## **Technical Summary**

January 2024

Pit Name: Tuc UI Nuit Pit

**Provincial Pit Number: 0479** 

**Location:** Tuc UI Nuit Pit is approximately 1.3km south of the intersection of Highway 97 and Tucelnuit Drive (Figure 1). Access to the pit can be made from Tucelnuit Drive.

**Legal Land Description:** The site is currently a Section 16 Map Reserve (LF# 0236153) held by the British Columbia Ministry of Transportation and Infrastructure (BC MoTI). The legal description of the Map Reserve is "Lots 826, 827 and 828 of District Lot 2450s, Plan 4997, together with Block W, District Lot 2450s, Plan 5753, all of Similkameen Division Yale District, containing 18.36 hectares, more or less". The layout of the Map Reserve boundary is shown in the legal plan (Figure 2).

**Subsurface Investigation:** Subsurface investigations at Tuc UI Nuit Pit were carried out in 1971 by Ministry of Transportation & Infrastructure.

In 1971 thirty-one (31) test holes were drilled to depths ranging from 1.8 to 12.2m. During drilling, subsurface soil conditions were logged and representative samples of the granular materials were collected for laboratory testing and future reference. Laboratory testing was carried out on nineteen (19) of these samples to assess the gradation and durability characteristics. The tests completed were wet sieve analysis, degradations, sand equivalent, and magnesium sulfate (MgSO<sub>4</sub>).

Based on the results of the 1971 investigation, one (1) granular area was defined (Figure 3). The detailed results of the subsurface testing are provided in the Test Pit Summaries and test pit locations are shown on the Pit Development 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 in Area A as well as the Unified Soil Classification (USC [included after test pit summary]) for the samples tested.

Table 1: Pit Run Gradation for Area A

Classification:	Average (%)	Range (%)
Gravel (4.75-75mm)	50	21 - 74
Sand (0.075-4.75mm)	48	25 - 77
Fines (<0.075mm)	2	1 - 4

**Material Durability:** Table 2 shows the results of the durability tests as well as the specifications as required in the Standard Specifications for Highway Construction.

Table 2: Durability Test Results

Test Pit	MgSO <sub>4</sub> (%)		Degradation	Absorption %		Relative Density	
	Coarse	Fine	(%)	Coarse	Fine	Coarse	Fine
1971							
TP71-05			79.3				
TP71-25			70.9				
Crushing	4.9	8.3	72.7	0.85	1.52	2.64	2.58
		В	C MoTI Specific	cations			
MgSO <sub>4</sub>			Soundness by use of magnesium sulphate <20 for coarse fraction <25 for fine fraction				
Degradation			Test preceding Micro Deval >35 for base and sub-base >40 for graded aggregate seal				
Absorption			<2.0% for coarse paving aggregates ≤1.0% for coarse and ≤1.5% for fine graded aggregate seals				
Relative Density			~2.65	for all agg	regate p	roducts	

**Material Suitability:** Based on the 1971 investigation results, the material is judged to be suitable for the following purposes:

**Table 3: Suitability** 

	Pit Run	Crush
Tuc UI Nuit Pit Suitability Area A	SGSB	25mm WGB Asphalt Mix Aggregates Graded Agg Seals

## **Sulphate and Chloride Testing**

No sulphate and chloride testing has been done in the pit area.

**Volume Estimates:** Table 4 shows the volume estimates that can be expected for 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 4: Volume Estimates

Suitability Area	Developed Area within Area A 1.8Ha
Volume (m³)	100,000

## **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 and 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.
- 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 processing area is recommended to be located on the pit floor as identified on the Pit Development Plan (near TP71-13), with mining proceeding in a northern direction as indicated.
- Processed aggregate may be stockpiled to the south of the production site (near TP71-27), where space permits as indicated on the Pit Development Plan.
- 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:

Laura Courtenay Steven Lee

Sr. Aggregate Resource Specialist Sr. Aggregate Resource Specialist

### **Enclosures**

Figures:

Figure 1 - Location Plan

Figure 2 - Legal Plan

Figure 3 - Pit Development Plan

Test Pit Summaries

Test Hole Stick Logs (1971)

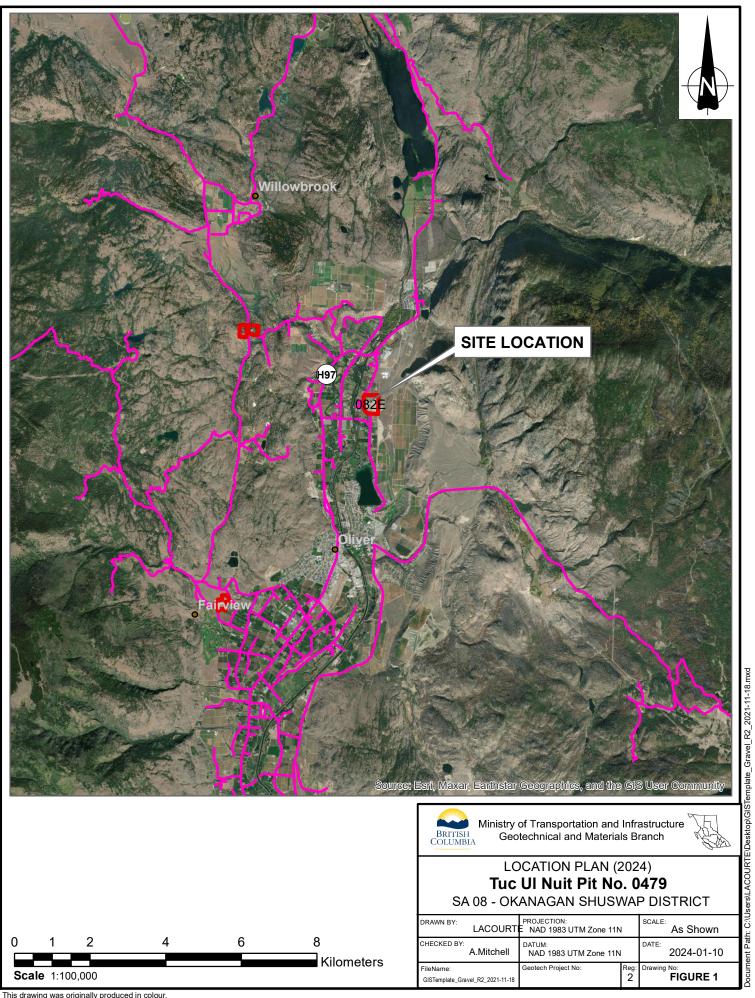
Test Hole Lab Summary (1971)

