown but the Contractor elects to remove and relocate the utilities instead of protecting and supporting them in place, then the cost for the removal and relocation of the utilities shall be at the sole expense of the Contractor. The potholing and verification work shall be the first order of work and shall be completed within thirty (30) working days after the date of the Notice to Proceed prior to the design of the shoring system. The potholing work shall be scheduled with the Engineer and the District will provide inspection and/or survey services during the work."

IN **5-4 RELOCATION**, DELETE ALL OF THE LAST PARAGRAPH EXCEPT THE LAST TWO (2) SENTENCES.

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AFTER **5-6 COOPERATION**, ADD THE FOLLOWING:

**"5-7 LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS - FLOOD CONTROL DISTRICT STORM DRAIN CONDUITS.** Construction in the vicinity of all Los Angeles

County Department of Public Works (LACDPW) - Flood Control District storm drain conduits shall conform to the requirements of the LACDPW - Flood Control District. Construction under storm drain conduits shall be accomplished by jacking, tunneling, open cut methods, or as specified on the Plans. The Contractor shall submit to and obtain approval from the LACDPW - Flood Control District, through the District, for the proposed methods. The submittal shall be submitted not less than forty-five (45) calendar days in advance of the proposed construction to allow sufficient time for LACDPW - Flood Control District review and approval. If open cut method is used, the Contractor shall provide an approved temporary support and a permanent concrete support per Districts' Standard Drawing S-a-217. The Contractor shall submit to and obtain approval from the District of his proposed method of temporary support prior to any construction."

IN **6-1.1 Construction Schedule**, FIRST PARAGRAPH, DELETE THE SECOND AND THIRD SENTENCE.

IN **6-1.1 Construction Schedule**, FIRST PARAGRAPH, ADD THE FOLLOWING TO THE END:

"The Contractor shall have obtained acceptance of its construction schedule prior to mobilization and the start of excavation."

IN **6-1.1 Construction Schedule**, AFTER THE FIRST PARAGRAPH, ADD THE FOLLOWING:

"The Contract time specified is the District's best estimate of how long it will take to complete the Work. If the Contractor elects to submit an early completion schedule for the Project, it does so at its own risk and such a submission does not change the working day schedule contained in the Contract Documents. Moreover, the District will not accept any responsibility for nor be held liable for any damages allegedly caused by the Contractor's failure to complete the Project within its proposed early completion schedule.

"IN **6-1.1 Construction Schedule**, SECOND PARAGRAPH, ADD THE WORDS "for acceptance" AFTER THE WORDS "submit to the Engineer".

IN **6-1.1 Construction Schedule**, AFTER THE LAST PARAGRAPH, ADD THE FOLLOWING:

**6-1.1.1 General.** Unless Bar Chart 2 (6-1.2) or CPM 1 (6-1.3) Construction Schedules are required, the following applies. Bar charts shall be clear and legible. All schedule information shall be submitted in hard copy format unless otherwise specified. The submission of computer discs or CDs is not permitted.

The Contract time, Contract milestones, and special construction requirements specified in the Special Provisions shall be accurately represented in the project schedule.

**6-1.1.2 Baseline Schedule.** The baseline schedule shall represent the Contractor's plan to build the work at the time of bid in accordance with all requirements of the bid documents without exception. The baseline schedule shall be accepted by the District prior to the start of physical work. The District's review period for the baseline schedule submittal and each resubmittal shall be fifteen (15) working days. The Contractor shall continue to resubmit the baseline schedule until obtaining District's acceptance.

The baseline schedule will be reviewed by the District for general conformity with the Plans and Specifications. District's acceptance of any project schedule submittal shall not relieve the Contractor of its obligation to fulfill all requirements of the Contract. Errors in the project schedule may be discovered at any time and shall be corrected by the Contractor in the next update for consistency with the Contract requirements.



**6-1.1.3 Schedule Structure.** The project schedule shall include activities of sufficient detail to accurately represent a feasible plan for the timely completion of the full scope of the work. Project schedule activities shall include, but not necessarily be limited to the following: site mobilization; all construction activities; required notifications to Engineer for shop and field testing; punchlist and demobilization; and one activity for each Contract milestone, the preparation of each submittal, the review of each submittal, and the procurement of each major material and type of equipment.

The schedule shall contain at least ten (10) construction activities; the maximum duration of each construction activity shall be fifteen (15) working days.

Float shall be a jointly owned resource available to the District and Contractor on an equal basis. Float shall be consumed by both the District and the Contractor on a first come, first served basis. Generated float shall be applied to mitigate delays in the reverse order of their occurrence.

**6-1.1.4 Project Schedule Update.** The Contractor shall update the project schedule monthly. In each update, the Contractor shall accurately document the progress of the work to date and correct the schedule to accurately reflect the Contractor's current plan for the timely completion of the work. Updates shall include a pay request and a brief, clear narrative explanation of the changes made to the project schedule. Updates shall be submitted on the second working day after the data date of the update. The data date will be determined by the Engineer at the preconstruction meeting. The District review period for project schedule updates and resubmittals shall be five (5) working days.

The Contractor shall not be eligible to receive pending progress payments until the corresponding monthly update is accepted by the District. No final payment shall be made nor any bonds released by the District until an as-built schedule submittal is accepted by the District.

**6-1.1.5 Contract Time Accounting.** The Contractor shall mitigate all delays as efficiently and economically as possible, with the objective of minimizing both the time and cost impact of the delay, regardless of responsibility for the delay. The District will not be liable for damages which the Contractor could have avoided by reasonable means, such as prudent scheduling of the work and judicious handling of forces, equipment, or plant.

## **6-1.2 BAR CHART 2 CONSTRUCTION SCHEDULE**

**6-1.2.1 General.** If the Bar Chart 2 schedule is required per the Special Provisions, the following applies.

**6-1.2.1.1 Terms.** The project schedule shall be in the basis for evaluating all issues related to time for this Contract. The term "project schedule" shall refer to the baseline schedule, update schedules, the record schedule, look-ahead schedules, mitigation schedules, the as-built schedule, and all scheduling submittals required by the Contract.

**6-1.2.1.2 Bar Chart.** Bar charts, whether printed or handwritten, shall be clear and legible. For non-Unifier™ projects, all schedule information shall be submitted in hard copy format. The submission of computer discs or CDs is not permitted.

**6-1.2.1.3 Record Schedule.** The District-accepted baseline schedule shall be the record schedule until the District accepts the first update of the project schedule. Thereafter, the most recent District-accepted update shall be the record schedule.

**6-1.2.1.4 Contract Time.** The Contract time, Contract milestone, and special construction requirements shall be accurately represented in the project schedule.

**6-1.2.2 Baseline Schedule.**

**6-1.2.2.1 Submittal.** The baseline schedule shall represent the Contractor's plan to build the work at the time of bid in accordance with all requirements of the bid documents without exception. District's acceptance of the baseline schedule shall be a condition precedent to the start of physical work. The baseline schedule shall be submitted no later than fifteen (15) working days after the date of Notice To Proceed (NTP). The District's review period for this submittal shall be fifteen (15) working days. If resubmittal of the baseline schedule is required, the Contractor shall resubmit within six (6) working days of receipt of the District's comments. The District's review period for each baseline schedule resubmittal shall be six (6) working days.

The Contractor shall continue to resubmit the baseline schedule until obtaining District's acceptance. With each resubmittal, the Contractor shall provide a written explanation of its response to each District's comment to date.

**6-1.2.2.2 Early Completion.**

**6-1.2.2.2.1 Baseline Schedule.** If the baseline schedule shows the early completion of any Contract milestone, the early completion schedule shall satisfy all requirements of the Contract Documents. A change order will be issued to revise Contract milestone date(s) to the early completion date(s) shown in the baseline schedule. Physical work at the project site shall not commence prior to execution of this change order. The Contractor shall be liable for liquidated damages for each Contract milestone in the dollar amounts specified in the Special Provisions for failure to achieve the revised Contract milestone date(s).

**6-1.2.2.2.2 Overhead Cost.** The Contractor's bid shall include overhead costs for the full duration of the Contract through achievement of the Contract Completion milestone as shown in the District-accepted baseline schedule. In no case shall the Contractor be eligible for additional compensation for overhead costs incurred in relation to performance of the as-bid Contract work during the period from the date for opening of bids through the planned date of the Contract Completion milestone as shown in the District-accepted baseline schedule.

**6-1.2.2.2.3 Reduction of Contract Scope.** In the event that the District reduces the scope of the Contract and the eliminated work is on the controlling path to a Contract milestone, the District may change the required deadline for the milestone such that upon deletion of the work the total float of the milestone remains unchanged. In this event, the Contractor shall not be eligible for additional compensation to achieve the revised Contract milestone date and the Contractor shall be liable for liquidated damages for the Contract milestone in the dollar amounts specified in the Special Provisions for failure to achieve the revised Contract milestone date.

**6-1.2.3 Schedule Structure.** The project schedule shall include activities of sufficient detail to accurately represent a feasible plan for the timely completion of the full scope of the work. Project schedule activities shall include, but not necessarily be limited to the following: site mobilization including setup of storage yard, all construction activities; required notifications to Engineer; shop and field testing; punchlist and demobilization; and one activity for each Contract milestone, the preparation of each submittal, the review of each submittal, and the procurement of each major material and type of equipment.

Each activity description shall unambiguously identify a unique scope of work. All activity descriptions in the baseline schedule shall be in upper case letters. Descriptions of all activities added in updates shall be in lower case letters. The schedule shall contain at least ten (10) construction activities; the maximum duration of any individual construction activity shall be fifteen (15) working days. The schedule shall indicate the party responsible for each activity. The critical path shall be indicated.

If the project requires cost loading per the Special Provisions, a nonzero budgeted cost shall be assigned to each construction activity. The maximum dollar amount assigned to each construction activity shall be Twenty-five thousand dollars (\$25,000). Front end loading of costs shall result in the rejection of the project schedule. Except as otherwise specified, all administrative, indirect, and engineering activities, including, but not necessarily limited to, scheduling, submittal preparation, and mobilization shall have a budgeted cost of zero. The following cost-loaded indirect activities shall be included in the project schedule: "Bonds and Insurance" with budgeted cost not to exceed actual amount of paid invoices (payment applies only to general Contractor costs, not to Subcontractors); "Obtain District's Approval of As-Built Drawings" with budgeted cost of Twenty thousand dollars (\$20,000); "Obtain District's Acceptance of As-Built Schedule" with budgeted cost of Ten thousand dollars (\$10,000). The latter two (2) activities shall each have a duration of zero, a single predecessor of the Contract Completion milestone with a Finish-Finish relationship, and no successors.

Payment for mobilization, not including bonds and insurance, will be made in the amount of two percent of the Contractor's bid price. A separate cost-loaded activity shall be included in the project schedule representing mobilization. Payment for mobilization shall not be made prior to the completion of mobilization and the start of construction of permanent facilities. Completion of mobilization shall include setup of all trailers, establishment of site utilities, and securing parking, yard, and laydown areas. Start of construction of permanent facilities shall be as determined by the Engineer and shall not include any exploratory work, such as potholing, or the delivery of materials and equipment.

The baseline schedule narrative shall include an explanation of the Contractor's labor and equipment resource plan. The plan shall define all Contractor and Subcontractor crews and identify the work each crew will perform, including the activity ID's and descriptions of the first and last activity to be performed by each crew. All equipment requiring a seated operator shall be listed and the work for which it is needed identified. The plan shall identify the criteria for mobilizing and demobilizing each piece of equipment.

The use of float suppression techniques by the Contractor will not be permitted and shall be grounds for rejection of the project schedule. Float shall be a jointly owned resource available to the District and Contractor on an equal basis. Float shall be consumed by both the District and the Contractor on a first come, first served basis. Generated float shall be applied to mitigate delays in the reverse order of their occurrence.

**6-1.2.4 Project Schedule Update.** The Contractor shall update the project schedule monthly. In each update, the Contractor shall accurately document the progress of the work to date and correct the schedule to accurately reflect the Contractor's current plan for the timely completion of the work. The final update shall be the as-built schedule.

The project schedule shall be updated monthly and submitted no later than the second working day after the data date of the update. The data date will be determined by the Engineer at the preconstruction meeting. The District's review period shall be five (5) working days. If the update is not acceptable, the Contractor shall correct the update in accordance with the District's comments. The corrected update shall be resubmitted within three (3) working days of receipt of the District's review comments. The District's review period for all resubmittals shall be five (5) working days.

The Engineer's decision shall be final regarding the update. If the Contractor disagrees with the District's review comments, the Contractor shall record its objections both in the update narrative and in a schedule that represents the update that the Contractor believes is correct. The schedule containing the Contractor's objection shall be submitted with the update that has been corrected per the District's comments and shall be produced in the same manner and quality as the update schedule.

The Contractor shall prepare and submit to the Engineer, on the first day of each week, a three (3) week look-ahead schedule. The look-ahead schedule shall be derived from and consistent with the record schedule.

If projects require cost loading per the Special Provisions, the Contractor's submission of the monthly update shall be the Contractor's application for payment. The Contractor shall not be eligible to receive pending progress payments until the corresponding monthly update is accepted by the District and until the three (3) week look-ahead schedule is correctly submitted. The review period for an update will not begin prior to the date of acceptance of the update for the preceding period. The Contractor shall be responsible for all impacts due to its failure to submit acceptable updates in a timely manner. No final payment shall be made nor any bonds released by the District until the as-built schedule submittal is accepted by the District.

#### **6-1.2.5 Contract Time Accounting.**

**6-1.2.5.1 Unforeseen Event and Delay.** An unforeseen event, "UFE," shall be any event that is not represented in the record schedule that has or may have a time or cost impact to the work. A delay shall be defined as a day when a UFE prevents an activity in the record schedule from being performed on the date scheduled, resulting in a reduction of the total float of a Contract milestone as recorded in the record schedule and when the resulting total float of that milestone is less than zero. When the activity that cannot be performed on the date scheduled in the record schedule is a construction activity, that activity shall be prevented from being performed when and only when the Contractor is prevented from working during five (5) hours of that scheduled activity with at least sixty percent of the scheduled labor for that activity. The traditional notion of a "rain day" has no merit. Delays due to rain shall be administered the same as all other UFE's.

An excusable delay shall be a delay due to an unforeseen event that is beyond the control of the Contractor as specified in Section 6-6. A nonexcusable delay shall be a delay due to an unforeseen event for which the Contractor is responsible. A compensable delay shall be an excusable delay for which the District is responsible. A noncompensable delay shall be an excusable delay for which the District is not responsible. Concurrent delays shall be defined as two (2) or more delays that occur on the same day when each delay impacts the same Contract milestone.

The Contractor's eligibility for time and/or extended overhead shall be as determined by the Engineer in the statement of Contract time accounting in accordance with the following:

CONTRACTOR'S ELIGIBILITY FOR TIME AND/OR EXTENDED OVERHEAD				
DELAY TYPE	NON-CONCURRENT DELAY	DELAY CONCURRENT WITH		
		Nonexcusable Delay	Compensable Delay	Noncompensable Delay
Nonexcusable	X	X		
Compensable	TEO	T	TEO	
Noncompensable	T	T	T	T
<u>ELIGIBILITY</u>				
X: No Time and No Extended Overhead      T: Time      EO: Extended Overhead				

Extended overhead shall refer to all actual time-related jobsite overhead costs incurred by the Contractor due to completion later than the contractual completion date. This shall not include home office or branch office overhead due to the performance of extra work pursuant to 6-6.3. This shall not include any increased nondirect labor costs, including superintendence costs, due to changes in the work. All increases in the Contractor's nondirect labor costs, including superintendence costs, due to changes in the work shall be included in the markups specified for changes in the work in accordance with 3-3.

**6-1.2.5.2 Schedule Analysis, Changes in Work and Extensions of Time.** Unless otherwise requested by the Engineer, the Contractor shall submit a schedule analysis of the impact of each UFE or contemplated change in work, and the cost breakdown specified in 3-2 within five (5) working days after submitting an acceptable update for the period in which the UFE or request to evaluate a contemplated change occurred. When requested by the Engineer, the Contractor shall submit the schedule analysis within five (5) working days of receipt of the Engineer's written request at no additional cost to the District. When appropriate, the schedule analysis shall include a request for time extension. The record schedule in effect at the time a UFE occurs or at the time the District requests evaluation of a contemplated change shall be the schedule analyzed to determine the corresponding impact.

A schedule analysis shall be the Contractor's written request for eligibility for time and/or extended overhead for all delays occurring during an update period. Each schedule analysis shall address all impacts to a single milestone during the corresponding update period. The schedule analysis shall include additional activities as necessary to accurately represent the UFE in accordance with the requirements for the project schedule. The detailed analysis shall include a description of any long lead material or equipment items and shall include any vendor-supplied supporting documentation indicating length of lead time. The District's review period for each schedule analysis is ten (10) working days.

The Contractor shall provide written notice to the District of each UFE within forty-eight (48) hours after each UFE becomes apparent. If it fails to provide the specified timely notice or to submit a schedule analysis and request for a time extension by the specified deadline, the Contractor shall not be eligible for compensation of any kind. When the Contractor fails to submit a timely schedule analysis in accordance with the requirements of this section progress payments may be withheld until all outstanding schedule analyses have been submitted.

A time extension to a Contract milestone will only be granted to the extent that a UFE impacts the timely completion of a Contract milestone. The resulting delay must be beyond the fault or negligence of the Contractor.

**6-1.2.5.3 Mitigation of Delay.** The Contractor shall be responsible to develop mitigative measures for all delays, regardless of responsibility for the delays, and to identify all time and cost impacts to the work associated with those mitigative measures. Unless circumstances otherwise require, the Contractor shall not pursue mitigative action for which it expects the District to be liable, prior to notifying the District in writing and receiving District written authorization to proceed with the mitigative action.

When the need for mitigation arises to ensure timely completion, the Contractor shall review all uncompleted activities on critical paths to the subject Contract milestone for errors in scope, duration, and logic, and for the feasibility of performing in parallel, work currently scheduled sequentially. All schedule analyses, all Contractor proposals for mitigative action, and all proposed revisions for timely completion shall confirm that the Contractor has verified the accuracy of all critical paths to the subject Contract milestone.

Whenever it is possible for the Contractor to mitigate delay without added cost to the project, the Contractor shall do so. The Contractor shall mitigate all delays as efficiently and economically as possible, with the objective of minimizing both the time and cost impact of the delay, regardless of responsibility for the delay. The District will not be liable for damages which the Contractor could have avoided by reasonable means, such as prudent scheduling of the work and judicious handling of forces, equipment, or plant. The District will not be liable for damages incurred by the Contractor during any period of time when the Contractor has failed to provide a schedule analysis in accordance with the Contract requirements.

**6-1.2.6 Project Schedule Submittals.** For non-Unifier™ projects, the number of copies shall be four (4) plus the number of copies the Contractor desires to be returned. All project schedule submittals shall include a bar chart and a typed narrative for projects that don't required cost loading. If the project requires cost loading, all project submittals shall include a bar chart, typed narrative and an earned value report formatted to the satisfaction of the Engineer. The narrative shall explain the baseline logic, all changes to logic in updates, and describe all delays that occurred during the update period. All baseline schedule submittals shall include diagrams and definitions as necessary for comprehension of activity descriptions. For projects that don't require cost loading, monthly updates shall also include a pay request formatted to the satisfaction of the Engineer.

For Unifier™ projects, all schedule submittals shall include a bar chart and a typed narrative for projects that don't require cost loading. If the project requires cost loading, all project submittals shall include a bar chart, typed narrative and an earned value report formatted to the satisfaction of the Engineer. The narrative shall explain the baseline logic, all changes to logic in updates, and describe all delays that occurred during the update period. All baseline schedule submittals shall include diagrams and definitions as necessary for comprehension of activity descriptions. For projects that don't require cost loading, monthly updates shall also include a pay request formatted to the satisfaction of the Engineer. The narrative file shall be in portable document format ("PDF") and in accordance with the requirements of 2-13. The baseline schedule submittal package files shall be submitted as attachments to the Submittal workflow and the update submittal package files shall be submitted as attachments to the Contractor to Field Engineering Correspondence workflow described in 2-13.4.4.

Project schedule submittals will be reviewed by the District for general conformity with the Plans and Specifications. District's acceptance of any project schedule submittal shall not relieve the Contractor of its obligation to fulfill all requirements of the Contract. Errors in the project schedule may be discovered at any time and shall be corrected by the Contractor in the next update for consistency with the Contract requirements.

## **6-1.3 CPM 1 CONSTRUCTION SCHEDULE**

**6-1.3.1 General.** If the CPM 1 schedule is required per the Special Provisions, the following applies.

**6-1.3.1.1 Terms.** The project schedule shall be the basis for evaluating all issues related to time for this Contract. The term "project schedule" shall refer to the baseline schedule, monthly updates, record schedule, look-ahead schedules, mitigation schedules, the as-built schedule, and all scheduling submittals required by the Contract.

**6-1.3.1.2 Software.** The project schedule shall be a computer-generated, time scaled, critical path method (CPM) network utilizing the precedence diagram method of representation. The software utilized shall be Suretrak version 3.0 or Primavera Project Planner version 3.1.

**6-1.3.1.3 Record Schedule.** The District-accepted baseline schedule shall be the record schedule until the District accepts the first update of the project schedule. Thereafter, the most recent District-accepted update shall be the record schedule.

**6-1.3.1.4 Contract Time.** The Contract time, Contract milestones, and special construction requirements specified in the Special Provisions shall be accurately represented in the project schedule.

### **6-1.3.2 Baseline Schedule**

**6-1.3.2.1 Baseline Schedule Submittal.** The baseline schedule shall represent the Contractor's plan to build the work at the time of bid in accordance with all requirements of the bid documents without exception. District's acceptance of the baseline schedule shall be a condition precedent to the start of physical work. The baseline schedule shall be submitted no later than twenty (20) working days after the date of Award of Contract. The District's review period for this submittal shall be fifteen (15) working days. If resubmittal of the baseline schedule is required, the Contractor shall resubmit within six (6) working days of receipt of the District's comments. The District's review period for each baseline schedule resubmittal shall be six (6) working days.

The baseline schedule shall include an activity representing start of physical work. The activity ID number for this activity shall be "STRT". Description for this activity shall be "Start of Physical Work". Predecessors for this activity shall be "Notice to Proceed", "Acceptance of the Baseline Schedule", and acceptance of all required early submittals. The successor for this activity shall be only the "Mobilization" activity.

The baseline schedule shall also include a hammock activity representing the entirety of the Contract. The activity ID number for this activity shall be "PROJ". Description for this activity shall be "Total Project". Predecessor for this activity shall be "Notice to Proceed" with a Start-to-Start relationship, and the successor for this activity shall be "Project Completion Milestone" with a Finish-to-Finish relationship.

All interim milestones shall have a start milestone activity, a finish milestone activity, and a hammock activity representing the start, completion, and entirety of the work for that milestone.

The Contractor shall continue to resubmit the baseline schedule until obtaining District's acceptance. With each resubmittal, the Contractor shall include a detailed statement for each review comment, with reference to the appropriate activity number, that explains how that comment was addressed. These explanations are critical for the District to perform timely reviews. Activity numbers shall not be changed or modified in the resubmittals, unless directed by the District. Any other changes made by the Contractor shall be listed in the detailed statement which accompanies the resubmittal. All revisions necessary as a result of District's review shall be made by the Contractor at no additional cost to the District.

The submitted baseline schedule shall contain all required activities, logic, coding, and cost loading if required, and shall comply with all project schedule requirements. For non-Unifier™ baseline schedule submittals shall include a READ-ONLY CD containing the schedule file and narrative. The CD shall have a label that clearly shows the project file name, name of the project, Contractor's name, Contract number, submittal number, and the date of the submittal. The narrative shall explain the schedule logic and construction sequencing.

Failure to meet any of the following criteria shall result in the rejection of the baseline schedule submittal for correction and resubmittal. For projects that require cost loading per the Special Provisions, the sum of all dollar values shall equal the Contract price and activity costs shall not be front-end loaded. Logic shall be complete and shall not include redundant logic or extraneous logic ties. The use of float suppression techniques by the Contractor, including preferential sequencing, special lead/lag logic restraints, extended activity durations, or imposed dates will not be permitted and shall be grounds for rejection of the project schedule. The baseline schedule shall accurately represent the special construction requirements specified in the Special Provisions and show the timely completion of each Contract milestone. All activities shall have a percent complete of zero, total float greater than or equal to zero, and there shall be no actual start or actual finish dates. Submittal components shall be complete and in accordance with their specified format.

#### **6-1.3.2.2 Early Completion**

**6-1.3.2.2.1 Baseline Schedule.** If the baseline schedule shows the early completion of any Contract milestone, the early completion schedule shall satisfy all requirements of the Contract Documents. A change order will be issued to revise Contract milestone date(s) to the early completion date(s) shown in the baseline schedule. Physical work at the project site shall not commence prior to execution of this change order. The Contractor shall be liable for liquidated damages for each Contract milestone in the dollar amounts specified in the Special Provisions for failure to achieve the revised Contract milestone date(s).

**6-1.3.2.2.2 Overhead Cost.** The Contractor's bid shall include overhead costs for the full duration of the Contract through achievement of the Contract Completion milestone as shown in the District-accepted baseline schedule. In no case shall the Contractor be eligible for additional compensation for overhead costs incurred in relation to performance of the as-bid Contract work during the period from the date for opening of bids through the planned date of the Contract Completion milestone as shown in the District-accepted baseline schedule.

**6-1.3.2.2.3 Reduction of Contract Scope.** In the event that the District reduces the scope of the Contract and the eliminated work is on the controlling path to a Contract milestone, the District may change the required deadline for the milestone such that upon deletion of the work the total float of the milestone remains unchanged. In this event, the Contractor shall not be eligible for additional compensation to achieve the revised Contract milestone date and the Contractor shall be liable for liquidated damages for the Contract milestone in the dollar amounts specified in the Special Provisions for failure to achieve the revised Contract milestone date.

#### **6-1.3.3 Schedule Structure**

**6-1.3.3.1 Activities and Logic.** The project schedule shall include activities of sufficient detail to accurately represent and clearly convey the Contractor's feasible plan for the timely completion of the full scope of the work. Project schedule activities shall include, but not necessarily be limited to, the following: site mobilization including setup of storage yard, all construction activities; required notifications to Engineer; shop and field testing; punch list and demobilization; and one activity for each Contract milestone, the preparation of each submittal, the review of each submittal, and the procurement of each major material and type of equipment. Each activity shall represent the work of a single Subcontractor or the Contractor. Exceptions may be made for small scale concrete work.



The Contractor shall be responsible for developing the logic of the baseline schedule and updating the logic in monthly updates. The planning unit for the project shall be "days". The schedule shall contain at least twenty (20) construction activities. For projects that require cost loading per the Special Provisions, the maximum dollar amount of any individual activity shall be Twenty-five thousand dollars (\$25,000). The maximum duration of construction activities shall be fifteen (15) working days, with few exceptions at the consent of the Engineer.

Activity ID's shall be left justified and contain alphanumeric characters only with no spaces. Each activity shall have a description that unambiguously defines a unique scope of work. Activity descriptions in the baseline schedule shall use only upper case letters. Activities added subsequent to baseline acceptance shall use only lower case letters.

The use of lags shall be kept to a minimum and shall be subject to the approval of the Engineer. The use of negative lags is not allowed. Apply (do not alter) the default software calculation settings of retained logic and contiguous durations. Date constraints shall be limited to Start-No-Earlier-Than, Start-No-Later-Than, Finish-No-Later-Than, and Finish-No-Earlier-Than and shall be applied only to Contract milestones. Zero free float constraints may be applied only to notification activities. Total float constraints shall not be used. Activity predecessors and successors shall be included in the project schedule as necessary to show the work flow and resource limitations. Every activity, except the project start and project finish milestones, shall have a minimum of one predecessor and one successor.

All analyses of time impacts shall be based upon total float. Total float shall be the difference in working days between the late finish date and the early finish date of an activity. The use of redundant logic and float suppression techniques including preferential sequencing, special lead/lag logic restraints, extended activity durations, or imposed dates will not be permitted and shall be grounds for rejection of the project schedule. Float shall not be for the exclusive use of either the District or the Contractor. Float shall be a jointly owned resource. Float shall be consumed by both the District and the Contractor on a first come, first served basis. Generated float shall be available to both the District and the Contractor on an equal basis.

**6-1.3.3.2 Coding.** The Contractor shall define values for each of the following activity codes, including but not limited to, Type, Responsibility, Area, Submittal Number, Bid Item, Discipline, and Interim Milestone. Unless otherwise specified, each activity in the project schedule shall be assigned a value for each of the specified codes. Project schedule submittals may be rejected for inaccurate coding when coding errors occur in more than one percent of the total number of activities or fifty (50) activities, whichever is less.

- a. Type - A value shall be assigned for each activity to represent the type of activity. The Type code values are as follows:

Type	Value
Administrative Activities	ADM
Submittal Activities	SUB
District Review and Approval Activities	REV
Procurement of Materials and Equipment Activities	PRO
Delivery of Materials and Equipment Activities	DEL
Construction Activities	CON
Other Activities	OTH

- b. Responsibility - A value shall be defined for the Contractor (GC), the District (LACSD), each Subcontractor, and for each relevant third party, such as, Southern California Edison (SCE).
- c. Area - A value shall be defined for each area where work will be performed.

- d. Submittal Number - The Contractor shall define values that correspond to each submittal number. For example, "2B-01" shall be assigned to all activities representing Submittal No. 2B-01. In the baseline schedule, only section numbers shall be used: 2B, 2C, etc. For example, "2B" will be updated to "2B-01" in the next update following submission of Submittal No. 2B-01. Assign this code to all submittal, review, fabrication, shop test, and delivery activities.
- e. Bid Item - A value shall be defined for each bid item.
- f. Discipline (DISC) - A value shall be defined for each of the following disciplines according to the division of the Special Provisions in which they are specified: civil (Division 2); structural (Divisions 5, 7, 9, 13, 14); mechanical (Divisions 11, 15, 18); electrical (Divisions 16, 17); architectural (Divisions 4, 6, 8, 10, 12).
- g. Interim Milestone - Interim milestone code values shall have the form "IM1" (Interim Milestone No. 1), etc. Assign interim milestone code values to only those activities representing the scope of the corresponding interim milestone.

**6-1.3.3.3 Cost Loading.** The following applies to projects that require cost loading per the Special Provisions, except as otherwise specified, only construction activities shall be cost loaded. Each construction activity shall have a nonzero budgeted cost that represents the total cost of that activity. Front end loading of costs is not permitted and shall result in rejection of the schedule. The sum of the budgeted costs of all activities in the project schedule shall equal the Contract price. The sum of the budgeted costs for all activities coded to a particular bid item shall equal the amount of that bid item as shown on the Proposal Form.

Payment for mobilization, not including bonds and insurance, will be made in the amount of two percent of the Contractor's bid price. A separate cost-loaded activity shall be included in the project schedule representing mobilization. Payment for mobilization shall not be made prior to the completion of mobilization and the start of construction of permanent facilities. Completion of mobilization shall include setup of trailers, establishment of site utilities, and securing of parking, yard, and laydown areas. Start of construction shall be as determined by the Engineer and shall not include any exploratory work, such as potholing, or the delivery of materials and equipment.

The following cost-loaded indirect activities shall be included in the project schedule: "Bonds and Insurance" with budgeted cost not to exceed actual amount of paid invoices (payment applies only to general Contractor costs, not to Subcontractors); "Obtain District Approval As-Built Drawings" with budgeted cost of Twenty thousand dollars (\$20,000); "Obtain District Acceptance of As-Built Schedule" with budgeted cost of Ten thousand dollars (\$10,000). The latter two (2) activities shall each have a duration of zero, a single predecessor of the Contract Completion milestone with a Finish-Finish relationship, and no successors.

**6-1.3.3.4 Resource Loading.** The baseline schedule narrative shall include an explanation of the Contractor's labor and equipment resource plan. The plan shall define all Contractor and Subcontractor crews and identify the work each crew will perform, including the activity ID's and descriptions of the first and last activity to be performed by each crew. All equipment requiring a seated operator shall be listed and the work for which it is needed identified. The plan shall identify the criteria for mobilizing and demobilizing each piece of equipment.

**6-1.3.4 Project Schedule Update.** The Contractor shall update the project schedule monthly. In each update, the Contractor shall accurately document the progress of the work to date and correct the schedule to accurately reflect the Contractor's current plan for the timely completion of the work. The final update shall be the as-built schedule.

The data date of the update will be determined by the Engineer at the preconstruction meeting. The monthly update shall be submitted no later than the second (2nd) working day following the data date. The District's review period shall be five (5) working days. If the update is not acceptable, the Contractor shall correct the update in accordance with the District's comments. The corrected update shall be resubmitted within three (3) working days of receipt of the District's review comments. The District's review period for the resubmittal shall be five (5) working days.

No changes shall be made to the project schedule in a monthly update without the authorization of the Engineer. These include, but are not necessarily limited to, changes to activity numbers, activity descriptions, original durations, schedule settings, etc. The Engineer's decision shall be final regarding the update. Failure of the Contractor to adhere to these requirements shall result in rejection of the update without further review. If the Contractor disagrees with the District's review comments, this shall be noted in the narrative that accompanies the monthly update. All objections shall identify specific schedule data that the Contractor believes is incorrect and shall provide alternative data that the Contractor believes is correct. The Contractor's objections shall also be recorded in a schedule file that represents what the Contractor believes to be the correct update. The monthly update submittal will be incomplete without the objections schedule file.

Each monthly update submittal shall contain the following information as a minimum: actual start and finish dates; percent complete and remaining duration; narrative; logic corrections, including, but not necessarily limited to, correction of out-of-sequence logic and addition of activities representing authorized extra work; critical path; earned value report formatted to the Engineer's satisfaction for projects that require cost loading; pay request formatted to the Engineer's satisfaction for non-cost loading projects; the schedule file and all required reports.

Weekly, the Contractor shall prepare and submit to the Engineer, a four (4) week rolling schedule, which shall record the actual events of the preceding week and forecast activities that the Contractor plans to perform in the succeeding three weeks. The four (4) week rolling schedule shall be a bar chart derived from and consistent with the record schedule. However, it is not acceptable to merely print out all activities from the record schedule that fall within the date range of the rolling schedule. The Contractor shall remove those activities with sufficient float that the Contractor does not intend to pursue in the next (3) three weeks. Conversely, the Contractor shall add greater detail than the record schedule as necessary to accurately represent work. Additional detail shall include, but not necessarily be limited to, the following: further breakdown of schedule activities, planned shutdowns, notifications, third party impacts, and submittals and RFIs that may impact the work. Detail in the bar chart shall be as necessary to accurately and clearly convey the Contractor's current work plan to the satisfaction of the Engineer. The Contractor shall submit a copy of the four (4) week rolling schedule. An electronic schedule file shall be submitted at no additional cost when requested by the Engineer.

If cost loading is required per the Special Provisions, the Contractor's submission of the monthly update shall be the Contractor's application for payment. The Contractor shall not be eligible to receive pending progress payments until the corresponding monthly update is submitted and accepted and until the four (4) week rolling schedule is correctly submitted. Updates will be reviewed in chronological order. Regardless of its submittal date, the review period for an update will not begin prior to the date of acceptance of the update for the preceding period. The Contractor shall be responsible for all impacts due to its failure to submit acceptable updates in a timely manner. No final payment shall be made nor any bonds released by the District until the as-built schedule submittal is accepted by the District.

### **6-1.3.5 Contract Time Accounting**

**6-1.3.5.1 Unforeseen Event & Delay.** An unforeseen event, "UFE" shall be any event that is not represented in the record schedule that has or may have a time or cost impact to the work. A delay shall

be defined as a day when a UFE prevents an activity in the record schedule from being performed on the date scheduled, resulting in a reduction of the total float of a Contract milestone as recorded in the record schedule and when the resulting total float of that milestone is less than zero. When the activity that cannot be performed on the date scheduled in the record schedule is a construction activity, that activity shall be prevented from being performed when and only when the Contractor is prevented from working during five (5) hours of that scheduled activity with at least sixty percent of the scheduled labor for that activity. The traditional notion of a "rain day" has no merit. Delays due to rain shall be administered the same as all other UFE's.

An excusable delay shall be a delay due to an unforeseen event that is beyond the control of the Contractor as specified in Section 6-6. A nonexcusable delay shall be a delay due to an unforeseen event for which the Contractor is responsible. A compensable delay shall be an excusable delay for which the District is responsible. A noncompensable delay shall be an excusable delay for which the District is not responsible. Concurrent delays shall be defined as two (2) or more delays that occur on the same day when each delay impacts the same Contract milestone.

The Contractor's eligibility for time and/or extended overhead shall be as determined by the Engineer in the statement of Contract time accounting in accordance with the following:

CONTRACTOR'S ELIGIBILITY FOR TIME AND/OR EXTENDED OVERHEAD				
DELAY TYPE	NON- CONCURRENT DELAY	DELAY CONCURRENT WITH		
		Nonexcusable Delay	Compensable Delay	Noncompensable Delay
Nonexcusable	X	X		
Compensable	TEO	T	TEO	
Noncompensable	T	T	T	T
<u>ELIGIBILITY</u>				
X: No Time and No Extended Overhead      T: Time      EO: Extended Overhead				

Extended overhead shall refer to all actual time-related jobsite overhead costs incurred by the Contractor due to completion later than the contractual completion date. This shall not include home office or branch office overhead due to the performance of extra work pursuant to 6-6.3. This shall not include any increased nondirect labor costs, including superintendence costs, due to changes in the work. All increases in the Contractor's nondirect labor costs, including superintendence costs, due to changes in the work shall be included in the markups specified for changes in the work in accordance with Section 3-3.

**6-1.3.5.2 Schedule Analysis, Changes in Work and Extensions of Time.** Unless otherwise requested by the Engineer, the Contractor shall submit a schedule analysis of the impact of each UFE or contemplated change in work, and the cost breakdown specified in Section 3-2. Within ten (10) working days after submitting an acceptable update for the period in which the UFE or request to evaluate a contemplated change occurred. When requested by the Engineer, the Contractor shall submit the schedule analysis within five (5) working days of receipt of the Engineer's written request at no additional cost to the District. When appropriate, the schedule analysis shall include a request for time extension. The record schedule in effect at the time a UFE occurs or at the time the District requests evaluation of a contemplated change shall be the schedule analyzed to determine the corresponding impact.

A schedule analysis shall be the Contractor's written request for eligibility for time and/or extended overhead for delays occurring during an update period. Each schedule analysis shall address all impacts to a single milestone during the corresponding update period. The schedule analysis shall include additional activities as necessary to accurately represent the UFE in accordance with the requirements for the project schedule. The detailed analysis shall include a description of any long lead material or equipment items and shall include any vendor-supplied supporting documentation indicating length of lead time. The District's review period for each schedule analysis is fifteen (15) working days.

The Contractor shall provide written notice to the District of each UFE within forty-eight (48) hours after each UFE becomes apparent. If it fails to provide the specified timely notice or to submit a schedule analysis and request for a time extension by the specified deadline, the Contractor shall not be eligible for compensation of any kind. When the Contractor fails to submit a timely schedule analysis in accordance with the requirements of this section, progress payments may be withheld until all outstanding schedule analyses have been submitted.

A time extension to a Contract milestone will only be granted to the extent that a UFE impacts the timely completion of a Contract milestone. The resulting delay must be beyond the fault or negligence of the Contractor.

**6-1.3.5.3 Mitigation of Delay.** The Contractor shall be responsible to develop mitigative measures for all delays, regardless of responsibility for the delays, and to identify all time and cost impacts to the work associated with those mitigative measures. Unless circumstances otherwise require, the Contractor shall not pursue mitigative action for which it expects the District to be liable, prior to notifying the District in writing and receiving District's written authorization to proceed with the mitigative action.

When the need for mitigation arises to ensure timely completion, the Contractor shall review all uncompleted activities on critical paths to the subject Contract milestone for errors in scope, duration, and logic, and for the feasibility of performing in parallel, work currently scheduled sequentially. All schedule analyses, all Contractor proposals for mitigative action, and all proposed revisions for timely completion shall confirm that the Contractor has verified the accuracy of all critical paths to the subject Contract milestone.

Whenever it is possible for the Contractor to mitigate delay without added cost to the project, the Contractor shall do so. The Contractor shall mitigate all delays as efficiently and economically as possible, with the objective of minimizing both the time and cost impact of the delay, regardless of responsibility for the delay. The District will not be liable for damages which the Contractor could have avoided by reasonable means, such as prudent scheduling of the work and judicious handling of forces, equipment, or plant. The District will not be liable for damages incurred by the Contractor during any period of time when the Contractor has failed to provide a schedule analysis in accordance with the Contract requirements.

**6-1.3.6 Project Schedule Submittals.** All project schedule submittal packages shall be submitted electronically via Unifier™ unless otherwise noted. The Suretrak or Primavera generated project schedule file shall be submitted to the District using the Suretrak/Primavera "Backup" function only. If the Contractor is using Primavera, then both the "Compress Files" and "Remove access list during backup" shall be selected/enabled as part of the creation of the backup schedule file. If the Contractor is using Suretrak, then both the "Compress" and "Include shared layouts" shall be selected/enabled as part of the creation of the backup schedule file.

Each backup schedule filename shall be assigned a unique alphanumeric name. The filename of the first backup baseline schedule shall be "BA01" and the filename of each resubmittal shall increase consecutively (e.g., "BA02", "BA03", etc.). The filename of the first backup (monthly) update schedule be "UP01" and the filename of each resubmittal shall increase consecutively (e.g., "UP02", "UP03", etc.).

All project schedule submittal packages shall be composed of both the backup schedule file and the schedule narrative file. The narrative file shall be in portable document format ("PDF") and in accordance with the requirements of the Special Provisions. The baseline schedule submittal package files and the update submittal package files shall be submitted as attachments to the Contractor to Field Engineering Correspondence workflow.

The baseline narrative shall explain the baseline logic. Update narratives shall summarize progress for the update period, describe all changes made to the schedule and the reasons for each change, describe the cause of each delay occurring during the update period, describe the mitigation plan for each delay, and identify issues that may potentially cause delay. All baseline schedule submittals shall include diagrams and definitions as necessary for comprehension of activity descriptions.

For non-Unifier™ projects, the number of copies for all project schedule submittals shall be four (4) plus the number of copies the Contractor desires to be returned. All project schedule submittals shall include electronic schedule files on a read-only CD or computer disk, a printed time-scaled bar chart, and a typed narrative. The baseline narrative shall explain the baseline logic. Update narratives shall summarize progress for the update period, describe the cause of each delay occurring during the update period, describe the mitigation plan for each delay, and identify issues that may potentially cause delay. All baseline schedule submittals shall include diagrams and definitions as necessary for comprehension of activity descriptions.

For both Unifier™ and non-Unifier™ projects, project schedule submittals will be reviewed by the District for general conformity with the Plans and Specifications. District's acceptance of any project schedule submittal shall not relieve the Contractor of its obligation to fulfill all requirements of the Contract. Errors in the project schedule may be discovered at any time and shall be corrected by the Contractor in the next update for consistency with the Contract requirements. "

IN **6-1.2 Commencement of the Work**, DELETE THE SECTION NUMBER 6-1.2 AND REPLACE WITH 6-1.4 AND DELETE THE PARAGRAPH IN ITS ENTIRETY AND REPLACE WITH THE FOLLOWING:

"The Contract time shall start on date of the Notice to Proceed, which will be established by the Engineer and may be any date after award of Contract by the Districts' Board of Directors."

IN **6-2 PROSECUTION OF THE WORK**, AFTER THE FIRST PARAGRAPH, ADD THE FOLLOWING:

"As soon as possible under the provisions of the Specifications, the Contractor shall backfill all excavations and restore to usefulness all improvements existing prior to the start of the Work. If the Contractor fails to complete any work with a specified time limit, the Engineer may suspend all other work until the past due work is complete. No additional compensation and/or time extension will be granted due to such work suspension."

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IN **6-4 DEFAULT BY THE CONTRACTOR**, DELETE ALL PARAGRAPHS AND REPLACE WITH THE FOLLOWING:

"If the Contractor fails to begin delivery of material and equipment, to commence work within the time specified, to maintain the rate of delivery of material, to execute the work in the manner and at such locations as specified, fails to maintain a work program which will ensure the District's interest, becomes insolvent, or, if the Contractor is not carrying out the intent of the Contract, the Engineer's written notice may be served upon the Contractor and the Surety on its faithful performance bond demanding satisfactory compliance with the Contract. If the Contractor or its Surety does not comply

with such written notice within five (5) days after receiving it, or after starting to comply, fails to continue, the District may exclude them from the premises, take possession of all material and equipment and find the Contractor and its Surety in default and cancel the Contract. The Contractor, in having tendered a Bid, shall be deemed to have waived any and all claims for damages because of cancellation of the Contract for any such reason.

Upon taking such action, the District may complete the work by District's forces, by letting the unfinished work to another Contractor, or by a combination of such methods. In any event, the cost of completing the Work shall be charged against the Contractor and its Surety and may be deducted from any money due from the District. If the sums under the Contract are insufficient for completion of the Work, the Contractor or Surety shall pay to the District, within five (5) days after completion of the Work, all costs in excess of the Contract Price.

If the Surety assumes any part of the Work, it shall take the Contractor's place in all respects for that part and shall be paid by the District for all work performed by it in accordance with the Contract. If the Surety assumes the entire Contract, all money due the Contractor at the time of its default shall be payable to the Surety as the work progresses, subject to the terms of the Contract.

The provisions of this section shall be in addition to all other rights and remedies available to the District under law."

