MARITIME TESTING (1985) LIMITED
CONSULTING ENGINEERING & PROFESSIONAL SERVICES

Natural Resources Canada | Ressources Naturelles Canada

Geological Survey of Canada | Commission géologique du Canada

AGGREGATE TESTING OF MARINE SAND AND GRAVEL SAMPLES FROM OFFSHORE CAPE BRETON ISLAND

Submitted by:
Maritime Testing (1985) Limited
116-900 Windmill Road
Dartmouth, N.S.
B3B 1P7

Submitted to:
Atlantic Geoscience Centre
Bedford Institute of Oceanography
Dartmouth, N.S.
B2Y 4A2

NAO-1268

February, 1995

MARITIME TESTING (1985) LIMITED
CONSULTING ENGINEERING & PROFESSIONAL SERVICES

February 6, 1995

NAO-1268

Atlantic Geoscience Centre
Bedford Institute of Oceanography
P.O. Box 1006
Dartmouth, Nova Scotia
B2Y 4A2

Attention: Mr. Gordon B. J. Fader

Dear Mr. Fader,

RE: AGGREGATE TESTING OF MARINE SAND AND GRAVEL SAMPLES FROM OFFSHORE CAPE BRETON ISLAND
SSC FILE NO. HAL94-00782-(110)
CONTRACT NO. 23420-4M195/01-HAL

On November 8, 1994 Maritime Testing (1985) Limited picked up fifteen marine sand and gravel samples at the Atlantic Geoscience Centre (AGC), Dartmouth, NS. These samples were obtained by the AGC from offshore Cape Breton and were to be evaluated for possible use as Portland Cement and Asphaltic Cement Aggregates. Fifteen Canadian Standards Association (CSA) tests and one British Standards (BS) test were to be conducted on these samples.

Because of the small mass and the gradation of these samples, some changes were made in the testing regime. Tests were scheduled in a specific order and material reused where possible in order to obtain the maximum amount of information from a limited amount of sample material. The minimum mass of test sample suggested by CSA in some of the tests was not obtainable. However, where our experience indicated testing a smaller sample could yield an accurate result, we carried out the test. In instances where a small sample size could give erroneous results we deleted the test and reported it as having insufficient sample to conduct that test.

The CSA test procedures were designed for relatively clean (less than 4% $<80\ \mu m$) concrete sand aggregate and concrete stone aggregate. The test samples from offshore Cape Breton consist of a mixture of gravel, sand, and silt. This made certain CSA tests inappropriate for these samples.

The soft, rounded sandstone would not make a good concrete aggregate because of its low strength, low density and high absorption rate.

The samples tested contain a relatively high amount of minus 80 μm diameter particles. This excess of fine material would decrease the strength of the concrete. The excess fines would have to be removed through a screening or washing procedure. This screening procedure would also have to separate the material into coarse and fine aggregate to meet CSA gradation specifications.

The presence of salt in the test samples would have to be addressed. Marine samples which contain chlorides can have detrimental effects on concrete. Chlorides can cause efflorescence, increase drying shrinkage, and alter time of set. It is not recommended to use aggregates with chlorides present in the production of steel reinforced concrete. The chlorides can increase the risk of corrosion of the steel reinforcement. The amount of salt present in this aggregate could be reduced by washing the material at the time of screening and processing.

SUITABILITY OF MATERIAL FOR USE AS ASPHALTIC CONCRETE AGGREGATE

The aggregate test results are compared to Nova Scotia Department of Transportation and Public Works Canada Specifications on the attached Table 2.

This table compares ranges of results with the predominantly granite samples in one group and predominantly sandstone samples in the other group.

If these were terrestrial samples we would recommend against the use of the sandstone samples due to high percentage lumps, high soundness losses, high absorptions, and poor petrographic values. The granite samples could have some potential, however there are a wide range of easily accessible terrestrial granite deposits available in Nova Scotia.

CSA test A23.2-6A, Relative density and absorption of fine aggregate and CSA test A23.2-11A, Surface moisture of fine aggregate could not be conducted because of the difficulty in determining the surface saturated dry state of the samples. These tests were developed for relatively clean sands, not for mixtures of gravel, sand, and silt. The test samples were received in a saturated condition and the moisture content was obtained for all samples and reported. The CSA test A23.2-12A, Relative density and absorption of coarse aggregate was conducted on all samples with sufficient mass.

CSA test A23.2-16A, Los Angeles Abrasion (LAR) of small size coarse aggregates and CSA test 23.2-17A, LAR of large size coarse aggregate require relatively large masses of aggregate to conduct testing. Substituting smaller amounts of aggregate could yield erroneous test results. Sample #16 was the only sample which had the required mass to run this test.

CSA test A23.2-4A, Low density granular material was modified as follows: Sucrose was used to create a liquid with a specific gravity of approximately 1.5 instead of a zinc chloride to create a liquid with a specific gravity of 2.0. This was because of the difficulty in acquiring zinc chloride.

CSA test A23.2-18A, Clay size particles in aggregate was conducted on all the samples. The test results have been reported in conjunction with CSA A23.2-2A, Sieve analysis of fine and coarse aggregate. As can be seen on the report forms there is an anomaly in regards to the percent of particles smaller than the 80 μm diameter size. This is due to the presence of salt in the test samples which gave an artificially high hydrometer reading for these particles. This results in test results that show a slightly higher percent of minus 80 μm diameter size particles than actually exist in the test samples.

SUITABILITY OF MATERIAL FOR USE AS PORTLAND CEMENT AGGREGATE

Attached is a table from CSA Standard A23.1-94, A23.2-94, Limits for Deleterious Substances and Physical Properties. (Table 1) This table lists properties for both coarse and fine concrete aggregate.

The samples from Offshore Cape Breton are either predominantly granite material or predominantly sandstone material.

The granite is rounded but durable. The rounded, smooth surface of the granite may cause a decrease in the bond strength between the aggregate and the paste in the hardened concrete. But a concrete mix using rounded aggregate usually requires less water to obtain a workable mix. This can allow for the use of a lower water to cement ratio.

We trust the above is self explanatory, however, if you have any further questions please feel free to contact this office at your convenience.

Sincerely,

MARITIME TESTING (1985) LIMITED

Kevin Bearnes, C.E.T.
Laboratory Supervisor

KB/lh

Table 1
Limits for Deleterious Substances* and Physical Properties

Property	Maximum percentage by mass of total sample		
		Coarse aggregate	
	Fine aggregate	Exposure classifications† F-1, C-1, C-2,	Other exposure conditions
Standard Requirements			
Clay lumps (see Note 1)	1.0	0.25	0.5
Low-density granular materials (see Note 2)	0.5	0.5	1.0
Material finer than 80 μm	3.0§	1.0‡	1.0‡
$MgSO_4$ soundness loss (see Note 3)	16	12	18
Abrasion loss**	N/A	50	50
Alternative Requirements (see Note 3)			
Micro-Deval test (see Note 4)	20	—	—
Unconfined freeze-thaw test (see Note 5)	—	6	10

**Limits for deleterious substances not listed in the Table, such as shalestone, siltstone, sandstone, or argillaceous limestone, shall be specified by the Owner to encompass deleterious materials known to be present in a particular region. In the absence of such information aggregate shall be accepted or rejected in accordance with Clause 5.9.*

†*See Table 7.*

‡*In the case of crushed aggregate, if material finer than the 80 μm sieve consists of the dust of fracture, essentially free from clay or shale, the maximum shall be 1.5%.*

§*This limit shall be 5% if the clay size material (finer than 2 μm) does not exceed 1% of the total fine aggregate sample. The amount of material of clay size shall be determined by performing a hydrometer analysis as per ASTM Standard D422 on a sample washed through an 80 μm sieve.*

***The abrasion loss shall not be greater than 35% when the aggregate is used in concrete paving or for other concrete surfaces subjected to significant wear. This does not refer to air-cooled iron blast-furnace slag coarse aggregate.*

Notes:

(1) *Clay lumps are defined as fine-grained, consolidated, sedimentary materials of a hydrous aluminosilicate nature.*

(2) *A liquid with a relative density of 2.0 is generally used to separate particles classified as coal or lignite. Liquids with relative densities higher or lower than 2.0 may be required to identify other deleterious low-density materials.*

(3) *The $MgSO_4$ soundness loss requirements can be waived provided the material meets the Alternative Requirements detailed in Table 3.*

(4) ***CSA Test Method A23.2-23A.*** *This test for fine aggregate is rapid, has excellent precision, and has a significant correlation with the more complex and variable $MgSO_4$ soundness test. For more information see "Micro-Deval Test for Evaluating the Quality of Fine Aggregate for Concrete and Asphalt", C.A. Rogers, M. Bailey, and B. Price, Transportation Research Board, Record No. 1301, pp. 68–76, 1991.*

(Continued)

TABLE 2: Comparison of Test Results to Typical Asphalt Aggregate Specifications

Test Method and Discription	Test Results		N S DOTC Spec	PWC AK Spec	Comments
	Granite	Sandstone			
A 23.2 - 2A Sieve Analysis of Fine and Coarse Aggregate	Varying amounts of Sand,Silt and Clay		Various	Various	Highly variable gradations
A 23.2 - 3A Clay Lumps in Natural Aggregate	Low	0 - 90 %	"Free from clay"		Too much clay in sandstone samples
A 23.2 - 4A Low Density Material in Aggregate	0	0	"Free from deleterious Material"		O. K.
A 23.3 - 5A Amount of Material finer than 80 μm in Aggregate	Variable		Typically 8 % Max	Typically 8%	Samples variable, many require washing
A 23.2 - 7A Organic Impurities in sands for Concrete	Typically > 3		Not Applicable		
A 23.2 - 9A Magnesium Sulphate Soundness	Typically Less Than 2%	Some samples 18 - 27 %	Max 10 or 15 %	Max 12 or 16 %	Sandstone samples failed Spec
A 23.2 - 10A Density of Aggregate					
A 23.2 - 12A Relative Density and Absorption of Coarse Aggregate	1 - 1.6	2 - 4	Max 1.75 %		Granitic aggregates O.K. Sandstone Failed
A 23.2 - 13A Flat and Elongated particles in Coarse Aggregate	Predominantly rounded and subrounded		B S 812 Max 45 %	"Free from flat elongated"	
A23.2 - 15A Petrographic Examination of Coarse Aggregate	223 121,119 121,136	323 198 261,241	135 -200 Depending on traffic		Granitic Samples could be be O.K. Sandstones too soft
A 23.2 - 16A Los Angeles Abrasion Small Aggregate (< 40 mm)	22		35% Maximum	25% Maximum	

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APPENDIX A
TEST RESULTS

MARITIME TESTING (1985) LIMITED
Suite 116, 900 Windmill Road
Dartmouth, N.S. B3B 1P7 468-6486

GRAIN SIZE ANALYSIS - CSA CERTIFIED LAB

TO: ATLANTIC GEOSCIENCE CENTRE/BIO
DARTMOUTH, NOVA SCOTIA
B2Y 4A2
0

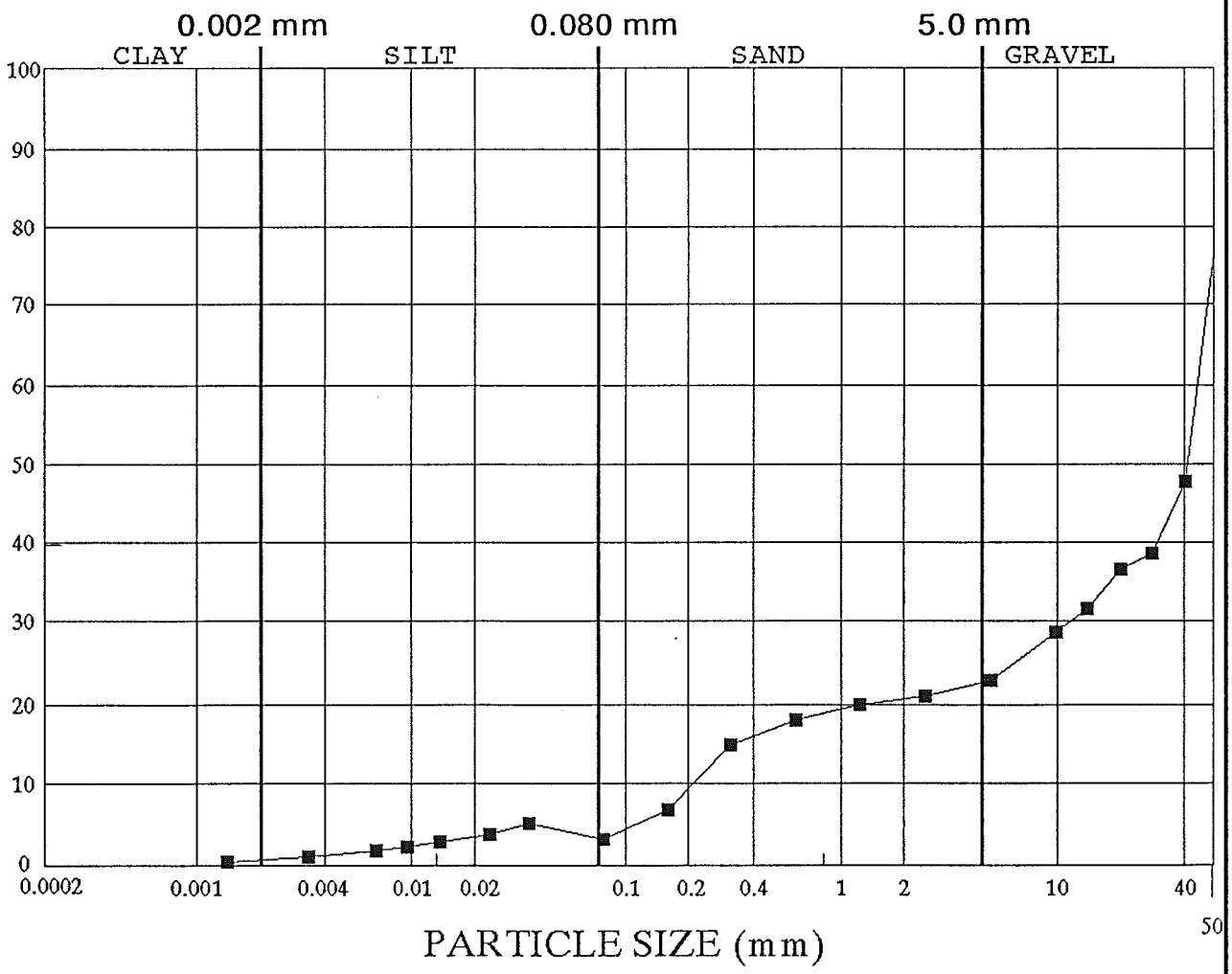
FILE: NAO-1268
DATE: 19 JANUARY 95
CLIENT PO:

ATTENTION: MR. GORDON FADER

PROJECT: 94-131 J.L. HART P.O.#23420-4-M195/01-HAL

SOURCE: STN #1 DEPTH: N/A
SAMPLE TYPE: DREDGED SAMPLE DATE TESTED: 16 JANUARY 95

SIEVE SIZE (MM)	% PASS
112	100.0
80	100.0
56	79.0
40	48.0
28	39.0
20	37.0
14	32.0
10	29.0
5.0	23.0
2.5	21.0
1.25	20.0
0.63	18.0
0.315	15.0
0.160	7.0
0.080	3.2
0.0359	5.2
0.0234	3.8
0.0137	2.8
0.0097	2.4
0.0069	1.8
0.0034	1.1
0.0014	0.5



COMMENTS:

The irregularity in gradation below 80 um particle size is due to the salt present in the sample.

A.S.T.M. DESIGNATION D422

MARITIME TESTING (1985) LIMITED
Suite 116, 900 Windmill Road
Dartmouth, N.S. B3B 1P7 468-6486

GRAIN SIZE ANALYSIS - CSA CERTIFIED LAB

TO: ATLANTIC GEOSCIENCE CENTRE/BIO
DARTMOUTH, NOVA SCOTIA
B2Y 4A2
0

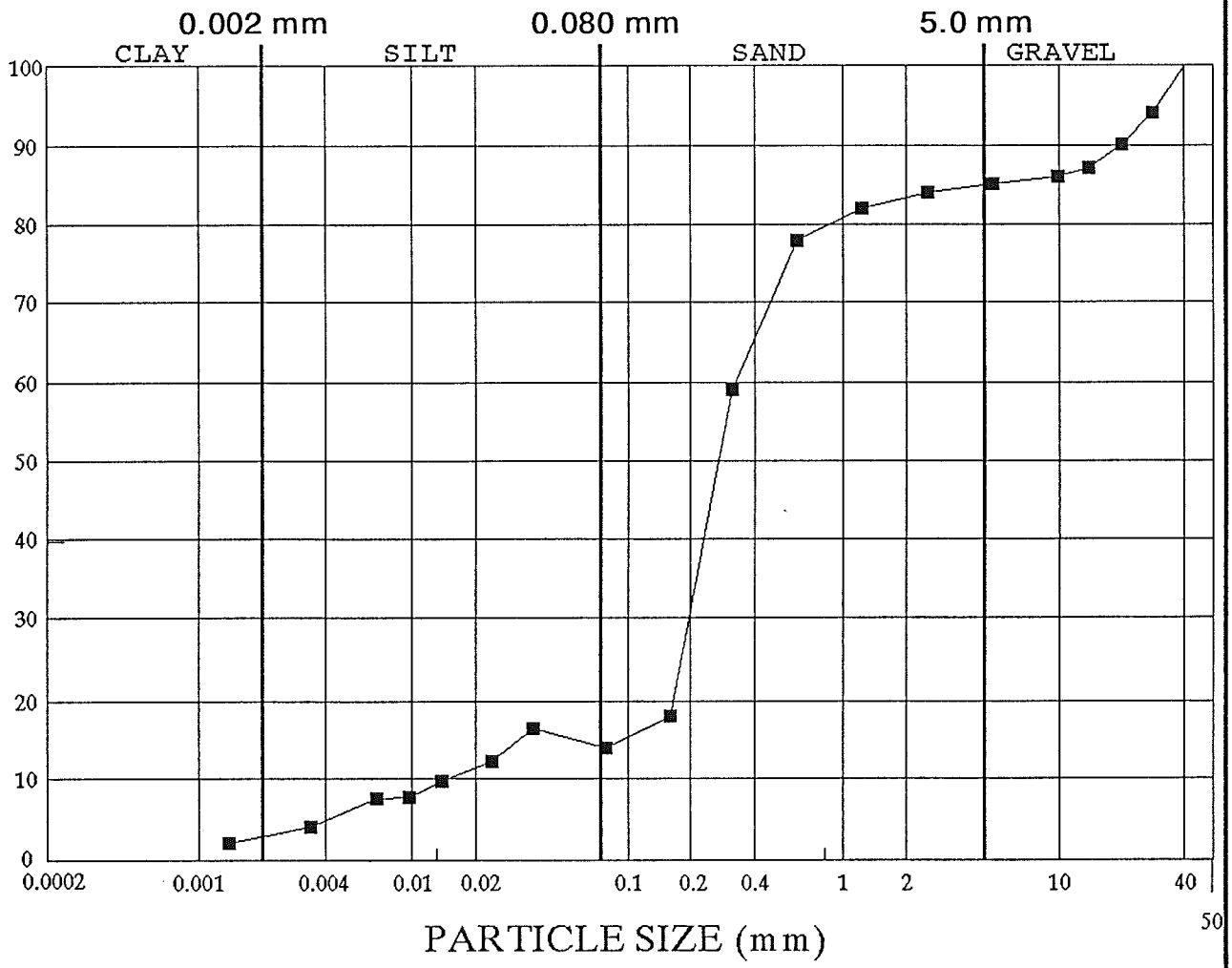
FILE: NAO-1268
DATE: 19 JANUARY 95
CLIENT PO:

