

**2012 SAN DIEGO REGIONAL
SUPPLEMENT**

TO THE

2012 EDITION OF

The “GREENBOOK”

**STANDARD SPECIFICATIONS
FOR
PUBLIC WORKS CONSTRUCTION**

**Approved and adopted by the
San Diego Regional Standards Committee
September 2012**

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FOREWARD TO 2012 REGIONAL SUPPLEMENT TO THE GREENBOOK

The “**2012 San Diego Regional Supplement to the 2012 Edition of the “Greenbook” Standard Specifications for Public Works Construction**” (Regional Supplement) has been prepared and adopted by the San Diego Regional Standards Committee (RSC) for use in the San Diego region by local agencies. The San Diego region is defined as the land area within the boundaries of the County of San Diego.

The specifications contained in this Regional Supplement take precedence over the specifications contained in the “2012 Greenbook”. The intent of the Regional Supplement is to address the unique conditions in the San Diego region that have not been addressed in the “2012 Greenbook”.

The Regional Supplement is published every three years and is posted on the website:

<http://www.regional-stds.com>

The website contains information about membership, operating procedures, meeting schedules, agenda and minutes, standard drawings and specifications, Regional Supplements, a link to the Greenbook Committee, member agencies and a form for submitting proposed revisions. Users of the San Diego Regional Supplement and the Regional Standard Drawings are encouraged to submit proposed changes to the Regional Standards Committee (RSC) at:

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The following is a list of the County of San Diego Coordinator and the subcommittee chairpersons who over the last three years have made this publication possible by integrating the input from all agencies in the County:

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Kirk Ammerman, PE	Concrete Structures & ADA Committee Chair	City of Chula Vista
Tim Regello, PE, PLS	Drainage Systems Committee Chair	City of Vista
Dennis Gerschoffer	Dry Utilities and Misc. Committee Chair	SDG&E
Christy Villa, PE	General Surface Facilities Committee Co-Chair	City of Encinitas
Melody Rocco, PE	General Surface Facilities Committee Co-Chair	City of Poway
Nabil Batta, PE	Landscape and Irrigation Committee Chair	City of San Diego
Dennis Gerschoffer	Traffic/Lighting/Electrical Committee Chair	SDG&E
Blair Knoll, PE, PLS	Water / Sewer Committee Chair	San Dieguito Water District

The “Greenbook” was first published in 1967 and the Regional Standards Committee was established under San Diego County Board of Supervisors Policy I-50 in 1973. The Regional Standards Committee membership is open to the City Engineers, Directors of Public Works, District Engineers and Heads of Engineering, or their designees, from the County of San Diego, cities within the County of San Diego, all water and sewer districts, utility companies,

construction associations, consultant associations, and various private industry organizations. The County Department of Public Works provides coordination and staff support for the Regional Standards Committee. The RSC Chairman is selected by the committee members and serves a three-year term.

The 2012 San Diego Regional Supplement to the 2012 Edition of the Greenbook and the 2012 San Diego Regional Standard Drawings have discontinued the use of dual units and adopted English imperial units only based on the State of California and most other states returning to English only units (unlike the 2012 Greenbook which continues to have English imperial units followed by metric units in parenthesis).

Please note only those sections of the 2012 Greenbook that are modified by this Regional Supplement are included herein. Also, revision updates from the 2009 Supplement to the 2012 Supplement are indicated with a vertical line along the left side of the page.

A handwritten signature in blue ink that reads "Timothy N. Stanton". The signature is fluid and cursive, with the first name "Timothy" and last name "Stanton" clearly legible.

Timothy N. Stanton, PE

Chair, San Diego Regional Standards Committee

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PART 1

GENERAL PROVISIONS

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

1-2 TERMS AND DEFINITIONS.

Working Day –

Delete e) and f) from definition.

SECTION 2 - SCOPE AND CONTROL OF WORK

2-3 SUBCONTRACTS.

2-3.2 Self Performance.

Delete the second sentence in the first paragraph and replace with the following sentence:

Unless 'Specialty Items' are designated by the Engineer in the Bid Proposal, the following items will qualify as 'Specialty Items', providing they are listed by the bidder in the Bid Proposal(s) and their total 'Specialty' cost does not exceed fifty percent (50%) of the total contract cost:

Iron or steel, irrigation, landscaping, masonry, pavement markings, pre-cast paving units, sewer, stamped concrete, street lights, traffic signals, water.

2-4 CONTRACT BONDS.

Replace the last sentence of the fourth paragraph with the following sentence:

The bond may be reduced to twenty-five percent (25%) of the Contract Price plus Change Orders at the sole discretion of the Agency.

2-5 PLANS AND SPECIFICATIONS.

2-5.2 Precedence of Contract Documents.

Revise precedence as follows:

- a) Permits of other agencies as may be required by law.
- b) Change Orders and Supplemental Agreements; whichever occurs last.
- c) Contract/Agreement.
- d) Addenda.
- e) Bid/Proposal.
- f) Project Special Provisions.
- g) Project Plans.
- h) Agency Standard Drawings.
- i) Regional Standard Drawings.
- j) Agency Supplement.

- k) Regional Supplement.
- l) "Greenbook" Standard Specifications for Public Works Construction.
- m) Reference Specifications.

2-8 RIGHT-OF-WAY.

Add the following sentence after the first sentence:

The Contractor shall be responsible for coordinating with property owners as to timing, when access is provided through rights of entry, and shall protect private improvements.

SECTION 3 - CHANGES IN WORK

3-3 EXTRA WORK.

3-3.2 Payment.

3-3.2.2 Basis for Establishing Costs.

3-3.2.2.3 Tool and Equipment Rental.

Revise the second paragraph to read as follows:

Regardless of ownership, the rates to be used in determining equipment rental costs shall not exceed listed rates found in the most recent edition of the State Department of Transportation (Caltrans) "Labor Surcharge and Equipment Rental Rates", which is available online at:

www.dot.ca.gov/hq/construc/egrr/Book_2012.pdf

The date when the work was accomplished shall be within the date range of the rental rate document. Where the Contractor can substantiate that the rental rates prevailing locally exceed the published rates by more than fifteen percent (15%); the Contractor will be entitled to a rental rate adjustment. For equipment not listed in said publication, rental rates shall not exceed listed rates prevailing locally at equipment rental agencies or distributors, at the time the work is performed.

SECTION 4 – CONTROL OF MATERIALS

4-1 MATERIALS AND WORKMANSHIP.

4-1.3 Inspection Requirements.

4-1.3.3 Inspection of Items Not Locally Produced.

Add the following paragraph:

When required by the Special Provisions or as noted on the Project Plans, the Engineer may elect to perform inspection of an out-of-town manufacturer. The Contractor shall incur all inspection costs. These costs shall include travel expenses, a per diem allowance for lodging, meals, car rental, and ten (10) minutes of long distance phone calls to the Agency's area per day. If the manufacturing plant operates a double shift, a double shift shall be figured in the inspection costs. At the option of the Engineer, full time inspection will continue for the length of the manufacturing period. If the manufacturing period will exceed three (3) consecutive weeks, the expenses of the Engineer's supervisor will be included in the figures for one 2-day trip to the site per month. Inspection costs paid by the Contractor will not include the wages of the Engineer and their supervisor if employed by the Agency, when required by the Special Provisions or as shown on Project Plans.

SECTION 5 - UTILITIES

5-1 LOCATION.

Add the following sentence:

The Contractor shall notify the Agency at least two (2) working days prior to start of construction, unless, earlier notice is required by another permit or plan.

SECTION 6 - PROSECUTION, PROGRESS, AND ACCEPTANCE OF THE WORK

6-7 TIME OF COMPLETION.

6-7.3 Contract Time Accounting.

Change "...a periodic statement..." to "at least a monthly statement ..." in the second sentence.

6-9 LIQUIDATED DAMAGES.

Insert the following after \$250 in the first paragraph:

"...for contracts with a value of \$100,000 or less, and the sum of \$500 for contracts with a value of over \$100,000..."

Insert the following after \$250 in the second paragraph:

"... per day for contracts with a value of \$100,000 or less, or \$500 per day for contracts with a value of over \$100,000..."

SECTION 7 - RESPONSIBILITIES OF THE CONTRACTOR

7-3 LIABILITY INSURANCE.

Revise the second and third paragraphs to read as follows:

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

Bodily Injury	\$ 500,000 each person \$1,000,000 each occurrence \$1,000,000 aggregates products and completed operations
Property Damage	\$ 250,000 each occurrence \$ 500,000 aggregate

A combined single limit policy with aggregate limits in the amount of \$2,000,000 will be considered equivalent to the required minimum limits.

Change the words "...registered mail..." in the fifth paragraph to read "...certified mail..."

7-6 THE CONTRACTOR'S REPRESENTATIVE.

Add the following paragraph:

The Contractor and Engineer shall provide each other with a local area code and phone number at which they or their representative may be contacted twenty-four (24) hours a day.

7-10 PUBLIC CONVENIENCE AND SAFETY.

7-10.1 Access.

7-10.1.1 General.

7-10.1.1.2 Pedestrian Access.

Replace the first sentence with the following:

7-10.1.1.2 Pedestrian Access. The Contractor shall provide and maintain a safe pedestrian walkway access that is at least four feet (4') wide along the entire length of the construction area and complies with applicable ADA standards unless otherwise approved by the Engineer.

7-10.2 Work Area Traffic Control.

7-10.2.1 General.

Add the following paragraphs:

The Contractor shall maintain, whether shown on the Plans or not, all existing traffic control signs or signals in their proper location on temporary mounting supports until permanent signs or signals are restored.

Traffic control safety devices shall have the owner's name clearly noted.

7-10.5 Security and Protective Devices.

7-10.5.3 Steel Plate Covers.

Add the following paragraphs after the first sentence:

Transverse or longitudinal cuts within the right-of-way that cannot be properly completed within a workday shall be protected by steel plate covers in such a way as to preserve unobstructed traffic or pedestrian flow. The Contractor shall secure written approval, in advance, for use of any temporary bridge proposed by it for public use and shall not be installed until said approval has been obtained from the local governing Agency. Signs and postings conforming to the current requirements covering "signs" as set forth in the California MUTCD published by the California Department of Transportation, including advance warning signs (e.g. a Rough Road, W8-8, with black lettering on an orange background) indicating that steel plate covers are in use shall be clearly posted. Additional signage and postings with a two inch (2") minimum letter height shall indicate the steel plate cover load limit, the Contractor's name and a twenty-four (24) hour emergency contact phone number. These specifications shall also apply to the street closures, barricades, detours, lights, and other safety devices required.

Temporary steel plate covers shall be in accordance with the following requirements:

- a) Steel plate covers shall be A36 grade steel designed for HS20-44 truck loading per the Caltrans Bridge Design Specifications Manual and shall extend a minimum of twelve inches (12") beyond the edges of the trench; Engineer may require more than twelve inches, based upon depth of plated trench and soil conditions. Refer to **Table 7-10.5.3 (A)** below for the advisory minimal thickness of steel plate cover bridging required for a given trench width:

Table 7-10.5.3 (A) – Trench Width / Minimum Plate Thickness

Trench Width	Minimum Plate Thickness
10"	One-half inch (1/2")
1'-11"	Three-quarters inch (3/4")
2'-7"	Seven-eighths inch (7/8")
3'-5"	One inch (1")
5'-3"	One & three-quarters inch (1-3/4")

- b) The Contractor shall submit to the Agency for approval, working drawings prepared on 24" x 36" 'D' size sheets per Subsection **2-5.3 "Submittals."** of the Greenbook. Note: For temporary steel plate cover spans greater than 5'-3" (63"), a structural design including a shoring system shall be prepared by a California registered civil or structural engineer and approved by the Agency. Calculations need not accompany working drawings previously approved for the same project except as required by the Agency.
- c) Steel plate covers used in the traveled way shall have a skid-resistant surface that was manufactured with a nominal Coefficient of Friction (COF) of 0.35 as determined by California Test Method 342 (also see Appendix H of the most current Caltrans Encroachment Manual).
- d) The dimensions of the steel plate covers; size and locations of the connections; and size and spacing of the members shall be detailed on the working drawings.
- e) The bearing pad shall be on firm ground or pavement for support of the steel plate covers.

Steel plate covers and appurtenant shoring system shall be installed using either Method 1) or 2) listed below:

Method 1): **[FOR SPEEDS EQUAL TO OR GREATER THAN 36 MPH]**

The pavement shall be milled / cold-planed to provide a depth, width and length equal to that of the steel plate cover such that it is recessed and flush with the surrounding pavement surface.

Method 2): **[FOR SPEEDS 35 MPH AND LESS]**

Approach and ending steel plate covers (if longitudinal placement) shall be attached to the roadway by a minimum of two (2) dowels installed in pre-drilled holes into the corners of the plates and drilled a minimum four inches (4") into the pavement. In addition to dowels, adjustable cleats, shims, welding, or other devices, shall be installed to secure steel plate covers against movement or displacement and in such a manner that will

minimize noise as traffic drives over the steel plate covers.

Subsequent plates are butted to each other and tack welded as directed by the local governing Agency. Fine graded asphalt concrete shall be placed and compacted to form a minimum twelve inch (12") tapered transition ramp with a maximum slope of 8.5% to cover all edges of the steel plate covers. Alternatively, Contractor may use pre-fabricated neoprene rubber mats manufactured by American Highway Products, or equivalent (if approved by local governing Agency).

When the steel plate covers are removed the pavement shall be restored and dowel holes in the pavement shall be backfilled with either graded fines of asphalt concrete mix, concrete slurry, epoxy or an equivalent that is satisfactory and as required by the local governing Agency.

The type of steel plate cover installation shall be evaluated on a case-by-case basis since, in some cases, a particular type of steel plate cover installation may be required (e.g. near a school, weather conditions, traffic speed, volume and composition, duration and dimensions of plates, etc.).

All steel plate covers shall provide complete coverage to prevent any person, bicycle, motorcycle or motor vehicle from being endangered due to steel plate cover movement causing separations or gaps.

Unless specifically noted or granted in the Agency's Special Provisions or approved by the Agency's Inspector:

- a) The installation of steel plate covers SHALL NOT exceed four (4) consecutive working days in any given week.
- b) The installation of steel plate covers SHALL NOT exceed fifty lineal feet (50') in length.

The Contractor is responsible for maintaining the steel plate covers, shoring system, asphalt concrete tapered transition ramps and ensuring they meet minimum specifications. All steel plate covers within the right-of-way whether used in or out of the traveled way shall be without deformation. The trueness of a steel plate cover can be determined by using a straight edge. Any steel plate cover found to be permanently deformed shall be rejected and removed from the right-of-way.

The Contractor shall immediately mobilize necessary personnel and equipment after being notified by the Inspector, the Agency's emergency service section, or a member of the public of a repair need. This includes, but is not limited to, plate movement, noise, plate anchors, cold-mix, asphalt concrete transition ramp between the steel plate cover surface and the existing roadway or sidewalk.

Failure to respond to the emergency request within two (2) hours of Agency's initial attempt to contact the Contractor shall be grounds for the Agency to perform necessary repairs that will be invoiced at actual cost including overhead or \$500 per incident, whichever is greater. All Traffic Control Plans currently require prompt repairs of steel plate covers by the Contractor.

Lack of Contractor conformance shall be automatic grounds for suspension of their permit/contract.

If payment provisions for performing all work necessary to provide Steel Plate Covers or Traffic Plate Bridging are not included in the bid items, then payment for such work will be deemed to be included in the other various items of work that required the steel plate covers and no additional payment will be allowed.

PART 2 CONSTRUCTION MATERIALS

SECTION 200 - ROCK MATERIALS

200-1 ROCK PRODUCTS.

200-1.6 Stone for Riprap.

200-1.6.2 Grading Requirements.

Add the following:

The individual classes of rocks used in slope protection shall conform to **TABLE 200-1.6(A)**.

Replace Table 200-1.6(A) with:

TABLE 200-1.6 (A)

Rock Sizes	Percentage Larger Than				
	C L A S S E S				
	2 Ton	1 Ton	½ Ton	1/4 Ton	No. 2 Backing
4 Ton	0-5				
2 Ton	50-100	0-5			
1 Ton	95-100	50-100	0-5		
½ Ton			50-100	0-5	
1/4 Ton		95-100		50-100	
200 lb.			95-100		
75 lb.				95-100	0-5
25 lb.					25-75
5 lb.					90-100
1 lb.					

The amount of material smaller than the smallest size listed in the table for any class of rock slope protection shall not exceed the percentage limit listed in the table determined on a weight basis. Compliance with the percentage limit shown in the table for all other sizes of the individual pieces of any class of rock slope protection shall be determined by the ratio of the number of individual pieces larger than the smallest size listed in the table for that class also pertaining to this Greenbook Supplement Subsection **200-1.7, “Selection of Riprap and Filter Blanket Material.”**

200-1.6.3 Quality Requirements.

Change the second sentence in the first paragraph from "...60 days..." to "...30 days..."

Add the following new subsection:

200-1.7 Selection of Riprap and Filter Blanket Material.

TABLE 200-1.7

Velocity (1)	Rock Class (2)	Rip-Rap Thickness "T"	Filter Blanket Upper Layer(s) (3)				Filter Blanket Lower Layer (7)
			Option 1 (4A)	Option 1 (4B)	Option 2 (5)	Option 3 (6)	
6 – 10 ft/sec	No. 2 Backing	1.1 ft	1/4"		B3	D.G.	
10 – 12 ft/sec	¼ Ton	2.7 ft	3/4"			3/4"- 1-1/2" P.M.B.	SAND
12 – 14 ft/sec	½ Ton	3.5 ft	1"			3/4"- 1-1/2" P.M.B.	SAND
14 – 16 ft/sec	1 Ton	4.4 ft		1-1/2"		TYPE B	SAND
16 – 18 ft/sec	2 Ton	5.4 ft		2"		TYPE B	SAND

Table 200-1.7 Notes:

See Subsection **200-1.6 “Stone for Riprap.”** See also **TABLE 200-1.6 (A)**.

Practical use of this table is limited to situations where Rip-Rap Thickness "T" is less than inside diameter of the culvert outletting to the energy dissipater.

- (1) Average velocity in pipe or bottom velocity in energy dissipater, whichever is greater.
- (2) If desired rip rap and filter blanket class is not available, use next larger class.

Light	Rock Class	200 lb.
Facing	Rock Class	75 lb.
No. 2 Backing	Rock Class	5 lb.

