



MANITOBA

DEPARTMENT OF ENERGY AND MINES
MINERAL RESOURCES DIVISION

OPEN FILE REPORT
OF82-5

AGGREGATE RESOURCE INVENTORY OF THE RURAL
MUNICIPALITY OF BROKENHEAD

compiled by
R.V. Young



MANITOBA

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Winnipeg 1982

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ABSTRACT

An aggregate resource inventory was conducted within the Rural Municipality of Brokenhead. Field investigations included mapping the surficial geology and subsurface testing of selected sand, gravel and silica-rich sand deposits. Surficial deposits are predominantly clays and calcareous till with secondary glaciofluvial and littoral sand and gravel deposits. Total reserves of sand and gravel are estimated at 11.8 million cubic metres with an annual demand of 105 000 cubic metres. Several silica-rich sand deposits were found to outcrop near the surface along the western portion of the municipality. The near-surface bedrock is suitable for use as base course, fill or surfacing gravel.

INTRODUCTION

Objectives

Field mapping within the Rural Municipality of Brokenhead was initiated with the following objectives:

1. To evaluate the distribution and quality of sand and gravel deposits as an aid for land use planning;
2. To evaluate silica-rich sand;
3. Map the surficial geology to obtain a more detailed understanding of the Quaternary stratigraphy; and
4. To determine the suitability of near-surface bedrock for crushed stone.

Acknowledgements

This report is primarily based on field investigations conducted by G. Conley, who mapped the surficial geology within the Rural Municipality of Brokenhead during 1980. Sand and gravel computer data analysis was conducted by staff of the Aggregate Resources Section. The author is grateful to B. Bannatyne and C. Jones who collected selected bedrock samples.

Location, Access, Drainage

The Rural Municipality of Brokenhead is located approximately 48 km northeast of Winnipeg (Fig. 1). The 1976 population of the municipality was 2900 (Department of Municipal Affairs, 1980) and major settlements in the municipality include the Town of Beausejour, Village of Garson and the Community of Tyndall.

Access is by Provincial Trunk Highways 12 and 44, Provincial Roads 317, 316, 435, 215 and 302, and by gravelled section roads.

The municipality is characterized by a gently undulating clay plain at 243 m a.s.l. The highest elevation is Wolverine Hill, part of the Belair Interlobate Moraine, in the north-west at 266 m a.s.l.

The Brokenhead River, which flows northward through the eastern part of the municipality towards Lake Winnipeg, is the most notable drainage feature. It collects surface

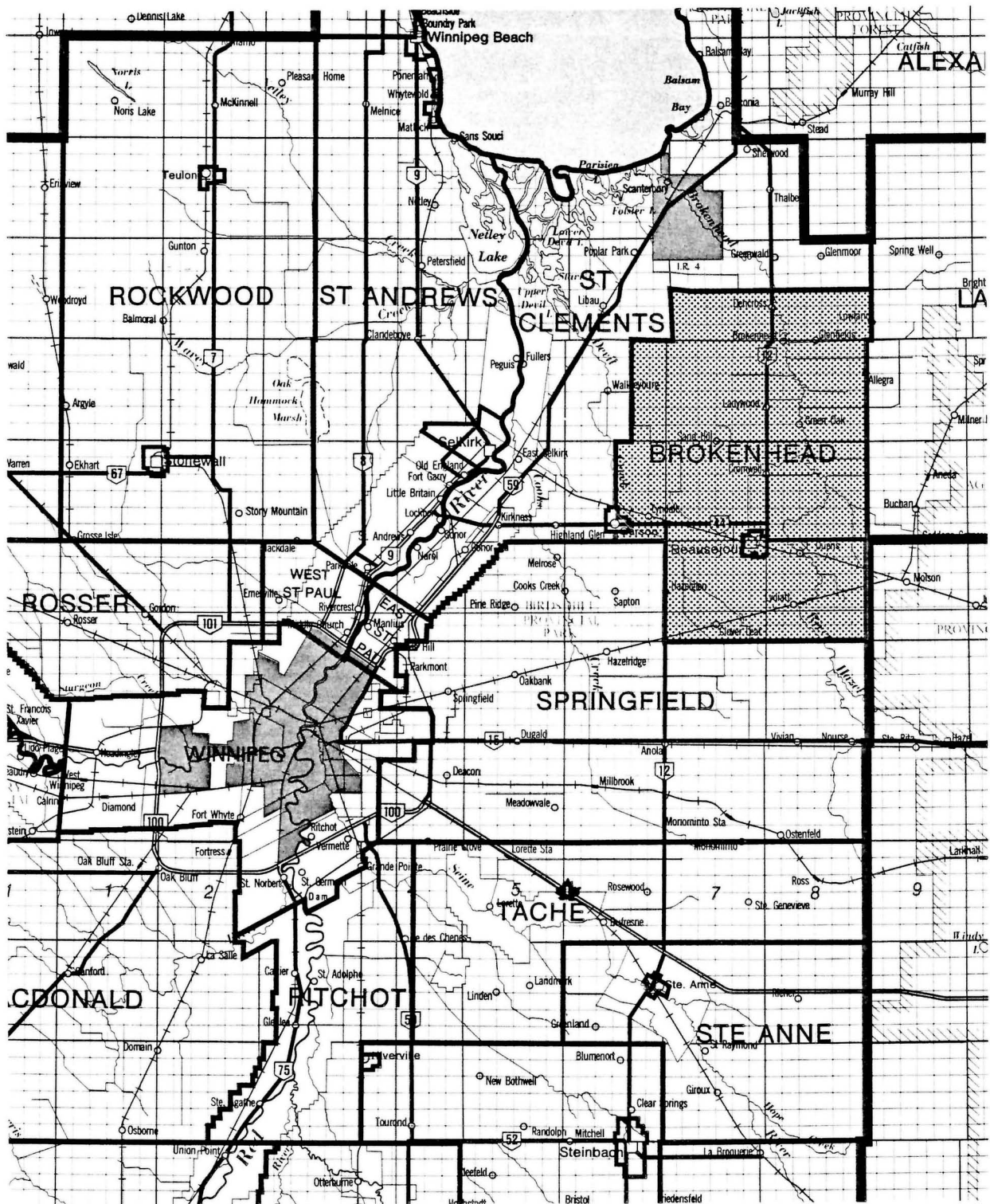


Figure 1. Location of the Rural Municipality of Brokenhead.

water from the eastern portion of the municipality, while the western portion is drained to the west and north-west by Devils Creek and several man-made drainage ditches.

Previous Work

Dowling (1900) described the bedrock outcrops along the east shore of Lake Winnipeg in one of the first geological reports to include the map area. Descriptions of limestone building stone production for the Garson-Tyndall area are presented by Parks (1916) and Goudge (1933, 1944). Macauley et al., (1951) described outcrops of the Winnipeg Formation. Baillie (1952) mapped and described the Ordovician Geology of Lake Winnipeg and adjacent areas. A summary of geology and industrial minerals within the municipality are presented by Davies et al., (1962).