ATTENTION: MR. GORDON FADER

PROJECT: 94-131 J.L. HART P.O.#23420-4-M195/01-HAL

SOURCE: STN #4 DEPTH: N/A
SAMPLE TYPE: DREDGED SAMPLE DATE TESTED: 16 JANUARY 95

SIEVE SIZE (MM)	% PASS
112	100.0
80	100.0
56	100.0
40	100.0
28	94.0
20	90.0
14	87.0
10	86.0
5.0	85.0
2.5	84.0
1.25	82.0
0.63	78.0
0.315	59.0
0.160	18.0
0.080	14.1
0.0371	16.6
0.0238	12.4
0.0138	9.9
0.0099	7.9
0.0070	7.7
0.0034	4.1
0.0014	2.1



COMMENTS:

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Suite 116, 900 Windmill Road
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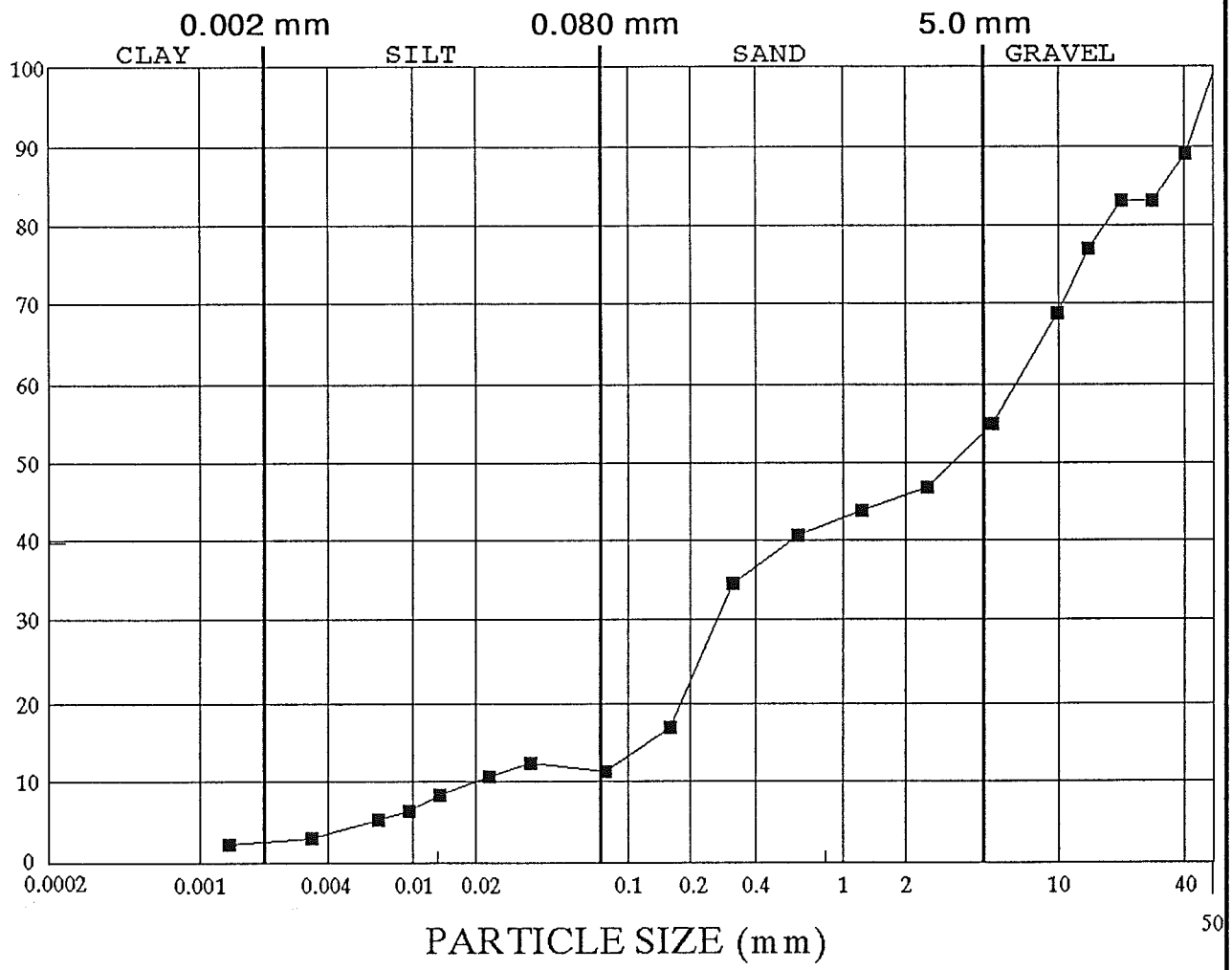
ATTENTION: MR. GORDON FADER

PROJECT: 94-131 J.L. HART P.O.#23420-4-M195/01-HAL

SOURCE: STN #5 DEPTH: N/A
SAMPLE TYPE: DREDGED SAMPLE DATE TESTED: 16 JANUARY 95

SIEVE SIZE (MM)	% PASS
112	100.0
80	100.0
56	100.0
40	89.0
28	83.0
20	83.0
14	77.0
10	69.0
5.0	55.0
2.5	47.0
1.25	44.0
0.63	41.0
0.315	35.0
0.160	17.0
0.080	11.4
0.0360	12.4
0.0231	10.8
0.0135	8.5
0.0097	6.5
0.0069	5.3
0.0034	3.1
0.0014	2.3



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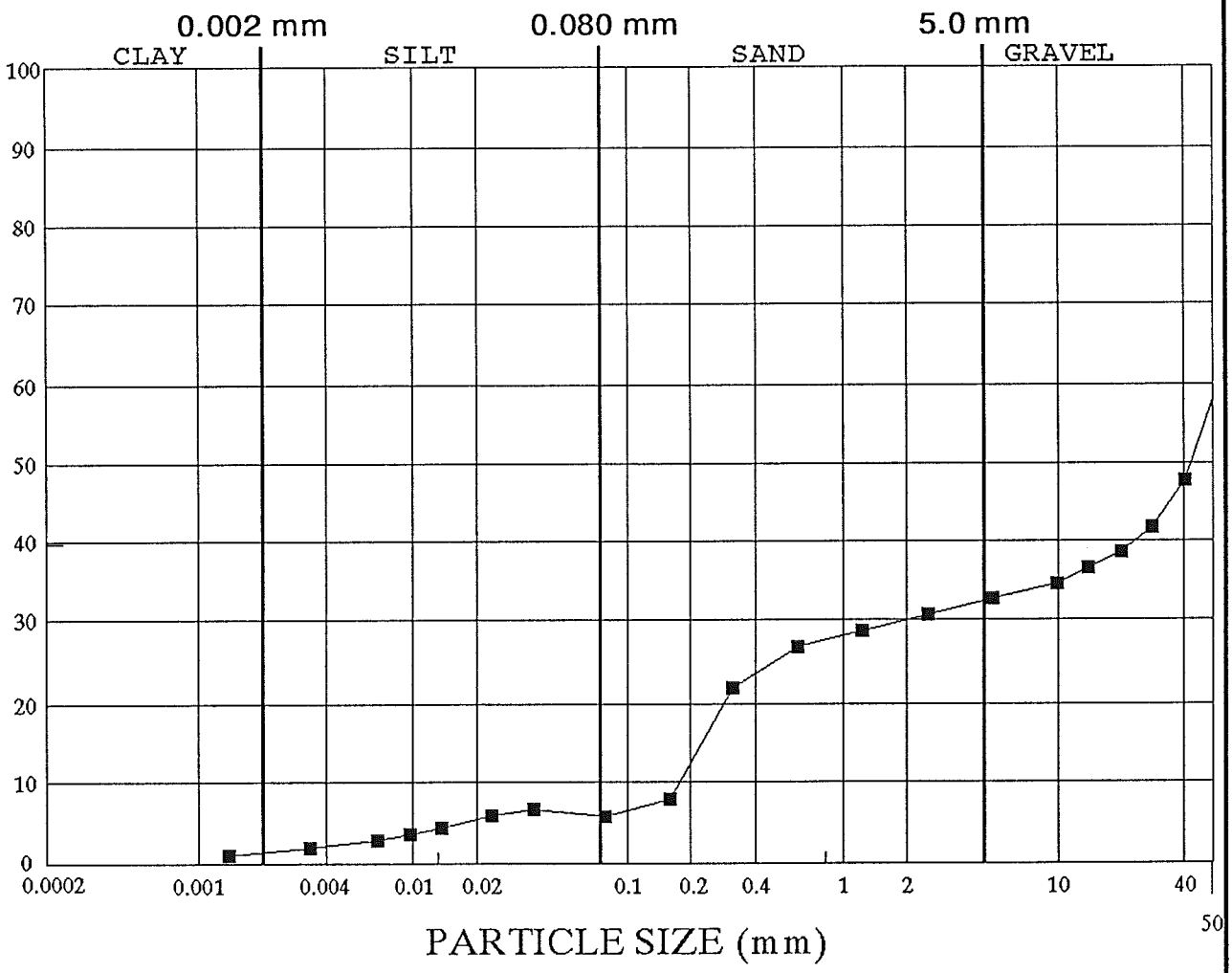
ATTENTION: MR. GORDON FADER

PROJECT: 94-131 J.L. HART P.O.#23420-4-M195/01-HAL

SOURCE: STN #8 DEPTH: N/A
SAMPLE TYPE: DREDGED SAMPLE DATE TESTED: 16 JANUARY 95

SIEVE SIZE (MM)	% PASS
112	100.0
80	100.0
56	59.0
40	48.0
28	42.0
20	39.0
14	37.0
10	35.0
5.0	33.0
2.5	31.0
1.25	29.0
0.63	27.0
0.315	22.0
0.160	8.0
0.080	5.9
0.0367	6.8
0.0234	6.0
0.0137	4.5
0.0098	3.8
0.0070	2.9
0.0034	2.0
0.0014	1.1



COMMENTS:

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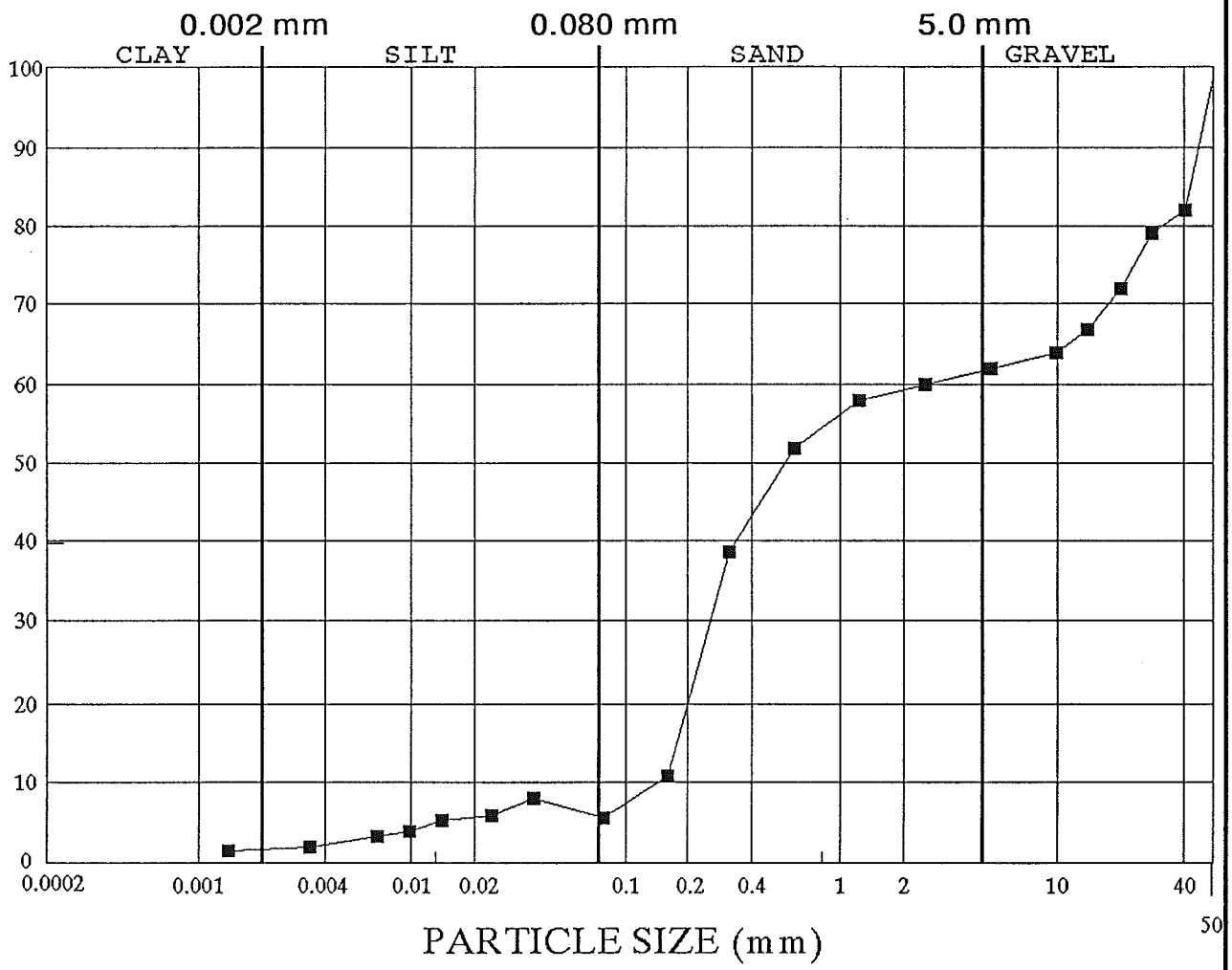
ATTENTION: MR. GORDON FADER

PROJECT: 94-131 J.L. HART P.O.#23420-4-M195/01-HAL

SOURCE: STN #9 DEPTH: N/A
SAMPLE TYPE: DREDGED SAMPLE DATE TESTED: 16 JANUARY 95

SIEVE SIZE (MM)	% PASS
112	100.0
80	100.0
56	100.0
40	82.0
28	79.0
20	72.0
14	67.0
10	64.0
5.0	62.0
2.5	60.0
1.25	58.0
0.63	52.0
0.315	39.0
0.160	11.0
0.080	5.7
0.0378	8.2
0.0242	6.0
0.0140	5.4
0.0100	4.0
0.0070	3.4
0.0034	1.9
0.0014	1.5



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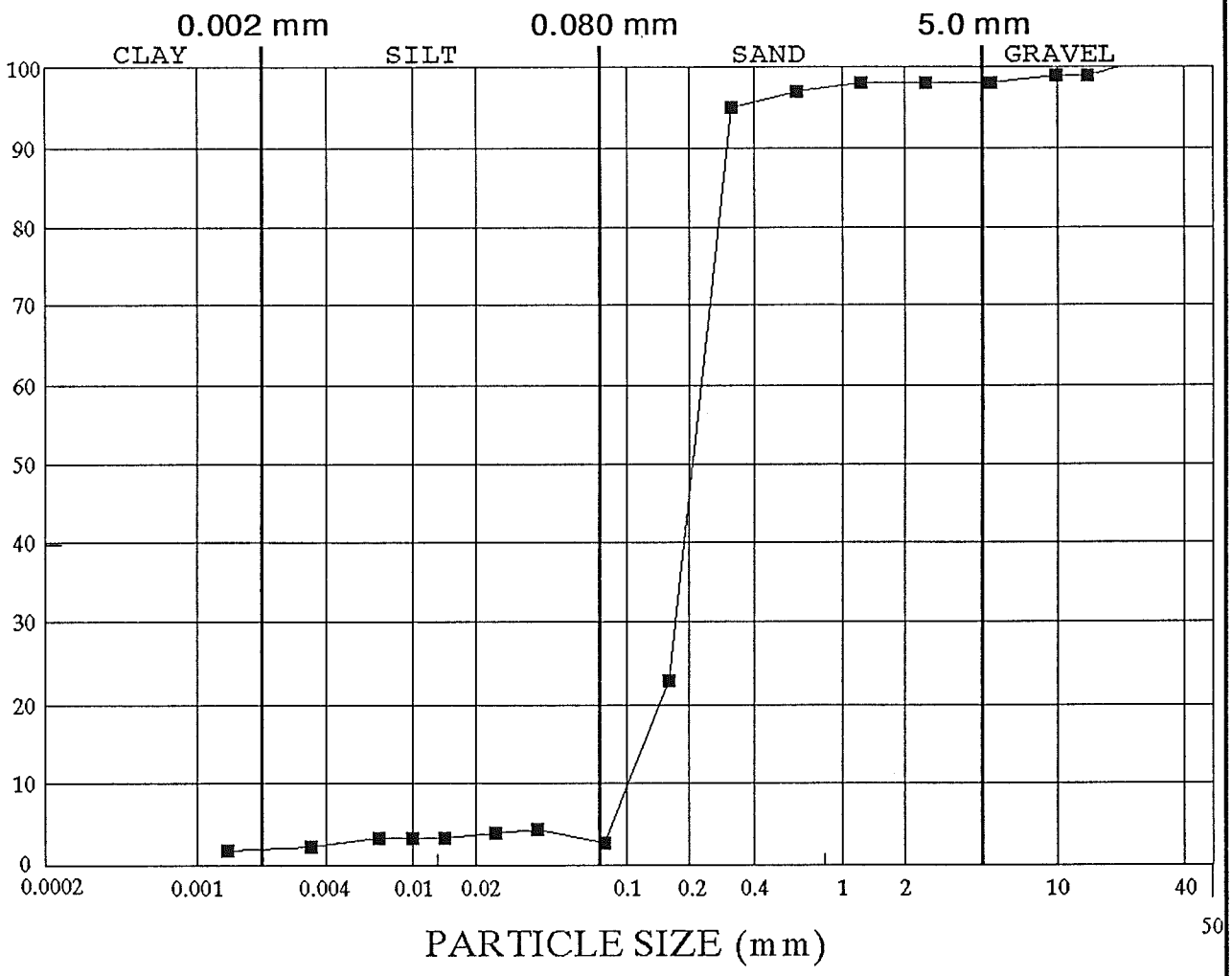
PROJECT: 94-131 J.L. HART P.O.#23420-4-M195/01-HAL

SOURCE: STN #12 DEPTH: N/A
SAMPLE TYPE: DREDGED SAMPLE DATE TESTED: 16 JANUARY 95

SIEVE SIZE (MM)	% PASS
112	100.0
80	100.0
56	100.0
40	100.0
28	100.0
20	100.0
14	99.0
10	99.0
5.0	98.0
2.5	98.0
1.25	98.0
0.63	97.0
0.315	95.0
0.160	23.0
0.080	2.8
0.0390	4.5
0.0247	4.1
0.0143	3.4
0.0101	3.4
0.0071	3.4
0.0034	2.3
0.0014	1.8