- (3) Filter blanket thickness = 1 foot or "T", whichever is less.
- (4A) **Option 1** shall meet the requirements of Table 200-1.2(A) of the Standard Specifications for Public Works Construction.
- (4B) **Option 1** shall meet the requirements of Table 200-1.4(B) of the Standard Specifications for Public Works Construction.
- (5) **Option 2** shall meet the asphalt concrete requirements of Table 400-4.3(C) of the Standard Specifications for Public Works Construction.
- (6) D.G. = Disintegrated Granite per Table 200-2.7.2(A) of the Standard Specifications for Public Works Construction [0.04" to 0.39"].
P.M.B. = Processed Miscellaneous Base per Subsection **200-2.5 “Processed Miscellaneous Base.”** of the Standard Specifications for Public Works Construction.
TYPE B = Type B bedding material shall conform to the requirements for ½" crushed

rock or No. 4 concrete aggregate in Subsection **200-1 “Rock Products.”**, Table **200-1.2 (A)** or **200-1.4(B)**, of the Standard Specifications for Public Works Construction.

(7) Sand = 25% passing No. 200 sieve (75% retained).

SECTION 201 - CONCRETE, MORTAR AND RELATED MATERIALS

201-1 PORTLAND CEMENT CONCRETE.

201-1.1 Requirements.

201-1.1.2 Concrete Specified by Class and Alternate Class.

Modify Table 201-1.1.2 (A) as follows:

TABLE 201-1.1.2 (A)

Type of Construction	Concrete Class U.S. Standard Measures
<i>Street Surface Improvements</i>	
Revise: Concrete Pavement (not integral with curb) To Read: Concrete Pavement (not integral with curb) Cross Gutter and Alley Aprons	Revise: 520-A-2500 (310-A-17) To Read: 520-C-2500 560-C-3250
Revise: Curb, Integral Curb and Pavement, Gutter, Walk, Alley Aprons To Read: Curb and Gutter (separate or combined) And Walks	Revise: 520-C-2500 (310-C-17) 520-C-2500P ¹ (310-C-17P ¹) To Read: 520-C-2500 520-C-2500P ¹
<i>Sewer & Storm Drainage Facilities</i>	
Side hill Surface Drainage Facilities	Revise: 500-C-2500 (295-C-17) To Read: 520-C-2500
Pipe Bedding and Encasement, Anchors and Thrust Blocks, Wall Support for Pipe	Revise: 450-C-2000 ² (265-C-14 ²) To Read: 480-C-2000 ²
<i>Miscellaneous</i>	
Fence and Guardrail Post Foundations	Revise: 500-C-2500 (295-C-17) To Read: 520-C-2500

201-1.2 Materials.

201-1.2.1 Portland Cement.

Revise the first sentence in the first paragraph to read as follows:

All cement to be used or furnished shall be low alkali and shall be either Type I or Type II Portland Cement conforming to ASTM C150, or Type IP (MS) portland - pozzolan cement

conforming to ASTM C595, unless otherwise specified.

201-1.2.3 Water.

In the second paragraph replace:

"1,000 mg/L of sulfates" **with** "1,300 mg/L of sulfates"

In the third paragraph replace:

"800 mg/L of sulfates" **with** "1,300 mg/L of sulfates"

201-1.3 Proportioning.

201-1.3.1 General.

Add the following phrase after "or less" in first paragraph:

"...or when using continuous mobile volumetric mixers,..."

Add the following paragraphs:

When proportioning by continuous mobile volumetric mixer, the mixing auger shall be charged by calibrated conveyer belts which are interlocked between the feeds for cement, course aggregate, and the fine aggregate.

The amount of water to be added to the mixture shall be measured into the mixing auger through a valve with a positive cut off and interlocked with the feeds for cement and aggregate.

Calibrated belt feeds shall not vary from the designated volume by more than one percent (1%) for cement, one percent (1%) for water, one and one-half percent (1-1/2%) for any size of aggregate, nor one percent (1%) for the total aggregate in any batch.

201-1.3.2 Combined Aggregate Gradings.

Replace Grading Class C with the following in TABLE 201-1.3.2(A):

Sieve Size	Percentage Passing Sieves
	Grading C
2"	----
1-1/2"	100
1"	85-100
3/4"	75-95
3/8"	45-75
No. 4	35-60
No. 8	25-45
No. 16	20-35
No. 30	10-25
No. 50	5-15
No. 100	1-5
No. 200	0-2

201-1.3.3 Concrete Consistency.

Delete the following from the second paragraph:

"...and shall not exceed amounts shown in the following:..."

Delete:

TABLE 201-1.3.3 (A)

201-1.4 Mixing.

201-1.4.3 Transit Mixers.

Add the following sentence after listing of information for weighmaster certificate:

Transit mixed concrete may be certified by mix design number provided a copy of the mix proportions are kept on file at the plant location for a period of four (4) years after the use of the mix.

Add the following new subsection:

201-1.4.5 Continuous Mobile Volumetric Mixer.

The type, capacity, and manner of operation of the mixing and transporting equipment for continuous mobile volumetric mixers shall conform to the current "Standard Specifications for Concrete Made by Continuous Mobile Volumetric Mixing ASTM C685," and the manufacturer's recommendations.

Continuous mobile volumetric mixers shall be calibrated at least every six months or less by the Engineer, or a laboratory recognized by the Engineer. Copies of the calibration charts shall be maintained on the mobile mixer and be available to the Engineer.

All changes between mix designs will require the mixing auger to be emptied and cleaned unless changing to a concrete mixture of a lower strength and approved by the Engineer.

Moisture content of the aggregate shall not vary by more than one-half percent (1/2%) for coarse aggregate and one and one-half percent (1-1/2%) for fine aggregate in the truck.

When concrete is being placed for pavement or concrete structures, all changes in the concrete consistency shall take place in one-quarter cubic yard (1/4 yd³) of concrete or less.

The Engineer shall be provided with a legible delivery ticket signed by the driver certifying to the concrete mixture delivered. When mix portions have been designated for the project and are identified by number, the Engineer may accept a legible certificate, which shall contain the following information:

- a) Name of Vendor
- b) Name of Contractor
- c) Project Location
- d) Number of cubic yards delivered
- e) Mix designation number
- f) Maximum Slump
- g) Maximum allowable water
- h) Time and date of starting mixing

When number does not designate the mix portions, or when required by the Engineer, the certificate shall contain the following additional information:

- 1) Actual weights of cement and of each size of aggregate
- 2) Brand and type of cement
- 3) Brand, type and amount of admixture

201-3 EXPANSION JOINT FILLER AND JOINT SEALANTS.

201-3.8 Type “E” joint Sealant (Polysulfide Polymer and Rubber Rod).

Add the following new subsection:

201-3.8.1 Water Stops.

Water stops to be placed in joints in concrete during construction to prevent the passage of water through them, shall be either fabricated from a plastic compound, the basic resin of which shall be polyvinyl chloride or sheet metal. Metal may be copper, lead, or zinc. The metal water stops shall be folded to a U shape longitudinally, with extensions or flanges embedded in the concrete two inches (2”) or more, sometimes perforated for better bond with the concrete. Sheet copper water stops shall conform to AASHO M138 or ASTM B152; lead & zinc sheets with ASTM B29 and ASTM B69. Plasticized-polyvinyl chloride resin water stops shall conform to ASTM D412 62T. The following are minimum physical requirements:

Shore durometer "A" hardness (plus or minus 5)	68
Tensile strength, psi	1000
Elongation, percent	300
Specific Gravity (plus or minus 0.03)	1.48
Brittleness Temp. (ASTM D736), Pass	-22 ⁰ F

Prior to supplying any water stops, the Contractor shall advise the Engineer and obtain approval for the proposed product to be provided. Splicing of water stops shall be done in accordance with manufacturer's specifications and Engineer's instructions.

201-3.9 Test Report and Certification.

Add the following to the first sentence:

"...including water stops."

SECTION 203 - BITUMINOUS MATERIALS

203-1 PAVING ASPHALT.

203-1.6 Measurement and Payment.

Replace the subsection in its entirety to read as follows:

203-1.6 Measurement and Payment. Unless otherwise stated in the Contract Special Provisions, the cost of paving asphalt shall be included in the item of work to which its use is incidental. When paving asphalt is to be paid for as a Contract item of work, the unit of measurement shall be a ton.

203-2 LIQUID ASPHALT.

203-2.6 Measurement and Payment.

Replace the subsection in its entirety to read as follows:

203-2.6 Measurement and Payment. Unless otherwise stated in the Contract Special Provisions, the cost of liquid asphalt shall be included in the item of work to which its use is incidental. When liquid asphalt is to be paid for as a Contract item of work, the unit of measurement shall be a ton.

203-3 EMULSIFIED ASPHALT.

Add the following new subsection:

203-3.9 Measurement and Payment.

203-3.9 Measurement and Payment. Unless otherwise stated in the Contract Special Provisions, the cost of emulsified asphalt shall be included in the item of work to which its use is incidental. When emulsified asphalt is to be paid for as a Contract item of work, the unit of measurement shall be a ton.

SECTION 205 - PILES

205-3 CONCRETE PILES.

205-3.1 General.

Add in the last paragraph, after ASTM C31:

"...and ASTM C39."

SECTION 207 - PIPE

207-9 IRON PIPE AND FITTINGS.

207-9.2 Ductile Iron Pipe for Water and Other Liquids.

207-9.2.6 Polyethylene Encasement for External Corrosion Protection.

Revise the subsection to read as follows:

207-9.2.6 Polyethylene Encasement for External corrosion Protection. Loose polyethylene encasement for the protection of ductile and cast iron pipes, fittings, valves, and appurtenances shall be furnished and installed in accordance with the requirements of AWWA C105.

Add the following new subsection:

207-25 POLYVINYL CHLORIDE (PVC) PRESSURE PIPE.

207-25 POLYVINYL CHLORIDE (PVC) PRESSURE PIPE. This subsection applies to four inch through twelve inch (4" - 12") PVC pressure water pipe.

Pipe shall conform to the requirements of AWWA C900. Design and installation shall comply with AWWA Manual M-23, "PVC Pipe Design and Installation," with the following exceptions:

- 1) Dimensions for PVC pipe shall conform to Table 2 of AWWA C900 for CI-equivalent ODs (CIOD).

- 2) Pressure and SDR rating shall be Class 150 and 18, respectively, unless higher-pressure class is called out on the Plans.
- 3) Pipe ends shall be plain by elastomeric gasket bell or plain by plain. Coupling for plain pipe shall be furnished with two (2) elastomeric gaskets. For pipe to pipe connections, solvent cement or mechanical joints shall not be accepted.
- 4) Fittings shall be mechanical joints and are as described in AWWA C153 and AWWA C111. Bolt holes in the flanges of the mechanical joint fitting shall straddle the vertical centerline of the fitting. The fitting shall be cement mortar lined in accordance with AWWA C104. The outside shall be asphalt-coated and the fitting, when assembled, shall be polyethylene-encased in accordance with the requirements of AWWA C105. Glands shall be made of ductile iron and shall be factory-stamped. Ductile iron from which the glands are cast shall have a minimum elongation of 5 percent (5%). Bolts shall be tee heads made of high-strength low-alloy steel or ductile iron per AWWA C111.

Installation of mechanical joint shall conform to Appendix A of AWWA C111. Over stressing of bolts to compensate for poor installation shall be avoided. Bolts and nuts shall be coated with rust-preventive grease.

Solvent cement joints or push-on joints will not be accepted.

207-25.1 Polyvinyl Chloride (PVC) Pressure Water Pipe.

207-25.1 Polyvinyl Chloride (PVC) Pressure Water Pipe. This subsection applies to fourteen inch (14") through thirty-six inch (36") diameter PVC pipe.

Pipe shall conform to the requirements of AWWA C905.

Design shall comply with accepted standards for PVC pipe and the following enhancements and exceptions:

- 1) All pipes shall carry a safety factor of 2.5. Calculations and data from the pipe manufacturer showing that the pipe conforms to the design requirements of AWWA C900 shall be submitted to the Engineer for approval prior to ordering pipe.
- 2) Dimensions for PVC water pipe shall comply with Table 2 of AWWA C905 for CI-equivalent ODs (CIOD).
- 3) Minimum acceptable Pressure Rating(s) (PR) and/or Dimension Ratio(s) (DR) for pressure water pipe are shown on the Plans. Pipe shall have a minimum DR of 18.
- 4) Fittings shall have mechanical joints, in conformance with this Greenbook Supplement Subsection **207-25** as revised herein. Solvent cement joints or push-on joints shall not be used.

Add the following new subsection:

207-26 PIPE APPURTENANCES.

207-26.1 Water Services Two-inch (2") and Smaller.

Concrete Water Meter Boxes: Boxes shall be of makes and models, which have been approved by the Agency. Portland cement concrete used shall consist of a uniform mix of cement and sand with a minimum compressive five thousand pounds per square inch (5,000 psi) at twenty-eight (28) days.

A concrete cover and lid selected at random, when tested at least twenty-eight (28) days after manufacture, shall support without failure a total vertical load of at least one thousand pounds (1,000 lbs.), when supported in a horizontal position in a meter box of the type and size for which the cover is designed. The load shall be applied to the center of the lid by a cylindrical pin, 1.954 inch in diameter (1.954"ø), three square inches (3 in.²) supported on a one-half inch (1/2") thick rubber pad.

Corporation Stops, Curb Stops, and other Bronze Water Service Fittings: All bronze water service fittings including stops shall be cast of high grade bronze conforming to the requirements of ASTM Standard Specification B62. The Engineer shall have the right to take one or more from each lot of stops and/or fittings and have it analyzed. All fittings shall be of makes and models, which have been tested and approved by the Agency.

Copper Tube: Copper tube shall conform to the requirements of ASTM Standard Specification No. B88, for Seamless Copper Water Tube, Type K soft. It shall be of the size indicated on the drawings and/or called for in the specifications.

Polyethylene Pipe: Polyethylene (PE) plastic pipe for water services shall be PE 3306 conforming to the provisions of ASTM Designation D2239. The pipe shall be extruded from PE plastic compound of Type III, Class "C", Category 3, Grade P33 conforming to ASTM Designation D1248.

The pipe shall be iron pipe size having a standard thermoplastic pipe dimension ratio of seven (7) (SDR 7), shall have a pressure rating of not less than one hundred sixty pounds per square inch (160 psi) for water at seventy three and one-half degrees Fahrenheit (73.5⁰F), shall be approved by the National Sanitation Foundation for use in transporting potable water, and shall be approved by the Agency.

Fittings for PE pipe shall be the rubber ring compression type and shall be made of B-62 bronze. All fittings shall be of make and model approved by the Agency.

Insulation: All copper services which are attached to metallic water mains shall be insulated as follows: The corporation stop and the copper tube and fittings within a minimum distance of three feet (3') of the main shall be wrapped tightly with an approved polyvinyl chloride pipe coating tape combined with the application of a liquid adhesive primer or finish coating recommended for the purpose by the manufacturer of the tape.

The tape and adhesive or coating shall be applied in the manner and sequence recommended by the manufacturer. Prior to application of insulation, the tubing, fittings, corporation stop and the surface of the main within four feet (4') of the stop shall be thoroughly cleaned of all dirt and grease, and dried. Copper tube shall be wrapped with tape two inches (2")

or less in width lapped not less than three-eighths inch (3/8”).

The tape shall be not less than ten (10) mils in thickness and shall have the following characteristics:

Tensile strength	3,500 to 4,200 psi
Tear resistance	High
Elongation at break	300% to 350%
Moisture absorption	0.03%
Dielectric strength	750 – 1,000 volts/mil
Insulation resistance	200,000 Ω

Polyvinyl Chloride Pipe One and One-half Inch and Two Inch (1-1/2” and 2”) only: Polyvinyl chloride (PVC) pipe for water services shall meet the requirements of ASTM D2241 plastic pipe (SDR-PR) and Class T, or ASTM D1785 plastic pipe (Schedule 40, 80, 120). The pipe shall be extruded from polyvinyl chloride compounds, meeting the requirements of ASTM D1784.

The pipe shall be of the type and compound listed in the table below:

Standard	Pipe Description	Compound
ASTM D2241	SDR = 17	PVC 1120 or 1220
ASTM D1785	PR = 530	
ASTM D1785	Schedule 40	PVC 1120 or 1220

Fittings for polyvinyl chloride pipe shall be socket solvent weld type meeting the requirements of ASTM D2466. The welding solvent shall meet the requirements of ASTM D2564.

Polyvinyl chloride pipe, fittings and solvents shall be approved by the National Sanitation Foundation for use in transporting potable water and shall be supplied by manufacturers approved by the Agency.

207-26.2 Fire Hydrants.

207-26.2 Fire Hydrants. Fire hydrants furnished under these specifications shall conform to the provisions of AWWA C503 for "Wet Barrel Fire Hydrants", and to the modifications and supplements herein.

Valve seats and stem guides may be threaded into or cast into the hydrant body or may be secured to the body by means of a lock nut.

Unless otherwise specified, fire hydrants for residential areas shall have one four inch (4”) port and one two and one-half inch (2-1/2”) port and fire hydrants for commercial and industrial areas shall have one four inch (4”) port and two two and one-half inch (2-1/2”) ports.

Hydrant valves shall open counter clockwise.

Threads for pumper and hose nozzles shall conform to the American National Standard adopted by the American Insurance Association (formerly the National Board of Fire Underwriters) and the National Fire Protection Association published in pamphlet No. 194, Fire Hose Couplings, by N.F.P.A. in 1968.

Outer end of all hose coupling threads shall be terminated by the blunt start of "Higbee Cut" on full thread (to avoid crossing thread).

Hydrant body base flange shall be drilled in a nine and one-half inch (9-1/2") bolt circle with six (6) bolt holes, seven-eighths inch in diameter (7/8"Ø) oriented to the center of the pumper connection.

Hydrant bodies shall be solid bronze. Fire hydrant caps shall be solid cast iron or bronze and metal chains. ABS plastic fire hydrant caps are acceptable replacements for bronze or cast iron caps, when approved by the Agency.

Valve stems shall have a pentagon end and shall have a short radius of one-half inch (1/2") to center of flat sides.

Hydrant components made from brass or bronze shall be of a grade containing not more than sixteen percent (16%) zinc and not more than two percent (2%) aluminum as specified in Section 2.6.4 of the AWWA Standard C503 for waters with specific conductance exceeding 350 micro Mho per cm (µmhos/cm).

Exterior surfaces shall be painted with a zinc chromate primer of the same color as the finished coat. The finished coat shall be of chrome yellow enamel meeting the requirement of Federal Specification TT-C-595, Color No. 13538.

207-26.3 Gate Valves.

207-26.3 Gate Valves. Gate valves shall conform to the provisions of AWWA Specification C500 as modified herein, except that valves three inch (3") and under shall be all bronze; conforming to ASTM B62.