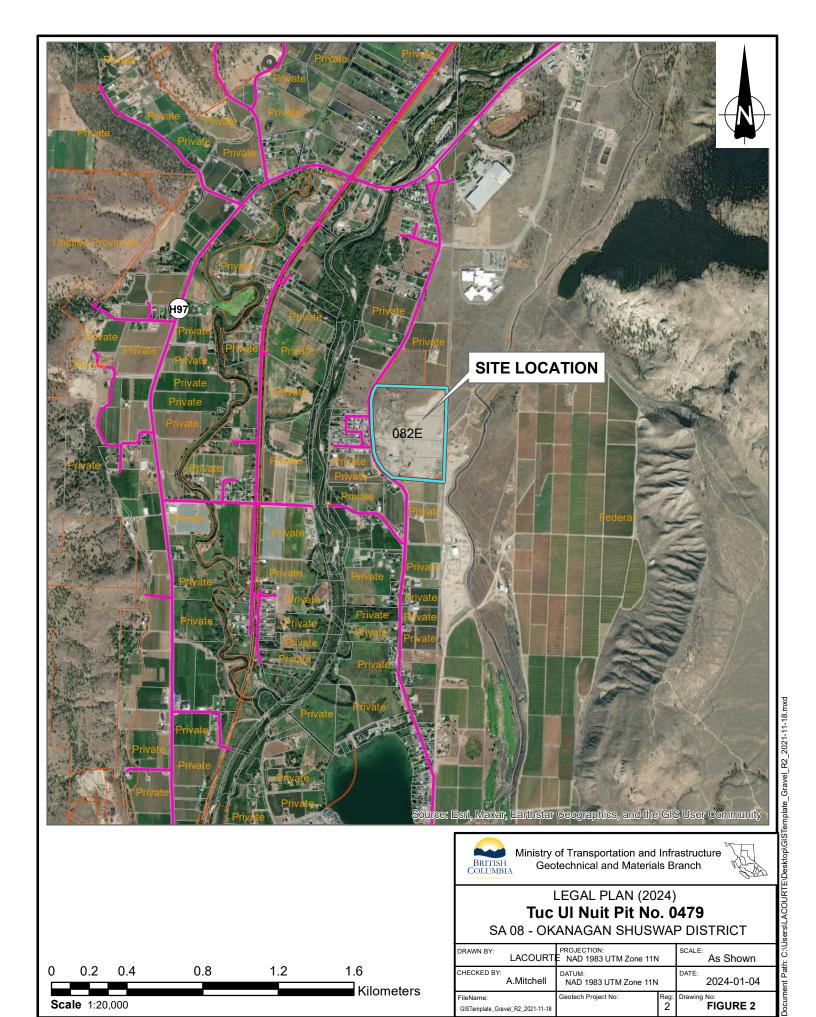
Aggregate Gradation Charts

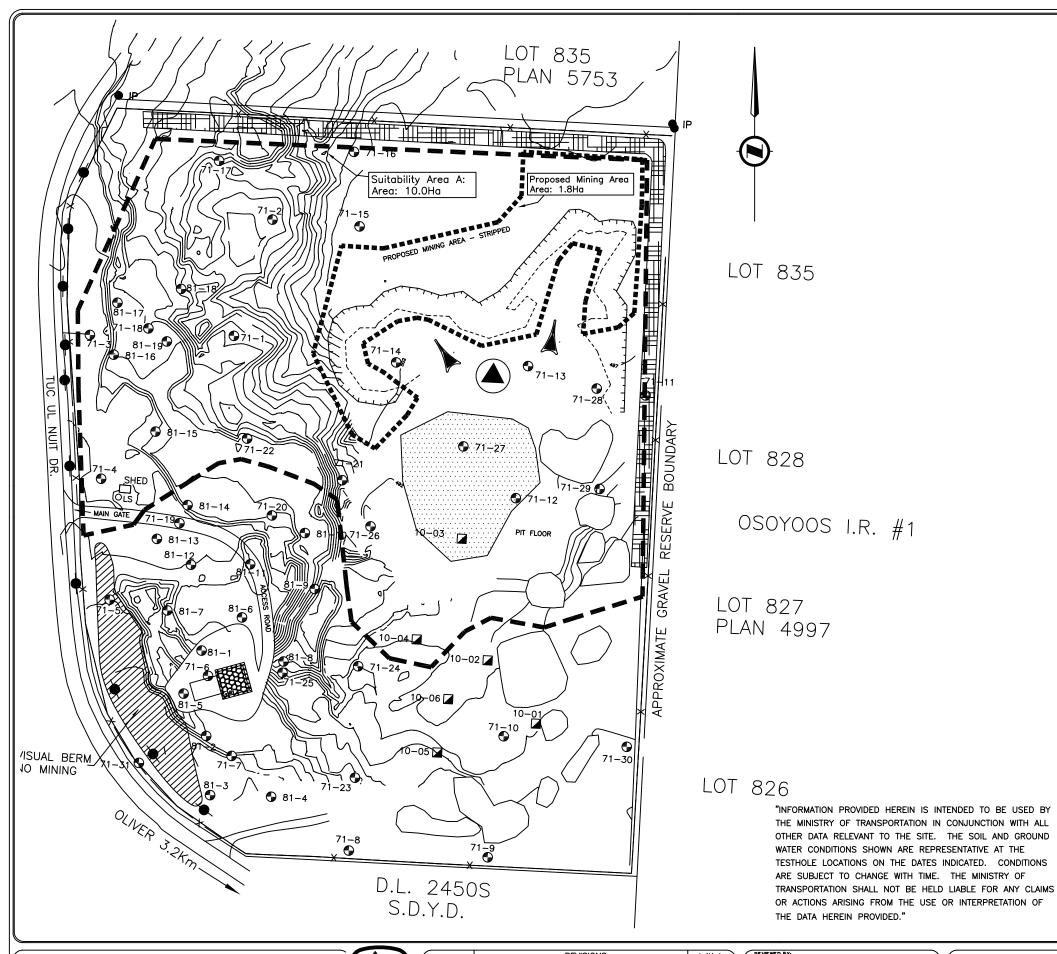
USC Legend

Photos

# **Figures**







LEGEND

PROCESSING PLANT LOCATION

DEVELOPMENT DIRECTION

PROPOSED MINING AREA

EXISTING PIT FACE

SUITABILITY AREA A

**⊕** 71−2

TEST HOLE 71-2, DRILLED IN 1971.

GRAVEL RESERVE BOUNDARY

ACCESS ROAD

IRON PIN

PROCESSED AGGREGATE STOCKPILE AREA



OVERBURDEN STOCKPILE SITE

**FENCE** 

POWER POLE

### MINING NOTES

- All vegetation, topsoil and overburden is to be stripped a minimum of 2 metres back from active pit faces.
- Topsoil and overburden is to be stockpiled and seeded with grass. Removal of this material is not permitted.
- At the completion of mining activities, all pit faces are to be sloped to a minimum of 1 1/2 to 1 with native
- For projects mining in excess of 1,000 cubic metres, the Ministry of Energy Mines (Mines Division) must be notified (approximately 14 days prior to the commencement of mining).
