- FRACTURE -

METHOD A : for Crushed Granular Surfacing and Base Aggregate

METHOD B : for Crushed Paving Aggregate

McLay Pit 87-01 SA #1

×700 - ×701

		METHOD A (Count)	METHOD B (Mass)
RETAINED on 9.5 mm sieve. 3/8"	UNFRACTURED	49	183.4
	1 FRACTURE	10	36.1
	2+ FRACTURES	209	729.6
PASSING 9.5mm sieve. RETAINED on 4.75mm sieve.	UNFRACTURED	12	5.49
	1 FRACTURE	253	121.5
	2+ FRACTURES	339	135.89
TOTAL	UNFRACTURED	61	
	1 FRACTURE	263	
	2+ FRACTURES	548	
	TOTAL	872	999.3
	TOTAL FRACTURE	811	729.6
	FRACTURE %	93.0	76.9

Completed by : Ken

- FRACTURE -

METHOD A : for Crushed Granular Surfacing and Base Aggregate

METHOD B : for Crushed Paving Aggregate

McKay Pit 87-10 SA#1
X707 - X708
87-05-25

		METHOD A (Count)	METHOD B (Mass)
RETAINED on 9.5 mm sieve.	UNFRACTURED	97	389
	1 FRACTURE	12	47
	2+ FRACTURES	67	291
PASSING 9.5mm sieve. RETAINED on 4.75mm sieve.	UNFRACTURED	588	278
	1 FRACTURE	12	6
	2+ FRACTURES	205	56
TOTAL	UNFRACTURED	685	
	1 FRACTURE	24	
	2+ FRACTURES	272	
	TOTAL	981	726
	TOTAL FRACTURE	296	291
	FRACTURE %	30.2	40.1

Completed by : Dains

- FRACTURE -

METHOD A : for Crushed Granular Surfacing and Base Aggregate

METHOD B : for Crushed Paving Aggregate

MCLAY PIT
87-10 SA2
87-05-25
x 709 - 710

		METHOD A (Count)	METHOD B (Mass)
RETAINED on 9.5 mm sieve.	UNFRACTURED	103	382
	1 FRACTURE	13	47
	2+ FRACTURES	65	266
PASSING 9.5mm sieve. RETAINED on 4.75mm sieve.	UNFRACTURED	413	245
	1 FRACTURE	14	6
	2+ FRACTURES	110	44
TOTAL	UNFRACTURED	516	
	1 FRACTURE	27	
	2+ FRACTURES	175	
	TOTAL	718	695
	TOTAL FRACTURE	202	266
	FRACTURE %	28.1	38.3

Completed by : Dean Caillet

- FRACTURE -

METHOD A : for Crushed Granular Surfacing and Base Aggregate

METHOD B : for Crushed Paving Aggregate

McLay Pit
87-10A SA #1 x712 - x713

87-06-24

		METHOD A (Count)	METHOD B (Mass)
RETAINED on 9.5 mm sieve.	UNFRACTURED	2[illegible]	354
	1 FRACTURE	51	156
	2+ FRACTURES	141	608
PASSING 9.5mm sieve. RETAINED on 4.75mm sieve.	UNFRACTURED	249	
	1 FRACTURE	14	
	2+ FRACTURES	193	
TOTAL	UNFRACTURED	342	
	1 FRACTURE	45	
	2+ FRACTURES	334	
	TOTAL	723	1118
	TOTAL FRACTURE	384	608
	FRACTURE %	52.7 %	54.4 %

Completed by : Diane Caillet

- FRACTURE -

METHOD A : for Crushed Granular Surfacing and Base Aggregate

METHOD B : for Crushed Paving Aggregate

McLay Pit
87-10A SA 3

X570/X544

87-06-24

		METHOD A (Count)	METHOD B (Mass)
RETAINED on 9.5 mm sieve.	UNFRACTURED	97	353
	1 FRACTURE	34	160
	2+ FRACTURES	123	471
PASSING 9.5mm sieve. RETAINED on 4.75mm sieve.	UNFRACTURED	234	631
	1 FRACTURE	36	45
	2+ FRACTURES	122	21
TOTAL	UNFRACTURED	331	
	1 FRACTURE	70	
	2+ FRACTURES	245	
	TOTAL	646	984
	TOTAL FRACTURE	315	471
	FRACTURE %	48.8%	47.9%

Completed by : Dain

- FRACTURE -

METHOD A : for Crushed Granular Surfacing and Base Aggregate

METHOD B : for Crushed Paving Aggregate

MCKAY PIT 87-11 SA2
X 546 - X547

		METHOD A (Count)	METHOD B (Mass)
RETAINED on 9.5 mm sieve.	UNFRACTURED	90	392
	1 FRACTURE	32	189
	2+ FRACTURES	115	530
PASSING 9.5mm sieve. RETAINED on 4.75mm sieve.	UNFRACTURED	481	270
	1 FRACTURE	47	23
	2+ FRACTURES	184	85
TOTAL	UNFRACTURED	571	
	1 FRACTURE	79	
	2+ FRACTURES	299	
	TOTAL	949	1111
	TOTAL FRACTURE	378	530
	FRACTURE %	39.8	47.7

Completed by : Diane

- FRACTURE -

METHOD A : for Crushed Granular Surfacing and Base Aggregate

METHOD B : for Crushed Paving Aggregate

McLay Pit : 87-11 SA #3

X543

		METHOD A (Count)	METHOD B (Mass)
RETAINED on 9.5 mm sieve.	UNFRACTURED	149	471
	1 FRACTURE	13	43
	2+ FRACTURES	114	458
PASSING 9.5mm sieve. RETAINED on 4.75mm sieve.	UNFRACTURED	318	133
	1 FRACTURE	4	2
	2+ FRACTURES	63	22
TOTAL	UNFRACTURED	467	
	1 FRACTURE	17	
	2+ FRACTURES	177	
	TOTAL	661	972
	TOTAL FRACTURE	194	458
	FRACTURE %	29.3	47.1

Completed by : Diane

- FRACTURE -

METHOD A : for Crushed Granular Surfacing and Base Aggregate

METHOD B : for Crushed Paving Aggregate

McLay Pit 87-12 SA# 3

X539 - X540

		METHOD A (Count)	METHOD B (Mass)
RETAINED on 9.5 mm sieve.	UNFRACTURED	57	176
	1 FRACTURE	51	173
	2+ FRACTURES	263	1005
PASSING 9.5mm sieve. RETAINED on 4.75mm sieve.	UNFRACTURED	134	63
	1 FRACTURE	19	7
	2+ FRACTURES	304	122
TOTAL	UNFRACTURED	191	
	1 FRACTURE	70	
	2+ FRACTURES	567	
	TOTAL	1204	1354
	TOTAL FRACTURE	637	1005
	FRACTURE %	52.9	74.2

Completed by : Evans

- FRACTURE -

METHOD A : for Crushed Granular Surfacing and Base Aggregate

METHOD B : for Crushed Paving Aggregate

MCLAY PIT
87-13 SA #2
87-05-25
x533 x539

		METHOD A (Count)	METHOD B (Mass)
RETAINED on 9.5 mm sieve.	UNFRACTURED	112	460
	1 FRACTURE	34	144
	2+ FRACTURES	115	462
PASSING 9.5mm sieve. RETAINED on 4.75mm sieve.	UNFRACTURED	470	
	1 FRACTURE	51	
	2+ FRACTURES	249	70
TOTAL	UNFRACTURED	582	
	1 FRACTURE	85	
	2+ FRACTURES	364	
	TOTAL	1031	1066
	TOTAL FRACTURE	449	462
	FRACTURE %	43.5	43.3

Completed by : Dave

- FRACTURE -

METHOD A : for Crushed Granular Surfacing and Base Aggregate

METHOD B : for Crushed Paving Aggregate

McLay Pit x532

87-13 SA 3

87-05-25

		METHOD A (Count)	METHOD B (Mass)
RETAINED on 9.5 mm sieve.	UNFRACTURED	130	460
	1 FRACTURE	25	100
	2+ FRACTURES	151	658
PASSING 9.5mm sieve. RETAINED on 4.75mm sieve.	UNFRACTURED	441	195
	1 FRACTURE	25	10
	2+ FRACTURES	150	56
TOTAL	UNFRACTURED	571	
	1 FRACTURE	50	
	2+ FRACTURES	301	
	TOTAL	621	1218
	TOTAL FRACTURE	351	658
	FRACTURE %	56.5	54.0

Completed by : Diane Caillet

- FRACTURE -

METHOD A : for Crushed Granular Surfacing and Base Aggregate

METHOD B : for Crushed Paving Aggregate

MCLAY PIT
87-14 SA#1 X530 - X531
87-05-26

		METHOD A (Count)	METHOD B (Mass)
RETAINED on 9.5 mm sieve.	UNFRACTURED	119	475
	1 FRACTURE	29	150
	2+ FRACTURES	143	548
PASSING 9.5mm sieve. RETAINED on 4.75mm sieve.	UNFRACTURED	236	130
	1 FRACTURE	26	17
	2+ FRACTURES	130	92
TOTAL	UNFRACTURED	355	
	1 FRACTURE	55	
	2+ FRACTURES	273	
	TOTAL	683	1173
	TOTAL FRACTURE	328	548
	FRACTURE %	48.0	46.7

Completed by : Diane

- FRACTURE -

METHOD A : for Crushed Granular Surfacing and Base Aggregate

METHOD B : for Crushed Paving Aggregate

McLay Pit 87-16 SA #2

x 525 + x526

		METHOD A (Count)	METHOD B (Mass)
RETAINED on 9.5 mm sieve.	UNFRACTURED	106	412 g
	1 FRACTURE	20	104 g
	2+ FRACTURES	165	762 g
PASSING 9.5mm sieve. RETAINED on 4.75mm sieve.	UNFRACTURED	124	[illegible]
	1 FRACTURE	22	[illegible]
	2+ FRACTURES	223	[illegible]
TOTAL	UNFRACTURED	230	[illegible]
	1 FRACTURE	110	[illegible]
	2+ FRACTURES	388	[illegible]
	TOTAL	728	1278
	TOTAL FRACTURE	498	762
	FRACTURE %	68.4	59.6

Completed by : Diane (Connie, Christine)

- FRACTURE -

METHOD A : for Crushed Granular Surfacing and Base Aggregate

METHOD B : for Crushed Paving Aggregate

87-17 SA#1

X517

		METHOD A (Count)	METHOD B (Mass)
RETAINED on 9.5 mm sieve.	UNFRACTURED	88	334.9 g
	1 FRACTURE	33	143.3 g
	2+ FRACTURES	95	407.2 g
PASSING 9.5mm sieve. RETAINED on 4.75mm sieve.	UNFRACTURED	208	105.6 g
	1 FRACTURE	29	11.2 g
	2+ FRACTURES	88	40.6 g
TOTAL	UNFRACTURED	296	
	1 FRACTURE	62	
	2+ FRACTURES	183	
	TOTAL	541	885.4
	TOTAL FRACTURE	245	407.2 - 91
	FRACTURE %	45.3	46.0

