## **Technical Summary**

May 2024

Pit Name: Yard Creek Loop

**Provincial Pit Number:** 0417

**Location:** The pit is located approximately 14km northeast of Sicamous via the TransCanada Highway 1, Oxbow Frontage Road, then Yard Creek Loop Road. (Figure 1).

**Legal Land Description:** The pit is legally described as that part of Section 19, Township 22, Range 6, W6M, KDYD. The pit is covered by a Crown Land Act Section 16 Map Reserve in the name of the Ministry of Transportation and Infrastructure. The Map Reserve is 12.269 hectares in size. The geographical coordinates are Universal Transverse Mercator Grid Zone 11, 372300 Easting, 5639600 Northing. The layout of the Map Reserve boundary is shown in the pit plan (Figure 2).

**Subsurface Investigation:** Subsurface investigations at Yard Creek Loop Pit were carried out in 1982, 1986, 2013 and 2018 by the Ministry of Transportation & Infrastructure.

In 1982 twenty-three (23) test holes were excavated to depths up to 7.0 m and in 1986 nine (9) test pits were excavated to depths up to 6.7 m. The results of these investigations are included in the appendix of this report.

In 2013 seven (7) test pits were excavated to depths of 6.0 m and in 2018, eleven (11) test pits were excavated to depths ranging from 4.0 m to 5.0 m. During the test pitting, subsurface soil and groundwater conditions were logged and representative samples of the granular materials were collected for laboratory testing and future reference. Laboratory testing was carried out on all eighteen (18) of these samples at Wood PLC laboratories to assess the gradation and durability characteristics. The tests completed were wet sieve analysis, microdeval, sand equivalent, relative density, and absorption.

Based on the results of the 1982, 1986, 2013 and 2018 investigations, two suitable granular areas for mining have been defined – Development Area A and Development Area B. The detailed results of the subsurface testing are provided in the Test Pit Summaries and in the appendix, and test pit locations are shown on the Pit Plan (Figure 3).

Material Gradation: Table 1 shows the gradation as a percentage by weight of the fines (silts and clays), sand and gravel components as well as the Unified Soil Classification for the samples tested from 2013 and 2018.

Table 1: Pit Run Gradation

Test Pit	Depth (m)	Fines (%)* <0.075mm	Sand (%)* 0.075- 4.75mm	Gravel (%)* 4.75-75mm	usc
		20	13		
TP13-01	1.5-6	1.1	48.2	50.7	GP
TP13-02	0-6	1.3	43.8	54.9	GP
TP13-03	0-6	2.5	45.5	52	GP
TP13-04	0-6	2	42.5	55.5	GP
TP13-05	0-6	2.1	47.1	50.8	GP
TP13-06	0-6	2	42	56	GP
TP13-07	0-6	2.4	37	61	GP
Ave	rage	1.9	43.7	54.4	-
		20	18		
TP18-01	1-5.3	0.7	60.5	38.8	SP
TP18-02	0.3-5.3	1.5	48.1	50.4	GP
TP18-03	0.3-4	0.8	58.4	40.9	SP
TP18-04	2.7-4.7	1.9	62.1	36	SP
TP18-05	0.4-4.3	0.7	56.2	43.1	SP
TP18-06	0.4-5	1.3	49	49.7	GP
TP18-07	0.3-2.5	1.1	61.7	37.2	SP
TP18-08	0.3-4.7	1.7	58	40.3	SP
TP18-09	0.3-5	2.1	40.1	57.8	GP
TP18-10	0.3-5	1.5	53.9	44.6	SP
TP18-11	0-5	0.7	54.1	45.3	SP
Ave	rage	1.3	54.7	44	-

Oversize Field Estimates: Table 2 shows the estimated percent of oversize rock as noted in the field during exploration.

Table 2: Oversize Field Estimates

1986

Classification:	Average (%)	Range (%)
Boulders (>375mm)	1.3	<1 – 4
Cobbles (150-375mm)	4.2	1 – 10
Cobbles (75-150mm)	7.3	3 – 12

Maximum rock size observed was 1040 mm.

2013

Classification:	Average (%)	Range (%)
Boulders (>375mm)	4.5	<1 – 20
Cobbles (150-375mm)	6.3	<1 – 10
Cobbles (75-150mm)	8.9	<1 – 15

Maximum rock size observed was 1200mm.

#### 2018

Classification:	Average (%)	Range (%)
Boulders (>375mm)	0.9	0 – 2
Cobbles (150-375mm)	2.8	0 – 8
Cobbles (75-150mm)	5.9	3 – 12

Maximum rock size observed was 780mm.

**Material Durability:** Table 3 shows the results of the durability tests as well as the specifications as required in the Standard Specifications for Highway Construction. Degradation and Sand Equivalent test results from the 1982 and 1986 exploration programs are included in the Laboratory Testing Summary table in this report's appendix.

Table 3: Durability Test Results

Table 6. Zarazinty 1661 Nobalic								
	Sand	Micro	Abso	rption	Relative Density			
Test Pit	Equivalent	Deval (% loss)	Coarse	Fine	Coarse	Fine		
			2013					
TP13-01	70	13.4/10.4						
TP13-03			1.08	1.15	2.618	2.6		
TP13-04	74	12/11.2						
			2018					
TP18-03	83							
TP18-05		14.1/11.1						
TP18-07			1.17	1.13	2.622	2.596		
TP18-10		13.4/11.1						
TP18-11	82							
		BC MoTI	Specifica	tions				
Sand Equivalent			r surfacing,		sphalt mix ag and bridge e			

Micro Deval	≤30% for sub-base and bridge end fill aggregates ≤25% for surfacing & base course aggregates ≤18% for Class 1 Pavement asphalt mix aggregates				
	≤20% for Class 2 Pavement asphalt mix aggregates				
	<2.0% for coarse paving aggregates				
Absorption	≤1.0% for coarse and ≤1.5% for fine graded aggregate				
	seals				
Relative Density	~2.65 for all aggregate products				

**Material Suitability:** Based on the 2013 and 2018 investigation results, the material in the proposed suitability area is judged to be suitable for the following purposes:

Table 4: Suitability

	Pit Run	Crush
Yard Creek Loop	Bridge End Fill	25mm WGB
Suitability area	SGSB	Asphalt Mix Aggregates

The samples tested meet the gradation, sand equivalent, and micro-deval specifications for base course, bridge end fill and asphalt mix aggregate. Based on the absorption results the samples meet the specification for coarse paving aggregates and fine graded aggregate seals; however, did not meet the specifications for coarse graded aggregate seals. With additional processing, such as crushing the oversize rocks (>75 mm diameter) with the gravel, absorption values may improve. Should the quality improve, the material may then be suitable for other aggregate products and graded aggregate seal.

### **Sulphate and Chloride Testing**

Table 5 shows the sulphate and chloride test results from a pit face sample from Yard Creek Loop Pit. These results are provided for information and have not been considered for material suitability.

Table 5: Sulphate and Chloride Test Results

Test Pit	Water-Soluble Sulphate	Water-Soluble Chloride
2020 Grab Sample	<0.050	<0.010

**Volume Estimates:** Table 6 shows the volume estimates that can be expected for topsoil, overburden and gravel from the proposed suitability area. This is based on the measured depths encountered during the subsurface investigation. The potential volumes of granular material were calculated by averaging the total thickness of granular material encountered in test pits and multiplying by the estimated surface area.

Table 6: Volume Estimates

Suitability Area A (~2.8 ha)	Topsoil	Overburden	Granular Material
Average Layer Thickness (m)	0.0	0.3	4.5
Volume (m³)	0	2,040	117,000
Suitability Area B (~3.7 ha).	Topsoil	Overburden	Granular Material
Average Layer Thickness (m)	0.0	0.0	6.0
Volume (m³)	0	0.0	222,000

### **Pit Development Notes**

- All development must be carried out in accordance with the Health, Safety, and Reclamation Code for Mines in British Columbia, BC Ministry of Energy, Mines & Low Carbon Innovation (2022, or later edition), the Standard Specifications for Highway Construction, BC Ministry of Transportation and Infrastructure (2020, or later edition) and the Aggregate Operators Best Management Practices Handbook for BC.
- The mining area available for the Grindrod to Sicamous project has recently been developed but has not been mined. A pit face will have to be established.
- A stockpile of old asphalt is located in the southeast portion of the pit.
- A primary crusher capable of reducing all material up to 375mm x 450mm will be required.

- All trees, vegetation, and overburden are to be removed within 2m of the top of the pit faces. Topsoil, overburden, and aggregate cannot be removed within five meters of the reserve boundary.
- The crusher is recommended to be located in the at the base of the the slope as identified on the Pit Development Plan, with mining proceeding in an eastern direction as indicated.
- Processed aggregate may be stockpiled where space permits. Additional grading may be required to establish a stockpile area.
- No dumping of debris or petroleum products will be permitted, and the site must be left in a clean and safe condition.
- At the completion of the pit development operations, but prior to the depletion of the pit, the sides of the pit faces, waste piles, and overburden stockpiles must be trimmed to a 1.5H:1V slope. Active pit faces must be reshaped with native granular materials.
- Upon depletion of the pit, all disturbed areas are to be reclaimed. The
  minimum reclamation procedure should include re-sloping of the pit faces
  and waste piles to a 2H:1V slope, contouring the area for appropriate
  drainage, spreading of overburden followed by topsoil, and seeding.
- Should any of the above conditions conflict with the Health, Safety, and Reclamation Code for Mines in British Columbia, then the Code will prevail.

#### Closure

The findings of this report and the soil conditions noted above are inferred from the extrapolation of limited surface and subsurface data collected during the site investigation. It should be noted that different and possibly poorer soil conditions may exist between the test pit locations and volume estimates may vary from those reported in this report.

