2011 CUMULATIVE SUPPLEMENT

TO

"GREENBOOK"

STANDARD SPECIFICATIONS

FOR

PUBLIC WORKS CONSTRUCTION

2009 EDITION

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— PAGE 3 —

REVISE OR ADD THE FOLLOWING DEFINITIONS IN 1-2 TO READ

Service Connection—All or any portion of the conduit cable or duct including meter, between a utility distribution line and an individual consumer.

Service Lateral Connection—The interface of the House Connection Sewer with the host pipe.

— PAGE 4 —

REVISE OR ADD THE FOLLOWING COMMON USAGE TERMS IN 1-3.2 TO READ

ADA ..... Americans with Disabilities Act of 1990 (Public Law 101-336, 104 Sat. 1990, 42 USC 12101-12213 (as amended))

HC ..... House Connection

MSDS ..... Material Safety Data Sheet

PCC ..... Portland Cement Concrete

PRCB ..... Precast Reinforced Concrete Box

SLC ..... Service Lateral Connection

WATCH ..... Work Area Traffic Control Handbook

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ADD NEW SECTION 2-12 TO READ:

2-12 SPECIAL NOTICES. When specified in the Specifications or as directed by the Engineer, any notice required to be given in accordance with this subsection shall be in writing, dated, and signed by the Contractor or the Engineer. Such notices shall be served by any of the following methods:

a) Personal delivery with proof of delivery which may be made by declaration under penalty of perjury by any person over the age of 18 years. The proof of delivery shall show that delivery was performed in accordance with these provisions. Service shall be effective on the date of delivery. Notices given to the Contractor by personal delivery may be made to the Contractor's authorized representative at the Work site; or

b) Certified mail addressed to the mailing address of the recipient postage prepaid; return receipt requested. Service shall be effective on the date of the receipt of the mailing.

Simultaneously, the Agency may send the same notice by regular mail. If a notice that is sent by certified mail is returned unsigned, then delivery shall be effective pursuant to regular mail, provided the notice that was sent by regular mail is not returned.

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REVISE 6-4 TO READ:

6-4 TERMINATION OF THE CONTRACT FOR DEFAULT.

6.4.1 General. If, prior to the acceptance of the Work, the Contractor:

a) becomes insolvent, assigns its assets for the benefit of its creditors, is unable to pay its debts as they become due, or is otherwise financially unable to complete the Work,

b) abandons the Work by failing to report to the Work site and diligently prosecute the Work to completion,

c) disregards written instructions from the Agency or materially violates provisions of the Contract Documents,

d) fails to prosecute the Work according to the schedule approved by the Engineer,

e) disregards laws or regulations of any public body having jurisdiction, or

f) commits continuous or repeated violations of regulatory or statutory safety requirements, then the Agency will consider the Contractor in default of the Contract.

Notices, and other written communications regarding default between the Contractor, the Agency, and the Surety shall be transmitted in accordance with 2-12.

6-4.2 Notice to Cure. The Agency will issue a written notice to cure the default to the Contractor and its Surety. The Contractor shall commence satisfactory corrective actions within 5 Working Days after receipt.

6-4.3 Notice of Termination for Default. If the Contractor fails to commence satisfactory corrective action within 5 Working Days after receipt of the notice to cure, or to diligently continue satisfactory and timely correction of the default thereafter, then the Agency will consider the Contractor in default of the Contract and:

a) will terminate the Contractor's right to perform under the Contract by issuing a written notice of termination for default to the Contractor and its Surety,

b) may use any materials, equipment, tools or other facilities furnished by the Contractor to secure and maintain the Work site, and

c) may furnish labor, equipment, and materials the Agency deems necessary to secure and maintain the Work site.

The provisions of this subsection shall be in addition to all other legal rights and remedies available to the Agency.

6-4.4 Responsibilities of the Surety. Upon receipt of the written notice of termination for default, the Surety shall immediately assume all rights, obligations and liabilities of the Contractor under the Contract. If the Surety fails to protect and maintain the Work site, the Agency may do so, and may recover all costs incurred. The Surety shall notify the Agency that it is assuming all rights, obligations and liabilities of the Contractor under the Contract and all money that is due, or would become due, to the Contractor shall be payable to the Surety as the Work progresses, subject to the terms of the Contract.

Within 15 Working Days of receipt of the written notice of termination for default, the Surety shall submit to the Agency a written plan detailing the course of action it intends to take to remedy the default. The Agency will review the plan and notify the Surety if the plan is satisfactory. If the Surety fails to submit a satisfactory plan, or if the Surety fails to maintain progress according to the plan accepted by the Agency, the Agency may, upon 48 hours written notice, exclude the Surety from the premises, take possession of all material and equipment, and complete the Work in any way the Agency deems to be expedient. The cost of completing the Work by the Agency shall be charged against the Surety and may be deducted from any monies due, or which would become due, the Surety. If the amounts due under the Contract are insufficient for completion, the Surety shall pay to the Agency, within 30 days after the Agency submits an invoice, all costs in excess of the remaining Contract Price.

6-4.5 Payment. The Surety will be paid for completion of the Work in accordance with 9-3 less the value of damages caused to the Agency by acts of the Contractor.

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REVISE 6-5 TO READ:

6-5 TERMINATION OF THE CONTRACT FOR CONVENIENCE. The Board may terminate the Contract if it becomes impossible or impracticable to proceed, because of conditions or events beyond the control of the Agency.

The Agency will issue a written notice of termination for convenience in accordance with 2-12. Upon receipt, the Contractor shall immediately cease work, except work the Contractor is directed to complete by the Engineer or required to complete for public safety and convenience. The Contractor shall immediately notify Subcontractors and suppliers to immediately cease their work.

The Contractor will be paid without duplication for:

a) work completed in accordance with the Contract Documents prior to the effective date of termination for convenience;

b) reasonable costs incurred in settlement of terminated contracts with Subcontractors, suppliers and others; and

c) reasonable expenses directly attributable to termination.

The Contractor shall submit a final termination settlement proposal to the Agency no later than 90 days from the effective date of termination, unless extended, in writing, by the Agency upon written request by the Contractor.

If the Contractor fails to submit a proposal, the Agency may determine the amount, if any, due the Contractor as a result of the termination. The Agency will pay the Contractor the amount it determines to be reasonable. If the Contractor disagrees with the amount determined by the Agency as being reasonable, the Contractor shall provide notice to the Agency within 30 days of receipt of payment. Any amount due shall be as later determined by arbitration, if the Agency and the Contractor agree thereto, or as fixed in a court of law.

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REVISE 7-10 TO READ:

7-10 PUBLIC CONVENIENCE AND SAFETY.

7-10.1 Access.

7-10.1.1 General. The Contractor's operations shall cause no unnecessary inconvenience to the public or businesses in the vicinity of the Work. The Contractor shall have no greater length or quantity of Work under construction than can be properly prosecuted with a minimum of inconvenience to the public and other contractors engaged in adjacent or related work.

The Contractor shall provide continuous and unobstructed access to the adjacent properties unless otherwise specified in the Special Provisions or approved by Engineer. Work requiring traffic lane closures shall only be performed between the hours specified in the Special Provisions or shown on the TCP. Traffic shall be permitted to pass through the Work site, unless otherwise specified in the Special Provisions or shown on the TCP.

7-10.1.1.1 Vehicular Access. Vehicular access to residential driveways shall be maintained to the property line except when necessary construction precludes such access . If backfill has been completed to the extent that safe access may be provided and the street is opened to local traffic, the Contractor shall immediately clear the street and driveways and provide and maintain access.

7-10.1.1.2 Pedestrian Access. Safe, adequate, and ADA compliant pedestrian access shall be maintained unless otherwise approved by the Engineer.

7-10.2 Work Area Traffic Control .

7-10.2.1 General. Work area traffic control shall conform to the California MUTCD, WATCH, or as specified in the Special Provisions. The total length of the traffic control zone shall include a buffer space, advance signing, striping transitions in advance of the Work site, existing striping, signing, and raised medians.

7-10.2.2 Traffic Control Plan.

7-10.2.2.1 General. If so specified in the Special Provisions or on the permit, the Contractor shall submit a TCP in accordance with 2-5.3.

The sheets of the TCP shall display the title, phase identification, name of the firm preparing the TCP, name and stamp of the Registered Traffic or Civil Engineer, approval block for each jurisdictional agency, north arrow, sheet number, and number of sheets comprising the TCP. General notes and symbol definitions shall be included when required. Adequate dimensioning shall be provided to allow for proper field installation.

The TCP shall be drawn to a 1 inch = 40 feet scale on common size sheets, either 8-1/2 inches x 11 inches, 8-1/2 inches x 14 inches, 11 inches x 17 inches, or 2-foot x 3-foot plan sheets as dictated by the length of the Work.

The requirements in the Special Provisions shall govern the design of the proposed TCP.