- All reject material, resulting from aggregate production, is to be placed in neat, easily accessible stockpiles free of deleterious material (i.e. wood waste).
- No dumping of Demolition, Land Clearing and Construction debris is permitted without prior written approval of the Ministry of

### RECLAMATION NOTES

- Remove debris.
- Slope to a minimum of 2 to 1.
- Replace topsoil.
- Seed reclaimed areas with an appropriate grass mixture.

### NOTES

- Tuc UI Nuit Pit is situated in the Agricultural Land Reserve.
- Test Hole locations are approximate only.

METER CONTOUR INTERVAL

Province of British Columbia Ministry of Transportation GEOTECHNICAL and MATERIALS ENGINEERING



7	۱ ۱	(	KEVISIUNS	Initial	
۱ م	١ ١	Date	Description		
S I		Unknown	Panterra Pit Survey by Penticton District		
k I		Nov 96	Maintenance Contráct		
31		May 97	revisions		
- /		Jan 01	Put into PS/MS, New Mnotes		
		Jan 24	Updated survey and mining area		フ
					_

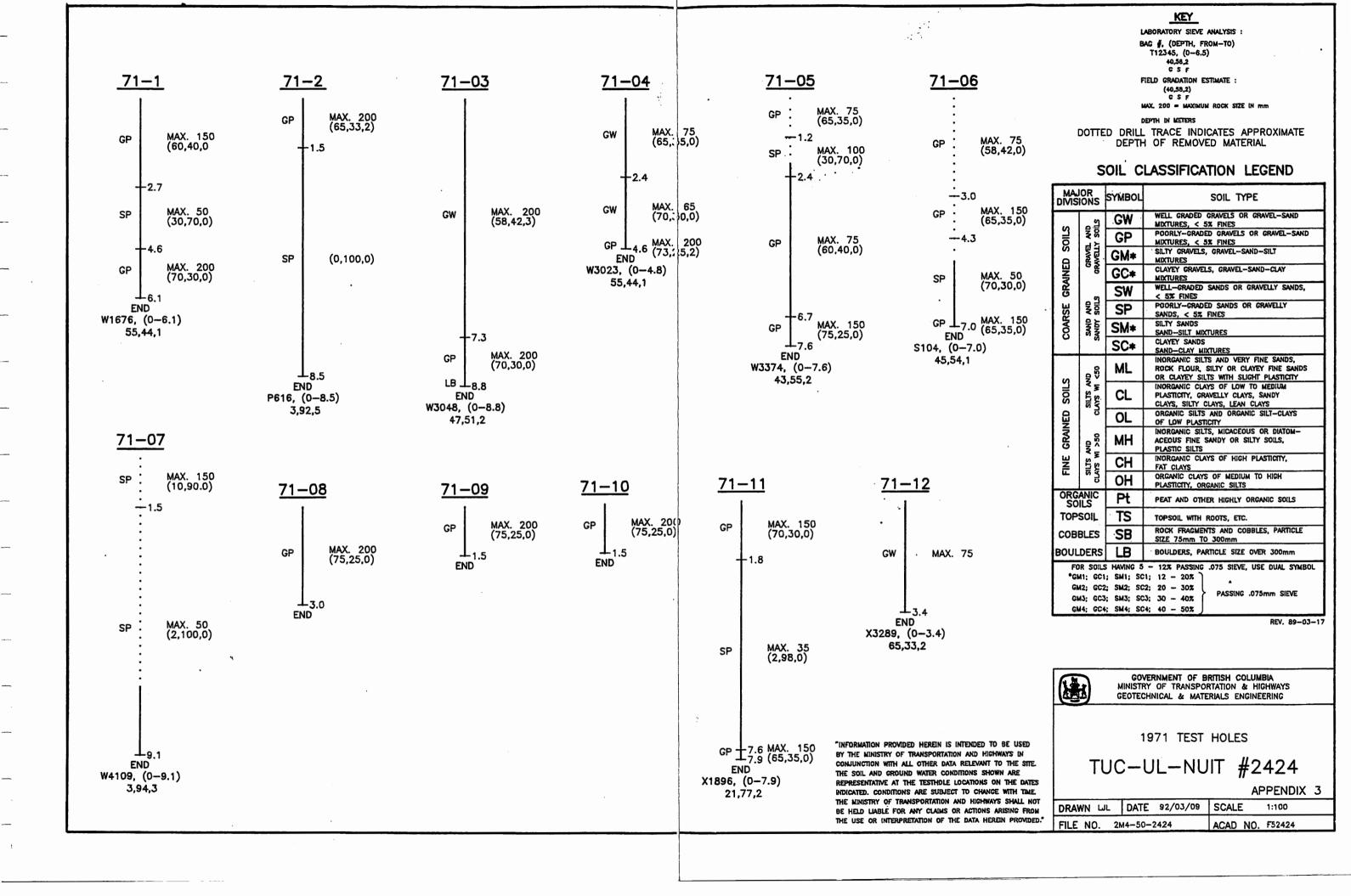
SCALE: DRAWN: DATE: AutoCAD:

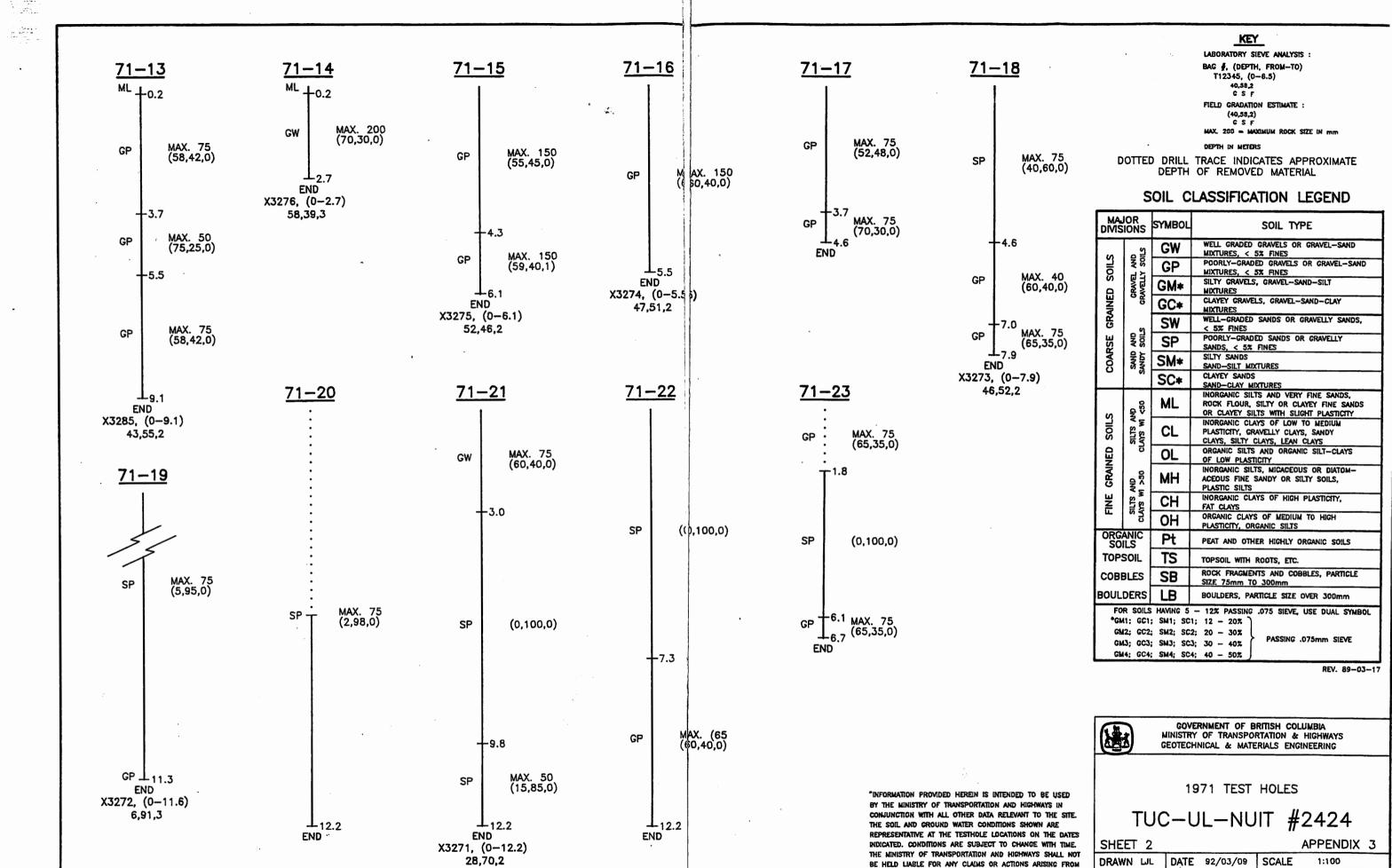
1:2500 WSR MAR/2017 F30479

TUC UL NUIT PIT #0479 DEVELOPMENT PLAN FILE NO. 50-08-0479

FIGURE

# **Test Pit Summaries**

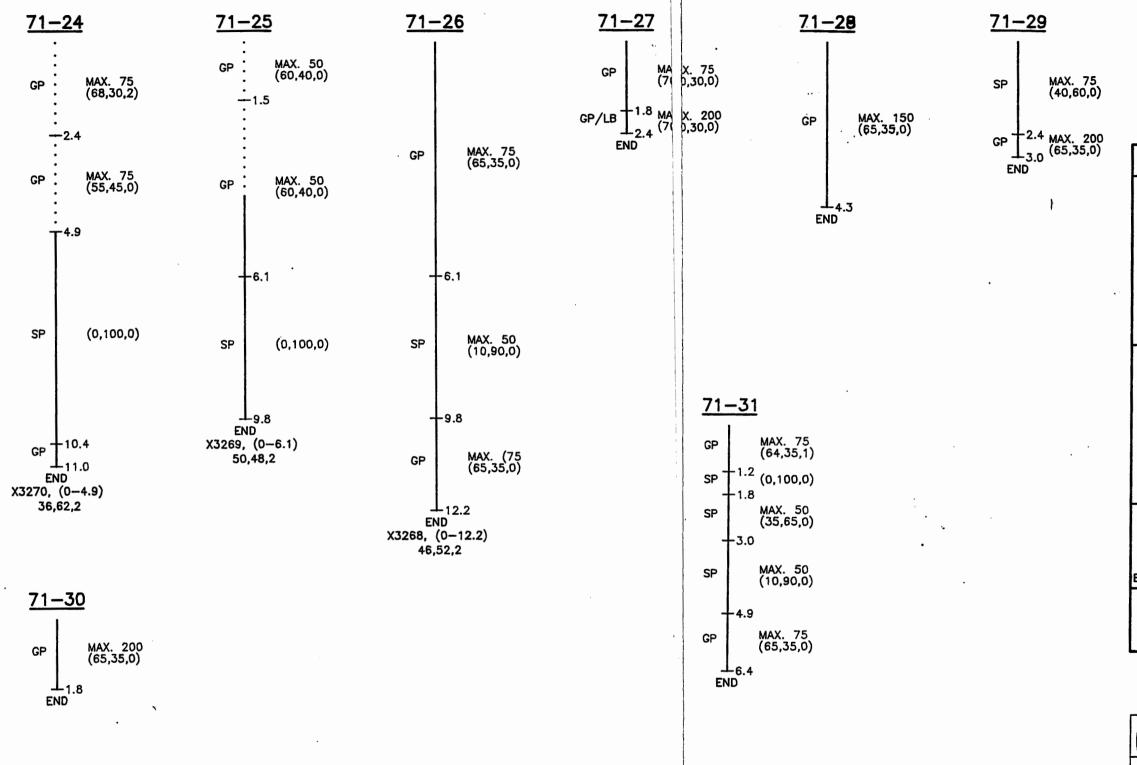




THE USE OR INTERPRETATION OF THE DATA HEREIN PROVIDED."

FILE NO. 2M4-50-2424

ACAD NO. F62424



KEY

LABORATORY SIEVE ANALYSIS : BAG #. (DEPTH, FROM-TO) T12345, (0-6.5) 40,50,2 C S F FIELD GRADATION ESTIMATE : (40,58,2) C S F

MAX. 200 - MAXIMUM ROCK SIZE IN TOTAL

DOTTED DRILL TRACE INDICATES APPROXIMATE DEPTH OF REMOVAL

## SOIL CLASSIFICATION LEGEND

	SOIL ODASSI TOATTON ELGEND						
MAJ DIVIS		SYMBOL	SOIL TYPE				
"	รู	GW	WELL GRADED GRAVELS OR GRAVEL—SAND MIXTURES, < 5% FINES				
COARSE GRAINED SOILS	IL AND	GP	POORLY-GRADED GRAVELS OR GRAVEL-SAND MIXTURES, < 5% FINES				
O.	GRAVEL GRAVELLY	GM*	SILTY GRAVELS, GRAVEL—SAND—SILT MIXTURES				
VINE	8	GC*	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES				
S <sub>E</sub>	. 87	SW	WELL-GRADED SANDS OR GRAVELLY SANDS, < 5% FINES				
