BASIC SPECIFICATIONS

SECTION A

GENERAL SPECIFICATIONS

1. REFERENCE SPECIFICATIONS

The following published reference specification shall hereby become part of these specifications.

A. State of California, Department of Transportation, "Standard Specifications", (Latest Edition).

B. "Standard Specifications for Public Works Construction", Latest Edition, published by Building News, Inc., 3055 Overland Avenue, Los Angeles, California 90034. Part l of the "Standard Specifications for Public Works Construction" shall apply to work accomplished under the contract except as herein modified.

2. CONTRACTOR'S SCHEDULE OF WORK

Within seven (7) days from the time the Contract is executed by all parties and at such other times as may be requested by the District, the Contractor shall submit to the District a detailed construction schedule which shall show the order in which the Contractor proposes to carry on the work, the dates at which the Contractor will start the several parts of the work, and the estimated dates of completion of the several parts. The District reserves the right to approve or alter the Schedule proposed by the Contractor, prior to the start of work.

The District may establish priorities for completion of certain parts of the work which may be necessary to provide certain services or which the District may deem advisable in the interest of public safety and convenience.

The construction schedule and supplementary construction schedules submitted shall be consistent in all respects with the time requirements of the contract.

3. INSPECTION

All work and materials furnished under these specifications shall be subject to rigid District inspection and acceptance. Inspection shall mean those services to ensure that the project is constructed in accordance with the plans and specifications including but not limited to District, Agency, or Consultant Inspection Services, Geotechnical and Soils Services, Painting and Coating Inspection Services, Electrical and Structural Inspection Services, etc.

The Contractor shall notify the District at least two working days in advance of any work to be done, in order that inspection, including that of on-site materials, may be provided with a minimum of inconvenience to the District or delay to the Contractor. The Contractor shall perform construction only in the presence of an inspector unless written permission to work during the absence of an inspector has been granted by the District or inspector. Any work done in the absence of an inspector without permission shall be subject to rejection.

The District shall at all times have access to the work during its construction and shall be furnished with every reasonable facility for ascertaining that materials and workmanship are in accordance with the requirements of these Specifications.

When required, the Contractor shall notify the District a sufficient time in advance of manufacture or production of materials to be supplied, in order that the District may arrange for shop or plant inspection and testing. The District shall have access to all parts of the shop or plant where material subject to inspection is being manufactured.

All materials shipped prior to having satisfactorily passed such testing and inspection by the District shall not be used unless approved by the District.

The Contractor shall also furnish the District duplicate, certified copies of all factory and mill test reports when required by the District.

Work or materials failing to conform to these Specifications may be rejected at any time.

The District has made the necessary arrangements for inspection of Contractor's work during the District's field services' regular (i.e. 7:00 a.m. to 3:30 p.m., Monday through Friday) 40 hour work week. If the Contractor works more than an 8 hour day, a

40 hour week, and/or District observed holidays, the financial responsibility for added inspection shall be the responsibility of the Contractor. The prevailing hourly rates for inspection are on file with the District. Such prevailing rates will be applied at 1-1/2 times the regular rates for periods over 8 hours a day and/or 40 hours per week and/or District observed holidays and 2 times the regular rates for periods over 12 hours in one (1) day.

4. DEFECTIVE WORKMANSHIP AND MATERIAL

The Contractor shall promptly remove from the premises all work and materials condemned by the District as failing to conform to the contract, whether incorporated or not, and the Contractor shall promptly replace and re-execute their own work in accordance with the contract and without expense to the District and shall bear the expense of making good all work of other contractors destroyed or damaged by such removal or replacement and pay for reinspection costs.

If the Contractor does not remove such condemned work or materials within a reasonable time after notice, the District may remove them and store the materials at the expense of the Contractor. If the Contractor does not pay the expenses of such removal within 10 days' time after such removal, the District may, upon thirty days' written notice, sell such materials at auction or at private sale and shall account for the net proceeds thereof after deducting all the costs and expenses that should have been borne by the Contractor.

5. SANITATION

All parts of the work shall be maintained in a neat, clean, sanitary condition. Fixed and portable toilets, which are made inaccessible to flies, shall be provided wherever needed for use of employees, and their use shall be strictly enforced. All waste and refuse from sanitary facilities provided by the Contractor or from any source related to Contractor's operations shall be taken care of in a sanitary manner, satisfactory to the District, and in accordance with the laws and regulations pertaining thereto. Contractor shall rigorously prohibit and prevent committing of nuisance within the work site area or upon the District's right-of-way or adjacent to private property. Contractor shall furnish all facilities and means for proper sanitation of the work, and shall protect and save harmless the District, its officers and employees from any liability resulting from improper or insufficient sanitation.

6. FIRST AID AND PROTECTIVE FACILITIES

First aid facilities and supplies shall be kept on the jobsite. Instructions in first aid shall be given, and Contractor shall provide emergency first aid treatment and supplies for their employees sufficient to comply with all legal requirements.

7. CONTRACTOR TO PROVIDE FACILITIES FOR EMPLOYEES

Contractor shall, at their own expense, provide all labor, materials, equipment, and facilities which may be required to carry out effectively the provisions of these specifications. Contractor shall receive no additional payment therefore, and all compensation to be received for such work shall be included in the prices bid on the Bidding Sheet.

8. POWER

The Contractor shall provide, at their own expense, all necessary power required for their operations under the contract. The Contractor shall provide and maintain in good order such modern power equipment and installation as shall be adequate, in the opinion of the District, to perform in a safe and satisfactory manner the work required by the Contract.

9. CLEANUP

THROUGHOUT ALL PHASES OF CONSTRUCTION, INCLUDING SUSPENSION OF WORK, AND UNTIL FINAL ACCEPTANCE OF THE PROJECT, the Contractor shall keep the premises occupied by them and the project site in a neat and clean condition, and free from unsightly accumulation of rubbish, excess construction materials, and excess excavated materials. 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 streets will not be permitted as a substitute for sweeping or other cleaning methods.

Materials and equipment shall be removed from the site as soon as they are no longer necessary.

Care shall be taken to prevent spillage on haul routes. Any such spillage shall be removed immediately and the area cleaned.

Excess excavated material from the pipe trench shall be removed from the site immediately. Sufficient material may remain for use as backfill. Forms and form lumber shall be removed from the site as soon as practicable after stripping.

FAILURE OF THE CONTRACTOR TO COMPLY WITH THE DISTRICT'S CLEANUP ORDERS MAY RESULT IN AN ORDER TO SUSPEND WORK UNTIL THE CONDITION IS CORRECTED. No additional compensation or extension of time will be allowed as a result of such suspension.

The Contractor shall not discharge smoke, dust, or any other air contaminants into the atmosphere in such quantity as will violate the regulations of any legally constituted authority.

Upon completion of work and before the final estimate is submitted, the Contractor shall, at their own expense and cost, satisfactorily dispose of or remove from the vicinity of the work all plants, buildings, rubbish, unused materials, concrete forms, and other equipment and materials belonging to them or used under their direction during the construction, and in the event of their failure to do so, the same may be removed and disposed of by the District at the Contractor's expense.

10. UTILITIES AND EASEMENTS

The plan portion of each sheet indicates the general location of underground utilities as shown on available records. No attempt has been made to show service connections other than those services improved as part of the contract work. The plans also indicate the location of public right-of-way lines and easements that will be acquired by the District. It shall be the Contractor's responsibility to conduct all their operations within the rights-of-way and easements as shown on these plans.

11. RELATIONSHIP WITH OTHER GOVERNMENTAL AGENCIES

Where the pipeline and structures are constructed within the rights of way under the jurisdiction of other governmental agencies, Contractor shall comply with all requirements of said agencies.

Where the same subject matter is covered by the specifications of two or more agencies, the specifications more restrictive on the Contractor shall govern in all cases.

12. EXPOSURE OF UTILITIES IN ADVANCE OF WORK

It shall be the Contractor's responsibility to determine the exact location and depth of all utilities and service connections. The Contractor shall also determine the type, material, and condition of any utility which may be affected by or affect the work. The Contractor shall have all utility companies field locate all underground lines before start of construction.

In order to provide sufficient lead time to resolve unforeseen conflicts, order materials and take other appropriate measures to ensure that there is no delay in work, the CONTRACTOR SHALL POTHOLE ALL UTILITY MAINS THAT MUST BE CROSSED OR CLOSELY PARALLELED PRIOR TO ANY CONSTRUCTION. CONTRACTOR SHALL THEN IMMEDIATELY PROVIDE THE LOCATION AND DEPTH OF THE "POTHOLED" UTILITIES TO THE ENGINEER. The Contractor shall expose all service connections before excavation in the area. All cost incurred in exposing utilities shall be borne by the Contractor.