Completed by : Chrissy

- FRACTURE -

METHOD A : for Crushed Granular Surfacing and Base Aggregate

METHOD B : for Crushed Paving Aggregate

87-18 SA#1

X519 - X520

87-06 - 2

		METHOD A (Count)	METHOD B (Mass)
RETAINED on 9.5 mm sieve.	UNFRACTURED	118	409
	1 FRACTURE	23	104
	2+ FRACTURES	156	591
PASSING 9.5mm sieve. RETAINED on 4.75mm sieve.	UNFRACTURED	240	
	1 FRACTURE	14	
	2+ FRACTURES	146	
TOTAL	UNFRACTURED	358	
	1 FRACTURE	37	
	2+ FRACTURES	302	
	TOTAL	697	1104
	TOTAL FRACTURE	339	591
	FRACTURE %	48.6%	53.5%

Completed by : Dian

- FRACTURE -

METHOD A : for Crushed Granular Surfacing and Base Aggregate

METHOD B : for Crushed Paving Aggregate

McLay Pit 87-19 SA #2

x522 - x523

		METHOD A (Count)	METHOD B (Mass)
RETAINED on 9.5 mm sieve.	UNFRACTURED	74	266
	1 FRACTURE	6	31
	2+ FRACTURES	105	471
PASSING 9.5mm sieve. RETAINED on 4.75mm sieve.	UNFRACTURED	260	124
	1 FRACTURE	4	2
	2+ FRACTURES	141	64
TOTAL	UNFRACTURED	334	
	1 FRACTURE	10	
	2+ FRACTURES	246	
	TOTAL	590	471
	TOTAL FRACTURE	256	768
	FRACTURE %	43.4	61.3

Completed by : Dian

- FRACTURE -

METHOD A : for Crushed Granular Surfacing and Base Aggregate

METHOD B : for Crushed Paving Aggregate

MCLAY PIT
87-19 SA3 X538
87-05-25

		METHOD A (Count)	METHOD B (Mass)
RETAINED on 9.5 mm sieve.	UNFRACTURED	145	485
	1 FRACTURE	19	98
	2+ FRACTURES	129	536
PASSING 9.5mm sieve. RETAINED on 4.75mm sieve.	UNFRACTURED	475	201
	1 FRACTURE	23	8
	2+ FRACTURES	112	70
TOTAL	UNFRACTURED	620	
	1 FRACTURE	42	
	2+ FRACTURES	241	
	TOTAL	903	1119
	TOTAL FRACTURE	283	536
	FRACTURE %	31.3	47.9

Completed by : Dani

- FRACTURE -

METHOD A : for Crushed Granular Surfacing and Base Aggregate

METHOD B : for Crushed Paving Aggregate

McLay Pit
87-20 SA #1
87-06-02
X 536 - X557

		METHOD A (Count)	METHOD B (Mass)
RETAINED on 9.5 mm sieve.	UNFRACTURED	131	423
	1 FRACTURE	35	130
	2+ FRACTURES	136	524
PASSING 9.5mm sieve. RETAINED on 4.75mm sieve.	UNFRACTURED	322	172
	1 FRACTURE	39	19
	2+ FRACTURES	183	77
TOTAL	UNFRACTURED	453	
	1 FRACTURE	74	
	2+ FRACTURES	589	
	TOTAL	1116	1127
	TOTAL FRACTURE	663	524
	FRACTURE %	59.4	46.5

Completed by : Diane

- FRACTURE -

METHOD A : for Crushed Granular Surfacing and Base Aggregate

METHOD B : for Crushed Paving Aggregate

McLAY
97-20 SA 2 X516/X521
FRAC.

97-06-18

		METHOD A (Count)	METHOD B (Mass)
RETAINED on 9.5 mm sieve.	UNFRACTURED	133	498
	1 FRACTURE	36	148
	2+ FRACTURES	175	645
PASSING 9.5mm sieve. RETAINED on 4.75mm sieve.	UNFRACTURED	408	175
	1 FRACTURE	11	8
	2+ FRACTURES	197	66
TOTAL	UNFRACTURED	541	
	1 FRACTURE	47	
	2+ FRACTURES	372	
	TOTAL	960	1291
	TOTAL FRACTURE	419	645
	FRACTURE %	44%	50%

Completed by : Dian

- FRACTURE -

METHOD A : for Crushed Granular Surfacing and Base Aggregate

METHOD B : for Crushed Paving Aggregate

McLay Pit 87-20 SA #3
X515

		METHOD A (Count)	METHOD B (Mass)
RETAINED on 9.5 mm sieve.	UNFRACTURED	197	708
	1 FRACTURE	29	168
	2+ FRACTURES	77	267
PASSING 9.5mm sieve. RETAINED on 4.75mm sieve.	UNFRACTURED	530	208
	1 FRACTURE	3	1
	2+ FRACTURES	45	13
TOTAL	UNFRACTURED	727	
	1 FRACTURE	32	
	2+ FRACTURES	122	
	TOTAL	881	1143
	TOTAL FRACTURE	154	267
	FRACTURE %	17.5	23.4

Completed by : Diane

- FRACTURE -

METHOD A : for Crushed Granular Surfacing and Base Aggregate

METHOD B : for Crushed Paving Aggregate

McLay Pit
07-21-Sa #1
x513-514

07-06-02

		METHOD A (Count)	METHOD B (Mass)
RETAINED on 9.5 mm sieve.	UNFRACTURED	108	414.6
	1 FRACTURE	81	142.8
	2+ FRACTURES	134	533.5
PASSING 9.5mm sieve. RETAINED on 4.75mm sieve.	UNFRACTURED	163	103.3 g
	1 FRACTURE	57	26.2 g
	2+ FRACTURES	137	75.6 g
TOTAL	UNFRACTURED	271	
	1 FRACTURE	38	
	2+ FRACTURES	271	
	TOTAL	630	1090.9
	TOTAL FRACTURE	359	533.5
	FRACTURE %	57.0	48.9

Completed by : _____

- FRACTURE -

METHOD A : for Crushed Granular Surfacing and Base Aggregate

METHOD B : for Crushed Paving Aggregate

McLay Pit
87-06-18
87-22 SA#1

		METHOD A (Count)	METHOD B (Mass)
RETAINED on 9.5 mm sieve.	UNFRACTURED	136	474
	1 FRACTURE	29	128
	2+ FRACTURES	180	693
PASSING 9.5mm sieve. RETAINED on 4.75mm sieve.	UNFRACTURED	332	
	1 FRACTURE	27	
	2+ FRACTURES	187	
TOTAL	UNFRACTURED	468	
	1 FRACTURE	56	
	2+ FRACTURES	367	
	TOTAL	291	1295
	TOTAL FRACTURE	423	693
	FRACTURE %	47.5%	53.5 %

Completed by : Dian

SPECIFIC GRAVITY AND ABSORPTION OF COARSE AGGREGATE

87-10A
SA#1

Date 87-05-27

Technician Dan

Sample of 25mm

Project McLAY PIT

District NANAIMO

		①	②
Mass of Basket / S.S.D. Sample in Air		2936 g	2597 g
Mass of Basket in Air		1500 g	1500 g
Mass of S.S.D. Sample in Air	(A)	1436 g	1097 g
Mass of Basket / S.S.D. Sample in Water		2427 g	2206 g
Mass of Basket in Water		1500 g	1500 g
Mass of S.S.D. Sample in Water	(B)	927 g	706 g
Mass of Oven Dry Sample in Air	(C)	1426 g	1089 g

Specific Gravity (S.S.D.) = $\frac{A}{A - B}$

$\frac{1436}{1436 - 927} = 2.821$

$\frac{1097}{1097 - 706} = 2.805$

2.81

Absorption = $\frac{A - C}{C} \times 100$

$\frac{1436 - 1426}{1426} \times 100 = 0.70$

$\frac{1097 - 1089}{1089} \times 100 = 0.73$

0.72

Bulk S.G. (if required) = $\frac{C}{A - B}$

$\frac{1426}{1436 - 927} = 2.80$

$\frac{1089}{1097 - 706} = 2.79$

2.795

SPECIFIC GRAVITY AND ABSORPTION TESTS OF FINE AGGREGATE

87-10A SA #1
x712 - x713

Date 87-06-09

Technician Dani Cullet

Sample of 25mm CRUSH

Project MCLAY PIT

District NANAIMO

Flask No.

		(1)	(2)
Mass of Flask		180.94 g	177.14 g
Mass of Flask and S.S.D. Sample		656.29 g	628.74 g
Mass of S.S.D. Sample	(A)	475.35 g	451.60 g
Mass of Flask & S.S.D. Sample & Water	(B)	978.10 g	959.60 g
Mass of Water		321.81 g	330.86 g
Mass of Oven Dry Sample	(D)	463.70 g	440.8 g
Temperature 0°C		22.80°	22.80°
Mass of Flask at Temperature	(C)	679.75	675.20

Specific Gravity (S.S.D.) = $\frac{A}{C + A - B}$

$\frac{475.35}{179.71 + 475.35 - 975.10} = \frac{475.35}{176.50} = 2.70$

$\frac{451.60}{675.20 + 451.60 - 959.60} = \frac{451.60}{167.20} = 2.70$

2.70

Absorption = $\frac{A - D}{D} \times 100$

$\frac{475.35 - 463.70}{463.70} \times 100 = 2.51$

$\frac{451.60 - 440.80}{440.80} \times 100 = 2.45$

2.48

Bulk S.G. (if required) = $\frac{D}{C + A - B}$

$\frac{463.70}{176.00} = 2.634$

$\frac{440.80}{167.20} = 2.636$

2.64

SPECIFIC GRAVITY AND ABSORPTION OF COARSE AGGREGATE

TH 87-10A
SA #3

Date 87-05-27

Technician Dan.