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IN **6-6.1 General**, FIRST PARAGRAPH, ADD THE FOLLOWING TO THE BEGINNING:

"The Contractor shall immediately provide written notification to the Engineer of any delay to the work and submit, when required or requested by the Engineer, a schedule analysis demonstrating the impact on the project schedule and a written plan of delay mitigation."

IN **6-6.1 General**, ADD THE FOLLOWING TO THE END:

"The Contractor's inability to obtain specified material or equipment shall not constitute an unforeseen event under this section if it results from matters within the control of the Contractor's Subcontractor, equipment vendor or manufacturer, or material vendor or manufacturer."

IN **6-6.3 Payment for Delays**, ADD THE FOLLOWING TO THE END:

"Compensation for losses sustained by the Contractor shall be limited to actual labor, equipment and work site facilities affected by such delays together with applicable mark-up under 3-3.2.3. Under no circumstances will the District compensate the Contractor for general or administrative costs for such delay including without limitation, interest on money or costs attributable to home office or branch office overhead in excess of the applicable markups."

AFTER **6-6.4 Written Notice and Report**, ADD THE FOLLOWING:

**"6-6.5 Unfavorable Construction Conditions.** During unfavorable weather, wet ground, or other unsuitable construction conditions, the Contractor shall confine its operations to work which will not be affected adversely thereby. No portion of the work shall be constructed under conditions which would affect adversely the quality or efficiency thereof, unless special means or precautions are taken by the Contractor, with approval of the Engineer, to perform the work in a proper and satisfactory manner.

The Engineer shall have the authority to direct the Contractor to cease operations in areas of work which might be affected adversely by predicted unfavorable weather, wet ground, or other unsuitable construction conditions. The Contractor, being directed to cease operations, shall not be entitled to claim additional compensation for delays."

IN **6-7.1 General**, ADD THE FOLLOWING TO THE END:

"The Contractor shall not, in the absence of the express consent of the Engineer, cause any work to be done on the following days:

- 1) Any Saturday.
- 2) Any Sunday.
- 3) Any day designated or observed as a holiday by the District for the following holidays: New Years Day, Memorial Day, Independence Day, Labor Day, Veterans Day, Thanksgiving Day, the Friday immediately after Thanksgiving Day, and Christmas Day.

If the Contractor is allowed to work on any of the above days, it shall be considered a working day.

Unless otherwise specified, normal working hours for any working day shall start at 7:00 a.m. and end at 3:30 p.m. The Contractor shall not perform any work outside of normal working hours without prior written approval of the District. The Contractor shall provide a written request to the District a minimum of forty-eight (48) hours prior to performing any work outside of normal working hours and shall provide a written request a minimum of five (5) working days prior to a shift change. Nothing herein shall be construed as granting a right to the Contractor to demand approval of changes to working hours or a shift."

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IN **6-7.2 Working Day**, ADD THE FOLLOWING TO THE END:

"If the Contractor is allowed to work on any Saturday, Sunday, or holiday designated or observed by the District as defined in 6-7.1, it shall be considered a working day."

IN **6-8 COMPLETION, ACCEPTANCE, AND WARRANTY**, SECOND PARAGRAPH, LAST SENTENCE, ADD THE FOLLOWING TO THE END:

"and the date to which liquidated damages for late completion of the Work, if any, will be computed."

IN **6-8 COMPLETION, ACCEPTANCE, AND WARRANTY**, DELETE THE THIRD AND FOURTH PARAGRAPHS AND REPLACE WITH THE FOLLOWING:

"The Contractor shall guarantee that the equipment, materials, and workmanship furnished will be as specified and will be free of defects due to faulty materials or workmanship for a period of one year from the date of final acceptance of the Work by the District's Board. In addition, the equipment furnished by the Contractor shall be guaranteed to be free from defects in design. The performance bond shall remain in full force and effect through the guarantee period. The guarantee period shall apply to all work, regardless of when it is placed into service by the District.

In the event that equipment is placed into service prior to acceptance of the Work by the District's Board, the Engineer may, at his or her option, accept the equipment after all punch list items regarding that equipment are completed, and allow the one year guarantee period to start from the date of such acceptance, except for defects in design, which shall remain as described above.



Within the guarantee period and upon notification of the Contractor by the District, the Contractor shall within ten (10) calendar days make needed adjustments, repairs or replacement arising out of defects which, in the judgment of the Engineer, become necessary during such period. The cost of materials, parts, labor transportation, supervision, special tools and supplies required for correction of abnormalities shall be paid by the Contractor.

Parts of equipment that have been repaired or replaced shall be guaranteed against failure or defect for a period of one year from the date of installation of the repaired or replaced part.

If the Contractor neglects to make or undertake with due diligence the necessary repair or adjustments within ten (10) days after the District gives the Contractor notice of a defect, failure, or abnormality of the work, the District will make the repair or adjustment or order the work to be done by a third party. The cost of the work shall be paid by the Contractor.

In the event of an emergency where, in the District's judgment, delay would cause serious loss or damage, repairs or adjustments will be made by the District, or a third party chosen by the District without a requirement for notice to the Contractor. The cost of the work shall be paid by the Contractor."

IN **6-9 LIQUIDATED DAMAGES**, FIRST PARAGRAPH, LAST SENTENCE, ADD THE WORDS: "commencing from the date specified in the Notice to Proceed" AFTER THE WORDS "completion of the Work" AND DELETE THE AMOUNT "\$250" AND REPLACE WITH THE AMOUNT "\$500".

IN **6-9 LIQUIDATED DAMAGES**, SECOND PARAGRAPH, FIRST SENTENCE, DELETE THE AMOUNT "\$250" AND REPLACE WITH THE AMOUNT "\$500".

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IN **7-1.1 'General**, AFTER THE FIRST PARAGRAPH ADD THE FOLLOWING:

"The Contractor shall render its machinery and equipment inoperable at all times except during actual construction. The Contractor shall be responsible for construction means, controls, techniques, sequences, procedures and construction safety. All equipment and facilities shall meet all requirements of applicable ordinances and laws. The Contractor shall comply with applicable local, state and federal rules and regulations, including, but not limited to being in compliance with requirements for portable engine-powered equipment. The Contractor shall also bear full legal and financial responsibility for its violations of any federal, state and local rules and regulations and for any Subcontractor.

Prior to mobilization, the Contractor shall certify that all portable engine-powered equipment mobilized to the job site have valid California Air Resources Board and local air quality management district or air pollution control district permits. District's Contractor compliance certification forms shall be executed by the Contractor certifying that portable engine-powered equipment provided by Contractor or Subcontractors are compliant with federal, state and local rules and regulations. Violations resulting in non-compliance shall be corrected by the Contractor at his own expense before final payment is issued."

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IN **7-3 LIABILITY INSURANCE**, DELETE THE SECOND AND THIRD PARAGRAPHS AND REPLACE WITH THE FOLLOWING:

"The Contractor may file insurance acceptable to the District covering more than one project. The coverage shall provide the following minimum limits for liability insurance:

Contracts less than \$2,000,000

Each Occurrence Limit .....\$3,000,000  
Products/Completed Operations Aggregate Limit.....\$3,000,000  
General Aggregate Limit .....\$3,000,000  
(other than Products/Completed Operations)

Contracts \$2,000,000 and over

Each Occurrence Limit .....\$5,000,000  
Products/Completed Operations Aggregate Limit.....\$5,000,000  
General Aggregate Limit .....\$5,000,000  
(other than Products/Completed Operations)

The Contractor shall provide automobile liability insurance with the following minimum limits:

Each Occurrence Limit .....\$1,000,000

All-Risk/Builders Insurance will be required when the Contract entails taking possession of any District's property, including building and equipment. The coverage shall provide a sufficient amount to include the value of the property and the value of the Contract for the duration of the Contract as specified in the Special Provisions."

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IN **7-5 PERMITS**, AFTER THE FIRST PARAGRAPH, ADD THE FOLLOWING:

"All expenses for complying with the requirements of the permits obtained by the District and by the Contractor including, but not limited to, traffic control, repairs, lights, signs, and backfill shall be borne by the Contractor. Inspection fees for resurfacing required by local authority will be borne by the District. The District will reimburse the Contractor for all State inspection costs incurred for work performed within State of California Department of Transportation (Caltrans) right of way. The Contractor shall invoice the District for the costs without any Contractor's markup and the Contractor will be reimbursed by purchase order. Prior to commencing any work, the Contractor shall obtain a separate Caltrans permit (Double Permit) and shall submit to Caltrans a signed construction application including a Performance Bond in the specified amount and an excavation permit from the State of California Division of Occupational Safety and Health."

IN **7-6 THE CONTRACTOR'S REPRESENTATIVE**, SECOND PARAGRAPH, ADD THE FOLLOWING TO THE END:

"The Contractor shall designate in writing a superintendent for contracts in excess of \$500,000. This superintendent shall be the Contractor's representative.

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IN **7-8.1 General**, FIRST PARAGRAPH, ADD THE FOLLOWING TO THE END:

"The Contractor shall also abate dust nuisance by cleaning, sweeping, and sprinkling with water, or other means as necessary. The use of water resulting in mud on public or private streets or roadways will not be permitted as a substitute for sweeping or other methods. "

IN **7-8.1 General**, DELETE THE SECOND AND THIRD PARAGRAPHS AND REPLACE WITH THE FOLLOWING:

"The Contractor shall have a self-loading motor sweeper with spray nozzles on the jobsite at all times to keep paved areas acceptably clean wherever construction, including restoration, is incomplete. Care shall be taken to prevent spillages and tracking on haul routes. Trucks shall not be overloaded. Any spillage or tracking shall be removed immediately and the areas cleaned to the satisfaction of the Engineer. The routes used by trucks to carry material, including pipe, to the jobsite and debris and excavation therefrom shall be approved by the Engineer at the preconstruction meeting."

IN **7-8.1 General**, FOURTH PARAGRAPH, ADD THE FOLLOWING TO THE END:

"No additional compensation will be allowed as a result of such suspension. Failure of the Contractor to comply with the Engineer's cleanup orders may also result in the District having the cleanup work done by others. The Contractor shall bear all costs incurred by the District in having the work done and such costs shall be deducted from amounts due or become due to the Contractor. "

IN **7-8.4.1 General**, SECOND PARAGRAPH, ADD THE FOLLOWING TO THE END:

"Excess or waste concrete, including concrete truck wash out wastes, shall be placed in a lined container for proper disposal after the concrete has set up."

IN **7-8.4.1 General**, AFTER THE FIRST PARAGRAPH, ADD THE FOLLOWING:

"The Engineer shall approve all storage locations."

IN **7-8.4.2 Storage in Public Streets**, FIRST PARAGRAPH, SECOND SENTENCE, AFTER THE WORDS "after unloading shall be" ADD THE WORDS "removed from the Work site and".

IN **7-8.4.2 Storage in Public Streets**, SECOND PARAGRAPH, ADD THE WORDS "or excavation" AFTER THE WORD "trench".

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IN **7-8.5.2 Sewage Bypass and Pumping Plan**, DELETE THE PARAGRAPH AND REPLACE WITH THE FOLLOWING:

"The sewer bypass and pumping plan shall be in accordance with 500-1.1.7(f). "

IN **7-8.5.3 Spill Prevention and Emergency Response Plan**, DELETE ALL PARAGRAPHS AND REPLACE WITH THE FOLLOWING:

"The spill prevention and emergency response plan shall be in accordance with 500-1.1.7(f). "

IN **7-8.6 Water Pollution Control**, DELETE ALL PARAGRAPHS AND SUBSECTIONS AND REPLACE WITH THE FOLLOWING:

**"7-8.6.1 General.** The Contractor shall comply with the applicable provisions of the State Water Resources Control Board's Water Quality Order 99-08-DWQ, "National Pollutant Discharge Elimination System General Permit for Storm Water Discharges Associated with Construction Activity (General Permit)" and any modifications thereof (including, but not limited to, Resolution No. 2001-046); and Federal, State, and local regulations that govern the Contractor's operations and storm water discharges from the project site.

In accordance with State Water Resources Control Board (SWRCB) requirements, the Contractor may be required to prepare, submit and implement a Storm Water Pollution Prevention Plan (SWPPP) for this project. Based on the requirements of the General Permit and the Contractor's proposed construction activities, the Contractor shall determine whether or not a SWPPP will be required for this project. If the Contractor determines that a SWPPP will not be required for this project, the Contractor shall submit a letter to the District certifying compliance with SWRCB Water Quality Order 99-08-DWQ.

If a SWPPP will be required, the Contractor shall notify the District in writing within twenty (20) working days from the date of the award of the Contract by the District's Board of Directors. The District will submit a Notice of Intent to the SWRCB. The Contractor shall submit a minimum of three (3) copies of the SWPPP to the District for review and approval. The Contractor shall select appropriate Best Management Practices (BMPs) from the 2003 CASWQA Construction Handbook ([www.cabmphandbooks.com](http://www.cabmphandbooks.com)). If the project includes groundwater dewatering activities, the extract and groundwater shall not be discharged to the street surfaces, storm drains or surface waters without an NPDES Permit as required under 306-1.1.8.

If revisions to the SWPPP are required, as determined by the District, the Contractor shall revise and resubmit the SWPPP. Review by the District will not relieve the Contractor of the adequacy of the SWPPP or serve to eliminate full compliance with all applicable Federal, State, and local laws and regulations that govern water quality. The Contractor will not be allowed to start any construction activities without an approved SWPPP.

**7-8.6.2 Storm Water Pollution Prevention Plan (SWPPP).** The SWPPP shall conform to the requirements of the General Permit and shall include, but not be limited to, the following items:

**7-8.6.2.1** A site plan with sufficient detail to show proposed grading; soil stockpile location; equipment staging, storage, fueling and maintenance areas; and storage areas for construction materials (i.e., chemicals, fuel, lubricants). The site plan shall also show the location of all affected storm drain catch basins and include anticipated surface drainage patterns. Digital file(s) of the topography of the project area, in a Portable Data File (PDF) format, will be made available to the Contractor upon request.

**7-8.6.2.2** Information regarding the construction site surface area: the size (in acres or square feet), the runoff coefficient for the site, and the percentage of surface area that is paved or otherwise impervious.

**7-8.6.2.3** A construction schedule which describes the anticipated start date and duration for grading/excavation or other work activities that could affect water quality. This construction schedule shall be updated to reflect any changes in the Contractor's operations that would affect the necessary implementation of BMPs.

**7-8.6.2.4** A listing of construction activities which could cause pollutants, sediment, fuel, chemicals, or construction materials to contaminate storm water discharges from the site.

**7-8.6.2.5** A listing of all anticipated non-storm water discharges.

**7-8.6.2.6** A listing of all hazardous materials which will be used and stored on site. Proper material handling, storage, and disposal protocols shall be established and enforced. Training must be provided for personnel who have a role in the management of hazardous materials including delivery, maintenance, storage, disposal, and spill response. Materials Safety Data Sheets (MSDS) must be submitted for review prior to moving any hazardous materials onto the site.

**7-8.6.2.7** The rationale used for selecting or rejecting BMPs, a narrative description of the BMPs selected and a description identifying the proposed location for each BMP. In addition, a listing of

specific individuals, Contractors, and Subcontractors responsible for BMP installation, monitoring, inspection, maintenance, repair and record keeping shall be included. Such individuals shall possess training in the use of BMPs. Documented evidence of the training and/or experience shall also be included in the SWPPP.

**7-8.6.2.8** When applicable, a description of the erosion and sediment control practices that will be implemented during rain events.

**7-8.6.2.9** An inspection program at the construction site that includes inspection of the BMPs prior to a forecast storm, after a precipitation event which causes site runoff, at 24-hour intervals during extended precipitation events and routinely, a minimum of once every week.

**7-8.6.3 Sampling and Analysis.** The Contractor shall develop and implement a sampling and analysis program for pollutants which are not visually detectable in storm water discharges, which are or should be known to occur on the project site, and which could cause or contribute to pollution of the receiving water. All sampling, sample preservation, and analyses must be conducted in accordance with the test procedures under 40 CFR Part 136. Laboratory analyses shall be conducted by a laboratory accredited by the California Department of Health Services, Environmental Laboratory Accreditation Program (ELAP) and approved by the District. A list of accredited laboratories is available from ELAP-Headquarters, 1625 Shattuck Avenue, Berkeley, CA 94709-1611 or contact by telephone at (510) 540-2800. The Contractor shall submit all water quality analytical results to the District within ten (10) working days from the date of the sampling. If downgradient samples show elevated levels of the tested parameter relative to levels in the control sample, the Contractor shall correct or modify BMPs and/or the SWPPP to prevent downgradient impacts.

All proposed modifications or amendments to the SWPPP shall be submitted and approved by the District prior to implementation. In the event a deficiency is identified in any aspect of the implementation of the SWPPP or amendments, the deficiency shall be corrected immediately. If the Contractor fails to correct the identified deficiency and submit the appropriate documentation to the District, the District may order the suspension of any construction operation until such time that the deficiency is corrected.

The Contractor shall keep a copy of the SWPPP on site at all times, along with updates, revisions, and amendments until a Notice of Termination (NOT) has been submitted to the Regional Water Quality Control Board and the Regional Board has approved the NOT. The SWPPP shall be made available upon request of a representative of the Regional Water Quality Control Board, State Water Resources Control Board, United States Environmental Protection Agency or the local storm water management agency. Requests for review by the public shall be directed to the Engineer.

When the project is completed, the Contractor shall submit a complete copy of the SWPPP, all reports generated, and all documents related to updates and modifications of the SWPPP.

**7-8.6.4 Certification of the SWPPP.** The SWPPP shall be prepared and stamped by a Civil Engineer currently registered in the State of California and has experience preparing a SWPPP. The SWPPP shall include a statement from the Civil Engineer certifying to the effect:

*"As the engineer of record, I have selected appropriate BMPs to effectively minimize the negative impacts of this project's construction activities on storm water quality. The project owner and Contractor are aware that the selected BMPs must be installed, monitored, and maintained to ensure their effectiveness. The BMPs not selected for implementation are redundant or deemed not applicable to the proposed construction activity."*

The SWPPP shall also include a statement from the Contractor certifying to the effect:

*"I certify that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, to the best of my knowledge and belief, the information submitted is true, accurate, and complete. I am aware that submitting false and/or inaccurate information, failing to update the SWPPP to reflect current conditions, or failing to properly and/or adequately implement the SWPPP may result in revocation of grading and/or other permits or other sanctions provided by law."*

**7-8.6.5 Annual Certification.** By June 15 of each year or at the completion of the project, the Contractor shall submit to the District an annual certification of compliance. If the Contractor is unable to certify compliance, a detailed report shall be submitted to the District within five (5) working days, identifying all noncompliance events. For each noncompliance event, the report shall include an assessment of any impact caused by the event, describe the actions necessary to achieve compliance, and include a time schedule indicating when compliance will be achieved."

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IN **7-9 PROTECTION AND RESTORATION OF EXISTING IMPROVEMENTS**, FIRST PARAGRAPH, ADD THE FOLLOWING TO THE END:

"This includes revenue generating facilities owned and/or operated by the District. If any of these facilities are damaged, disrupted or destroyed during construction, the Contractor shall be responsible to pay to the District the amount of income that, but for that damage, disruption or destruction, would have been earned by the District. The Contractor shall verify in the field the existing improvements which may be damaged or removed by its construction operations before submitting its bid."

IN **7-9 PROTECTION AND RESTORATION OF EXISTING IMPROVEMENTS**, SECOND PARAGRAPH, ADD THE FOLLOWING TO THE END:

"If traffic signal vehicle detection loops are damaged during construction, the entire loop shall be replaced. The replacement of vehicle detection loops shall be performed by a Subcontractor specialized in this type of work. If the damaged or removed curb or sidewalk is in a pedestrian crosswalk area, the Contractor shall construct a sidewalk access ramp for the handicapped as part of the restoration required by this subsection, unless otherwise approved by the jurisdictional agency through the Engineer. At an intersection, the crosswalk area shall be considered to include, but not necessarily be limited to, the entire curb return area. If the damaged or removed curb is in an area where no sidewalk exists, the ramp will not be required. The ramp shall be constructed in accordance with the notes and details shown on the Plans, or, on the absence thereof, the requirements of the jurisdictional agency as furnished by the Engineer. In the event field conditions necessitate a change of plan which requires the removal of curb or sidewalk not previously requiring removal within pedestrian crosswalk areas as described above, the Contractor shall construct a sidewalk access ramp, and payment therefore will be made under the provisions of 3-3. The ramp shall be constructed in accordance with details furnished by the jurisdictional agency through the Engineer."

IN **7-9 PROTECTION AND RESTORATION OF EXISTING IMPROVEMENTS**, FOURTH PARAGRAPH, DELETE THE LAST SENTENCE AND REPLACE WITH THE FOLLOWING:

"Lawns shall be replaced with sod, unless otherwise approved by the Engineer."

IN **7-10.1 Traffic and Access**, FIRST PARAGRAPH, ADD THE FOLLOWING TO THE END:

"Unless otherwise specified or allowed by the jurisdictional agency and approved by the Engineer, the Contractor shall not implement traffic control measures (i.e. lane closure, traffic diversion and detour) within a public street for more than 2,500 feet in length at any one time.

IN **7-10.3 Street Closures, Detours, Barricades**, FIRST PARAGRAPH, SECOND SENTENCE, ADD THE WORD "K-rails," AFTER THE WORD "barriers,".

IN **7-10.3 Street Closures, Detours, Barricades**, AFTER THE THIRD PARAGRAPH, ADD THE FOLLOWING:

"Traffic shall be maintained on the proper sides of any raised median at all times. Unless otherwise permitted by the Engineer, all traffic lanes shall have a minimum width of 10 feet. A minimum distance of 5 feet to any excavation and 2 feet from obstructions such as curbs or poles shall be maintained in addition to the lane width specified. Traffic lanes shall have a minimum radius of 250 feet. When parking restriction is to be imposed, "Temporary No Parking" signs shall be posted at least 24 hours prior to commencing construction, unless otherwise required by the jurisdictional agency. All signs to be used on the project during periods of darkness shall be reflectorized. Unless otherwise noted, all signs, barricades, and methods shall conform to requirements of the current "Work Area Traffic Control Handbook" (WATCH), except in State of California Department of Transportation (Caltrans) right of way and within unincorporated Los Angeles County right of way or as required by a city, where all signs, barricades and methods shall conform to the requirements of the current "California Manual on Uniform Traffic Control Devices" adopted by the State of California Department of Transportation. Flashing arrow boards, if used, shall be solar powered. When a traffic control plan is required by the Plans, the traffic control plan shall be drawn to a 1" = 40' scale on size D sheets (24" x 36"). The total length of the project shall be shown including the advance signing and striping transitions in advance of and beyond the end of the work area. The sheets shall display the project name, phase identification, name of firm preparing the plan, name and stamp of the design engineer, approval block, north arrow, sheet number, and number of sheets comprising the traffic control plans. Include general notes and symbol definition when required. Adequate dimensioning shall be provided to allow for checking and proper field installation.

All costs for temporary and permanent traffic striping shall be borne by the Contractor and shall be included in the appropriate pipe and/or structure bid items. The Contractor shall hire a firm specialized in traffic striping, removal and replacement of pavement markers and street lettering to perform the work. The firm shall be approved by the Engineer. All traffic striping shall be restored to its original condition, or better, within sixty (60) calendar days after relocation.

Plate bridging of trench excavation shall be in accordance with the requirements of the 1996 Edition of WATCH. The Contractor shall furnish and erect a temporary 6 foot high chain link fence to completely enclose all excavation left unattended or left overnight. Chain link material shall be fastened to posts driven into the pavement or anchored in concrete. The posts shall be spaced adequately to support the fencing. Substituting supports for posts in lieu of driving or anchoring shall be used only if approved by the Engineer. All fence panels shall be undamaged and securely fastened to adjacent fencing at the top, middle and bottom locations.

When the Contractor's operation requires that traffic is transitioned to the opposite side of a street to maintain the number of traffic lanes specified in the Plans, the Contractor shall adjust positioning of existing traffic signals and/or provide temporary traffic signal as required by the jurisdictional agency."

IN **7-10.4.1 Safety Orders**, SECOND PARAGRAPH, DELETE THE PARAGRAPH AND REPLACE WITH THE FOLLOWING:

“Before commencing any excavation 5 feet or more in depth, the Contractor shall submit to the Engineer a detailed plan showing the design of shoring, bracing, sloping or other provisions to be made for the workers' protection (which include but is not limited to Contractor employees, Subcontractors, District's representatives, and third party agents) from the hazard of caving ground during the excavation. The plan shall comply with the Construction Safety Orders of the California Code of Regulations (Cal-OSHA) these requirements or the Special Provisions, whichever is more stringent. The plan along with calculations shall be prepared and stamped by a Structural or Civil Engineer currently registered by the State of California. The submittal shall show the anticipated soil and surcharge loads and the capacity of the shoring to support all loads. The shoring design shall accommodate the existing underground utilities. If the slope(s) on the excavation plan varies from the Cal-OSHA standards or the slope or benching is for an excavation that is 20 feet or more deep, the plan shall also be prepared and stamped by a Geotechnical Engineer currently registered by the State of California. Any additional soils investigation or testing required to provide substantiation or justification for the adequacy of the registered Geotechnical Engineer's plan shall be performed by the Contractor at his expense. Any damage to the utilities, which occurs through the negligence or fault of the Contractor, shall be repaired by the Contractor at his expense. Any damage due to settlement, water or earth pressures, slides, cave-in, or other causes due to failure to provide proper dewatering, shoring or bracing, or through other negligence or fault of the Contractor, shall be repaired by the Contractor at the Contractor's expense.

Excavating shall not proceed where groundwater is anticipated or present within the excavation until a dewatering plan has been reviewed and accepted by the Engineer. Any cost and time in developing, obtaining approvals and permits shall be the responsibility of the Contractor and shall not be the basis of a claim.

The shoring design shall list all assumptions and cite references for the design methodology. Photocopies of the pertinent sections of the cited references shall be included as a part of the submittal. **SUBMITTALS RECEIVED WITHOUT COPIES OF CITED REFERENCES WILL BE RETURNED WITHOUT REVIEW.** Design conforming to the assumptions and methods detailed in the Caltrans Trenching and Shoring manual will be accepted as conforming to the above requirements if cited as the reference source.

The minimum lateral pressures for the design of the shoring and/or bracing shall comply with the recommendations of the geotechnical investigation(s) for this project if provided.

The submitted plan and supporting calculations shall also address surcharge loading from roadway, railroad traffic, support of other pipes, duct banks, adjoining structures, other utilities, and show the minimum distance that soil or material stock piling may be placed from the edge of the excavation. The distance shall be determined and supported by calculations prepared and stamped by a Civil or Structural Engineer currently registered by the State of California. The minimum default distance when no distance is shown is one and half times the depth of excavation plus 2 feet. Both plan and calculations shall be submitted to the Engineer for review and acceptance.

Plans, sections and details, and calculations for pre-engineered shoring devices, which include but are not limited to trench shores, trench shields or boxes showing the load limitations or lateral soil pressure capacity, physical and mechanical properties, geometrical configuration, sizing, connection details and installation limitations or conditions shall be prepared and stamped by a Civil or Structural Engineer currently registered by the State of California. Sheet piling or driven piles will not be allowed. The above shall be submitted to the District for review and acceptance.



Results from computer programs used in the analysis shall be accompanied with copies of the manual, which details the required input and defines the output and design assumptions. All calculations shall be typed with a minimum character size of 12 point.

No excavation shall start until the Engineer has accepted the plan in writing and the Contractor has obtained a permit from the Division of Occupational Safety and Health. A copy of the permit shall be submitted to the Engineer. In addition, prior to any excavation, the Contractor shall submit the name of the "competent person" as defined in Title 8, Section 1504 of the California Code of Regulations. The "competent person" shall be present at the job site as required by Cal-OSHA.

The competent person shall have a minimum of ten years of direct verifiable experience in identifying soil types for excavations greater than 10 feet when performing excavations or a geotechnical engineer currently registered by the State of California. The competent person shall be identified to the Engineer in writing for acceptance prior to start of excavation. The competent person shall observe the soil while excavating to verify that no changes in soil will compromise the safety of the workers as provided by the shoring or slope of the excavation. The competent person shall calculate the soil pressure and note in writing to the Engineer to acknowledge that the soil load is within the capacity of the shoring or bracing system. The interval between observations shall be no more than 90 minutes apart and no more than every 10 cubic yards of soil excavated, whichever results in the greatest frequency of observations. If there are changes in soil conditions, the excavating work shall immediately stop until a resolution is determined and accepted by the District's Engineer. Manufacturer's tabulated data and installation provisions for trench shores shall comply fully with the tables prepared or certified by a Civil or Structural Engineer currently registered by the State of California and shall be submitted along with supporting calculations. For slope excavations the Contractor shall identify the figure from the Cal-OSHA standards to the Engineer in writing for acceptance.

If the Contractor fails to submit a shoring system plan or fails to comply with an accepted plan, the Contractor shall suspend work at the affected location(s) when directed to do so by the Engineer. Such a directive shall not be the basis of a claim for extra work and the Contractor shall not receive additional compensation due to the suspension.

While working in existing sewerage facilities or making connections to existing sewerage facilities, the Contractor shall provide positive ventilation as accepted by the Engineer. The Contractor's employees working in said facilities shall be provided with safety lines, harness, gas detectors, and other protective equipment as accepted by the Engineer.

All shoring shall be removed when no longer required. Voids created by the removal of shoring or soldier piles shall be filled with lean concrete. "

IN **7-10.4.3 Special Hazardous Substances and Processes**, FIRST PARAGRAPH, SECOND SENTENCE, ADD THE WORDS "Title 8," BEFORE THE WORDS "Section 5194."

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IN **7-11 PATENT FEES OR ROYALTIES**, DELETE THE PARAGRAPH AND REPLACE WITH THE FOLLOWING:

"The Contractor shall absorb in its Bid, the patent fees or royalties on any patented article or process which may be furnished or used in the Work.

The Contractor agrees to hold the District harmless from and to indemnify the District against any and all costs, attorneys' fees, and damages arising out of or connected with any claim, demand, action, lawsuit, judicial determination or judgment concerning infringement upon the rights of others, including

patent rights, by the use of any article or process which may be furnished or used in the Work. In the event of any such claim of infringement, the Contractor shall notify the District within ten (10) days of such claim, and keep the District advised of all developments; shall comply with all reasonable requests by the District for information and data in defense of any such suit; and agrees to defend any and all such claims, demands, actions and suits.

In the event that any equipment or process furnished or used in the Work is determined by the District or by a Court to infringe upon the rights of a third party, the District shall in addition have the option of:

1. Replacing the equipment with non-infringing equipment;
2. Modifying the equipment or process to the extent required to avoid such infringement;
3. Continuing to use the equipment or process;
4. Receiving as partial compensation the refund of all monies paid to the Contractor.

In the event of replacement or modification, the amounts spent on such replacement or modification shall be charged against and be recoverable from the Contractor. Final payment to the Contractor by the District will not be made while any suit or claim remains unsettled.

The District may itself defend any such claim, demand, action or suit, and settle or take any other action it deems necessary or advisable in connection with any such claim, demand, action or suit."

AFTER **7-14 ANTITRUST CLAIMS**, ADD THE FOLLOWING:

**"7-15 PROJECT SIGN.** On all sewer projects, the Contractor shall furnish and install two (2) project signs in accordance with the Districts' Standard Drawing S-a-221."

IN **8-1 GENERAL**, FIFTH PARAGRAPH, FIRST SENTENCE, ADD THE WORD "weekly" BEFORE THE WORD "janitorial".

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IN **8-2.1 Class "A" Field Office**, DELETE THE SECOND PARAGRAPH AND REPLACE WITH THE FOLLOWING:

"Furniture shall be provided as follows: One 6-foot drafting table, one standard 5-foot double pedestal desk with a drawer suitable for holding files, two chairs, one 5-caster desk chair, one drafting stool, 4-drawer legal size filing cabinet, 3-shelf bookcase at least 4-foot high and one plan rack of the vertical plan-hold type, including twelve hanging clamps. The furniture provided shall be new and shall be subject to the Engineer's approval."

IN **8-2.1 Class "A" Field Office**, FOURTH PARAGRAPH, SECOND SENTENCE, DELETE THE WORDS "drinking water" AND REPLACE WITH THE WORDS "a drinking water unit (hot and cold type)."

IN **8-2.1 Class "A" Field Office**, DELETE THE FIFTH PARAGRAPH AND REPLACE WITH THE FOLLOWING:

"A copier, fax machine and telephone, with extended area telephone service, shall be provided within the office area. The telephone shall have a voice messaging system and sufficient extension cord to serve the plan table and desk."

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IN **9-3.1 General**, DELETE THE SIXTH PARAGRAPH AND REPLACE WITH THE FOLLOWING:

"Whenever, in the opinion of the Engineer, the Contractor has not taken sufficient precaution for the safety of the public or the protection of the Work to be constructed under this Contract or of adjacent structures or property, and whenever, in the opinion of the Engineer, an emergency has arisen and immediate action is considered necessary, then the District, with or without notice to the Contractor, may provide suitable protection by causing work to be accomplished and material to be furnished and placed. The cost of such work and material shall be borne by the Contractor, and such costs will be deducted from amounts due or to become due to the Contractor. The performance of such emergency work shall not relieve the Contractor of responsibility for damage which may occur."

AFTER **9-3.1 General**, ADD THE FOLLOWING:

**9-3.1.1 Stipulated Unit Prices.** The stipulated unit prices listed below shall be used as payment for work performed, and not covered by Contract unit prices as directed by the Engineer. Unless otherwise specified, the following prices are for work and materials, complete and in place, including all labor and incidental costs:

Pavement and Resurfacing

Premix or AC pavement, per inch of thickness per 302-5 and 306-1.5.2	\$0.75/sq. ft.
Concrete pavement, per inch of thickness per 302-6 and 306-1.5.2	\$1.25/sq. ft.
Base material per inch thickness per 301-2 and 306-1.5.2	\$0.25/sq. ft.
Emulsion Aggregate Slurry (Type I) per 302-4 and 306-1.5.2	\$0.15/sq. ft.

Backfill Materials

Crushed aggregate per 200-2.2 and 306-1.3	\$35.00/cu. yd.
Sand per 200-1.5 and 306-1.3	\$24.00/cu. yd.

Miscellaneous

Concrete curb, 8" thick base, CF to match existing per 303-5	\$10.00/lin. ft.
Concrete gutter, 8" thick per 303-5	\$5.50/lin. ft.
Integral concrete curb and gutter, 8" thick and 2' wide per 303-5	\$22.00/lin. ft.
Unclassified excavation, e.g. from utility conflicts	\$150.00/cu. yd.
Adjustment of pullbox to grade	\$120.00 each
Removal of integral concrete curb and 2' wide gutter, including any curb armor, curb bar, or reinforcing steel	\$5.50/lin. ft.

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IN **9-3.2 Partial and Final Payment**, SECOND PARAGRAPH, AFTER THE FIRST SENTENCE, ADD THE FOLLOWING:

"When payment has been made for work, material or equipment, including material or equipment delivered to the site, which is subsequently damaged, discovered to be defective or otherwise not in conformance with the Contract Documents, such payment shall be deducted from future monthly progress payments until the damage and/or nonconformance are corrected to the satisfaction of the Engineer."

IN **9-3.3 Delivered Materials**, ADD THE WORDS "**and Equipment**" TO THE TITLE.

IN **9-3.3 Delivered Materials and Equipment**, AFTER THE SENTENCE, ADD THE FOLLOWING:

"The progress estimate so prepared will be subject to the following constraints where applicable:

- 1) No values will be included for specific equipment and materials until the equipment and materials have been approved by the District and have been delivered and stored in accordance with the Special Provisions and the manufacturer's recommendations, as approved by the Engineer.
- 2) Five percent of the value of a specific equipment item will not be included until the associated Operation and Maintenance manuals are submitted and approved by the District.
- 3) Additional withholding of the value of a specific equipment item may apply per the Special Provisions.
- 4) For sewer pipe, the value of delivered material not yet used in the work shall be limited to that corresponding to 1,500 linear feet of pipe or the pipe footage which the Contractor has proved capable of laying in five (5) working days, whichever is greater."

IN **9-3.4 Mobilization**, ADD THE FOLLOWING TO THE END:

"When a mobilization bid item is included in the Proposal Form on sewer projects, a lump sum progress payment will be made to the Contractor once the Contractor has started physical work on permanent facilities and once all the following submittals, when required, are approved: construction schedule, shoring, pipe, flow bypass plan, and traffic control. The lump sum payment will be made under the mobilization bid item. Potholing will not be considered as the start of physical work."

AFTER **9-3.4 Mobilization**, ADD THE FOLLOWING:

**"9-4 PROMPT PAYMENT**

Pursuant to Subsection (f) of Section 20104.50 of Public Contract Code, Article 1.7 of Part 3 of Division 2 of said Code is included below:

ARTICLE 1.7

Modifications; Performance; Payment

**§ 20104.50. Timely progress payments; legislative intent; interest; payment requests**

(a) (1) It is the intent of the Legislature in enacting this section to require all local governments to pay their Contractors on time so that these Contractors can meet their own obligations. In requiring prompt payment by all local governments, the Legislature hereby finds and declares that the prompt payment of outstanding receipts is not merely a municipal affair, but is, instead a matter of statewide concern.

(2) It is the intent of the Legislature in enacting this article to fully occupy the field of public policy relating to the prompt payment of local governments' outstanding receipts. The Legislature finds and declares that all government officials, including those in local government, must set a standard of prompt payment that any business in the private sector which may contract for services should look towards for guidance.

(b) Any local agency which fails to make any progress payment within thirty (30) days after receipt of an undisputed and properly submitted payment request from a Contractor on a construction Contract shall pay interest to the Contractor equivalent to the legal rate set forth in subdivision (a) of Section 685.010 of the Code of Civil Procedure.

(c) Upon receipt of a payment request, each local agency shall act in accordance with both of the following:

(1) Each payment request shall be reviewed by the local agency as soon as practicable after receipt for the purpose of determining that the payment request is a proper payment request.

(2) Any payment request determined not to be a proper payment request suitable for payment shall be returned to the Contractor as soon as practicable, but not later than seven (7) days, after receipt. A request

returned pursuant to this paragraph shall be accompanied by a document setting forth in writing the reasons why the payment request is not proper.

(d) The number of days available to a local agency to make a payment without incurring interest pursuant to this section shall be reduced by the number of days by which a local agency exceeds the seven (7) day return requirement set forth in paragraph (2) of subdivision (c).

(e) For purposes of this article:

(1) A "local agency" includes, but is not limited to, a city, including a charter city, a county, and a city and county, and is any public entity subject to this part.

(2) A "progress payment" includes all payments due Contractors, except that portion of the final payment designated by the Contract as retention earnings.

(3) A payment request shall be considered properly executed if funds are available for payment for the payment request, and payment is not delayed due to an audit inquiry by the financial officer of the local agency.

(f) Each local agency shall require that this article, or a summary thereof, be set forth in the terms of any Contract subject to this article. "

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IN **201-1.1.1 General**, FIRST PARAGRAPH, DELETE THE FIRST SENTENCE AND REPLACE WITH THE FOLLOWING:

"Concrete shall consist of portland cement, concrete aggregates, water, and when required or approved for use, admixture and/or fly ash in accordance with these provisions. "

IN **201-1.1.1 General**, FIRST PARAGRAPH, FIFTH SENTENCE, AFTER THE WORDS "shall also include the size and source of aggregate", ADD THE WORDS "(with the results of sieve analysis and gradation), results of reactive aggregate testing,".

IN **201-1.1.1 General**, DELETE THE SIXTH PARAGRAPH AND ADD THE FOLLOWING AT THE END:

"Reclaimed concrete material may only be incorporated into concrete mixtures being used in non-structural applications when approved by the Engineer. The reclaimed concrete material, if used, shall be in accordance with 201-1.2.6.

Ready-mixed concrete shall comply with the requirements of ASTM C94, Standard Specification for Ready-Mixed Concrete, Sections 1, 2, 6, 15, 16, 17.4, and Annex A1. In case of conflict between the listed ASTM C94 sections and the Standard Specifications, the most stringent requirements as determined by the District shall apply. In cases where the term "purchaser" is found in ASTM C94, it shall indicate the District or Engineer as applicable.

Water shall not be added to the batch on arrival at the job site without the approval of the Engineer. Water shall not be added once discharge of the batch from the ready mix truck begins. Water in excess of the amount shown on the mix design or which will change the mix proportions shall not be added."

IN **201-1.1.1 General**, SEVENTH PARAGRAPH, DELETE THE SECOND SENTENCE AND REPLACE WITH THE FOLLOWING:

"The mix design shall show the mix identification number and the applicable proportions, weights, and quantities, of portland cement, aggregate, water, and where applicable, fly ash, and admixtures."

IN **201-1.1.1 General**, SEVENTH PARAGRAPH, DELETE THE THIRD SENTENCE AND REPLACE WITH THE FOLLOWING:

"The mix design shall also include the gradation (with the results of sieve analysis) and source of aggregate, results of reactive aggregate testing, the type and source of Portland cement and fly ash, the brand and designation of chemical admixtures, and slump requirement."

IN **201-1.1.2 Concrete Specified by Class and Alternate Class, TABLE 201-1.1.2(A), Sewer & Storm Drainage Facilities**, DELETE "Pre-Cast Manhole Components,"

IN **201-1.1.2 Concrete Specified by Class and Alternate Class**, AFTER **TABLE 201-1.1.2(A)**, ADD THE FOLLOWING:

"Lean Concrete. Where lean concrete is specified for backfilling, the Contractor shall use a two-sack cement/sand grout with a maximum slump of 5 inches."

IN **201-1.1.2 Concrete Specified by Class and Alternate Class**, AFTER **TABLE 201-1.1.2(A)**, Note 3, DELETE THE SECOND AND THIRD SENTENCES AND REPLACE WITH THE FOLLOWING:

"For backfill after twenty-four (24) hours, add a non-chloride accelerating admixture approved by the Engineer at dosages as required by the manufacturer of the admixture. For backfill after sixteen (16) hours and removal of sheeting after eighteen (18) hours, use 660-C-3750 with a non-chloride accelerating admixture approved by the Engineer at dosages as required by the manufacturer of the admixture."

IN **201-1.1.2 Concrete Specified by Class and Alternate Class**, AFTER **TABLE 201-1.1.2 (A)**, NOTE 5, DELETE THE NOTE AND REPLACE WITH THE FOLLOWING NOTE:

"5. 28 MPA (4000 psi) and higher strength concrete mixes require the use of a water reducing admixture conforming to the requirements of 201-1.2.4, 'Admixtures'."

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IN **201-1.1.4 Concrete Specified by Compressive Strength**, THIRD PARAGRAPH, ADD THE FOLLOWING TO THE END:

"Alternatively, if test data are not submitted, the Contractor shall submit a mix design with a water-cement ratio that complies with the following:

Maximum Permissible Water-Cement Ratios for  
Concrete When Strength Data From Field Experience  
or Trial Mixtures Are Not Available

Specified 28-day compressive strength, f'c psi	Water-cement ratio by weight	
	Non-air entrained concrete	Air-entrained concrete
2500	0.67	0.54
3000	0.58	0.46
3500	0.51	0.40
4000	0.44	0.35
4500	0.38	*
5000	*	*

\*For strength above 4500 psi (non-air entrained concrete) and 4000 psi (air-entrained concrete), concrete proportions shall be established from field data and trial mixtures."

IN **201-1.1.5 Test for Portland Cement Concrete**, DELETE THE THIRD PARAGRAPH AND REPLACE WITH THE FOLLOWING:

"Strength tests shall be performed on the concrete by an independent accredited testing laboratory. All costs for testing of cylinders by the testing laboratory shall be borne by the Contractor. The Engineer shall procure test samples using the containers provided by the laboratory. The Contractor shall afford the Engineer all reasonable access, without charge for the procurement of samples of fresh concrete at time of placement. The frequency of sampling for each class of concrete placed each day shall be taken: not less than once a day, or not less than once for each 50 cubic yards of concrete, or not less than once for each 1,350 square feet of surface area for slabs or walls, or a minimum of one for every five columns. On a given project, if the total volume of concrete is such that the frequency of testing required would provide less than five strength tests for a given class of concrete, tests shall be made from at least five randomly selected batches or from each batch if fewer than five batches are used. A strength test shall be the average of the strengths of two cylinders made from the same sample of concrete and tested at twenty-eight (28) days or a test age designated. Each sampling shall consist of four test cylinders. One cylinder shall be tested at seven (7) days, two test cylinders tested at twenty-eight (28) days or at age specified, and one test cylinder held. The laboratory shall pick up the test samples and perform the required tests and send certified tests results directly to the Engineer."

IN **201-1.1.5 Test for Portland Cement Concrete**, AFTER THE FOURTH PARAGRAPH, ADD THE FOLLOWING:

"Strength tests of specimens cured under field conditions may be required by the Engineer to check the adequacy of curing and protection of the concrete in the structure. Such specimens shall be molded at the same time and from the same samples as the laboratory-cured acceptance test specimens. Procedures for protecting and curing the concrete shall be improved when the strength of field-cured cylinder at the test age designated for measuring  $f_c$  is less than 85 percent of that of the companion laboratory-cured cylinders. When the laboratory-cured cylinder strengths are appreciably higher than  $f_c$  the field-cured cylinder strengths need not exceed  $f_c$  by more than 500 psi even though the 85 percent criterion is not met."

