

**GCC of America**

Cherry Creek Plaza 1, 600 S. Cherry Street, 10th Floor, Glendale, CO 80246  
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**MATERIAL CERTIFICATION REPORT**

**Plant:** Rapid City  
**Address:** 501 N. St Onge Street  
Rapid City, South Dakota  
**Contact:** Gail B. Amicucci  
**Phone:** (605) 721-7100

**Cement Type:** V, Low Alakli  
**Date Issued:** 01-Jun-18  
**Production Period:** 1-May-18  
**To:** 31-May-18

**STANDARD REQUIREMENTS ASTM C150-12/AASHTO M-85-12**

CHEMICAL		
Item	ASTM C150 Spec. Limit	Test Result
SiO <sub>2</sub> (%)	A	21.4
Al <sub>2</sub> O <sub>3</sub> (%)	6.0 Max	4.3
Fe <sub>2</sub> O <sub>3</sub> (%)	6.0 Max	3.7
CaO (%)	A	63.8
MgO (%)	6.0 max	1.1
SO <sub>3</sub> (%)	3.5 max <sup>B</sup>	2.9
Loss on Ignition (%)	3.5 max	1.6
Na <sub>2</sub> O (%)	A	0.10
K <sub>2</sub> O (%)	A	0.63
Insoluble Residue (%)	1.5 max	0.38
CO <sub>2</sub> (%)	A	0.4
Limestone (%)	5.0 max	-
CaCO <sub>3</sub> in Limestone (%)	70 min	-
Potential Phase Composition <sup>C</sup>		
C <sub>3</sub> S (%)	A	55
C <sub>2</sub> S (%)	A	20
C <sub>3</sub> A (%)	5 max	5
C <sub>4</sub> AF (%)	A	11
C <sub>3</sub> S + 4.75C <sub>3</sub> A (%)	25 max	79

PHYSICAL		
Item	ASTM C150 Spec. Limit	Test Result
Air Content (volume %)	12 max	9
Blaine Fineness (cm <sup>2</sup> /g)	2600-4300	4280
Residue 45 µm (No. 325) Sieve (%)	A	1.2
Autoclave Expansion (%)	0.80 max	-0.03
Compressive Strength		
1 day, MPa (psi)	A	13.5 (1960)
3 days, MPa (psi)	12.0 (1741) min	23.5 (3410)
7 days, MPa (psi)	19.0 (2760) min	31.4 (4560)
28 days, MPa (psi)	A	46.0 (6670)
Time of Setting, Initial Vicat (minutes)	45-375	150
Mortar Bar Expansion C-1038 (%)	<sup>B</sup>	-

INORGANIC PROCESSING ADDITION (If Applicable)			
Type	None	Base Phase Cement Composition	
SiO <sub>2</sub> (%)	NA	C <sub>3</sub> S (%)	55
Al <sub>2</sub> O <sub>3</sub> (%)	NA	C <sub>2</sub> S (%)	20
Fe <sub>2</sub> O <sub>3</sub> (%)	NA	C <sub>3</sub> A (%)	5
CaO (%)	NA	C <sub>4</sub> AF (%)	11
SO <sub>3</sub> (%)	NA		

**OPTIONAL REQUIREMENTS ASTM C150/AASHTO M85/ASTM C1157**

CHEMICAL		
Item	ASTM C150 Spec. Limit	Test Result
Equivalent Alkalies (%)	0.60 max	0.52

PHYSICAL			
Item	ASTM C150 Spec. Limit	ASTM C1157 Spec. Limit	Test Result
False Set (%)	50 min	50 min	71

<sup>A</sup> Not applicable

<sup>B</sup> It is permissible to exceed the specification limit provided that ASTM C1038 Mortar Bar Expansion does not exceed 0.020 % at 14 days.

<sup>C</sup> Adjusted per Annex A1.6

<sup>D</sup> No limit specified, data reported for information purpose only

<sup>E</sup> Test result of prior month

GCC of America Cement is warranted to conform at the time of shipment with current ASTM C150/AASHTO M85/ASTM C1157. No other warranty is made or implied. Having no control over the use of its cements, GCC of America does not guarantee finished work. GCC is not responsible for any additives not stated in the Certificate of Compliance. GCC of America certifies that the data described above under "Processing Addition" represents the materials in the cement manufactured during the production period indicated.