THE DISTRICT RESERVES THE RIGHT TO MAKE MINOR ADJUSTMENTS IN PIPELINE ALIGNMENT AND GRADE, ALL AT NO ADDITIONAL COST TO THE DISTRICT.

Failure of the Contractor to comply with these provisions will result in an order to suspend work until these provisions are complied with, and no additional compensation or extension of time will be allowed as a result of such suspension. Payment per bid item or spread.

13. ADVANCE NOTIFICATION OF AGENCIES

It shall be the Contractor's responsibility to determine and notify those agencies requiring advance notification for inspection or other purposes before beginning construction in any area of concern to said Agency. A minimum of two working days advance notice shall be given to the various agencies before beginning construction in the area unless specific advance times and requirements are stated in these detailed specifications or required by the Agency.

14. CROSSING, PROTECTION AND/OR RELOCATION OF UTILITIES

A. General

Utilities for the purpose of these specifications shall be considered as including, but not limited to, and irrespective of ownership; Pipelines (including irrigation mains), conduits, transmission lines, and appurtenances of "Public Utilities" (as defined in the Public Utilities Act of the State of California) and those of private industry, business, or individuals solely for their own use or for use of their tenants; and storm drains, sanitary sewer, street lighting, traffic signal systems, duct banks, telephone cable, transmission cables, and completely buried structures.

The District has made an earnest effort to locate and indicate on the drawings all utilities which exist within the limits of the work. However, the accuracy and completeness of the utilities indicated on the drawings are not guaranteed. If utilities are shown in profile, the depth indicated is based on general practice and is not guaranteed at any specific location. No attempt has been made to show service connections on the plans. It shall be the responsibility of the Contractor to determine the exact location of all utilities and their service connections. The Contractor shall have the utility companies field locate their utilities before excavation. The Contractor shall verify with each utility company the extent to which they will field locate their utilities. Where required, field location by Contractor forces shall be included in the contract price for which such work is appurtenant thereto and no additional allowance will be made therefore. The Contractor shall make their own investigation as to the location and type of existing utilities and associated appurtenances and service connections which may be affected by the contract work, and shall notify the District as to any utility located by the Contractor which has been incorrectly shown or omitted from the drawings.

B. Utilities Shown on Plans

Where utilities cross or parallel the pipeline trench but do not conflict with the permanent work to be constructed, the Contractor shall protect the utility in place unless otherwise indicated on the plans. The Contractor shall notify the utility owner at least two working days in advance of the crossing or parallel construction and will coordinate the construction schedule with the utility service requirements.

Unless otherwise provided in the specifications, full compensation for crossing or paralleling of utilities shown on the plans shall be included in the contract unit price for which such work is appurtenant thereto and no additional allowance will be made therefore. Said various contract prices shall include all labor, materials, tools and equipment necessary or incidental to the work.

C. Special Water, Sewer and Recycled Water Crossings

At the locations shown on the plans or if the vertical separation between the outside of the sewer/recycled water pipe and the outside of existing water pipes at crossings is less than one (1) foot, and when directed by the District, the Contractor shall provide the construction required per the detail shown on the plans and per the California Department of Public Health Water/Sewer/Recycled Water Special Construction Requirements. The special construction will be deleted at locations shown if the vertical separation of the waterline above the sewerline is 1 foot or greater.

The District hereby reserves the right to increase or decrease this item from the quantity shown on the Proposal forms without altering the unit price bid per each. Payment will be made in accordance with the unit bid price provided on the Bidding Sheet; in the event no item for said special construction work is designated on the Bidding Sheet, Contractor shall be paid under the "Extra Work" provisions of the Contract Appendix.

D. Relocation of Utilities by the Contractor for Their Own Convenience

The temporary relocation or the alteration of any utility desired by the Contractor solely for their own convenience in the performance of the contract work, to a position or condition other than that provided for in the specifications or shown on the drawings, shall be the Contractor's own responsibility, and they shall make all arrangements with the property owners regarding such work. Any costs of such work for the Contractor's own convenience shall be absorbed in the unit prices or included in the lump sum amounts bid for the various contract items.

E. Service Connections

Compensation for service connection crossings (not shown on the Plans) shall be included in the contract price for which such work is appurtenant thereto and no additional allowance will be made therefore.

F. Utility Conflicts with Proposed Improvements

If a utility, whether shown on the plans or not, should intersect the proposed improvement at grade anywhere along the line of the improvement, the Contractor shall immediately notify the District. The Contractor may be advised to continue with the construction, leaving sufficient "gap" in their construction as determined by the District as may be necessary to accommodate resolution of the conflict, to be completed after the conflict has been resolved. In addition, the Contractor shall notify the District in writing, stating the nature of the conflict, location by schedule, sheet number, name of the street or location of easement and the station at which the conflict occurred. The District shall, within a reasonable time, make the necessary arrangements to resolve the conflict. Completion of the gap after the resolution of conflict shall not be just cause for additional compensation. Such completion of the "gap" shall be started within three working days after the Contractor has been notified of resolution of the conflict and completed in a workmanlike manner within reasonable time thereafter. When directed or approved by the District, changes in line or grade of any structure being built may be made in order to avoid utilities. Any additional costs because of such changes will be paid for as "Extra Work".

When a utility shown on the plans conflicts with the proposed improvements, the District will arrange for the relocation or alteration of said utility or require the Contractor to do same as "Extra Work". Work required in connection with unknown utilities will be performed and paid for as specified in the following paragraphs.

G. Unknown Utilities Disclosed During Contract Work

(Not including service connection)

In the event that a utility is disclosed or installed subsequent to the award of contract, such utility not being indicated on the drawings, the alteration, relocation or proper support and protection shall be done and paid for as follows:

(1) When said utility is found to occupy the space required to be occupied by a part of the permanent works to be constructed under the Contract, the District will arrange for the relocation or alteration of said utility, or require the Contractor to do same as "Extra Work".*

(2) When the said utility is found to lie parallel to the permanent work and within the trench prism defined by the minimum allowable trench excavation consistent with safety and the rules, orders and regulations of local, State and Federal agencies having jurisdiction; the District will arrange for the relocation, protection or alteration of said utility, or require the Contractor to do same as "Extra Work".*

(3) When said utility is more or less parallel with, and any portion of it does not lie within the trench prism specified hereinabove, the Contractor shall advise the District thereof, and in cooperation with the District of the utility, provide and place the necessary support, if any, for proper protection to ensure continuous and safe operation of the utility. All costs of such work shall be borne by the Contractor.

(4) Utilities found to cross the excavation but not intercepting the permanent works to be constructed, then the Contractor will be required to protect the existing facility in place and construct the proposed facility under the unknown utility.

Compensation for such crossings will be at a unit price per each in accordance with the proposal therefore. The number of such crossings is estimated and the District hereby expressly reserves the right to add to the number shown or decrease from the number shown or to totally delete the item for unknown utility crossings at no change in the unit price per each. The time extension for such crossings shall be determined by the District

* For District contracted work

and shall be added to the total time for completion allowed and for which no liquidated damages will be assessed.

(5) Upon disclosing a utility in the course of excavation that was not indicated on the drawings or marked in the field, the Contractor shall protect it in place. However, the Contractor shall immediately investigate if it is abandoned. The Contractor will be compensated at the bid unit price for unknown utility crossings only for the initial crossing of abandoned lines; and only if the Contractor did protect the abandoned utility in place.

H. Responsibility of the Contractor

The Contractor shall be held responsible for all costs for the repair of any and all damage to the contract work or to any utility (whether previously known or disclosed during the work), as may be caused by their operations. Utilities not shown on the drawings to be relocated or altered by others, shall be maintained in place by the Contractor.

At the completion of the contract work, the Contractor will leave all utilities and appurtenances in a condition satisfactory to the utility owners and the District.

15. PROTECTION OF FACILITIES OTHER THAN UTILITIES

It shall be the Contractor's responsibility to protect in place or remove and replace to original condition all existing facilities. The existing natural and man-made features and elevations on the plans are shown by topography. The topography shown is not guaranteed complete. It shall be the Contractor's responsibility to familiarize themselves with the conditions of proposed work and to identify by field investigation those features, whether or not shown on the plans, which require removal and replacement or protection in place. These features include, but are not limited to, fences, cross gutters, roads, sidewalks, driveways, curbs and gutters, power poles, signs, drainage structures, trees, landscaping, etc.

