

CONSTRUCTION NOTES – LIGHTWEIGHT FILL MATERIAL

1.0 GENERAL REQUIREMENTS

- 1.1.

THE CONSTRUCTION NOTES ON THIS DRAWING COVER THE REQUIREMENTS FOR THE SUPPLY AND PLACEMENT OF WATER COOLED ULTRA LIGHTWEIGHT BLAST FURNACE SLAG TO BE USED FOR CONSTRUCTION OF THE STRUCTURES FOR THE WINDSOR–ESSEX PARKWAY (WEP) PROJECT. AT THE WEP PROJECT, THE ULTRA LIGHTWEIGHT BLAST FURNACE SLAG MATERIAL IS GENERALLY REFERRED TO AS THE LIGHT WEIGHT FILL (LWF).
- 1.2.

THESE CONSTRUCTION NOTES ARE TO BE READ IN CONJUNCTION WITH THE ACCOMPANYING DESIGN DRAWING(S), OTHER RELEVANT CONSTRUCTION NOTES AND GEOTECHNICAL REPORT.
- 1.3.

THE CONSTRUCTION WORKS SHALL BE EXECUTED IN ACCORDANCE WITH THE DESIGN ILLUSTRATED ON THE ACCOMPANYING DRAWINGS, AND THE REQUIREMENTS SPECIFIED IN THE FOLLOWING STANDARDS, SPECIFICATIONS AND PUBLICATIONS:

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MTO

NSSP ULTRA LIGHTWEIGHT BLAST FURNACE SLAG (WATER COOLED)

•

ASTM D422

PARTICLE–SIZE ANALYSIS OF SOILS

•

ASTM D2216

MOISTURE CONTENT OF SOILS

•

ASTM D2922

DENSITY OF SOIL AND SOIL–AGGREGATE IN PLACE BY NUCLEAR METHODS

•

ASTM D3017

WATER CONTENT OF SOIL AND ROCK IN PLACE BY NUCLEAR METHODS

•

OPSS 212

BORROW

•

OPSS 501

COMPACTION

•

OPSS 517

DEWATERING

•

OPSS 1010

AGGREGATES–BASE, SUBBASE, SELECT SUBGRADE, AND BACKFILL MATERIAL

•

OPSS 1860

GEOTEXTILES
- 1.4.

IF THERE IS ANY CONFLICT BETWEEN THE REQUIREMENTS GIVEN ON THIS DRAWING AND THE STANDARDS AND SPECIFICATIONS DOCUMENTS LISTED IN SECTION 1.3, THE DESIGNER SHOULD BE CONSULTED FOR CLARIFICATION AND RECOMMENDATIONS.
- 1.5.

IN THE FOLLOWING SPECIFICATIONS, THE CONTRACTOR MEANS PIC AND ITS SUB–CONTRACTORS, AND THE ENGINEER MEANS THE GEOTECHNICAL SITE ENGINEER, AND THE DESIGNER MEANS THE GEOTECHNICAL DESIGNER OF THE PROJECT.

2.0 SITE PREPARATION AND EXCAVATION

- 2.1

THE SITE PREPARATION AND EXCAVATION REQUIREMENTS ON THE CONSTRUCTION NOTES FOR THE BACKFILL AT STRUCTURES ARE APPLICABLE.

3.0 SUBMISSION AND DESIGN REQUIREMENTS

- 3.1

THE CONTRACTOR SHALL SUBMIT TO PIC AND THE ENGINEER CERTIFICATES OF CONFORMANCE SEALED AND SIGNED BY THE QUALITY VERIFICATION ENGINEER AS FOLLOWS:

a.

PRIOR TO THE PLACEMENT OF THE LIGHTWEIGHT FILL MATERIAL ON THE PROJECT, THE CONTRACTOR SHALL SUBMIT TO THE CONTRACT ADMINISTRATOR A CERTIFICATE OF CONFORMANCE STATING THAT THE MATERIAL SATISFIES THE MATERIAL PROPERTIES SPECIFIED IN SECTION 4.1.

b.