Valves shall have bottom or side wedging double discs, parallel seats, all bronze internal working parts, either "O" rings or stuffing box stem seals, and two inch (2") square operating nut, and shall open by turning the stem counter-clockwise. Ends shall be as specified, designed for use with the connecting pipe. Components made from brass or bronze shall be of a grade containing not more than sixteen percent (16%) zinc and not more than two percent (2%) aluminum as specified in Section 5.5 of the AWWA Standard C500 for waters with specific conductance exceeding 350 micro Mho per cm (µmhos/cm).

Valves sixteen inch (16") and larger shall be designed for horizontal mounting, with three inch (3") by-passes and totally enclosed gear case. Integral or extended gear cases are acceptable.

External bolts and nuts for valve fittings shall be hexagonal head machine bolts and hexagonal nuts conforming to ASTM 307, Grade B or SAE Grade 2. All bolt threads shall be lubricated with graphite and oil prior to installation.

By-pass connections for all gate valves over twelve inches (12”) shall be cast into the valve and shall not obstruct the water way to the by-pass. Bronze by-pass valves shall be wheel operated.

Gate valves may be of resilient-seated type at the option of the Contractor, in sizes up to twelve inches (12”). Valves used with PVC pipe shall have mechanical joint ends.

Twelve inch (12”) gate valves shall have two inch (2”) by-passes when the operating pressure is greater than eighty pounds per square inch (80 psi); except that twelve inch (12”) resilient-seated gate valves do not require by-passes when the operating pressure is less than one hundred sixty five pounds per square inch (165 psi).

All ductile and gray cast iron fittings, valves, and appurtenances directly buried in the ground shall be wrapped with polyethylene film in conformance with Section 5-4 of AWWA C105.

207-26.4 Butterfly Valves.

207-26.4 Butterfly Valves. Butterfly valves and operators shall conform to the provisions of AWWA C504, "Standard for Rubber-Seated Butterfly Valves", as modified and supplemented herein.

Valves and operators shall be Class 150B, totally enclosed for direct burial in the ground without a vault. They shall be designed for installation in a nearly horizontal pipeline with the disc shaft horizontal and the operating shaft vertical. Valves shall be either short body, or long body, with ends as specified. Flanged ends shall conform to AWWA C207.

The operator shall be manual with a two inch (2”) square operating nut, and shall open the valve when turned counter-clockwise. The number of turns required to fully close the valve from a fully open position is shown in the table below for valve diameter six inch to forty-eight inch (6” - 48”).

Valve Diameter (Inches)	Minimum Number of Turns to Close
6	15
8	18
10	24
12	26
14	28
16	30
18	32
20	36
24	42
30	48
36	56
42	64
48	72

The operator, and any other parts requiring lubrication, shall be fully lubricated at the

factory and shall require no additional lubrication for the life of the valve.

The valve disc may be of cast iron, alloy cast iron, stainless steel, monel, bronze, or ductile iron. The metal seating surface which meets the rubber seat shall be of stainless steel or bronze.

Bolts and nuts for valve end flanges shall be hexagonal head bolts and hexagonal nuts conforming to ASTM 307, Grade B or SAE Grade 2. All bolt threads shall be lubricated with graphite or oil prior to installation.

Spool type rubber liners covering the entire inner surface of the valve body will not be accepted.

Prior to the installation of working parts, all internal steel or cast iron surfaces of valves, except finish or bearing surfaces, shall be coated with approved epoxy in accordance with AWWA C550, "Protective Interim Coatings for Valve and Hydrants." The minimum thickness of the coatings, when dry, shall be ten (10) mils when measured by an electric or magnetic thickness gauge and shall be applied in accordance with the manufacturer's recommendations. The epoxy surface shall be tested with an approved holiday detector.

207-26.4.1 Class 250B Butterfly Valves.

207-26.4.1 Class 250B Butterfly Valves. This subsection applies to sixteen inch through fifty-four inch (16" - 54") Class 250B butterfly valves.

Butterfly valves shall conform to the requirements of AWWA C504 for Class 250B service in terms of performance criteria. Class 250B Butterfly valves shall have flanged ends, be manually operated, tight closing, and have rubber seats. Valves shall be bubble-tight at the rated pressure with flow in either direction, and shall be satisfactory for applications involving throttling service and/or frequent operation after long periods of inactivity. All valves and valve operators shall be suitable for buried service. Design shall comply with these Regional Supplement Amendments to Standard Specifications for Public Works Construction, other accepted standards for butterfly valves and the following enhancements and exceptions:

- a) Valve Bodies shall be short and constructed of cast iron conforming to ASTM A126 Class B. Flanges shall be flat-faced and flange drilling shall be in accordance with ANSI B16.1, Class 125 or Class 250, as required for the design pressure. On valves thirty inch (30") and larger the valve port diameter shall not reduce more than a one and one-half inch (1-1/2") of nominal diameter. Flow direction shall be indicated on the valve body. The use of stops or lugs cast integrally with or mechanically secured to the body for limiting disc travel shall not be acceptable.
- b) Valve Disc shall have no external ribs transverse to the flow of water through the valve. The disc shall not have any hollow chambers that can entrap water. The disc shall be made from cast iron ASTM A126 Class B or ductile iron ASTM A536. The disc shall be furnished with a nickel-chrome or stainless steel Type 316 seating edge to mate with the rubber seat.
- c) The Valve Seat shall be attached to the valve body. Retaining rings, clamps,

screws and bolts attaching the rubber seat to the valve body shall be fabricated from stainless steel Type 316. For valves twenty-four inch (24") and larger, valve seats shall be field adjustable around the three hundred sixty degree (360⁰) circumference and replaceable without dismantling the operator, disc or shaft and without removing the valve from the pipeline. The valve manufacturer shall certify the rubber seat is field replaceable as specified above. Spool-type rubber liners covering the entire surface of the valve body and extending over any portion of the flange faces will not be acceptable. Valves employing the use of snap rings to retain the rubber seat will not be acceptable.

Rubber for valve seats shall conform to the applicable provisions of AWWA Standard C504.

- d) Valve shafts shall be stainless steel ASTM A564 Type 630 Condition H-1100.

The valve/disc connection shall be made through the use of on-center taper pins. The taper pins shall be of the same material as the valve shaft.

- e) Shaft seals shall be standard split V packing and be provided where the shaft projects through the valve body. Shaft seals shall be of design allowing replacement without removing the valve shaft.
- f) Valve bearings shall be sleeve type that is corrosion resistant and self-lubricating. Thrust bearings shall be provided per the governing standard. Thrust bearings, which are exposed to water and consist of a metal bearing surface in rubbing contact with an opposing metal bearing surface, shall not be acceptable.
- g) Valve operator shall be fully grease packed and have stops in the open/closed position. The operator shall have a mechanical stop, which will withstand an input torque of four hundred fifty foot-pounds (450 ft.-lbs.), against the stop. The traveling nut shall engage alignment grooves in the housing. The operator shall have a built in packing leak bypass to eliminate possible leakage into the operator housing. The operator shall be designed to hold the valve in any intermediate position between fully open and fully closed without creeping or fluttering. The operator shall be sized to provide adequate torque to operate the valve on which it is mounted at the full pressure rating of the valve. All operators shall meet minimum requirements for AWWA C504.

Valve operator shall be mounted on the valve at the valve manufacturer's facility. The valve manufacturer shall insure proper operator sizing and satisfactorily test the operator and valve assembly prior to shipment to the work site.

- h) All valves shall be hydrostatic and leak tested. The leak test shall be performed in both directions at a differential pressure of two hundred fifty pounds per square foot (250 psi) with the disc in a closed position. In a slightly open position, internal hydrostatic pressure equal to five hundred pounds per square inch (500 psi) shall be applied to the inside of the valve body for five minutes. Proof of a design cycle test in accordance with AWWA C504 Section 5.2.4.3 shall be submitted before installation.

SECTION 209 – STREET LIGHTING AND TRAFFIC SIGNAL MATERIALS

209-3 COMPONENTS FOR STREET LIGHTING AND TRAFFIC SIGNAL SYSTEMS.

209-3.2 Anchor Bolts, Nuts, and Washers.

Add the following sentence to the end of the third paragraph:

All reinforcing steel, cables, deformed bars, base plates, anchor bolts and stud bolts shall be electrically bonded together.

Add the following paragraph after the third paragraph:

A quarter inch (1/4") hot dip galvanized or stainless steel bolt, accessible through the access hole, or a copper strap brazed or mechanically connected to the reinforcing steel shall be provided to ground direct burial poles.

209-3.4 Mast Arms.

Add the following paragraph after the first paragraph:

Mast arms shall be positively bonded to stud bolts and/or reinforcing steel and cables, by welding or brazing of steel materials, or brazing or mechanically connecting copper strap to steel members.

Add the following new subsection:

209-3.4.1 Luminaire Mast Arm.

209-3.4.1 Luminaire Mast Arm. Mast arms shall be two inch (2") I.P.S. galvanized steel or aluminum, self-supporting, without braces, scrolls or rods. Mounting shall be perpendicular to street centerline unless otherwise shown on Plans. The steel arms shall conform to ASTM A120. Aluminum arms shall be made of corrosion resistant alloys such as Aluminum Association wrought alloys 6061 or 6062, and cast alloys 319 or 356.

Changes in configuration of mast arms will be permitted, providing the mounting height and stability are maintained. Mast arms shall be galvanized as provided in Subsection **210-3 "Galvanizing."**

209-3.5 Conduit.

209-3.5.3 Galvanized Pipe.

Replace c) with the following:

- c) Be UL listed and approved.

209-4 STREET LIGHTING SYSTEM MATERIALS.

209-4.1 Reinforced Concrete Standards.

209-4.1.1 General.

Add the following sentence to the end of the second paragraph:

Electroliers shall be reinforced concrete unless otherwise shown on the Plans.

Replace the first two sentences of the third paragraph with the following sentences:

Concrete poles shall be tapered, centrifugally cast and prestressed. They may be round or octagonal, black and white marble aggregate or natural exposed aggregate, direct burial or anchor base type. Minimum outside diameter dimensions of direct burial poles shall be as follows: Top of pole five inches (5"), bottom of pole nine inches (9"). Pole shape and color shall

be uniform for any one project. Replacement poles shall match existing. Aggregates shall conform to current requirements of ASTM C33, except that abrasion requirements therein shall not apply and that no more than seven percent shall pass a No. 100 mesh sieve. No dye or sealer shall be used, without approval of the Agency.

Add the following paragraph after the last paragraph:

Poles shall be furnished with steel pipe brackets that provide a minimum of six inches (6") straight section at the end of the bracket arm to mount a two point three eight inch outside diameter (2.38"Ø) I.P.S. slipfitter type luminary.

209-4.1.2 Reinforcement.

Add the following paragraphs after the last paragraph:

The ultimate strength of a pole shall be calculated in accordance with the latest revision of ACI-318 utilizing a load factor of 2.0.

Under working loads (including wind loading) the pole must not be stressed beyond the cracking strength. Wind loads shall be as specified in the latest edition of the AASHTO Standards.

All reinforcing steel shall have a minimum cover of five-eighths inch (5/8"). Direct burial prestressed poles shall have the prestressing steel cut off one-eighth inch (1/8") minimum below the surface, at the base.

209-4.1.4 Finish of Concrete Standards.

Add the following sentence to the end of the first paragraph:

After curing, the surface of the standard shall be treated to remove cement laitance and develop the surface textures.

209-4.2 Wire/Conductors.

209-4.2.1 General.

Add the following sentences after the fifth sentence in the first paragraph:

Service runs to lights shall be copper wire, No. 10 AWG minimum. Voltage drop in service runs shall not exceed five percent (5%); size of wire used shall be indicated on "As Built" Plans.

Add the following paragraphs at the end of the subsection:

Conductors shall be copper of the gauge shown on the Plans, unless otherwise specified. Wire sizes shall be based on American Wire Gage (AWG). Conductors for multiple lighting installations shall be UL listed and rated for six hundred volt (600-V) operation. The insulation for No. 16 or smaller conductors shall be Type TF. The insulation for No. 14 and larger conductors shall be one of the following:

- a) Type TW polyvinyl chloride conforming to the requirements of ASTM Designation: D2219.
- b) Type THW polyvinyl chloride.
- c) Type XHHW or Type RHW cross-linked polyethylene.

Minimum thickness of any of the above insulations shall be 45 mils for conductor sizes No. 14 to No. 10 inclusive, and 60 mils for No. 8 to No. 2, inclusive. A certificate of compliance with these specifications shall be submitted to the Engineer by the manufacturer with all five thousand volt (5,000-V) series lighting conductors.

209-4.4 High Pressure Sodium Luminaires.

209-4.4.1 General.

Replace the second sentence in the first paragraph with the following:

Each luminaire shall consist of cast aluminum housing, aluminum reflector or equivalent, a refractor or lens, a mogul (lamp) socket with support assembly, which is adjustable to provide variation in light distribution, an internal (integral) ballast, starter, a terminal strip and a lamp.

Add the following sentences to the end of the third paragraph:

All exposed hardware shall be cadmium-coated, hot dipped galvanized or stainless steel. All protected hardware not visible after installation shall be cast aluminum, stainless steel, hot dipped galvanized or cadmium-plated steel.

Add the following sentences to the end of the twelfth paragraph:

Certified distribution curves made in accordance with I.E.S. testing recommendation shall be available for the luminaire. Unless otherwise shown on Plans, the light distribution patterns shall be ASA/IES:

Type II for 175 watt and 250 watt lights

Type III for 400 watt and larger

Add the following paragraphs after the sentences above are added to the end of the twelfth paragraph:

The refractor shall be made from pressed borosilicate glass and the lamp chamber shall be sealed against dust with a heat resistant gasket.

The outer metal surface of the luminaire shall have a baked process finish of modified alkyd, acrylic, enamel, or other equivalent corrosion preventative surface finish. The exterior color shall be ASA70, Light Gray. In general, the luminaire shall be easy to relamp and be safe for handling and use. The luminaire shall be capable of operating in a temperature environment of minus twenty to one hundred fifty degrees Fahrenheit (-20°F - +150°F).

209-4.5 Lamp Ballasts.

209-4.5.1 General.

Add the following sentences after the third sentence in the first paragraph:

The operating sound pressure noise level shall not exceed the ambient noise level by more than five (5) decibels at a distance of thirty feet (30') when measured by a sound level meter conforming to the American Standard for sound Level Meters. Where the ambient noise level is below forty (40) decibels a minimum of forty (40) decibels shall be assumed as ambient.

Add the following sentence to the end of the fourth paragraph:

Rubber covered ballast leads of all external ballasts shall be non-hygroscopic and the entrance of the leads into the ballasts shall have a watertight seal.

Add the following sentence to the end of the fifth paragraph:

External ballasts shall be protected from moisture by encasement in a suitable non-corroding material.

Add the following new subsection:

209-4.5.9 Multiple Ballasts.

209-4.5.9 Multiple Ballasts. The power factor for multiple ballasts shall be better than ninety percent (90%). Ballasts losses (in lamp watts) for the various sizes of mercury vapor lamp ballasts shall not exceed the following:

MERCURY VAPOR LAMP BALLAST	
Watts	Percentage Loss
175	25
250	20
400	15
700	12
1,000	10

Integral ballasts shall be of the component type with resin-impregnated coils and metal-cased, hermetically sealed, capacitors. Ballasts for multiple circuits shall be a constant wattage type with a nominal primary voltage rating of 120/240 or 240/480 volts and shall regulate the lamp wattage to plus or minus thirteen percent (13%) variation in primary voltage. The lamp current wave shape crest factor shall not exceed 2.0 at rated line voltage.

SECTION 211 - MATERIAL TESTS

211-1 COMPACTION TESTS.

211-1.1 Laboratory Maximum Density.

Revise second and third paragraphs as follows:

After "ASTM D1557" add "or Calif. Test Method No. 216".

211-1.2 Field Density.

Revise section to read as follows:

211-1.2 Field Density. Field density of soils shall be determined by ASTM D1556, ASTM D2922, Calif. Test Method No. 216, or Calif. Test Method No. 231 or as directed by the Engineer.

The minimum test hole volume shall be 0.075 cubic feet (ft³). The minimum test hole depth shall be five inches (5"). If the compacted layer of soil/material is less than five inches (5") deep, then the full depth of the layer shall be tested, and the minimum test volume waived.

The following tests are similar and may be alternated with one another when allowed by the Agency:

ASTM	Calif. Test Method No.
C31	540
C39	521
C40	213
C88	214
C127	206
C131	211
C136	202
C143	533
D1188	308
C2419	217

SECTION 212 - LANDSCAPE AND IRRIGATION MATERIALS

212-1 LANDSCAPE MATERIALS.

212-1.1 Topsoil.

212-1.1.1 General.

Revise the first sentence to read as follows:

212-1.1.1 General. Topsoil shall be designated as Class A (imported), Class B (selected), Class C (unclassified) or Class D (baseball infield) as specified herein.

Add the following paragraphs:

The above specifications are for unamended soils and are also required tests to be performed on amended soils.

The composition of amended soils shall be as follows:

- a) To the unamended soils uniformly add twenty to twenty-five percent (20 - 25%) of blended organic materials.
- b) The organic material shall be composed of wood products, manure, and other organic composts per Subsection **212-1.2, "Soil Fertilizing and Conditioning Materials."**

212-1.1.2 Class "A" Topsoil.

Revise the third sentence in the second paragraph to read as follows:

Change "1 inch" to read "one-half inch (1/2)".

Revise 3) in the third paragraph to read as follows:

- 3) **Agricultural Suitability.** The topsoil shall be suitable to sustain the growth of the plants specified, and shall comply with the following requirements listed in the table below:

pH	Six minimum to seven and one-half maximum (6 - 7.5)
Eco	Zero to three (0 - 3) maximum (electrical conductivity)
ESP	Zero to twelve (0 - 12) maximum (exchangeable sodium percentage)

Add the following new subsection:

212-1.1.5 Class “D” Topsoil.

212-1.1.5 Class “D” Topsoil. Class “D” topsoil is defined as topsoil designated for use in baseball infield areas shown on the Plans. Class “D” topsoil shall meet the following requirements.

Sieve Size	Percentage (%) Passing Sieve
No. 4	100
No. 8	90 – 100
No. 16	85 – 95
No. 30	65 – 85
No. 50	35 – 55
No.100	20 – 35
No. 200	10 – 25

Sand Equivalent	15 – 25
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pH (7.2 Neutral)	6 - 8.5
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Percent Clay	10 - 15
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212-1.2 Soil Fertilizing and Conditioning Materials.

212-1.2.1 General.

Revise the second paragraph to read as follows:

The Contractor shall furnish a Certificate of compliance stating that the material substantially meets the specifications.

