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SAND AND GRAVEL RESOURCE STUDY

OF THE

CUMBERLAND & T'SABLE RIVER AREA VANCOUVER ISLAND -BRITISH COLUMBIA

By: BAYROCK AND REIMCHEN SURFICIAL GEOLOGY LTD. North Vancouver, British Columbia

PREPARED FOR WELDWOOD OF CANADA LIMITED

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WELDWOOD

OF CANADA LIMITED

TABLE OF CONTENTS

Letter of Transmittal	
INTRODUCTION	1
Terms of Reference	1
Previous Work	1
Study Approach	2
Geological Setting	2
GEOLOGY	5
Fieldwork	5
Survey Results	6
POTENTIAL AGGREGATE RESERVES	7
QUALITATIVE ASPECT OF SAND	
AND GRAVEL DEPOSITS	9
MATERIAL TESTING	10
Introduction	10
Summary	10
Recommendations	11
CONCLUSIONS	14
RECOMMENDATIONS	17
REFERENCES CITED	19
SAMPLES	20
Field Descriptions	20
TABLES: TABLE I - Summary of Test Results	13
TABLE II - Petrographic Analyses	15
TABLE III - Mechanical Alteration	
Required to Improve Pitrun Gravel	
For Concrete Aggregate	16

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Table of Contents

Page No.

FIGURES: Figure 1 - Locality W-35 following page 20 11 Figure 2 -.. W-35 ... 11 11 Figure 3 -... W-35 ti. 11 Figure 4 -... W- 36 ... 11 21 11 Figure 5 -** W- 37 11 ... Figure 6 -W- 37 44 88 11 11 Figure 7 -W- 38 **99** 22 11 Figure 8 -.... •• W**-** 38 23 W-44 II. ... 26 Figure 9 -44 .. 11 Figure 10 -11 W-44 ... Figure 11 -It W-45 11 11 27 Figure 12 - Close-up View of top set delta gravels 11 11 29 Figure 13 - Concrete out buildings Constructed near locality W-38 f† H. ., Figure 14 - Close-up view of Figure 13 following page 29 19 APPENDIX I: Field Description of Samples APPENDIX II: Concrete Aggregate Report Analyses end of report Location of Sand and Gravel Deposits MAPS: Included Isopach Map, Surface Deposits Severally Volume Estimate of Sand and Gravel

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August 7, 1975

Mr. M. P. Curcio, Weldwood of Canada Limited, 1055 West Hastings Street, Vancouver, B.C. V6B 3V8

Dear Mike:

We are pleased to have had the opportunity to perform a study on the sand and gravel deposits of Cumberland and T'Sable River areas near Courtenay, British Columbia.

We have calculated that the <u>minimum</u> potential aggregate reserve of this area is in the order of 250,000,000 cubic yards.

Three areas have been delineated for development work. The sand and gravel deposits, with a minimum of alterations, have the necessary requirements for concrete aggregate. We would be pleased to answer any questions you may have regarding this report.

Sincerely, mick (i T.H.F. Reimchen, P. Geol.

THFR/mp

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VANCOUVER ISLAND RESOURCE STUDY SAND AND GRAVEL SURVEY OF THE CUMBERLAND AND T'SABLE RIVER AREA

INTRODUCTION

Terms of Reference

To conduct a survey of sand and gravel in the Cumberland and T'Sable River areas.

To evaluate the quality and quantity of sand and gravel deposits in the same area on a reconnaissance basis.

Previous Work

A soil survey for this area of Vancouver Island was conducted by Day, Farstad and Laird in 1959. The surface soils which overlie much of the sand and gravel deposits are brown podsols. A preliminary estimate of the quantity of some of the sand and gravel deposits for the Courtenay area was conducted by Leaming in 1968. The study is of a general nature but it does approximate a rough outline of some deposits. The surficial geology of the area was mapped on an exploratory basis by Fyles in 1960. The map identified many of the major deposits and their approximate outline.

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Study Approach

This study is based on an interpretation of aerial photographs, published data, and Weldwood Company reports in conjunction with a field investigation. In addition, several samples were collected on a reconnaissance basis in an attempt to typify the deposits, both quantitatively and qualitatively.

Geological Setting

Vancouver Island forms part of a chain of mountains called Insular Mountains. These mountains form the outer fringe of the mountain range of the Coast Mountains. Vancouver Island Mountains consist of folded and faulted volcanic and sedimentary rocks, chiefly, of Mesozoic Age, which have been intruded by igneous rocks during Late Mesozoic and younger time. Consequently, the volcanic and sedimentary rocks have been metamorphosed by heat and pressure during the time of this igneous intrusion.

Lowlands form only a small portion of the whole of the Island. In general, those present on the east coast as a narrow belt parallelling the Strait of Georgia are termed the Nanaimo Lowlands. They are underlain by sedimentary rocks of Cretaceous and younger ages. The formations are flat to gently dipping and have not been involved in the orogeny of the Vancouver Island Mountains (the Cumberland and T'Sable River Lease Area is underlain for the most part by cretaceous rocks of the Nanaimo Lowlands). The Georgia Depression which underlies the Strait of Georgia to the east, is an orogenically active depression belt. It contains a thick sequence of Cretaceous and younger sedimentary rocks which form part of the Coastal Trough.

The mountains of Vancouver Island are relatively young in the geomorphic sense as they show considerable ruggedness and relief. This is partly due to relatively recent uplift.

Post-glacial (the last 9,000 years) isostatic readjustment has been uneven on Vancouver Island as the highest marine deposits on the west coast of the island are found at an elevation of 50 feet above sea level; 300 feet above sea level at Victoria; rising to 600 feet above sea level north of Campbell River (Day et al. 1959). In the Courtenay area the upper limit of marine overlap seems to be at the 575 foot contour.

On the other hand, the fiords and narrow inlets on the west coast of the mainland along the Strait of Georgia and Queen Charlotte Sound signify for a fact that recent submergence of the land has occurred, drowning former well-integrated river systems.

During the last several million years, Western Canada has been subjected to numerous and

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intense glaciations. These Continental Cordilleran glaciations resulted in sculpturing some of the mountains into Alpine topography, overdeepening of previous river valleys by valley glaciers and deposition of variable thicknesses of glacial deposits. On Vancouver Island glacial deposits are thin in the mountains and relatively thicker in the lowlands.

In the Beaufort Range and Forbidden Plateau west of Courtenay, small glaciers enlarged their cirque basins and flowed downslope. They became integrated into a large valley glacier which was situated in the depression now occupied by Comox Lake. As the glacier advanced eastward towards the sea, it eroded the underlying bedrock thereby overdeepening the Comox Lake Valley. The valley glacier issued forth onto the Nanaimo Lowlands depositing till at the base of the glacier. When the supply of ice was depleted in the cirque basins up stream, the valley glacier stagnated. At the junction of the mountains and the lowlands, east of Comox Lake, meltwater streams flowed from the glacier and deposited sand and gravel into the sea in the form of a delta. These sand and gravel deposits are greater than 150 feet in thickness in some places, and are thought to coarsen westward (up current). As the toe of this valley glacier decreased in size due to melting, sand and gravel became concentrated in cracks in the decaying ice sheet. Upon final melting of the ice, diverse sizes of linear to circular mounds of sand and gravel, resulted. These mounds of sand and gravel termed

kames grade north and east into the flat deltaic terrace deposits. The kames are thought to be coarser than the deltaic terrace deposits as less sorting has occurred.

As the lowlands of Vancouver Island emerged from the sea the waves washed and winnowed the surface of the surrounding glacial deposits. As a result, a thin cover (usually less than 10 feet) of horizontally bedded, coarse sands and gravels mantle the countryside.

In the latter phases of glacial stagnation and upon coastal emergence the Brown's, Puntledge, Trent and T'Sable Rivers incised themselves through the surface deposits into the underlying bedrock forming their present courses. Small terraces of limited extent were formed on the banks of these rivers prior to their incision into the bedrock.

GEOLOGY

Fieldwork

Conventional aerial photographs of two scales; 40 chain (1" = 2,640°) and 80 chain (1" = 5,280°) were studied for this area. The large scale photographs (80 chain) proved useful for broad descriptions and locations of surface deposits. Detailed delineations of all fluvial deposits were performed on the small scale (40 chain) photographs.

The results were investigated in the field in late June and early July. All accessible roads and trails were traversed by truck and motor bike, for all of the lease area.

SurveyaResults

Aggregate deposits (more than 250,000,000 yds.³) of commercial value were located north and west of Cumberland.

A smaller deposit (6,000,000 yds.³) of terrace gravel was located in the lease area, south of the Trent River.

No significant deposits of gravel were located on the lease blocks north of the T'Sable River.

As described previously, a thin deposit of horizontally bedded, coarse sands and gravels overlies much of the terrain below the 575 foot contour. These wave washed sediments, usually less than 10 feet in thickness, are too erratic in distribution and thickness for commercial development. Locally, they can be mined for road construction.

POTENTIAL AGGREGATE RESERVES

Air photo interpretation combined with field mapping delineated the location of the kames (gravel and sand) and deltaic terrace deposits (sand and gravel). After the geological sequence of events had been determined in the field, the drill hole data was reinterpreted. An isopach map of surface deposits was then constructed using the reinterpreted drill hole information and field work results.

A drill hole (BH-127) in northeast quarter Section 34, Township 10 contains 178 feet [±] of sand and gravel. In support of the interpretation of this drill hole log, some of the gravel pits presently being mined in Section 36 have faces of 130 feet. Air photo interpretation and field data suggest a minimum of an additional 40 to 60 feet of sand and gravel below the floor of the pits. The sand and gravel in all cases rests on bedrock. Since the surface of the bedrock is flat to gently sloping between Cumberland and the Puntledge River, it is nearly certain that the central parts of the deltaic terrace are greater than 150 feet in thickness.

The linear to circular mounds of sand and gravel (kames) south of the delta vary in elevation from 30 feet to greater than 100 feet. It is assumed that the thickness of gravel and sand in

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this area is in the order of 20 feet average. Locally, many areas can be found where the gravel will be 100 feet or more in thickness. It was found necessary to average the thickness of gravel in this area so that a volume estimate could be made. Superimposing the location map of sand and gravel deposits with that of the isopach map of surface deposits, on a grid pattern, an approximate volume of potential aggregate was determined. In this way, it was calculated that the <u>minimum</u> potential aggregate reserve of the Cumberland and T'Sable river area is in the order of 250,000,000 cubic yards.

Some of the deltaic gravel and sand deposits west of the headwaters of the Puntledge River and adjacent to the mountains, are covered by coarse, angular fan material about 10 feet in thickness. This alluvial material contains a significant proportion of fines in the silt and clay size fraction.

The sand and gravel supplies in the lease area south of the Trent River approximate 6,000,000 cubic yards. The presence of soft sandstones and shale in this deposit would seem to preclude its use for concrete. In addition, the sand and gravel because of its origin (river terrace deposit) contains a significant proportion of silt and clay size material. The aggregate supplies in this deposit are useful in general road construction.

QUALITATIVE ASPECT OF SAND AND GRAVEL DEPOSITS

The approximate outline of all comercially viable aggregate deposits are shown on the location map.

The river terrace deposit, south of the Trent River is thought to be unsuited for concrete aggregate because of its deleterious constituents. However, it is excellent aggregate for road construction as it would require a minimum of alteration.

The kames and deltaic terrace north and west of Cumberland have been samples on a reconnaissance basis. Thirteen samples were collected (see Location Map and Appendix 1). These samples, with an average weight of 50 pounds, were analysed with emphasis placed on their use for concrete aggregate.

MATERIAL TESTING VANCOUVER ISLAND RESOURCE STUDY PREPARED FOR BAYROCK AND REIMCHEN SURFICIAL GEOLOGY LIMITED BY TRYLOWSKY ENGINEERING LTD.

Introduction

Thirteen pitrun samples were received from Bayrock and Reimchen Surficial Geology Ltd. for the purpose of concrete aggregate quality evaluation. The samples were visually assessed and appropriate tests were performed as specified in CSA A23.1.

In all cases sieve analyses were done to determine the size distribution of the coarse and the fine fractions as well as the split between the two.

Five samples were also tested for soundness as per CSA A23.2.4 - Sulphate Resistance Test. A summary of the test results is attached together with the grain size distribution curves and other data.

Summary (Table I)

In general, all samples consisted of gravelly sands or sandy gravels where the sand (fine aggregate fraction) was clean and coarse, having F.M. (Fineness Modulus) values in the upper

range or above the specified limits.

The rock (coarse aggregate fraction) is generally sub angular or round, very hard and durable. Some samples contained rock stained with iron or manganese, this however, would not preclude their use for concrete manufacture.

Recommendations

1. The proportion of fine aggregate (sand) to the coarse (rock) is fairly high especially in the most accessible deposits (W-35 and W-36). The excess sand could be used for purposes other than the "normal" concrete. These could include production of precast products such as pipes, posts or panels.

The in situ sand is very clean requiring no washing; also it is in most cases too coarse for normal concrete production. Some blending (in most cases less than 20 per cent) would be recommended using either local beach sand (see sample W-35c) or Fraser River sand (sample SA 015).

2. The test results show the rock fraction to be of good quality and acceptable for the production of concrete aggregates. A simple crushing operation would be required to utilize all the available material and to produce the necessary sizing.

TABLE	Ι
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	FI	NE AGGREGAT	E	COARS	SE AGGRE	GATE	
SAMPLE NO.	% of Tota	l F.M.	% Minus # 100	🛱 of Total	Soundr A23.2.	ness % CSA 9 1-1/2"	REMARKS
SPECS OR "NORMAL"	43	2.2 - 3.2	2 - 10	57	12%	0 - 5	
W-35 A 75	75	3.5	0.3	25	-	0	
W-35 B 75	49	3.7	0.3	51		1 6	
W-36 A 75	76	3.1	0.9	24	-	0	W_n of Sand-4.4%
W-37 - 75	3 3	3.2	2.1	67	0.37	56	Max. size of C.A.3"
W-38 - 75	50	2.7	5.0	50	-	34	
W-41 - 75	37	3.5	1.3	63	0.69	27	
W-42 - 75	46	3.6	1.5	54	0.09	0	
W-43 - 75	53	3.4	1.8	47	-	0	•
W-45 - 75	48	3.8	1.0	52	0.72	0	
W-46 - 75	50	3.7	0.7	50	0.51	26	
W -48 - 75	62	3.8	0.9	38	-	0	Some sand coating on C.A.
W-49 - 75	30	3.7	2.7	70	-	0	Rust coating on C.A,
W-50 - 75	3 5	3.7	1.4	65	-	0	
W-35 C 75		1.4	2.3				Possible blend sead

SUMMARY OF TEST RESULTS

W-44 was not analysed as it was considered to be the same as W-41.