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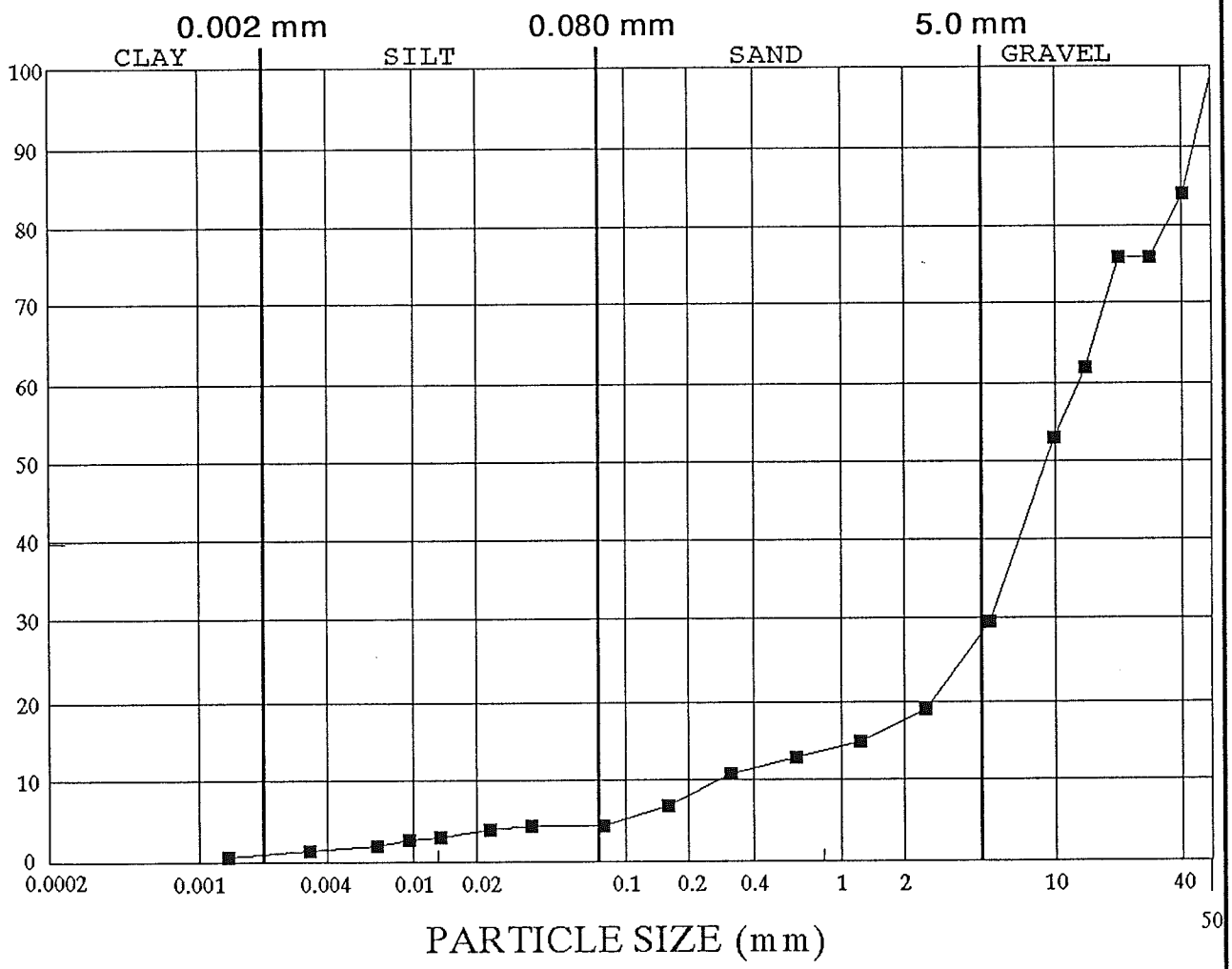
PROJECT: 94-131 J.L. HART P.O.#23420-4-M195/01-HAL

SOURCE: STN # 13 DEPTH: N/A
SAMPLE TYPE: DREDGED SAMPLE DATE TESTED: 16 JANUARY 1995

SIEVE SIZE (MM)	% PASS
112	100.0
80	100.0
56	100.0
40	84.0
28	76.0
20	76.0
14	62.0
10	53.0
5.0	30.0
2.5	19.0
1.25	15.0
0.63	13.0
0.315	11.0
0.160	7.0
0.080	4.5
0.0364	4.5
0.0233	3.9
0.0136	3.1
0.0097	2.7
0.0069	2.1
0.0033	1.3
0.0014	0.7



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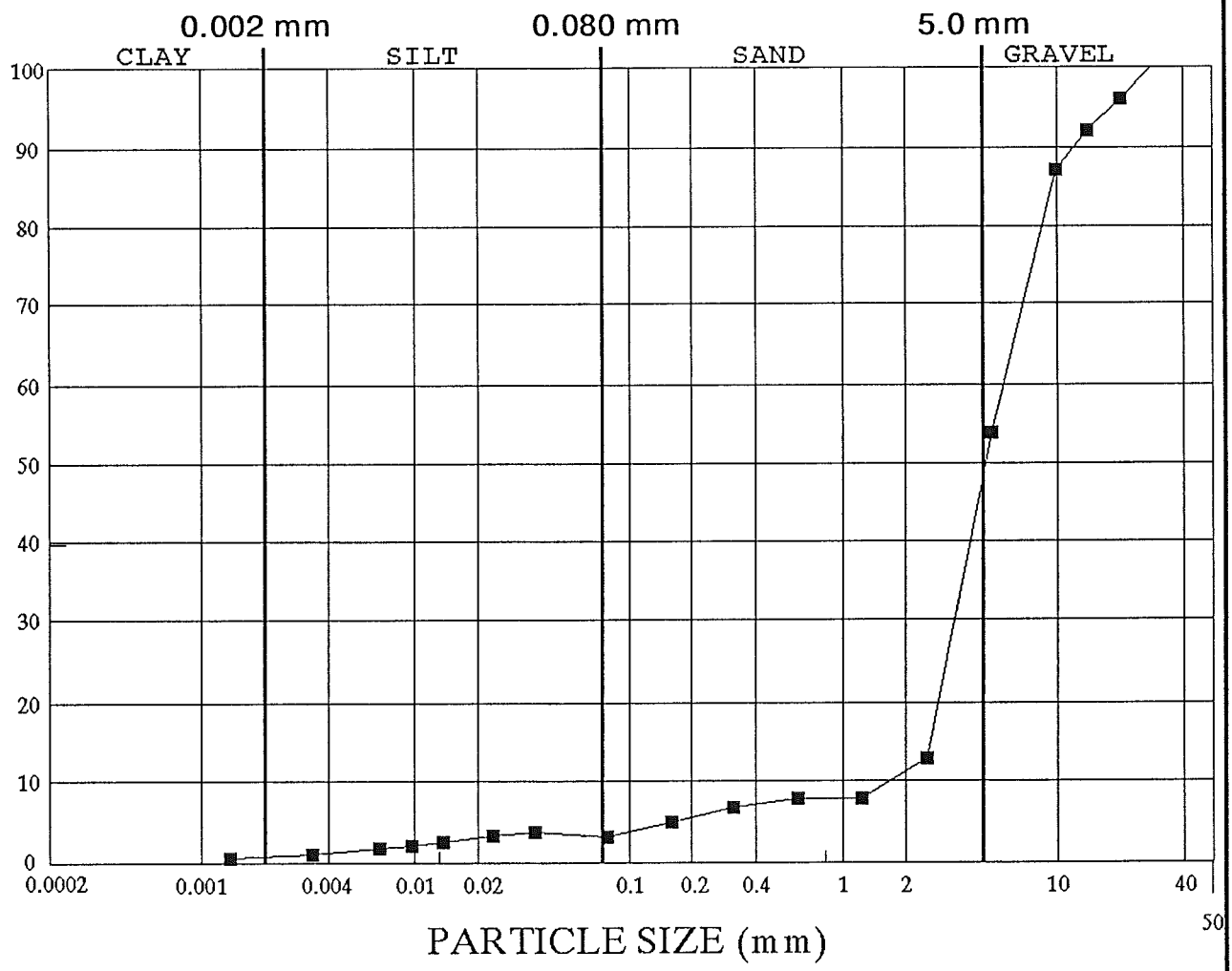
PROJECT: 94-131 J.L. HART P.O.#23420-4-M195/01-HAL

SOURCE: STN #16 DEPTH: N/A
SAMPLE TYPE: DREDGED SAMPLE DATE TESTED: 16 JANUARY 95

SIEVE SIZE (MM)	% PASS
112	100.0
80	100.0
56	100.0
40	100.0
28	100.0
20	96.0
14	92.0
10	87.0
5.0	54.0
2.5	13.0
1.25	8.0
0.63	8.0
0.315	7.0
0.160	5.0
0.080	3.3
0.0367	3.9
0.0235	3.3
0.0137	2.6
0.0098	2.1
0.0069	1.8
0.0034	1.1
0.0014	0.6



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Suite 116, 900 Windmill Road
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GRAIN SIZE ANALYSIS - CSA CERTIFIED LAB

TO: ATLANTIC GEOSCIENCE CENTRE/BIO
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DATE: 19 JANUARY 95
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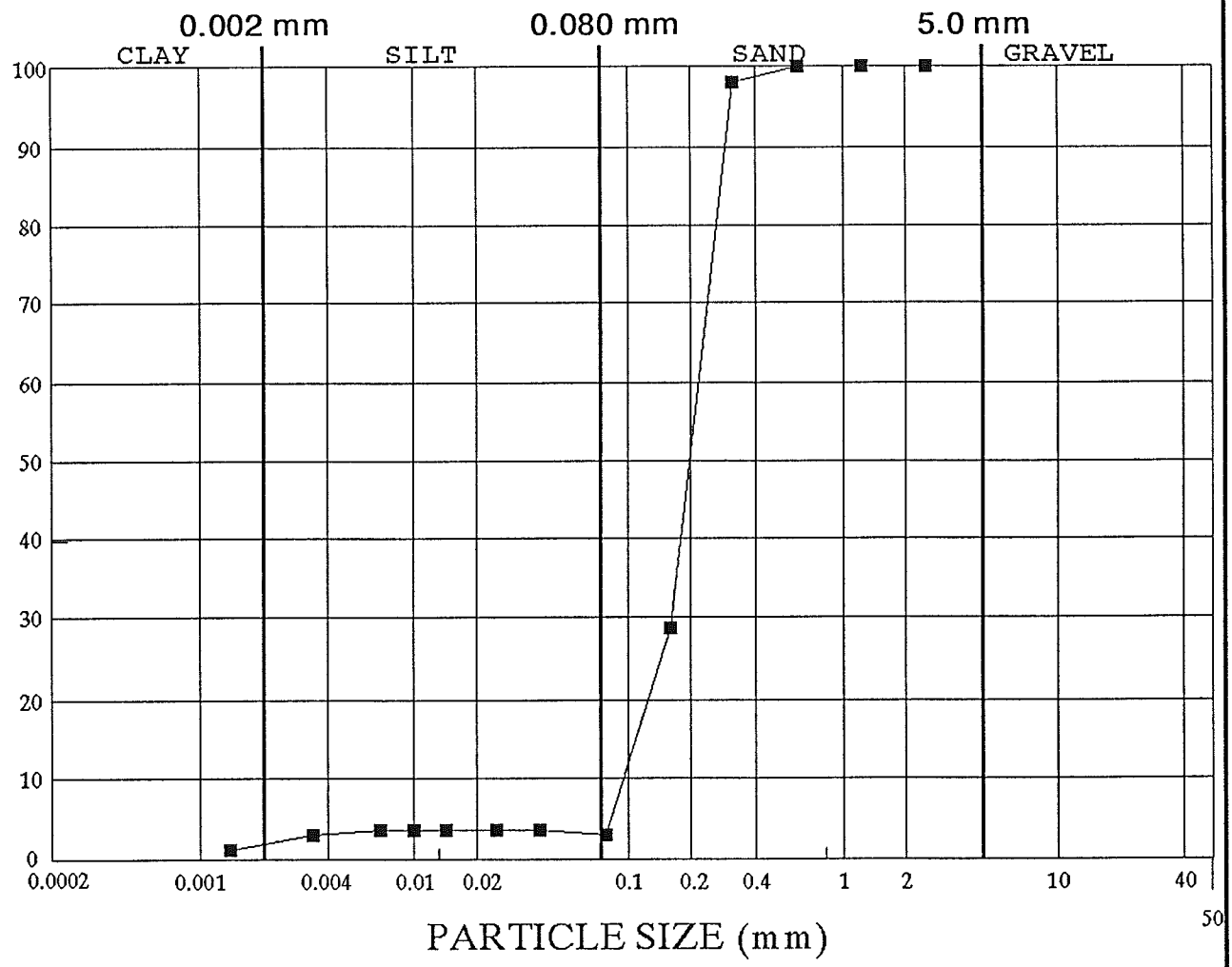
ATTENTION: MR. GORDON FADER

PROJECT: 94-131 J.L. HART P.O.#23420-4-M195/01-HAL

SOURCE: STN #17 DEPTH: N/A
SAMPLE TYPE: DREDGED SAMPLE DATE TESTED: 16 JANUARY 95

SIEVE SIZE (MM)	% PASS
112	100.0
80	100.0
56	100.0
40	100.0
28	100.0
20	100.0
14	100.0
10	100.0
5.0	100.0
2.5	100.0
1.25	100.0
0.63	100.0
0.315	98.0
0.160	29.0
0.080	3
0.0392	3.6
0.0248	3.6
0.0143	3.6
0.0101	3.6
0.0071	3.6
0.0034	3.1
0.0014	1.2



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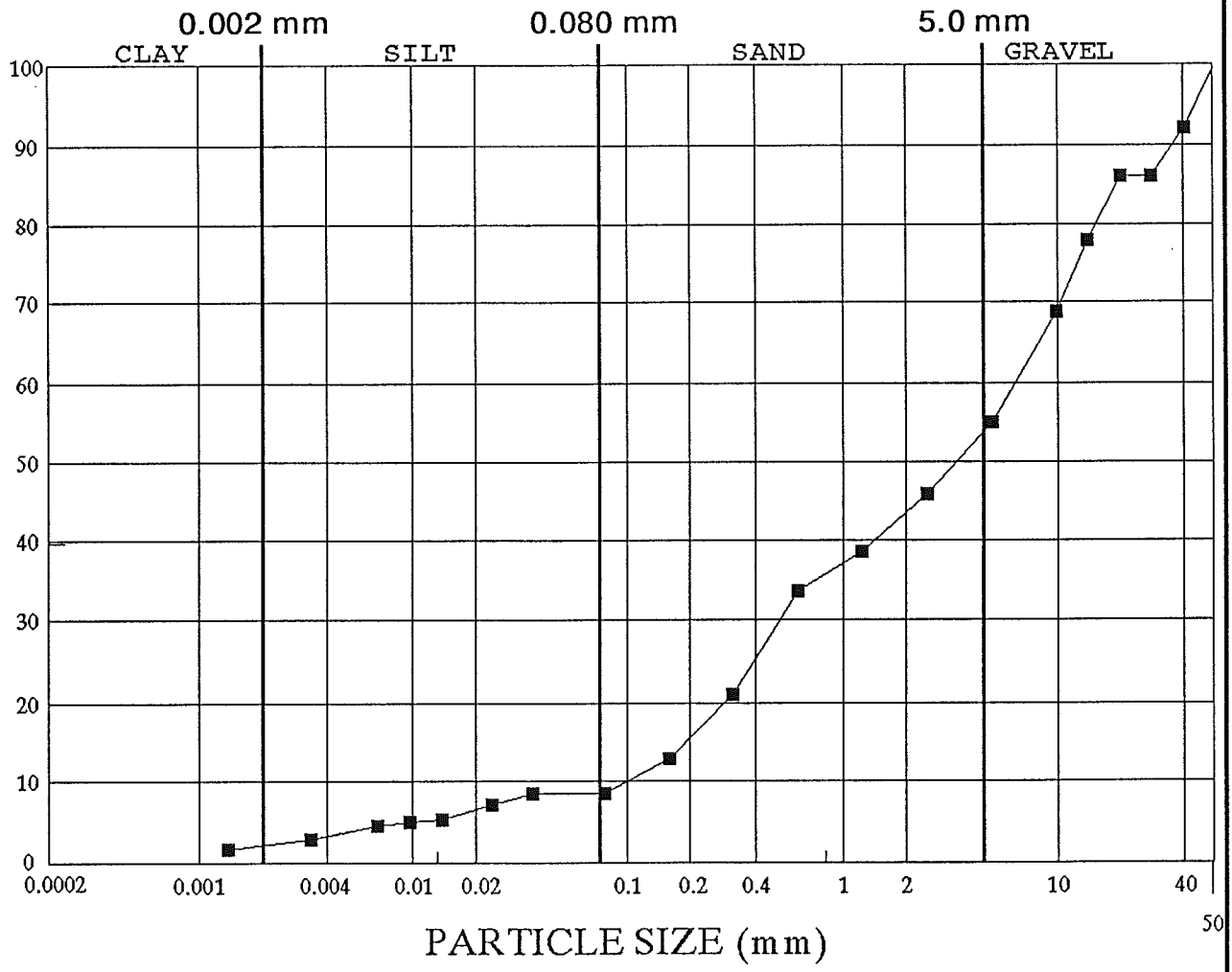
ATTENTION: MR. GORDON FADER

PROJECT: 94-131 J.L. HART P.O.#23420-4-M195/01-HAL

SOURCE: STN #20 DEPTH: N/A
SAMPLE TYPE: DREDGED SAMPLE DATE TESTED: 16 JANUARY 95

SIEVE SIZE (MM)	% PASS
112	100.0
80	100.0
56	100.0
40	92.0
28	86.0
20	86.0
14	78.0
10	69.0
5.0	55.0
2.5	46.0
1.25	39.0
0.63	34.0
0.315	21.0
0.160	13.0
0.080	8.6
0.0370	8.7
0.0237	7.3
0.0139	5.4
0.0098	5.1
0.0069	4.6
0.0034	2.9
0.0014	1.7



COMMENTS:

The irregularity in gradation below the 80 um particle size is due to the salt present in the sample.