Prepared by: Reviewed by:

Steven Lee Laura Courtenay

Sr. Aggregate Resource Specialist Sr. Aggregate Resource Specialist

#### **Enclosures**

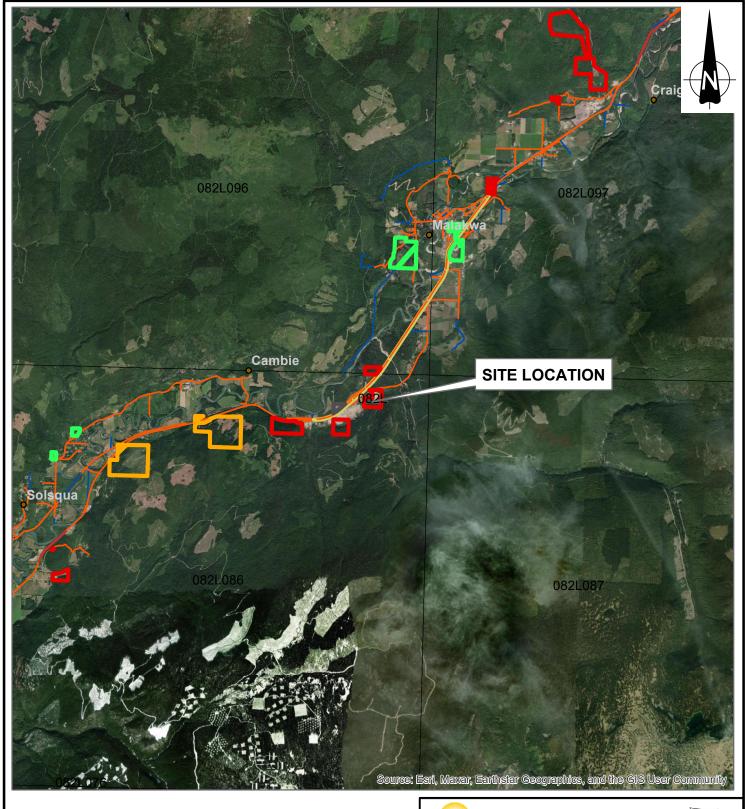
Figures:

Figure 1 - Location Plan Figure 2 - Legal Plan

Figure 3 - Development Plan

Test Pit Logs

Wet Sieve Analysis Chart Aggregate Gradation Charts USC Legend Photos **Figures** 





Ministry of Transportation and Infrastructure Geotechnical and Materials Branch

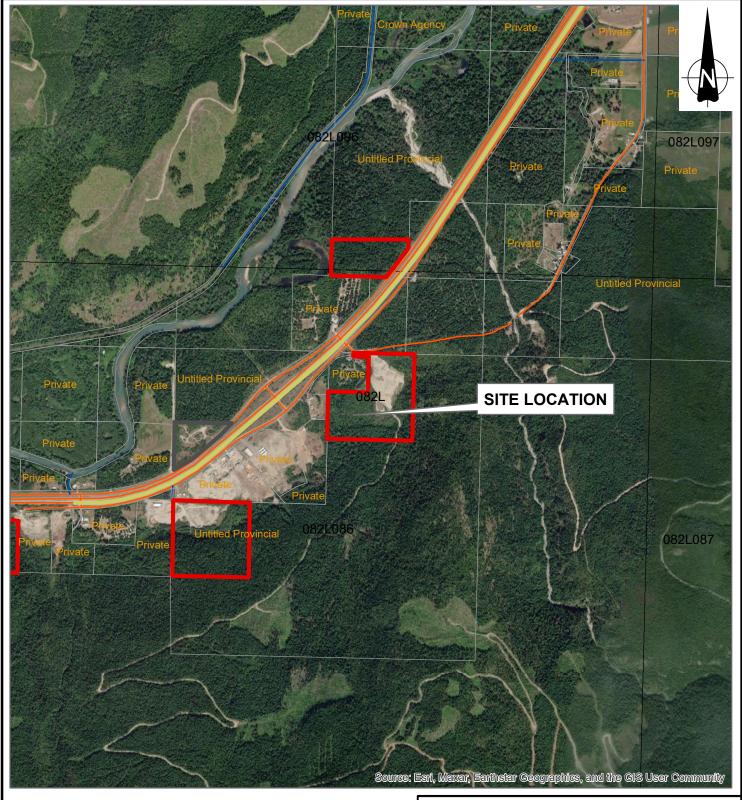


LOCATION PLAN (2024)

Yard Creek Loop Pit No. 0417

SA 13 - OKANAGAN SHUSWAP DISTRICT

DRAWN BY: STELEE	PROJECTION: NAD 1983 UTM Zone 11N	I	SCALE: As Shown
CHECKED BY: A.Mitchell	DATUM: NAD 1983 UTM Zone 11N		DATE: 2024-05-22
FileName: GISTemplate_Gravel_Provincial_2023-	· ·	Reg:	Drawing No: FIGURE 1





Ministry of Transportation and Infrastructure Geotechnical and Materials Branch

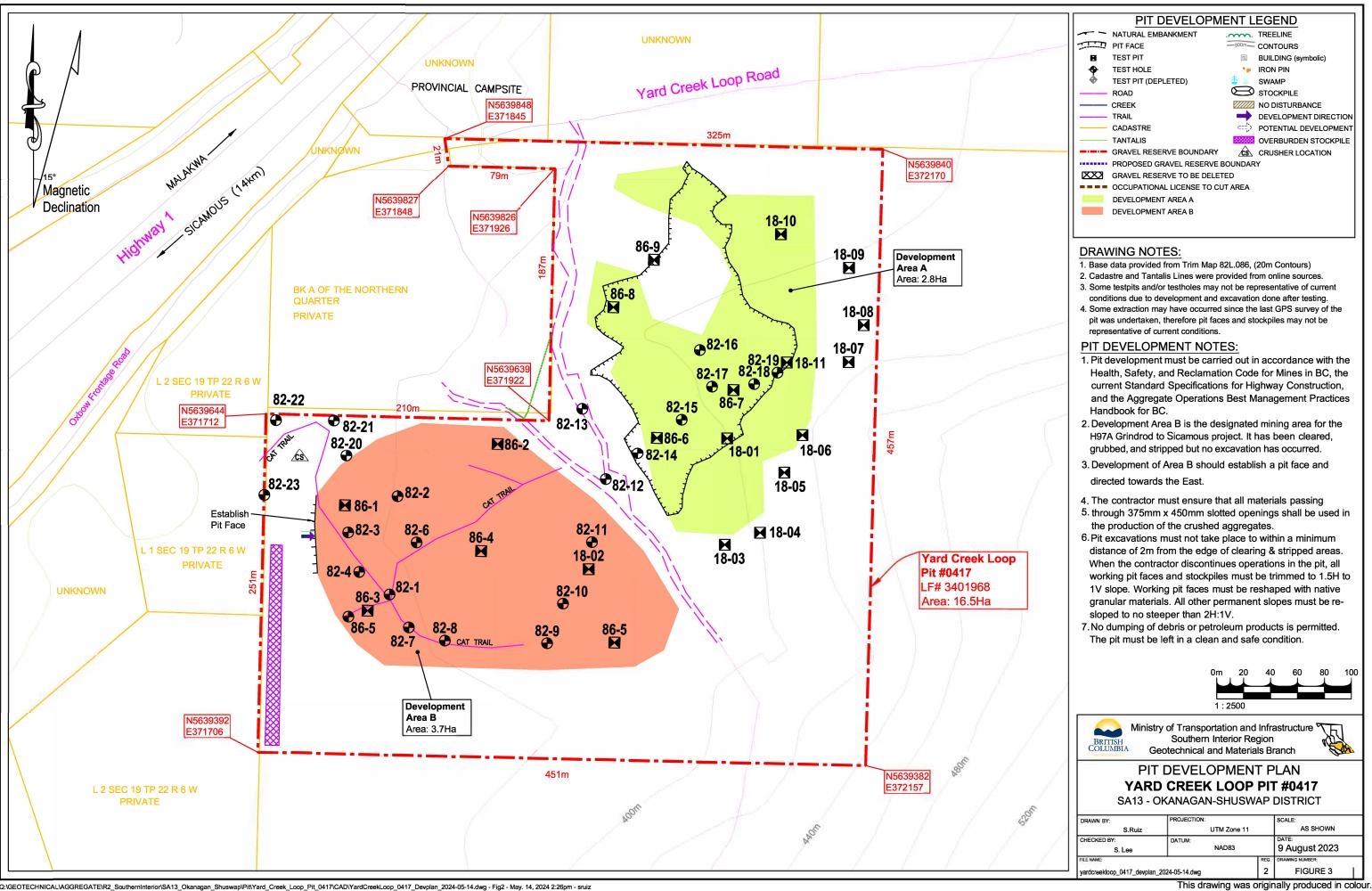


LEGAL PLAN (2024)

Yard Creek Loop Pit No. 0417

SA 13 - OKANAGAN SHUSWAP DISTRICT

DRAWN BY: STELEE	PROJECTION: SCALE: AS Show		
CHECKED BY: A.Mitchell	DATUM: NAD 1983 UTM Zone 11N		DATE: 2024-05-22
FileName: GISTemplate_Gravel_Provincial_2023-	-	Reg:	Drawing No: FIGURE 2