212-1.2.2 Manure.

Revise the first sentence in the first paragraph to read as follows:

212-1.2.2 Manure. Manure shall be the by-product of yard fed cattle or poultry guano, free of weed seed, straw or other inert material, and aged at least three (3) months.

212-1.2.5 Mulch.

Revise d) and e) to read as follows:

- d) **Type 4 Mulch** (peat), shall be brown compressed sphagnum (pH=4.2) or hypnum (pH=7.6).
- e) **Type 5 Mulch** (fir or redwood bark chips), shall be fir or redwood bark chips in the gradation specified.

Add the following classifications:

- g) **Type 7 Mulch** (wood chips), shall be wood chips in the size and type specified.
- h) **Type 8 Mulch** (rock or gravel) shall be rock or gravel in the size specified.
- i) **Type 9 Mulch** (wood fiber), clean, natural non-recycled wood fiber processed to contain no germination or growth inhibiting factors, using nontoxic dye to facilitate metering of materials, manufactured in such a manner that after addition and agitation in slurry tanks with fertilizer, seed, water, and other approved additives, fibers in material will become uniformly suspended forming a homogeneous slurry that when hydraulically sprayed on ground, forms a blotter like ground cover impregnated uniformly with seed; which after application, will allow moisture, rainfall to percolate to underlying soil. Suppliers shall certify that their product meets all foregoing requirements based on testing.
- j) **Type 10 Mulch** (stabilizing emulsion), stabilizing emulsion shall be a concentrated liquid chemical that forms a plastic film upon drying and allows water and air to penetrate. The films shall be non-flammable and shall have an effective life of at least 1 year.

Stabilizing emulsion shall be nontoxic to plant or animal life and non-staining to concrete or painted surfaces. In the cured state, the stabilizing emulsion shall not be re-emulsifiable. The material shall be registered with and licensed by the State of California, Department of Food and Agriculture, as an "auxiliary soil chemical".

- k) **Type 11 Mulch** (shredded redwood or cedar bark), shall be either redwood or incense cedar bark, which knits in a manner to minimize sloughing, floating or being kicked away.

Add the following new subsection:

212-1.2.6 Inorganic Soil Amendments.

Iron Sulfate. Iron sulfate shall be ferric or ferrous sulfate in pelleted or granular forms containing not less than eighteen percent (18%) metallic iron. It shall conform to the Agricultural Code of the State of California.

Gypsum. Gypsum shall be commercially processed and packaged. $\text{CaSO}_4 - 2\text{H}_2\text{O}$, with a minimum eighty percent (80%) grade containing fourteen percent (14%) minimum combined sulfur.

212-1.3 Seed.

Replace the second paragraph to read as follows:

All seed used for lawn, erosion control or other planting specified on the Plans or listed in the specifications, shall be furnished in labeled and sealed standard containers, with duplicate signed copies of a statement from the vendor, certifying that each container of seed delivered is fully labeled in accordance with the California State Agricultural Code, stating certified percent of purity and germination. Seed, which has become wet, moldy or otherwise, damaged in transit or storage will not be accepted. Seed must be certified to conform to the specified purity and

germination.

212-1.4 Plants.

212-1.4.1 General.

Replace the first paragraph to read as follows:

212-1.4.1 General. Plants shall be inspected and approved by the Engineer prior to planting.

Delete the second sentence in the second paragraph.

Replace the third paragraph to read as follows:

No pruning shall be done prior to inspection at the Nursery.

212-1.4.5 Sod and Stolons (turf grass).

Insert the following as a new second paragraph between the existing first and second paragraphs:

Sod shall be fully mature, well maintained and free of all other grasses or weeds and shall be evenly cut with a sod cutting machine to the thickness specified on the Plans or in the Special Provisions. All the material shall be from the same growing ground and delivered to the job site in prime condition.

212-1.4.6 Cuttings.

Revise the first sentence to read as follows:

212-1.4.6 Cuttings. Cuttings shall be fresh stock cut with a sharp hand tool from the stem tips of healthy, vigorous plants of the species specified.

Add the following new subsection:

212-1.4.7 Vines.

212-1.4.7 Vines. Vines shall be of the specified type and size, selected from high quality well-shaped nursery stock.

212-1.5 Headers, Stakes and Ties.

212-1.5.3 Tree Stakes.

Revise the first sentence in the first paragraph to read as follows:

212-1.5.3 Tree Stakes. The type of tree stake and length shall be as designated on the Plans or in the Special Provisions.

Add the following new subsection:

212-1.6 Erosion Control Matting.

212-1.6.1 Jute.

212-1.6.1 Jute. Jute matting shall be of open weave, with approximately one-inch square (1" x 1") mesh. It shall be manufactured from loosely twisted jute yarn varying in thickness no more than half its normal diameter.

Matting shall be made smolder resistant by treatment with chemicals, which are non-leaching and non-toxic to vegetation. An identification mark to differentiate it from untreated jute cloth shall be present.

212-1.6.2 Excelsior.

212-1.6.2 Excelsior. Excelsior blanket shall consist of a cured wood excelsior mat.

Fibers shall be evenly distributed over the entire area of matting; eighty percent (80%) shall be at least six inches (6”) long with consistent thickness. The topside of the matting shall be covered with two inch by one inch (2” x 1”) biodegradable extruded plastic mesh. The blanket shall be made smolder resistant without chemical additives.

212-1.6.3 Staples.

212-1.6.3 Staples. Staples for erosion control matting shall be eleven gage (11-g) steel wire, bent in a "U" shape with six inches (6”) minimum length.

212-2 IRRIGATION SYSTEM MATERIALS.

212-2.1 Pipe and Fittings.

212-2.1.3 Plastic Pipe for Use with Solvent Weld Socket or Threaded Fittings.

Revise the second and third paragraphs to read as follows:

Class 200 pipe shall be used for installation on the discharge side of control valves and Schedule 40 or Class 315 pipe shall be used for continuously pressurized pipe on the supply side of control valves. When threaded joints are specified or otherwise permitted by the Engineer, only Schedule 80 pipe shall be supplied for continuously pressurized pipe on the supply side of control valves and Schedule 40 pipe may be used for non-pressure pipe.

Fittings and couplings for plastic pipe shall be threaded or slipfitting tapered socket solvent weld type. Threaded female adapters shall be provided with socket pipe for connections to threaded pipe. Plastic pipefittings and couplings shall be PVC I or PVC I/II material. The type of plastic material and schedule size shall be indicated on each fitting or coupling. Fittings and couplings shall comply with the following specifications:

Socket Fittings	
Schedule 40	ASTM D2466
Schedule 80	ASTM D2467
Threaded Fittings	
Schedule 40	ASTM D2464
Schedule 80	ASTM D2464

212-2.2 Valves and Valve Boxes.

212-2.2.4 Remote Control Valves.

Revise the second sentence to read as follows:

Unless otherwise specified, they shall be brass or bronze with accurately machined valve seat surfaces, equipped with flow control adjustment and capability for manual operation.

212-2.2.6 Quick-Coupling Valves and Assemblies.

Replace the first sentence to read as follows:

212-2.2.6 Quick-Coupling Valves and Assemblies. Quick coupling valves shall be brass or bronze with built-in flow control and self-closing valve, and supplied in one-inch (1”) size unless otherwise specified.

212-2.2.7 Valve Boxes.

Add the following as a new second sentence:

Covers may also be green vinyl clad cast iron with locking device.

212-2.4 Sprinkler Equipment.

Delete the second sentence in the first paragraph.

Replace the third paragraph to read as follows:

Fixed heads, shrubbery heads and bubbler heads shall have adjustable radius control.

212-3 ELECTRICAL MATERIALS.

212-3.2 Conduit and Conductors.

212-3.2.1 Conduit.

Revise subsection to read as follows:

212-3.2.1 Conduit. Conduit shall be Schedule 40 PVC or galvanized steel conforming to the applicable provisions of Subsection **209-3.5 “Conduit.”**

212-3.2.2 Conductors.

Revise subsection to read as follows:

212-3.2.2 Conductors. Line voltage conductors shall be supplied in the sizes and types shown on the Plans and shall be solid copper, THW, 600-volt insulation rating, conforming to the applicable provisions of ASTM D734. Low voltage control conductors shall be Type UF, solid copper and supplied in the sizes shown on the Plan or in accordance with the control equipment manufacturer's recommendation, and shall be UL approved for direct burial installation.

PART 3

CONSTRUCTION METHODS

SECTION 300 - EARTHWORK

300-1 CLEARING AND GRUBBING.

300-1.3 Removal and Disposal of Materials.

300-1.3.2 Requirements.

a) Bituminous Pavement.

Revise the first sentence to read:

- a) **Bituminous Pavement.** Bituminous pavement shall be cut and removed in such a manner so as not to tear, bulge or displace adjacent paving by use of saw cutting, rockwheel, jackhammer or milling machine. Wheel type pressure cutters and drop hammer cutters will not be permitted for final edge cut.

300-1.4 Payment.

Add the following as a third paragraph:

When the item of clearing and grubbing is paid for on a lump sum basis, any adjustment in compensation due to an increase or decrease in quantity of work which is ordered by the Engineer will be made in accordance with Subsection 3-2.2.3 "Agreed Prices."

300-2 UNCLASSIFIED EXCAVATION.

300-2.5 Slopes.

Replace the second paragraph to read as follows:

The tops of excavation slopes and the ends of excavations shall be rounded where shown on the Plans.

300-3 STRUCTURE EXCAVATION AND BACKFILL.

300-3.1 General.

Add the following paragraph:

In order to determine the character of the foundation material, the Contractor shall, if directed by the Engineer, dig test pits and make test borings and foundation bearing tests, and the cost thereof will be paid for as extra work.

300-3.5 Structure Backfill.

300-3.5.1 Requirements.

Revise the second sentence in the first paragraph to read as follows:

No backfill material shall be deposited against the back of concrete abutments, concrete or masonry retaining walls, until the concrete or grout has developed not less than the specified 28-day compressive strength.

Add the following to end of third paragraph:

Except that the backfill for bridge abutments and box culverts, shall have a relative compaction of not less than ninety-five percent (95%). The thickness of each layer of backfill shall not exceed 0.67 foot (0.67') before compaction except when compaction is done by ponding and jetting.

300-4 UNCLASSIFIED FILL.

300-4.4 Benching.

Delete the second sentence in the first paragraph and replace with the following:

A minimum six foot (6') horizontal bench shall be constructed to ensure that the new work is constructed on a firm foundation free of loose or disturbed material.

300-5 BORROW EXCAVATION.

300-5.2 Imported Borrow.

Add the following sentence to first paragraph:

Imported borrow shall be of a quality suitable for the purpose intended, free of vegetable matter or other unsatisfactory materials.

In second paragraph, after: "ground surface", add "after stripping".

300-6 EARTHWORK FOR DEBRIS DAMS AND BASINS.

300-6.3 Stripping.

Add the following to the end of the first sentence in the third paragraph:

"...to not less than ninety percent (90%) relative compaction."

300-8 GEOTEXTILES FOR DRAINAGE.

300-8.1 Trench Drains.

Add the following at beginning of section:

300-8.1 Trench Drains. Geotextile fabric for use with rock slope protection shall be either woven or non-woven and conform to Subsection **213-2.2 "Physical Properties."** In addition, fabric weight shall be not less than six ounces per square yard (6 oz./sq. yd.) in accordance with ASTM Designation D1910.

300-9 GEOTEXTILES FOR EROSION CONTROL.

300-9.1 Bank and Shore Protection.

Add the following before the first sentence:

300-9.1 Bank and Shore Protection. Geotextile fabric for use with rock slope protection shall be either woven or nonwoven and shall conform to Subsection **213-2 "GEOSYNTHETICS."** In addition, fabric weight shall be no less than 6 ounces per square yard (6 oz./sq. yd.) in accordance with ASTM Designation D1910.

300-9.1.1 Placement.

Add the following before the first sentence of the first paragraph:

300-9.1.1 Placement. Surfaces upon or against which filter fabric is to be placed, shall be free of loose or extraneous material and sharp objects that may damage the fabric during installation. Filter Fabric shall additionally conform to the ground surface without stretching when outer stone cover or bedding layer of aggregate particles is laid.

Revise the third sentence of the second paragraph to read as follows:

The size and composition of the stitching material and stitching pattern shall be approved by the Engineer.

Add the following to the end of the sixth paragraph:

For filter fabric which, in the opinion of the Engineer, is not resistant to ultra violet rays, the seven (7) calendar day period shall be reduced to twenty-four (24) hours.

Add the following new eighth paragraph:

Except as otherwise specified in these Standard Specifications, special provisions and contract Plans, filter fabric shall be handled and placed in accordance with the manufacturer's recommendations.

300-9.1.2 Measurement and Payment.

Add the following after first sentence:

The contract price paid per square yard for filter fabric for rock slope protection shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work involved in placing the filter fabric, complete in place, as shown on the Plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

300-11 STONEMWORK FOR EROSION CONTROL.

Delete entire subsection and replace with the following:

300-11 RIPRAP FOR ROCK SLOPE PROTECTION.

300-11.1 General.

300-11.1 General. Rock slope protection shall consist of placing revetment type rock course on the slopes. The slope protection shall be placed in conformance with these specifications, the special provisions, and the details and dimensions shown on the Plans or as directed by the Engineer.

The size of the individual pieces of rock shall be as indicated in the table(s) in Subsection **200-1.6(A)** and this Greenbook Supplement Subsection **200-1.7 “Selection of Riprap and Filter Blanket Material.”**, or as specified in the Special Provisions. The classes of rock slope protection are indicated by the average size of the individual piece to be used and will be designated on the Plans as 2-ton, 1 ton, 1/2 ton, 1/4 ton, or No. 2 backing.

300-11.2 Placing Stone.

300-11.2 Placing Stone. Rock slope protection shall be placed in accordance with one of the following methods as designated on the Plan.

METHOD A PLACEMENT

A footing trench shall be excavated along the toe of slope as shown on the Plans. The larger rocks shall be placed in the footing trench.

Rocks shall be placed with their longitudinal axis normal to the embankment face and arranged so that each rock above the foundation course has a three-point bearing on the underlying rocks. Foundation course is the course placed on the slope in contact with the ground surface. Bearing on smaller rocks, which may be used for chinking voids, will not be acceptable. Placing of rocks by dumping will not be permitted.

Local surface irregularities of the slope protection shall not vary from the planned slope

by more than one foot measured at right angles to the slope.

METHOD B PLACEMENT

A footing trench shall be excavated along the toe of the slope as shown on the Plans.

Rocks shall be so placed as to provide a minimum of voids and the larger rocks shall be placed in the toe course and on the outside surface of the slope protection. The rock may be placed by dumping and may be spread in layers by bulldozers or other suitable equipment.

Local surface irregularities of the slope protection shall not vary from the planned slopes by more than one foot (1') measured at right angle to the slope. At the completion of slope protection work, the footing trench shall be filled with excavated material and compaction will not be required.

300-11.3 Measurement.

300-11.3 Measurement. Rock slope protection will be paid for either by the ton, cubic yard or square yard as designated in the proposal or bid schedule.

Quantities of rock slope protection to be paid for by the cubic yard or square yard will be determined from the dimensions shown on the Plans or the dimensions directed by the Engineer and rock slope protection placed in excess of these dimensions will not be paid for. All measurements will be made parallel to the slope.

Quantities of rock slope protection to be paid for by the ton will be weighed in accordance with the provisions in Subsection 9-1 "**MEASUREMENT OF QUANTITIES FOR UNIT PRICE WORK.**"

Quantities of earthwork required in connection with placking rock slope protection will be measured for the type of earthwork involved, all in accordance with the provisions in Subsection 300-7 "**EARTHWORK FOR CHANNELS.**" Full compensation for backfilling footing trenches will be considered as included in the contract price paid for excavating the trench and no separate payment will be made therefor.

300-11.4 Payment.

300-11.4 Payment. The price paid per cubic yard, square yard or ton for rock slope protection (the class of rock and method of placement to be designated in the Contract Document) shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in constructing the rock slope protection complete in place, as shown on the Plans, and as specified in these specifications and the special provisions, and as directed by the Engineer, except excavation. Excavation will be paid for as provided in Subsection 300-7.6 "**Measurement and Payment.**"

SECTION 301 - TREATED SOILS, SUBGRADE PREPARATION AND PLACEMENT OF BASE MATERIALS

301-1 SUBGRADE PREPARATION.

301-1.3 Relative Compaction.

Revise the first paragraph to read as follows:

301-1.3 Relative Compaction. When pavement, base, subbase, or cross gutter is to be placed directly on subgrade material, the top twelve inches (12") of subgrade material in streets and the top six inches (6") of subgrade material in alleys shall be compacted to a minimum density of ninety-five percent (95%) relative compaction. When curb, gutter, driveways, or sidewalks are to be placed on the subgrade material, the top six inches (6") of such subgrade material shall be compacted to a relative compaction of ninety percent (90%).

Add the following paragraphs:

When in the opinion of the Engineer, the Contractor has employed satisfactory construction methods in accordance with the Standard Specifications, and the subgrade is at or greater than optimum moisture content, the following additional test may be required by the Engineer:

The subgrade shall be tested with a loaded truck of ten ton capacity or greater, and having a load of seventy-five pounds or more per square inch (75+ psi) of the tire contact area. The subgrade shall support this load without perceptible indentation or movement. The base, surfacing or pavement shall not be scheduled for construction until the subgrade has been tested as described above and approved by the Engineer.

301-1.7 Payment.

Revise the last paragraph to read as follows:

If payment provisions do not provide for adjustment or reconstruction of manholes shown on Plans, payment for such work will be deemed to be included in the other items of work and no additional payment will be made therefor.

301-3 PORTLAND CEMENT TREATED MIXTURES.

301-3.3 Cement-Treated Base.

301-3.3.3 Central Plant Mixing.

Add the following sentence to the second paragraph:

The cement feeder shall be equipped with a device by which the rate of cement feed can be determined while the plant is in full operation.

301-3.3.6 Measurement and Payment of Cement-Treated Base.

Revise subsection to read as follows:

301-3.3.6 Measurement and Payment of Cement-Treated Base. Cement-treated base and subbase shall be paid for by the ton, complete in place as shown on the Plans or as directed by the Engineer. The price per ton shall include payment for furnishing the treated material and shall include mixing, spreading, shaping, compacting, trimming and curing.

Add the following new subsection:

301-3.3.7 Surfacing of Cement-Treated Base.

301-3.3.7 Surfacing of Cement-Treated Base. Asphalt concrete paving on Cement-Treated Base at an earlier date than the seventh (7th) day will be permitted upon approval of the Engineer, but no paving will be permitted between the day CTB is placed and five (5) days after the treated base has been placed.