A.S.T.M. DESIGNATION D422

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Dartmouth, N.S. B3B 1P7 468-6486

GRAIN SIZE ANALYSIS - CSA CERTIFIED LAB

TO: ATLANTIC GEOSCIENCE CENTRE/BIO
DARTMOUTH, NOVA SCOTIA
B2Y 4A2
0

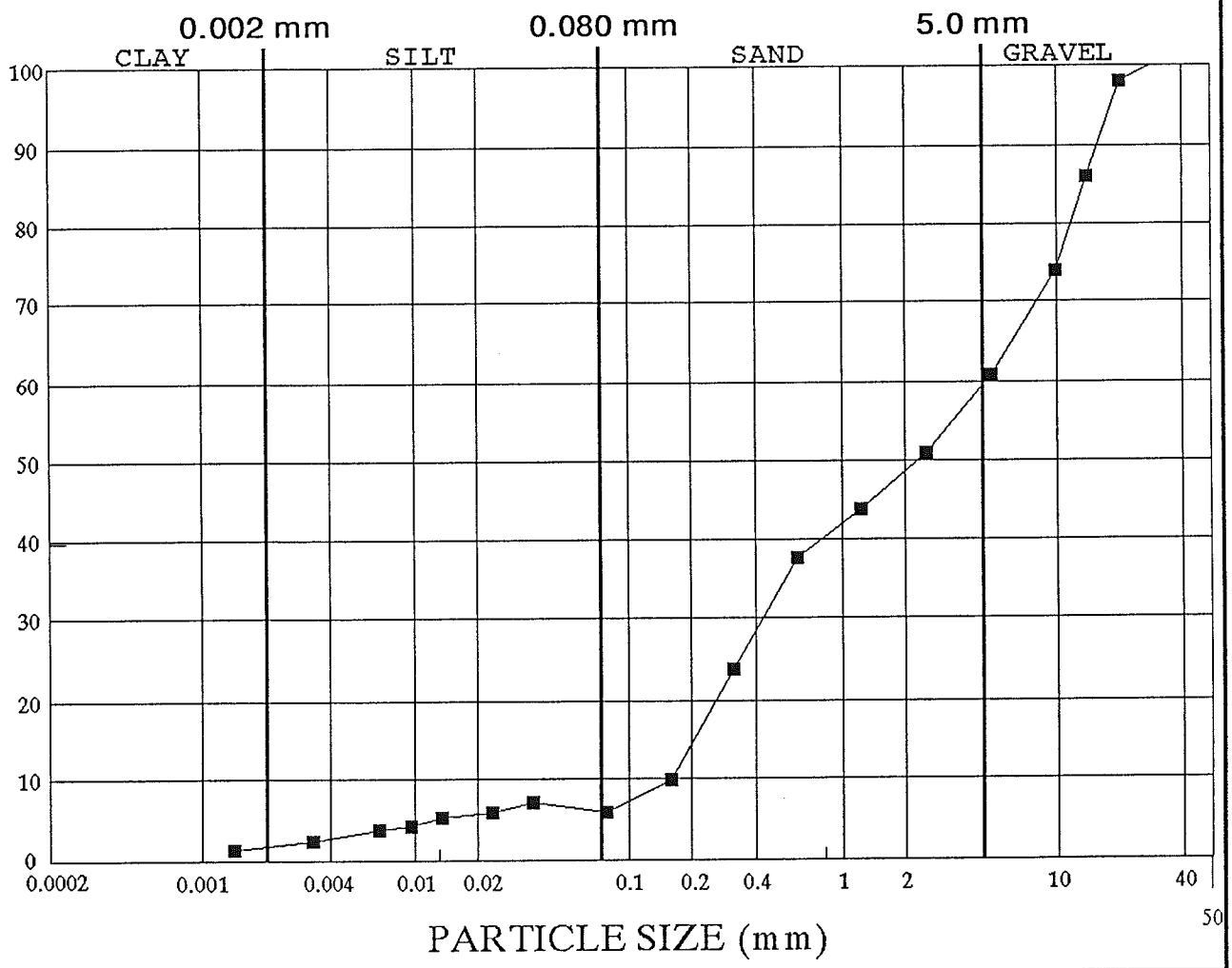
FILE: NAO-1268
DATE: 19 JANUARY 95
CLIENT PO:

ATTENTION: MR. GORDON FADER

PROJECT: 94-131 J.L. HART P.O.#23420-4-M195/01-HAL

SOURCE: STN #21 DEPTH: N/A
SAMPLE TYPE: DREDGED SAMPLE DATE TESTED: 16 JANUARY 95

SIEVE SIZE (MM)	% PASS
112	100.0
80	100.0
56	100.0
40	100.0
28	100.0
20	98.0
14	86.0
10	74.0
5.0	61.0
2.5	51.0
1.25	44.0
0.63	38.0
0.315	24.0
0.160	10.0
0.080	6
0.0366	7.2
0.0234	6.0
0.0135	5.4
0.0097	4.3
0.0068	3.9
0.0033	2.4
0.0014	1.4



COMMENTS:

The irregularity in gradation below the 80 um particle size is due to the salt present in the sample.

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GRAIN SIZE ANALYSIS - CSA CERTIFIED LAB

TO: ATLANTIC GEOSCIENCE CENTRE/BIO
DARTMOUTH, NOVA SCOTIA
B2Y 4A2
0

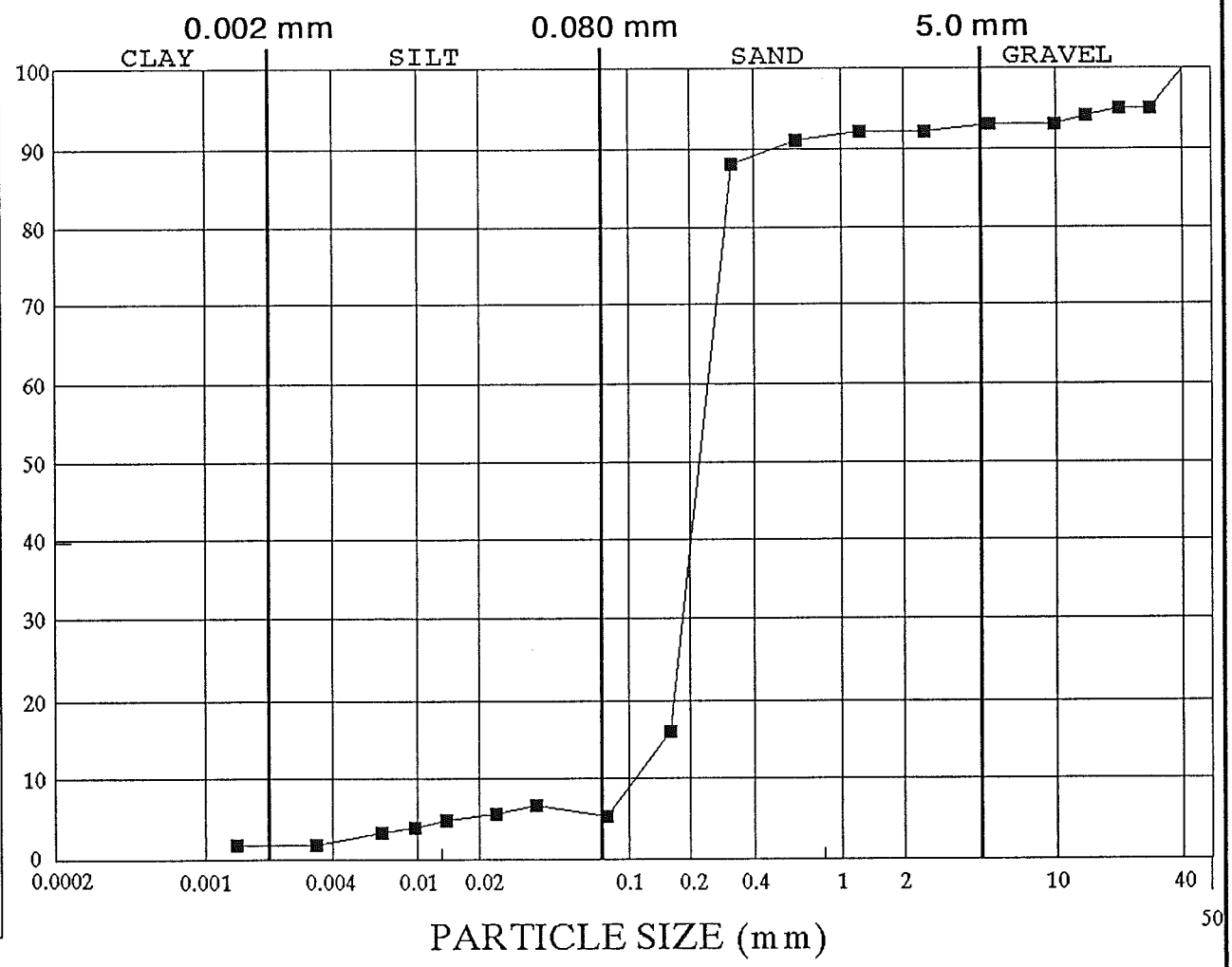
FILE: NAO-1268
DATE: 19 JANUARY 95
CLIENT PO:

ATTENTION: MR. GORDON FADER

PROJECT: 94-131 J.L. HART P.O.#23420-4-M195/01-HAL

SOURCE: STN #24 DEPTH: N/A
SAMPLE TYPE: DREDGED SAMPLE DATE TESTED: 16 JANUARY 95

SIEVE SIZE (MM)	% PASS
112	100.0
80	100.0
56	100.0
40	100.0
28	95.0
20	95.0
14	94.0
10	93.0
5.0	93.0
2.5	92.0
1.25	92.0
0.63	91.0
0.315	88.0
0.160	16.0
0.080	5.4
0.0377	6.8
0.0239	5.6
0.0138	5.0
0.0098	4.1
0.0069	3.4
0.0034	1.8
0.0014	1.8



COMMENTS:

The irregularity in gradation below the 80 um particle size is due to the salt present in the sample.

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GRAIN SIZE ANALYSIS - CSA CERTIFIED LAB

TO: ATLANTIC GEOSCIENCE CENTRE/BIO
DARTMOUTH, NOVA SCOTIA
B2Y 4A2
0

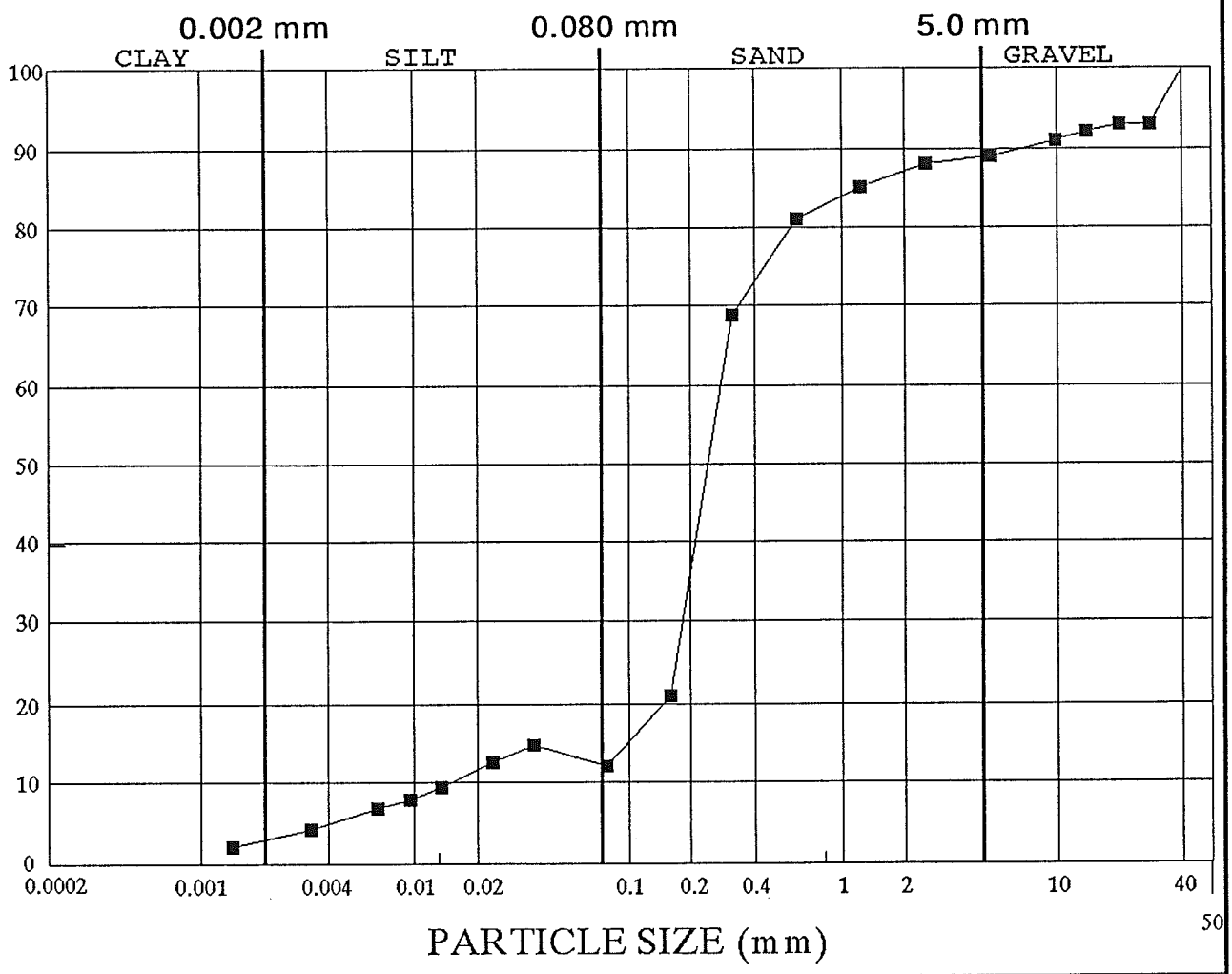
FILE: NAO-1268
DATE: 19 JANUARY 95
CLIENT PO:

ATTENTION: MR. GORDON FADER

PROJECT: 94-131 J.L. HART P.O.#23420-4-M195/01-HAL

SOURCE: STN #25 DEPTH: N/A
SAMPLE TYPE: DREDGED SAMPLE DATE TESTED: 16 JANUARY 95

SIEVE SIZE (MM)	% PASS
112	100.0
80	100.0
56	100.0
40	100.0
28	93.0
20	93.0
14	92.0
10	91.0
5.0	89.0
2.5	88.0
1.25	85.0
0.63	81.0
0.315	69.0
0.160	21.0
0.080	12.2
0.0365	14.9
0.0233	12.7
0.0136	9.5
0.0097	8.1
0.0068	7.0
0.0033	4.2
0.0014	2.1



COMMENTS:

The irregularity in gradation below the 80 um particle size is due to the salt present in the sample.

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GRAIN SIZE ANALYSIS - CSA CERTIFIED LAB

TO: ATLANTIC GEOSCIENCE CENTRE/BIO
DARTMOUTH, NOVA SCOTIA
B2Y 4A2
0

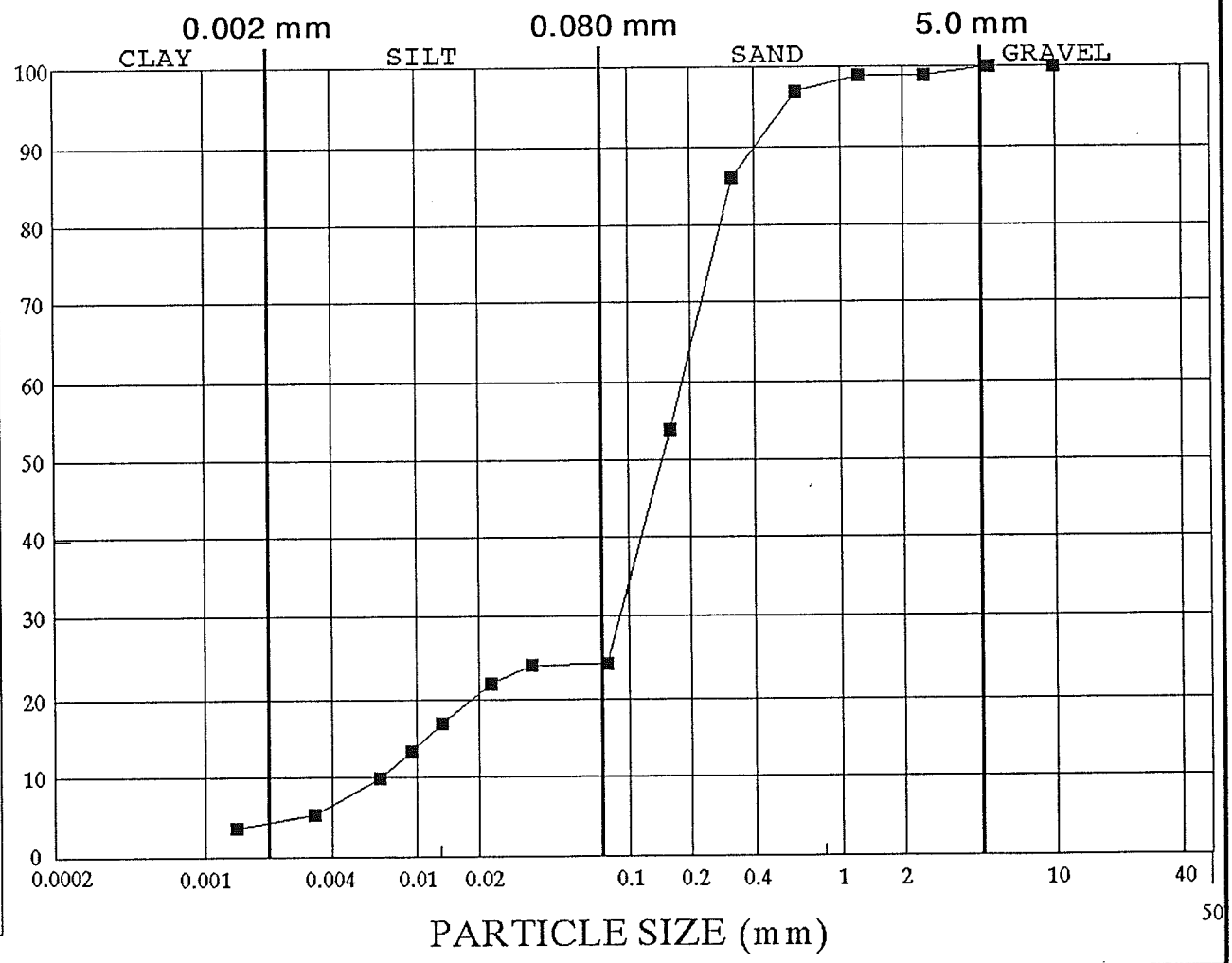
FILE: NAO-1268
DATE: 19 JANUARY 95
CLIENT PO:

ATTENTION: MR. GORDON FADER

PROJECT: 94-131 J.L. HART P.O.#23420-4-M195/01-HAL

SOURCE: STN #28 DEPTH: N/A
SAMPLE TYPE: DREDGED SAMPLE DATE TESTED: 16 JANUARY 95

SIEVE SIZE (MM)	% PASS
112	100.0
80	100.0
56	100.0
40	100.0
28	100.0
20	100.0
14	100.0
10	100.0
5.0	100.0
2.5	99.0
1.25	99.0
0.63	97.0
0.315	86.0
0.160	54.0
0.080	24.4
0.0355	24.3
0.0227	21.9
0.0133	17.0
0.0095	13.4
0.0068	10.0
0.0033	5.3
0.0014	3.6



COMMENTS:

The irregularity in gradation below the 80 um particle size is due to the salt present in the sample.

