

# PUBLIC WORKS STANDARDS, INC. – GREENBOOK COMMITTEE

## MEETING AGENDA -

### JUNE 16, 2022

**Presiding:**

1. **Called to Order:**
2. **Self-Introduction:**
3. **Establish a Quorum:** (minimum 13 voting members, including 1 public utility member and 1 contractor)
4. **Distribute Agenda-** via TEAMS invite
5. **Approval of Minutes: May 19, 2022**
6. **Correspondence –**
  - Committee chair names updated on Greenbook Site with the following:
    - Secretary** = Bill Mahoney
    - Vice Chair – Editorial** = Charles Chen
    - Vice Chair – Communications** = Charles Chen
    - General Provisions** = Dan Peterson
    - Special Provisions** = **TBD**
    - Editorial Standards** = Charles Chen
    - Street Lighting & Traffic Signal Systems** = Irene Chia
    - Landscaping & Irrigation** = David Gallagher
    - Greenbook Retention** = Edward Arrington

- Editorial Standards Committee reviewed and approved Change No. 314 SM – Coarse Aggregate Gradation. This change is now ready for Greenbook Committee Review.

PUBLIC WORKS STANDARDS, INC. - GREENBOOK COMMITTEE

ACTIVE CHANGE SUBMITTAL LOG														
LATEST REVISION: 06/09/22														
SM = Surface Materials, SP = Standard Plans, UM = Underground Materials														
email change # assigned to Requestor, Lance Grindle, Dan Peterson and Bill Mahoney														
Change No.	Subsection(s) or Std Plan(s)	Date Proposal Received	Subject	Submitted by Name/ Agency <small>(Sponsorship required only for new or major changes)</small>	Subcommittee Action			Editorial Standards Review		Greenbook Committee Action				
					Assigned to	ACTION		Date	Date	Date	ACTION		Date	GB Edition
						A	R		Submitted	Returned	A	R		
314 SM	Table 200-1.4(B) 2018 ED.	04/15/21 3/40/2024	Coarse Aggregate Gradation	Nathan Forrest Orange County Public Works	CA-SM	x		4/19/2022	5/16/2022	6/9/2022				

- BNI emailed Section 203-6 (Asphalt Concrete), of the 2021 Greenbook to Erik Updyke.
- BNI emailed copy of Change order log to Catherine Dungca

7. **Old Business:**
8. **New Business:**
  - a) APWA Co-Chairman’s Report: ..... Lance Grindle
  - b) Secretary’s Report: ..... Bill Mahoney

c) Vice Chair Communication Report: ..... Charles Chen

d) Vice Chair Editorial Report: ..... Charles Chen

**Greenbook Subcommittees:**

e) Surface Materials and Methods Subcommittee Report: ..... Vinh Tran

f) Underground Materials and Methods Subcommittee Report:..... Gean Na

g) Standard Plans Subcommittee Report: ..... Temo Galvez / Alex Salazar

h) General Provisions Subcommittee Report ..... Dan Peterson

i) Editorial Standards Subcommittee Report ..... Charles Chen

j) Greenbook Retention Subcommittee Report..... Edward Arrington

k) Landscaping and Irrigation Subcommittee Report ..... David Gallaher

l) Street Lighting and Traffic Systems Subcommittee Report ..... Phil Phan / Irene Chia

m) Other New Business:

**9. General Discussion:**

**10. Next meeting: July 21, 2022**

**11. Adjourn:**

Proposed Revision To: <input checked="" type="checkbox"/> <b>Standard Specifications For Public Works Construction</b> <input type="checkbox"/> <b>Standard Plans For Public Works Construction</b>	<b>Change No. 314</b> <span style="border: 1px solid red; padding: 2px;">SM</span>  (ASSIGNED BY GREENBOOK COMMITTEE)
Public Works Standards, Inc. c/o Associated General Contractors of California Los Angeles District Office 1906 West Garvey Avenue, Suite No. 100 West Covina, California 91760	<b>Date Proposal Received</b>  March 10 <sup>th</sup> , 2021  (ASSIGNED BY GREENBOOK COMMITTEE)
<b>Subsection or Standard Plan to be revised: Table 200-1.4(B)</b> <b>On page(s): 46 (2018 Ed.)</b>	
<b>Warning:</b> Public Contract Code §3400 prohibits any local agency specification that limits bidding, directly or indirectly, to any one specific concern or product. If this revision describes a proprietary or patented product, it must identify other products which equally perform the functions of the proprietary or patented product.	
<b>Revision:</b> See attached.	
<b>Reason For Revision:</b> Table 200-1.4(B) describes the required coarse aggregate gradations for Portland Cement Concrete. Currently, for No. 3 gradation, this Greenbook table requires a minimum of 8% passing the 3/8" sieve, spec. range = 8-20, while ASTM and Caltrans allow for 0%.  Orange County Public Works staff performed a thorough review of previously-submitted concrete mixes going back to 2012 (approximately 3,100 samples) and found that 35% of the samples failed the 3/8" sieve specification. 60% of those failures show less than 8 percent passing the 3/8" sieve.  It is very difficult for aggregate producers to prepare coarse aggregates that pass at least 8% of the material through the 3/8 sieve, while simultaneously passing less than 5% through the No. 4 sieve.  For those reasons, it is proposed to update the limits in the table to reflect those found in ASTM C33 as well as those allowed by Caltrans and make the percent passing tolerance 0 to 20% - see attached supporting documentation.	
Submitted By: <u>Concrete Ad-Hoc / Nathan Forrest</u> Phone No: <u>520-235-0480</u> Agency: <u>OC Public Works (Sponsor)</u> Address: <u>1152 E. Fruit St. Santa Ana, CA 92701</u>	
<b>Instructions:</b> Use a separate form for each revision. Attach plain paper if more space is needed. For minor changes, copy present wording striking out words to be deleted and <u>underlining</u> new text. For major changes, rewrite or add paragraph or sections. All proposed revisions must include the reason(s) for the revision.	
<b>Subcommittee Action:</b> On <u>4/19/2022</u> (Date) <input type="checkbox"/> Recommended For _____ Supplement/Edition <input type="checkbox"/> Rejected <span style="color: red;">■</span> As Modified	<b>Editorial Standards Subcommittee Review:</b> On <u>6/9/2022</u> (Date) <input type="checkbox"/> Reviewed For Surf/Und/Spec/Plans Subcommittee <input checked="" type="checkbox"/> NO Modifications <input type="checkbox"/> As Modified
<b>Greenbook Committee Action:</b>  On _____ (Date) <input type="checkbox"/> Approved For _____ Supplement/Edition <input type="checkbox"/> As Modified <input type="checkbox"/> Rejected	

TABLE 200-1.4 (A)

Tests	Tests Method No.	Requirements
Cleanness Value	California 227	75 Minimum
Percentage Wear	ASTM C131	15 Maximum
100 revolutions		52 Maximum
500 revolutions		2.58 Minimum <sup>1</sup>
Specific Gravity (Bulk saturated surface dry)	ASTM C127	

1. Not more than 15 percent by weight shall be particles with a bulk specific gravity below 2.50.

2. Moving Average calculated in accordance with 211-5; no individual test result used shall be less than 71.

Concrete aggregate will be designated by number and shall conform to the following gradations:

TABLE 200-1.4 (B)

Sieve Size	Percentage Passing Sieve		
	No. 2	No. 3	No. 4
2" (50 mm)	100	-	-
1-1/2" (37.5 mm)	90-100	100	-
1" (25.0 mm)	5-40	90-100	-
3/4" (19.0 mm)	0-15	55-85	100
3/8" (9.5 mm)	0-5	8-20	85-100
No. 4 (4.75 mm)	-	0-5	0-30
No. 8 (2.36 mm)	-	0-5	0-10
No. 200 (75 µm)	0-2	0-2	0-2
ASTM C131 Test Grading	A	B	C

### 200-1.5 Sand.

**200-1.5.1 General.** Sand shall consist of natural or manufactured granular material, or a combination thereof, free of deleterious amounts of organic material, mica, loam, clay, and other substances not suitable for the purpose intended.

**200-1.5.2 Sand for Asphalt Concrete.** The sand shall conform to the gradation specified for asphalt concrete in 200-1.5.5.

