



Ministry of Transportation and Infrastructure

Geotechnical and Materials Engineering

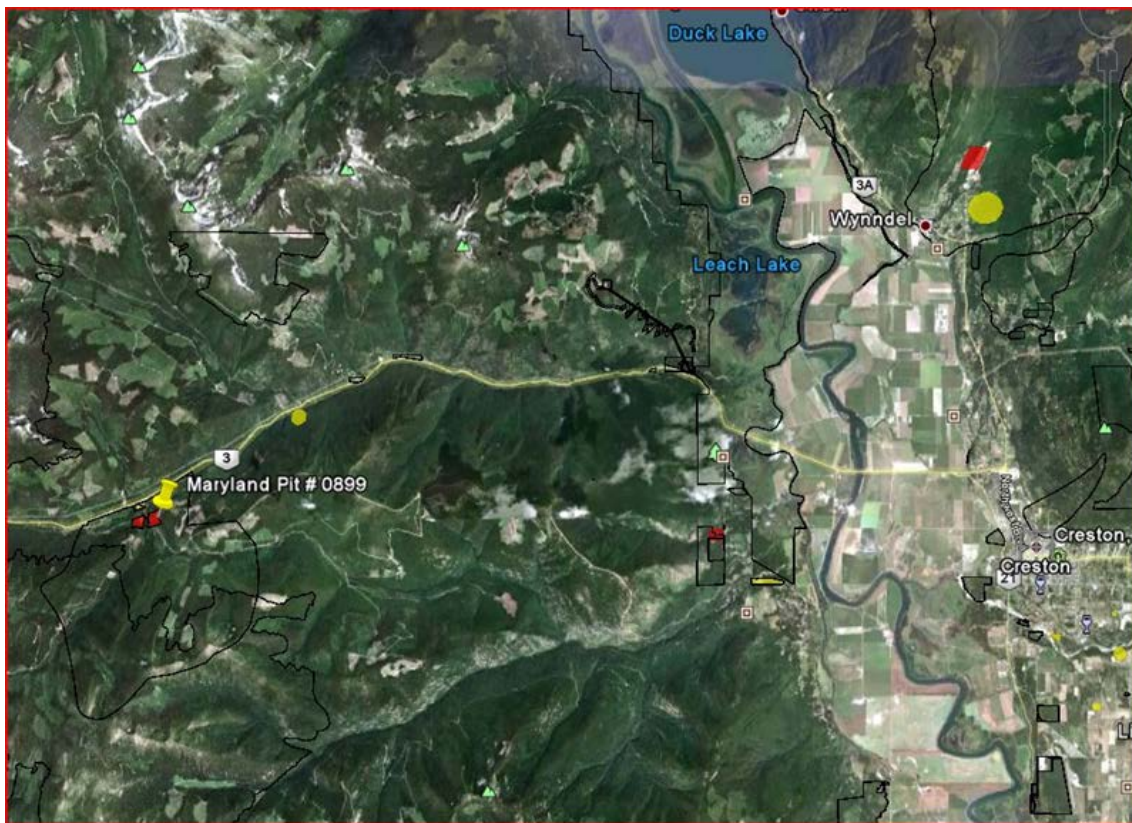
Southern Interior Region

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Maryland Pit No. 0899

2017 Technical Information Report

Location: The pit is located 37 km west of Creston on North Boulais Road. The pit is accessed via Maryland Forest Service Road, then turn onto North Boulais Road.



Legal Description: Ministry of Transportation and Infrastructure Section 16 Map Reserve, legally described as all that Unsurveyed Crown Land, being Sites 1/2 and 2/2, situated in the vicinity of Maryland, Summit, and Boulais Creeks, Kootenay District, containing 100.0 hectares, more or less. UTM co ordinates Zone 11, 510600 Easting, 5439000 Northing.

Gradation: The average and range of laboratory samples as well as oversize rock field estimates for material sampled in 2008 and 2014 are as follows:

2014 Laboratory Samples

Classification:	Average (%)	Range (%)
Gravel (4.75-75mm)	67.6	66.7 – 70.5
Sand (0.075-4.75mm)	28.2	24.0 – 29.6
Fines (<0.075mm)	4.2	3.6 – 5.5

2014 Oversize Field Estimates

Classification:	Average (%)	Range (%)
Boulders (>375mm)	0.8	0 – 2
Cobbles (150-375mm)	2	1 – 3
Cobbles (75-150mm)	3	2 – 4

The maximum size rock observed was 300 mm.

