

SIEVE ANALYSIS OF FINE AND COARSE AGGREGATE ASTM C136 & C117



October 28, 2005

MINISTRY OF TRANSPORTATION
7818 Sixth Street
Burnaby, B.C. V3N 4N8

JOB NUMBER: 05-1416-172

ATTENTION: Mr. Joe Sam

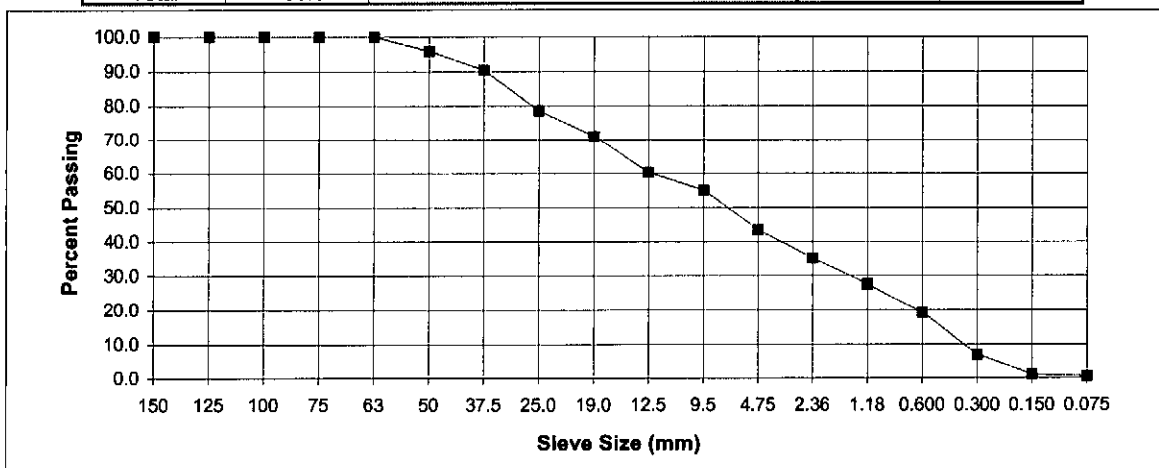
PROJECT: Aggregate Testing, Telegraph Pit

Sample:	TP 05-2 (Bag # 52873)
---------	-----------------------

DATE SAMPLED: October 13, 2005

SAMPLED BY: S.L.

SIEVE ANALYSIS					MATERIAL SPECIFICATION :	
Sieve Size (mm)	% Retained	% Passing	Individual % Retained (Split values)			
			+ 4.75	- 4.75		
150	0.0	100.0	0.0			
125	0.0	100.0	0.0			
100	0.0	100.0	0.0			
75	0.0	100.0	0.0			
63	0.0	100.0	0.0			
50	4.1	95.9	7.3			
37.5	5.5	90.4	9.7			
25.0	11.7	78.6	20.7			
19.0	7.5	71.1	13.3			
12.5	10.8	60.3	19.0			
9.5	5.2	55.1	9.2			
4.75	11.8	43.4	20.8			
2.36	8.1	35.3				
1.18	7.8	27.5				
0.600	8.3	19.2				
0.300	12.3	6.9				
0.150	5.8	1.1				
0.075	0.5	0.6				
PAN	0.6					
Total	100.0					



Remarks: Percent Gravel (+ 4.75 and coarser) : 56.6%
Percent Sand (- 4.75 and finer) : 43.4%

Reported by: R. Nurse

Reviewed by: F. Shrimmer, P.Geo.

DRAFT

Notice: The test data given herein pertain to the sample provided and may not be applicable to material from other production zones. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.

SIEVE ANALYSIS OF FINE AND COARSE AGGREGATE ASTM C136 & C117



October 28, 2005

MINISTRY OF TRANSPORTATION
7818 Sixth Street
Burnaby, B.C. V3N 4N8

JOB NUMBER: 05-1416-172

ATTENTION: Mr. Joe Sam

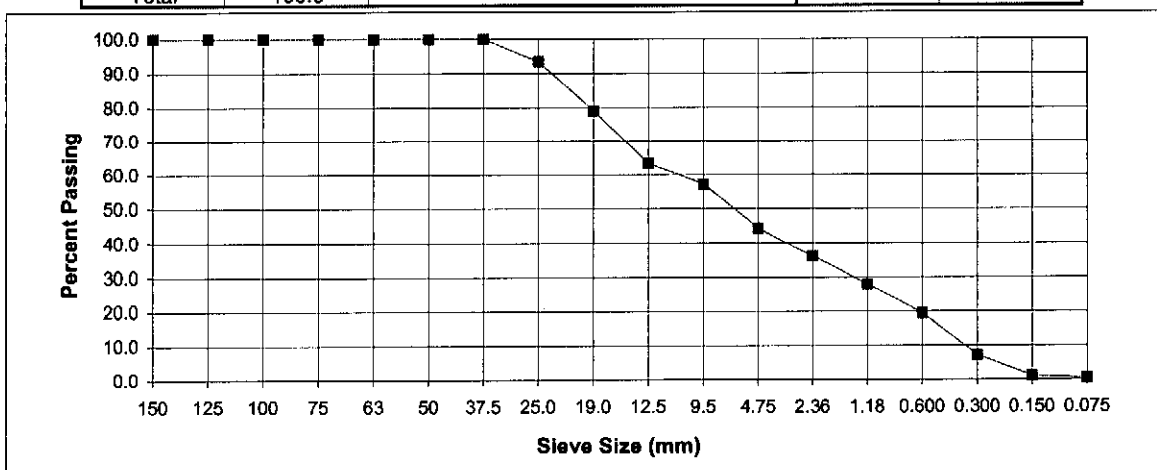
PROJECT: Aggregate Testing, Telegraph Pit

Sample:	TP 05-02 Bag # 52873 (CRUSHED)
---------	--------------------------------

DATE SAMPLED: October 13, 2005

SAMPLED BY: S.L.

SIEVE ANALYSIS					MATERIAL SPECIFICATION :	
Sieve Size (mm)	% Retained	% Passing	Individual % Retained (Split values)			
			+ 4.75	- 4.75		
150	0.0	100.0	0.0			
125	0.0	100.0	0.0			
100	0.0	100.0	0.0			
75	0.0	100.0	0.0			
63	0.0	100.0	0.0			
50	0.0	100.0	0.0			
37.5	0.0	100.0	0.0			
25.0	6.6	93.4	11.8			
19.0	14.3	79.1	25.7			
12.5	15.7	63.4	28.1			
9.5	6.2	57.2	11.0			
4.75	13.0	44.2	23.4			
2.36	8.2	36.0		18.5		
1.18	8.1	27.9		18.3		
0.600	8.5	19.4		19.2		
0.300	12.2	7.2		27.6		
0.150	6.1	1.1		13.8		
0.075	0.7	0.4		1.5		
PAN	0.4			1.0		
Total	100.0					



Remarks: Percent Gravel (+ 4.75 and coarser) : 55.8%
Percent Sand (- 4.75 and finer) : 44.2%

Reported by:

R. Nurse

Reviewed by:

F. Shrimer, P.Geo.

DRAFT

Notice: The test data given herein pertain to the sample provided and may not be applicable to material from other production zones. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.

SIEVE ANALYSIS OF FINE AND COARSE AGGREGATE ASTM C136 & C117



October 28, 2005

MINISTRY OF TRANSPORTATION
7818 Sixth Street
Burnaby, B.C. V3N 4N8

JOB NUMBER: 05-1416-172

ATTENTION: Mr. Joe Sam

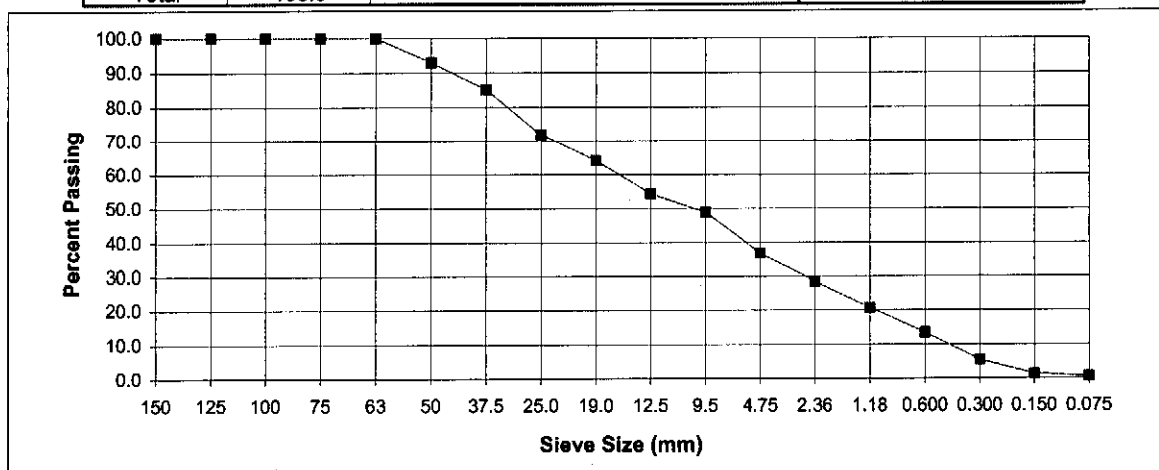
PROJECT: Aggregate Testing, Telegraph Pit

Sample:	TP 05-06 (Bag # 52875)
---------	-------------------------

DATE SAMPLED: October 13, 2005

SAMPLED BY: S.L.

SIEVE ANALYSIS				MATERIAL SPECIFICATION :		
Sieve Size (mm)	% Retained	% Passing	Individual % Retained (Split values)			
			+ 4.75			- 4.75
150	0.0	100.0	0.0			
125	0.0	100.0	0.0			
100	0.0	100.0	0.0			
75	0.0	100.0	0.0			
63	0.0	100.0	0.0			
50	7.0	93.0	11.1			
37.5	8.0	85.0	12.6			
25.0	13.2	71.9	20.9			
19.0	7.8	64.1	12.3			
12.5	9.8	54.3	15.5			
9.5	5.5	48.8	8.6			
4.75	12.0	36.9	19.0			
2.36	8.3	28.5				22.6
1.18	7.9	20.7				21.3
0.600	7.2	13.5		19.5		
0.300	8.1	5.4		21.9		
0.150	4.1	1.3		11.2		
0.075	0.6	0.6		1.8		
PAN	0.6			1.7		
Total	100.0					



Remarks: Percent Gravel (+ 4.75 and coarser) : 63.1%
Percent Sand (- 4.75 and finer) : 36.9%

DRAFT

Reported by: R. Nurse

Reviewed by: F. Shrimmer, P.Geo.

Notice: The test data given herein pertain to the sample provided and may not be applicable to material from other production zones. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.

SIEVE ANALYSIS OF FINE AND COARSE AGGREGATE ASTM C136 & C117



October 28, 2005

MINISTRY OF TRANSPORTATION
7818 Sixth Street
Burnaby, B.C. V3N 4N8

JOB NUMBER: 05-1416-172

ATTENTION: Mr. Joe Sam

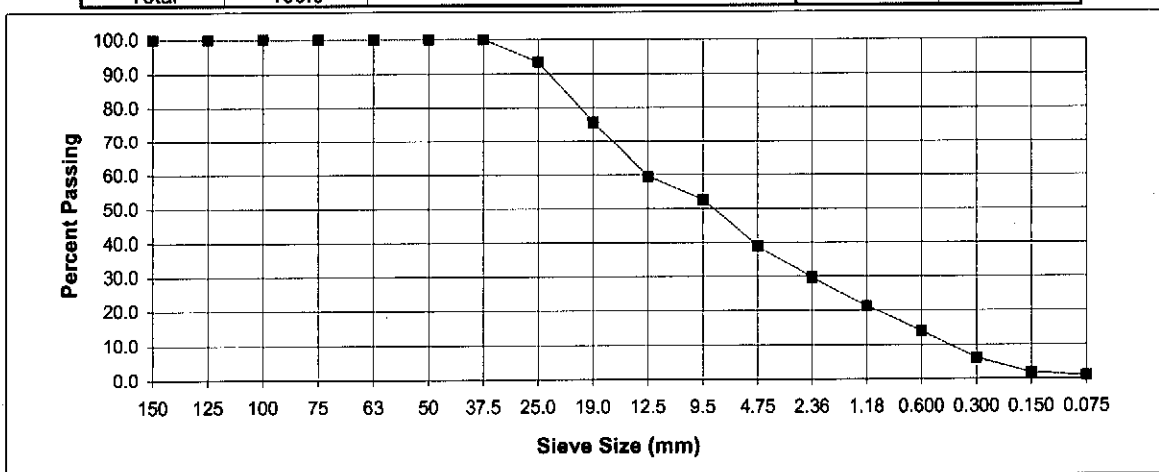
PROJECT: Aggregate Testing, Telegraph Pit

Sample:	TP 05-06 (Bag # 52875) Crushed
---------	----------------------------------

DATE SAMPLED: October 13, 2005

SAMPLED BY: S.L.

SIEVE ANALYSIS					MATERIAL SPECIFICATION :	
Sieve Size (mm)	% Retained	% Passing	Individual % Retained (Split values)			
			+ 4.75	- 4.75		
150	0.0	100.0	0.0			
125	0.0	100.0	0.0			
100	0.0	100.0	0.0			
75	0.0	100.0	0.0			
63	0.0	100.0	0.0			
50	0.0	100.0	0.0			
37.5	0.0	100.0	0.0			
25.0	6.6	93.4	10.8			
19.0	17.6	75.8	28.8			
12.5	16.3	59.5	26.6			
9.5	6.9	52.6	11.3			
4.75	13.8	38.8	22.5			
2.36	9.2	29.7		23.6		
1.18	8.5	21.2		21.8		
0.600	7.2	14.0		18.5		
0.300	8.0	6.0		20.5		
0.150	4.3	1.8		11.0		
0.075	0.7	1.1		1.9		
PAN	1.1			2.8		
Total	100.0					



Remarks: Percent Gravel (+ 4.75 and coarser) : 61.2%
Percent Sand (- 4.75 and finer) : 38.8%

Reported by: R. Nurse

Reviewed by: F. Shrimmer, P.Geo.

DRAFT

Notice: The test data given herein pertain to the sample provided and may not be applicable to material from other production zones. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.

SIEVE ANALYSIS OF FINE AND COARSE AGGREGATE ASTM C136 & C117



October 28, 2005

MINISTRY OF TRANSPORTATION
7818 Sixth Street
Burnaby, B.C. V3N 4N8

JOB NUMBER: 05-1416-172

ATTENTION: Mr. Joe Sam

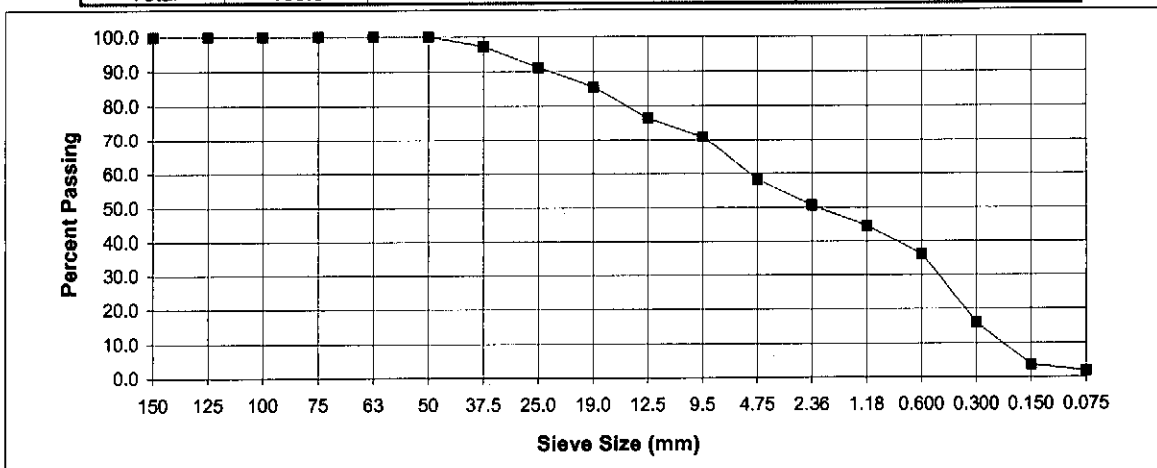
PROJECT: Aggregate Testing, Telegraph Pit

Sample:	TP 05-09 (Bag # 52877)
---------	-------------------------

DATE SAMPLED: October 13, 2005

SAMPLED BY: S.L.

SIEVE ANALYSIS				MATERIAL SPECIFICATION :		
Sieve Size (mm)	% Retained	% Passing	Individual % Retained (Split values)			
			+ 4.75			- 4.75
150	0.0	100.0	0.0			
125	0.0	100.0	0.0			
100	0.0	100.0	0.0			
75	0.0	100.0	0.0			
63	0.0	100.0	0.0			
50	0.0	100.0	0.0			
37.5	2.8	97.2	6.6			
25.0	6.1	91.1	14.7			
19.0	5.6	85.5	13.4			
12.5	9.2	76.4	21.9			
9.5	5.4	70.9	13.0			
4.75	12.7	58.2	30.4			
2.36	7.7	50.6		13.2		
1.18	6.1	44.4		10.5		
0.600	8.2	36.2		14.1		
0.300	20.3	15.9		34.9		
0.150	12.4	3.5		21.3		
0.075	1.7	1.8		3.0		
PAN	1.8			3.0		
Total	100.0					



Remarks: Percent Gravel (+ 4.75 and coarser) : 41.8%
Percent Sand (- 4.75 and finer) : 58.2%

Reported by: R. Nurse

Reviewed by: F. Shrimmer, P.Geo.

DRAFT

Notice: The test data given herein pertain to the sample provided and may not be applicable to material from other production zones. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.

SIEVE ANALYSIS OF FINE AND COARSE AGGREGATE ASTM C136 & C117



October 28, 2005

MINISTRY OF TRANSPORTATION
7818 Sixth Street
Burnaby, B.C. V3N 4N8

JOB NUMBER: 05-1416-172

ATTENTION: Mr. Joe Sam

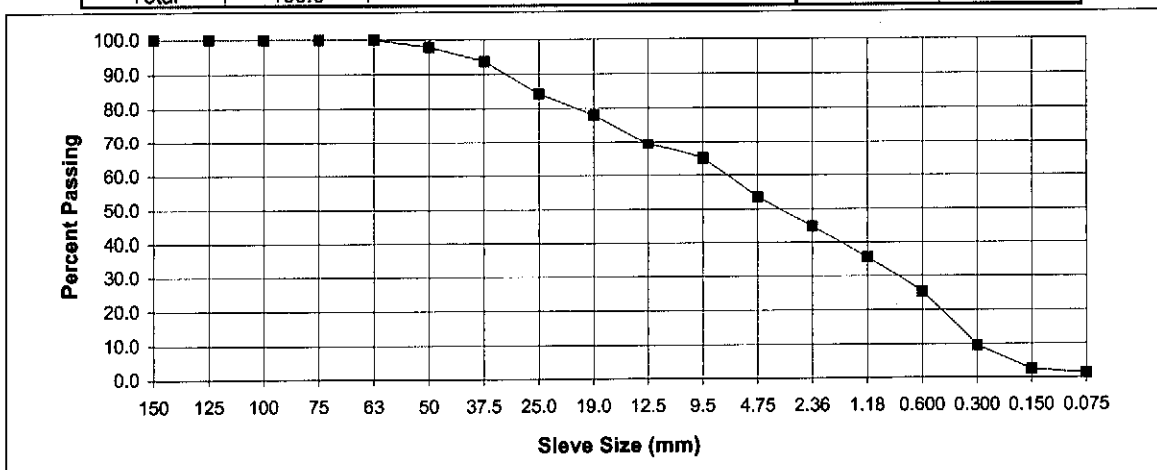
PROJECT: Aggregate Testing, Telegraph Pit

Sample:	TP 05-11 (Bag # 52879)
---------	------------------------

DATE SAMPLED: October 13, 2005

SAMPLED BY: S.L.