**200-1.5.3 Sand for Portland Cement Concrete.** Sand for Portland cement concrete shall be washed and shall conform to the gradation specified for Portland cement concrete in 200-1.5.5 and the following quality requirements:

TABLE 200-1.5.3

Tests	Test Method No.	Requirements
Organic Impurities	ASTM C40	Satisfactory <sup>1</sup>
Sand Equivalent	California 217	75 Minimum
Moving Average <sup>3</sup>		75 Minimum
Soundness <sup>2</sup> (%)	California 214	10 Maximum

1. The resultant color of the testing solution shall not be darker than the ASTM C40 standard.

2. The soundness requirement will be waived, provided that the durability index, Df, is 60 or greater, when determined by California Test 229.

3. Moving Average calculated in accordance with 211-5; no individual test result used shall be less than 70.

**TABLE 3 Grading Requirements for Coarse Aggregates**

Size Number	Nominal Size (Sieves with Square Openings)	Amounts Finer than Each Laboratory Sieve (Square-Openings), Mass Percent													
		100 mm (4 in.)	90 mm (3½ in.)	75 mm (3 in.)	63 mm (2½ in.)	50 mm (2 in.)	37.5 mm (1½ in.)	25.0 mm (1 in.)	19.0 mm (¾ in.)	12.5 mm (½ in.)	9.5 mm (¾ in.)	4.75 mm (No. 4)	2.36 mm (No. 8)	1.18 mm (No. 16)	300 µm (No. 50)
1	90 to 37.5 mm (3½ to 1½ in.)	100	90 to 100	...	25 to 60	...	0 to 15	...	0 to 5	...	...	...	...	...	...
2	63 to 37.5 mm (2½ to 1½ in.)	...	...	100	90 to 100	35 to 70	0 to 15	0 to 5	...	...	...	...	...	...	...
3	50 to 25.0 mm (2 to 1 in.)	...	...	...	100	90 to 100	35 to 70	0 to 15	...	0 to 5	...	...	...	...	...
357	50 to 4.75 mm (2 in. to No. 4)	...	...	...	100	95 to 100	...	...	...	10 to 30	0 to 5	...	...	...	...
4	37.5 to 19.0 mm (1½ to ¾ in.)	...	...	...	...	100	90 to 100	20 to 55	0 to 15	...	0 to 5	...	...	...	...
467	37.5 to 4.75 mm (1½ in. to No. 4)	...	...	...	...	100	95 to 100	...	35 to 70	...	0 to 5	...	...	...	...
5	25.0 to 12.5 mm (1 to ½ in.)	...	...	...	...	...	100	90 to 100	20 to 55	0 to 10	0 to 5	...	...	...	...
56	25.0 to 9.5 mm (1 to ¾ in.)	...	...	...	...	...	100	90 to 100	40 to 85	10 to 40	0 to 15	0 to 5	...	...	...
57	25.0 to 4.75 mm (1 in. to No. 4)	...	...	...	...	...	100	95 to 100	...	25 to 60	0 to 10	0 to 5	...	...	...
6	19.0 to 9.5 mm (¾ to ¾ in.)	...	...	...	...	...	...	100	90 to 100	20 to 55	0 to 15	0 to 5	...	...	...
67	19.0 to 4.75 mm (¾ in. to No. 4)	...	...	...	...	...	...	100	90 to 100	...	0 to 10	0 to 5	...	...	...
7	12.5 to 4.75 mm (½ in. to No. 4)	...	...	...	...	...	...	...	100	90 to 100	0 to 15	0 to 5	...	...	...
8	9.5 to 2.36 mm (¾ in. to No. 8)	...	...	...	...	...	...	...	...	100	40 to 70	0 to 10	0 to 5	...	...
89	9.5 to 1.18 mm (¾ in. to No. 16)	...	...	...	...	...	...	...	...	100	85 to 100	0 to 10	0 to 5	0 to 5	0 to 5
9 <sup>A</sup>	4.75 to 1.18 mm (No. 4 to No. 16)	...	...	...	...	...	...	...	...	...	100	10 to 40	5 to 30	0 to 10	0 to 5

<sup>A</sup> Size number 9 aggregate is defined in Terminology C125 as a fine aggregate. It is included as a coarse aggregate when it is combined with a size number 8 material to create a size number 89, which is a coarse aggregate as defined by Terminology C125.