The depositional history of the Winnipeg Formation is described by Vigrass (1971). The geology of the Garson area is described by Kent et al., (1972) and again by Bannatyne (1975). Drift thickness, geology and bedrock topography data are on several map series; notably by Klassen et al., (1970), Teller et al., (1976) and Little (1980).

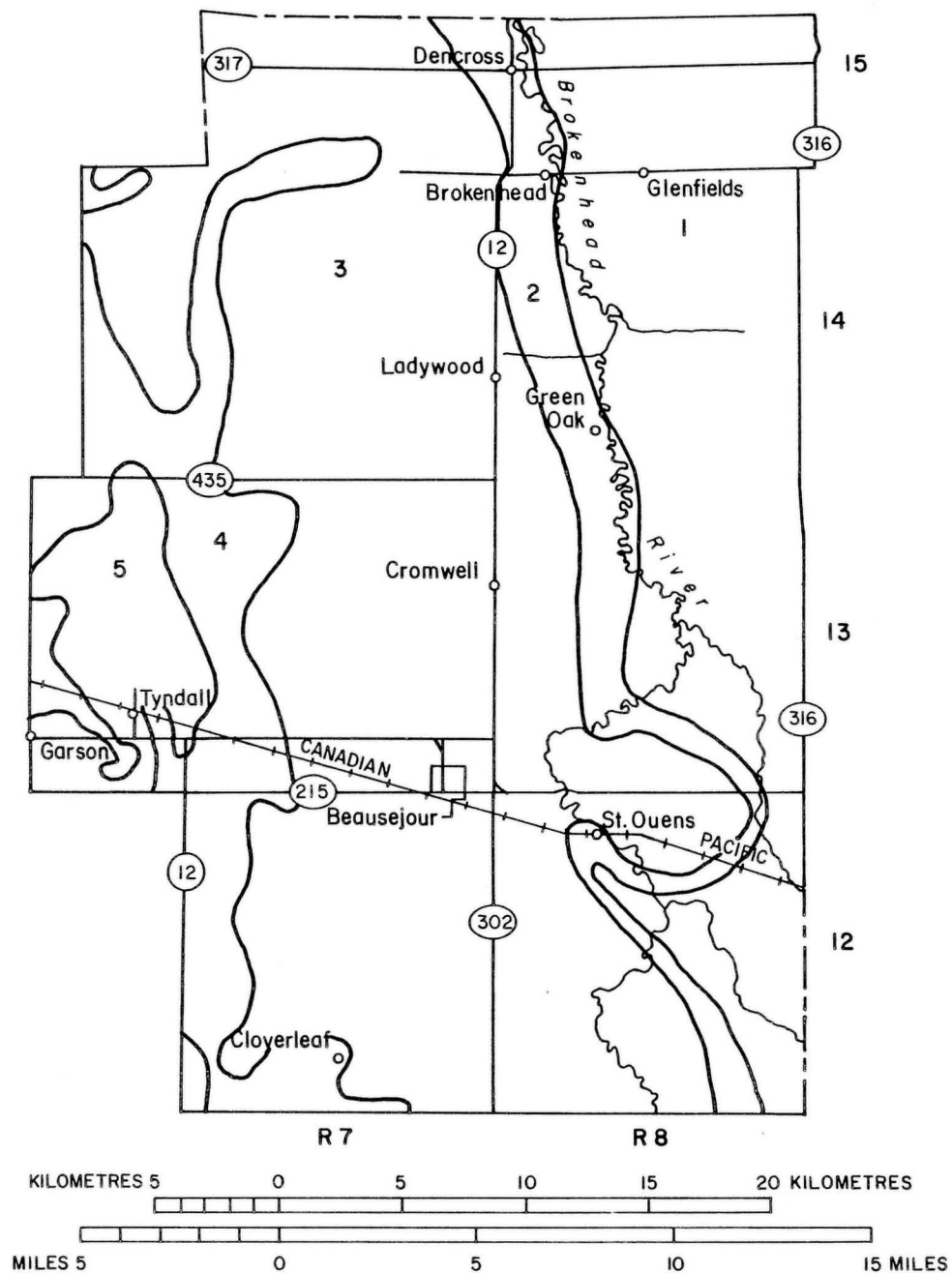
Early Quaternary studies in Manitoba recognized the former existence of Lake Agassiz and mapping of its associated beach ridges began (Keating 1825, Hind 1859 and Upham 1890). The boundaries of ice-sheets and final drainage of Lake Agassiz were presented by Antevs (1931). Lake Agassiz deposits and raised beaches were first mapped and described by Johnston (1921) for the Winnipegosis and upper Whitemouth River areas. The study area was first mapped and the Lake Agassiz beaches described in detail by Johnston (1934, 1946). Pleistocene gravel deposits in the Winnipeg area were mapped by Organ (1952) with special reference to the Birds Hill deposit, and Ringrose (1979) described the stratigraphy and process of deposition of the same deposit. Elson (1965) mapped the extent of glacial Lake Agassiz and distribution of end moraines in southern Manitoba.

The objectives of more recent Quaternary studies in southeastern Manitoba have been to identify lithostratigraphic units and to deduce a sequence of depositional events. McPherson (1970) studied the Pleistocene geology of the Beausejour area recording two ice advances across the map area, one from the northeast and a second advance from the northwest. Wyder (1971) recorded a minimum of four glacial advances and retreats in south central Manitoba. Teller and Fenton (1980) recorded two ice advances and two readvances across southeastern Manitoba.

Present Study

Surficial deposits were mapped using air photographs at scales of 1:50 000 and 1:15 840. Field investigations included the examination of natural exposures and road cuts. A backhoe was used to evaluate selected deposits.

Sand and gravel deposits were sampled either from existing pit faces or by backhoe. Size fractions greater than 8 cm were normally not included with the sample. Each sample was



Red River Formation

- 5 Selkirk Member: dolomitic limestone
- 4 Cat Head Member: dolomite to dolomite limestone
- 3 Dog Head Member: dolomitic limestone
- 2 Winnipeg Formation: kaolinitic shale and quartzose limestone

Precambrian

- 1. granite

Figure 2. Bedrock geology of the Rural Municipality of Brokenhead (after Bannatyne and Jones, 1979).

was sieved and the grain size distribution between 101.6 to 0.074 mm recorded. Grain sizes less than 0.74 mm were recorded as combined silt and clay. Geochemical analysis was performed on selected sand samples to determine the silica content. Engineering tests were performed on selected bedrock samples to determine the suitability of the bedrock for crushed stone.

Bedrock Geology

The bedrock within the Rural Municipality of Brokenhead consists of rock of Precambrian and Ordovician age (Fig. 2). The Precambrian bedrock, mainly granites and granite gneisses of the Superior Province of the Canadian Shield, outcrop in the northeast portion of the municipality.

The Winnipeg Formation of Ordovician age is composed of interbedded shale and sandstone with the sandstone unit composed of poorly consolidated well-rounded and frosted quartzose sand (Davies *et al.*, 1962). Several small outcrops of the Ordovician Red River Formation are located north of Tyndall. The Red River Formation consists of mottled dolomitic limestone of the Dog Head Member, dolomite to dolomitic limestone of the Cat Head Member, and dolomitic limestone of the Selkirk Member (Bannatyne and Jones, 1979). The Red River Formation outcrops near Garson where the bedrock is mined as Tyndall stone (Fig. 3) a mottled dolomitic limestone used as building stone.