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CONCLUSIONS (TABLE III)

Large, commercially viable reserves of sand and gravel have been located in the Courtenay area. The aggregate has been sampled on a reconnaissance basis and found suitable for concrete aggregate with some alterations.

All of the samples analysed, except W-38, are lacking to some degree in fine sand (less than 100 mesh). The sand and gravel from location W-38 requires a small amount of crushing for use as concrete aggregate.

Samples W-35b, W-37, W-41 and W-46 have an overabundance of coarse aggregate above 1-1/2inches and requires some degree of crushing.

Samples W-35a, W-36, W-37, W-43, W-48, W-49 and W-50 lack either sufficient gravel size materials or sand size materials for use as concrete aggregates. Blending of fine sand such as wind blown dune sand or the addition of sand from the delta of the Fraser River in Vancouver would be suitable. Coarse gravel size materials would have to be obtained from kame locations nearby.

The petrographic analyses of four samples was performed in accordance with CSA Standards for concrete aggregate (TABLE II). The samples were selected for the basis of a gross representation for the area. Since the source of all of these sand and gravel supplies is similar, the lithology will be the same.

TABLE II

PETROGRAPHIC ANALYSES OF FOUR SAND AND GRAVEL SAMPLES FROM THE CUMBERLAND AND T'SABLE RIVER AREAS

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		SAMPL	ES		CT.ASSTRT_	
ROCK TYPE	W-36a	W- 37	W- <u>38</u>	W-43	CATION	FACTOR
Fine grained acid volcanic	81.0	85.0	84.0	89.0	Good	1
Granite (hard)	8.5	6.0	6.0	3.0	Good	1
Quartzite (hard)	9.5	7.5	9+5	6.0	Good	1
Chert	1.0	1.5		1.0	Fair	3
Clay iron stone (encrustation)				1.0	Poor	б
Conglomerate			0.5		Good	1

The petrographic examination was made in accordance with CSA Standards on material retained on the 3/8 inch sieve.

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TABLE III

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MECHANICAL ALTERATION REQUIRED TO IMPROVE PITRUN GRAVEL FOR CONCRETE AGGREGATE

		Addition of	Addition of	Addition of
<u>Sample</u>	Crushing	fine sand	sand	gravel
W-35a		х		x
W-35d	Х	х		
W- 36		х		X
W-37	Х	х	х	
W - 38	X.			
W-41	Х	x		
W-42		х		
W-43		х		X
W-45		х		
W-46	X	x		
W- 48		x		x
W-49		х	x	
W-50		x	x	

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RECOMMENDATIONS (See Location Map)

1. The best deposit of sand and gravel is located at sample locality W-38 west of Cumberland by Comox Lake. The testing of the 80 foot face of exposed gravel shows it to be uniform in composition and would require the minimum amount of alteration for concrete aggregate. In the immediate area around the sample location approximately 6,000,000 cubic yards of concrete aggregate are present.

It is recommended to commence detailed development testing of the area as outlined on the Location Map.

2. Excellent gravel deposits are located at the northern end of the Pigeon Pond sanitation land fill, at sampling localities W-37, W-41 and W-42. The tests conducted on the gravel show it to be of very good quality with small alterations required for concrete aggregate beneficiation. It is estimated that in the vicinity of the above mentioned sample localities approximately 30,000,000 cubic yards of gravel are present.

It is recommended that additional testing be done in that locality in order to prove the extent of this deposit.

3. Excellent gravel deposits are located at the north end of Maple Lake around localities W-45 and W-46. The preliminary tests conducted at these localities show the gravel to be of good quality with only the addition of fine sand required for concrete aggregate. Although some large boulders will be present to the northeast of Maple Lake, a very minimum amount of crushing is expected. It is estimated that there are approximately 16,000,000 cubic yards of gravel present as outlined on the Location Map.

It is recommended that further testing be done to typify the sand and gravel.

REFERENCES CITED

Day, J. H., Farstad, L., and Laird, D. G. 1959 Soil Survey of Southeast Vancouver Island and Gulf Islands, British Columbia: Rept. 6, B. C. Soil Survey, 104 pages, 4 maps.

Fyles, J. C. 1960 Surficial Geology of Courtenay, British Columbia; Geol. Surv. Canada, Map 32-1960

Leaming, S. F. 1968 Sand and Gravel in the Strait of Georgia Area; Geol. Surv. Canada, Paper 66-60, 149 pages.

FIELD DESCRIPTIONS OF SAMPLES

APPENDIX I

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SAMPLES

Field Descriptions:

Locality W-35 (Figure 1)

Gravel pit in Section 36, Township 10; 400 feet ⁺ above sea level.

0 - 100 feet+ The top several feet consists of alternating beds of sand and gravel from granule to pebble size, horizontally bedded and heavily iron stained. This unit truncates cross-beds which dip westerly $(265^{\circ} - 305^{\circ})$ from 15 to 32 degrees. The cross-beds consist of alternating beds, 2 - 3 feet thick, of very clean, coarse sand with 10 per cent greater than number 4 sieve size and beds of granule to pebble size sand and gravel of maximum size less than 2 inches. There seems to be a shortage of fine sand in this deposit. Scattered in seemingly random layers are 3 foot beds of large cobbles up to 6 inches long diameter. The pebbles are heavily stained with iron and manganese oxides in the upper 20 feet. Below this iron oxide coatings tend to become rare but manganese coatings are



FIGURE 1: Locality W-35; Gravel pit showing cross-beds dipping westerly. In upper right-hand corner note horizontal bedded deltaic top set gravels. Face of pit is greater than 100 feet.



FIGURE 2: Locality W-35; Close-up of clean, coarse sandy layer

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FIGURE 3: Locality W-35; Close-up of coarse, pebbly layer.

common. The sands and gravels are loose and uncemented and consist mainly of volcanic rocks (98 per cent) with minor amounts of quartzite, granites and chert.

Locality W-35a (Figure 2)

Channel sample taken of the very coarse, clean sand.

Locality W-35b (Figure 3)

Channel sample taken of the granule ' to pebble size layers.

Locality W-36

Gravel pit in eastern part of Section 36, Township 10; 400 feet [±] above sea level.

0 - 120 feet This gravel pit is similar to W-35, although there seems to be more clean, coarse sand in beds ranging from 1 to 4 feet in thickness, (Figure 4). A channel sample was taken of the alternating beds of sand and sand and gravel as shown in Figure 4.



FIGURE 4: Locality W-36; Close-up of alternating beds of clean, coarse sand and pebbly sand and gravel.



FIGURE 5: Locality W-37; Panoramic view of the top one-half of a kame near the Pigeon Pond sanitation land fill. The bedding on the righthand side of the photograph shows post-depositional slumping resulting from the melting out of ice after deposition.



FIGURE 6: Locality W-37; Close-up of gravel and sand in the upper six feet showing iron staining and recent rootlets.

Locality W-37 (Figure 5)

Sanitation land fill (garbage dump) at Pigeon Pond about 1 mile northwest of Cumberland near old railway grade; 550 feet ⁺ above sea level.

0 - 35 Feet+

Sand and gravel, poorly sorted, wellgraded, granule to cobble size: modal size is 1 inch and comprises 30 per cent of the pebbles; 10 per cent of the pebbles are over 3 inches; the matrix is relatively clean, about 3 per cent would pass through a 200 mesh sieve. The iron staining seems to be concentrated near the base of the pebble layers, and around Recent rootlets which extend 8 feet down from the surface (Figure 6). The sands and gravels are loose and uncemented and the pebbles are sub to well-rounded. They consist predominately of volcanics (99 per cent) with minor amounts of granites, quartzites and the odd chert pebble. Channel sample taken.

Locality W-38 (Figure 7)

Gravel pit in Section 27 of Township 10, just east of Comox Lake; 500 feet + above sea level.



FIGURE 7: Locality W-38; Panoramic view of abandoned gravel pit by Comox Lake. Note horizontal top set beds near top which truncate cross-beds below. 0 - 60 feet+ Sand and gravel in mounds, some greater than 80 feet in height kames. The upper 10 feet of these deposits are horizontally bedded and tends to be coarser than the underlying cross-beds it truncates. The crossbeds dip 20 to 30 degrees in a southwesterly direction. The cross-beds consist of alternating bands of coarse granular sand and granules with pebble to cobble size bands, poorly sorted (well-graded). No large rocks over 4 inches in long diameter are present (Figure 8). About 80 per cent of this deposit would probably pass through a 4 inch sieve. Some of the cross-beds are disrupted and show signs of postdepositional slumping. This faulting is most likely caused by ice melting out from below the gravel after deposition. The sands and gravels are loose and uncemented and consist predominately of volcanic rocks (78 per cent) and granites (18 per cent), minor amounts of quartzites and chert are present. Channel sample was taken.

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FIGURE 8: Locality W-38; Close-up of alternating beds of clean sand and sand and gravel.

Locality W-41

Backhoe hole at junction of delta and kames 1/4 mile east of Pigeon Pond sanitation land fill; 550 feet + above sea level.

0 - 4 feet Gravel and sand, pebble to cobble size grading to clean, coarse, pebbly gravel. The gravel and sand is horizontally bedded and heavily iron stained. This unit represents top set beds of the delta.

4 - 14 feet+ Gravel and sand, horizontally bedded, pebble to cobble size, modal size is 1.5 inches and comprises 70 per cent of the pebbles. Beds of medium to coarse sand, 1 foot thick are present. The pebbles have manganese and iron oxide staining; the iron oxide seems to be concentrated in bands 4 inches thick. The lithology consists predominately of volcanic rocks (94 per cent) with minor amounts of granites and quartzites. Channel sample taken.

Locality W-42

Backhoe hole on old rail grade about 1/3 mile west of Pigeon Pond sanitation

land fill in Section 34, Township 10: 550 feet ⁺ above sea level.

0 - 4 feet Gravel and sand with large boulders of 12 inch long diameter, poorly sorted; less than 5 per cent of the pebbles are over 3 inches long diameter. The gravels and sands are heavily iron stained.

4 - 14 feet Sand and gravel, little iron staining from 6 feet to 14 feet. Sand and gravel is clean and ranges from granules to boulders up to 2 feet in long diameter although the average size is less than 2 inches. Channel sample taken from 6 - 14 feet above the surface. This sample is taken 24 feet below the surface of the top of the delta, as sand and gravel was formerly removed for construction of a railway grade.

Locality W-43

Backhoe hole near the eastern edge of the delta in Section 34, Township 10. The top 3 feet of sand and gravel has been removed for construction of a roadway many years ago.

- 0-6 feet Sand and gravel, loose, uncemented, very clean, no boulder sizes are present. 80 per cent of the material is less than 1 inch in size. The iron staining is concentrated in the coarse pebble bands.
- 6 11 feet + Sand and gravel, clean, coarse, granule to pebble size, no iron staining evident. Channel sample taken from 4 - 11 feet.

Locality W-44

Backhoe hole on trail 100 yards east from the Pigeon Pond sanitation land fill road. The surface of this area is flat to gently rolling with local relief of 20 feet; 550 feet [±] above sea level.

0 - 10 feet+ Sand and gravel, pebbles to cobble size, clean, coarse, heavily iron stained (Figure 9) in top 6 feet, boulders to 14 inches long diameter, 10 per cent pebbles by volume, less than 4 inches in size. The upper 6 feet of this unit is horizontally bedded and truncates cross-beds similar to W-35. The cross-beds are clean and fine-grained, greater than 90 per cent of the material is less than 3 inches



FIGURE 9: Locality W-44; Close-up view of iron staining in the top four feet. Recent rootlets extend several feet from the surface.



FIGURE 10: Locality W-44; Close-up view of sand size material near bottom of hole.

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in size, (Figure 10). Channel sample taken from 0 - 10 feet.

Locality W-45

Backhoe hole on old road about 100 feet above Maple Lake to the north in Section 36, Township 10. This sample is taken near the junction of the delta and kames; 500 feet [±] above sea level.

- 0 10 feet Gravel and sand, coarse with 70 per cent pebbles by volume up to 16 inches long diameter, greater than 60 per cent of the pebbles are less than 4 inches (Figure 11).
- 10 13 feet+ Sand and gravel, clean, granules to
 pebbles, cross-bedded to horizontally
 bedded, loose, iron-stained, poorly
 sorted, although there is a conspic uous absence of sand size material.
 Channel sample taken from 0 13 feet.

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Locality W-46

Backhoe hole on trail east of cemetary of Section 25, Township 10 by Maple Lake; 450 feet ⁺ above sea level.



FIGURE 11: Locality W-45; Close-up view of coarse sand and gravel. Note iron and manganese staining on pebbles.

- 0 6 feet Sand and gravel horizontally bedded
 granules to pebbles, 90 per cent
 are less than 3 inches long diameter.
 This bed is striking by its absence
 of matrix.
- 6 12 feet+ Gravel and sand, pebble to cobble size, clean, loose matrix present. Channel sample taken from 2 - 12 feet.

Locality W-48

Backhoe hole one-half mile southeast of Pigeon Pond sanitation land fill on railway grade in Section 26, Township 10. This area is marked by strongly rolling mounds of sand and gravel greater than 30 feet in height. 530 feet [±] above sea level.