IN **201-1.1.5 Test for Portland Cement Concrete**, LAST PARAGRAPH, AFTER THE FIFTH SENTENCE ADD THE FOLLOWING:

"If the concrete in the structure will be dry under service conditions, the core shall be air dried (temperature 60 to 80 degrees F, relative humidity less than 60 percent) for seven (7) days before test and shall be tested dry. If the concrete in the structure will be more than superficially wet under service conditions, the cores shall be immersed in water for at least forty (40) hours and tested wet."

IN **201-1.1.5 Test for Portland Cement Concrete**, LAST PARAGRAPH, DELETE THE LAST SENTENCE AND REPLACE WITH THE FOLLOWING:

"To check testing accuracy, locations represented by erratic core strengths may be retested. If these strength acceptance criteria are not met by the core tests, and if structural adequacy remains in doubt, the Engineer may order load tests for the questionable portion of the structure, or take other action appropriate to the circumstances."

IN **201-1.2.2 Aggregates**, ADD THE FOLLOWING TO THE END:

"Aggregates from all of the Upper San Gabriel River area will be accepted as having a silica-released to alkali-reduced ratio less than one without the testing requirements."

IN **201-1.2.4 Chemical Admixtures, (e) Air-Entraining Admixtures**, ADD THE FOLLOWING TO THE END:

"Unless otherwise specified or directed by the Engineer, the Contractor shall furnish and add an air-entraining agent, containing no calcium chloride, conforming with ASTM C-260 to all concrete. The agent shall be added in such amounts that not less than 4 percent or more than 6 percent of air by volume is entrained in the concrete as it enters the forms. The air entraining agent shall be added to the concrete in solution in the mixing water in such a manner as to insure uniform distribution throughout the concrete."

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IN **201-1.2.5.3 Fly Ash**, FIRST PARAGRAPH, AFTER THE LAST SENTENCE, ADD THE FOLLOWING:

"The maximum amount of fly ash shall not exceed 20 percent of the total weight of the cement plus fly ash content, unless specified otherwise by the Engineer in the Special Provisions. "

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IN **201-1.2.5.3 Fly Ash, B) Class C Fly Ash**, DELETE ALL PARAGRAPHS AND REPLACE WITH THE FOLLOWING:

"Class C fly ash shall not be used. "

IN **201-1.2.5.4 Class N Pozzolans**, AFTER THE LAST PARAGRAPH, ADD THE FOLLOWING:

"Class N pozzolans shall be used only when specified by the Engineer in the Special Provisions."

IN **201-1.2.6 Reclaimed Concrete Material** FIRST PARAGRAPH, DELETE THE FIRST SENTENCE AND REPLACE WITH THE FOLLOWING:

"Reclaimed concrete material may be used only in concrete mixtures for non-structural applications in accordance with this section when approved by the Engineer and subject to the satisfactory results of tests of the proposed mix design which include but is not limited to slump, strength, modulus of rupture, modulus of elasticity, and permeability which meets or exceeds the properties of the specified concrete mix without the addition of reclaimed concrete material. An independent testing laboratory approved by the Engineer shall perform the tests using the latest ASTM or ACI standards. All test results shall be submitted to the Engineer prior to approval of the proposed concrete mix. The cost of sampling and testing shall be the responsibility of the Contractor."

IN **201-1.2.6 Reclaimed Concrete Material** DELETE THE FOURTH PARAGRAPH AND REPLACE WITH THE FOLLOWING:

"Reclaimed concrete material may not be used in special exposure mixtures or where architectural aesthetics are a concern."



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IN **201-1.3.1 General**, LAST PARAGRAPH, ADD THE FOLLOWING TO THE END:

"For projects where the total cubic yardage of concrete to be placed exceeds 2,500 yards, the Contractor shall provide for independent third party inspection at the batch plant."

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IN **201-1.4.3 Transit Mixers**, FOURTH PARAGRAPH, ADD THE FOLLOWING TO THE END:

"The revolving of the drum shall be continuous until the concrete is completely emptied from the drum."

IN **201-1.4.3 Transit Mixers**, SIXTH PARAGRAPH, DELETE THE SECOND SENTENCE AND REPLACE WITH THE FOLLOWING:

"The Engineer may waive this limitation if the concrete is of such condition, based on tests and other factors, after the 90-minute time limit has been reached that it can be placed without the addition of water to the batch. These tests may include, but are not limited to, slump and temperature readings of the batch, formwork and reinforcing steel. Other factors may include, but are not limited to, time required to place the concrete and extent of placing and finishing effort, the time of day, and weather conditions."

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IN **201-2.2.1 Reinforcing Steel**, DELETE THE FIRST SENTENCE AND REPLACE WITH THE FOLLOWING:

"Unless otherwise specified, reinforcing steel shall be Grade 400 (60) billet steel conforming to ASTM A706/706M."

IN **201-2.4.1 General**, LAST SENTENCE, ADD THE WORDS "or requested" AFTER THE WORD "required".

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IN **201-3.6 Type "C" Sealant (Asphalt-Latex Emulsion Joint Sealant)**, FIRST PARAGRAPH, DELETE THE SECOND SENTENCE AND REPLACE WITH THE FOLLOWING:

"The sealing compound shall be an emulsion consisting of paving asphalt conforming to 203-1 emulsified with rubber latex in a suitable emulsifying agent."

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IN **201-6.1.1 General**, FIRST PARAGRAPH, DELETE THE FIRST SENTENCE AND REPLACE WITH THE FOLLOWING:

"Controlled Low Strength Material (CLSM) shall be placed as required on the Plans or specified in the Special Provisions. At the written request of the Contractor and with the approval of the Engineer, CLSM may be used as trench backfill, non-structural backfill or pipe bedding."

IN **201-6.1.1 General**, DELETE THE THIRD AND FOURTH PARAGRAPHS AND REPLACE WITH THE FOLLOWING:

"The CLSM mix shall contain: at least 100 pounds of cement and 250 pounds of flyash; no more than 500 pounds of water; with about 2700 pounds of sand and no more than 1.25 percent entrapped air per cubic yard. The density shall be a minimum of 132 pounds per cubic feet and the compressive strength shall be no less than 100 psi and no more than 300 psi."

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IN **201-7 NON-MASONRY GROUT**, DELETE ALL THE PARAGRAPHS AND REPLACE WITH THE FOLLOWING:

**201-7.1 Portland Cement Grout and Dry Pack.** Unless otherwise shown or specified, grout and dry pack shall conform to the following: Grout shall be composed of 1 part Portland cement and not more than 3 1/2 parts of sand by volume with sufficient water for placing. Dry pack shall be composed of 1 part Portland cement and not more than 2 1/2 parts of sand with sufficient water for hydration of the cement. Dry pack shall provide an effective load bearing surface and shall be used where a stiff or plastic grout is needed. Dry pack may also be used to repair the holes.

**201-7.2 Nonshrink Grout.** Nonshrink grout shall be a high strength nonstaining grout meeting the requirements of ASTM C 1107. The nonshrink grout shall be submitted to the Engineer for review and approval. The grout shall be mixed, handled, placed, and cured in accordance with the manufacturer's written instructions. The non-shrink grout shall be suitable and certified by the manufacturer for the purpose intended.

**201-7.3 Epoxy Grout.** Epoxy grout shall be used where specified on the Plans and shall be a Sika grout manufactured by Sika Chemical Corporation, Lyndhurst, New Jersey, Five Star grout manufactured by Five Star Products, Inc., Fairfield, Connecticut, or equal. The surface to receive the grout shall be dry and shall be prepared in accordance with the manufacturer's written instructions. The epoxy grout shall be mixed and placed strictly in accordance with the manufacturer's written recommendations."

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IN **203-1.2 Testing Requirements**, AFTER THE SENTENCE, ADD THE FOLLOWING:

"As used in Table 203-1.2(A), the term "binder" shall mean paving asphalt."

IN **203-6.2 Mix Designs**, THIRD PARAGRAPH, AFTER THE FIRST SENTENCE, ADD THE FOLLOWING:

"Unless otherwise waived by the Engineer at delivery time, the Contractor shall furnish the District an updated mix certificate."

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IN **203-7.1 General**, DELETE THE SECOND PARAGRAPH AND REPLACE WITH THE FOLLOWING:

"RAC will be designated by class and grade, i.e., "C2-PG 64-10-RAC". The end product shall meet both the gradation and paving asphalt grade specified."

IN **203-7.2.2 Reclaimed Asphalt Pavement**, SECOND PARAGRAPH, DELETE THE FIRST SENTENCE AND REPLACE WITH THE FOLLOWING:

"The RAC producer shall perform sand equivalent tests on the unextracted RAP, and tests of RAP paving asphalt content, RAP paving asphalt viscosity or performance grade, and gradation of RAP aggregates on solvent extracted samples of RAP taken from stockpiles."

IN **203-7.2.3 RAC Bituminous Materials**, DELETE THE LAST PARAGRAPH AND REPLACE WITH THE FOLLOWING:

"The results of tests performed on the RAC binder shall meet the RTFO residue requirements in Table 203-1.2(A) for the AR grade specified in the RTFO and PAV test requirements in Table 203-1.2(B) for the PG grade specified, except the "Percent of Original Penetration" is not required."

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IN **203-11.2.1 Paving Asphalt**, DELETE THE SENTENCE AND REPLACE WITH THE FOLLOWING:

"Paving asphalt used for asphalt-rubber shall be performance grade PG 64-16 and shall be modified with an asphalt modifier. Performance grade paving asphalt other than PG 64-16 may be used if so specified in the Special Provisions or approved by the Engineer."

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AFTER **204-2.5 Handling and Protection of Treated Materials**, ADD THE FOLLOWING:

**"204-2.6 Rough Hardware for Permanent Construction.**

**204-2.6.1 Common Nails.** Commercial Standard, 16d unless otherwise specified; galvanized or aluminum where exposed to weather.

**204-2.6.2 Threaded Nails.** "Screw-Tite" or "Stronghold", or equal, either spiral thread or annular-grooved. Type 316 stainless steel where exposed to weather, water or wastewater, galvanized otherwise.

**204-2.6.3 Screws.** Commercial Standard, galvanized where exposed.

**204-2.6.4 Bolts and Nuts.** American Standard, unfinished, except galvanized where exposed. Provide with matching cut or pressed steel washers for both bolts and nuts, where bearing on wood, unless otherwise shown."

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IN **206-1.1.1 General**, DELETE THE FIRST SENTENCE AND REPLACE WITH THE FOLLOWING:

"Unless noted otherwise, all steel, the class of which is not definitely designated herein, in the Special Provisions, or on the Plans, shall be structural steel and shall conform to the requirements of ASTM A36. Structural steel wide flange shapes shall conform to the requirements of ASTM A992 or ASTM A572 with S5, Charpy V-notch Impact Test and S14 Bend Test."

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IN **206-1.4.1 Unfinished Bolts**, DELETE THE THIRD SENTENCE AND REPLACE WITH THE FOLLOWING:

"Washers shall be furnished unless otherwise specified. In addition, structural plate washers shall be supplied for oversized and slotted holes and shall completely cover the oversized or slotted holes with minimum 1/4-inch overlap. The minimum thickness of the structural plate washers shall be the same thickness as the outermost ply of the bolted materials."

IN **206-1.4.1 Unfinished Bolts**, ADD THE FOLLOWING TO THE END:

"Stainless steel bolts shall be Type 316 with stainless steel nuts and washers, unless shown otherwise."

IN **206-1.4.2 High-Strength Bolts**, DELETE THE FIRST SENTENCE AND REPLACE WITH THE FOLLOWING:

"The bolts shall conform to ASTM A325 and shall be furnished with hardened washers. In addition, structural plate washers shall be supplied for oversized and slotted holes and shall completely cover the oversized and slotted holes with minimum 1/4-inch overlap. The minimum thickness of the structural plate washers shall be the same thickness as the outermost ply of the bolted materials."

IN **206-1.4.3 Anchor Bolts**, DELETE THE SENTENCE AND REPLACE WITH THE FOLLOWING:

"Steel anchor bolts shall conform to ASTM F1554 Grade 36 and shall be galvanized where shown on the Plans. Stainless steel anchor bolts shall be TYPE 316 with stainless steel nuts and washers."

AFTER **206-1.4.3 Anchor Bolts**, ADD THE FOLLOWING:

**206-1.4.4 Concrete Fasteners.** Concrete fasteners including concrete anchors, stud or wedge anchors, and adhesive anchors shall have an ICC Evaluation Report. Concrete nails and power-driven fasteners are not acceptable. Adhesive anchors shall be epoxy adhesive anchors with Type 316 stainless steel, unless noted otherwise. Installation shall comply with the ICBO or ICC Evaluation Report. Special inspection shall be provided for adhesive anchors." A written report of each special inspection shall be submitted to the Engineer within five (5) working days of the inspection. All costs associated with the special inspection shall be borne by the Contractor."

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IN **206-3.1 General** FOURTH PARAGRAPH, ADD THE FOLLOWING TO THE END:

"Foundry identification mark, heat and date shall be cast on the bottom of the cover and on the inside of the frame. Imported covers and frames shall have the country of origin marking in compliance with the Federal Regulations."

IN **206-3.2 Test Requirements**, THIRD PARAGRAPH, AFTER THE FIRST SENTENCE, ADD THE FOLLOWING:

"The proof-load shall be 55,300 pounds."

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AFTER **206-6.8 Repair of Damaged Coatings**, ADD THE FOLLOWING:

**206-7 Stainless Steel.** Stainless steel shall conform to TYPE 316. Where welding is used to join, the stainless steel shall conform to TYPE 316L.

**206-8 Aluminum.** All aluminum plate, rods, and structural shapes shall conform to alloy and temper designation 6061-T6. All aluminum bearing on or embedded in concrete shall have one coat of an epoxy primer by Tnemec Co. Series L69 Hi-Build Epoxoline II, or PPG Amercoat 400 VOC, or equal."

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IN **207-2.1 General**, FIRST PARAGRAPH, ADD THE FOLLOWING THE END:

"Reinforced concrete pipe shall be manufactured in accordance with ASTM C76 except as modified herein."

IN **207-2.1 General**, THIRD PARAGRAPH, FIRST SENTENCE, DELETE THE WORDS "three sets of".

IN **207-2.1 General**, DELETE THE FOURTH PARAGRAPH AND ADD THE FOLLOWING TO THE END OF THE THIRD PARAGRAPH:

"Vertical and horizontal curves shall be constructed with a uniform deflection at each joint within the curve using factory fabricated beveled pipe and/or by pulling joints. Siphons shall be constructed along a vertical curve having a vertical point of intersection as shown on the Plans using factory fabricated mitered or beveled pipe and/or by pulling joints. The deflection at any point along the siphon shall not exceed 10 degrees and points of deflection shall be separated by a pipe joint. On mitered pipe, the maximum space between the adjacent ends of the pipe at the point of deflection shall not exceed 4 inches. If the mitered pipe is to be plastic lined, the space shall be plastic lined with a Type P-1 joint, except that the joint strip shall be 6 inches wide. Detailed drawing of the mitered pipe shall be submitted to the Engineer for approval. All drawings for siphons and vertical curves shall include a scaled drawing indicating the station and elevation of each pipe joint or mitered bend.

Where 6-inch or larger stubs are required on the Plans, the pipe manufacturer shall provide holes by blocking out prior to spinning or casting the pipe. Unless otherwise stated, stubs are to be placed at 45 degrees above the horizontal axis. Any circumferential steel, cut for placement of holes, shall be secured by a circle of reinforcing steel of the same size placed around the blockout. Minimum steel clearance shall be maintained. Blockouts shall be 2 inches in diameter larger than the outside diameter of the stubs at the outside diameter of the concrete pipe and tapering to the outside diameter of the stub at the inside diameter of the concrete pipe.

Grout holes shall be provided on all jacked pipe. Grout holes shall be cast into the pipe on 4 foot longitudinal centers at 45 degrees above the horizontal axis alternating left and right. No grout holes shall be closer than 2 feet to any joint. These grout holes shall consist of steel couplings 1 1/2 inch minimum diameter for pipe sizes through 57 inches and 2-inch minimum diameter for 60 inches and larger pipe. After the grouting operation has been completed, the steel couplings shall be sealed with steel grout plugs. The grout plugs shall be recessed a minimum of 3/4-inch from the inside of the pipe. Prior to manufacture of the jacked pipe, detailed drawings of the grout couplings and grout plug design, and grout hole spacing and location within the pipe shall be submitted to the Engineer for approval.

Unless otherwise specified, RCP shall be either wet cast or spun. Machine-made RCP is acceptable if 360 degree PVC lined and supplied by a plant certified for machine-made RCP by the District prior to bid. PVC lining is not required for machine made RCP to be used for storm drain applications. Machine-made RCP shall not be used for jacking."

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IN **207-2.4.1 General**, FIRST PARAGRAPH, ADD THE FOLLOWING TO THE END:

"Welded wire fabric shall not be used as reinforcement unless otherwise approved by the Engineer."

IN **207-2.4.1 General**, SECOND PARAGRAPH, ADD THE FOLLOWING TO THE END:

"unless otherwise approved by the Engineer."

IN **207-2.4.1 General**, FOURTH PARAGRAPH, ADD TO THE FOLLOWING TO THE END:

"Fastenings placed against the forms shall be stainless steel or plastic, approved by the Engineer."

IN **207-2.4.1 General**, LAST PARAGRAPH, DELETE THE WORDS "Upon request," AND ADD THE WORDS "area of steel," AFTER THE WORD "spacing,"

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IN **207-2.4.2 Location of Reinforcement**, LAST PARAGRAPH, DELETE THE SECOND SENTENCE.

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IN **207-2.5 Joints**, ADD THE FOLLOWING TO THE END:

**207-2.5.1 Rubber-Gasketed Joints.** Depending on the method of construction, joints for the rubber gasket reinforced concrete pipe shall be of the types specified in 207-2.5.1.1 or 207-2.5.1.2. All surfaces of the reinforced concrete pipe which come into contact with the rubber gasket shall be coated with epoxy. The epoxy shall be Select Bond GP-2000, as manufactured by Select Products Company, Upland, California or equal.

**207-2.5.1.1 Open Cut and Tunneling Construction.** Pipe joints of the rubber gasket reinforced concrete pipe for open cut and tunneling construction shall be double-gasketed joints designed such that the joint can be pulled 3/4-inch open along the outside of the pipe from normal closure without impairment of the water tightness or contact of the concrete surfaces between the bell and the spigot. Thickness of the bell or the spigot shall not be less than 35 percent of the pipe barrel wall thickness and shall in no case be less than 3 inches thick measured at the body. The spigot end of the pipe shall have a length to thickness ratio not to exceed 2 to 1. All steel used shall be well embedded in concrete and shall serve the purpose of reinforcement only. Circumferential reinforcement shall be placed in both the bell and the spigot and shall have an area of steel not less than that of the barrel of the pipe for single cage pipe, and not less than the area of the inner cage for double cage pipe. In addition, both the bell and the spigot shall be manufactured with a minimum total longitudinal reinforcing steel area of 0.22 in<sup>2</sup>/ft. of pipe circumference. The inner face of the bell shall include an additional reinforcing steel cage embedded into the pipe barrel. The longitudinal reinforcing steel in the bell or the spigot shall terminate one inch from the end face.

Additional longitudinal reinforcing steel, if provided, shall be extended through the joint not less than 12 inches into the barrel and shall be equally spaced around the circumference of the pipe matching the spacing of the longitudinal steel bars of the reinforcement cage. Additional longitudinal steel bars if used, shall not be larger than 1/2-inch in diameter and shall be placed to provide maximum clearance between the steel and the forms as determined by the Engineer. The size, spacing and location of all additional reinforcing steel used shall be included as a part of the pipe submittal.

The Contractor shall test each pipe joint immediately after it has been installed and prior to installing the adjoining pipe or backfilling the pipe. The joints shall be pressurized to 15 psig and held for a minimum of 5 seconds and shall drop not more than 1 psig. In the event the pressure drop is greater than 1 psig, the Contractor shall remove and re-install the pipe and retest the pipe until the leakage test passes. This testing shall be in addition to the field joint leakage test outlined in 207-2.5.2.2.

**207-2.5.1.2 Jacking Construction.** Pipe joints of the rubber gasket reinforced concrete pipe to be jacked shall be full wall, double gasket joint with stainless steel compression band design. The joint shall have an outside diameter same as the pipe, so when assembled, the joint is essentially flush with the outside diameter of the pipe. In no case shall the outside diameter of the stainless steel band be greater than the outside diameter of the pipe. The stainless steel compression band shall be of one piece design and fit over the recessed end(s) of the pipe. The band shall be made of Type 316 stainless steel and shall be a minimum 3/8-inch thick. Pipe wall thickness at the recess shall be designed to withstand the maximum allowable jacking forces to be used and the recess shall be manufactured 1/4-inch greater in depth than the band thickness and with a continuous groove for the placing of the gasket. The longitudinal length of the recess shall be designed such that after the joint is assembled and jacked in place, the clearance remaining on each side of the stainless steel band will be 1 inch or less. Leading edge of the band shall be tapered upwards to ensure that the stainless steel band will properly mate with the preceding joint of pipe during jacking. The minimum concrete cover over the reinforcing steel at the recess shall be in accordance with 207-2.4.2. The longitudinal reinforcing steel shall extend to 1 inch from the pipe end. The variation in laying lengths of two (2) opposite sides of the pipe to be jacked shall not be more than 1/4-inch in any length of pipe. The ends of the pipe shall be square within 3/16 inch.

**207-2.5.2 Rubber-Gasketed Joint Leakage Tests.** In addition to all the testing requirements specified for reinforced concrete pipe, rubber gasket reinforced concrete pipe shall be subjected to both a yard joint leakage test and a field joint leakage test. The Contractor shall, at his own expense, furnish all water, materials and labor for performing the tests required. All yard joint leakage tests shall be conducted under the direction and in the presence of the Engineer. All field joint leakage tests shall be witnessed by an independent laboratory at the Contractor's expense. Any damages resulting or becoming evident from the leakage tests and any subsequent repair that is necessary shall be the responsibility of the Contractor. The Contractor shall submit to and obtain approval from the Engineer of his proposed testing procedures, setup and independent laboratory prior to conducting the leakage tests. All leakage tests shall be conducted prior to welding the plastic liner at the pipe joints.

**207-2.5.2.1 Yard Joint Leakage Tests.** Two (2) yard joint leakage tests shall be conducted by the pipe manufacturer for each pipe size and each joint design. The Engineer will select two (2) pieces of pipe of each pipe size and each joint design for each yard test. The pipe manufacturer may elect to bulkhead the ends of the pipes and pressurize the pipes. The joint shall be subjected to the test pressure of 15 psig for a period of twenty-four (24) hours prior to testing. The test pressure shall be maintained for a minimum of thirty (30) minutes with no apparent leakage. The pipe manufacturer shall not ship any pipe until both yard joint leakage tests are passed.

**207-2.5.2.2 Field Joint Leakage Tests.** One field joint leakage test shall be performed on each reach of the installed rubber gasket reinforced concrete pipe. The pipe shall be saturated with water before the test. The test pressure of 15 psig shall be held on the pipe reach for a minimum of thirty (30) minutes with no apparent leakage. If the test is failed, the Contractor shall repair the leaking joint(s) in accordance with 207-2.5.3.

In lieu of testing the entire pipe reach, the Contractor may elect to test each of the pipe joints installed. The joint shall be pressurized to 15 psig. The test pressure shall be held for a minimum of five (5) seconds and shall drop not more than 1 psig. If the test is failed, the Contractor shall repair the joint in accordance with 207-2.5.3.

The testing including any re-testing of each pipe joint shall be witnessed by an independent laboratory. The laboratory shall be retained by the Contractor, at its expense, and approved by the Engineer prior to the start of testing. Upon completion of all joint testing within each reach of sewer, the Contractor shall submit certification by the independent laboratory that all joints have been tested in accordance with the approved testing procedures and are in compliance with these Specifications. This certification shall not relieve the Contractor of the responsibility to correct defective work. The Contractor shall perform repairs in accordance with 207-2.5.3 and retest the pipe reach until the leakage test passes. In addition, this certification shall be received by the District prior to welding the plastic liner at the pipe joints.

**207-2.5.3. Joint Repair.** The Contractor shall repair any pipe joint not passing the leakage test in accordance with any additional joint repair methods as deemed necessary. The Contractor shall comply with and develop the joint repair procedures in accordance with these requirements as a minimum and submit to the District for approval any additional joint repair methods as deemed necessary. The submittal shall include a detailed description of the procedures, all the materials to be used and installation procedures as recommended by the pipe and material manufacturers, the joint testing procedure, and the independent laboratory with the name and qualifications of the inspector(s). The Contractor shall not begin any joint repair work without an approved submittal. The Contractor shall use a Subcontractor specializing in this type of work to repair the joints and shall hire an independent laboratory approved by the District to witness the preparation, the joint repair work, and the testing. All joint repair costs shall be borne by the Contractor.

The Contractor shall remove the plastic liner, clean and prepare the surfaces, and repair the joint using hydrophobic polyurethane chemical grout and epoxy grout. The polyurethane chemical grout shall be SikaFix HH as manufactured by Sika Corporation, Concrevice 1230 as manufactured by ChemRex Corporation, or equal. The epoxy grout shall be Sikadur 45 as manufactured by Sika Corporation, Masterflow MP as manufactured by Master Builders, or equal. The Contractor shall prepare the joint as required by the epoxy grout manufacturer. The joint shall be cleaned by mechanical abrasion and shall be free of contaminants and laitance with a surface profile as required to provide a bond with the epoxy grout.

For joint gaps greater than 3/16-inch, the Contractor shall insert oakum material saturated with polyurethane chemical grout 1 1/2 inches into the joint and allow the polyurethane chemical grout to activate. The Contractor may have to spray with water to allow the polyurethane chemical grout to activate, if necessary. Oakum shall be sized to fill the full width of the joint. After the polyurethane chemical grout has set, the Contractor shall fill the remaining joint gap with epoxy grout. For joint gaps less than 3/16-inch, the Contractor shall omit the use of oakum material and shall inject the epoxy directly into the joint per the pipe manufacturer's written instructions.

The Contractor shall drill holes for injection ports along the joints and install the injection ports (packers) into the drilled holes. For polyurethane chemical grout injection, holes shall be drilled at an angle to intersect the joint behind the oakum and to avoid damaging reinforcing steel. The holes shall be placed on alternating sides of the joint and placed at interval to allow for maximum penetration of the polyurethane resin. The Contractor shall start the polyurethane chemical grout injection starting at the pipe invert and work towards the pipe soffit and shall follow the manufacturer's recommended injection procedures for mixing, injection pressure and injection process. The Contractor shall remove the injection ports flush with the surrounding concrete surface and remove any excess polyurethane chemical grout.

The joint shall then be tested in accordance with 207-2.5.2.2. The independent laboratory inspector shall monitor the testing. After the joint has been repaired and when directed by the Engineer, the Contractor shall repair the existing plastic liner in accordance with applicable provisions of 311.



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IN **207-2.8 Causes for Rejection**, FIRST PARAGRAPH, AFTER SUBPARAGRAPH q) ADD THE FOLLOWING:

- "r) Use of unapproved fasteners.
- s) Inside pipe diameter larger than specified
- t) Inside pipe diameter smaller than 99 percent of specified diameter."

IN **207-2.8 Causes for Rejection**, SECOND PARAGRAPH, DELETE THE LAST SENTENCE AND REPLACE WITH THE FOLLOWING:

"All pipes found to be acceptable shall be marked with the District's stamp prior to delivery to the jobsite. Marking of the pipe at the place of manufacture shall not be considered a final acceptance of the pipe."

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IN **207-2.9.2 D-Load Bearing Strength Test**, DELETE THE LAST PARAGRAPH.

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IN **207-3.1 General**, FIRST PARAGRAPH, DELETE THE SECOND SENTENCE AND REPLACE WITH THE FOLLOWING:

"The plastic lining material shall be embedded in concrete and shall comply with 210-2 and shall be tested in accordance with 211-2."

IN **207-3.1 General**, FIRST PARAGRAPH, AFTER THE THIRD SENTENCE, ADD THE FOLLOWING:

"Unless otherwise shown on the Plans, lined reinforced concrete pipe shall be supplied with Type P-2 joints as specified in 311-1.5.2."

IN **207-3.1 General**, ADD THE FOLLOWING TO THE END:

"When coverage for plastic lined reinforced concrete pipe is 360 degrees, the manufacturer shall furnish test pipes identical in design to the lined pipe except without the plastic liner. The test pipe length shall be determined by the pipe manufacturer but in no case shall the test section be less than 4 feet. The number of test pipes and the tests to be performed shall be in accordance with the applicable provisions of 207-2.9.2, except that for pipe size 60 inches and larger, the number of test pipes shall be two (2) for each pipe size and D-load required."

IN **207-3.2 Causes For Rejection**, SUBPARAGRAPH a), ADD THE WORDS "stainless steel" BEFORE THE WORDS "holding rods".

IN **207-3.2 Causes for Rejection**, SUBPARAGRAPH l) (1), DELETE THE WORDS "throughout a continuous" AND REPLACE WITH WORDS "measured at close intervals for a".

IN **207-3.2 Causes for Rejection**, ADD THE FOLLOWING TO THE END:

- "m) Test pipe fails the D-Load bearing strength test.
- n) Any reduction in thickness of the spigot due to compression of the liner extension except as allowed by the Engineer.
- o) Any longitudinal wrinkling or locking extension pullout except as allowed by the Engineer."

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IN **207-5.1 General**, ADD THE FOLLOWING TO THE END:

"The Contractor shall submit design calculations for approval prior to the manufacture of any pipe."

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IN **207-8.1 General**, ADD THE FOLLOWING TO THE END:

"Vertical and horizontal curves shall be constructed with a uniform deflection at each joint within the curve using factory fabricated mitered or beveled pipe and/or by pulling joints. In no case shall joints be pulled more than recommended by the pipe manufacturer or approved by the Engineer."

Siphon shall be constructed along vertical curves having no more than 4 degrees of deflection at any point along the curve. Points of deflection shall be separated by a pipe joint.

Prior to the manufacture of pipe required for horizontal and vertical curves and for siphons, pipe detail and layout drawings for said curve and siphons shall be submitted to the Engineer for review and approval. All drawings for siphons and vertical curves shall include a scaled drawing indicating station and elevation of each pipe joint or mitered bend."

IN **207-8.2.1 General**, ADD THE FOLLOWING TO THE END:

"and shall be marked so as to clearly identify the long and short sides, and curve designation or plan station."

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IN **207-8.5.1 General**, FIRST PARAGRAPH, FIRST SENTENCE, ADD THE FOLLOWING TO THE END:

"and joint tests as described in 208."

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IN **207-8.5.4 Acceptance**, FIRST SENTENCE, DELETE THE WORDS "hydrostatic pressure and bearing" AND REPLACE WITH THE WORD "required".

IN **207-8.5.4 Acceptance**, ADD THE FOLLOWING TO THE END:

"All pipes found to be acceptable shall be marked with the District's stamp prior to delivery to the job site. Marking of the pipe at the place of manufacture shall not be considered a final acceptance of the pipe."

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IN **207-9.2.2 Pipe Joints, Table 207-9.2.2 (A)**, ADD THE FOLLOWING JOINT TYPE AND REFERENCED SPECIFICATION:

"Grooved Joint AWWA C606"

IN **207-9.2.3 Fittings**, ADD THE FOLLOWING TO THE END:

"All grooved couplings and fittings shall be made of ductile iron. Grooved ductile iron fittings shall conform to AWWA C-110 for center-to-end dimensions and AWWA C-153 for wall thickness. Gaskets for grooved ductile iron couplings shall be halogenated butyl rubber and furnished with Type 304 stainless steel bolts and nuts. The grooved couplings, gaskets, fittings and bolting for iron pipe shall be furnished by the same manufacturer. The manufacturer shall be able to demonstrate five years of successful operation of the couplings-gasket system in similar service and shall submit a list of previous users and factory testing results upon request. Grooved ductile iron piping for underground installation shall be flexible type. Rigid type joints are not acceptable. The Contractor shall follow manufacturer's instructions and recommendations on pipe end preparation and installation."

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IN **207-10.3.1 General**, LAST PARAGRAPH, DELETE THE WORDS "If required in the Specifications" AND ADD THE FOLLOWING TO THE END:

"If the heat number is not legible, the pipe will be rejected unless otherwise accepted by the Engineer."

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IN **207-10.4.2 Cement-Mortar Lining and Coating**, SECOND PARAGRAPH, ADD THE FOLLOWING TO THE END:

"Interior surfaces shall be sandblast or grit blast cleaned to near white with exterior surfaces cleaned to commercial quality blast. In no case shall blast cleaned pipe remain overnight without mortar coating."

IN **207-10.4.2 Cement-Mortar Lining and Coating**, ADD THE FOLLOWING TO THE END:

"After the lining has been properly cured, the ends of the pipe shall remain tightly sealed with transparent plastic covers until field installation. Care shall be taken to insure a moist environment within the pipe at all times. After installation, linings shall be kept continuously moist by sprinkling until placed into service. The surface of the pipe exposed to sunlight shall be sprinkled with water in the daytime to prevent cracking of the lining and/or coating."

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IN **207-21.6 Joints**, ADD THE FOLLOWING TO THE END OF SUBPARAGRAPH (a):

"The seat shall be concentric with the inside diameter of the pipe. An eccentricity greater than 3/8" will be cause for rejection of the pipe."

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IN **209-2.3 Conduit**, LAST PARAGRAPH, LAST SENTENCE, DELETE "conductors" AND REPLACE WITH "conduits".

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AFTER **207-24.6 Inspection and Acceptance**, ADD THE FOLLOWING:

**"207-25 Precast Manhole Shafting.** Prior to the shipment of precast concrete manhole components, the Contractor shall submit stacking sequence to the Engineer for approval. The submittal shall indicate the location and spacing of all manhole steps.

All manholes shall conform to the Districts' Standard Drawings and concrete for the components shall be 660-B-4000. All pinholes exceeding 1/8-inch in dimension shall be treated as pockets for finishing. Pockets are defined as areas where aggregate is exposed and shall be filled using a class "C" mortar. Any precast components which have lost cement fines at form closures and/or cracked components will be subject to rejection.

All precast manhole shafting found to be acceptable shall be marked with the District's stamp prior to delivery to the jobsite. Marking of the shafting at the place of manufacture shall not be considered as final acceptance of the precast manhole shafting.

If plastic liner is specified, the plastic liner shall be installed in accordance with the applicable provisions of 210-2 and 311."

IN **209-2.4 Wire**, LAST PARAGRAPH, LAST SENTENCE, DELETE "THW OR THWN" AND REPLACE WITH "XHHW or THHN/THWN".

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IN **208-6.1 General**, ADD THE FOLLOWING TO THE END:

"This type of flexible coupling shall not be used unless specified and/or approved by the Engineer"

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IN **210-2.1 General**, SECOND PARAGRAPH, ADD THE FOLLOWING TO THE END:

"Testing of the plastic liner for conformance with 210-2 shall be witnessed and approved by the Engineer."

IN **210-2.1 General**, LAST PARAGRAPH, ADD THE FOLLOWING TO THE END:

"or in structures."

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IN **210-2.2.1 Approval of Details**, ADD THE FOLLOWING TO THE END:

"Plans, sections, details, and location where details are used shall be submitted for the Engineer's review and approval"

IN **210-2.2.3 Material Sizes**, AFTER THE WORD "pipe", ADD THE WORDS "or structure".

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IN **210-2.4.2 Shop-Welded Joints**, ADD THE FOLLOWING TO THE END:

"All PVC liner sheets to be formed in the shop shall be fabricated by lapping basic size sheets a minimum of 0.50 inch and fusing the sheets together by high frequency dielectric fusion to produce continuous welded seams."

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IN **210-3.3 Workmanship**, FIRST PARAGRAPH, DELETE THE THIRD SENTENCE AND REPLACE WITH THE FOLLOWING:

"Machine work, die work, cutting, punching, bending, welding, drilling, thread cutting, straightening and other fabricating shall be completed before the galvanizing, or as approved by the Engineer."

IN **210-3.5 Repair of Damaged Zinc Coatings**, AFTER THE WORD "methods", ADD THE WORD "as".

IN **210-3.5.3 Zinc Dust Paint**, FOURTH SENTENCE, DELETE "A3" AND REPLACE WITH "A2".

IN **210-3.5.4 Zinc Based Solders**, DELETE "A3" AND REPLACE WITH "A1".

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IN **211-1**, DELETE THE HEADING "**COMPACTION TESTS**" AND REPLACE WITH "**SOILS AND AGGREGATE TESTS**," AND DELETE SUBSECTIONS 211-1.1, 211-1.2 AND 211-1.3 AND REPLACE WITH THE FOLLOWING:

**"211-1.1 LABORATORY TESTING.** All soils and aggregate testing shall be performed by an independent accredited testing laboratory approved by the Engineer at the Contractor's expense. The frequency of sampling shall be as needed to determine the acceptability of fill materials or shall be as required in other sections or items of the Standard Specifications (i.e., 306), and for structure backfill or compaction shall be as required in the County of Los Angeles Building Code, Section 3313.8. For trenches, a minimum of one compaction test for the pavement base material and one compaction test for each specified relative compaction of backfill material is required for every 300 feet of trenching and at least once for every 300 cubic yards of backfill material. For other excavations besides trenches, compaction tests shall be taken at least once every 2 vertical feet and at least once every 500 cubic yards. The independent testing laboratory representative shall notify the Engineer's representative upon arrival at the site and advise the Engineer's representative of preliminary results prior to leaving the site.

The accredited soils testing laboratory shall confirm and verify that the fills installed were placed upon competent and properly prepared material and compacted in compliance with the Standard Provisions and the Building Code and shall prepare a final soils engineers report attesting the above, which shall be stamped and signed by a Geotechnical or Civil Engineer currently registered by the State of California. The report shall include the following:

- A. Description of the materials encountered at the bottom of the excavation.
- B. Preparation of the subgrade prior to placement of fill.
- C. Inspection and approval of the subgrade by the Soils Engineer.
- D. Inspection and approval of the subdrain installation by the Soils Engineer.

- E. Identification of the types of fill material placed with the Unified Soil Classification System, maximum dry densities and optimum moisture contents.
- F. Thickness of layers (typically 6 - 8 inches).
- G. Method of compaction.
- H. Moisture content control if mechanical compaction is used.
- I. ASTM testing designations for density and laboratory maximum density.
- J. Purpose/use of fill: i.e., to support footings (structural), for walkways/paving (secondary), for landscaping (non-structural), etc.
- K. Certification that a qualified representative of the independent testing laboratory continuously monitored fill placement, when required.

**211-1.2 COMPACTION TESTS.**

**211-1.2.1 Laboratory Maximum Density.** The following method shall be used for compaction tests:

Laboratory maximum density test shall be performed in accordance with ASTM D 1557, Method "C".

The Engineer may modify ASTM D 1557 at his option to calculate relative compaction based on adjusted laboratory maximum wet density calculated as follows:

$$D_a = (100 D_m) (100 \pm W_a)$$

$D_a$  = Adjusted laboratory maximum wet density.

$D_m$  = Maximum wet density per ASTM D 1557, Method "C".

$\pm W_a$  = Percent change in moisture content from field moisture to laboratory optimum moisture. Use minus when field moisture content is higher than laboratory optimum moisture content. Use plus when field moisture content is lower than laboratory optimum moisture content.

**211-1.2.2 Field Density and Relative Compaction.** Field density of soil shall be determined by any method which will accurately and consistently determine the density and moisture content of the soil.

A minimum of 20 percent of the field density tests shall be by the sand cone method in accordance with ASTM D 1556. Locations of the field density test shall be mutually acceptable to the laboratory and Engineer, and the results of the testing shall be presented to the Engineer monthly. Test results shall be reported as Relative Compaction, which shall be defined as the ratio of the field dry or wet density to the laboratory maximum dry density or adjusted wet density, respectively, expressed as a percentage. Test results showing less than the specified compaction will not be acceptable. Removal, recompaction, and re-testing of the areas that failed to meet specified degree of compaction shall be included. Frequency of testing shall be as determined by the Engineer, but shall not be less than required for compaction testing.

**211-1.3 SAND EQUIVALENT TEST.** This test is intended to serve as a field test to indicate the presence or absence of plastic fine material. The test shall be run in accordance with Calif. Test 217 or ASTM D 2419. When testing material containing asphalt, this test method shall be modified by drying the sample at a temperature not exceeding 38 degrees C (100 degrees F). Frequency of testing shall be the same as for compaction testing.

**211-1.4 PERMEABILITY TEST.** Permeability tests for granular soils will be performed in accordance with ASTM D 2434, using samples compacted to the specified field density.

**211-1.5 SIEVE ANALYSES.** Sieve analyses shall be performed in accordance with ASTM C 136. Frequency of testing shall be the same as for compaction testing.

**211-1.6 SULFATE IN SOILS.** Fill soils whether imported or from stockpile shall be tested to determine sulfate content. The test shall be performed in accordance with the latest edition of ASTM C 1580. Soils with sulfate contents greater 150 parts per million (ppm) shall not be allowed to use as fill. Frequency of testing shall be every 500 cubic yards from each source or once per day.

**211-1.7 CHLORIDES IN SOILS.** Fill soils whether imported or from stockpile shall be tested to determine chloride content. The test shall be performed in accordance with the latest edition of California Test 422. Soils with chloride contents greater 500 parts per million (ppm) shall not be allowed to use as fill. Frequency of testing shall be every 500 cubic yards from each source or once per day."

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IN **212-1.4.1 General**, FIRST PARAGRAPH, ADD THE FOLLOWING TO THE END:

"Plant labels shall identify each species and variety of plant."

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IN **212-2.2.7 Valve Boxes**, ADD THE FOLLOWING TO THE END:

"or if approved, plastic valve boxes may be substituted."

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IN **212-3.2.1 Conduit**, ADD THE FOLLOWING TO THE END:

"or if approved, UL approved schedule 40 PVC conduit."

IN **212-3.2.2 Conductors**, FIRST PARAGRAPH, DELETE "THW OR THWN" AND REPLACE WITH "XHHW or THHN/THWN".

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IN **300-1.3.2 Requirements**, (a) **Bituminous Pavement**, DELETE THE PARAGRAPH AND REPLACE WITH THE FOLLOWING:

"Bituminous pavement shall be removed to clean, straight lines. Where only the surface of existing bituminous pavement is to be removed, the method of removal shall be approved by the Engineer, and a minimum laying depth of 1 inch of new pavement material shall be provided at the join line. Unless otherwise stated on the Plans, where bituminous pavement adjoins a trench, the edges adjacent to the trench shall be saw cut to neat straight lines before resurfacing to ensure that all areas to be resurfaced are accessible to the rollers used to compact the subgrade or paving materials. The saw cut lines shall parallel the trench centerline. Angled cuts (1:10 maximum) may be allowed by the Engineer. The saw cut edge shall be made to a minimum depth of 1 1/2 inches after trench backfill and compaction have been completed and shall be a minimum of 6 inches beyond the trench edges. Removal of the full thickness of the existing bituminous pavement is required between the trench edge and saw cut edge.

If the edge of the remaining section of pavement which adjoins an excavation is within 2 1/2 feet of an existing edge of pavement, curb and gutter, spandrel, cross gutter, concrete pavement or other existing improvement, the Contractor shall remove and replace the remaining section of pavement. If an improvement is to be constructed adjacent to existing bituminous pavement, a 1 foot section of pavement shall be removed and then replaced after the improvement is completed."

IN **300-1.3.2 Requirements (b) Concrete Pavement**, SECOND SENTENCE, DELETE THE WORDS "a minimum depth of 38 mm (1 1/2 inches)" AND REPLACE WITH THE WORDS "the full thickness of the pavement".

IN **300-1.3.2 Requirements, (b) Concrete Pavement**, AFTER THE THIRD SENTENCE, ADD THE FOLLOWING:

"The saw cut edge adjacent to a trench shall extend a minimum of 6 inches beyond the actual edge of trench, such that the concrete replaced will be a minimum of 1 foot wider than the trench width at the surface."

IN **300-1.3.2 Requirements (c) Concrete Curb, Walk, Gutters, Cross Gutters, Driveways, and Alley Intersections**, FIRST SENTENCE, DELETE THE WORDS "a minimum depth of 38 mm (1 1/2 inches)" AND REPLACE WITH THE WORDS "the full thickness of the concrete".

IN **300-1.3.2 Requirements, (c) Concrete Curb, Walk, Gutters, Cross Gutters, Driveways, and Alley Intersections**, DELETE THE LAST SENTENCE AND REPLACE WITH THE FOLLOWING:

"Curb and gutter shall be sawed to the full thickness of the concrete on a neat line at right angles to the curb face. If any concrete cross gutter is removed, the concrete cross gutter shall be removed by sawcutting between the centerline of the street and the spandrel, and the sawcut section shall be replaced. After backfilling and compacting the trench, an approved epoxy binder shall be used on all construction joints. If a portion of a spandrel is cut, the entire spandrel shall be replaced. If a concrete cross gutter is tunneled under, the tunnel shall be backfilled with sand-cement grout having 141 pounds of cement per cubic yard of grout."

IN **300-2.1 General**, ADD THE FOLLOWING TO THE END:

"such as trench excavation".

IN **300-2.2.1 General**, DELETE THE FIRST PARAGRAPH AND REPLACE WITH THE FOLLOWING:

"Material that is unsuitable for the planned use shall be excavated and removed from the job site immediately."

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IN **300-2.4 Slides and Slipouts**, DELETE THE FIRST PARAGRAPH AND REPLACE WITH THE FOLLOWING:

"Material outside the planned excavation limits which is unstable and constitutes a potential slide as determined by the soils laboratory or Engineer, material which has come into the planned excavation limits, and material which has slipped out of new or old fills shall be excavated to designated lines or slopes either by benching or in such manner as directed by the Engineer. Such material may be used in the construction of an unclassified fill or disposed of as approved by the Engineer."