SIEVE ANALYSIS				MATERIAL SPECIFICATION :		
Sieve Size (mm)	% Retained	% Passing	Individual % Retained (Split values)			
			+ 4.75			- 4.75
150	0.0	100.0	0.0			
125	0.0	100.0	0.0			
100	0.0	100.0	0.0			
75	0.0	100.0	0.0			
63	0.0	100.0	0.0			
50	2.3	97.7	4.9			
37.5	4.0	93.7	8.7			
25.0	9.5	84.2	20.4			
19.0	6.3	77.9	13.4			
12.5	8.4	69.5	18.1			
9.5	4.4	65.1	9.3			
4.75	11.7	53.4	25.1			
2.36	8.7	44.7		16.3		
1.18	9.0	35.7		16.9		
0.600	10.2	25.5		19.1		
0.300	15.9	9.6		29.7		
0.150	7.2	2.3		13.5		
0.075	1.1	1.3		2.0		
PAN	1.3			2.4		
Total	100.0					



Remarks: Percent Gravel (+ 4.75 and coarser) : 46.6%
Percent Sand (- 4.75 and finer) : 53.4%

Reported by: R. Nurse

Reviewed by: F. Shrimmer, P.Geo.

DRAFT

Notice: The test data given herein pertain to the sample provided and may not be applicable to material from other production zones. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.

SIEVE ANALYSIS OF FINE AND COARSE AGGREGATE ASTM C136 & C117



October 28, 2005

MINISTRY OF TRANSPORTATION
7818 Sixth Street
Burnaby, B.C. V3N 4N8

JOB NUMBER: 05-1416-172

ATTENTION: Mr. Joe Sam

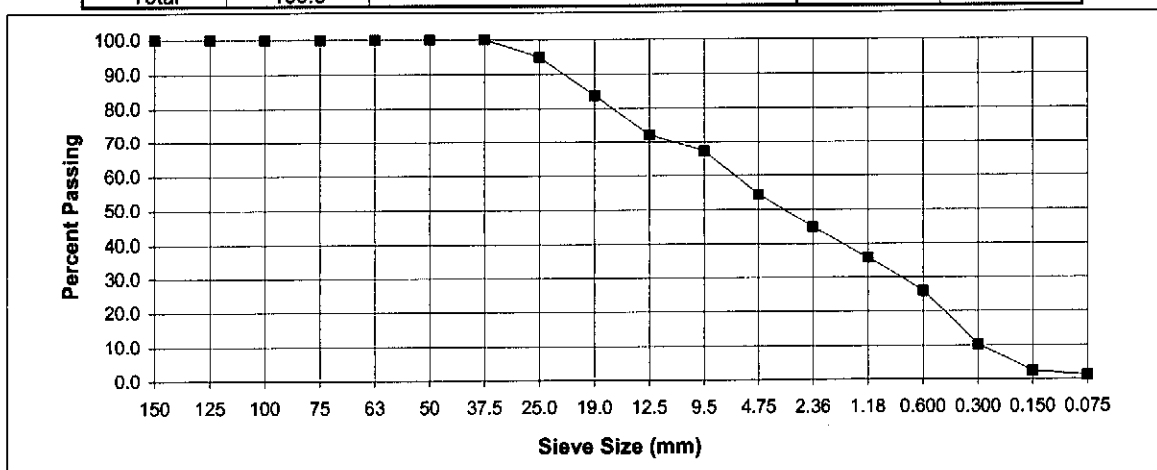
PROJECT: Aggregate Testing, Telegraph Pit

Sample:	TP 05-11 (Bag # 52879) Crushed
---------	----------------------------------

DATE SAMPLED: October 13, 2005

SAMPLED BY: S.L.

SIEVE ANALYSIS					MATERIAL SPECIFICATION :	
Sieve Size (mm)	% Retained	% Passing	Individual % Retained (Split values)			
			+ 4.75	- 4.75		
150	0.0	100.0	0.0			
125	0.0	100.0	0.0			
100	0.0	100.0	0.0			
75	0.0	100.0	0.0			
63	0.0	100.0	0.0			
50	0.0	100.0	0.0			
37.5	0.0	100.0	0.0			
25.0	5.1	94.9	11.2			
19.0	11.3	83.6	24.7			
12.5	11.4	72.2	25.0			
9.5	5.1	67.1	11.3			
4.75	12.7	54.4	27.8			
2.36	9.7	44.7		17.8		
1.18	8.8	35.9		16.2		
0.600	9.8	26.1		18.0		
0.300	15.9	10.2		29.2		
0.150	7.8	2.4		14.4		
0.075	1.2	1.2		2.2		
PAN	1.2			2.2		
Total	100.0					



Remarks: Percent Gravel (+ 4.75 and coarser) : 45.6%
Percent Sand (- 4.75 and finer) : 54.4%

Reported by: R. Nurse

Reviewed by: F. Shrimmer, P.Geo.

DRAFT

Notice: The test data given herein pertain to the sample provided and may not be applicable to material from other production zones. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.

SIEVE ANALYSIS OF FINE AND COARSE AGGREGATE ASTM C136 & C117



October 28, 2005

MINISTRY OF TRANSPORTATION
7818 Sixth Street
Burnaby, B.C. V3N 4N8

JOB NUMBER: 05-1416-172

ATTENTION: Mr. Joe Sam

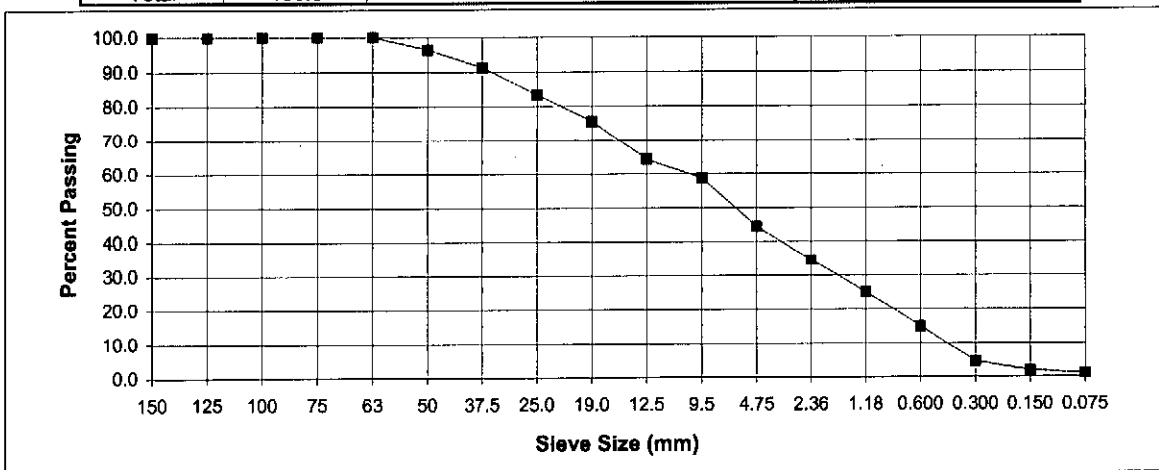
PROJECT: Aggregate Testing, Telegraph Pit

Sample:	TP 05-14 (Bag # 52882)
---------	-------------------------

DATE SAMPLED: October 13, 2005

SAMPLED BY: S.L.

SIEVE ANALYSIS					MATERIAL SPECIFICATION :	
Sieve Size (mm)	% Retained	% Passing	Individual % Retained (Split values)			
			+ 4.75	- 4.75		
150	0.0	100.0	0.0			
125	0.0	100.0	0.0			
100	0.0	100.0	0.0			
75	0.0	100.0	0.0			
63	0.0	100.0	0.0			
50	3.6	96.4	6.5			
37.5	5.1	91.3	9.1			
25.0	7.9	83.4	14.2			
19.0	7.8	75.6	14.0			
12.5	11.3	64.3	20.3			
9.5	5.5	58.7	10.0			
4.75	14.4	44.3	25.8			
2.36	9.7	34.6		22.0		
1.18	9.4	25.2		21.3		
0.600	10.2	15.0		23.0		
0.300	10.3	4.6		23.3		
0.150	2.6	2.0		5.9		
0.075	0.9	1.1		1.9		
PAN	1.1			2.5		
Total	100.0					



Remarks: Percent Gravel (+ 4.75 and coarser) : 55.7%
Percent Sand (- 4.75 and finer) : 44.3%

DRAFT

Reported by: R. Nurse

Reviewed by: F. Shrimmer, P.Geo.

Notice: The test data given herein pertain to the sample provided and may not be applicable to material from other production zones. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.

SIEVE ANALYSIS OF FINE AND COARSE AGGREGATE ASTM C136 & C117



October 28, 2005

MINISTRY OF TRANSPORTATION
7818 Sixth Street
Burnaby, B.C. V3N 4N8

JOB NUMBER: 05-1416-172

ATTENTION: Mr. Joe Sam

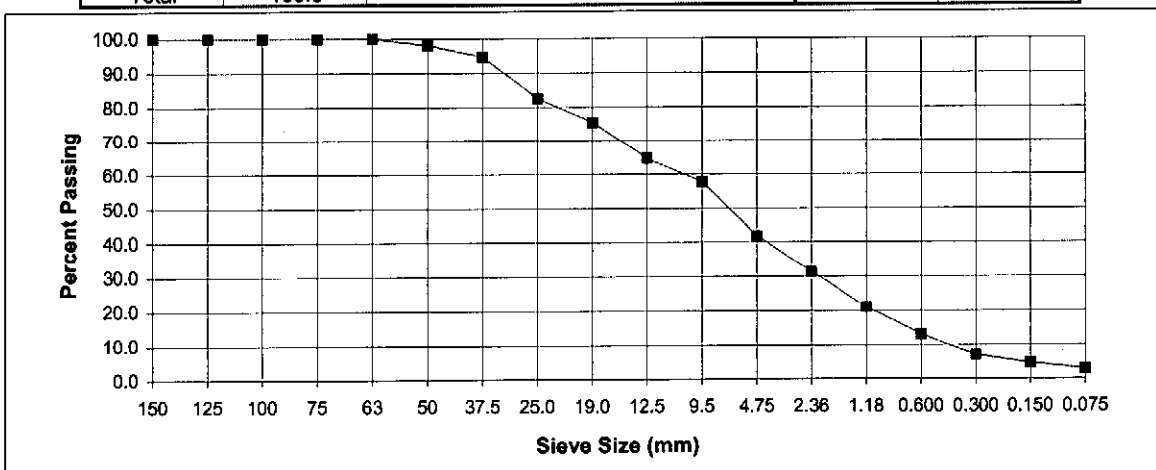
PROJECT: Aggregate Testing, Telegraph Pit

Sample:	TP 05-17 (Bag # 52883)
---------	------------------------

DATE SAMPLED: October 13, 2005

SAMPLED BY: S.L.

SIEVE ANALYSIS					MATERIAL SPECIFICATION :	
Sieve Size (mm)	% Retained	% Passing	Individual % Retained (Split values)			
			+ 4.75	- 4.75		
150	0.0	100.0	0.0			
125	0.0	100.0	0.0			
100	0.0	100.0	0.0			
75	0.0	100.0	0.0			
63	0.0	100.0	0.0			
50	2.0	98.0	3.4			
37.5	3.3	94.7	5.7			
25.0	12.2	82.5	21.0			
19.0	7.0	75.5	12.0			
12.5	10.8	64.7	18.6			
9.5	7.0	57.7	12.0			
4.75	15.9	41.8	27.3			
2.36	10.4	31.4		24.9		
1.18	10.3	21.0		24.7		
0.600	8.0	13.0		19.2		
0.300	6.0	7.0		14.4		
0.150	2.4	4.6		5.8		
0.075	1.7	2.9		4.0		
PAN	2.9			6.9		
Total	100.0					



Remarks: Percent Gravel (+ 4.75 and coarser) : 58.2%
Percent Sand (- 4.75 and finer) : 41.8%

Reported by: R. Nurse

Reviewed by: F. Shrimmer, P.Geo.

DRAFT

Notice: The test data given herein pertain to the sample provided and may not be applicable to material from other production zones. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.

SIEVE ANALYSIS OF FINE AND COARSE AGGREGATE ASTM C136 & C117



October 28, 2005

MINISTRY OF TRANSPORTATION
7818 Sixth Street
Burnaby, B.C. V3N 4N8

JOB NUMBER: 05-1416-172

ATTENTION: Mr. Joe Sam

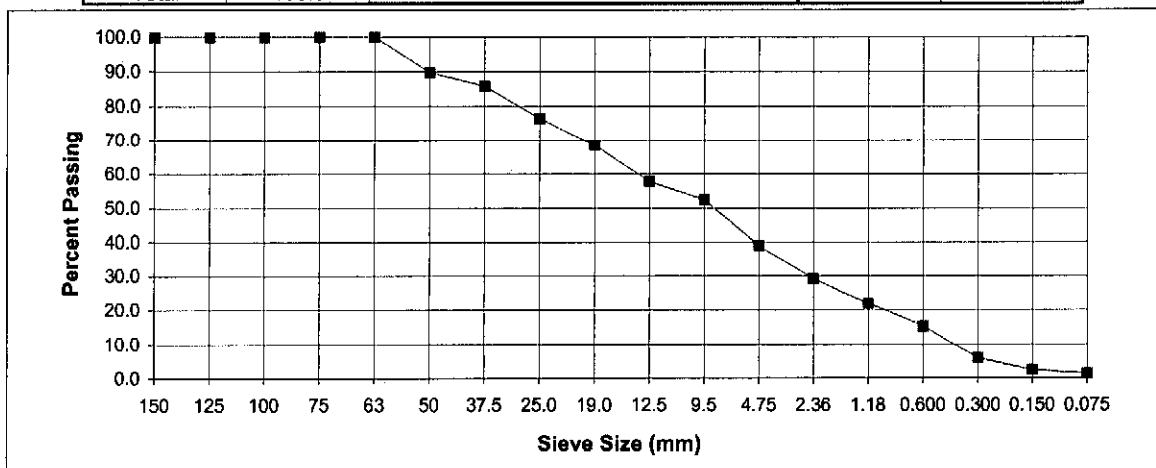
PROJECT: Aggregate Testing, Telegraph Pit

Sample:	TP 05-19 (Bag # 52881)
---------	------------------------

DATE SAMPLED: October 13, 2005

SAMPLED BY: S.L.

SIEVE ANALYSIS					MATERIAL SPECIFICATION :	
Sieve Size (mm)	% Retained	% Passing	Individual % Retained (Split values)			
			+ 4.75	- 4.75		
150	0.0	100.0	0.0			
125	0.0	100.0	0.0			
100	0.0	100.0	0.0			
75	0.0	100.0	0.0			
63	0.0	100.0	0.0			
50	10.2	89.8	16.8			
37.5	4.0	85.7	6.6			
25.0	9.3	76.4	15.2			
19.0	8.0	68.4	13.2			
12.5	10.6	57.7	17.4			
9.5	5.4	52.3	8.8			
4.75	13.5	38.9	22.0			
2.36	9.7	29.1		25.0		
1.18	7.2	22.0		18.5		
0.600	6.7	15.2		17.3		
0.300	9.3	5.9		24.0		
0.150	3.5	2.4		8.9		
0.075	1.1	1.3		2.9		
PAN	1.3			3.4		
Total	100.0					



Remarks: Percent Gravel (+ 4.75 and coarser) : 61.1%
Percent Sand (- 4.75 and finer) : 38.9%

DRAFT

Reported by: R. Nurse

Reviewed by: F. Shrimmer, P.Geo.

Notice: The test data given herein pertain to the sample provided and may not be applicable to material from other production zones. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.

SIEVE ANALYSIS OF FINE AND COARSE AGGREGATE ASTM C136 & C117



October 28, 2005

MINISTRY OF TRANSPORTATION
7818 Sixth Street
Burnaby, B.C. V3N 4N8

JOB NUMBER: 05-1416-172

ATTENTION: Mr. Joe Sam

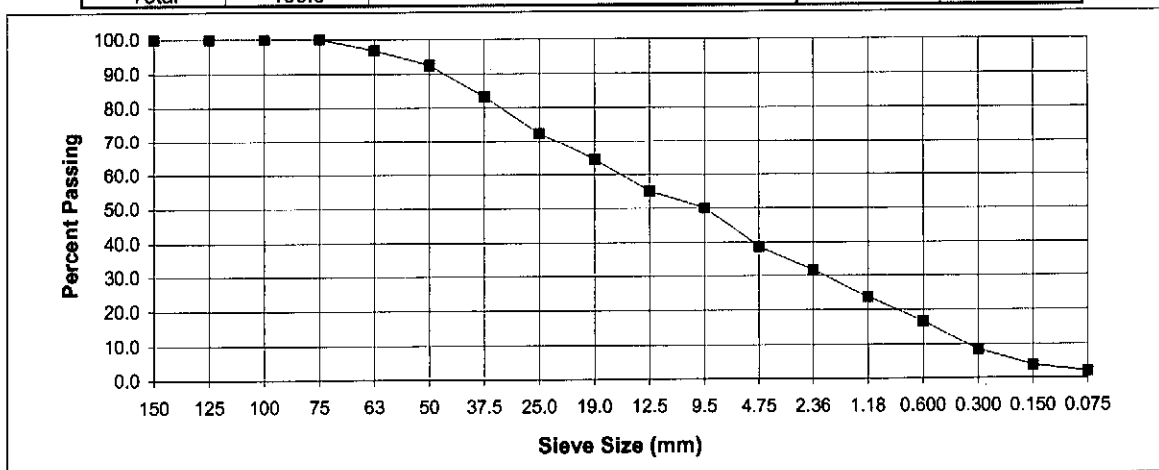
PROJECT: Aggregate Testing, Telegraph Pit

Sample:	TP 05-20 (Bag # 52884)
---------	-------------------------

DATE SAMPLED: October 13, 2005

SAMPLED BY: S.L.