7-10.2.2.2 Payment. Payment for preparation of the TCP shall be included in the appropriate lump sum Bid items. If no Bid items have been provided, payment shall be included in the various Bid items unless otherwise specified in the Special Provisions.

7-10.3 Haul Routes. Unless otherwise specified in the Special Provisions, the haul route(s) shall be determined by the Contractor.

7-10.4 Safety.

7-10.4.1 Work Site Safety.

7-10.4.1.1 General. The Contractor shall provide safety measures as necessary to protect the public and workers within, or in the vicinity of, the Work site. The Contractor shall ensure that its operations will not create safety hazards.

The Contractor shall provide safety equipment, material, and assistance to Agency personnel so that they may properly inspect all phases of the Work.

When asbestos is being removed, the requirements of the CCR Title 8, Div. 1, Chapter 4, Subchapter 4 and Subchapter 7 shall be implemented.

7-10.4.1.2 Work Site Safety Official. The Contractor shall designate in writing a "Project Safety Official" who shall be at the Work site at all times, and who shall be thoroughly familiar with the Contractor's Injury and Illness Prevention Program (IIPP) and Code of Safe Practices (CSP). The Project Safety Official shall be available at all times to abate any potential safety hazards and shall have the authority and responsibility to shut down an unsafe operation, if necessary.

7-10.4.2 Safety Orders.

7-10.4.2.1 General. The Contractor shall have at the Work site, copies or suitable extracts of Construction Safety Orders, Tunnel Safety Orders, and General Industry Safety Orders issued by the State Division of Industrial Safety.

Prior to beginning any excavation 5 feet in depth or greater, the Contractor shall submit to the Engineer, the name of the "Competent Person" as defined in CCR, Title 8, Section 1504, in accordance with 2-5.3. The "Competent Person" shall be present at the Work site as required by Cal-OSHA.

7-10.4.2.2 Shoring Plan. Before excavating any trench 5 feet (1.5m) or more in depth, the Contractor shall submit in accordance with 2-5.3 a detailed working drawing (shoring plan) showing the design of the shoring, bracing, sloping, or other provisions used for the workers' protection . If the shoring plan varies from the shoring system standards, the shoring plan shall be prepared by a registered Structural or Civil Engineer. The shoring plan shall accommodate existing underground utilities. No excavation shall start until the Engineer has accepted the shoring plan and the Contractor has obtained a permit from the State Division of Industrial Safety. A copy of the permit shall be submitted to the Engineer in accordance with 2-5.3. If the Contractor fails to submit a shoring plan or fails to comply with an accepted shoring plan, the Contractor shall suspend work at the affected location(s) when directed to do so by the Engineer. Such a directive shall not be the basis of a claim for Extra Work and the Contractor shall not receive additional compensation or Contract time due to the suspension.

7-10.4.2.3 Payment. Payment for shoring shall be included in the Bid item provided therefor. Payment for compliance with the provisions of the safety orders and all other laws, ordinances, and regulations shall be included in the various Bid items.

7-10.4.3 Use of Explosives. Explosives may be used only when authorized in writing by the Engineer, or as otherwise specified in the Special Provisions.

Explosives shall be handled, used, and stored in accordance with all applicable regulations.

Prior to blasting, the Contactor shall comply with the following requirements:

a) The jurisdictional law enforcement agency shall be notified 24 hours in advance of blasting.

b) The jurisdictional fire department shall be notified 24 hours in advance of blasting.

c) Blasting activities and schedule milestones shall be included in the Contractor's construction schedule per 6-1.

For a Private Contract, specific permission shall be obtained from the Agency in writing, prior to any blasting operations in addition to the above requirements.

The Engineer's approval of the use of explosives shall not relieve the Contractor from liability for claims caused by blasting operations.

7-10.4.4 Hazardous Substances . An MSDS as described in CCR, Title 8, Section 5194, shall be maintained at the Work site for all hazardous material used by the Contractor.

Material usage shall be accomplished with strict adherence to California Division of Industrial Safety requirements and all manufacturer warnings and application instructions listed on the MSDS and on the product container label.

The Contractor shall notify the Engineer if a specified product cannot be used under safe conditions.

7-10.4.5 Confined Spaces.

7-10.4.5.1 Confined Space Entry Program (CSEP). The Contractor shall be responsible for implementing, administering and maintaining a CSEP in accordance with CCR, Title 8, Sections 5156, 5157 and 5158.

Prior to the start of the Work, the Contractor shall prepare and submit a CSEP in accordance with 2-5.3. The CSEP shall address all potential physical and environmental hazards and contain procedures for safe entry into confined spaces such as the following:

a) Training of personnel

b) Purging and cleaning the space of materials and residue

c) Potential isolation and control of energy and material inflow

d) Controlled access to the space

e) Atmospheric testing of the space

f) Ventilation of the space

g) Special hazards consideration

h) Personal protective equipment

i) Rescue plan provisions

The submittal shall include the names of the Contractor's personnel, including each Subcontractor's personnel, assigned to the Work that will have CSEP responsibilities, their CSEP training, and their specific assignment and responsibility in carrying out the CSEP.

7-10.4.5.2 Permit-Required Confined Spaces. Entry into permit-required confined spaces as defined in CCR, Title 8, Section 5157 may be required as a part of the Work. Manholes, tanks, vaults, pipelines, excavations, or other enclosed or partially enclosed spaces shall be considered permit-required confined spaces until the pre-entry procedures demonstrate otherwise. The Contractor shall implement a permit-required CSEP prior to performing any work in a permit-required confined space.

A copy of the permit shall be available at all times for review by the Contractor and the Engineer at the Work site.

7-10.4.5.3 Payment. Payment for the CSEP shall be included in the Bid items for which the CSEP is required.

7-10.5 Security and Protective Devices.

7-10.5.1 General. Security and protective devices shall consist of fencing, steel plates, or other devices as specified in the Special Provisions to protect open excavations.

7-10.5.2 Security Fencing. The Contractor shall completely fence open excavations. Security fencing shall conform to 304-3.5. Security fencing shall remain in place unless workers are present and construction operations are in progress during which time the Contractor shall provide equivalent security.

7-10.5.3 Steel Plate Covers. The Contractor shall provide steel plate covers as necessary to protect from accidental entry into openings, trenches, and excavations.

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REVISE 9-3.2 TO READ:

9-3.2 Partial and Final Payment. The Engineer will, after award of the Contract, establish a closure date for the purpose of making monthly progress payments. The Contractor may request in writing that such monthly closure date be changed. The Engineer may approve such request when it is compatible with the Agency's payment procedure.

Each month, the Engineer will make an approximate measurement of the work performed to the closure date and as a basis for making monthly progress payments, estimate its value based on Contract Unit Prices or in accordance with 9-2. When the Work has been satisfactorily completed, the Engineer will determine the quantity of work performed and prepare the final estimate.

From each progress payment, not less than 5 percent will be deducted and retained by the Agency. The Agency will withhold not less than 5 percent of the total Contract amount until acceptance of the Work.

If so specified in the Special Provisions, from each progress payment, 10 percent will be deducted and retained by the Agency, and the remainder less the amount of all previous payments will be paid. After 50 percent of the Work has been completed and if progress on the Work is satisfactory, the deduction to be made from remaining progress payments and from the final payment may be limited to $500 or 10 percent of the first half of total Contract amount, whichever is greater.

No progress payment made to the Contractor or its Sureties will constitute a waiver of the liquidated damages specified in 6-9.

Pursuant to Section 22300 of the Public Contract Code, the Contractor may substitute securities for any monies withheld by the Agency to ensure performance under the Contract.

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ADD 200-3 TO READ:

200-3 NOT USED

ADD 200-4 TO READ:

200-4 LEAN CONCRETE BASE (LCB).

200-4.1 General. LCB shall consist of a mixture of:

a) portland cement,
b) aggregate,
c) water, and
d) at the option of the Contractor, water reducing and/or air-entraining admixtures.

The proportions of portland cement, water and other materials shall be determined by the Contractor.

The Contractor shall submit a mix design with laboratory results in accordance with 2-5.3.4. The mix design shall show the amount and type of portland cement, and the amount of water, the aggregate grading and source, and the type and manufacturer of any proposed admixtures.

The amount of portland cement shall not to exceed 300 lbs/yd^3 (178 kg/m^3). The compressive strength, when tested in conformance with California Test 548, shall be a minimum of 700 psi (4.8 MPa) at 7 days.

200-4.2 Materials.

200-4.2.1 Portland Cement. Portland cement shall be Type II/V conforming to 201-1.2.1, added at a rate of 270 lbs/yd^3 (160 kg/m^3). SCMs shall not be substituted for portland cement.

200-4.2.2 Aggregate.