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IN **300-3.3 Foundation Material Treatment**, AFTER THE LAST PARAGRAPH ADD THE FOLLOWING:

"In the presence of the Engineer and after approval of the excavation, the Contractor shall scarify the exposed surface to a depth of 8 inches, moisture condition to about 2 percent above optimum moisture content, and compact the subgrade to at least 90 percent of maximum dry density."

IN **300-3.4 Inspection**, FIRST AND SECOND SENTENCES, ADD THE WORDS "soils laboratory and" BEFORE THE WORD "Engineer".

IN **300-3.5.1 Requirements**, FIRST PARAGRAPH, ADD THE FOLLOWING TO THE END:

"The backfill shall be brought up uniformly on all sides of the structure."

IN **300-3.5.1 Requirements**, SECOND PARAGRAPH, AFTER THE TABLE, ADD THE FOLLOWING:

"Material used shall also have an expansion index less than 20 as determined by ASTM 4829."

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IN **300-4.1 General**, DELETE THE THIRD AND FOURTH PARAGRAPHS AND REPLACE WITH THE FOLLOWING:

"Clods or hard lumps of earth shall be broken up before compacting the material in the fill. Clods, rocks or boulders incorporated into the fill shall have no dimension greater than 6 inches. No cemented brick rubble, broken asphalt pavement, or broken concrete will be allowed in the fill unless allowed by the Contract Documents."

IN **300-4.3 Other Fill Materials**, DELETE THE ENTIRE SUBSECTION 300-4.3.

IN **300-4.4 Benching**, SECOND PARAGRAPH, FIRST SENTENCE, ADD THE WORDS "soils laboratory and" BEFORE THE WORD "Engineer".

IN **300-4.5 Placing Materials for Fills**, FIRST PARAGRAPH, THIRD SENTENCE AND SECOND PARAGRAPH, FIRST SENTENCE, ADD THE WORDS "soils laboratory and" BEFORE THE WORD "Engineer".

IN **300-4.5 Placing Materials for Fills**, DELETE THE FOURTH PARAGRAPH AND REPLACE WITH THE FOLLOWING:

"Broken portland cement concrete and bituminous type pavement and cemented brick rubble shall not be placed in the fill."

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IN **300-4.6 Application of Water**, SECOND PARAGRAPH, FIRST AND SECOND SENTENCES, ADD THE WORDS "soils laboratory and" BEFORE THE WORD "Engineer".

IN **300-4.7 Compaction**, FIRST PARAGRAPH, FIRST SENTENCE, ADD THE WORDS "soils laboratory and" BEFORE THE WORD "Engineer".

IN **300-5.1 Local Borrow**, FIRST PARAGRAPH, FOURTH SENTENCE, ADD THE WORDS "soils laboratory and" BEFORE THE WORD "Engineer".

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IN **300-5.2 Imported Borrow**, SECOND PARAGRAPH, ADD THE WORDS "soils laboratory and" BEFORE THE WORD "Engineer".

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IN **300-6.5 Compacted Fills**, THIRD AND FIFTH PARAGRAPHS, ADD THE WORDS "soils laboratory and" BEFORE THE WORD "Engineer".

IN **300-6.5 Compacted Fills**, SIXTH PARAGRAPH, ADD THE WORDS "soils laboratory and" BEFORE THE WORD "Engineer".

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IN **301-1.6 Adjustment of Manhole Frame and Cover Sets to Grade**, FIRST PARAGRAPH, DELETE THE FIRST TWO SENTENCES AND REPLACE WITH THE FOLLOWING:

"Sewer and storm drain manhole frames and covers within the area to be paved shall be set to finish grade by the Contractor. Utility manhole and vault frames and covers owned by the District shall also be set to finish grade by the Contractor. Utility manhole and vault frames and covers owned by others shall be set to finished grade by the owners thereof."

IN **301-1.6 Adjustment of Manhole Frame and Cover Sets to Grade**, DELETE THE LAST PARAGRAPH AND REPLACE WITH THE FOLLOWING:

"The Contractor shall exercise necessary caution to prevent debris from falling into manholes. In the event that debris should fall into a manhole, the Contractor shall immediately notify the District and then remove the debris following all required safety measures. Unless otherwise authorized by the Engineer, the adjustment to grade shall be completed prior to final inspection of the pipe interior and manholes."

IN **301-1.6 Adjustment of Manhole Frame and Cover Sets to Grade**, ADD THE FOLLOWING TO THE END: "FOR LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS CASH CONTRACTS ONLY:

"The Contractor shall notify the County Sanitation Districts, telephone (323) 774-7272, two (2) working days prior to starting any work involving the District's manhole and shall furnish the cost, to be confirmed in writing, for adjusting or reconstructing each manhole according to 301-1.6, 301-1.7 and 302-5.8. The District will notify the Contractor within one (1) workday whether to proceed with the work, at the price quoted, or that the District will perform the necessary adjusting or reconstruction as the utility owner.

If the Contractor is authorized to proceed to adjust or reconstruct each manhole, then the District will issue a purchase order in the amount of the written price. The Contractor shall proceed to adjust or reconstruct each manhole as the owner, as stipulated in 301-1.6, 301-1.7 and 302-5.8. The District will provide inspection of the work at no cost to the Contractor. Full payment for the work performed will be made within thirty (30) days of the receipt of an invoice and acceptance of the work by the District.

If the District elects to adjust or reconstruct the District's manholes as the owner, then the following procedures will be followed:

For each manhole involved, the District will place a temporary cover over the channel and will lower the manhole to a point 6 inches below subgrade. The Contractor shall provide and place a suitable temporary cover plate for the manhole. Following completion of paving operations, the Contractor shall remove the pavement and base material from the surrounding area, remove the temporary cover plate and remove any construction debris that may have accumulated in the manhole. The District will adjust the manhole to final grade. The Contractor shall then backfill and pave the surrounding area.

Where the District's manholes are existing within a paved area to be resurfaced with asphalt concrete pavement, the Contractor shall mark the location of the District's manholes which have been paved over. The District will perform all removal and adjustment work within forty-eight (48) hours. The Contractor shall then repave around the adjusted manholes."

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IN **302-5.5 Distribution and Spreading**, FOURTH PARAGRAPH, ADD THE FOLLOWING TO THE END:

"Unless otherwise approved by the Engineer, asphalt concrete shall not be placed over cement/sand slurry backfill within forty-eight (48) hours after placement of the slurry."

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IN **302-5.6.2 Density and Smoothness**, FIRST PARAGRAPH, LAST SENTENCE, ADD THE FOLLOWING TO THE END:

"unless otherwise approved by the Engineer."

IN **302-5.8 Manholes (and other structures)**, DELETE THE LAST PARAGRAPH AND REPLACE WITH THE FOLLOWING:

"After the pavement has been completed, the pavement, base and subgrade shall be removed to a depth of 12 inches below finish grade and a distance of 12 inches around the outside of the manhole frame and the manhole frame set to the grade of the adjacent pavement. The removal area shall be backfilled to within 1 1/2 inches of the surface with Portland cement concrete conforming to 302-6.1. The remaining 1 1/2 inches shall be filled by the Contractor with asphalt concrete placed and compacted in a workmanlike manner to match the pavement surface. For Los Angeles County Department of Public Works Cash Contracts, see 301-1.6 for procedures.

Proposed manholes on new sewer construction shall be constructed to approximate finish grade prior to placing temporary or permanent resurfacing. Paving over structures temporarily covered with steel plate will not be allowed."

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IN **302-6.5.1 General**, LAST PARAGRAPH, ADD THE FOLLOWING:

"Unless noted otherwise on the Plans or Specifications, weakened-plane joints shall be installed in concrete pavements at 10 feet on center in each direction. Greater spacing may be directed by the Engineer."

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IN **302-7.2.2.1 General**, FIRST PARAGRAPH, REPLACE THE FIRST SENTENCE WITH THE FOLLOWING:

"The tack coat shall be performance grade PG 64-10 paving asphalt conforming to 203-1."

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IN **303-1.1 General**, FIRST PARAGRAPH, FIRST SENTENCE, ADD THE WORDS "sewer manholes," BEFORE THE WORDS "catch basins"

IN **303-1.1 General**, FIRST PARAGRAPH, ADD THE FOLLOWING TO THE END:

"The Contractor shall coordinate the work of all trades so that all piping, conduits, anchor bolts and other shapes to be cast in the concrete are properly placed in the forms, and that provision is made for all adjacent and abutting construction and equipment. All such work shall be in place at least twenty-four (24) hours prior to the scheduled concrete placement to allow adequate time and access for inspection. Concrete placement will not be permitted until all noted deficiencies are corrected. Adequate equipment and sufficient workmen shall be on the job site to handle the amount of concrete being placed and finished."

IN **303-1.2 Subgrade for Concrete Structures**, FIRST PARAGRAPH, ADD THE FOLLOWING TO THE END:

"When excavation has occurred below the subgrade of the structures, it shall be filled with select material, approved by the Engineer and compacted to a relative density of 95 percent."

IN **303-1.3 Forms**, DELETE THE SECOND PARAGRAPH AND REPLACE WITH THE FOLLOWING:

"Forms for all surfaces shall be constructed using plywood and shall be approved by the Engineer. Plywood forms shall be made with 4 foot by 8 foot sheets for all concrete surfaces unless otherwise approved by the Engineer. Prior to setting reinforcing steel for walls, one side of the forms shall be set and braced to line and grade."

IN **303-1.3 Forms**, THIRD PARAGRAPH, DELETE THE FIRST SENTENCE AND REPLACE WITH THE FOLLOWING:

"Forms for all surfaces of concrete structures shall be constructed of plywood or an approved equal."

IN **303-1.3 Forms**, THIRD PARAGRAPH, DELETE THE FIFTH SENTENCE AND REPLACE WITH THE FOLLOWING:

"Plywood panels shall be a minimum of 15 mm (5/8-inch) thick and shall be attached directly to the studs or joists, which shall be spaced not more than 305 mm (12 inches), center to center."

IN **303-1.3 Forms**, LAST PARAGRAPH, DELETE THE FIRST SENTENCE AND REPLACE WITH THE FOLLOWING:

"With the approval of the Engineer, concrete may be placed directly against the sides of excavations, provided the following conditions are met:"

IN **303-1.3 Forms**, LAST PARAGRAPH, SUBPARAGRAPH a), ADD THE FOLLOWING TO THE END:

"The Contractor may place building paper in lieu of gunite if, in the opinion of the Engineer, ground conditions do not require gunite to prevent raveling."

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IN **303-1.4.1 General**, ADD THE FOLLOWING TO THE END:

"Forms of vertical members such as walls, including those on box sections, may be removed after the concrete has obtained a compressive strength of 1,500 psi as determined by cylinder tests, but not before twenty-four (24) hours after completion of the concrete placement. Forms supporting horizontal members such as beams and slabs, including those on box sections, may be removed after the concrete has attained a compressive strength of 2,000 psi as determined by cylinder tests. The age-strength relations shall be determined from tests of representative samples taken from batches of concrete used in the members under consideration and cured under job conditions. Additional test cylinders as required shall be obtained and cylinder testing shall comply with the requirements of 201-1."

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IN **303-1.5 Removal of Forms for Box Sections**, DELETE THE SECTION IN ITS ENTIRETY.

IN **303-1.6.1 General**, DELETE THE FIRST PARAGRAPH AND REPLACE WITH THE FOLLOWING:

"Falsework shall comply with Article 29, Section 1717 of the Construction Safety Orders issued by the Division of Occupational Safety and Health."

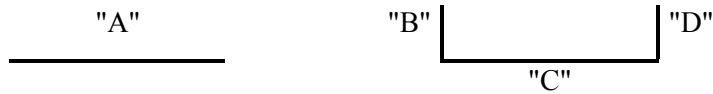
IN **303-1.6.1 General**, THIRD PARAGRAPH, FIRST SENTENCE DELETE "HE" AND REPLACE WITH "THE".

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IN **303-1.7.1 General**, DELETE THE FIRST PARAGRAPH AND REPLACE WITH THE FOLLOWING:

"Before placing reinforcing steel, the Contractor shall submit a reinforcing steel placing drawing and bar list in accordance with 2-5.3 and as specified below.

- 1) Reinforcing steel placing drawing shall show plans and sections detailing the size, spacing, and location of the bars in the structure.
- 2) Bar list prepared from the placing drawing used in cutting, bending, tagging and shipping shall show the number of pieces, size, length, grade of steel, mark of bars, and bending details of all bent bars. The bar list shall be a complete summary of materials required. The bar list shall be submitted with the reinforcing steel placement drawings and shall be presented in the following format."



MARK NUMBER	"A"	"B"	"C"	"D"	REBAR SIZE	QUANTITY	GRADE (KSI)
450	3'-2"				4	10	60
451	4'-6"				4	6	60
500		2'-6"	2'-6"		5	2	60
501		2'-6"	3'-6"		5	12	60
502		4'-0"	6'-4"		5	12	60
650		8'-0"	20'-6"	8'-0"	6	8	60
651		6'-4"	15'-0"	3'-6"	6	8	60
652		7'-6"	14'-6"	6'-0"	6	24	60

IN **303-1.7.1 General**, SECOND PARAGRAPH, ADD THE FOLLOWING AFTER THE FIRST SENTENCE:

"Detailing shall be in accordance with the "Manual of Standard Practice" of the Concrete Reinforcing Steel Institute, unless specified or shown otherwise on the Plans or Special Provisions. In cases of conflict, the most stringent shall govern. "

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IN **303-1.7.2 Splicing**, FIRST PARAGRAPH, DELETE THE SECOND SENTENCE AND REPLACE WITH THE FOLLOWING:

"Where bars are spliced, they shall be at least a Class B Splice in accordance with ACI 318, latest edition or lapped at least thirty (30) diameters, whichever is greatest or most stringent, unless otherwise shown on the Plans."

IN **303-1.8.2 Grouting**, DELETE THE SECOND SENTENCE AND REPLACE WITH THE FOLLOWING:

"Unless otherwise specified by the Engineer, the grout mixture shall conform to Concrete Class 752-E- $f'_c$ , where  $f'_c$  is the specified twenty-eight (28) day strength for the reinforced concrete structures. This grout shall have a maximum slump of 7 inches. "

IN **303-1.8.2 Grouting**, ADD THE FOLLOWING TO THE END:

"The grout mixture shall be submitted to the Engineer for review and approval prior to use. The depth of the grout mixture shall be 3 inches minimum to 6 inches maximum."

IN **303-1.8.3 Depositing**, THIRD PARAGRAPH, DELETE THE FIRST SENTENCE AND REPLACE WITH THE FOLLOWING:

"Concrete shall not be permitted to fall more than 1.8m (6 feet) without the use of tremies."

IN **303-1.8.8 Placing Concrete Under Adverse Weather Conditions**, LAST PARAGRAPH, ADD THE FOLLOWING TO THE END:

"Concrete shall not be placed during inclement weather without the prior approval of the Engineer.

The Contractor shall submit detailed procedures for the production, transportation, placement, protection, curing, and temperature monitoring of concrete during cold and hot weather. The procedures shall be prepared, stamped and signed by a Structural or Civil engineer registered by the State of California and experienced in placing concrete during cold and hot weather. Subject to District's approval, the Contractor shall incorporate applicable preventative measures conforming to ACI 306R Cold Weather Concreting and ACI 305R Hot Weather Concreting for placing concrete during cold or hot weather to meet project requirements.

**303-1.8.8.1 Cold Weather Placement.** Work shall conform to the requirements of ACI 306.1, Standard Specification for Cold Weather Concreting. Frozen subgrade shall be thawed to a minimum depth of 4 inches prior to placement of concrete. Do not allow concrete temperature to decrease below 50 degrees F. Obtain approval by the Engineer prior to placing concrete when the ambient temperature is below 40 degrees F or when concrete is likely to be subjected to freezing temperatures within twenty-four (24) hours. Cover concrete and provide sufficient heat to maintain 50 degrees F minimum adjacent to both the formwork and the structure while curing. Limit the rate of cooling to 5 degrees F in any hour and 50 degrees F in twenty-four (24) hours after heat application. Temperature of protected concrete shall be recorded not less than every hour. The Contractor shall provide field cured concrete strength test cylinders to monitor the strength development of the in-place concrete.

**303-1.8.8.2 Hot Weather Placement.** The temperature of concrete when it is being placed shall be not more than 90 degrees F. If concrete is placed when the weather is such that the temperature of the concrete would exceed 90 degrees F, the Contractor shall employ means which include but is not limited to precooling of aggregates and mixing water, using ice, placing at night, proper attention to ingredients, production methods, handling, placing, and protection as necessary to maintain the temperature of the concrete, as it is placed, below 90 degrees F. Maintain required concrete temperature using Figure 2.1.5 in ACI 305R to prevent the evaporation rate from exceeding 0.2 pounds of water per square foot of exposed concrete per hour. Temperature measurements shall be made every hour.

**303-1.8.8.3 Temperature Tests.** Test the concrete delivered and the concrete in the forms. Perform tests in hot or cold weather conditions (below 50 degrees F and above 80 degrees F for each batch (minimum) or every 20 cubic yards of concrete, and whenever test cylinders and slump tests are made. An independent testing laboratory submitted by the Contractor for District's review and approval shall perform the measurements and record the results. The Contractor is responsible for all costs of the testing and providing access for the testing. Measurements may discontinue after curing is complete or as directed by the Engineer. "

IN **303-1.9.1 General**, DELETE THE LAST PARAGRAPH AND REPLACE WITH THE FOLLOWING:

"The entire channel and shelves of cast-in-place and precast channels for sewer manholes and structures shall be given a steel trowel finish."

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IN **303-1.9.2 Ordinary Surface Finish**, FIRST PARAGRAPH, FIRST SENTENCE, DELETE THE WORD "Immediately"

IN **303-1.9.2 Ordinary Surface Finish**, FIRST PARAGRAPH, ADD THE FOLLOWING TO THE END:

"All pinholes exceeding 1/8 inch in dimension shall be treated as pockets for finishing. Pockets are defined as areas where aggregate is exposed."

IN **303-1.9.2 Ordinary Surface Finish**, SECOND PARAGRAPH, DELETE THE LAST SENTENCE AND SUBPARAGRAPHS a) THRU d) AND REPLACE WITH THE FOLLOWING:

"All surfaces shall as a minimum receive ordinary surface finish including but not limited to:

- 1) All interior surfaces of tanks, hoppers, channels, and pumping plant wet wells and other similar surfaces.
- 2) All exterior surfaces of tanks, hoppers, channels, galleries and similar structures which are to be temporarily buried underground but later exposed as a result of future expansion.
- 3) Exposed interior vertical and soffit surfaces of galleries, pipe shafts, stairwells and similar interior structures."

IN **303-1.9.3 Class 1 Surface Finish**, DELETE THE FIRST PARAGRAPH AND SUBPARAGRAPHS a) THRU f) AND REPLACE WITH THE FOLLOWING:

"Class 1 surface finish shall be applied to all surfaces as a preparation for Class 2 surface finish."

IN **303-1.9.3 Class 1 Surface Finish**, LAST PARAGRAPH, AFTER THE FIRST SENTENCE, ADD THE FOLLOWING:

"After completion of the ordinary surface finish, bulges which exceed the tolerance for a true flat surface of 1/4-inch in any 10 foot length in any direction shall be removed by chipping or bushhammering and the surface repaired with mortar as described for ordinary surface finish."

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IN **303-1.9.4 Class 2 Surface Finish**, DELETE ALL PARAGRAPHS AND REPLACE WITH THE FOLLOWING:

"Upon completion of the Class 1 surface finish (the preparation finish for Class 2 surface finish), and after the concrete has been pre-dampened, a slurry consisting of 1-part cement (including appropriate quantity of white cement) and 1 1/2 parts sand passing the No. 16 sieve, by damp loose volume, shall be spread over the surface with clean burlap pads or sponge rubber floats. Any surplus shall be removed by scraping and then rubbing with clean burlap.

Class 2 surface finish shall be the final finish for the following surfaces, which includes all concrete exposed to view:

- 1) All exposed vertical surfaces of walkways and walls above finished ground and to at least one foot below finished ground.



- 2) All exposed vertical surfaces of walkways and walls above normal water level and to at least one foot below normal water level in all tanks not covered.
- 3) All exposed interior surfaces of walls and stairs, galleries, stairwells, pumping plant dry wells and access openings."

AFTER **303-1.9.4 Class 2 Surface Finish**, ADD THE FOLLOWING:

**"303-1.9.5 Flatwork Finish.** All slabs and exposed horizontal surfaces shall be finished with a steel trowel. The steel trowel finish shall be an integral finish obtained by troweling with a steel trowel after the surface has been floated and allowed to stand until all water sheen has disappeared. Final troweling shall be done after the concrete has hardened sufficiently to prevent drawing moisture and fine materials to the surface and when the concrete is sufficiently hard that no mortar accumulates on the trowel. Cement or mixtures of cement and sand shall not be spread on surfaces to absorb excess water or to stiffen the concrete. Troweling shall produce a dense, smooth, impervious surface, free from defects and blemishes. Final troweling shall be applied in a rotary pattern to achieve a sweat finish."

IN **303-1.10 Curing**, DELETE THE FOURTH PARAGRAPH AND REPLACE WITH THE FOLLOWING:

"The use of plastic sheeting to cover the surface shall be submitted to the District for approval. When the surface is covered with plastic sheeting, it shall remain covered for at least fourteen (14) consecutive days. The plastic sheeting shall be minimum 6 mil thickness, reinforced, transparent plastic sheet vapor barrier. The plastic sheeting shall be laid with edges lapped not less than 6 inches and taped. The perimeter of the plastic sheet vapor barrier shall be completely sealed in a manner acceptable to the Engineer. The vapor barrier shall be maintained in a sealed condition and any damage to the vapor barrier shall be immediately repaired as directed by the Engineer. The Contractor's submittal shall include the method of maintaining the plastic sheeting in place."

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IN **303-4.1.2 Construction**, FOURTH PARAGRAPH, DELETE THE SECOND SENTENCE AND REPLACE WITH THE FOLLOWING:

"All concrete block units and any partially laid walls which become wet during the construction shall be permitted to dry until such time that sufficient bond between the mortar and masonry units is accomplished, before recommencing work."

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IN **303-4.1.3 Placing Reinforcing Steel**, DELETE THE FIRST PARAGRAPH, AND REPLACE WITH THE FOLLOWING:

"Before placing reinforcing steel, the Contractor shall submit a reinforcing steel placement drawing and bar list to show the reinforcing steel to be placed in accordance with the Contract Documents and as specified below:

- 1) Reinforcing steel placement drawing shall show plans and sections detailing the size, spacing, and location of the bars in the structure. The drawings shall be prepared in accordance with the "Manual of Standard Practice" of the Concrete Reinforcing Steel Institute, unless specified or shown otherwise on the Plans or Special Provisions. In cases of conflict, the most stringent shall govern.

- 2) Bar list prepared from the placing drawing used in cutting, bending, tagging, and shipping shall show the number of pieces, size, length, grade of steel, mark of bars, and bending details of all bent bars. The bar list shall be a complete summary of materials required. The bar list shall be submitted with the reinforcing steel placement drawings.

Unless shown otherwise on the Plans, splices shall be lapped a minimum of 40 diameters, except column dowels. Column dowels shall lap 60 diameters. "

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IN **304-1.1.1 Shop Drawings**, SECOND PARAGRAPH, DELETE THE FIRST SENTENCE AND REPLACE WITH THE FOLLOWING:

"The Contractor shall furnish to the Engineer, before commencement of the Work, detailed drawings of the structure to be built. "

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IN **304-1.1.2 Falsework Plans**, DELETE THE PARAGRAPH AND REPLACE WITH THE FOLLOWING:

"Falsework shall comply with Article 29, Section 1717 of the Construction Safety Orders issued by the Division of Occupational Safety and Health."

IN **304-1.3 Inspection**, DELETE THE FIRST PARAGRAPH AND REPLACE WITH THE FOLLOWING:

"An authorized representative of the Engineer may examine the metals and metal items to be fabricated before they are worked in the shop and may exercise constant surveillance over the Work during its progress with full power to reject all materials or workmanship not conforming to the Plans and Specifications.

An independent inspector acceptable to the Engineer shall be retained by the Contractor to inspect all materials and workmanship. The inspector shall be certified by the American Welding Society (AWS) and the County of Los Angeles Building Department as a Special Inspector. All inspection reports shall be furnished by the inspector to the Engineer in a timely manner for acceptance by the Engineer prior to shipping from the shop or access to the work is removed, restricted or eliminated for both shop and field work. The Contractor is responsible for the cost of all inspection.

In lieu of a special inspector, a certificate of compliance from an "Approved Shop" performing shop fabrication shall be furnished to the Engineer for acceptance prior to shipment of the assemblies. The "Approved Shop" shall be certified by the City of Los Angeles Building Department in the appropriate category for the work."

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IN **304-1.5.5 Assembling Steel. c) Field Work**, AT THE BEGINNING OF THE FIRST PARAGRAPH, ADD THE FOLLOWING:

"Steel erection shall comply with 29 CFR Part 1926, Safety Standards for Steel Erection unless specified or shown otherwise in the Plans or Special Provisions. In cases of conflict, the most stringent shall govern. "

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IN **304-1.5.7 Bolted Connections**, IN THE FIFTH PARAGRAPH ADD THE FOLLOWING:

"All high strength steel bolted assemblies shall be 100 percent inspected by a Special Inspector approved by the Engineer. The inspector shall be certified by the County of Los Angeles Building Department as a Special Inspector. A written report of each special inspection shall be submitted to the Engineer within five (5) working days of the inspection. All cost for inspection shall be the responsibility of the Contractor."

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IN **304-1.7 Bearings and Anchorage**, AT THE END OF THE FIRST PARAGRAPH ADD THE FOLLOWING:

"All concrete and masonry anchors shall have a minimum embedment depth of eight (8) bolt diameters."

IN **304-1.9 Welding**, DELETE THE FIRST AND SECOND PARAGRAPHS AND REPLACE WITH THE FOLLOWING:

"All welding shall conform to the requirements of American Welding Society (AWS) Structural Welding Codes or national standards which include, but is not limited to, the ASME Codes, as appropriate for the application, unless noted otherwise, and these Specifications. The latest edition shall be used. In cases of conflict the most stringent requirement shall apply. Compliance shall be in accordance with, but is not limited to, the partial list of AWS Codes below.

Structural Welding Code	ANSI/AWS Standard
Steel	D1.1
Aluminium	D1.2
Sheet Steel	D1.3
Reinforcing Steel	D1.4
Stainless Steel	D1.6

The welder shall be certified by AWS and the City of Los Angeles Building Department. For welding under ASME or other national standards, the welder shall be certified in accordance with the appropriate standards.

Inspection of welding made to control the quality of welds and workmanship shall be performed in accordance with the requirements of the AWS and national standards. An independent inspection agency or laboratory acceptable to the Engineer shall perform the inspection. The inspector shall be certified by AWS and the County of Los Angeles Building Department. All welds shall be 100 percent visually inspected. Welds in material 1 inch thick and thicker shall be inspected using radiographic, ultrasonic, and magnetic particle techniques. All non-destructive testing of welds (which include but is not limited to visual, radiographic, ultrasonic, magnetic particle and liquid penetrant techniques) that are designated in the Contract Documents and these Specifications shall be the Contractor's responsibility. The cost of re-inspection of defective welds that are repaired shall also be borne by the Contractor. A written report of each inspection shall be submitted to the Engineer within five (5) working days of the inspection."

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IN **304-3.2 Fence Construction**, DELETE THE FIFTH PARAGRAPH AND REPLACE WITH THE FOLLOWING:

"Unless otherwise specified, all fence shall be installed with top and bottom tension wires or rails."

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IN **306-1.1.1 General**, FIRST PARAGRAPH, FIRST SENTENCE, DELETE THE WORDS "For the purpose of shoring or bracing, a".

IN **306-1.1.1 General**, SECOND PARAGRAPH, ADD THE WORDS "insertion pits" AFTER THE WORDS "thrust blocks,".

IN **306-1.1.1 General**, ADD THE FOLLOWING TO THE END:

"Unless otherwise allowed by the Engineer, the Contractor shall commence construction at the lower end of the Project defined on the Plans as 'BEGINNING OF CONSTRUCTION' and shall proceed up grade in a continuous operation. The Contractor shall not have open excavation at more than one location unless required on the Plans or authorized by the Engineer."

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IN **306-1.1.2 Maximum Length of Open Trench**, DELETE THE FIRST PARAGRAPH AND REPLACE WITH THE FOLLOWING:

"Except as authorized by the Engineer, the trench at the end of each day shall not be excavated more than 25 feet in advance of the pipe laid that day, nor left unbackfilled for more than 25 feet where pipe has been laid.

Unless otherwise allowed by the Engineer, the Contractor shall complete construction at each location including the base course of the final resurfacing within thirty (30) calendar days after commencement of construction at the location. The final course of resurfacing shall be completed within sixty (60) calendar days after commencement of construction at each location. Completion of construction shall include all work required on the Plans and in the Specifications, including manholes, house connections, planting, and replacement or repair of damaged surface improvements. Failure on the part of the Contractor to complete construction at each location, including final resurfacing, within the time limit specified may result in a directive from the Engineer to cease progress on any or all parts of the Work under Contract until the past due work is completed and progress payments may be withheld. No additional compensation will be allowed as a result of such directive.

Irrespective of the requirements as stated above, unless otherwise authorized by the Engineer, the maximum length of trench without the base course of the final resurfacing shall not exceed 2,000 linear feet at any one time and the maximum length of trench without the final course of final resurfacing shall not exceed 5,000 linear feet at any one time."

IN **306-1.1.3 Maximum and Minimum Width of Trench**, DELETE THE FIRST, FOURTH AND FIFTH PARAGRAPHS AND REPLACE THE FIRST PARAGRAPH WITH THE FOLLOWING:

"Unless otherwise stated on the Plans or Special Provisions, the maximum allowable width of trench for vitrified clay pipe, including the width required for sheeting measured at the top of the pipe, shall be as shown in the following tables. Values for the maximum allowable trench width may not be interpolated. Unless otherwise permitted by the Engineer, if the actual depth of cover over pipe is in between the depths of cover shown, the trench width value of the greater depth of cover shall be used. The maximum trench width for reinforced concrete pipe shall be as shown on the Plans or as specified in the Special Provisions.

**TABLE 306-1.1.3(A)**

**EXTRA STRENGTH VITRIFIED CLAY PIPE  
 MAXIMUM ALLOWABLE TRENCH WIDTH IN INCHES  
 WITHOUT SPECIAL BEDDING**

Depth of Cover Over Pipe, ft.	Pipe Size, in.												
	8	10	12	15	18	21	24	27	30	33	36	39	42
7	*	*	*	*	*	*	*	*	*	*	*	*	*
8	*	*	*	*	*	*	*	*	*	*	*	78	82
9	*	*	*	*	*	*	*	61	63	66	71	73	77
10	*	*	*	39	43	49	54	57	60	62	67	69	73
11	*	*	33	38	42	47	52	55	57	60	64	66	69
12	*	31	32	36	40	45	50	53	55	57	61	63	66
13	29	30	32	36	39	44	48	51	53	**	59	**	**
14	28	30	31	35	38	43	47	50	52	**	**	**	**
15	28	29	31	34	38	42	46	**	**	**	**	**	**
16	27	29	30	34	**	41	45	**	**	**	**	**	**
17	27	29	30	**	**	**	**	**	**	**	**	**	**
18	27	28	30	**	**	**	**	**	**	**	**	**	**
19	27	28	**	**	**	**	**	**	**	**	**	**	**
20	27	28	**	**	**	**	**	**	**	**	**	**	**
21	26	28	**	**	**	**	**	**	**	**	**	**	**
22	26	28	**	**	**	**	**	**	**	**	**	**	**
23	26	28	**	**	**	**	**	**	**	**	**	**	**
24 to 40	26	**	**	**	**	**	**	**	**	**	**	**	**

Note: \* No limit on width of trench. \*\* Not permitted.

**TABLE 306-1.1.3(B)**

**EXTRA STRENGTH VITRIFIED CLAY PIPE  
MAXIMUM ALLOWABLE TRENCH WIDTH IN INCHES  
WITH CRUSHED ROCK BEDDING**

Depth of Cover Over Pipe, ft.	Pipe Size, in.												
	8	10	12	15	18	21	24	27	30	33	36	39	42
9	*	*	*	*	*	*	*	*	*	*	*	*	*
10	*	*	*	*	*	*	*	*	*	73	*	81	85
11	*	*	*	*	*	*	*	64	66	69	74	77	80
12	*	*	*	42	46	52	57	61	63	66	71	73	77
13	*	*	36	40	45	50	55	59	61	63	68	70	73
14	*	33	35	39	44	49	53	57	59	61	65	68	71
15	*	33	34	39	43	47	52	55	57	60	63	65	68
16	31	32	34	38	42	46	51	54	56	58	62	64	66
17	30	32	34	37	41	46	50	53	55	57	60	**	**
18	30	32	33	37	41	45	49	52	54	**	59	**	**
19	30	31	33	36	40	44	48	51	53	**	**	**	**
20	30	31	33	36	40	44	47	50	52	**	**	**	**
21	29	31	32	36	39	43	47	49	**	**	**	**	**
22	29	31	32	36	39	43	46	49	**	**	**	**	**
23	29	31	32	35	39	42	46	**	**	**	**	**	**
24	29	30	32	35	38	42	45	**	**	**	**	**	**
25	29	30	32	35	38	42	45	**	**	**	**	**	**
26	29	30	32	35	38	41	45	**	**	**	**	**	**
27	29	30	31	35	38	41	45	**	**	**	**	**	**
28	29	30	31	35	38	41	**	**	**	**	**	**	**
29	29	30	31	34	**	41	**	**	**	**	**	**	**
30	29	30	31	34	**	41	**	**	**	**	**	**	**
31	29	30	31	34	**	41	**	**	**	**	**	**	**
32 to 40	28	30	31	34	**	**	**	**	**	**	**	**	**

Note: \* No limit on width of trench. \*\* Not permitted.

**TABLE 306-1.1.3(C)**

**EXTRA STRENGTH VITRIFIED CLAY PIPE  
 MAXIMUM ALLOWABLE TRENCH WIDTH IN INCHES  
 WITH CONCRETE CRADLE TYPE 1 OR 1A PER S-a-212**

Depth of Cover Over Pipe, ft.	Pipe Size, in.												
	8	10	12	15	18	21	24	27	30	33	36	39	42
13	*	*	*	*	*	*	*	*	*	*	*	*	*
14	*	*	*	*	*	*	*	*	*	*	*	88	93
15	*	*	*	*	*	*	*	*	74	77	82	85	89
16	*	*	*	*	53	*	*	69	72	74	79	82	86
17	*	*	*	47	52	57	63	67	70	72	77	80	83
18	*	*	41	46	51	56	62	65	68	71	75	78	81
19	*	*	40	45	50	55	60	64	66	69	73	76	79
20	*	38	40	45	49	54	59	63	65	68	72	74	77
21	*	38	40	44	48	53	58	62	64	66	70	73	76
22	35	37	39	44	48	53	58	61	63	65	69	71	74
23	35	37	39	43	47	52	57	60	62	64	68	70	73
24	35	37	39	43	47	52	56	59	61	63	67	69	72
25	35	37	38	43	47	51	56	58	61	63	66	68	71
26	35	36	38	42	46	51	55	58	60	62	65	67	70
27	35	36	38	42	46	50	55	57	59	61	65	67	69
28	34	36	38	42	46	50	54	57	59	61	64	66	69
29	34	36	38	42	45	50	54	56	58	60	64	65	68
30	34	36	38	41	45	49	53	56	58	60	63	65	67
31	34	36	37	41	45	49	53	56	58	60	63	64	67
32	34	36	37	41	45	49	53	55	57	59	62	64	66
33	34	36	37	41	45	49	53	55	57	59	62	64	66
34	34	36	37	41	44	49	52	55	57	58	61	63	**
35	34	36	37	41	44	48	52	55	56	58	61	63	**
36	34	35	37	41	44	48	52	54	56	58	61	63	**
37	34	35	37	41	44	48	52	54	56	58	61	**	**
38	34	35	37	41	44	48	52	54	56	57	60	**	**
39	34	35	37	41	44	48	51	54	56	57	60	**	**
40	34	35	37	40	44	48	51	54	55	57	60	**	**

Note: \* No limit on width of trench. \*\* Not permitted.



**TABLE 306-1.1.3(D)**  
**EXTRA STRENGTH VITRIFIED CLAY PIPE**  
**MAXIMUM ALLOWABLE TRENCH WIDTH IN INCHES**  
**WITH CONCRETE CRADLE TYPE 2 OR 2A PER S-a-212**

Depth of Cover Over Pipe, ft.	Pipe Size, in.												
	8	10	12	15	18	21	24	27	30	33	36	39	42
19	*	*	*	*	*	*	*	*	*	*	*	*	*
20	*	*	*	*	*	*	*	*	*	*	*	97	101
21	*	*	*	*	*	*	*	*	*	86	91	94	98
22	*	*	*	*	*	*	*	*	81	84	89	92	96
23	*	*	*	*	60	*	*	76	79	82	87	90	94
24	*	*	*	53	59	65	71	75	78	81	86	89	93
25	*	*	*	53	58	64	70	74	77	80	84	87	91
26	*	*	47	52	58	63	69	73	76	79	83	86	90
27	*	*	47	52	57	63	68	72	75	78	82	85	88
28	*	44	46	52	57	62	68	71	74	77	81	84	87
29	*	44	46	51	56	62	67	71	73	76	80	83	86
30	*	44	46	51	56	61	67	70	73	75	79	82	85
31	42	44	46	51	55	61	66	69	72	74	79	81	84
32	42	44	46	50	55	60	66	69	71	74	78	80	83
33	41	43	45	50	55	60	65	68	71	73	77	79	83
34	41	43	45	50	55	60	65	68	70	73	77	79	82
35	41	43	45	50	54	59	64	68	70	72	76	78	81
36	41	43	45	50	54	59	64	67	69	72	75	78	81
37	41	43	45	50	54	59	64	67	69	71	75	77	80
38	41	43	45	49	54	59	63	66	69	71	75	77	80
39	41	43	45	49	54	58	63	66	68	71	74	76	79
40	41	43	45	49	53	58	63	66	68	70	74	76	79

Note: \* No limit on width of trench. \*\* Not permitted.

**TABLE 306-1.1.3(E)**

EXTRA STRENGTH VITRIFIED CLAY PIPE  
 MAXIMUM ALLOWABLE TRENCH WIDTH IN INCHES  
 WITH CONCRETE ENCASEMENT TYPE 1 PER S-a-212

Depth of Cover Over Pipe, ft.	Pipe Size, in.												
	8	10	12	15	18	21	24	27	30	33	36	39	42
26	*	*	*	*	*	*	*	*	*	*	*	*	*
27	*	*	*	*	*	*	*	*	*	*	*	104	108
28	*	*	*	*	*	*	*	*	*	93	99	102	107
29	*	*	*	*	*	*	*	*	89	92	98	101	105
30	*	*	*	*	*	*	*	85	88	91	96	99	104
31	*	*	*	*	66	73	79	84	87	90	95	98	102
32	*	*	*	60	66	72	79	83	86	89	94	97	101
33	*	*	*	59	65	72	78	82	85	88	93	96	100
34	*	*	53	59	65	71	77	81	84	87	92	95	99
35	*	*	53	59	64	71	77	81	84	87	91	94	98
36	*	*	53	59	64	70	76	80	83	86	91	93	97
37	*	50	53	58	64	70	76	80	82	85	90	93	96
38	*	50	53	58	63	69	75	79	82	85	89	92	96
39	*	50	52	58	63	69	75	79	81	84	89	91	95
40	*	50	52	58	63	69	75	78	81	84	88	91	94

Note: \* No limit on width of trench. \*\* Not permitted.

**TABLE 306-1.1.3(F)**

EXTRA STRENGTH VITRIFIED CLAY PIPE  
 MAXIMUM ALLOWABLE TRENCH WIDTH IN INCHES  
 WITH CONCRETE ENCASEMENT TYPE 1A PER S-a-212

Depth of Cover Over Pipe, ft.	Pipe Size, in.												
	8	10	12	15	18	21	24	27	30	33	36	39	42
29	*	*	*	*	*	*	*	*	*	*	*	*	*
30	*	*	*	*	*	*	*	*	*	*	*	108	113
31	*	*	*	*	*	*	*	*	*	97	*	107	111
32	*	*	*	*	*	*	*	*	93	96	102	105	110
33	*	*	*	*	*	*	*	*	92	95	101	104	108
34	*	*	*	*	*	*	*	88	91	94	100	103	107
35	*	*	*	*	69	76	83	87	90	94	99	102	106
36	*	*	*	63	69	76	82	86	90	93	98	101	105
37	*	*	*	63	68	75	82	86	89	92	97	100	104
38	*	*	*	62	68	75	81	85	88	91	96	99	103
39	*	*	56	62	68	74	81	85	88	91	96	99	102
40	*	*	56	62	67	74	80	84	87	90	95	98	102

Note: \* No limit on width of trench. \*\* Not permitted.

**TABLE 306-1.1.3(G)**

**HIGH STRENGTH VITRIFIED CLAY PIPE  
MAXIMUM ALLOWABLE TRENCH WIDTH IN INCHES  
WITHOUT SPECIAL BEDDING**

Depth of Cover Over Pipe, ft.	Pipe Size, in.												
	8	10	12	15	18	21	24	27	30	33	36	39	42
8	*	*	*	*	*	*	*	*	*	*	*	*	*
9	*	*	*	*	*	*	*	*	*	*	*	80	84
10	*	*	*	*	*	*	*	62	65	68	72	76	79
11	*	*	*	40	45	50	56	59	62	65	68	72	75
12	*	*	35	39	44	48	54	57	60	62	65	68	71
13	*	32	34	38	42	47	52	55	57	59	63	66	68
14	30	31	33	37	41	46	50	53	56	58	61	63	66
15	29	31	33	36	40	44	49	52	54	56	59	**	**
16	29	30	32	36	40	44	48	50	53	**	**	**	**
17	29	30	32	35	39	43	47	49	52	**	**	**	**
18	28	30	32	35	39	42	46	**	**	**	**	**	**
19	28	29	31	35	38	42	46	**	**	**	**	**	**
20	28	29	31	34	38	41	45	**	**	**	**	**	**
21	28	29	31	34	**	41	**	**	**	**	**	**	**
22	28	29	31	34	**	**	**	**	**	**	**	**	**
23	28	29	31	34	**	**	**	**	**	**	**	**	**
24	27	29	31	**	**	**	**	**	**	**	**	**	**
25	27	29	30	**	**	**	**	**	**	**	**	**	**
26	27	29	30	**	**	**	**	**	**	**	**	**	**
27 to 40	27	28	30	**	**	**	**	**	**	**	**	**	**

Note: \* No limit on width of trench. \*\* Not permitted.

**TABLE 306-1.1.3(H)**

**HIGH STRENGTH VITRIFIED CLAY PIPE  
MAXIMUM ALLOWABLE TRENCH WIDTH IN INCHES  
WITH CRUSHED ROCK BEDDING**

Depth of Cover Over Pipe, ft.	Pipe Size, in.												
	8	10	12	15	18	21	24	27	30	33	36	39	42
10	*	*	*	*	*	*	*	*	*	*	*	*	*
11	*	*	*	*	*	*	*	*	*	*	*	84	87
12	*	*	*	*	*	*	*	65	69	72	76	79	83
13	*	*	*	43	48	54	60	63	66	69	73	76	79
14	*	*	38	42	47	52	58	61	64	66	70	73	76
15	*	35	37	41	46	51	56	59	62	64	68	71	74
16	*	34	36	40	45	49	55	57	60	62	66	69	71
17	32	34	36	40	44	48	53	56	59	61	64	67	69
18	32	33	35	39	43	48	52	55	58	59	63	65	68
19	31	33	35	39	43	47	51	54	56	58	61	64	66
20	31	33	35	38	42	46	51	53	56	57	60	63	**
21	31	32	34	38	42	46	50	52	55	56	59	**	**
22	31	32	34	38	41	45	49	52	54	56	**	**	**
23	31	32	34	37	41	45	49	51	53	**	**	**	**
24	30	32	34	37	41	44	48	51	53	**	**	**	**
25	30	32	34	37	41	44	48	50	52	**	**	**	**
26	30	32	34	37	40	44	48	50	52	**	**	**	**
27	30	31	33	37	40	43	47	49	**	**	**	**	**
28	30	31	33	36	40	43	47	49	**	**	**	**	**
29	30	31	33	36	40	43	47	49	**	**	**	**	**
30	30	31	33	36	40	43	46	**	**	**	**	**	**
31	30	31	33	36	39	43	46	**	**	**	**	**	**
32	30	31	33	36	39	42	46	**	**	**	**	**	**
33	30	31	33	36	39	42	46	**	**	**	**	**	**
34	30	31	33	36	39	42	46	**	**	**	**	**	**
35	30	31	33	36	39	42	46	**	**	**	**	**	**
36 to 40	30	31	33	36	39	42	45	**	**	**	**	**	**

Note: \* No limit on width of trench. \*\* Not permitted.