SIEVE ANALYSIS					MATERIAL SPECIFICATION :	
Sieve Size (mm)	% Retained	% Passing	Individual % Retained (Split values)			
			+ 4.75	- 4.75		
150	0.0	100.0	0.0			
125	0.0	100.0	0.0			
100	0.0	100.0	0.0			
75	0.0	100.0	0.0			
63	3.4	96.6	5.5			
50	4.2	92.4	6.9			
37.5	9.2	83.2	15.1			
25.0	10.8	72.4	17.6			
19.0	7.9	64.5	12.9			
12.5	9.4	55.1	15.3			
9.5	5.1	50.0	8.3			
4.75	11.3	38.7	18.5			
2.36	7.1	31.6		18.4		
1.18	7.7	23.9		19.9		
0.600	7.3	16.6		18.8		
0.300	8.1	8.4		21.1		
0.150	4.6	3.8		12.0		
0.075	1.8	2.0		4.5		
PAN	2.0			5.3		
Total	100.0					



Remarks: Percent Gravel (+ 4.75 and coarser) : 61.3%
Percent Sand (- 4.75 and finer) : 38.7%

DRAFT

Reported by: R. Nurse

Reviewed by: F. Shrimmer, P.Geo.

Notice: The test data given herein pertain to the sample provided and may not be applicable to material from other production zones. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.

SIEVE ANALYSIS OF FINE AND COARSE AGGREGATE ASTM C136 & C117



October 28, 2005

MINISTRY OF TRANSPORTATION
7818 Sixth Street
Burnaby, B.C. V3N 4N8

JOB NUMBER: 05-1416-172

ATTENTION: Mr. Joe Sam

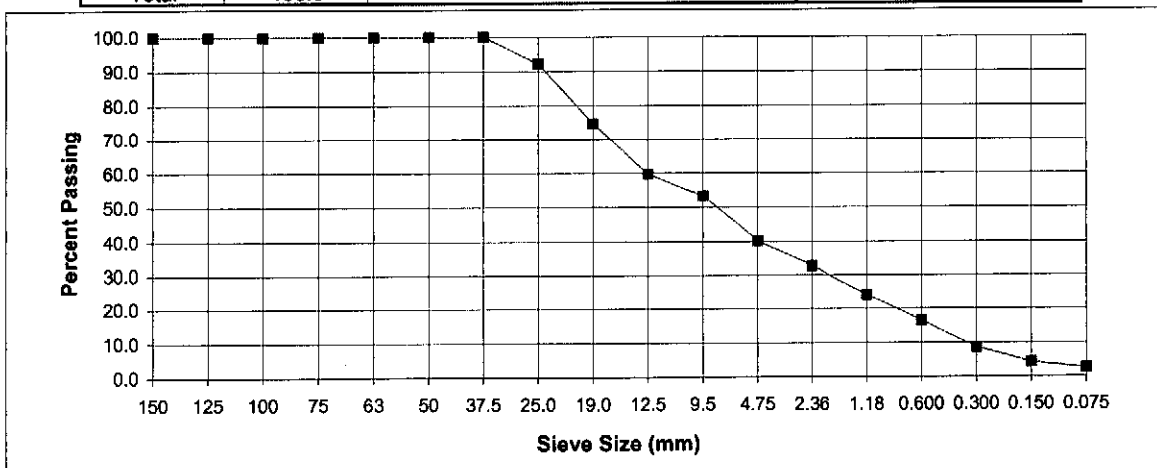
PROJECT: Aggregate Testing, Telegraph Pit

Sample:	TP 05-20 (Bag # 52884) Crushed
---------	----------------------------------

DATE SAMPLED: October 13, 2005

SAMPLED BY: S.L.

SIEVE ANALYSIS					MATERIAL SPECIFICATION :	
Sieve Size (mm)	% Retained	% Passing	Individual % Retained (Split values)			
			+ 4.75	- 4.75		
150	0.0	100.0	0.0			
125	0.0	100.0	0.0			
100	0.0	100.0	0.0			
75	0.0	100.0	0.0			
63	0.0	100.0	0.0			
50	0.0	100.0	0.0			
37.5	0.0	100.0	0.0			
25.0	7.8	92.2	13.1			
19.0	17.5	74.7	29.3			
12.5	15.0	59.7	25.1			
9.5	6.3	53.3	10.6			
4.75	13.1	40.2	22.0			
2.36	7.5	32.7		18.7		
1.18	8.6	24.0		21.5		
0.600	7.5	16.5		18.7		
0.300	7.9	8.6		19.8		
0.150	4.3	4.3		10.6		
0.075	1.7	2.6		4.3		
PAN	2.6			6.5		
Total	100.0					



Remarks: Percent Gravel (+ 4.75 and coarser) : 59.8%
Percent Sand (- 4.75 and finer) : 40.2%

Reported by: R. Nurse

Reviewed by: F. Shrimmer, P.Geo.

DRAFT

Notice: The test data given herein pertain to the sample provided and may not be applicable to material from other production zones. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.

**SOUNDNESS OF AGGREGATE BY
USE OF MAGNESIUM SULFATE
ASTM C 88**



November 7, 2005
Job Number: 05-1416-172

MINISTRY OF TRANSPORTATION
7818 Sixth Street
Burnaby, B.C.
V3N 4N8

ATTENTION: Mr. Joe Sam

PROJECT: Aggregate Testing, Telegraph Pit

Sample:	TP 05-6, Lab Crushed
---------	----------------------

Date sampled: October 11/12, 2005

Sampled by: S. L.

Sieve Fraction (mm)	Original Grading (%)	Mass per fraction before test (g)	Loss (%)	Weighted Loss (%)
63 x 50 50 x 37.5	--	--	--	--
37.5 x 25 25 x 19	39.6	1511.6	0.9	0.4
19 x 12.5 12.5 x 9.5	37.9	999.7	3.1	1.2
9.5 x 4.75	22.5	300.9	4.1	0.9
	100.0		TOTAL	2.5

Notes:

1. Used MgSO_4 solution and five cycles of immersion.

Reported by: _____

R. Nurse

Reviewed by: _____

F. Shrimmer, P. Geo.

Date: _____

DRAFT

Notice: The test data given herein pertain to the sample provided, and may not be applicable to material from other production zones. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.

GOLDER ASSOCIATES LTD., Unit B, 12330 - 88th Avenue, Surrey, B.C. Canada V3W 3J6 Tel: 604-591-6616 Fax: 604-591-6608

**SOUNDNESS OF AGGREGATE BY
USE OF MAGNESIUM SULFATE
ASTM C 88**



November 7, 2005
Job Number: 05-1416-172

MINISTRY OF TRANSPORTATION
7818 Sixth Street
Burnaby, B.C.
V3N 4N8

ATTENTION: Mr. Joe Sam

PROJECT: Aggregate Testing, Telegraph Pit

Sample:	TP 05-6, Lab Crushed
---------	----------------------

Date sampled: October 11/12, 2005

Sampled by: S. L.

Sieve Fraction (mm)	Original Grading	Mass per fraction before test (g)	Loss (%)	Weighted Loss (%)
9.5 × 4.75	--	-	--	--
4.75 × 2.36	23.6	103.0	8.0	1.9
2.36 × 1.18	21.8	102.5	8.9	1.9
1.18 × 0.600	18.5	104.5	10.7	2.0
0.600 × 0.300	20.5	101.3	7.2	1.5
0.300 × 0.150	10.9	--	0.0	0.0
0.150 × 0.075	1.9	--	0.0	0.0
< 0.075	2.8	--	0.0	0.0
	100		TOTAL	7.3

Notes:

1. Used MgSO_4 solution and five cycles of immersion.

Reported by: _____

R. Nurse

DRAFT

Reviewed by: _____

F. Shrimmer, P. Geo.

Date: _____

Notice: The test data given herein pertain to the sample provided, and may not be applicable to material from other production zones. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.

GOLDER ASSOCIATES LTD., Unit B, 12330 - 88th Avenue, Surrey, B.C. Canada V3W 3J6 604-591-6616 Fax: 604-591-6608

RESISTANCE OF FINE AGGREGATE TO DEGRADATION BY ABRASION IN THE MICRO-DEVAL APPARATUS



November 2, 2005
Job Number: 05-1416-172

MINISTRY OF TRANSPORTATION
7818-6th Street
BURNABY, BC
V3N 4N8

ATTENTION: Mr. Joe Sam

PROJECT: Aggregate Testing, Telegraph Pit

Sample:	TP 05-6, Lab Crushed
---------	----------------------

Date sampled: October 11/12, 2005

Sampled by: Client

Source	--
Grading	- 4.75mm
Mass of spheres (g)	1251.2
Mass of test sample (g)	504.5
Loss at conclusion of test (%)	6.4

Loss (%) for Control Sand, test completed October 26, 2005	16.0
---	------

Note:

Reported by: R. Nurse

Reviewed by: F. Shrimer, P. Geo. DATE: _____

DRAFT

Notice: The test data given herein pertain to the sample provided, and may not be applicable to material from other production zones. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.

GOLDER ASSOCIATES LTD., Unit B - 12330 - 88th Avenue, Surrey, B.C. Canada V3W 3J6 Tel: 604-591-6616 Fax: 604-591-6608

**RESISTANCE OF COARSE AGGREGATE
TO DEGRADATION BY ABRASION IN THE
MICRO-DEVAL APPARATUS
ASTM D6928**



November 2, 2005
Job Number: 05-1416-172

MINISTRY OF TRANSPORTATION
7818-6th Street
BURNABY, BC
V3N 4N8

ATTENTION: Mr. Joe Sam

PROJECT: Aggregate Testing, Telegraph Pit

Sample:	TP 05-6, Lab Crushed
----------------	-----------------------------

Date sampled: October 11/12, 2005

Sampled by: Client

Source	--
Grading	8.2
Mass of spheres (g)	5000.4
Mass of test sample (g)	1499.9
Loss at conclusion of test (%)	6.3

Loss (%) for Control aggregate (Brechtin Stone), test completed October 26, 2005	18.6
---	-------------

Note:

Reported by: 
R. Nurse

Reviewed by: _____
F. Shrimmer, P. Geo.

Date: _____

DRAFT

Notice: The test data given herein pertain to the sample provided, and may not be applicable to material from other production zones. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.

GOLDER ASSOCIATES LTD., Unit B, 12330 - 88th Avenue, Surrey, B.C. Canada V3W 3J6 Tel: 604-591-6616 Fax: 604-591-6608

FRACTURE COUNT OF COARSE AGGREGATE BCH-113



November 2, 2005

JOB NUMBER: 05-1416-172

MINISTRY OF TRANSPORTATION

7818 Sixth Street

Burnaby, B.C., V3N 4N8

ATTENTION: Mr. Joe Sam

PROJECT: Aggregate Testing, Telegraph Pit

Sample:	TP 05-2, Lab Crushed
---------	----------------------

DATE SAMPLED: October 11/12 2005

SAMPLED BY: Client

METHOD A - FOR CRUSHED GRANULAR SURFACING AND BASE AGGREGATES

METHOD B - FOR CRUSHED PAVING AGGREGATES

METHOD A - COUNT (pcs)

AGGREGATE SIZE mm	FRACTURED a	UNFRACTURED b	TOTAL a+b	% FRACTURE a/(a+b)
37.5 x 25	23	26	49	46.9 % (25)
25 x 19	131	89	220	59.5 % (19)
19 x 12.5	89	126	215	41.4 % (12.5)
12.5 x 9.5	83	123	206	40.3 % (9.5)
9.5 x 4.75	140	191	331	42.3 % (4.75)
TOTAL	466	555	1021	45.6 % FRACTURE A

METHOD B - MASS (grams)

AGGREGATE SIZE mm	FRACTURED a	UNFRACTURED b	TOTAL a+b	% FRACTURED a/(a+b)
19 X 13.2				% (13.2)
13.2 X 9.5				% (9.5)
AVERAGE				% FRACTURE B

Notes:

Reported by:

R. Nurse

Reviewed by:

F. Shrimer, P. Geo.

DRAFT

Notice: The test data given herein pertain to the sample provided and may not be applicable to material from other production zones. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.

**FRACTURE COUNT
OF COARSE AGGREGATE
BCH-113**



November 2, 2005

JOB NUMBER: 05-1416-172

MINISTRY OF TRANSPORTATION
7818 Sixth Street
Burnaby, B.C., V3N 4N8

ATTENTION: Mr. Joe Sam

PROJECT: Aggregate Testing, Telegraph Pit

Sample:	TP 05-6, Lab Crushed
---------	----------------------

DATE SAMPLED: October 11/12 2005

SAMPLED BY: Client

METHOD A - FOR CRUSHED GRANULAR SURFACING AND BASE AGGREGATES
METHOD B - FOR CRUSHED PAVING AGGREGATES

METHOD A - COUNT (pcs)

AGGREGATE SIZE mm	FRACTURED a	UNFRACTURED b	TOTAL a+b	% FRACTURE a/(a+b)
37.5 x 25	23	6	29	79.3 % (25)
25 x 19	79	37	116	68.1 % (19)
19 x 12.5	60	101	161	37.3 % (12.5)
12.5 x 9.5	60	149	209	28.7 % (9.5)
9.5 x 4.75	247	707	954	25.9 % (4.75)
TOTAL	469	1000	1469	31.9 % FRACTURE A

METHOD B - MASS (grams)

AGGREGATE SIZE mm	FRACTURED a	UNFRACTURED b	TOTAL a+b	% FRACTURED a/(a+b)
19 X 13.2				% (13.2)
13.2 X 9.5				% (9.5)
AVERAGE				% FRACTURE B

Notes:

Reported by:

R. Nurse

Reviewed by:

F. Shrimer, P. Geo.

DRAFT

Notice: The test data given herein pertain to the sample provided and may not be applicable to material from other production zones. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.

FRACTURE COUNT OF COARSE AGGREGATE BCH-I13



November 2, 2005

JOB NUMBER: 05-1416-172

MINISTRY OF TRANSPORTATION

7818 Sixth Street

Burnaby, B.C., V3N 4N8

ATTENTION: Mr. Joe Sam

PROJECT: Aggregate Testing, Telegraph Pit

Sample:	TP 05-11, Lab Crushed
---------	-----------------------

DATE SAMPLED: October 11/12 2005

SAMPLED BY: Client

METHOD A - FOR CRUSHED GRANULAR SURFACING AND BASE AGGREGATES

METHOD B - FOR CRUSHED PAVING AGGREGATES

METHOD A - COUNT (pcs)

AGGREGATE SIZE mm	FRACTURED a	UNFRACTURED b	TOTAL a+b	% FRACTURE a/(a+b)
37.5 x 25	5	2	7	71.4 % (25)
25 x 19	22	20	42	52.4 % (19)
19 x 12.5	35	71	106	33.0 % (12.5)
12.5 x 9.5	35	92	127	27.6 % (9.5)
9.5 x 4.75	481	1010	1491	32.3 % (4.75)
TOTAL	578	1195	1773	32.6 % FRACTURE A

METHOD B - MASS (grams)

AGGREGATE SIZE mm	FRACTURED a	UNFRACTURED b	TOTAL a+b	% FRACTURED a/(a+b)
19 X 13.2				% (13.2)
13.2 X 9.5				% (9.5)
AVERAGE				% FRACTURE B

Notes:

Reported by:

R. Nurse

Reviewed by:

F. Shrimmer, P. Geo.

DRAFT

Notice: The test data given herein pertain to the sample provided and may not be applicable to material from other production zones. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.

FRACTURE COUNT OF COARSE AGGREGATE BCH-113



November 2, 2005

JOB NUMBER: 05-1416-172

MINISTRY OF TRANSPORTATION
7818 Sixth Street
Burnaby, B.C., V3N 4N8

ATTENTION: Mr. Joe Sam

PROJECT: Aggregate Testing, Telegraph Pit

Sample:	TP 05-20, Lab Crushed
---------	-----------------------

DATE SAMPLED: October 11/12 2005

SAMPLED BY: Client

METHOD A - FOR CRUSHED GRANULAR SURFACING AND BASE AGGREGATES
METHOD B - FOR CRUSHED PAVING AGGREGATES

METHOD A - COUNT (pcs)

AGGREGATE SIZE mm	FRACTURED a	UNFRACTURED b	TOTAL a+b	% FRACTURE a/(a+b)
37.5 x 25	12	5	17	70.6 % (25)
25 x 19	49	16	65	75.4 % (19)
19 x 12.5	73	76	149	49.0 % (12.5)
12.5 x 9.5	53	90	143	37.1 % (9.5)
9.5 x 4.75	604	879	1483	40.7 % (4.75)
TOTAL	791	1066	1857	42.6 % FRACTURE A

METHOD B - MASS (grams)

AGGREGATE SIZE mm	FRACTURED a	UNFRACTURED b	TOTAL a+b	% FRACTURED a/(a+b)
19 X 13.2				% (13.2)
13.2 X 9.5				% (9.5)
AVERAGE				% FRACTURE B

Notes:

Reported by:

R. Nurse

Reviewed by:

F. Shrimer, P. Geo.

DRAFT

Notice: The test data given herein pertain to the sample provided and may not be applicable to material from other production zones. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.

**SPECIFIC GRAVITY AND ABSORPTION
OF COARSE AGGREGATE
ASTM C 127**



November 2, 2005
Job Number: 05-1416-172

MINISTRY OF TRANSPORTATION
7818-6th Street
BURNABY, BC
V3N 4N8

ATTENTION: Mr. Joe Sam

PROJECT: Aggregate Testing, Telegraph Pit

Sample:	TP 05-6, Lab Crushed
---------	----------------------

Date sampled: October 11/12, 2005

Sampled by: Client

Trial No.	Relative Density (dry basis)	Relative Density (SSD basis)	Apparent Relative Density	Absorption (%)
1	2.796	2.818	2.859	0.79
2	2.804	2.822	2.856	0.65
3	2.814	2.831	2.864	0.62
AVERAGE	2.804	2.824	2.860	0.69

Notes:

Reported by: R. Nurse
R. Nurse

Reviewed by: _____

Date: _____

DRAFT

Notice: The test data given herein pertain to the sample provided, and may not be applicable to material from other production zones.
This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.

GOLDER ASSOCIATES LTD., Unit B, 12330 - 88th Avenue, Surrey, B.C. Canada V3W 3J6 Tel: 604-591-6616 Fax: 604-591-6608

**SPECIFIC GRAVITY AND ABSORPTION
OF FINE AGGREGATE
ASTM C 128**



November 2, 2005
Job Number: 05-1416-172

MINISTRY OF TRANSPORTATION
7818-6th Street
BURNABY, BC
V3N 4N8

ATTENTION: Mr. Joe Sam

PROJECT: Aggregate Testing, Telegraph Pit

Sample:	TP 05-6, Lab Crushed
---------	----------------------

Date sampled: October 11/12, 2005

Sampled by: Client

Trial No.	Relative Density (dry basis)	Relative Density (SSD basis)	Apparent Relative Density	Absorption (%)
1	2.701	2.736	2.799	1.29
2	2.702	2.734	2.792	1.2
3	2.703	2.735	2.793	1.19
AVERAGE	2.702	2.735	2.795	1.23

Notes:

Reported by: _____

R. Nurse

DRAFT

Reviewed by: _____

Date: _____

Notice: The test data given herein pertain to the sample provided, and may not be applicable to material from other production zones.
This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.