FOLLOWING FILL PLACEMENT, THE CONTRACTOR SHALL SUBMIT TO THE CONTRACT ADMINISTRATOR A CERTIFICATE OF CONFORMANCE STATING THAT THE MATERIAL SATISFIES THE REQUIREMENTS OF THIS SPECIFICATION AND THAT THE WORK HAS BEEN CARRIED OUT IN GENERAL CONFORMANCE WITH THE CONTRACT DOCUMENTS AND SPECIFICATIONS. THE CONTRACTOR SHALL ALSO SUBMIT ALL QUALITY CONTROL TEST RESULTS FOR INFORMATION ONLY.

4.0 MATERIAL

- 4.1

THE LWF SHALL SATISFY THE FOLLOWING PHYSICAL, MECHANICAL AND CHEMICAL PROPERTY REQUIREMENTS:

•

ANGLE OF INTERNAL FRICTION

>35° (ASTM 2850–85)

•

HYDRAULIC CONDUCTIVITY

>8 E–03 CM/S (ASTM 5856–95, METHOD A)

•

CHEMICAL COMPOSITION

THE MATERIAL SHALL MEET THE LEACHATE CRITERIA ESTABLISHED UNDER ONTARIO REGULATION 347

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IN SITU WET UNIT WEIGHT

<12.5 kN/m<sup>3</sup> (ASTM D2922) (MAXIMUM WHEN PLACED AND COMPACTED IN ACCORDANCE WITH THE SPECIFICATIONS)

5.0 CONSTRUCTION

- 5.1

THE LWF (BLAST FURNACE SLAG) IS SUSCEPTIBLE TO CRUSHING IF OVERCOMPACTED AND CAREFUL CONSTRUCTION PROCEDURES AND SUPERVISION ARE REQUIRED. THE CONTRACTOR SHALL PLACE THE LWF MATERIAL AND SHALL ACHIEVE COMPACTION WITHOUT CRUSHING THE MATERIAL SINCE CRUSHING INCREASES ITS UNIT WEIGHT. THE CONTRACTOR SHALL PLACE THE LWF MATERIAL WITHOUT EXCEEDING THE SPECIFIED IN SITU UNIT WEIGHT AND MAINTAINING CRUSHING OF THE MATERIAL BELOW 5%.
- 5.2

TO PREVENT OVER–CRUSHING AND OVER–COMPACTION, THE LWF SHALL BE PLACED AS FOLLOWS:

a.

FOR EMBANKMENTS THE LWF SHALL BE PLACED IN LIFTS OF 300 mm AND COMPACTED BY 3 PASSES OF SINGLE DRUM VIBRATORY EQUIPMENT APPROVED BY THE ENGINEER (E.G., BOMAG 142 OR EQUIVALENT, TABLE 1).

b.

FOR BACKFILL TO STRUCTURES, THE LWF SHALL BE PLACED IN LIFTS OF 300 mm AND COMPACTED WITH 8 PASSES OF MANUALLY GUIDED TAMPER SUCH AS A BOMAG BPR 30/38 D OR EQUIVALENT (TABLE 1).

c.

THE CONTRACTOR SHALL PLACE AND SPREAD THE LOOSE LIFTS USING A RUBBER TIRE FRONT–END LOADER SUCH AS A CATERPILLAR 980 F OR EQUIVALENT.
- 5.3

COMPACTION EQUIPMENT TECHNICAL DETAILS ARE PROVIDED IN TABLE 1.
- 5.4

THE LWF ZONES SHALL BE APPROPRIATELY WRAPPED IN GEOTEXTILE TO AVOID LOSS OF FINES FROM THE ADJACENT BACKFILL OR NATIVE MATERIALS IN CONTACT WITH THE LWF ZONES.

