BRITISH COLUMBIA
The Best Place on Earth

MINISTRY OF TRANSPORTATION
Laboratory Schedule of Tests

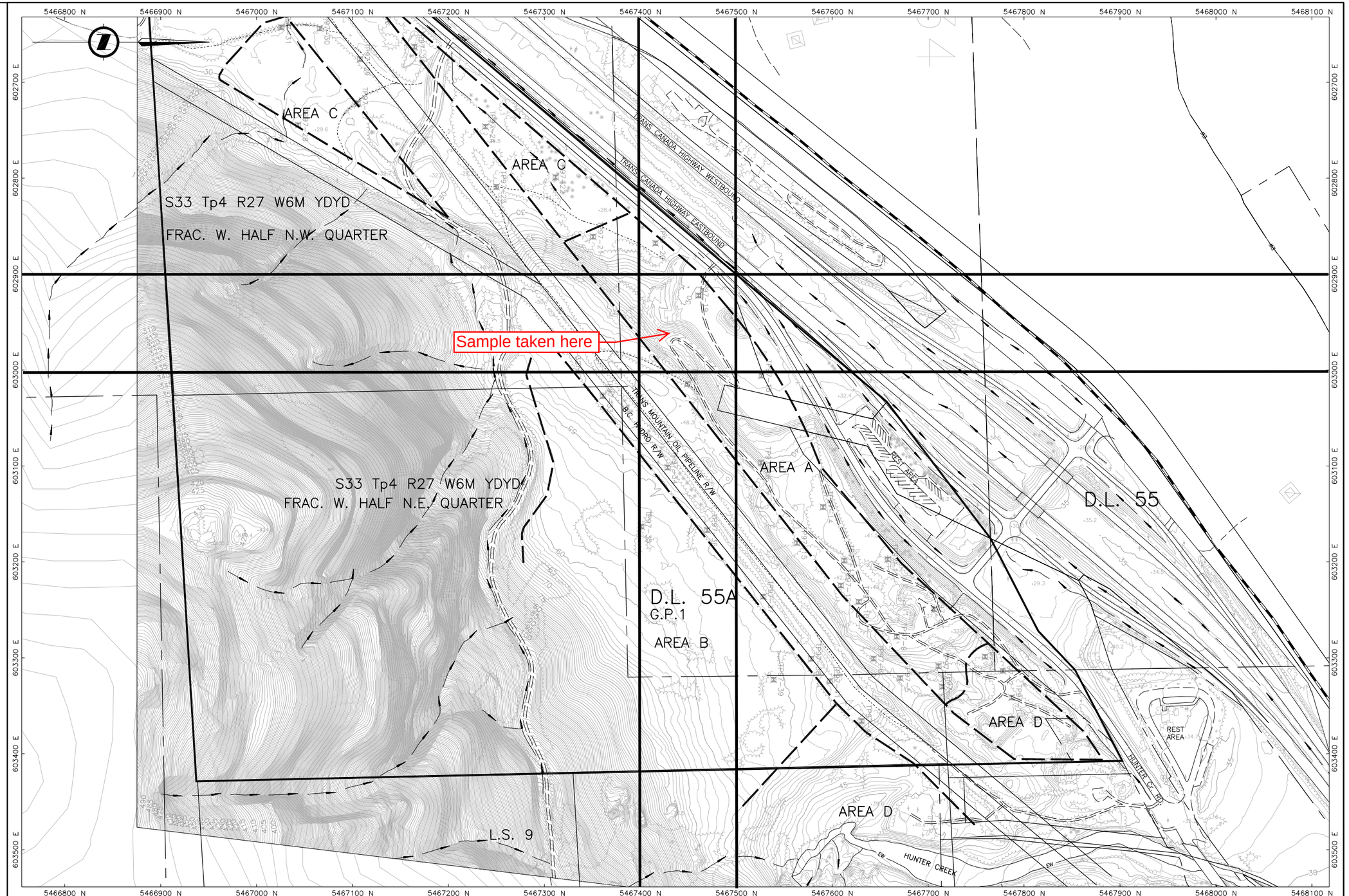
Project: Bulger Pit **Location:** Lower Mainland District
Date: July 21, 2014