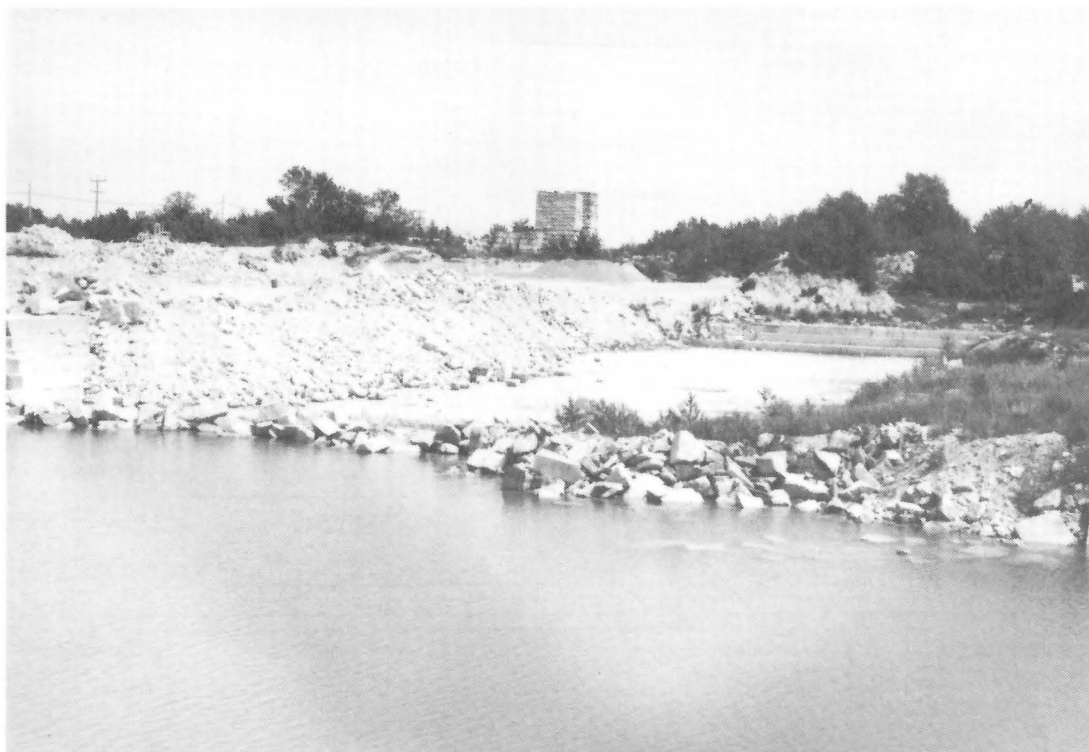


Figure 3. Ordovician limestone bedrock exposed at Garson quarry, NW 3-13-6 E.P.M.

In the western portion of the municipality, the Red River Formation lies close to the surface. Bedrock within 3 m of the surface is shown in Figure 4.

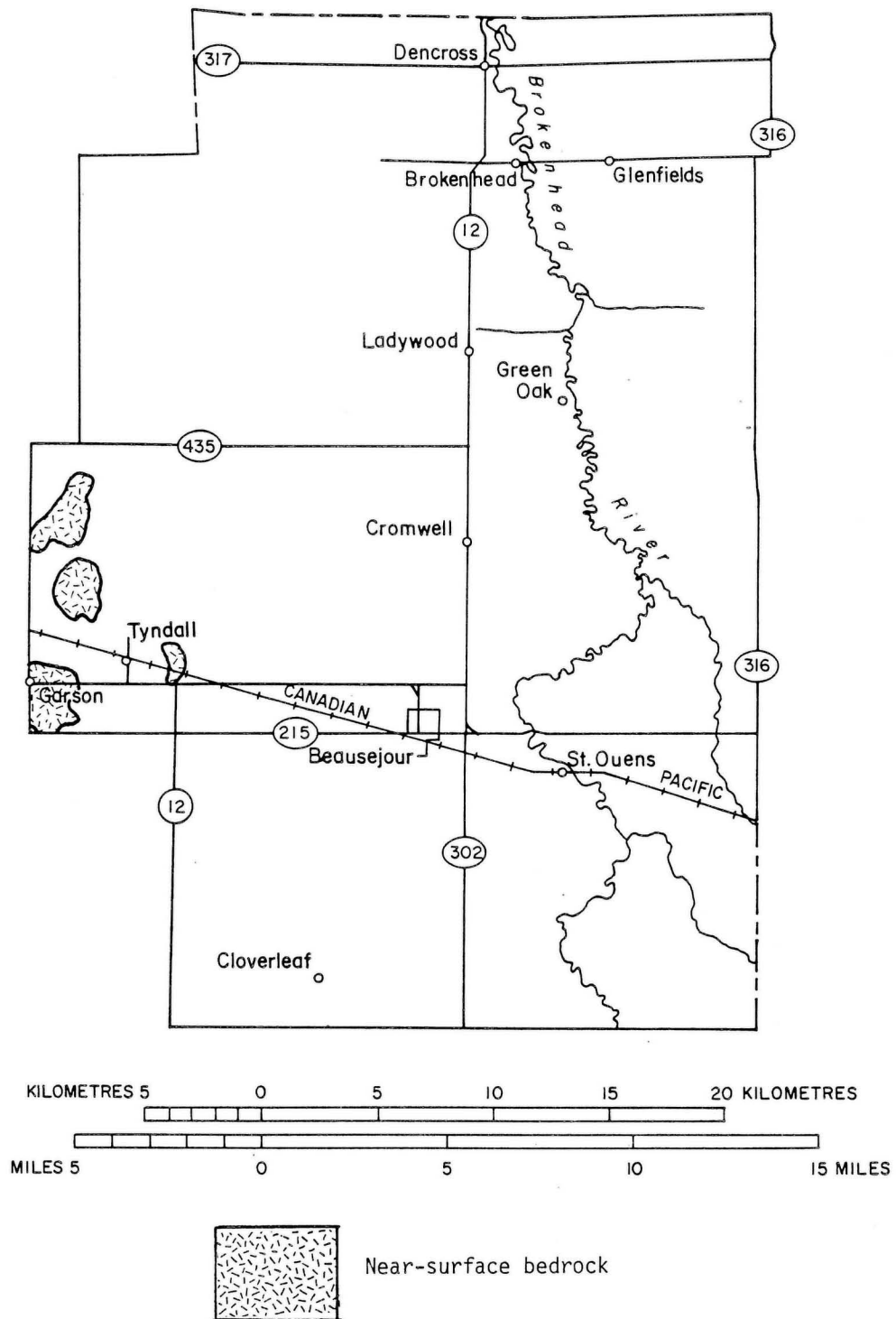


Figure 4. Near-surface (less than 3 m) bedrock (after Bannatyne and Jones, 1979).