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GRAIN SIZE ANALYSIS - CSA CERTIFIED LAB

TO: ATLANTIC GEOSCIENCE CENTRE/BIO
DARTMOUTH, NOVA SCOTIA
B2Y 4A2
0

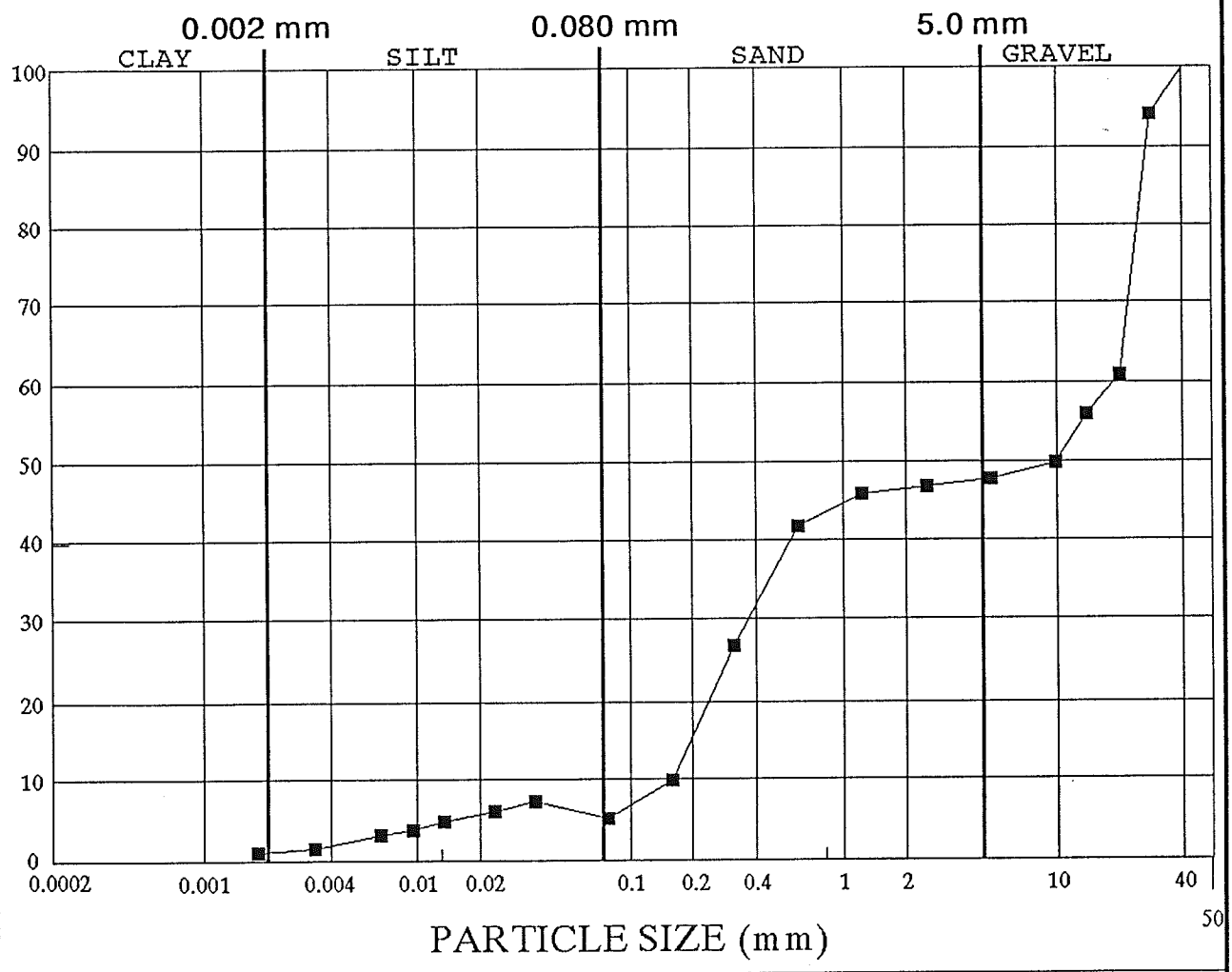
FILE: NAO-1268
DATE: 19 JANUARY 95
CLIENT PO:

ATTENTION: MR. GORDON FADER

PROJECT: 94-131 J.L. HART P.O.#23420-4-M195/01-HAL

SOURCE: STN #29 DEPTH: N/A
SAMPLE TYPE: DREDGED SAMPLE DATE TESTED: 16 JANUARY 95

SIEVE SIZE (MM)	% PASS
112	100.0
80	100.0
56	100.0
40	100.0
28	94.0
20	61.0
14	56.0
10	50.0
5.0	48.0
2.5	47.0
1.25	46.0
0.63	42.0
0.315	27.0
0.160	10.0
0.080	5.3
0.0366	7.4
0.0234	6.1
0.0136	4.8
0.0097	3.8
0.0069	3.2
0.0034	1.6
0.0018	1.1



COMMENTS:

The irregularity in gradation below the 80 um particle size is due to the salt present in the sample.

A.S.T.M. DESIGNATION D422

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LAB REPORT FORM

CLAY LUMPS
CSA A23.2 - 3A

Client Atantic Geoscience Center (B.I.O.) **Job #** NAO-1268

Sample # 1 **Date** Jan.26/95

COARSE AGGREGATE		
M, Mass of Sample (g)	=	
R, Mass After Clay Removed (g)	=	
$\frac{M - R}{M\%}$ = L = Clay Lumps	=	

FINE AGGREGATE 100g - 1.25mm		
M, Mass of Sample (g)	=	
R, Mass After Clay Removed (g)	=	
$\frac{M - R}{M\%}$ = L = Clay Lumps	=	

COMMENTS: Insufficient Sample To Conduct Test

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Your Reference No.

LAB REPORT FORM

CLAY LUMPS
CSA A23.2 - 3A

Client Atlantic Geoscience Center (B.I.O.) **Job #** NAO-1268

Sample # 4 **Date** Jan.26/95

COARSE AGGREGATE		
M, Mass of Sample (g)	=	313.9
R, Mass After Clay Removed (g)	=	294.9
$\frac{M - R}{M\%} = L$ = Clay Lumps	=	6.1%

FINE AGGREGATE 100g - 1.25mm		
M, Mass of Sample (g)	=	126.1
R, Mass After Clay Removed (g)	=	38.4
$\frac{M - R}{M\%} = L$ = Clay Lumps	=	69.5%

COMMENTS:

SUITE 116, 900 WINDMILL ROAD, DARTMOUTH, NOVA SCOTIA B3B 1P7 - TELEPHONE (902) 468-6486 - FAX 468-4919
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LAB REPORT FORM

CLAY LUMPS
CSA A23.2 - 3A

Client Atlantic Geoscience Center (B.I.O.) **Job #** NAO-1268

Sample # 5 **Date** Jan.26/95

COARSE AGGREGATE		
M, Mass of Sample (g)	=	1656.9
R, Mass After Clay Removed (g)	=	1632.4
$\frac{M - R}{M\%}$ = L = Clay Lumps	=	1.5%

FINE AGGREGATE 100g - 1.25mm		
M, Mass of Sample (g)	=	129.6
R, Mass After Clay Removed (g)	=	109.7
$\frac{M - R}{M\%}$ = L = Clay Lumps	=	15.4%

COMMENTS:

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LAB REPORT FORM

CLAY LUMPS

CSA A23.2 - 3A

Client Atlantic Geoscience Center (B.I.O.) **Job #** NAO-1268

Sample # 8 **Date** Jan.26/95

COARSE AGGREGATE

M, Mass of Sample (g)	=	1277.6
R, Mass After Clay Removed (g)	=	1274.4
$\frac{M - R}{M\%} = L$ = Clay Lumps	=	0.3%

FINE AGGREGATE 100g - 1.25mm

M, Mass of Sample (g)	=	115.3
R, Mass After Clay Removed (g)	=	73.1
$\frac{M - R}{M\%} = L$ = Clay Lumps	=	36.6%

COMMENTS:

SUITE 116, 900 WINDMILL ROAD, DARTMOUTH, NOVA SCOTIA B3B 1P7 - TELEPHONE (902) 468-6486 - FAX 468-4919
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CLAY LUMPS
CSA A23.2.- 3A

Client Atlantic Geoscience Center (B.I.O.)

Job # NAO-1268

Sample # 9

Date Jan.26/95

COARSE AGGREGATE

M, Mass of Sample (g)	=	1403.5
R, Mass After Clay Removed (g)	=	1402.8
$\frac{M - R}{M\%}$ = L = Clay Lumps	=	0.1%

FINE AGGREGATE 100g - 1.25mm

M, Mass of Sample (g)	=	99.9
R, Mass After Clay Removed (g)	=	81.9
$\frac{M - R}{M\%}$ = L = Clay Lumps	=	18.0%

COMMENTS:

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CLAY LUMPS
CSA A23.2 - 3A

Client Atlantic Geoscience Center (B.I.O.) **Job #** NAO-1268

Sample # 12 **Date** Jan.26/95

COARSE AGGREGATE	
M, Mass of Sample (g)	=
R, Mass After Clay Removed (g)	=
$\frac{M - R}{M\%}$ = L = Clay Lumps	=

FINE AGGREGATE 100g - 1.25mm	
M, Mass of Sample (g)	=
R, Mass After Clay Removed (g)	=
$\frac{M - R}{M\%}$ = L = Clay Lumps	=

COMMENTS: Insufficient Sample To Conduct Test

SUITE 116, 900 WINDMILL ROAD, DARTMOUTH, NOVA SCOTIA B3B 1P7 - TELEPHONE (902) 468-6486 - FAX 468-4919
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LAB REPORT FORM

CLAY LUMPS
CSA A23.2 - 3A

Client Atlantic Geoscience Center (B.I.O.) **Job #** NAO-1268

Sample # 13 **Date** Jan.26/95

COARSE AGGREGATE		
M, Mass of Sample (g)	=	1936.3
R, Mass After Clay Removed (g)	=	1936.3
$\frac{M - R}{M\%}$ = L = Clay Lumps	=	0 %

FINE AGGREGATE 100g - 1.25mm		
M, Mass of Sample (g)	=	127.4
R, Mass After Clay Removed (g)	=	126.5
$\frac{M - R}{M\%}$ = L = Clay Lumps	=	0.7%

COMMENTS:

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CLAY LUMPS
CSA A23.2 - 3A

Client Atlantic Geoscience Center (B.I.O.) **Job #** NAO-1268

Sample # 16 **Date** Jan.26/95

COARSE AGGREGATE		
M, Mass of Sample (g)	=	904.7
R, Mass After Clay Removed (g)	=	903.3
$\frac{M - R}{M\%}$ = L = Clay Lumps	=	0.2%

FINE AGGREGATE 100g - 1.25mm		
M, Mass of Sample (g)	=	136.2
R, Mass After Clay Removed (g)	=	135.1
$\frac{M - R}{M\%}$ = L = Clay Lumps	=	0.8%

COMMENTS:

SUITE 116, 900 WINDMILL ROAD, DARTMOUTH, NOVA SCOTIA B3B 1P7 - TELEPHONE (902) 468-6486 - FAX 468-4919
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CLAY LUMPS
CSA A23.2 - 3A

Client Atlantic Geoscience Center (B.I.O.)

Job # NAO-1268

Sample # 17

Date Jan.26/95

COARSE AGGREGATE

M, Mass of Sample (g) = _____

R, Mass After Clay Removed (g) = _____

$\frac{M - R}{M\%}$ = L = Clay Lumps = _____

FINE AGGREGATE 100g - 1.25mm

M, Mass of Sample (g) = _____

R, Mass After Clay Removed (g) = _____

$\frac{M - R}{M\%}$ = L = Clay Lumps = _____

COMMENTS: Insufficient Sample To Conduct Test

SUITE 116, 900 WINDMILL ROAD, DARTMOUTH, NOVA SCOTIA B3B 1P7 - TELEPHONE (902) 468-6486 - FAX 468-4919
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CLAY LUMPS
CSA A23.2 - 3A

Client Atlantic Geoscience Center (B.I.O.) **Job #** NAO-1268

Sample # 20 **Date** Jan.26/95

COARSE AGGREGATE		
M, Mass of Sample (g)	=	2047.9
R, Mass After Clay Removed (g)	=	2045.8
$\frac{M - R}{M\%} = L$ = Clay Lumps	=	0.1%

FINE AGGREGATE 100g - 1.25mm		
M, Mass of Sample (g)	=	110.7
R, Mass After Clay Removed (g)	=	108.0
$\frac{M - R}{M\%} = L$ = Clay Lumps	=	2.4%

COMMENTS:

SUITE 116, 900 WINDMILL ROAD, DARTMOUTH, NOVA SCOTIA B3B 1P7 - TELEPHONE (902) 468-6486 - FAX 468-4919
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CLAY LUMPS
CSA A23.2 - 3A

Client Atlantic Geoscience Center (B.I.O.) **Job #** NAO-1268

Sample # 21 **Date** Jan.26/95

COARSE AGGREGATE		
M, Mass of Sample (g)	=	994.8
R, Mass After Clay Removed (g)	=	994.8
$\frac{M - R}{M\%}$ = L = Clay Lumps	=	0 %

FINE AGGREGATE 100g - 1.25mm		
M, Mass of Sample (g)	=	114.4
R, Mass After Clay Removed (g)	=	112.9
$\frac{M - R}{M\%}$ = L = Clay Lumps	=	1.3%

COMMENTS:

SUITE 116, 900 WINDMILL ROAD, DARTMOUTH, NOVA SCOTIA B3B 1P7 - TELEPHONE (902) 468-6486 - FAX 468-4919
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CLAY LUMPS
CSA A23.2 - 3A

Client Atlantic Geoscience Center (B.I.O.) **Job #** NAO-1268

Sample # 24 **Date** Jan.26/95

COARSE AGGREGATE	
M, Mass of Sample (g)	=
R, Mass After Clay Removed (g)	=
$\frac{M - R}{M\%}$ = L = Clay Lumps	=

FINE AGGREGATE 100g - 1.25mm	
M, Mass of Sample (g)	=
R, Mass After Clay Removed (g)	=
$\frac{M - R}{M\%}$ = L = Clay Lumps	=

COMMENTS: Insufficient Sample To Conduct Test

SUITE 116, 900 WINDMILL ROAD, DARTMOUTH, NOVA SCOTIA B3B 1P7 - TELEPHONE (902) 468-6486 - FAX 468-4919
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LAB REPORT FORM

CLAY LUMPS
CSA A23.2 - 3A

Client Atlantic Geoscience Center (B.I.O.) **Job #** NAO-1268

Sample # 25 **Date** Jan.26/95

COARSE AGGREGATE		
M, Mass of Sample (g)	=	469.4
R, Mass After Clay Removed (g)	=	460.1
$\frac{M - R}{M\%}$ = L = Clay Lumps	=	2.0 %

FINE AGGREGATE 100g - 1.25mm		
M, Mass of Sample (g)	=	100.6
R, Mass After Clay Removed (g)	=	56.2
$\frac{M - R}{M\%}$ = L = Clay Lumps	=	44.1%

COMMENTS:

SUITE 116, 900 WINDMILL ROAD, DARTMOUTH, NOVA SCOTIA B3B 1P7 - TELEPHONE (902) 468-6486 - FAX 468-4919
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Your Reference No

LAB REPORT FORM

CLAY LUMPS
CSA A23.2 - 3A

Client Atlantic Geoscience Center (B.I.O.) **Job #** NAO-1268

Sample # 28 **Date** Jan.26/95

COARSE AGGREGATE

M, Mass of Sample (g)	=	
R, Mass After Clay Removed (g)	=	
$\frac{M - R}{M\%}$ = **L = Clay Lumps**	=	

FINE AGGREGATE 100g - 1.25mm

M, Mass of Sample (g)	=	106.6
R, Mass After Clay Removed (g)	=	8.8
$\frac{M - R}{M\%}$ = **L = Clay Lumps**	=	91.7%

COMMENTS: Insufficient Coarse Aggregate To Conduct Test

SUITE 116, 900 WINDMILL ROAD, DARTMOUTH, NOVA SCOTIA B3B 1P7 - TELEPHONE (902) 468-6486 - FAX 468-4919
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LAB REPORT FORM

CLAY LUMPS
CSA A23.2 - 3A

Client Atlantic Geoscience Center (B.I.O.) **Job #** NAO-1268

Sample # 29 **Date** Jan.26/95

COARSE AGGREGATE		
M, Mass of Sample (g)	=	3737.4
R, Mass After Clay Removed (g)	=	3733.0
$\frac{M - R}{M\%}$ = L = Clay Lumps	=	0.1%

FINE AGGREGATE 100g - 1.25mm		
M, Mass of Sample (g)	=	
R, Mass After Clay Removed (g)	=	
$\frac{M - R}{M\%}$ = L = Clay Lumps	=	

COMMENTS: Insufficient Fine Aggregate To Conduct Test

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CONSULTING ENGINEERING & PROFESSIONAL SERVICES

LAB REPORT FORM

LOW DENSITY MATERIAL
CSA A23.2 - 4A (MODIFIED)

Client AGC/BIO **Job #** NAO-1268

Sample # Station #1 **Date** January 31, 1995

COARSE AGGREGATE

M_2, Dry Mass of Aggregate (g)	=	655.8
M_1, Dry Mass of Decanted Aggregate (g)	=	0.0
$\frac{M_1}{M_2}$ = L = % Low Density Particles	=	0%

FINE AGGREGATE

M_2, Dry Mass of Aggregate (g)	=	110.3
M_1, Dry Mass of Decanted Aggregate (g)	=	0.0
$\frac{M_1}{M_2}$ = L = % Low Density Particles	=	0%

COMMENTS:

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LAB REPORT FORM

LOW DENSITY MATERIAL

CSA A23.2 - 4A (MODIFIED)

Client AGC/BIO **Job #** NAO-1268

Sample # Station #4 **Date** January 31, 1995

COARSE AGGREGATE

M_2, Dry Mass of Aggregate (g)	=	**
M_1, Dry Mass of Decanted Aggregate (g)	=	**
$\frac{M_1}{M_2}$ = L = % Low Density Particles	=	**

FINE AGGREGATE

M_2, Dry Mass of Aggregate (g)	=	93.3
M_1, Dry Mass of Decanted Aggregate (g)	=	0.0
$\frac{M_1}{M_2}$ = L = % Low Density Particles	=	0%

COMMENTS: **Insufficient Coarse Aggregate to conduct test.

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LAB REPORT FORM

LOW DENSITY MATERIAL
CSA A23.2 - 4A MODIFIED

Client Atlantic Geoscience Centre/ B.I.O. **Job #** NAO-1268

Sample # 5 **Date** January 31, 1995

COARSE AGGREGATE

M_2, Dry Mass of Aggregate (g)	=	1581.2
M_1, Dry Mass of Decanted Aggregate (g)	=	0.0
$\frac{M_1}{M_2}$ = L = % Low Density Particles	=	0%

FINE AGGREGATE

M_2, Dry Mass of Aggregate (g)	=	144.2
M_1, Dry Mass of Decanted Aggregate (g)	=	0.0
$\frac{M_1}{M_2}$ = L = % Low Density Particles	=	0%

COMMENTS:

SUITE 116, 900 WINDMILL ROAD, DARTMOUTH, NOVA SCOTIA B3B 1P7 - TELEPHONE (902) 468-6486 - FAX 468-4919
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LAB REPORT FORM

LOW DENSITY MATERIAL
CSA A23.2 - 4A MODIFIED

Client Atlantic Geoscience Centre/ B.I.O. **Job #** NAO-1268

Sample # 8 **Date** January 31, 1995

COARSE AGGREGATE

M_2, Dry Mass of Aggregate (g)	=	1268.1
M_1, Dry Mass of Decanted Aggregate (g)	=	0.0
$\frac{M_1}{M_2}$ = L = % Low Density Particles	=	0%

FINE AGGREGATE

M_2, Dry Mass of Aggregate (g)	=	107.0
M_1, Dry Mass of Decanted Aggregate (g)	=	0.0
$\frac{M_1}{M_2}$ = L = % Low Density Particles	=	0%

COMMENTS:

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LAB REPORT FORM

LOW DENSITY MATERIAL

CSA A23.2 - 4A MODIFIED

Client Atlantic Geoscience Centre/B.I.O. **Job #** NAO-1268

Sample # 9 **Date** January 30, 1995

COARSE AGGREGATE

M_2, Dry Mass of Aggregate (g)	=	1382.4
M_1, Dry Mass of Decanted Aggregate (g)	=	0.0
$\frac{M_1}{M_2}$ = L = % Low Density Particles	=	0%

FINE AGGREGATE

M_2, Dry Mass of Aggregate (g)	=	199.5
M_1, Dry Mass of Decanted Aggregate (g)	=	0.0
$\frac{M_1}{M_2}$ = L = % Low Density Particles	=	0%

COMMENTS:

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LAB REPORT FORM

LOW DENSITY MATERIAL
CSA A23.2 - 4A (MODIFIED)

Client AGC/BIO **Job #** NAO-1268

Sample # Station #12 **Date** January 31, 1995

COARSE AGGREGATE

M_2, Dry Mass of Aggregate (g)	=	**
M_1, Dry Mass of Decanted Aggregate (g)	=	**
$\frac{M_1}{M_2}$ = L = % Low Density Particles	=	**

FINE AGGREGATE

M_2, Dry Mass of Aggregate (g)	=	117.7
M_1, Dry Mass of Decanted Aggregate (g)	=	0.0
$\frac{M_1}{M_2}$ = L = % Low Density Particles	=	0%

COMMENTS: **Insufficient Coarse Aggregate to conduct test.