TP/TH No.	Bag No.	Sample No.	PR Wash Sieve	25mm Crush and Wash Sieve	Fracture Count		Micro Duval		MgSO4		Specific Gravity		Absorption		Sand Equivalent	Petro Analysis	Petro No.	Petro for ARD/ML		
					A	B	C	F	C	F	C	F	C	F						
STPL 1	727	1	x	x	x	x	x	x												

Comments: Amec
Use 25mm WGB gradation spec for crushes

LEGEND

- HYPSOGRAPHIC CONTOURS WITH ELEVATION INDEX
- TP93-02 TH93-02 — TEST PIT, TEST HOLE (YEAR 1993, No. 02)
- TREE, SPOT ELEVATION
- MONUMENT, WOODEN POST, STANDARD IRON PIN
- DITCH/CREEK CENTRE
- ROAD
- DISTRICT LOT BOUNDARY
- PARCEL BOUNDARY
- RESERVE BOUNDARY
- GRANULAR BOUNDARY
- SURVEY BOUNDARY
- GARDEN, LAWNS, VEGETATION
- FENCE
- TREE LINE
- CSA — CRUSHER SETUP AREA
- DEVELOPMENT DIRECTION
- POTENTIAL FUTURE EXTENSION
- 10 m — BUFFER AREA
- SA-A — STOCKPILE AREA:
  SA-A = AGGREGATE
  SA-OB = OVERBURDEN
  SA-TS = TOPSOIL
  SA-RJ = REJECT
  SA-DEB = DEBRIS
- STPL-A — EXISTING STOCKPILE:
  STPL-A (Type) = AGGREGATE
  STPL-OB = OVERBURDEN
  STPL-TS = TOPSOIL
  STPL-RJ (Type) = REJECT
  STPL-DEB = DEBRIS
  STPL-OVERS = OVERSIZE



GENERAL NOTES

- Coordinates are UTM Zone 10 NAD 83.
- Lot boundaries are approximate.
- Survey date: August 2003.

MINING NOTES

General:

- Development areas are based on sampling completed to a 5 metre depth. Once these thicknesses have been extracted re-evaluation of material quality will be required.
- A minimum 2 metre cleared, grubbed and stripped zone is to be maintained above all active pit faces.
- All pit development slopes will be 1,5 H to 1,0 V.
- All final reclamation slopes will be 2,0 H to 1,0 V.
- The pit is to be developed in accordance with: Health, Safety and Reclamation Code for Mines in B.C., Reclamation and Environmental Protection Handbook for Sand, Gravel and Quarry Operations in B.C., Aggregate Operators Best Management Practices Handbook for B.C.
- For material extractions in excess of 1000 m3 a Notice of Pit/Quarry Mining must be filed with the Ministry of Energy and Mines minimum 14 days prior to commencement of operations.
- The dumping of off-site soils, overburden or road building debris is not permitted.

Development Area "A":

- Additional fines may be required to produce high fines surfacing aggregate.
- Selective mining and the use of a primary crusher is required.

Development Area "B":

- Sand rejection may be required on the #30 sieve size to produce SGSB.

Development Area "C":

- Selective mining and the use of a primary crusher is required.
- The addition of blend sand may be required to meet MAM specification.

Development Area "D":

- Sand rejection may be required on the #30 sieve size to produce SGSB.

APPROVED USAGE

AREA	PIT RUN	SGSB	WGB (mm) 25	WGB (mm) 50	WGB (mm) 75	PAVING MAM	PAVING CAM	PAVING SUPER	BEF	WAB
A		✓							✓	
B		✓			✓					
C			✓				✓			
D	✓									✓

DRAFTING BY:
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SCALE: 0 1:4000 100

REV.	DATE	REVISIONS	INITIALS

BRITISH COLUMBIA
Ministry of Transportation
Geotechnical and Materials Engineering