GOLDER ASSOCIATES LTD., Unit B, 12330 - 88th Avenue, Surrey, B.C. Canada V3W 3J6 Tel: 604-591-6616 Fax: 604-591-6608



Hardy BBT Limited

CONSULTING ENGINEERING & ENVIRONMENTAL SERVICES

SIEVE ANALYSIS REPORT 8 16 30 50 SERIES

Mr. Wayne Janusson

Ministry of Transportation & Highways
Geotechnical and Materials,
3260 Norwell Drive,
Nanaimo, B.C., V9T 1X5

PROJECT NO: NX00666
DATE: 90.Nov.02
CLIENT P.O.: A09,A12,D26-1
CC:

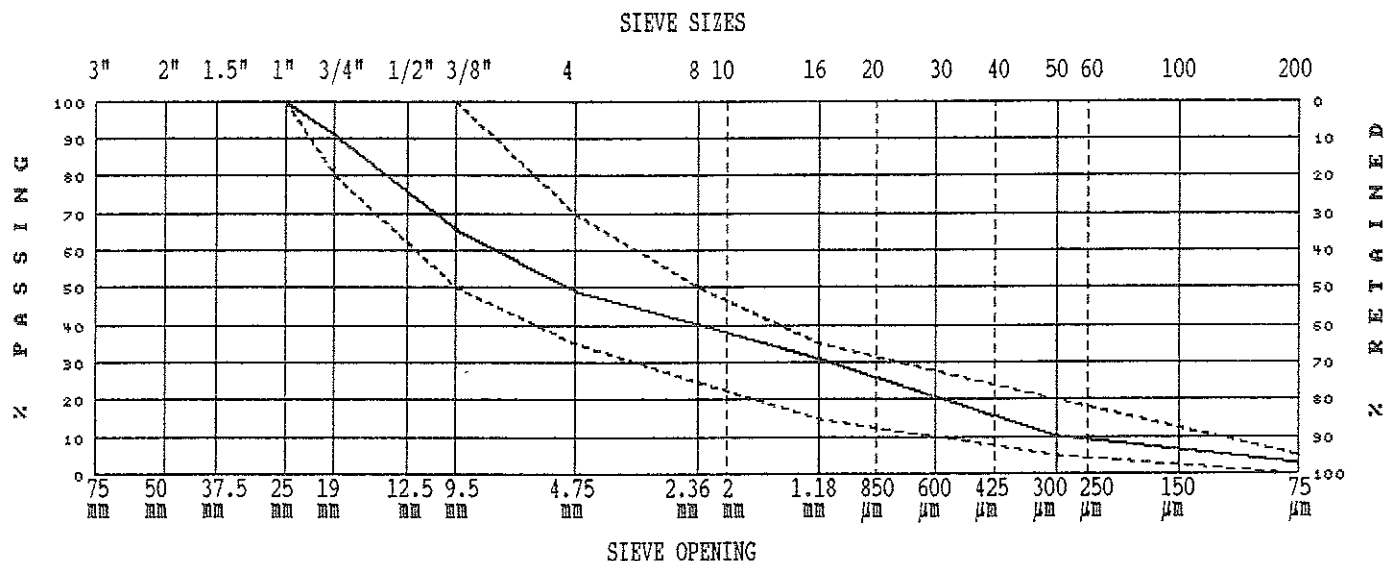
PROJECT: 1990 Miscellaneous Testing
Nanaimo, B.C.

TESTNO: 1 SOURCE: Telegraph Creek Pit

SAMPLE TYPE: 25mm WGBC

DATE SAMPLED: 90.Nov.01 BY: Client

DATE TESTED: 90.Nov.02



GRAVEL SIZES			PERCENT PASSING	GRADATION LIMITS
3"	75	mm		
2"	50	mm		
1 1/2"	37.5	mm		
1"	25	mm	100.0	100 - 100
3/4"	19	mm	91.0	80 - 100
1/2"	12.5	mm		
3/8"	9.5	mm	65.8	50 - 100

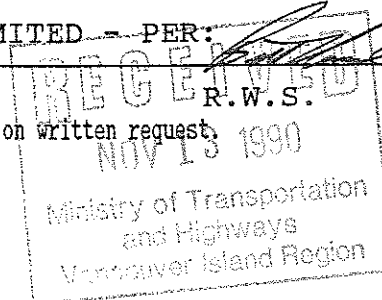
SAND SIZES AND FINES			PERCENT PASSING	GRADATION LIMITS
No. 4	4.75	mm	49.3	35 - 70
No. 8	2.36	mm	40.1	25 - 50
No. 16	1.18	mm	31.1	15 - 35
No. 30	600	µm		
No. 50	300	µm	10.5	5 - 20
No. 100	150	µm		
No. 200	75	µm	3.1	0 - 5

COMMENTS: PERCENT CRUSHED IS 40%, ONE FACE FRACTURED

HARDT BBT LIMITED - PER:

Reporting of these test results constitutes a testing service only.

Engineering interpretation or evaluation of the test results is provided only on written request.



NOV 14 1990



Hardy BBT Limited

CONSULTING ENGINEERING & ENVIRONMENTAL SERVICES

SIEVE ANALYSIS REPORT 8 16 30 50 SERIES

Mr. Wayne Janusson

Ministry of Transportation & Highways
Geotechnical and Materials,
3260 Norwell Drive,
Nanaimo, B.C., V9T 1X5

PROJECT NO: NX00666
DATE: 90.Nov.02
CLIENT P.O.: A09,A12,D26-1
CC:

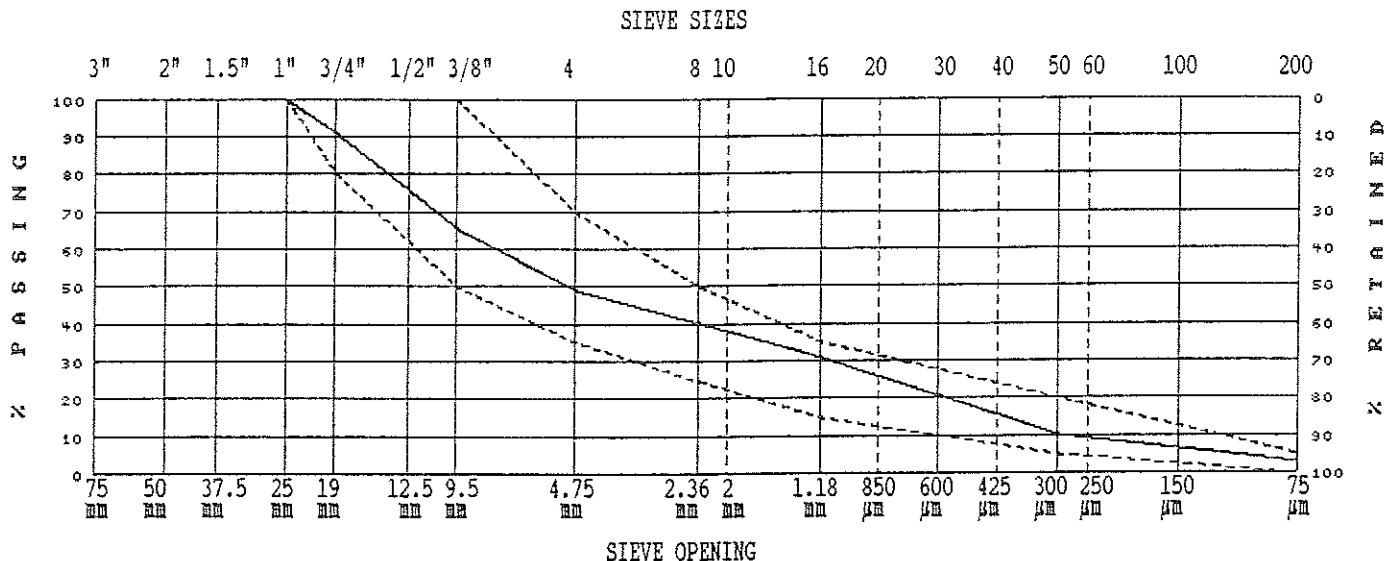
PROJECT: 1990 Miscellaneous Testing
Nanaimo, B.C.

TESTNO: 1 SOURCE: Telegraph Creek Pit

SAMPLE TYPE: 25mm WGBC

DATE SAMPLED: 90.Nov.01 BY: Client

DATE TESTED: 90.Nov.02



GRAVEL SIZES	PERCENT PASSING	GRADATION LIMITS
3" 75 mm		
2" 50 mm		
1 1/2" 37.5 mm		
1" 25 mm	100.0	100 - 100
3/4" 19 mm	91.0	80 - 100
1/2" 12.5 mm		
3/8" 9.5 mm	65.8	50 - 100

SAND SIZES AND FINES	PERCENT PASSING	GRADATION LIMITS
No. 4 4.75 mm	49.3	35 - 70
No. 8 2.36 mm	40.1	25 - 50
No. 16 1.18 mm	31.1	15 - 35
No. 30 600 µm		
No. 50 300 µm	10.5	5 - 20
No. 100 150 µm		
No. 200 75 µm	3.1	0 - 5

COMMENTS: PERCENT CRUSHED IS 40%, ONE FACE FRACTURED

HARDT BBT LIMITED - PER:

Reporting of these test results constitutes a testing service only.

R.W.S.

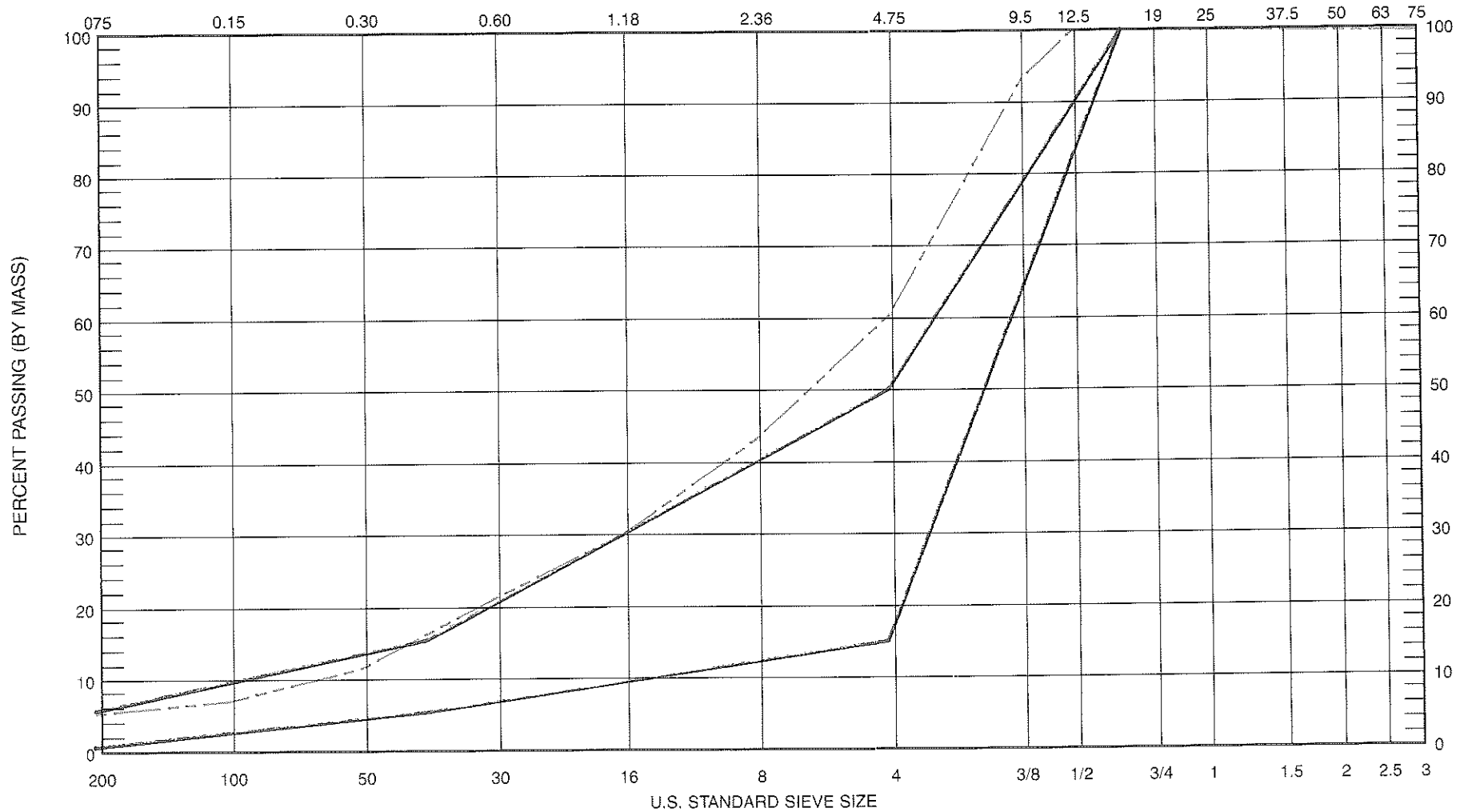
Engineering interpretation or evaluation of the test results is provided only on written request.

NOV 14 1990
NOV 1 1990

AGGREGATE GRADATION CHART

SIEVE OPENING (mm)

PROJECT: TELEGRAPH 61008
DISTRICT: SOUTH ISLAND

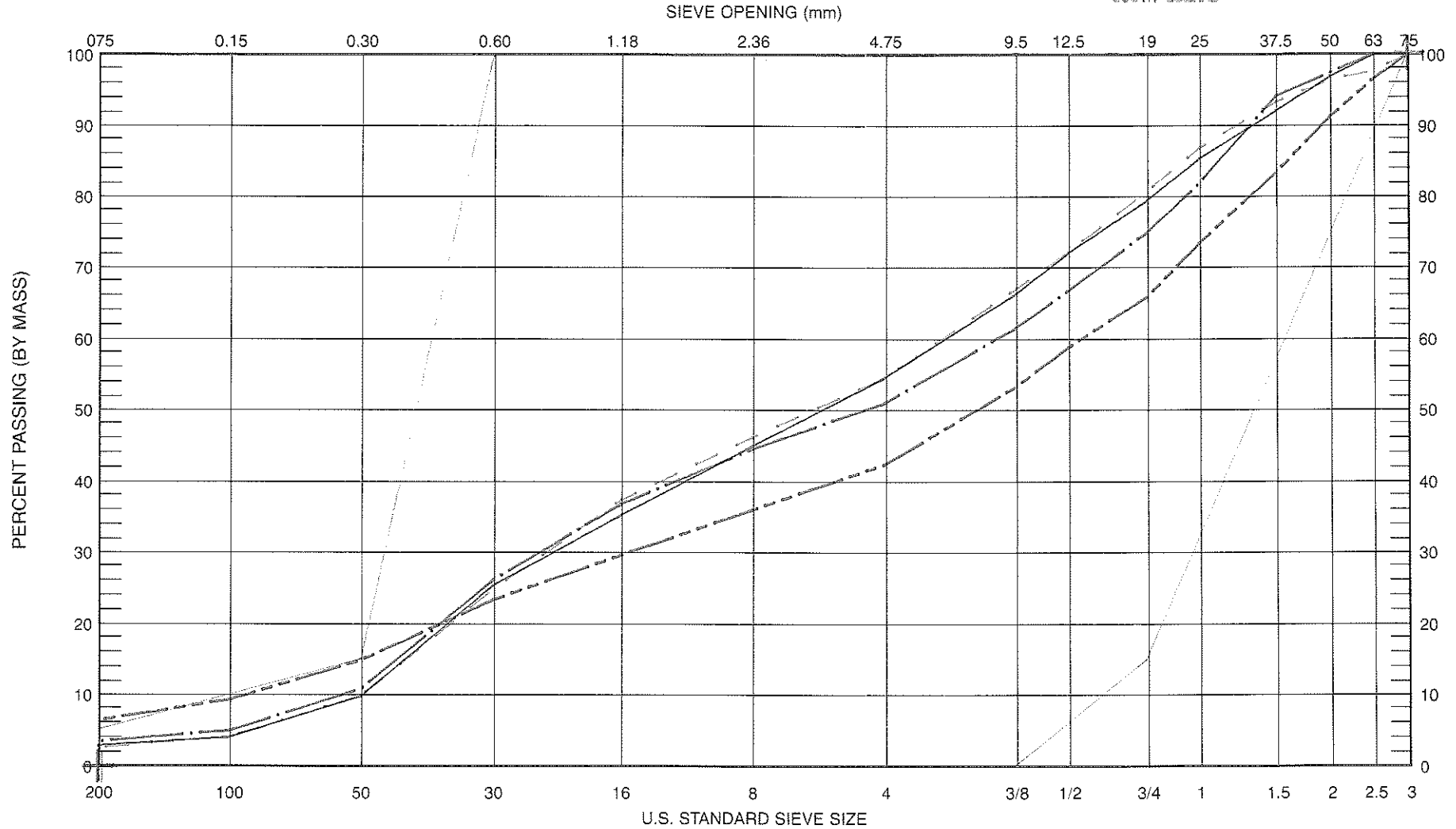


BAG #	SAMPLE #	TEST HOLE / PIT	DEPTH	SAMPLE OF	SAMPLED BY	METHOD	DATE	TESTED BY	DATE
35299		STOCKPILE	UNKNOWN	16mm GRADED SEAL	88	HAND	89.08.01	NANA.IHU LAB	89.08.03