Quaternary History

The earliest recognized ice advance within the municipality was from the northeast approximately 24 000 years B.P. (Teller and Fenton, 1980). The retreat of northeastern ice to the position of the Belair Moraine was contemporaneous with an ice advance from the northwest. The Belair Interlobate Moraine was formed during a major standstill of these two ice lobes (Nielsen and Matile, 1982). The northeast ice lobe retreated and stabilized east of the municipality forming the Milner Ridge End Moraine. Continued expansion of northwestern ice advanced over both moraines and deposited the calcareous Libau Drift described by McPherson (1970). The retreat of northwestern ice was concurrent with the development of Lake Agassiz.

The entire municipality was covered by deep water lake sediment consisting of silt and clay. Fluctuations of the lake level were controlled by the opening and closing of eastern drainage outlets. A minor readvance of ice and subsequent retreat caused the level of Lake Agassiz again to rise. As the ice retreated from the area Lake Agassiz regressed forming a series of shoreline deposits around many of the higher land areas. By 11 000 years B.P., the last ice advance was gone from southern Manitoba (Teller and Fenton, 1980).

Surficial Geology

The surficial geology is shown on Map OF82-5 accompanying this report. Precambrian granite bedrock underlies the eastern portion of the municipality and minor outcrops are located in the northeastern portion of the municipality. Ordovician limestone bedrock outcrops near the surface at Garson and is exposed in the quarries at Garson.

The oldest known Quaternary unit within the municipality is thought to be a glacio-fluvial silica-rich sand deposit located in a topographically high area approximately 6 km west of Dencross, specifically 9-15-7 E.P.M. The silica-rich sand forms the floor and lower 5 to 6 metres of an 8 metre deep pit (Fig. 5). This fine grained, well sorted, bedded sand has a paleocurrent direction ranging from 110° to 180° . Folds and faults in the bedded sands suggest deposition in a glaciofluvial ice-contact environment.

The dominant surficial sediment is Lake Agassiz silts and clays. These deposits are frequently laminated, consisting of dolomite, feldspar, quartz and clay minerals (McPherson, 1970). The terrain is moderately level with occasional iceberg scours (Fig. 6). The sediments are up to 20 m deep in the western portion of the municipality and 5 m in the eastern portion. Stratigraphically the silts and clays overlie till (Fig. 7a and 7b).

A beige, sandy calcareous till is present at or near the surface throughout the municipality. This till was deposited by the northwestern ice advance and is tentatively correlated with the Libau till (McPherson, 1970). A very hard, compact, grey, clayey till with few clasts has been observed underlying an olive-beige sandy till in several backhoe test pits. The lower till is correlated with the Belair till as described by McPherson (1970).



Figure 5. Glaciofluvial bedded outwash silica-rich sand at N₂ of 9-15-7 E.P.M.
Survey pole divided into 1 foot units.



Figure 6. Airphoto (A25230-24, 1:15 840) illustrating lacustrine clay plain with iceberg scours.

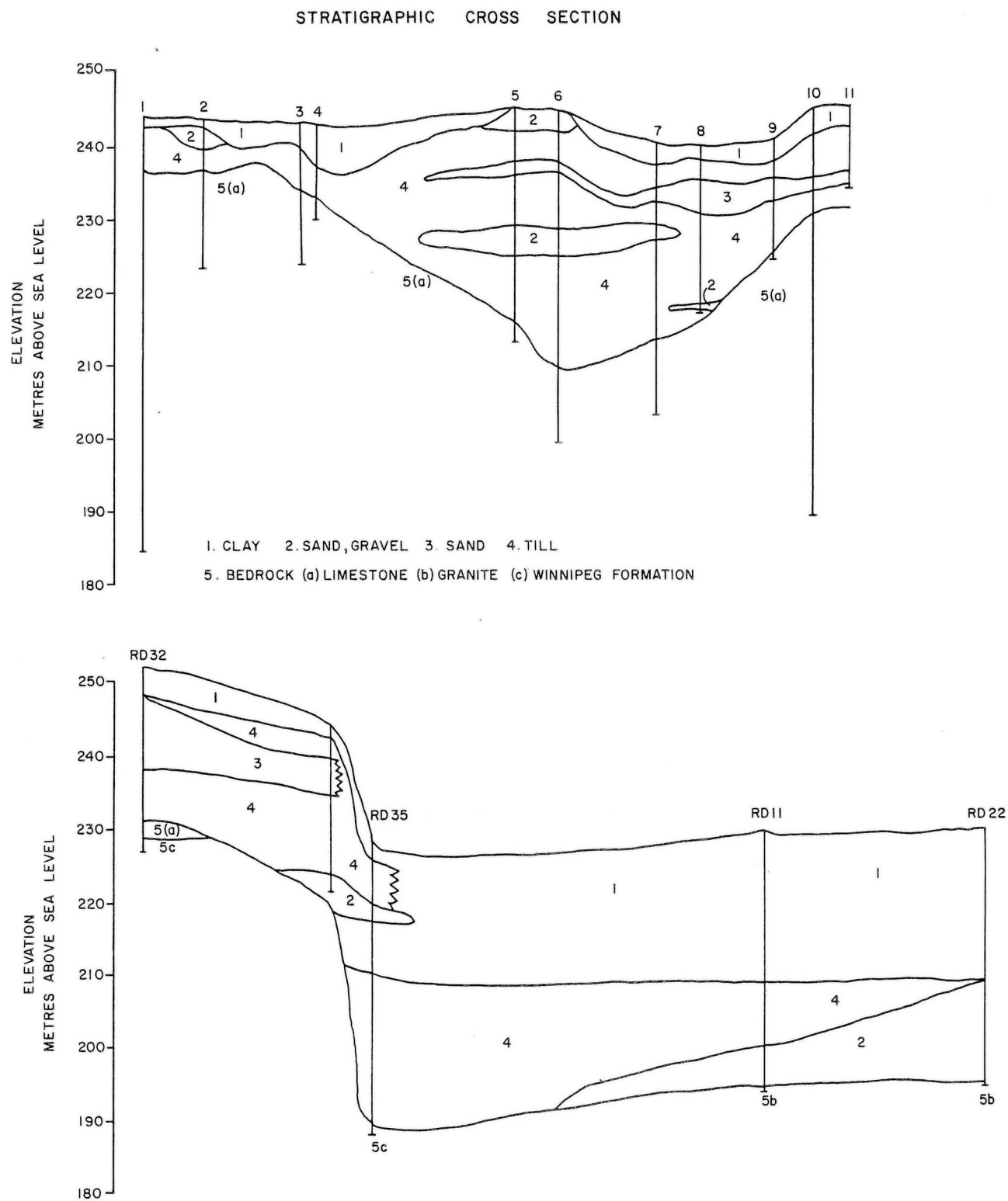


Figure 7a. Stratigraphic cross-section through the Rural Municipality of Brokenhead. Modified after Michalyna, Gardiner, Podolsky (1975) and Lebedin (1978).