0 - 12 feet+

Gravel and sand, horizontal beds to cross-beds. Alternating bands of pebbles, 3 inches in thickness with clean, coarse sand beds, 3 inches in thickness. The granules to cobbles comprise about 75 per cent of the material by volume. The gravels are cemented somewhat by iron oxides down to the 5 foot level. Channel sample taken. Locality W-49

Backhoe hole on trail west of Pigeon Pond sanitation land fill near a little lake in Section 27, Township 10; 550 feet [±] above sea level. The area consists of linear to circular mounds of sand and gravel with local relief greater than 35 feet in height. Description of deposit same as W-48. Channel sample taken from 3 - 12 feet.

Locality W-50

Backhoe hole on trail in northeast Section 33, Township 10, on top of the delta, 550 feet [±] above sea level.

0 - 13 feet Sand and gravel, horizontally bedded, cemented by iron oxides in upper 4 feet. Rootlets to 4 feet. About 50 per cent of the material is pebble size, boulders comprise less than 5 per cent of the material. Channel sample taken from 4 - 13 feet.



FIGURE 12: Close-up view of top set delta gravels truncating lower cross-beds in gravel pit by cemetary.



FIGURE 13: View of concrete out buildings constructed prior to 1918 near the east end of Comox Lake. The area is overgrown by vegetation to over 100 feet in height.



FIGURE 14: Close-up view of uncrushed pebbles, pit-run, used from gravel pit (Locality W-38) in construction of concrete out buildings of Fig.13.

CONCRETE AGGREGATE REPORT ANALYSES

APPENDIX II

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CONCRETE AGGREGATE REPORT

CLIENT BAYROCK & REIMCHEN

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A second to

DATE JULY 20/75 SAMPLE NO. W 35 A - 75 TEST NO. 5A 002 CLIENT P.O.

00100	SE AGGREGATE		17a	NE AGGREGATE	11/13
SIEVE	% RET/	AINED	SIEVE	RET.	ATNED
SIZE	INDIVIDUAL	CUMULATIVE	<u>stže</u>	IND IV IDUAL	CUMULATIV
			3/8		
- <u></u>	······································		No. 4		0
1			8	24.6	24.6
3/4	12.5	23.6	30	50.9	55-3
1/2	19.2	42.8	50	13.8	<u> </u>
3/8	13.2	56.0	100	5.6	99.7
<u>No. 4</u>	44.0	100.0	200		A. 4 - 14
Pan			Pan Pan	0.3	100.0
			I	<u> </u>	3.5
COAL CONTER	NT NIL		ORG. IMPURIT		-
REMARKS			REMARKS REPR.	75% OF T	0746
COARSE AGGI GRADATION 2. RETAIN 1 ¹ 2-4	REGATE LIMITS NED 1-4 3/4-4	0 10 20	REMARKS REPR.	75% OF T	
COARSE AGGI GRADATION 1 ¹ / ₂ -4 0	REGATE LIMITS NED 1-4 3/4-4	0 10 20 30	REMARKS REPR.	75% OF T	
REMARKS COARSE AGGI GRADATION I $\frac{1}{2} - 4$ 0 $\frac{1}{2} - 5$ 0	REGATE LIMITS NED 1-4 3/4-4 0 -5 0	0 10 20 30 40	REMARKS REPR.	75% OF T	
COARSE AGGI GRADATION 	REGATE LIMITS NED 1-4 3/4-4 0 -5 0	$ \begin{array}{c} 0 \\ 10 \\ 20 \\ 30 \\ 40 \\ \hline 10 \\ 50 \\ \hline 10 \\ 50 \\ \hline 10 \\ 10 \\ 10 \\ 10 \\ 10 \\ 10 \\ 10 \\ 10 \\$	REMARKS REPR.	75% oF T	
COARSE AGGI GRADATION 1 ¹ 2-4 0 1 ² 20-5 0 4 30-65 2 4	REGATE LIMITS NED 1-4 3/4-4 0 -5 0 0-10 0-75	0 10 20 30 40 60	REMARKS REPR.	75% OF T	
COARSE AGGI GRADATION """"""""""""""""""""""""""""""""""""	REGATE LIMITS NED 1-4 3/4-4 0 -5 0 0-10 0-75 45-80	0 10 20 30 40 50 60 70		75% oF T	
$\begin{array}{c} \text{REMARKS} \\ \hline \text{COARSE} & \text{AGGI} \\ \text{GRADATION} \\ \hline 1^{1}2 - 4 \\ \hline 0 \\ \hline 1^{2}2 & 0 - 5 \\ \hline 0 \\ \hline 0 \\ \hline 4 & 30 - 65 \\ \hline 2 \\ \hline 4 \\ 8 & 70 - 90 \\ \hline 4 & 95 - 100 90 \\ \hline \end{array}$	REGATE LIMITS NED 1-4 3/4-4 0 -5 0 0-10 0-75 45-80 0-10090-100	0 10 20 30 40 40 50 60 70 80		75% of T	
REMARKS COARSE AGGI GRADATION "2 RETAIN 1 ¹ 2-4 0 1 ² 2 0-5 0 1 ² 2 0-5 0 4 30-65 2 4 8 70-90 4 95-100 90 8 00	REGATE LIMITS NED 1-4 3/4-4 0 -5 0 0-10 0-75 45-80 0-10(90-100 5-10(95-100	0 10 20 30 40 50 60 70 80 90		75% oF 7	
REMARKS COARSE AGGI GRADATION 112-4 0 12-4 0 12-4 0 12-4 0 12-4 0 12-4 0 12-4 0 12-4 0 12-4 0 12-4 0 12-4 0 12-4 0 12-4 0 12-4 0 13-65 2 4 8 70-90 4 95-100 8 95	REGATE LIMITS NED 1-4 3/4-4 0 -5 0 0-10 0-75 45-80 0-10090-100 5-10095-100	0 10 20 30 40 50 60 70 80 90 100 0 100 0 10 0 0 0 0 0 0 0 0 0 0 0 0 0		75% of T	

CONCRETE AGGREGATE REPORT

CLIENT

BAYROCK & REIMCHEN

DATE JULY 30/75 SAMPLE NO. W 358-75 TEST NO. SA 006 TEST NO. CLIENT P.O.

		SAMPLE TYPE		SAMPLED BY	
ATE SAMPLED		DATE RECEIVED	2/7/75	DATE TESTED	27/7/75
COARS	SE AGGREGATE		FI	NE AGGREGATE	
SIEVE	% RET	AINED	SIEVE	% RE	TAINED
SIZE	INDIVIDUAL	CUMULATIVE	SIZE	INDIVIDUAL	CUMULATIVE
			3/8		
2	<u> </u>		<u>No. 4</u>	0	<u> </u>
12	- A		8	24.4	29.9
7/4		5.0	10	36.5	
	<u> </u>	25.4	50	22.6	82.3
7/9	27.3	50.7	50	13.8	<u> </u>
<u> </u>	<u> </u>	60.0	200	2.6	
NO. 4	<u>~~7.7</u>	71.6	200	<u> </u>	/2.0.0
Ban			E M	0.5	100.0
			• • • • • • • • • • • • • • • • • • • •		•
COAL CONTEN REMARKS	$\frac{1}{100} \frac{1}{100} \frac{1}$	7 1/2 in.	ORG. IMPURI COAL CONTEN REMARKS V REPR. 9	TIES NO. T NIL ERY CLEAN 49º/3 OF 7	N, GREY SAN TOTAL SAMPL
COAL CONTEN REMARKS	$\frac{1}{10} \frac{1}{10} \frac$	$\begin{array}{c} \begin{array}{c} \\ \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \\ \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \\ \\ \\ \end{array} \\ \begin{array}{c} \\ \\ \\ \end{array} \\ \end{array} \\ \begin{array}{c} \\ \\ \\ \end{array} \\ \begin{array}{c} \\ \\ \\ \end{array} \\ \end{array} \\ \begin{array}{c} \\ \\ \\ \end{array} \\ \begin{array}{c} \\ \\ \\ \end{array} \\ \end{array} \\ \begin{array}{c} \\ \\ \\ \end{array} \\ \begin{array}{c} \\ \\ \\ \end{array} \\ \end{array} \\ \begin{array}{c} \\ \\ \\ \end{array} \\ \begin{array}{c} \\ \\ \\ \end{array} \\ \begin{array}{c} \\ \\ \\ \end{array} \\ \end{array} \\ \begin{array}{c} \\ \\ \\ \end{array} \\ \begin{array}{c} \\ \\ \\ \end{array} \\ \end{array} \\ \begin{array}{c} \\ \\ \\ \end{array} \\ \end{array} \\ \begin{array}{c} \\ \\ \\ \end{array} \\ \begin{array}{c} \\ \\ \\ \end{array} \\ \end{array} \\ \begin{array}{c} \\ \\ \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \\ \\ \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \\ \\ \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \\ \\ \end{array} $	ORG. IMPURI COAL CONTEN REMARKS REPR. 9	TIES NO. T NIL ERY CLEAT	V, GREY SAN TOTAL SAMPL 90 80
COAL CONTEN REMARKS / COARSE AGGE GRADATION 1 2 RETAIN 1 ¹ 2-4 1 2 0	$\frac{1}{1} \frac{1}{1} \frac{1}$	$7 1'/_{2} iN.$	ORG. IMPURI COAL CONTENT REMARKS V REPR. 9	TIES NO. T NIL ERY CLEAT	N, GREY SAN TOTAL SAMPL 10 9 8 7
COAL CONTEN REMARKS	$\frac{\text{REGATE}}{1-4}$	$> 1'/_{2} iN.$	ORG. IMPURI COAL CONTEN REMARKS REPR. 9	TIES NO. T NIL ERY CLEAN 19% OF T	V, GREY SAN TOTAL SAMPL 10 10 10 10 10 10 10 10 10 10 10 10 10
COAL CONTEN REMARKS $/$ COARSE AGGE GRADATION I $^{\circ}$ RETAIN $1^{\circ}_{2}-4$ 1 2° 0 1°_{2} 0	$\frac{\text{NT} \text{NIL}}{0} \text{ wAS}$	$7 1'/_{2} iN.$	ORG. IMPURI COAL CONTEN REMARKS REPR. 9	TIES NO. T NIL ERY CLEAT	N, GREY SAN TOTAL SAMPL 10 9 80 7 6
COAL CONTEN REMARKS $/$ COARSE AGGE GRADATION I 2 RETAIN $1^{1}2-4$ 1 2 0 $1^{1}2$ 0-5 1 0-5 1 0 3 (4 120 65	$\frac{1}{\sqrt{6}} = \frac{1}{\sqrt{6}} = 1$	$\begin{array}{c} 0 \\ 10 \\ 20 \\ 30 \\ 40 \\ 50 \end{array}$	ORG. IMPURI COAL CONTENT REMARKS V REPR. 9	TIES NO. T NIL ERY CLEAT	V, CREY SAN TOTAL SAMPL 10 9 8 7 8 7 6 5
COAL CONTEN REMARKS $/$ COARSE AGGE GRADATION I 2 RETAIN $1^{1}2-4$ 1 2 0 $1^{1}2$ 0-5 1 0 3/4 30-65 1/2	$\frac{100}{10} = \frac{100}{10} = 1$	$7 1'/_{2} iN.$	ORG. IMPURI COAL CONTENT REMARKS V REPR. 9	TIES NO. T NIL ERY CLEAT	V, GREY SAN TOTAL SAMPL 10 9 8 7 6 5 4
COAL CONTEN REMARKS / 4 COARSE AGGE GRADATION I 5. RETAIN 1 ¹ 2-4 1 2 0 1 ¹ 2 0-5 1 0 3/4 30-65 1/2 4	$\frac{100}{10} = \frac{100}{10} = 1$	7 $1'/_{2}$ iN .	ORG. IMPURI COAL CONTEN REMARKS REPR. 9	TIES NO. T NIL ERY CLEAT	V, GREY SAN TOTAL SAMPL 10 9 80 7 6 5 40 40 40 40 40 40 40 40 40 40 40 40 40
COAL CONTEN REMARKS / 4 COARSE AGGE GRADATION I 2. RETAIN 1 ¹ 2-4 1 2 0 1 ¹ 2 0-5 1 0 3/4 30-65 1/2 4 3/8 70-90	$\frac{\text{REGATE}}{0} = \frac{3/4 - 4}{0}$	$\begin{array}{c} 0 \\ 10 \\ 20 \\ 30 \\ 40 \\ 50 \\ 60 \\ 70 \\ 80 \\ \end{array}$	ORG. IMPURI COAL CONTEN REMARKS REPR. 9	TIES NO. T NIL ERY CLEAT	V, GREY SAN TOTAL SAMPL 101 91 81 71 61 81 71 61 81 71 61 81 71 61 81 71 61 81 71 61 81 71 81 71 81 71 81 71 81 71 81 71 81 71 81 71 81 81 71 81 81 71 81 81 81 81 81 81 81 81 81 81 81 81 81
COAL CONTEN REMARKS / $(1)^{-1}$ COARSE AGGE GRADATION I (2, R) RETAIN $(1)^{2}-4$ 1 (2, 0) $(1)^{2}$ 0 $(1)^{2}$ 0 $(1)^$	$\frac{\text{REGATE}}{\text{IMITS}} = \frac{1}{2} \frac{3}{4} - 4$	$\begin{array}{c} 0 \\ 10 \\ 20 \\ 30 \\ 40 \\ 50 \\ 60 \\ 70 \\ 80 \\ 80 \\ 80 \\ 80 \\ 80 \\ 80 \\ 8$	ORG. IMPURI COAL CONTEN REMARKS REPR. 9	TIES NO. T NIL ERY CLEAT	V, GREY SAN TOTAL SAMPL 100 90 80 70 60 50 40 30 20
COAL CONTEN REMARKS / 4^{-1} COARSE AGGE GRADATION I 5. RETAIN 1 ¹ 2-4 1 2 0 1 ¹ 2 0-5 1 0 3/4 30-65 1/2 4 3/8 70-90 0. 4 95-100 90 8 95	$\frac{\text{NT} \text{N}}{\text{N}} \frac{\text{N}}{\text{N}} \frac{\text{N}}{N} \frac{\text{N}}{N} \frac{\text{N}}{N} \frac{\text{N}} \frac{\text{N}}{N} \frac{\text{N}}} \frac{\text{N}}{N} \frac{\text{N}} \frac{\text{N}}{N} \frac{\text{N}}{N} \frac{\text{N}} \frac{\text{N}}{N} \frac{\text{N}}} \frac{\text{N}}{N} \frac{\text{N}} \frac{\text{N}}{N} \frac{\text{N}} \frac{\text{N}}{N} \frac{\text{N}}} \frac{\text{N}}{N} \frac{N} \frac{\text{N}}{N} \frac{N}} \frac{\text{N}}{N} \frac{N} \frac{N}}{N} \frac{N} \frac{N}}{N} \frac{N} \frac$	7 $1'/_{2}$ iN .	ORG. IMPURI COAL CONTEN REMARKS REPR. 9	TIES NO. T NIL ERY CLEAT 19% OF T	V, GREY SAN TOTAL SAMPL 100 90 80 70 60 50 40 20 10

CONCRETE AGGREGATE REPORT

CLIENT BAYROCK & REIMCHEN

DATE JULY 30/75 SAMPLE NO. W36 A - 75 5A 003 TEST NO. CLIENT P.O.