The Contractor shall repair all existing structures which may be damaged as a result of the work under the contract. Reconstruction shall be of the same type and material as the existing facility and shall be of equal quality or better than the original work.

Full compensation for complying with these requirements shall be considered as included in the price bid for the various items of work, and no additional compensation shall be made therefore.

16. GROUND WATER

Contractor shall investigate the possibility of ground water prior to submitting bid and shall assume all cost and liabilities incurred, should a ground water problem arise.

17. CONSTRUCTION WATER

The Contractor shall make all arrangements to furnish all construction water, all at no cost to the District, unless otherwise stated in the Special Requirements herein.

Bidder should contact District prior to submitting bid for further information regarding District's policy on construction water.

The Contractor shall coordinate with the District to obtain and check-out the District's hydrant meter including paying all deposits and fees. Refer to District Standard Drawing No. D-3 for Construction Meter Installation Detail.

18. WATER SUPPLY FOR COMPACTION AND DUST CONTROL

Contractor shall furnish and apply all water necessary for compaction and dust abatement purposes.

The contractor shall apply water to construction areas where dust conditions so warrant, as directed by the district.

The water supply and payment of fees shall be the responsibility of the Contractor, unless otherwise stated in the Special Requirements herein.

Full compensation for complying with these requirements shall be considered as included in the price bid for the various items of work, and no additional compensation shall be made therefore.

19. TRAFFIC CONTROL

It shall be the Contractor's responsibility to maintain traffic warning signs, barricades, flagmen, and other traffic control devices as required to maintain two-way

traffic, and as required by agencies having jurisdiction over the roadways in the work area. It shall be the responsibility of the Contractor to investigate with various agencies having jurisdiction over the right-of-way in work area to determine the extent of traffic control that may be required by each agency.

Also, it shall be the Contractor's responsibility to provide all traffic control devices to ensure a safe working environment for any associated project work such as survey, geotechnical and materials testing, etc. that is required.

Full compensation for compliance with those provisions shall be considered as included in the bid unit price for various items, and no other compensation shall be made therefore.

20. ACCESS TO ADJACENT PROPERTIES

Contractor shall at all times provide access to the properties in the area of work, unless otherwise approved by District. The Contractor shall be responsible for providing 24 hours notice to properties that will not have access. It shall be the responsibility of the Contractor to provide such temporary structures in the area of work to provide reasonable access to the properties. At least one (1) lane on cross streets shall be available at all times for use of vehicles and emergency equipment.

Full compensation for compliance with these provisions shall be considered as included in the bid unit price for various items, and no other compensation shall be made therefore.

21. CONSTRUCTION STAKING

A. Surveying and Staking

The Contractor will provide all construction staking in accordance with Contract Documents. One (1) set of stakes must be provided at 25-foot stations plus all horizontal and vertical angle points and appurtenance outlets for the gravity sewer pipelines. One (1) set of stakes must be provided at 50-foot stations plus all horizontal and vertical angle points and appurtenance outlets for the waterline and sewer force mains. Any costs for re-staking due to stakes lost during construction shall be the responsibility of the Contractor. If the Contractor requires additional staking, the Contractor will be responsible for the additional survey/staking costs.

All plans, descriptions and calculations related to surveying including grade sheets, shall be signed and stamped by the Contractor's Land Surveyor, or Professional Engineer authorized by the State of California to practice land surveying.

The Contractor shall provide the District all cut or grade sheets and survey data within no more than two working days after staking and no less than three days prior to construction for any particular phase of the construction work.

B. Lines and Grades

All work under this Contract shall be built in accordance with the lines and grades as shown on the drawings. If changes are required from the original design plans for whatever reason, the Contractor is responsible for revising the staking accordingly. Distance and measurements, except elevations and structural dimensions, are given and made on horizontal planes. For pipeline work, the surveyor will provide offset line and grade stakes at ground level and furnish cut sheets, therefore; the Contractor shall be responsible to transfer of such line and grade into the trench for construction of the work and for accuracy of the transfer cost of transfer shall be included in the unit bid for the work and no extra compensation will be made to the Contractor. The Contractor shall preserve bench marks, survey stakes, and points sets for lines, grades, or measurement of the work in their proper places until authorized by the Project Engineer to remove them. The Contractor shall provide the Engineer with Cut Sheets for approval at minimum of three (3) working days prior to commencing construction. All issues with the staking shall be specifically marked on the cut or grade sheets when these are provided to the District and submitted as an RFI for specific resolution.

C. Potholing

The Contractor shall provide coordinates and elevations, (x, y and z coordinates) of all potholing. The coordinates shall be referenced to the plan provided by the Engineer. Survey of all potholing locations shall be considered part of the construction staking and included in the bid item. No additional compensation will be allowed.

D. Data Provided by the Owner

The Owner or Engineer shall provide the original design data in AutoCAD/Civil 3D format with control data (Northing, Easting) for monumentation shown on recorded maps only. Control data provided by the Owner shall be verified for conformance to the recorded map by the Contractor prior to use for any purpose. The Contractor is responsible for determining if any conflict exists.

The Owner makes no representation as to the compatibility of this Data with your hardware or your software beyond the specified release of referenced specifications.

The Data provided is part of the Owner's proprietary instruments of service and shall not be used by the Contractor or anyone else receiving these datum through or from the Contractor for any purpose other than as a convenience for construction staking services for this project.

To the extent that the Data is electronic files, those files are not the approved construction documents. Further, differences may exist between this Data and corresponding hard-copy, engineering documents or recorded survey documents. In the event that a conflict arises between the signed, recorded or sealed hard-copy survey documents or construction documents ("Hard-Copy Documents") prepared by the Owner and the electronic files, the Hard-Copy Documents shall govern. The Contractor is responsible for determining if any conflict exists. By the use of this Data, the Contractor is not relieved of their duty to fully comply with the contract documents, including, and without limitation, the need to check, confirm and coordinate all dimensions and details, take field measurements, verify field conditions and coordinate your work with that of other contractors for the project.

To the extent that the Data is intended to be used for staking and/or grading of property, the Contractor should be aware that the Data was prepared anticipating that a duly licensed and qualified Land Surveyor would perform on-site interpretation, verification, cross-checking and field-correction of the Data at the time of actual staking of the property prior to grading.

If changes are required to the original design, the Owner will provide to the Contractor redlined changes on the original plans in PDF format only of the approved changes.

22. PROTECTION OF SURVEY MONUMENTS

It shall be the Contractor's responsibility to protect all of the existing survey monuments. Removal of such monuments or displacement thereof shall require their resetting per the existing type of monument. The cost of resetting such monuments shall be the financial responsibility of the Contractor. Contractor is advised that resetting of monuments must be done by a registered civil engineer or licensed land surveyor. Should the Contractor anticipate removal of any survey monuments, they shall include the cost of resetting of the same in the various items of work.

23. RECORD DRAWINGS

The Contractor SHALL PROVIDE, and keep up-to-date, a complete "as-built" record set of blueline prints, which shall be corrected daily and show every change from the original Drawings and Specifications and the exact "as-built" locations, measurements, sizes, and kinds of equipment. Prints for this purpose shall be obtained from the Engineer at cost. This set of Drawings shall be kept on the work site and shall be used only as a record set. The Engineer shall require that these drawings be presented monthly for review prior to any progress payment being made. At the completion of construction, the Contractor shall deliver said record set of prints to the District and will be required to certify the accuracy of the Record Drawings.

24. RE-PLANTING

Where cultivated and maintained ground covers in lawns, parkways or easements have been removed for installation of pipelines, the Contractor shall restore or replace such ground cover in kind by re-planting or resodding, after the backfill in the trench or excavation has been consolidated and the construction area graded and cleared of rocks and other objectionable material as required by these specifications. After re-planting or resodding the areas shall be covered with a suitable mulch.

Where natural vegetation has been removed for installation of pipelines, after the installation, compaction, grading and clearing has been completed, the Contractor shall re-

planting such areas in accordance with Section 25 - "Erosion Control" of these Basic General Specifications.

All costs to the Contractor for restoration, replacement, re-planting or resodding shall be absorbed in their bid for the applicable unit prices per linear foot of pipe and no other compensation will be made therefore.

25. EROSION CONTROL

A. General

The Contractor shall provide erosion control measures as defined herewith on all areas where the natural vegetation has been disturbed by the construction of the facilities. If a ground cover other than natural vegetation has been disturbed, this section does not apply and the Contractor shall replace said ground cover in kind.

B. Preparation

After the backfill has been compacted and the pipe line tested, the Contractor shall remove and dispose of rocks and debris from the area to be reseeded. No seeding shall be performed during windy weather or when the ground is too wet or in an untillable condition. The fertilizer and seed shall be spread before the straw cover material is applied. Commercial fertilizer shall not be applied until after the seed has been sown.