**Test Pit Summaries** 

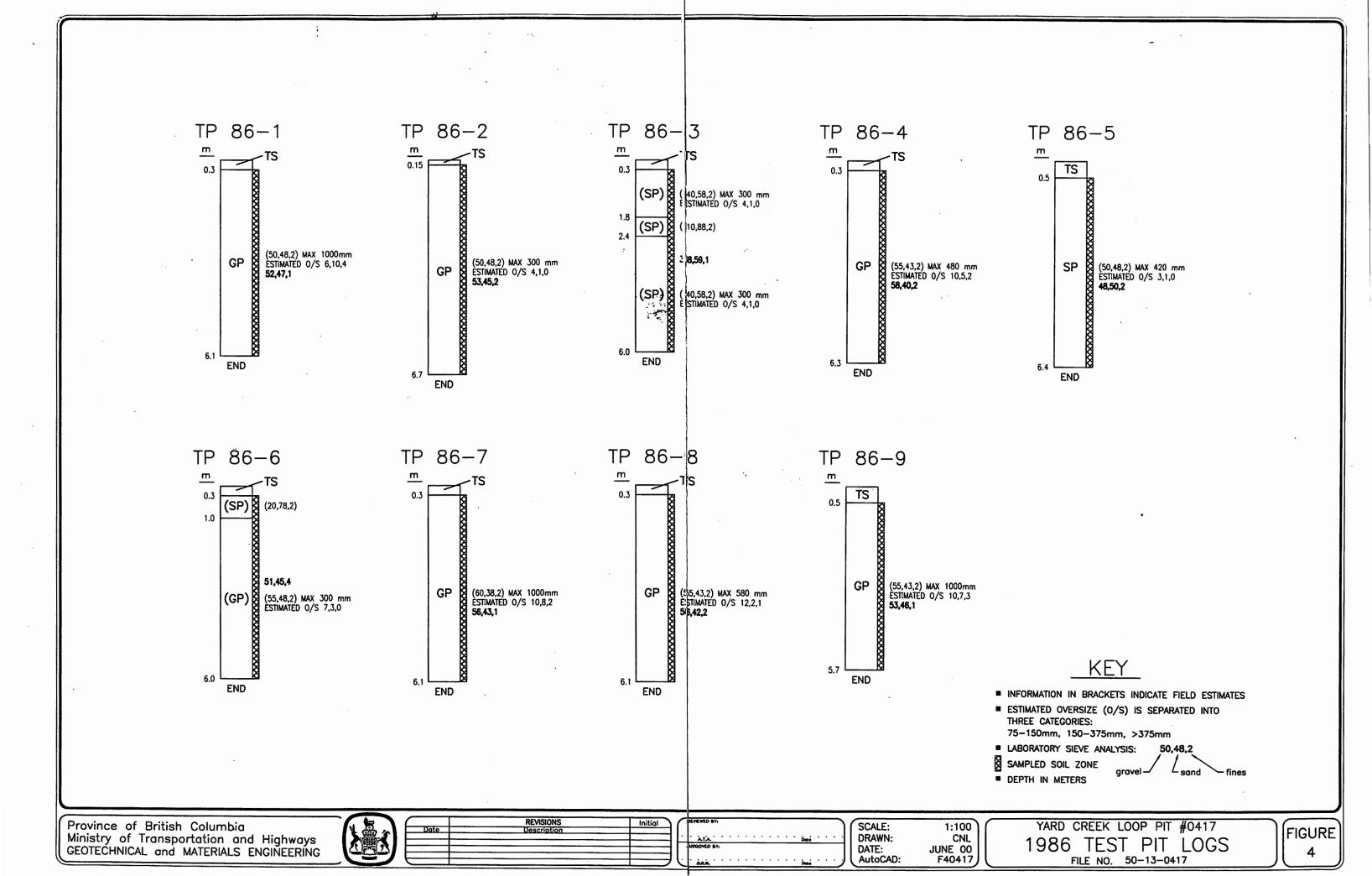
# **YARD CREEK LOOP PIT #0417**

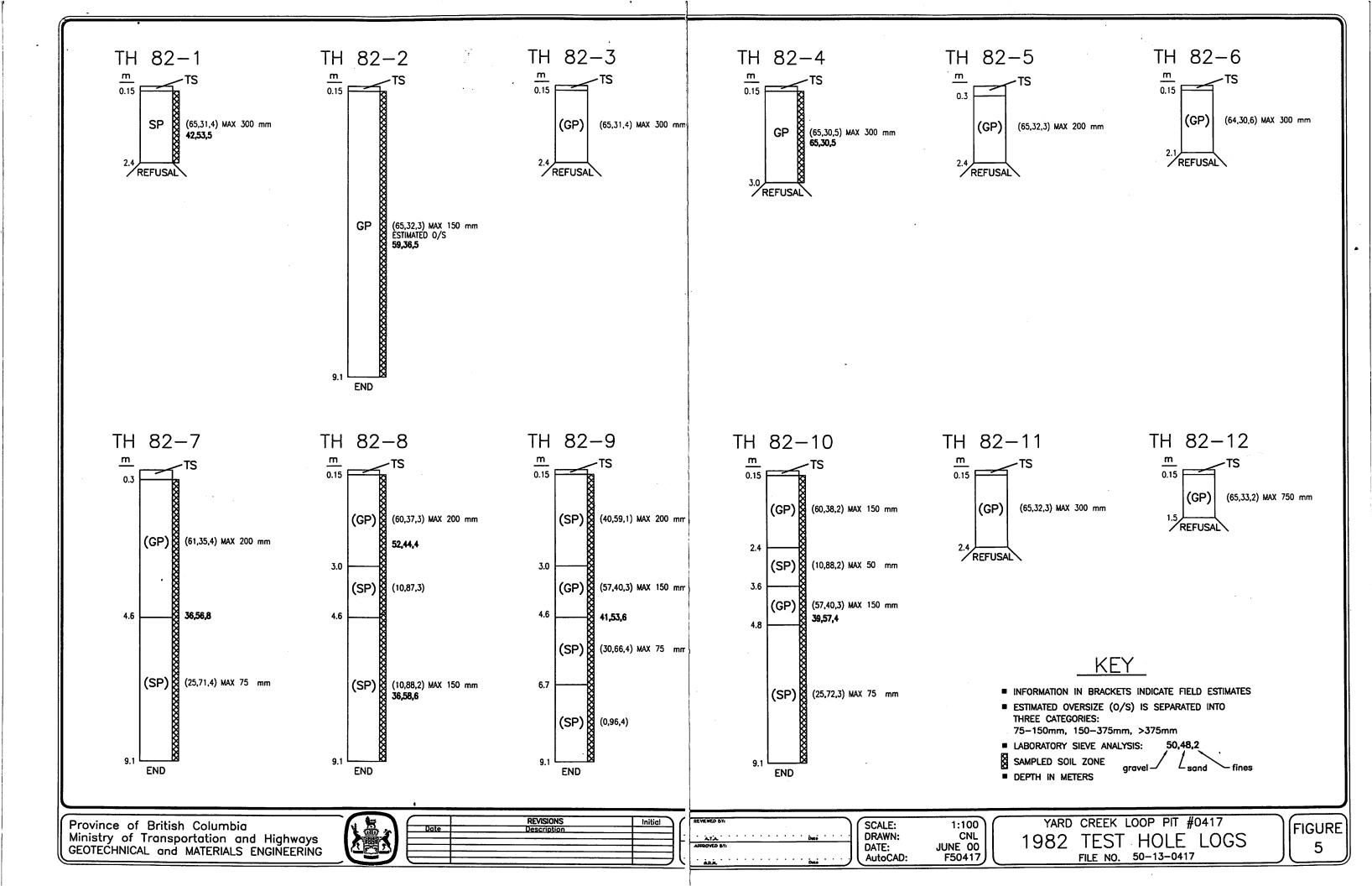
### LABORATORY TESTING SUMMARY

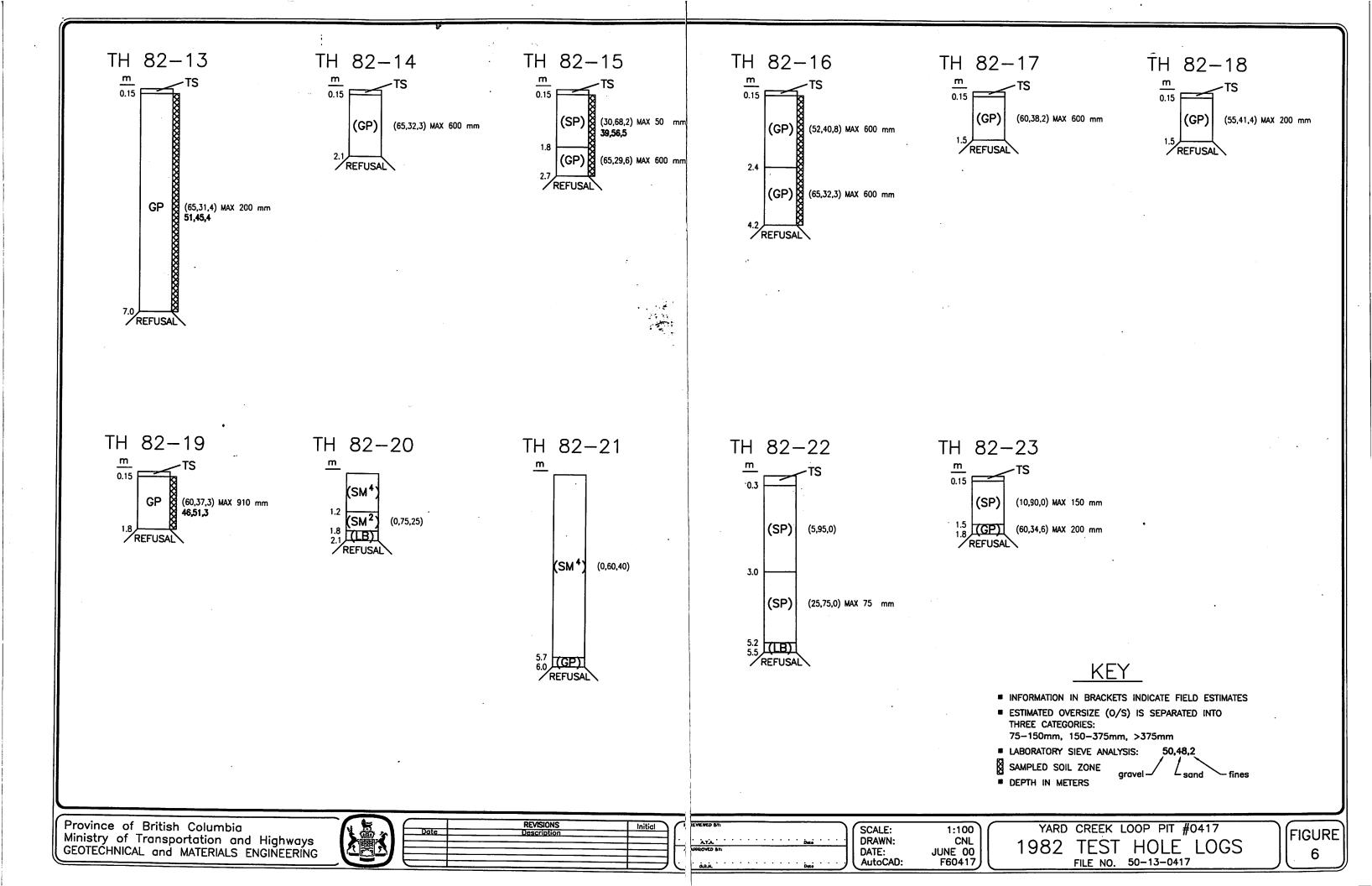
TH/TP	LAB#	SAMPLE#	DEPTH	MAX	<75 mm	GRAVEL	SAND	FINES	SE	DEG	%LOSS
TH 82-1	490	B930	0.15-2.4	300		42	53	5		76.6	1.4
82-2	505	D7351	0.15-9.1	150		59	36	5			
82-4	495	A10769	0.15-3.0	300		65	30	5			
82-7	497	B457	0.3-9.1	200		36	56	8		74.0	1.5
82-8	498	B936	0.15-4.5	200		52	44	4		79.3	1.5
82-8	499	P1448	4.5-9.1	80		36	58	6			
82-9	500	P1443	0.15-9.1	80		41	53	6			
82-10	501	A6854	0.15-9.1	150		39	57	4			
82-13	502	A10772	0.15-7.0	180		51	45	4			
82-15	503	A10765	0.15-2.7	600		39	56	5		67.9	1.7
82-19	504	P1444	0.15-1.8	900		46	51	3		65.6	1.8
TP 86-1	6A046	P1267	0.3-6.1	1000	20	52	46	2			
86-2	6A047	MOH1895	0.15-6.7	300	5	53	45	2			
86-3	6A048	D2083	0.3-6.0	300	5	38	60	2			
86-4	6A049	D2082	0.3-6.3	480	17	58	40	2	84.2		
86-5	6A050	C463	0.5-6.4	420	4	48	50	2			
86-6	6A051	C2900	0.3-6.0	300	10	51	45	4			
86-7	6A052	MOH7837	0.3-6.1	1000	20	56	43	1			
86-8	6A053	C221	0.3-6.1	580	15	56	42	2			
86-9	6A054	MOH5049	.05-5.7	1000	20	53	46	1			
								-			

# APPENDIX B

1986 Test Pit and 1982 Test Hole Logs









## LOG AGGREGATE

PROJECT : Yard Creek hopp Propert Pit

PIT NO.: 2291 DISTRICT : Salmon Arm SAMPLED BY: B.J./B.L.

METHOD: Backhoe

DATE: Jan 7/56

TH.		РТН	SAMPLE BAG	CLASSIFICATION	GR	TIMAT ADAT	ION	R	ESTIM	> 75r		SANI		
#	FROM	10	NO.	CLAS	GRAVEL	SAND	FINES	MAX SIZE	75mm (3") to 50mm (6")	ISOmm(6") to 375mm(I5")	) 375 mm (15")	F - FINE M-MEDIUM	02-2	REMARKS
86-1	.3	,3	P1267	TS GP	<b>51.9</b> 50.50	46.7	1.4	1040		10	4		V	Mainly Sand & bookless Subsounded rock
86-2	0 -15	.15	MOH 1595	TS GP	<b>53.3</b> SO	<del>44.0</del> 48	2.1	30cm	4	1	-		~	
86-3	0 .3 1.8	.3 1.6 2.4 6.0	Q 263	TS 5P SP SP	37.9 40 10	59.5 58 88	2.6	30 cm -	-		-			
36-4	0,3	.3	D 2062	TS GP	<b>56.2</b> 55	<b>31.1</b> 43	<b>2.4</b> 2	48 cm	lo	5	2	V	\ \ \	
Se-5	o .5	.5	C463	JS SP GP.	50	<del>50.2</del> 48		42 cm	3	l	-	V	V	
86-6	0 .3	1.0	2000	TS SP GP	20 51.4 55	78 148 45.1	2 3.5 2	30 cm	7	3	-		\ \ \ \	
86-7	•3	(0.1	Мон 7837	TS GP	<b>%.1</b> 60	<b>42.6</b> 38	1.1	lolem	10	8	2		V	large boolders.
86-8	.3	.3	C 221	75 GP	<b>55.9</b> 55	<b>418</b> 43	23 2	58cm	12	2	1	·	V	
80.9	,5	,5 5.7	мон ѕоч	TS GP	53.1 \$55	<b>45.5</b> 43	. 1.4	104 cm	10	7	3		V	

Project No: Yard en Pit

Location: SICAMOUS\_\_

