

TEST PIT NO. 4

0 - 0.15 m.	OVERBURDEN - roots, organics, topsoil
0.15 - 0.4 m.	CLAY - brown, moist, firm
# 0.95 m	- damp, no stones, stiff
# 1.57 m	- dry, light brown, stiff
1.57 - 2.0 m	CLAY-TILL - some silt, 3" - 6" stones, compact, hard, dry
2.0 - 3.0 m	CLAY-TILL - some silt, 3" - 6" stones, compact, hard, very dry

END OF TEST PIT AT 3.0 m
DAY ON COMPLETION

0 - 0.15 m	OVERBUREN - roots, organics, topsoils
0.15 - 0.4 m	CLAY - brown, moist, firm
0.4 - 0.8 m	CLAY - dry, very stiff, fractures into 1' squares, trace silt
0.8 - 1.3 m	very dry, some silt
1.3 - 1.9 m	CLAY-TILL - very dry, silty, compact, hard, small 1" stones
1.9 - 3.9 m	CLAY-TILL - very dry, silty compact, hard, small stones

END OF TEST PIT AT 3.9 m.
 DRY ON COMPLETION.

0 - 0.15 m	OVERBURDEN - roots, organics, topsoil
0.15 - 0.5 m	CLAY - brown, moist, firm
0.5 - 0.9 m	CLAY - damp, stiff, dense, fractures into 1' - 2' squares
1.65 m	- lighter colour, no stones
2.05 m	CLAY-PHILL - silty, dry, hard, small stones compact
2.05 - 2.25 m	CLAY-PHILL - hard, dry, 1' - 6' stones, silty
2.25 - 2.4 m	- very hard
END OF TEST PIT AT 2.4 m DRY ON COMPLETION	

0 - 0.15 m	OVERBURDEN - roots, organics, topsoil
0.15 - 0.5 m	CLAY - damp, firm
0.5 - 0.9 m	CLAY - dry, stiff
0.9 - 1.3 m	CLAY-FILL - dry, silty, hard, 2" stones
@ 2.0	- compact, 2" - 3" stones
3.8 - 4.4 m	- mostly clay, layered, breaks into angular chunks, small pebbles, damp, some silt

0 - 0.15 m	OVERBURDEN - roots, organic, topsoil
0.15 - 0.5 m	CLAY - damp, trace silt, crumbles, odd stone
1.0 - 1.6 m	CLAY-FILL - silt hard, 1' - 2' stones, dry, some
@ 2.0 m	- silty, 1' - 2' stones, hard, compact
@ 2.5 m	- silty, 1' - 4' stones, hard, compact
@ 3.45	- silty, 1' - 6' stones, very hard, compact
END OF TEST PIP AT 3.45 m	
DRY ON COMPLETION	

0 - 0.25 m OVERBURDEN - topsoil, organics
0.25 - 0.45 m CLAY - damp, small 1" stones, stiff
0.45 - 0.9 m. CLAY-TILL - damp, crumbly, 1' - 2" stones,
 hard
@ 1.35 m - dry, hard, one large 8" stone

END OF TEST PIT AT 1.35 m
DRY ON COMPLETION.

Granular sub-base material to the following requirements:

- .1 Crushed pit run or screened stone, gravel or sand consisting of hard durable angular particles free from clay lumps, cementation, organic material, frozen material and other deleterious materials.
- .2 Gradations to be within limits specified when tested to ASTM C136-84 and ASTM C117-84 and to have a smooth curve without sharp breaks when plotted on semi log grading chart.

Sieve Designation	% Passing
75 mm	100
25 mm	55-100
4.75 mm	25-100
2.00 mm	15-80
0.425 mm	4-50
0.075 mm	0-8

- .1 Liquid Limit
ASTM D4318-84
Maximum 25
- .2 Plasticity Index
ASTM D4318-84
Maximum 6
- .3 Los Angeles Abrasion
ASTM C131-81 (1987)
Gradation 'A'
Max % Loss by mass 50

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.1 Granular base requirements:
.1 Crushed stone or gravel consisting of hard,
durable, angular particles, free from
clay lumps, cementation, organic
material, frozen material and other
deleterious materials.
.2 Gradations to be within limits specified
when tested by ASTM C136-84 and ASTM
C117-84 and to have a smooth curve
without sharp breaks when plotted on
semi-log grading chart.

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<u>ASTM Sieve Designation</u>	<u>% Passing</u>
19 mm	100
9.5 mm	60 - 95
4.75 mm	40 - 70
2.36 mm	30 - 60
1.18 mm	20 - 45
0.30 mm	8 - 20
0.075 mm	2 - 9

- 3 Liquid Limit 2 - 9
ASTM D4318-84 Maximum 25
4 Plasticity Index
ASTM D4318-84 Maximum 6
5 Los Angeles Abrasion
ASTM C131-87 (1987)
Gradation 'A'
Max. % loss by weight: 45
6 Crushed particles: at least 50% of
particles by mass within each of
following sieve designation ranges to
be used at least 1.5% freshly fractured face.
Material to be divided into ranges
using methods of ASTM C136-84a.