Failure to meet the compaction requirements of the treated base will modify the placement of paving in the following manner:

Compaction	Before 7 days	7 days or Greater
90 – 95%	Not Permitted	Permitted

SECTION 302 - ROADWAY SURFACING

302-5 ASPHALT CONCRETE PAVEMENT.

302-5.1 General.

In the first paragraph, replace "203-6," with "Subsection **400-4** "ASPHALT CONCRETE."

Add the following sentence to the last paragraph:

All testing of underground installations at any given point shall be completed before the surfacing is placed at the point.

302-5.3 Prime Coat.

Add "or MC-70" after "Grade SC-250".

302-5.4 Tack Coat.

Add the following sentence to the end of the last paragraph:

A 'cold pavement joint' is asphalt concrete pavement which has cooled below the lower limits of the spreading temperature prescribed in Subsection **302-5.5 "Distribution and Spreading."**

302-5.5 Distribution and Spreading.

Add the following new paragraphs:

Where the pavement slopes towards a concrete gutter, asphalt concrete shall be placed such that the pavement surface is one-quarter inch plus or minus one-eighth inch ($1/4" \pm 1/8"$) above the lip of gutter elevation. Where the pavement slopes away from a concrete gutter, asphaltic concrete shall be placed such that the pavement surface is flush with the lip of gutter elevation unless otherwise directed by the Engineer.

Unless otherwise specified, the first paving pass shall start at the low side of the crown of the street section, and successive passes shall proceed to the high side of the crown of the street section. This shall apply to both sides of the street section unless otherwise directed by the Engineer.

Add the following new subsection:

302-5.5.1 Asphalt Base Distribution and Spreading.

302-5.5.1 Asphalt Base Distribution and Spreading. The contractor may employ

distribution and spreading methods as hereinafter specified when the total thickness of asphalt concrete pavement to be constructed is four inches (4") or greater.

Asphalt concrete to be placed by asphalt base distribution and spreading methods shall be a medium coarse type as specified in Subsection **400-4.3, "Combined Aggregates."**

The depositing, distribution and spreading of asphalt concrete shall be accomplished in a single, continuous operation by means of a self-propelled paving machine. In those instances in which, due to nature or location of the work, the use of said equipment would be obviously impractical, the asphalt concrete may be placed by any method approved by the Engineer.

Asphalt concrete may be placed with no limitation in thickness, except that final grade elevation must be attained in accordance with this Greenbook Supplement Subsection **302-5.5.2 "Asphalt Concrete Pavement Distribution and Spreading."**

Successive courses may be laid upon previously laid courses as soon as the previous course has cooled sufficiently to show no appreciable displacement under equipment load. The surface of the finished asphalt base at any point shall not vary more than 0.02 foot (0.02') above or below the grade established by the Engineer.

Add the following new subsection:

302-5.5.2 Asphalt Concrete Pavement Distribution and Spreading.

302-5.5.2 Asphalt Concrete Pavement Distribution and Spreading. The following distribution and spreading method shall be employed when the specified total thickness of asphalt concrete pavement is less than four inches (4") and for the final course of asphalt concrete pavement the base course of which has been constructed in accordance with this Greenbook Supplement Subsection **302-5.5.1 "Asphalt Base Distribution and Spreading."**

Regardless of the method of construction employed for the lower course of asphalt concrete pavement, the final grade elevation shall be attained in a course of a minimum thickness of one inch (1") and a maximum thickness of four inches (4"), placed in accordance with this Subsection.

The depositing, distributing and spreading of the asphalt concrete shall be accomplished in a single, continuous operation by means of a self-propelled mechanical spreading and finishing machine designed especially for that purpose, except in those instances in which, due to the nature or locations of the work, it would obviously be impractical. The machine shall be equipped with a suitable full width compacting screed capable of being accurately regulated and adjusted to distribute a layer of the material to a definite predetermined thickness as noted in the Greenbook Supplement **TABLE 302-5.5.2** below.

TABLE 302-5.5.2

Specified Total Thickness of Payment		Minimum Number Of Courses	Type of Mixture
Greater than inch	But not more than inch		
0	1	1	Fine
1	1-1/2	1	Medium
1-1/2	4	1	Medium or Medium-Course, as Directed
4	-	2	Medium, or Medium-Coarse, as Directed

Spreading, once commenced, must be continued without interruption. No greater amount of the mixture shall be delivered in any one day than can be properly distributed and rolled during that day.

Successive courses may be laid upon previously laid courses as soon as the previous course has cooled sufficiently to show no perceivable displacement under equipment or loaded material delivery trucks.

302-5.6 Rolling.

302-5.6.1 General.

Replace Part c) of the second paragraph as follows:

Vibratory rollers shall be limited to breakdown, unless otherwise directed by the Engineer. The vibratory rollers shall have a compactive effort of not less than 250 PLI (pounds per linear inch) of centrifugal force at the setting indicated by the manufacturer’s ID plate.

Add the following paragraph after last paragraph:

Unless otherwise directed by the Engineer, initial breakdown rolling shall be followed by a pneumatic-tired roller as described in this Subsection. A seal coat shall be applied per this Greenbook Supplement Subsection **302-5.10 “Sealcoat.”**

302-5.6.2 Density and Smoothness.

Revise the first paragraph to read as follows:

302-5.6.2 Density and Smoothness. Upon completion, the pavement shall be true to grade and cross section. When a ten-foot (10’) straight edge is laid on the finished surface parallel to the centerline of the roadway, the surface shall not vary from the edge of the straightedge more than one-eighth inch (1/8”); when a ten-foot (10’) straight edge is laid on the finished surface traverse to the centerline of the roadway, the surface shall not vary from the edge of the straightedge more than one-quarter inch (1/4”), except at intersections or at changes of grade. Any areas that are not within this tolerance shall be brought to grade immediately following the initial rolling.

302-5.7 Joints.

Add the following paragraphs:

Joints between longitudinal (parallel) passes shall be tack coated if the temperature of the preceding pass has cooled below one hundred eighty degrees Fahrenheit (180°F).

The pinched joint method of rolling is to be used for rolling all asphalt concrete joints. The roller shall be employed in a longitudinal direction on the first pass of the breakdown roll with the roller entirely on fresh asphalt and four to six inch (4" - 6") from the existing asphalt or concrete.

The second pass shall be made with the roller centered longitudinally on the four to six inch (4" - 6") wide strip. With the approval of the Engineer, the four to six inch (4" - 6") wide strip may be compacted on the return trip of the first pass of the roller.

302-5.9 Measurement and Payment.

Add the following paragraphs:

Quantities of pavement reinforcing fabric placed and paving asphalt applied as a binder for the pavement reinforcing fabric will be paid for at the contract price per square yard for pavement reinforcing fabric, not including additional fabric for overlap. Full compensation for furnishing and spreading asphaltic sand to cover exposed binder material, if necessary, shall be considered as included in the contract price paid per square yard for pavement reinforcing fabric and no separate payment will be made therefore.

Small quantities of asphalt concrete placed on pavement reinforcing fabric to prevent the fabric from being displaced by construction equipment or to allow traffic to cross over the fabric, shall be considered as part of the layer of asphalt concrete to be placed over the fabric and will be measured and paid for by the ton as asphalt concrete.

Add the following new subsection:

302-5.10 Sealcoat.

302-5.10 Sealcoat. All asphalt concrete surfaces shall be sealcoated unless otherwise specified. The sealcoat shall consist of a coat of asphaltic emulsion and a cover coat of sand. The asphaltic emulsion shall be mixing type conforming to Section **203-3 "EMULSIFIED ASPHALT."** Sand shall be clean and dry.

Immediately before applying asphaltic emulsion, the surface to be sealcoated shall be thoroughly cleaned of all dirt and loose material. Asphaltic emulsion shall not be applied when the street is overly wet or when the atmospheric temperature is below fifty degrees Fahrenheit (50°F).

The asphaltic emulsion shall be applied by use of a power-spraying device that uniformly applies the emulsion to the surfacing at a rate of 0.1 to 0.15 gallon per square yard (0.1-0.15 g/sq. yd.). The distributor spray bar shall be equipped with asphaltic emulsion type spray jets. Curbs, gutters, other adjoining improvements shall be carefully protected from the emulsion, and any such improvements spattered or touched with emulsion shall be carefully cleaned.

Immediately after the application of asphaltic emulsion, a cover coat of sand shall be spread at the rate of 6 to 12 pounds per square yard (6-12 lbs./sq. yd.). After the sand has been spread, any piles, ridges, or uneven distribution shall be broomed to maintain an even layer over

the surface.

Five (5) days after the seal coat has been applied, the surface shall again be broomed and any excess sand shall be picked up and removed from the job. The Engineer may authorize the sand to be broomed, picked up and removed from the job after two (2) or more days.

Add the following new subsection:

302-5.10.1 Measurement and Payment.

302-5.10.1 Measurement and Payment. When sealcoat is paid for as a contract item of work, the unit of measurement shall be either per square foot, in which case measurements shall be made in horizontal planes, or per ton of asphaltic emulsion and per ton of sand.

302-7 PAVEMENT FABRIC.

302-7.2 Placement.

302-7.2.3 Laydown.

Revise the last sentence of the eighth paragraph to read as follows:

If necessary, exposed tack coat on top of fabric shall be covered lightly with sand.

SECTION 303 - CONCRETE AND MASONRY CONSTRUCTION

303-1 CONCRETE STRUCTURES.

303-1.6 Falsework.

303-1.6.1 General.

Add the following new paragraphs:

The Contractor shall be responsible for designing and constructing falsework which provides the necessary rigidity, supports the loads imposed, and produces in the finished structure the lines and grades indicated on the Plans. No falsework construction shall start until the Engineer has reviewed and approved the Plans of the falsework proposed to be used per Subsection 2-5.3.3 “**Shop Drawings.**” The Contractor shall provide sufficient time for the Engineer to complete this review. Such time shall be proportionate to the complexity of the falsework design and in no case shall be less than two (2) weeks.

For falsework over railroads, approval of the Engineer of the falsework Plans will be contingent upon the Plans being satisfactory to the Railroad Company involved.

303-1.9 Surface Finishes.

303-1.9.2 Ordinary Surface Finish.

Add the following new paragraph:

If rock pockets, in the opinion of the Engineer, are of such an extent or character as to affect the strength of the structure materially or to endanger the life of the steel reinforcement, he may declare the concrete defective and require the removal and replacement of the portions of the structure affected.

303-5 CONCRETE CURBS, WALKS, GUTTERS, CROSS GUTTERS, ALLEY INTERSECTIONS, CURB RAMPS, AND DRIVEWAYS.

303-5.1 Requirements.

303-5.1.1 General.

Change the minimum thickness of the walk in the second paragraph from

"3 inches (75mm)" to "four inches (4")".

303-5.2.1 Standard Forms.

Add the following new paragraph:

Concrete curb, gutter and sidewalk shall be formed full height, front and back, unless an approved mechanical extruding device is approved.

303-5.3 Placing Concrete.

Add the following new paragraphs:

The top and/or face of the finished concrete surfaces shall be true and straight, of uniform width and free of humps, sags, or other irregularities. The finished concrete surface shall not vary more than 0.02 foot (0.02') from a ten-foot (10') straight edge, except at grade changes or curves. No freestanding water will be permitted on slope over one percent (1%). No freestanding water deeper than one-sixteenth inch (1/16") will be permitted on slopes of less than one percent (1%).

Concrete placed immediately before rain shall be protected to prevent rainwater from coming in contact with it. Sufficient protective covering shall be kept on hand at all times for this purpose.

303-5.4 Joints.

303-5.4.2 Expansion Joints.

Revise the first sentence of the third paragraph to read as follows:

Expansion joint filler one-quarter inch (1/4") thick shall be placed in walk at the EC and BC of all walk returns, at forty-five foot (45') intervals in lieu of the regular weakened plane joint and around all utility poles which may project into the concrete along the line of the work.

303-5.4.3 Weakened Plane Joints.

a) General.

In the second paragraph change "10 feet (3m)." to "fifteen feet (15)".

In the third paragraph change "20 feet (6m)." to "fifteen feet (15)".

303-5.5 Finishing.

303-5.5.5 Alley Intersections, Curb Ramps and Driveways.

Revise subsection to read as follows:

303-5.5.5 Alley Intersections, Curb Ramps and Driveways. Alley intersections, access ramps and driveways shall be constructed as specified for concrete pavement in Subsection 302-6 "PORTLAND CEMENT CONCRETE PAVEMENT." except final finishing for alley intersections, access ramps and the sloping portion of driveways shall be done by hand with a steel trowel followed with medium coarse broom and the remaining portion of the driveway finished as specified for walks in accordance with Subsection 303-5.5.3 "Walk."

303-5.6 Curing.

Add the underlined portion to the second sentence in the third paragraph:

"...bituminous pavement or cement-treated base adjacent to concrete curb..."

SECTION 306 - UNDERGROUND CONDUIT CONSTRUCTION

306-1 OPEN TRENCH OPERATIONS.

306-1.2 Installation of Pipe.

306-1.2.1 Bedding.

306-1.2.1.1 General.

Add the following to the end of the third paragraph:

If, when jetting by observation of the Engineer, the adjacent soils permits percolation of the excess water or the Contractor removes excess water by pumping or other means. Care shall be exercised to avoid floating of the pipe.

Replace the eighth paragraph with the following:

For all types of water main, except steel pipe, a minimum of six inches (6") of bedding material shall be placed below the outside bottom of pipe. For steel pipe, a minimum of four inches (4") of bedding material shall be placed below the outside bottom of pipe.

Additional bedding ordered below normal bedding, because of unsuitable materials, shall be one and one-half inch (1-1/2") foundation rock.

For storm drains and all types of gravity sanitary sewer mains, three-quarter inch (3/4") crushed rock per Subsection **200-1.2 "Crushed Rock and Rock Dust"** shall be placed to a depth of four inches (4") below the outside diameter of the pipe or one inch below the bell of the pipe, whichever is greater.

Compaction in the bedding zone for storm drains gravity sanitary sewers and water mains shall be a minimum of ninety percent (90%) relative density. Care should be exercised in compaction and/or placement of bedding material to avoid damage to pipe coating materials. Damaged coatings shall be repaired immediately, per manufacturer's recommendation with the approval of the Engineer.

306-1.2.1.3 Bedding for Plastic Pipe and Fittings.

Add the following as the last paragraph:

It is important that care be taken to provide proper support under the pipe haunches and to each side of the pipe and that the pipe is not moved during the placement and compaction of the bedding material. Care shall be exercised in using granular bedding that contains significant voids. Certain silty or sandy soils near or in the bedding zone tend to migrate into these voids, particularly in the presence of groundwater. Compaction shall be performed in such a manner so that no compaction equipment is used directly above the pipe until sufficient backfill has been placed over the pipe to prevent damage. The Contractor shall provide at least thirty-six inches (36") of cover over the top of the pipe before the trench is wheel-loaded and a minimum of forty-eight inches (48") of cover before utilization of a hydrohammer.

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 and fourth paragraphs 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. One side of the joint shall be tight and on the opposite side the tongue and groove may be opened to have a minimum overlap of one-quarter inch (1/4"). The resulting space shall be filled with Class "C" mortar for the full thickness of the pipe wall. When the opened joint

overlaps less than one-quarter inch (1/4”), a pipe collar per San Diego Regional Standard Drawing **D-62** shall be provided.

306-1.2.6 Field Jointing of Iron Pipe.

Add the following to:

(d) Flanged Joints., (e) Mechanical Joints.:

Nuts and bolts shall be protected from corrosion by a protective coating, as required by the Agency.

306-1.3 Backfill and Densification.

306-1.3.1 General.

Insert the following after the tenth paragraph as a new eleventh, twelfth and thirteenth paragraphs:

Native material will be found not acceptable for trench backfill when:

- 1) the Contractor has attempted compaction and demonstrates through testing that the soil is not compactable in the native state and
- 2) is not dryable, as further required, by finding of a sand equivalent of less than fifteen (15), or more than fifteen percent (15%) passing through a No. 200 sieve; and
- 3) when either of the following values are exceeded:

Liquid Limit	50
Plasticity Index	20

The Engineer shall have the authority to require further testing when, in the opinion of the Engineer, the nature of the native material has changed in either moisture content or ability to be dried.

The Contractor will be compensated for import material and for export of unacceptable material on the basis of unit prices bid. If no bid item is provided, the Contractor shall be compensated for import material and for export of unacceptable material in accordance with **SECTION 3 - CHANGES IN WORK.**

306-1.3.3 Jetted Backfill.

Revise the second paragraph to read as follows:

c) The lift of backfill shall not exceed that which can be readily densified by jetting, but in no case shall the undensified lift exceed ten feet (10’).

d) The suitable backfill material to be jetted shall have a sand equivalent of twenty (20) or greater.

306-1.3.5 Jetted Bedding and Backfill Compaction Requirements.

Delete 306-1.3.5 and replace with the following:

306-1.3.5 Backfill Requirements in Streets & Easements.

306-1.3.5 Backfill Requirements in Streets & Easements. All trench backfill shall be compacted to a minimum ninety percent (90%) relative compaction except where ninety five percent (95%) relative compaction shall be required by Subsection **301-1.3 “Relative**

Compaction.”

306-1.3.6 Mechanical Compaction Requirements.

Delete 306-1.3.6 in its entirety.

306-1.3.7 Imported Backfill.

Add the following sentence to the second paragraph:

Import material shall have a Sand Equivalent (SE) not less than 20.

306-1.4 Testing Pipelines.

306-1.4.4 Air Pressure Test.

Add the following sentence to the fifth paragraph:

For PVC sewer mains, minimum gauge pressure, test duration, acceptance requirements, and gauge certification shall be in accordance with this Greenbook Supplement Subsection **306-1.4.4.1 “Air Pressure Test for PVC Sewer Mainlines.”**

306-1.4.4.1 “Air Pressure Test for PVC Sewer Mainlines.”

Add the following new subsection:

306-1.4.4.1 Air Pressure Test for PVC Sewer Mainlines.

306-1.4.4.1 Air Pressure Test for PVC Sewer Mainlines. After laying, backfilling and compacting sewer lines, including laterals, they shall be air pressure tested by the Contractor.

The test section shall be pressurized to three and one-half pounds per square inch (3.5 psi) and shall be held above three pounds per square inch (3.0 psi) for not less than five (5) minutes. Air shall be added if necessary to keep the pressure above three pounds per square inch (3.0 psi).

When the prevailing groundwater is above the pipe being tested, air pressure shall be increased 0.43 pounds per square inch (0.43 psi) for each foot the water table is above the invert of the pipe.