C. Material

Materials shall consist of the following: Seed - The seed shall consist of the following mixture: Crested wheatgrass, 47 percent; Intermediate Wheatgrass, 27 percent; Wimmera Ryegrass, 13 percent; Blando Ryegrass, 13 percent. The seed shall be spread at the rate of 100 pounds per acre and shall be applied by the use of a "Cyclone Seed Sower" or equal. Fertilizer - The fertilizer shall be Ammonium Phosphate (16-20-0) spread at the rate of 300 pounds per acre and shall be applied by the use of a "Cyclone Seed Sower" or equal. Mulch - After the application of the seed and fertilizer, new straw (stable bedding straw shall not be used) shall be uniformly spread at the approximate rate of four tons per acre. The straw shall then be "Mulched" into the ground by use of a "wire" roller or other approved equipment.

D. Protection for Steep Slopes

In cases where the grade over the pipe line exceeds 25 percent slope the Contractor shall provide additional erosion control measures to stabilize the backfill material. The Contractor shall submit to the Engineer for the Engineer's approval, special engineering details of the method to be used.

Full compensation for complying with the requirements of this section shall be included in the unit price per linear foot of pipe installed and no other compensation shall be made therefore. Bidder's attention is specifically called to the fact that the responsibility of determining the amount and the type of erosion protection shall rest with the prospective bidder.

26. CONTRACTOR'S SUBMITTALS

Whenever called for in these Specifications or on the Drawings, or where required by the District, the Contractor shall furnish to the District for review 7 copies of each submittal at no expense to the District. Copies of all shop drawings shall be submitted, accompanied by a letter of transmittal, and shall be addressed to the District.

The letter of transmittal, shall give a list of the numbers of the drawings submitted. All drawings must be marked with the name of the project and the name of the Contractor and be numbered consecutively. All drawings must be complete in every respect.

Revisions indicated on submittals shall be considered as changes necessary to meet the requirements of the Contract Drawings and Specifications and shall not be taken as the basis of claims for extra work.

It is considered reasonable that the Contractor shall make a complete and acceptable submittal to the District by the second submission of a submittal item. The District reserves the right to withhold monies due the Contractor to cover additional costs of review beyond the second submission.

Approval of shop drawings will be general and shall not relieve the Contractor from the responsibility for proper fitting and construction of the work, nor from furnishing the material and work required which may not be indicated in the shop drawings when approved; neither does it relieve the Contractor from responsibility for errors in shop drawings.

Example submittals include, but are not limited to the following:

A. All materials provided by the Contractor

B. All appurtenances provided by the Contractor

C. Miscellaneous

(1) Pothole information for utilities

(2) Copies of permits required to be obtained by the Contractor

(3) SWPPP

(4) Schedule of construction (with key milestones provided)

(5) Waterline filling, disinfection, and flushing procedures

(6) Sewer bypass plan

(7) Safety program

27. RESPONSIBILITY FOR MATERIAL FURNISHED BY THE DISTRICT

The Contractor's responsibility for material furnished by the District shall begin upon the Contractor's acceptance at the point of delivery to them. All material shall be examined by the Contractor and District. The Contractor shall immediately (upon delivery) notify the District of any material the Contractor perceives to be defective in manufacture or otherwise damaged. Should the District concur that the material should not be utilized the material will be replaced by the District. Material furnished by the District in good condition and accepted by the Contractor which is later discovered to have been damaged, shall be replaced by the Contractor at their expense. The Contractor shall be responsible for the safe storage of all materials until they have been incorporated in the completed project.

28. ERRORS OR DISCREPANCIES NOTED BY CONTRACTOR

If the Contractor, either before commencing work or in the course of the work, finds any discrepancy between these Specifications and drawings, or between either of them and the physical conditions at the site of the work, or finds any error or omission in any of the drawings or in any survey, they shall promptly notify the Engineer in writing of such discrepancy, error or omission.

29. HANDLING AND STORAGE OF MATERIALS

All materials shall be handled in such a manner as to prevent damage and, in the case of water system work, maintain sanitary conditions. All materials for use in the work shall be stored by the Contractor in such a manner as to prevent damage from exposure to the elements, admixture of foreign materials or from any other cause. The Contractor shall be entirely responsible for damage or loss by weather or other causes as to work under the Contract

30. GEOTECHNICAL SERVICES

All construction operations should be observed by a representative of the geotechnical engineer. The presence of the geotechnical engineer's field representative will be for the purpose of providing observation and field testing, and will not include any supervising or directing of the actual work of the Contractor, their employees, or agents. Neither the presence of the geotechnical engineer's field representative nor the observations and testing by the geotechnical engineer shall excuse the Contractor in any way for defects discovered in their work. It is understood that the geotechnical engineer will not be responsible for job or site safety on this project, which will be the sole responsibility of the Contractor. CONTRACTOR TO PROVIDE SAFE ACCESS FOR GEOTECHNICAL IN CONFORMANCE WITH OSHA STANDARDS AT NO ADDITIONAL COST TO THE DISTRICT.

Dependent upon the circumstances of each particular project, as determined by the District, geotechnical services may include full time monitoring and testing or part time, periodic monitoring and testing.

31. EARTHWORK

A. General

Earthwork shall conform to the requirements of the Agency having jurisdiction, but shall not be less than herein specified. Earthwork shall be performed in accordance with the requirements of Section 19 of the Specifications entitled: "State of California, Department of Transportation, Standard Specifications", Latest Edition, insofar as the same may apply and except as herein modified.

All excavations and embankments required to complete the work as specified herein shall be unclassified and made to the lines and grades shown upon the plans, or as staked in the field. (ALL EXCAVATION SHALL BE UNCLASSIFIED AND IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY PRIOR TO SUBMITTING THEIR PROPOSAL TO FAMILIARIZE THEMSELF WITH THE CONDITIONS THAT THEY MAY ENCOUNTER DURING CONSTRUCTION.) Excavated materials not required for fill, embankments or backfills shall become the property of the Contractor, and shall be disposed of at their own expense.

All excavations shall be protected and supported as required for safety and in the manner set forth in the rules, orders and regulations prescribed by the Division of Industrial Safety of the State of California.

All trenches and excavations shall be backfilled overnight and on weekends and holidays. Barriers shall be placed at each end of all excavations, and at such places as may be necessary along excavations from sunset each day to sunrise of the next day until such excavation is entirely refilled. (BACKFILL SHALL BE COMPLETE AND STREETS OPEN TO TRAFFIC BY 5:00 P.M. UNLESS OTHERWISE APPROVED BY THE DISTRICT.)

No excavated material shall be deposited on private property unless written permission of the Property Owner thereof is secured by the Contractor, or specifically provided for on these plans and in these specifications. Copies of said written permission, duly signed by the Property Owners of the private property involved, shall be furnished the District by the Contractor before any excavated material is placed outside the limits of the established right-of-way. Free access must be provided to all driveways, watergates, hydrants, etc.

Any water which may be encountered or may accumulate in the excavation shall be pumped out or otherwise removed as necessary to keep the bottom of the excavation free and clear of water during the progress of the work.

All backfill and pipe bedding material shall conform to the requirements herein this section, the provisions of the Agency having jurisdiction, pipe manufacturer’s requirements, and the requirements of the contract and drawings. The Contractor shall remove and legally dispose of any nonconforming material

including but not limited to pipe material, trash, debris, nonconforming fill, pavement, etc., all at no additional cost to the contract.

B. Clearing and Grubbing

Areas where construction is to be performed shall be cleared of all rubbish and other objectionable material of any kind, which, if left in place, would interfere with the proper performance or completion of the contemplated work, would impair its subsequent use or form obstructions therein. Trees and other landscaping, unless otherwise specifically identified on the plans for removal, shall not be destroyed, and such measures as are necessary shall be taken by the Contractor for the protection thereof. Organic material from clearing and grubbing operations will not be incorporated in excavation backfill.

It shall be the Contractor's responsibility to remove and dispose of all excess material resulting from clearing and grubbing operations at their own expense. The Contractor shall make their own arrangements for disposal sites at their own expense, at which said material may be wasted. Full compensation for clearing and grubbing shall be included in the contract unit price for which such work is appurtenant thereto, and no additional allowance will be made therefore.

C. Grading Along Pipeline

The Contractor shall perform all grading to provide a working pad along the pipeline. The pad grade shall follow the existing ground grade as nearly as possible. If unnecessary excessive overcutting occurs during this operation, the Contractor may be required to replace all such overcut material and recompact to 90%, or to do other remedial work as directed by the District, all at no cost to the District.