2008 Laboratory Samples

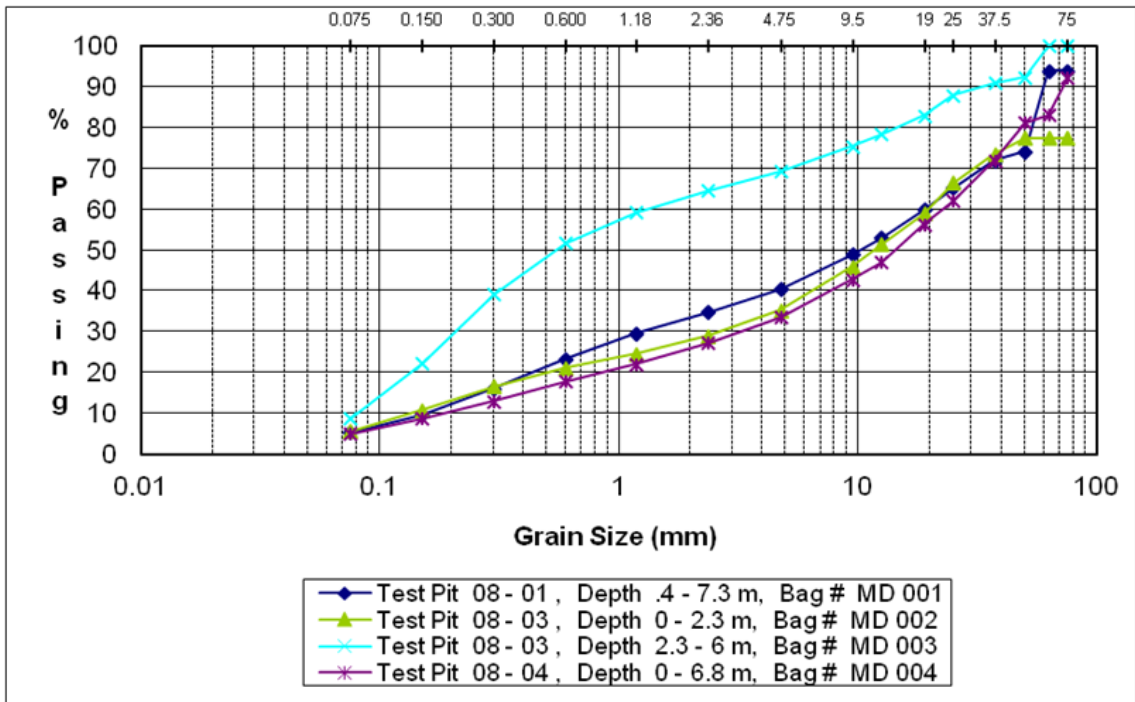
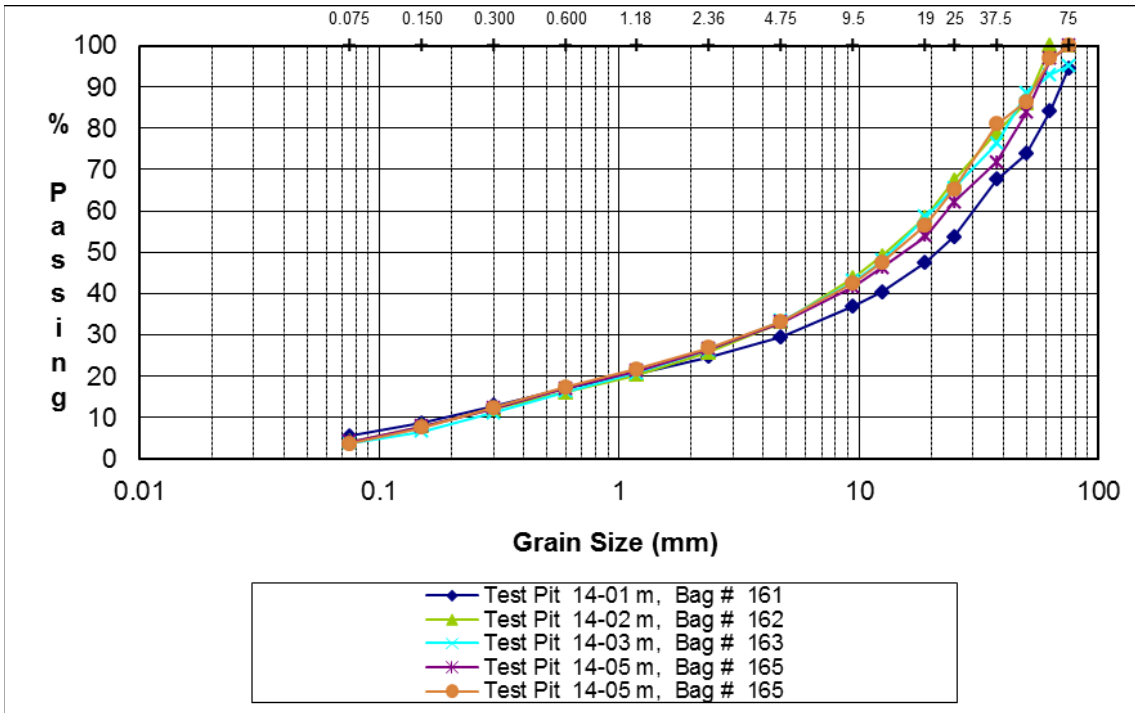
Classification:	Average (%)	Range (%)
Gravel (4.75-75mm)	55	23 – 67
Sand (0.075-4.75mm)	38	28 – 61
Fines (<0.075mm)	6	2 - 19