3SE	SOILS	SP	POORLY-GRADED SANDS OR GRAVELLY SANDS, < 5% FINES				
SOA	SAND	SM*	SILTY SANDS SAND—SILT MIXTURES				
	σ	SC*	CLAYEY SANDS SAND-CLAY MIXTURES				
(A)	ND <50	ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY				
GRAINED SOILS	SILTS AND CLAYS WI <5(	CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS				
ÆD	ថ	OL	ORGANIC SILTS AND ORGANIC SILT—CLAYS OF LOW PLASTICITY				
GRA	AND VI >50	МН	INORGANIC SILTS, MICACEOUS OR DIATOM— ACEOUS FINE SANDY OR SILTY SOILS, PLASTIC SILTS				
FINE	SILTS A CLAYS WI	СН	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS				
	ថ	ОН	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS				
ORG/ SOI		Pt	PEAT AND OTHER HIGHLY ORGANIC SOILS				
TOPS	SOIL	TS	TOPSOIL WITH ROOTS, ETC.				
COBE	3LES	SB	ROCK FRAGMENTS AND COBBLES, PARTICLE SIZE 75mm TO 300mm				
BOUL		LB	BOULDERS, PARTICLE SIZE OVER 300mm				
*GM GM	FOR SOILS HAVING 5 - 12% PASSING .075 SIEVE, USE DUAL SYMBOL  *GM1; GC1; SM1; SC1; 12 - 20%  GM2; GC2; SM2; SC2; 20 - 30%  GM3; GC3; SM3; SC3; 30 - 40%  PASSING .075mm SIEVE						