**TABLE 306-1.1.3(I)**

**HIGH STRENGTH VITRIFIED CLAY PIPE  
 MAXIMUM ALLOWABLE TRENCH WIDTH IN INCHES  
 WITH CONCRETE CRADLE TYPE 1 OR 1A PER S-a-212**

Depth of Cover Over Pipe, ft.	Pipe Size, in.												
	8	10	12	15	18	21	24	27	30	33	36	39	42
15	*	*	*	*	*	*	*	*	*	*	*	*	*
16	*	*	*	*	*	*	*	*	*	80	85	89	93
17	*	*	*	*	*	*	*	72	75	78	83	86	90
18	*	*	*	*	54	60	66	70	73	76	80	84	87
19	*	*	*	48	53	59	65	68	72	74	78	82	85
20	*	*	43	47	53	58	64	67	70	73	77	80	83
21	*	40	42	47	52	57	62	66	69	71	75	78	81
22	*	39	42	46	51	56	62	65	68	70	74	77	80
23	*	39	42	46	51	55	61	64	67	69	72	75	78
24	37	39	41	45	50	55	60	63	66	68	71	74	77
25	37	38	41	45	50	54	59	62	65	67	70	73	76
26	36	38	41	45	49	54	59	61	64	66	70	72	75
27	36	38	40	44	49	53	58	61	63	65	69	71	74
28	36	38	40	44	49	53	58	60	63	65	68	71	73
29	36	38	40	44	48	52	57	60	62	64	67	70	72
30	36	38	40	44	48	52	57	59	62	64	67	69	72
31	36	37	40	44	48	52	56	59	61	63	66	69	71
32	36	37	40	43	48	52	56	59	61	63	66	68	70
33	36	37	40	43	47	51	56	58	61	62	65	68	70
34	36	37	39	43	47	51	55	58	60	62	65	67	69
35	36	37	39	43	47	51	55	58	60	62	65	67	69
36	35	37	39	43	47	51	55	57	60	61	64	66	69
37	35	37	39	43	47	51	55	57	59	61	64	66	68
38	35	37	39	43	47	50	55	57	59	61	64	66	68
39	35	37	39	43	47	50	54	57	59	61	63	65	68
40	35	37	39	43	46	50	54	57	59	60	63	65	67

Note: \* No limit on width of trench. \*\* Not permitted.

**TABLE 306-1.1.3(J)**

HIGH STRENGTH VITRIFIED CLAY PIPE  
 MAXIMUM ALLOWABLE TRENCH WIDTH IN INCHES  
 WITH CONCRETE CRADLE TYPE 2 OR 2A PER S-a-212

Depth of Cover Over Pipe, ft.	Pipe Size, in.												
	8	10	12	15	18	21	24	27	30	33	36	39	42
21	*	*	*	*	*	*	*	*	*	*	*	*	*
22	*	*	*	*	*	*	*	*	*	*	*	99	103
23	*	*	*	*	*	*	*	*	*	88	93	97	101
24	*	*	*	*	*	*	*	*	84	87	92	95	99
25	*	*	*	*	*	*	*	79	83	85	90	94	97
26	*	*	*	*	62	67	74	78	81	84	89	92	96
27	*	*	*	55	61	67	73	77	80	83	87	91	94
28	*	*	*	55	60	66	72	76	79	82	86	90	93
29	*	*	49	54	60	65	72	75	78	81	85	89	92
30	*	46	49	54	59	65	71	74	78	80	84	87	91
31	*	46	49	54	59	64	70	74	77	79	83	87	90
32	*	46	49	53	59	64	70	73	76	79	83	86	89
33	*	45	48	53	58	63	69	72	76	78	82	85	88
34	43	45	48	53	58	63	69	72	75	77	81	84	87
35	43	45	48	53	58	63	68	71	74	77	80	83	86
36	43	45	48	52	57	62	68	71	74	76	80	83	86
37	43	45	48	52	57	62	68	71	74	76	79	82	85
38	43	45	48	52	57	62	67	70	73	75	79	82	84
39	43	45	47	52	57	62	67	70	73	75	78	81	84
40	43	45	47	52	57	61	67	70	72	75	78	81	83

Note: \* No limit on width of trench. \*\* Not permitted.

**TABLE 306-1.1.3(K)**

**HIGH STRENGTH VITRIFIED CLAY PIPE  
 MAXIMUM ALLOWABLE TRENCH WIDTH IN INCHES  
 WITH CONCRETE ENCASEMENT TYPE 1 PER S-a-212**

Depth of Cover Over Pipe, ft.	Pipe Size, in.												
	8	10	12	15	18	21	24	27	30	33	36	39	42
28	*	*	*	*	*	*	*	*	*	*	*	*	*
29	*	*	*	*	*	*	*	*	*	*	*	*	112
30	*	*	*	*	*	*	*	*	*	*	*	107	111
31	*	*	*	*	*	*	*	*	*	96	101	105	109
32	*	*	*	*	*	*	*	*	92	95	100	104	108
33	*	*	*	*	*	*	*	87	91	94	99	103	107
34	*	*	*	*	69	75	82	86	90	93	98	102	106
35	*	*	*	*	69	75	82	86	90	92	97	101	104
36	*	*	*	62	68	74	81	85	89	92	96	100	103
37	*	*	*	62	68	74	81	84	88	91	95	99	103
38	*	*	56	61	67	73	80	84	87	90	95	98	102
39	*	*	56	61	67	73	80	83	87	90	94	97	101
40	*	52	56	61	67	73	79	83	86	89	93	97	100

Note: \* No limit on width of trench. \*\* Not permitted.



**TABLE 306-1.1.3(L)**

**HIGH STRENGTH VITRIFIED CLAY PIPE  
MAXIMUM ALLOWABLE TRENCH WIDTH IN INCHES  
WITH CONCRETE ENCASEMENT TYPE 1A PER S-a-212**

Depth of Cover Over Pipe, ft.	Pipe Size, in.												
	8	10	12	15	18	21	24	27	30	33	36	39	42
32	*	*	*	*	*	*	*	*	*	*	*	*	*
33	*	*	*	*	*	*	*	*	*	*	*	112	116
34	*	*	*	*	*	*	*	*	*	101	106	110	115
35	*	*	*	*	*	*	*	*	*	100	105	109	113
36	*	*	*	*	*	*	*	*	96	99	104	108	112
37	*	*	*	*	*	*	*	91	95	98	103	107	111
38	*	*	*	*	72	79	*	90	94	97	102	106	110
39	*	*	*	*	72	78	86	90	94	97	101	105	109
40	*	*	*	65	72	78	85	89	93	96	101	104	108

Note: \* No limit on width of trench. \*\* Not permitted.

Crushed rock bedding shall be 1/2 inch crushed rock as defined in 200-1.2. The crushed rock shall extend from the bottom of the pipe to 12 inches above the top of the pipe and shall be densified by mechanical compaction or vibration, unless otherwise approved by the Engineer. Crushed rock bedding shall be at the option of the Contractor and at his expense.

Unless otherwise stated on the Plans, the maximum allowable width of trench in undisturbed soil for all pipe other than vitrified clay pipe, including the width required for sheeting, measured at the top of the pipe or conduit, shall be the outside diameter of the pipe exclusive of bells or collars, plus 16 inches.

The width of trench for all pipes or conduits shall be such that there will be a minimum of 4 inches clear between the outer surface of the pipe or conduit and the excavation or the trench sheeting."

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IN **306-1.1.6 Bracing Excavations**, DELETE THE THIRD PARAGRAPH AND REPLACE WITH THE FOLLOWING:

"Soldier piles shall be installed in drilled holes. Driving soldier piles is not permitted without written approval from the Engineer. Sheet piling shall only be used with prior written approval by the Engineer. The Contractor shall be responsible for the removal of all shoring and bracing materials used during trenching and excavations once the work is completed. During excavating, installation and removal of the excavation shoring or bracing, the Contractor shall exercise extreme care to avoid damage to utilities. The Contractor shall be responsible for repair of all damaged utilities."

AFTER **306-1.1.6 Bracing Excavations**, ADD THE FOLLOWING:

**"306-1.1.7 House Connection Sewers.** Where an existing house connection sewer crosses the trench excavation and is not in actual conflict with the proposed sewer, it shall be temporarily maintained in place by the Contractor. Prior to placing final backfill and compaction, the house connection sewer shall be protected from damage due to settlement of the backfill in accordance with subparagraphs (a), (b), or (c) below.

Where an existing house connection sewer crosses the trench excavation and is in actual conflict with the proposed sewer, it shall be temporarily reconstructed to new line and grade to clear the proposed sewer, or connected to the proposed sewer as directed by the Engineer or shown on the Plans. Prior to placing final backfill and compaction, the temporary house connection sewer shall be permanently reconstructed and protected from damage due to settlement of the backfill in accordance with subparagraphs (a), (b), or (c) below.

- (a) After construction of the proposed sewer, the Contractor shall consolidate the material beneath the existing or temporary house connection sewer by mechanically compacting to a relative density of 90 percent, remove the existing or temporary house connection sewer and 8 inches of subbedding material 18 inches in width, then place sufficient compacted crushed aggregate base material on the subgrade to allow the new house connection sewer to be relayed on the proper grade. The permanent house connection sewer shall be Class 52 ductile iron pipe, and shall be equal in length to one and one half times the trench width at the elevation and line of the house connection sewer; however, in no case shall it extend less than 18 inches into the undisturbed trench wall at either end. Connection to the existing house connection sewer shall be by a coupling approved by the Engineer. All voids beyond the limits of the trench which are under the reconstructed house connection sewer shall be filled with 420-C-2000 concrete.
- (b) After construction of the proposed sewer, the Contractor shall consolidate the material beneath the existing or temporary house connection sewer by mechanically compacting to a relative density of 90 percent. The Contractor shall then reconstruct the house connection sewer on a reinforced concrete beam in accordance with the Districts' Standard Drawing S-a-227. Forms used for a beam cast in place shall be approved by the Engineer.
- (c) If the clear distance between the top of the proposed sewer and the house connection sewer is 3 feet or less, the Contractor shall support the house connection sewer in accordance with the Districts' Standard Drawing S-a-217. If the clear distance is more than 3 feet, the Contractor may support the house connection sewer in accordance with the Districts' Standard Drawing S-a-217 in lieu of (a) or (b) above.

Payment for reconstruction of house connection sewers in actual conflict with the proposed sewer and for the protection and support of house connection sewers not shown on the Plans shall be made under the bid item established for that purpose. No payment will be made for maintaining, repairing, or permanently supporting house connection sewers shown on the Plans which cross the excavation but which do not have to be reconstructed due to conflict with the proposed sewer. House connections which have been removed from service shall be bulkheaded.

**306-1.1.8 Dewatering.** The Contractor shall submit a dewatering plan for approval per 2-5.3. All water encountered during construction shall be disposed of lawfully by the Contractor in manner such that it will not damage public or private property or create a nuisance or health menace. Water shall not be discharged to street surfaces, storm drains, or surface waters without a NPDES permit. Copies of the NPDES permit application forms and the regulations upon which the permit will be based shall be

obtained from the California Regional Water Quality Control Board. The District will pay for the permit application fee, if any. The Contractor shall invoice the District for the cost without any Contractor's markup and the Contractor will be reimbursed by purchase order. The Contractor shall allow a minimum sixty (60) days for the review and processing of the permit application. The Contractor shall comply with the requirements and conditions in the permit issued. A copy of the permit shall be submitted to the District for record. The District will provide water quality sampling and laboratory analysis of the water at the frequency required in the permit at no cost to the Contractor. The Contractor shall provide access for the District to obtain the water samples.

The Contractor shall furnish, install and operate pumps, pipes, and equipment of sufficient capacity to keep all excavations free from water while concrete or pipe is being placed, and until all concrete and mortar have set hard, unless otherwise authorized by the Engineer. The Contractor shall provide all means or facilities necessary to convey water to the pumps and to the point of discharge. The Contractor shall be aware that excessive dewatering may cause subsidence. The extent of the dewatering required for construction shall be determined solely by the Contractor. In addition, the Contractor shall be aware that the pipe may float due to water. The Contractor shall perform all work as deemed necessary to prevent the pipe from floating.

Except for the permit fee and the cost for sampling and laboratory analysis which will be paid for by the District, the Contractor shall be responsible for all costs for the dewatering operation, including pumping, storage, and desilting as required to meet the criteria for lawful disposal of the water."

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IN **306-1.2.1 Bedding**, DELETE ALL PARAGRAPHS AND REPLACE WITH THE FOLLOWING:

"Bedding is defined as that material surrounding and extending to one foot above the top of the pipe unless otherwise noted. Subbedding is defined as that material below the bottom of the pipe and supporting the pipe unless otherwise noted. Where concrete or rock is specified or used to cover the pipe, the top of the concrete or rock shall be considered as the top of the bedding. Bedding and subbedding for plastic pipe and fittings shall be per 306-1.2.1.3.

If soft, spongy, unstable, or similar other material or rock, shale or other hard unyielding material is encountered at the grade of the bottom of the pipe which, in the opinion of the Engineer, is not suitable subbedding material for the pipe, the unsuitable material shall be removed to a depth ordered by the Engineer and replaced with suitable densified subbedding material. If the necessity for such subbedding material has been caused by an act or failure to act on the part of the Contractor, or required for the control of the ground-water, the Contractor shall bear the expense of the additional excavation and subbedding. Otherwise, the additional subbedding will be paid for by the District under the appropriate bid item, if any, and if there is no appropriate bid item, under 3-2.2.3 or 3-3. Payment for densified subbedding shall be in full compensation for all expenses, including excavation and disposal of unsuitable subbedding material, furnishing, placing and compaction of the subbedding material, overhead and all other direct and indirect expenses. The quantity for payment shall be the computed weight or volume of densified subbedding based on the trench width of outside diameter of the pipe plus 16 inches and the thickness as ordered by the Engineer.

Unless otherwise indicated on the Plans or directed by the Engineer, the pipe shall be laid directly upon the undisturbed foundation material encountered in the trench bottom. Shaping of the trench bottom to fit the outside diameter of the pipe will not be required; however, the trench bottom shall be graded to provide firm and uniform bearing.

Unless otherwise specified, the bedding material for all pipe, except vitrified clay pipe, shall be the most granular native material from the excavation, free from stones and pieces of concrete and paving greater than 2 inches in diameter. Except where otherwise specified, bedding material for vitrified clay pipe shall be sand, crushed aggregate base (CAB), or, native free-draining granular material having a sand equivalent of not less than 30, and shall be free from stones greater than 3/4-inch in diameter, or other material approved by the Engineer. CAB, if used as bedding, shall meet the requirements as specified in 200-2.2 and conform to Table 200-2.2.2, except that the Percentage Passing the 3/4-inch Sieve Size shall be 100 percent. The District will also allow the use of crushed miscellaneous base (CMB) as bedding material. CMB, if used as bedding, shall meet the requirements as specified in 200-2.4 and conform to Table 200-2.4.2 (A) for "Fine" gradation, except that the Percentage Passing for 3/4-inch Sieve Size shall be 100 percent. The maximum allowable width of trench for vitrified clay pipe with CMB bedding shall comply with Table 306-1.1.3(A) or 306-1.1.3(G). The maximum trench width for rubber gasket reinforced concrete pipe with CMB bedding shall be the same as with normal bedding. All costs for the bedding material shall be absorbed in the pipe bid item.

Unless otherwise specified, whenever the Contractor is directed by the Engineer to place subbedding material, whether the Contractor is to bear the cost or the cost is to be paid by the District, the subbedding material shall be 1/2 inch crushed rock."

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IN **306-1.2.1.3 Installation of Plastic Pipe and Fittings**, DELETE THE THIRD PARAGRAPH AND TABLE 306-1.2.1.3(A) AND REPLACE WITH THE FOLLOWING:

"The bedding zone shall extend down to not less than 6 inches below the pipe or bell, whichever is lower in elevation. The bedding zone shall extend to not less than 12 inches above the pipe or bell, whichever is higher in elevation. For bedding zone width or minimum and maximum side clearance beyond the pipe or bell OD, see the Plans or Special Provisions. "

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IN **306-1.2.2 Pipe Laying**, SEVENTH PARAGRAPH, SECOND SENTENCE, DELETE THE WORD "bedding" AND REPLACE WITH THE WORD "subbedding".

IN **306-1.2.2 Pipe Laying**, EIGHTH PARAGRAPH, DELETE THE SECOND SENTENCE AND REPLACE WITH THE FOLLOWING:

"The maximum offset at any point of the joint shall be 1 percent of the inside diameter or 10mm (3/8-inch), whichever is smaller."

IN **306-1.2.2 Pipe Laying**, AFTER THE TENTH PARAGRAPH, ADD THE FOLLOWING:

"Unless otherwise allowed by the Engineer, exterior surfaces of any concrete pipe that is to be encased in concrete or embedded in a concrete structure manhole, shall be cleaned by sandblasting prior to concrete placement."

IN **306-1.2.3 Field Jointing of Clay Pipe**, ADD THE FOLLOWING TO THE END:

- "d) **Flexible Joints at Manholes and Structures.** A flexible joint shall be installed in the pipeline within 18 inches of the outside manhole or structure wall and an additional flexible joint shall be installed 2 feet from the first joint."

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IN **306-1.2.4 Installation, Field Jointing, and Inspection of Reinforced Concrete Pipe, (b) Tongue and Groove (T&G) Self-centering Joints**, DELETE THE THIRD PARAGRAPH AND REPLACE WITH THE FOLLOWING:

"Pipes used on curves shall have one or both ends beveled, or shall be pulled to provide a smooth curve. If there is any space between the extremities (outmost elements) of adjacent pipe, a reinforced concrete collar as shown on the Districts' Standard Drawings, Plans or as required by the Engineer, shall be provided at the Contractor's expense. When the pipe is under 21 inches in diameter, the joints shall be made by filling the outer joint space with mortar."

IN **306-1.2.4 Field Jointing of Reinforced Concrete Pipe, (b) Tongue and Groove Self-centering Joints**, FOURTH AND FIFTH PARAGRAPHS, FIRST SENTENCE, DELETE THE NUMBERS "600 mm (24 inches)" AND REPLACE WITH THE NUMBERS "530 mm (21 inches)".

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IN **306-1.2.9 Field Jointing of Solvent-Welded ABS and PVC Pipe**, SECOND PARAGRAPH, ADD THE FOLLOWING TO THE END:

"After cutting, the pipe ends shall be beveled in accordance with the manufacturer's printed instructions."

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IN **306-1.3.1 General**, FIRST PARAGRAPH, DELETE THE SECOND SENTENCE AND REPLACE WITH THE FOLLOWING:

"Backfill shall be considered as starting 12 inches above the pipe or conduit. All material below this point shall be considered as bedding and subbedding."

IN **306-1.3.1 General**, DELETE THE FOURTH PARAGRAPH.

IN **306-1.3.1 General**, ELEVENTH PARAGRAPH, FIRST SENTENCE, ADD THE WORDS "most granular native" BEFORE THE WORDS "material obtained from project excavations" AND DELETE THE WORD "may" AND REPLACE WITH THE WORD "shall".

IN **306-1.3.1 General**, FOURTEENTH PARAGRAPH, DELETE THE WORDS "or vibrated".

IN **306-1.3.1 General**, LAST PARAGRAPH, ADD THE FOLLOWING TO THE END:

"All costs shall be borne by the Contractor."

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IN **306-1.3.3 Jetted Backfill**, FIRST PARAGRAPH, DELETE THE SECOND SENTENCE AND REPLACE WITH THE FOLLOWING:

"Jetting shall only be utilized where specified or otherwise allowed by the Engineer."

IN **306-1.3.3 Jetted Backfill**, SECOND PARAGRAPH, DELETE SUBPARAGRAPHS 3), 4) AND 5) AND REPLACE WITH THE FOLLOWING:

- "3) The lift of backfill shall not be limited, provided the jet pipe used for the flooding is of sufficient length to extend from the ground surface or from the surface of the backfill to within 2 feet of the bottom of the lift being densified.
- 4) Where, in the opinion of the Engineer, the nature of the material excavated from the trench is generally unsuitable for densification with water, the unsuitable material shall be removed as ordered by the Engineer and replaced with an imported material having a sand equivalent equal to or greater than 20. The removal of the unsuitable material and import of a material with a sand equivalent of 20 or greater shall be paid for by the District under the appropriate bid item. If there is no appropriate bid item, payment shall be made in accordance with 3-2.2.3 or 3-3. Payment for removal of the unsuitable material shall be in full compensation for all expenses, including excavation and disposal of unsuitable material, furnishing, placing and densification of the imported material and all other direct and indirect expense. The quantity for payment shall be the computed weight or volume of densified imported material based on a trench width of outside diameter of the pipe plus 16 inches and thickness (depth) as ordered by the Engineer.

The backfill shall be allowed to thoroughly drain until the surface of the backfill is in a firm and unyielding condition prior to commencement of any subsequent improvements. The Engineer may require the Contractor, at the Contractor's expense, to provide a sump and pump to remove any accumulated water."

IN **306-1.3.3 Jetted Backfill**, SECOND PARAGRAPH, SUBPARAGRAPH 7), AFTER THE FIRST SENTENCE, ADD THE FOLLOWING TO THE END:

"A water truck shall not be used for jetting unless approved by the Engineer."

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IN **306-1.3.5 Jetted Bedding and Backfill Compaction Requirements**. DELETE HEADING AND ALL PARAGRAPHS AND REPLACE WITH THE FOLLOWING:

**"306-1.3.5 Backfilling Around Sewer Manholes and Structures.**

Unless otherwise specified or allowed by the Engineer, backfill around all sewer manholes and structures shall be a cement/sand slurry mix having 141 pounds of cement per cubic yard of slurry. The slurry backfill shall extend to undisturbed native soil or, if placed against compacted backfill material, shall extend a minimum of 2 feet beyond the manhole or structure outside wall; as directed by the Engineer."

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IN **306-1.3.6 Mechanical Compaction Requirements**, FIRST PARAGRAPH, DELETE SUBPARAGRAPHS 1, 2 AND 3 AND REPLACE WITH THE FOLLOWING:

- "1. 90 Percent Relative Compaction Required:
  - a) In the upper 3 feet measured from the pavement subgrade (or finish grade where there is no pavement), within the existing or future traveled way, shoulders, sidewalks and other paved areas (or areas to receive pavement).
  - b) Within engineered embankments.
  - c) Where lateral support is required for existing or proposed structures.
2. A Specific Percent Relative Compaction not Required:
  - a) Within the pipe bedding. Unless approved otherwise by the Engineer, the pipe bedding shall be densified by jetting.
  - b) Between the pipe bedding and the upper 3 feet measured from the pavement subgrade (or finish grade where there is no pavement), within the existing or future traveled way, shoulders, sidewalks, other paved areas (or areas to receive pavement) and within native material or unengineered embankments when densified by jetting.
  - c) Outside the traveled way, shoulders and other paved areas (or areas to receive pavement) when densified by jetting.
3. 85 Percent Relative Compaction Required:
  - a) Between the pipe bedding and the upper 3 feet measured from the pavement subgrade (or finish grade where there is no pavement) if the backfill is mechanically compacted .
  - b) Outside the traveled way, shoulders, sidewalks and other paved areas (or areas to receive pavement) and within native material or unengineered embankments if the backfill is mechanically compacted.
4. 95 percent Relative Compaction where required by 301-1.3.

IN **306-1.4.1 General**, SECOND PARAGRAPH, SUBPARAGRAPH 2), DELETE "600 MM (24 INCHES)" AND REPLACE WITH "680 MM (27 INCHES)"

IN **306-1.4.1 General**, SECOND PARAGRAPH, SUBPARAGRAPH 3), DELETE "600 MM (24 INCHES)" AND REPLACE WITH "680 MM (27 INCHES)"

IN **306-1.4.1 General**, SECOND PARAGRAPH, DELETE SUBPARAGRAPH 4) AND REPLACE WITH THE FOLLOWING:

"RGRCP gravity sewers - leakage test in accordance with 207-2.5.2."

IN **306-1.4.1 General**, SECOND PARAGRAPH, DELETE SUBPARAGRAPH 5).

IN **306-1.4.1 General**, SECOND PARAGRAPH, AFTER SUBPARAGRAPH 6), ADD THE FOLLOWING:

- "7) Gravity Sewer Siphons (any size in diameter) - Water exfiltration test or water infiltration test as directed. The pipe shall have zero leakage at siphons. The Engineer may allow substitution of an air pressure test for the water exfiltration test. On plastic lined reinforced concrete pipe, the leakage test shall be made prior to welding the plastic liner at the pipe joints."

IN **306-1.4.1 General**, SECOND PARAGRAPH, AFTER SUBPARAGRAPH 7), ADD THE FOLLOWING:

"In addition to the above requirements, sewers constructed by open trench, jacking, or tunneling operations shall be inspected by closed circuit television methods in accordance with 500-1.1.5."

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IN **306-1.4.2 Water Exfiltration Test**, FIRST PARAGRAPH, ADD THE FOLLOWING TO THE END:

"The water exfiltration test shall be conducted for a minimum of four (4) hours for each section of sewer."

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IN **306-1.5.1 Temporary Resurfacing**, FIRST PARAGRAPH, DELETE THE LAST SENTENCE AND REPLACE WITH THE FOLLOWING:

"Temporary resurfacing shall be placed as soon as the condition of the backfill, in the opinion of the Engineer, is suitable to receive it and it shall be maintained in place by the Contractor until the backfill is replaced by permanent resurfacing as determined and directed by the Engineer."

IN **306-1.5.1 Temporary Resurfacing**, THIRD PARAGRAPH, DELETE THE LAST SENTENCE AND REPLACE WITH THE FOLLOWING:

"The temporary resurfacing shall be rolled with a self-propelled steel roller. It shall be maintained by the Contractor as directed by the Engineer, and removed and disposed of by the Contractor when directed by the Engineer."

If the Contractor is allowed to place the base course of the permanent resurfacing in lieu of temporary resurfacing, he shall maintain said base course to the satisfaction of the Engineer until the permanent resurfacing is completed and accepted."

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IN **306-1.5.2 Permanent Resurfacing**, FIRST PARAGRAPH, DELETE THE LAST SENTENCE AND REPLACE WITH THE FOLLOWING:

"Trench resurfacing shall be one inch greater in thickness than existing pavement. Prior to placing the base course of asphalt concrete the Contractor shall thoroughly clean and wash the street to allow the Engineer to inspect and determine the limits of the pavement to be replaced. Pavement which is required to be replaced outside the excavation limits shall be replaced in conjunction with the excavation pavement. The final course of asphalt concrete placed shall overlap the saw cut edge a minimum 6 inches. The area to be resurfaced shall be prepared to receive a pavement as required in 300-1.3.2. Unless otherwise specified on the Plans, the maximum lift thickness for replacement of bituminous pavement shall not exceed 3 inches."

Unless otherwise approved by the Engineer, asphalt concrete shall not be placed over cement/sand slurry backfill within forty-eight (48) hours after placement of the slurry."



If the Contractor is required to replace paving or base material of greater thickness than is indicated on the Plans, place paving or base material where none is indicated on the Plans, or slurry seal the pavement, the District will reimburse the Contractor at the rates specified in 9-3.1.1.

Payment for additional paving and base material at the rates in 9-3.1.1 or as specified in the Contract Documents shall be in full for all costs for sawcutting, removal and disposal of all materials required to place additional paving and base materials, and furnishing and installing expansion joint filler material.

Quantity for payment for additional paving or base material will be based on the actual width of material replaced. If the Contractor is required to replace paving or base material of less thickness than is indicated on the Plans, contract price will be reduced by an amount representing the reduction in paving or base material based on 80 percent of the rates and on the width indicated above.

Requirements on the Plans for thickness of resurfacing do not necessarily reflect the thickness of the existing pavement. Existing pavement may be greater or less thickness than required replacement."

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IN **306-1.5.5 Finish Course for Asphalt Concrete Placement**, FIRST PARAGRAPH, DELETE THE SECOND SENTENCE AND REPLACE WITH THE FOLLOWING:

"The final lift of asphalt concrete shall be placed with a paving machine which complies with the applicable provisions of 302-5.5 unless otherwise allowed by the Engineer."

IN **306-1.5.5 Finish Course for Asphalt Concrete Placement**, FIRST PARAGRAPH, DELETE THE LAST SENTENCE.

IN **306-1.5.5 Finish Course for Asphalt Concrete Placement**, DELETE THE SECOND AND THIRD PARAGRAPHS.

IN **306-1.5.6 Density and Smoothness**, DELETE ALL PARAGRAPHS AND REPLACE WITH THE FOLLOWING:  
"The Contractor shall comply with 302-5.6.2."

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IN **306-1.6 Basis of Payment for Open Trench Installations**, ADD THE FOLLOWING TO THE END:

"Payment for all stubs in the structure shall be made under the pipe bid items for the same size and strength. If no pipe item exists with the same size and strength, payment for such stubs shall be deemed to be included in the amount paid under the structure bid item."

IN **306-2.1 General**, FIRST PARAGRAPH, ADD THE FOLLOWING TO THE END:

"Unless otherwise specified and approved by the Engineer, the actual pipe jacking operation to or from a pit shall commence within ten (10) working days from the date the excavation at that pit location was initially open. Once excavation at a location begins, all work required to complete construction at the location shall be diligently prosecuted to completion. Jacking pit shall be backfilled and final base course paved so existing traffic could be restored within ten (10) consecutive working days after the pipe jacking to or from the pit was completed. The Contractor shall complete construction at each jacking/receiving pit excavation, including base course of the final paving, within forty-five (45) calendar days after

commencement of construction at the pit location. Failure on the part of the Contractor to begin the jacking operation or complete construction within the time specified may result in a directive from the Engineer to cease work on any or all other parts of the Contract until construction is completed at locations where the time specified has been exceeded. No additional compensation will be allowed as a result of such directive."

IN **306-2.1 General**, SECOND PARAGRAPH, ADD THE FOLLOWING TO THE END:

"Dewatering shall be in accordance with 306-1.1.8."

IN **306-2.1 General**, DELETE THE THIRD PARAGRAPH AND REPLACE WITH THE FOLLOWING:

"The leading section of conduit shall be equipped with a steel jacking head fit securely around the entire circumference of the leading section with sufficient overlap to prevent any wobble or variation in alignment during the jacking operation. The jacking head shall have sufficient structural elements welded to it to uniformly transmit the loads to the end of the leading section. Bolting of the jacking head to the leading section of conduit will not be permitted."

IN **306-2.1 General**, FIFTH PARAGRAPH, ADD THE FOLLOWING TO THE BEGINNING:

"Excavation shall be performed entirely within the jacking head and no excavation in advance thereof will be permitted."

IN **306-2.1 General**, DELETE THE SIXTH PARAGRAPH AND REPLACE WITH THE FOLLOWING:

"Jacking operations shall occur only during the working hours specified in the Contract Documents. The Contractor shall submit to the Engineer for prior approval methods and details that will prevent the "freezing" of the jacked conduit and ensure that the heading is stable at all times."

IN **306-2.1 General**, SEVENTH PARAGRAPH, ADD THE FOLLOWING TO THE END:

"The Contractor shall verify the allowable grouting pressure with the pipe manufacturer and shall limit the grout pressure used to prevent any damage to the pipe and the pipe joints. The pressure used during grouting shall be monitored continuously to ensure that the maximum allowable grout pressure specified by the pipe manufacturer is not exceeded."

IN **306-2.1 General**, EIGHTH PARAGRAPH, DELETE THE WORDS "and drilling of grout holes".

IN **306-2.1 General**, ADD THE FOLLOWING TO THE END:

"Where the Engineer has reasonable doubt that the voids caused by the jacking operations have not been completely filled by pressure grouting from within the casing or conduit, the Contractor shall pressure grout such locations as ordered through grout pipes installed from the ground surface in accordance with 306-3.8."

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IN **306-2.2 Jacking Reinforced Concrete Pipe**, DELETE THE SEVENTH PARAGRAPH AND REPLACE WITH THE FOLLOWING:

"Grout plug fittings shall be cast in the reinforced concrete pipe in accordance with 207-2.1. All voids outside the pipe shall be filled by the Contractor with portland cement-sand grout placed under pressure. The grout shall contain 750 pounds of cement per cubic yard."

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IN **306-2.3 Jacking Steel Casing**, THIRD PARAGRAPH, ADD THE FOLLOWING TO THE END:

"After the pipe is installed in the casing but prior to backfilling, the pipe shall be air pressure tested in accordance with 306-1.4.4. In addition, the pipe shall be inspected by closed circuit television methods in accordance with 500-1.1.5."

IN **306-2.3 Jacking Steel Casing**, FOURTH PARAGRAPH, DELETE THE FIRST SENTENCE AND REPLACE WITH THE FOLLOWING:

"Backfill shall be 1000 psi pressure concrete, except where specified otherwise in the Plans or the Special Provisions. "

IN **306-2.3 Jacking Steel Casing**, DELETE THE SEVENTH PARAGRAPH, AND REPLACE WITH THE FOLLOWING:

"Where pressure concrete backfill is to be used, the pipe shall be laid on a subbase of pipe bedding concrete as specified in 201-1 at least 125 mm (5 inches) thick at the centerline. "

IN **306-2.3 Jacking Steel Casing**, AFTER THE EIGHTH PARAGRAPH, ADD THE FOLLOWING:

"In lieu of laying the pipe on the concrete subbase specified above, the Contractor may, subject to the approval of details by the Engineer, lay the pipe on steel rails in the steel casing set to true line and grade.

All voids outside of the casing shall be filled by pressure grouting with portland cement-sand grout containing 750 pounds of cement per cubic yard. The Contractor shall place grout holes 1 1/2 inch minimum diameter at 4 foot longitudinal centers at 45 degrees above the horizontal axis alternating right and left."

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IN **306-3.1 General**, FIRST PARAGRAPH, SECOND SENTENCE, DELETE THE WORDS "at the Contractor's option" AND REPLACE WITH THE WORDS ", if approved by the Engineer,".

IN **306-3.1 General**, FIRST PARAGRAPH, ADD THE FOLLOWING TO THE END:

"Calculations supporting the above details shall be prepared and stamped by a Civil or Structural Engineer currently registered by the State of California and submitted to the Engineer."

IN **306-3.1 General**, DELETE THE SECOND AND THIRD PARAGRAPHS.

IN **306-3.2 Excavations**, FIRST PARAGRAPH, ADD THE FOLLOWING TO THE END:

"Unless otherwise specified and approved by the Engineer, the actual tunneling operations to or from an access shaft or portal shall commence within ten (10) working days from the date the excavation at that location was initially open. Once excavation at a location begins, all work required to complete

construction at the location shall be diligently prosecuted to completion. Access shaft and portals shall be backfilled and final base course paved so existing traffic could be restored within ten (10) consecutive working days after the tunneling to or from the location was completed. Failure on the part of the Contractor to begin tunneling operations or complete construction within the time specified may result in a directive from the Engineer to cease work on any or all other parts of the Contract until construction is complete at locations where the time specified has been exceeded. No additional compensation will be allowed as a result of such directive."

IN **306-3.2 Excavations**, FOURTH PARAGRAPH, ADD THE FOLLOWING TO THE END:

"No blasting shall be done until written permission has been obtained from the Engineer."

IN **306-3.2 Excavations**, LAST PARAGRAPH, FIRST SENTENCE, DELETE THE WORD "bedding" AND REPLACE WITH THE WORD "subbedding".

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IN **306-3.3 Dewatering**, DELETE THE PARAGRAPH AND REPLACE WITH THE FOLLOWING:

"Dewatering shall be in accordance with 306-1.1.8."

IN **306-3.4 Tunnel Supports**, EIGHTH PARAGRAPH, SUBPARAGRAPH c), DELETE THE WORD "bedding" AND REPLACE WITH THE WORD "subbedding".

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IN **306-3.5 Subgrade and Bedding**, DELETE THE WORD "**Bedding**" FROM THE TITLE AND REPLACE WITH THE WORD "**Subbedding**".

IN **306-3.5 Subgrade and Subbedding**, THIRD AND FIFTH PARAGRAPHS, DELETE THE WORD "bedding" AND REPLACE WITH THE WORD "subbedding".

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IN **306-3.7 Tunnel Backfill**, SECOND PARAGRAPH, DELETE THE FIRST SENTENCE AND REPLACE WITH THE FOLLOWING:

"The space between the tunnel supports and the pipe shall be completely backfilled with materials and by methods specified on the Plans or as approved by the Engineer. The Contractor shall completely fill the space and demonstrate complete filling by allowing material to flow from the next adjacent fill point, by drilling test holes in the crown of the pipe at locations selected by the Engineer or by an alternate method submitted to, and approved by the Engineer."

IN **306-3.7 Tunnel Backfill**, DELETE THE FIFTH PARAGRAPH AND REPLACE WITH THE FOLLOWING:

"Unless the Plans and Specifications (including the following provisions) for tunnels to be constructed in soil require the use of pressure concrete or gunite concrete for backfill, the Contractor may use dry silica sand for backfill. For rib and lag shored tunnels, the annular space shall be backfilled with a pressure grout containing a minimum of 750 pounds of cement per cubic yard."

IN **306-3.7 Tunnel Backfill**, ADD THE FOLLOWING TO THE END:

"The pipe shall be inspected by closed circuit television methods in accordance with 500-1.1.5, prior to placing the sewer in service."

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IN **306-5 ABANDONMENT OF CONDUITS AND STRUCTURES**, FIRST PARAGRAPH, IN THE FIRST SENTENCE AFTER THE WORDS "storm drain conduit", ADD THE WORDS " or other pipe or conduit".

IN **306-5 ABANDONMENT OF CONDUITS AND STRUCTURES**, FIRST PARAGRAPH, AFTER THE FIRST SENTENCE, ADD THE FOLLOWING: "The Contractor shall remove and dispose of any water, sewage, or debris in these conduits as necessary for the construction".

IN **306-5 ABANDONMENT OF CONDUITS AND STRUCTURES**, THIRD PARAGRAPH, ADD THE FOLLOWING TO THE END:

"and the structures shall be backfilled with sand or crushed miscellaneous base."

IN **306-5 ABANDONMENT OF CONDUITS AND STRUCTURES**, FIFTH PARAGRAPH, ADD THE FOLLOWING TO THE END:

"All frames and covers of manholes to be abandoned shall be salvaged and shall become the property of the District. The Contractor shall clean the manhole frames and covers and shall deliver them to the District's Compton Field Office, 920 South Alameda Street, Compton. The Contractor shall unload the manhole frames and covers at a location designated by the Engineer."

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IN **306-6 REMODELING EXISTING SEWER FACILITIES**, AFTER THE SECOND PARAGRAPH, ADD THE FOLLOWING:

"The existing concrete manhole bases are overpoured and the Contractor shall remove any overpoured concrete necessary to connect the proposed pipe to the manhole. Prior to joining an existing stub, the Contractor shall remove the bulkhead from the end of the stub and remove any sand, dirt or debris in the stub. If the stub is open to the manhole, the Contractor shall, prior to removing the bulkhead at the end of the stub, remove any debris in the stub and furnish and install a plug in the stub at the wall of the manhole. If the stub is bulkheaded at the manhole, the Contractor shall remove the bulkhead at the manhole when directed by the Engineer. If the joint of the existing stub is damaged or if the joint does not match that of the pipe being installed, the Contractor shall join the two pipe ends with a standard concrete collar in accordance with Districts' Standard Drawing S-a-225. Cost for all the above work shall be included in the appropriate pipe bid item."

IN **306-6 REMODELING EXISTING SEWER FACILITIES**, AFTER THE NEXT TO THE LAST PARAGRAPH, ADD THE FOLLOWING:

"Any connection between an existing facility and a proposed facility which has not been placed in service shall be sealed with a mechanical plug or a brick bulkhead. The mechanical plug or brick bulkhead shall be removed when directed by the Engineer."

AFTER **306-8.5 Pipe Specifications**, ADD THE FOLLOWING:

**"306-9 HIGH PH SLURRY SPRAYING OF EXISTING SEWER.**

**306-9.1 General.** When designated in the Contract Documents, existing RCP and NRCP sewers to be removed from service shall be sprayed with a high pH slurry onto the entire interior surface of the pipe or conduit. The high pH slurry mixture to be used with the spray process shall be an approximate 50% magnesium hydroxide,  $Mg(OH)_2$ , slurry by weight.

The Contractor or Subcontractor performing the high pH mixture spraying shall be trained and experienced in all aspects of safety related to work in sewers, handling of  $Mg(OH)_2$  slurry, and be knowledgeable with regards to equipment operation and its performance when used in the spray application of  $Mg(OH)_2$  slurry to sewers. In addition, the Contractor shall be a "qualified"  $Mg(OH)_2$  slurry spray applicator. The District will consider the Contractor "qualified" if the Contractor has successfully sprayed  $Mg(OH)_2$  slurry on at least 5 miles of concrete sewer 18 inches in diameter or greater. At the request of the District, the Contractor shall provide a listing of the names, addresses, telephone numbers, contacts, and scope of work (length, sizes, and production rate) for previous spray contracts using  $Mg(OH)_2$  slurry.

The Contractor shall be responsible for providing all labor, materials, and equipment to spray the existing sewer pipe. All of the costs associated with spraying a high pH slurry mixture onto the entire interior surface of the existing sewer shall be included in the bid item for removing the sewer from service.

**306-9.2 Equipment.** The Contractor shall be responsible for selecting and furnishing all equipment necessary to meet the requirements of these Specifications. The District will not be responsible for the Contractor's equipment under any circumstances. Equipment shall not remain in a sewer unattended, nor shall manhole covers be left open unattended. Unless otherwise allowed by the Engineer, all equipment shall be removed from the sewer at the end of each workday.

**306-9.3 Material.** An approximate 50%  $Mg(OH)_2$  slurry by weight shall be used with the spray process. The Contractor shall submit to the District a chemical analysis and physical property description representative of the  $Mg(OH)_2$  product to be used and an applicable Material Safety Data Sheet. The  $Mg(OH)_2$  slurry to be sprayed in the District's sewers shall meet the following criteria:

i.	Percent Solids	$\geq 48\%$
ii.	Specific Gravity	1.4 - 1.6 (water = 1.0 at 60 degrees F)
iii.	Solids Particle Size	10 microns (median)
iv.	Viscosity	400 cps (Brookfield model Hat 50 RPM, #3)
v.	Surface Area	10 m <sup>2</sup> /g
vi.	Magnesium Hydroxide, $Mg(OH)_2$	$\geq 93\%$ dry basis
vii.	Calcium Oxide, CaO	$\leq 2.5\%$ dry basis
viii.	Iron Oxide, $Fe_2 O_3$	$\leq 0.6\%$ dry basis
ix.	Aluminum Oxide, $Al_2 O_3$	$\leq 0.5\%$ dry basis
x.	Sulfate, $SO_3$	$\leq 0.6\%$ dry basis
xi.	Silica, $SiO_2$	$\leq 2.3\%$ dry basis
xii.	Chloride, Cl	$\leq 0.14\%$ dry basis
xiii.	Asbestos	$\leq 0.25\%$ dry basis (using TEM method of analysis)
ivx.	Neutralization Capacity	$\geq 87.0\%$ dry basis as $Mg(OH)_2$

**306-9.4 Application.** The minimum application thickness shall be 125 mils (1/8 inch). The spray rate and travel speed of the spray head to achieve the minimum application thickness shall be determined by the Contractor. The Contractor shall have an approved means of determining the quantity of chemical sprayed. Application records shall be kept and submitted to the District. If the application thickness in a treated reach does not meet the 125 mils minimum standard, as calculated by the District, the Contractor shall be responsible for re-spraying that reach at no additional cost to the District."

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IN **310-5.1.3 Application of Paint**, SECOND PARAGRAPH, DELETE THE WORDS "exposed to the atmosphere".

IN **310-5.1.3 Application of Paint**, DELETE THE FIFTH PARAGRAPH AND REPLACE WITH THE FOLLOWING:

"Open seams at contact surfaces shall be caulked with non-sag polysulphide material conforming to Federal Specification TT-S-230, Type 2, or other approved material that is compatible with paint before applying the second coat of primer."

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AFTER **310-5.6.10 Measurement and Payment**, ADD THE FOLLOWING:

**"310-5.7 Painting Miscellaneous Metals Except Steel Stop Logs.** 310-5.1 shall apply to painting miscellaneous metals except steel stop logs.

**310-5.8 Painting of Steel Stop Logs.** All surfaces of ferrous stop logs shall be cleaned and protective coated as follows:

All grease and oil shall be removed by steam or solvent cleaning. All surfaces shall be dry blast cleaned to a near-white blast cleaned surface finish conforming to 310-2.5. All dust shall be removed by brushing, vacuuming or air blasting. In no case shall bare metal surfaces be left overnight before applying the first coat.

The stop logs shall be painted with one of the following coating systems or equal:

1. Ameron-Amercoat 351
2. Mainstay Corporation - Mainstay DS-4
3. Courtaulds Aerospace/Specialty Products (PRC)-PR 475
4. Tenemec-W164 Epoxoline 80 epoxy

Application shall be in strict conformance with the manufacturer's instructions using approved spray equipment. All surfaces to be coated shall first receive a prime coat recommended by the manufacturer. The finished system shall consist of a minimum of two 2 coats with a total dry film thickness of 30 mils minimum. Each coat shall be a different color as approved by the Engineer. The finished system shall be checked with a low-voltage, non-destructive holiday detector furnished by the Contractor. Testing shall be performed by the Contractor in the presence of the Engineer. Repairs shall be made where directed by the Engineer in strict conformance with the manufacturer's instructions.

**310-5.9 Defective Workmanship or Material.** Any work or material not conforming to the Plans or Specifications is unacceptable and shall be redone, removed, replaced or made satisfactory to the Engineer at the sole expense of the Contractor."

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IN **311-1.1 General**, SECOND PARAGRAPH, SECOND SENTENCE, ADD THE FOLLOWING TO THE END:

"or contain other contaminates that will stain the plastic liner."