D. Trench Excavation

(1) General

Excavation for water/sewer pipe, fittings, and appurtenances shall be in open trench to the depth and in the direction necessary for the proper installation of the same as shown upon the plans or as otherwise directed by the District. Trench banks shall be kept as near vertical as is safe, and where necessary shall be properly braced and sheeted, in accordance with the provisions of the Section herein entitled "Trench and Excavation Shoring".

The trench bottom shall be graded to provide a smooth, firm and stable foundation at every point throughout the length of the pipe. For sewer pipe, at each joint the bottom of the trench shall be recessed in such a manner as to relieve the bell or coupling of all load.

Where the excavation has been made deeper than necessary, the Contractor shall furnish crushed rock, sand, or other material approved by the District for bedding to provide uniform support under the lower third of the depth of the pipe barrel. The cost of the material and labor to place and compact to achieve a firm and stable foundation herein specified shall be included in the unit price bid for the size of pipe laid thereon.

(2) Limit of Excavation

Except with specific approval of the Engineer, no more than 500 feet of open trench shall be excavated in advance of laying of pipe.

(3) Tunneling

Tunneling will be permitted only where native earth is of such firmness that it will remain in its original position, without sloughing off, throughout the work of excavation and backfilling; if sloughing occurs, the roof of the tunnel shall be broken down and the trench excavated as an open trench as herein specified.

(4) Trench Widths

(a) Water and Recycled Water

As stated elsewhere in these Specifications, all trenches shall have vertical sides, unless District may designate otherwise. Trench width shall be such that ample working room shall be provided on either side of pipe, provided that width of ditch measured at top of pipe shall not exceed 3 pipe diameters or 3', whichever is greater. In the event of cave-ins of trench sides where aforesaid width is exceeded, District may, at their discretion, require Contractor to use concrete or other means of special backfill for a vertical distance of not less than 1/4 the outer pipe diameter. The cost of the labor and

material to provide the concrete cradle, if required, shall be the responsibility of the Contractor, and no additional compensation will be made therefore.

(b) Sewer

The maximum allowable trench width, at the top of the pipe, is the outside diameter of the barrel plus ten (10) inches on either side of the exterior of the pipe barrel. Where the trench width at the top of the pipe is wider than ten (10) inches on either side of the exterior of the pipe barrel, the pipe shall be backfilled from the bottom of the trench to a level one-fourth (1/4) of the diameter above the center of the pipe with 3/4-inch crushed rock or as directed by the District. The cost of the labor and material to provide crushed rock encasement, if required, shall be the responsibility of the Contractor, and no additional compensation will be made therefore.

(5) Blasting

Use of explosives on the work shall be subject to approval of the District. All operations involving handling, storage and use of explosives shall be conducted with every precaution prescribed by Construction Safety Orders of Division of Industrial Safety, State of California, and by local laws and regulations. Only competent, reliable persons working under experienced supervision shall be permitted to use explosives. Contractor will be held responsible for and shall make good any damage caused by blasting or otherwise resulting from disposition or use of explosives on the work. Contractor shall obtain, at no additional cost to the District, blasting permit(s) that may be required.

(6) Grading for Pipeline Appurtenances

The Contractor shall perform all rough and fine grading to provide a graded area, sloped to drain, extending 3' minimum radially outside the limits of each air valve or blow-off installation as directed by the District in the field to assure accessibility.

The Contractor shall perform all rough and fine grading to provide a graded area, sloped to drain, extending 4' minimum radially outside the limits of each complete fire hydrant installation to assure accessibility. The location and elevation of graded pad for each fire hydrant installation will be directed by the District in the field.

E. Trench and Excavation Shoring

Pursuant to Section 6705 of the Labor Code of the State of California, in advance of any excavation pursuant to this contract, Contractor shall submit to the District for District acceptance a detailed plan showing the design of shoring, bracing, sloping, or other provisions to be made for worker protection from the hazard of caving ground during the excavation of such trench or trenches. If such plan varies from the shoring system standards, the plan shall be prepared by a registered civil or structural engineer. Nothing in this provision shall be deemed to allow the use of a shoring, sloping, or protective system less effective than that required by the "Construction Safety Orders". Reference shall also be made to the rules, orders, and regulations of the Division of Industrial Safety of the State of California, latest edition, and the U.S. Department of Labor, Safety and Health Standards for Construction, latest edition.

FULL COMPENSATION FOR COMPLYING WITH THESE REQUIREMENTS SHALL BE CONSIDERED TO BE INCLUDED WITHIN THE CONTRACT UNIT OR LUMP SUM BID PRICES PAID FOR THE VARIOUS ITEMS ON THE BIDDING SCHEDULE, AND NO ADDITIONAL ALLOWANCE WILL BE MADE THEREFORE.

F. Pipe Bedding

(1) General

(a) Water and Recycled Water

Normal bedding without crushed rock or concrete cradle shall be used unless otherwise shown on Drawings or ordered by District. For normal bedding of pipe, bottom of trench shall be excavated uniformly to grade as indicated on the Standard Drawings.

Trench bottom shall be given a final trim such that each pipe section when first laid will be continuously in contact with ground along extreme bottom of pipe. At each joint in the water pipe, the bottom of the trench shall be recessed in such a manner as to relieve the bell of the pipe of all load. Rounding out trench to form a cradle for pipe will not be required.

(b) Sewer

All pipe bedding shall be of the type indicated on the plans and shall be in accordance with the pipe bedding Standard Drawings included in these Specifications.

Bedding shall be sand, gravel or crushed aggregate having a minimum sand equivalent of not less than 30 or having a coefficient of permeability greater than 0.001 centimeters per second. (COMPENSATION FOR BEDDING MATERIAL AS INDICATED ON THE PLANS SHALL BE INCLUDED IN THE CONTRACTOR'S BID FOR THE APPLICABLE UNIT PRICES PER LINEAR FOOT OF PIPE AND NO ADDITIONAL COMPENSATION WILL BE MADE THEREFORE.) Minimum compaction for all pipe bedding shall be 90% relative compaction.

Where native material is acceptable for bedding as approved by the Engineer (sand equivalent of 30 or greater) the trench bottom shall be graded to provide smooth, firm and stable foundation at every point throughout the length of the pipe. At each joint in the pipe, the bottom of the trench shall be recessed in such a manner so that the load will be carried uniformly throughout the length of pipe, including the bell or collar.

(2) Unstable Material

Where material at the bottom of the trench is found to be unstable, soft, or spongy, such material shall be removed to a depth as determined by the Engineer and replaced with Special Crushed Rock Bedding as specified in Section 1-G herein.

(3) Rock

Where rock is encountered, it shall be removed below grade, and the trench backfilled with suitable material to provide a compacted earth cushion with a thickness under the pipe of not less than 1/2-inch per inch of nominal diameter of the pipe to be installed, with a minimum allowable thickness of 6-inches. Where a special bedding class is indicated on the plans, the depth indicated on the Standard Drawing shall be increased to that stated herein, all at no additional cost to the Owner.

CONTRACTOR SHALL RECEIVE NO ADDITIONAL COMPENSATION FOR ABOVE MENTIONED WORK.

G. Crushed Rock Bedding

As indicated on the plans, or when groundwater is encountered in the excavation, or when soft, spongy and unstable material is encountered in the bottom of the trench, and when approved by the District, the material in the bottom of the trench shall be removed to a depth directed by the District and replaced with well graded 3/4-inch maximum crushed rock bedding as specified below. The crushed rock bedding shall be installed and compacted as shown on the Standard Drawing attached to these Specifications, or with no standard drawing place crushed rock bedding 8" min. thickness (90% min. compaction) under bottom of pipe. The 3/4-inch maximum crushed rock material shall be approved by the District before use.

Crushed rock shall be the product of crushing rock or gravel. Fifty percent of the particles retained on a 3/8-inch sieve shall have their entire surface area composed of faces resulting from fracture due to mechanical crushing. Not over 5% shall be particles that show no faces resulting from crushing. Less than 10% of the particles that pass the 3/8-inch sieve and are retained on the No. 4 sieve shall be waterworn particles. Gravel shall not be added to crushed rock. Crushed rock shall have the following gradation:

Sieve Sizes	3/4-inch Max Crushed Rock % Passing
1"	100
3/4"	90-100
1/2"	30-60
3/8"	0-20
No. 4	0-5
No. 8	--

Crushed Rock Bedding, where ordered by the District, shall be paid for at the unit price per ton complete in place, if Bidding Sheet so indicates, otherwise total cost of special crushed rock bedding shall be borned by the Contractor.