GM4; GC4; SM4; SC4; 40 - 50%

GOVERNMENT OF BRITISH COLUMBIA MINISTRY OF TRANSPORTATION & HIGHWAYS GEOTECHNICAL & MATERIALS ENGINEERING

REV. 89-03-17

1971 TEST HOLES

TUC-UL-NUIT #2424

SHEET 3		APPENDIX	3
DRAWN LJL	DATE 92/03/09	SCALE 1:100	
FILE NO. 2M	44-50-2424	ACAD NO. F72424	

"INFORMATION PROVIDED HEREIN IS INTENDED TO BE USED BY THE MINISTRY OF TRANSPORTATION AND HIGHWAYS IN CONJUNCTION WITH ALL OTHER DATA RELEVANT TO THE SITE. THE SOIL AND GROUND WATER CONDITIONS SHOWN ARE REPRESENTATIVE AT THE TESTHOLE LOCATIONS ON THE DATES INDICATED. CONDITIONS ARE SUBJECT TO CHANGE WITH TIME THE MINISTRY OF TRANSPORTATION AND HIGHWAYS SHALL NOT BE HELD LIABLE FOR ANY CLAIMS OR ACTIONS ARISING FROM THE USE OR INTERPRETATION OF THE DATA HEREIN PROVIDED."

# TUC-UL-NUIT PIT #2424

## LABORATORY TESTING SUMMARY

LOCATION		GRADA	GRADATION OF -75mm			QUALITY				
TEST HOLE	BAG	DEPTH	GRAVEL	SAND	FINES	S.E.	DEG.	S.G.(%)	ABS.(%)	MgSO4(%)
YR-NO.	NO.	(m)	(%)	(%)	(%)	(%)	(%)	C/F	C/F	C/F
71–1	W1676	0-6.1	· 55	44	1				·	
71-2	P1616	1.5-8.5	3	92	5					
71–3	W3048	0-8.8	47	51	2				-	
71–4	W3023	0-4.9	55	44	1					
71–5	W3374	0-7.6	43	55	2		79.3			
71–6	S104	0-7.0	45	54	1					
71–7	W4109	1.5-9.1	3	94	3					
71–11	X1897	0-7.9	21	77	2					
71–12	X3289	0-3.4	65	33	2					
71–13	X3285	0-9.1	43	55	2					
71–14	X3276	0-2.7	58	39	3					
71–15	X3275	0–6.1	52	46	2					
71–16	X3274	0-5.5	47	51	2					
71–18	X3273	0-7.9	46	52	2					
71–19	X3272	0-11.6	6	91	3					-
71–21	X3271	0-12.2	28	70	2					
71-24	X3270	0-11.0	36	62	2					
71–25	X3269	0–6.1	50	48	2		70.9			
71-26	X3268	0-12.2	46	52	2					
71 CRUSI	HING									4.9/8.3
										<u>-</u>
81–1	A10642	0-9.1	62	34	4	49.2	82.1			
81-2	A543	1.5–6.7	19	78	3					
81-3	P1890	0-7.6	23	73	4					
81-4	A10615	0-10.7	23	73	4					
81-5	A504	0-9.1	39	57	4		82.1			
81–6	A505	0-12.2	30	67	3				. =	
81–7	D7519	0-12.2	47	49	4					
81–8	A535	0-11.6	35	61	4		76.6			
81-9	A542	0-12.2	32	65	3	69.8	76.6			
81-10	A507	0-12.2	22	76	2					
81-11	D7573	0-12.2	18	78	4					
81-12	D5774	0-12.2	46	51	3					
81-13	D547	0-9.1	37	60	3					
81–14	D10653	0-12.2	9	87	4					
81–16	A10562	0-5.2	74	25	1					
81–17	A10561	0–6.1	55	42	3		75.3			
81-19	B3877	0-6.1_	61	36	3	69.0	76.6			

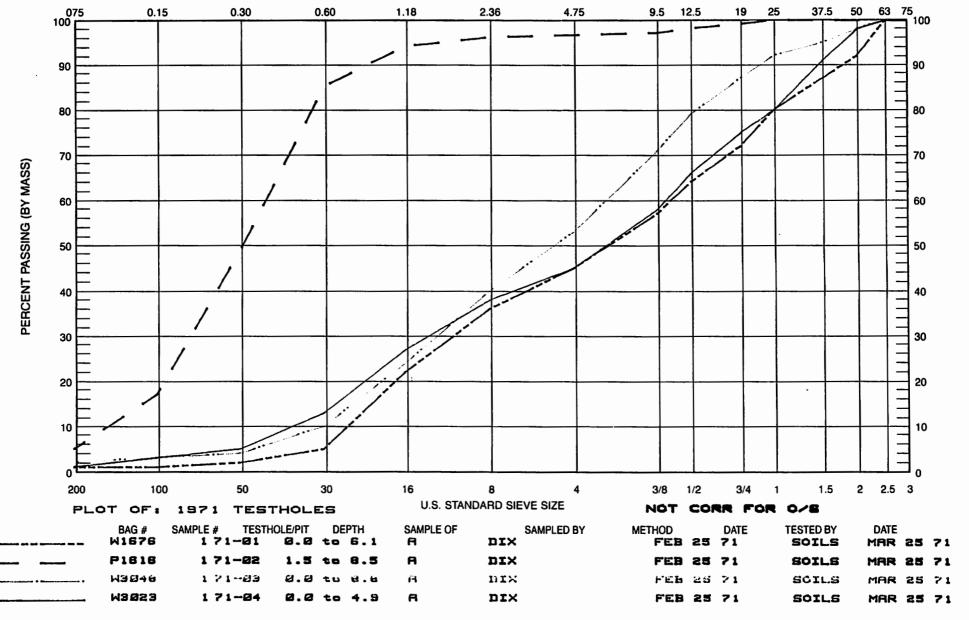
# AGGREGATE GRADATION CHART

3

PROJECT: TUC-UI-NUIT (BYERS)