Date Sampled: SENT 21/82

Sampled by: R. Dung

Depth (F	et)	Sample No.	REMARKS PIT #2
From	To		T. H# 82-1:
0	艺'		M.L. over Burden
生'	8'	B-930	G.P. L.B.
			C/17- 40) 5
			SAND - 31 Po 53 Fine GRAVEL - 65 P. 42 # 4-TO. 12" AND LARGER.
			GRAVEL - 65 %. 42 # 4-TO. 12" AND LAKOEK.
			over 3"-To-12"= 15%
			Very LARGE BOULDERS
			TOO DENSE TO HUYEN PAST.
- 1			$P_{11}^{c}$ $P_{2}^{c}$
	±'		T. H # 82-2 Pin 2
0	2		M.L. Over Busher
艺	30'	D7351	G.P. L.B.
			SILT-30% 5
		-	SAND-329. 36 Fine 14ED.
			GRAVEL. 657. 59 # 4-To-6"
			over 3"-To-6" = 10%.
			M. L. Over Busher
0	立'		M. L. over Busher
		JiV.	
12!	.8'	1	6.P. L.Ts. 5927-49.
			SAHD-317, Fine AND LARGER
	-		GRAUSL- 65 % # 4- Ta. 12" AND LARGER
			DENSE PAST 8' Moved 10' Augustal
			SAME DEPIH .

Project No: LARD, CR. PIT

Location: SICAMOUS \_\_

Date Sampled: SEPT-21 182

Sampled by:

Depth (Fe	et)	Sample No.	REMARKS Pi #2
rom	To		T. H# 82-4
0	左'		M.L. over Burden
艺'	10'	A 10769	6.P. L.B. 5/LT-5-D. 5
			5/LT- 5-0/ 5
			SAND- 30 % 30 Fine GRAVEL. 65 % 65 # 4-To-12"
			Over 3"-To-12" = 15%.
			Very HARD To Auger
	:		
			T.H#82-5 PIT#2
0	11		M.L. Over Burde
		NIL	
1'	8"	10/	6.p. L.B
			SiLT- 3%
			SAND - 32% Fine GRAVEL- 65 % # 4-TO-8"
		*	GRAVEL- 65 % # 4-TO-8"
•			Very HARD Augering
			TOO DENSE PAST 8"
			T.H # 82-6 PiT#2
0	立	1016	M.L OK Burden
立'	7'	10,	6.P. L.B!
	*		Siet - 60.
			5AND-30 7. Fine
			GRAVEL- 64%. # 4-To. 12"
			HIT LARGE BOILDERS ATTHORIGH
			PENSE POST 7
			Moved TRYED UNARLE TO GET DO

Project No: YARD\_PIT

Location: SICAMOUS \_\_

Date Sampled: 567-22/82 Sampled by: B\_ Duson

### LOG OF SOIL TEST HOLES

B 457 Sample Depth (Feet) REMARKS No. T.H#82-7 PIT#2 To From . Of M.L. 0 G.P. L.TS. (HARD Augering) SILT- 49. 1'-30'B 457 SAND- 35 7. GRAVEL. 617. # 4-To. 8" 1-30' 36 SA40-719.

Project No: PARD CR PIJ

Location: SICAMOUS\_

Date Sampled: 5157.22/82

Sampled by: 1 Dues

Depth (Fe	et)	Sample No.	REMARKS
From	То		T. H#82-8 P.T#2.
0	专:		14. L. over Burden
专'	10'		G.P. L.B.
			5,2T-39. 4
[v]			5AND - 3707. 44 Fine MED.
	生'-15'	B936	5AND - 370%. 44 Fine MED. GRAVEL- 609. 52 # 4-To. 8"
10'	15'		5.P.
			5.P. Sict-30.
			SAND- 979. Fine 1440.
· · · · · · · · · · · · · · · · · · ·			GRADEL-107.
15"	30'	P1448	S.P. with 5.73.  SILT- 20: 6
			SILT- 2 % 6
. 1			SAND - 88% 58 Fine GRAVEL - 10 % 36 # 4-To-3", OPD 6"
			GRAVEL - 10 % 36 # 4-To-3"
		-	

PROVINCE OF BRITISH COLUMN LA DEPARTMENT OF ELGENAYS ILBRING BIGGER.