Sample of 25 mm

Project McLAY PIT

District NANAIMO

	①	②
Mass of Basket / S.S.D. Sample in Air	2868 g	2703 g
Mass of Basket in Air	1500 g	1500 g
Mass of S.S.D. Sample in Air (A)	1369 g	1203 g
Mass of Basket / S.S.D. Sample in Water	2389 g	2278 g
Mass of Basket in Water	1500 g	1500 g
Mass of S.S.D. Sample in Water (B)	889 g	778 g
Mass of Oven Dry Sample in Air (C)	1359 g	1194 g

Specific Gravity (S.S.D.) = $\frac{A}{A - B}$

$\frac{1369}{1369 - 889} = 2.852$

$\frac{1203}{1203 - 778} = 2.830$

2.84

Absorption = $\frac{A - C}{C} \times 100$

$\frac{1369 - 1359}{1359} \times 100 = .74$

$\frac{1203 - 1194}{1194} \times 100 = 0.75$

.74

Bulk S.G. (if required) = $\frac{C}{A - B}$

$\frac{1359}{1369 - 889} = 2.83$

$\frac{1194}{1203 - 778} = 2.81$

2.82

SPECIFIC GRAVITY AND ABSORPTION TESTS
OF
FINE AGGREGATE

87-10A SA #3
X544 - X545

Date 87-05-27

Technician Dani

Sample of SAND - 25mm CRUSH

Project MCLAY PIT

District NANAIMO

		①	②
Flask No.			
Mass of Flask		180.81 g	176.95 g
Mass of Flask and S.S.D. Sample		691.81 g	638.28 g
Mass of S.S.D. Sample	(A)	511.00 g	461.33 g
Mass of Flask & S.S.D.Sample & Water	(B)	1003.17 g	968.34 g
Mass of Water		311.36 g	330.06 g
Mass of Oven Dry Sample	(D)	502.60 g	454.10 g
Temperature 0°C		21.2°	21.3°
Mass of Flask at Temperature	(C)	678.93	675.38

Specific Gravity (S.S.D.) = $\frac{A}{C + A - B}$

$\frac{511.00}{678.93 + 511.00 - 1003.17} = 2.74$

$\frac{461.33}{675.38 + 461.33 - 968.34} = 2.74$

2.74

Absorption = $\frac{A - D}{D} \times 100$

$\frac{511.00 - 502.60}{502.60} \times 100 = 1.67$ %

$\frac{461.33 - 454.10}{454.10} \times 100 = 1.59$ %

1.63

Bulk S.G. (if required) = $\frac{D}{C + A - B}$

$\frac{502.60}{678.93 + 511.00 - 1003.17} = \frac{502.60}{186.76} = 2.69$

$\frac{454.10}{675.38 + 461.33 - 968.34} = \frac{454.10}{168.37} = 2.69$

2.69

SPECIFIC GRAVITY AND ABSORPTION OF COARSE AGGREGATE

TH 87-18
SA #1

Date 87-05-27

Technician Dion

Sample of 25 mm

Project McLAY PIT

District NANAIMO

		①	②
Mass of Basket / S.S.D. Sample in Air		2620 g	2689 g
Mass of Basket in Air		1500 g	1500 g
Mass of S.S.D. Sample in Air	(A)	1120 g	1189 g
Mass of Basket / S.S.D. Sample in Water		2224 g	2265 g
Mass of Basket in Water		1500 g	1500 g
Mass of S.S.D. Sample in Water	(B)	724 g	765 g
Mass of Oven Dry Sample in Air	(C)	1110 g	1177 g

Specific Gravity (S.S.D.) = $\frac{A}{A - B}$

$\frac{1120}{1120 - 724} = 2.828$

$\frac{1189}{1189 - 765} = 2.804$

2.82

Absorption = $\frac{A - C}{C} \times 100$

$\frac{1120 - 1110}{1110} \times 100 = .900$

$\frac{1189 - 1177}{1177} \times 100 = 1.019$

.96

R.D.
Bulk ~~S.G.~~ (if required) = $\frac{C}{A - B}$

$\frac{1110}{1120 - 724} = \frac{1110}{396} = 2.80$

$\frac{1177}{1189 - 765} = \frac{1177}{424} = 2.78$

2.79

SPECIFIC GRAVITY AND ABSORPTION TESTS OF FINE AGGREGATE

Date 87-06-03

87-18 SA #1 Technician Diane

×519 - ×520 Sample of 25mm CRUSH

Project MCLAY PIT District NANAIMO

		(1)	(2)
Flask No.			
Mass of Flask		180.93 g	177.08 g
Mass of Flask and S.S.D. Sample		604.55 g	676.97 g
Mass of S.S.D. Sample	(A)	423.62 g	499.89 g
Mass of Flask & S.S.D. Sample & Water	(B)	941.31 g	984.95 g
Mass of Water		336.76 g	307.98 g
Mass of Oven Dry Sample	(D)	406.70 g	479.84 g
Temperature 0°C		22.7°	22.6°
Mass of Flask at Temperature	(C)	678.75	678.76

Specific Gravity (S.S.D.) = $\frac{A}{C + A - B}$

$\frac{423.62}{678.75 + 423.62 - 941.31} = 2.63$ 2.61

$\frac{499.89}{678.76 + 499.89 - 984.95} = 2.58$

Absorption = $\frac{A - D}{D} \times 100$

$\frac{423.62 - 406.70}{406.70} \times 100 = 4.16$

$\frac{499.89 - 479.84}{479.84} \times 100 = 4.18$ 4.17

Bulk S.G. (if required) = $\frac{D}{C + A - B}$ R.D.

$\frac{406.70}{678.7 + 423.62 - 941.31} = \frac{406.70}{161.01} = 2.53$

$\frac{479.84}{678.75 + 499.89 - 984.95} = \frac{479.84}{193.69} = 2.48$ 2.51

Ministry of Transportation and Highways
GEOTECHNICAL AND MATERIALS BRANCH

PROJECT McLay Pit
Station or T.H. 87-10A Sample No. 1
Depth 2.2 - 3.0 m Cost Code
Date 87-06-09
Technician Dan Caillet

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

Sieve Size Passing	Sieve Size Retained	Grading of Original Sample (%)	Mass of Test Fractions Before Test (g)		After 5 Cycles: Mass Remaining (g)	After 5 Cycles: Loss (%)	Weighted Percentage Mass Loss (%)
SOUNDNESS TEST OF COARSE AGGREGATE							
63 mm	50 mm						
50 mm	37.5 mm						
37.5 mm	25.0 mm	26.5	995.5	1491.7	1473.5	1.2	0.3
			496.2				
25.0 mm	19.0 mm						
19.0 mm	12.5 mm	40.1	670.3	1000.5	980.2	2.0	0.8
			330.2				
12.5 mm	9.5 mm						
9.5 mm	4.75 mm	33.4		300.3	289.3	3.7	1.2
TOTALS		100.0					2.3
SOUNDNESS TEST OF FINE AGGREGATE							
★9.5 mm	4.75 mm						
4.75 mm	2.36 mm	29.0	B-1.18	100.0	92.7	7.3	2.1
2.36 mm	1.18 mm	24.0	C-3.00	100.0	91.2	8.8	2.1
1.18 mm	.600 mm	26.9	D-1.18	100.0	62.4	37.6	10.1
.600 mm	.300 mm	20.1	C-600	100.0	85.1	14.9	3.0
.300 mm	.150 mm						
.150 mm	PAN						
TOTALS		100.0					17.3

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

% Of Initial Sample Passing 4.75 mm Sieve = _____ % CYCLE ###

REMARKS:-

D-71/VI-57

Ministry of Transportation and Highways
GEOTECHNICAL AND MATERIALS BRANCH

PROJECT McLay Pit x354/x590
Station or T.H. 87-10A Sample No. 3
Depth 0.0 - 1.0 Cost Code
Date 87-06-09
Technician Dean Caillet

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						
5 mm	25.0 mm		36.1	1017.3 / 499.8	1517.1	1502.5	0.64	.23
25.0 mm	19.0 mm						
19.0 mm	12.5 mm		37.3	669.6 / 330.4	999.0	972.8	2.72	1.01
12.5 mm	9.5 mm						
9.5 mm	4.75 mm	L	26.6	300.0	291.0	3.00	0.80
TOTALS			100.0				2.04
SOUNDNESS TEST OF FINE AGGREGATE							
★9.5 mm	4.75 mm						
4.75 mm	2.36 mm	M	27.7	100	93.6	6.4	1.8
2.36 mm	1.18 mm	N	22.8	100	92.4	7.6	1.7
1.18 mm	.600 mm	O	20.0	100	86.3	13.7	2.7
.600 mm	.300 mm	P	29.5	100	81.6	18.4	5.4
.300 mm	.150 mm						
.150 mm	PAN						
TOTALS			100.0				11.6

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

% Of Initial Sample Passing 4.75 mm Sieve = _____%

REMARKS:-

H87 (Rev. 80/06)

Ministry of Transportation and Highways
GEOTECHNICAL AND MATERIALS BRANCH

PROJECT McLay Pit
Station or T.H. 87-18 Sample No. 1
Depth 1.3 - 4.0 m Cost Code
Date 87-08-09
Technician Dian Caillet

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

Sieve Size Passing	Sieve Size Retained	Grading of Original Sample (%)	Mass of Test Fractions Before Test (g)	After 5 Cycles: Mass Remaining (g)	After 5 Cycles: Loss (%)	Weighted Percentage Mass Loss (%)
SOUNDNESS TEST OF COARSE AGGREGATE						
63 mm	50 mm					
50 mm	37.5 mm					
37.5 mm	25.0 mm	25.6	997.9 499.7	1497.6	1469.2	1.90	0.49
25.0 mm	19.0 mm					
19.0 mm	12.5 mm	37.7	670.8 328.1	998.9	963.3	3.56	0.34
12.5 mm	9.5 mm					
9.5 mm	4.75 mm R	36.7		300.1	272.2	7.63	2.80
TOTALS		100.0					3.63
SOUNDNESS TEST OF FINE AGGREGATE						
★9.5 mm	4.75 mm					
4.75 mm	2.36 mm S	36.9	100	91.4	8.6	3.17
2.36 mm	1.18 mm T	29.3	100	83.4	16.6	4.90
1.18 mm	.600 mm U	13.7	100	79.3	20.7	3.87
.600 mm	.300 mm V	14.9	100	74.2	25.8	3.84
.300 mm	.150 mm					
.150 mm	PAN					
TOTALS		100.0					15.78

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

% Of Initial Sample Passing 4.75 mm Sieve = _____ %

REMARKS:-

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

Project MCLAY PIT
Station 87-01 X700 - X701
Sample No. 1 Depth
Sampled By HEB Date
Tested By Diana Date 87-05-28

DEGRADATION

SAMPLE NUMBER	#1	
SEDIMENT HEIGHT (H)	10.8	
DEGRADATION FACTOR (D)	12.9	

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

SAMPLE NUMBER	#1	
SEDIMENT PERIOD	20MIN	
CLAY HEIGHT	11.5"	
SAND HEIGHT	3.2"	

DURABILITY INDEX COARSE

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

CALCULATION:

$Dc = 30.3 + 20.8\ \mathrm{Cot}(0.29+.0059H)$

DURABILITY INDEX FINE

SAMPLE NUMBER		
SEDIMENT PERIOD		
CLAY HEIGHT		
SAND HEIGHT		

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

Project McLAY PIT
Station 87-01 X700 - X701
Sample No. 1 Depth
Sampled By M.E.B. Date
Tested By Diana Date 87-05-26

DEGRADATION

SAMPLE NUMBER	#1	
SEDIMENT HEIGHT (H)	10.8	
DEGRADATION FACTOR (D)	12.4	

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:

$Dc = 30.3 + 20.8\ \mathrm{Cot}(0.29+.0059H)$

SAND EQUIVALENT

SAMPLE NUMBER	#1	
SEDIMENT PERIOD	20MIN	
CLAY HEIGHT	11.5"	
SAND HEIGHT	3.2"	
SAND EQUIVALENT	27.8	

POWDERY FINE SAND.