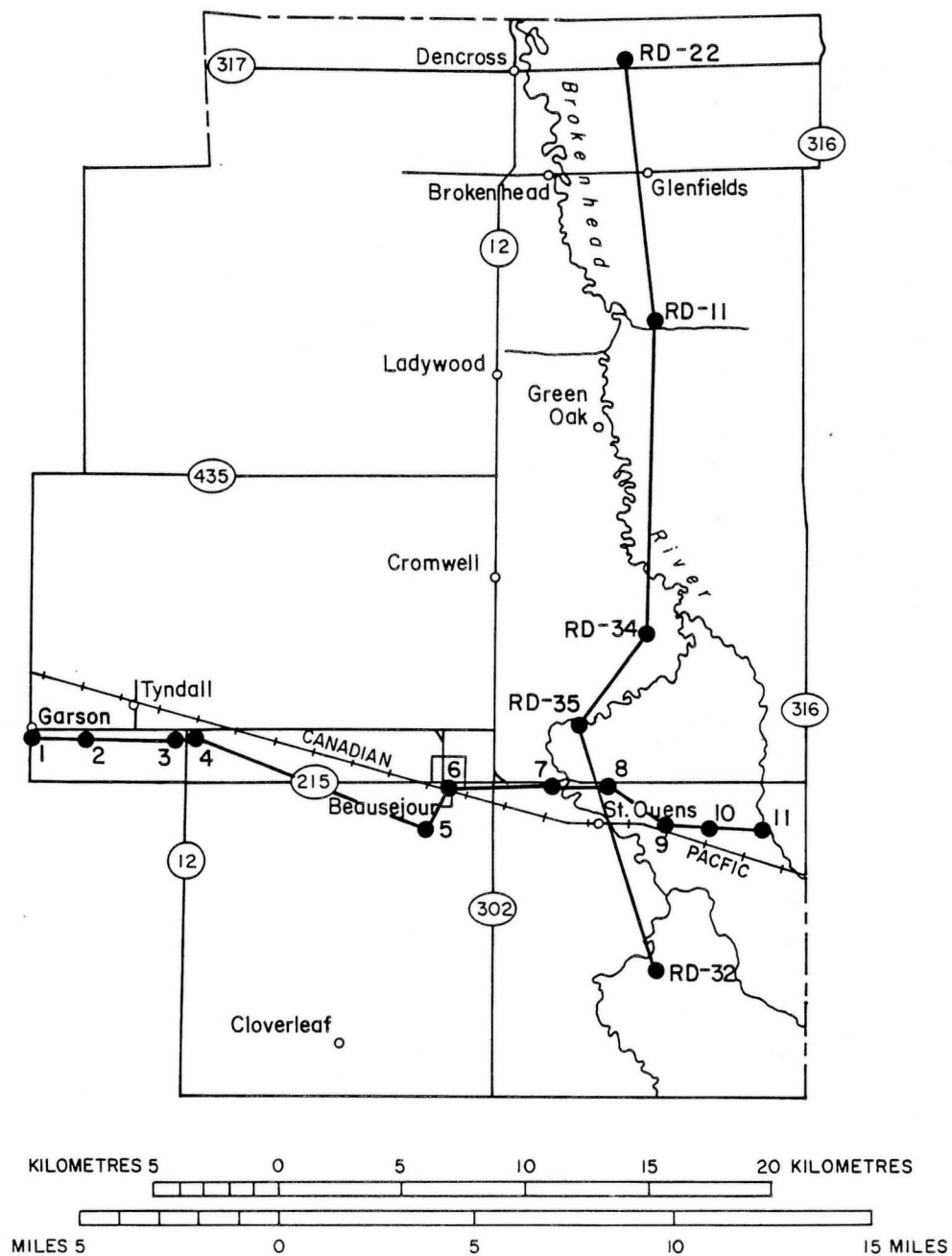


Figure 7b. Location of drill logs for stratigraphic cross-sections.

Sand and gravel deposits consist of glaciofluvial silica-rich sand, glaciofluvial carbonate-rich sand and gravel almost exclusively in the form of eskers, and glaciolacustrine beach ridges (Fig. 8).

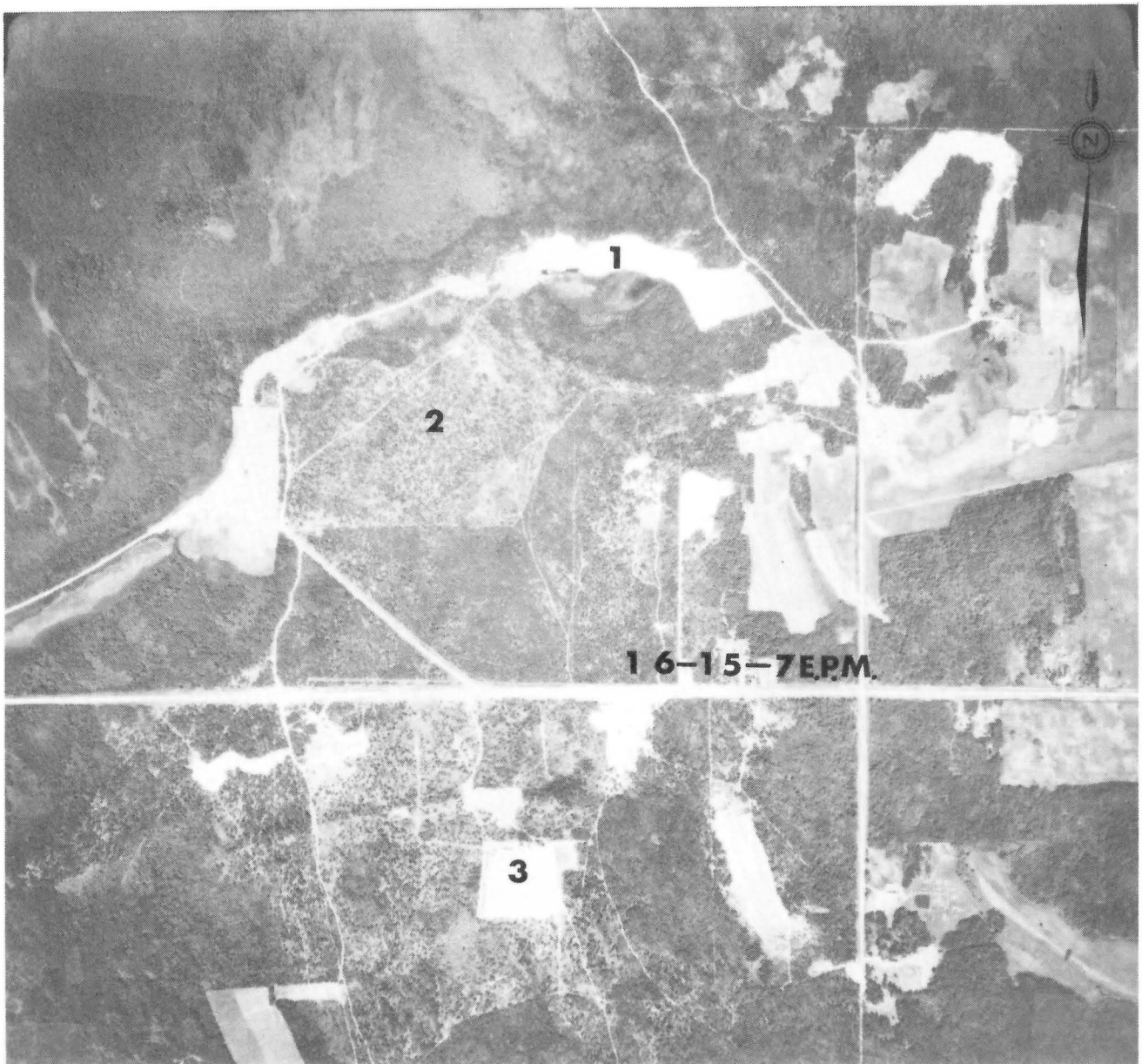


Figure 8. Airphoto (A25229-15, 1:15 840) illustrating sand and gravel deposits (1) beach ridge, (2) glaciofluvial sand, and (3) silica-rich sand.