200-4.2.2.1 General. Aggregate shall conform to 200-2. Should the Contractor change the source or grading, the Contractor shall notify the Engineer, in writing, of the new source or grading. The Contractor shall make the aggregate available for sampling and testing at least 45 days prior to its intended use.

The 1-1/2 inch (38mm) maximum or the 1 inch (25mm) maximum may be used. Once a grading is selected, the grading shall not be changed without the Engineer's written approval.

200-4.2.2.2 Gradation. The combined aggregate gradation for the grading selected shall conform to Table 200-4.2.2.1(A). The percentage retained shall be determined by California Test 202, modified by California Test 105 when there is a difference in specific gravity of 0.2 or more between the coarse and fine aggregate.

TABLE 200-4.2.2.1(A)

Sieve Sizes	Percent Passing[1]			
	1-1/2" (37.5 mm) Maximum		1" (25.0mm) Maximum	
	Moving Average[2]	Individual Test Results	Moving Average[2]	Individual Test Results
2" (50.0 mm)	100	100	---	---
1 ½" (37.5 mm)	90 -100	87-100	100	100
1" (25.0 mm)	—	—	90 – 100	87 – 100
3/4" (19.0 mm)	50 – 85	45 – 90	50 – 100	45 – 100
3/8" (9.5 mm)	40 – 75	35 – 80	40 – 75	35 – 80
No. 4 (4.75 mm)	25 – 60	20 – 65	35 – 60	30 – 65
No. 30	10 – 30	6 – 34	10 – 30	6 – 34
No. 200	0 – 12	0 – 15	0 – 12	0 – 15

1. Coarse aggregate is material retained on the No. 4 (4.75 mm) sieve and fine aggregate is material passing the No. 4 (4.75 mm) sieve.
2. Statistical testing shall conform to 400-1.1.3 as modified in 301-4.6.2.

200-4.2.2.3 Sand Equivalent. Aggregate shall not be treated with lime, portland cement or other chemicals before being tested. Aggregate shall have a sand equivalent value of not less than that shown in Table 200-4.2.2.2(A).

TABLE 200-4.2.2.2(A)

Moving Average[1]	**30**
Individual Test Results	**27**

1. Statistical testing shall conform to 400-1.1.3 as modified in 301-4.6.2.

If the test results of the tests for either or both aggregate grading and sand equivalent tests do not meet the requirements specified for the "moving average" but meet the "individual test" requirements, placement of the LCB may be continued for the remainder of the working day. Work shall not resume until tests indicate that the aggregate to be used complies with the requirements specified for the "moving average."

No single aggregate grading or sand equivalent test shall represent more than 500 yd^3 (400 m^3) or one day of production, whichever is smaller.

200-4.2.3 Water. Water shall conform to 201-1.2.3.

200-4.2.4 Chemical Admixtures. Chemical admixtures shall conform to 201-1.2.4. Water reducing admixtures shall be Type A or Type F.

The air content of LCB shall not exceed 4 percent. An air-entrainment reducing admixture shall be used when aggregate is produced from reclaimed material containing asphalt or other material which would cause the air content to exceed 4 percent.

200-4.3 Proportioning, Mixing and Transporting. Proportioning shall conform to 201-1.3, except that the dividing of aggregate into sizes will not be required and the slump shall not exceed 3 inches (75mm).

Mixing and transporting shall conform to 201-1.4 and 201-1.5.

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REVISE LAST ROW IN TABLE 201-1.1.2(A) TO READ:

Type of Construction	Concrete Class[7, 8, 9] U.S. Standard Measures (Metric Units)	Alternate Class U.S. Standard Measures (Metric Units)	Maximum Slump Inches (Millimeters)
Coarse Masonry Grout	610-E-2000G[4] (360-E-14G[4])	610-EF-2000G[4] (360-EF-14G[4]) 580-EFW-2000G[4] (345-EFW-14G[4])	10 (250) 10 (250)

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REVISE TABLE 201-1.1.2(A) FOOTNOTES 1-7 TO READ:

1. Concrete mixes followed by a "P" have been designed to accommodate placement by a concrete pump. A pump mix may be substituted for a similar class or alternate class mix and placed utilizing standard placement methods by the Contractor at its option. Said substitution, if made, shall be at the Contractor's expense.
2. Use B aggregate gradation when placing conditions permit.
3. Use limited to bedding concrete over which backfill will be placed not less than 40 hours after placement. For backfill after 24 hours, add 3 pints per 100 pounds of cement (31 milliliters per kilogram of cement) of calcium chloride. For backfill after 16 hours and r moval of

sheeting after 18 hours, use 660-C-3750 (390-C-26) with 3 pints per 100 pounds of cement (31 milliliters per kilogram of cement) calcium chloride solution.
4. Concrete mixes followed by a "G" have been designed to accommodate the grout requirements of 202. Water-reducing admixtures shall not be used with masonry grout aids.
5. A water reducing admixture conforming to 201-1.2.4 may be used in any concrete specified by class and is required in all 4000 psi (28 MPa) compressive strength concrete specified by class.
6. Fibers conforming to 201-2.3 may be used in any concrete specified by class.
7. Color conforming to 303-7 may be used in any concrete specified by class.

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ADD 201-1.6 TO READ:

201-1.6 Pervious Concrete.

201-1.6.1 General.

201-1.6.2 Materials.

201-1.6.3 Mix Design.

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REVISE 201-5.2 TO READ:

201-5.2 Cement. Portland cement shall conform to 201-1.2.1.

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REVISE 202 TO READ:

SECTION 202 – MASONRY MATERIALS

202-1 BRICK.

202-1.1 General. Brick shall be whole, sound, hard, burned, give a clear ringing sound when struck together, and be uniform in quality. Brick shall be culled or sorted before delivery to the Work site. Mortar used in brick construction shall be Class "D" conforming to 202-3.1. Grout used in brick construction shall conform to 202-3.2. Fine grout shall be used in spaces less than 2 inches (50 mm) clear in any dimension. Coarse grout shall be used in spaces 2 inches (50 mm) or larger in all horizontal directions.

202-1.2 Manhole Brick. Sewer manhole brick shall conform to ASTM C 62, Grade MW, modified as follows:

a) The average compressive strength of 5 bricks shall not be less than 4,000 psi (28 MPa) and the compressive strength of any individual brick shall not be less than 3,500 psi (24 MPa).

b) The absorption of any individual brick shall not be more than 16 percent when submerged 24 hours in cold water.

c) Dimensions shall conform to the following:

TABLE 202-1.2 (A)

	Depth inches (mm)	Width inches (mm)	Length inches (mm)
Standard Size	2-1/2 (64)	3-7/8 (98)	8-1/4 (210)
Allowed Variation	± 1/4 (± 6)	± 3/8 (± 10)	± 1/2 (± 13)

d) Plaster for brick sewer structures shall be Class "D" mortar conforming to 201-5.1.

202-1.3 Building Brick. Building brick shall conform to ASTM C62 Grade MW. The size and texture shall be as shown on the Plans, as specified in the Special Provisions or as approved by the Engineer.

202-1.4 Facing Brick. Facing brick shall conform to ASTM C216, Grade MW, Type FBS. The size, color, and texture shall be as shown on the Plans, as specified in the Special Provisions or as approved by the Engineer.

202-2 CONCRETE BLOCK.

202-2.1 General. Mortar used in concrete block construction shall be Class "D" or "E" conforming to 202-3.1. Grout used in concrete block construction shall conform to 202-3.2. Fine grout shall be used in spaces less than 4 inches (100 mm) clear in any dimension. Coarse grout shall be used in spaces 4 inches (100 mm) or larger in all horizontal directions.

202-2.2 Masonry Units. Masonry units shall be made with sand-gravel aggregate and conform to ASTM C90. The net size of the units shall be as indicated on the Plans. Unless otherwise specified in the Special Provisions, all units shall be of the normal weight classification [oven-dry weight of concrete 125 pounds per cubic foot (2000 kg/m3) or more].

202-3 Mortar, Grout, and Water.

202-3.1 Mortar. Mortar shall be as specified in 201-5.1 to which 1/4 to 1/2 part hydrated lime or lime putty has been added to portland cement mixtures. Mortar shall attain a minimum compressive strength of 1,800 psi (13 MPa) in 28 days when tested in accordance with ASTM C109.

202-3.2 Grout.

202-3.2.1 General.

a) Grout shall attain a minimum compressive strength of 2,000 psi (14 MPa) in 28 days.

b) Grout shall be tested in accordance with ASTM C1019, Sampling and Testing Grout.

202-3.2.2 Site-Mixed Grout.

a) Site-mixed grout shall be proportioned by volume.

b) Fine grout shall be 1 part portland cement and 2-1/4 to 3 parts sand to which 1/10 part hydrated lime may be added.

c) Coarse grout used in brick construction shall be 1 part portland cement, 2 to 3 parts sand, and not more than 2 parts No. 4 Concrete Aggregate.

d) Coarse grout used in concrete block construction shall be 1 part portland cement, 2 to 3 parts sand, and 1-3/4 to 2 parts No. 4 Concrete Aggregate.