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:

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

INTERPRETATION OF SAND EQUIVALENT:

50	40	30	20	10
ABSENCE OF PLASTIC MATERIAL		POSSIBLE PLASTIC MATERIAL		PLASTIC MATERIAL

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

Project Hwy 4 #15
Station 87-10 X707-X708
Sample No. 1 Depth
Sampled By AEB Date
Tested By Dcini Date 87-05-25

DEGRADATION

SAMPLE NUMBER	#1	
SEDIMENT HEIGHT (H)	2.0"	
DEGRADATION FACTOR (D)	70.3	

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:

$Dc = 30.3 + 20.8\ \mathrm{Cot}(0.29+.0059H)$

SAND EQUIVALENT

SAMPLE NUMBER	1	
SEDIMENT PERIOD	20min	
CLAY HEIGHT	4.9"	
SAND HEIGHT	4.0"	
SAND EQUIVALENT	81.6	

FINE SAND

CALCULATIONS:

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:

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

INTERPRETATION OF SAND EQUIVALENT:

50	40	30	20	10
ABSENCE OF PLASTIC MATERIAL		POSSIBLE PLASTIC MATERIAL		PLASTIC MATERIAL

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

Project MCGAY #11
Station 87-10 x709 - x710
Sample No. 2 Depth
Sampled By AEB. Date
Tested By Deans Date 87-05-26

DEGRADATION

SAMPLE NUMBER	#2	
SEDIMENT HEIGHT (H)	2.0"	
DEGRADATION FACTOR (D)	70.3	

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:

$Dc = 30.3 + 20.8\ \mathrm{Cot}(0.29+.0059H)$

SAND EQUIVALENT

SAMPLE NUMBER	2	
SEDIMENT PERIOD	20 MIN	
CLAY HEIGHT	4.6"	
SAND HEIGHT	3.7"	
SAND EQUIVALENT	80.4	

FINE SAND

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:

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

INTERPRETATION OF SAND EQUIVALENT:

50	40	30	20	10
ABSENCE OF PLASTIC MATERIAL		POSSIBLE PLASTIC MATERIAL		PLASTIC MATERIAL

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

Project McLAY
Station 87-10A x712 x713
Sample No. 1 Depth
Sampled By RFB Date
Tested By Hans Date 87-05-25

DEGRADATION

SAMPLE NUMBER	#1A	
SEDIMENT HEIGHT (H)	2.4"	
DEGRADATION FACTOR (D)	65.6	

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	#1A	
SEDIMENT HEIGHT (H)	1"	25.4mm
DURABILITY INDEX (Dc)	75	

CALCULATION:

$Dc = 30.3 + 20.8\ \mathrm{Cot}(0.29+.0059H)$

SAND EQUIVALENT

SAMPLE NUMBER	#1A	
SEDIMENT PERIOD	20min	
CLAY HEIGHT	4.5"	
SAND HEIGHT	3.7"	
SAND EQUIVALENT	82.2	

CORR 4.7 MI 7MIN

CALCULATIONS:

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

DURABILITY INDEX FINE

SAMPLE NUMBER	#1A	
SEDIMENT PERIOD	20min	
CLAY HEIGHT	5.6"	
SAND HEIGHT	3.9"	
D.I. FINE	69.6	

CALCULATION:

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

INTERPRETATION OF SAND EQUIVALENT:

50	40	30	20	10
ABSENCE OF PLASTIC MATERIAL		POSSIBLE PLASTIC MATERIAL		PLASTIC MATERIAL

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

Project MCLAY PIT
Station 87-10A X544-X545
Sample No. 3 Depth
Sampled By AEB Date
Tested By DC Date 87-05-25

DEGRADATION

	#3	
SAMPLE NUMBER		
SEDIMENT HEIGHT (H)	1.3"	
DEGRADATION FACTOR (D)	79.3	

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

	#3	
SAMPLE NUMBER		
SEDIMENT HEIGHT (H)	0.8"	
DURABILITY INDEX (Dc)	20.3	

CALCULATION:

$Dc = 30.3 + 20.8\ \mathrm{Cot}(0.29+.0059H)$

SAND EQUIVALENT

	#3	
SAMPLE NUMBER		
SEDIMENT PERIOD	20MIN	
CLAY HEIGHT	4.3"	
SAND HEIGHT	3.9"	
SAND EQUIVALENT	90.7	

SETTLED IN UNDER 5 MIN

CALCULATIONS:

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

DURABILITY INDEX FINE

	#3	
SAMPLE NUMBER		
SEDIMENT PERIOD	20MIN.	
CLAY HEIGHT	5.4"	
SAND HEIGHT	3.6"	
D.I. FINE	66.7	

CALCULATION:

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

INTERPRETATION OF SAND EQUIVALENT:

50	40	30	20	10
ABSENCE OF PLASTIC MATERIAL		POSSIBLE PLASTIC MATERIAL		PLASTIC MATERIAL

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

Project McGAR PIT
Station 87-41 X596-X597
Sample No. 2 Depth
Sampled By AEB Date
Tested By Diane Date 87-05-25

DEGRADATION

SAMPLE NUMBER	#2	
SEDIMENT HEIGHT (H)	1.6	
DEGRADATION FACTOR (D)	75.3	

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:

$Dc = 30.3 + 20.8\ \mathrm{Cot}(0.29+.0059H)$

SAND EQUIVALENT

SAMPLE NUMBER	2	
SEDIMENT PERIOD	20 min	
CLAY HEIGHT	4.3"	
SAND HEIGHT	3.9"	
SAND EQUIVALENT	90.7	

CLAY 4.5" @ 9 min

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:

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

INTERPRETATION OF SAND EQUIVALENT:

50	40	30	20	10
ABSENCE OF PLASTIC MATERIAL		POSSIBLE PLASTIC MATERIAL		PLASTIC MATERIAL

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

Project McLay
Station 87-11 X543
Sample No. 3 Depth
Sampled By REB Date
Tested By Dean Date 87-05-25

DEGRADATION

SAMPLE NUMBER	#3	
SEDIMENT HEIGHT (H)	2.1"	
DEGRADATION FACTOR (D)	69.1	

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:

$Dc = 30.3 + 20.8\ \mathrm{Cot}(0.29+.0059H)$

SAND EQUIVALENT

SAMPLE NUMBER	X543	
SEDIMENT PERIOD	20MIN	
CLAY HEIGHT	4.4"	
SAND HEIGHT	3.8"	
SAND EQUIVALENT	86.4	

WELL GRADED

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:

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

INTERPRETATION OF SAND EQUIVALENT:

50	40	30	20	10
ABSENCE OF PLASTIC MATERIAL		POSSIBLE PLASTIC MATERIAL		PLASTIC MATERIAL

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

Project McLAY RD
Station 87-12 X539 - X540
Sample No. 3 Depth
Sampled By AEB Date
Tested By Diana Date 87-05-25

DEGRADATION

SAMPLE NUMBER	#3	
SEDIMENT HEIGHT (H)	2.5"	
DEGRADATION FACTOR (D)	64.5	

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:

$Dc = 30.3 + 20.8\ \mathrm{Cot}(0.29+.0059H)$

SAND EQUIVALENT

SAMPLE NUMBER	3	
SEDIMENT PERIOD	20min	
CLAY HEIGHT	4.2"	
SAND HEIGHT	3.6"	
SAND EQUIVALENT	85.7	

COARSE SAND

DURABILITY INDEX FINE

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

CALCULATIONS:

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

CALCULATION:

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

INTERPRETATION OF SAND EQUIVALENT:

50	40	30	20	10
ABSENCE OF PLASTIC MATERIAL		POSSIBLE PLASTIC MATERIAL		PLASTIC MATERIAL

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

Project MC4144 P11
Station 87-13 X533-X538
Sample No. 2 Depth
Sampled By AEB Date
Tested By Dmi Date 87-05-25

DEGRADATION

SAMPLE NUMBER	#2	
SEDIMENT HEIGHT (H)	2.3"	
DEGRADATION FACTOR (D)	66.7	

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:

$Dc = 30.3 + 20.8\ \mathrm{Cot}(0.29+.0059H)$

SAND EQUIVALENT

SAMPLE NUMBER	2	
SEDIMENT PERIOD	20min	
CLAY HEIGHT	4.1	
SAND HEIGHT	3.9	
SAND EQUIVALENT	95.1	

CLAY AT 4.3" AT 5MIN

CALCULATIONS:

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:

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

INTERPRETATION OF SAND EQUIVALENT:

50	40	30	20	10
ABSENCE OF PLASTIC MATERIAL		POSSIBLE PLASTIC MATERIAL		PLASTIC MATERIAL

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

Project MCLAY PIT
Station 87-16 X525-X526
Sample No. 2 Depth
Sampled By AEB Date
Tested By Dean Date 87-05-25

DEGRADATION

SAMPLE NUMBER	#2	
SEDIMENT HEIGHT (H)	5.5"	
DEGRADATION FACTOR (D)	38.6	

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:

$Dc = 30.3 + 20.8\ \mathrm{Cot}(0.29+.0059H)$

SAND EQUIVALENT

SAMPLE NUMBER	SA #2	
SEDIMENT PERIOD	20min	
CLAY HEIGHT	5.4"	
SAND HEIGHT	3.7"	
SAND EQUIVALENT	68.5	

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:

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

INTERPRETATION OF SAND EQUIVALENT:

50	40	30	20	10
ABSENCE OF PLASTIC MATERIAL		POSSIBLE PLASTIC MATERIAL		PLASTIC MATERIAL

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

Project McLay #11
Station 87-17 x517
Sample No. 1 Depth
Sampled By AEB Date
Tested By Dian Date 87-05-25

DEGRADATION

SAMPLE NUMBER	#1	
SEDIMENT HEIGHT (H)	10.4"	
DEGRADATION FACTOR (D)	13.9	

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:

$Dc = 30.3 + 20.8\ \mathrm{Cot}(0.29+.0059H)$

SAND EQUIVALENT

SAMPLE NUMBER	#1	
SEDIMENT PERIOD	20 MIN	
CLAY HEIGHT	4.7"	
SAND HEIGHT	3.8"	
SAND EQUIVALENT	80.9	

DURABILITY INDEX FINE

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

CALCULATIONS:

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

CALCULATION:

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

INTERPRETATION OF SAND EQUIVALENT:

50	40	30	20	10
ABSENCE OF PLASTIC MATERIAL		POSSIBLE PLASTIC MATERIAL		PLASTIC MATERIAL

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

Project MCLAY PIT
Station 87-18 x 519-x520
Sample No. 1 Depth
Sampled By AEB Date
Tested By Dian Date 87-05-25