16 mm GRADED SEAL AGGREGATE

AGGREGATE GRADATION CHART

PROJECT: TELEGRAPH
DISTRICT: SOUTH ISLAND

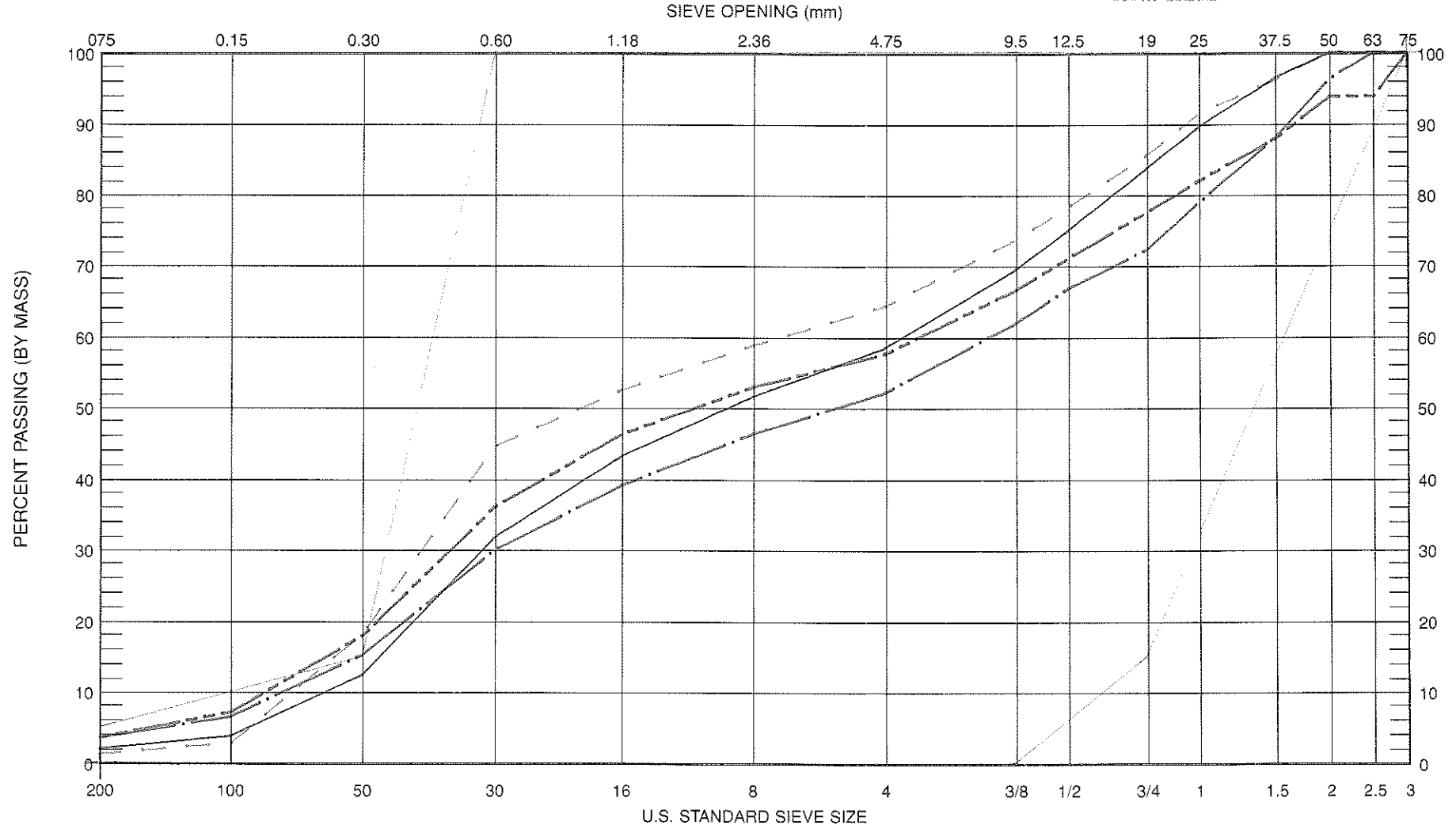


BAG #	SAMPLE #	TESTHOLE/PIT	DEPTH	SAMPLE OF	SAMPLED BY	METHOD	DATE	TESTED BY	DATE
-----	X15454	89-01	1.8-3.6m	PIT RUN	ES/BL	BECKER	FEB 7 89	BW	JAN 2 89
-----	X15455	89-01	9.1-10.4m	PIT RUN	ES/BL	BECKER	FEB 7 89	BW	JUN 2 89
-----	X15452	89-02	1.8-3.1m	PIT RUN	ES/BL	BECKER	FEB 7 89	BW	JUN 2 89
-----	X15453	89-02	5.5-6.7m	PIT RUN	ES/BL	BECKER	FEB 7 89	BW	JUN 2 89

----- SELECT GRANULAR SUB-BASE

AGGREGATE GRADATION CHART

PROJECT: TELEGRAPH
DISTRICT: SOUTH ISLAND



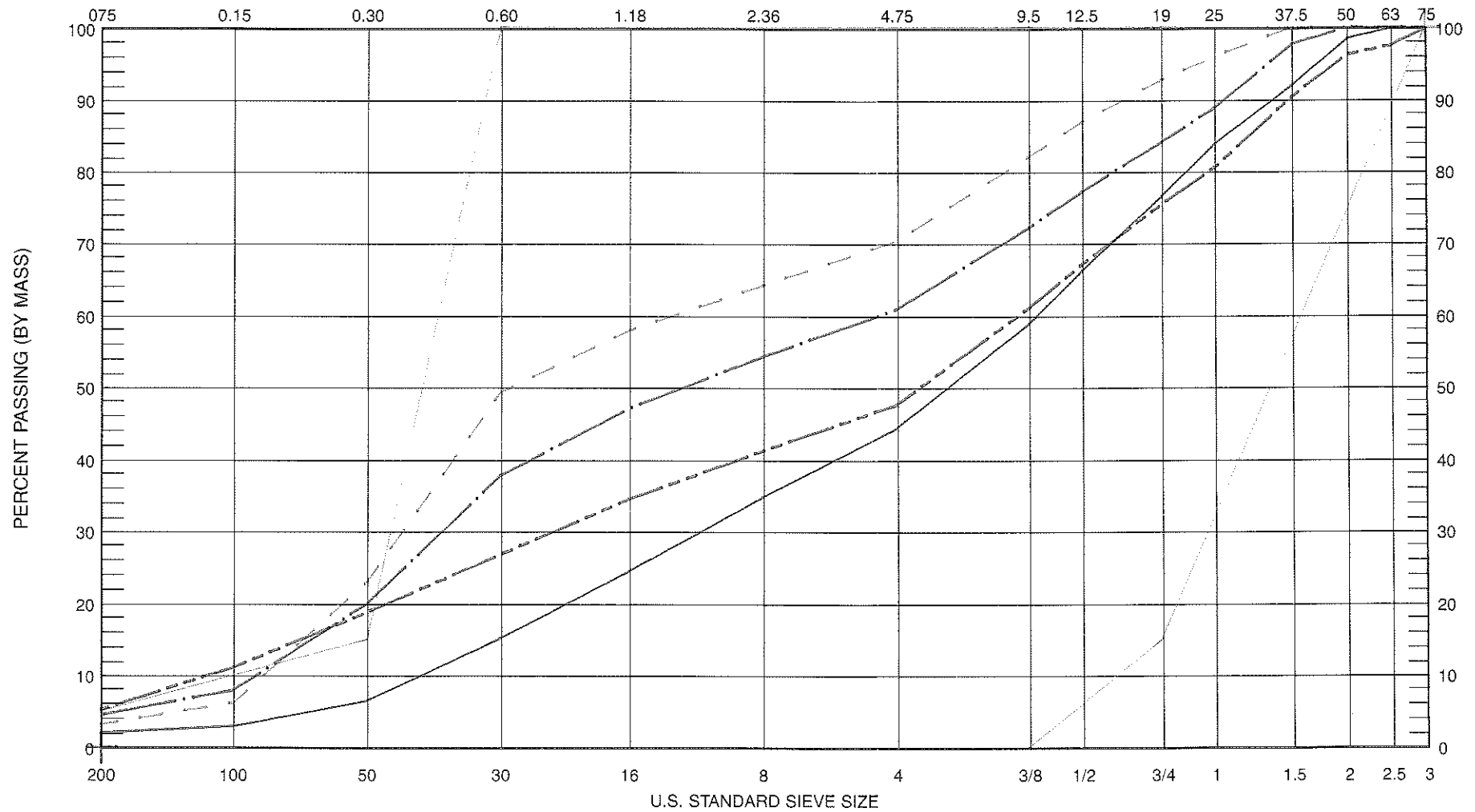
BAG #	SAMPLE #	TESTHOLE/PIT	DEPTH	SAMPLE OF	SAMPLED BY	METHOD	DATE	TESTED BY	DATE
X15450	X15450	89-03	1.8-3.1m	PIT RUN	ES/BL	BECKER	FEB 7 89	BN	JUN 2 89
X15451	X15451	89-03	7.9-9.1m	PIT RUN	ES/BL	BECKER	FEB 7 89	BN	JUN 2 89
X15248	X15248	89-04	1.8-3.1m	PIT RUN	ES/BL	BECKER	FEB 7 89	BN	JUN 2 89
X15249	X15249	89-04	5.5-6.7m	PIT RUN	ES/BL	BECKER	FEB 7 89	BN	JUN 2 89

SELECT GRANULAR SUB-BASE

AGGREGATE GRADATION CHART

PROJECT: TELEGRAPH
DISTRICT: SOUTH ISLAND

SIEVE OPENING (mm)

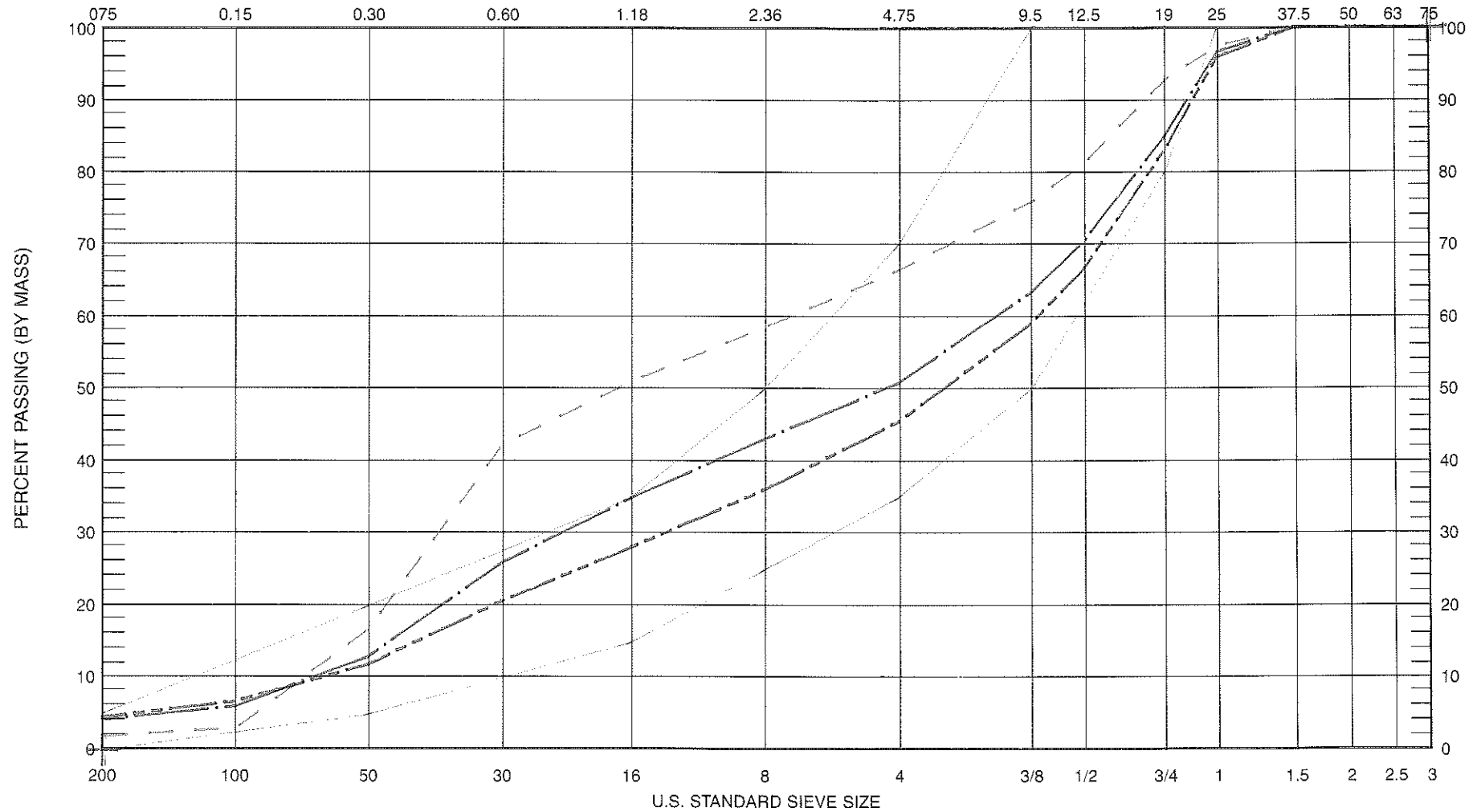


	BAG #	SAMPLE #	TESTHOLE/PIT	DEPTH	SAMPLE OF	SAMPLED BY	METHOD	DATE	TESTED BY	DATE
-----	X15244	X15244	89-06	1.8-3.1m	PIT RUN	ES/BL	BECKER	FEB 7 89	BW	JAN 2 89
-----	X15245	X15245	89-06	14-15.2m	PIT RUN	ES/BL	BECKER	FEB 7 89	BW	JUN 2 89
-----	X15457	X15457	89-07	9.1-10.4m	PIT RUN	ES/BL	BECKER	FEB 7 89	BW	JUN 2 89
-----	X15460	X15460	89-09	1.8-3.1m	PIT RUN	ES/BL	BECKER	FEB 7 89	BW	JUN 2 89

----- SELECT GRANULAR SUB-BASE

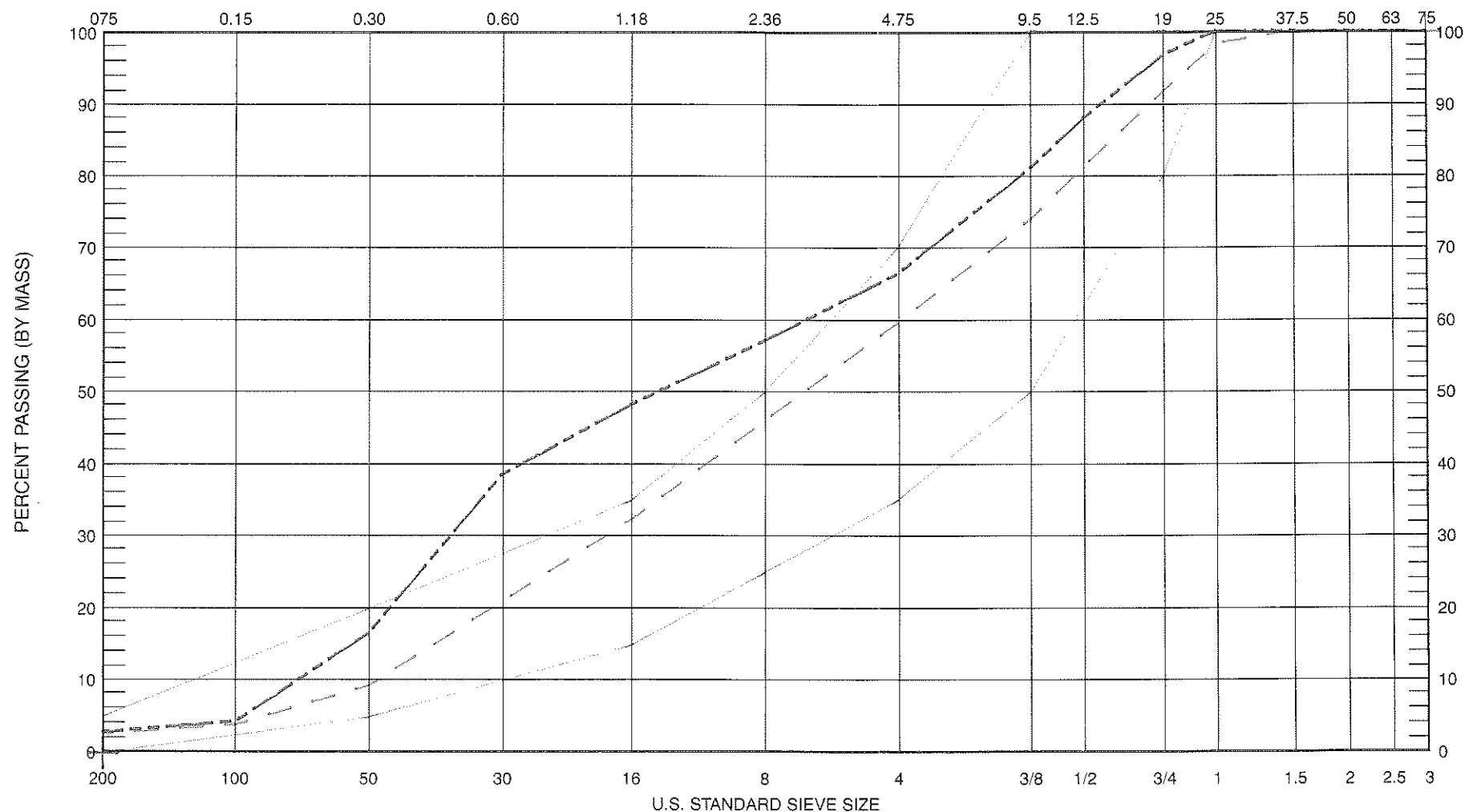
AGGREGATE GRADATION CHART

SIEVE OPENING (mm)

PROJECT: TELEGRAPH
DISTRICT: SOUTH ISLAND


AGGREGATE GRADATION CHART

SIEVE OPENING (mm)

PROJECT: TELEGRAPH
DISTRICT: SOUTH ISLAND


BAG #	SAMPLE #	TESTHOLE/PIT	DEPTH	SAMPLE OF	SAMPLED BY	METHOD	DATE	TESTED BY	DATE
X15245	X15245	89-06	14-15.2m	LAB CRUSH	ES/BL	BECKER	FEB 7 89	EW	FEB 27 90
X15460	X15460	89-09	1.8-3.1m	LAB CRUSH	ES/BL	BECKER	FEB 7 89	EW	FEB 27 90

25mm WELL GRADED BASE

PROVINCE OF BRITISH COLUMBIA
MINISTRY OF TRANSPORTATION & HIGHWAYS
GEOTECHNICAL AND MATERIALS BRANCH

Project TELEGRAPH

Sta. or T.H. C9-1 Sample # X15454

Depth _____

Cost Code _____ Date MAR/90

Technician B. Woods

SAND EQUIVALENT TEST

TRIAL #	1	2	3	4
Clay Height mm	<u>7.85"</u>	<u>7.70"</u>	_____	_____
Sediment Period	<u>20 MIN</u>	<u>20 MIN</u>	_____	_____
Sand Height mm	<u>3.70"</u>	<u>3.70"</u>	_____	_____
Sand Equivalent (SE)	<u>47.1</u>	<u>48.0</u>	_____	_____

INTERPRETATION OF RESULTS

SE	50	40	30	20
	↑			
	absence of plastic material	possible plastic material	plastic material	

REMARKS:

CALCULATIONS:

$$\text{Sand Equivalent (SE)} = \frac{\text{Sand Height}}{\text{Clay Height}} \times 100$$

Project TELEGRAPH
Sta. or T.H. 89-3 Sample # V15451
Depth _____
Cost Code _____ Date MAR/90
Technician B. LONG

SAND EQUIVALENT TEST

TRIAL #	1	2	3	4
Clay Height mm	<u>6.0"</u>	<u>6.0"</u>	_____	_____
Sediment Period	<u>20 min</u>	<u>20 min</u>	_____	_____
Sand Height mm	<u>4.2"</u>	<u>4.3"</u>	_____	_____
Sand Equivalent (SE)	<u>70</u>	<u>72</u>	_____	_____

INTERPRETATION OF RESULTS

SE <u>70</u>	50	40	30	20
	absence of plastic material		possible plastic material	
				plastic material

REMARKS:

CALCULATIONS:

$$\text{Sand Equivalent (SE)} = \frac{\text{Sand Height}}{\text{Clay Height}} \times 100$$