202-3.2.3 Ready-Mixed Grout.

a) Ready mixed grout shall conform to 201-1.

b) Fine grout shall consist of a minimum of 750 pounds per cubic yard (445 kg per cubic meter) of portland cement, sand, and sufficient water to achieve a 10-inch (250 mm) slump. Admixtures may be used as specified in the Special Provisions or as approved by the Engineer.

c) Coarse grout shall conform to Table 201-1.1.2 (A) for "Coarse Masonry Grout."

202.-3.3 Water. Water shall conform to 201-1.2.3. The quantity of water to be used in the preparation of the mortar or grout shall be the minimum required to produce a mixture sufficiently workable for the purpose intended.

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REVISE 203-6.1 TO READ:

203-6 ASPHALT CONCRETE.

203-6.1 General. Asphalt concrete shall be the product of mixing mineral aggregate and a maximum of 15 percent reclaimed asphalt pavement (RAP) with paving asphalt conforming to 203-1 at a central mixing plant. Asphalt concrete containing greater than 15 percent RAP shall conform to 203-7. RAP shall conform to 203-7.2.2, except the viscosity of the paving asphalt recovered from the RAP in accordance with ASTM D1856 (Abson Recovery Method) will not be required. The content of the paving asphalt recovered from the RAP, if required in the Special Provisions, shall be determined in accordance with California Test 382.

Asphalt concrete shall be designated by class and grade (i.e., "C2-PG 64-10"). Asphalt concrete containing up to 15 percent RAP shall be identified by adding the suffix "RAP" to the class and grade (i.e., "C2-PG 64-10 "RAP"").

REVISE 203-6.2 TO READ:

203-6.2 Job Mix Formula (JMF) and Mix Designs. The Contractor shall submit in accordance with 2-5.3 a JMF that summarizes each asphalt concrete mix design for each class and grade of asphalt concrete required to construct the Work. The JMF shall identify the source and individual grading of each material used to produce the mix design (including the percentage and individual gradation of any manufactured or natural sands), the combined aggregate gradation, the optimum binder content (OBC), void content, RAP percentage, stability value, plant identification, mix number, and the source and performance grade of the paving asphalt. Upon request, the asphalt concrete mix design test data represented by the JMF shall be immediately made available to the Engineer.

The asphalt concrete mix design method shall be Hveem with the OBC determined by California Test 367. The combined aggregate gradation shall be uniformly graded from coarse to fine when tested in accordance with ASTM C136 and C117 or California Test 202. The target S value, at the OBC, for the mix design shall be at least 2 points above the minimum specified in Table 203-6.4.3(A). The mix design shall meet the requirements of Table 203-6.4.3(A) for the class specified on the Plans or in the Special Provisions. These values will be used for mix design only.

When the mix design is more than 30 days old, the JMF shall be supplemented with a mix certificate that shows that the combined aggregate gradation is +/- 3 percent from the referenced mix design based upon a 30 day moving average or a minimum of the 10 most current test results. If the combined aggregate gradation does not meet the previously submitted JMF by +/- 3 percentage points on any sieve even though it may be within the target values or if the source of any aggregate is changed, grade of binder is changed, or the mix design is over 2 years old, a new mix design shall be prepared and a new JMF shall be submitted to the Engineer for approval. Samples shall be obtained from the bins for batch-type plants. Individual samples shall be obtained from under the feeders for drum-type plants.

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REVISE 206-6.9 TO READ:

206-6.9 Security Fencing. Security fencing shall be 5 feet (1.5m) high. Security fencing material shall be chain link fabric or welded wire fabric (6x6-W9xW9 minimum) and constructed using:

a) Tensioned fencing material with top and bottom tension wires securely fastened to driven steel posts or other equally rigid elements at a maximum spacing of 12 feet (3.7m); or

b) Untensioned fencing materials securely fastened to extended trench shoring elements at a maximum spacing of 8 feet (2.4m) and fastened to continuous top and bottom rails including toe plates constructed of nominal 2-inch x 4-inch (50mm x 100mm) lumber or equally rigid material.

Framed panels with suitable supporting elements fastened together to form a continuous fence may also be used.

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REVISE THE FIRST SENTENCE OF 209-5.8.2.4 TO READ:

209-5.8.2.4 Sealants. Sealants shall be packaged in containers clearly labeled "detector loop sealant" and the label shall include the batch and lot number of the manufacturer. The sealant for filling slots shall conform to one of the following:

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REVISE FIRST PARAGRAPH OF 211-2 TO READ:

211-2 CHEMICAL RESISTANCE (PICKLE JAR) TEST. This test is used to determine the physical properties and weight change of material specimens used in sewers after exposure to chemical solutions. Specimens of composite materials shall be seal coated on 2 adjacent edges of their 4 edges and not seal coated on the inner or outer surface. Specimens of non-composite materials shall not be seal coated. Test specimens shall be conditioned in a mechanical convection oven for 7 days at a constant weight and at a temperature of 110° F ± 3° F (43° C ± 3° C) and subsequently cooled for 3 hours in a desiccator. This conditioning shall be performed before and after submersion of the test specimens in the solutions specified in Table 211-2 (A) for a period of 28, 56, 84 and 112 days at 77° F ± 5° F (25° C ± 3° C). Test specimens shall be provided as follows, unless otherwise approved by the Engineer.

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ADD SUBPARAGRAPHS a) AND b) FOLLOWING THE FIRST PARAGRAPH OF 211-2 TO READ:

a) Specimens For Non-Composite Materials - Provide 55 each ASTM D638 specimens and 164 each ASTM D543 specimens measuring 1 inch x 3 inches x 0.125 inch thick (25mm x 76mm x 3mm).

b) Specimens For Composite Materials - Provide 55 each ASTM D638 specimens and 164 each ASTM D543 specimens measuring 1 inch x 3 inches x 0.125 inch to 0.25 inch thick (25mm x 76mm x 3mm to 6mm).

The allowable percent weight gain or loss for these specimens shall be as specified for the respective type of material.

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REVISE TABLE 211-2 (A) TO READ:

TABLE 211-2 (A)

Chemical Solution	Concentration[1]	Tolerance	Check Concentration	Replace Chemical Solution
Sulfuric Acid (H_2SO_4)	20%	±0.1%	NA[2]	NA
Sodium Hydroxide (NaOH)	5%	±0.2%	56 days	When < 4.8%
Ammonium Hydroxide (NH_4OH)	5%	±1.0%	28 days	When < 4.0%
Nitric acid (HNO_3)	1%	±0.1%	28 days	When Turbid
Ferric Chloride ($FeCl_3$)	1%	±0.2%	28 days	When Turbid
Sodium Hypochlorite (NaOCl)	1%	±0.1%	NA	28 days
Soap	0.10%	NA	NA	28 days
Detergent (Linear alkyl benzyl sulfonate or LAS)	0.10%	NA	NA	28 days
Bacteriological (BOD)	≥ 700 ppm	NA	NA	7 days

1. Volume percentages – Actual concentration of reagent must be corrected to 100%.
2. NA – Not Applicable.

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ADD NEW PARAGRAPH FOLLOWING TABLE 211-2 (A) TO READ:

If required by the type of material and the manufacturer, specimens thicker than 0.25 inch (6 mm) will be accepted and evaluated. The same number of ASTM D638 AND D543 specimens, as specified in 211-2a or 211-2b above, will be required. The allowable weight change value for the 112-day test period for these thicker specimens shall conform to the values in Table 211-2 (B).

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ADD THE FOLLOWING TABLE 211-2 (B) AND PARAGRAPHS TO READ:

TABLE 211-2 (B)

Thickness of Sample Inches (mm)	Weight Change 1,2
0.375 (9.5)	± 0.75 %
0.50 (12.7)	± 0.63 %
0.75 (19.1)	± 0.50 %
1.0 (25.4)	± 0.44 %
1.5 (38.1)	± 0.38 %

1. With respect to initial test results.
2. Allowable percent weight gain or loss for the thickness between the designated values can be a straight line interpretation.

If required by the type of material being evaluated, additional size and quantity specimens may be required in order to meet the testing and ASTM specifications in the Section for the material.

Five of the ASTM D638 specimens and 16 of the ASTM D543 specimens for the type of material being tested shall be submersed in each of the 9 solutions listed in Table 211-2 (A). At 28-day intervals, 4 specimens shall be removed from each chemical solution, tested for weight change and the percent weight gain or loss shall be recorded. Required physical property testing shall be obtained at 0 and 112 days. The chemical strength of each solution shall be tested and

replaced if not in compliance with the required values shown in Table 211-2 (A). If any specimen fails to meet the 112-day requirement specified for the material being tested before completion of the 112-day exposure, the material will be rejected.