Six eskers are associated with the upper till unit and all exhibit a west to east orientation and an easterly paleocurrent direction. The eskers are highly variable in composition, often ranging from a medium coarse sand and gravel to fine sand, and occasionally, laminated silts, over a distance of less than a kilometre. The eskers are usually overlain by till varying in thickness from a few centimetres to several metres, although a cover of

glaciolacustrine clays was observed at several locations (deposits 3923 and 3919). Only three eskers contained economic gravel, deposits 3923 and 3913 (Fig. 9) which are presently mined and near depletion, and deposit 3934 which is now depleted. The remaining eskers consist of sand, pebbly sand (deposit 3918) and clay and sand overlying gravel at a depth of 4 m (deposit 3919).



Figure 9. Glaciofluvial deposit 3913 (NE 13-14-7 E.P.M.) mined to depletion and rehabilitated. The pit was mined below the water table and is currently stocked with fish.

Other aggregate deposits associated with the upper till sheet are the numerous beaches marking still-stands of receding Lake Agassiz. Most beaches consist of sand or pebbly sand with the exception of the most northerly beaches at elevations of approximately 236 m (deposits 3900 and 3903). However, these beach deposits are near depletion. In the south, a large 4 m thick beach (deposit 3932) consisting of medium quality sandy fine pebble gravel lies adjacent to the hamlet of Cloverleaf. Generally, most beaches tend to be less than 2 m thick and less than 100 m wide. Glaciofluvial deposit 3926 near Bunker Hill (NW 24-12-8E) consists of sand and gravel containing several beds of well sorted granules in clast support. Cross-bedding indicates a paleocurrent direction of 155° . Numerous large boulders are also present.

Recent deposits include seasonally submerged organic deposits in low-lying areas, and alluvial deposits along the Brokenhead River. The alluvium consists of silt and clay with minor organic deposits.

SAND AND GRAVEL RESOURCES

Quality of Sand and Gravel

A total of 34 sand and gravel deposits have been identified within the municipality. The generalized quality of each deposit is estimated based on field observations, the percentage gravel (sizes greater than 2.0 mm), estimated reserves, and potential industrial uses. Laboratory analysis was performed on 25 samples and included sieving the sample between 0.074 and 101.6 mm sizes. Sizes less than 0.074 mm were recorded as the combined silt-clay fraction. Sizes greater than 150 mm were not sampled but recorded in the field as crushable material.

The type of industrial uses for which the sample is suited is related to the grain size distribution. Although processing methods can modify the sediment to accommodate a variety of potential uses, the industrial uses are based on the natural (unprocessed) characteristics of the deposit. A computer program developed by the Aggregate Resources Section of the Mineral Resources Division correlates specification requirements (grain size distribution) of 48 different industrial uses with the grain size distribution data derived from laboratory testing of each sample. The computed results include individual ratings (suitable, marginal, or not suitable) for each correlation, and a positive or negative indication of whether screening is required; whether it is necessary to remove silt or clay from the deposit; whether crushable material is available on site; or whether it is necessary to add fines to meet the specifications for a particular use.

Size fractions greater than 8 cm were normally not included within the deposit sample. Size fractions greater than 15 cm are recorded in the field and referred to as crushable material. Due to the complexity of sampling the coarse size fractions (cobbles and boulders) this size fraction was not included with the grain size distribution and is reflected in the absence of suitabilities for the coarse aggregate specifications.

The grain size distributions and industrial use assessment for each sample are presented in Appendix I.

Reserves of Sand and Gravel

Each identified sand and gravel deposit is plotted on the map accompanying this report. The depth of each deposit was estimated based on topographic relief, generalized stratigraphy, site inspections and backhoe testing. The area distribution of each deposit was determined by planimetry using 1:50 000 scale maps. Reserve estimates were calculated by multiplying the deposit areal distribution by the average deposit depth.

The material content, generalized quality and estimated reserves of sand and gravel are shown in Table 1. Total reserves within the municipality are estimated at 11.8 million cubic metres. Reserves by quality are summarized in Table 2.

TABLE 1

Sand and Gravel Resources in the R.M. of Brokenhead

Deposit #	Generalized Material Content	Generalized Quality	Reserves (cu. m)	Land Use	Ownership	Comments
3900	Pebbly granules	High	404 000	Extraction	Crown Management; Some private; Municipality	Economic gravel only at fringes
3901	Gravel	Medium	46 800	Agricultural	Private	Possible extension of Deposit 3900
3902	Gravel	Medium	251 300	Agricultural	Private; Manage- ment	Possible extension of Deposit 3900
3903	Pebbly sand	Low	289 200	Temporary use	Crown	
3904	Pebbly sand	Low	906 400	Wildlife Management	Crown; Management	Up to 1.5 m coarse material over silica- rich sand at north end of deposit
3905	Pebble gravel	High	54 500	Temporary use	Crown	
3906	Pebbly sand	Medium	199 000	Forest	Private	
3907	Sandy fine pebble gravel	Medium	186 400	Agricultural	Private	
3908	Coarse pebble gravel	Medium-High	46 100	Easement	Private	
3909	Sandy cobbly pebble gravel	Medium	95 100	Forest	Private	
3910	Gravel	Medium	237 000	Extraction	Private; Municipal	Municipal pit
3911	Gravel	Medium	49 500	Forest	Private	
3912	Gravel	Medium	121 500	Forest	Private	Possible extension of Deposit 3910

TABLE 1 (continued)

Deposit #	Generalized Material Content	Generalized Quality	Reserves (cu. m)	Land Use	Ownership	Comments
3913	Coarse pebble gravel	High	326 800	Extraction	Private	
3914	Coarse pebble gravel	Medium	257 300	Temporary	Private	
3915	Sand	Low	268 500	Agricultural	Private	
3916	Sandy fine pebble gravel	Medium	588 400	Pasture	Private	
3917	Coarse Pebble gravel	Medium	93 000	Highway	Private	
3918	Pebbly sand	Low	56 000	Agriculture	Private	
3919	Sandy Pebble gravel	Medium	241 500	Agriculture	Private	Up to 4 m clay and sand over gravel
3920	Sandy coarse pebble gravel	Medium-Low	68 400	Highway	Private	
3921	Sandy fine pebble gravel	Medium-Low	405 900	Temporary	Private	70% depleted-poss- ible silica-rich sands at depth
3922	Sand	Low	170 000	Agricultural	Private	No sample taken
3923	Sandy pebble gravel	Medium	313 200	Extraction	Private	70% depleted
3924	Sandy fine pebble gravel	Medium-Low	66 000	Temporary	Private	90% depleted (in Beausejour)
3925	Sand with occasional pebbles	Low	1 898 000	Agriculture	Private	
3926	Cobbly coarse pebble sand	Medium	643 200	Temporary	Private	Municipal dump nearby
3927	Sandy pebble gravel	Medium	10 000	Temporary	Private	90% depleted