Project No: YARP CR. LIT

Location: SICAMOUS\_

Date Sampled: SEST. 22/82

Sampled by: A Revo-

Depth (Fe	et)	Sample No.	REMARKS
From	To		T.H#82.9 PIT#2
0	之'		M.L. Over Busch
士'	10'		5.P.
			5.P. 5/LT-19.
	1' 3-1	D 1442	SAND-599. FINE - COARS-1 GRAVEL-409. #4 To. 3" OPP 8"
1	2-30	7 1973	GRAVEL- 101. 4703
10'	15'		6.P. 42-30' 41
			5/cT- 3% 53
			SAND - 409. 6 FINA GRAVEL- 579. #4-TO.3" 000 6"
			CRAINE ST.
15	22'		S.P.
			SALT - 4 %
			SAND - 68 9. Fine
			GRAVEL 307. # 4-To-3"
22'	30'		5.P.
-			SAND- 960) Very Fine
			SAND- 960) Very Fine
			:
			·

PROVINCE OF BRITISH COLUMN LA DEPARTMENT OF HIGHWAYS IZZING BIG ICE

\_\_\_\_\_

Project No: PARD\_ Ch. PIJ Location: SICAMOUS\_

Date Sampled: SEPT. 22/82 Sampled by: B\_ Denon

# LOG OF SOIL TEST HOLES

A6854 Sample REMARKS Depth (Feet) No. T.H#82.10- Pi,#2: From M. L. GIP. L.B. SILT-29. SAND - 38 %. Fine Coarse GRAVEL. 609. # 4-To- 6" 516T. 29. 57 s 1-30' A 6854 SAND - 88°7. GRAVEL - 10 %. # 4-To. 2" 121 SILT - 30). SAND - 407. Fine GRAJEL- 57% # 4-To. 6" 16' 30' S.P. WITH GP. LAYERS SICT- 3 7. SAND - 729. GRAVEL - 25 7.

PROVINCE OF BRITISH COLUM, ADDEPARTMENT OF HIGHWAYS

Project No: YARP SR Pij

Location: SICAMOUS\_

Date Sampled: SEPT 22/82
Sampled by:

Depth (Fe	et)	Sample No.	REMARKS PIT # 2
rom	То		T. H# 82-11
0	5'		M.L. over Busher
45	0'	Wit	6.P. L.B.
12	0		6.P. L.B
			SAND - 327. Fine
			GRAUKL- 65-7. #4-To. 19"
			LARGE BOULDERS OVER 3"= 15%.
	•		
			T 4 # 00 10 PIT # 2
0	七'		M.L. OUCO Benda.
0	-		17.L. OUCO Deno
2	5'		G.P. L.B.
			5167 = 29.
			SAND-33 P. FIRE MED GRADEL- 65 % # 4-To- 22 FOT
			BOULPERS Over 6" = 20%.
			DENSE BOULDERS
-			
	1		
			•

PROVINCE OF BRITISH COLUMNA AD DEPARTMENT OF BIGHNAYS

Project No: JARP SR PI

Location: SIEAMOUS\_

Date Sampled: Spot 22/82

Sampled by:

Depth (Fe		Sample No.	REMARKS				
From	To		the second secon				
0	生!		T. H# 82-13 Pin #2 M.L. Over Burden				
左,	23'	A10722	6.P. L.B.				
			5147-47. 4				
			SAND - 31 9. 45 Fine MED.				
			SAND - 31 7. 45 Fine MED. GRAVEL - 657. 51 # 4-To.6" OPP 8"				
			BOULDER Over 3"=10%.				
			HIT L.B. TOO DENSE PAST 23'				
	•						
			T. H# 82-14 Pij # 2				
0	立'		M.L. over Busda				
	·						
生'	71.		6.P. L.B				
			SILT - 3 %.				
			SILT- 3°. SAND- 32°. FINS MED. GRAVEL 65°D = 4-To. 2° FOOT DENSE AT 5'				
			SAND - 32%. FINS MED. GRAVEL 650 = 4-To. 2 FOOT				
			DENSE AT 5'				

PROVINCE OF BRITISH COLUMN DEPARTMENT OF HIGHWAYS ILLIVING BIG VOIL

Project No: PARD SR. P.J.

Location: SISAMONS.

Date Sampled: Spp. 22/82

Sampled by:

Depth (Fe	et)	Sample No.	REMARKS 9-4
rom	To		M.L. over Burden
0	专'		M.L. over Burlan
	1		
2	6'		5.1.
			5117- 29.
	5-91	A10765	- SAND - 68 %. Fine COURSE
			Glavel - 200/ # 4 - 7 9"
	,		112-9' 39 9
6'	9'		6.P. L.B. 56 5
			SiLT-69.
	•		SAND- 29 % Fine
			6 RAUEL - 65 9- # 4-To- 24"
		1	LOTS O LARGE BOULDERS
			HARD PACKER
			PENIN PT 9'
			T. H# 82-16 Pit # 2
D	室'		M.L. Over Bush
乞'	8'		6.P. L.B.
			5127-89.
			5AMD - 400). Fine
		WIV.	GRAVEL- 52 7. #4-To-24"
		11/	
8'	14'		G.P. L.B HARD TO Auger SILT-30%.
			^
			5AND - 32% Fine 1960.
			GRAVEL- 65 #4-To-24"
			LOT of L.B.S DENSE PAST 14'
			1

LOG OF SOIL TEST HOLES

Project No: YARP\_CR PIJ

Location: SICAMOUS\_

Date Sampled: SEPT 22/88

Sampled by: Dinor

Depth (Feet)		Sample No.	REMARKS PIT # 2				
rom	То		T.H#82-17 2				
0	乞'	Nit	M.L. Over Burde				
左'	.5'	Jv.					
			G.P. L.B. SiLT-29.				
			Spars-389. Fine COURS.  GRAVKE-609. # 4-To-24"  Too DRNSE. TO Auger				
			TO DE-CE TO 24				
			100 SKNSE 10 Augus				
•			T. H# 82-18 PITA2				
D	立		M.L. over Burken				
七	5		6.P L.B. 5127- 4 7. SA4D- 41 7. Fine COURSA				
. '			5iLT- 4 P.				
			SAUD- 41 %. Fine COURSA				
			GRAVEL - 55 % # 4 To - 8"				
			DENSE PAST 5' L.B.				
•							
			<del>-</del>				
·							
			. 1				

Project No: YARP\_CR\_PIT

Location: SICAMOUS

Date Sampled: SEPT . 23/82

Sampled by: Danco

Depth (F	eet)	Sample No.	REMARKS				
From	To		T.H#82-19 PIT #2:				
0	7		M.L. Over Bench				
L'	6'	PIUU4	6.8				
2	8	1 1771	5161-3 7. 3				
			SAND-379. 51 Fine COURS				
			SAND-379. 51 Fine COURS.  GRAVEL 609. 40 #4-To-12" 00036"				
			PUT 8' CAT CUT IN BANK				
			PUT & CAT CUT IN BANK				
			TOOK SAMPLE From EPT CUT.				
			Very LARGE BOULDERS IN CAT CUT.				
	-						
-							
			,				
		-					

Project No: JARA CR. Pin.

Location: SILANOUS\_

Date Sampled: St. 107 23/88

Sampled by:

Depth (Fe	et)	Sample No.	REMARKS
From	To		T. H# 82-20
0	4'		T. H # 82-20 Pit # 2  5.M. 4 Oven Bende
4'	6'	· · · ·	5.14.2 5127-25 %. SAND 75 %. Wary Fine
6'	ን′		L.B. TOO DENSE TO Auger
			Pit #9
0	19'		T.H# 82- X1 Pit #2
	- / /		5.M.4 SILT- 40
		W	SAND- 60 Deny Fine
19'	20'		6.P. L.B.
4			
-			
1			

Project No: YARD ER RT

Location: Sicamous \_\_

Date Sampled: SEPT. 23/82

Sampled by: R Ducer

Depth (Fe	et)	Sample No.	REMARKS				
rom	То		F. H= 82-22 P, T # 2.				
0	t ·		M.L. Over Rende				
11	10'		5.0				
			5 AND. 95 ). FINE GRADEL-5 %				
10"	17'	he	5.P. 5.73. SAND 759.				
			GRAVEL- 25 0 1"-To-3"				
17:	18.		L.B. DENSK TO Augeor.				
			T. H# 82-23 Pij #2				
0	堂'		M.L. ever Burden				
2'	5'	NIV	S.P. S.B.				
		NIV	SAND. 90 Fin MED.  GRAVEL-10 #4-TE.6"				
5-1	6'						
			6.P. L.B. HARP PACKED.  5ilt - 69.  5AND - 34 97. Fine  6RAVKL-60 9. # 4-10. \$" AND OW				
			GRAVKL-60 % # 4-10. 8.00 AND OUR				
			TOO DENSE PAST 6"				
·							

TH/TP	DEPTH SAN		SAMPLE	SOIL S CLASS	ESTIMATE	D GRAD	UATION	ESTI	MATED F	ROCK 7	5mm	SAND TYPE	REMARKS
	FROM	то	BAG No.		G	s	F	MAX SIZE	75mm - 150mm	150mm - 375mm	>375mm	F M C	Lab Test Result
TP 13-01	0	1.5	323	GP	52	46	2	850	10	10	20	С	
	1.5	6.0	323	GP	52	46	2	250	5	5	0	С	
				GP	50.7	48.2	1.1						
TP 13-02	0	6	381	GP	57	42	1	750	15	10	5	С	Sluffing in
				GP	54.9	43.8	1.3						
TP 13-03	0	6	411	GP	56	42	2	300	10	2	0	С	
				GP	52.0	45.5	2.5						
TP 13-04	0	6	412	GP	57	42	1	450	10	2	1	С	
				GP	55.5	42.5	2.0						
TP 13-05	0	6	413	GP	53	45	2	1200	10	10	5	FM	
				GP	50.8	47.1	2.1						
TP 13-06	0	6	414	GP	53	45	2	650	10	10	5	С	
				GP	49.2	48.8	2.0						
TP 13-07	0	6		SP	43	55	2	300	<1	<1	0	MC	
				SP	42.9	54.7	2.4						

