Northwest Testing, Inc.
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TECHNICAL REPORT

Report To:	Mr. Ben Steer Miller Consulting Engineers 9570 SW Barbur Blvd. Suite 100 Portland, Oregon 97219	**Date:** **Lab No.:**	12/10/18 18-354
Project:	Murata Retaining Wall	**Project No.:**	3321.1.1

Report of: Segmental retaining wall block testing

Sample Identification

As requested, NTI provided unit weight testing on ¾"-0 crushed aggregate to be used in segmental retaining wall block. An NTI representative obtained the sample aggregate from the final belt at Knife River Coffee Lake on November 29, 2018. The segmental retaining wall block was sampled on December 6, 2018 by a Western Interlock representative and delivered by NTI. Our laboratory's test results are summarized on the attached tables.

Attachments: Laboratory Test Results

Copies: Addressee (e-mail only)
Landon Pegg (e-mail only)
Wyatt Pegg (e-mail only)

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Laboratory Test Results

Bulk Density (Unit Weight) – Procedure Used Shoveling					
Test No.	**Volume of Void in Block (ft^3)**	**Weight of Block (lbs)**	**Weight of Aggregate (lbs)**	**Total Weight of Aggregate and Block (lbs)**	**Bulk Density (Unit Weight) pcf**
1	0.2506	58.85	24.13	82.98	96.3
2	0.2506	58.85	24.95	83.80	99.6
Average	0.2506	58.85	24.54	83.39	98.0

Photo 1: Hollow portion of block filled with aggregate by shoveling. No vibration was used.

Bulk Density (Unit Weight) – Procedure Used Vibratory Table					
Test No.	**Volume of Void in Block (ft^3)**	**Weight of Block (lbs)**	**Weight of Aggregate (lbs)**	**Total Weight of Aggregate and Block (lbs)**	**Bulk Density (Unit Weight) pcf**
1	0.2506	58.85	25.09	83.94	100.1
2	0.2506	58.85	25.26	84.11	100.8
Average	0.2506	58.85	25.18	84.03	100.4

Photo 2: Hollow portion of block filled with aggregate and consolidated by a vibrating table operating for approximately 1 min. until no visual consolidation of aggregate was observed.

Note: Aggregate was air dried in laboratory before testing. The air-dried moisture content of aggregate was 3.3%. Volume of void provided by Miller Consulting Engineers (***433 in^3***).