CAD FILE: PDP0251.DWG
PDF: PDP0251.PDF
NEGATIVE: -

DESIGNED: KWL DATE: 2005-04-08
DRAWN: IWTS DATE: 2005-04-08
CHECKED: KWL DATE: 2005-04-08

LOWER MAINLAND DISTRICT

BULGER PIT #0251

PIT DEVELOPMENT PLAN

FILE No.	PROJECT No.	REG	DRAWING No.
0251	-	1	-

CANCEL PRINTS BEARING PREVIOUS LETTER

BULGER PIT
OVERS STOCKPILE/STPL
SA-1 BAG- 727
KWL JULY 14, 2014

TRAN
727


MADE IN CANADA
BARMY TECH
THE CANVAS BAG CO.
100% COTTON
COLD WATER WASH DRY FLAT
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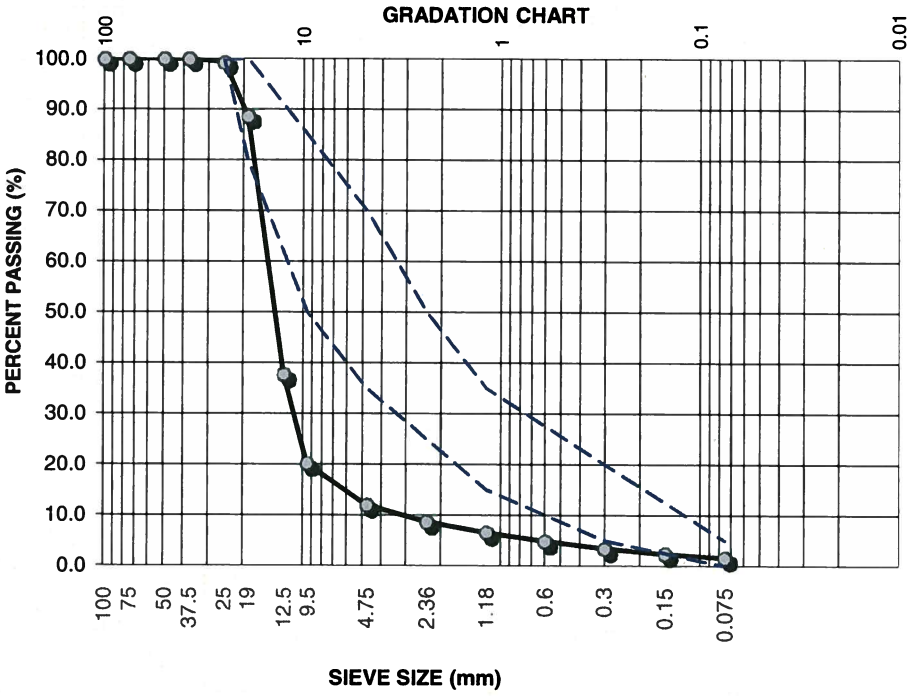
AMEC Environment & Infrastructure
#110 - 18568 - 96th Avenue
Surrey British Columbia
Canada, V4N 3P9
Tel: 604-295-8657
Fax: 604-295-8658

SIEVE ANALYSIS REPORT

CLIENT: Ministry of Transportation & Infrastructure
310 - 1500 Woolridge St.
Coquitlam, BC V3K 0B8
ATTN: Terence Lai

Project Number: KA21098-300
Date: 28-Jul-2014
Client Contract No.: 156CS0824
Client Project No.: 39100-20-Bulger

PROJECT: Bulger Pit- Lower Mainland District



Lab Number: L5126

Date Sampled: Sampled by MOTI
Date Received: 1-Jul-14
Date Tested: 23-Jul-14
Sampled By: MOTI
Tested By: Kris McLean/ Rodrigo L.

TP/TH No.: STPL 1
Bag No.: 727
Material Type: Crush
Sample No.: 1

Gravel Sizes (mm)	Percent Passing	Gradation Limits Lower	Upper
100	100	-	
75	100	-	
50	100	-	
37.5	100	-	
25	99	100 -	100
19	89	80 -	100
12.5	38	-	
9.5	20	50 -	85

Sand Sizes And Fines (mm)	Percent Passing	Gradation Limits Lower	Upper
4.75	12	35 -	70
2.36	8.6	25 -	50
1.18	6.5	15 -	35
0.6	4.9	-	
0.3	3.4	5 -	20
0.15	2.3	-	
0.075	1.6	0 -	5

Comments: Sieve analysis test was conducted in accordance with ASTM C136 and C117
Plotted to Table 202-C WGB gradation specification