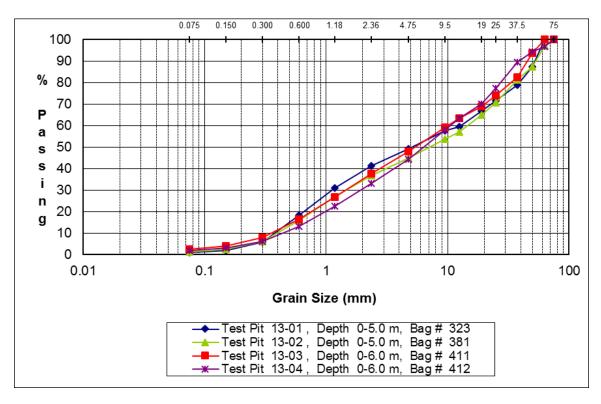
	-		-			Α	GG	REG	ATE	L	OG	-						
PROJI	ECT:		Yard	Creek Lo	op Pit	t		S	AMP	LED	BY:	Samantha Kinniburgh						
Р	PIT#:			0417					M	ETH	OD:		Excavator					
DISTRICT:			Oka		-		DA	TE:		July 25 2018								
TEST PIT	DEPTH		SAMPLE	SOILS	ESTIMATED GRADATION			ESTIMA	TED RO	OCK 7	5m m	SAND TYPE	REMARKS					
NO.	FROM	то	BAG NO.	CLASS	G	s	F	MAX SIZE	75mm - 150mm	150mm 375mm	>375m m	F M C	Lab Sieve					
	0	1		GP	50	47	3						Pit floor in front of face, top 1m bony,					
40.04	1	5.3	1801	SP	44	55	1	530	5	2	1	М	sandy below that with sloughing					
18-01				SP	38.8	60.5	0.7						at 1.5-2m					
	0	0.3		OB/Soil									NW end of asphalt stockpile,					
	0.3	5.3	1802	SP	45	52	3	540	4	2	1	M-C	coarse sand, some OS					
18-02				GP	50.4	48.1	1.5			<del></del>			oodide dana, como de					
	0	0.2		OB/Soil									Test help done on the clane most ST					
	0.3	0.3 4	1803	SP	40	59	1	150	3	0	0	M-C	Test hole done on the slope, near SE end of FSR. Sandy, coarse, less OS					
18-03		4	1003	SP	40.9	<b>58.4</b>	0.8	130			<u>V</u>	IVI-C	Sloughing under overburden					
,																		
	0.4	0.4 1.5		OB/Soil SP	33	65	2						Very sandy with varying amounts of rock, beach sand and low fines					
18-04	1.5	2.7		SP	13	85	2	•					Sloughing at 0.5m					
10 0 1	2.7	4.7	1804	SP	33	65	2	160	3	1	0	M	Cloughing at C.om					
				SP	36	62.1	1.9			•								
	0	0.4		OB/Soil									Sandy with OS, TP on ridge going					
18-05	0.4	4.3	1805	SP	35	63	2	510	5	3	1	М	into slope above developed face					
10-05				SP	43.1	56.2	0.7											
	0	0.4		OB/Soil									Test hole on south east slope above					
40.00	0.4	5	1806	SP	40	58	2	340	5	2	0	М	pit face, sandy with OS					
18-06				GP	49.7	49	1.3											
	0	0.3		OB/Soil														
40.07	0.3	2.5	1807	SP	35	63	2	<b>†</b>					Sampled top layers					
18-07			************	SP	37.2	61.7	1.1	*********				**********						
	2.5	5.5		SP	40	58	2	600	8	3	1	М						
	0	0.3		OB/Soil									Lots of larger OS, sandy and					
18-08	0.3	4.7	1808	SP	40	58	2	570	5	3	2	М	consistent with TP1806 & 1807					
10-00	ļ	ļ		SP	40.3	58	1.7	ļ			ļ							
			<u> </u>					<u> </u>										

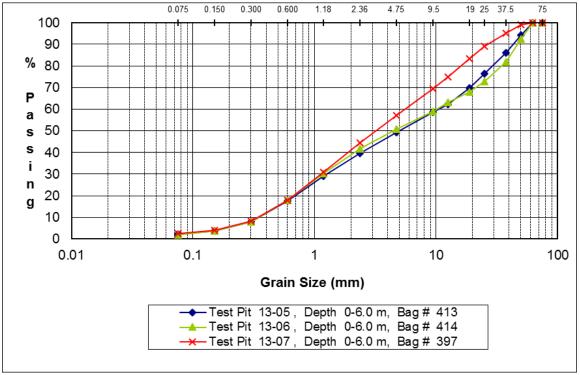
	AGGREGATE LOG															
PROJECT: PIT #: DISTRICT:		_	Yard	Creek Lo	op Pi	t		S	AMP	LED	BY:	Samantha Kinniburgh				
		•		_	M	ETH	OD:		Excavator							
				_		DA	TE:	July 25 2018								
DE TEST PIT		РТН	SAMPLE	SOILS	ESTIMATED GRADATION			ESTIMA	TED RC	OCK 7	ōm m	SAND TYPE	REMARKS			
NO.	FROM	то	BAG NO.	CLASS	G	s	F	MAX SIZE	75mm - 150mm	150mm 375mm	>375m m	F M C	Lab Sieve			
	0	0.3		OB/Soil									Most OS present yet, large boulders			
18-09	0.3	5	1809	GP	58 40 2			780	12	8	2	М	bony			
10-03	ļ			GP	57.8	40.1	2.1	ļ	ļ							
	0	0.3		OB/Soil									Sandy with OS and coarse sand			
18-10	0.3	5	1810	SP	40	_58_	2_	620	10	5	2	M-C				
.0 .0	<b></b>			SP	44.6	53.9	1.5									
	0	5	1811	SP	38	60	2	290	5	2	0	М	Southeast pit floor in front of face,			
18-11	ļ			SP	45.3	54.1	0.7			ļ			sandy with some OS, no real			
	ļ			<b></b>				ļ	<b></b>	<b></b> -			sloughing			

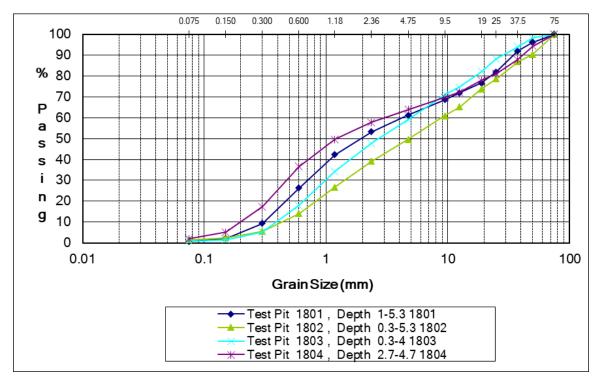
# Wet Sieve Analysis

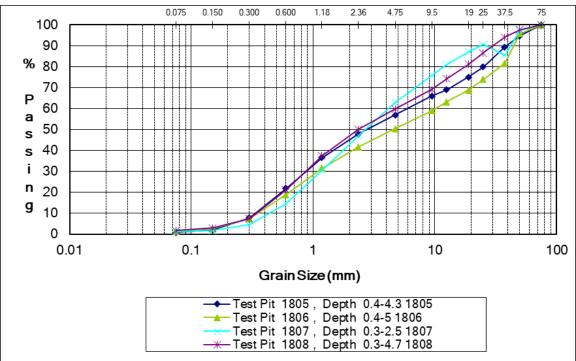
PROJEC	T REPOR	RT OF														
SIEVE A	NALYSIS	SUMM.	ARIES					PERC	ENT PAS	SING						
Project:			86004					F	Project No.:			86004				
Sample Source:			Yard Creek	Loop Pit	No. 0417			Client:			MoTI					
Material:			PIT RUN	RUN					Date:		2018-08-01					
San	nple Informa	ation						Pe	rcent Passi	ng						
Test Pit	Depth Bag #							Pit Run Sieve Sizes (mm)								
	(m)		75	50	37.5	25	19	12.5	9.5	4.75	2.36	1.18	0.6	0.3	0.15	0.075
1801	1-5.3	1801	100.0	96.2	92.0	82.0	76.6	72.0	68.7	61.2	53.2	42.2	26.3	9.3	2.1	0.7
1802	0.3-5.3	1802	100.0	90.5	86.9	78.7	73.8	65.1	60.9	49.6	39.1	26.7	14.0	5.5	2.5	1.5
1803	0.3-4	1803	100.0	98.2	94.1	88.2	82.1	74.8	71.1	59.1	47.8	34.2	17.9	5.2	1.5	0.8
1804	2.7-4.7	1804	100.0	94.3	88.0	81.1	77.9	72.2	69.8	64.0	57.8	49.6	36.6	17.3	5.1	1.9
1805	0.4-4.3	1805	100.0	94.7	89.4	79.8	75.0	68.9	65.9	56.9	47.8	36.4	21.8	7.8	1.9	0.7
1806	0.4-5	1806	100.0	95.7	81.6	73.9	68.8	63.1	58.9	50.3	41.6	31.5	18.8	7.3	2.5	1.3
1807	0.3-2.5	1807	100.0	97.2	85.5	90.6	87.1	81.0	75.8	62.8	47.0	30.5	14.6	4.5	1.7	1.1
1808	0.3-4.7	1808	100.0	97.6	94.0	86.6	81.1	74.3	69.0	59.7	50.0	37.4	21.1	7.4	2.9	1.7
1809	0.3-5	1809	100.0	93.7	87.2	73.6	67.2	59.9	54.3	42.2	31.7	22.1	12.9	5.9	3.1	2.1
1810	0.3-5	1810	100.0	90.8	86.9	77.7	72.8	68.2	64.2	55.4	46.3	34.9	20.1	7.6	2.7	1.5
1811	0-5	1811	100.0	95.5	87.6	79.6	74.9	67.5	63.9	54.7	45.9	35.1	20.7	7.0	1.7	0.7