The pressure gauge used shall be supplied by the Contractor, shall have minimum divisions of one-tenth pound per square inch (0.1 psi) and shall have an accuracy of four-hundredths pound per square inch (0.04 psi). A certified testing shall certify accuracy and calibration of the gauge firm annually or when requested by the Engineer.

At the end of the five (5) minute saturation period, note the pressure must be three pounds per square inch (3.0 psi) minimum and begin the same lapse required for air pressure drop. If the pressure drops more than one-half pound per square inch (0.5 psi) in less than the time shown in **TABLE 306-1.4.4.1 (A)** below, the section of pipe is deemed to have failed the test.

TABLE 306-1.4.4.1 (A)

1 Pipe Dia. (in)	2 Min. Time (min:sec)	3 L for Min. Time (ft)	4 Time For Add'l L (sec)	Specification Time for Length (L) Shown (min:sec)							
				100 ft.	150 ft.	200 ft.	250 ft.	300 ft.	350 ft.	400 ft.	450 ft.
4	1.53	597	0.190 x L	1:53	1:53	1:53	1:53	1:53	1:53	1:53	1:53
6	2.50	398	0.427 x L	2:50	2:50	2:50	2:50	2:50	2:50	2:51	3:12
8	3.47	298	0.760 x L	3:47	3:47	3:47	3:47	3:48	4:26	5:04	5:42
10	4.43	239	1.187 x L	4:43	4:43	4:43	4:57	5:56	6:55	7:54	8:54
12	5.4	199	1.709 x L	5:40	5:40	5:42	7:08	8:33	9:58	11:24	12:50
15	7.05	159	2.671 x L	7:05	7:05	8:54	11:08	13:21	15:35	17:48	20:02
18	8.30	133	3.846 x L	8:30	9:37	12:49	16:01	19:14	22:26	25:38	28:51
21	9.55	114	5.235 x L	9:55	13:05	17:27	21:49	26:11	30:32	34:54	39:16
24	11.20	99	6.837 x L	11:24	17:57	22:48	28:30	34:11	39:53	45:35	51:17
27	12.45	88	8.653 x L	14:25	21:38	28:51	36:04	43:16	50:30	57:42	46:54
30	14.10	80	10.683 x L	17:48	26:43	35:37	44:31	53:25	62:19	71:13	80:07
33	15.35	72	12.926 x L	21:33	32:19	43:56	53:52	64:38	75:24	86:10	96:57
36	17.00	66	15.384 x L	25:39	38:28	51:17	64:06	76:55	89:44	102:34	115:23

For larger diameter pipe use the following formula: Minimum time in seconds = 1.2 x diameter in mm

306-1.4.5 Water Pressure Test.

Add the following sentence before the first sentence of the last paragraph:

The allowable leakage shall be fifteen gallons per inch of diameter per mile of pipeline per twenty-four (24) hours (15 g/inchΦ/mile/24 hours).

Add the following new subsection:

306-1.4.7 Disinfection.

306-1.4.7 Disinfection. All new water mains shall be disinfected in accordance with AWWA C601 and State Health Department requirements. The Agency will perform a chlorine residual test prior to flushing and a bacteriological test after flushing. No main shall be placed in service until the results of the bacteriological tests are announced as satisfactory.

Add the following new subsection:

306-1.4.8 Digital Video Recording Sewer Mains and Storm Drains.

306-1.4.8 Digital Video Recording Sewer Mains and Storm Drains. New sewer mains less than thirty-six inch in diameter (36" Φ) and storm drains eighteen inches in diameter to thirty-five inches in diameter (18" – 35" Φ) shall be inspected by color digital video after completion of trench backfill and finished grading but prior to the placement of pavement or permanent trench resurfacing, to determine the existence and extent of any obstructions, structural deficiencies, or sags. Storm drains less than fifty feet (50') in length for a single run

are not required to be videoed.

The Contractor in cooperation with the Agency and its Engineer shall do the digital video recording. The Engineer reserves the right to require the Contractor to digitally re-record any new sewer main, at the Contractor's expense, after the placement of pavement or permanent trench resurfacing, but before acceptance by the Engineer, to determine the existence and extent of any foreign material or obstructions such as, but not necessarily limited to, cement grout, wood, rocks, sand, concrete, or pieces of pipe, and any structural deficiencies or sags precipitated by the permanent resurfacing operations or other contract work. The Contractor shall notify the Engineer thirty (30) working days in advance of the anticipated date that final acceptance will be requested. If the specified advance notice is not given, final acceptance and bond release may be delayed.

The digital recording format shall be as approved by the Agency prior to recording. Five (5) working days shall be allowed for the Engineer to review each individual digital recording of each and every sewer main or storm drain documented on that particular digital video disc (DVD). In the event that any deficiencies or sags are discovered by the Engineer, either by the Contractor's initial digital recording or the Engineer's required digital re-recording, three (3) working days shall be allowed for the Engineer to determine whether the deficiencies or sags are repairable in place. If the Engineer determines that the deficiencies or sags are not repairable in place, the affected portion(s) shall be reconstructed in accordance with Subsection **6-8 "COMPLETION, ACCEPTANCE, AND WARRANTY."**

The Contractor shall not be entitled to any additional working days due to delays resulting from the correction of any deficiencies or sags, either repairable or non-repairable in place, as determined by digitally recorded inspections and the Engineer.

Add the following new subsection:

306-1.4.8.1 General Requirements.

- a) The digital video recording operator must have at least one (1) year of experience with a project of a similar nature within the recent past.
- b) "Read only" DVDs shall be high definition color format and recorded in mode and disc format as directed and approved by Agency. Any out-of-focus, inadequate, or faulty (electrical interference, etc.) digital video recordings or portions thereof, shall be cause for rejection of the digital recordings and will necessitate re-recording of the digital video.
- c) The Engineer shall be notified forty-eight (48) hours prior to the digital video recording.
- d) The Contractor shall turn over the original DVD to the Engineer immediately after digital video recording.
- e) Digital video recording shall be done in one direction for the entire length between manholes; each section shall be isolated from the remainder of the sewer line or storm drain as required. Sufficient water shall be supplied to cause drainage within the isolated section prior to digital video recording.

- f) For underground sewer or storm drain conduit installations, the maximum operation tolerance for sag shall be one-hundredth foot/inch of pipe diameter (0.01 ‘/Φ’). No sag shall be longer than sixty feet (60’). When digital video recording inspection is used to check for sags, a calibrated device acceptable to the Engineer shall be used to measure the depth of sag.
- g) The Contractor shall not be entitled to any additional working days due to delays in securing the digital video services of a private vendor.

Add the following new subsection:

306-1.4.8.2 Equipment for Digital Video Recording.

306-1.4.8.2 Equipment for Digital Video Recording. Color digital video recording equipment shall include the solid state color digital video recording camera, digital video monitor, cables, power source, lights and other equipment necessary to the digital video recording operation to meet the requirements specified herein. The components of the digital video system shall be capable of producing high definition picture quality to the satisfaction of the Agency. The components shall provide an image that meets the following specifications or approved equal.

- a) The gray scale shall show equal changes in brightness ranging from black to white with a minimum of five (5) stages.
- b) With the video monitor control correctly adjusted, the six colors – yellow, cyan, green, magenta, red and blue, plus black and white shall be clearly resolved with the primary colors in order of decreasing luminance. The gray scale shall appear in contrasting shades of gray with no color tint.
- c) The picture shall show no convergence or divergence over the whole of the picture. The monitor shall be at least thirteen inches (13”) diagonally measured across the picture screen.

The camera shall be specifically designed and constructed with a rotational lens for operation in connection with sewer or storm drain inspection and capable of viewing the complete circumference of the pipe as well as manhole and cleanout structures. The camera shall be self-operative in one hundred percent (100%) humidity conditions. The camera lens shall be an auto-iris type with a focal distance which can be remote-adjustable through a range of from one inch (1”) to infinity. The camera shall be self-propelled or mounted on skids suitably sized for each pipe diameter to be investigated. Cameras incorporating mirrors for viewing sides or using exposed rotating heads are not acceptable. Lighting intensity for the camera shall be remote controlled and shall be adjusted to minimize reflective glare. Camera and lighting quality shall be suitable to provide a clear, continuously in-focus digital video picture of the entire inside periphery of the sewer pipe or storm drain for all conditions encountered during the work except submergence. The remote reading footage counter shall be accurate to within one-half percent (0.5%) over measured distance of the particular section being inspected and shall be displayed on the digital video monitor. The digital video camera, video monitor and other components of the digital video system shall be defined as ISO-MPEG Level 1 (MPEG-1) coding having a resolution of 352 pixels (x) by 240 pixels (y) (minimum) and an encoded frame rate of 29.97 frames per second. The digital recording shall include both audio and video information that accurately reproduces the original picture and sound of the digital video inspection. The video portion of the digital recording shall be free of electrical interference and shall produce a clear and stable image. The audio portion shall be sufficiently free of background and electrical noise

so as to produce an oral report that is clear and discernible. The digital video camera shall be capable of registering a minimum of 470 lines horizontal resolution and be a clear, stable image with no interference. The equipment shall be capable of digitally recording the entire length in one direction. When digital video recording storm drains the camera shall be capable of scanning the joints for three hundred and sixty degrees (360°).

Add the following new subsection:

306-1.4.8.3 Digital Video Recording Procedures.

306-1.4.8.3 Digital Video Recording Procedures. The digital video camera shall be moved through the pipeline in a downstream direction at a uniform rate, stopping when necessary to ensure proper documentation of the condition of the sewer line but in no case shall the digital video camera be pulled at a speed greater than thirty feet per minute (30 fpm). Manual winches, power winches, cable and powered rewinds or other devices that do not obstruct the camera view or interface with proper documentation of the sewer line or storm drain conditions shall be used to move the camera through the sewer line or storm drain.

If, during the digital video recording operations, the digital video camera will not pass through an entire manhole section or storm access point section, the Contractor shall reset the equipment in a manner so that the inspection can continue opposite the obstruction. If the digital video camera encounters an obstruction within a section not accessible to a manhole or storm drain access point, the Contractor shall remove the obstruction by excavation or other appropriate means, replace whatever pipe is necessary, and re-record the entire section.

Whenever non-remote powered and controlled winches are used to pull the digital video camera through the line, telephones, radios, or other suitable means of communication shall be set up between the two manholes or storm drain access points of the section being inspected to ensure that adequate communications exist between members of the crew.

The importance of accurate distance measurements is emphasized. Measurement for location of defects shall be above ground by means of a metering device. Marking on the cable, or the like, which would require interpolation for depth of manhole or storm access points, will not be acceptable.

The accuracy of the measurement meters shall be checked daily by use of a walking meter, roll-a-tape, or other suitable device. Footage measurements shall begin at the centerline of the upstream manhole or storm drain access point, unless permission is given by the Engineer to do otherwise. Footage shall be shown on the digitally video recorded data view at all times.

Add the following new subsection:

306-1.4.8.4 Documentation of Digital Video Recording.

306-1.4.8.4 Documentation of Digital Video Recording. Audio and written documentation shall accompany all DVD(s) submitted to the Engineer.

The voice recording of the DVD(s) shall make brief but informative comments on data of significance, including, but not limited to, the locations of unusual conditions, type and size of connection, collapsed section, the presence of scale and corrosion, and other discernible features.

The DVD(s) shall include the following:

- a) Data View
 - i) Report No.
 - ii) Date of digital video recording inspection.
 - iii) Upstream and downstream manhole, storm drain access point or station numbers.
 - vi) Current distance along reach (digital video recording counter footage).
 - v) Printed labels on DVD container with location information, date format information, and other descriptive information.

- b) Audio
 - i) Date of the digitally recorded video inspection.
 - ii) Confirmation of upstream and downstream manhole, storm access point or station numbers.
 - iii) Description of pipe size, types and pipe joint length.
 - iv) Description and location of each defect.
 - v) Description and location of each service connection.

- c) Written
 - i) Date of digital video recorded inspection.
 - ii) DVD number.
 - iii) Location, size, type, and length of pipe.
 - iv) Direction of flow and measurement ("From" manhole/storm drain access point/station number "To" manhole/storm drain access point/station number).
 - v) DVD counter numbers (beginning and end).
 - vi) Sketch showing the street and cross streets where the digitally recorded video inspection was made.
 - vii) Description and location of each defect.
 - viii) Description and location of each connection.

Add the following new subsection:

306-1.4.8.5 Payment for Digital Video Recording.

306-1.4.8.5 Payment for Digital Video Recording. Where payment for digital video recording sewer mains and/or storm drains by the Contractor is a separate bid item, it shall include all work covered by these specifications. Where a separate payment is not provided, it shall be included in the cost per foot of pipe installed and shall include all work covered by these specifications at no additional costs.

306-1.5 Trench Resurfacing.

306-1.5.2 Permanent Resurfacing.

Add the following as a new second paragraph:

Permanent asphalt concrete trench resurfacing shall be placed within a maximum of thirty (30) calendar days after traffic is restored.

306-1.6 Basis of Payment for Open Trench Installations.

Revise the second paragraph to read as follows:

The price per linear foot for pipe and conduit in place shall be considered full compensation for all wyes, tees, bends, monolithic catch basin connections, and specials shown on the Plans; the removal and/or restoration of Interfering portions of existing sewers, storm

drains, and existing improvements as shown on Plans; the closing or removing of abandoned conduit and structures; the excavations of the trench; the control of ground and surface waters; the preparation of subgrade; placing, joining and testing pipe; backfilling the trench; disposal of excess excavation; temporary resurfacing when not a bid item; permanent resurfacing, and all other work necessary to install the pipe or conduit, complete in place.

In the third paragraph, after the word "backfill," add: "..., disposal of all excess excavation,..."

306-7 CURB DRAINS.

Delete the following from the last sentence in the second paragraph:

"...and terminate one-inch (1") back of the curb face. "

Add the following to the end of the second paragraph:

The drain pipe shall be trimmed to end flush with the face of curb.

Add the following new subsection:

306-9 FILTER FABRIC.

306-9.1 General.

306-9.1 General. Filter fabric for use with underdrains, edgedrains, and permeable material blankets shall conform to the requirements in SECTION 213 "ENGINEERING FABRICS." Filter fabric shall be placed in underdrain trenches when required by the Plans, and shall be placed in accordance with the details shown on the Plans and as specified in this Greenbook Supplement Subsection 306-10 "UNDERDRAINS."

Add the following new subsection:

306-10 UNDERDRAINS.

306-10.1 General.

306-10.1 General. Trenches for underdrains shall be excavated, the filter fabric placed, if required, the pipe installed and the trench backfilled with permeable material according to the dimensions and details shown on the Plans. When underdrains are installed in trenches outside the subgrade area, the top six inches (6") of the trench shall be backfilled, as shown on the Plans, with structure backfill conforming to the requirements in Subsection 300-3, "STRUCTURE EXCAVATION AND BACKFILL."

Surfaces to receive filter fabric, immediately prior to placing, shall be free of loose or extraneous material and sharp objects that may damage the filter fabric during installation.

Adjacent rolls of the fabric shall be overlapped from twelve to eighteen inches (12" - 18").

The preceding roll shall overlap the following roll in the direction the material is being spread.

Should the fabric be damaged during placing, the torn or punctured section shall be either completely replaced or shall be repaired by placing a piece of fabric that is large enough to cover the damaged area and to meet the overlap requirement.

Damage to the fabric resulting from the Contractor's vehicles, equipment or operation

shall be replaced or repaired by the Contractor at his expense.

Add the following new subsection:

306-11 PERMEABLE MATERIAL BLANKETS.

306-11.1 General.

306-11.1 General. Filter fabric for use with permeable material blankets shall conform to the requirements in this Greenbook Supplement Subsection **306-9 “FILTER FABRIC.”** and the following:

The subgrade to receive the filter fabric, immediately prior to placing, shall conform to the compaction and elevation tolerance specified for the material involved.

Filter fabric shall be handled and placed in accordance with the manufacturer's recommendations. The fabric shall be aligned and placed in a wrinkle-free manner.

Adjacent borders of the fabric shall be overlapped from twelve to eighteen inches (12” to 18”) or stitched. The preceding roll shall overlap the following roll in the direction the material is being spread or shall be stitched. When the fabric is joined by stitching, it shall be stitched with yarn of a contrasting color. The size and composition of the yarn shall be as recommended by the fabric manufacturer. The stitches shall number five to seven per inch (5 - 7”) of seam.

Within twenty-four (24) hours after the filter fabric has been placed, it shall be covered with the planned thickness of permeable material or untreated base material as shown on the Plans.

During spreading and compaction of the permeable material and untreated base material, a minimum of six inches (6”) of such material shall be maintained between the fabric and the Contractor's equipment. Where embankment material is to be placed on the filter fabric, a minimum of eighteen inches (18”) of embankment material shall be maintained between the fabric and the Contractor's equipment. Equipment or vehicles shall not be operated or driven directly on the filter fabric.

Add the following new subsection:

306-11.2 Measurement.

306-11.2 Measurement. The quantity of filter fabric to be paid for will be measured by the square yard of area covered, not including additional fabric for overlap.

Add the following new subsection:

306-11.3 Payment.

306-11.3 Payment. Items of work, measured as specified in this Greenbook Supplement Subsection **306-11.2 “Measurement.”** will be paid for at the contract price per square yard for filter fabric or as specified in the special provisions.

SECTION 307 - STREET LIGHTING AND TRAFFIC SIGNAL SYSTEMS

307-1 GENERAL.

Revise third paragraph to read as follows:

Unless otherwise authorized in writing by the Engineer, the Contractor shall, within thirty (30) days following award of the contract, submit to the Engineer for approval, a list of equipment, wiring diagrams and materials which he proposes to install. The list shall be complete as to name of manufacturer, size and identifying number of each item. Prior to completion, the Contractor shall, in accordance with Subsection 2-5.3 "Submittals." submit detailed shop drawings and wiring diagrams of controllers, cabinets, electrical equipment, or street lighting equipment to be used. The Agency will not be liable for any material purchased, labor performed, or delay to the work prior to such review.

307-2 MAINTENANCE OF EXISTING AND TEMPORARY SYSTEMS.

Add the following paragraphs:

Where an existing system or temporary system is being modified, work not shown on the Plans or specified in the special provisions and which is considered by the Engineer as necessary to keep all or any part of the system in effective operation will be paid for as extra work as provided in the special provisions. The local authorities will furnish electrical energy for operation.

Where damage is caused by the Contractor's operations, the Contractor shall, at his expense, repair or replace damaged facilities promptly in accordance with these specifications. Should the Contractor fail to perform the required repairs or replacements, the cost of performing such repairs or replacements will be deducted from any moneys due or to become due the Contractor.