Payment for trench width for Crushed Rock Bedding shall be limited to a maximum width of three (3) outside pipe diameters or the actual width, whichever is less. Any trench excavation beyond the maximum width limit shall be filled and compacted with crushed rock per the Standard Drawing, and the COST OF THE ADDITIONAL BEDDING SHALL BE BORNE BY THE CONTRACTOR.

THE DISTRICT RESERVES THE RIGHT TO INCREASE OR DECREASE THIS ITEM WITHOUT CHANGE IN UNIT PRICE OF THIS ITEM OR ANY OTHER ITEM.

H. Trench Backfill and Compaction Requirements

(1) General Requirements (Water and Recycled Water)

All excavations shall be backfilled with compacted material to level of original ground surface, unless otherwise shown on Drawings or ordered by District. Materials used for backfill shall be imported or selected excavated material and shall be placed as shown on Drawings or as specified in these Specifications or any specifications made a part hereof by reference, or as directed by District. Backfill materials shall not be dropped directly on structures or pipeline, and all materials placed within 6" of pipe or structure shall be free from rocks or boulders larger than 2" maximum dimension and from unbroken masses of earthy materials which might lodge and thereby cause unfilled pockets in excavations.

(2) Backfill Procedure (Water and Recycled Water)

Material used in backfilling first layer shall be cohesionless, sandy loam, sandy, or sandy gravel material obtained from required excavation or from approved borrow areas. It shall not contain any rocks or other hard material detrimental to good bedding of pipe or that might be damaging to protective pipe coating. Trench shall be filled to 6" over top of pipe and flooded, jetted, and poled to secure adequate saturation and permitted to stand and settle before placing next layer; balance of trench shall be filled with material from excavation in layers not exceeding 3' in depth. Each layer shall be flooded, poled, and jetted, taking care not to disturb underlying layer, before placing succeeding layer, and Contractor shall at all times protect pipe against flotation.

Contractor shall understand that procedure for backfill outlined hereinabove is general and that conditions may be encountered where, due to a change in type of soil, methods specified hereinabove, particularly flooding, may result in leaving therein areas of dry, uncompacted backfill material adjacent to pipe and that when, in the opinion of District, soil type encountered does not permit adequate backfill compaction by flooding, Contractor will be required to jet all backfill compaction as District may direct or as specified elsewhere in these Specifications or any specifications made a part hereof by reference.

Along road or street right of way, ENTIRE TRENCH SHALL BE BACKFILLED AS PRESCRIBED BY AGENCY HAVING JURISDICTION. In no event shall backfill material be compacted to a density of less than that of surrounding undisturbed soil. All trench backfill shall be compacted to 90% of maximum density as determined by ASTM D 1557-91, if so required by District and unless greater compaction is prescribed by agency having jurisdiction.

(3) Pipe Protection (Water and Recycled Water)

Before backfilling, conductor tubes, if used, shall be strutted sufficiently to prevent distortion while compacting backfill. All struts shall be removed after compacting backfill. After insertion of pipe, conductor

tubes shall be grouted with either dry sand or cement grout, at District's option.

Before backfilling, mortar-lined and coated steel pipe, 30" diameter and larger, shall be either filled with water or braced with studs sufficiently to prevent distortion while compacting backfill. All bracing shall be removed after compacting backfill.

(4) Pipe Zone (Sewer)

After the sewer pipe has been laid and inspected as herein specified, the trench shall be backfilled from the level of the bedding shown on the Standard Drawings, to a height of one (1) foot above the top of the pipe with specially selected and carefully compacted material which shall be clean, fine earth or sand, free from large stones or lumps. Backfilling shall be carried on simultaneously on each side of the pipe to assure proper protection of the pipe. Minimum compaction for all pipe zone material shall be 90% relative compaction.

(5) Procedure Above Pipe Zone (Sewer)

From the top of the pipe zone backfill to ground surface, the material for backfill may contain stones ranging in size up to 6-inches in diameter, in quantity not exceeding 40 percent of the volume when said coarse materials are well distributed throughout the finer materials so as to eliminate voids and the specified compaction may be attained. Unless otherwise specified, the balance of trench shall be filled with material from excavation in layers not exceeding 1' in depth. Rocks greater than 2-1/2 inches in any dimension will not be permitted in backfill placed within one foot of pavement subgrade.

(6) Compaction Above Pipe Zone (Water, Sewer and Recycled Water)

Relative compaction in all streets and easements, public and private, from the pipe zone to the bottom of base material shall be 90% (95% to within 12 inches of the bottom of the base material). The base material shall be the thickness required and compacted to 95% relative compaction.

(7) Compaction Tests

The compaction test, as required by the District, that meets the required compaction, shall be paid for directly to the testing laboratory by the District. The minimum District requirements are as follows: Compaction tests shall be made at intervals not greater than 150' and one (1) test every 1’ maximum vertical increment of trench backfill. Additionally at least 50% of all service laterals shall be tested. The tests shall be made in accordance with a combination of the Sand Cone Method (ASTM D1556) and nuclear gauge testing methodology at rates (i.e. 1 sand cone method to “10” nuclear gauge tests) specified by the District and at varying depths.

It should be noted that dependent upon the circumstance of each project (e.g. quantity of earthwork involved), compaction testing could be administered on a full time basis. The test interval may range from 40’ to 100’ and up to 100% of all service laterals. Therefore, the Contractor shall be prepared to perform backfill and compaction in lifts and allow for the testing to occur, providing for all safety, protection, shielding, entry support for geotechnical testing personnel. The Contractor shall incorporate this testing procedure in their efforts and schedules at no additional cost to the contract.

Compaction testing is required at all manholes. Manhole compaction testing will be required at 2’ maximum vertical increment of excavation backfill.

It shall be the Contractor's responsibility to pay for all compaction tests that indicate insufficient compaction in the area where the Contractor has previously indicated that compaction was completed.

The Contractor shall provide, at their own expense, all labor and equipment necessary for all compaction test holes. Choice of location of all tests will be made by the District. The aforementioned labor and equipment shall be readily available to perform the necessary work when required. Should the contractor not be ready to perform such work in support conducting the compaction test, and standby charges are incurred by the

District for such a delay, the contractor shall be responsible for payment of said standby charges.

It shall be the Contractor's responsibility to advise the District two working days prior to requiring compaction tests.

(8) Compaction Requirements under Agency Permit

Where the permit of a governing agency sets forth requirements for compaction more stringent than those stated herein, the Contractor shall adhere to the Agency requirements.

(9) Excess Excavated Material

The Contractor shall make the necessary arrangements for and shall remove and dispose of all excess or unsuitable material. All costs for the disposal of excess or waste material shall be borne by the Contractor.

It is the intent of these specifications that all surplus material not required for backfill shall be disposed of by the Contractor outside the limits of the public rights-of-way.

Excavated material shall not be deposited on private property unless written permission from the Property Owner thereof is secured by the Contractor. Copies of said written permission, duly signed by the Property Owner of the private property, shall be furnished to the District by the Contractor before such material is placed on private property.

(10) Imported Backfill Material

Whenever the excavated material is, in the opinion of the District, unsuitable for backfill, the Contractor shall arrange and furnish imported backfill material. Such backfill material shall comply with the requirements of pipe bedding in Section 31.F.(1) herein.

Full compensation for disposing of unsuitable material, as well as for providing suitable material as herein specified, shall be paid for at unit price per ton of such material delivered and placed in accordance with

backfill requirements, if Bidding Sheet so indicates, otherwise total cost of Imported Backfill Material shall be borne by the Contractor.

Contractor is hereby notified that the actual quantity of imported backfill material specified herein cannot be determined at this time. The District is anticipating a condition that may not exist; therefore, the quantities are fictitious for the purpose of comparing bids and the District reserves the right to reduce, to totally delete, or increase, the quantity of imported backfill material required without any consideration for adjustment in unit price of this item or any other item if the material is not needed or the final quantities are substantially different from those shown on the bidding schedule.

(11) Start and Stop Trench Transition

The end of shift backfill shall be performed with proper backfill and compaction pursuant to provisions and requirements herein to allow for temporary pavement and access for traffic. At the start of the next shift as backfill continues, excavate back a minimum of 5 linear feet of trench or as directed by geotechnical engineer from the previous stopping point. As pipeline construction commences, perform backfill and compaction pursuant to the provisions and requirements herein.

I. Structure Excavation and Backfill

Structure excavation shall include the removal of all material of whatever nature necessary for the construction of foundations and other structures in accordance with the plans.