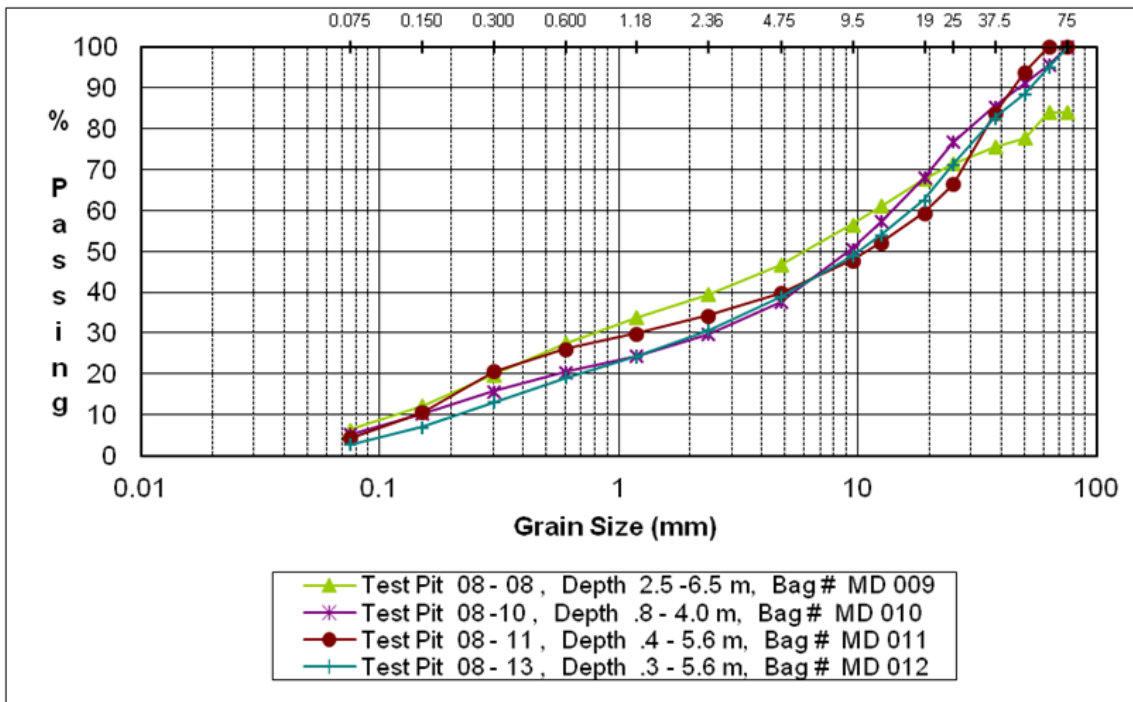
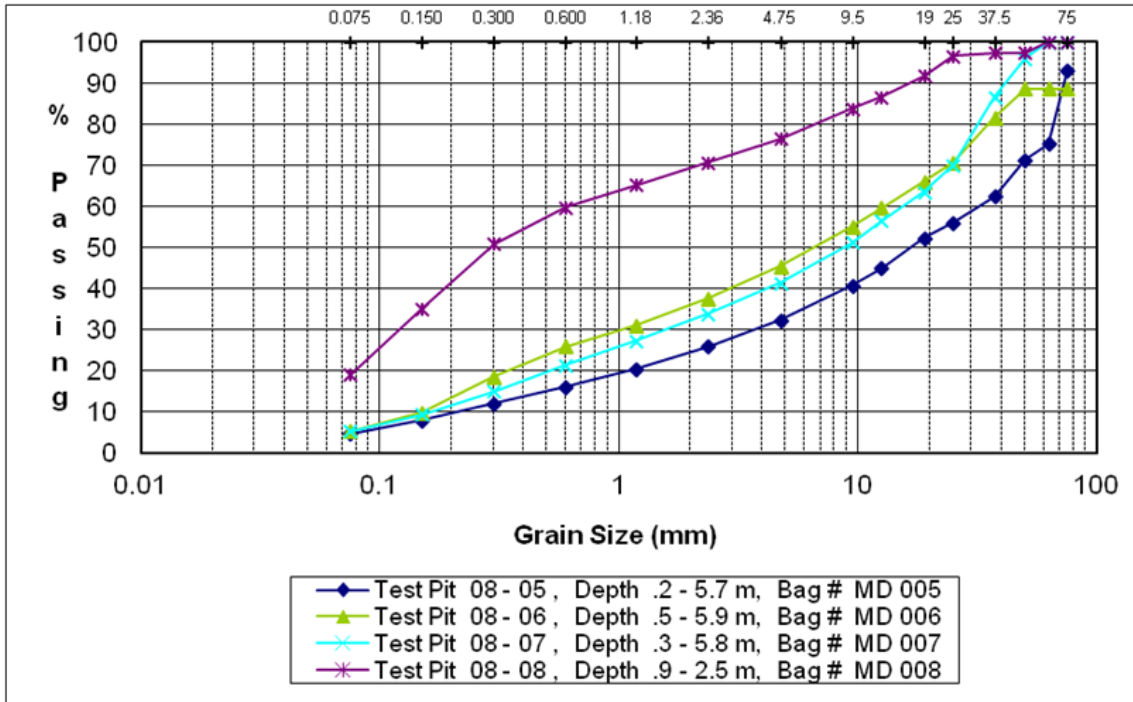
2008 Oversize Field Estimates