The Contractor shall furnish a Certificate of Compliance conforming to 4-1.5, signed by an authorized representative of the testing laboratory, identifying the product, the test results for each of the 9 solutions and confirming conformance with the Specifications. Supporting test data shall be furnished upon request by the Engineer.

The chemical resistance test is a qualification test only. Requalification is required only when the compound formulation changes.

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ADD NEW SECTION 215 TO READ:

SECTION 215 NOT USED

— PAGE 250 —

ADD NEW SECTION 216 TO READ:

SECTION 216 – PRECAST REINFORCED CONCRETE BOX

216-1 GENERAL. These specifications cover materials for single-cell precast reinforced concrete box (PRCB) sections intended for the conveyance of storm water.

The span, rise, and design earth cover, shall be as shown on the Plans or specified in the Special Provisions.

Three sets of prints of the PRCB layout diagrams and 2 sets of shop drawings shall be submitted to the Engineer in accordance with 2-5.3, except one reproducible print of the layout diagrams will not be required. The layout diagrams will be used by the Engineer for reference only, and their use shall in no way relieve the Contractor for its responsibility for accuracy. The Engineer may waive the PRCB layout diagrams requirement.

216-2 MATERIALS.

216-2.1 Portland Cement Concrete (PCC). PCC for PRCB sections shall have a compressive strength of 5000 psi minimum and conform to 201-1.1.4 unless otherwise specified in the Special Provisions.

PCC shall conform to the following:

a) Portland cement shall conform to 201-1.2.1.

b) Aggregate shall conform to the reactivity requirements specified in 201-1.2.2.

c) The combined aggregate gradation shall include aggregate of 3/4 inch (18mm) maximum diameter unless otherwise approved by the Engineer.

d) Water shall conform to 201-6.2.3.

e) Chemical admixtures shall conform to 201-1.2.4.

f) Cementitious material(s) shall be Portland cement or Portland cement and fly ash.

g) The water-cementitious material(s) ratio shall not exceed 0.53 by weight.

h) Proportioning shall conform to 201-1.3.

i) Mixing shall conform to 201-1.4.

216-2.2 Fly Ash. Fly ash shall be Class F conforming to 201-1.2.5 unless otherwise specified in the Special Provisions.

216-2.3 Reinforcement.

216-2.3.1 Deformed Welded Wire Reinforcement. The diameter of any deformed wire in finished deformed welded wire reinforcement shall conform to ASTM A496 or AASHTO M32 or M221. Deformed welded wire reinforcement shall conform to ASTM A497 or AASHTO M55 or M221.

216-2.3.2 Deformed Bars. Deformed bars shall be Grade 60, billet-steel bars conforming to 201-2.2.1.

216-2.4 Leveling Bed Material. Leveling bed material shall be sand, crushed aggregate or crushed miscellaneous base, native free-draining granular material having a sand equivalent of not less than 30, or the material specified in the Special Provisions.

216-3 FABRICATION.

216-3.1 General. PRCB sections shall be fabricated as shown on the Plans or Standard Plans.

PRCB sections of greater strength than that specified may be furnished at the Contractor's option, and at its own expense. The interior surfaces of PRCB sections shall be smooth.

216-3.2 Joints. Joints for PRCB sections shall be fabricated with tongue and groove ends.

Outer cage transverse reinforcement shall be placed in the top and bottom slabs at the groove portion of the joint.

216-3.3 Reinforcement.

216-3.3.1 General. Reinforcement shall be deformed welded wire reinforcement conforming to 216-2.3.2 or deformed bars conforming to 216-2.3.3 unless otherwise specified in the Special Provisions. Other details shall be as shown on the Plans or Standard Plans.

Before reinforcement is placed it shall be free of mortar, oil, dirt, excessive mill scale and scabby rust, and any other coating of any nature that would destroy or reduce its ability to bond.

216-3.3.2 Area of Steel Reinforcement. The area of steel reinforcement shall be as shown on the Plans or Standard Plans. Steel areas greater than those shown on the Plans or Standard Plans shall not exceed 25 percent, unless the Engineer is provided with calculations verifying that the required ductile response is maintained. The calculations shall be prepared by a Registered Civil or Structural Engineer and submitted to the Engineer in accordance with 2-5.3.

If deformed steel bars are used, the steel area shall be increased to account for the difference in steel yield strength, steel spacing, concrete cover, and crack control between the welded wire reinforcement and steel bars.

216-3.3.3 Placement. Reinforcement placement shall conform to the details shown on the Plans or Standard Plans. Reinforcement shall be firmly and securely held in position by wiring at intersections and splices and by using plastic or ferrous metal chairs, spacers, metal hangers supporting wires, or other devices of sufficient strength to resist crushing under applied loads. Wooden or

aluminum supports shall not be used. Placement on layers of fresh concrete as the work progresses will not be permitted. Tack welding of reinforcing bars will not be permitted.

Welded wire fabric shall be rolled flat before placing concrete, unless otherwise shown on the Plans or Standard Plans.

216-3.3.4 Splicing. Splices in reinforcing bars shall be constructed using lap splices.

Splicing of reinforcing bars will not be permitted at locations shown on the Plans or Standard Plans as a "No-Splice Zone." At the option of the Contractor, reinforcing bars may be continuous at locations where splices are shown on the Plans or Standard Plans. The locations of splices, except where shown on the Plans or Standard Plans, shall be determined by the Contractor.

Unless otherwise shown on the Plans or Standard Plans, splices in adjacent reinforcing bars at any particular section shall be staggered. The minimum distance between staggered lap splices or mechanical lap splices shall be the same as the length required for a lap splice in the largest bar.

216-3.4 Curing.

216-3.4.1 General. Curing shall be for a length of time sufficient for the PCC to develop the specified compressive strength in 28 days or less. Any one of the following methods of curing or combinations thereof may be used:

a) Steam Curing.

Steam curing shall conform to ASTM C1433 (C1433M). PRCB sections shall be low pressure, steam-cured by a system capable of maintaining a moist atmosphere.

b) Water Curing.

Water curing shall conform to ASTM C1433 (C1433M). PRCB sections shall be kept moist continuously.

c) Membrane Curing.

A sealing membrane conforming to ASTM 309 shall be applied and left intact until the specified PCC compressive strength is attained. The temperature of the PCC at the time of application of the membrane shall be within ± 100F (± 60C) of the atmospheric temperature. All surfaces shall be kept moist prior to the application of the membranes and shall be damp when the membrane is applied.

216-3.5 Forms. Forms shall have sufficient rigidity to be capable of maintaining section dimensions within the permissible tolerances. Form surfaces which will come into contact with PCC shall be constructed of smooth non-porous material.

216-3.6 Lifting Holes or Devices. Lifting holes or devices may be cast into, or attached to, PRCB sections. Shop drawings shall be submitted in accordance with 2-5.3.3 if so specified in the Special Provisions.

216-4 TESTING REQUIREMENTS.

216-4.1 Test Specimens. Test specimens shall conform to 201-1.1.5 as modified to allow the use of Section 11 of ASTM C497 or AASHTO T280. The Engineer shall be notified before testing is started.

216-4.2 Compression Testing of Cylinders.

216-4.2.1 General. Compression testing of cylinders shall conform to 201-1.1.5. A minimum of 3 test cylinders shall be prepared from each PCC mix used for each lot of PRCB sections. A production lot for PRCB shall be the lesser of one day's production, 400 feet (120m) or 50 units.

216-4.2.2 Acceptance. When the average compressive strength of all cylinders tested is equal to or greater than the specified compressive strength of the PCC, and not more than 10 percent of the cylinders tested have a compressive strength less than the specified compressive strength, and no cylinder tested has a compressive strength less than 80 percent of the specified compressive strength, the lot will be accepted.

When the compressive strength of the cylinders tested does not conform to the aforementioned acceptance criteria, acceptance of the lot shall be determined in accordance with 216-4.3.

216-4.3 Compression Testing of Cores.

216-4.3.1 General. Cores shall be obtained and tested for compressive strength in accordance with 201-1.1.5.

216-4.3.2 Core Holes. Core holes shall be plugged and sealed using high-strength, non-shrink grout. The compressive strength of the repaired core holes shall meet or exceed the compressive strength requirements of the PRCB section.

216-5 PERMISSIBLE VARIATIONS.

216-5.1 Internal Dimensions. Internal dimensions shall not vary more than 1 percent from the dimensions shown on the Plans or Standard Plans. The haunch dimensions shall not vary more than 1/4 inch (6mm) from the dimensions shown on the Plans or Standard Plans.

216-5.2 Slab and Wall Thickness. Slab and wall thicknesses shall not be less than that shown on the Plans or Standard Plans by more than 5 percent or 3/16 inch (5mm), whichever is greater. A thickness greater than that shown on the Plans or Standard Plans will not be a cause for rejection.