<u>Passing</u>		<u>Retained on</u>
50 mm	to	25 mm
25 mm	to	19.0 mm
19.0 mm	to	4.75 mm

<p><u>1.1 Fires</u></p> <p>1.2 Disposal of <u>Wastes</u></p> <p><u>1.3 Drainage</u></p> <p><u>1.4 Site Clearing and Plant Protection</u></p> <p><u>1.5 Pollution Control</u></p> <p><u>1.6 Classification of Excavation</u></p>	<p>1. Fires and burning of rubbish on site permitted only when approved by Engineer. Obtain all necessary permits for governing agencies.</p> <p>2. Provide supervision, attendance and fire protection measures as directed.</p> <p>1. Do not bury rubbish and waste materials on site unless approved by Engineer and B.C. Parks.</p> <p>2. Do not dispose of waste or volatile materials, such as mineral spirits, oil or paint thinner into waterways.</p> <p>1. Provide temporary drainage and pumping as necessary to keep excavations and site free from water.</p> <p>2. Do not pump water containing suspended materials into waterways.</p> <p>3. Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authority requirements.</p> <p>1. Minimize stripping of topsoil and vegetation.</p> <p>2. Restrict tree removal to areas indicated or designated by Engineer and B.C. Parks.</p> <p>1. Control emissions from equipment and plant to local authorities emission requirements.</p> <p>2. Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads.</p> <p>1. General: excavation of rock and earth materials shall include clearing of site, placing of suitable excavated materials in embankment fills or dikes, and disposal of unsuitable material.</p> <p>2. Rock Excavation:</p> <p>1. Igneous, metamorphic and sedimentary rock in solid beds or masses in its original position which cannot be excavated without blasting or moved without prior loosening.</p> <p>2. Boulders or rock fragments having individual volume in excess of 1 m³.</p> <p>3. Earth Excavation: materials other than rock <u>including partially cemented materials</u> which can be ripped and excavated with heavy construction equipment.</p>
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2.1 Materials .1 Clay lining: selected clay sub-soil. Obtain from pond excavation or borrow area approved by Engineer and B. C. Parks

3.1 Excavation

- 1 Clear and grade lagoon area to a uniform level surface free of trees, stumps and debris.
- 2 Remove and dispose of all deleterious materials not classified as topsoil nor can be used for construction of lagoon embankment.
- 3 Remove and stockpile topsoil from lagoon area for replacement on cut slopes and outside slope of dykes.
- 4 Excavate by-pass ditches or re-routed surface drainage ditches as required.
- 5 Remove topsoil, humus, roots, pockets of sand and gravel and other deleterious material from dike to depth as directed.
- 6 Excavate basin for pond to lines and elevations indicated on the drawings.
- 7 Proof roll floor of lagoons, with heavy roller repair all soft spots.

3.2 Dike Construction

- 1 Construct dikes in locations indicated on the drawings to 1:1 slope (inside of cell) and 2:1 slope (outside berm slopes).
- 2 Use suitable excavated materials in dike construction.
- 3 Use only clean clay sub-soil for core construction. Place other excavated materials on slopes or faces of banks of lagoon.
- 4 Place excavated materials in 150mm compacted thickness layers and compact each layer to min. 95% Standard Proctor Density.
- 5 Hand finish or grade surface of completed dike to remove stones over 50mm in size and other debris.
- 6 Seed grass on all exposed embankment and cut slopes.
- 7 Rip-rap areas indicated on the drawings.

3.3 Installation of Sewers

- 1 Install or construct required manholes, cleanouts, distribution structures and lagoon piping in accordance with drawings.
- 2 Install sewer lines and make connections as indicated on drawings and in accordance with B.C. Plumbing Code.

3.4 Clay Lining

- 1 Place a 150mm compacted thickness layer of clay on bottom and sides of pond as indicated. Compact clay to 95% of Standard Proctor Density.

3.5 Landscaping

- 1 Grade in accordance with required elevations and slopes in accordance with Contract Drawings.

3.6 Fencing

- 1 Locate and install chain link type fencing as indicated.

3.7 Testing

- 1 Fill lagoon with water to a depth of approximately 450mm.
- 2 Mark level of water surface at a minimum of 3 points approximately 50 m apart.
- 3 Check and record levels of water surface daily for two weeks to an accuracy of 1mm.
- 4 Fill a watertight pan of at least 1 m² area to a depth of 200mm in a location near lagoon and exposed to weather.
- 5 If there is loss of water, in lagoon, compare to pan, locate leaks and repair.
- 6 Repeat above test if repairs were made.
- 7 Perform test and repairs at no cost to Owner.

3.8 Clean Up

- 1 Remove surplus material and debris from site. Spread and level piles of excess material as directed.

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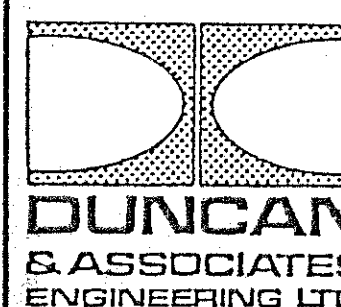
National Topographic Series Sheet 93 G / 2	Dwg. 1-1-5 No.
Park File Number 2-1-1-5	Sheet no. 3 of 4
Microfilm Number	

PROVINCE OF BRITISH COLUMBIA
MINISTRY OF PARKS

SCALE: N.T.S.	APPROVED BY:	DRAWN BY R.I.
DATE: NOV 1990	D.F.D.	REVISED

TEN MILE LAKE PROVINCIAL PARK
SEWAGE DISPOSAL SYSTEM

LAGOON DETAILS-TEST PIT LOGS



202-1940 THIRD AVE.
PRINCE GEORGE, B.C.