IN **311-1.1 General**, LAST PARAGRAPH, ADD THE FOLLOWING TO THE END:

"For each specific project, all parts of the plastic liner installation including the liner sheets and corner, flat, angle, and contraction joint welding strips shall be extruded from the same batch of materials by the same manufacturer."

AFTER **311-1.1 General**, ADD THE FOLLOWING:

"**311-1.1.1 Submittals**. Prior to plastic liner installation, the Contractor shall submit shop drawing of construction details. See 2.5.3 for additional requirements. The shop drawings shall include the following information:

- 1) Complete liner placement drawings for each location.
- 2) Complete description of plastic liner installation including material lists, certifications and required test results.
- 3) Welder certifications for each welder."

IN **311-1.2.2 Welders**, FIRST PARAGRAPH, DELETE THE SECOND SENTENCE AND REPLACE WITH THE FOLLOWING:

"Welders shall be requalified every five years or at any time deemed necessary by the Engineer."

IN **311-1.3.1 Coverage**, THIRD PARAGRAPH, FIRST SENTENCE, DELETE THE WORDS "where is a difference in" AND REPLACE WITH THE WORDS "where there is a difference in circumferential coverage".

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IN **311-1.4.1 Concrete Placement**, DELETE THE WORDS "shall be", AND REPLACE WITH THE WORDS "the concrete shall be carefully, thoroughly, and".

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IN **311-1.5.1 General**, FIRST PARAGRAPH, ADD THE FOLLOWING TO THE END:

"When the pipe liner coverage is 360 degrees, 6 to 8 inches of the downstream side of the joint strip or flap at the pipe invert shall not be welded."

IN **311-1.5.1 General**, ADD THE FOLLOWING TO THE END:

"All field joints shall be double welded with 1-inch welding strips welded to both front and back of the joint wherever possible, as determined by the Engineer. All field joints that do not include a double welded strip shall be overlapped wherever possible, as determined by the Engineer. The overlap shall be welded to the adjacent plastic liner with locking extensions. The overlap shall not be less than



1 1/2 inches and the entire seam between the overlap and plastic liner shall be covered by a 1-inch welding strip over the front of the joint. All welds shall be probed in accordance with 311-1.10. For joints requiring two welds, the first weld shall be probed and approved by the Engineer before applying the second weld."

IN **311-1.5.2 Field Joints in Pipe Installation**, FIRST PARAGRAPH, DELETE THE FIRST SENTENCE AND REPLACE WITH THE FOLLOWING:

"Field joint in liner plate at pipe joints shall be double welded as specified in 311-1.5.1 and shall be one of the following types:"

IN **311-1.5.2 Field Joints in Pipe Installation**, FIRST PARAGRAPH, SUBPARAGRAPH b), FIRST SENTENCE, DELETE THE WORDS "the spigot" AND REPLACE WITH THE WORDS "either the spigot or the bell".

IN **311-1.5.2 Field Joints in Pipe Installation**, FIRST PARAGRAPH, SUBPARAGRAPH b), SECOND PARAGRAPH, ADD THE FOLLOWING TO THE END:

"Heat shall be applied to straighten the PVC flap as needed to prevent cracking of the PVC."

IN **311-1.5.2 Field Joints in Pipe Installation**, FIRST PARAGRAPH, DELETE SUBPARAGRAPH d) AND ALL REMAINING PARAGRAPHS AND REPLACE WITH THE FOLLOWING:

"d) Field joints in rigid liner at manhole joints shall use Type CJ-2 and shall consist of 38 mm (1 1/2 inch) by 38 mm (1 1/2 inch) factory-installed L-angle. When manholes are installed in the field, polyurethane compound, approved by the Engineer, shall be applied between L-angles for sealing purposes.

Field joints in liner at pipe joints shall not be made until ~~in~~ the mortar in the pipe joint has been allowed to cure for at least 48 hours and the pipe has successfully passed the leakage test.

All joints between flexible-lined pipe and flexible-lined cast-in-place structures shall be either Type C-1 or Type C-2 specified herein."

IN **311-1.5.3 Field Joints in Cast-in-Place Structures**, DELETE THE FIRST SENTENCE AND REPLACE WITH THE FOLLOWING:

"Field joints in liner plate on cast-in-place structures shall be double welded as specified in 311-1.5.1 and shall be one of the following types:"

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IN **311-1.5.4 Installation of Welding Strips for Flexible Liner**, FIRST PARAGRAPH, ADD THE FOLLOWING TO THE END:

"Prior to welding, the surfaces which are to be fused to the welding strips shall be roughened with a wire wheel or with another approved method."

IN **311-1.5.4 Installation of Welding Strips for Flexible Liner**, FOURTH PARAGRAPH, ADD THE FOLLOWING TO THE END:

"The weld strip shall be completely fused across its entire width, except for the allowable gap. Incomplete fusion, charred, or blistered welds will be rejected."

IN **311-1.6 Application of Liner to Concrete Surfaces**, DELETE ALL PARAGRAPHS AND REPLACE WITH THE FOLLOWING:

"Attachment of PVC liner plate without locking extensions to concrete surfaces shall be by adhesive in accordance with the Special Provisions."

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IN **311-1.8 Application of Liner to Steel**, DELETE ALL PARAGRAPHS AND REPLACE WITH THE FOLLOWING:

"Attachment of PVC liner plate without locking extensions to steel surfaces shall be by adhesive in accordance with the Special Provisions."

IN **311-1.9 Protection and Repair of Liner**, SECOND PARAGRAPH, THIRD SENTENCE, ADD THE FOLLOWING TO THE END: "and holes not exceeding 1/4-inch diameter."

IN **311-1.9 Protection and Repair of Liner**, SECOND PARAGRAPH, ADD THE FOLLOWING TO THE END: "and holes not exceeding 1/4-inch diameter."

"Patching at liner plate holes shall be made with a patch which overlaps the edge of the hole by a minimum of 3/4-inch."

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IN **311-1.10 Field Tests**, DELETE ALL PARAGRAPHS AND REPLACE WITH THE FOLLOWING:

"Upon completion of the installation, the Contractor shall clean the surface of the liner and shall perform visual inspection and spark testing in the presence of the Engineer. In addition, all weld joints shall be probed with a trowel, putty knife, or similar tool approved by the Engineer. Single weld joints shall be probed vigorously by striking with the corner of a stiff putty knife. Double weld joints may be probed in a less rigorous manner if the procedure is submitted to and approved by the Engineer. The Contractor shall provide adequate ventilation, ladders for access, barricades or other traffic control devices, and shall be responsible for opening and closing entrances and exits. All areas of liner failing to meet the field test shall be properly repaired and retested. The spark-type detector shall be supplied by the Contractor and shall be a Tinker & Rason Holiday Detector (Model AP-W). The voltage used for testing shall be approved by the Engineer. The Contractor, at his expense, shall have an independent laboratory perform the visual inspection and the probing of all weld joints. The independent laboratory and the inspection and probing procedures shall be approved by the Engineer. In addition, the independent laboratory shall witness the spark testing and any repairs performed by the Contractor. Inspectors employed by the independent laboratory to test the welds shall have passed the qualification welding test specified in 311-1.2. Upon completion of all liner testing and inspection, the Contractor shall submit certification by the independent laboratory that all installation and weld joints have been tested and inspected and are in compliance with the Specifications. However, this certification shall not relieve the Contractor of the responsibility to correct defective work."

Acceptance of the work is subject to inspection by the Engineer. If the overall quality of the welding is found to be unacceptable, in the opinion of the Engineer, re-testing and re-certification by the laboratory will be required. In addition, the Contractor shall comply with the following requirements:

- 1) The independent laboratory shall check the quality of work (i.e. probe the welds) of each welder after they have completed 100 linear feet of welding, but before 200 linear feet has been completed. The findings shall be immediately reported to the Engineer.
- 2) The specified field tests shall be performed within thirty (30) working days after installation of the liner material at each location, or, in the case of pipeline construction, after the pipe is installed at each location.
- 3) Repair of defective weld joints shall extend a minimum of 3 inches beyond the defect.
- 4) If the number of defects in each weld strip exceeds an average of one per linear foot, the entire weld strip shall be considered defective and repaired accordingly.

Any spark testing of liner by the Contractor for its purposes shall be done with a detector complying with 210-2.3.6."

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IN **500-1.1.1 General**, FIRST PARAGRAPH, FIRST SENTENCE, DELETE THE WORDS "that may be used as an alternative to pipeline replacement" AND ADD THE FOLLOWING TO THE END:

"Many of these processes are covered by patents. It is the sole responsibility of the Contractor to abide by the patents law and to ensure that the procedures being used will not infringe upon others' patented processes."

IN **500-1.1.1 General**, SECOND PARAGRAPH, DELETE THE SECOND SENTENCE.

IN **500-1.1.1 General**, ADD THE FOLLOWING TO THE END:

"The Contractor shall maintain the existing sewer in continuous service and shall be aware that periodic surcharging of the sewer may occur. Unless otherwise allowed or required by the Plans or Special Provisions, the Contractor shall not bypass or divert flow from the sewer and shall not cause flow to be backed up in the sewer at any time. If the Contractor's operation causes a flow back-up and if the Contractor is not responsive or unable to perform the work to correct the problem, the District is empowered to implement the emergency procedures as specified in 9-3.1. In addition, all equipment shall be removed from the sewer and manhole at the end of each day, no exception.

In the event any sewage overflow occurs, the Contractor shall be fully responsible for containing the spillage, preventing any sewage from reaching a watercourse, recovery of the spilled sewage back into the sewer, and any fines or penalties associated with the sewage spill.

Unless otherwise shown or specified, all requirements pertaining to underground construction of pipelines and/or conduits, including but not limited to the requirements specified in 5 and 306, shall apply to all work in this section. Where cost of the work is specified to be absorbed in the pipeline bid item, these costs shall be included under the sewer rehabilitation bid item."

IN **500-1.1.4 Cleaning and Preliminary Inspection**, DELETE THE FIRST PARAGRAPH, AND REPLACE WITH THE FOLLOWING:

"The Contractor shall verify the inside diameter of the sewer pipe, remove all protrusions and obstructions, and clean the sewer, prior to closed circuit television (CCTV) inspection and rehabilitation.

All protruding rebars shall be cut from within the sewer and all intruding roots shall be removed by using a suitable mechanical cutting device.

The Contractor shall complete the cleaning of a sewer reach before the Contractor will be allowed to start the cleaning of the next reach. The Contractor shall be aware that re-deposition of the debris may occur. To effectively clean the sewer and to prevent flow backup, cleaning of a sewer reach may have to be repeated and performed in multiple passes. The District does not provide any special access for the Contractor to perform the sewer cleaning work. The Contractor shall be responsible for providing his own access as required to clean the sewer. The Contractor may gain access through existing manholes or construct access pits at his own cost for performing the sewer cleaning work.

Debris in the sewer may contain large pieces of broken concrete, aggregate, sludge, dirt, sand, rocks, grease, roots, solid or semisolid materials, and other foreign objects. The Contractor shall perform all work as necessary to trap and remove the debris from a sewer reach and shall not allow the debris to move to the sewer reach that has already been cleaned or to the sewer reach that is not a part of the project. All debris collected and removed from the sewer shall be disposed of off the site at the end of each day. The Contractor shall be aware that landfills may have daily tonnage limits and the business hours may vary. If the daily tonnage limit is reached, the landfill will be closed for business that day. The Contractor shall be responsible for scheduling and sequencing his cleaning operations. Temporary storage of the debris, if necessary, shall be arranged and provided by the Contractor at no additional cost to the District. If the Contractor elects to dispose the debris at the District's landfill facilities, the Contractor shall notify the District at least two (2) days in advance. Disposal fee shall be the responsibility of the Contractor. Costs associated with the sewer cleaning work shall include construction of access pits, trapping, collecting, removing, hauling and transportation, temporary storage, dewatering, disposal of the debris and dumping fees, and closure of access pits. If there is no sewer cleaning bid item, all costs associated with the sewer cleaning shall be included in the appropriate sewer line rehabilitation or other appropriate bid item.

The Contractor shall be solely responsible for the cleaning method(s) being utilized. The District's acceptance of the cleaning method does not relieve the Contractor of such responsibility. The District reserves the right to reject the Contractor's proposed cleaning method if the District determines that the method selected may endanger or adversely affect the continuous operation of the existing facilities.

For segmented liner pipe installations, the Contractor may utilize the steel pipe test section as specified in 500-1.1.7(b) for cleaning the sewer at his own risk and may utilize the insertion pits as the cleaning access pits. If the Contractor elects to utilize an insertion pit as the access for sewer cleaning, the work shall start within five (5) working days after the Engineer accepts the construction of the insertion pit for that reach of sewer. The Contractor may also construct separate access pits at his own cost for performing the sewer cleaning work. Cleaning access pit(s), if required, shall be located, constructed and waterproofed in the same manner as an insertion pit in accordance with 500-1.1.7(c) and are subject to the approval of the District and the Agencies. After the sewer cleaning work is completed, the Contractor shall reinstall the cut portion of the RCP and encase in reinforced concrete, backfill and restore all the disturbed areas in the same manner as an insertion pit."

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AFTER **500-1.1.4(c) Mechanically Powered Equipment**, DELETE ALL REMAINING PARAGRAPHS AND TABLE 500-1.1.4 (A).

IN **500-1.1.5 Television Inspection**, DELETE ALL PARAGRAPHS AND REPLACE WITH THE FOLLOWING:

"This section covers the requirements for closed circuit television (CCTV) inspection of sewers.

**500-1.1.5.1 General.** Unless otherwise specified, CCTV inspection shall be performed on all sewer projects including new sewers constructed per 306 and sewers rehabilitated per 500-1. For new sewer construction, CCTV inspection shall be performed after the sewer is installed but prior to the sewer being placed in service. For sewer rehabilitation, CCTV inspection shall be performed after sewer cleaning to document the condition of the existing host pipe, to ensure that the existing host pipe is ready to be lined or sliplined, and to verify the number, location and status of all existing local sewer or house connections. Additionally, CCTV inspection shall be performed after rehabilitation to locate and document any defects, to confirm the work has been done in accordance with the Contract Documents, and to verify all the connections have been properly re-established and the end seals have been properly made up. Any defects found shall be repaired and the sewer shall be re-inspected. For segmented liner pipe installations, the pre-rehabilitation CCTV inspection shall be performed after insertion of the test section but prior to insertion of the liner pipe, and the post-rehabilitation CCTV inspection shall be performed after grouting of the annular space and reconnection of all the existing connections.

**500-1.1.5.2 Inspection.** CCTV inspection equipment to be used shall be approved by the Engineer prior to the start of the inspection. The CCTV camera shall be a pan/tilt and rotating head camera capable of providing a full view of the inside of all connections. The camera shall be mounted on a skid, floatable raft system, or transporter based on the conditions of sewer to be televised. The camera and skid, raft, or transporter shall be furnished with emergency pull-back cables of sufficient strength for all returning situations. The camera shall be specifically designed and constructed for sewer inspection environment and shall be operative in 100 percent relative humidity. Focal distance shall be adjustable through a range from 1 inch to infinity. The camera and monitor shall produce a minimum 460 lines per inch resolution. Telephones, radios, or other suitable means of communication shall be set up to ensure that adequate communication exists between members of the crew.

At the setup manhole, recording of the CCTV inspection shall begin outside of the manhole and shall continue as the camera is lowered into the manhole and shall show the general condition of the manhole. CCTV inspection shall show a clear view of the entire periphery (circumference) of the sewer including all the defects. Any problems identified during an inspection shall be immediately brought to the attention of the Engineer. For segmented liner pipe installations, the Contractor shall perform the pre- and post-rehabilitation CCTV inspection during low flow. For sewer lining, the Contractor shall perform the pre- and post-rehabilitation CCTV inspection while flow is being bypassed and/or diverted around the sewer, and without standing wastewater. For post-rehabilitation inspection, the video recording shall also include a clear view of the outside ends of the liner from each manhole upstream and downstream of the liner. Unless otherwise directed by the Engineer, the camera shall be moved through the sewer, from upstream to downstream, at a uniform rate of not more than 30 feet per minute. Distance of sewer between adjacent manholes shall be measured and recorded. The distance measurements shall be made from the centerline of the manhole that the camera is traveling from and shall be accurate to within 2 feet for every 1,000 feet inspected. If more than one manhole reach is inspected in a single run, the footage counter shall be reset to zero at all intermediate manholes.

The camera shall pause for a sufficient length of time to adequately document and provide accurate distance measurements of all the defects and the connections observed in the sewer. The camera shall rotate and look directly at each defect and look into each connection to thoroughly document the conditions and determine if the connection is in service. In the same manner, the Contractor shall identify all sewer connections at each manhole including the beginning of setup manhole, all intermediate

manholes, and the end of setup manhole. The Contractor shall capture photos of any moderate and severe damage and/or abnormal conditions.

The Contractor shall submit to the District a detailed plan for CCTV inspection, including a description of the setup, procedures, retrieving method, list of equipment, and personnel. The Contractor shall not begin inspections until the CCTV submittal and the bypass pumping submittal, if required, are approved by the District. If any changes in schedule are necessary, the Contractor shall notify the District a minimum of twenty-four (24) hours prior to performing the inspection. The Contractor shall be responsible for making all necessary arrangements for gaining access to the manholes located in private property. If the work is done in residential areas, the Contractor shall notify the residents in writing, a minimum of seven (7) days prior to the start of the work. The Contractor shall comply with all applicable traffic requirements. No open manhole shall be left unattended. The Contractor shall remove all equipment from the sewer and manholes at the end of each inspection run and shall reseal all previously sealed manholes at the end of each day.

### **500-1.1.5.3 Inspection Video Tapes and DVDs.**

**500-1.1.5.3.1 Video.** Video recording shall be in color and shall have the best quality possible. The image shall be in focus at all times. The recording shall be done with adequate lighting to provide a clear view of the entire periphery of the sewer including any defects while keeping glare to a minimum. The image shall not be obscured by "fog" in the sewer. If any submitted recording has unacceptable focus, lighting, sound, data, imaging or interferences, the sewer shall be re-inspected at the Contractor's expense.

The inspection shall be recorded in VHS videotape and data DVD format using new high quality video tapes in the standard play (2-hour) recording mode and high quality DVD-/+ R discs. The recording on each tape and DVD shall be for a single trunk sewer, contiguous and shall be from upstream to downstream. The DVDs shall be indexed with the WinCan software as specified in 500-1.1.5.3.3. At the beginning of each inspection run, the general information of the inspection shall be displayed in the following format:

- A. Date of the recording
- B. Time of the recording
- C. Name of the Contractor performing the CCTV inspection
- D. Name of trunk sewer
- E. Direction of inspection (upstream or downstream)
- F. Pipe or liner material
- G. Pipe diameter
- H. Length of reach to be televised
- I. Manhole number from which the camera is traveling
- J. Manhole number to which the camera is traveling

In addition, each recording shall continuously display the following information:

- A. Name of trunk sewer
- B. Manhole number from which the camera is traveling
- C. Manhole number to which the camera is traveling
- D. Date of recording
- E. Pipe diameter
- F. Pipe or liner material
- G. Footage - Distance from the centerline of the manhole from which the camera is traveling shall be displayed and continuously updated

The background of the overlays showing the inspection information shall be transparent as to not block out the video. The information shall be displayed at the lower left hand corner of the image in accordance with the following format:

Name of Trunk Sewer		
MH No. (Upstream) to MH No. (Downstream)		
Pipe Size and Material	Date	Footage

All original CCTV inspection tapes and DVDs, including log sheets and reports, shall be submitted to the Engineer and shall become property of the District. The individual tapes and the cases containing them shall each have identifying labels on their spines and front in the following format:

District No.	Name of Sewer	Month/Day/Year
From MH No. to MH No.		Pipe Size and Material
Name of Contractor	Pre or Post Rehabilitation Video (if applicable)	

The crystal cases containing each DVD shall each have identifying labels on their spines containing the name of the sewer. The front of the DVD crystal case and the face of the DVD shall contain identifying labels in the following format:

District No.	Name of Sewer	Month/Day/Year
From MH No. to MH No.		Pipe Size and Material
Name of Contractor	Pre or Post Rehabilitation Video (if applicable)	

**500-1.1.5.3.2 Audio.** The recording shall include an audio portion describing the condition of the sewer with the video image. The audio portion shall be sufficiently free of background noise to produce an oral report that is clear and easily discernible. At the beginning of each inspection run, the audio shall identify the Contractor name, each crew member, date, time, street location, name of trunk sewer, pipe size, pipe or liner material, direction of inspection (upstream or downstream), and the manhole numbers at the beginning and end of each run. The audio shall note the location and condition of the pipe defects, including all cracks, breaks, cracked or misaligned joints, root intrusion, infiltration, missing pieces of pipe, corrosion, deposits, obstructions, and dips. The audio shall also note the location of the connections to the nearest foot, clock position of the connections, condition of the connections, and whether the connection is in service. The description shall be objective and shall not include inspector's estimate of severity, or assumptions about the pipe material or conditions. However, subjective observations shall be included on the inspection report.

**500-1.1.5.3.3 Digital Recording.** Continuous digital recordings of the inspection view as it appears on the monitor shall be stored. It is intended that a digital recording will be made of the complete pipe inspection. The recording shall also be used as a permanent record of defects. Unless directed otherwise by the Engineer, the recording shall be MPEG I and shall comply with ISO/IEC 11172 MPEG I Specifications. The digital encoding shall include both sound and visual information that can be reproduced with an image equal to the quality of the original picture on the monitor. Compression rate shall be 1.5 Mb/s. The operator shall pause the digital recording at any time there is a delay in the inspection. The pause shall in no way effect, freeze or interrupt the replay of the video and shall not close

the video file during the inspection. The operator shall store a single video file for each reach inspection. The video files shall have a resolution of 352 by 240 pixels and an interlaced frame rate of minimum 24 frames per second. The data shall be time coded using the elapsed time from the video file. The naming of the video file shall be automatic and shall match the indexing file name.

For each video file, indexing shall exist as a separate text file. The text file shall include the observation detail and the frame number at which the observation is located. The frame number shall be 150 to 200 frames prior to the feet distance the observation appears. This shall allow the user in WinCan to use the indexing feature and go to that defect with a click instead of fast forwarding or rewinding.

Separate MPEG files shall be created for each sewer manhole to manhole reach. MPEG files, picture files in JPEG format, inspection data, and text files used for indexing shall be stored on DVDs for delivery to the Engineer.

**500-1.1.5.4 Submittal.** The Contractor shall submit the CCTV inspection tapes and DVDs of the sewer and a CCTV inspection report. For a given sewer manhole to manhole reach, the MPEG files, picture files in JPEG format, inspection data, and text files used for indexing shall be included on the same DVD. It is intended that each DVD shall contain all of the information necessary to view digital video and data files for a given reach, and shall have functional indexing capability. Submittals that require more than one (1) DVD to view digital video and data for a given reach, or to implement the indexing function, will be rejected. For pre-rehabilitation CCTV inspection, the Contractor shall only submit the inspection tapes of the sewer; submission of DVDs and CCTV inspection reports is not required. Acceptance of the submittal is subject to review by the Engineer. If the inspection is not performed in accordance with the District's standards or if the quality of the inspection tapes, DVDs, or recording is found to be unacceptable, the submittal will be rejected and the sewer shall re-inspected at the Contractor's sole expense.

CCTV inspection reports shall be generated using the WinCan inspection software customized for the District. The reports shall be printed in color and shall include a hard copy log and computer generated graphic for each inspected sewer reach. The log shall include the appropriate District number or Joint Outfall letter, the name of the trunk sewer, the upstream manhole, the downstream manhole, the pipe diameter, the pipe or liner material, the date and time of the inspection, the footage to each defect or feature in the order observed during the inspection, a computer generated graphic for each manhole to manhole reach which indicates the location of each defect or feature found in the segment, and photos of moderate to severe damage and/or abnormal conditions. WinCan inspection software is available from WinCan America, Inc., Albuquerque, New Mexico (505) 341-0109.

The inspection data shall include data tables of observations, photographs, and video where applicable. The observation codes shall be consistent with those used by the District. The Contractor will be provided with customized files by the District for use with WinCan. These files contain the District's observation codes and approved fields for data collection and reporting.

**500-1.1.5.5 Payment.** Payment for all costs associated with the CCTV inspection of the sewer including all work appurtenant thereto shall be included in appropriate pipe bid item or sewer rehabilitation bid item."

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IN **500-1.1.6 Sampling, Testing, and Installation**, ADD THE FOLLOWING TO THE END:

"If the pipeline rehabilitation systems in 500-1.4, 500-1.7, or 500-1.10 are to be installed or if required in the Special Provisions, the Contractor shall implement a sampling and testing plan for



compliance samples collected in the field. All samples shall be tested by an independent accredited testing laboratory to be approved by the District. The Contractor shall authorize and direct the approved testing laboratory, in writing, to release the test results directly to the District immediately after the tests for a given sample are complete. The Contractor shall submit this written authorization to the District for approval prior to transmittal to the laboratory. In the event that test results for a given sample are not submitted to the District within fifteen (15) working days of sample collection or if the samples fail to meet the specified physical properties, the District reserves the right to suspend all lining operations. The District will continue to charge working days against the Contract time during any suspension periods caused by the late submittal of test results or failure of compliance samples to meet the specified physical properties. In addition, the District may withhold progress payments during these delays.

All compliance samples shall be removed from the pipe or sampling location immediately after the pipe liner is installed. All samples shall be marked and tagged in the field to identify each sample and to ensure that the chain of custody of each sample can be traced. Sample tags shall be Keller Ball type seals, or equal as approved by the Engineer. The corresponding tag number for each sample shall be clearly marked on each sample with indelible ink prior to the transfer of the sample to the approved testing laboratory. The Contractor shall utilize the Liner Sample Chain of Custody Form, which is shown at the end of this section. The Contractor shall verify that the samples have been tagged, using the approved tagging system, complete the appropriate sections of the Chain of Custody Form, and have the District's inspector sign the form. The compliance samples and the completed Chain of Custody Form shall be transferred to the approved testing laboratory in the field on the same day that the samples are collected. Samples shall be transferred in the presence of the District's inspector. The original completed Chain of Custody Forms shall be submitted to the District with the final test report.

The Contractor shall submit a detailed sampling and testing plan to the District for review and approval. The Contractor shall not commence the Work until the sampling and testing plan has been approved. The sampling and testing plan shall include but not be limited to the following information: sampling methods and procedures, details of false bottoms or other sampling devices to be used, procedures for marking and tagging samples, procedures and methods to verify chain of custody, copies of current certificates of accreditation for each independent testing laboratory to be used, procedures for preparing samples into specimens, procedures for preparing specimens for testing, detailed testing procedures, and a table listing the proposed sampling locations for each liner installation showing the sewer reach to be lined, manhole number or station where the samples will be taken, nominal pipe diameter of the sewer being lined, and description of the sampling method used. The Contractor shall include actual chain of custody tags and/or seals and all other forms or materials to be used as part of the field sampling procedures with the submittal."

COUNTY SANITATION DISTRICT NO. \_\_\_\_ OF LOS ANGELES COUNTY

LINER SAMPLE CHAIN OF CUSTODY FORM

PROJECT: \_\_\_\_\_

Contractor's Name \_\_\_\_\_  
Date Sample Taken \_\_\_\_\_  
Date Sent to Lab \_\_\_\_\_

Contractor's Representative's Name \_\_\_\_\_  
Inspector's Name \_\_\_\_\_

Installation No. \_\_\_\_ From MH \_\_\_\_ to MH \_\_\_\_ Length (ft) \_\_\_\_ Diam. (in.) \_\_\_\_ Installed Thickness \_\_\_\_ Or SDR \_\_\_\_

Sample Type (R, F, C)	Security Tag #	Location of Sample (See Below)	Inspector Signature	Contractor's Signature	Lab Signature*	Lab Sample Number

R = Restrained Sample

F = Flat Plate (only if R not possible)

C = Core Sample (in conjunction with F)

\*Verifies Lab received sample with intact security tag

Location of Sample

Project Requirements

1. Restrained Sample: Downtube: DT  
Intermediate MH: IMH  
Terminating MH: TMH

Nominal Felt Thickness to be Installed \_\_\_\_\_  
Flexural Modulus 250,000 psi  
Flexural Strength 4,500 psi  
(if applicable)

2. Core Sample: Core samples shall be taken at 10:00, 12:00 and 2:00 o'clock

Designate location of core and from what MH  
e.g. 10:00 D/S of MH \_\_\_\_\_

IN **500-1.1.7 Miscellaneous, a) Service Connection**, ADD THE FOLLOWING TO THE END:

"The Contractor shall notify all the residents and businesses, whose service connections will be disrupted, a minimum of fourteen (14) days prior to commencing any work. The notice shall be by registered letter and shall include the date and estimated time (in hours) that the sewer service will be disrupted. The Contractor shall provide approved temporary sanitary facilities for all affected residents and businesses. Unless otherwise specified, if a cleanout is available, the Contractor shall continuously maintain the flow from all residences, apartments and multiple dwelling unit complexes by individually bypassing their flow from the cleanout. If no cleanout is available, for residences and apartments or multiple dwelling unit complexes with five (5) units or less, the Contractor shall provide one (1) sanitary facility (portable toilet) with a hand washing facility for each affected residence/unit. The Contractor may be required to place the sanitary facility in the front, side, or in the back of the affected property. Exact placement of the sanitary facilities shall be as determined by the Engineer. The Contractor shall have the sanitary facilities cleaned and emptied before they are moved to the next location. If no cleanout is available, for residences and apartments or multiple dwelling unit complexes with six (6) units or more, the Contractor shall install cleanouts at the locations as directed by the Engineer and continuously bypass the flow. Sewer service shall be reinstated within twenty-four (24) hours, and the Contractor shall be responsible for limiting the length of each liner installation and having adequate equipment to ensure that this is achieved. The Contractor shall confirm the notifications verbally a minimum of twenty-four (24) hours prior to the scheduled interruption. If verbal notification is not successful, a typewritten notice shall be placed on the doorknob. The Contractor shall submit notification letters and doorknob hangers to the District for review and approval. In addition, the Contractor shall provide the Engineer with mailing receipts for the notification letters upon request.

For segmented liner pipe installation, the Contractor shall remove a portion of the host pipe at each connection location to connect the connection to the inserted liner pipe so flow can be contained in the liner pipe. The Contractor shall not reconnect any stubs. The Contractor is limited to a maximum of seven (7) calendar days from the date the liner pipe is sliplined past a connection to complete the tie-in to the liner pipe. Prior to grouting, the Contractor shall construct a bulkhead between the host pipe and the liner pipe at each connection. The bulkhead shall secure each connection in place during grouting and shall be constructed complete with grout injection and vent pipes. For connections that are connected to manholes, bulkheads shall be constructed at both the upstream and downstream ends of the manhole. The Contractor shall provide for containment and disposal of any spilled sewage."

IN **500-1.1.7 Miscellaneous, b) Segmented Liner Pipes**, DELETE ALL PARAGRAPHS AND REPLACE WITH THE FOLLOWING:

"After the insertion pit is constructed and accepted by the Engineer, and after cleaning, prior to commencing the sliplining operation, the Contractor shall insert a steel pipe test section, to ensure that the existing pipe is free of obstructions and ready to be sliplined. The test section shall have a minimum length and an outside diameter equal to that of the typical liner pipe section for that insertion run. A baffle plate(s) shall be attached to the test section with adequate height to trap any remaining debris which may be present. The debris shall be removed and disposed of off the site at no additional cost to the District. The test section shall be removed prior to actual sliplining operation. Upon successful completion of the insertion of the test section, the existing sewer shall be considered ready to receive the liner pipe and commencement of the sliplining operation. The sliplining operation shall commence within twenty-four (24) hours after successful insertion of the test section. The Contractor shall submit the manufacturer's details of the pushing or pulling heads to be used. Retainer cables, clamps, or any other devices shall not be allowed in the annular space while inserting the liner pipe. The installation heads or mechanism shall incorporate a gauging system which will provide a continuous monitor of the force being applied during insertion of the liner pipe. The gauging system shall be calibrated. If the gauging system does not provide a direct reading of the force being applied, the Contractor shall furnish

calibrated data in tabulated form to allow the Engineer to readily determine the force being applied in pounds. The insertion force used by the Contractor shall not exceed the liner pipe manufacturer's recommended maximum allowable pulling or pushing force that can be exerted onto the liner pipe without damaging integrity of the pipe or pipe joints.

The curve data and angular deflection and invert elevations of the existing sewer as depicted on the Plans were based on original design drawings and have not been verified. The Contractor shall verify all the existing curve data, angular deflection and invert elevations prior to performing any work which may be affected. Unless otherwise shown or specified, liner pipe at curves shall be installed by open cut; the Contractor shall not slipline liner pipe through any curve. In addition, unless otherwise approved by the Engineer, the Contractor shall not slipline liner pipe through any angle points and through any manholes where there is a change in pipe diameter; a directional change in the sewer alignment; or an excessive change in the inlet and outlet elevations. At these manholes, special mitered fittings may be required. The Contractor shall field verify and determine the actual configuration of these manholes before ordering or fabricating the required fittings. At all other locations, the liner pipe shall be sliplined through the manholes. Unless otherwise shown or specified, final positioning of liner pipe joints in manholes is not allowed. If the Contractor sliplines liner pipe through angle points and manholes where there is a change in pipe diameter; a directional change in the sewer alignment; or an excessive change in the inlet and outlet elevations, the Contractor shall do so at his own risk and the District will not be responsible for any changed conditions the Contractor may encounter.

At locations where the Contractor will install the liner pipe by open cut including curves, the Contractor shall prepare and waterproof the excavation prior to the start of sawcutting. The Contractor shall order the appropriate length of liner pipe required for lining the curves. Methods and procedures for any field cutting and fabrication work shall be reviewed and approved by the liner pipe manufacturer and submitted to the District for review and approval. The Contractor shall retain the services of an authorized representative of the liner pipe manufacturer approved by the District to inspect and verify that the field work is performed in accordance with the approved methods and procedures. Costs for the inspection services shall be included in the appropriate liner pipe bid item. After the work is completed at that location, the Contractor shall reinstall the cut portion of the RCP and encase it in reinforced concrete in the same manner as an insertion pit.

For sewers where flow diversion and dewatering are possible and if allowed by the Plans, the Contractor may slipline through curves in the dry. For sliplining curves with centrifugally cast fiberglass reinforced plastic mortar liner pipe, the liner pipe shall be connected with jacking bell and spigot joints. The seal design of the jacking bell and spigot joint will accommodate limited joint angular deflection allowing the liner pipe to negotiate through curves. The maximum allowable joint angular deflection of a joint varies according to pipe diameter. After the liner pipes are assembled and prior to water testing, the Contractor shall measure the angular deflection and/or measure the gap and calculate the angular deflection of each joint. If the angular deflection at a joint is less than 1 degree that joint shall be considered to have passed. If the angular deflection at a joint is 1 degree or greater but less than 1.5 degrees, the joint shall be subjected to a leakage test. The test pressure shall be equivalent to the maximum allowable grout pressure and shall be maintained for 30 minutes with zero leakage. If the joint should leak or if the angular deflection at a joint is 1.5 degrees or greater but less than 2 degrees, the joint shall receive a joint seal layup consisting of 15 ply of resin impregnated glass reinforcement, as a minimum. If the angular deflection at a joint is greater than 2 degrees, the joint shall receive a structural layup consisting of 30 ply of resin impregnated glass reinforcement, as a minimum, for restoring both the pipe strength and stiffness. If the liner pipe joint telescopes, the portion of the liner pipe protruding into the flow stream shall be cut out and removed as directed by the Engineer. Any resulting gap after removing the protrusion shall receive a joint seal layup or a structural layup based on the criteria established above. Instead of the jacking bell and spigot joints, the Contractor may carry in plain end mitered liner pipes and connect the liner pipes with approved closure couplings or make up the joints

internally by filling the gap with resin impregnated glass reinforcement. If the gap at a joint is 1 inch or less, the gap shall receive a joint seal layup consisting of 15 ply of resin impregnated glass reinforcement, as a minimum. If the gap at the joint is greater than 1 inch, the joint shall receive a structural layup consisting of 30 ply of resin impregnated glass reinforcement, as a minimum, for restoring both the pipe strength and stiffness. All joint seal or structural layup and all joint make up work shall be in strict conformance with the liner pipe manufacturer's recommended methods and written procedures approved by the District, and shall be performed in the presence of the authorized representative of the liner pipe manufacturer. In addition, supportive calculations demonstrating the adequacy of the structural layup shall be prepared by the liner pipe manufacturer and submitted to the District for approval. Resin used for all layup or joint makeup work shall be compatible with the resin used in the manufacture of the liner pipe. Technical data sheets of the property values of the resin shall be reviewed with and accepted by the liner pipe manufacturer in writing and submitted to the District for approval prior to use."

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IN **500-1.1.7 Miscellaneous c) Access/Insertion Pits**, DELETE THE PARAGRAPH AND REPLACE WITH THE FOLLOWING:

"Access/insertion pits, if required, shall be constructed in accordance with the Plans and as specified herein. Prior to commencing any work, as part of the construction schedule submittal, the Contractor shall submit the location and number of all the proposed access/insertion pits to the District for review and approval. The pits shall be located in accordance with the spacing as recommended by the liner pipe manufacturer based on maximum allowable force that can be exerted onto the liner pipe. The Contractor shall not start any pit excavation until all the liner pipe materials and equipment required to complete the sliplining to or from that pit are delivered on site. Temporary occupational right of ways and access have been obtained and existing utilities have been researched through record documents only at the areas on the Plans designated as potential pit locations. The pit locations shown do not represent the exact location nor the total number of pits required to complete the sliplining work. The potential pit locations are being identified so the Contractor is aware that these areas have been approved by the Agencies and/or property owners for use as the access or insertion pits and that existing utilities located within these areas have been researched and that pits may be located within these areas.

The odor scrubber locations shown on the Plans are based on the number and location of the potential pits shown. If the Contractor plans to complete the sliplining work with additional or less number of pits or selects pit locations other than those shown on the Plans, the Contractor shall do so at his own risk. In addition, the Contractor shall assume all the costs and shall solely be responsible for making all necessary arrangements with the Agency(ies), property owner(s), occupant(s), and utilities and acquiring any additional permits, occupational right of ways, and relocating any interfering substructures. The Contractor shall also revise and submit any required change in number and locations of odor scrubber units for approval. To be effective, an odor scrubber unit shall not be placed further than 1,000 feet away from an insertion pit. The District reserves the right to reject the Contractor's proposed pit locations. As a guideline, unless otherwise shown or approved by the Engineer, access/insertion pits shall be located in public right of way where there is minimum impact to local traffic and where there is minimum interference with existing utilities. Access/insertion pits shall not be located at any intersection or in front of any driveway access. All costs associated with selection of different pit locations and/or construction of any additional pits including, acquiring right of ways, and locating, identifying, protecting, and restoring utilities shall be borne by the Contractor. No additional compensation and/or extension of time will be granted due to the change in number or locations of access/insertion pits or change in number or locations of odor scrubber units.

All existing utilities and improvements disturbed shall be replaced by the Contractor and/or restored to the original condition. The Contractor shall pothole and verify the location of all the utilities shown at each pit at least ninety (90) calendar days prior to the start of pit excavation. The Contractor shall incorporate the actual locations of these utilities in the design of the shoring. Unless otherwise allowed by the Engineer, the existing sewer pipe shall be sawcut at the springline and 1/2-inch crushed rock shall be placed in the entire pit floor up to the springline. Prior to removing the sawcut pipe section, all exposed soil surfaces within the insertion pit including the floor and end walls shall be covered with a minimum of 4 inches thick gunite or concrete up to adjacent ground surface. The Contractor shall continuously dewater and dispose of any sewage which may be present as the existing sewer may surcharge.

Insertion of test section and liner pipe shall proceed within five (5) working days after the existing sewer pipe is sawcut. To reduce odor, pits shall not remain open to the atmosphere at any time except during actual liner pipe insertion. The pits shall be covered and sealed daily to prevent emission of any odor upon the cessation of liner pipe insertion, at the end of each workday, during all non-working hours, and as directed by the Engineer. Covers to be installed shall be temporary and readily removable. Minimum 50 mils thick extra heavy polyethylene sheets shall be used to cover the entire insertion pit. The edges of the sheets shall be weighed down to prevent emission of sewer gas. The Contractor shall submit the method of covering and sealing of the pit for review and approval. Unless otherwise specified or approved by the Engineer, an access/insertion pit shall be backfilled and paved within a maximum of thirty (30) consecutive calendar days, from the date the pit was initially open."

AFTER **500-1.1.7 Miscellaneous, e) End Seals**, ADD THE FOLLOWING:

"f) **Bypassing Requirements.** When required by the process and allowed by the Plans, the Contractor shall bypass all sewage flows around sections of sewer to be rehabilitated and dewater the work area, all in accordance with 7-8.4 and 306-3.3, and as specified herein. The Contractor shall be responsible for installing, continuously monitoring, maintaining and operating the bypass pumping system at all times during the work. The Contractor shall provide a person, "Monitor", to be stationed at the mainline bypass site with no other duties than to monitor and maintain that system. If additional bypasses are required to supplement the mainline bypass, the Contractor shall provide additional Monitors with no other duties than to monitor and maintain these supplemental bypass systems. The Contractor shall provide one Monitor to maintain no more than four (4) supplemental bypass systems. Each Monitor shall maintain a log of the depth of flow in the suction manhole being monitored. Readings shall be taken and recorded every fifteen (15) minutes throughout the duration of bypass. Logs shall be signed by the Monitor and submitted weekly to the Engineer. In addition to logging the depth of flow, the Monitor's duties shall include, but not be limited to, maintaining the fuel levels in the pumps, regulating pump speed to maintain the level of flow in the manhole to a maximum of 1 foot above the soffit of the pipe, and activating the standby pumping system if the primary pumping system fails. The Monitor shall also arrange for the immediate repair or replacement of any pump which stops operating or is not operating properly. In order to communicate with the District's representative, the Monitor shall be able to speak the English language. The Contractor shall identify low manholes on the local sewer system and the District's sewer system and continuously monitor flow levels during the work to ensure that there are no sewage spills.

The Contractor shall submit a detailed flow bypass plan to the District for review and approval. The Contractor shall have an approved submittal prior to commencing any work. The submittal shall indicate the locations and capacities of all pumps, sumps, suction, and discharge lines. The bypass pumping system, including all equipment and piping, shall be sized to handle peak flow of the section of sewer to be rehabilitated and shall be installed in strict conformance with local ordinances and traffic requirements. Pump size shall be selected such that the intersection of the values for the pumping system's total dynamic head and the peak flow rate is in the middle of the pump's operating envelope. All

bypass pumps, except for submersible pumps, shall be self priming pumps. Non-self priming pumps shall not be used. For peak flows greater than 1 cfs, only prime assist self priming pumps shall be used. For peak flows 1 cfs or less, wet prime self priming pumps will be allowed. The Contractor shall provide a backup bypass pumping system in case of malfunction or failure of the primary system. The backup bypass pumping system shall provide 100 percent standby capability, and shall be fully installed, laid out and ready for use. Each standby pump shall be a complete unit with its own suction and discharge piping. In addition to the backup system, the Contractor shall furnish and operate vacuum trucks when required by the Plans.

The primary and standby mainline and local sewer bypass systems shall be pressure tested, with potable water, with all needed blind flanges and valves on the mainline bypass piping for connection with local sewer and house connection bypasses. This pressure test shall be conducted at the beginning of each bypass setup and at a minimum of once per month for extended bypass setups.

As part of the bypass plan, the Contractor shall submit a detailed drawing for all bypasses including showing how the mainline bypass pipes will be placed in the various streets and crossing the side streets. Additional bypass plan submittals shall include, but will not be limited to: design calculations for mainline and local sewer bypass pumps, suction and discharge pipe; description of program for monitoring mainline and local sewer bypass systems including discharge pipes; location, layout and length of time each mainline bypass system will be in place.

The Contractor shall utilize a manifold or cross-connection with isolation valves, as approved by the Engineer, in each mainline and local sewer bypass system if the peak flow is greater than 1 cfs or if a flow-through plug is utilized in the sewer bypass system.

All discharge pipes shall have fittings and connections for flushing and draining the pipes after the bypass is completed. The Contractor shall flush the mainline bypass system with potable water for a minimum of thirty (30) minutes prior to cutting or disconnecting the bypass pipes and moving them to a new location. After flushing the discharge pipes with potable water, the Contractor shall vacuum-up any residual water from the pipe resulting from the breakdown of the pipes and properly dispose of the residual water.

The use of flow-through sleeves and the proposed anchoring system shall be submitted for approval. Flow-through sleeves shall typically consist of two flow-through plugs connected by a flexible wire reinforced fabric hose secured by a cable. When containing flow greater than 1 cfs, the Contractor shall anchor the flow-through sleeve with a cable via the pipe to a manhole immediately upstream of the insertion manhole. For flow less than or equal to 1 cfs, the Contractor may anchor the sleeve in the insertion manhole. The use of flow-through sleeves will not be allowed where undetected surcharging of the influent sewer could cause wastewater to backup through house connections into structures or overflow from cleanouts. Use of flow-through sleeves is acceptable only where surcharging of the influent sewer can be detected in the immediately upstream manhole without causing the aforementioned wastewater backups or as specified in the Special Provisions.

The Contractor shall secure all sewer plugs to an anchoring device with a steel cable which shall be submitted to the Engineer for approval. Flow-through plugs will not be allowed in manholes where undetected surcharging of the influent sewer could cause wastewater to backup through house connections into structures or overflow from cleanouts. Use of flow-through plugs is acceptable only where surcharging of the influent sewer can be detected in the upstream manhole without causing the aforementioned wastewater backups or as specified in the Special Provisions.