216-5.3 Length of Opposite Surfaces. The length of opposite surfaces shall not vary more than 1/8 inch/foot of internal span. The maximum variation shall not exceed 5/8 inch (15mm) for all sizes through an internal span of 7 feet (2100mm), and 3/4 inch (18mm) for an internal span greater than 7 feet (2100mm), except where beveled ends for laying of curves are specified.

216-5.4 Length of Section. The under-run in length shall not be more than 1/8 inch/foot of length with a maximum of 1/2 inch (12mm) in any PRCB section.

216-5.5 Position of Reinforcement. The maximum variation in the position of the reinforcement for slab and wall thicknesses of 5 inches (125mm) or less shall be ± 3/8 inch (9 mm), and for thicknesses greater than 5 inches (125mm) shall be ± 1/2 inch (12mm).

The cover over the reinforcement shall not be less than 5/8 inch (15mm), as measured to the internal surface or the external surface of the slab except as follows. The cover over the reinforcement for the external surface of the top slab for PRCB sections with less than 2 feet (600mm) of cover shall not be less than 1-5/8 inches (40mm). The aforementioned minimum cover limitations do not apply at the mating surfaces of a joint.

Hooks and bends shall conform to ACI 318.

216-6 MARKINGS. The following information shall be legibly marked on each PRCB section by indentation or waterproof paint:

a) PRCB section span,

b) rise,

c) table number,

d) maximum and minimum design earth cover,

e) specification designation,

f) interior invert cover,

g) date of manufacture, and

h) the word "top" lettered on the inside top surface.

216-7 CAUSES FOR REJECTION. Inspection of PRCB as may be deemed necessary by the Engineer will be made at the place of manufacture. Individual PRCB sections may be rejected due to any of the following unless repairs are made and approved by the Engineer:

a) Fractures or cracks with widths exceeding 0.10 inch (3mm).

b) Mixing and molding defects, honeycombed or open texture that would adversely affect the function of the PRCB section,

c) Failure to meet the permissible variations specified in 216-5.

d) Exposure of any reinforcement arising from misplacement thereof.

216-8 BASIS OF ACCEPTANCE. The basis of acceptance shall be by one of the following as specified in the Special Provisions:

a) Compliance with these Specifications, inspection of the manufacturing, and inspection of the completed PRCB sections.

b) Acceptance of a Certificate of Compliance conforming to 4-1.5.

Such acceptance, however, shall be considered a tentative acceptance. Final acceptance will only be made when the Work is completed.

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REVISE 301-4 TO READ:

301-4 LEAN CONCRETE BASE (LCB).

301-4.1 General. This subsection specifies the methods to be used to place LCB conforming to 200-4.

301-4.2 Subgrade. Immediately prior to placement, the subgrade shall conform to 301-1. The subgrade shall be free of loose or extraneous material and shall be sufficiently dampened to ensure that no water is absorbed from the LCB.

301-4.3 Placement. Placement shall conform to 302-6.3.

Unless otherwise required by the Plans or the Special Provisions, LCB shall be placed in widths of not less than 12 feet (4m) separated by construction joints. LCB placed monolithically in widths greater than 26 feet (8m) shall be placed with a longitudinal weakened plane joint offset not more than

3 feet (1m) from the centerline of the width being constructed. Longitudinal weakened plane joints shall conform to 302-6.5.4.

When PCC pavement is to be placed over LCB, longitudinal construction joints and longitudinal weakened plane joints in the LCB shall not be within 1 foot (300mm) of longitudinal weakened plane joints nor longitudinal construction joints in the PCC pavement.

Areas of the subgrade that are lower than the grade established on the Plans shall be filled with LCB.

LCB shall not be mixed nor placed while the atmospheric temperature is below 35° F (2° C), and shall not be placed on frozen ground.

301-4.4 Spreading, Compacting and Shaping. Spreading, compacting, and shaping shall conform to 301-3.3.

In advance of curing operations, LCB to be surfaced with asphalt concrete pavement shall be textured with a drag strip of burlap, a broom, or a spring steel tine device capable of producing scoring in the finished surface. The scoring shall be parallel with or transverse to the centerline.

LCB to be surfaced with PCC pavement shall not be textured and shall be finished to a smooth surface, free of mortar ridges and other projections, before curing compound is applied.

The finished surface of LCB shall be free from porous areas and not vary at any point more than 5/8 inch (16mm) above or below the grade shown on the Plans.

301-4.5 Curing. LCB shall be cured with a pigmented curing compound conforming to 201-4. Curing compound shall be applied to areas to be surfaced with PCC pavement in 2 separate applications. Each application shall be applied at a rate of approximately 1 gal/150 ft^2 (1L/4 m^2).

Curing compound shall be applied before the atmospheric temperature falls below 40° F (40 C).

Areas to be covered with PCC pavement that are not covered by the fourth day after the curing compound is applied shall be given a subsequent application (or applications, if necessary) so that each application occurs no more than 4 days in advance of placing the overlying PCC pavement. LCB surfaces shall be cleaned of all foreign material prior to the application of curing compound.

Curing compound shall be applied at a rate of approximately 1 gal/200 ft^2 (1L/5 m^2) for each subsequent application.

Damage to the curing compound or the LCB shall be promptly repaired by the Contractor at the Contractor's expense, as directed by the Engineer.

301-4.6 Acceptance.

301-4.6.1 Material. LCB will be tested for acceptance in accordance with 201-1.1.5.

301-4.6.2 Placement.

301-4.6.2.1 Surfaces Not Within Tolerance. Hardened LCB with a surface lower than 5/8 inch (16mm) below the grade shown on the Plans shall be removed and replaced with LCB, or if permitted by the Engineer, low areas shall be filled with paving material as follows:

a) When the surface pavement is PCC, low areas shall be filled with PCC at the time and in the same operation the PCC pavement is placed.

b) When the surface pavement is asphalt concrete, the low areas shall be filled with asphalt concrete at the time and in the same operation that asphalt concrete pavement is placed.

Hardened LCB with a surface higher than 5/8 inch (16mm) above the grade shown on the Plans shall be removed and replaced with LCB, or if permitted by the Engineer, high areas may be ground until the surface conforms to the tolerances specified in 301-4.4. Grinding shall be performed with diamond blade or carborundum blade grinding equipment. Ground areas to be surfaced with PCC pavement shall be cleaned of all foreign material and grinding residue as soon as all free water has left the surface. Curing compound conforming to 301-4.5 shall be applied at a rate of approximately 1 gal/150 ft^2 (1L/4 m^2).

301-4.7 Measurement. LCB will be measured by the cubic yard (cubic meter). The volume will be calculated on the basis of the dimensions shown on the Plans adjusted by the amount of any change approved by the Engineer. LCB used to fill depressed areas of subgrade will not be measured for payment.

301-4.8 Payment. Payment for LCB will be made at the Contract Unit Price per cubic yard (cubic meter).

No separate payment will be made for bringing the surface of the LCB within tolerance. Payment will be considered as included in the Contract Unit Price paid per cubic yard (cubic meter).

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REVISE 302-5.6.2 TO READ:

302-5.6.2 Density and Smoothness. Asphalt concrete pavement shall be true to grade and cross section. When a 10-foot (3m) straightedge is laid on the finished surface parallel to the centerline of the roadway, the finished surface shall not vary from the edge of the straightedge more than 1/8 inch (3mm), 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. If the paving material has cooled below the lower limits of the spreading temperatures prescribed in 302-5.5 or 302-9.4, the surface of the pavement shall be brought to a true grade cross section. The paving material in the area to be repaired shall be removed, by cold milling, to provide a minimum laying depth of 1 inch (25mm), or 2 times the maximum size aggregate, whichever is greater, of the new pavement at the join line. Repairs shall not be made to the pavement surface by tapering the thickness at the join lines.

The compaction after rolling shall be 95 percent of the density obtained on samples compacted with the California Kneading Compactor per California Test 304. The density shall be determined in accordance with California Test 308, Method A. Method C may be used if the absorption of the compacted specimen is less than 2 percent.

The field density of compacted asphalt concrete shall be determined by:

a) A properly calibrated nuclear asphalt testing device in the field, or

b) California Test 308, Method A when slabs or cores are taken for laboratory testing.

In case of dispute, method b) (above) shall be used.

Paved areas not to be subject to vehicular traffic shall be compacted to 90 percent of the density determined as specified above.

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REVISE 307-7.2.2.4 TO READ:

302-7.2.2.4 Calibration Procedure. The calibration procedure shall be as follows:

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REVISE 303-8.1 TO READ:

303-8.1 General. Pervious concrete shall conform to 201-1.6. Pervious concrete shall be constructed a minimum of 6 inches (150mm) thick, unless otherwise specified in the Special Provisions or shown on the Plans.