The exact location of existing conduit runs and the Contractor shall ascertain pull boxes before using equipment that may damage such facilities or interfere with any system.

Where roadways are to remain open to traffic and existing lighting systems are to be modified, the lighting systems shall remain in operation and the final connection to the modified circuit shall be made so that the modified circuit will be in operation before nightfall of the same day.

Temporary electrical installations shall be kept in effective operation until the temporary installations are no longer required for the traveling public. Removal of temporary installations shall conform to the provisions in Subsection 307-20 "SALVAGE."

307-3 COORDINATION WITH SERVING UTILITY.

307-3.1 General.

Add the following new subsection:

307-3.1.1 Safety Precautions.

Before starting work on existing series street lighting circuits, the Contractor shall obtain daily a safety circuit clearance from the serving utility. By-pass switch plugs shall be pulled and "Men at Work" signs posted at switch boxes before any work is done.

307-10 STANDARDS, PEDESTALS AND MAST ARMS.

307-10.2 Mast Arms.

Add the following new subsection:

307-10.2.1 Standards and Steel Pedestals.

Add the following new subsection:

307-10.2.1.1 Installation of Direct Burial Standard.

Installation of the Direct Burial Standard shall be in accordance with Project Plans, Standard Specifications and San Diego Regional Standard Drawings. Particular attention is called to applicable paragraphs of **SECTION 209 – “STREET LIGHTING AND TRAFFIC SIGNAL SYSTEMS.”** and San Diego Regional Standard Drawing Number **E-1** and others as may apply. Selected sand backfill material shall be clean, free from organic material, trash, debris, rubbish, or other objectionable substances. For direct burial poles, installation shall be as indicated on San Diego Regional Standard Drawing Number E-1 and shall also be as follows: Hole shall be augured eighteen inches (18”) in diameter and five feet (5’) deep. The surrounding earth shall be five feet plus three inches (5’ + 3”) from final grade line. Bottom of hand hole shall be approximately eight inches (8”) above grade line. Center line of pole shall be five and one-half feet plus two inches (5.5’ + 2”) or as directed by the Engineer from specified distance to curb. Pole shall be grounded by three-fourths inch by eight foot (¾” x 8’) copper covered steel ground rod in feeder trench approximately twenty-one inches (21”) from center line of pole, when non-metallic conduit is used.

The Contractor shall call for inspection of the pole for backfill compaction and plumb prior to capping with class 520-C-2500 concrete cap.

The space around the pole shall be backfilled with selected sand, free of rocks and other deleterious materials. The minimum acceptable compaction shall be ninety-five percent (95%). The backfill of each pole will be tested for compaction by penetration of the backfill by a steel rod under controlled pressure, calibrated for the material used in the backfilled. The Contractor shall furnish to the agency sufficient quantities of the sand to be used in the backfill for calibration of the test equipment. At the time inspection is requested the Contractor shall provide delivery receipts or other acceptable proof that the sand used in the backfill is the same as that provided for calibration of the test equipment.

If ninety-five percent (95%) relative compaction is not achieved, it shall be the responsibility of the Contractor to perform the necessary rework to achieve ninety-five percent (95%) relative compaction.

The pole shall be plumb with a permitted variation not to exceed 0.08 inches per foot (0.08”/’) of pole length above grade.

Prestressed poles shall have the exposed ends of the prestressing steel and the base of the light standard heavily coated with roofing asphalt or coal tar enamel.

307-11 PULL BOXES.

307-11.1 General.

Add the following at the end of the third paragraph:

- d) A No. 3-1/2 pull box shall be installed within five feet (5’) of each street lighting standard unless the standard is within five feet (5’) of service point.

Add the following paragraphs after the fifth paragraph:

Grout shall be placed prior to the installation of conductors. A layer of roofing paper shall be placed between the grout and the crushed rock sump. A one inch (1”) drain hole shall be provided in the center of the pull box through the grout and the roofing paper.

Covers shall be secured with three-eighths inch (3/8") bolts, cap-screws, or studs, and nuts which shall be of brass, stainless steel or other non-corroding material. Stainless steel hold-down bolts, cap screws and studs, and nuts and washers shall have a chromium content of not less than eighteen percent (18%) and nickel content of not less than eight percent (8%). Nuts shall be recessed below surface of cover.

307-12 CONDUIT.

307-12.1 General.

Add the following sentence after the first sentence in the sixth paragraph:

Street light conduit for multiple lighting shall be not less than two inches (2") in size. Street light conduit for series lighting shall not be less than one and one-half inches (1-1/2") in size.

Add the following sentence to the end of the seventh paragraph:

Service riser conduit shall terminate with a service head or shall be sealed to prevent the entrance of water, as approved by the serving utility.

Add the following sentences to the end of the ninth paragraph:

The threads of all ferrous metal conduits shall be painted with rust preventive paint before couplings are made up. Where the coating on metallic-type conduit has been damaged in handling or installing, such damaged places will be painted with rust preventive paint.

307-13 WIRES, CONDUCTORS AND CABLES.

307-13.1 General.

Add the following paragraph after the fifth paragraph:

Wire connectors shall be of a type approved by the Engineer and bear the Underwriters Laboratory (UL) seal of approval. The installation procedure, including connector size and crimping tools shall conform to the manufacturer's recommendations. Generally, bulky or odd shape connectors and narrow connectors will not be allowed. The mechanical performance of the connectors which may damage the wire, or twist-on split-bolt type connectors shall be such that no free play can be observed after the connector is subjected to a combination of hand-applied twists and pulls. A solid cross section will also be required when the connector is subjected to saw cutting. All wire connectors shall have a nominal cross sectional area equivalent to the area of the largest conductor connected.

307-13.4 Bonding and Grounding.

Add the following sentence to the end of the second paragraph:

Neutral leg of lighting conductors shall be grounded to base of standard at service entry.

Add the following paragraphs after the third paragraph:

At each multiple service point, unless otherwise shown on the Plans, a ground electrode shall be furnished and installed. Ground electrodes of steel or iron shall be one-piece lengths of galvanized rod or pipe at least three-fourths inch in diameter (3/4" Φ). Electrodes of non-ferrous materials shall not be less than one-half inch in diameter (1/2" Φ). Ground electrodes shall be installed in accordance with the provisions of the Code.

Ground clamps for service grounding and for grounding of equipment on wood poles shall be a one-half inch (1/2") galvanized, malleable iron conduit hub with swivel feature.

307-14 SERVICES.

307-14.1 General.

Add the following paragraph after the third paragraph:

Upon request of the Contractor, the Engineer will arrange with the serving utility to complete service connections for temporary installations and the Contractor shall pay all required costs and fees therefore.

307-14.5 Payment.

Add the following paragraph after the first paragraph:

Full compensation for furnishing and installing service poles, service equipment, conduit, and conductors (including equipment, conduit, and conductors placed on utility poles, and the additional conductor where the service utility requires 3-wire, 120/240-volt service into the meter socket for a 120-volt load), and for any service connection fees, shall be considered as included in the contract item for electrical work involved and no additional compensation will be allowed therefore.

307-16 STREET LIGHTING CONSTRUCTION.

307-16.1 General.

Add the following definitions:

Electrolier: The complete assembly of lighting standard, luminaire, ballast and lamp.

Luminaire: The assembly, which houses the light source and controls the light emitted from the light source. Luminaries consist of hood (including socket), reflector, and glass globe or refractor.

Lighting Standard: The pole and mast arm, which support the luminaire.

307-16.4 Wiring/Conductors.

Add the following paragraphs:

Service run splices shall be located in pull boxes. When no box is required the splice shall be located in the base of the standard. Splices shall be made using an approved connector, as specified in Subsection **307-13 “WIRES, CONDUCTORS AND CABLES.”**, and shall provide electrical properties equivalent to those of the cables being joined and shall be waterproof.

The hot leg of lighting conductors shall be fused with a Slo-Blo midget ferrule type fuse, of appropriate amperage, in the plug connector, in the pull box, or in the base of Standard if within five feet (5') of service point. The connector shall be readily accessible. The fuse holder shall completely enclose the fuse and shall protect the fuse against damage from water and weather. The contact between the fuse and the fuse holder shall be by spring pressure. Springs shall not be part of the current carrying circuit. The terminals of the fuse holder shall be rigidly crimped to the line conductor, using a tool of the type recommended by the manufacturer of the fuse holder.

Add the following new subsection:

307-16.4.1 Wiring Color Code.

307-16.4.1 Wiring Color Code. Ground wire shall be green (or bare). Neutral wire shall be white. Hot wire shall be any color other than green or white.

307-20 SALVAGE.

Add the following as a third paragraph:

Holes formed by removing pull boxes and foundations shall be filled with material equivalent to the surrounding material.

Add the following new subsection:

307-21 PAYMENT.

307-21 PAYMENT. The lump sum price or prices paid for roadway lighting systems, lighting systems on structures or combinations thereof, modifying systems, temporary systems, removing systems, or the unit prices paid for various units of said systems shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in furnishing and installing, modifying, or removing the systems or combinations thereof as shown on the Plans, and as specified in these specifications and the special provisions, and as directed by the Engineer, including any necessary pull boxes; excavation and backfill; concrete foundations; restoring sidewalk, pavement and appurtenances damaged or destroyed during construction; salvaging existing material; and making all required tests.

Full compensation for all additional materials and labor, not shown on the Plans or specified, which are necessary to complete the installation of the various systems, shall be considered as included in the prices paid for the systems, or units thereof.

The contract price paid per foot for cast-in-drilled-hole concrete piles (signal foundation) shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in drilling holes, disposing of the material resulting from drilling holes, furnishing and placing anchor bolt assemblies and reinforcing steel, complete in place, as shown on the Plans, and as specified in these specifications and the special provisions, and as directed by the Engineer.

SECTION 308 - LANDSCAPE AND IRRIGATION INSTALLATION

308-2 EARTHWORK AND TOPSOIL PLACEMENT.

308-2.2 Trench Excavation and Backfill.

Revise the second paragraph to read as follows:

Unless otherwise specified, the minimum depth of cover over irrigation pipelines and conduits shall be as follows:

- 1) Electrical conduit – Eighteen inches (18")
- 2) Water lines continuously pressurized
Three inches (3") and smaller pipe – Fifteen inches (15")
Four inches (4") and larger pipe – Twenty-four inches (24")
- 3) Lateral sprinkler lines – Fifteen inches (15")

Add the following sentence after the last sentence of the last paragraph:

Other methods of compacting backfill maybe approved by the Engineer.

308-2.3 Topsoil Preparation and Conditioning.

Re-title section: Topsoil Preparation.

308-2.3.1 General.

Revise the third paragraph to read as follows:

The existing soil below subgrade for Class A or B topsoil shall be deep ripped in a cross pattern to a depth of eight inches (8"). Rocks six inches or greater (6"+) in length shall be removed from the deep ripped area. The area shall be smooth and uniform before topsoil is placed.

In the last paragraph, change the following word:

"...scarified..." to "...deep ripped..."

308-2.3.2 Fertilizing and Conditioning Procedures.

Revise the first sentence in the second paragraph to read as follows:

Soil amendment materials shall be uniformly spread at the prescribed rate.

Revise the first sentence of the third paragraph to read as follows:

After spreading, the soil amendments shall be cultivated into the upper six inches (6") of soil by suitable equipment operated in at least two (2) directions at approximate right angles.

308-2.4 Finish Grading.

Revise the first paragraph to read as follows:

308-2.4 Finish Grading. Contours and finish grade shall provide for drainage to sheet and shall not channel drainage in a manner where volume and velocity of water will create surface erosion.

In the second paragraph, change the following words:

"1 inch" to "one-half inch (1/2")"

Revise the first sentence in the third paragraph to read as follows:

After blending solid amendments and fertilizers into soil, soil shall be watered and allowed to settle to provide a stable base.

Add the following paragraph:

Finish grade shall insure positive drainage from the site. Surface drainage shall be away from all building foundations. The Engineer shall approve the final grades and elevations before planting operations may begin.

308-3 HEADER INSTALLATION.

Delete the second paragraph.

308-4 PLANTING.

308-4.1 General.

Add the following at the end of sentence in the fourth paragraph:

"... and finish grading."

308-4.2 Protection and Storage.

Add the following sentence:

Shade-loving plants, stolons and sod shall be stored in the shade or screened from the sun.

308-4.5 Tree and Shrub Planting.

Delete the following words from the first sentence in the first paragraph:

"...approximately square with vertical sides..."

Revise the first sentence of the second paragraph to read as follows:

Containers shall be removed in such a manner that the plant root is not injured.

Add the following sentence to the end of the third paragraph:

The sides of the planting holes shall be scarified or roughened.

Revise the second sentence of the fourth paragraph to read as follows:

Prepared soil mix shall consist of twenty to forty percent (20% - 40%) Type 1, 2, or 3 organic soil amendment, and the remainder native soil, depending on soil conditions at each site, as specified by Agency.

Delete parts 1) through 7) after the fifth paragraph and replace with the following:

- 1) The bottom of the planting hole shall be scarified to a depth of six inches (6") and the native soil mixed with an equal amount of soil mix.
- 2) Soil mix shall be added and water compacted in the bottom of the planting hole so that the crown of the plant is one inch (1") above finish grade.
- 3) The plant shall be approximately at the center of the hole and plumb.
- 4) Prepared soil mix shall be added in the hole to cover one-half (1/2) the height of the root ball. Water shall then be added to thoroughly saturate the root ball and adjacent soil.
- 5) After the water has drained, the specified number of fertilizer tablets shall be placed in the planting hole adjacent to the root ball. The Engineer shall approve fertilizer tablet placement prior to filling remainder of hole with soil mix.
- 6) The backfill shall be thoroughly water settled and additional prepared soil mix added to fill any remaining void below finish grade.
- 7) A circular watering basin four inches (4") high shall be constructed around the plant in the following diameters:

Two foot diameter (2' Φ)	One gallon (1 g) plant
Three foot diameter (3' Φ)	Five gallon (5 g) plant
Four foot diameter (4' Φ)	Fifteen gallon (15 g) plant

The bottom of the basin shall be at approximate finish grade or slightly lower. Specified mulch shall be spread at least two inches (2") thick in the basin.

- 8) The plant shall be guyed and staked as specified in Subsection **308-4.6 “Plant Staking and Guying.”**
- 9) The area around plants shall be re-graded to finish grade. The excess soil shall be disposed of by the Contractor or as directed by the Engineer.

308-4.6 Plant Staking and Guying.

308-4.6.1 Method “A” Tree Staking.

Revise the first sentence to read as follows:

308-4.6.1 Method “A” Tree Staking. The tree shall be staked with the type and length of stake specified on the Plans or in the Special Provisions. The stake shall be placed at the windward side of the tree and positioned adjacent to the root ball. The stake shall be vertical and driven twelve inches (12”) into undisturbed soil.

308-4.6.2 Method “B” Tree Staking.

Revise the first and second sentences to read as follows:

The tree shall be staked with the type and length of stake specified on the Plans or in the Special Provisions. One (1) stake shall be placed eighteen inches (18”) from each side of the tree trunk.

308-4.6.3 Guying.

Delete the first paragraph.

308-4.7 Ground Cover and Vine Planting.

Add the following sentence to the second paragraph:

Soil shall be moist within the total root zone of the material being planted.

Change the following word in the first sentence of the third paragraph:

"flat" to “container”

Revise the second sentence of the fourth paragraph to read as follows:

A two-inch (2”) layer of the specified mulch shall be spread over the planted areas.

Delete the second sentence in the sixth paragraph.

308-4.8 Lawn Planting.

308-4.8.2 Seed.

Revise the following:

a) **Method A.**

Add the following sentences to the first paragraph:

The soil shall be moist for a depth of six inches (6”) before planting. If not, prior to planting the soil shall be deep watered to a depth of eight inches (8”) and allowed to dry out to the point soil is moist and will support labor and equipment without damage or undue compaction to soil and finish grade.

b) **Method B.**

Revise the fourth paragraph to read as follows:

Areas to be planted by this method shall be moistened to a depth of six inches

(6”).

308-4.8.3 Sod.

Change the following word in the second sentence of the second paragraph:

"conditioning" to "preparation".

Add the following sentence to the second paragraph:

Sod shall be installed no more than forty-eight (48) hours after cutting.

Change the following words in the fifth paragraph:

"8 inches" to "six inches (6”)"

308-4.8.4 Stolons.

Delete the following words from the first sentence:

"and conditioning"

Revise the first sentence in the second paragraph to read as follows:

The area to be planted in stolons shall be thoroughly irrigated to a depth of at least six inches (6”) before planting.

308-4.9 Erosion Control Planting.

308-4.9.1 General.

Delete the following words from the second sentence:

"and conditioning"

308-5 IRRIGATION SYSTEM INSTALLATION.

308-5.1 General.

Revise the fourth paragraph to read as follows:

Utility connections shall be as shown on the Plan or designated by the utility company. The Contractor shall include in its bid, all costs for such utility connections shown on the Plans or designated by the utility company.

308-5.2 Irrigation Pipeline Installation.

308-5.2.1 General.

Revise the fourth paragraph to read as follows:

Unless otherwise specified no PVC pressure pipeline shall be installed within three feet (3') of and parallel to another line.

308-5.2.2 Steel Pipeline.

Revise the third paragraph to read as follows:

Joints shall be made with a non-toxic non-hardening joint compound or Teflon tape and applied to the male threads only.

308-5.2.4 Copper Pipeline.

Add the following sentence to the end of the first paragraph:

Copper pipe shall have a straight butt square edge with all burrs and fins removed.

Change the following words in the second sentence of the second paragraph:

"50-50 tin-lead solder." to "40-60 tin-lead solder."

308-5.3 Installation of Valves, Valve Boxes, and Special Equipment.

Revise the third, fourth, fifth and sixth paragraphs to read as follows:

Valves shall be the same size as the pipeline in which they are to serve. Gate valves and sectional control valves shall be installed below ground and shall be equipped with a sleeve centered on the valve stem.

Quick coupler valves and garden valves projecting above grade shall be twelve inches (12") from curbs, pavement and walks. In ground cover and shrubbery areas, quick coupler valves shall be set four inches (4") above finish grade, and garden valves shall be set a minimum of eight inches (8") above finish grade.

Quick couplers in lawn/turf areas shall be installed at finish grade to not over one-half inch (1/2") above finish grade.

All valve boxes and pipe sleeves with caps shall be set to finish grade. Backflow preventers shall be provided with pipe supports and the accessories necessary to properly secure the assembly.

308-5.4 Sprinkler Head Installation and Adjustment.

308-5.4.2 Location, Elevation and Spacing.