TABLE 1 (continued)

Deposit #	Generalized Material Content	Generalized Quality	Reserves (cu. m)	Land Use	Ownership	Comments
3928	Coarse pebbly sand	Medium	412 000	Highway	Private	
3929	Pebbly sand	Low	152 000	Dump, unauthorized	Private; Municipal	
3930	Sand	Low	625 000	Agricultural	Private	
3931	Bouldery sand	Low	891 300	Agricultural	Private	Boulders available for crushing
3932	Sandy fine pebble gravel	Medium	1 119 000	Rail easement	Private	
3933	Sand	Low	312 000	Agricultural	Private	No sample taken
3834	Cobbly Coarse pebble gravel	Medium-High	8 500	Concrete plant	Private	Depleted above water table
Total Reserves			11 812 800			

TABLE 2

Estimated Reserves of Sand and Gravel
within the R.M. of Brokenhead

Quality	Reserves (Cubic Metres)
Low	5 568 400
Medium-Low	540 300
Medium	4 864 200
Medium-High	54 600
High	785 300
TOTAL	11 812 800

Demand for Sand and Gravel

Estimation of the demand for sand and gravel was derived from consideration of:

- i) Requirements of the Rural Municipality of Brokenhead;
- ii) Requirements for the Town of Beausejour;
- iii) Department of Highways upgrading and improvements; and
- iv) Requirements of local construction companies.

The R.M. of Brokenhead utilizes a total of 30 000 cubic metres of sand and gravel annually. Of this, 18 000 cubic metres is mined outside the municipality, primarily from Seddons Corner, while an estimated 12 000 cubic metres is mined within the municipality. The Town of Beausejour purchases an estimated 10 000 cubic metres annually from private construction companies, of which an estimated 2 000 cubic metres is mined within the municipality.

The Department of Highways and Transportation is responsible for the maintenance of approximately 60 miles of provincial roads within the municipality. It is estimated that the Department of Highways and Transportation will utilize an estimated 78 000 cubic metres mined within the municipality. Private construction companies consume an estimated 13 000 cubic metres annually.

The estimated demand for sand and gravel within the municipality is shown in Table 3.

TABLE 3

Estimated Annual Demand for Sand and Gravel
within the R.M. of Brokenhead

User	Demand (Cubic Metres)
R.M. of Brokenhead	12 000
Town of Beausejour	2 000
Department of Highways	78 000
Construction Companies	13 000
TOTAL	105 000

Supply and Demand for Sand and Gravel

A comparison of supply and demand of sand and gravel shows there are an estimated 11.8 million cubic metres of naturally occurring sand and gravel of various qualities, with an annual demand of 105 000 cubic metres. Although the demand is sufficient to meet the requirements of the municipality for several years, the extraction of sand and gravel will be dependent upon the economics of mining the low quality reserves. Of the estimated 11.8 million cubic metres of reserves only 785 300 cubic metres are high quality and at current rates of extraction, the high quality reserves would be consumed within seven years.

Silica-Rich Sand

Two silica-rich sand deposits are currently being mined within the municipality. One operation is within the town limits of Beausejour (Fig. 10) and the second is the Mars Hill area (Deposit 3904). The primary uses of the silica-rich sands are in the production of portland cement and, in the past, for sand-lime brick and glass. The Beausejour deposit contains 76-89 per cent SiO_2 .

Several silica-rich sand deposits were observed in backhoe test pits (Fig. 11). Silica-rich sand underlies littoral sand at sample location 8, and underlies the till at sample locations 1 and 5. The geochemical analysis of the silica-rich sand sampled from backhoe test pits are shown in Table 4. The lateral and horizontal distribution of these secondary sites have not been confirmed as more detailed research is required to accurately delineate the geological boundaries.

NEAR-SURFACE BEDROCK

Near-surface limestone bedrock was evaluated for potential uses as crushed stone, an alternate source of sand and gravel. Two bedrock samples from the Selkirk Member of the Ordovician Red River Formation were tested. The samples were obtained from the mottled dolomitic limestone beds from Gillis quarries in Garson.

Tests selected were based in specifications from the American Society for Testing and Materials (A.S.T.M.), the Canadian Standards Association (C.S.A.), and from data supplied by Provincial contractors and engineering firms. Specific tests included;

- (1) Los Angeles abrasion which is a measure of the abrasive resistance of the bedrock.
- (2) Sodium sulphate soundness which is designed to measure a sample's resistance to disintegration.
- (3) Absorption which is a measure of the increase in weight of a porous solid body resulting from penetration of a liquid into the rock's permeable pores.

The Aggregate Resources Section has developed Table 5 which summarizes some of the engineering specifications for various end uses of crushed stone. Included within the table



Figure 10. Silica-rich sand quarried from glaciofluvial deposit at Beausejour
(NE 35-12-7 E.P.M.).