DATE SAMPLED DATE RECEIVED $2/7/75$ DATE TESTED $27/7/7$ COARSE AGGREGATE FINE ACGREGATE SILVE * RETAINED SILVE * RETAINED SILVE * No. 4 0 - 1 /5./ /5./ 16 2/./ 3/4 /7.7 32.8 30 37.8 1/2 /9./ 5/.9 2/.6 9 3/8 /4.8 66./ 100 5.2 9 No. 4 33.3 /0.0.0 200 5.2 9 SHAPE ROUNDED. F.M. 2.2 2.6 2.6 2.6 2.6 2.9 3.2 COARSE SOUNDNESS (VISUAL) V. G. F.M. RANGE 2.2 9 3.2 COARSE SAND % CRUSH SOUNDES YOUCANIC KOCK YOUCANIC KOCK YOUCANIC KOCK NATE MOISTURE - 4.4.4/0 NATE MOISTURE - 4.4.4.6 Y	
COARSE AGGREGATE FINE AGGREGATE SILVE 3 RETAINED SILVE 3 RETAINED SILVE 3 RETAINED SILVE 3 RETAINED SILVE $3/8$ $1001VIDUAL$ CUMULATIVE $3/8$ 2 $3/8$ $1001VIDUAL$ CUMULATIVE $3/8$ 1 15.7 15.7 16 21.7 $3/4$ 17.7 32.8 30 37.8 69 $1/2$ 9.7 51.7 9.6 9.7 9.7 $3/8$ 14.8 66.7 100 5.2 9.7 $No. 4$ 33.3 100.9 5.2 9.7 9.7 $No. 4$ 33.3 100.9 $9.22.9$ 5.2 9.7 $SIAPE$ $RoundED.$ $F.M.$ $Range 2.6 - 2.9 FINE SOUNDNESS (VISUAL) V. G. F.M. RAnge 2.6 - 2.9 FINE SOUNDNESS (VISUAL) V. G. F.M. RAnge $	5
SILVE 3 RETAINED SILVE 3 RETAINED SIZE INDIVIDUAL CUMULATIVE $3/8$ INDIVIDUAL CUMULA 2 No. 4 0 $3/8$ 7.4 7.4 7.4 1 15.7 5.7 16 21.7 32.8 30 34.8 657 $1/2$ 19.7 51.9 50 24.6 92 92.6 92.7 $3/8$ 14.8 66.7 100 5.2 96 92.7 96 92.7 96.7 92.7 96.7 92.7 96.7 92.7 96.7 92.7 96.7 92.7 96.7 92.7 96.7 92.7 96.7 92.7 96.7 92.7 96.7 92.7 96.7 92.7 96.7 92.7 96.7 92.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 96.7 9	·
INDIVIDUAL COMULATIVE 37.8 INDIVIDUAL CUMULA 2 No. 4 0 3/8 $/3/8$ <	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	TIVE
1^{L}_{2} 8 73.4 74.6 94.6 97.2 <td><u></u></td>	<u></u>
1 15.7 15.7 16 27.7 37.8 300 37.8 66.7 $1/2$ 17.7 32.8 300 37.8 66.7 1000 5.2 97.6 $3/8$ 14.8 66.7 1000 5.2 97.6 97.6 8 79.6 2000 97.6 97.6 97.6 97.6 8 79.6 97.6 97.6 97.6 97.6 97.6 8 79.6 97.6 97.6 97.6 97.6 97.6 8 79.6 97.6 97.6 97.6 97.6 97.6 8 79.6 97.6	4
$\begin{array}{c c c c c c c c c c c c c c c c c c c $.5
1/2 $1/4$ $1/4$ $3/4$ $3/4$ $1/4$ $3/4$ $1/4$ $3/4$ $1/4$ <t< td=""><td>1.3</td></t<>	1.3
No. 4 33.3 100 3.0 100 8 100 200 200 200 910 9.7 100 9 Pan 0.9 100 7.0 910 0.9 100 9 Pan 0.9 100 7.0 7.0 7.0 9 Pan 0.9 7.0 7.0 7.0 7.0 SHAPE $Rounded J$ $V. G.$ $F.M.$ RANGE 2.2 2.6 7.0 8.0 9.5 $9.$	3.9
8 Pan 0.9 107 Pan 9.9 9.9 107 SHAPE Rounded. F.M. 2 2.2 2.2 2.9 MEDIUM SURSH SOUNDNESS (VISUAL) V. G. F.M. RANGE 2.2 2.9 -3.2 COARSE SOUNDNESS (VISUAL) V. G. SAND SAND SAND SAND COAL CONTENT N/L REMARKS GREY VOLCANIC KOCK REMARKS VERY CLEAN SHARP S A. REPRES. 24 % o F TOTAL NAT. MOISTURE -4.4 % o 0 O 10 20 30 40 10 20 30 40 11 0-5 0 10 20 30 40 10 <	1./
Pan F.M. Z SHAPE $R \circ u \wedge D \in D$. F.M. $2.2 - 2.6$ FINE SUMPE $R \circ u \wedge D \in D$. F.M. $2.2 - 2.6$ FINE SOUNDNESS (VISUAL) $V. G.$ F.M. $2.9 - 3.2$ COARSE SOUNDNESS (VISUAL) $V. G.$ $3 SAND$ $3 SAND$ $3 SAND$ COAL CONTENT N/L $SCORSE ACCONTENT N/L$ N/L $COARSE ACCONTENT N/L$ N/L REMARKS $GREY$ $VOLCANIC Kock$. $NAT. MOISTURE - 4.4 ^{0}/_{0}$ $OCOAL CONTENT N/L$ COARSE ACGREGATE 0 0 0 0 0 1^{12} $0-5$ 0 10 20 0 0 1^{12} $0-5$ 0 10 0 0 0 $1/2$ $40-75$ 30 0 0 0 0 $3/4$ $30-65$ $0-10$ 0 0 0 0 0 $1/2$ $40-75$ 0 0 0 0 0 0 0 0 0	0.0
SHAPE $R \circ UNDED$. \$ CRUSH SOUNDNESS (VISUAL) V. G. COAL CONTENT N/L REMARKS GREY VOLCANIC ROCK. A.REPRES. 24% OF TOTAL. COARSE AGGREGATE GRADATION LIMITS $\frac{115}{2} - 4$ 1-4 3/4-4 $\frac{2}{2} 0$ $\frac{115}{2} - 5$ 0 $\frac{115}{2} - 5$ 0	5./
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	
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$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	- 7
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	6
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	
$ \frac{3/8}{0.495-10090-10090-100} = \frac{45-80}{90} $ $ \frac{2}{12} \frac{1}{2} \frac{3}{45} \frac{3}{8} \frac{4}{8} = \frac{8}{16} = \frac{10}{100} $	7
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	
$2 \frac{14}{2} \frac{3}{44} \frac{3}{8} \frac{4}{8} \frac{16}{8} \frac{30}{50} \frac{50}{100}$	2
SIEVE SIZE	

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CONCRETE AGGREGATE REPORT

BAYROCK & REIMCHEN CLIENT

DATE $\int ULY \frac{3}{75} / \frac{75}{55}$ SAMPLE NO. W - 37 - 75TEST NO. SA 004CLIENT P.O.

		SAMPLE TYPE	R. SAND.	SAMPLED BY	
PATE SAMPLED		DATE RECEIVED	2/7/75	DATE TESTED	27/1/75
COARS	SE AGGREGATE		FI	NE AGGREGATE	
SIEVE	<u>% RET</u>	AINED	SIEVE	% RE	TAINED
	INDIVIDUAL	CUMULATIVE	7/0	INDIVIDUAL	
	<u></u>		<u> </u>	0	
15	-*		8	21.2	21,2
1	12.5	12.5	16	23.3	44.5
3/4	25.3	37.8	30	25.4	69.9
$\frac{1/2}{7/8}$	3/.8	69.6	100	20.9	90.8
<u> </u>	1/9	98.1	200	/ <i>/</i> •/	<i>1 · 7</i>
8			Pan	2.1	/0-0.0
Pan	1.9	100.0	F.M.		3.2
% CRUSH SOUNDNESS	(VISUAL) GOO	۵	% FINER THA	N No. 200	
COAL CONTEN REMARKS LARGER TO MOST ROC	NT 56 % 07 HAN 11/2 11 KS WITH IR	E C.A. WAS N — MAX 3". LON COATING.	COAL CONTEN REMARKS	A. REPR.	33 % OF TOT
COAL CONTER REMARKS LARGER TO MOST ROC COARSE AGGI GRADATION	NT * 56 % 07 NAN 11/2 17 KS WITH IR REGATE LIMITS	E C.A. WAS $N - MAX 3^{4}$. <u>LON COATING</u> .	COAL CONTEN REMARKS	A. REPR.	33 % OF 707
COAL CONTEL REMARKS LARGER TO MOST ROC COARSE AGGI GRADATION	NT K 56 % 07 NAN 11/2 11 KS WITH IR REGATE LIMITS NED	$E C.A. WAS$ $N - MAX 3^{4}.$ $\frac{ON COATING}{10}$	COAL CONTEN REMARKS	A. REPR.	33 % oF 707
COAL CONTER REMARKS LARGER TO MOST ROC COARSE AGGI GRADATION 2 RETAIN 1 ¹ 2-4	NT K 56 % 07 NAW 1'/2 // KS WITH IR REGATE LIMITS VED 1-4 3/4-4	E C.A. WAS $N - MAX 3".$ $ON COATING.$ 0 10 20	COAL CONTEN REMARKS	A. REPR.	33 % 0F 707
COAL CONTEL REMARKS LARGER TO MOST ROC COARSE AGGI GRADATION I C RETALL 1 ¹ 2-4 2 0	$\frac{1}{4} 56 \% 07$ $\frac{1}{1} 1 \% 17$ $\frac{1}{1} 1 \%$ $\frac{1}{1} 1 \%$ $\frac{1}{1} 1 \%$ $\frac{1}{1} 1 \%$ $\frac{1}{1} 4 3/4 - 4$	E C.A. WAS $N - MAX 34.$ $LoN COATING.$ 0 10 20 30	COAL CONTEN REMARKS	A. REPR.	33 % oF 707 100 90 80 70 60
COAL CONTER REMARKS LARGER TO MOST Roc COARSE AGGI GRADATION I $^{\circ}$ RETAIN $1^{1}2-4$ 2 0 $1^{1}2$ 0-5	$ \frac{1}{4} 56 \frac{1}{2} \frac{1}{2} $ $ \frac{1}{1} \frac{1} \frac$	E C.A. WAS $N - MAX 3".$ $O = 10$ 10 20 30 40	COAL CONTEN REMARKS	A. REPR.	33 % oF 707 100 90 80 70 60
COAL CONTEL REMARKS LARGER TO MOST ROC COARSE AGGI GRADATION I $^{\circ}$ RETALL $1^{1}2-4$ 2 0 $1^{1}3$ 0-5 1 0 3/4 30-65	$ \frac{1}{4} 56 \frac{1}{2} \frac{1}{2} $ $ \frac{1}{1} \frac{1} \frac$	E C.A. WAS $N - MAX 34.$ $LoN COATING.$ 0 10 20 30 40 0 50	COAL CONTEN REMARKS	A. REPR.	33 7. oF 707 100 90 80 70 60 50
COAL CONTER REMARKS LARGER TO MOST Roc COARSE AGGI GRADATION $^{\circ}$ RETAIN $1^{1}2-4$ 2 0 $1^{1}2$ 0-5 1 0 3/4 30-65 1/2	$ \frac{1}{4} 56 \frac{1}{2} \frac{1}{2} $ $ \frac{1}{4} \frac{1}{2} \frac{1}{2} \frac{1}{2} $ $ \frac{1}{4} \frac{3}{4} \frac{4}{4} $ $ \frac{1}{6} \frac{1}{6} \frac{1}{2} \frac{1}{2} $ $ \frac{1}{2} $	E C.A. WAS $N - MAX 34.$ $O = 10$ 10 20 30 40 40 $G = 50$ 60	COAL CONTEN REMARKS	A. REPR.	33 % oF 707 100 90 80 70 60 50 40
COAL CONTEL REMARKS CARGER TO MOST Roc COARSE AGGI GRADATION $^{\circ}$ RETALL 1 ¹ 2-4 2 2 0 1 ¹ 2-4 2 1 0 3/4 30-65 1/2 4 3/8 70-80		$ \begin{array}{c} C.A. WAS \\ $	COAL CONTEN REMARKS	A. REPR.	33 7. oF 707 100 90 80 70 60 50 40 30
COAL CONTEN REMARKS LARGER TO MOST ROC COARSE AGGI GRADATION 2 RETAIN $1^{1}2-4$ 2 0 $1^{1}2$ 0 $1^{1}2$ 1 0 3/4 30-65 1/2 4 3/8 70-90 No. 495-10090	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$C.A. WAS N - MAX 3^{4}.ON COATING$. O 10 20 30 40	COAL CONTEN REMARKS	A. REPR.	337. oF 707 100 90 80 70 60 50 40 30 20
COAL CONTEN REMARKS LARGER TO MOST ROC COARSE AGGI GRADATION $^{\circ}$ RETAIN $1^{1}2-4$ 2 0 $1^{1}2$ 0 $1^{1}2$ 0 $1^{1}2$ 4 3/4 30-65 1/2 4 3/8 70-90 No. 4 95-100 90	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$C.A. WAS V - MAX 3^{4}.ON COATING$. O 10 20 30 40	COAL CONTEN REMARKS	A. REPR.	33 7. oF 707 100 90 80 70 60 50 40 30 20 10
COAL CONTEN REMARKS LARGER TO MOST ROC COARSE AGGI GRADATION $^{\circ}$ RETAIN $1^{1}2-4$ 2 0 $1^{1}2$ 0-5 1 0 3/4 30-65 1/2 4 3/8 70-90 No. 4 95-100 90 8 99	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$C.A. WAS V - MAX 3^4.ON COATING.01020304040404040404040404$	COAL CONTEN REMARKS	A. REPR.	337. oF 707 100 90 80 70 60 50 40 30 20 10 0
COAL CONTEN REMARKS LARGER TO MOST ROC COARSE AGGI GRADATION $^{\circ}$ RETAIN $1^{1}2-4$ 2 0 $1^{1}2$ 0 $1^{1}2$ 0 $1^{1}2$ 4 3/4 30-65 1/2 4 3/8 70-90 No. 4 95-100 90 8 99	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$ \begin{array}{c} C.A. WAS \\ N - MAX 34. \\ 20 \\ 20 \\ 30 \\ 40 \\ 40 \\ $	COAL CONTEN REMARKS F.	A. REPR.	33 7. oF 707 100 90 80 70 60 50 40 30 20 10 0 50 100 200
COAL CONTEL REMARKS LARGER TO MOST Roc COARSE AGGI GRADATION I 2 RETAIN $1^{1}2-4$ 2 0 $1^{1}2 0-5$ 1 0 3/4 30-65 1/2 4 3/8 70-90 No. $4 95-100 90$ 8 99	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$ \begin{array}{c} C.A. WAS \\ N - MAX 3". \\ 20N COATING. \\ $	COAL CONTEN REMARKS F	T NIL A. REPR. 8 16 30 12E LIM	337. 0F 707 100 90 80 70 60 50 40 30 20 10 50 100 20 10 0 50 100 200 ITS PER CSA A23
COAL CONTEN REMARKS LARGER TO MOST ROC COARSE AGGI GRADATION $^{\circ}$ RETAIN $1^{\circ}_{2}-4$ 2 0 1°_{2} 0 $1^{\circ}_{2} -4$ 2 0 $1^{\circ}_{2} -4$ 3/4 30-65 1/2 4 3/8 70-90 No. 4 95-100 90 8 99 TESTED BY	NT f 56 % 7 NAN 1 $\%$ 17 KS WITH IR REGATE LIMITS SED 1-4 3/4-4 0 -5 0 0-10 0-75 45-80 0-100 5-10095-100 S. U. F.	$ \begin{array}{c} C.A. WAS \\ V - MAX 34. \\ \underline{ONCOATING}. \\ \\ \underline{ONCOATING}. \\ \underline{ONCOATING}. \\ \underline{OONCOATING}. \\ \underline{OONCOATING . \\ \underline{OONCOATING}. \\ OONCOATING . \\ \underline{OONCOATING . \\ $	COAL CONTEN REMARKS F.	A. REPR.	33 7. 6 F 707 100 90 80 70 60 50 40 30 20 10 50 100 200 ITS PER CSA A23