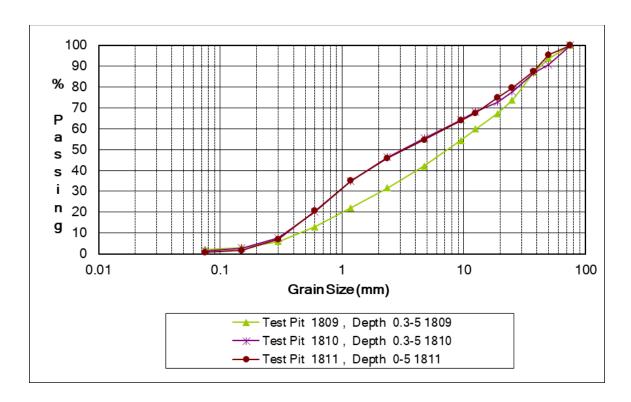
### **Aggregate Gradation Charts**







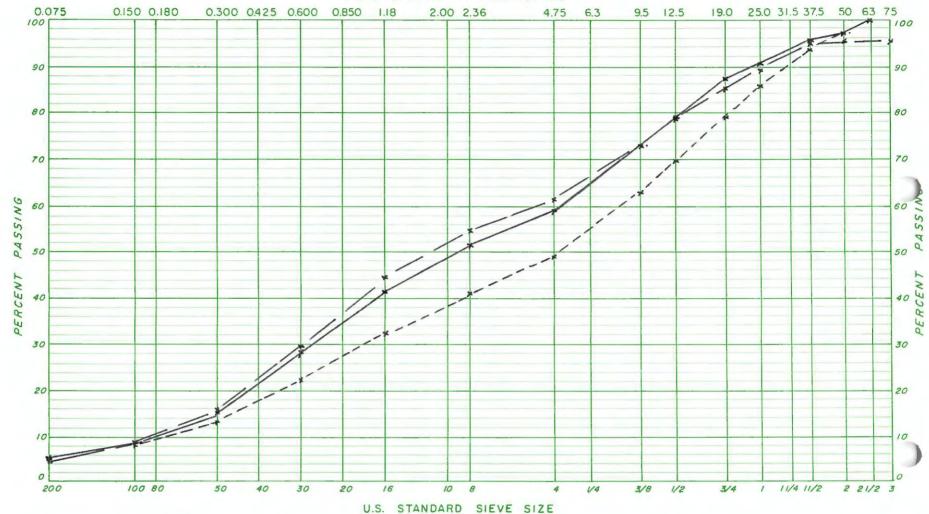






### AGGREGATE CHART

Geotechnical and Materials Branch



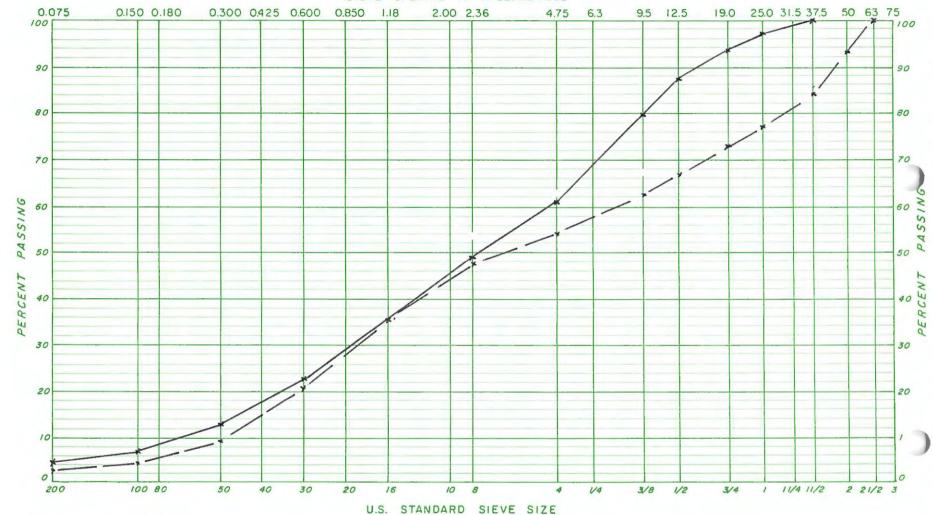
	S	AMPLE	NO		SAMPLE NO.				
PASSING	RET.ON	MASS	%	TOTAL % PASSING	PASSING	RET.ON	MASS	%	TOTAL % PASSING
500	P 14	43		0.15-9.1	TH-9				
501	A 6	854		0.15-9.1		TH-10	2		
502	A10	122		0,15-7,0		TH-	3		

IDENTIFICAT	TON
PROJECT NO. YARD CR LOO	PPIT
SECTION #	2291
LOCATION	
STATION PLACED	
SAMPLE OF PIT PUN	
SAMPLED BY R.DIXON	DATE SEP 22/82
SIEVE ANALYSIS BY JUC	DATE SEP 29/82



# AGGREGATE CHART

Geotechnical and Materials Branch



SAMPLE NO.									SAMPLE NO.				
PASSING	RET.C	NC	MASS	%	TO	TAL %	PASSING	PAS	SING	RET.ON	MASS	%	TOTAL % PASSING
503	A	10	765			0.15	-2.7		TH	1#15			
7	DEG	ک	6	7.9° 5.6	4	Less	1.7	-					
~			6	5.6	10		1.8	L					
504	PI	14	44			0.15	- 1.8		TH	# 19			

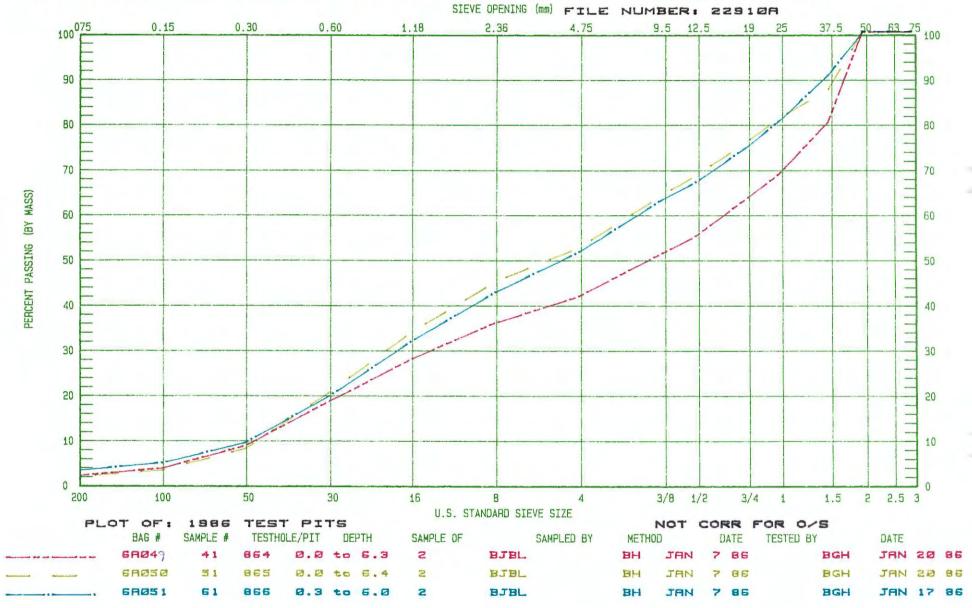
PROJECT NO. YARD CE. LO	OP PIT
PROJECT NO. YARD CE. LO	291
LOCATION	
STATION PLACED	
SAMPLE OF PIT RUN	
SAMPLED BY R. DIXON	DATE SEP 22/82 DATE SEP 29/82
SIEVE ANALYSIS BY JWC	DATE SPP 29/82