For peak flows greater than 4 cfs, a flow bypass pumping Contractor or Subcontractor shall be responsible for designing and implementing the flow bypass plan and operating the flow bypass pumping system required for the lining work. The flow bypass pumping Contractor or Subcontractor shall have experience designing, installing and operating flow bypass pumping operations with peak flows greater than 4 cfs and shall have completed a minimum of three (3) verifiable projects within the last three (3) years with conditions similar to the project where the bypassed flows were 10 cfs or greater. The Contractor shall submit the specialty Subcontractor or Contractor information with its bid.

All bypass pump suction and discharge lines that extend into District's manholes shall be of rigid hose or hard pipe, lay flat hose will not be allowed. Lay flat hose up to and including 6 inches in diameter and PVC, HDPE, steel or aluminum piping will be allowed for discharge pipes. Heavy duty lay flat hose up to and including 4 inches in diameter will be allowed for vehicle traffic at residential driveways. For all other driveways and alleys, the discharge pipes shall be ramped or trenched as approved by the Engineer. Where crossing areas which are subject to traffic, bypass piping shall be installed in trenches with adequate cover and protected from through traffic.

If the construction of a cleanout is required for the bypass of flow, the Contractor shall contact the owner or manager of the complex to determine placement of the cleanout and for their requirements for the bypassing of the flow. The minimum size cleanout to be constructed shall be 6 inches in diameter. The Contractor shall submit the type of cleanout to be constructed, the location of the cleanout, layout of discharge pipe and design of bypass pump system. The Contractor shall provide a person with no other duties than to monitor and maintain up to a maximum of four (4) bypass systems from cleanouts. The Contractor shall provide on site a backup pump for each bypass from a cleanout. Only one (1) discharge pipe will be required for each bypass from a cleanout.

The local sewers shown on the Plans are for information only. The District does not guarantee the completeness or accuracy of this information. The Contractor shall research, obtain and verify any additional information as deemed necessary to prepare and implement the flow bypass plan. Prior to installing any plug in a local sewer, the Contractor shall perform a CCTV inspection of the local sewer from the manhole to the upstream manhole to verify the condition of the existing pipe and shall submit to the Engineer for approval prior to initiating the bypass. If the District determines that the condition of the existing pipe may be inadequate to sustain the intended bypass operation, the District may direct the Contractor to revise and resubmit the flow bypass plan for review and approval. After the installation of the liner and removal of the plug are completed, the Contractor shall re-televiser the local sewer and submit the inspection tapes to the District for approval.

Unless otherwise specified, the Contractor shall not allow any sewer, including any of the District's or local sewers, to surcharge more than one foot above the soffit of pipe at any time. If a flow backup occurs during the rehabilitation process, the Contractor shall cut the liner or liner pipe and/or stop his operation allowing the flow to move downstream, as directed by the Engineer. The District will not be responsible for any subsequent delay or rework if the flow backup is caused by the Contractor's failure to install, operate and maintain the bypass system; improper implementation of the bypass procedures; faulty setup; defective materials or equipment malfunctions. In addition, if the Contractor is not responsive or unable to perform the work required to correct the problem, the District is empowered to implement the emergency procedures as specified in 9-3.1.

The Contractor shall prepare and implement an Emergency Spill Response Plan (ESRP) to mitigate any damage in the event a sewage spill does occur. The ESRP shall account for all storm drain systems in the vicinity of the Work that could be affected by a sewage spill. For each liner installation, the Contractor shall identify and show or describe the location in the ESRP of all storm drain catch basins and other storm drain inlets (SDIs) that could receive spilled sewage as a result of the Work. These catch basins and SDIs shall be sealed prior to operating the bypass pumping system, to minimize the potential of spilled sewage from entering the storm drain system. The Contractor shall seal the catch basins and



SDIs with sand bags and plastic sheeting or other methods approved by the Engineer. The Contractor shall remove all material used to seal the catch basin when bypass pumping is completed. The storm drain systems shown on the Plans are for information only. The District does not guarantee the completeness or accuracy of this information. The Contractor shall research, obtain and verify any additional information on the storm drain systems as deemed necessary to prepare and implement the ESRP. The Contractor shall submit the ESRP along with the bypass plan submittal to the District for review and approval. The ESRP shall be site specific and shall include as a minimum, storm drain catch basin and SDI protection; procedures and locations of spill containment; including procedures in the event that sewage reaches a watercourse or storm drain system; spill control, including isolating the spill from the public and returning the wastewater to the sewer; notifications; cleanup; and spill and damage reporting. The Contractor will not be allowed to start any flow bypass without an approved ESRP.

In the event any sewage overflow occurs, the Contractor shall be fully responsible for containing the spillage, preventing any sewage from reaching a watercourse or storm drain system, washing down the spill area with potable water, recovering and returning all the spilled sewage including all the washdown water back into the sewer. Chlorine shall not be used as a means of disinfection. In the event the Contractor is unable to satisfactorily respond to a sewage overflow as determined by the Engineer, or if the sewage enters a watercourse or storm drain system, the District will deploy staff and equipment in response to the sewage overflow. The Contractor shall make available its manpower and equipment resources to the District as directed by the Engineer.

In the event any sewage overflow occurs, the Contractor shall immediately contact the Sanitation Districts' Long Beach Main Alarm Center at (562) 437-6520 or (562) 437-1881. The Contractor shall provide the spill location and the time the spill was first observed to the Long Beach Main Alarm Center.

The Contractor shall bear all of the costs associated with the sewage overflow including any costs incurred by the District which may include spill control, spill containment, spill recovery, laboratory sampling, cleanup and restoration, and spill and damage reporting. Additionally, the Contractor shall be responsible for any fines and penalties associated with the sewage overflow.

g) **Odor Scrubber Units.** Where indicated on the Plans, the District will furnish, install and operate trailer-mounted, carbon adsorption odor scrubber unit(s) including flexible air duct. Operation of the odor scrubber unit requires 220 volts, 100 amp breaker and single phase electrical service. The Contractor shall be responsible for providing and maintaining temporary electrical services for operating the odor scrubber unit(s) and safekeeping of these unit(s). The Contractor shall make all necessary arrangements with the appropriate utility and pay for all fees and charges for providing and maintaining a temporary electrical service pole, if necessary, transformer and meter at the scrubber location. The District will pay for the electrical usage charges for operating the scrubbers. The Contractor shall invoice the District for this cost without any Contractor's markup and the Contractor will be reimbursed by purchase order. Requirements and costs for providing and maintaining temporary electrical service shall be obtained from the appropriate utility.

Unless otherwise specified or shown, the Contractor shall furnish and install 8-foot high chain link fencing with razor ribbon wire for securing each odor scrubber unit. The fence posts shall be anchored to the pavement or in concrete. The chain link fence to be installed shall be furnished with lockable gates of sufficient size for the delivery and removal of the 9-foot wide by 25-foot long trailer mounted odor scrubber unit. Unless otherwise allowed by the Engineer, the Contractor shall not commence any work which may cause the release of sewer gas to the atmosphere until after the odor scrubber unit is installed and ready to be placed into service. After the temporary electrical service pole, transformer and meter are in place and the chain link fencing and gate installed and accepted by the Engineer, the District will deliver the odor scrubber unit on site. The temporary electrical service pole shall be located within the chain link fence enclosure unless otherwise approved by the Engineer. The

Contractor shall allow a minimum of two weeks for the District to arrange for the delivery, installation and completion of the electrical hookup of each odor scrubber unit. Materials and construction of chain link fencing shall be in accordance with 304-3. Upon completion of the work at a location, the District will move the odor scrubber unit accordingly. After the odor scrubber unit is moved, when directed by the Engineer, the Contractor shall remove the temporary service and chain link fencing and gate and restore the area in accordance with 7-9. All costs associated with providing and maintaining temporary electrical services for the odor scrubber units including installation and removal of temporary service poles, transformers, meters and chain link fence and gates shall be included in the sewer line rehabilitation bid item.

The number and location of the odor scrubber units as depicted on the Plans are based on the number and location of the potential insertion pits shown. The District may change the odor scrubber unit locations and/or increase the number of units operating to accommodate Contractor's access/insertion pit locations and direction of his sliplining operation. No additional compensation and/or extension of time will be granted due to the change in location and number of odor scrubber units. In addition, depending on availability, the District may elect to remove the odor scrubber unit(s) from the project at any time. The Contractor shall be aware that the odor scrubber unit is intended for controlling of odor only and shall not be considered as a part of the Contractor's safety equipment. Use of the odor scrubber unit is at the District's sole discretion; and use of the odor scrubber unit does not alleviate the Contractor's responsibility to comply with all applicable requirements as stipulated by the State Division of Occupational Safety and Health for working in existing sewerage facilities."

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IN **500-1.1.9 Measurement and Payment**, THIRD PARAGRAPH, FIRST SENTENCE, DELETE THE WORDS "The price per linear foot (meter) or lump sum for" AND REPLACE WITH THE WORDS "The payment for".

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IN **500-1.2.4 Sewer Bypassing and Dewatering**, DELETE THE PARAGRAPH AND REPLACE WITH THE FOLLOWING:

"Sewer bypassing and dewatering shall conform to 500-1.1.7 (f)."

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IN **500-1.3.7 Annular Space Grouting**, DELETE THE LAST SENTENCE AND THE TABLE.

IN **500-1.4 Cured-In-Place Pipe Liner**, DELETE ALL PARAGRAPHS AND REPLACE WITH THE FOLLOWING:

**500-1.4.1 General.** This section covers the requirements for rehabilitating the sewer with a CIPP liner.

**500-1.4.2 Notifications.** Prior to commencing any work, the Contractor shall notify all the residents and businesses whose services will be disrupted per 500-1.1.7(a).

**500-1.4.3 Cleaning, Preliminary Inspection and Closed Circuit Television Inspection.**

Cleaning and preliminary inspection shall be performed in accordance with 500-1.1.4. Prior to fabricating the felt tube, the Contractor shall field verify the diameter and length of the existing sewer to ensure that the tube will have sufficient wall thickness and length to cover the entire reach of lining run.

The number and location of the existing house connections depicted on the Plans are provided for bid comparison only and are not guaranteed for accuracy. After cleaning and preliminary inspection, the Contractor shall perform CCTV inspection to ensure that the sewer is ready to be lined and to verify the number and location and status of all the existing connections. Minimum guidelines for the CCTV inspection work to be performed shall be as specified in 500-1.1.5. CCTV inspection shall also be performed after the sewer is lined and existing sewer connection, if any, re-established.

The Contractor shall complete any necessary point repairs and removal of obstructions not cleared by cleaning prior to performing the CCTV inspection. Any protruding house connections that may interfere with liner installation shall be cut flush with the existing pipe by the use of an approved remote cutting device from within the sewer.

**500-1.4.4 Materials.** The CIPP liner shall comply with all applicable requirements of ASTM F1216 or ASTM F1743, except as modified herein.

The CIPP liner shall be suitable for continuous service in sewerage environments with 1 N sulfuric acid at an average wastewater temperature of 80 degrees F and for intermittent exposure (at a frequency of 1 1/2 hours two times a week) to sewage with a pH of 11. Unless otherwise specified, the CIPP liner shall be a structural liner consisting of a fabric tube and epoxy vinyl ester resin system. The resin system shall have structural properties listed in 500-1.4.5. The tube shall be free of defects and will be subject to inspection prior to resin impregnation. The catalyst shall be compatible with the resin system to be utilized. Quantity and type of catalyst shall be selected based on the curing conditions and recommendations of the resin supplier.

**500-1.4.5 Design.** The CIPP liner shall have a minimum service life of fifty (50) years and shall have, as a minimum, the following initial structural property values which the resin system shall meet:

	<u>Test Method</u>	<u>Initial</u>
Flexural Strength	ASTM D790	4,500 psi
Flexural Modulus	ASTM D790	250,000 psi
Tensile Strength	ASTM D638	3,000 psi
Tensile Modulus	ASTM D638	250,000 psi

**500-1.4.6 Submittal Data.** The Contractor shall submit CIPP liner submittals to the District for approval. The submittals shall include complete information on the material composition including resin and catalyst, felt tube material, material safety data sheets, design calculations, including the regression analysis of the flexural properties, if available, detailed installation procedures including equipment setup and layout, resin impregnation, insertion and access locations, compliance sampling and testing plan, flow bypass plan including schematic, and certified test reports for the qualification test. The CIPP liner installation submittal shall include a liner installation list indicating for each installation, the diameter and length of liner to be installed, the installation manhole, the terminating manhole, sampling manhole(s), and an estimate of the installation time including reinstatement of any service connections and local sewers. In addition, the Contractor shall submit manufacturer's certified Fourier Transform Infrared Spectroscopic scans of the proposed resin system with the CIPP liner submittal. The Contractor shall have approved submittals prior to commencing any work. The Contractor shall plan and allow sufficient time in his schedule for the review of submittals and for the required testing. Performance of the chemical resistance test will require a minimum of one month to complete.

**500-1.4.7 Testing.** Testing to be performed shall include a qualification test and a compliance test. The testing shall be performed by an independent accredited testing laboratory approved by the District. The qualification test shall be performed on fabricated specimens to verify that the design, as contained in the submittal, will meet the specified performance. The compliance test shall be performed to ensure that the installed liner complies with the Specifications.

**500-1.4.7.1 Qualification Test.** Prior to actual installation, the Contractor shall fabricate cured specimens of the fabric tube, resin and catalyst system and shall have the following tests performed. Test results from prior projects are not acceptable. The specimens will be subject to inspection prior to testing.

- Flexural Strength and Flexural Modulus test per ASTM D790
- Chemical Resistance test per ASTM F1216 Appendix X2, except the test solutions shall be 10% sulfuric acid (by volume) and shall be 40 mg/l sodium hydroxide in distilled water. In addition to flexural strength and flexural modulus, weight change shall be reported. The weight of the test specimen after exposure shall be within  $\pm 1.5\%$  of the initial weight.

Each test shall be performed on a minimum of three specimens. If the result of any flexural test is less than the minimum flexural property values in 500-1.4.5, or if the result of chemical test fails to meet the criteria set forth in ASTM F1216 Appendix X-2, the liner design shall be reevaluated and the reformulated system shall be retested and the results resubmitted to the District for approval.

If the Contractor submits a resin system that has successfully passed the qualification test on a District's project within twelve (12) months prior to the bid date for the Work or if the resin and felt tube system has been tested in accordance with 211-2 and meets the requirements of 500-1.4.5, the qualification test will be waived. The Contractor must use the resin system that meets these requirements for the Work to receive a waiver from the qualifications tests.

**500-1.4.7.2 Compliance Test.** The Contractor shall collect resin samples for FT-IR scans during the wet-out procedure or from the cured resin felt composite sample for each CIPP installation. The Contractor shall notify the Engineer at least twenty-four (24) hours in advance of the wet-out procedure. The Contractor shall perform FT-IR scans on the resin samples collected and submit the certified results of the scans along with the compliance test results. Samples for compliance testing of the cured resin shall be collected at an intermediate manhole. If no intermediate manhole is available, compliance samples shall be collected at the terminating manhole. Prior to commencing the Work, the Contractor shall submit a sampling and testing plan for compliance samples to the District per 500-1.1.6. The Contractor shall collect a minimum of one compliance sample for installations less than 1,000 feet in length and a minimum of two (2) samples for installations that exceed 1,000 feet in length. Unless otherwise specified in the Plans, the Contractor may designate sampling manholes. Prior to liner installation, sampling manholes shall be fitted with false bottoms or other approved sampling device. The false bottoms or other approved sampling devices shall be fabricated to have the same inside diameter as the pipe to be lined, such that the cured wall thickness of the liner sample will be representative of the installed CIPP liner. In addition, the sample shall be of sufficient size to provide all the required specimens for testing. In the event that the Contractor must cut the sample into smaller pieces to facilitate removal from the sampling manholes, the Contractor shall place match marks on the sample pieces for identification so that entire sample may be reassembled into its original configuration.

The compliance samples of the cured resin shall be divided into individual specimens and outside layers of the tube and/or any plastic coatings that are not included in the structural design of CIPP liner shall be ground off prior to testing or measurements. The specimens shall be subjected to the following tests and certified test reports shall be submitted to the District.

- Flexural Strength and Flexural Modulus test per ASTM D790
- Measurement of Cured Wall Thickness per ASTM D5813 Section 8.1.2

A minimum of five specimens shall be tested for flexural properties. If any of the specimens fails to meet the minimum property values listed in 500-1.4.5, the entire installation length shall be considered out of compliance and the District has the authority to direct the Contractor to remove the installed CIPP liner and reline the entire length of the installation. For cured wall thickness measurements, the average thickness shall be calculated using eight equally spaced measurements around the circumference of the restrained sample, measured a minimum of 4 inches inside the edge of the sample pipe. Cured wall thickness measurements shall be submitted for information only. The District will use the cured wall thickness measurements as secondary verification that the Contractor has installed the felt tube as specified in the Special Provisions. Re-testing is not allowed unless approved by the Engineer. In the event that the Contractor fails to collect compliance samples due to his own negligence, the entire length of the installation will be considered to be out of compliance and the District will also have the authority to direct the Contractor to remove the installed CIPP liner and reline the entire length of the installation. Any removal of installed CIPP liner and relining, if required by the Engineer, shall be performed at no additional cost to the District and shall be constructed and installed in accordance with the specified liner design and thickness. No time extension will be granted.

The Contractor shall use a Keller Ball type seal, or equal, as a tagging system for each sample. The Contractor shall also utilize the Liner Sample Chain of Custody Form shown in the Special Provisions. The Contractor shall verify that the samples have been tagged, using the approved tagging system, and shall have the inspector sign the Chain of Custody Form after the Contractor completes the required information. The compliance samples and signed Chain of Custody Form shall be turned over to the independent testing laboratory in the field at the time the samples are collected. The transfer of samples shall take place in the presence of the District's construction inspector.

The Contractor shall send a letter to the approved independent testing laboratory authorizing and requiring the laboratory to release the preliminary and final test results of the compliance samples directly to the District as each individual test is completed. The Contractor shall submit this letter to the District for approval prior to sending it to the laboratory.

The lining operation may be suspended if the preliminary and final compliance test results of lining are not submitted to the District within five (5) and fifteen (15) working days respectively, of the sample being taken or if the preliminary or final test results fail to meet the specified requirements. The Contract time shall continue during any suspension period caused by late submittal or failure of compliance test results and progress payments may be withheld.

**500-1.4.8 Installation.** The Contractor shall install the CIPP liner utilizing a felt tube having a nominal thickness as specified in the Special Provisions. The Contractor shall install the CIPP liner with the specified nominal felt tube thickness regardless of the flexural retention value of the resin. The felt tube manufacturer shall stencil the diameter and nominal thickness of the tube on the coated side of the felt tube at 5-foot intervals so that the markings are visible along its entire reach. The Contractor will not be allowed to install any liner without a properly marked felt tube. The installation of the liner shall take place within forty-eight (48) hours of cleaning the sewer. The resin-impregnated tube shall be stored under controlled temperature as recommended by the resin supplier. The resin-impregnated tube shall be either installed by inversion under a sufficient hydrostatic head to fully fill and line the interior of the sewer; or shall be pulled through the sewer and inflated by inverting a bladder inside the resin impregnated tube under a sufficient hydrostatic head for expanding the bladder and tube against the sewer pipe wall. The outer layer of the pulled tube shall be perforated, allowing surplus resin to press against the pipe wall. The hydrostatic head being applied shall be closely regulated. The Contractor shall use either an end-stop or hold back mechanism as required to prevent the resin impregnated tube from protruding into the adjacent sections of sewer which are not designated to be lined.

After the resin-impregnated tube is in place and secured, the entire lined pipe shall be heat cured with water. Temperature shall be maintained during the curing period in accordance with the recommendation of the resin supplier and the approved submittal and shall be monitored. After curing and a sufficient cool-down period, the liner shall be cut and trimmed with ends at manholes tapered with resin. A temporary 2-inch diameter hole shall be cut at each house connection to return it to service immediately. The Contractor shall not disrupt service for more than twenty-four (24) hours. If service is disrupted for more than twenty-four (24) hours, the Contractor shall provide additional sanitary facilities to affected residents and businesses as may be necessary. The Contractor shall be responsible for any extra costs that accrue due to service not being reinstated within the first twenty-four (24) hours. All existing house connections shall be re-established without excavation by the use of an approved cutting device from within the sewer. The Contractor shall not re-establish any stub. The final re-established house connection shall be equal to the original opening both in size and shape with clean and smooth edges. The Contractor shall have a back-up cutting device onsite in case of malfunction.

**500-1.4.9 End Seals.** After installation, the ends of the liner shall be cut off flush with the manhole wall and sealed. If a manhole has been lined through, the top half of the liner shall be cut even with the top of the shelf. The ends of the liner shall be sealed with a material that will bond to both the liner and the host pipe. The sealant material shall be suitable for continuous immersion in water and shall be resistant to a corrosive sewer environment. The sealant shall provide a smooth transition from the host pipe to the liner and shall not reduce the inside diameter of the liner. The sealant material to be used shall be Sikadur®31 or 35, Sika Corporation, or equivalent approved by the Engineer. The Contractor shall apply the material prior to the expiration of its shelf life and in accordance with the manufacturer's recommendations.

**500-1.4.10 Inspection and Repair.** A post CCTV inspection shall be performed to inspect the finished liner for defects. All defects found in the finished liner, including core sample holes, foreign inclusions, dry spots, pinholes, wrinkles, fins, delamination, deflections, sags, and voids between the liner and pipe, shall be repaired. The repair to be performed shall be determined by the Engineer and may include grinding, cutting, and removing the defective areas, relining, replacing with the same resin mixture, and filling voids by injecting the resin mixture. The Engineer will sound the interior of the sewer to locate any voids and areas with poor adhesion. If the lined surface is suspected to contain any voids or to have poor adhesion, the Contractor shall drill hole(s) through the liner as directed by the Engineer to determine the extent of the voids. The Contractor shall submit the repair method to the District for approval and shall be responsible for all costs of the repair.

**500-1.4.11 Payment.** Payment for furnishing all labor, equipment and materials to rehabilitate the existing sewer with the CIPP liner, including flow bypass, point repairs, cleaning, cutting of protruding house connections and removal of obstructions, providing temporary sanitary facilities, all testing, installation of the CIPP liner, re-establishing local sewer and house connections, physical inspection, pre- and post-CCTV inspection, repairs including grouting of voids, and all work appurtenant thereto, shall be made under the CIPP liner bid item. Unless otherwise specified, the CIPP liner bid item quantity does not include length of liner at manhole(s). If the Contractor installs the CIPP liner through a manhole and a compliance sample is not collected at that manhole, the District may allow all portions of the liner within the manhole to remain in place to facilitate the manhole rehabilitation work. If the liner is allowed to remain in a manhole, the District will reimburse the Contractor the cost by adjusting the bid item quantity to include the length of the liner at that manhole based on the unit cost of the CIPP liner bid item. If the Engineer determines the liner within the manhole has substantial wrinkles or abnormalities or if the Contractor installs the liner through a manhole which will be used as a sample manhole, the Contractor shall cut and remove all portions of the liner within the manhole. Cost for installing and removing the liner at these manholes shall be the responsibility of the Contractor. If the CIPP liner is to be removed from a manhole, the Contractor shall cut the CIPP liner flush with the end of the existing sewer pipe at the manhole wall."

IN **500-1.5 Polyvinyl Chloride (PVC) Pipe Lining System**, DELETE ALL PARAGRAPHS AND REPLACE WITH THE FOLLOWING:

**500-1.5.1 General.** This section covers the requirements for rehabilitating the sewer with a PVC pipe lining system. The lining system shall be designed to restore the structural integrity of the existing sewer. Limits of the lining and the minimum grout thickness required shall be as shown on the Plans.

Cleaning and preliminary inspection shall be performed in accordance with 500-1.1.4. The Contractor shall televise the sewer after preparing the concrete surfaces, and after the sewer is completely lined and grouted. The inspection shall record the conditions of the existing sewer and serve as a condition for final acceptance of the work. The Contractor shall utilize the existing manhole and structure to access the sewer.

**500-1.5.2 Qualification.** The work shall be performed by Contractor or Subcontractor licensed by the lining system manufacturer.

**500-1.5.3 Surface Preparation.** All surfaces to be lined shall be prepared as specified herein. The Contractor shall not install any PVC liner until the prepared surfaces have been accepted by the Engineer. All materials generated by preparation of the surfaces shall be trapped, collected and removed from the sewer. The materials removed from the sewer shall be disposed of off the site on the same day.

All the surfaces to be lined shall be thoroughly cleaned to remove grease, sludge, dirt, and other foreign deposits. After the initial cleaning, the Contractor shall remove all loose and deteriorated concrete by sandblasting, high pressure water blasting (minimum 10,000 psi at a flow rate of not less 5 gpm), and/or a combination of high pressure water/sandblasting. Concrete substrates with hydrogen sulfide damage shall be removed to a depth where all the white calcium sulfate is removed and only hard grey concrete with a surface pH of 7.0 or greater remains. After the deteriorated concrete is removed, the Contractor shall thoroughly clean the surface including vacuuming to remove all fines and deleterious materials that will adversely affect the bonding of the grout.

Any reinforcing steel exposed, including those exposed after removing deteriorated concrete shall be thoroughly cleaned by sandblasting to remove all contaminated concrete and rust particles. Immediately after the cleaned reinforcing steel is inspected and accepted by the Engineer, the Contractor shall place a protective coating on the exposed reinforcing steel. The protective coating shall be 40 mils of Sikatop 108 Armatec, Sika Corporation, Master Builders Emaco-P22, or equal.

**500-1.5.4 PVC liner.** The PVC liner shall be made from unplasticized PVC compounds with a cell classification of 13354, 12344, or 13334 as defined in ASTM D1784. Additives and fillers in the PVC compounds shall not exceed 15 percent in weight. The minimum thickness of the former strip and joiner strip and the minimum profile height of the PVC liner shall be as shown on the Plans. The manufacturer shall submit a certificate of compliance with Specifications including test results for the PVC liner being furnished.

**500-1.5.5 Grouting.** The grout used to fill the annulus between the exterior of the PVC liner and the interior of the prepared concrete surfaces shall be a colloidal cement, fly ash, bentonite slurry. The grout shall have a minimum compressive strength of 5,000 psi at twenty-eight (28) days per ASTM C39 or C109 and a maximum shrinkage not exceeding 1.0 percent by volume as measured by ASTM 1090 (28 days moist cure). The Contractor shall provide a water meter to monitor and insure the amount of water used is in accordance with the approved grout mix design. Bleed water shall be less than 5 percent.

**500-1.5.6 Installation.** The Contractor shall retain the services of a qualified and authorized representative of the lining system manufacturer to provide field instruction and direction to ensure that the work is performed in accordance with the lining system manufacturer's recommendations. Conformance of the work to the Specifications shall be determined solely by the Engineer.

The Contractor shall verify the layout of the curve and angular deflection of the existing sewer prior to ordering the PVC liner. The Contractor shall utilize the maximum widths of PVC liner possible. Depending on the limits of lining required, the PVC liner shall either be furnished in coils and spiral wound to completely line the interior of the sewer or furnished in panels and installed square and perpendicular with the conduit. Edges of the adjacent liner shall be joined together with a continuous PVC joiner strip with snap-tight joint. After assembled, the joint shall be water and gas leak tight. Details for joining the leading and terminating edges shall be submitted for approval. At locations where the gap between liner sections precludes the use of joiner strips, H-strip shall be used. The H-strip and PVC liner shall be coated with a primer and sealed with SikaFlex 1A, or equal as recommended by the manufacturer and approved by the Engineer.

The Contractor shall maintain service connections in service without interruption and without excavation. The annular space between the PVC liner and the host pipe at the service connections shall be bulkheaded. The bulkhead, grout and existing RCP shall be protected from the sewage and sewer gases by a method recommended by the manufacturer and approved by the Engineer.

After the PVC liner is in place and joined, the ends of the liner shall be bulkheaded. The Contractor shall exercise extreme care during grouting. The Contractor shall stage the grouting in multiple lifts and shall provide all the bracing and supports as deemed necessary to prevent the PVC liner from buckling and floating during grouting. Grout for each lift shall be allowed to set before the succeeding lift of grout is placed. Grout holes may be drilled in the PVC liner. After grouting, the grout holes shall be plugged with PVC plugs and sealed by polyurethane sealant. All waste grout shall be removed and disposed of off the site.

A minimum of three grout samples shall be taken for each grout lift. Each grout sample shall be tested for bleeding, density and consistency, and shall conform to the approved grout mix design. In addition, a total of three samples shall be taken at locations determined by the Engineer and tested for compressive strength at twenty-eight (28) days. The average compressive strength of the samples shall be greater than the minimum compressive strength as specified in 500-1.5.5. If the average compressive strength is less than the specified strength or if the compressive strength of any sample is less than 85 percent of the specified strength, the entire lined sewer shall be considered to be out of compliance. All testing shall be performed by an independent testing laboratory approved by the District. Results of the testing shall be submitted to the Engineer for approval. Cost of the testing shall be paid for by the Contractor.

**500-1.5.7 Inspection and Testing.** After installation of the PVC liner and completion of the annular space grouting, the surface of the liner shall be cleaned and prepared for inspection and testing by the Engineer. The Engineer will sound the interior of the sewer to locate any voids and areas with poor adhesion. The Contractor shall drill hole(s) through the lined surface as directed by the Engineer to determine the extent of the voids. After the inspection, any voids and areas with poor adhesion found behind the lined surface, including all the drilled holes, shall be repaired.

**500-1.5.8 Repair of Defects.** The Contractor shall submit the repair method to the District for approval and shall be responsible for all costs of the repair.

**500-1.5.9 Drawings and Data.** The Contractor shall submit the following for approval:



1. Complete description of the concrete surface preparation including equipment, setup, and procedures.
2. Sequence of work and complete layout plan.
3. Certificate of compliance including a complete materials list and design of the grout mix showing proportioning of cement, water, fly ash, bentonite, admixtures and fillers; grout properties including workability, working time and temperature; and results of testing by the independent testing laboratory including consistency per the flow cone test per ASTM C939, bleeding ASTM C232 C940 or C232, setting time per ASTM C403, compressive strength per ASTM C39 or C109, density per ASTM C138 shrinkage per ASTM C157 and C1090.
4. Detailed description of the installation and grouting procedures including number of grout lifts, and maximum height allowed for each lift.

**500-1.5.10 Payment.** Payment for furnishing all labor, equipment and materials to install the PVC pipe lining system including sewer cleaning; removal and disposal of debris; surface preparation; installation of the reinforcing steel; installation of the PVC panels; grouting and appurtenant work shall be made under the appropriate sewer rehabilitation bid item."

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IN **500-1.7 Deformed/Re-Formed HDPE Pipe Liner**, DELETE ALL PARAGRAPHS AND REPLACE WITH THE FOLLOWING:

**"500-1.7.1 General.** This section covers the requirements for rehabilitating the sewer with a deformed and re-formed HDPE pipe liner.

**500-1.7.2 Notifications.** Prior to commencing any work, the Contractor shall notify all the residents and businesses whose services will be disrupted per 500-1.1.7(a).

**500-1.7.3 Cleaning, Preliminary Inspection and Closed Circuit Television Inspection.** Cleaning and preliminary inspection shall be performed in accordance with 500-1.1.4. Prior to ordering the HDPE pipe liner, the Contractor shall field verify the diameter and length of the existing sewer.

The number and locations of the existing house connections depicted on the Plans are provided for bid comparison only and are not guaranteed for accuracy. After cleaning and preliminary inspection, the Contractor shall perform CCTV inspection to insure that the sewer is ready to be lined and to verify the number and locations and status of all the existing connections. Minimum guidelines for the CCTV inspection work to be performed shall be as specified in 500-1.1.5. CCTV inspection shall also be performed after the sewer is lined and existing sewer connection, if any, re-established.

The Contractor shall complete any necessary point repairs and removal of obstructions not cleared by cleaning prior to performing the CCTV inspection. Any protruding house connections that may interfere with liner installation shall be cut flush with the existing pipe by the use of an approved remote cutting device from within the sewer.

**500-1.7.4 Materials.** Deformed HDPE pipe liner shall be made from PE resins with a cell classification of 345434 C, D or E as defined in ASTM D3350. The liner shall have undergone and met the chemical resistance and minimum physical property values as specified in 207-19.5, at the time of bid. Requirements shall be met with samples taken from pipe liner that has undergone the de-forming and re-forming process. Upon request, proof of meeting these requirements shall be submitted to the District within two (2) days after receipt of bids.

The Contractor shall submit to the District certified test results from the manufacturer to verify that the resin material used for the extrusions of the pipe liner will meet the specified requirements, including the quality control records during the extrusion process.

**500-1.7.5 Marking.** Marking shall conform to 207-19.4 except the material shall be designated by cell classification.

**500-1.7.6 Design.** The deformed and re-formed HDPE pipe liner shall have a minimum service life of 50 years and shall be designed by the manufacturer based on the assumption that the existing sewer is fully deteriorated. Calculations shall be based on a modulus of soils reaction ( $E_s'$ ) value of 700 psi, a unit weight of soil of 120 lb/cf, and percentage of ovality of original pipe (q) of 2 percent.

The deformed pipe liner shall have the standard diameter ratio (SDR) as specified in the Plans. The SDR and minimum wall thicknesses specified are calculated based on an initial flexural modulus of 110,000 psi and a long-term creep modulus of 27,500 psi based on a 25 percent retention factor. If a liner has undergone and completed flexural testing per ASTM D790 and if justified by the test results, the District may allow the use of a higher initial flexural modulus for calculating the long-term creep modulus and resulting in a design wall thickness less than the specified wall thickness. The flexural testing shall be done by an independent accredited testing laboratory and shall be completed at the time of bid. In any event, the highest initial flexural modulus that can be used in calculating the long-term creep modulus under the cell classification being specified shall be 160,000 psi and the 25 percent retention factor shall remain constant.

**500-1.7.7 Submittal Data.** The Contractor shall submit a deformed/re-formed HDPE pipe liner submittal to the District for approval. The submittal shall include material certification per 4-1.5 including cell classification, chemical resistance and physical properties; design calculations; cleaning procedures; flow bypass plan and schematic; detailed installation procedures which are specific to the project including equipment setup and layout, insertion and access manhole locations, details and dimensions of the sampler, and the recommended temperature and pressure limits; and method of and materials used for providing end seals. The Contractor shall have approved submittals prior to commencing any work.

**500-1.7.8 Testing.** To ensure the material used in the manufacture of the pipe liner complies with the specified cell classifications, the Contractor shall submit test results in accordance with Section 10 of ASTM D3350 to the District for approval. Testing shall be performed once per shift, change in material batch or coil. The Contractor shall have approved test results prior to installing the liner. In addition, the wall thickness of the liner shall be measured and submitted with the test results. Liner wall thickness shall be measured in accordance with ASTM D2122 and shall meet the minimum specified wall thickness or the wall thickness in the approved submittal.

Two compliance samples shall be collected from each insertion/lining run. The Contractor shall submit a sampling and testing plan for the field samples to the District per 500-1.1.6. One of the samples from each of the insertion/lining runs will be selected by the Engineer and subject to the following tests to ensure that the installed liner complies with the Specifications. The testing shall be performed by an independent accredited testing laboratory approved by the District.

- Flexural Modulus per ASTM D790
- Wall Thickness Measurement per ASTM D2122

The Contractor shall submit four (4) copies of the certified test report to the District for approval. If any of the test values from a sample fails to meet the specified values or values in the approved submittal, specimens from the second sample shall be prepared and subject to retest. If any of the test

values of the second sample fails to meet the specified values or values in the approved submittal, the lined sewer reach shall be considered to be out of compliance and the District shall have the authority to direct the Contractor to reline the entire sewer reach. The relining, if required by the Engineer, shall be performed at no additional cost to the District. No time extension will be granted.

**500-1.7.9 Installation.** Installation of the deformed and re-formed HDPE pipe liner shall be in strict conformance of the installation procedures recommended by the manufacturer and shall take place within forty-eight (48) hours of cleaning the sewer. The Contractor shall retain the services of a qualified authorized representative of the manufacturer to assist the Contractor during preparation and installation and to certify that the work has been performed in accordance with the manufacturer's recommendations. The existing sewer shall be cleared of any obstructions, cleaned and televised, and the condition shall be approved by the Engineer prior to the start of installation. Deformed HDPE pipe liner shall be pulled into the sewer by cable through existing manholes from upstream to downstream, without excavation. Appropriate sleeves and rollers shall be installed to protect and prevent the liner from damage during installation.

After the deformed HDPE liner is in place and secured, the liner shall undergo a thermo-pressurization rerounding process. Temperature and pressure measuring instruments shall be attached to both ends of the liner to continuously monitor the temperature and pressure being applied. Through the use of steam and air pressure, the deformed pipe liner shall be progressively reformed to conform to the interior of the existing sewer pipe. The reformed pipe liner shall be cooled in accordance with the manufacturer's recommendations. Temperatures and pressures shall be recorded to ensure that each phase of the process is achieved at the manufacturer's recommended temperature and pressure limits.

Service connections shall be re-established within ten (10) hours after the completion of each liner installation. If service is disrupted for more than twenty-four (24) hours, the Contractor shall provide additional sanitary facilities to affected residents and businesses as may be necessary. The Contractor shall be responsible for any extra costs that accrue due to service not being reinstated within the first twenty-four (24) hours. The connections shall be re-established without excavation by the use of an approved remote control cutting device from within the sewer. The Contractor shall not re-establish any stub. The final re-established house connection shall be equal to the original opening both in size and shape with clean and smooth edges. The Contractor shall have a fully operational backup device on site in case of malfunction.

**500-1.7.10 End Seals.** After installation, the ends of the liner shall be cut off flush with the manhole wall and sealed. If a manhole has been lined through, the top half of the liner shall be cut even with the top of the shelf. The ends of the liner shall be sealed with a material that will bond to both the liner and the host pipe. The sealant material shall be suitable for continuous immersion in water and shall be resistant to a corrosive sewer environment. The sealant shall provide a smooth transition from the host pipe to the liner and shall not reduce the inside diameter of the liner. The sealant material to be used shall be Sikadur®31 or 35, Sika Corporation, or equivalent approved by the Engineer. The Contractor shall apply the material prior to the expiration of its shelf life and in accordance with the manufacturer's recommendations.

**500-1.7.11 Inspection and Repair.** A post CCTV inspection shall be performed to inspect the finished liner for defects. All defects found in the finished liner shall be repaired. The repair to be performed shall be determined by the Engineer and may include excavating, removing and replacing the lined sewer, or relining. The Contractor shall submit the repair method to the District for approval and shall be responsible for all costs of the repair.

**500-1.7.12 Payment.** Payment for furnishing all labor, equipment and materials to rehabilitate the existing sewer with the deformed and re-formed HDPE pipe liner, including flow bypass, point repairs, cleaning, cutting of protruding house connections and removal of obstructions, providing temporary sanitary facilities, all testing, installation of the liner, re-establishing local sewer and house connections, physical inspection, pre- and post-CCTV inspection, repairs including relining, and all work appurtenant thereto, shall be made under the deformed and re-formed HDPE pipe liner bid item.

Unless otherwise specified, the deformed and reformed HDPE pipe liner bid item quantity does not include length of liner at manhole(s). If the Contractor installs the liner through a manhole and a compliance sample is not collected at that manhole, the District may allow all portions of the liner within the manhole to remain in place to facilitate the manhole rehabilitation work. If the liner is allowed to remain in a manhole, the District will reimburse the Contractor the cost by adjusting the bid item quantity to include the length of the liner at that manhole based on the unit cost of the deformed and reformed HDPE pipe liner bid item. If the Engineer determines the liner within the manhole has abnormalities or if the Contractor installs the liner through a manhole which will be used as a sample manhole, the Contractor shall cut and remove all portions of the liner within the manhole. Cost for installing and removing the liner at these manholes shall be the responsibility of the Contractor. If the HDPE pipe liner is to be removed from a manhole, the liner shall be cut flush with the ends of the existing sewer pipes at the manhole wall."

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IN **500-1.8 Centrifugally Cast Fiberglass Reinforced Plastic Mortar (CCFRPM) Liner Pipe**, DELETE ALL PARAGRAPHS AND REPLACE WITH THE FOLLOWING:

**"500-1.8.1 General.** Fiberglass liner pipes, joints, and fittings, shall be designed and manufactured in accordance with AWWA M45, Manual of Water Supply Practices, Chapter 5 and ASTM D3262, Standard Specification for "Fiberglass" (Glass-Fiber-Reinforced-Thermosetting-Resin) Sewer Pipe.

Fiberglass liner pipes, joints and fittings shall be suitable for continuous service in sewerage environments with 1N sulfuric acid at an average wastewater temperature of 80 degrees F and for intermittent exposure (at a frequency of 1 1/2 hours two times a week) to sewage with a pH of 11.

**500-1.8.2 Design.** The fiberglass liner pipe shall have a minimum service life of 50 years and shall be designed by the manufacturer to withstand the total loads, including, but not limited to, soil load, live load, hydrostatic loads, and construction loads. Design shall be based on prism load and AASTO H-20 live load and the assumption that the existing sewer is fully deteriorated and that the grout placed in the annular space provide no structural support to the liner pipe, except for transmitting loads.

The liner pipe shall be designed such that the pipe shall not fail by crushing, collapsing, buckling, cracking, delamination or excessive deflection under loads. The long-term (50 years) vertical deflection anticipated under all loads shall not exceed five percent. The ring bending strain at the maximum allowable long-term vertical deflection developed in pipe wall shall be less than the long-term (50 years) ring-bending strain, with a minimum design factor of 1.5. Determination of the long-term ring bending strain shall be as defined in AWWA C950, AWWA Standard for Fiberglass Pressure Pipe. Unless otherwise specified, the liner pipe shall have a minimum pipe stiffness of 46 psi when tested in accordance with ASTM D2412.

**500-1.8.3 Materials.** Fiberglass liner pipes shall be centrifugally cast fiberglass-reinforced resin design. Unless otherwise specified, the resin used in the manufacture of the pipe shall be polyester resin systems. The reinforced glass fibers shall be commercial grade, type E chopped glass fibers. Aggregate,

when used as a filler, shall be siliceous sand conforming to ASTM C33 except the requirements for gradation do not apply. Sand shall be 98 percent silica with a maximum moisture content of 0.2 percent. The interior surface of the pipe shall be a resin rich liner, minimum 40 mils thick, with no fillers.

**500-1.8.4 Dimensions.** Unless otherwise specified, the diameters of the liner pipe called for in the Plans are the nominal and the minimum inside diameters required. The 14- through 54-inch pipe outside diameters shall be in accordance with the dimensions for the outside diameter control pipe with cast iron pipe equivalent in ASTM D3262. Outside diameters of other pipe sizes shall be as specified on the Plans. Unless otherwise specified or required, liner pipes shall be furnished in 10 or 20-foot lengths.

**500-1.8.5 Pipe Joints.** Unless otherwise specified, the liner pipe shall be connected with jacking bell and spigot joint by utilizing a proper elastomeric sealing gasket to maintain a leak-proof joint when deflected per ASTM D4161. The assembled joint shall be designed to withstand the total loads during the specified service life. The joint shall have an outside diameter same as the pipe, so when assembled, the joint will be flush with the outside diameter of the pipe. Elastomeric gaskets shall be EPDM and shall conform to ASTM F477.

**500-1.8.6 Submittal Data and Drawings.** A Confirmation Test shall be performed to verify that the pipe design, as contained in the submittal, will meet the specified performance. No pipe shall be manufactured until this submittal is reviewed and accepted by the District.

The liner pipe submittal shall include the following:

1. Name of the manufacturer and complete information on the material composition including resins, reinforcing materials, and fillers.
2. Certification of the materials including the cell classifications, grades, resin type, glass fibers, and other materials used in the manufacture of the liner pipe.
3. Design calculations including list of parameters, formulas, and all other technical data used in the design of the liner pipe. Calculations submitted shall include, but not be limited to: pipe stiffness (PS), wall crushing strength, initial and long-term (50 years) vertical pipe deflection, ring-bending strain, hydrostatic collapse resistance, constrained buckling strength, maximum allowable jacking force, and maximum allowable grout pressure. Unless otherwise specified, the calculations shall be based on a composite modulus of soil reaction ( $E'$ ) of 700 psi, a design temperature of 80 degrees F, a specific weight of soil of 120 lb/cf, a wheel load of 16,000 lbs, a shape factor  $D_f$  of 5.0, a deflection coefficient  $K_x$  of 0.103, and a deflection lag factor  $D_L$  of 1.0 (initial) and 1.5 (long-term).
4. Regression analysis for allowable long-term ring bending strain.
5. Drawings showing the pipe cross section and dimensions and pipe joint details including manufacturer's allowable tolerances on joint dimensions.
6. Fittings and special pieces including details of closure couplings and saddles.
7. Installation, storage, and handling procedures.

#### **500-1.8.7 Inspection and Testing.**

**500-1.8.7.1 General.** Liner pipe shall be tested in accordance with all applicable ASTM and AWWA Standards and as specified herein. The District shall not be held liable for any subsequent delay to the project or be responsible for any costs as a result of the testing or retesting of the liner pipe as designed by the manufacturer, should it fail. All costs for the testing shall be borne by the Contractor.

**500-1.8.7.2 Inspection.** All materials to be used in the manufacture of the liner pipe shall be inspected by the authorized representative of the District. This representative is authorized by the District to reject all materials or workmanship not conforming to the Plans and Specifications and the approved liner pipe submittal. After receipt of the approved submittal, the Contractor shall give the Engineer a minimum of five (5) days advance written notice prior to the start of the manufacturing operations and/or conducting the confirmation test, to permit ample time for inspection of the materials. Pipe produced prior to the inspection will not be accepted.