Prepared By: Giti Ghorbanian
Senior Materials Technologist

Reviewed By:
Daniel St-Pierre, M.Sc., PE, P.Eng.
Senior Civil Materials Engineer

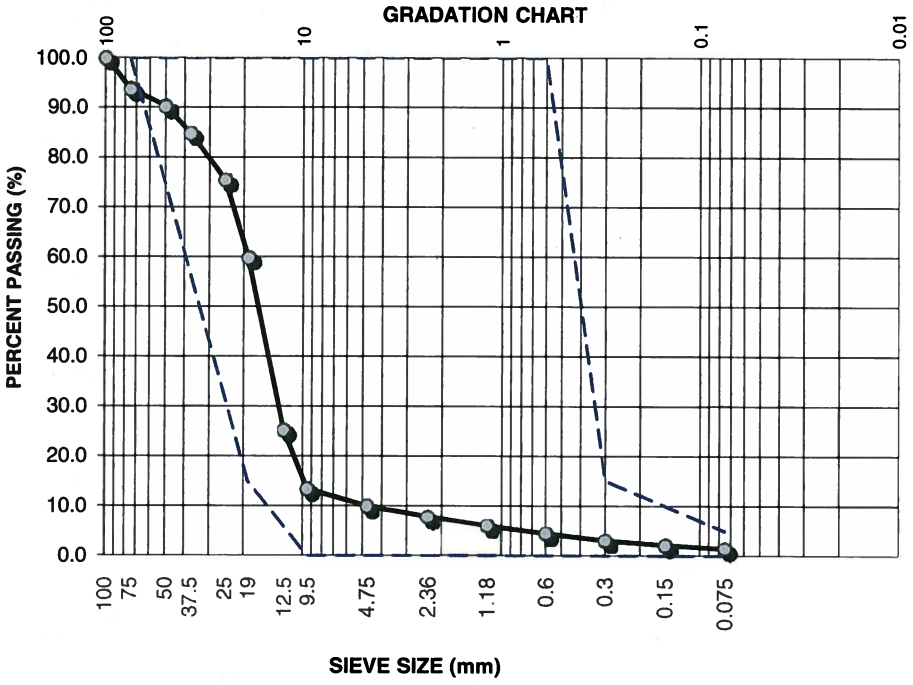
AMEC Environment & Infrastructure
#110 - 18568 - 96th Avenue
Surrey British Columbia
Canada, V4N 3P9
Tel: 604-295-8657
Fax: 604-295-8658

SIEVE ANALYSIS REPORT

CLIENT: Ministry of Transportation & Infrastructure
310 - 1500 Woolridge St.
Coquitlam, BC V3K 0B8
ATTN: Terence Lai

Project Number: KA21098-300
Date: July 28, 2014
Client Contract No: 156CS0824
Client Project No: 39100-20-Bulger

PROJECT: Bulger Pit- Lower Mainland District



Lab Number: L5126

Date Sampled: Sampled by MOTI
Date Received: 1-Jul-14
Date Tested: 22-Jul-14
Sampled By: MOTI
Tested By: Kris McLean

TP/TH No.: STPL 1
Bag No.: 727
Material Type: Pit Run
Sample No.: 1

Gravel Sizes (mm)	Percent Passing	Gradation Limits Lower	Upper
100	100	-	
75	94	100 -	100
50	90	-	
37.5	85	-	
25	75	-	
19	60	15 -	100
12.5	25	-	
9.5	13	0 -	100

Sand Sizes And Fines (mm)	Percent Passing	Gradation Limits Lower	Upper
4.75	10	-	
2.36	7.8	-	
1.18	6.0	-	
0.6	4.5	0 -	100
0.3	3.1	0 -	15
0.15	2.1	-	
0.075	1.5	0 -	5

Comments: Sieve analysis test was conducted in accordance with ASTM C136 and C117
Plotted to Table 202-C SGSB gradation specification

Prepared By: Giti Ghorbanian
Senior Materials Technologist

Reviewed By:
Daniel St-Pierre, M.Sc., PE, P.Eng.
Senior Civil Materials Engineer

AMEC Environment &
Infrastructure
#110 - 18568 - 96th Avenue
Surrey British Columbia
Canada, V4N 3P9
Tel: 604-295-8657
Fax: 604-295-8658

FRACTURE COUNT FOR COARSE AGGREGATE (BCH 1-13)

CLIENT: Ministry of Transportation & Infrastructure
310 - 1500 Woolridge St.
Coquitlam, BC V3K 0B8
ATTN: Terence Lai

Project Number: KA21098-300
Date: July 28, 2014
Client Contract No.: 156CS0824
Client Project No.: 39100-20-Bulger