DISTRICT: SOUTH OKANAGAN

SIEVE OPENING (mm) FILE NUMBER: 2M4-50-2424



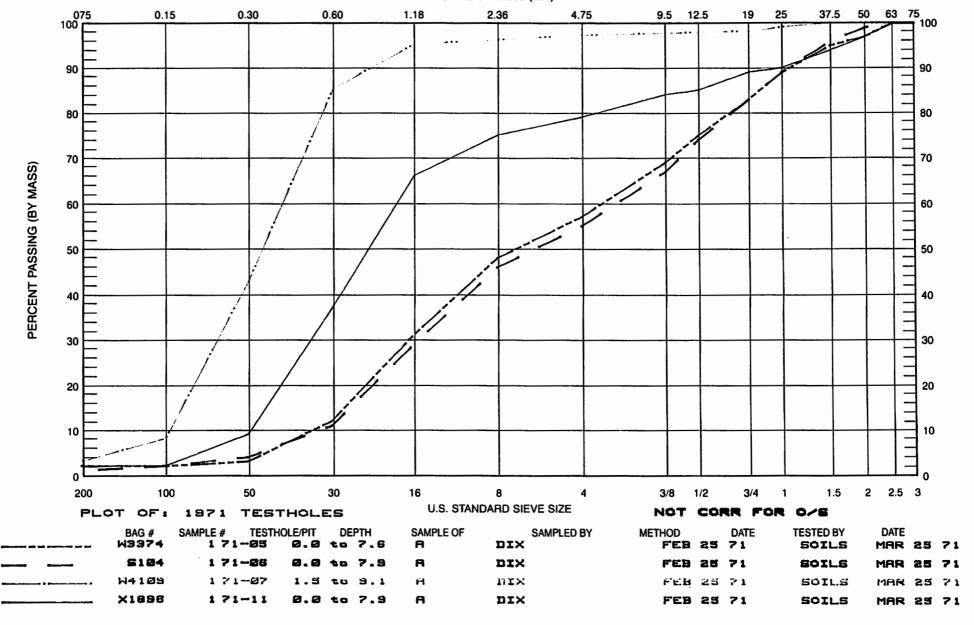
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# AGGREGATE GRADATION CHAR

PROJECT: TUC-UI-NUIT (BYERS)

DISTRICT: SOUTH OKANAGAN



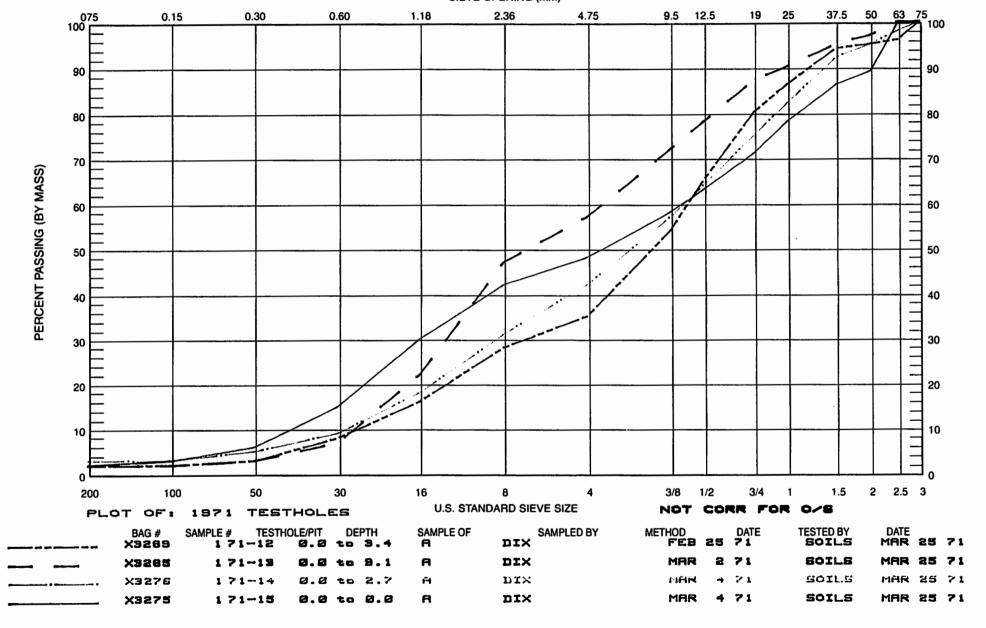


# AGGREGATE GRADATION CHART

PROJECT: COLUMN OKCOLOGIL

DISTRICT: SOUTH OKANAGAN



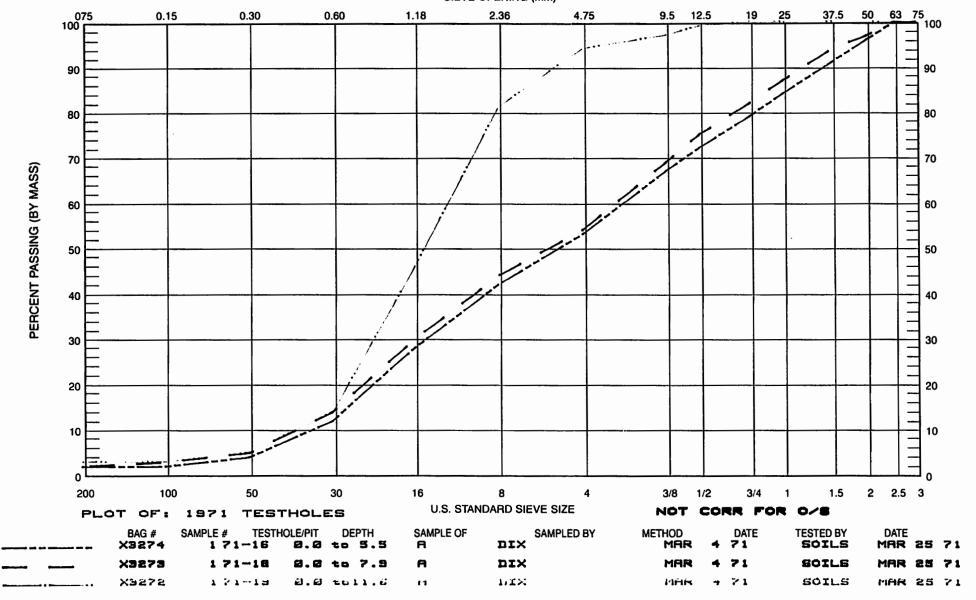


# AGGREGATE GRADATION CHART

PROJECT: TUC-UI-NUIT (BYERS)