Classification:	Average (%)	Range (%)
Boulders (>375mm)	0.2	0 – 1
Cobbles (150-375mm)	4	0 – 10
Cobbles (75-150mm)	12	0 – 20

The maximum size rock observed was 500 mm.

Aggregate Gradation Charts





Summary of Test Pit Logs (including Laboratory Results – bolded in red) are located below:

AGGREGATE LOG												
PROJECT:		Maryland Pit					SAMPLED BY:		JS - MoTI			
PIT #:		0899					METHOD:		EXCAVATOR			
DISTRICT:		West Kootenay					DATE:		15-10-2014			
TH / TP	DEPTH (m)		SAMPLE BAG No.	SOILS CLASS	ESTIMATED GRADATION			ESTIMATED ROCK 75mm				Laboratory Results
	FROM	TO			G	S	F	MAX SIZE	75mm 150mm	150mm 300mm	300mm	
TP 14-01	0.0	5.0	161	GP	57	40	4	250	3	2	-	GP-GM 70.5/24.0/5.5
TP14-02	0.0	0.2		TS								
	0.2	5.3	162	GP	50	46	4	300	4	3	1	GW 67.0/28.9/4.1
TP14-03	0.0	0.1		TS								
	0.1	0.7		ML			100					
	0.7	5.1	163	GP	58	39	3	300	3	2	1	GW 66.7/29.6/3.7
TP14-04	0.0	5.0	164	GP	55	41	4	200	3	1	-	GW 67.0/28.9/4.1
TP14-05	0.0	0.8	Mixed Pit	Floor								
	0.8	4.9	165	GW	60	38	2	300	2	2	2	GW 66.8/29.6/3.6