DEGRADATION

SAMPLE NUMBER	#1	
SEDIMENT HEIGHT (H)	6.2	
DEGRADATION FACTOR (D)	34.0	

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	#1	
SEDIMENT HEIGHT (H)	1.2"	30.5mm
DURABILITY INDEX (Dc)	72	

CALCULATION:

$Dc = 30.3 + 20.8\ \mathrm{Cot}(0.29+.0059H)$

SAND EQUIVALENT

SAMPLE NUMBER	SA#1	
SEDIMENT PERIOD	20min	
CLAY HEIGHT	1.7"	
SAND HEIGHT	3.3"	
SAND EQUIVALENT	70.2	

CALCULATIONS:

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

DURABILITY INDEX FINE

SAMPLE NUMBER	#1	
SEDIMENT PERIOD	20min.	
CLAY HEIGHT	1.7"	
SAND HEIGHT	3.9"	
D.I. FINE	50.6	

CALCULATION:

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

INTERPRETATION OF SAND EQUIVALENT:

50	40	30	20	10
★ ABSENCE OF PLASTIC MATERIAL		POSSIBLE PLASTIC MATERIAL		PLASTIC MATERIAL

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

Project [illegible]
Station 87-19 X522-X523
Sample No. 2 Depth
Sampled By AEB Date
Tested By Dani Date 87-05-25

DEGRADATION

SAMPLE NUMBER	#2	
SEDIMENT HEIGHT (H)	85	
DEGRADATION FACTOR (D)	21.8	

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:

$Dc = 30.3 + 20.8\ \mathrm{Cot}(0.29+.0059H)$

SAND EQUIVALENT

SAMPLE NUMBER	#2	
SEDIMENT PERIOD	20 MIN	
CLAY HEIGHT	5.1"	
SAND HEIGHT	3.8"	
SAND EQUIVALENT	74.5	

FINE SAND

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:

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

INTERPRETATION OF SAND EQUIVALENT:

50	40	30	20	10
ABSENCE OF PLASTIC MATERIAL		POSSIBLE PLASTIC MATERIAL		PLASTIC MATERIAL

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

Project MCLAY PIT
Station 87-20 X586-X587
Sample No. SA 1 Depth
Sampled By AEB Date
Tested By Dcain Date 87-05-25

DEGRADATION

SAMPLE NUMBER	#1	
SEDIMENT HEIGHT (H)	7.1"	
DEGRADATION FACTOR (D)	28.8	

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:

$Dc = 30.3 + 20.8\ \mathrm{Cot}(0.29+.0059H)$

SAND EQUIVALENT

SAMPLE NUMBER	#1	
SEDIMENT PERIOD	20min	
CLAY HEIGHT	4.0"	
SAND HEIGHT	4.0"	
SAND EQUIVALENT	100	

COARSE SAND. FINE SETTLED INTO VOIDS AROUND SAND

CALCULATIONS:

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:

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

INTERPRETATION OF SAND EQUIVALENT:

50	40	30	20	10
ABSENCE OF PLASTIC MATERIAL		POSSIBLE PLASTIC MATERIAL		PLASTIC MATERIAL

FRACTURE COUNT

MINISTRY OF TRANSPORTATION AND HIGHWAYS – GEOTECHNICAL BRANCH

METHOD A – FOR CRUSHED GRANULAR SURFACING AND BASE
METHOD B – FOR CRUSHED PAVING AGGREGATE

PROJECT: MOTH 475 - July 1990 DISTRICT: South Island

TESTHOLE/PIT: 89-01 SAMPLE NO.: ___ BAG NO.: X0000 DEPTH: 10.4 - 11.6 m

McKay

METHOD A (COUNT)

			COUNT		
PASSING	37.5	UNFRACTURED	2		
RETAINED	25	1 + FRACTURED	3	60.0	% (25 mm)
PASSING	25	UNFRACTURED	15		
RETAINED	19	1 + FRACTURED	11	42.3	% (19 mm)
PASSING	19	UNFRACTURED	34		
RETAINED	12.5	1 + FRACTURED	31	47.7	% (12.5 mm)
PASSING	12.5	UNFRACTURED	68		
RETAINED	9.5	1 + FRACTURED	51	42.9	% (9.5 mm)
PASSING	9.5	UNFRACTURED	276		
RETAINED	4.75	1 + FRACTURED	443	61.6	% (4.75 mm)
TOTAL		UNFRACTURED	395		
		1 + FRACTURED	539	= 57.7	% FRACTURE A
TOTAL NUMBER OF PIECES			934		

METHOD B (MASS)

			MASS		
PASSING	19	UNFRACTURED	10.8		
RETAINED	13.2	2 + FRACTURED	326.2	74.6	% (13.2 mm)
PASSING	13.2	UNFRACTURED	218.9		
RETAINED	9.5	2 + FRACTURED	57.7	27.6	% (9.5 mm)

ARITHMETIC AVERAGE 54.4 % 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: McCLAY DISTRICT: South Island

TESTHOLE/PIT: 89-01 SAMPLE NO.: ___ BAG NO.: X17001 DEPTH: 14.0-15.2

METHOD A (COUNT)

			COUNT		
PASSING / RETAINED	37.5 / 25	UNFRACTURED / 1 + FRACTURED	1 / 6	85.7	% (25 mm)
PASSING / RETAINED	25 / 19	UNFRACTURED / 1 + FRACTURED	4 / 4	50.0	% (19 mm)
PASSING / RETAINED	19 / 12.5	UNFRACTURED / 1 + FRACTURED	22 / 11	33.3	% (12.5 mm)
PASSING / RETAINED	12.5 / 9.5	UNFRACTURED / 1 + FRACTURED	68 / 22	24.4	% (9.5 mm)
PASSING / RETAINED	9.5 / 4.75	UNFRACTURED / 1 + FRACTURED	317 / 392	55.3	% (4.75 mm)
TOTAL		UNFRACTURED / 1 + FRACTURED	412 / 435	= 51.4	% FRACTURE A
TOTAL NUMBER OF PIECES			847		

METHOD B (MASS)

			MASS		
PASSING / RETAINED	19 / 13.2	UNFRACTURED / 2 + FRACTURED	147.2 / 36.1	19.7	% (13.2 mm)
PASSING / RETAINED	13.2 / 9.5	UNFRACTURED / 2 + FRACTURED	168.6 / 30.2	15.2	% (9.5 mm)
ARITHMETIC AVERAGE				17.5	% 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: MOTH LTS - July 1990 DISTRICT: South Island

TESTHOLE/PIT: 89-02 SAMPLE NO.: ___ BAG NO.: X15393 DEPTH: 6.7-7.9 m

McClay

METHOD A (COUNT)

			COUNT		
PASSING	37.5	UNFRACTURED	1		
RETAINED	25	1 + FRACTURED	4	80.0	% (25 mm)
PASSING	25	UNFRACTURED	3		
RETAINED	19	1 + FRACTURED	10	76.9	% (19 mm)
PASSING	19	UNFRACTURED	17		
RETAINED	12.5	1 + FRACTURED	27	61.4	% (12.5 mm)
PASSING	12.5	UNFRACTURED	49		
RETAINED	9.5	1 + FRACTURED	35	45.5	% (9.5 mm)
PASSING	9.5	UNFRACTURED	234		
RETAINED	4.75	1 + FRACTURED	324	58.1	% (4.75 mm)
TOTAL		UNFRACTURED	297		
		1 + FRACTURED	400	= 57.1	% FRACTURE A
TOTAL NUMBER OF PIECES			697		

METHOD B (MASS)

			MASS		
PASSING	19	UNFRACTURED	164.0		
RETAINED	13.2	2 + FRACTURED	103.3	38.6	% (13.2 mm)
PASSING	13.2	UNFRACTURED	113.0		
RETAINED	9.5	2 + FRACTURED	69.8	37.8	% (9.5 mm)
ARITHMETIC AVERAGE				38.2	% 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: McCLAY DISTRICT: South Island

TESTHOLE/PIT: 89-03 SAMPLE NO.: ___ BAG NO.: X153955 DEPTH: 3.1 - 3.3

METHOD A (COUNT)

			COUNT		
PASSING / RETAINED	37.5 / 25	UNFRACTURED	1		
		1 + FRACTURED	7	87.5	% (25 mm)
PASSING / RETAINED	25 / 19	UNFRACTURED	3		
		1 + FRACTURED	9	75.0	% (19 mm)
PASSING / RETAINED	19 / 12.5	UNFRACTURED	14		
		1 + FRACTURED	32	70.2	% (12.5 mm)
PASSING / RETAINED	12.5 / 9.5	UNFRACTURED	38		
		1 + FRACTURED	51	57.3	% (9.5 mm)
PASSING / RETAINED	9.5 / 4.75	UNFRACTURED	293		
		1 + FRACTURED	584	66.6	% (4.75 mm)
TOTAL		UNFRACTURED	349		
		1 + FRACTURED	686	= 66.3	% FRACTURE A
TOTAL NUMBER OF PIECES			1035		

METHOD B (MASS)

			MASS		
PASSING / RETAINED	19 / 13.2	UNFRACTURED	105.9		
		2 + FRACTURED	169.7	61.3	% (13.2 mm)
PASSING / RETAINED	13.2 / 9.5	UNFRACTURED	106.6		
		2 + FRACTURED	77.3	42.0	% (9.5 mm)
ARITHMETIC AVERAGE				51.7	% 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: McClay DISTRICT: South Island

TESTHOLE/PIT: 89-03 SAMPLE NO.: ___ BAG NO.: X155796 DEPTH: 7.9-9.1

METHOD A (COUNT)

			COUNT		
PASSING	37.5	UNFRACTURED	2		
RETAINED	25	1 + FRACTURED	0	100	% (25 mm)
PASSING	25	UNFRACTURED	4		
RETAINED	19	1 + FRACTURED	2	33.3	% (19 mm)
PASSING	19	UNFRACTURED	28		
RETAINED	12.5	1 + FRACTURED	19	40.4	% (12.5 mm)
PASSING	12.5	UNFRACTURED	52		
RETAINED	9.5	1 + FRACTURED	41	44.1	% (9.5 mm)
PASSING	9.5	UNFRACTURED	231		
RETAINED	4.75	1 + FRACTURED	431	65.1	% (4.75 mm)
TOTAL		UNFRACTURED	317		
		1 + FRACTURED	493	= 60.9	% FRACTURE A
TOTAL NUMBER OF PIECES			810		

METHOD B (MASS)

			MASS		
PASSING	19	UNFRACTURED	212.4		
RETAINED	13.2	2 + FRACTURED	62.7	22.8	% (13.2 mm)
PASSING	13.2	UNFRACTURED	165.1		
RETAINED	9.5	2 + FRACTURED	49.2	23.0	% (9.5 mm)