Revise the second, third, fourth and fifth paragraphs to read as follows:

In lawn areas, sprinkler heads shall be installed one-half inch (1/2") above finish grade. Lawn sprinklers shall be installed two inches (2") clear of adjacent walks, curbs, paving headers and similar improvements.

Sprinkler heads shall be installed a minimum of six inches (6") from adjacent vertical elements projecting above grade, such as walls, planter boxes, curbs and fences.

Unless otherwise specified, shrub heads, bubbler heads and impact sprinklers shall be installed six inches (6") above finish grade.

Nozzle lines projecting above finish grade shall be at least twelve inches (12") from adjacent curbs, walk, paving and similar improvements.

308-5.4.3 Riser and Nozzle Line Installation.

Change the following word in the first sentence of the second paragraph:

"oscillating" to "impact"

Delete the third, fourth and fifth paragraphs.

Revise the sixth, seventh and eighth paragraphs to read as follows:

Double swing joint riser assemblies shall utilize a horizontal three inch (3") pipe nipple, threaded into a side outlet ell or tee installed in the lateral supply line. Three standard ninety-degree (90°) elbows shall be used in the remaining assembly ahead of the vertical riser pipe.

Risers for impact sprinkler heads installed above grade shall be supported by a one-half inch (1/2") galvanized iron pipe stake thirty inches (30") long, driven into the ground and secured with two (2) stainless steel clamps. The upper end of the pipe stake shall be six inches (6") above finish grade.

When nozzle lines cannot be supported on adjacent fences, guardrails and the like, they shall be supported on driven one-half inch (1/2") pipe stakes thirty inches (30") long at ten-foot (10') centers. The nozzle line shall be secured to the top of the stake with three-eighths inch (3/8") anchor rings twelve inches (12") long.

308-5.5 Automatic Control System Installation.

Add the following sentence after the first sentence in the second paragraph:

Each controller shall have a power ON/OFF switch, with lock-out, tag-out capability.

Revise the third paragraph to read as follows:

Remote control valves shall be compatible with the automatic controller. When the valve is to be housed in a valve box, it shall be installed with at least a four inches minimum to a six inches maximum (4" – 6") clearance below the cover. The box shall be set to finish grade on an unmortared brick foundation.

Revise the fourth and fifth paragraphs to read as follows:

All service wiring shall be installed at the minimum depth specified in Subsection **307-2.2 "Trench Excavation and Backfill."** in galvanized steel or PVC conduit from the service point to the controller. For the purpose of these specifications, service shall include all material and equipment necessary to complete the electrical connection between the terminating point of the serving utility and the irrigation controller. A separate disconnect switch or combination meter socket, as required, shall be installed between the source of power and the controller. The minimum service wire shall be No. 12 AWG copper 600 volt type TW, TWH or TWHH or larger as required by the contract documents or controller manufacturer. Wire splices shall be located only in specified pull boxes and shall be made with a packaged kit approved for underground use. Valve boxes shall be set to grade on an unmortared brick foundation.

Control wiring or hydraulic control tubing shall be housed in conduit between the controller and a point at least one foot (1') outside the limits of the controller foundation, or the structure foundation where the controller is housed. All other wiring and hydraulic control tubing issuing from the conduit shall be direct burial installed in main or lateral water line trenches wherever practicable. The wiring or tubing shall be installed in the lower corner of the irrigation pipeline trench. Sufficient slack shall be left in the wiring or tubing to provide for expansion and contraction. When the control wiring or tubing cannot be installed in a pipe trench, it shall be installed a minimum of eighteen inches (18") below finish grade.

Add the following sentence after the second sentence in the seventh paragraph:

The minimum insulation resistance to the ground shall be fifty megaohms (50 mΩ). Any wiring not meeting this requirement shall be replaced.

Add the following sentence to the seventh paragraph:

In multiple controller installations, the common control wires shall be separate for each controller.

Revise the eighth paragraph to read as follows:

Upon completion of the work, the control system shall be in operating condition with an operational chart mounted within the controller cabinet, including the location of the circuit breaker feeding the controller.

Add new paragraph to read as follows:

Each installed remote control valve shall be coded to its parent controller.

308-5.6 Flushing and Testing.

308-5.6.2 Pipeline Pressure Test.

Revise the third sentence to read as follows:

Pressure mains shall be tested with all control valves open and outlet side of valves capped.

Revise the fifth sentence to read as follows:

The constant test pressure and the duration of the test are as follows:

Mains	Four (4) hours at 125 psi
Laterals	Two (2) hours at 100 psi

308-6 MAINTENANCE AND PLANT ESTABLISHMENT.

Change the following words in the second sentence of the fifth paragraph:

"30 calendar days" to "60 calendar days"

Add the following new subsection:

308-8 GUARANTEE.

308-8 GUARANTEE. The entire irrigation system shall be guaranteed against defects in materials and workmanship for a period of one (1) year from date of acceptance of the work. The Contractor shall furnish a faithful performance bond in the amount specified in the Contract Documents to cover the guarantee.

SECTION 309 - MONUMENTS

309-1 DESCRIPTION.

After the word "Plans", add:

"...in accordance with the San Diego Regional Standard Drawing Number **M-10** if applicable, ..."

309-2 MATERIALS.

Revise the second paragraph to read as follows:

Monument markers shall be as approved by the Agency and furnished by the Contractor.

309-3 CONSTRUCTION.

Revise the first sentence of the first paragraph to read as follows:

309-3 CONSTRUCTION. Survey monuments shall be either pre-cast or cast-in-place

in neat holes without the use of forms.

PART 4

SECTION 400 - ALTERNATE ROCK PRODUCTS, ASPHALT CONCRETE, PORTLAND CEMENT CONCRETE AND UNTREATED BASE MATERIAL

(This subsection shall apply only when Alternate Rock Material-Type S is specified)

400-1 ROCK PRODUCTS.

400-1.1 Requirements.

400-1.1.1 General.

Add the following sentence to the first paragraph:

Recycled material, when approved by the Engineer, shall conform to the appropriate subsections in **PART 2 CONSTRUCTION MATERIALS**.

Revise the third paragraph as follows:

After "ASTM C131, " add "or California Test 211,".

Revise the fifth paragraph to read as follows:

Coarse aggregate is material retained on the No. 4 sieve, fine aggregate is material passing the No. 4 sieve, supplemental fine aggregate is filler material, and dust from the bags of a baghouse collector or added fine aggregate (one hundred percent (100%) passing the No. 30 sieve).

400-1.1.2 Source.

Revise the last sentence of the first paragraph to read as follows:

The supplier shall have on file, with the Agency, mix designs for Portland Cement Concrete and Asphalt Concrete.

400-2 UNTREATED BASE MATERIALS.

400-2.1 General.

400-2.1.1 Requirements.

Revise the second sentence to read as follows:

Materials for use as base or subbase shall be classified in the order of preference as follows:

- Crushed Aggregate Base
- Crushed Slag Base
- Crushed Miscellaneous Base
- Processed Miscellaneous Base
- Class 2 Aggregate Base
- Disintegrated Granite Base
- Select Subbase

400-2.2 Disintegrated Granite.

Add the following sentence.

When base material without further qualification is specified, the Contractor shall supply Processed Miscellaneous Base (Fine Gradation).

Add the following new subsections:

400-2.3 Class 2 Aggregate Base.

400-2.3.1 General.

400-2.3.1 General. Aggregate for Class 2 aggregate base shall be free from vegetable matter and other deleterious substances, and shall be of such nature that it can be compacted readily under watering and rolling to form a firm, stable base.

400-2.3.2 Grading.

400-2.3.2 Grading. The coarse aggregate (material retained on the No. 4 sieve) shall consist of material of which a minimum of twenty-five percent (25%) by weight shall be crushed particles as determined by California Test 205.

Aggregate shall conform to the grading and quality requirements shown in Table 400-2.3.2(A). At the option of the Contractor, the grading for either the one and one-half inch (1-1/2") maximum or three-fourths inch (3/4") maximum shall be used, except that once a grading is selected it shall not be changed without the Engineer's written approval.

**TABLE 400-2.3.2 (A)
PERCENTAGE PASSING**

Sieve Size	1-1/2" Maximum Individual Test Results	3/4" Maximum Individual Test Results
2"	100	-----
1-1/2"	87-100	-----
1"	-----	100
3/4"	45-90	87-100
No. 4	20-50	30-60
No. 30	6-29	5-35
No. 200	0-12	0-12

400-2.3.3 Quality Requirements.

Class 2 aggregate base shall also conform to the following requirements:

TABLE 400-2.3.3(A)

Tests	California Test	Individual Test
Resistance (R-value)	Calif. 301	78 Min.
Sand Equivalent	Calif. 217	30 Min.
Durability Index		35 Min.

400-3 PORTLAND CEMENT CONCRETE.

400-3.1 Coarse Aggregate.

Add the following after TABLE 400-3.3.1(A) PERCENTAGE PASSING:
(ASTM C131 Test Grading C or Alternate California Test 211)

400-3.2 Fine Aggregate.

Add the following paragraphs after the last paragraph below TABLE 400-3.2.1(A) PERCENTAGE PASSING:

The content of material in fine aggregate, determined as prescribed in ASTM C117, shall not exceed five percent (5%) by weight. When tested as prescribed in ASTM C40, the resultant color of the testing solution shall not be darker than the ASTM C40 standard.

The fine aggregate shall have a minimum average sand equivalent of 75, as determined by at least three tests. No individual test shall have a value less than 70.

Fine aggregate shall be such that cement mortar specimens made therefrom will develop in seven (7) days a compressive strength not less than ninety-five percent (95%) of that developed in the same length of time by specimens similarly made with Ottawa standard sand; the compressive strength of the respective mortars being considered as the average of that developed in not less than three (3) specimens of each prepared and tested as described in California Test 515.

Fine aggregate may be a natural sand, manufactured sand or combination of both.

400-4 ASPHALT CONCRETE.

400-4.1 General.

Revise the second sentence in the second paragraph to read as follows:

Unless otherwise specified PG 64-10 (AR-4000) paving grade asphalt shall be used for Type III asphalt concrete, and PG 64-16 (AR-8000) paving grade asphalt shall be used for asphalt concrete dikes.

400-4.2 Materials.

400-4.2.4 Fine Aggregate.

Add the following as new third and fourth paragraphs:

The total amount of material passing the No. 200 sieve shall be determined by washing the material through the sieve with water. Not less than one-half (1/2) of the material passing the No. 200 sieve by washing shall pass the No. 200 sieve by dry sieving.

Fine aggregate shall be tested for soundness in accordance with ASTM D1073, and shall not exceed fifteen percent (15%) loss by weight.

400-4.3 Combined Aggregates.

Add the following to the end of the first paragraph:

ASTM D2419 Test Method may be substituted for California Test 217.

Add the following Class "A" gradation to TABLE 400-4.3(C) Type III ASPHALT CONCRETE:

Modify the sand equivalent value in TABLE 400-4.3(A), to the values in Table 400-4.3(D).

**TABLE 400-4.3 (C):
TYPE III ASPHALT CONCRETE**

Percentage Passing Sieves	
CLASS	A
Sieve Sizes	Percentage Passing
1-1/4 inch	100
1 inch	90-100
3/4 inch	75-90
3/8 inch	50-65
No. 4	35-50
No. 8	25-42
No. 30	9-24
No. 200	2-7
Asphalt %	4.6-6.0

Revise Table 400-4.3 (C) after the third paragraph to read as follows:

Table 400-4.3(C): TYPE III ASPHALT CONCRETE

Percentage Passing Sieves				
CLASS	B2		B3	
Sieve Sizes	Individual Test Results	Moving Average	Individual Test Results	Moving Average
1"	100	100	100	100
3/4"	87-100	90-100	90-100	95-100
1/2"	75-95	80-90	85-100	85-95
3/8"	50-80	60-75	60-84	65-80
No. 4	30-60	40-55	40-60	45-60
No. 8	22-44	27-40	24-50	30-45
No. 30	8-26	12-22	11-29	14-25
No. 200	1-8	3-6	1-9	3-7
Asphalt %	4.6-6.0		4.6-6.0	

Change the percentage passing sieves in Table 400-4.3: Type III Asphalt Concrete as follows:

Class D - Change percentage (%) Passing No. 200 from "5 - 14" to "5 - 12"
Add the following table after TABLE 400-4.3 (C):

TABLE 400-4.3 (D)
Table of Sand Equivalent and Cleanness Values

Mix Size	Sand Equivalent (Min.)	Cleanness Value (Min.)
F	45 Individual	-----
D	45 Individual 50 Moving Avg.	55 Individual 60 Moving Avg.
C	50 Individual	60 Individual
B	50 Individual	60 Individual
A	50 Individual	60 Individual

Add the following paragraphs after the last paragraph:

The aggregate from each separate bin for asphalt concrete, Type III, except for the bin containing the fine material, shall have a Cleanness Value as noted in Table 400-4.3(D) and as determined by California Test 227, modified as follows:

Test will be performed on the material retained on the No. 8 sieve from each bin and will not be a combined or averaged result.

Each test specimen will be prepared by hand shaking for thirty (30) seconds, a single loading of the entire sample on a twelve inch (12") diameter, No. 4 sieve nested on top of a twelve inch (12") diameter, No. 8 sieve.

Where a coarse aggregate bin contains material which will pass a three-eighths inch (3/8") sieve and be retained on a No. 8 sieve, the test specimen weight and wash water volume specified for seal coat screenings will be used.

Where a coarse aggregate bin contains material which will pass the maximum size specified and be retained on a three-eighths inch (3/8") sieve, the test specimen weight and volume of wash water specified for one inch x No. 4 aggregate size will be used.

Samples will be obtained from the weigh box area during or immediately after discharge from each bin of the batching plant or immediately prior to mixing with asphalt in the case of continuous mixers.

The Cleanness Value of the test sample from each of the bins will be separately computed and reported.

400-4.4 Storing, Drying, and Screening Aggregates.

Add the following sentence:

When the Contractor adds supplemental fine aggregate, each such supplemental fine aggregate used shall be stored separately and kept thoroughly dry.

Add the following subsections:

400-5 PLANT MIXED CEMENT TREATED BASE.

400-5.1 Mineral Aggregate.

400-5.1 Mineral Aggregate. Mineral aggregate shall be free from adobe, vegetable matter and other deleterious substances. The combined mineral aggregate shall be uniformly graded from coarse to fine and the percentage composition by weight as determined by laboratory sieves, shall conform to the following grading and sand equivalent:

Passing a 1" sieve	90 – 100
Passing a 3/8" sieve	65 – 85
Passing a No. 4 sieve	45 – 65
Passing a No. 30 sieve	15 – 35
Passing a No. 200 sieve	3 - 15
Sand Equivalent	30 minimum

400-5.1.1 Compressive Strength.

400-5.1.1 Compressive Strength. The combined mineral aggregate shall be of such quality that when mixed with Portland Cement in a minimum amount of two percent (2%) by weight of the dry aggregate and compacted with optimum moisture content as determined by ASTM Designation D1557, Method C, the compressive strength of samples of the compacted mixture shall not be less than four hundred pounds per square inch (400 psi) in seven (7) days. The compressive strength of soil cement mixtures shall be determined from specimens fabricated, cured and test as follows:

The mix consisting of aggregate, cement and water shall be compressed into a four-inch diameter (4" Φ) tin liner mounted in a split mold. The compression load shall be two thousand pounds per square inch (2,000 psi) transmitted to the mixture through free moving plungers at the top and bottom of the mold. After the test specimen is removed, it shall be sealed on both ends of the tin liner and cured at room temperature for six (6) days. On the sixth day, the specimen shall be removed from the tin liner and soaked in water for twenty-four (24) hours, then capped with Plaster of Paris and tested for compressive strength.

400-5.1.2 Soundness.

400-5.1.2 Soundness. Not more than three percent (3%) of the material retained on the No. 4 sieve shall be composed of lumps or pieces of materials, which will soften and disintegrate when soaked in water for a period of thirty (30) minutes.

400-5.1.3 Cement and Water.

400-5.1.3 Cement and Water. Portland Cement and water shall conform to the requirements of Subsections **201-1.2 "Materials."** and **201-1.4 "Mixing."** of these specifications.

400-5.1.4 Curing Seal.

400-5.1.4 Curing Seal. Bituminous material to be used as curing seal shall be penetration or mixing type asphaltic emulsion, which shall conform to and be furnished in accordance with the applicable provisions of Subsection **203-3 "EMULSIFIED ASPHALT."** of these specifications.

400-5.1.5 Temperature.

400-5.1.5 Temperature. Aggregate, which has been put through a drier, shall not be used until cooled to a temperature of one hundred twenty degrees Fahrenheit (120° F) or less.

400-5.2 Proportioning.

400-5.2.1 Cement Treated Base Aggregates.

400-5.2.1 Cement Treated Base Aggregates. The aggregates for cement treated base shall be separated into at least two (2) sizes and each size shall be stored separately. One (1) storage facility shall contain aggregate retained on a No. 4 sieve of which not more than twenty percent (20%) shall be finer than a No. 4 sieve. The other storage facility shall contain aggregate of which at least eighty percent (80%) is finer than the No. 4 sieve. If aggregates are separated into more than two (2) sizes, any combination of sizes approved by the Engineer that will meet the grading and other test requirements will be acceptable.

400-5.2.2 Cement.

400-5.2.2 Cement. Cement delivered in sacks from commercial producers will be assumed to weigh ninety-four pounds (94 lbs.) per sack and need not be weighed. Bulk cement or fractional sacks shall be weighed or scaled separate and distinct from the aggregate batching scales. Cement shall be added to the base materials in a manner that will cause the cement to be distributed throughout the coarse or fine aggregate and shall not enter the mixer as a distinct unit separated from the aggregates.

400-5.2.3 Cement Content.

400-5.2.3 Cement Content. The amount of cement to be added to the mineral aggregate shall be a minimum amount of two percent (2%) by weight, of the dry aggregate.

400-5.2.4 Water.

400-5.2.4 Water. The amount of water needed and the number of water trucks required to handle it will vary with the optimum moisture content of the mixture, existing moisture in the soil, rate of evaporation, length of water haul, and rate of processing. Usually a minimum of two trucks will be required to handle water for mixing and finishing. Where the water haul is very long, one or more additional trucks may be necessary. On very large jobs, two or more trucks will be required to handle water for mixing and an additional one for finishing. Weight or volume may proportion water. The quantity of water added to the mixture shall be adjusted to permit maximum compaction by the treated material on the roadbed, as determined ASTM D1557, Method C. The quantity, the rate, and the time of addition of water to the aggregate shall be subject to the approval of the Engineer and all water additions shall be made under conditions, which will permit an accurate determination of the quantity of water added.

END OF 2012 SAN DIEGO REGIONAL SUPPLEMENT TO THE GREENBOOK