PROVINCE OF BRITISH COLUMBIA
MINISTRY OF TRANSPORTATION & HIGHWAYS
GEOTECHNICAL AND MATERIALS BRANCH

Project TELEGRAPH

Sta. or T.H. 89-6 Sample # X15245

Depth _____

Cost Code _____ Date MAR/90

Technician B. WONG

SAND EQUIVALENT TEST

TRIAL #	1	2	3	4
Clay Height mm	<u>6.0"</u>	_____	_____	_____
Sediment Period	<u>20 min</u>	_____	_____	_____
Sand Height mm	<u>4.2"</u>	_____	_____	_____
Sand Equivalent (SE)	<u>70</u>	_____	_____	_____

INTERPRETATION OF RESULTS

SE 70

50

40

30

20

absence of plastic
material

possible plastic
material

plastic
material

REMARKS:

CALCULATIONS:

$$\text{Sand Equivalent (SE)} = \frac{\text{Sand Height}}{\text{Clay Height}} \times 100$$

PROVINCE OF BRITISH COLUMBIA
MINISTRY OF TRANSPORTATION & HIGHWAYS
GEOTECHNICAL AND MATERIALS BRANCH

Project TELEGRAPH
Sta. or T.H. 89-9 Sample # X15460
Depth _____
Cost Code _____ Date MAR/90
Technician B. WONG

SAND EQUIVALENT TEST

TRIAL #	1	2	3	4
Clay Height mm	<u>6.1"</u>	_____	_____	_____
Sediment Period	<u>20 min</u>	_____	_____	_____
Sand Height mm	<u>4.2"</u>	_____	_____	_____
Sand Equivalent (SE)	<u>69</u>	_____	_____	_____

INTERPRETATION OF RESULTS

SE	50	40	30	20
<u>69</u>	absence of plastic material	possible plastic material	plastic material	

REMARKS:

CALCULATIONS:

$$\text{Sand Equivalent (SE)} = \frac{\text{Sand Height}}{\text{Clay Height}} \times 100$$

PROVINCE OF BRITISH COLUMBIA
MINISTRY OF TRANSPORTATION & HIGHWAYS
GEOTECHNICAL & MATERIALS BRANCH

DEGRADATION TEST

Project TELEGRAPH
Sta or T.H. 89-1 Sample # X15454
Depth _____
Cost Code _____ Date MAR 190
Technician B. LONG

TRIAL #

1

2

3

4

Sediment Height (H) mm

46

Degradation Factor (D)

72.59

CALCULATIONS

$$D = \frac{381 - H}{381 + 1.75 H} \times 100$$

PROVINCE OF BRITISH COLUMBIA
MINISTRY OF TRANSPORTATION & HIGHWAYS
GEOTECHNICAL & MATERIALS BRANCH

DEGRADATION TEST

Project TELEGRAPH
Sta or T.H. K9-3 Sample # X15451
Depth _____
Cost Code _____ Date MAR/90
Technician B. Wong

TRIAL #

1

2

3

4

Sediment Height (H) mm

36

Degradation Factor (D)

77.02

CALCULATIONS

$$D = \frac{381 - H}{381 + 1.75 H} \times 100$$

PROVINCE OF BRITISH COLUMBIA
MINISTRY OF TRANSPORTATION & HIGHWAYS
GEOTECHNICAL & MATERIALS BRANCH

DEGRADATION TEST

Project TELEGRAPH
Sta or T.H. 89-6 Sample # X15245
Depth _____
Cost Code _____ Date MAR/90
Technician B-Wong

TRIAL #

1

2

3

4

Sediment Height (H) mm

41

Degradation Factor (D)

74.59

CALCULATIONS

$$D = \frac{381 - H}{381 + 1.75 H} \times 100$$

PROVINCE OF BRITISH COLUMBIA
MINISTRY OF TRANSPORTATION & HIGHWAYS
GEOTECHNICAL & MATERIALS BRANCH

DEGRADATION TEST

Project TELEGRAPH

Sta or T.H. 89-7 Sample # X15460

Depth _____

Cost Code _____ Date MAY 190

Technician B. WONG

TRIAL #

1

2

3

4

Sediment Height (H) mm

53

Degradation Factor (D)

68.77

CALCULATIONS

$$D = \frac{381 - H}{381 + 1.75 H} \times 100$$



FRACTURE COUNT

MINISTRY OF TRANSPORTATION AND HIGHWAYS - GEOTECHNICAL BRANCH

METHOD A - FOR CRUSHED GRANULAR SURFACING AND BASE

METHOD B - FOR CRUSHED PAVING AGGREGATE

PROJECT: Telegraph - Pomberton

DISTRICT: South Island

TESTHOLE/PIT: 89-11 SAMPLE NO.: BAG NO.: X15369 DEPTH: 1.8-3.1 m

METHOD A (COUNT)

			COUNT			
PASSING	37.5	UNFRACTURED	<u>1</u>			
RETAINED	25	1 + FRACTURED	<u>1</u>	<u>50.0</u>	% (25 mm)	
PASSING	25	UNFRACTURED	<u>3</u>			
RETAINED	19	1 + FRACTURED	<u>9</u>	<u>75.0</u>	% (19 mm)	
PASSING	19	UNFRACTURED	<u>24</u>			
RETAINED	12.5	1 + FRACTURED	<u>14</u>	<u>36.8</u>	% (12.5 mm)	
PASSING	12.5	UNFRACTURED	<u>35</u>			
RETAINED	9.5	1 + FRACTURED	<u>15</u>	<u>30.0</u>	% (9.5 mm)	
PASSING	9.5	UNFRACTURED	<u>198</u>			
RETAINED	4.75	1 + FRACTURED	<u>390</u>	<u>66.3</u>	% (4.75 mm)	
TOTAL		UNFRACTURED	<u>261</u>			
		1 + FRACTURED	<u>429</u>			
				<u>= 62.2</u>	% FRACTURE	
TOTAL NUMBER OF PIECES			<u>690</u>			

METHOD B (MASS)

			MASS			
PASSING	19	UNFRACTURED	<u>178.11</u>			
RETAINED	13.2	2 + FRACTURED	<u>71.13</u>	<u>28.5</u>	% (13.2 mm)	
PASSING	13.2	UNFRACTURED	<u>102.61</u>			
RETAINED	9.5	2 + FRACTURED	<u>25.33</u>	<u>19.8</u>	% (9.5 mm)	
ARITHMETIC AVERAGE				<u>25.6</u>	% FRACTURE B	

15-3-78

Project MOTH LTS-90
Station TELEGRAPH FAMBURTON
Sample No. TH 89-11 Depth 1.8-3.1m
Sampled By _____ Date _____
Tested By TJB Date June 19/90

X 15369

DEGRADATION

3 500
SAMPLE NUMBER X 15369
SEDIMENT HEIGHT (H) 1.5
DEGRADATION FACTOR (D) 77

CALCULATIONS:

$$\text{ENGLISH UNITS } D = \frac{15-H}{15+1.75 H} \times 100$$

$$\text{S.I. UNITS } D = \frac{381-H}{381+1.75 H} \times 100$$

4
SAND EQUIVALENT 4:15
4:38

SAMPLE NUMBER X 15369
SEDIMENT PERIOD _____
CLAY HEIGHT 6.2
SAND HEIGHT 3.8
SAND EQUIVALENT 61

CALCULATIONS:

$$\text{SAND EQUIVALENT} = \frac{\text{SAND HEIGHT}}{\text{CLAY HEIGHT}} \times 100$$

DURABILITY INDEX COARSE

SAMPLE NUMBER _____
SEDIMENT HEIGHT (H) _____
DURABILITY INDEX (Dc) _____

CALCULATION:

$$Dc = 30.3 + 20.8 \cot(0.29 + 0.0059H)$$

DURABILITY INDEX FINE

SAMPLE NUMBER _____
SEDIMENT PERIOD _____
CLAY HEIGHT _____
SAND HEIGHT _____
D.I. FINE _____

CALCULATION:

$$\text{D.I. FINE} = \frac{\text{SAND HEIGHT}}{\text{CLAY HEIGHT}} \times 100$$



FRACTURE COUNT

MINISTRY OF TRANSPORTATION AND HIGHWAYS - GEOTECHNICAL BRANCH

METHOD A - FOR CRUSHED GRANULAR SURFACING AND BASE

METHOD B - FOR CRUSHED PAVING AGGREGATE

PROJECT: MOH-LTS/90

DISTRICT: _____

TESTHOLE/PIT: 89-12

SAMPLE NO.: _____

BAG NO.: X15466

DEPTH: 7.9-9.1 m

METHOD A (COUNT)

			COUNT		
PASSING	37.5	UNFRACTURED	<u>1</u>	<u>87.5</u>	% (25 mm)
RETAINED	25	1 + FRACTURED	<u>7</u>		
PASSING	25	UNFRACTURED	<u>3</u>	<u>82.2</u>	% (19 mm)
RETAINED	19	1 + FRACTURED	<u>15</u>		
PASSING	19	UNFRACTURED	<u>11</u>	<u>54.2</u>	% (12.5 mm)
RETAINED	12.5	1 + FRACTURED	<u>13</u>		
PASSING	12.5	UNFRACTURED	<u>03</u>	<u>45.2</u>	% (9.5 mm)
RETAINED	9.5	1 + FRACTURED	<u>19</u>		
PASSING	9.5	UNFRACTURED	<u>002</u>	<u>58.1</u>	% (4.75 mm)
RETAINED	4.75	1 + FRACTURED	<u>080</u>		
TOTAL		UNFRACTURED	<u>040</u>	<u>58.2</u>	% FRACTURE
		1 + FRACTURED	<u>324</u>		
TOTAL NUMBER OF PIECES			<u>574</u>		

METHOD B (MASS)

			MASS		
PASSING	19	UNFRACTURED	<u>99.73</u>	<u>31.0</u>	% (13.2 mm)
RETAINED	13.2 12.0	2 + FRACTURED	<u>44.90</u> 144.63		
PASSING	13.2 12.5	UNFRACTURED	<u>69.15</u>	<u>32.9</u>	% (9.5 mm)
RETAINED	9.5	2 + FRACTURED	<u>33.94</u> 103.09		
ARITHMETIC AVERAGE				<u>31.8</u>	% FRACTURE B

MINISTRY OF TRANSPORTATION AND HIGHWAYS
Geotechnical and Materials Branch

15-3-78

Project MOTH LTS-90
Station TELEGRAPH PEMBERTON
Sample No. TH89-12 Depth 7.9-9.1
Sampled By _____ Date _____
Tested By TJB Date June 18/90

X 15466

DEGRADATION

#1 2:32
SAMPLE NUMBER X15466
SEDIMENT HEIGHT (H) 3.2
DEGRADATION FACTOR (D) 57

CALCULATIONS:

ENGLISH UNITS $D = \frac{15-H}{15+1.75 H} \times 100$

S.I. UNITS $D = \frac{381-H}{381+1.75 H} \times 100$

#2 11:09 - 2:19
SAND EQUIVALENT 21 -> 41

SAMPLE NUMBER X15466
SEDIMENT PERIOD 20 min
CLAY HEIGHT 6.0
SAND HEIGHT 3.8
SAND EQUIVALENT 63

CALCULATIONS:

SAND EQUIVALENT = $\frac{\text{SAND HEIGHT}}{\text{CLAY HEIGHT}} \times 100$

DURABILITY INDEX COARSE

SAMPLE NUMBER _____
SEDIMENT HEIGHT (H) _____
DURABILITY INDEX (Dc) _____

CALCULATION:

$D_c = 30.3 + 20.8 \text{ Cot}(0.29 + 0.0059H)$

DURABILITY INDEX FINE

SAMPLE NUMBER _____
SEDIMENT PERIOD _____
CLAY HEIGHT _____
SAND HEIGHT _____
D.I. FINE _____

CALCULATION:

D.I. FINE = $\frac{\text{SAND HEIGHT}}{\text{CLAY HEIGHT}} \times 100$



FRACTURE COUNT

MINISTRY OF TRANSPORTATION AND HIGHWAYS - GEOTECHNICAL BRANCH

METHOD A - FOR CRUSHED GRANULAR SURFACING AND BASE

METHOD B - FOR CRUSHED PAVING AGGREGATE

PROJECT: North Lab Testing AP/90

DISTRICT: South Island

TESTHOLE/PIT: 89-14

SAMPLE NO.:

BAG NO.: 415475

DEPTH: 6-7-7.9

METHOD A (COUNT)

			COUNT		
PASSING	37.5	UNFRACTURED	<u>1</u>		
RETAINED	25	1 + FRACTURED	<u>3</u>	<u>75</u>	% (25 mm)
PASSING	25	UNFRACTURED	<u>3</u>		
RETAINED	19	1 + FRACTURED	<u>9</u>	<u>75</u>	% (19 mm)
PASSING	19	UNFRACTURED	<u>8</u>		
RETAINED	12.5	1 + FRACTURED	<u>15</u>	<u>65.2</u>	% (12.5 mm)
PASSING	12.5	UNFRACTURED	<u>11</u>		
RETAINED	9.5	1 + FRACTURED	<u>31</u>	<u>73.8</u>	% (9.5 mm)
PASSING	9.5	UNFRACTURED	<u>151</u>		
RETAINED	4.75	1 + FRACTURED	<u>338</u>	<u>71.9</u>	% (4.75 mm)
		UNFRACTURED	<u>174</u>		
TOTAL		1 + FRACTURED	<u>446</u>	<u>71.9</u>	% FRACTURE
TOTAL NUMBER OF PIECES			<u>620</u>		

METHOD B (MASS)

			MASS		
PASSING	19	UNFRACTURED	<u>81.87</u>		
RETAINED	13.2	2 + FRACTURED	<u>84.07</u>	<u>48.9</u>	% (13.2 mm)
PASSING	13.2	UNFRACTURED	<u>22.34</u>		
RETAINED	9.5	2 + FRACTURED	<u>59.56</u>	<u>64.1</u>	% (9.5 mm)
ARITHMETIC AVERAGE			<u>54.2</u>	<u>54.2</u>	% FRACTURE B

15-3-78

Project MOH LTS-90
Station TELEGRAPH REMBERTON
Sample No. TH89-14 Depth 6.7-7.9m
Sampled By _____ Date _____
Tested By TJB Date June 18/90

X15475

DEGRADATION

#1
SAMPLE NUMBER

X15475

SEDIMENT HEIGHT (H)

1.5

DEGRADATION FACTOR (D)

77

CALCULATIONS:

ENGLISH UNITS $D = \frac{15-H}{15+1.75 H} \times 100$

S.I. UNITS $D = \frac{381-H}{381+1.75 H} \times 100$

SAND EQUIVALENT

F2

SAMPLE NUMBER

X15475

SEDIMENT PERIOD

20 min

CLAY HEIGHT

9.2

SAND HEIGHT

3.1

SAND EQUIVALENT

34

CALCULATIONS:

SAND EQUIVALENT = $\frac{\text{SAND HEIGHT}}{\text{CLAY HEIGHT}} \times 100$

DURABILITY INDEX COARSE

SAMPLE NUMBER

SEDIMENT HEIGHT (H)

DURABILITY INDEX (Dc)

CALCULATION:

$D_c = 30.3 + 20.8 \cot(0.29 + 0.0059H)$

DURABILITY INDEX FINE

SAMPLE NUMBER

SEDIMENT PERIOD

CLAY HEIGHT

SAND HEIGHT

D.I. FINE

CALCULATION:

D.I. FINE = $\frac{\text{SAND HEIGHT}}{\text{CLAY HEIGHT}} \times 100$



FRACTURE COUNT

MINISTRY OF TRANSPORTATION AND HIGHWAYS - GEOTECHNICAL BRANCH

METHOD A - FOR CRUSHED GRANULAR SURFACING AND BASE

METHOD B - FOR CRUSHED PAVING AGGREGATE

PROJECT: Math Lab Testing - AP190 DISTRICT: South Taber
TESTHOLE/PIT: 49-15 SAMPLE NO.: BAG NO.: 15471 DEPTH: 1.8-3.1

METHOD A (COUNT)

			COUNT			
PASSING	37.5	UNFRACTURED	<u>1</u>			
RETAINED	25	1 + FRACTURED	<u>1</u>	<u>50.0</u>	% (25 mm)	
PASSING	25	UNFRACTURED	<u>7</u>			
RETAINED	19	1 + FRACTURED	<u>8</u>	<u>53.3</u>	% (19 mm)	
PASSING	19	UNFRACTURED	<u>27</u>			
RETAINED	12.5	1 + FRACTURED	<u>10</u>	<u>27.0</u>	% (12.5 mm)	
PASSING	12.5	UNFRACTURED	<u>32</u>			
RETAINED	9.5	1 + FRACTURED	<u>16</u>	<u>33.3</u>	% (9.5 mm)	
PASSING	9.5	UNFRACTURED	<u>327</u>			
RETAINED	4.75	1 + FRACTURED	<u>257</u>	<u>43.4</u>	% (4.75 mm)	
			<u>578</u>			
TOTAL		UNFRACTURED	<u>394</u>			
		1 + FRACTURED	<u>286</u>			
				<u>42.1</u>	% FRACTURE	
TOTAL NUMBER OF PIECES			<u>680</u>			

METHOD B (MASS)

			MASS			
PASSING	19	UNFRACTURED	<u>193.94</u>			
RETAINED	13.2	2 + FRACTURED	<u>35.17</u>	<u>15.4</u>	% (13.2 mm)	
PASSING	13.2	UNFRACTURED	<u>96.96</u>			
RETAINED	9.5	2 + FRACTURED	<u>27.85</u>	<u>22.3</u>	% (9.5 mm)	
			<u>124.81</u>			
ARITHMETIC AVERAGE				<u>17.8</u>	% FRACTURE	

Province of British Columbia
Ministry of Transportation and Highways
Geotechnical and Materials Branch

15-3-78

Project MOH LTS-90
Station TELEGRAPH FEMBERTON
Sample No. 1189-5 Depth 1.8-3.1m
Sampled By _____ Date _____
Tested By TJB Date June 18/90

X 15471

DEGRADATION

#1 342
SAMPLE NUMBER X 15471
SEDIMENT HEIGHT (H) 4.2
DEGRADATION FACTOR (D) 48

CALCULATIONS:

ENGLISH UNITS $D = \frac{15-H}{15+1.75 H} \times 100$

S.I. UNITS $D = \frac{381-H}{381+1.75 H} \times 100$

#1 11.13-23
SAND EQUIVALENT 25-45

SAMPLE NUMBER X 15471
SEDIMENT PERIOD 20mm
CLAY HEIGHT 11.4
SAND HEIGHT 2.4
SAND EQUIVALENT 21

CALCULATIONS:

SAND EQUIVALENT = $\frac{\text{SAND HEIGHT}}{\text{CLAY HEIGHT}} \times 100$

DURABILITY INDEX COARSE

SAMPLE NUMBER _____
SEDIMENT HEIGHT (H) _____
DURABILITY INDEX (Dc) _____

CALCULATION:

$D_c = 30.3 + 20.8 \cot(0.29 + 0.0059H)$

DURABILITY INDEX FINE

SAMPLE NUMBER _____
SEDIMENT PERIOD _____
CLAY HEIGHT _____
SAND HEIGHT _____
D.I. FINE _____

CALCULATION:

D.I. FINE = $\frac{\text{SAND HEIGHT}}{\text{CLAY HEIGHT}} \times 100$



FRACTURE COUNT

MINISTRY OF TRANSPORTATION AND HIGHWAYS - GEOTECHNICAL BRANCH

METHOD A - FOR CRUSHED GRANULAR SURFACING AND BASE

METHOD B - FOR CRUSHED PAVING AGGREGATE

PROJECT: TELEGRAPH - PEMBERTON DISTRICT: South Island

TESTHOLE/PIT: 89-15 SAMPLE NO.: BAG NO.: X15472 DEPTH: 5.5-6.7m

METHOD A (COUNT)

			COUNT			
PASSING	37.5	UNFRACTURED	<u>4</u>			
RETAINED	25	1 + FRACTURED	<u>2</u>	<u>33.3</u>	% (25 mm)	
PASSING	25	UNFRACTURED	<u>2</u>			
RETAINED	19	1 + FRACTURED	<u>7</u>	<u>77.8</u>	% (19 mm)	
PASSING	19	UNFRACTURED	<u>16</u>			
RETAINED	12.5	1 + FRACTURED	<u>22</u>	<u>57.9</u>	% (12.5 mm)	
PASSING	12.5	UNFRACTURED	<u>24</u>			
RETAINED	9.5	1 + FRACTURED	<u>28</u>	<u>53.8</u>	% (9.5 mm)	
PASSING	9.5	UNFRACTURED	<u>83</u>			
RETAINED	4.75	1 + FRACTURED	<u>352</u>	<u>80.9</u>	% (4.75 mm)	
TOTAL		UNFRACTURED	<u>129</u>			
		1 + FRACTURED	<u>411</u>			
				<u>76.1</u>	% FRACTURE A	
TOTAL NUMBER OF PIECES			<u>540</u>			

METHOD B (MASS)

			MASS			
PASSING	19	UNFRACTURED	<u>159.50</u>			
RETAINED	13.2	2 + FRACTURED	<u>106.08</u>	<u>40.0</u>	% (13.2 mm)	
PASSING	13.2	UNFRACTURED	<u>72.77</u>			
RETAINED	9.5	2 + FRACTURED	<u>42.79</u>	<u>37.0</u>	% (9.5 mm)	

ARITHMETIC AVERAGE

39.1 % FRACTURE B

Project MOTH LAB TESTING
Station TH 89-15 @ 5.5-6.7 m
Sample No. _____ Depth _____
Sampled By _____ Date _____
Tested By DM Date July 3/90
X 15472

DEGRADATION

SAMPLE NUMBER X 15472
SEDIMENT HEIGHT (H) 2.1
DEGRADATION FACTOR (D) 69

CALCULATIONS:

ENGLISH UNITS $D = \frac{15-H}{15+1.75 H} \times 100$ 109

S.I. UNITS $D = \frac{381-H}{381+1.75 H} \times 100$

2
SAND EQUIVALENT 31 3139
401

SAMPLE NUMBER X 15472
SEDIMENT PERIOD 20 min
CLAY HEIGHT 11.0
SAND HEIGHT 3.4

SAND EQUIVALENT 31

CALCULATIONS:

SAND EQUIVALENT = $\frac{\text{SAND HEIGHT}}{\text{CLAY HEIGHT}} \times 100$

DURABILITY INDEX COARSE

SAMPLE NUMBER X 15472
SEDIMENT HEIGHT (H) 0.8
DURABILITY INDEX (Dc) 78

CALCULATION:

$D_c = 30.3 + 20.8 \text{ Cot}(0.29 + 0.0059H)$

DURABILITY INDEX FINE

SAMPLE NUMBER X 15472
SEDIMENT PERIOD 20 min
CLAY HEIGHT 5.5
SAND HEIGHT 3.7

D.I. FINE 67.3

CALCULATION:

D.I. FINE = $\frac{\text{SAND HEIGHT}}{\text{CLAY HEIGHT}} \times 100$

Ministry of Transportation and Highways
GEOTECHNICAL AND MATERIALS BRANCH

PROJECT TELEGRAPH - PEMBERTON
LAB TESTING SERVICES
Station or T.H. TH 89-15 Sample No. _____
Depth 5.5-6.7 m ³¹⁶ East Code X15472
Date JUNE 28/90
Technician A.G.W.

SOUNDNESS TEST (A.S.T.M. C88)

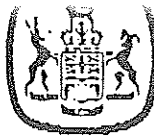
Sieve Size		Grading of Original Sample (%)	Mass of Test Fractions Before Test (g)	After 5 Cycles		Weighted Percentage Mass Loss (%)
Passing	Retained			Mass Remaining (g)	Loss (%)	
SOUNDNESS TEST OF COARSE AGGREGATE						
63 mm	50 mm	{	{			
50 mm	37.5 mm				*	
37.5 mm	25.0 mm	{	{	1505.3	1471.0	2.3
25.0 mm	19.0 mm					
19.0 mm	12.5 mm	{	{	995.3	957.31	3.8
12.5 mm	9.5 mm					
9.5 mm	4.75 mm	{	{	300.3	293.82	2.4
TOTALS		100.0				2.9

SOUNDNESS TEST OF FINE AGGREGATE						
★ 9.5 mm	4.75 mm					
4.75 mm	2.36 mm	28.7		100.00	92.20	7.8
2.36 mm	1.18 mm	20.9		100.06	91.54	8.5
1.18 mm	.600 mm	15.6		100.00	87.99	12.0
.600 mm	.300 mm	13.6		100.00	95.80	4.7
.300 mm	.150 mm	6.0				
.150 mm	PAN	15.2				
TOTALS		100.0				6.5

★ This Fraction is not used When Sample Contains Both Coarse and Fine Portions

% Of Initial Sample Passing 4.75 mm Sieve = 39.7 %

REMARKS:- * 1 particle split and there was some flaking.



FRACTURE COUNT

MINISTRY OF TRANSPORTATION AND HIGHWAYS - GEOTECHNICAL BRANCH

METHOD A - FOR CRUSHED GRANULAR SURFACING AND BASE

METHOD B - FOR CRUSHED PAVING AGGREGATE

PROJECT: Telegraph Pemberton DISTRICT: South Island

TESTHOLE/PI: 89-13 SAMPLE NO.: BAG NO.: X15474 DEPTH: 12.8-14.1M

METHOD A (COUNT)

			COUNT			
PASSING	37.5	UNFRACTURED	<u>1</u>	<u>50</u>	% (25 mm)	
RETAINED	25	1 + FRACTURED	<u>1</u>			
PASSING	25	UNFRACTURED	<u>3</u>	<u>62.5</u>	% (19 mm)	
RETAINED	19	1 + FRACTURED	<u>5</u>			
PASSING	19	UNFRACTURED	<u>20</u>	<u>39.4</u>	% (12.5 mm)	
RETAINED	12.5	1 + FRACTURED	<u>13</u>			
PASSING	12.5	UNFRACTURED	<u>19</u>	<u>47.2</u>	% (9.5 mm)	
RETAINED	9.5	1 + FRACTURED	<u>17</u>			
PASSING	9.5	UNFRACTURED	<u>69</u>	<u>84.3</u>	% (4.75 mm)	
RETAINED	4.75	1 + FRACTURED	<u>412</u>			
TOTAL		UNFRACTURED	<u>112</u>	<u>80.0</u>	% FRACTURE	
		1 + FRACTURED	<u>448</u>			
TOTAL NUMBER OF PIECES			<u>560</u>			

METHOD B (MASS)

			MASS			
PASSING	19	UNFRACTURED	<u>153.1</u>	<u>27.4</u>	% (13.2 mm)	
RETAINED	13.2	2 + FRACTURED	<u>57.8</u>			
PASSING	13.2	UNFRACTURED	<u>61.6</u>	<u>20.5</u>	% (9.5 mm)	
RETAINED	9.5	2 + FRACTURED	<u>15.9</u>			
ARITHMETIC AVERAGE			<u>25.6</u>	% FRACTURE B		

Project MOTH LTS-90
 Station TELEGRAPH FEMBERTON
 Sample No. TH89-15 Depth 12.8-14.0m
 Sampled By _____ Date _____
 Tested By TJB Date June 18/90
X 15474

DEGRADATION

#1 4:36
 SAMPLE NUMBER X15474
 SEDIMENT HEIGHT (H) 1.2
 DEGRADATION FACTOR (D) 81

CALCULATIONS:

ENGLISH UNITS $D = \frac{15-H}{15+1.75 H} \times 100$
 S.I. UNITS $D = \frac{381-H}{381+1.75 H} \times 100$

#2
 SAND EQUIVALENT 3:43
3:45

SAMPLE NUMBER X15474
 SEDIMENT PERIOD 20 min
 CLAY HEIGHT 6.4
 SAND HEIGHT 3.8
 SAND EQUIVALENT 59

CALCULATIONS:

SAND EQUIVALENT = $\frac{\text{SAND HEIGHT}}{\text{CLAY HEIGHT}} \times 100$

DURABILITY INDEX COARSE

SAMPLE NUMBER _____
 SEDIMENT HEIGHT (H) _____
 DURABILITY INDEX (Dc) _____

CALCULATION:

$D_c = 30.3 + 20.8 \cot(0.29 + 0.0059H)$

DURABILITY INDEX FINE

SAMPLE NUMBER _____
 SEDIMENT PERIOD _____
 CLAY HEIGHT _____
 SAND HEIGHT _____
 D.I. FINE _____

CALCULATION:

D.I. FINE = $\frac{\text{SAND HEIGHT}}{\text{CLAY HEIGHT}} \times 100$



FRACTURE COUNT

MINISTRY OF TRANSPORTATION AND HIGHWAYS - GEOTECHNICAL BRANCH

METHOD A - FOR CRUSHED GRANULAR SURFACING AND BASE

METHOD B - FOR CRUSHED PAVING AGGREGATE

PROJECT: Telegraph - Pemberton DISTRICT: South Island
TESTHOLE/PIT: 89-19 SAMPLE NO.: BAG NO.: X15483 DEPTH: 1.8-3.1

METHOD A (COUNT)

			COUNT		
PASSING	37.5	UNFRACTURED	<u>0</u>		
RETAINED	25	1 + FRACTURED	<u>2</u>	<u>100</u>	% (25 mm)
PASSING	25	UNFRACTURED	<u>5</u>		
RETAINED	19	1 + FRACTURED	<u>15</u>	<u>75</u>	% (19 mm)
PASSING	19	UNFRACTURED	<u>14</u>		
RETAINED	12.5	1 + FRACTURED	<u>14</u>	<u>50</u>	% (12.5 mm)
PASSING	12.5	UNFRACTURED	<u>22</u>		
RETAINED	9.5	1 + FRACTURED	<u>30</u>	<u>57.7</u>	% (9.5 mm)
PASSING	9.5	UNFRACTURED	<u>185</u>		
RETAINED	4.75	1 + FRACTURED	<u>288</u>	<u>40.9</u>	% (4.75 mm)
			<u>473</u>		
TOTAL		UNFRACTURED	<u>226</u>		
		1 + FRACTURED	<u>349</u>	<u>60.7</u>	% FRACTURE ^
TOTAL NUMBER OF PIECES			<u>575</u>		

METHOD B (MASS)

			MASS		
PASSING	19	UNFRACTURED	<u>19.56</u>		
RETAINED	13.2	2 + FRACTURED	<u>67.63</u>	<u>77.6</u>	% (13.2 mm)
			<u>87.19</u>		
PASSING	13.2	UNFRACTURED	<u>67.86</u>		
RETAINED	9.5	2 + FRACTURED	<u>51.38</u>	<u>42.3</u>	% (9.5 mm)
			<u>118.64</u>		

ARITHMETIC AVERAGE

57.8 % FRACTURE B

Province of British Columbia
Ministry of Transportation and Highways
Geotechnical and Materials Branch

15-3-78

Project MOTM - LTS 90
Station TELEGRAPH PEMBERTON
Sample No. TH89-19 Depth 1.8-3.1m
Sampled By _____ Date _____
Tested By TJB Date June 19/90
X 15483

DEGRADATION

#3 5.57
SAMPLE NUMBER 15483
SEDIMENT HEIGHT (H) 2.8
DEGRADATION FACTOR (D) 61

CALCULATIONS:

$$\text{ENGLISH UNITS } D = \frac{15-H}{15+1.75 H} \times 100$$

$$\text{S.I. UNITS } D = \frac{381-H}{381+1.75 H} \times 100$$

DURABILITY INDEX COARSE

SAMPLE NUMBER _____
SEDIMENT HEIGHT (H) _____
DURABILITY INDEX (Dc) _____

CALCULATION:

$$Dc = 30.3 + 20.8 \cot(0.29 + 0.0059H)$$

#1 8.18
SAND EQUIVALENT 8.40.5

SAMPLE NUMBER X 15483
SEDIMENT PERIOD 20 MIN
CLAY HEIGHT 8.3
SAND HEIGHT 3.2
SAND EQUIVALENT 39

CALCULATIONS:

$$\text{SAND EQUIVALENT} = \frac{\text{SAND HEIGHT}}{\text{CLAY HEIGHT}} \times 100$$

DURABILITY INDEX FINE

SAMPLE NUMBER _____
SEDIMENT PERIOD _____
CLAY HEIGHT _____
SAND HEIGHT _____
D.I. FINE _____

CALCULATION:

$$\text{D.I. FINE} = \frac{\text{SAND HEIGHT}}{\text{CLAY HEIGHT}} \times 100$$



FRACTURE COUNT

MINISTRY OF TRANSPORTATION AND HIGHWAYS - GEOTECHNICAL BRANCH

METHOD A - FOR CRUSHED GRANULAR SURFACING AND BASE

METHOD B - FOR CRUSHED PAVING AGGREGATE

PROJECT: Telegraph-Pomberton DISTRICT: South Island

TESTHOLE/PIT: 89-19 SAMPLE NO.: BAG NO.: X15484 DEPTH: 11.6-12.8m

METHOD A (COUNT)

			COUNT		
PASSING	37.5	UNFRACTURED	<u> </u>		
RETAINED	25	1 + FRACTURED	<u>5</u>	<u>100.0</u>	% (25 mm)
PASSING	25	UNFRACTURED	<u> </u>		
RETAINED	19	1 + FRACTURED	<u>7</u>	<u>100.0</u>	% (19 mm)
PASSING	19	UNFRACTURED	<u>5</u>		
RETAINED	12.5	1 + FRACTURED	<u>12</u>	<u>70.6</u>	% (12.5 mm)
PASSING	12.5	UNFRACTURED	<u>11</u>		
RETAINED	9.5	1 + FRACTURED	<u>24</u>	<u>68.6</u>	% (9.5 mm)
PASSING	9.5	UNFRACTURED	<u>40</u>		
RETAINED	4.75	1 + FRACTURED	<u>282</u>	<u>87.6</u>	% (4.75 mm)
TOTAL		UNFRACTURED	<u>56</u>		
		1 + FRACTURED	<u>330</u>		
				<u>85.5</u>	% FRACTURE
TOTAL NUMBER OF PIECES			<u>386</u>		

METHOD B (MASS)

			MASS		
PASSING	19	UNFRACTURED	<u>54.5</u>		
RETAINED	13.2	2 + FRACTURED	<u>43.3</u>	<u>44.3</u>	% (13.2 mm)
PASSING	13.2	UNFRACTURED	<u>39.1</u>		
RETAINED	9.5	2 + FRACTURED	<u>45.2</u>	<u>53.6</u>	% (9.5 mm)

ARITHMETIC AVERAGE

48.6 % FRACTURE B

Province of British Columbia
Ministry of Transportation and Highways
Geotechnical and Materials Branch

15-3-78

Project MOTH - LTS 90
Station TELEGRAPH PEMBARTON
Sample No. 7489-19 Depth 11.6-12.8
Sampled By _____ Date _____
Tested By TJB Date June 19/90

X 15484

DEGRADATION

#4 9.29.3
SAMPLE NUMBER 15484
SEDIMENT HEIGHT (H) 2.0
DEGRADATION FACTOR (D) 70

DURABILITY INDEX COARSE

SAMPLE NUMBER _____
SEDIMENT HEIGHT (H) _____
DURABILITY INDEX (Dc) _____

CALCULATIONS:

ENGLISH UNITS $D = \frac{15-H}{15+1.75 H} \times 100$

S.I. UNITS $D = \frac{381-H}{381+1.75 H} \times 100$

CALCULATION:

$D_c = 30.3 + 20.8 \cot(0.29 + 0.0059H)$

SAND EQUIVALENT

#2 8.22
8.16
SAMPLE NUMBER X 15484
SEDIMENT PERIOD 20 min
CLAY HEIGHT 5.5
SAND HEIGHT 3.9
SAND EQUIVALENT 71

DURABILITY INDEX FINE

SAMPLE NUMBER _____
SEDIMENT PERIOD _____
CLAY HEIGHT _____
SAND HEIGHT _____
D.I. FINE _____

CALCULATIONS:

$SAND EQUIVALENT = \frac{SAND HEIGHT}{CLAY HEIGHT} \times 100$

CALCULATION:

$D.I. FINE = \frac{SAND HEIGHT}{CLAY HEIGHT} \times 100$



FRACTURE COUNT

MINISTRY OF TRANSPORTATION AND HIGHWAYS - GEOTECHNICAL BRANCH

METHOD A - FOR CRUSHED GRANULAR SURFACING AND BASE

METHOD B - FOR CRUSHED PAVING AGGREGATE

PROJECT: TELEGRAPH - PEMBERTON

DISTRICT: South Island

TESTHOLE/PIT: 89-21

SAMPLE NO.:

BAG NO.: X15490

DEPTH: 5.5-6.7m

METHOD A (COUNT)

			COUNT			
PASSING	37.5	UNFRACTURED	<u>2</u>			
RETAINED	25	1 + FRACTURED	<u>3</u>	<u>60.0</u>	% (25 mm)	
PASSING	25	UNFRACTURED	<u>2</u>			
RETAINED	19	1 + FRACTURED	<u>9</u>	<u>81.8</u>	% (19 mm)	
PASSING	19	UNFRACTURED	<u>7</u>			
RETAINED	12.5	1 + FRACTURED	<u>14</u>	<u>66.7</u>	% (12.5 mm)	
PASSING	12.5	UNFRACTURED	<u>14</u>			
RETAINED	9.5	1 + FRACTURED	<u>31</u>	<u>68.9</u>	% (9.5 mm)	
PASSING	9.5	UNFRACTURED	<u>100</u>			
RETAINED	4.75	1 + FRACTURED	<u>293</u>	<u>73.9</u>	% (4.75 mm)	
TOTAL		UNFRACTURED	<u>125</u>			
		1 + FRACTURED	<u>340</u>	<u>73.1</u>	% FRACTURE A	
TOTAL NUMBER OF PIECES			<u>465</u>			

METHOD B (MASS)