CONCRETE AGGREGATE REPORT

CLIENT BAYROCK & REIMCHEN

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JULY 30/75 DATE SAMPLE NO. W 38-75 TEST NO. SA 005 TEST NO. CLIENT P.O.

DATE SAMPLED DATE RECEIVED $2/7/75$ DATE TESTED $2/7/75$ DATE TESTED $2/7/75$ COARSE AGGREGATE SILVE \$ RETAINED SILVE \$ SILVE \$ SILVE \$ SILVE \$ SILVE \$ SILVE \$ SOUNDAL \$ SILVE \$ SOUND \$ SOUND & SILVE \$ SAND			SAMPLED BY	R. SAND	SAMPLE TYPE G		URCE
COARSE AGGREGATE FINE AGGREGATE SILVE % RETAINED SLEVE % RETAINED SIZE INDIVIDUAL CUMULATIVE $3/6$ INDIVIDUAL CUMU 2 No. 4 0 0 0 0 1 15.9 1.5.9 16 13.7 2 3/4 30.9 46.8 30 23.7 5 3/4 30.9 46.8 30 23.7 5 3/8 14.8 50 30.7 5 5 3/8 14.9 8 2.7 100 14.4 7 No. 4 16.5 9.8.9 200 7 6 7 7 No. 4 16.5 9.8.9 200 7	75	+1/7/7	DATE TESTED 구	2/7/75	DATE RECEIVED		TE SAMPLED
SIEVE % RETAINED SLEVE % RETAINED SIZE INDIVIDUAL CUMULATIVE $3/8$ INDIVIDUAL CUMULATIVE 2 $3/8$ $3/8$ $3/8$ 0 0 1'1 15.9 15.9 16 13.7 2 $1/2$ $2/3.3$ 68.1 50 30.2 23.7 $5/4$ $3/8$ $1/2$ $2/3.3$ 68.1 50 30.2 23.7 $5/6$ $3/8$ $1/2$ $2/3.3$ 68.1 50 30.2 8 $3/8$ $1/4.8$ 82.7 100 14.4 6 68.1 50 30.2 8 $3/8$ $1/4.8$ 82.7 100 14.4 68.1 50 30.2 8 Shape $80.0 \times DED$ $F.M.$ $Range \rightarrow 22.2$ 2.6 2.9 $MEDIUM$ Soundness $VISUAL$ 60.0 $F.M.$ $RANGE \rightarrow 22.6$ 2.9 $MEDIUM$ COAL CONTENT N/L $REMARKS$ $F.A \cdot REFR \cdot 50.\%$ 60 </td <td></td> <td></td> <td>IE AGGREGATE</td> <td>FI</td> <td></td> <td>AGGREGATE</td> <td>COARS</td>			IE AGGREGATE	FI		AGGREGATE	COARS
S12E IND IV IDUAL CUMULATIVE S12E IND IV IDUAL CUMU 2 3/8 No. 4 0 1 12 12 No. 4 0 1 14 15.9 16 13.7 2 3/4 30.9 46.8 30 23.7 5 1/2 2/.3 68.7 50 30.2 5 3/8 14.8 30.9 44.8 30 23.7 5 3/8 14.8 30.2 23.7 5 5 5 3/8 14.9 8.2.7 100 14.4 4 6 7 No. 4 16.0 9.8.9 200 7 6 7 7 7 8 9.6.9 200 5.0 19 7		TAINED	% RETA	SIĘYĘ	INED	% RETA	SIEVE
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	LATIVE	CUMULA	INDIVIDUAL	SIZE	CUMULATIVE		5126
112 10.4 8 73.0 1 1 15.9 15.9 16 13.7 2 3/4 30.9 46.8 30 23.7 3 1/2 21.3 68.1 50 30.2 3 3/8 14.8 30 23.7 30.2 3 3/8 14.8 32.7 100 14.4 4 No. 4 16.0 98.9 200 30.2 30.2 30.2 No. 4 16.0 98.9 200 70.0 70.0 70.0 70.0 70.0 70.0 70.0 Pan 1.1 10.0 98.9 200 20.2 20.0 70.			~	<u> </u>			
1 15.9 15.9 16 13.7 2 $3/4$ 30.9 46.8 30 23.7 53.7	<u>รับ</u>	1 /2	/2 0	8			11%
3/4 30.9 46.8 30 23.7 30.2 $1/2$ $2/.3$ 68.7 50 30.2 50.2 $3/8$ $1/4.8$ 82.7 100 14.4 50 $3/8$ $1/4.9$ 82.7 100 14.4 70.200 8 98.9 200 14.4 70.200 14.4 70.200 8 98.9 200 98.9 200 70.4 70.200 8 98.9 200 98.9 200 70.200 70.200 8 70.700 6.000 7.000 7.000 7.0000 7.0000 8 70.70000 7.00000 7.000000 $7.000000000000000000000000000000000000$	<u>., 7</u>	26	13.7	16	159	15.9	1
1/2 $2/.3$ 68.7 50 30.2 8 $3/8$ $1/4.8$ 81.7 100 $1/4.4$ 7.4 No. 4 $1/6.5$ 98.9 200 7.4 98.9 200 8 7.6 98.9 200 7.6 7.6 7.6 7.6 9 7.6 7.6 7.6 7.6 7.6 7.6 7.6 9 7.6	0.4	50	23.7	30	46.8	30.9	3/4
$3/8$ 14.8 $8 \pm .9$ 100 14.4 74.4	50.6	80	30.2	50	68.1	21.3	1/2
No. 4 16.0 9.89 200 Pan 7.0 Pan 5.0 7 Pan 7.0 0 F.M. 9 9 9 9 9 10 <td>15.0</td> <td>95</td> <td>14.4</td> <td>100</td> <td>82.9</td> <td>14.8</td> <td>3/8</td>	15.0	95	14.4	100	82.9	14.8	3/8
8 7an 5.0 7 Pan 1.1 700.0 F.M. SHAPE $koundEd$ F.M. F.M. SHAPE $koundEd$ F.M. F.M. F.M. Stape $koundEd$ F.M. F.M. F.M. F.M. Stape $koundEd$ F.M. F.M. F.M. F.M. F.M. Stape $koundEd$ F.M. F.M. F.M. F.M. F.M. F.M. Stape 2.2 2.2 2.2 2.2 2.9 Galaxies Stape 3.0 0.0 </td <td></td> <td></td> <td></td> <td>200</td> <td>9.8.9</td> <td>/6.0</td> <td><u>No. 4</u></td>				200	9.8.9	/6.0	<u>No. 4</u>
Pan P.M. SHAPE $kounded$ SHAPE $kounded$ SCRUSH SOUNDNESS (VISUAL) SOUNDNESS (VISUAL) Good COAL CONTENT N/L REMARKS $34' o/o oF C.A · > 1'/2''$ REMARKS $34' o/o oF C.A · > 1'/2''$ REMARKS CLEAN COARSE AccKS CLEAN $10'_2$ $1^12 0-5 0$ 0 $1^12 0-5 0$ 0 $1^12 0-5 0$ 0 $1^12 0-5 0$ 0 $1^12 0-5 0$ 0 $1^12 0-5 0$ 0 $1^12 0-5 0$ 0 $1^12 0-5 0$ 0 $1^12 0-5 0$ 0 $1^12 0-5 0$ 0 $1^12 0-5 0$ 0 $0 0$ 0 $0 0$ 0 $0 0$ 0 $1^12 0-5 0$ 0 $1^12 0-5 0$ 0 $0 0$ 0 $0 0$ 0 $0 0$ 0 $0 0$ 0	50.0	100	5.0	Pan		<u> </u>	8
SHAPE $kounded Fine % CRUSH Soundness (visual) Good Fine Soundness (visual) Good Good % SAND COAL CONTENT N/L Remarks 34' \circ / \circ \circ F C.A · > /1/2" Remarks 34' \circ / \circ \circ F C.A · > /1/2" Coal content N/L Remarks 34' \circ / \circ \circ F C.A · > /1/2" Remarks Sound content N/L Remarks CLEAN Intro or for the standard content of the standard conten$	<u>.</u> ./	eL .		<u> </u>	100,0	<u></u>	ran
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	T0741	S OF T	NIL REPR. 50%	COAL CONTEN REMARKS F.A.	$A \cdot > 1 / 2$	HOLO OF C. KS CLEAN	COAL CONTEN REMARKS 3 Roc
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	100				0	GATE MITS	COARSE AGGR GRADATION L
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	8(<u> </u>		┝─╍┥╍┞╼┅╌┼╌╴	20	4 3/4-4	112-4 1
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	7(├ <u>──</u> ┤──	30		2 0
1 0-5 0 3/4 30-65 0-10 60 1/2 40-75 70	6/			<u> </u>	40		1 ¹ / ₂ 0-5
3/4 30-65 0-10 60 1/2 40-75 70 10	c (5 0	1 0-
1/2 40-75 E 70						0-10	3/4 30-65
						-75	1/2 40
$3/8 70-90 45-80 \propto $						45-80	3/8 70-90
495-10090-10090-100 8 0	20			╽───┟╍╎	e 80	10090 - 100	0. 495-10090
8 90 90 90			<u>┈┦───┤───┤</u> ───	╏━╍╌┨╌┨──╍╍╸┨╺╍╍	90	10095-100	8 05
	(<u></u>	<u> </u>			10422 1001	
2 1 3/4 3/8 4 8 16 30 50 10	0 200	50 100	8 16 30	3/45 3/8 4	2 15 1		
SIEVE SIZE	SA A23	TS PER CSA	1.7MTT	SIEVE S			,

CONCRETE AGGREGATE REPORT

JULY 31/75 DATE CLIENT BAYROCK & REIMCHEN SAMPLE NO. W 41-75 5A 012 TEST NO. CLIENT P.O. PROJECT CK. SAND SAMPLE TYPE SOURCE SAMPLED BY 2/7/75 DATE TESTED 29/7/75 DATE SAMPLED DATE RECEIVED COARSE AGGREGATE FINE AGGREGATE SIEVE **% RETAINED** % RETAINED SIEVE SIZE SIZE INDIVIDUAL CUMULATIVE INDIVIDUAL CUMULATIVE 3/8 No. 4 0 15 8 25 21.7 1 21.7 16 22. 48.8 3/425.9 30 47.6 23 1/220.2 7.8 50 92 ð Q 3/8 9 100 10. 7 8.7 98 <u>No, 4</u> 200 8 Pan 3 00.0 Pan 00,0 F.M. 2.3 2.2 - 2.62.6 - 2.92.9 - 3.2FINE MEDIUM ROUNDED SHAPE F.M. RANGE COARSE **%** CRUSH % SAND GOOD 8 FINER THAN NO. 200 < 3 % SOUNDNESS (VISUAL) ORG. IMPURITIES NO. COAL CONTENT -NIL COAL CONTENT 277. WAS > 11/2 IN REMARKS REMARKS REPR. 37% OF TOTAL COARSE AGGREGATE 0 100 GRADATION LIMITS 10 90 % RETAINED 13-4 1-4 3/4-4 20 80 2 0 30 70 13 0-5 0 40 60 1 0-5 Ō RETAINED 50 50 3/4 30-65 0-10 60 40 1/2 40-75 30 70 3/8 70-90 45-80 80 20 No. 495-100 90-100 90-100 90 10 8 b5-10d 01-10 100 o 2 13 1 3/43 3/8 4 8 16 30 50 100 200 SIEVE SIZE LIMITS PER CSA A23 S.U.F. TESTED BY

CHECKED BY

CONCRETE AGGREGATE REPORT

CLIENT

BAYROCK & REIMCHEN

JULY 30/75 NO. W 42-75 NO. SA 009 DATE SAMPLE NO. TEST NO. CLIENT P.O.