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LAB REPORT FORM

LOW DENSITY MATERIAL
CSA A23.2 - 4A MODIFIED

Client Atlantic Geoscience Centre/B.I.O. **Job #** NAO-1268

Sample # 13 **Date** January 31, 1995

COARSE AGGREGATE

M_2, Dry Mass of Aggregate (g)	=	1930.5
M_1, Dry Mass of Decanted Aggregate (g)	=	0.0
$\frac{M_1}{M_2}$ = L = % Low Density Particles	=	0%

FINE AGGREGATE

M_2, Dry Mass of Aggregate (g)	=	212.4
M_1, Dry Mass of Decanted Aggregate (g)	=	0.0
$\frac{M_1}{M_2}$ = L = % Low Density Particles	=	0%

COMMENTS:

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LAB REPORT FORM

LOW DENSITY MATERIAL
CSA A23.2 - 4A MODIFIED

Client Atlantic Geoscience Centre/B.I.O. **Job #** NAO-1268

Sample # 16 **Date** January 31, 1995

COARSE AGGREGATE

M_2, Dry Mass of Aggregate (g)	=	895.5
M_1, Dry Mass of Decanted Aggregate (g)	=	0.0
$\frac{M_1}{M_2}$ = L = % Low Density Particles	=	0%

FINE AGGREGATE

M_2, Dry Mass of Aggregate (g)	=	227.6
M_1, Dry Mass of Decanted Aggregate (g)	=	0.0
$\frac{M_1}{M_2}$ = L = % Low Density Particles	=	0%

COMMENTS:

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LAB REPORT FORM

LOW DENSITY MATERIAL
CSA A23.2 - 4A (MODIFIED)

Client AGC/BIO **Job #** NAO-1268

Sample # Station #17 **Date** January 31, 1995

COARSE AGGREGATE

M_2, Dry Mass of Aggregate (g)	=	**
M_1, Dry Mass of Decanted Aggregate (g)	=	**
$\frac{M_1}{M_2}$ = L = % Low Density Particles	=	**

FINE AGGREGATE

M_2, Dry Mass of Aggregate (g)	=	
M_1, Dry Mass of Decanted Aggregate (g)	=	
$\frac{M_1}{M_2}$ = L = % Low Density Particles	=	

COMMENTS: **Insufficient material to conduct either test.

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LAB REPORT FORM

LOW DENSITY MATERIAL
CSA A23.2 - 4A MODIFIED

Client Atlantic Geoscience Centre/B.I.O. **Job #** NAO-1268

Sample # 20 **Date** January 31, 1995

COARSE AGGREGATE

M_2, Dry Mass of Aggregate (g)	=	2053.4
M_1, Dry Mass of Decanted Aggregate (g)	=	0.0
$\frac{M_1}{M_2}$ = L = % Low Density Particles	=	0%

FINE AGGREGATE

M_2, Dry Mass of Aggregate (g)	=	180.6
M_1, Dry Mass of Decanted Aggregate (g)	=	0.0
$\frac{M_1}{M_2}$ = L = % Low Density Particles	=	0%

COMMENTS:

40

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LAB REPORT FORM

LOW DENSITY MATERIAL
CSA A23.2 - 4A MODIFIED

Client Atlantic Geoscience Centre/B.I.O. **Job #** NAO-1268

Sample # 21 **Date** January 31, 1995

COARSE AGGREGATE

M_2, Dry Mass of Aggregate (g)	=	941.2
M_1, Dry Mass of Decanted Aggregate (g)	=	0.0
$\frac{M_1}{M_2}$ = L = % Low Density Particles	=	0%

FINE AGGREGATE

M_2, Dry Mass of Aggregate (g)	=	241.1
M_1, Dry Mass of Decanted Aggregate (g)	=	0.0
$\frac{M_1}{M_2}$ = L = % Low Density Particles	=	0%

COMMENTS:

SUITE 116, 900 WINDMILL ROAD, DARTMOUTH, NOVA SCOTIA B3B 1P7 - TELEPHONE (902) 468-6486 - FAX 468-4919
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LAB REPORT FORM

LOW DENSITY MATERIAL
CSA A23.2 - 4A Modified

Client Atlantic Geoscience Centre/B.I.O. **Job #** NAO-1268

Sample # 24 **Date** January 31, 1995

COARSE AGGREGATE

M_2, Dry Mass of Aggregate (g) = _____

M_1, Dry Mass of Decanted Aggregate (g) = _____

$\frac{M_1}{M_2}$ = L = % Low Density Particles = _____

FINE AGGREGATE

M_2, Dry Mass of Aggregate (g) = _____

M_1, Dry Mass of Decanted Aggregate (g) = _____

$\frac{M_1}{M_2}$ = L = % Low Density Particles = _____

COMMENTS: Insufficient material retained on the required sieves.

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LAB REPORT FORM

LOW DENSITY MATERIAL
CSA A23.2 - 4A MODIFIED

Client Atlantic Geoscience Centre/B.I.O. **Job #** NAO-1268

Sample # 25 **Date** January 31, 1995

COARSE AGGREGATE

M_2, Dry Mass of Aggregate (g)	=	455.1
M_1, Dry Mass of Decanted Aggregate (g)	=	0.0
$\frac{M_1}{M_2}$ = L = % Low Density Particles	=	0%

FINE AGGREGATE

M_2, Dry Mass of Aggregate (g)	=	152.4
M_1, Dry Mass of Decanted Aggregate (g)	=	0.0
$\frac{M_1}{M_2}$ = L = % Low Density Particles	=	0%

COMMENTS:

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LAB REPORT FORM

LOW DENSITY MATERIAL
CSA A23.2 - 4A (MODIFIED)

Client AGC/BIO **Job #** NAO-1268

Sample # Station #28 **Date** January 31, 1995

COARSE AGGREGATE

M_2, Dry Mass of Aggregate (g)	=	**
M_1, Dry Mass of Decanted Aggregate (g)	=	**
$\frac{M_1}{M_2}$ = L = % Low Density Particles	=	**

FINE AGGREGATE

M_2, Dry Mass of Aggregate (g)	=	85.4
M_1, Dry Mass of Decanted Aggregate (g)	=	0.0
$\frac{M_1}{M_2}$ = L = % Low Density Particles	=	0%

COMMENTS: **Insufficient Coarse Aggregate to conduct test.

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LAB REPORT FORM

LOW DENSITY MATERIAL
CSA A23.2 - 4A MODIFIED

Client Atlantic Geoscience Centre/B.I.O. **Job #** NAO-1268

Sample # 29 **Date** January 31, 1995

COARSE AGGREGATE

M_2, Dry Mass of Aggregate (g)	=	3713.6
M_1, Dry Mass of Decanted Aggregate (g)	=	0.0
$\frac{M_1}{M_2}$ = L = % Low Density Particles	=	0%

FINE AGGREGATE

M_2, Dry Mass of Aggregate (g)	=	231.7
M_1, Dry Mass of Decanted Aggregate (g)	=	0.0
$\frac{M_1}{M_2}$ = L = % Low Density Particles	=	0%

COMMENTS:

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ORGANIC IMPURITIES IN FINE AGGREGATE CSA A23.2 - 7A

CLIENT: AGC/BIO **PROJECT:** NAO-1268

CONTACT: Gordon Fader **DATE TESTED:** February 2, 1995

SAMPLE #	COLOUR
1	2
4	4
5	between 4 & 5
8	between 3 & 4
9	3
12	between 2 & 3
13	3
16	2
17	1
20	4
21	between 4 & 5
24	2
25	4
28	4
29	4

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AGGREGATE SOUNDNESS REPORT

CSA A23.2 - 9A

CLIENT: Atlantic Geoscience Center/ B.I.O.

DATE: February 3, 1995

CONTACT: Gordon Fader

PROJECT NO: NAO-1268

Test No.: STN #1	Aggregate: Gravel
Date Sampled: -	Sampled By: Client
Date Received: -	Date Tested: Jan.23-31/95
Test Solution: MgS04	Number of Cycles: 5

Coarse Aggregate		Fine Aggregate	
Sieve Size Passing/Retained	Weighted Average % Loss	Sieve Size Passing/Retained	Weighted Average % Loss
80 mm 56 mm			
56 mm 40 mm		10 mm 5 mm	
40 mm 28 mm		5 mm 2.5 mm	
28 mm 20 mm		2.5 mm 1.25 mm	
20 mm 14 mm		1.25 mm 0.630 mm	
14 mm 10 mm		0.630 mm 0.315 mm	
10 mm 5 mm	0.8		
Loss Subtotal:		Loss Subtotal:	
	Total Loss:	%	1

Comments:

Certified by:

Plate No.

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AGGREGATE SOUNDNESS REPORT

CSA A23.2 - 9A

CLIENT: Atlantic Geoscience Center/ B.I.O.

DATE: February 3, 1995

CONTACT: Gordon Fader

PROJECT NO: NAO-1268

Test No.: STN #4	Aggregate: Sand
Date Sampled:	Sampled By: Client
Date Received:	Date Tested: Jan.23-31/95
Test Solution: MgS04	Number of Cycles: 5

Coarse Aggregate		Fine Aggregate	
Sieve Size Passing/Retained	Weighted Average % Loss	Sieve Size Passing/Retained	Weighted Average % Loss
80 mm 56 mm			
56 mm 40 mm		10 mm 5 mm	
40 mm 28 mm		5 mm 2.5 mm	
28 mm 20 mm		2.5 mm 1.25 mm	
20 mm 14 mm		1.25 mm 0.630 mm	8.02
14 mm 10 mm		0.630 mm 0.315 mm	18.64
10 mm 5 mm			
Loss Subtotal:		Loss Subtotal:	
	Total Loss:	%	27

Comments:

Certified by:

Plate No.

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AGGREGATE SOUNDNESS REPORT

CSA A23.2 - 9A

CLIENT: Atlantic Geoscience Center/ B.I.O.

DATE: February 3, 1995

CONTACT: Gordon Fader

PROJECT NO: NAO-1268

Test No.: STN #5	Aggregate: Gravel
Date Sampled: -	Sampled By: Client
Date Received: -	Date Tested: Jan.23-31/95
Test Solution: MgS04	Number of Cycles: 5

Coarse Aggregate			Fine Aggregate		
Sieve Size Passing/Retained		Weighted Average % Loss	Sieve Size Passing/Retained		Weighted Average % Loss
80 mm	56 mm				
56 mm	40 mm		10 mm	5 mm	
40 mm	28 mm		5 mm	2.5 mm	0.72
28 mm	20 mm		2.5 mm	1.25 mm	
20 mm	14 mm		1.25 mm	0.630 mm	
14 mm	10 mm	0.96	0.630 mm	0.315 mm	
10 mm	5 mm	2.69			
Loss Subtotal:			Loss Subtotal:		
		Total Loss:	%		5

Comments:

Certified by:

Plate No.

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AGGREGATE SOUNDNESS REPORT

CSA A23.2 - 9A

CLIENT: Atlantic Geoscience Center/ B.I.O.

DATE: February 3, 1995

CONTACT: Gordon Fader

PROJECT NO: NAO-1268

Test No.: STN #8	Aggregate: Gravel
Date Sampled: -	Sampled By: Client
Date Received: -	Date Tested: -
Test Solution: -	Number of Cycles: -

Coarse Aggregate		Fine Aggregate	
Sieve Size Passing/Retained	Weighted Average % Loss	Sieve Size Passing/Retained	Weighted Average % Loss
80 mm 56 mm			
56 mm 40 mm		10 mm 5 mm	
40 mm 28 mm		5 mm 2.5 mm	
28 mm 20 mm		2.5 mm 1.25 mm	
20 mm 14 mm		1.25 mm 0.630 mm	
14 mm 10 mm		0.630 mm 0.315 mm	
10 mm 5 mm			
Loss Subtotal:		Loss Subtotal:	
	Total Loss: %		

Comments: INSUFFICIENT MATERIAL FOR TEST

Certified by:

Plate No.

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AGGREGATE SOUNDNESS REPORT

CSA A23.2 - 9A

CLIENT: Atlantic Geoscience Center/ B.I.O.

DATE: February 3, 1995

CONTACT: Gordon Fader

PROJECT NO: NAO-1268

Test No.: STN #9	Aggregate: Sand
Date Sampled: -	Sampled By: Client
Date Received: -	Date Tested: Jan.23-31/95
Test Solution: MgS04	Number of Cycles: 5

Coarse Aggregate		Fine Aggregate	
Sieve Size Passing/Retained	Weighted Average % Loss	Sieve Size Passing/Retained	Weighted Average % Loss
80 mm 56 mm			
56 mm 40 mm		10 mm 5 mm	
40 mm 28 mm		5 mm 2.5 mm	
28 mm 20 mm		2.5 mm 1.25 mm	0.26
20 mm 14 mm		1.25 mm 0.630 mm	0.52
14 mm 10 mm		0.630 mm 0.315 mm	1.46
10 mm 5 mm			
Loss Subtotal:		Loss Subtotal:	
	Total Loss: %		2

Comments:

Certified by:

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AGGREGATE SOUNDNESS REPORT

CSA A23.2 - 9A

CLIENT: Atlantic Geoscience Centre/ B.I.O.

DATE: February 3, 1995

CONTACT: Gordon Fader

PROJECT NO: NAO-1268

Test No.:STN #12	Aggregate: Sand
Date Sampled: -	Sampled By: Client
Date Received: -	Date Tested: -
Test Solution: -	Number of Cycles: -

Coarse Aggregate			Fine Aggregate		
Sieve Size Passing/Retained		Weighted Average % Loss	Sieve Size Passing/Retained		Weighted Average % Loss
80 mm	56 mm				
56 mm	40 mm		10 mm	5 mm	
40 mm	28 mm		5 mm	2.5 mm	
28 mm	20 mm		2.5 mm	1.25 mm	
20 mm	14 mm		1.25 mm	0.630 mm	
14 mm	10 mm		0.630 mm	0.315 mm	
10 mm	5 mm				
Loss Subtotal:			Loss Subtotal:		
		Total Loss: %			

Comments: Insufficient Sample to Conduct Test.

Certified by:

Plate No.

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AGGREGATE SOUNDNESS REPORT

CSA A23.2 - 9A

CLIENT: Atlantic Geoscience Center/ B.I.O.

DATE: February 3, 1995

CONTACT: Gordon Fader

PROJECT NO: NAO-1268

Test No.: STN #13	Aggregate: Gravel
Date Sampled: -	Sampled By: Client
Date Received: -	Date Tested: Jan.23-31/95
Test Solution: MgS04	Number of Cycles: 5

Coarse Aggregate		Fine Aggregate	
Sieve Size Passing/Retained	Weighted Average % Loss	Sieve Size Passing/Retained	Weighted Average % Loss
80 mm 56 mm			
56 mm 40 mm		10 mm 5 mm	
40 mm 28 mm		5 mm 2.5 mm	0.18
28 mm 20 mm		2.5 mm 1.25 mm	
20 mm 14 mm		1.25 mm 0.630 mm	
14 mm 10 mm	0.02	0.630 mm 0.315 mm	
10 mm 5 mm	0.11		
Loss Subtotal:		Loss Subtotal:	
	Total Loss:	%	0.3
Comments:			
Certified by:		Plate No.	

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AGGREGATE SOUNDNESS REPORT

CSA A23.2 - 9A

CLIENT: Atlantic Geoscience Center/ B.I.O.

DATE: February 3, 1995

CONTACT: Gordon Fader

PROJECT NO: NAO-1268

Test No.: STN #16	Aggregate: Gravel
Date Sampled: -	Sampled By: Client
Date Received: -	Date Tested: Jan.23-31/95
Test Solution: MgS04	Number of Cycles: 5

Coarse Aggregate		Fine Aggregate	
Sieve Size Passing/Retained	Weighted Average % Loss	Sieve Size Passing/Retained	Weighted Average % Loss
80 mm 56 mm			
56 mm 40 mm		10 mm 5 mm	
40 mm 28 mm		5 mm 2.5 mm	0.15
28 mm 20 mm		2.5 mm 1.25 mm	
20 mm 14 mm	0.01	1.25 mm 0.630 mm	
14 mm 10 mm	0	0.630 mm 0.315 mm	
10 mm 5 mm	0.04		
Loss Subtotal:		Loss Subtotal:	
	Total Loss:	%	0.2

Comments:

Certified by:

Plate No.

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Suite 116, 900 Windmill Road
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AGGREGATE SOUNDNESS REPORT

CSA A23.2 - 9A

CLIENT: Atlantic Geoscience Centre/ B.I.O.

DATE: February 3, 1995

CONTACT: Gordon Fader

PROJECT NO: NAO-1268

Test No.: STN #17	Aggregate: Sand
Date Sampled: -	Sampled By: Client
Date Received: -	Date Tested: -
Test Solution: -	Number of Cycles: -

Coarse Aggregate		Fine Aggregate	
Sieve Size Passing/Retained	Weighted Average % Loss	Sieve Size Passing/Retained	Weighted Average % Loss
80 mm 56 mm			
56 mm 40 mm		10 mm 5 mm	
40 mm 28 mm		5 mm 2.5 mm	
28 mm 20 mm		2.5 mm 1.25 mm	
20 mm 14 mm		1.25 mm 0.630 mm	
14 mm 10 mm		0.630 mm 0.315 mm	
10 mm 5 mm			
Loss Subtotal:		Loss Subtotal:	
	Total Loss: %		

Comments: Insufficient Sample to Conduct Test.

Certified by:

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AGGREGATE SOUNDNESS REPORT

CSA A23.2 - 9A

CLIENT: Atlantic Geoscience Center/ B.I.O.

DATE: February 3, 1995

CONTACT: Gordon Fader

PROJECT NO: NAO-1268

Test No.: STN #20	Aggregate: Gravel
Date Sampled: -	Sampled By: Client
Date Received: -	Date Tested: Jan.23-31/95
Test Solution: MgS04	Number of Cycles: 5

Coarse Aggregate		Fine Aggregate	
Sieve Size Passing/Retained	Weighted Average % Loss	Sieve Size Passing/Retained	Weighted Average % Loss
80 mm 56 mm			
56 mm 40 mm		10 mm 5 mm	
40 mm 28 mm		5 mm 2.5 mm	0.14
28 mm 20 mm		2.5 mm 1.25 mm	
20 mm 14 mm		1.25 mm 0.630 mm	
14 mm 10 mm	0	0.630 mm 0.315 mm	
10 mm 5 mm	0.13		
Loss Subtotal:		Loss Subtotal:	
	Total Loss:	%	0.2

Comments:

Certified by:

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AGGREGATE SOUNDNESS REPORT

CSA A23.2 - 9A

CLIENT: Atlantic Geoscience Center/ B.I.O.