In operating compacting equipment near structures, care shall be used to prevent the displacement of, or injury to, the structure. Backfill shall be carried up evenly on all sides in accordance with the soils engineer's recommendations.

No backfilling shall be done until concrete is thoroughly set and is safe to withstand the load.

All excavation shall be unclassified and it shall be the Contractor's responsibility prior to submitting their proposal to familiarize themselves with the conditions that they may encounter during construction.

Full compensation for complying with the above requirements for structure excavation and backfill shall be considered as included in the lump sum bid for a structure, and no other compensation shall be made therefore.

J. Control of Water

The Contractor shall provide and maintain at all times during construction, ample means and devices with which to promptly remove and dispose of all water entering the excavations or other parts of the work. No concrete footings or floors shall be laid in water nor shall water be allowed to rise over them until the concrete or mortar has set at least eight hours. Water shall not be allowed to rise unequally against walls for a period of 28 days. Ground water shall not be allowed to rise around pipe installations until jointing compound in the joints has set.

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

Dewatering for structures and pipe lines shall commence when ground water is first encountered, and shall be continuous until such times as water may be allowed to rise in accordance with the provisions of this Section.

K. Payment

Payment for earthwork and for conforming to all of the provisions of these specifications, unless otherwise specified herein and itemized in the bid schedule, shall be considered to be included in the contract unit or lump sum prices paid for the various items of work wherein earthwork is required, and no additional allowance will be made therefore.

32. STEEL CASING

Steel casing shall be butt welded of sheets conforming to ASTM Specification A283/A283M or A53/A53M and shall be constructed at the location shown on the plans

or as directed by the District. Construction may be by open trench. If the Contractor elects to install the casing pipe by jacking, the provisions of these specifications for jacked steel casing pipe shall apply. However, payment shall be at the bid unit price for steel casing.

The casing pipe shall have a steel thickness not less than l/4 inch. It shall be the Contractor's responsibility for selecting a size of casing, at or above the minimum specified, in order that the installation may be done with a sufficient degree of accuracy. Any and all increased costs resulting from the Contractor's use of steel casing pipe with greater diameter or thickness than the minimum specified shall be borne by the Contractor.

Carrier pipe conforming to these specifications for the designated pipe shall be installed within the casing pipe to the lines and grades shown on the plans. The carrier pipe shall be supported on Advanced Products & Systems Casing Spacers and Insulators, PSI Pipeline Seal and Insulator Inc., Cascade Waterworks Manufacturing Co., or District approved equal. The ends of the steel casing shall be sealed with synthetic rubber end seals with stainless steel band straps with a weephole installed at lower end for drainage. The annular space between the steel casing and carrier pipe shall be left empty unless grouting is specified by the Engineer or on the plans.

Measurement for payment for casing pipe, excluding carrier pipe within said casing, shall be made along the centerline of the casing pipe between the limits shown on the plans and/or staked in the field.

Payment for steel casing pipe will be at the contract unit price per linear foot for steel casing pipe placed in accordance with these plans and specifications. Payment shall be full compensation for furnishing all labor, excavation, backfill, steel casing pipe, shoring, equipment, services, transportation, sand cement, concrete, all grouting operations described herein, and other appurtenant items of labor and material required to complete the work. The water carrier pipe will be paid for under the bid item for pipe.

33. JACKED STEEL CASING

The Work of this section includes furnishing and installing jacked steel casing under roadways, railroads, storm drain facilities and other major pipelines, facilities or structures; including all labor, excavation, backfill, boring, jacking, steel casing pipe, shoring, equipment, services, transportation, sand cement, concrete, grouting, and other appurtenant items of labor and materials required to complete the work. Jacked steel casings and bore installations shall be installed only by a qualified company regularly engaged in this specialty work.

Jacked steel casing shall be butt welded of sheets conforming to ASTM Specification A283/A283M and shall be constructed in accordance with the provisions of

Section 306-2 of the "Standard Specifications for Public Works Construction", Latest Edition, except as herein specified or Northwest Pipe Co. Perma Lok steel casing conforming to ASTMA 36, ASTMA 515, grade 60 or ASTMA 572, grade 42.

The casing pipe shall have a steel thickness not less than 3/8 inch. The casing pipe shall be a minimum of 20 feet in length to a maximum of 40 feet in length. Any and all increased costs resulting from the Contractor's use of steel casing pipe with greater diameter or thickness than the minimum specified shall be borne solely by the Contractor.

Steel casing pipe of the minimum size and thickness specified shall be installed in place by jacking and boring methods without the use of water or air at the locations shown on the plans, and to grades required to install carrier pipe. If the bore casing is equal to or exceeds 18-inches in diameter and the length of the bore exceeds 80-feet in length, the contractor shall bore using a track machine, unless otherwise directed by the District.

Voids, if developed outside the casing and within limits for boring or jacking, from any cause such as removal of rocks encountered in boring, shall be filled with lean grout forced in under pressure by insertion of a grout pipe outside of the casing. The lean grout shall consist of one part of portland cement to not more than four parts of sand by volume, placed at low pressure. Grout pressure is to be controlled so as to avoid deformation of the casing. Sand for grout to be placed outside the casing shall be of such fineness that 100% will pass a No. 8 sieve and no less than 35% will pass a No. 50 sieve.

If the Contractor is not ready to place the pipe in the casing at the time of completion of boring and jacking operations, the ends shall be bulk headed, and the approach trenches in public streets shall be backfilled, temporary surfacing placed thereon, and the affected portion of the street reopened to traffic. For short (overnight) duration, the trenches may be securely covered with armored plates to allow for uninterrupted traffic.

The contractor shall be responsible for maintaining the specified line and grade, and preventing settlement of overlying structures, or other damage due to the boring and jacking operations. Except as otherwise indicated in this Section of the Specifications, the Contractor shall comply with the applicable provisions of latest adopted edition of the Standard Specifications for Public Works Construction (SSPWC) together with any latest Supplement Amendment. Additionally, jacked steel casing shall be in accordance with applicable ASTM Standards.

A. Submittal

(1) The following shall be submitted:

(a) Submittals for jacking or boring operation shall be in accordance with SSPWC Section 306-2.1 unless indicated otherwise.

(b) The contractors attention is directed to the provisions for "Shoring and Bracing Drawings" in Section 6705 of the California Labor Code. If such plan varies from the shoring system standards established in the Construction Safety Orders of the State of California, such alternative systems plans shall be prepared by a civil or structural engineer licensed in the State of California.

(c) Casing installation schedules which include schedules of excavation, pipeline installation, and backfill operations.

(d) Material list including diameter, thickness, and class of steel casing.

(e) Detailed locations and sizes of all boring or jacking and receiving pits.

(f) Shop drawings of casing insulators (spacers) and end seals including manufactures' catalog information.

(g) Permits associated with the boring or jacking operations.

(h) Pressure concrete mix design and bracing plans to prevent the carrier pipe from shifting or floating in accordance with SSPWC Section 306-2.3.

B. Potholing of Existing Utilities

Contractor shall be required to pothole any existing underground utilities crossing the proposed jacked steel casing installation that may potentially interfere with the installation. Refer to Special Conditions.

C. Permit Provisions and Requirements

(1) Contractor shall be responsible for obtaining any required permits other than those indicated in the Special Conditions to be obtained by the District. Contractor shall comply and adhere to all permit requirements at no additional cost to the Owner.

(2) Where Agency permit provisions differ from the specification requirements stated herein, the highest and most stringent standard or requirement shall govern; and Contractor shall construct the installation to said higher standard at no additional cost to the District.

D. Casing Spacers

Casing isolators/spacers shall have a minimum 14 gauge steel band and where required, 10 gauge risers. The band, risers and connecting studs shall be welded and cleaned at the factory before the application of a fluidized bed fusion bonded PVC coating of between 10-16 mils thickness. The PVC coating shall provide good resistance to acids and alkalies and excellent resistance under ASTM B117 salt spray tests. The isolators/spacers shall have a flexible PVC inner liner of 0.09 inch thickness with a durometer "A" 85-90 hardness and a minimum 58,000 volt dielectric strength. The runners shall be high pressure molded glass reinforced polymer with a minimum compressive strength of 18,000 psi per ASTM D638. The runners shall be 2.0 inch in width and a minimum of 7.0 inches long for C8G-2 models and 11" for C12G-2 models (polyethylene runners are not an acceptable alternative). The runners shall be attached to the band or riser by 3/8" welded steel studs and lock nuts which shall be recessed far below the wearing surface on the runner. The recess shall be filled with a corrosion inhibiting filler. The band section shall be bolted together with cadmium plated studs, nuts and washers. End seals shall be made of synthetic rubber. Banding straps shall be made of stainless steel.