AGGREGATE LOG													
PROJECT:		Maryland Pit					SAMPLED BY:		Contractor				
PIT #:		0899					METHOD:		Excavator				
DISTRICT:		West Kootenay					DATE:		August 27-29, 2008				
TH / TP	DEPTH		SAMPLE BAG No.	SOILS CLASS	ESTIMATED GRADATION			ESTIMATED ROCK > 75mm				SAND TYPE F M C	REMARKS
	FROM	TO			G	S	F	MAX SIZE	75mm 150mm	150mm 375mm	375mm		
08-01	0	0.4		SP	0	95	5		0	0	0		
	4	7.3	MD-001	GP	60	36	4	280	15	3	0	M	GP-GM 59.5/35.2/5.2 Some Sand Seams
08-02	0	3.2		ML									
	3.2	6		SP-SM	0	93	7					F	Layers of fine sand and silt
	6	7.1		ML									
08-03	0	2.3	MD-002	GP	55	42	3	200	10	2	0	M - C	GW-GM 64.8/29.6/5.6
	2.3		(combined)	SP	0	94	6		0	0	0	F	interbedded layers of sand and gravel 0.2 to 0.5m thick
			MD-003	GP	55	42	3		10	2	0	M - C	SP-SM 30.7/60.5/8.8
		6		SP	0	94	6		0	0	0	F	

AGGREGATE LOG													
PROJECT:		Maryland Pit						SAMPLED BY:		Contractor			
PIT #:		0899						METHOD:		Excavator			
DISTRICT:		West Kootenay						DATE:		August 27-29, 2008			
TH / TP	DEPTH		SAMPLE BAG No.	SOILS CLASS	ESTIMATED GRADATION			ESTIMATED ROCK > 75mm				SAND TYPE F M C	REMARKS
	FROM	TO			G	S	F	MAX SIZE	75mm 150mm	150mm 375mm	375mm		
08-04	0	6.8	MD-004	GP	57	40	3	220	15	2	0	M - C	GW 66.5/28.6/5.0 Some thin sand seams <0.1m thick
08-05	0	0.2		TS									
	0.2	5.7	MD-005	GP-GM	60	35	5	420	20	10	1		GW 67.7/27.7/4.6 Consistent GP-GM
08-06	0	0.5		ML - TS									
	0.5	3.1	MD-006	GP	55	42	3	330	20	7	1	M	GP-GM 54.6/40.2/5.2
	3.1	3.5	(combined)	SP	0	97	3		0	0	0		
	3.5	5.9		GP	60	37	3	400	20	10	1	C	
08-07	0	0.3		TS									
	0.3	5.8	MD-007	GP	57	40	3	100	20	8	0	M	GP-GM 58.7/36.1/5.2 Consistent GP; subangular cobbles
08-08	0	0.9		OH	60	37	3	80	10	3	0	M	Strippings with some gravel (no O/B)
	0.9	2.5	MD-008	SM ₁	10	77	13					F	SM₁ 23.5/57.5/18.9 Sand with silt lenses/clumps
	2.5	6.5	MD-009	GM	51	45	4	80	15	4	1	M	GP-GM 53.3/40.3/6.4 Sandy gravel
08-09	0	0.3		TS									Overburden
	0.3	2.3		GP	55	28	17	500	10	8	2	F	Subangular to subrounded cobbles
	2.3	4.9		GM ₄ /ML	30	20	50	200	10	5	0	F	Very dense hardpan/till (angular frags) Refusal at bottom; bedrock or large boulders embedded in dense till.
08-10	0	0.8		TS									
	0.8	4	MD-010	GP	70	26	4	150	20	10	0	F - M	GW-GM 62.5/32.2/5.3 Some silt; subangular to subrounded
	4	5.2		GM ₄ /ML	40	15	45	250	10	8	0	F	Cobbles; refusal at bottom; dense till
08-11	0	0.4		TS									Overburden
	0.4	3.8	MD-011	GP	60	37	3	120	20	8	0	M	GP 60.2/35.5/4.3 Subrounded/subangular cobbles
	3.8	5.6	(combined)	GP-GM	52	45	3	80	12	3	0	F - M	More sand at depth; clean
08-12	0	0.8		TS									
	0.8	1		GM/BR									Refusal; bedrock
08-13	0	0.3		SM ₃								F	Pit floor; no O/B; silty layer
	0.3	5.6	MD-012	GP	68	40	2	200	20	4	0	M	GW 61.1/36.1/2.7 Clean gravel, fairly consistent

Photographs:



Test pit 08-03 material



Test Pit 08-04



Al Mitchell
Aggregate Resource Manager

November 21, 2017