**500-1.8.7.3 Testing.** Testing to be performed shall include a confirmation test, a quality control test, and a joint leakage test. The District reserve the right to have the authorized representative, or employ an independent testing laboratory to witness all testing to be performed. Prior to scheduling the testing, the Contractor shall submit to the District detailed testing procedures, including the testing setups and the make and calibration data of the testing equipment for approval. All testing equipment shall be calibrated not more than six (6) months prior to the testing.

**500-1.8.7.3.1 Confirmation Test.** The following tests shall be performed to verify that the liner pipe to be furnished will meet or exceed the specified performance based on design and dimensions submitted by the manufacturer. Test results from prior projects are not acceptable.

- Pipe Stiffness test per ASTM 2412
- Workmanship and dimension test per ASTM D3567
- Flattening test per ASTM D2412

The Contractor shall submit the certified test reports in triplicate to the District for approval. The manufacturer shall not commence pipe production until the confirmation test is performed and the results are accepted by the District. If the first specimen fails the testing requirements, an additional specimen shall be made and tested. If the second specimen fails the testing requirements, the liner pipe design shall be reevaluated and a new design shall be submitted to the District for approval and the pipe retested.

**500-1.8.7.3.2 Quality Control Test.** After successful completion of the confirmation test, the following tests shall be performed to ensure that the pipe produced will continue to comply with the accepted pipe design and project Specifications.

- Workmanship and dimensions per ASTM D3567 as stipulated in Section 8.1 of ASTM D3262
- Pipe stiffness test per ASTM D2412 and Section 8.3 of ASTM D3262
- Flattening test per ASTM D2412 and Section 8 of ASTM D3262

One length out of each lot of pipe produced will be selected for testing by the District's authorized representative. A lot is defined as 100 lengths of pipe or 2,000 feet of pipe (20 feet per length of pipe). Certified copies of all manufacturer and quality control records shall be submitted to the District. If the tested specimen of a designated lot passes the test, then all the pipes from that lot shall be considered as complying with the requirements. If the tested specimen of a designated lot fails to pass the test, then five additional specimens from the same lot shall be selected for retesting. If all five specimens pass the test, then the lot will be considered as complying with the requirements, except for the previous tested specimen that failed. If any of these five specimens fails to pass the test, then the entire lot will be rejected. The Contractor will be allowed to downgrade pipe from a rejected lot to a lower pipe strength, provided that the lower pipe strength still meets the minimum required stiffness specified and the intended use would be justified by the inspection report to be submitted. Downgrading of pipe shall be in accordance with 207-2.9.4. The liner pipe, which passed the test, will be stamped by the District's authorized representative. Any liner pipe shipped without the inspector's stamp will not be accepted at the project site.

**500-1.8.7.3.3 Joint Leakage Test.** A leakage test shall be performed, if required by the Engineer, to verify the design of the pipe joint. Two (2) sections of pipe will be selected by the District's authorized representative. The pipes shall be joined together and the ends of the pipe shall be bulkheaded and sealed. The assembled joint shall be deflected 2 percent, secured and subjected to a test pressure equivalent to the maximum allowable grout pressure. The pipe shall be saturated with water before the test. The test pressure shall be maintained for a minimum of thirty (30) minutes with zero leakage.

**500-1.8.8 Marking.** Each length of pipe delivered to the project site shall be clearly marked with the name of manufacturer, pipe sizes, type of resins, cell classification, pipe stiffness, production code, lot number, and the marking of ASTM D3262.

**500-1.8.9 Payment.** Payment for furnishing all labor, equipment and materials and performing all work associated with furnishing and installing the liner pipe shall be made under the liner pipe bid item. Unless otherwise approved by the Engineer, no pipe shall be installed and no partial payment will be made until the liner pipe has successfully completed and passed the required quality control testing."

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IN **500-1.10 Folded and Re-formed PVC Pipe Liner**, DELETE ALL PARAGRAPHS EXCEPT TABLES 500-1.10.2 (A) and 500-1.10.2(B) AND REPLACE WITH THE FOLLOWING:

**"500-1.10.1 General.** This section covers the requirements for rehabilitating the sewer with a folded and re-formed PVC pipe liner.

**500-1.10.2 Notifications.** Prior to commencing any work, the Contractor shall notify all the residents and businesses whose services will be disrupted per 500-1.1.7(a).

**500-1.10.3 Cleaning, Preliminary Inspection and Closed Circuit Television Inspection.** Cleaning and preliminary inspection shall be performed in accordance with 500-1.1.4. Prior to ordering the PVC pipe liner, the Contractor shall field verify the diameter and length of the existing sewer.

The number and locations of the existing house connections depicted on the Plans are provided for bid comparison only and are not guaranteed for accuracy. After cleaning and preliminary inspection, the Contractor shall perform CCTV inspection to insure that the sewer is ready to be lined and to verify the number and locations and status of all the existing connections. Minimum guidelines for the CCTV inspection work to be performed shall be as specified in 500-1.1.5. CCTV inspection shall also be performed after the sewer is lined and existing sewer connection, if any, re-established.

The Contractor shall complete any necessary point repairs and removal of obstructions not cleared by cleaning prior to performing the CCTV inspection. Any protruding house connections that may interfere with liner installation shall be cut flush with the existing pipe by the use of an approved remote cutting device from within the sewer.

**500-1.10.4 Materials.** Folded PVC pipe liner shall be made from PVC compounds having a cell classification of 13223, 12334, or 12111 as defined in ASTM D1784. The liner shall have undergone and met the chemical resistance and minimum physical property values as specified in 207-15.3 except as modified by 211-2 and Tables 500-1.10.2 (B) and 500-1.10.3(B) at the time of bid. Upon request, proof of meeting these requirements shall be submitted to the District within two (2) days after the receipt of the bids. Requirements shall be met with samples taken from the pipe liner that has undergone the folding and re-forming process. Upon request, proof of meeting these requirements shall be submitted to the District within two (2) days after receipt of bids.

The Contractor shall submit to the District certified test results from the manufacturer to verify that the resin material used for the extrusions of the pipe liner will meet the specified requirements, including the quality control records during the extrusion process.

**500-1.10.5 Marking.** Marking shall conform to all applicable provisions of 207-17.2.1.

**500-1.10.6 Design.** The folded and re-formed PVC pipe liner shall have a minimum service life of 50 years and shall be designed by the manufacturer based on the assumption that the existing sewer is fully deteriorated. Calculations shall be based on a modulus of soils reaction ( $E_s$ ) value of 700 psi, a unit weight of soil of 120 lb/cf, and percentage of ovality of original pipe (q) of 2 percent.

The folded PVC pipe liner shall have the standard dimension ratio (SDR) as specified in the Plans. The SDR and minimum wall thicknesses specified for deformed pipe liner with the cell classification of 13223-B and 12334-B are calculated based on an initial flexural modulus of 280,000 psi and a long-term creep modulus of 106,400 psi based on a 38 percent retention factor. The SDR and minimum wall thicknesses specified for deformed pipe liner with the cell classification of 12111-C are calculated based on an initial flexural modulus of 145,000 psi and a long-term creep modulus of 55,100 psi based on a 38 percent retention factor.

**500-1.10.7 Submittal Data.** The Contractor shall submit a folded/re-formed PVC pipe liner submittal to the District for approval. The submittal shall include material certification per 4-1.5 including cell classification, chemical resistance and physical properties; design calculations; cleaning procedures; flow bypass plan and schematic; detailed installation procedures which are specific to the project, including equipment setup and layout, insertion and access manhole locations, details and dimensions of the sampler, and the recommended temperature and pressure limits; and methods of and materials used for providing end seals. The Contractor shall have approved submittal prior to commencing any rehabilitation work.

**500-1.10.8 Testing.** To ensure the material used in the manufacture of the pipe liner complies with the specified cell classifications, the Contractor shall submit test results in accordance with Section 11 of ASTM D1784 to the District for approval. Testing shall be performed once per shift, change in material batch or coil. The Contractor shall have approved test results prior to installing the liner. In addition, the wall thickness of the liner shall be measured and submitted with the test results. Liner wall thickness shall be measured in accordance with ASTM D2122 and shall meet the minimum specified wall thickness or the wall thickness in the approved submittal.

Two (2) compliance samples shall be collected from each insertion/lining run. The Contractor shall submit a sampling and testing plan for the field samples to the District per 500-1.1.6. One of the samples from each of the insertion/lining runs will be selected by the Engineer and subject to the following tests to ensure that the installed liner complies with the Specifications. The testing shall be performed by an independent accredited testing laboratory approved by the District.

- Flexural Modulus per ASTM D790
- Wall Thickness Measurement per ASTM D2122

The Contractor shall submit certified test reports in triplicate to the District for approval. If any of the test values from a sample fails to meet the specified values or values in the approved submittal, the second sample shall be prepared and subject to testing. If any of the test values of the second sample fails to meet the specified values or values in the approved submittal, the lined sewer reach shall be considered to be out of compliance and the District shall have the authority to direct the Contractor to reline the entire sewer reach. The relining, if required by the Engineer, shall be performed at no additional cost to the District. No time extension will be granted.



**500-1.10.9 Installation.** Installation of the folded and reformed PVC pipe liner shall be in strict conformance of the installation procedures recommended by the manufacturer and shall take place within forty-eight (48) hours of cleaning the sewer. The Contractor shall retain the services of a qualified authorized representative of the manufacturer to assist the Contractor during preparation and the installation to certify that the work has been performed in accordance with the manufacturer's recommendations. The existing sewer shall be cleared of any obstructions, cleaned and televised, and the condition shall be approved by the Engineer prior to the start of installation. Folded PVC pipe liner shall be pulled into the sewer by cable through existing manholes from upstream to downstream, without excavation. Appropriate sleeves and rollers shall be installed to protect and prevent the liner from damage during installation.

After the folded PVC pipe liner is in place and secured, the liner shall undergo a thermo-pressurization reforming process allowing the folded liner to reform. Temperature and pressure measuring instruments shall be attached to both ends of the liner to continuously monitor the temperature and pressure being applied. Through the use of steam and air pressure, the folded PVC pipe liner shall be progressively reformed to conform to the interior of the existing sewer pipe. The reformed liner shall be cooled in accordance with the manufacturer's recommendations. Temperatures and pressures shall be recorded to ensure that each phase of the process is achieved at the manufacturer's recommended temperature and pressure limits. Use of a rounding device may be permitted if the rounding process will not cause any damage to the liner.

Service connections shall be re-established within ten (10) hours after the completion of each liner installation. If service is disrupted for more than twenty-four (24) hours, the Contractor shall provide additional sanitary facilities to affected residents and businesses as may be necessary. The Contractor shall be responsible for any extra costs that accrue due to service not being reinstated within the first twenty-four (24) hours. The connections shall be re-established without excavation by the use of an approved remote control cutting device from within the sewer. The Contractor shall have a fully operational backup device on site. The Contractor shall not re-establish any stub. The final re-established house connection shall be equal to the original opening both in size and shape with clean and smooth edges.

**500-1.10.10 End Seals.** After installation, the ends of the liner shall be cut off flush with the manhole wall and sealed. If a manhole has been lined through, the top half of the liner shall be cut even with the top of the shelf. The ends of the liner shall be sealed with a material that will bond to both the liner and the host pipe. The sealant material shall be suitable for continuous immersion in water and shall be resistant to a corrosive sewer environment. The sealant shall provide a smooth transition from the host pipe to the liner and shall not reduce the inside diameter of the liner. The sealant material to be used shall be Sikadur®31 or 35, Sika Corporation, or equivalent approved by the Engineer. The Contractor shall apply the material prior to the expiration of its shelf life and in accordance with the manufacturer's recommendations.

**500-1.10.11 Inspection and Repair.** A post CCTV inspection shall be performed to inspect the finished liner for defects. All defects found in the finished liner shall be repaired. The repair to be performed shall be determined by the Engineer and may include excavating, removing and replacing the lined sewer, or relining. The Contractor shall submit the repair method to the District for approval and shall be responsible for all costs of the repair.

**500-1.10.12 Payment.** Payment for furnishing all labor, equipment and materials to rehabilitate the existing sewer with the folded and re-formed PVC pipe liner pipe liner, including flow bypass, point repairs, cleaning, cutting of protruding house connections and removal of obstructions, providing temporary sanitary facilities, all testing, installation of the liner, re-establishing local sewer and house connections, physical inspection, pre- and post-CCTV inspection, repairs including grouting of voids, and all work appurtenant thereto, shall be made under the folded and reformed PVC pipe liner bid item.

Unless otherwise specified, the folded and reformed PVC pipe liner bid item quantity does not include length of liner at manhole(s). If the Contractor installs the liner through a manhole and a compliance sample is not collected at that manhole, the District may allow all portions of the liner within the manhole to remain in place to facilitate the manhole rehabilitation work. If the liner is allowed to remain in a manhole, the District will reimburse the Contractor the cost by adjusting the bid item quantity to include the length of the liner at that manhole based on the unit cost of the folded and reformed PVC pipe liner bid item. If the Engineer determines the liner within the manhole has abnormalities or if the Contractor installs the liner through a manhole which will be used as a sample manhole, the Contractor shall cut and remove all portions of the liner within the manhole. Cost for installing and removing the liner at these manholes shall be the responsibility of the Contractor. If the PVC pipe liner is to be removed from a manhole, the liner shall be cut flush with the ends of the existing sewer pipes at the manhole wall."

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IN **500-1.12 Polyvinyl Chloride (PVC) Closed Profile Liner Pipe**, DELETE ALL PARAGRAPHS AND REPLACE WITH THE FOLLOWING:

**"500-1.12.1 General.** Polyvinyl Chloride (PVC) closed profile segmented liner pipe shall conform to the requirements of ASTM F794.

PVC liner pipes, joints and fittings shall be suitable for continuous service in sewerage environments with 1N sulfuric acid at an average wastewater temperature of 80 degrees F and for intermittent exposure (at a frequency of 1 1/2 hours two times a week) to sewage with a pH of 11.

**500-1.12.2 Design.** PVC liner pipe shall have a minimum service life of 50 years and shall be designed by the manufacturer to withstand the total loads, including, but not limited to, soil load, live load, hydrostatic loads, and construction loads. Design shall be based on prism load and AASTO H-20 live load and the assumption that the existing sewer is fully deteriorated and that the grout placed in the annular space provide no structural support to the liner pipe, except for transmitting loads.

The liner pipe shall be designed such that the pipe shall not fail by crushing, collapsing, buckling, cracking, or excessive deflection under loads. The long-term 50 years vertical deflection anticipated under all loads shall not exceed five percent. The ring bending strain at the maximum allowable long-term vertical deflection developed in pipe wall shall be less than the long-term 50 years ring-bending strain, with a minimum design factor of 1.5. Unless otherwise specified, the liner pipe shall have a minimum pipe stiffness of 46 psi when tested in accordance with ASTM D2412.

**500-1.12.3 Materials.** The material for the pipe and fittings shall be made from unplasticized PVC compounds having a cell classification of 12364 as defined in ASTM D1784. Elastomeric sealing gaskets shall conform to the requirements of 208-4 and ASTM F477.

**500-1.12.4 Dimensions.** Unless otherwise specified, the diameters of the liner pipe called for in the Plans are the nominal and the minimum inside diameters required. Outside diameters of other pipe sizes shall be as specified on the Plans. Unless otherwise specified or required, liner pipes shall be furnished in 10 or 20-foot lengths.

**500-1.12.5 Pipe Joints.** The liner pipe shall be furnished no-bell gasketed joints and shall be connected with gasketed couplings. The assembled joint shall be designed to withstand the total loads during the specified service life. The joint shall be designed so that neither the outside diameter of the pipe is increased nor the internal diameter decreased at the joint.

**500-1.12.6 Submittal Data and Drawings.** A confirmation test shall be performed to verify that the pipe design, as contained in the submittal, will meet the specified performance. No pipe shall be manufactured until this submittal is reviewed and accepted by the District.

The liner pipe submittal shall include the following:

1. Name of the manufacturer and complete information on the material composition including resins, reinforcing materials, and fillers.
2. Certification of the materials including the cell classifications, grades, resin type, glass fibers, and other materials used in the manufacture of the liner pipe.
3. Design calculations including list of parameters, formulas, and all other technical data used in the design of the liner pipe. Calculations submitted shall include, but not be limited to: pipe stiffness (PS), wall crushing strength, initial and long-term 50 years vertical pipe deflection, ring-bending strain, hydrostatic collapse resistance, constrained buckling strength, maximum allowable jacking force, and maximum allowable grout pressure. Unless otherwise specified, the calculations shall be based on a composite modulus of soil reaction ( $E'$ ) of 700 psi, a design temperature of 80 degrees F, a specific weight of soil of 120 lb/cf, a wheel load of 16,000 lbs, a shape factor  $D_f$  of 5.0, a deflection coefficient  $K_x$  of 0.103, and a deflection lag factor  $D_L$  of 1.0 (initial) and 1.5 (long-term).
4. Regression analysis for allowable long-term ring bending strain.
5. Drawings showing the pipe cross section and dimensions and pipe joint details including manufacturer's allowable tolerances on joint dimensions.
6. Fittings and special pieces including details of closure couplings and saddles. Closure couplings shall be made of rigid material or shall have stainless steel bands.
7. Installation, storage, and handling procedures.

**500-1.12.7 Inspection and Testing.**

**500-1.12.7.1 General.** Liner pipe shall be tested in accordance with all applicable ASTM standards and as specified herein. The District shall not be held liable for any subsequent delay to the project or be responsible for any costs as a result of the testing or retesting of the liner pipe as designed by the manufacturer, should it fail. All costs for the testing shall be borne by the Contractor.

The liner pipe shall be free from cracks, holes, blisters, foreign inclusions or other defects that would, due to their nature, degree, or extent, have a deleterious effect on the pipe performance as determined by the Engineer. For testing purposes, a production lot shall consist of all liner pipe having the same lot marking number, but shall not exceed two shifts of production. Pipe length, wall thickness and joint dimensions shall be verified by testing for each lot in accordance with ASTM F794. Records of this testing shall be made available when requested by the Engineer.

Liner pipe shall conform to 207-17.5 except as modified herein.

Property	ASTM Test Method	Value (Initial and After 112-Day Exposure) Cell Class 12364A
Tensile Strength Yield, psi, min.	D638	6000
Impact Strength Ft. lbs./in. notch min	D256 Method A (Size ½" x ⅛" x 2½")	0.65
Weight Change % Unconditioned Conditioned	D543	±1.5 max ±1.0 max

Verification shall be provided that physical testing of the product confirms conformance to ASTM F794 and ASTM D2412.

**500-1.12.7.2 Inspection.** All materials to be used in the manufacture of the liner pipe shall be inspected by the authorized representative of the District. This representative is authorized by the District to reject all materials or workmanship not conforming to the Plans and Specifications and the approved liner pipe submittal. After receipt of the approved submittal, the Contractor shall give the Engineer a minimum of five (5) days advance written notice prior to the start of the manufacturing operations and/or conducting the confirmation test, to permit ample time for inspection of the materials. Pipe produced prior to the inspection will not be accepted.

**500-1.12.7.3 Testing.** Testing to be performed shall include a confirmation test, a quality control test, and a joint leakage test. The District reserves the right to have the authorized representative, or employ an independent testing laboratory to witness all testing to be performed. Prior to scheduling the testing, the Contractor shall submit to the District detailed testing procedures, including the testing setups and the make and calibration data of the testing equipment for approval. All testing equipment shall be calibrated not more than six (6) months prior to the testing. All costs for the testing shall be borne by the Contractor.

**500-1.12.7.3.1 Confirmation Test.** The following tests shall be performed to verify that the liner pipe to be furnished will meet or exceed the specified performance based on design and dimensions submitted by the manufacturer. Test results from prior projects are not acceptable.

- Pipe Stiffness test per ASTM 2412
- Workmanship and dimension test per ASTM D2122
- Flattening test per ASTM D2412

The Contractor shall submit the certified test reports in triplicate to the District for approval. The manufacturer shall not commence pipe production until the confirmation test is performed and the results are accepted by the District. If the first specimen fails the testing requirements, an additional specimen shall be made and tested. If the second specimen fails the testing requirements, the liner pipe design shall be reevaluated and a new design shall be submitted to the District for approval and the pipe retested.

**500-1.12.7.3.2 Quality Control Test.** After successful completion of the confirmation test, the following tests shall be performed to ensure that the pipe produced will continue to comply with the accepted pipe design and project Specifications.

- Workmanship and dimensions per ASTM D2122 as stipulated in Section 8.4 of ASTM F794
- Pipe stiffness test per ASTM D2412 and Section 8.7 of ASTM F794
- Flattening test per ASTM D2412 and Section 8.5 of ASTM F794

One length out of each lot of pipe produced will be selected for testing by the District's authorized representative. A lot is defined as 100 lengths of pipe or 1,500 feet of pipe (feet per length of pipe). Certified copies of all manufacturer and quality control records shall be submitted to the District. If the tested specimen of a designated lot passes the test, then all the pipes from that lot shall be considered as complying with the requirements. If the tested specimen of a designated lot fails to pass the test, then five additional specimens from the same lot shall be selected for retesting. If all five (5) specimens pass the test, then the lot will be considered as complying with the requirements, except for the previous tested specimen that failed. If any of these five (5) specimens fails to pass the test, then the entire lot will be rejected. The liner pipe which passed the test will be stamped by the District's authorized representative. Any liner pipe shipped without the inspector's stamp will not be accepted at the project site.

**500-1.12.7.3.3 Joint Leakage Test.** A leakage test shall be performed, if required by the Engineer, to verify the design of the pipe joint. Two (2) sections of pipe will be selected by the District's authorized representative. The pipes shall be joined together and the ends of the pipe shall be bulkheaded and sealed. The assembled joint shall be deflected 2 percent, secured and subjected to a test pressure equivalent to the maximum allowable grout pressure. The pipe shall be saturated with water before the test. The test pressure shall be maintained for a minimum of thirty (30) minutes with zero leakage.

**500-1.12.8 Installation.** The existing sewer shall be maintained in operation during sliplining. The host pipeline shall be cleaned of any obstructions and televised per 500-1.1.4 and 500-1.1.5. Liner pipe installation shall conform to 500-1.1.7(b) except as modified herein. The pushing force shall be applied to the grooved end of the pipe. The pushing load shall not exceed 10 tons nor the maximum allowable pushing load recommended by the liner pipe manufacturer, whichever is less.

The first section of slipliner pipe shall follow a tapered nose cone to allow for passage past any slight obstruction or offset joint. All sections of slipliner pipe shall be restrained by full circle clamps from premature insertion into the existing sewer pipe until the slipliner joint is completed. A joint is completed when less than one inch of gasketed coupling is visible.

Closure of the liner pipe inside an insertion pit shall be accomplished by a special closure kit recommended by the manufacturer and shall be submitted to the Engineer for approval. At locations where the liner pipe will be installed by open cut for lining curves, either mitered flush joints or fabricated gasketed bell x bell fittings made from the PVC liner pipe shall be used as recommended by the pipe manufacturer.

**500-1.12.9 Marking.** Each pipe section shall be marked at one end on the inside and every 5 feet on the outside showing the manufacturers name, manufacturing number (identifies production plant, date, shift), cell classification, lot number, nominal diameter, pipe stiffness and ASTM F-794. Internally the pipe shall have a numbered air testing certificate (sticker) that can be correlated through plant records to each piece of pipe. A key of the manufacturer's production and lot codes shall be submitted to the Engineer prior to delivery.

**500-1.12.10 Payment.** Payment for furnishing all labor, equipment and materials and performing all work associated with furnishing and installing the liner pipe shall be made under the liner pipe bid item. Unless otherwise approved by the Engineer, no pipe shall be installed and no partial payment will be made until the liner pipe has successfully completed and passed the required quality control testing."

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IN **500-2.5.1 General**, ADD THE FOLLOWING TO THE END:

"The form shall have sufficient stiffness and strength to preclude shifting and/or collapse during concrete placement and to ensure safe man-entry."

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IN **500-2.5.3 Installation and Field Inspection**, FIRST PARAGRAPH, SECOND SENTENCE, ADD THE FOLLOWING TO THE END:

"and provide a minimum clear manhole opening of not less than 24 inches in diameter. For manholes with shafts less than 30 inches in diameter, the Contractor shall excavate and replace the existing manhole shafts until the specified minimum manhole opening can be attained."

IN **500-2.5.3 Installation and Field Inspection**, FIRST PARAGRAPH, FOURTH SENTENCE, AFTER THE WORDS "The installation", ADD THE WORDS "and inspection".

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IN **500-2.9 Epoxy Mastic and Flexible PVC Liner System**, DELETE ALL PARAGRAPHS AND REPLACE WITH THE FOLLOWING:

**500-2.9.1 General.** This section sets forth the requirements for the epoxy mastic and flexible PVC protective lining system for rehabilitation of manholes and structures. The protective lining system shall be installed in accordance with the limits shown on the Plans.

**500-2.9.2 Qualifications.** The work shall be performed by a Contractor or Subcontractor who is certified by the manufacturer of the protective lining system specified. Each applicator who will be applying the protective lining system shall also be certified.

**500-2.9.3 Shipping, Packaging and Storage of Materials.** All materials specified by name, brand or manufacturer shall be delivered to the job site in original unopened containers with labels designating the project name and Contractor number, name of the manufacturer, product name, batch number, date of manufacture and product preparation, quantity of contents and storage life. Materials shall be stored as recommended by the manufacturer. Stored materials shall be protected from excessive heat and cold. Materials exceeding the manufacturer's recommended storage life shall not be used.

**500-2.9.4 Repair and Preparation of Concrete Surfaces.** Surfaces to receive the protective lining system shall be thoroughly cleaned by washdown and/or water blast to remove grease, sludge, dirt, and other foreign deposits and followed by high pressure water blasting (minimum 10,000 psi at a flow rate of not less than 10 gpm). All material removed during the preparation of the surfaces shall be trapped, collected and disposed of off site; no material will be allowed to enter into the sewer at any time. Wet sandblasting may be used instead of high pressure water blasting. If wet sandblasting is used, the Contractor shall submit information on the blasting materials and the method for collecting blasting materials to the District for review and approval.

Concrete substrates with hydrogen sulfide damage shall be removed to a depth where all the white calcium sulfate is removed and only hard grey concrete with a surface pH of 7.0 or greater remains. After the deteriorated concrete is removed, the Contractor shall thoroughly clean the surface including vacuuming and air drying to remove all fines and deleterious materials that will adversely affect the bonding of the lining system.

If reinforcing steel is exposed, including those exposed after removing deteriorated concrete, it shall be thoroughly cleaned by sandblasting to remove all contamination and rust particles. Immediately after the cleaned reinforcing steel is inspected and accepted by the Engineer, the Contractor shall place a protective coating on the exposed reinforcing steel. The protective coating used shall be 40 mils of Sikatop 108 Armatec, Sika Corporation, or Master Builders Emaco-P22, or equal. Where more than 50 percent of the cross-sectional area of reinforcing steel is missing, the Contractor shall replace the reinforcing steel. The replacement reinforcing steel shall be cleaned, sandblasted and coated as specified above.

Prior to installing the protective lining system, the Contractor shall rebuild the concrete surfaces to their original lines and shapes. All surface areas with depressions greater than 1/4-inch shall be filled in with a polymer cement patching compound. The polymer patching compound to be used shall be compatible with the protective lining system specified and shall be Sika Corporation, Sikatop 122 or 123; Master Builders, Masterpatch 210 or 230VP; or equal. The Contractor shall follow the instructions and recommendations of the patching compound manufacturer as to application, curing time requirements, depth of repair and surface preparation procedures. The repaired concrete surface shall in general have a finish that will match the non-corroded concrete surface. All repaired concrete surfaces, which are to receive the protective lining system, shall have a light sweep sandblast to remove laitance from the repaired areas. The sandblast operation shall be followed by a thorough cleanup operation including air drying and vacuuming to provide a clean dry surface for the application of the protective lining system.

The Contractor shall not start the lining application until the surface pH, moisture content and temperature are within the recommended limits and the prepared surfaces have been accepted by the Engineer.

**500-2.9.5 Materials.** Materials for the protective lining system shall include a primer, a two (2) component epoxy mastic, joint sealant, and extruded PVC liners with locking extensions as manufactured by Ameron Protective Linings Division, Brea, CA (714) 256-7755. A materials list for the lining system shall be provided to the District and no substitutes for these materials will be allowed.

The primer shall be Arrow-Lock Mastic Primer No. 5101.

Mastic shall be a two (2) component epoxy gel mastic and shall be resistant to weathering, aging, dilute acids (ten percent sulfuric acid solution or acid conditions generating pH levels of 1.0) and dilute alkalis. The mastic shall be Arrow-Lock Mastic No. 9912

The PVC liner shall be a white homogeneous thermoplastic sheet material with locking extensions. The PVC liner shall exhibit the following minimum physical properties at  $77 \pm 5$  degrees F:

Specific gravity, ASTM D792	1.28
Hardness, Shore D, ASTM D2240	50 – 60 @ 1 sec.
Tensile, ASTM D882	2,200 psi
Elongation, ASTM D882	200 percent
Brittle Point, Model E ASTM D746	5 degrees F
Tear Strength, ASTM D1004	220 g/mil
Thickness	65 mils

**500-2.9.6 Installation.** The Contractor shall retain the services of a qualified and authorized technical representative of Ameron Protective Linings Division to provide field inspection and direction during installation of the lining system to ensure that the work, including the surface preparation, drying times, mixing and application procedures are performed in accordance with the manufacturer's recommendations and to provide a written certification of same to the District as a condition of payment for the work. All parts of the work shall be made accessible to the Engineer for inspection. Conformance of the work to the Specifications shall be determined solely by the Engineer.

The primer shall be rolled on or spray applied to the prepared concrete surface at a rate of 1 gallon of primer per 200 square feet of surface. The primer shall be allowed to cure for a minimum of twenty (20) minutes before applying the mastic. The epoxy mastic shall be applied by troweling at a rate of 1 gallon per 6 square feet of surface with a minimum dry film thickness of 250 mils.

The Contractor shall utilize the maximum size PVC liner sheet possible with a minimum number of seams. Seams, both vertical and horizontal, shall overlap a minimum of 1/2-inch and shall be welded with 1-inch wide weld strips. Corner strips shall be used at interior and exterior corners or liner shall be wrapped around the corner and lapped onto adjacent sheet with a minimum 1/2-inch overlap and shall be welded with 1-inch wide weld strips.

The liner sheets shall be properly aligned and installed with the arrow ribs in the vertical direction to prevent any moisture from accumulating behind the liner. PVC liners shall be protected from debris contamination prior to placing it onto the mastic. The PVC liner shall be placed while the wetting ability of the base coat is at its optimum and shall be pressed into the mastic and rolled to remove any trapped air and ensure the best possible adhesion. The rolling process shall occur immediately after the liner is placed. Care shall be taken to keep the mastic surface and the PVC liner surface clean and free of dust and debris. The Contractor shall coordinate the application of the mastic and the placement of the PVC liner so that the mastic is still tacky when the sheet is rolled in place.

Installation of the lining system shall generally conform with the details as shown on the Plans. The lining system shall be allowed to cure for the amount of time recommended by the Ameron Protective Linings Division's representative. The average dry film thickness of the cured lining system shall not be less than 315 mils.

**500-2.9.7 Inspection and Testing.** In addition to continuous inspection by the Ameron Protective Lining Division's representative, after installation of the protective lining system, the surface of the liner shall be cleaned and prepared for visual inspection by the Engineer. In addition to the visual inspection, installation of the protective lining system shall be tested in accordance with 311-1.10. The testing shall be performed by an independent testing laboratory approved by the District.

All surfaces of the liner will be visually inspected for areas showing poor adhesion, air inclusion, edge and seam defects and any other defects in the lining system.

To assure proper embedment of the PVC liner sheets to the mastic and the mastic to the prepared concrete surface, the protective lining system shall have a "pull test" performed by the Ameron Protective Lining Division's representative at a location designated by the Engineer and prepared by the Contractor. The minimum pull strength test value shall not be less than 16 pounds per linear inch after seven (7) days of curing at a minimum ambient temperature of 55 degrees F.

**500-2.9.8 Repair of Defects.** The Contractor shall repair all defects found in the lining system. Areas where the liner failed to meet the minimum pull strength test value specified and areas that have air inclusions larger than 4 inches in either direction shall have all of the defective lining, including the mastic, removed as directed by the Engineer. A new protective lining system shall be applied over the



defective area, overlapping the adjacent lined areas a minimum of 6 inches in all directions and shall be reinspected.

**500-2.9.9 Drawings and Data.** The Contractor shall submit the following for approval: certification for each applicator installing the lining system, a materials list for the lining system including material safety data sheets and laboratory test data, a complete description of the concrete surface preparation procedure including equipment and setup, and a complete description of the lining system including written instructions for application, inspection and testing and the size of the PVC liner sheets to be used."

DELETE **500-2.10 Measurement and Payment**, AND all paragraphs and REPLACE with the following:

**"500-2.10 Cured-in-Place Fiberglass Manhole Lining System.**

**500-2.10.1 General.** This section covers the requirements for installing a cured-in-place fiberglass manhole lining system.

**500-2.10.2 Materials.** The lining system shall be suitable for continuous service in sewerage environments with 1N sulfuric acid at an average wastewater temperature of 80 degrees F and intermittent exposure to a pH of 11. The lining system shall consist of a 4-ply fiberglass reinforcing fabric and an integral non-porous PVC membrane. The fiberglass reinforcing shall be impregnated with a modified epoxy resin, and the entire lining system shall have a minimum cured wall thickness of 90 mils. The fiberglass fabric shall be a layered product of Type E glass stitched with chopped strand and bound with styrene-soluble binder. The surfacing veil shall be woven and made of Type E glass with volan finish and styrene-soluble binder. The modified epoxy resin shall be a two components resin/mastic system cross-linked with a modified polyamide curing agent.

**500-2.10.3 Pre-inspection and Surface Preparation.** Prior to commencing any work, the Contractor shall inspect and verify all dimensions and the locations and number of all sewer connections entering each manhole, and examine the condition of the existing manholes. Any areas of apparent structural damage shall be reported to the Engineer. Outside dimensions of the reinforcing fabric shall be sized properly allowing for stretch to fit the contour and shape of the interior of the manhole.

All surfaces to be lined shall be cleaned by water blasting to remove all loose deteriorated concrete, dirt, grease, sand and other foreign matter. All materials generated by preparation of surfaces shall be trapped and collected for disposal off site; no materials will be allowed to enter into the sewer at any time. If a degreasing compound is used, the surface shall be thoroughly rinsed prior to the installation of the lining system. All large voids and spalled areas shall be filled and patched to provide a relatively smooth surface. The cementitious patching/plugging compound shall be Renderoc HBA as manufactured by Fosroc, Inc., or equal. New concrete shall contain no curing membranes or hardeners and shall be cured for a minimum of fourteen (14) days prior to installing the liner system. All connection sewers protruding into the manhole shall be cut flush with the interior manhole wall or prepared using hydraulic cement and fiberglass, per the manufacturer's recommendation. All stubs shall be bulkheaded and mortared smooth flush with interior manhole wall. Pull rings shall be left in place and sealed with resin and fiberglass. Any other obstructions including manhole steps shall be cut flush with the interior manhole wall. All infiltration shall be stopped using Scotch Seal Brand #5610 as manufactured by 3M Concrete Products, or equal.

**500-2.10.4 Installation.** Installation of the lining system shall be performed by a licensed Subcontractor or Contractor certified by the manufacturer to install the system. Unless otherwise shown on the Plans, limits of the lining shall extend from the manhole frame down to include the shelf area. If the existing manhole does not have a shelf, the lining shall extend down to the low water level as directed by the Engineer.

Installation of the lining system shall be scheduled and coordinated with the sewer rehabilitation work. To ensure proper installation of the lower limits of the lining system, the Contractor shall schedule installation during low flow hours. If bypassing of flow is allowed in the Special Provisions, the Contractor may bypass flow in accordance with 500-1.1.7(f) in order to facilitate the lining system installation." Unless otherwise allowed by the Engineer, for segmented liner pipe installations, installation of the manhole lining system shall not start until after the cleaning and surface preparation are completed and the liner pipe sliplined through the manhole and grouted in place, and when approved by the Engineer. For cured-in-place pipe liner or PVC pipe lining installations, installation of manhole lining system shall be scheduled after the sewer is lined.

The reinforcing fabric shall be saturated with the properly mixed resin system and lowered into the manhole and secured in place. The liner system shall be inflated with air pressure to fit the interior of the manhole and allowed to cure under suitable heat and controlled temperature. After curing and after an adequate cool down period, the lining system shall be cut and trimmed with all services restored. The perimeter of the system shall be fully sealed with compatible resin and fiberglass to form a structurally sound and vapor tight joint with the liner pipe and the lined sewer. The completed product shall be a permanent, monolithic, lined and impervious structure shaped to the interior of the manhole. The lined manhole shall be completely water tight and free of any joints or openings other than pipe inlets, pipe outlets and the rim opening. All defective areas and imperfections including, but not limited to poor adhesion, excessive voids, air bubbles, and exposed glass shall be repaired in strict conformance with the recommendation of the manufacturer and subject to the approval of the Engineer.

**500-2.10.5 Drawings and Data.** The Contractor shall submit a complete manhole rehabilitation submittal to the District for review and approval. The submittal shall include, but shall not be limited to the following:

1. Name of the manufacturer and product data including the safety data sheets, certifications of materials, and the physical properties and chemical resistance testing of the resin system.
2. Name of the manufacturer and product data including the safety data sheets for the patching/plugging compound and the chemical sealant, if infiltration exists.
3. Plan of construction including schedule, equipment setup, inspection, preparation, cleaning, and complete installation procedures and details.
4. Qualifications of the installer including certification by the manufacturer.

AFTER **500-2.10 Cured-in-Place Fiberglass Manhole Lining System**, ADD THE FOLLOWING:

**"500-2.11 Measurement and Payment.**

**500-2.11.1 Measurement.** Manhole and structure rehabilitation shall be measured by each.

**500-2.11.2 Payment.** Payment for manhole and structure rehabilitation shall be made at the Contract Unit Price or lump sum price in the Bid for each. The Bid price shall include full compensation for furnishing all labor, equipment as required to rehabilitate each manhole including all other appurtenant work.

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IN **500-3 ANNULAR SPACE GROUTING**, DELETE ALL PARAGRAPHS AND REPLACE WITH THE FOLLOWING:

**"500-3.1 General.** This section covers the requirements for grouting the annular space between the exterior of the liner pipe and interior of the existing sewer pipe or manhole shaft.

**500-3.2 Grout.** The grout shall be a cement and bentonite slurry mix. The grout shall have low viscosity and high fluidity capable of filling the annular space between the liner pipe and the host pipe under low injection pressure. The grout shall have a specific weight of not less than 64 pcf to displace any residual water trapped in the annular space. The grout shall be sulfate resistant and shall not deteriorate due to fluctuations in moisture content or temperature in the annular space. The minimum compressive strength of the grout shall not be less than 100 psi at seven (7) days and 300 psi at twenty-eight (28) days per ASTM C109 or C495.

**500-3.3 Grouting Requirements.** To prevent buildup of debris which could be trapped in the annular space, upon completion of the sliplining of a sewer reach, the Contractor shall immediately construct an approved bulkhead between the existing host pipe and the inserted liner pipe at the downstream end of the upstream-most manhole. The Contractor shall not construct the bulkhead at the downstream manhole until after all the existing connections upstream of the manhole have been connected to the inserted liner pipe. In addition, the Contractor shall construct a bulkhead between the host pipe and the liner pipe at each connection. The bulkhead shall secure each connection in place during grouting and shall be constructed complete with grout injection and vent pipes. All bulkheads constructed shall be tested and shall be leak tight and be built to withstand the maximum allowable grouting pressure. Prior to grouting, the Contractor shall flush the annular space and inject clear water into the annular space and pressurize to the maximum allowable grout pressure to test all the bulkheads and the integrity of the liner pipe installed. The test pressure shall be maintained for a minimum of 10 minutes and the liner pipe and the bulkheads shall show no signs of leakage. Non-toxic dye provided by the Contractor shall be used to locate submerged leaks. Any section of line that does not pass the initial pressure test for whatever reason shall be retested at low flow while conducting an internal CCTV inspection of the liner pipe joint. The retest and additional CCTV inspection work including any field verification work shall be performed at no additional cost to the District. Upon successful completion of the pressure test, the Contractor shall completely dewater the annular space and proceed with the grouting operation. Grouting operations for each reach of sewer shall be completed within sixty (60) calendar days after sliplining the reach.

The Contractor shall determine the length of grouting run, the number and spacing of all the grout injection and vent locations required to completely fill the annular space based on grout supplier's recommendation. The grout pressure shall not exceed 12 psi nor the maximum allowable pressure recommended by the liner pipe manufacturer, whichever is lower. Bulkheads shall be provided at all grout injection and vent locations. Each bulkhead installed shall be complete with all the grout injection and vent pipes with adequate height. If the Engineer determines that the bulkheads installed could break or leak during grouting, the Engineer shall have the authority to direct the Contractor to reinforce or replace the bulkheads at no additional cost to the District. Grout pressure shall be continuously monitored and regulated. The liner pipe will float during grouting. The amount of flotation depends on the grout density and the grout pressure used, and the depth of flow in the sewer, which varies with time. Excessive flotation will cause the liner pipe to deflect and the joints to leak. To prevent leakage, the Contractor shall verify with the liner pipe manufacturer and limit the grout pressure to ensure that the maximum allowable joint deflection is not exceeded. The Contractor shall not restrict flow in the sewer and shall not cause any flow blockage in the sewer at any time. All waste grout shall be removed by pumping or vacuum truck method; no grout will be allowed to be dumped into the sewer at anytime. Grout density shall be within two percent of the design density at the injection and vent points to insure that the grout is properly batched. The Contractor shall provide a scale accurate to 0.01 pounds to verify grout densities.

**500-3.4 Submittal Data and Drawings.** The Contractor shall submit a complete grouting submittal, including number and location of the proposed grouting points. Confirmation tests shall be conducted to verify that the grout design contained in the submittal will meet the specified performance.

The grout submittal shall include, but shall not be limited to the following:

1. Design of the grout mix showing the proportioning of cement, water, and chemical admixtures; and grout properties including consistency per the flow cone test ASTM C939, workability and working time, bleeding test per ASTM C232, setting time per ASTM C403, compressive strength per ASTM C109 or C495, shrinkage per ASTM C1090, and working temperature.
2. Detailed description of the grouting procedures including mix equipment, grout pressure, number and spacing of grout injection and vent locations, dewatering procedure, and grout pressure regulating equipment.
3. Shop drawings showing details of the bulkheads, grout injection piping including pressure gauges and regulators, vent piping, and waste grout recovery system.

To ensure that the grout mix to be used will meet or exceed the specified requirements, after the District's acceptance of the grout submittal, the Contractor shall submit certified test result of the sample of the approved grout mix to the District for approval. The grout sample shall be tested for compressive strength at twenty-eight (28) days, shrinkage, density and consistency. The testing shall be performed by an independent accredited testing laboratory approved by the District. Test results from prior projects are not acceptable. If the grout sample fails to meet any of the specified requirements or the approved submittal, a new grout mix design shall be submitted to the District for approval and a sample of the new grout mix shall be tested. The Contractor shall not start any grouting until the test is performed and the results are accepted by the District. The Contractor shall plan and allow sufficient time in the schedule for the testing. Any subsequent delay to the project and all costs associated with the testing shall be the responsibility of the Contractor.

**500-3.5 Confirmation Testing.** A minimum of one (1) grout sample from each grout run shall be collected from the grout injected into the annular space each day. The grout sample shall be collected at the downstream end of the grout runs. Each grout sample shall be tested for compressive strength at twenty-eight (28) days, shrinkage, bleeding, density, and consistency. The Contractor shall provide the Engineer a flow cone as required by ASTM C939 to allow spot testing of the grout consistency. The Contractor shall furnish the District with the "mud balance" for each reach of sewer. All testing shall be performed by an independent testing laboratory approved by the District. Results of the testing shall be submitted to the Engineer for approval. Cost for testing shall be borne by the Contractor.

**500-3.6 Payment.** For bidding purposes, the Contractor shall utilize the anticipated volume of annular space in the sewer after sliplining provided in the Special Provisions. Measurement of payment shall be based on volume of grout actually placed in the annular space, in cubic yards, and in accordance with the accepted design mix of the grout. Quantities will be computed based on the accepted grout mix design and the volume of water and the dry weight of the materials actually used. The dry weight used shall be verified by weigh tickets signed by an independent certified weighmaster. The actual volume of grout placed in the annular space shall be the difference between the total volume of grout mixed and the volume of waste grout as determined by the Engineer. The Contractor shall furnish a container on site, at a location approved by the Engineer, to collect the waste grout generated from his operation. Volume of waste grout will be determined by the Engineer. Prior to commencing any grouting, the Contractor shall submit to the District for approval the method of collecting, handling, storage and disposal of waste grout.

In the event that the Contractor has to place grout in excess of the volume indicated, the District will reimburse the Contractor for furnishing all labor, equipment and materials for the placement of the additional grout on the criteria set forth above including overhead and profit, the unit price of \$180 per cubic yard. If a foaming agent is used, the volume of grout measured and used for determining the payment shall be the volume prior to mixing with the foam. If the measured volume of grout is less than the volume indicated, the Contractor shall credit the District at the unit price of \$180 per cubic yard."