DATE: February 3, 1995

CONTACT: Gordon Fader

PROJECT NO: NAO-1268

Test No.: STN #21	Aggregate: Sand
Date Sampled: -	Sampled By: Client
Date Received: -	Date Tested: Jan.23-31/95
Test Solution: MgS04	Number of Cycles: 5

Coarse Aggregate		Fine Aggregate	
Sieve Size Passing/Retained	Weighted Average % Loss	Sieve Size Passing/Retained	Weighted Average % Loss
80 mm 56 mm			
56 mm 40 mm		10 mm 5 mm	
40 mm 28 mm		5 mm 2.5 mm	0.30
28 mm 20 mm		2.5 mm 1.25 mm	
20 mm 14 mm		1.25 mm 0.630 mm	
14 mm 10 mm	0	0.630 mm 0.315 mm	
10 mm 5 mm	0.22		
Loss Subtotal:		Loss Subtotal:	
	Total Loss: %		1

Comments:

Certified by:

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AGGREGATE SOUNDNESS REPORT

CSA A23.2 - 9A

CLIENT: Atlantic Geoscience Centre/ B.I.O.

DATE: February 3, 1995

CONTACT: Gordon Fader

PROJECT NO: NAO-1268

Test No.: STN #24	Aggregate: Sand
Date Sampled: -	Sampled By: Client
Date Received: -	Date Tested: -
Test Solution: -	Number of Cycles: -

Coarse Aggregate		Fine Aggregate	
Sieve Size Passing/Retained	Weighted Average % Loss	Sieve Size Passing/Retained	Weighted Average % Loss
80 mm 56 mm			
56 mm 40 mm		10 mm 5 mm	
40 mm 28 mm		5 mm 2.5 mm	
28 mm 20 mm		2.5 mm 1.25 mm	
20 mm 14 mm		1.25 mm 0.630 mm	
14 mm 10 mm		0.630 mm 0.315 mm	
10 mm 5 mm			
Loss Subtotal:		Loss Subtotal:	
	Total Loss: %		

Comments: Insufficient Sample to Conduct Test.

Certified by:

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AGGREGATE SOUNDNESS REPORT

CSA A23.2 - 9A

CLIENT: Atlantic Geoscience Center/ B.I.O.

DATE: February 3, 1995

CONTACT: Gordon Fader

PROJECT NO: NAO-1268

Test No.: STN #25	Aggregate: Sand
Date Sampled: -	Sampled By: Client
Date Received: -	Date Tested: Jan.23-31/95
Test Solution: MgS04	Number of Cycles: 5

Coarse Aggregate		Fine Aggregate	
Sieve Size Passing/Retained	Weighted Average % Loss	Sieve Size Passing/Retained	Weighted Average % Loss
80 mm 56 mm			
56 mm 40 mm		10 mm 5 mm	
40 mm 28 mm		5 mm 2.5 mm	
28 mm 20 mm		2.5 mm 1.25 mm	
20 mm 14 mm		1.25 mm 0.630 mm	
14 mm 10 mm		0.630 mm 0.315 mm	17.5
10 mm 5 mm			
Loss Subtotal:		Loss Subtotal:	
	Total Loss:	%	18

Comments:

Certified by:

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AGGREGATE SOUNDNESS REPORT

CSA A23.2 - 9A

CLIENT: Atlantic Geoscience Center/ B.I.O.

DATE: February 3, 1995

CONTACT: Gordon Fader

PROJECT NO: NAO-1268

Test No.: STN #28	Aggregate: Sand
Date Sampled: -	Sampled By: Client
Date Received: -	Date Tested: Jan.24-Feb.2/95
Test Solution: MgS04	Number of Cycles: 5

Coarse Aggregate		Fine Aggregate	
Sieve Size Passing/Retained	Weighted Average % Loss	Sieve Size Passing/Retained	Weighted Average % Loss
80 mm 56 mm			
56 mm 40 mm		10 mm 5 mm	
40 mm 28 mm		5 mm 2.5 mm	
28 mm 20 mm		2.5 mm 1.25 mm	
20 mm 14 mm		1.25 mm 0.630 mm	
14 mm 10 mm		0.630 mm 0.315 mm	2.3
10 mm 5 mm			
Loss Subtotal:		Loss Subtotal:	
	Total Loss: %		2

Comments:

Certified by:

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AGGREGATE SOUNDNESS REPORT

CSA A23.2 - 9A

CLIENT: Atlantic Geoscience Center/ B.I.O.

DATE: February 3, 1995

CONTACT: Gordon Fader

PROJECT NO: NAO-1268

Test No.: STN #29	Aggregate: Sand
Date Sampled: -	Sampled By: Client
Date Received: -	Date Tested: Jan.23-31/95
Test Solution: MgS04	Number of Cycles: 5

Coarse Aggregate		Fine Aggregate	
Sieve Size Passing/Retained	Weighted Average % Loss	Sieve Size Passing/Retained	Weighted Average % Loss
80 mm 56 mm			
56 mm 40 mm		10 mm 5 mm	
40 mm 28 mm		5 mm 2.5 mm	
28 mm 20 mm		2.5 mm 1.25 mm	
20 mm 14 mm		1.25 mm 0.630 mm	
14 mm 10 mm		0.630 mm 0.315 mm	4.5
10 mm 5 mm			
Loss Subtotal:		Loss Subtotal:	
	Total Loss:	%	5

Comments:

Certified by:

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TO Atlantic Geoscience Centre/B.I.O.
Dartmouth, Nova Scotia
B2Y 4A2

FILE: NAO-1268

DATE: January 26, 1995

CLIENT P.O. 23420-4-M195/01-HAL

ATTN: Gordon Fader
PROJECT: 94-131 J.L. Hart

SOURCE Offshore Cape Breton
STATION #1
SAMPLE TYPE -

SAMPLE DATE: -
DATE RECEIVED: -
DATE TESTED: January 13, 1995

RODDED UNIT WEIGHT

	TRIAL 1	TRIAL 2	TRIAL 3
SAMPLE + TARE			
TARE			
SAMPLE			
DENSITY			
	AVERAGE DENSITY	Insufficient Material for density of aggregate.	

CSA A23.2 - 10A

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TO Atlantic Geoscience Centre/B.I.O.
Dartmouth, Nova Scotia
B2Y 4A2

FILE: NAO-1268

DATE: January 26, 1995

CLIENT P.O. 23420-4-M195/01-HAL

ATTN: Gordon Fader
PROJECT: 94-131 J.L. Hart

SOURCE Offshore Cape Breton
STATION #4
SAMPLE TYPE Sand

SAMPLE DATE: -
DATE RECEIVED: -
DATE TESTED: January 13, 1995

UNIT #20 RODDED UNIT WEIGHT Factor = 141.0

	TRIAL 1	TRIAL 2	TRIAL 3
SAMPLE + TARE	13780	13818	13922
TARE	4288	4288	4288
SAMPLE	9492	9530	9634
DENSITY	1338	1344	1358
	AVERAGE DENSITY	1347 kg/m^3	

CSA A23.2 - 10A

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Dartmouth, Nova Scotia
B2Y 4A2

FILE: NAO-1268

DATE: January 26, 1995

CLIENT P.O. 23420-4-M195/01-HAL

ATTN: Gordon Fader
PROJECT: 94-131 J.L. Hart

SOURCE Offshore Cape Breton
STATION #5
SAMPLE TYPE Gravel

SAMPLE DATE: -
DATE RECEIVED: -
DATE TESTED: January 12, 1995

UNIT X

RODDED UNIT WEIGHT

FACTOR = 350.0

	TRIAL 1	TRIAL 2	TRIAL 3
SAMPLE + TARE	7396	7434	7478
TARE	2704	2704	2704
SAMPLE	4692	4730	4774
DENSITY	1642	1656	1671
	AVERAGE DENSITY	1656 kg/m^3	

CSA A23.2 - 10A

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FILE: NAO-1268

DATE: January 26, 1995

CLIENT P.O. 23420-4-M195/01-HAL

ATTN: Gordon Fader
PROJECT: 94-131 J.L. Hart
SOURCE Offshore Cape Breton
STATION #8
SAMPLE TYPE

SAMPLE DATE: -
DATE RECEIVED: -
DATE TESTED: January 12, 1995

UNIT X RODDED UNIT WEIGHT FACTOR = 350.0

	TRIAL 1	TRIAL 2	TRIAL 3
SAMPLE + TARE	7940	7907	
TARE	2704	2704	
SAMPLE	5236	5203	
DENSITY	1833	1821	
	AVERAGE DENSITY	1827 kg/m^3	

CSA A23.2 - 10A

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FILE: NAO-1268

DATE: January 26, 1995

CLIENT P.O. 23420-4-M195/01-HAL

ATTN: Gordon Fader
PROJECT: 94-131 J.L. Hart

SOURCE Offshore Cape Breton
STATION #9
SAMPLE TYPE Sand

SAMPLE DATE: -
DATE RECEIVED: -
DATE TESTED: January 13, 1995

UNIT #20 RODDED UNIT WEIGHT FACTOR = 141.0

	TRIAL 1	TRIAL 2	TRIAL 3
SAMPLE + TARE	16413	16584	16600
TARE	4288	4288	4288
SAMPLE	12125	12296	12312
DENSITY	1710	1734	1736
	AVERAGE DENSITY	1727 kg/m^3	

CSA A23.2 - 10A

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FILE: NAO-1268

DATE: January 26, 1995

CLIENT P.O. 23420-4-M195/01-HAL

ATTN: Gordon Fader
PROJECT: 94-131 J.L. Hart

SOURCE Offshore Cape Breton
STATION #12
SAMPLE TYPE Sand

SAMPLE DATE: -
DATE RECEIVED: -
DATE TESTED: January 12 , 1995

UNIT X — RODDED **UNIT WEIGHT** — FACTOR = 350.0

	TRIAL 1	TRIAL 2	TRIAL 3
SAMPLE + TARE	6915	6947	6955
TARE	2704	2704	2704
SAMPLE	4211	4243	4251
DENSITY	1474	1485	1488
	AVERAGE DENSITY	1482 kg/m^3	

CSA A23.2 - 10A

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FILE: NAO-1268

DATE: January 26, 1995

CLIENT P.O. 23420-4-M195/01-HAL

ATTN: Gordon Fader
PROJECT: 94-131 J.L. Hart

SOURCE Offshore Cape Breton
STATION #13
SAMPLE TYPE Gravel

SAMPLE DATE: -
DATE RECEIVED: -
DATE TESTED: January 12 , 1995

UNIT X RODDED UNIT WEIGHT FACTOR = 350.0

	TRIAL 1	TRIAL 2	TRIAL 3
SAMPLE + TARE	8104	8168	8171
TARE	2704	2704	2704
SAMPLE	5400	5464	5467
DENSITY	1890	1912	1913
	AVERAGE DENSITY	1905 kg/m^3	

CSA A23.2 - 10A

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FILE: NAO-1268

DATE: January 26, 1995

CLIENT P.O. 23420-4-M195/01-HAL

ATTN: Gordon Fader
PROJECT: 94-131 J.L. Hart

SOURCE Offshore Cape Breton
STATION #16
SAMPLE TYPE Gravel

SAMPLE DATE: -
DATE RECEIVED: -
DATE TESTED: January 13, 1995

UNIT #20 RODDED **UNIT WEIGHT** FACTOR = 141.0

	TRIAL 1	TRIAL 2	TRIAL 3
SAMPLE + TARE	16201	16312	16355
TARE	4288	4288	4288
SAMPLE	11913	12024	12067
DENSITY	1680	1695	1701
	AVERAGE DENSITY	1692 kg/m^3	

CSA A23.2 - 10A

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FILE: NAO-1268

DATE: January 26, 1995

CLIENT P.O. 23420-4-M195/01-HAL

ATTN: Gordon Fader
PROJECT: 94-131 J.L. Hart

SOURCE Offshore Cape Breton
STATION #17
SAMPLE TYPE Sand

SAMPLE DATE: -
DATE RECEIVED: -
DATE TESTED: January 13, 1995

RODDED UNIT WEIGHT

	TRIAL 1	TRIAL 2	TRIAL 3
SAMPLE + TARE			
TARE			
SAMPLE			
DENSITY			
	AVERAGE DENSITY	Insufficient Material for density of aggregate test.	

CSA A23.2 - 10A

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FILE: NAO-1268

DATE: January 26, 1995

CLIENT P.O. 23420-4-M195/01-HAL

ATTN: Gordon Fader
PROJECT: 94-131 J.L. Hart

SOURCE Offshore Cape Breton
STATION #20
SAMPLE TYPE Gravel

SAMPLE DATE: -
DATE RECEIVED: -
DATE TESTED: January 12, 1995

UNIT X RODDED UNIT WEIGHT FACTOR = 350.0

	TRIAL 1	TRIAL 2	TRIAL 3
SAMPLE + TARE	8015	8101	8098
TARE	2704	2704	2704
SAMPLE	5311	5397	5394
DENSITY	1859	1889	1888
	AVERAGE DENSITY	1879 kg/m^3	

CSA A23.2 - 10A

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FILE: NAO-1268

DATE: January 26, 1995

CLIENT P.O. 23420-4-M195/01-HAL

ATTN: Gordon Fader
PROJECT: 94-131 J.L. Hart

SOURCE Offshore Cape Breton
STATION #21
SAMPLE TYPE Sand

SAMPLE DATE: -
DATE RECEIVED: -
DATE TESTED: January 13, 1995

UNIT X

RODDED UNIT WEIGHT

FACTOR = 350.0

	TRIAL 1	TRIAL 2	TRIAL 3
SAMPLE + TARE	8175	8136	8129
TARE	2704	2704	2704
SAMPLE	5471	5432	5425
DENSITY	1915	1901	1899
	AVERAGE DENSITY	1905 kg/m^3	

CSA A23.2 - 10A

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FILE: NAO-1268

DATE: January 26, 1995

CLIENT P.O. 23420-4-M195/01-HAL

ATTN: Gordon Fader
PROJECT: 94-131 J.L. Hart

SOURCE Offshore Cape Breton
STATION #24
SAMPLE TYPE Fine Sand

SAMPLE DATE: -
DATE RECEIVED: -
DATE TESTED: January 13, 1995

RODDED UNIT WEIGHT

	TRIAL 1	TRIAL 2	TRIAL 3
SAMPLE + TARE			
TARE			
SAMPLE			
DENSITY			
	AVERAGE DENSITY	Insufficient material for density of aggregate test.	

CSA A23.2 - 10A

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FILE: NAO-1268

DATE: January 26, 1995

CLIENT P.O. 23420-4-M195/01-HAL

ATTN: Gordon Fader
PROJECT: 94-131 J.L. Hart

SOURCE Offshore Cape Breton
STATION #25
SAMPLE TYPE Fine Sand

SAMPLE DATE: -
DATE RECEIVED: -
DATE TESTED: January 13, 1995

UNIT X

RODDED UNIT WEIGHT

FACTOR = 350.0

	TRIAL 1	TRIAL 2	TRIAL 3
SAMPLE + TARE	7126	7149	7161
TARE	2704	2704	2704
SAMPLE	4422	4445	4457
DENSITY	1548	1556	1560
	AVERAGE DENSITY	1555 kg/m^3	

CSA A23.2 - 10A

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FILE: NAO-1268

DATE: January 26, 1995

CLIENT P.O. 23420-4-M195/01-HAL

ATTN: Gordon Fader
PROJECT: 94-131 J.L. Hart

SOURCE Offshore Cape Breton
STATION #28
SAMPLE TYPE . Sand

SAMPLE DATE: -
DATE RECEIVED: -
DATE TESTED: January 12, 1995

UNIT # 20 RODDED UNIT WEIGHT FACTOR = 141.0

	TRIAL 1	TRIAL 2	TRIAL 3
SAMPLE + TARE	14123	14133	14105
TARE	4288	4288	4288
SAMPLE	9835	9845	9817
DENSITY	1387	1388	1384
	AVERAGE DENSITY	1386 kg/m^3	

CSA A23.2 - 10A

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FILE: NAO-1268

DATE: January 26, 1995

CLIENT P.O. 23420-4-M195/01-HAL

ATTN: Gordon Fader
PROJECT: 94-131 J.L. Hart

SOURCE Offshore Cape Breton
STATION #29
SAMPLE TYPE Sand

SAMPLE DATE: -
DATE RECEIVED: -
DATE TESTED: January 13, 1995

UNIT X RODDED **UNIT WEIGHT** FACTOR = 350.0

	TRIAL 1	TRIAL 2	TRIAL 3
SAMPLE + TARE	8009	7965	7987
TARE	2704	2704	2704
SAMPLE	5305	5261	5283
DENSITY	1857	1841	1849
	AVERAGE DENSITY	1849 kg/m^3	

CSA A23.2 - 10A

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COARSE SPECIFIC GRAVITY AND ABSORPTION CSA A23.2 - 12A

CLIENT: AGC/BIO **PROJECT:** NAO-1268

CONTACT: Gordon Fader **DATE TESTED:** January 26, 1995

SAMPLE #	BULK SPECIFIC GRAVITY	APPARENT SPECIFIC GRAVITY	ABSORPTION %
1	2.43	2.60	2.7
4	2.38	2.62	3.9
5	2.47	2.63	2.5
8	2.45	2.65	3.1
9	2.47	2.64	2.6
12	*	*	*
13	2.57	2.64	1.0
16	2.60	2.63	0.9
17	*	*	*
20	2.54	2.65	1.6
21	2.59	2.66	0.9
24	*	*	*
25	2.54	2.69	2.2
28	*	*	*
29	2.41	2.64	3.6

*Insufficient sample to conduct test

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Our Project No.
Your Reference No.

LAB REPORT FORM

FLAT & ELONGATED PARTICLES

CSA A23.2 - 13A MODIFIED

Client Atlantic Geoscience Center B.I.O. **Job #** NAO-1268

Sample # 1 **Date** Jan.26/95

Particle Size	Flat %	Elongated %	F & E %	Sphere. %	Blocky %

ANGULARITY

Particle Size	Angular %	Subangular %	Subrounded %	Rounded %	Well-Rounded %

COMMENTS: Insufficient Sample To Conduct Test

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Our Project No.
Your Reference No.

LAB REPORT FORM

FLAT & ELONGATED PARTICLES

CSA A23.2 - 13A MODIFIED

Client Atlantic Geoscience Center B.I.O. **Job #** NAO-1268

Sample # 4 **Date** Jan.26/95

Particle Size	Flat %	Elongated %	F & E %	Sphere. %	Blocky %

ANGULARITY

Particle Size	Angular %	Subangular %	Subrounded %	Rounded %	Well-Rounded %

COMMENTS: Insufficient Sample To Conduct Test

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Our Project No.
Your Reference No.