			MASS			
PASSING	19	UNFRACTURED	<u>65.2</u>			
RETAINED	13.2	2 + FRACTURED	<u>63.4</u>	<u>49.3</u>	% (13.2 mm)	
PASSING	13.2	UNFRACTURED	<u>50.9</u>			
RETAINED	9.5	2 + FRACTURED	<u>45.5</u>	<u>47.2</u>	% (9.5 mm)	
ARITHMETIC AVERAGE				<u>48.4</u>	% FRACTURE B	

Project: Wotil Job Road APPG
Station: 15490
Sample No. X15490 Depth 81-81.5-6.7
Sampled By: _____ Date: _____
Tested By: SLK Date: June 05

X15490

DEGRADATION

SAMPLE NUMBER _____ X15490
SEDIMENT HEIGHT (H) _____ 2.0
DEGRADATION FACTOR (D) _____ 70

CALCULATIONS:

$$\text{ENGLISH UNITS } D = \frac{15 - H}{15 + 1.75 H} \times 100$$

$$\text{S.I. UNITS } D = \frac{381 - H}{381 + 1.75 H} \times 100$$

SAND EQUIVALENT

SAMPLE NUMBER _____
SEDIMENT PERIOD _____ 20 min
CLAY HEIGHT _____ 8.6
SAND HEIGHT _____ 2.9
SAND EQUIVALENT _____ 34

CALCULATIONS:

$$\text{SAND EQUIVALENT} = \frac{\text{SAND HEIGHT}}{\text{CLAY HEIGHT}} \times 100$$

DURABILITY INDEX COARSE

SAMPLE NUMBER _____
SEDIMENT HEIGHT (H) _____
DURABILITY INDEX (Dc) _____

CALCULATION:

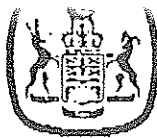
$$D_c = 30.3 + 20.8 \text{ Cot}(0.29 + 0.0059H)$$

DURABILITY INDEX FINE

SAMPLE NUMBER _____
SEDIMENT PERIOD _____
CLAY HEIGHT _____
SAND HEIGHT _____
D.I. FINE _____

CALCULATION:

$$\text{D.I. FINE} = \frac{\text{SAND HEIGHT}}{\text{CLAY HEIGHT}} \times 100$$



FRACTURE COUNT

MINISTRY OF TRANSPORTATION AND HIGHWAYS - GEOTECHNICAL BRANCH

METHOD A - FOR CRUSHED GRANULAR SURFACING AND BASE

METHOD B - FOR CRUSHED PAVING AGGREGATE

PROJECT: TELEGRAPH - PETERBORTON DISTRICT: South Island
TESTHOLE/PIT: 8921 SAMPLE NO.: BAG NO.: X15491 DEPTH: 12.8-14.0m

METHOD A (COUNT)

			COUNT			
PASSING	37.5	UNFRACTURED	<u>0</u>			
RETAINED	25	1 + FRACTURED	<u>1</u>	<u>100.0</u>	% (25 mm)	
PASSING	25	UNFRACTURED	<u>1</u>			
RETAINED	19	1 + FRACTURED	<u>4</u>	<u>80.0</u>	% (19 mm)	
PASSING	19	UNFRACTURED	<u>6</u>			
RETAINED	12.5	1 + FRACTURED	<u>11</u>	<u>64.7</u>	% (12.5 mm)	
PASSING	12.5	UNFRACTURED	<u>13</u>			
RETAINED	9.5	1 + FRACTURED	<u>29</u>	<u>69.0</u>	% (9.5 mm)	
PASSING	9.5	UNFRACTURED	<u>101</u>			
RETAINED	4.75	1 + FRACTURED	<u>313</u>	<u>75.6</u>	% (4.75 mm)	
TOTAL		UNFRACTURED	<u>121</u>			
		1 + FRACTURED	<u>358</u>	<u>74.7</u>	% FRACTURE	
TOTAL NUMBER OF PIECES			<u>479</u>			

METHOD B (MASS)

			MASS			
PASSING	19	UNFRACTURED	<u>64.65</u>			
RETAINED	13.2	2 + FRACTURED	<u>75.81</u>	<u>54.0</u>	% (13.2 mm)	
PASSING	13.2	UNFRACTURED	<u>413.03</u>			
RETAINED	9.5	2 + FRACTURED	<u>44.41</u>	<u>50.8</u>	% (9.5 mm)	
ARITHMETIC AVERAGE				<u>52.8</u>	% FRACTURE B	

Project Mt. Le Conte; PP/RO
Station _____
Sample No. X15491 Depth 89-21 12.8-14.0
Sampled By _____ Date _____
Tested By SLK Date June 25

DEGRADATION

SAMPLE NUMBER X15491/200
SEDIMENT HEIGHT (H) 4.9
DEGRADATION FACTOR (D) 43

CALCULATIONS:

ENGLISH UNITS $D = \frac{15 - H}{15 + 1.75 H} \times 100$
 $\frac{15 - 4.9}{15 + 1.75 \times 4.9} \times 100 = 42.18$

S.I. UNITS $D = \frac{381 - H}{381 + 1.75 H} \times 100$
 $\frac{381 - 4.9}{381 + 1.75 \times 4.9} \times 100 = 42.18$

DURABILITY INDEX COARSE

SAMPLE NUMBER _____
SEDIMENT HEIGHT (H) _____
DURABILITY INDEX (Dc) _____

CALCULATION:

$D_c = 30.3 + 20.8 \cot(0.29 + 0.0059H)$

SAND EQUIVALENT

SAMPLE NUMBER X15491
SEDIMENT PERIOD 60 min
CLAY HEIGHT 5.75
SAND HEIGHT 3.7
SAND EQUIVALENT 64

CALCULATIONS:

$\text{SAND EQUIVALENT} = \frac{\text{SAND HEIGHT}}{\text{CLAY HEIGHT}} \times 100$
 $\frac{3.7}{5.75} \times 100 = 64.35$

DURABILITY INDEX FINE

SAMPLE NUMBER _____
SEDIMENT PERIOD _____
CLAY HEIGHT _____
SAND HEIGHT _____
D.I. FINE _____

CALCULATION:

$D.I. \text{ FINE} = \frac{\text{SAND HEIGHT}}{\text{CLAY HEIGHT}} \times 100$



FRACTURE COUNT

MINISTRY OF TRANSPORTATION AND HIGHWAYS - GEOTECHNICAL BRANCH

METHOD A - FOR CRUSHED GRANULAR SURFACING AND BASE

METHOD B - FOR CRUSHED PAVING AGGREGATE

PROJECT: TELEGRAPH - REMBERTON DISTRICT: South Island
TESTHOLE/PIT: 39-29 SAMPLE NO.: BAG NO.: X/5352 DEPTH: 3.1-4.3m

METHOD A (COUNT)

			COUNT		
PASSING	37.5	UNFRACTURED	<u>1</u>		
RETAINED	25	1 + FRACTURED	<u>2</u>	<u>66.7</u>	% (25 mm)
PASSING	25	UNFRACTURED	<u>3</u>		
RETAINED	19	1 + FRACTURED	<u>9</u>	<u>75.0</u>	% (19 mm)
PASSING	19	UNFRACTURED	<u>9</u>		
RETAINED	12.5	1 + FRACTURED	<u>11</u>	<u>55.0</u>	% (12.5 mm)
PASSING	12.5	UNFRACTURED	<u>22</u>		
RETAINED	9.5	1 + FRACTURED	<u>25</u>	<u>53.2</u>	% (9.5 mm)
PASSING	9.5	UNFRACTURED	<u>119</u>		
RETAINED	4.75	1 + FRACTURED	<u>233</u>	<u>66.2</u>	% (4.75 mm)
TOTAL		UNFRACTURED	<u>154</u>		
		1 + FRACTURED	<u>280</u>	<u>64.5</u>	% FRACTURE
TOTAL NUMBER OF PIECES			<u>434</u>		

METHOD B (MASS)

			MASS		
PASSING	19	UNFRACTURED	<u>91.6</u>		
RETAINED	13.2	2 + FRACTURED	<u>52.8</u>	<u>36.6</u>	% (13.2 mm)
PASSING	13.2	UNFRACTURED	<u>75.0</u>		
RETAINED	9.5	2 + FRACTURED	<u>30.3</u>	<u>28.8</u>	% (9.5 mm)
ARITHMETIC AVERAGE				<u>33.3</u>	% FRACTURE B

DEGRADATION

SAMPLE NUMBER X15352
SEDIMENT HEIGHT (H) 5.5
DEGRADATION FACTOR (D) 39

CALCULATIONS:

ENGLISH UNITS $D = \frac{15-H}{15+1.75 H} \times 100$
S.I. UNITS $D = \frac{381-H}{381+1.75 H} \times 100$

DURABILITY INDEX COARSE

SAMPLE NUMBER _____
SEDIMENT HEIGHT (H) _____
DURABILITY INDEX (Dc) _____

CALCULATION:

$D_c = 30.3 + 20.8 \cot(0.29 + 0.0059H)$

SAND EQUIVALENT

SAMPLE NUMBER X15352
SEDIMENT PERIOD 80min
CLAY HEIGHT 4.7
SAND HEIGHT 3.6
SAND EQUIVALENT 77

CALCULATIONS:

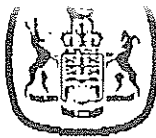
$\text{SAND EQUIVALENT} = \frac{\text{SAND HEIGHT}}{\text{CLAY HEIGHT}} \times 100$

DURABILITY INDEX FINE

SAMPLE NUMBER _____
SEDIMENT PERIOD _____
CLAY HEIGHT _____
SAND HEIGHT _____
D.I. FINE _____

CALCULATION:

$\text{D.I. FINE} = \frac{\text{SAND HEIGHT}}{\text{CLAY HEIGHT}} \times 100$



FRACTURE COUNT

MINISTRY OF TRANSPORTATION AND HIGHWAYS - GEOTECHNICAL BRANCH

METHOD A - FOR CRUSHED GRANULAR SURFACING AND BASE

METHOD B - FOR CRUSHED PAVING AGGREGATE

PROJECT: TELEGRAPH - PETERBERTON DISTRICT: South Island

TESTHOLE/PIT: 89-30 SAMPLE NO.: BAG NO.: X15367 DEPTH: 1.8-3.1m

METHOD A (COUNT)

			COUNT			
PASSING	37.5	UNFRACTURED	<u>2</u>			
RETAINED	25	1 + FRACTURED	<u>1</u>	<u>33.3</u>	% (25 mm)	
PASSING	25	UNFRACTURED	<u>4</u>			
RETAINED	19	1 + FRACTURED	<u>2</u>	<u>33.3</u>	% (19 mm)	
PASSING	19	UNFRACTURED	<u>9</u>			
RETAINED	12.5	1 + FRACTURED	<u>15</u>	<u>62.5</u>	% (12.5 mm)	
PASSING	12.5	UNFRACTURED	<u>20</u>			
RETAINED	9.5	1 + FRACTURED	<u>21</u>	<u>51.2</u>	% (9.5 mm)	
PASSING	9.5	UNFRACTURED	<u>231</u>			
RETAINED	4.75	1 + FRACTURED	<u>338</u>	<u>59.4</u>	% (4.75 mm)	
TOTAL		UNFRACTURED	<u>266</u>			
		1 + FRACTURED	<u>377</u>			
				<u>58.6</u>	% FRACTURE	
TOTAL NUMBER OF PIECES			<u>643</u>			

METHOD B (MASS)

			MASS			
PASSING	19	UNFRACTURED	<u>110.2</u>			
RETAINED	13.2	2 + FRACTURED	<u>53.7</u>	<u>32.8</u>	% (13.2 mm)	
PASSING	13.2	UNFRACTURED	<u>66.5</u>			
RETAINED	9.5	2 + FRACTURED	<u>33.1</u>	<u>33.2</u>	% (9.5 mm)	

ARITHMETIC AVERAGE

32.9 % FRACTURE B



FRACTURE COUNT

MINISTRY OF TRANSPORTATION AND HIGHWAYS - GEOTECHNICAL BRANCH

METHOD A - FOR CRUSHED GRANULAR SURFACING AND BASE

METHOD B - FOR CRUSHED PAVING AGGREGATE

PROJECT: TELEGRAPH - PETERBETTON DISTRICT: South Island
TESTHOLE/PI: 89-32 SAMPLE NO.: BAG NO.: X15362 DEPTH: 1.8-3.1m

METHOD A (COUNT)

			COUNT			
PASSING	37.5	UNFRACTURED	<u>1</u>			
RETAINED	25	1 + FRACTURED	<u>1</u>	<u>50.0</u>	% (25 mm)	
PASSING	25	UNFRACTURED	<u>4</u>			
RETAINED	19	1 + FRACTURED	<u>4</u>	<u>50.0</u>	% (19 mm)	
PASSING	19	UNFRACTURED	<u>5</u>			
RETAINED	12.5	1 + FRACTURED	<u>4</u>	<u>44.4</u>	% (12.5 mm)	
PASSING	12.5	UNFRACTURED	<u>10</u>			
RETAINED	9.5	1 + FRACTURED	<u>15</u>	<u>60.0</u>	% (9.5 mm)	
PASSING	9.5	UNFRACTURED	<u>94</u>			
RETAINED	4.75	1 + FRACTURED	<u>134</u>	<u>58.8</u>	% (4.75 mm)	
TOTAL		UNFRACTURED	<u>114</u>			
		1 + FRACTURED	<u>158</u>	<u>58.1</u>	% FRACTURE	
TOTAL NUMBER OF PIECES			<u>272</u>			

METHOD B (MASS)

			MASS			
PASSING	19	UNFRACTURED	<u>38.0</u>			
RETAINED	13.2	2 + FRACTURED	<u>17.7</u>	<u>31.8</u>	% (13.2 mm)	
PASSING	13.2	UNFRACTURED	<u>31.8</u>			
RETAINED	9.5	2 + FRACTURED	<u>23.5</u>	<u>42.5</u>	% (9.5 mm)	

ARITHMETIC AVERAGE

37.2 % FRACTURE B

Project MOTHA LTS.
Station TH 89-32 @ 1.8-3.1 m
Sample No. _____ Depth _____
Sampled By _____ Date _____
Tested By DJM Date July 3/90
X15 362

4:55
5:00

DEGRADATION

SAMPLE NUMBER X15362 _____
SEDIMENT HEIGHT (H) 1.9 _____
DEGRADATION FACTOR (D) 72 _____

CALCULATIONS:

ENGLISH UNITS $D = \frac{15-H}{15+1.75 H} \times 100$ 13.1
18.325
S.I. UNITS $D = \frac{381-H}{381+1.75 H} \times 100$

#3
SAND EQUIVALENT 3.5
4.09

SAMPLE NUMBER _____
SEDIMENT PERIOD 20 min _____
CLAY HEIGHT 5.8 _____
SAND HEIGHT 3.9 _____
SAND EQUIVALENT 67.2 _____

CALCULATIONS:

SAND EQUIVALENT = $\frac{\text{SAND HEIGHT}}{\text{CLAY HEIGHT}} \times 100$

DURABILITY INDEX COARSE

SAMPLE NUMBER _____
SEDIMENT HEIGHT (H) _____
DURABILITY INDEX (Dc) _____

CALCULATION:

$D_c = 30.3 + 20.8 \cot(0.29 + 0.0059H)$

DURABILITY INDEX FINE

SAMPLE NUMBER _____
SEDIMENT PERIOD _____
CLAY HEIGHT _____
SAND HEIGHT _____
D.I. FINE _____

CALCULATION:

D.I. FINE = $\frac{\text{SAND HEIGHT}}{\text{CLAY HEIGHT}} \times 100$

Project M.O.T.H. LTS - 90
Station IH09-32 @ 7.9-9.1 m
Sample No. _____ Depth _____
Sampled By _____ Date _____
Tested By DIM Date July 3/90

X 15363

DEGRADATION

SAMPLE NUMBER X 15363
SEDIMENT HEIGHT (H) 2.6
DEGRADATION FACTOR (D) 63

CALCULATIONS:

ENGLISH UNITS $D = \frac{15-H}{15+1.75 H} \times 100$ 124

S.I. UNITS $D = \frac{381-H}{381+1.75 H} \times 100$ 19.5

DURABILITY INDEX COARSE

SAMPLE NUMBER _____
SEDIMENT HEIGHT (H) _____
DURABILITY INDEX (Dc) _____

CALCULATION:

$D_c = 30.3 + 20.8 \cot(0.29 + 0.0059H)$

SAND EQUIVALENT

SAMPLE NUMBER X 15363
SEDIMENT PERIOD 20 min
CLAY HEIGHT 5.3
SAND HEIGHT 3.6
SAND EQUIVALENT 68

CALCULATIONS:

$SAND EQUIVALENT = \frac{SAND HEIGHT}{CLAY HEIGHT} \times 100$

DURABILITY INDEX FINE

SAMPLE NUMBER _____
SEDIMENT PERIOD _____
CLAY HEIGHT _____
SAND HEIGHT _____
D.I. FINE _____

CALCULATION:

$D.I. FINE = \frac{SAND HEIGHT}{CLAY HEIGHT} \times 100$



FRACTURE COUNT

MINISTRY OF TRANSPORTATION AND HIGHWAYS - GEOTECHNICAL BRANCH

METHOD A - FOR CRUSHED GRANULAR SURFACING AND BASE

METHOD B - FOR CRUSHED PAVING AGGREGATE

PROJECT: TELEGRAPH - PERMIT

DISTRICT: South Island

TESTHOLE/PIT: 89-33 SAMPLE NO.: BAG NO.: X15358 DEPTH: 9.1-10.4m

METHOD A (COUNT)

		COUNT			
PASSING	37.5	UNFRACTURED	<u> </u>		
RETAINED	25	1 + FRACTURED	<u> 3 </u>	<u>100.0</u>	% (25 mm)
PASSING	25	UNFRACTURED	<u> 3 </u>		
RETAINED	19	1 + FRACTURED	<u> 3 </u>	<u>50.0</u>	% (19 mm)
PASSING	19	UNFRACTURED	<u> 10 </u>		
RETAINED	12.5	1 + FRACTURED	<u> 14 </u>	<u>58.3</u>	% (12.5 mm)
PASSING	12.5	UNFRACTURED	<u> 18 </u>		
RETAINED	9.5	1 + FRACTURED	<u> 24 </u>	<u>57.1</u>	% (9.5 mm)
PASSING	9.5	UNFRACTURED	<u>104 </u>		
RETAINED	4.75	1 + FRACTURED	<u>275 </u>	<u>72.6</u>	% (4.75 mm)
TOTAL		UNFRACTURED	<u>135 </u>		
		1 + FRACTURED	<u>319 </u>	<u>70.3</u>	% FRACTURE A
TOTAL NUMBER OF PIECES			<u>454 </u>		

METHOD B (MASS)

		MASS			
PASSING	19	UNFRACTURED	<u>107.2</u>		
RETAINED	13.2	2 + FRACTURED	<u>45.7</u>	<u>29.9</u>	% (13.2 mm)
PASSING	13.2	UNFRACTURED	<u>75.6</u>		
RETAINED	9.5	2 + FRACTURED	<u>33.9</u>	<u>31.0</u>	% (9.5 mm)

ARITHMETIC AVERAGE

30.3 % FRACTURE B