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ADD CHAIN LINK FENCE CROSS REFERENCE IN 304-1 TO READ:

Chain Link Fence.....206-6

— PAGE 352 —

ADD NEW SECTION 304-3.5 TO READ:

304-3.5 Security Fencing. Security fencing shall conform to 206-6.9, the Plans, and the Special Provisions. Security fencing shall completely enclose all open excavations and remain in place until backfill has been placed to the approximate level of the adjacent ground.

304-3.5.1 Payment. Unless otherwise specified in the Special Provisions, payment for security fencing shall be included in the various Bid items that require security fencing.

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ADD NEW SECTION 306-1.7 TO READ:

306-1.7 Precast Reinforced Concrete Box.

306-1.7.1 General. These specifications cover the construction of single-cell precast reinforced concrete box (PRCB) sections intended to be used for the conveyance of storm water. The PRCB sections shall conform to 216.

306-1.7.2 Repairs. PRCB sections damaged due to imperfections in fabrication or handling shall be repaired by a method approved by the Engineer.

306-1.7.3 Subgrade. Subgrade material shall be densified to 90 percent relative compaction. Unsuitable subgrade material shall be removed to the depth shown on the Plans or determined by the Engineer and replaced with leveling bed material. Voids below subgrade shall be filled with leveling bed material prior to densification.

306-1.7.4 Leveling Bed Material. Leveling bed material shall conform to 216-2.4 and be densified to 90 percent relative compaction.

306-1.7.5 Installation. PRCB shall be laid up-grade with the groove ends up-grade unless otherwise approved by the Engineer. Connections shall be made as shown on the Plans or Standard Plans or as specified in the Special Provisions.

At the close of work each day, or whenever the work ceases for any reason, each end shall be securely closed as approved by the Engineer.

306-1.7.5.1 Tongue-and-Groove Joints. Tongue and groove joints shall be constructed in accordance with 306-1.2.4 (b) modified as follows:

a) Only one end shall be beveled for PRCB sections placed on curves.

b) Concrete used to fill clear spaces more than 1 inch (25mm) and less than 3 inches (75mm) shall be 560-C-3250 (330-C-23) or Class C mortar conforming to 201-5 unless otherwise specified in the Special Provisions.

Preformed flexible joint sealant conforming to ASTM C990 or AASHTO M198 may be used. Preformed flexible joint sealant shall be installed in accordance with the manufacturer's specifications on the tongue and groove, in order to fill the joint annular space on the inside of the PRCB section. Flexible plastic gaskets shall not be used on PRCB pulled to provide a curve.

Preformed flexible joint sealant bands conforming to ASTM C877 may be used, in conjunction with mastic or mortar, when installed in accordance with the manufacturer's specifications.

306-1.7.5.2 Structure Backfill. Structure backfill shall conform to 300-3.5.1. Structure backfill material shall be placed 12 inches (300mm) from the top and 24 inches (600mm) from each side.

306-1.7.6 Measurement. PRCB will be measured for payment along the longitudinal axis between the ends laid for each size. The length shall include the actual length of the PRCB in place but it shall not include the inside dimensions of structures.

306-1.7.7 Payment. Payment shall conform to 306-1.6. Payment for additional leveling bed material shall conform to 3-3 unless otherwise specified in the Special Provisions.

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REVISE 500-1.13 TO READ:

500-1.13 Spiral Wound Polyvinyl Chloride (PVC) Pipe Liner.

500-1.13.1 General. Spiral wound PVC pipe liner for use in the rehabilitation of circular and non-circular pipelines shall be a PVC profiled strip with a continuously sealed spiral joint. The profile may include steel reinforcing if so specified on the Plans or in the Special Provisions. The profiled strip is wound into the liner shape shown on the Plans to a size ranging from 6 inches through 15 feet (150mm through 4.6m). The profile may be designated as "Type 1" or "Type 2" on the Plans or in the Special Provisions. Type 1 is expandable to fit against the host pipe wall. Type 2 is installed with a fixed dimension, requiring annular space grouting between the liner and the existing host pipe. An end seal shall be provided at each manhole. Installation shall be in accordance with ASTM F1741 as modified herein.

500-1.13.2 Material Composition. The profiled strip shall be made from PVC compounds conforming to ASTM F1697, Section 5. The gasket and/or sealing material shall be as recommended by the manufacturer and shall be submitted in accordance with 2-5.3. When so specified in the Special Provisions, the steel reinforcing strip shall be fabricated from steel conforming to ASTM F1697,

Section 5.2. When so specified in the Special Provisions, annular space grout shall be self leveling and consolidating. Structural grout shall be of sufficient strength to support all required loads.

500-1.13.3 Material Acceptance. The material shall consist of a ribbed PVC profiled strip with interlocking, sealed edges, gasket material and steel reinforcing strip, if required. The edges lock together as the strip is wound into a pipe. The profiled strip shall have shaped ribs which vary in height and width as specified in ASTM F1697. The Contractor shall submit, in accordance with 2-5.3, a Certificate of Compliance that states that the PVC profiled strip material, gasket material, and the steel reinforcing strip conforms to ASTM F1697 and the requirements of the Plans and Special Provisions. The grout shall conform to ASTM F1741, the Plans and the Special Provisions.

500-1.13.4 Marking. Each PVC profiled strip shall be distinctively marked on its inside surface at intervals not to exceed 30 feet (9 m) measured longitudinally along the profiled strip with a coded number which identifies the manufacturer, plant, date of manufacture and shift, cell classification and profile type. This information shall also appear on each reel.

500-1.13.5 Chemical Resistance. The PVC profiled strip, gasket, end seals, sealants, and other material exposed to the sewer environment, as determined by the Engineer, shall be tested in accordance with 211-2 and, conform to the weight change requirements of Table 207-17.5(A).

500-1.13.6 Installation and Field Inspection. The existing pipeline shall be cleaned and televised in accordance with 500-1.1.4 and 500-1.1.5. When so specified in the Special Provisions, the existing pipeline may be inspected and televised by the man-entry method. The condition of the cleaned pipeline shall be approved by the Engineer prior to the installation of the liner pipe.

During this phase of operation all service openings shall be precisely located longitudinally and radially, and logged for subsequent reconnection after the installation of the liner pipe.

At the time of installation, the profiled strip material shall be homogeneous and free of defects, cracks, holes, blisters, or foreign materials.

The installed spiral wound PVC pipe liner shall be inspected and televised in accordance with 500-1.1.4 and 500-1.1.5 or by the man-entry method if so specified in the Special Provisions.

Spiral wound PVC pipe liner shall be of uniform appearance, undamaged, free of cracks, holes, unsealed joints, and shall be installed according to the manufacturer's recommendations and in accordance with ASTM F1741. End seals shall conform to 500-1.1.7, subparagraph e.

500-1.13.7 Connections. Connections for Type 1 liners shall be re-established in accordance with 500-1.1.7, subparagraph a.

The Contractor shall submit the data listed in 500-3.1.10, subparagraphs a through i, for the structural grout in accordance with 2-5.3.

The procedure for re-establishing service lateral connections for Type 2 liners shall be submitted to the Engineer in accordance with 2-5.3. This procedure shall include the method of blocking the service connections during grouting and the sleeving system to be used between the liner and the host pipe. The sleeving system shall conform to 500-3 and be submitted to the Engineer in accordance with 2-5.3.

500-1.13.8 Annular Space Grouting. Annular space grouting shall conform to ASTM F1741, Section 6.5. The utilization of structural or non-structural grout shall be as specified in the Special Provisions.

A structural grout mix design shall be submitted to the Engineer in accordance with 2-5.3 and shall have a minimum compressive strength of 5000 psi in 28 days when tested in accordance with ASTM

C39. The submittal shall include the data listed in 500-3.1.10, subparagraphs a through j, l and o, for structural grout .

Non-structural grout material shall conform to 500-3.

The entire annular space shall be grouted. Grout penetration shall be verified by the Contractor. The method of verifying the penetration of the grout shall be submitted to the Engineer in accordance with 2-5.3.

500-1.13.9 Repair. The Contractor shall submit a repair method to the Engineer in accordance with 2-5.3 for any profile strips or liner pipe found to be damaged during or after installation, or if grouting deficiencies are encountered.

500-1.13.10 Measurement and Payment.

500-1.13.10.1 Measurement. Spiral wound PVC pipe liner shall be measured by the linear foot of pipe lined, or by lump sum. Re-establishment of service connections shall be measured by each or by lump sum.

500-1.13.10.2 Payment. Payment for spiral wound PVC liner pipe shall be made at the Contract Unit Price, or lump sum, as specified in the Bid.

Payment for re-establishing service connections shall be made at the Contract Unit Price, or lump sum, as specified in the Bid.

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ADD 500-4 TO READ:

500-4 SERVICE LATERAL CONNECTION SEALING.