**SECTION 90**

**CONCRETE**

1. Fine aggregate sampled at the completion of processing at the aggregate production plant had a sand equivalent value of at least 82 when tested under California Test 217
2. Prequalification tests performed under California Test 549 showed that the aggregate would develop a relative strength of at least 95 percent and have a relative shrinkage of no more than 105 percent based on concrete

**90-1.02C(4) Aggregate Gradation**

**90-1.02C(4)(a) General**

Proposed aggregate gradations must be within the percentage passing limits shown in the following table:

Primary aggregate nominal size	Sieve size	Limits of gradation (% passing)
1-1/2 x 3/4 inch	1 in	19-41
1 inch x No. 4	3/4 in	52-85
1 inch x No. 4	3/8 in	15-38
1/2 inch x No. 4	3/8 in	40-78
3/8 inch x No. 8	3/8 in	50-85
Fine aggregate	No. 16	55-75
Fine aggregate	No. 30	34-46
Fine aggregate	No. 50	16-29

The Engineer may waive, in writing, the specifications for gradation if in the Engineer's opinion furnishing the gradation is not necessary for the work.

**90-1.02C(4)(b) Coarse Aggregate Gradation**

Coarse aggregate must be graded within the limits shown in the following table for each size of coarse aggregate:

Sieve size	Primary aggregate nominal sizes							
	1-1/2 x 3/4 inch		1 inch x No. 4		1/2 inch x No. 4		3/8 inch x No. 8	
	Operating Range (% passing)	Contract Compliance (% passing)	Operating Range (% passing)	Contract Compliance (% passing)	Operating Range (% passing)	Contract Compliance (% passing)	Operating Range (% passing)	Contract Compliance (% passing)
2 inch	100	100	--	--	--	--	--	--
1-1/2 inch	88-100	85-100	100	100	--	--	--	--
1 inch	X ± 18	X ± 25	88-100	86-100	--	--	--	--
3/4 inch	0-17	0-20	X ± 15	X ± 22	100	100	--	--
1/2 inch	--	--	--	--	82-100	80-100	100	100
3/8 inch	0-7	0-9	X ± 15	X ± 22	X ± 15	X ± 22	X ± 15	X ± 20
No. 4	--	--	0-16	0-18	0-15	0-18	0-25	0-28
No. 8	--	--	0-6	0-7	0-6	0-7	0-6	0-7

NOTE: "X" is the percent passing of the gradation that you propose to furnish for the specific sieve size under section 90-1.02C(4)(a).

Furnish coarse aggregate for the 1-1/2-inch maximum combined aggregate gradation under section 90-1.02C(4)(d) in 2 or more primary aggregate nominal sizes. You may separate each primary aggregate nominal size into 2 sizes and store them separately, provided that the combined material complies with the gradation specifications for the primary aggregate nominal size.

You may separate the coarse aggregate for the 1-inch maximum combined aggregate gradation under section 90-1.02C(4)(d) into 2 sizes and store them separately, provided that the combined material complies with the gradation specifications for the 1 inch x No. 4 primary aggregate nominal size.

**200-1.4 Coarse Aggregate for Portland Cement Concrete.** Concrete aggregate shall be composed of gravel, crushed rock, or a blended mixture. Concrete aggregate shall be washed before delivery to the batching plant and shall conform to the following:

**TABLE 200-1.4 (A)**

Tests	Tests Method No.	Requirements
Cleanness Value	California	75 Minimum
Percentage Wear	227	
100 revolutions	ASTM C131	15 Maximum
500 revolutions		52 Maximum
Specific Gravity (Bulk saturated surface dry)	ASTM C127	2.58 Minimum <sup>1</sup>

1. Not more than 15 percent by weight shall be particles with a bulk specific gravity below 2.50.
2. Moving Average calculated in accordance with 211-5; no individual test result used shall be less than 71.

Concrete aggregate will be designated by number and shall conform to the following gradations:

**TABLE 200-1.4 (B)**

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1" (25.0 mm)	5-40	90-100	-
3/4" (19.0 mm)	0-15	55-85	100
3/8" (9.5 mm)	0-5	<del>0-8</del> -20	85-100
No. 4 (4.75 mm)	-	0-5	0-30
No. 8 (2.36 mm)	-	0-5	0-10
No. 200 (75 µm)	0-2	0-2	0-2
ASTM C131 Test Grading	A	B	C