DISTRICT: SOUTH OKANAGAN

SIEVE OPENING (mm) FILE NUMBER: 2M4-50-2424



**NT270** 

X3269

X3268

171-25

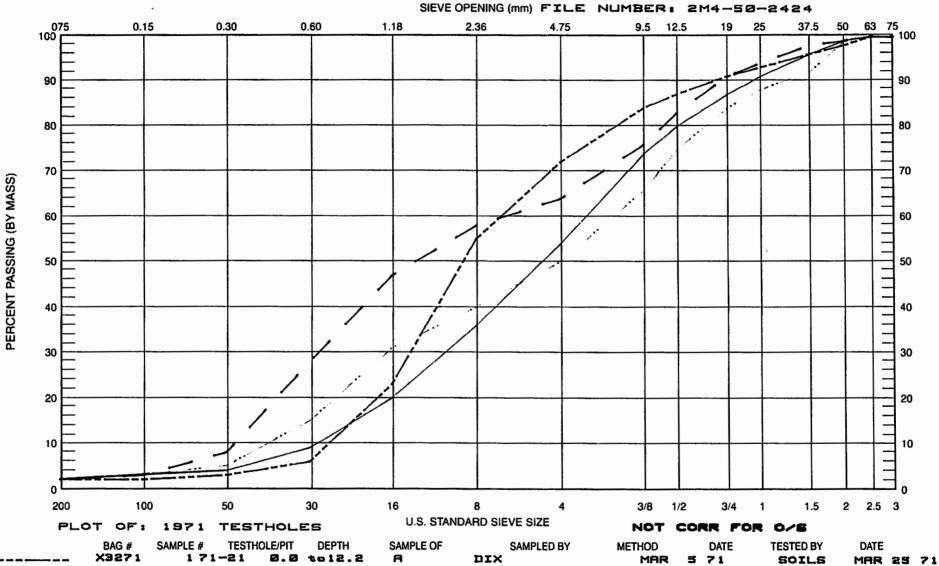
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#### REGION: THOMPSON-OKANAGAN

# AGGREGATE GRADATION CHART

PROJECT: TUC-UI-NUIT (BYERS)

DISTRICT: SOUTH OKANAGAN



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**USC Legend** 

# MATERIALS CLASSIFICATION LEGEND

MAJOR DIVISIONS		SYMBOL	SOIL TYPE				
	LS	GW	WELL GRADED GRAVELS OR GRAVEL—SAND MIXTURES, < 5% FINES				
STIC	AND SOILS	GP	POORLY-GRADED GRAVELS OR GRAVEL-SAND MIXTURES, < 5% FINES				
Š	GRAVEL GRAVELLY	GM*	SILTY GRAVELS, GRAVEL—SAND—SILT MIXTURES				
GRAINED SOILS	GR/	GC*	CLAYEY GRAVELS, GRAVEL—SAND—CLAY MIXTURES				
GR/	(0	SW	WELL-GRADED SANDS OR GRAVELLY SANDS, < 5% FINES				
SE	AND	SP	POORLY-GRADED SANDS OR GRAVELLY SANDS, < 5% FINES				
COARSE	SAND	SM*	SILTY SANDS SAND-SILT MIXTURES				
	S S	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	ND SILTS >50 CLAYS w	CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS				
Q J		OL	ORGANIC SILTS AND ORGANIC SILT—CLAYS OF LOW PLASTICITY				
		МН	INORGANIC SILTS, MICACEOUS OR DIATOM— ACEOUS FINE SANDY OR SILTY SOILS, PLASTIC SILTS				
FINE	SILTS AN	СН	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS				
	SI	ОН	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS				
	ANIC ILS	Pt	PEAT AND OTHER HIGHLY ORGANIC SOILS				
	SOIL	TS	TOPSOIL WITH ROOTS, ETC.				
COBBLES		SB	ROCK FRAGMENTS AND COBBLES, PARTICLE SIZE 75mm TO 300mm				
LARGE BOULDERS		LB	BOULDERS, PARTICLE SIZE OVER 300mm				
BEDROCK BR			BEDROCK				
FOR SOILS HAVING 5 - 12% PASSING .075 SIEVE, USE DUAL SYMBOL *GM1; GC1; SM1; SC1; 12 - 20% GM2; GC2; SM2; SC2; 20 - 30% GM3; GC3; SM3; SC3; 30 - 40% GM4; GC4; SM4; SC4; 40 - 50% PASSING .075mm SIEVE							



PROVINCE of BRITISH COLUMBIA MINISTRY OF TRANSPORTATION & HIGHWAYS Geotechnical & Materials Engineering

## **UNIFIED** SOIL CLASSIFICATION **LEGEND**

Drawn: LU Date: JULY'97 Scale:

ACAD File ACADSTDS File No.:

# **Photos**



Photo 1 Crusher-set up area and the west side of the pit face (June 2023).



Photo 2 Pit face is approximately 7m high (June 2023).



**Photo 3** Looking northeast from the side of the pit face looking down at the crusher set-up and stockpile areas (June 2023).



Photo 4 View of the western pit face (June 2023).

January 2024



**Photo 5** View looking south from the top of the developed area beyond the face with the crusher set up and stockpile area in the background (June 2023).



**Photo 6** Typical ground in the previously developed area that has seen regrowth (June 2023). January 2024