AMIN CALIFIC NO.		SAMPLE TYPE	GR. SAND	SAMPLED BY	& lalac
ATE SAMPLED	DEL ACCOUCATE	DATE RECEIVED	2/1/15	DATE TESTED	~ / / / / 3
CUA	KSE AGGREGATE		F 11	VE AGGREGATE	
SIEVE	<u> </u>	AINED	l sięże	% RETA	VINED
5126	INDIVIDUAL	CUMULATIVE	SIZE	INDIVIDUAL	CUMULATIVE
			3/8		<u> </u>
2			No. 4	_	
15	23.6	23.6	8	28.1	28.1
1	11.5	35.1	16	2.3.9	52.0
3/4	11.4	46.5	30	22.6	74.6
1/2	18.5	65.0	50	17.7	92.3
3/8	11 3	763	100	6.2	985
<u>No 4</u>	204	467	200		/ / / / / /
8		······	Pan	7.6	1000
Pap	2 2	755.0	F M	· · · ·	2 (
SHADE	ROUNDED	1	E M RANGE	2.2 - 2.6	FINE MEDIUM
		P A 1	I REMARKS	TAA 1151	ic mral
REMARKS	Rocks - CL	EA N		EPR. 46%	OF TOTAL
COARSE AG	Rocks - CL GREGATE LIMITS			EPR. 46%	0F 707AL
COARSE AG GRADATION	Rocks - CL GREGATE LIMITS INED	ел N 10		EPR. 46%	0F 707AL
COARSE AG GRADATION	Rocks - CL GREGATE LIMITS INED 1-4 3/4-4	0 10 20		EPR. 46%	0F 707AL
COARSE AG GRADATION 2 1 ¹ 2-4 2 0	ROCKS - CL GREGATE LIMITS INED 1-4 3/4-4	0 10 20 30		EPR. 46%	0F 707AL
COARSE AG GRADATION $\frac{1}{2}-4$ 2 0	ROCKS - CL GREGATE LIMITS INED 1-4 3/4-4 0	0 10 20 30		EPR. 46%	0F 707AL
COARSE AG GRADATION 2 RETA $1^{1}2-4$ 2 0 $1^{1}2$ 0-5 1	Rocks - CL GREGATE LIMITS INED 1-4 3/4-4 0 0-5	0 10 20 30 40		EPR. 46%	0F 707AL
COARSE AG GRADATION 2 RETA $1^{1}2-4$ 2 0 $1^{1}2$ 0-5 1	Rocks - CL GREGATE LIMITS INED 1-4 3/4-4 0 0 0-5	€AN 0 10 20 30 40 ⊕ 50		EPR. 46%	of 707AL
COARSE AG GRADATION 5 RETA 2 0 1 ¹ 2 0-5 1 3/4 30-65	Rocks - CL GREGATE LIMITS INED 1-4 3/4-4 0 0-5 0-10	EAN 0 10 20 30 40 50 60		EPR. 46%	0F 707AL
COARSE AG GRADATION 2. RETA 2 0 1 ¹ 2 0-5 1 3/4 30-65 1/2	Rocks - CL GREGATE LIMITS INED 1-4 3/4-4 0 0-5 0-10 40-75	EAN 0 10 20 30 40 50 60 10 10 20 30 40 10 10 20 30 40 10 10 10 10 10 10 10 10 10 1		EPR. 46%	oF 707AL
COARSE AG GRADATION $\frac{1}{2} - 4$ 2 0 $1\frac{1}{2} - 4$ 2 0 $1\frac{1}{2} - 5$ 1 3/4 30-65 1/2 3/8 70-90	Rocks - CL GREGATE LIMITS INED 1-4 3/4-4 0 0-5 0 0-10 40-75 45-80	EAN 0 10 20 30 40 50 60 70 0 10 20 30 40 0 10 20 30 40 0 10 20 30 40 0 10 20 30 40 0 10 10 10 10 10 10 10 10 10		EPR. 46%	
COARSE AG GRADATION $^{\circ}_{-}$ RETA $1^{1}2-4$ 2 0 $1^{1}2$ 0-5 1 3/4 30-65 1/2 3/8 70-90	$\begin{array}{c} R \circ c \ \textbf{KS} \ - \ \textbf{CL} \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\$	CAN 0 10 20 30 40 0 50 60 70 80		EPR. 46%	0F TOTAL
$\begin{array}{c} \text{COARSE AG} \\ \text{GRADATION} \\ & 1^{1}2 - 4 \\ \hline 2 & 0 \\ \hline 1^{1}2 & 0 - 5 \\ \hline 1 \\ \hline 3/4 & 30 - 65 \\ \hline 1/2 \\ \hline 3/8 & 70 - 90 \\ \hline \text{No. 4 95 - 100} \\ \end{array}$	$\begin{array}{c} R \circ c \ k \ s \ - \ c \ l \ \\ \\ R \circ c \ k \ s \ - \ c \ l \ \\ \\ \\ \\ R \circ c \ k \ s \ - \ c \ l \ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\$	CH N 0 10 20 30 40 0 0 10 20 30 40 0 0 0 0 0 0 0 0 0 0 0 0 0		EPR. 46%	0F T0TAL
$\begin{array}{c} \text{COARSE AG}\\ \text{GRADATION}\\ & 1^{1}2 - 4 \\ \hline 2 & 0 \\ \hline 1^{1}2 & 0 - 5 \\ \hline 1 & \\ \hline 3/4 & 30 - 65 \\ \hline 1/2 \\ \hline 3/8 & 70 - 90 \\ \hline \text{No. } 4 & 95 - 100 \\ \hline 8 \\ \hline \end{array}$	$\begin{array}{r} R \circ c \ k \ s \ - \ c \ l \ \\ \\ \hline \\ GREGATE \\ L IMITS \\ INED \\ \hline 1-4 \ 3/4-4 \\ \hline \\ 0 \\ \hline 0 \\ \hline 0 \\ -5 \ 0 \\ \hline 0 \\ -5 \ 0 \\ \hline 0 \\ -10 \\ \hline 40 \\ -75 \\ \hline \hline 45 \\ -80 \\ \hline 90 \\ -100 \\ 95 \\ -100 \\ 95 \\ -100 \\ 95 \\ -100 \\ \hline \end{array}$	CAN 0 10 20 30 40 40 0 50 60 70 80 90 90		EPR. 46%	
COARSE AG GRADATION 5 RETA 2 0 1 ¹ 2 0-5 1 3/4 30-65 1/2 3/8 70-90 No. 4 95-100 8	$\begin{array}{r} R \circ c \ k \ 5 \ - \ c \ L \\ \\ \hline \\ GREGATE \\ L IMITS \\ INED \\ \hline 1-4 \ 3/4-4 \\ \hline \\ 0 \\ 0 \\ \hline 0 \\ -5 \ 0 \\ \hline 0 \\ -5 \ 0 \\ \hline 0 \\ -10 \\ 40 \\ -75 \\ \hline 45 \\ -80 \\ 90 \\ -100 \\ 95 \\ -100 \\ 95 \\ -100 \\ 95 \\ -100 \\ \hline \end{array}$	EAN 0 10 20 30 40 50 40 50 40 50 40 50 50 50 50 50 50 50 50 2 1 ¹ / ₂ 1 2 1 ¹ / ₂ 1	REMARKS R 3/4½ 3/8 4 SIEVE S	EPR. 46 %	oF TOTAL
COARSE AG GRADATION 2. RETA 2 0 1 ¹ 2-4 2 0 1 ¹ 2 0-5 1 3/4 30-65 1/2 3/8 70-90 No. 4 95-100 8	$\begin{array}{r} R \circ C KS - CL \\ \hline \\ R \circ C KS - CL \\ \hline \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ $	EAN 0 10 20 30 40 0 40 0 50 40 0 50 0 0 10 20 30 40 0 0 10 20 30 40 0 0 20 30 40 0 0 20 30 40 0 20 30 40 0 20 20 30 40 0 20 20 30 40 0 20 20 20 20 20 20 20 20 20	REMARKS 2	EPR. 46 %	6F TOTAL

CONCRETE AGGREGATE REPORT

CLIENT BAYROCK & REIMCHEN

DATE JULY 30/75 SAMPLE NO. W 43-75 TEST NO. 5Å 010

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		SAMPLE TYPE G	R. SAND	SAMPLED BY	
ATE SAMPLED		DATE RECEIVED	2/7/75	DATE TESTED	28/7/75
COAR	SE AGGREGATE		FI	NE AGGREGATE	
SIEVE	% RE1	TAINED	SIĘVĘ	% RE	TAINED
5126	INDIVIDUAL	CUMULATIVE	SIZE	INDIVIDUAL	CUMULATIVE
			<u>3/8</u>		
125	15.2	15.2	8	244	244
1	6.0	21.2	16	229	47.3
3/4	7.7	28.9	30	21.6	68.9
1/2	16.3	45.2	50	20.7	89.6
		59.5	100	8.6	98.2
<u>NO. 4</u>	3 8 - 3	97.8	Pan	10	100.0
Pan	2.2	70-0.0	F.M.	1.0	34
200MDNE22	(VISUAL) GO	0 D	ORG. IMPURI	TIES NO.	o / د
COAL CONTE REMARKS	NT NIL SOME SAND	COATING	ORG. IMPURI COAL CONTEN REMARKS R	TIES NO. T - N/L $EPR \cdot 53^{\circ}$	5 OF TOTAL
COAL CONTE REMARKS	REGATE	0 0 0 0 10 20	ORG. IMPURI COAL CONTEN REMARKS R	$\frac{1}{1} \frac{1}{1} \frac{1}$	5 OF TOTAL
COAL CONTE REMARKS	REGATE LIMITS NED 1-4 3/4-4	0 0 0 0 10 20 30	ORG. IMPURI COAL CONTEN REMARKS R	TIES NO. T - N/L $EPR \cdot 53^{\circ}$	5 OF TOTAL
COAL CONTE REMARKS COARSE AGG GRADATION % RETAI 11/2-4 2 0 11/2 0-5	REGATE LIMITS NED 1-4 3/4-4	0 0 0 0 10 20 30 40	ORG. IMPURI COAL CONTEN REMARKS R	TIES NO. T - N/L $EPR \cdot 53^{\circ}$	5 0F TOTAL
COAL CONTE REMARKS COARSE AGG GRADATION C RETAI 1 ¹ / ₂ -4 2 0 1 ¹ / ₂ 0-5 1 0-5	$\frac{\text{REGATE}}{1-4}$	$\begin{array}{c} 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 $	ORG. IMPURI COAL CONTEN REMARKS &	TIES NO. T - N/L $EPR \cdot 53^{\circ}$	
COAL CONTE REMARKS COARSE AGG GRADATION "A RETAI 11/2-4 2 0 11/2 0-5 1 0 3/4 30-65	$\begin{array}{c} (VISUAL) \\ (VISUAL) \\ SOME \\ S$	$\begin{array}{c} 0 \\ 0 \\ 0 \\ 10 \\ 20 \\ 30 \\ 40 \\ \hline \\ \end{array}$	ORG. IMPURIT COAL CONTEN REMARKS R	TIES NO. T - N/L $EPR \cdot 53^{\circ}$	5 OF TOTAL 10 9 8 7 6 5
COAL CONTE REMARKS COARSE AGG GRADATION ⁶ RETAL 1 ¹ / ₂ -4 2 0 1 ¹ / ₂ 0-5 1 0-5 1 0 3/4 30-65 1/2 4	$\begin{array}{c} (VISUAL) \\ (VISUAL) \\ SOME \\ S$	0 COATING 10 20 30 40 40 0 0 0 10 20 30 40 0 0 0 0 0 0 0 0 0 0 0 0 0	ORG. IMPURIT COAL CONTEN REMARKS &	TIES NO. T - N/L $EPR \cdot 53^{*}$	5 OF TOTAL 10 10 9 8 7 6 5 4 7
COAL CONTE REMARKS COARSE AGG GRADATION * RETAL 1 ¹ / ₂ -4 2 0 1 ¹ / ₂ 0-5 1 0 3/4 30-65 1/2 4 3/8 70-90	$\begin{array}{cccc} \text{NT} & \text{N} & \text{IL} \\ \text{Some SAWL} \\ \text{REGATE} \\ \text{LIMITS} \\ \text{NED} \\ 1-4 & 3/4-4 \\ \hline 0 \\ 0 \\ -5 & 0 \\ \hline 0-10 \\ 0-75 \\ \hline 45-80 \end{array}$	0 COATING 10 20 30 40 40 50 60 70 10 20 30 40 0 10 20 30 40 0 10 20 30 40 0 10 20 30 40 10 10 10 10 10 10 10 10 10 1	COAL CONTEN REMARKS	TIES NO. T = N/L $EPR \cdot S3^{*}$	5 OF TOTAL 10 9 8 7 6 5 4 3
COAL CONTE REMARKS COARSE AGG GRADATION ⁵ RETAL 1 ¹ / ₂ -4 2 0 1 ¹ / ₂ 0-5 1 0 3/4 30-65 1/2 4 3/8 70-90 No. 4 95-1009	$\begin{array}{c} (VISUAL) & (VISUAL) \\ NT & N/L \\ SOME & SAV L \\ \hline \\ SOME & SAV L \\ \hline \\ REGATE \\ LIMITS \\ NED \\ \hline 1-4 & 3/4-4 \\ \hline \\ 0 \\ \hline 0 \\ \hline 0 \\ \hline -5 & 0 \\ \hline 0 \\ \hline$	0 COATING 10 20 30 40 40 50 60 70 80 •••	COAL CONTEN REMARKS &	$rac{1}{1}$	5 OF TOTAL 10 9 8 7 6 5 4 3 2
COAL CONTE REMARKS COARSE AGG GRADATION & RETAL 11/2 - 4 2 0 11/2 0-5 1 0 3/4 30-65 1/2 4 3/8 70-90 No. 4 95-10090 8 9	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	0 COATING 10 20 30 40 40 40 40 40 40 40 40 40 4	COAL CONTEN REMARKS	$rac{1}{1}$	5 OF TOTAL 10 9 8 7 6 5 4 3 2 1
COAL CONTE REMARKS COARSE AGG GRADATION <u>° RETAL</u> 1 ¹ / ₂ -4 2 0 1 ¹ / ₂ 0-5 1 0 3/4 30-65 1/2 4 3/8 70-90 No. 4 95-1009 8 9	$\begin{array}{cccc} \text{(VISUAL)} & \textbf{C-6} \\ \text{NT} & \textbf{N/L} \\ \text{SOME} & \text{SAN/L} \\ \hline \text{SOME} & \text{SAN/L} \\ \hline \text{REGATE} \\ \text{LIMITS} \\ \hline \text{NUD} \\ \hline 1-4 & 3/4-4 \\ \hline 0 \\ \hline 0 \\ \hline 0 \\ \hline -5 & 0 \\ \hline 0 \\ \hline 0 \\ \hline -5 & 0 \\ \hline 0 \\$	0 COATING 10 20 30 40 40 50 60 Law 80 90 100 2 1k 1	COAL CONTEN REMARKS &	$\frac{16}{8} = \frac{16}{70}$	5 0F TOTAL