LAB REPORT FORM

FLAT & ELONGATED PARTICLES
CSA A23.2 - 13A MODIFIED

Client Atlantic Geoscience Center B.I.O. **Job #** NAO-1268

Sample # 8 **Date** Jan.26/95

Particle Size	Flat %	Elongated %	F & E %	Sphere. %	Blocky %

ANGULARITY

Particle Size	Angular %	Subangular %	Subrounded %	Rounded %	Well-Rounded %

COMMENTS: Insufficient Sample To Conduct Test

SUITE 116, 900 WINDMILL ROAD, DARTMOUTH, NOVA SCOTIA B3B 1P7 - TELEPHONE (902) 468-6486 - FAX 468-4919
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LAB REPORT FORM

FLAT & ELONGATED PARTICLES
CSA A23.2 - 13A MODIFIED

Client Atlantic Geoscience Centre B.I.O. **Job #** NAO-1268

Sample # 5 **Date** Jan.26/95

Particle Size	Flat %	Elongated %	F & E %	Sphere. %	Blocky %
+ 10 mm	20.5	ø	ø	3.7	75.8

ANGULARITY

Particle Size	Angular %	Subangular %	Subrounded %	Rounded %	Well-Rounded %
+ 10 mm	12.1	40.0	36.4	7.8	3.7

COMMENTS:

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LAB REPORT FORM

FLAT & ELONGATED PARTICLES

CSA A23.2 - 13A MODIFIED

Client Atlantic Geoscience Center B.I.O. **Job #** NAO-1268

Sample # 13 **Date** Jan.26/95

Particle Size	Flat %	Elongated %	F & E %	Sphere. %	Blocky %
+ 14 mm	31.0	Ø	Ø	Ø	69.0
+ 10 mm	32.9	Ø	Ø	2.3	64.8

ANGULARITY

Particle Size	Angular %	Subangular %	Subrounded %	Rounded %	Well-Rounded %
+ 14 mm	10.6	43.5	28.2	17.7	Ø
+ 10 mm	6.1	34.7	40.6	16.2	2.3

COMMENTS:

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LAB REPORT FORM

FLAT & ELONGATED PARTICLES
CSA A23.2 - 13A MODIFIED

Client Atlantic Geoscience Center B.I.O. **Job #** NAO-1268

Sample # 16 **Date** Jan.26/95

Particle Size	Flat %	Elongated %	F & E %	Sphere. %	Blocky %
+ 10 mm	41.7	Ø	5.6	Ø	52.7

ANGULARITY

Particle Size	Angular %	Subangular %	Subrounded %	Rounded %	Well-Rounded %
+ 10 mm	1.0	31.2	41.3	26.5	Ø

COMMENTS:

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FLAT & ELONGATED PARTICLES
CSA A23.2 - 13A MODIFIED

Client Atlantic Geoscience Center B.I.O. **Job #** NAO-1268

Sample # 20 **Date** Jan.26/95

Particle Size	Flat %	Elongated %	F & E %	Sphere. %	Blocky %
+ 14 mm	4.4	Ø	Ø	Ø	95.6
+ 10 mm	2.4	2.8	Ø	4.9	89.9

ANGULARITY

Particle Size	Angular %	Subangular %	Subrounded %	Rounded %	Well-Rounded %
+ 14 mm	Ø	Ø	Ø	83.2	16.8
+ 10 mm	1.5	2.2	3.6	82.0	10.7

COMMENTS:

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Our Project No.
Your Reference No.

LAB REPORT FORM

FLAT & ELONGATED PARTICLES

CSA A23.2 - 13A MODIFIED

Client Atlantic Geoscience Center B.I.O. **Job #** NAO-1268

Sample # 21 **Date** Jan.26/95

Particle Size	Flat %	Elongated %	F & E %	Sphere. %	Blocky %
+ 14 mm	1.8	0	Ø	1.7	96.5
+ 10 mm	1.7	7.1	Ø	4.9	86.3

ANGULARITY

Particle Size	Angular %	Subangular %	Subrounded %	Rounded %	Well-Rounded %
+ 14 mm	Ø	Ø	Ø	95	5
+ 10 mm	Ø	Ø	Ø	95	5

COMMENTS:

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Our Project No.
Your Reference No.

LAB REPORT FORM

FLAT & ELONGATED PARTICLES
CSA A23.2 - 13A MODIFIED

Client Atlantic Geoscience Center B.I.O. **Job #** NAO-1268

Sample # 29 **Date** Jan.26/95

Particle Size	Flat %	Elongated %	F & E %	Sphere. %	Blocky %
+ 20 mm	5.2	Ø	Ø	Ø	94.8

ANGULARITY

Particle Size	Angular %	Subangular %	Subrounded %	Rounded %	Well-Rounded %
+ 20 mm	Ø	10.9	24.7	61.1	3.3

COMMENTS:

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COARSE AGGREGATE PETROGRAPHIC ANALYSIS

MARITIME TESTING (1985) LIMITED
CONSULTING ENGINEERING & PROFESSIONAL SERVICES

CLIENT:	Atlantic Geoscience Centre/BIO	**PROJECT**	NAO-1268
CONTACT:	Gordon Fader	**DATE:**	January 31, 1995
PIT NAME:	Station: #1	**DATE TESTED**	January 31, 1995
DATE SAMPLED:	-	**ANALYST:**	K. Bearnes

	TYPE	WEIGHT	%
FACTOR (1)	QUARTZITE		
	QUARTZ		1.3
	GREYWACKE		
	SANDSTONE		3.9
	GRANITE		46.0
	CARBONATES		
	VOLCANICS		
	BASALT		
	SUBTOTAL		51.2
FACTOR (3)	SANDSTONE		47.8
	VOLCANICS		
	GRANITE (BRITTLE OR WEATHERED)		
	SLATE		1.0
	SUBTOTAL		48.8
FACTOR (6)	SANDSTONE		
	VOLCANICS		
	SLATE		
	SHALE		
	SCHIST		
	SUBTOTAL		
FACTOR (10)	SLATE		
	SHALE		
	OCHRE		
	SUBTOTAL		

COMMENTS: Crushed by

Predominantly hard rounded granite and soft rounded brown sandstone.

FACTOR 1	X	51.2	=	51.2
FACTOR 3	X	48.8	=	146.4
FACTOR 6	X		=	
FACTOR 10	X		=	

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PER:	"P.N." TOTAL 198

COARSE AGGREGATE PETROGRAPHIC ANALYSIS

MARITIME TESTING (1985) LIMITED
CONSULTING ENGINEERING & PROFESSIONAL SERVICES

CLIENT:	Atlantic Geoscience Centre/BIO	**PROJECT**	NAO-1268
CONTACT:	Gordon Fader	**DATE:**	January 31, 1995
PIT NAME:	Station: #4	**DATE TESTED**	January 31, 1995
DATE SAMPLED:	-	**ANALYST:**	K. Bearnes

	TYPE	WEIGHT	%
FACTOR (1)	QUARTZITE		7.8
	QUARTZ		
	GREYWACKE		
	SANDSTONE		15.2
	GRANITE		
	CARBONATES		
	VOLCANICS		
	BASALT		
	SUBTOTAL		23.0
FACTOR (3)	SANDSTONE		56.1
	VOLCANICS		
	GRANITE (BRITTLE OR WEATHERED)		
	SLATE		6.4
	SUBTOTAL		62.6
FACTOR (6)	SANDSTONE		8.1
	VOLCANICS		
	SLATE		
	SHALE		
	SCHIST		
	SUBTOTAL		8.1
FACTOR (10)	SLATE		
	SHALE		
	OCHRE		
	Sandstone		6.4
	SUBTOTAL		6.4

COMMENTS: Crushed by

Predominantly soft brown and grey sandstone.

FACTOR 1	X	23.0	=	23.0
FACTOR 3	X	62.6	=	187.8
FACTOR 6	X	8.1	=	48.6
FACTOR 10	X	6.4	=	64.0

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PER:

"P.N." TOTAL 323

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COARSE AGGREGATE PETROGRAPHIC ANALYSIS

CLIENT:	Atlantic Geoscience Centre/ B.I.O.	**PROJECT:**	NAO-1268
Contact:	Gordon Fader	**DATE:**	January 26, 1995
PIT NAME:	Station #5	**DATE TESTED:**	January 24 , 1995
DATE SAMPLED:	_	**ANALYST:**	K. Bearnes

	TYPE	WEIGHT	%
FACTOR (1)	QUARTZITE		5.8
	QUARTZ		2.7
	GREYWACKE		
	SANDSTONE		9.5
	GRANITE		29.5
	CARBONATES		
	VOLCANICS		
	BASALT		
	SUBTOTAL		47.5
FACTOR (3)	SANDSTONE		35.4
	VOLCANICS		
	GRANITE (BRITTLE OR WEATHERED)		
	SLATE		
	Siltstone		11.1
	SUBTOTAL		46.5
FACTOR (6)	Siltstone		6.0
	VOLCANICS		
	SLATE		
	SUBTOTAL		6.0
FACTOR (10)	SLATE		
	SHALE		
	SUBTOTAL		

COMMENTS: Crushed by

Hard, rounded, red/brown granite, soft, brown, rounded siltstone, sandstone.

FACTOR 1	X	47.5	=	47.5
FACTOR 3	X	46.5	=	139.5
FACTOR 6	X	6.0	=	36.0
FACTOR 10	X		=	

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PER:

"P.N." TOTAL 223

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COARSE AGGREGATE PETROGRAPHIC ANALYSIS

CLIENT:	Atlantic Geoscience Centre/B.I.O.	**PROJECT:**	NAO-1268
Contact:	Gordon Fader	**DATE:**	January 26, 1995
PIT NAME:	Station #8	**DATE TESTED:**	January 25, 1995
DATE SAMPLED:	-	**ANALYST:**	K. Bearnes

	TYPE	WEIGHT	%
FACTOR (1)	QUARTZITE		5.9
	QUARTZ		1.9
	GREYWACKE		
	SANDSTONE		15.2
	GRANITE		10.9
	CARBONATES		
	VOLCANICS		
	BASALT		
	SUBTOTAL		33.9
FACTOR (3)	Sandstone		63.6
	VOLCANICS		
	GRANITE (BRITTLE OR WEATHERED)		
	SLATE		
	SUBTOTAL		63.6
FACTOR (6)	Mudstone		2.5
	VOLCANICS		
	SLATE		
	SUBTOTAL		2.5
FACTOR (10)	SLATE		
	SHALE		
	SUBTOTAL		

COMMENTS: Crushed by

Predominantly soft, brown, rounded sandstone.

FACTOR 1	X	33.9	=	33.9
FACTOR 3	X	63.9	=	191.7
FACTOR 6	X	2.5	=	15.0
FACTOR 10	X		=	

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PER:

"P.N." TOTAL 241

MARITIME TESTING (1985) LIMITED
Suite 116, 900 Windmill Road
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COARSE AGGREGATE PETROGRAPHIC ANALYSIS

CLIENT:	Atlantic Geoscience Centre/B.I.O.	**PROJECT:**	NAO-1268
Contact:	Gordon Fader	**DATE:**	January 26, 1995
PIT NAME:	Station #13	**DATE TESTED:**	January 24, 1995
DATE SAMPLED:	-	**ANALYST:**	K. Bearnes

	TYPE	WEIGHT	%
FACTOR (1)	QUARTZITE		10.0
	QUARTZ		7.9
	GREYWACKE		
	SANDSTONE		4.0
	GRANITE		67.6
	CARBONATES		
	VOLCANICS		
	BASALT		
	SUBTOTAL		89.5
FACTOR (3)	SANDSTONE		10.0
	VOLCANICS		
	GRANITE (BRITTLE OR WEATHERED)		
	SLATE		0.5
	SUBTOTAL		10.5
FACTOR (6)	SANDSTONE		
	VOLCANICS		
	SLATE		
	SUBTOTAL		
FACTOR (10)	SLATE		
	SHALE		
	SUBTOTAL		

COMMENTS: Crushed by

Predominantly hard, rounded, red/brown granite, milky quartz and grey quartzite.

FACTOR 1	X	89.5	=	89.5
FACTOR 3	X	10.5	=	31.5
FACTOR 6	X		=	
FACTOR 10	X		=	

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PER:

"P.N." TOTAL 121

MARITIME TESTING (1985) LIMITED
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COARSE AGGREGATE PETROGRAPHIC ANALYSIS

CLIENT: Atlantic Geoscience Centre/ B.I.O.
Contact: Gordon Fader
PIT NAME: Station #16
DATE SAMPLED: -

PROJECT: NAO-1268
DATE: January 26, 1995
DATE TESTED: January 25, 1995
ANALYST: K. Bearnes

	TYPE	WEIGHT	%
FACTOR (1)	QUARTZITE		6.7
	QUARTZ		6.2
	GREYWACKE		
	SANDSTONE		
	GRANITE		70.0
	CARBONATES		
	VOLCANICS		
	BASALT		
	SUBTOTAL		82.9
FACTOR (3)	SANDSTONE		16.5
	VOLCANICS		
	GRANITE (BRITTLE OR WEATHERED)		
	SLATE		
	SUBTOTAL		16.5
FACTOR (6)	SANDSTONE		0.6
	VOLCANICS		
	SLATE		
	SUBTOTAL		0.6
FACTOR (10)	SLATE		
	SHALE		
	SUBTOTAL		

COMMENTS: Crushed by

Predominantly hard,rounded red/brown granite and soft, rounded brown sandstone.

FACTOR 1	X	82.9	=	82.9
FACTOR 3	X	16.5	=	49.5
FACTOR 6	X	0.6	=	3.6
FACTOR 10	X		=	

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PER:

"P.N." TOTAL 136

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COARSE AGGREGATE PETROGRAPHIC ANALYSIS

CLIENT: Atlantic Geoscience Centre/ B.I.O.
Contact: Gordon Fader
PIT NAME: Station #20
DATE SAMPLED: -

PROJECT: NAO-1268
DATE: January 26, 1995
DATE TESTED: January 25, 1995
ANALYST: K. Bearnes

	TYPE	WEIGHT	%
FACTOR (1)	QUARTZITE		8.4
	QUARTZ		19.0
	GREYWACKE		
	SANDSTONE		
	GRANITE		62.9
	CARBONATES		
	VOLCANICS		
	BASALT		
	SUBTOTAL		90.3
FACTOR (3)	SANDSTONE / MUDSTONE		9.7
	VOLCANICS		
	GRANITE (BRITTLE OR WEATHERED)		
	SLATE		
	SUBTOTAL		9.7
FACTOR (6)	SANDSTONE		
	VOLCANICS		
	SLATE		
	SUBTOTAL		
FACTOR (10)	SLATE		
	SHALE		
	SUBTOTAL		

COMMENTS: Crushed by

Predominantly hard, rounded, red/brown granite and milky quartz with soft, brown sandstone and siltstone.

FACTOR 1	X	90.3	=	90.3
FACTOR 3	X	9.7	=	29.1
FACTOR 6	X		=	
FACTOR 10	X		=	

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PER:

"P.N." TOTAL 119

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COARSE AGGREGATE PETROGRAPHIC ANALYSIS

CLIENT:	Atlantic Geoscience Centre/B.I.O.	**PROJECT:**	NAO-1268
Contact:	Gordon Fader	**DATE:**	January 26, 1995
PIT NAME:	Station #21	**DATE TESTED:**	January 24 , 1995
DATE SAMPLED:	-	**ANALYST:**	K. Bearnes

	TYPE	WEIGHT	%
FACTOR (1)	QUARTZITE		15.0
	QUARTZ		16.8
	GREYWACKE		
	SANDSTONE		9.2
	GRANITE		48.3
	CARBONATES		
	VOLCANICS		
	BASALT		
	SUBTOTAL		89.3
FACTOR (3)	SANDSTONE/Mudstone		9.3
	VOLCANICS		
	GRANITE (BRITTLE OR WEATHERED)		
	SLATE		1.4
	SUBTOTAL		10.7
FACTOR (6)	SANDSTONE		
	VOLCANICS		
	SLATE		
	SUBTOTAL		
FACTOR (10)	SLATE		
	SHALE		
	SUBTOTAL		

COMMENTS: Crushed by

Material predominantly red/brown, rounded, hard granite, milky quartz and grey quartzite.

FACTOR 1	X	89.3	=	89.3
FACTOR 3	X	10.7	=	32.1
FACTOR 6	X		=	
FACTOR 10	X		=	

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PER:

"P.N." TOTAL 121

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COARSE AGGREGATE PETROGRAPHIC ANALYSIS

CLIENT:	Atlantic Geoscience Centre/B.I.O.	**PROJECT:**	NAO-1268
Contact:	Gordon Fader	**DATE:**	January 26, 1995
PIT NAME:	Station #29	**DATE TESTED:**	January 25, 1995
DATE SAMPLED:	-	**ANALYST:**	K. Bearnes

	TYPE	WEIGHT	%
FACTOR (1)	QUARTZITE		13.3
	QUARTZ		3.3
	GREYWACKE		
	SANDSTONE		2.2
	GRANITE		9.2
	CARBONATES		
	VOLCANICS		
	BASALT		
	SUBTOTAL		28.0
FACTOR (3)	SANDSTONE		66.4
	VOLCANICS		
	GRANITE (BRITTLE OR WEATHERED)		
	SLATE		
	SUBTOTAL		66.4
FACTOR (6)	SANDSTONE/Mudstone		5.6
	VOLCANICS		
	SLATE		
	SUBTOTAL		5.6
FACTOR (10)	SLATE		
	SHALE		
	SUBTOTAL		

COMMENTS: Crushed by

Predominantly rounded, soft brown sandstone and siltstone.

FACTOR 1	X	28.0	=	28.0
FACTOR 3	X	66.4	=	199.2
FACTOR 6	X	5.6	=	33.6
FACTOR 10	X		=	

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PER:

"P.N." TOTAL 261

MARITIME TESTING (1985) LIMITED
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LOS ANGELES ABRASION METRIC TEST REPORT

TO Atlantic Geoscience Centre/Bio
Dartmouth, Nova Scotia
B2Y 4A2

Attention: Gordon Fader

PROJECT NO. NAO-1268
DATE January 26, 1995
CLIENT P.O. 23420-4-M195/01-HAL
CC

PROJECT 94-131 J.L. Hart

SOURCE Station #16 **TYPE OF SAMPLE** 0.50" Gravel **SAMPLED BY** Client

DATE SAMPLED - **DATE RECEIVED** - **DATE TESTED** January 26, 1995

MATERIAL GRADING: D

ACTUAL SIEVE SIZES	AMOUNT	
5mm + 2.5mm	5003.0	g
+		g
+		g
+		g
	TOTAL SAMPLE 5003.0	g
NO. OF REVOLUTIONS 500		
NO. OF SPHERES 6	TOTAL SAMPLE 5003.0	
WT. OF SPHERES g	+ 1.8 MATERIAL AFTER 3904.4	g
	- 1.8 MATERIAL AFTER 1098.6	g

LOS ANGELES ABRASION = LOSS / TOTAL SAMPLE = 1098.6 / 5003.0 X 100 = 22 %

COMMENTS:

CSA A23.2 - 16A

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TECHNICIAN D.Garden/B. Mercer REPORT CERTIFIED

MARITIME TESTING (1985) LIMITED
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Dartmouth, N.S. B3B 1P7 468-6486

SHELL CONTENT TEST RESULTS

CLIENT: AGC/BIO
PROJECT: NAO-1268
CONTACT: 23420-4-M195/01-HAL
DATE TESTED: JANUARY 16, 1995
ANALYST: BM/KB
BS882: 1992

SAMPLE #	SHELL CONTENT COARSER THAN 10 mm		SHELL CONTENT FINER THAN 10 mm	
	%	***	%	***
1	0	0	0.1	0
4*	-	-	-	-
5	0.4	0	0.3	0
8	0	0	0.7	1
9	0.2	0	1.0	1
12*	-	-	-	-
13	0.2	0	0.3	0
16	0	0	0	0
17*	-	-	-	-
20	0	0	0.1	0
21	0	0	0	0
24*	-	-	-	-
25	0	0	1.0	1
28*	-	-	-	-
29	0.3	0	2.3	2

*Insufficient material to conduct test
***Rounded to nearest whole number

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AS RECEIVED MOISTURE CONTENT

CLIENT: AGC/BIO **PROJECT:** NAO-1268

CONTACT: Gordon Fader **DATE TESTED:** January 6, 1995

SAMPLE #	MOISTURE CONTENT %
STN #1	14.4
STN #4	41.4
STN #5	31.7
STN #8	24.4
STN #9	24.0
STN #12	26.6
STN #13	14.8
STN #17	32.6
STN #16	13.1
STN #20	18.3
STN #21	15.2
STN #24	34.3
STN #25	25.6
STN #28	43.2
STN #29	16.9

As received moisture; all samples arrived in a saturated condition.

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