Products of the type indicated shall be made by one of the following:

(1) Casing Spacers – Pipeline Seal and Insulator Inc. Model C12G-2, Advance Products & Systems Inc. Model S/12, or approved equal.

(2) End Seals – Pipeline Seal and Insulator Inc. Model S, C or W, Advance Products & Systems Inc. Model AC or AW, or approved equal.

The Contractor shall give the District a minimum of three (3) days advance notice of the start of an excavation or boring operation. All work shall be performed in the presence of the District, unless the District has granted prior approval to perform such work in its absence. All welding procedures used to fabricate steel casings shall be pre-qualified under the provisions of ANSI/AWS D1.1. Welding procedures shall be required for, but not necessarily limited to, longitudinal and girth or special welds for pipe cylinders, casing joint welds, reinforcing plates and

grout coupling connections. No exterior of interior joints of the carrier pipe shall have mortar grout applied over a seam until the seam has cooled. Exterior and interior joints of the carrier pipe shall be mortar coated and lined in the field.

E. Installation of Steel Casing

(1) JACKING HEAD: A steel jacking head shall be fitted to the lead section of the casing in such a manner that it extends around the entire outer surface of the steel casing and projects at least 18 inches beyond the driving end of the casing. The jacking head shall not protrude more than 1/2 –inch outside of the outer casing surface. The head shall be securely anchored to prevent any wobble or alignment variation during the boring or jacking operations. To minimize voids outside the casing, excavation shall be carried out entirely within the jacking head and not in advance of the head. Excavated materials shall be removed from the casing as the boring or jacking operation progresses and no accumulation of excavated materials within the casing shall be permitted.

(2) JACKING PIT: The excavations for the boring or jacking operations shall be adequately shored to safeguard existing substructures and surface improvements and to ensure against ground movement in the vicinity of the jack supports. Heavy guide timber, structural steel, or concrete cradles of sufficient length shall be provided to assure accurate control of boring or jacking alignment. The Contractor shall provide adequate space within the excavation to permit the insertion of the lengths of casing to be bored or jacked. Timbers and structural steel sections shall be anchored to ensure action of the jacks in line with the axis of the casing. A bearing block, consisting of a timber or structural steel framework, shall be constructed between the jacks and the end of the casing to provide uniform end bearing over the perimeter of the casing and distribute the jacking pressure evenly.

(3) CONTROL OF ALIGNMENT AND GRADE: The Contractor shall control the application of the jacking pressure and excavation of materials ahead of the casing as it advances to prevent the casing from becoming earthbound or deviating from the required line and grade. The Contractor shall restrict the excavation of the materials to the least clearance necessary to prevent binding in order to avoid

loss of ground and consequent settlement or possible damage to overlying structures.

(4) GROUTING: Not used.

(5) INSTALLATION: The installation of the casing shall be in accordance with the SSPWC Section 306-2.1 and subject to the approval of the agency having jurisdiction over the area containing the boring or jacking operations.

F. Installation of Carrier Pipe

(1) JOINTS: All joints of the carrier pipe within the casing shall be in accordance with District Standards.

(2) INSTALLATION OF PIPE: The end seals shall be pulled on (in case of pull on type of seals) and the casing spacers shall be installed over the carrier pipe at the proper location, in accordance with the casing spacers manufacturer's instructions. Care shall be taken not to damage the carrier pipe coating or the inner coating of casing pipe while installing the carrier pipe. The position of the runners in the carrier pipe and casing shall be as indicated and shall be uniform throughout the casing length. Line and grade of the carrier pipe shall be installed as specified on the plans and deviations shall be permitted. During installation, rifling (rotating) of the carrier within the casing can occur and can be a cause of line and grade discrepancies. Take necessary measures to prevent rifling. Guides may be installed as necessary to prevent rifling (rotating) of the carrier pipe during installation.

(3) TESTING OF THE CARRIER PIPE: Testing of the carrier pipe shall be completed prior to strapping the end seals.

(4) END SEALS: After the carrier pipe has been tested, the end seals shall be strapped by stainless steel bands in accordance with the manufacturer's instructions.

(5) CLOSING OF PITS: After equipment and excavated materials from the boring or jacking operations have been removed from the jacking pit, the Contractor shall prepare the bottom of the jacking pit as a pipe foundation. The Contractor shall remove all lose and

disturbed materials below pipe grade to undisturbed earth and re-compact the material.

Measurement for payment for casing pipe excluding carrier pipe within said casing shall be made along the centerline of the casing pipe between the limits shown on the plans and/or staked in the field.

Payment for jacked steel casing pipe will be at the contract unit price per linear foot for jacked steel casing pipe placed in accordance with these plans and specifications. Payment shall be full compensation for furnishing all labor, excavation, backfill, boring, jacking, steel casing pipe, shoring*, equipment, services, transportation, sand cement, concrete, all grouting operations described herein, and other appurtenant items of labor and material required to complete the work. The water carrier pipe will be paid for under the bid item for pipe. The ends of the casing pipe shall be closed using an end seal as manufactured by Advanced Products and Systems, Inc. or District approved equal. Brick and mortar is not acceptable.

34. ASBESTOS CEMENT PIPES HANDLING

This specification governs all work involving existing asbestos cement pipe (ACP), including locating, exposing, supporting, tapping, cutting, removing, stockpiling, transporting, and disposing of ACP encountered during construction. The installation of new asbestos cement pipe is strictly prohibited. Existing cementitious water pipe shall be presumed to contain asbestos unless verified otherwise by the District in writing.

All work involving ACP shall comply with the most stringent applicable federal, state, and local regulations, including but not limited to Cal/OSHA Title 8 California Code of Regulations Section 1529, OSHA 29 CFR 1926.1101, EPA Asbestos NESHAP 40 CFR Part 61 Subpart M, and all requirements of the governing local air quality management district and county environmental health department. The Contractor is solely responsible for compliance with all regulatory notification, training, monitoring, documentation, and disposal requirements.

The Contractor shall have demonstrated experience performing construction work involving asbestos cement water mains and shall designate a competent person trained in asbestos compliance who is responsible for implementing exposure control measures and ensuring regulatory compliance at all times. Prior to disturbing ACP, the Contractor shall submit an asbestos exposure control plan

* Shoring shall be by steel shield from top of bore pit excavation to bottom, unless otherwise directed by Engineer.

describing proposed work methods, wetting procedures, cutting controls, personal protective equipment, waste handling, and contingency measures for accidental breakage or friable conditions. No work involving ACP shall begin until the plan is accepted by the District and all required regulatory notifications have been completed.

Asbestos cement pipe shall be handled in a manner that keeps the material intact and non-friable at all times. Dropping, crushing, grinding, dry cutting, or pulverizing ACP is prohibited. Cutting or tapping of ACP shall be avoided to the maximum extent practicable through the use of mechanical couplings, transition fittings, or replacement pipe segments. When cutting is unavoidable, the pipe shall be continuously wetted and cut using controlled methods consistent with Cal/OSHA and OSHA requirements. Visible dust emissions are strictly prohibited.

Work areas involving ACP shall be controlled to limit access to authorized personnel only. Appropriate personal protective equipment, including respiratory protection where required by exposure assessment, shall be worn in accordance with the Contractor's exposure control plan and applicable regulations. Dry sweeping and the use of compressed air for cleanup are prohibited. Debris and residue shall be cleaned using wet methods or HEPA-filtered vacuum equipment.

Asbestos cement pipe designated for removal shall be removed in the largest practical sections and handled carefully to prevent cracking or breakage. Removed pipe and debris shall be kept wet, wrapped or sealed in leak-tight containers or polyethylene sheeting, labeled as asbestos-containing material, and stored in a designated protected area until transported for disposal. Temporary stockpiling shall be minimized and shall not allow vehicle traffic or other activities that could damage the pipe.

Transportation and disposal of asbestos cement pipe shall be performed at a landfill authorized to accept asbestos-containing waste in accordance with all regulatory requirements. The Contractor shall provide all required waste manifests, disposal receipts, and documentation to the District. If ACP becomes broken, crushed, or otherwise rendered friable, the Contractor shall immediately stop work, secure the area, apply wetting controls, notify the District, and implement contingency procedures in accordance with applicable asbestos regulations.

The Contractor shall maintain daily records of ACP handling activities, including locations, quantities, personnel, methods used, and disposal documentation. All costs associated with asbestos cement pipe handling, regulatory compliance,

disposal, and documentation shall be included in the Contract price unless otherwise specified.