#### REGION: KAMLOOPS

# AGGREGATE GRADATION CHAR

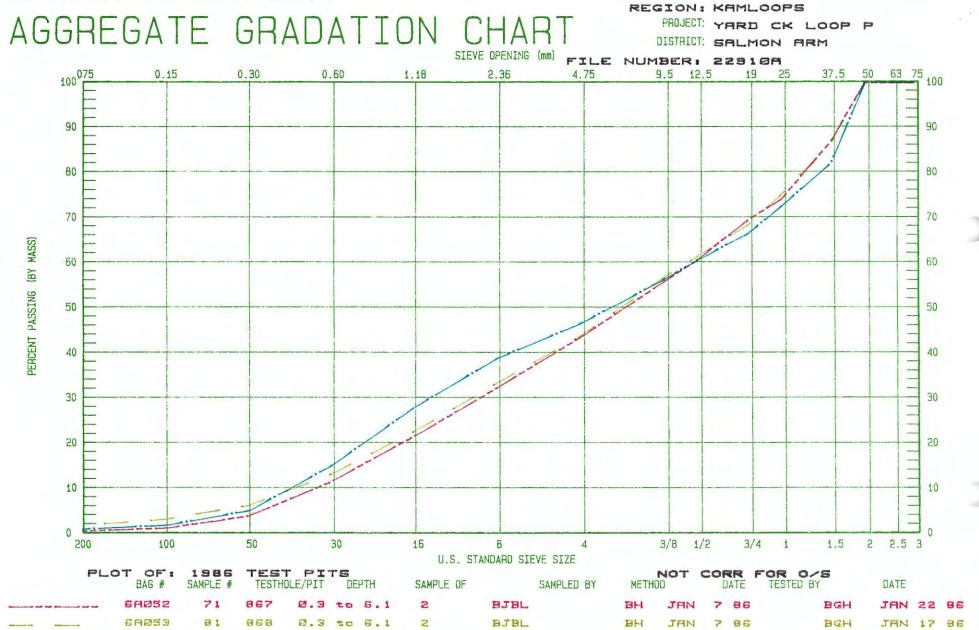
PROJECT: YARD CK LOOP P

DISTRICT: SALMON FRM



BGH

38 ES NAT



6**PØ5**4

91

869

Ø.5 to 5.7

BJBL

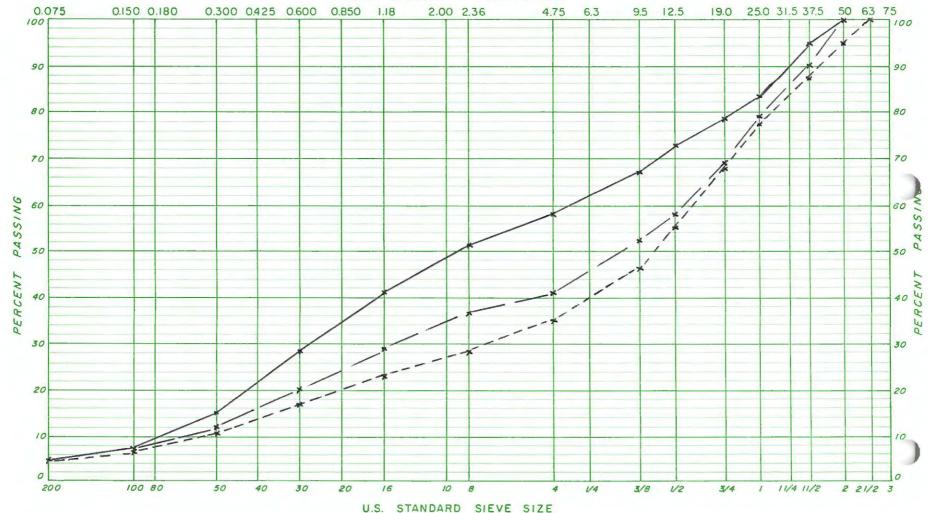
BH

JAN



# AGGREGATE CHART

and Highways
Geotechnical and Materials Branch



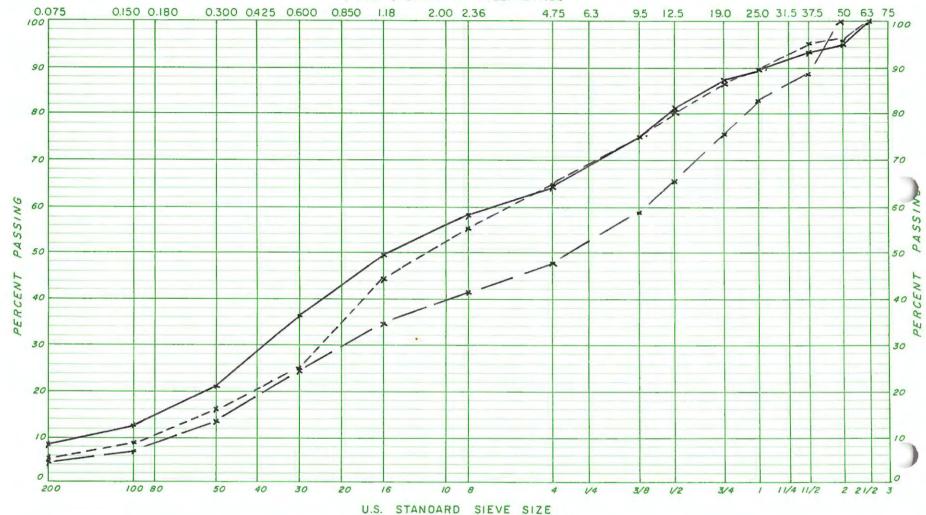
	S	AMPLE	NO.		SAMPLE NO.				
PASSING	RET.ON		%	TOTAL % PASSING	PASSING	RET.ON	MASS	%	TOTAL % PASSING
490	89	30		0.15 - 2.	4	1	1#1		
3	DEG!	5 7	1.99	Loss 1.4°C					
505	D73.	51		0.15 -	9,1	TH	#2		
495	A 107	69		0.15-3.0		TH	#4		

	IDE	NTIFIC	ATION		
PROJECT NO.	YARD	OCK	LOOP	PIT	
SECTION			# 220	31	
LOCATION					
STATION PLACE	D				
SAMPLE OF	PIT	RUN			
SAMPLED BY	P.DI	XON	DATE	SEPT	20/82
SIEVE ANALY	SIS BY	J.CHA	WHANDAT	ESEPT	79/82
		-1-11			



# AGGREGATE CHART

Geotechnical and Materials Branch



	S	AMPLE	NO.		SAMPLE NO.				
PASSING	RET.ON		%	TOTAL % PASSING	PASSING	RET.ON	MASS	%	TOTAL % PASSING
497	B45	7		0.3 - 9.1		TH	#7		
3	DEGS	74	01	Loss 1.54					
498	8930	0		0.15- 4.5		TH	#8		
499	P144	2		4.5 -9.1		TH	#8		

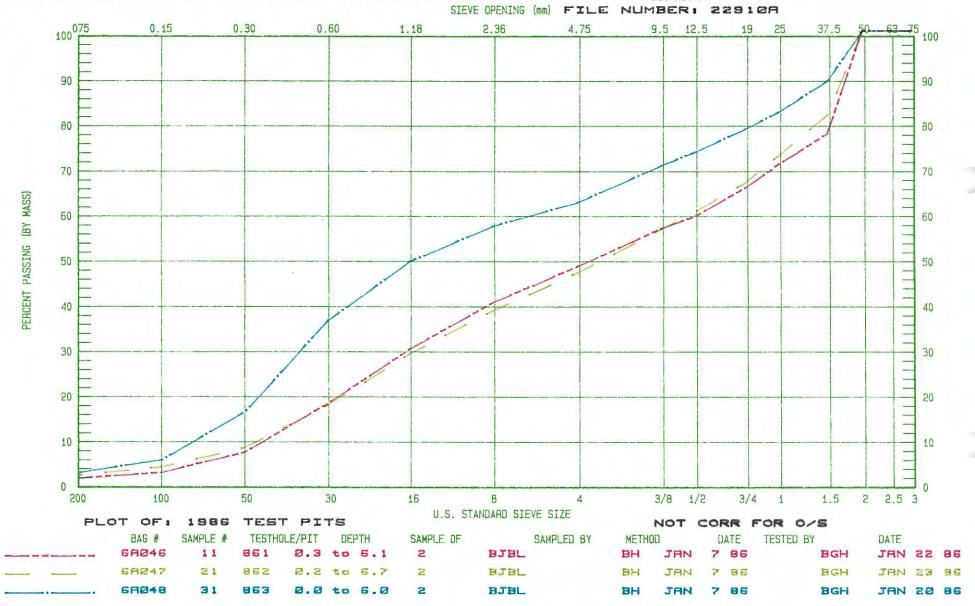
PROJECT NO. YARD CK LO	OP PIT
SECTION	# 2291
LOCATION	
STATION PLACED	
SAMPLE OF PIT EUN	
SAMPLED BY P. DIXON	DATE SEP 22/82
SIEVE ANALYSIS BY JUC	DATE SEP 29 /82

#### REGION: KAMLOOPS



PROJECT: YARD CK LOOP P

DISTRICT: SALMON ARM



**USC Legend** 

### MATERIALS CLASSIFICATION LEGEND

MAJ DIVIS	OR IONS	SYMBOL	SOIL TYPE
	SI	GW	WELL GRADED GRAVELS OR GRAVEL—SAND MIXTURES, < 5% FINES
OILS	- AND	GP	POORLY-GRADED GRAVELS OR GRAVEL-SAND MIXTURES, < 5% FINES
S	GRAVEL GRAVELLY	GM*	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES
INE	9 88	GC*	CLAYEY GRAVELS, GRAVEL—SAND—CLAY MIXTURES
GRAINED SOILS		SW	WELL-GRADED SANDS OR GRAVELLY SANDS, < 5% FINES
SE	AND SOILS	SP	POORLY-GRADED SANDS OR GRAVELLY SANDS, < 5% FINES
COARSE	SAND	SM*	SILTY SANDS SAND-SILT MIXTURES
0	SAS	SC*	CLAYEY SANDS SAND-CLAY MIXTURES
(0	AND 'L <50	ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
GRAINED SOILS	SILTS AN	CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
ĘD	7	OL	ORGANIC SILTS AND ORGANIC SILT-CLAYS OF LOW PLASTICITY
GRAIN	4ND >50	МН	INORGANIC SILTS, MICACEOUS OR DIATOM— ACEOUS FINE SANDY OR SILTY SOILS, PLASTIC SILTS
FINE	SILTS AND AYS *L >	СН	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
L	긍	ОН	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
ORG/ SO		Pt	PEAT AND OTHER HIGHLY ORGANIC SOILS
TOPS		TS	TOPSOIL WITH ROOTS, ETC.
COBE		SB	ROCK FRAGMENTS AND COBBLES, PARTICLE SIZE 75mm TO 300mm
LAF BOUL		LB	BOULDERS, PARTICLE SIZE OVER 300mm
BEDF	ROCK	BR	BEDROCK
*GM1; GM2;	GC1; S	M1; SC1; M2; SC2;	12% PASSING .075 SIEVE, USE DUAL SYMBOL 12 - 20% 20 - 30% 30 - 40%  PASSING .075mm SIEVE
			40 - 50%
			REV. 90-04-26

REV. 90-04-26

	TISH COLUMBIA ORTATION & HIGHWAYS oterials Engineering						
UNIFIED SOIL CLASSIFICATION LEGEND							
Drawn: LU Date: JULY'97	Scale:						
File No.:	ACAD File: ACADSTOS						

### Photos





TP 18-05 Spoil, July 2018.



TP 18-07 Spoil, July 2018.



TP 18-10, July 2018.



Photo taken on the eastern edge of Suitability Area B, facing north (May 2024).



Same location as previous photo, facing west into newly developed area (May 2024)



Same location as previous photo, facing southeast toward an area of stockpiled asphalt (May 2024).



Access into newly developed area near asphalt piles is blocked by boulders (May 2024).



View of southern and western edges of developed area (May 2024).



Overburden in background along western edge of developed area (May 2024).



Eastern developed area and recommended stockpile location (May 2024).



Example of surface conditions in center of newly developed area (May 2024).