ARITHMETIC AVERAGE 22.9 % 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: Mrclay DISTRICT: South Island

TESTHOLE/PIT: 89-83 SAMPLE NO.: ___ BAG NO.: X15397 DEPTH: 12.8-14.0

HLR

METHOD A (COUNT)

			COUNT		
PASSING 37.5 / RETAINED 25	UNFRACTURED	1		
	1 + FRACTURED	2	66.6	% (25 mm)
PASSING 25 / RETAINED 19	UNFRACTURED	4		
	1 + FRACTURED	4	50.0	% (19 mm)
PASSING 19 / RETAINED 12.5	UNFRACTURED	29		
	1 + FRACTURED	11	27.5	% (12.5 mm)
PASSING 12.5 / RETAINED 9.5	UNFRACTURED	49		
	1 + FRACTURED	18	26.9	% (9.5 mm)
PASSING 9.5 / RETAINED 4.75	UNFRACTURED	178		
	1 + FRACTURED	207	53.8	% (4.75 mm)
TOTAL	UNFRACTURED	261		
	1 + FRACTURED	249	= 48.1	% FRACTURE A
TOTAL NUMBER OF PIECES		503		

METHOD B (MASS)

			MASS		
PASSING 19 / RETAINED 13.2	UNFRACTURED	201.4		
	2 + FRACTURED	28.7	12.5	% (13.2 mm)
PASSING 13.2 / RETAINED 9.5	UNFRACTURED	134.6		
	2 + FRACTURED	13.5	9.1	% (9.5 mm)
ARITHMETIC AVERAGE			10.8	% FRACTURE B

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

Project M.O.T.H Lts - July 1990
Station McGregor X 17000
Sample No. TH89-1 Depth 10.4 - 11.6m
Sampled By _____ Date _____
Tested By DJM Date 14.7.90

DEGRADATION

SAMPLE NUMBER X 17000 _____

SEDIMENT HEIGHT (H) 1.9 _____

DEGRADATION FACTOR (D) 72 _____

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:

$Dc = 30.3 + 20.8\ \mathrm{Cot}(0.29+.0059H)$

SAND EQUIVALENT

SAMPLE NUMBER X 17000 _____

SEDIMENT PERIOD 20min _____

CLAY HEIGHT 5.9 _____

SAND HEIGHT 4.1 _____

SAND EQUIVALENT 70 _____

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:

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

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

Project M.O.T.H. Lts - July 1990
Station McClay X 15393
Sample No. TH 8902 Depth 6.7 - 7.9 m
Sampled By _____ Date _____
Tested By DJH Date 25 July 90

DEGRADATION

SAMPLE NUMBER X 15393 _____

SEDIMENT HEIGHT (H) 2.5 _____

DEGRADATION FACTOR (D) 65 _____

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:

$Dc = 30.3 + 20.8\ \mathrm{Cot}(0.29+.0059H)$

SAND EQUIVALENT

SAMPLE NUMBER X 15393 _____

SEDIMENT PERIOD 20 min. _____

CLAY HEIGHT 5.2 _____

SAND HEIGHT 3.6 _____

SAND EQUIVALENT 69 _____

CALCULATIONS:

SAND HEIGHT

DURABILITY INDEX FINE

SAMPLE NUMBER _____ _____

SEDIMENT PERIOD _____ _____

CLAY HEIGHT _____ _____

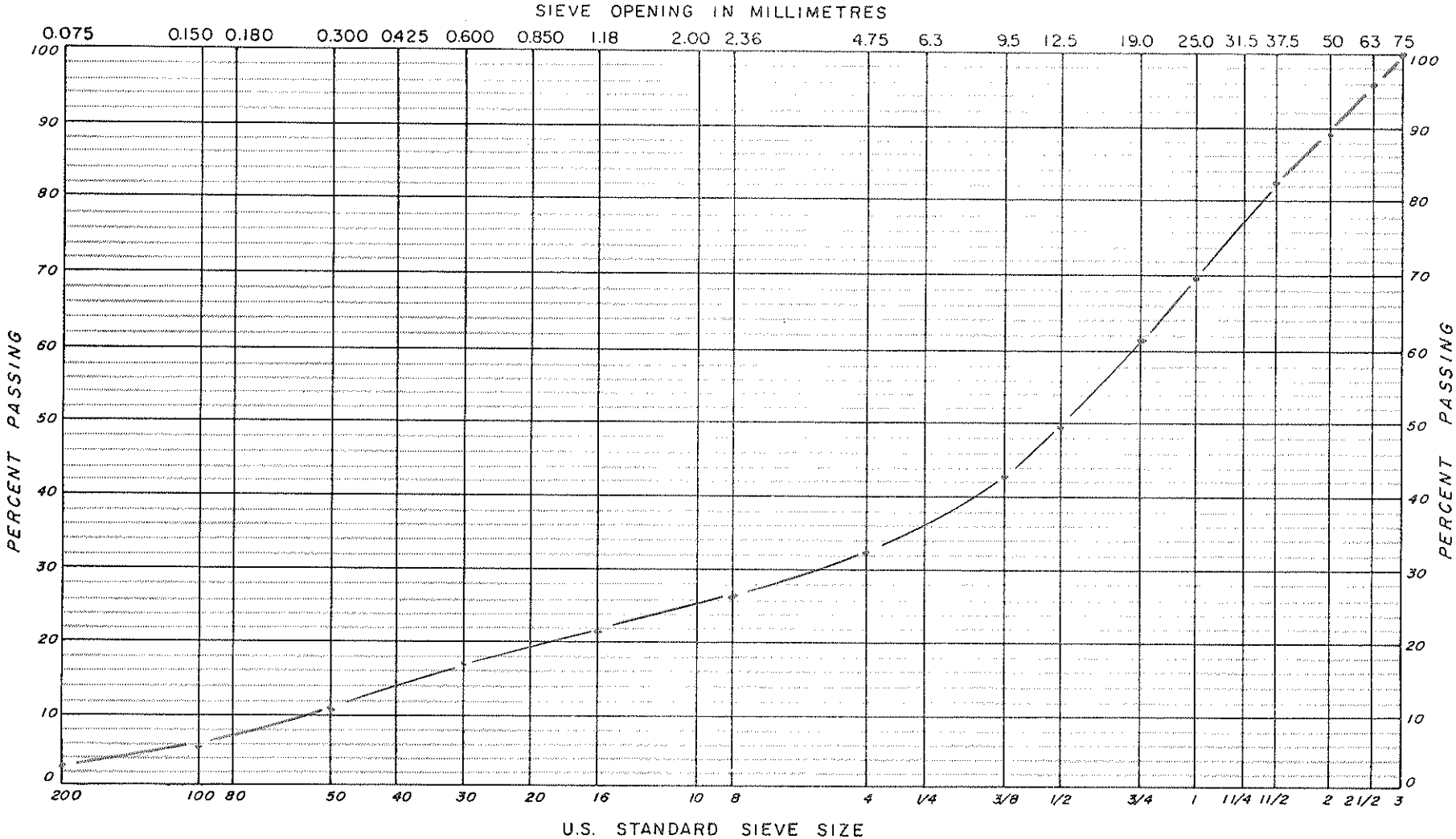
SAND HEIGHT _____ _____

D.I. FINE _____ _____

CALCULATION:

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

AGGREGATE CHART



SAMPLE NO.					SAMPLE NO.				
PASSING	RET. ON	MASS	%	TOTAL % PASSING	PASSING	RET. ON	MASS	%	TOTAL % PASSING

IDENTIFICATION	
PROJECT NO.	McLay
SECTION	
LOCATION	T.P. 89-05 @ 1.8 - 3.1 m
STATION PLACED	
SAMPLE OF	
SAMPLED BY	DATE
SIEVE ANALYSIS BY	OWD DATE Oct. 12, 1990

H.187 (Rev. 82/05)

FRACTURE COUNT

MINISTRY OF TRANSPORTATION AND HIGHWAYS – GEOTECHNICAL BRANCH

METHOD A – FOR CRUSHED GRANULAR SURFACING AND BASE
METHOD B – FOR CRUSHED PAVING AGGREGATE

PROJECT: Mchay Pit DISTRICT: South Island

TESTHOLE/PIT: 89-05 SAMPLE NO.: 1 BAG NO.: X15391 DEPTH: 9.1 – 10.4

METHOD A (COUNT)

			COUNT		
PASSING / RETAINED	37.5 / 25	UNFRACTURED	23		
		1 + FRACTURED	24	51.1	% (25 mm)
PASSING / RETAINED	25 / 19	UNFRACTURED	64		
		1 + FRACTURED	80	55.6	% (19 mm)
PASSING / RETAINED	19 / 12.5	UNFRACTURED	77		
		1 + FRACTURED	37	32.5	% (12.5 mm)
PASSING / RETAINED	12.5 / 9.5	UNFRACTURED	184		
		1 + FRACTURED	84	31.3	% (9.5 mm)
PASSING / RETAINED	9.5 / 4.75	UNFRACTURED	810		
		1 + FRACTURED	274	25.3	% (4.75 mm)
TOTAL		UNFRACTURED	1158		
		1 + FRACTURED	499	= 30.1	% FRACTURE A
TOTAL NUMBER OF PIECES			1657		

METHOD B (MASS)

			MASS		
PASSING / RETAINED	19 / 13.2	UNFRACTURED	578		
		2 + FRACTURED	169	22.6	% (13.2 mm)
PASSING / RETAINED	13.2 / 9.5	UNFRACTURED	539		
		2 + FRACTURED	130	19.4	% (9.5 mm)
ARITHMETIC AVERAGE				21.1	% 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: McLay Rr DISTRICT: South Island

TESTHOLE/PIT: 99-06 SAMPLE NO.: ___ BAG NO.: X15383 DEPTH: 3.1-4.3m

METHOD A (COUNT)

			COUNT		
PASSING	37.5	UNFRACTURED	4		
RETAINED	25	1 + FRACTURED	10	71.4	% (25 mm)
PASSING	25	UNFRACTURED	8		
RETAINED	19	1 + FRACTURED	22	73.3	% (19 mm)
PASSING	19	UNFRACTURED	30		
RETAINED	12.5	1 + FRACTURED	40	57.1	% (12.5 mm)
PASSING	12.5	UNFRACTURED	39		
RETAINED	9.5	1 + FRACTURED	43	52.4	% (9.5 mm)
PASSING	9.5	UNFRACTURED	320		
RETAINED	4.75	1 + FRACTURED	334	51.1	% (4.75 mm)
TOTAL		UNFRACTURED	401		
		1 + FRACTURED	449	= 52.8	% FRACTURE A
TOTAL NUMBER OF PIECES			850		

METHOD B (MASS)