PROJECT: Bulger Pit- Lower Mainland District
Sample Source & ID: STPL-1 Bag #727- SA #1 - Crushed
Lab No.: L5126

Sieve Size (mm)	Total No. of Particles	No. of Fractured Particles	No. of Non Fractured Particles	% Fracture per Sieve	Total % Fracture
50 to 37.5					
37.5 to 25.0					
25.0 to 19.0	310	284	26	92	
19.0 to 12.5	258	149	109	58	
12.5 to 9.5	376	226	150	60	
9.5 to 4.75	310	284	26	92	
Totals	1254	943			**75**

Comments: Fracture Particles in Coarse Aggregate tests were conducted in accordance with BCH 1-13 Method A

Prepared By: Giti Ghorbanian
Senior Materials Technologist

Reviewed By: Daniel St-Pierre, M.Sc., PE, P.Eng.
Senior Civil Materials Engineer

AMEC Environment &
Infrastructure
#110 - 18568 - 96th Avenue
Surrey British Columbia
Canada, V4N 3P9
Tel: 604-295-8657
Fax: 604-295-8658

FRACTURE COUNT FOR COARSE AGGREGATE (BCH 1-13)

CLIENT: Ministry of Transportation & Infrastructure
310 - 1500 Woolridge St.
Coquitlam, BC V3K 0B8
ATTN: Terence Lai

Project Number: KA21098-300
Date: July 28, 2014
Client Contract No.: 156CS0824
Client Project No.: 39100-20-Bugler

PROJECT: Bulger Pit- Lower Mainland District
Sample Source & ID: STPL-1 Bag #727- SA #1 - Crushed
Lab No.: L5126

Sieve Size (mm)	Original Weight (g)	Fractured Particles (g)	Non-Fractured Particles (g)	% Fracture
50 to 37.5				
37.5 to 25.0				
25.0 to 19.0	2697.3	1335.5	1361.8	
19.0 to 13.2	6215.2	5630.0	585.2	
13.2 to 9.5	1308.0	673.0	635.0	
Totals	10221	7639	2582	**75**

Comments: Fracture Particles in Coarse Aggregate tests were conducted in accordance with BCH 1-13 Method B

Prepared By: Giti Ghorbanian
Senior Materials Technologist

Reviewed By: Daniel St-Pierre, M.Sc., PE, P.Eng.
Senior Civil Materials Engineer

AMEC Environment &
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#110 - 18568 - 96th Avenue
Surrey British Columbia
Canada, V4N 3P9
Tel: 604-295-8657
Fax: 604-295-8658

Test Results for Resistance of Aggregate to Degradation by Abrasion in the Micro-Deval

CLIENT: Ministry of Transportation & Infrastructure
310 - 1500 Woolridge St.
Coquitlam, BC V3K 0B8
ATTN: Terence Lai

Project Number: KA21098-300
Date: July 28, 2014
Client Contract No.: 156CS0824
Client Project No.: 39100-20-Bulger

PROJECT: Bulger Pit- Lower Mainland District
Sample Source & ID: SSTPL-1 Bag #727- SA #1 - Crushed
Lab No.: L5126

Coarse and Fine Aggregate

Grading	Initial Mass (g)	Final Mass (g)	Loss of Mass (g)	% Loss
	A	B	A - B	(A-B)*100/A
Coarse	1500.4	1389.9	110.5	7.4
Fine	500.0	433.3	66.7	13.3

Comments:

Maximum size of aggregate is 25.0 mm.

Resistance of materials to Degradation by Abrasion in the Micro-Deval Apparatus was conducted in accordance with ASTM D6928 for Coarse aggregate and ASTM D7428 for Fine aggregate

Grading for coarse aggregate used for test is: 19-16 mm, 16-12.5 mm, 12.5-9.5 mm

Drain Brothers- Stony Lake Quarry was used as calibration coarse materials and percent loss is 15.0%. Southerland Sand was used as calibration fine materials and percent loss is 17.7%.

MOTI Standard:

Maximum acceptable value of any base material is 25 or less
Maximum acceptable value of any Sub-base material is 30 or less

Prepared By: Giti Ghorbanian
Senior Materials Technologist

Reviewed By: Daniel St-Pierre, M.Sc., PE, P.Eng.
Senior Civil Materials Engineer