500-4.1 General. This subsection specifies various SLC sealing systems, and methods of installation. The type of sealing systems and methods to be used shall be as shown on the Plans or specified in the Special Provisions. Unless otherwise specified in the Special Provisions, proof of compliance with the Chemical Resistance Test specified in 211-2 using the weight change specified in Table 500-4.1 (A) shall be submitted to the Engineer in accordance with 2-5.3.

SLC sealing systems shall consist of either a cured-in-place resin saturated felt or fiberglass lining material and tube installed in an existing mainline and HC. Dry or unsaturated areas are not acceptable. The lining material and tube shall be sized such that when installed they are properly aligned, tight fitting and without wrinkles. SLC sealing systems shall be manufactured so as to provide smooth tapered edges after curing. The curing method and schedule shall be submitted to the Engineer in accordance with 2-5.3. The cured SLC sealing system shall meet or exceed the specifications in Table 500-4.1 (A).

TABLE 500-4.1 (A)

Property	ASTM Test Method	Initial. PSI (MPa)
Flexural Strength	D790	3,000 (20.7)
Flexural Modulus	D790	250,000 (1,724)
Tensile Strength	D638	3,000 (20.7)
Tensile Modulus	D638	250,000 (1,724)
Weight Change[1]	-	±1.5%

1. Tested in Conformance with 211-2

Bonding materials used with SLC sealing systems shall be compatible with the existing mainline and HC or with the lining system used in the mainline and HC, and shall be submitted in accordance with 2-5.3.

500-4.2 Requirements.

500-4.2.1 Installer Qualifications. The installer shall be certified by the manufacturer of the SLC sealing system. Personnel installing the SLC sealing system shall be adequately trained in maintenance and operation of the required installation equipment. A letter from the manufacturer of the SLC sealing system, verifying the certification of the installer, shall be submitted in accordance with 2-5.3. The installer shall be on site at all times during installation.

Prior to installation, the Contractor shall submit a detailed installation plan to the Engineer in accordance with 2-5.3. This installation plan shall provide verification of compliance with the physical properties specified in Table 500-4.1 (A), the manufacturer's specified curing time, chemical composition and a detailed description of the SLC sealing system.

500-4.2.2 Cleaning, Inspection, and Surface Preparation. Prior to the installation of the SLC sealing system, the HC, SLC and mainline shall be prepared, as specified by the manufacturer, to produce a surface that is suitable for application of the specified sealing system. Cleaning methods shall be as specified by the manufacturer of the SLC sealing system and submitted to the Engineer in accordance with 2-5.3. Cleaning and surface preparation shall include CCTV inspection of the mainline and HC for locating any damage or leaks. CCTV inspection shall conform to 500-1.1.5. The HC's shall be inspected 16 inches (400 mm) beyond the end of the proposed lining unless otherwise specified in the Special Provisions. Any protrusions on the surface of the mainline and HC that could interfere with the installation of the SLC sealing system shall be removed. All roots larger than 1/8 inch (3 mm) shall be removed during the cleaning operation, and any damage or leaks shall be reported to the Engineer. Flow bypassing, if required, shall conform to 7-8.5.2, 7-8.5.3 and 306-3.3.

Debris from the cleaning operation shall not be allowed to enter the sewer system. The Contractor shall furnish, install and remove any necessary debris containment devices while maintaining sewer flow. The Contractor shall remove and dispose of all debris collected from the cleaning operation in accordance with 500-1.1.4.

500-4.3 Repair and Active Infiltration.

500-4.3.1 General. Material used to repair active infiltration shall be compatible with the SLC sealing system and mainline lining material. Proof of compatibility shall be submitted to the Engineer in accordance with 2-5.3.

500-4.3.2 Active Infiltration. Active infiltration shall be eliminated by pressure grouting with chemical grout as specified by the SLC system manufacturer or specified in the Special Provisions. Upon the completion of pressure grouting, if required, the area to be sealed shall be visibly clean with no excess grout prior to lining.

500-4.4 Field Inspection Testing and Repair of Installed SLC Sealing Systems.

500-4.4.1 General. The Contractor shall submit information on the equipment to be used in testing installed SLC sealing systems to the Engineer in accordance with 2-5.3.

500-4.4.2 CCTV Inspection. After the installation is complete, the Contractor shall perform CCTV inspection in accordance with 500-1.1.5.

500-4.4.3 Adhesion Testing. Adhesion testing shall be performed on each SLC seal installed. The Contractor shall notify the Engineer 24 hours prior to performing adhesion testing, if the

Engineer cannot be on site during testing, the Contractor shall videotape the test at each seal and shall submit the videotape to the Engineer in accordance with 2-5.3.

Adhesion testing shall be conducted after the SLC seal has cured in accordance with manufacturer's specifications and before the final video inspection is performed. Adhesion testing shall consist of inserting a high velocity, hydraulic cleaning type, 360 degree spinning nozzle and CCTV camera in the mainline pipe and positioning the nozzle at the SLC seal. The water from the nozzle shall be directed downstream for a minimum of 1 minute, at each edge of the SLC seal in the mainline at the minimum pressure of 1500 psi (10 MPa) and minimum flow rate of 65 gpm (246 liters per minute).

500-4.4.4 Air Pressure Test. Unless otherwise specified in the Special Provisions, cured SLC sealing systems shall be air pressure tested. A test plug shall be placed adjacent to the upstream and downstream end of the SLC sealing system in the mainline and adjacent to the upstream end in the HC Sewer. The test pressure shall be 4 psi (0.3 MPa) for a 3 minute test time during which the pressure shall not drop below 3.5 psi (0.2 MPa). If the SLC sealing system fails this test, the test plug in the HC Sewer may be moved onto the SLC seal and the test conducted again. If the second test passes, the SLC sealing system will be deemed to have passed the test.

500-4.4.5 Repairs of Sealing Systems. If the SLC sealing system fails either the adhesion or the second air pressure test, the Contractor shall remove and replace or repair the SLC sealing system as recommended by the manufacturer and approved by the Engineer.

500-4.5 Full Wrap "T-Style" SLC Sealing System.

500-4.5.1 General. This subsection specifies a full wrap "T-style" SLC sealing system.

500-4.5.2 Sealing Material. The sealing material shall consist of a cured-in-place resin saturated felt tube that provides a full-wrap tube in the mainline centered at the HC, with a tube section extended into the HC. The length of the tube section in the mainline and in the HC shall be as specified in the Special Provisions.

500-4.5.3 Installation and Curing. Installation shall conform to Section 7.0 of ASTM F2561. The installation method shall provide an air-tight seal of the SLC sealing system to the mainline pipe and HC Sewer as specified by the manufacturer and shall be submitted to the Engineer in accordance with 2-5.3. Prior to installation, the felt tube shall be saturated with resin at the Work site and stored at the temperature specified by the resin manufacturer. After installation, the felt tube shall be cured as specified by the resin manufacturer. The method of curing shall be submitted to the Engineer in accordance with 2-5.3.

500-4.6 "Brim Style" SLC Sealing System.

500.4.6.1 General. This subsection specifies a "brim style" SLC sealing system.

500.4.6.2 Sealing Material. The sealing material shall consist of a cured-in-place resin saturated fiberglass or felt material that provides a brim section in the mainline with the brim centered around the HC with a tube section extended in the HC. The length of the tube section in the HC and the size of the brim section in the mainline shall be as specified in the Special Provisions.

500.4.6.3 Installation and Curing. The fiberglass or felt material and tube shall be saturated with resin at the Work site or at the factory and stored at the temperature specified by the resin manufacturer. The resin saturated SLC sealing system shall be loaded on an applicator apparatus, attached to a robotic device and positioned in the mainline at the HC to be sealed. The robotic device shall be equipped with a CCTV camera which shall be used to align and center the SLC sealing system within the HC opening. The applicator apparatus shall include a bladder or an approved mechanical device of sufficient length in the mainline and HC such that the inflated bladder or approved mechanical device extends beyond the end of the SLC seal. The insertion pressure shall be adjusted to fully deploy the SLC sealing system in the HC and to hold the ends of the SLC seal against the pipe walls. The SLC sealing system shall produce a smooth transition between the SLC seal and the pipe walls without a ridge or gap between the SLC seal and the inner diameter of the mainline and HC. The insertion pressure shall be maintained for the duration of the curing process. Curing shall be as specified by the resin manufacturer. The method of curing shall be submitted to the Engineer in accordance with 2-5.3.

500-4.7 Measurement and Payment.

500-4.7.1 Measurement. SLC sealing systems shall be measured by "each".

500-4.7.2 Payment. Payment for SLC sealing systems will be made at the Contract Unit Price or lump sum price in the Bid for each SLC. The Contract Unit Price or lump sum price in the Bid shall include the installation of the SLC sealing system, surface preparation and repairs, preparation and tape submittal of all pre- and post-construction CCTV inspection, bypassing if required, and testing, unless otherwise specified in the Special Provisions.