			MASS		
PASSING	19	UNFRACTURED	215.8		
RETAINED	13.2	2 + FRACTURED	257.8	54.4	% (13.2 mm)
PASSING	13.2	UNFRACTURED	95.7		
RETAINED	9.5	2 + FRACTURED	91.7	48.9	% (9.5 mm)
ARITHMETIC AVERAGE				51.9	% 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: McLay Pit DISTRICT: South Island

TESTHOLE/PIT: 89-06 SAMPLE NO.: ___ BAG NO.: X15384 DEPTH: 11.6-12.8

METHOD A (COUNT)

			COUNT		
PASSING	37.5	UNFRACTURED	3		
RETAINED	25	1 + FRACTURED	10	76.9	% (25 mm)
PASSING	25	UNFRACTURED	10		
RETAINED	19	1 + FRACTURED	32	76.2	% (19 mm)
PASSING	19	UNFRACTURED	21		
RETAINED	12.5	1 + FRACTURED	63	75.0	% (12.5 mm)
PASSING	12.5	UNFRACTURED	21		
RETAINED	9.5	1 + FRACTURED	67	76.1	% (9.5 mm)
PASSING	9.5	UNFRACTURED	158		
RETAINED	4.75	1 + FRACTURED	443	73.7	% (4.75 mm)
TOTAL		UNFRACTURED	213		
		1 + FRACTURED	615	= 74.3	% FRACTURE A
TOTAL NUMBER OF PIECES			828		

METHOD B (MASS)

			MASS		
PASSING	19	UNFRACTURED	206.9		
RETAINED	13.2	2 + FRACTURED	397.9	65.8	% (13.2 mm)
PASSING	13.2	UNFRACTURED	84.2		
RETAINED	9.5	2 + FRACTURED	120.2	58.8	% (9.5 mm)

ARITHMETIC AVERAGE 64.0 % 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: McKay Pit DISTRICT: South Island

TESTHOLE/PIT: 89-07 SAMPLE NO.: ___ BAG NO.: X15386 DEPTH: 6.7 - 7.9

METHOD A (COUNT)

			COUNT		
PASSING 37.5 / RETAINED 25	UNFRACTURED	5			
	1 + FRACTURED	15	75.0	% (25 mm)	
PASSING 25 / RETAINED 19	UNFRACTURED	12			
	1 + FRACTURED	27	69.2	% (19 mm)	
PASSING 19 / RETAINED 12.5	UNFRACTURED	48			
	1 + FRACTURED	68	58.6	% (12.5 mm)	
PASSING 12.5 / RETAINED 9.5	UNFRACTURED	54			
	1 + FRACTURED	62	53.4	% (9.5 mm)	
PASSING 9.5 / RETAINED 4.75	UNFRACTURED	460			
	1 + FRACTURED	526	53.3	% (4.75 mm)	
TOTAL	UNFRACTURED	579			
	1 + FRACTURED	698	= 54.7	% FRACTURE A	
TOTAL NUMBER OF PIECES		1277			

METHOD B (MASS)

			MASS		
PASSING 19 / RETAINED 13.2	UNFRACTURED	339.4			
	2 + FRACTURED	359.8	51.5	% (13.2 mm)	
PASSING 13.2 / RETAINED 9.5	UNFRACTURED	139.5			
	2 + FRACTURED	105.3	43.0	% (9.5 mm)	
ARITHMETIC AVERAGE			49.3	% 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: McLay Pit DISTRICT: South Island

TESTHOLE/PIT: 89-07 SAMPLE NO.: ___ BAG NO.: X15387 DEPTH: 11.6-12.8

METHOD A (COUNT)

			COUNT		
PASSING	37.5	UNFRACTURED	2		
RETAINED	25	1 + FRACTURED	6	75.0	% (25 mm)
PASSING	25	UNFRACTURED	4		
RETAINED	19	1 + FRACTURED	29	87.9	% (19 mm)
PASSING	19	UNFRACTURED	24		
RETAINED	12.5	1 + FRACTURED	56	70.0	% (12.5 mm)
PASSING	12.5	UNFRACTURED	52		
RETAINED	9.5	1 + FRACTURED	75	59.1	% (9.5 mm)
PASSING	9.5	UNFRACTURED	634		
RETAINED	4.75	1 + FRACTURED	504	44.3	% (4.75 mm)
TOTAL		UNFRACTURED	716		
		1 + FRACTURED	670	= 48.3	% FRACTURE A
TOTAL NUMBER OF PIECES			1386		

METHOD B (MASS)

			MASS		
PASSING	19	UNFRACTURED	177.6		
RETAINED	13.2	2 + FRACTURED	302.7	63.0	% (13.2 mm)
PASSING	13.2	UNFRACTURED	140.6		
RETAINED	9.5	2 + FRACTURED	125.2	47.1	% (9.5 mm)

ARITHMETIC AVERAGE 57.4 % 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: McLay Pit DISTRICT: Burns Lake

TESTHOLE/PIT: 89-07 SAMPLE NO.: ___ BAG NO.: K15388 DEPTH: 14.0-15.2

METHOD A (COUNT)

			COUNT		
PASSING	37.5	UNFRACTURED	2		
RETAINED	25	1 + FRACTURED	4	66.7	% (25 mm)
PASSING	25	UNFRACTURED	27		
RETAINED	19	1 + FRACTURED	20	42.6	% (19 mm)
PASSING	19	UNFRACTURED	228		
RETAINED	12.5	1 + FRACTURED	79	25.7	% (12.5 mm)
PASSING	12.5	UNFRACTURED	292		
RETAINED	9.5	1 + FRACTURED	105	26.4	% (9.5 mm)
PASSING	9.5	UNFRACTURED	1412		
RETAINED	4.75	1 + FRACTURED	809	36.4	% (4.75 mm)
TOTAL		UNFRACTURED	1961		
		1 + FRACTURED	2016	= 34.1	% FRACTURE A
TOTAL NUMBER OF PIECES			2977		

METHOD B (MASS)

			MASS		
PASSING	19	UNFRACTURED	1533.4		
RETAINED	13.2	2 + FRACTURED	392.8	20.4	% (13.2 mm)
PASSING	13.2	UNFRACTURED	780.9		
RETAINED	9.5	2 + FRACTURED	204.5	20.8	% (9.5 mm)
ARITHMETIC AVERAGE				20.5	% FRACTURE B

MINISTRY OF TRANSPORTATION AND HIGHWAYS

GEOTECHNICAL AND MATERIALS BRANCH

PETROGRAPHIC ANALYSIS

Region: 6

District: NANAIMO

Pit Name: McLAY

Pit No.: 6199A

Project No.: BAG. X712/X713

Sample No.: TH. 87-10A SA# 1

Date: 87/06/25

Petrographer: RG

ROCK TYPES	DESCRIPTION	* CL	MASS GRAMS	MASS % G	MASS % F	MASS % P	MASS % D
SEDIMENTARY							
CHERT	Hard, Fresh, Sound	D					
CARBONATES	Hard, Siliceous, Sound	G					
	Soft, Slight to Moderate Weathering, Sound	F					
	Very Soft, Intensely Weathered, Friable, Clayey or Shaley	P					
CLAYSTONE	Soft, Friable	P					
SHALE	Soft, Friable	P	13			0.8	
ARGILLITE	Hard, Fresh, Sound	G					
	Medium Hard, Slight to Moderate Weathering, Sound	F					
	Intensely Weathered, Friable	P					
SILTSTONE	Hard, Fresh, Well Cemented, Sound	G					
	Medium Hard, Slight to Moderate Weathering, Firmly Cemented, Sound	F					
	Soft, Intensely Weathered, Friable	P					
SA[illegible]STONE	Hard, Fresh, Well Cemented, Sound	G	2.5	1.6			
	Medium Hard, Slight to Moderate Weathering, Firmly Cemented, Sound	F	21		1.4		
	Soft, Intensely Weathered, Friable	P	6			0.4	
CONGLOMERATE AND BRECCIA	Hard, Fresh, Well Cemented, Sound	G					
	Medium Hard, Slight to Moderate Weathering, Firmly Cemented, Sound	F					
	Soft, Intensely Weathered, Friable	P					
TOTAL							
METAMORPHIC							
MARBLE	Hard, Fresh, Siliceous, Sound	G					
	Soft, Slight to Moderate Weathering, Sound	F					
	Very Soft, Intensely Weathered, Friable	P					
QUARTZITE	Hard, Sound	G	10	0.7			
	Medium Hard, Slight to Moderate Weathering, Sound	F					
	Intensely Weathered, Friable	P					
SLATE	Planar Cleavage, Soft, Friable	P					
PHYLLITE	Schistose, Soft, Friable	P					
SCHIST	Micaceous, Soft, Friable	P					
AMPHIBOLITE	Hard, Fresh, Sound	G					
	Medium Hard, Slight to Moderate Weathering, Sound	F					
	Soft, Intensely Weathered, Friable	P					
HORNFELS	Hard, Fresh, Sound	G					
	Medium Hard, Slight to Moderate Weathering, Sound	F					
	Soft, Intensely Weathered, Friable	P					
GNEISS	Hard, Fresh, Sound	G					
	Medium Hard, Slight to Moderate Weathering, Sound	F					
	Soft, Intensely Weathered, Friable	P					
SERPENTINITE	Medium Hard, Fresh, Sound	F					
	Soft, Intensely Weathered, Friable	P					
GREENSTONE	Hard, Fresh, Sound	G					
	Medium Hard, Slight to Moderate Weathering, Sound	F					
	Soft, Intensely Weathered, Friable	P					
TOTAL							

H.175 (Rev. 83/11)

IGNEOUS		* CL	MASS GRAMS	MASS % G	F	P	D
PLUTONICS Incl.: Granite, Syenite, Diorite, Gabbro	Hard, Fresh, Sound	G	127	8.3			
	Medium Hard, Slight to Moderate Weathering, Sound	F	4		0.3		
	Soft, Intensely Weathered, Friable	P	2			0.1	
VOLCANICS Incl.: Felsite, Basalt, Obsidian, Porphyry, Tuff	Hard, Fresh, Sound	G	1219	79.5			
	Medium Hard, Slight to Moderate Weathering, Sound, Slightly Porous	F	87		5.7		
	Soft, Intensely Weathered, Friable	P	19			1.2	
TOTAL			1533				
TOTAL (SED + MET + IGN)							

* G = GOOD, F = FAIR, P = POOR, D = DELETERIOUS

ROCK TYPES (SUMMARY)	QUALITY PERCENT BY MASS GOOD	FAIR	POOR	DELETERIOUS
VOLCANICS	79.5	5.7	1.2	
PLUTONICS	8.3	0.3	0.1	
SANDSTONE	1.6	1.4	0.4	
SHALE			0.8	
QUARTZITE	0.7			
TOTAL %	90.1	7.4	2.5	