CONCRETE AGGREGATE REPORT

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CLIENT BAYROCK & REIMCHEN

40

DATE JULY 31/75SAMPLE NO. W 45-75 TEST NO. 54.011 CLIENT P.O.

OURCE		SAMPLE TYPE	K. SAND	SAMPLED BY		
ATE SAMPLED		DATE RECEIVED	2/7/75	DATE TESTED	29/7/75	
COAR	SE AGGREGATE		FINE AGGREGATE			
SIEVE	<u> </u>	AINED	SIEVE	\$ RET/	VINED	
512E	INDIVIDUAL	CUMULATIVE	5126	INDIVIDUAL	CUMULATIVE	
		+	3/8		<u> </u>	
			<u>NO. 4</u>	220	32.8	
1	15-4	159	16	27.0	27:0	
3/4	<u> </u>	2.6.9	30	2/9	82.2	
1/2	219	488	50	12-8	95.1	
3/8	9.4	58.2	100	29	990	
No. 4	40,4	98.6	200	/×/		
8		1	Pan	/. 0	100.0	
Pan	1.H	100.0	F.M.		3.8	
COAL CONTE REMARKS	NT NIL		ORG. IMPURI COAL CONTEN REMARKS REP	TIES NO. T - N/L $R \cdot 4-8 \frac{3}{3} \circ F$	· TOTAL	
COARSE AGG	REGATE	0			10	
RETAI	NED	10			9	
112-4	1-4 3/4-4	20	┼╍╍┼╍╵			
2 0		30				
11/2 0-5	0	40			6	
1 (-5 0					
3/4 20 65	0-10					
	0-10		<u>}</u>		· 4	
3/8 00 00			╏──┼┼──┼──			
<u>- 70 70-90</u>	45-00	80	┨╍╍┠┵┠╼╍╼╍┠╼╍			
10019-10019	0-100 90-100	90	┨──┤╌┨┈╍──┤╌━			
8 9	<u>5-10095-100</u>					
		2 1 1	3/4 ¹ 3/8 4 SIEVE S	8 16 30 IZE	50 100 200	

CONCRETE AGGREGATE REPORT

CLIENT B,	AYROCK & RE	lmchen	DA SA TE CI	TE \sqrt{ULY} 37 MPLE NO. W 4 ST NO. SA LIENT P.O.	/75 6-75 013
PROJECT			•		
SOURCE		SAMPLE TYPE G	R. SAND	SAMPLED BY	<u> </u>
DATE SAMPLED		DATE RECEIVED	2/1/15	DATE TESTED	29 / 7 /75
COA	RSE AGGREGATE		FI FI	NE AGGREGATE	
SIEVE	% RE1	TAINED	SIĘVĘ	% RETA	INED
5126	INDIVIDUAL	CUMULATIVE	3126	INDIVIDUAL	CUMULATIVE
2			No. 4		
14			8	36.0	36.0
1	12.7	12.7	16	25.7	61.7
3/4	15.4	28]	30	(5.3	77.0
3/8	15.6	247	100	15.6	93.6
<u>No. 4</u>	34.0	98.7	200	+	/ / 1 .
8			Pan	0.7	0.00
Pan	1.3	0.00	F.M.		3.7
SOUNDNESS COAL CONT REMARKS	(VISUAL) GO TENT - NIL 2670 7 1 TAPS OF SAWD	ОД Чу IN. STONE	* SAND * FINER THA ORG. IMPURI COAL CONTEN REMARKS	N No. 200 $\leftarrow 3$ TIES NO. T $-NIL$ PR. 50% o	45 0 F TOTAL
COARSE AG GRADATION % RETA 11/2-4 2 0 11/2 0-5 1 3/4 30-65 1/2 3/8 70-90 No. 495-100	GREGATE LIMITS INED 1-4 3/4-4 0 0 0-5 0 0-10 40-75 45-80 90-10090-100	0 10 20 30 40 40 EN 50 EN 60 EN 70 80 90			100 90 80 70 60 50 40 30 20 10
TESTED BY Checked by	S. U. F.		1 3/4⅓ 3/8 4 SIEVE S	8 16 30 IZU LIMIT	50 100 200 S PER CSA A23

CONCRETE AGGREGATE REPORT

CLIENT

DATE JULY 30/75 SAMPLE NO. W 48-75 TEST NO. 54 008 BAYROCK & REINCHEN

CLIENT P.O.

			DATE TESTED	and alac	
ATE SAMPLED	DATE RECEIVED		2/7/75	DATE TESTED	48/ 1/-/3
COARSE AGGREGATE			/ <u>FI</u>	NE AGGREGATE	
SIEVE	% RET/	AINED	SIEVE	% RET/	AINED
5126	INDIVIDUAL	CUMULATIVE	5120	INDIVIDUAL	CUMULATIVE
			<u> </u>	0	<u>ه</u>
11-	15.0	150	8	306	30.6
1	12.9	27.9	16	35.3	659
3/4	9.0	36.9	30	22.7	88.6
1/2	20.0	56.9	50	8.6	97.2
3/8	13.8	70.7	100	1.9	99.1
<u>No. 4</u>	21.1		200		
<u>8</u>	6 74		E M	0.7	20
			ORG. IMPURI	TIES NU.	
COAL CONTE REMARKS SEVE	ENT NTL SOME SAND C RAL RUST ST	COATING ALSO AINS	COAL CONTEN REMARKS REPR	T - NIL . 62% of	SAMPLË
COAL CONTE REMARKS SEVE COARSE AGO GRADATION	ENT NTL SOME SAND C RAL RUST ST GREGATE LIMITS	COATING ALSO AINS	COAL CONTEN REMARKS REPR	T - NIL . 62% OF	SAMPLE
COAL CONTR REMARKS SEVE COARSE AGO GRADATION	ENT NTL SOME SAND C RAL RUST ST BREGATE LIMITS INED	COATING ALSO AINS	COAL CONTEN REMARKS REPR	T - NIL . 62% OF	SAMPLE 10 9
COAL CONTE REMARKS SEVE COARSE AGO GRADATION % RETA 15-4	ENT NTL SOME SAND C RAL RUST, ST GREGATE LIMITS INED 1-4 3/4-4	OATING ALSO AINS	COAL CONTEN REMARKS REPR	T - NIL . 62 % OF	SAMPLE 10 9 8
COAL CONTR REMARKS SEVE COARSE AGO GRADATION % RETA 13-4 2 0	ENT NTL SOME SAND C RAL RUST ST SREGATE LIMITS INED 1-4 3/4-4	0 10 20 30	COAL CONTEN REMARKS REPR	T - NIL . 62% OF	SAMPLE 10 9 8 7
COAL CONTR REMARKS SEVE COARSE AGO GRADATION % RETA 1 ¹ 2-4 2 0 1 ¹ 2 0-5	ENT N7L SOME SAND C RAL RUST . S7 GREGATE LIMITS INED 1-4 3/4-4	0 10 20 30 40	COAL CONTEN REMARKS REPR	T - NIL . 62 % OF	SAMPLĒ 10 9 8 7 6
COAL CONTE REMARKS SEVE COARSE AGO GRADATION % RETA 14-4 2 0 11/2 0-5 1	ENT NTL SOME SAND C RAL RUST ST SREGATE LIMITS INED 1-4 3/4-4 0 0-5 0	$ \begin{array}{c} 20 \\ $	COAL CONTEN REMARKS REPR	T - NIL . 62% OF	SAMPLĒ 10 9 8 7 6 5
COAL CONTR REMARKS SEVE COARSE AGO GRADATION % RETA 11/2-4 2 0 11/2 0-5 1 3/4 30-65	ENT N7L SOME SAND C KAL RUST S7 SREGATE LIMITS INED 1-4 3/4-4 0 0 0-5 0-10	0 10 10 20 30 40 Generations 60	COAL CONTEN REMARKS REPR	T - NIL . 62 % OF	SAMPLĒ 10 9 8 7 6 5 4
COAL CONTR REMARKS SEVE COARSE AGO GRADATION % RETA 1½-4 2 0 1½ 0-5 1 3/4 30-65 1/2	ENT N7L SOME SAND C KAL RUST S7 GREGATE LIMITS INED 1-4 3/4-4 0 0-5 0-10 40-75	0 AINS 0 10 20 30 40 40 50 60 70	COAL CONTEN REMARKS REPR	T - NIL . 62 % OF	SAMPLE 10 9 8 7 6 5 4 3
COAL CONTR REMARKS SEVE COARSE AGO GRADATION % RETA 11/2-4 2 0 11/2 0-5 1 3/4 30-65 1/2 3/8 70-90	ENT NTL SOME SAND C KAL RUST ST SREGATE LIMITS INED 1-4 3/4-4 0 0 0-5 0-10 40-75 45-80	0 4 INS 0 10 20 30 40 40 50 60 70 80	COAL CONTEN REMARKS REPR	T - NIL . 62 % OF	SAMPLĒ 10 9 8 7 6 5 4 3 2
COAL CONTR REMARKS SEVE COARSE AGO GRADATION ". RETA 14-4 2 0 112 0-5 1 3/4 30-65 1/2 3/8 70-90 No. 4 95-100	ENT N7 L SOME SAND C KAL RUST S7 SREGATE LIMITS INED 1-4 $3/4-400-5$ 0 0-10 40-75 45-80 90-10090-100	0 4 1 NS 0 10 20 30 40 40 50 60 70 80 90	COAL CONTEN REMARKS REPR	T - NIL . 62 % OF	SAMPLE 10 9 8 7 6 5 4 3 2 1
COAL CONTR REMARKS SEVE COARSE AGO GRADATION " RETA 14-4 2 0 11/2 0-5 1 3/4 30-65 1/2 3/8 70-90 No. 4 95-100 8	ENT N7L SOME SAND C KAL RUST S7 GREGATE LIMITS INED 1-4 3/4-4 0 0-5 0 0-10 40-75 45-80 90-10090-100 95-10095-100	0 4 INS 0 10 20 30 40 40 40 40 50 60 40 40 40 40 40 40 40 40 40 4	COAL CONTEN REMARKS REPR	T - NIL . 62 % OF	SAMPLĒ 10 9 8 7 6 5 4 3 2 1

 igr			TRYLOWSKY EN	IGINEERING L	rD.	
		·	CONCRETE AGG	REGATE REPORT		
W LIENT	LIENT BAYROCK & REIMCHEN			DATE $JULY \frac{30}{75}$ SAMPLE NO. W $49 - 75$ TEST NO. SA 007		
ROJECT			t - 4			• • • •
SOURCE	LED		SAMPLE TYPE 5x DATE RECEIVED	7NDY GRAVE 217/75	LSAMPLED BY DATE TESTED	27/7/75
	COARSE AGGREG	ATE		FIN	IE AGGREGATE	
- SIEVE		% RETA	INED	SIEVE	% RETA	INED
5126	INDIVI	DUAL	CUMULATIVE	7/9	INDIVIDUAL	CUMULATIVE
2				No. 4	0	
11;	21.	8	21.8	8	36.7	36.7
3/4		· <u>]</u>	22.1	<u> </u>	24.3	6/.0
$-\frac{5/4}{1/2}$		9	59.3	50	12.6	92.0
4 3/8		4	73.7	100	5.3	97.3
<u>NO. 4</u> 8		.7	76.6	Pan	27	1000
Pan	3	4	100.0	F.M.		3.7
SHAPE	ROUNDE	ΞD		F.M. RANGE	2.2 - 2.6 2.6 - 2.9 2.9 - 3.2	FINE MEDIUM COARSE
% CRUS	SH —	-		% SAND	→ ··· ·· · · · · · · · · · · · · · · · ·	./
SOUNDN	NESS (VISUAL)	FATIC	TO GODD	SFINER THAN	1 No. 200 🧹 S	/.
COAL C	CONTENT			COAL CONTENT	NIL	
REMARI	(S MOST K	OCK	N4D	REMARKS Sc	ME RUST O	COATING.
T	RUST (CO ATIN	16	REPR. 3	0 % OF 101	AL
COARSI	AGGREGATE		0			100
	RETAINED		10			90
2 0	-4 1-4 3/4-	4	20	<u>├</u> \		80
<u> </u>	5 0		30			70
	0-5 0					
3/4 30-	65 0-10	5				
1/2	40-75					30 55
3/8 70-	-90 45-	80				20
No. 495-	100 90-100 90-1	00	90			10
8	95-10095-1	00]	100	<u> </u>		0
			2 1 <u>4</u> 1	3/41/2 3/8 4	8 16 30	50 100 200
TECTED DY				SIEVE SI	.2E LIMIT	S PER CSA A23
TROIDU BI	5. V. F.					
	-60					

CONCRETE AGGREGATE REPORT

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CLIENT BAYROCK & REIMCHEN

DATE JULY 31/75 SAMPLE NO. W 50 -75 TEST NO. SA 014 1 4 1 4 CLIENT P.O.

