



## MATERIAL CERTIFICATION REPORT

**Plant:** Trident  
  
**Address:** 4070 Trident Road  
 Three Forks, MT 59752  
  
**Contact:** Zach Gill  
**Phone:** (406) 285-3988

**Cement Type:** 1157 GU / 595-1L  
  
**Date Issued:** 6-Feb-19  
  
**Production Period:** 1-Aug-18  
**To:** 31-Jan-19

### STANDARD REQUIREMENTS ASTM C150/ASTM C1157/ASTM C595 Trident is and ISO 9001 Certified Facility

CHEMICAL			
Item	ASTM Test Method	ASTM C595 Spec. Limit	Test Result
SO <sub>3</sub> (%)	C114	3.0 max <sup>A</sup>	2.5
Loss On Ignition (%)	C114	10.0 max	5.5

PHYSICAL				
Item	ASTM Test Method	ASTM C595 Spec. Limit	ASTM C1157 Spec. Limit	Test Result
Air Content (%)	C185	12 max	12 max	7
Blaine Fineness (m <sup>2</sup> /kg)	C204	-	-	432
Residue 45 μm (No.325) Sieve (%)	C430	-	-	1.9
Autoclave Expansion (%)	C151	0.80 max; 0.2 max contraction	0.80 max	0.05
Compressive Strength				
3 days, MPa (psi)	C109	13.0 (1890) min	13.0 (1890) min	28.2 (4090)
7 days, MPa (psi)	C109	20.0 (2900) min	20.0 (2900) min	35.3 (5120)
28 days, MPa (psi) <sup>C</sup>	C109	28.0 (4060) min	28.0 (4060) min	45.0 (6560)
Time of Setting, Initial Vicat (min)	C191	45 min / 420 max	45 min / 420 max	140
Mortar Bar Expansion (%)	C1038	-	0.020 max	-0.005

ADDITIONAL DATA					
Type	Limestone	Test Method	Base Phase Composition	ASTM Test Method	Test Result

### OPTIONAL REQUIREMENTS ASTM C150/ASTM C1157

CHEMICAL			
Item	ASTM Test Method	ASTM C150 Spec. Limit	Test Result
Equivalent Alkalies (%)	C114	0.60 max	0.33

PHYSICAL				
Item	ASTM Test Method	ASTM C150 Spec. Limit	ASTM C1157 Spec. Limit	Test Result

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

GCC of America Cement is warranted to conform at the time of shipment with current ASTM C150/ASTM C1157/ASTM C595. No other warranty is made or implied. Having no control over the use of its cements, GCC of America does not guarantee finished work.