ESTIMATES

SHAPE	ANGULAR	SUB-ANGULAR	ROUNDED	FLAT OR PLATEY
MASS %		99		1

COATINGS	SPARSE TO NIL	PARTIAL	COMPLETE	> 0.5 MM
MASS %				
CLAY OR SILT	✓			
CALCITE				
LIMONITE				
MANGANESE				
WEATHERING	FRESH	SLIGHT TO MODERATE	INTENSE	

SUITABILITY

ALL USES ○ CONCRETE ○ ASPHALT SURFACING ○ BASE ○ SUBBASE ○

WINTER AGG ○ FILL ○ OTHER _____

REMARKS

MINISTRY OF TRANSPORTATION AND HIGHWAYS

GEOTECHNICAL AND MATERIALS BRANCH

PETROGRAPHIC ANALYSIS

Region: 6 Bay

District: NANAIMO

Pit Name: McLAY

Pit No.: M61-12-6199A

Project No.: X544/X545

Sample No.: TH*10A SA*3

Date: 87/5/29

Petrographer: RCG

ROCK TYPES	DESCRIPTION	* CL	MASS GRAMS	MASS % G	MASS % F	MASS % P	MASS % D
SEDIMENTARY							
CHERT	Hard, Fresh, Sound	D	2.0				0.1
CARBONATES	Hard, Siliceous, Sound	G					
	Soft, Slight to Moderate Weathering, Sound	F					
	Very Soft, Intensely Weathered, Friable, Clayey or Shaley	P					
CLAYSTONE	Soft, Friable	P					
SHALE	Soft, Friable	P					
ARGILLITE	Hard, Fresh, Sound	G					
	Medium Hard, Slight to Moderate Weathering, Sound	F					
	Intensely Weathered, Friable	P					
SILTSTONE	Hard, Fresh, Well Cemented, Sound	G					
	Medium Hard, Slight to Moderate Weathering, Firmly Cemented, Sound	F					
	Soft, Intensely Weathered, Friable	P	9.4			0.6	
SANDSTONE	Hard, Fresh, Well Cemented, Sound	G	9.1	0.6			
	Medium Hard, Slight to Moderate Weathering, Firmly Cemented, Sound	F	27.9		1.9		
	Soft, Intensely Weathered, Friable	P	0.5			0.1	
CONGLOMERATE AND BRECCIA	Hard, Fresh, Well Cemented, Sound	G					
	Medium Hard, Slight to Moderate Weathering, Firmly Cemented, Sound	F					
	Soft, Intensely Weathered, Friable	P					
TOTAL							
METAMORPHIC							
MARBLE	Hard, Fresh, Siliceous, Sound	G					
	Soft, Slight to Moderate Weathering, Sound	F					
	Very Soft, Intensely Weathered, Friable	P					
QUARTZITE	Hard, Sound	G	5.8	0.4			
	Medium Hard, Slight to Moderate Weathering, Sound	F					
	Intensely Weathered, Friable	P					
SLATE	Planar Cleavage, Soft, Friable	P					
PHYLLITE	Schistose, Soft, Friable	P					
SCHIST	Micaceous, Soft, Friable	P					
AMPHIBOLITE	Hard, Fresh, Sound	G					
	Medium Hard, Slight to Moderate Weathering, Sound	F					
	Soft, Intensely Weathered, Friable	P					
HORNFELS	Hard, Fresh, Sound	G					
	Medium Hard, Slight to Moderate Weathering, Sound	F					
	Soft, Intensely Weathered, Friable	P					
GNEISS	Hard, Fresh, Sound	G	9.5	0.6			
	Medium Hard, Slight to Moderate Weathering, Sound	F	3.0		0.2		
	Soft, Intensely Weathered, Friable	P					
SERPENTINITE	Medium Hard, Fresh, Sound	F					
	Soft, Intensely Weathered, Friable	P					
GREENSTONE	Hard, Fresh, Sound	G					
	Medium Hard, Slight to Moderate Weathering, Sound	F					
	Soft, Intensely Weathered, Friable	P					
TOTAL							

H.175 (Rev. 83/11)

IGNEOUS		* CL	MASS GRAMS	MASS % G	F	P	D
PLUTONICS							
Incl.: Granite, Syenite, Diorite, Gabbro	Hard, Fresh, Sound	G	95.1	6.4			
	Medium Hard, Slight to Moderate Weathering, Sound	F					
	Soft, Intensely Weathered, Friable	P					
VOLCANICS							
Incl.: Felsite, Basalt, Obsidian, Porphyry, Tuff	Hard, Fresh, Sound	G	1263.0	84.5			
	Medium Hard, Slight to Moderate Weathering, Sound, Slightly Porous	F	68.6		4.6		
	Soft, Intensely Weathered, Friable	P					
TOTAL			1493.9				
TOTAL (SED + MET + IGN)							

* G = GOOD, F = FAIR, P = POOR, D = DELETERIOUS

ROCK TYPES (SUMMARY)	QUALITY PERCENT BY MASS GOOD	FAIR	POOR	DELETERIOUS
VOLCANICS	84.5	4.6		
PLUTONICS	6.4			
SANDSTONE	0.6	1.9	0.1	
GNEISS	0.6	0.2		
SILTSTONE			0.6	
QUARTZITE	0.4			
CHERT				0.
				0.1
TOTAL %	92.5	6.7	0.7	0.1

ESTIMATES

SHAPE	ANGULAR	SUB-ANGULAR	ROUNDED	FLAT OR PLATEY
MASS %		99	1	

COATINGS	SPARSE TO NIL	PARTIAL	COMPLETE	> 0.5 MM
MASS %				
CLAY OR SILT	✓			
CALCITE				
LIMONITE				
MANGANESE				
WEATHERING	FRESH	(SLIGHT) TO MODERATE	INTENSE	

SUITABILITY

ALL USES ◯ CONCRETE ◯ ASPHALT SURFACING ◯ BASE ◯ SUBBASE ◯

WINTER AGG ◯ FILL ◯ OTHER _____

REMARKS

MINISTRY OF TRANSPORTATION AND HIGHWAYS

GEOTECHNICAL AND MATERIALS BRANCH

PETROGRAPHIC ANALYSIS

Region: 6

District: NANAIMO

Pit Name: MCLAY

Pit No.:

Project No.: X519/X520

Sample No.: TH 87-18 SM 1

Date: 87/06/11

Petrographer: RCG

ROCK TYPES	DESCRIPTION	* CL	MASS GRAMS	MASS % G	MASS % F	MASS % P	MASS % D
SEDIMENTARY							
CHERT	Hard, Fresh, Sound	D					
CARBONATES	Hard, Siliceous, Sound	G					
	Soft, Slight to Moderate Weathering, Sound	F					
	Very Soft, Intensely Weathered, Friable, Clayey or Shaley	P					
CLAYSTONE	Soft, Friable	P					
SHALE	Soft, Friable	P	22			2.2	
ARGILLITE	Hard, Fresh, Sound	G					
	Medium Hard, Slight to Moderate Weathering, Sound	F					
	Intensely Weathered, Friable	P					
SILTSTONE	Hard, Fresh, Well Cemented, Sound	G					
	Medium Hard, Slight to Moderate Weathering, Firmly Cemented, Sound	F					
	Soft, Intensely Weathered, Friable	P					
SANDSTONE	Hard, Fresh, Well Cemented, Sound	G					
	Medium Hard, Slight to Moderate Weathering, Firmly Cemented, Sound	F	11		1.1		
	Soft, Intensely Weathered, Friable	P	12			1.2	
CONGLOMERATE AND BRECCIA	Hard, Fresh, Well Cemented, Sound	G					
	Medium Hard, Slight to Moderate Weathering, Firmly Cemented, Sound	F					
	Soft, Intensely Weathered, Friable	P					
TOTAL							
METAMORPHIC							
MARBLE	Hard, Fresh, Siliceous, Sound	G					
	Soft, Slight to Moderate Weathering, Sound	F					
	Very Soft, Intensely Weathered, Friable	P					
QUARTZITE	Hard, Sound	G	7	0.7			
	Medium Hard, Slight to Moderate Weathering, Sound	F					
	Intensely Weathered, Friable	P					
SLATE	Planar Cleavage, Soft, Friable	P					
PHYLLITE	Schistose, Soft, Friable	P					
SCHIST	Micaceous, Soft, Friable	P					
AMPHIBOLITE	Hard, Fresh, Sound	G					
	Medium Hard, Slight to Moderate Weathering, Sound	F					
	Soft, Intensely Weathered, Friable	P					
HORNFELS	Hard, Fresh, Sound	G					
	Medium Hard, Slight to Moderate Weathering, Sound	F					
	Soft, Intensely Weathered, Friable	P					
GNEISS	Hard, Fresh, Sound	G					
	Medium Hard, Slight to Moderate Weathering, Sound	F					
	Soft, Intensely Weathered, Friable	P					
SERPENTINITE	Medium Hard, Fresh, Sound	F					
	Soft, Intensely Weathered, Friable	P					
GREENSTONE	Hard, Fresh, Sound	G					
	Medium Hard, Slight to Moderate Weathering, Sound	F					
	Soft, Intensely Weathered, Friable	P					
TOTAL							

IGNEOUS		* CL	MASS GRAMS	MASS % G	F	P	D
PLUTONICS Incl.: Granite, Syenite, Diorite, Gabbro	Hard, Fresh, Sound	G	39	3.9			
	Medium Hard, Slight to Moderate Weathering, Sound	F	11		1.1		
	Soft, Intensely Weathered, Friable	P	5			0.5	
VOLCANICS Incl.: Felsite, Basalt, Obsidian, Porphyry, Tuff	Hard, Fresh, Sound	G	681	67.8			
	Medium Hard, Slight to Moderate Weathering, Sound, Slightly Porous	F	216		21.5		
	Soft, Intensely Weathered, Friable	P					
TOTAL			1004				
TOTAL (SED + MET + IGN)							

* G = GOOD, F = FAIR, P = POOR, D = DELETERIOUS

ROCK TYPES (SUMMARY)	QUALITY PERCENT BY MASS GOOD	FAIR	POOR	DELETERIOUS
VOLCANICS	67.8	21.5		
PLUTONICS	3.9	1.1	0.5	
SANDSTONE		1.1	1.2	
SHALE			2.2	
QUARTZITE	0.7			
TOTAL %	72.4	23.7	3.9	

ESTIMATES

SHAPE	ANGULAR	SUB-ANGULAR	ROUNDED	FLAT OR PLATEY
MASS %	0	98	0	2

COATINGS	SPARSE TO NIL	PARTIAL	COMPLETE	>0.5 MM
MASS %				
CLAY OR SILT	3	96	1	
CALCITE				
LIMONITE				
MANGANESE				
WEATHERING	FRESH	SLIGHT TO MODERATE	INTENSE	

SUITABILITY

ALL USES ○ CONCRETE ○ ASPHALT SURFACING ○ BASE ○ SUBBASE ○

WINTER AGG ○ FILL ○ OTHER _____

REMARKS