6.0 QUALITY CONTROL

- 6.1

QUALITY CONTROL (QC) TESTING SHALL BE CARRIED OUT BY THE CONTRACTOR TO ENSURE THAT THE LWF MATERIAL IS PLACED AND COMPACTED AS SPECIFIED. FIELD DENSITY AND FIELD MOISTURE DETERMINATION SHALL BE MADE IN ACCORDANCE WITH ASTM D2922 AND ASTM D3017, RESPECTIVELY.
- 6.2

THE CONTRACTOR SHALL BUILD A CONTROL STRIP TO VERIFY THAT THE PLACEMENT AND COMPACTION PROCEDURE WILL ACHIEVE THE REQUIREMENTS OF THESE SPECIFICATIONS WITHOUT EVIDENCE OF CRUSHING AND WITHOUT EXCEEDING THE SPECIFIED MAXIMUM IN SITU WET UNIT WEIGHT OF 12.5 kN/m<sup>3</sup>.
- 6.3

MATERIAL PLACED IN THE CONTROL STRIP SHALL HAVE THE MOISTURE CONTENT THAT WILL YIELD THE SPECIFIED IN–SITU UNIT WEIGHT. FOR THE CONTROL STRIP DETERMINATION, THE NUCLEAR GAUGE METHOD WILL NOT BE CONSIDERED AN ACCEPTABLE METHOD OF DETERMINING THE IN–SITU MOISTURE CONTENT OF THE LWF MATERIAL. MOISTURE CONTENT SHALL BE DETERMINED BY THE OVEN DRY METHOD ON SELECTED COMPACTED EMBANKMENT MATERIAL SAMPLES IN ACCORDANCE WITH ASTM D2216.
- 6.4

AFTER THE TRIAL AREA IS COMPLETE, SAMPLES FOR MOISTURE CONTROL AND IN SITU UNIT WEIGHT DETERMINATION TESTING SHALL BE AS PER ASTM D2922.
- 6.5

IN ADDITION, GRADATION AS PER ASTM D422–63 BEFORE AND AFTER COMPACTION EFFORT SHALL BE PERFORMED TO DETERMINE THAT CRUSHING IS KEPT WITHIN 5%.
- 6.6

THE REQUIREMENTS OF THE CONTROL STRIP MUST BE SATISFIED AS PART OF THE ACCEPTANCE CRITERIA OF ANY PROPOSED CHANGE TO THE SPECIFIED COMPACTION METHOD OF THIS SPECIAL PROVISION.

7.0 USE

- 7.1

THIS DRAWING PROVIDES CONSTRUCTION REQUIREMENTS FOR GEOTECHNICAL ASPECTS OF BACKFILLING AT TRAIL EMBANKMENTS AND STRUCTURES.

METRIC

DIMENSIONS ARE IN METRES  
AND/OR MILLIMETRES  
UNLESS OTHERWISE SHOWN



Windsor–Essex  
Parkway Project  
RFP No. 09–54–1007

NEW CONSTRUCTION  
HWY 401  
TRAIL BRIDGE OVER CABANA RD.–TODD LN. TB–4  
CONSTRUCTION NOTES – LIGHTWEIGHT FILL MATERIAL



SHEET

S6406

Phase 1

IFC

TABLE 1: COMPACTION EQUIPMENT TECHNICAL DETAILS

	BOMAG 142 D	BOMAG BPR 30/38 D
WEIGHTS		
• OPERATING WEIGHT (kg)	4690±	175±
• MASS PER SQUARE METRE OF BASE PLATE (kg/m²)	N/A	1439
DIMENSIONS		
• DRUM WIDTH (mm)	1426±	N/A
• DRUM DIAMETER (mm)	1058±	N/A
• WIDTH OF BASE PLATE (mm)	N/A	380
• LENGTH OF BASE PLATE (mm)	N/A	730
DRIVE		
• PERFORMANCE DIN 6271 IFN (kW)	37±	3.7
• PERFORMANCE SAE (kW)	39.5	N/A
• SPEED (RPM)	2300	3600
VIBRATORY SYSTEM		
• FREQUENCY (Hz)	32±	68±
• AMPLITUDE (mm)	1.24±	N/A
• CENTRIFUGAL FORCE (KN)	66±	30±



DRAWING NOT TO BE SCALED  
100mm ON ORIGINAL DRAWING

REVISIONS					
DATE	REV.	BY	ISSUED FOR	CONSTRUCTION	
DESIGN	SF	CHK	NSV	CODE CAN/CSA S6-06	LOAD SEE T.A.F. DOC.
DRAWN	MM	CHK	DD	SITE 6–619	DATE 20–DEC–11