PROJECT

DATE SAMPLED		DATE RECEIVED	2/7/75	DATE TESTED	29/7/75
COA	DSE ACCRECATE				
SLEVE	ROL ROOKLOATL	TAINED	CIEVE	RE AOOREOATE	CAINED
SIZE	INDIVIDUAL	CUMULATIVE	SIZE	INDIVIDUAL	CUMULATIVE
			3/8		
2			No. 4		
15			8	30.4	304
1	13.9	13.4	16	27.9	57.8
3/4	11.0	30,4		23.8	81.6
3/8	110	72.0	100	12.4	93.0
<u>No. 4</u>	21.5	954	200	2.0	· · · · · · · · · · · · · · · · · · ·
8			Pan	1.4	100.0
Pan	4.6	/00.0	F.M.		3.7
	//////////			N N. 000	•
SOUNDNESS COAL CONT REMARKS	(VISUAL) GOI ENT NIL 21 0/0 >	かわ 1 1/~ 1N・	S FINER THAN ORG. IMPURIT COAL CONTENT REMARKS	N No. 200 $-$ TIES NO. T NIL SPR. 35%	OF TOTAL
COAL CONT REMARKS COARSE AG GRADATION	(VISUAL) Got ENT NIL 2/ 0/0 > GREGATE LIMITS INED 1-4 3/4-4	0 D 1 1/2 IN. 10 20	& FINER THAN ORG. IMPURIT COAL CONTENT REMARKS R	N No. 200 $-$ TIES NO. T NIL SPR. 35%	• •F 7074L
COARSE AG GRADATION 2 0	(VISUAL) GON ENT NIL 2/ 0/0 > GREGATE LIMITS INED 1-4 3/4-4	0	S FINER THAN ORG. IMPURIT COAL CONTENT REMARKS C	N No. 200 $-$ TIES NO. T NIL SPR. 35%	• • 7 7 7 4 0 10 9 8 7
COARSE AG GRADATION 2 2 1 ¹ 2 0-5	$(VISUAL) \qquad \qquad$	0	S FINER THAN ORG. IMPURI' COAL CONTEN' REMARKS R	N No. 200 $-$ TIES NO. T NIL SPR. 35%	• •F 7074L
COARSE AG GRADATION <u>° RITA</u> 1 ¹ 2-4 2 0 1 ¹ 2 0-5	$(VISUAL) \qquad \qquad$	0	S FINER THAN ORG. IMPURI' COAL CONTEN' REMARKS &	N No. 200 $-$ TIES NO. T NIL SPR. 35%	
COARSE AG GRADATION * REMARKS COARSE AG GRADATION * RETA 1 ¹ / ₂ -4 2 0 1 ¹ / ₂ 0-5 1 3/4 30-65	(VISUAL) Got ENT NIL 2/ 0/0 > GREGATE LIMITS INFD 1-4 3/4-4 0 0-5 0 0-10		S FINER THAN ORG. IMPURIT COAL CONTENT REMARKS R	N No. 200 $-$ TIES NO. T NIL SPR. 35%	• •F 7074L 10 9 8 7 6 5
SOUNDNESS COAL CONT REMARKS COARSE AG GRADATION 2 RLTA 1 $\frac{1}{2}$ -4 2 O 1 $\frac{1}{2}$ O	(VISUAL) Goa ENT NIL 2/ 0/0 > GREGATE LIMITS INED 1-4 3/4-4 0 0-5 0 0-10 40-75	$ \begin{array}{c} 0 \\ 1 \\ 1 \\ 1 \\ 2 \\ 3 \\ 4 \\ 0 \\ 4 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0$	S FINER THAN ORG. IMPURI' COAL CONTEN' REMARKS &	N No. 200 $-$ TIES NO. T NIL SPR. 35%	
COARSE AG GRADATION 	(VISUAL) Got ENT NIL 2/ 0/0 > GREGATE LIMITS INED 1-4 3/4-4 0 0-5 0 0-10 40-75 45-80	0 1 1/2 IN . 0 10 20 30 40 40 50 60 70	S FINER THAN ORG. IMPURIT COAL CONTENT REMARKS C	N No. 200 $-$ TIES NO. T NIL SPR. 35%	• •F 7074L 10 9 8 7 6 5 4 3
COARSE AG GRADATION * REMARKS COARSE AG GRADATION * RETA 2 0 1 ¹ / ₂ - 4 2 0 1 ¹ / ₂ - 4 2 0 1 ¹ / ₂ - 5 1 3/4 30-65 1/2 3/8 70-90 No. 495-100	$\begin{array}{c} (VISUAL) & Got \\ ENT & NIL \\ 2/ \frac{0}{0} \\ \hline 2/ \frac{0}{0} \\ \hline 2/ \frac{0}{0} \\ \hline 2/ \frac{0}{0} \\ \hline 2/ \frac{0}{0} \\ \hline 2/ \frac{0}{0} \\ \hline 2/ \frac{0}{0} \\ \hline 0 \\ \hline 0$	0 1 1/2 IN . 0 10 20 30 40 40 50 60 70 80	S FINER THAN ORG. IMPURI' COAL CONTEN' REMARKS R	N No. 200 $-$ TIES NO. T NIL SPR. 35%	• F ToTAL
COARSE AG GRADATION & RITA 11/2-4 2 0 11/2 0-5 1 3/4 30-65 1/2 3/8 70-90 No. 495-100 8	(VISUAL) Got ENT NIL 2/ 0/0 > GREGATE LIMITS INED 1-4 3/4-4 0 0-5 0 0-10 40-75 45-80 90-100 90-100 95-100 95-100	0 1 1/2 IN . 0 10 20 30 40 40 50 60 70 80 90	S FINER THAN ORG. IMPURI' COAL CONTEN' REMARKS &	N No. 200 $-$ TIES NO. T NIL SPR. 35%	0F 7074L 10 9 8 7 6 5 4 3 2 1
COARSE AG GRADATION * REMARKS COARSE AG GRADATION * RETA 1 ¹ / ₂ -4 2 0 1 ¹ / ₂ 0-5 1 3/4 30-65 1/2 3/8 70-90 No. 495-100 8	(VISUAL) Got ENT NIL 2/ 0/0 > GREGATE LIMITS INFD 1-4 3/4-4 0 0-5 0 0-10 40-75 45-80 90-100 90-100 95-100 95-100	$ \begin{array}{c} 0 \\ 1 \\ 1 \\ 1 \\ 2 \\ 3 \\ 4 \\ 0 \\ 4 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0$	S FINER THAN ORG. IMPURIT COAL CONTENT REMARKS C	N No. 200 $-$ TIES NO. T NIL SPR. 35%	• F ToTAL

		CONCRETE AG	GREGATE REPORT	,	
CLIENT BAYROCK & RÉIMCHEN		DA SA TE CL	TE buly 30 MPLE NO. W 3 ST NO. SA OC IENT P.O.	0/75 5 c 75 01	
ROJE CT					
OURCE	<u> </u>	SAMPLE TYPE	INE SAND	SAMPLED BY	5/7/75
COADSE	ACCRECATE			NE ACCRECATE	
SIEVE	% RET	AINED	SIEVE	RETA	AINED
SIZE	INDIVIDUAL	CUMULATIVE	SIZE	INDIVIDUAL	CUMULATIVE
2		1	<u>3/8</u> No. 4	l	
112			8		
			16	0.4	0.4
1/2	·····		50	3.5.9	37./
3/8			100	58.6	97.7
<u>No. 4</u>			<u>200</u> Pan	2.3	100.0
Pan			F.M.		1.4
SHAPE			F.M. RANGE	2.2 - 2.6 2.6 - 2.9 2.9 - 3.2	FINE MEDIUM COARSE
% CRUSH SOUNDNESS (V)	ISUAL)		% SAND % FINER THAN ORG. IMPURI	N No. 200	
COAL CONTENT REMARKS			REMARKS	·	
			CLEAN, Y	ELCOW BEACH	(\$4ND.
COARSE AGGREG	ATE HTS				
	4 3/4-4	20			8
2 0		30			7
1 ¹ 2 0-5 0		40			- 61
3/4 20-65	0-10	B 50			5
1/2 40-	75	Z 60			
7/0	45-80	₩ ⁷⁰			
3/8 70-90	10090-100	•• 80			
No. 4 95-100 90-		90			
378 70-90 No. 4 95-100 90- 8 95-1 95-1	10095-100		<u></u>) المستحد المستحد الم
378 70-90 No. 4 95-100 90- 8 95- 95-	<u>10495–100</u>	$100 \frac{1}{2} \frac{1}{1} \frac{1}{2} \frac{1}{1}$	3/41/2 3/8 4	8 16 30	50 100 200

CONCRETE AGGREGATE REPORT

CLIENT

BAYROCK & REIMCHEN

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JULY 31/75 DATE V SAMPLE NO. DATE 54 015 TEST NO. CLIENT P.O.

ATE SAMPLED	31/7/75	DATE RECEIVED	31/7/75	DATE TESTED	1/7/75	
COARSE AGGREGATE			FINE AGGREGATE			
SIEVE	% RETAINED		SIĘVE	% RETAINED		
SIZE	INDIVIDUAL	CUMULATIVE	SIZE	INDIVIDUAL	CUMULATIVE	
			3/8		·	
11		1	NO. 4	1.3		
1			16	1.8	<u> </u>	
3/4	[30	44	8.5	
1/2			50	47.8	56.3	
3/8			100	41.8	92.1	
<u>No. 4</u>			200	1.1	79.2	
8		· · · · ·	Pan	0.8	100.0	
SOUNDNESS COAL CONT REMARKS	(VISUAL) ENT		5 FINER THA ORG. IMPURI COAL CONTEN REMARKS	TIES NO.		
$\begin{array}{c} \text{COARSE AG} \\ \text{GRADATION} \\ & \text{RETA} \\ \hline 1^{1}2 - 4 \\ \hline 2 \\ 0 \\ \hline 1^{1}2 \\ \hline 3/4 \\ 30 - 65 \\ \hline 1/2 \\ \hline 3/8 \\ 70 - 90 \\ \hline \text{No. } 495 - 100 \\ \hline 8 \\ \hline \end{array}$	GREGATE LIMITS INED 1-4 3/4-4 0 0-5 0 0-10 40-75 45-80 90-100 90-100 95-100 95-100	0 10 20 30 40 40 40 40 40 40 40 40 40 4				
ESTED BY	87.	2 15 1	3/4½ 3/8 4 SIEVE S	8 16 30 512E LIMI'	50 100 200 TS PER CSA A23	

	SPRATT BA	LESTING EXPEDITING			
	2455 Cypress Street, Van	ncouver, B.C. V6J	3M9 Phone	736-7736	INVESTIGATION RESEARCH DEVELOPMENT
To:	Mr. B. Trylowsky 2770 Hawser Avenue Coquitlam, B.C.	· · ·	Date:	August 6,	1975
	· · · · ·	- 4 2 			
Project:	-		File #:	Misc. "T"/	75
Report of:	Aggregate Soundness		Report #:	1/75	

INTRODUCTION

Five samples of bank-run aggregate were submitted by the client for testing in accordance with instructions. For each sample the material was split over the #4 screen and the coarse fraction was retained for testing to C.S.A. A23.1.5.4.4 Magnesium Sulfate Soundness Test. All samples were subjected to 5 cycles and the individual and average weighted losses are shown below.

TEST RESULTS

Sample#	Sieve Size	Grading of Original Sample	Weight of Test Fraction before Testing	%Passing designated Sieve after Test	Weighted Percentage Loss
W37	1±''-3/4'' 3/4''-3/8'' 3/8''-#4	26.2 20.5 10.3	1496 1002 300	0.27 0.80 1.30	0.07 0.16 0.14
	TOTALS	57.0	-	-	0.37 Weighted loss
W41	1±''-3/4'' 3/4''-3/8'' 3/8''-#4	34.0 28.0 16.0	1499 1000 300	0.40 1.20 1.30	0.14 0.34 0.21
	TOTALS	78.0	•	-	0.69 Weighted loss
W42	1±''-3/4'' 3/4''-3/8'' 3/8''-#4	29.8 31.1 22.6	1500 998 300	0.07 0.10 0.17	0.02 0.03 0.04
	TOTALS ·	83.5	-	-	0.09 Weighted loss

Sample#	Sieve Size	Grading of Original Sample	Weight of Test Fraction before Testing	%Passing designated Sieve after Test	Weighted Percentage Loss
W45	1±''-3/4'' 3/4''-3/8'' 3/8''-#4	30.1 34.7 20.4	1502 1001 300	0.27 1.20 1.00	0.08 0.44 0.20
	TOTALS	85.2	-	-	0.72 Weighted loss
W46	1 <u>+</u> ''-3/4'' 3/8''-#4	28.9 32.8	1465 300	1.35 0.33	0.40 0.11
х. 1	TOTALS	61.7	-	-	0.51 Weighted loss

NOTE:

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C.S.A. A23.1 maximum allowable loss - 12%.

Technician: K. Moisuk

Supervisor

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Location of Sand and Gravel Deposits of the Cumberland and T'sable River Area

Area Recommended For Development

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ravel and o	and and G	Sand iravel	Sample Scale : 1	e I [″] =1320′	July, 1975
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Volume Estimate of Sand and Gravel, Cumberland and T'sable River Area (yd.º) Scale: 1"=1320' July, 1975

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