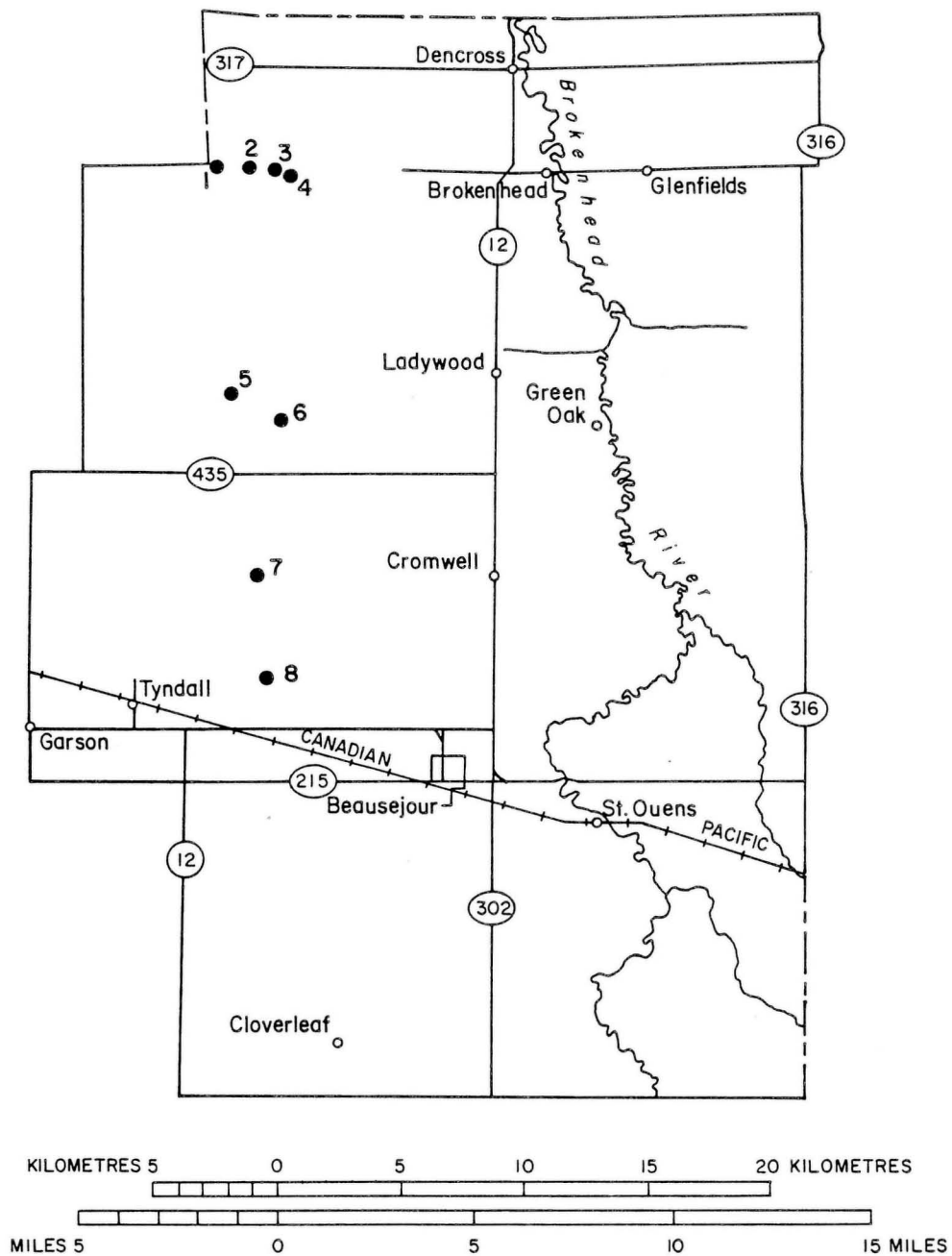


Figure 11. Location of backhoe test pits containing silica-rich sand.

TABLE 4

Geochemical Analysis of Silica-Rich Sand
(oxide weight per cent)

Sample	1	2	3	4	5	6	7	8
SiO ₂	87.10	90.25	87.45	82.75	90.25	84.75	86.70	88.20
Al ₂ O ₃	4.94	5.07	4.67	6.38	3.23	3.75	3.38	3.97
Fe ₂ O ₃	0.45	0.20	0.43	0.71	0.40	0.23	0.23	0.49
FeO	0.27	0.15	0.23	0.37	0.16	0.18	0.14	0.26
CaO	2.30	0.78	2.38	3.33	2.17	4.18	3.99	2.40
MgO	0.27	0.10	0.27	0.57	0.21	0.67	0.57	0.33
Na ₂ O	1.40	1.44	1.28	1.75	0.76	0.95	0.90	0.97
K ₂ O	0.91	1.00	0.83	1.22	0.71	0.74	0.65	0.87
TiO ₂	0.07	0.04	0.07	0.11	0.06	0.04	0.04	0.10
P ₂ O ₅	0.04	0.04	0.04	0.07	0.05	0.04	0.03	0.06
MnO	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
NiO								
Cr ₂ O ₃								
H ₂ O	0.30	0.28	0.27	0.41	0.40	0.27	0.24	0.37
S								
CO ₂	1.24	0.12	1.38	2.12	1.41	3.55	2.95	1.51
TOTAL	99.30	99.48	99.31	99.80	99.82	99.36	99.83	99.54

TABLE 5

Maximum Value Engineering Test Requirements
of Aggregate Derived from Crushed Bedrock

TEST	BASE COURSE		TRAFFIC TYPE	BITUMINOUS	CONCRETE		BALLAST	TERRAZO
	CLASS A	CLASS B	A	CLASS A	FINE	COARSE		AGGREGATE
Los Angeles Abrasion % Loss	60		35	35		50 40 35 ⁽¹⁾	40	25
Sodium Sulphate Soundness % Loss				12	16	12	10	6
Absorption - %				1-2		1-2	0.5-1.0	
Shale - %	15	5	15					
Fineness Modules						2.3 to 3.1		

(1) The abrasion loss shall not be greater than 35 per cent when aggregate is used in concrete paving or for other concrete surface subjected to significant wear.

is the percentage shale which is the allowable percentage deleterious material, and the fineness modulus which is an empirical factor of coarseness or fineness of aggregate relating the amount of water and cement that must be used in producing a workable mixture of concrete.

Sample 16 was obtained from Beds A-D and sample 17 from Beds E-I of the Selkirk Member (Wallace and Greer, 1927). Results of the engineering tests are shown on Table 6. A comparison of Table 5 and 6 shows the bedrock to be suitable for Type B base course, fill or surfacing gravel. Due to high soundness loss and absorption both samples would be marginal for use in concrete. The samples would not be considered for use as ballast.

TABLE 6

Bedrock Engineering Specifications

<u>Test</u>	<u>Sample</u>	
	16	17
Los Angeles Abrasion	51.1%	48.4%
Bulk Specific Gravity	2.38	2.42
Bulk Specific Gravity (Saturated Surface Dry Basis)	2.49	2.51
Apparent Specific Gravity	2.64	2.65
Absorption	4.0%	3.5%
Porosity	9.6%	8.5%
Soundness Loss		
1 1/2" to 3/4"	8.0%	3.5%
3/4" to 1/2"	10.4%	12.2%
1/2" to 3/8"	18.6%	21.3%

CONCLUSIONS

There are 34 identified sand and gravel deposits within the Rural Municipality of Brokenhead. Total reserves are estimated at 11.8 million cubic metres of which 785 300 cubic metres are high quality. There are sufficient reserves of medium and high quality sand and gravel to supply the requirements within the municipality in excess of 25 years. Near-surface bedrock may be considered as an alternate source of sand and gravel for base course, fill or surfacing gravel. Near-surface silica-rich sands have been observed to trend north from Beausejour to Mars Hill. Further investigation would be required to delineate the extent of these deposits.

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APPENDIX I

GRAIN SIZE DISTRIBUTION AND
INDUSTRIAL USAGE ASSESSMENT

SAMPLE IDENTIFICATION 003900A01507E16NWEN621

AVAILABILITY OF CRUSHABLE MATERIAL ON SITE - YES

WEIGHT OF SAND 3962.60 GMS. WASHED SAMPLE - WEIGHT BEFORE 838.10 AFTER 828.50 % LOSS 1.15

SIEVE SIZE	FINE FRACTION (GMS.)	SIEVE WEIGHTS (GMS.)	PERCENT	PERCENT PASSING	PERCENT RETAINED
4	IN	0.0	0.0	100.00	0.0
1/2	IN	0.0	0.0	100.00	0.0
1/2	IN	0.0	0.0	100.00	0.0
1/2	IN	390.30	7.57	92.43	7.57
1/2	IN	0.0	0.0	92.43	7.57
1/2	IN	0.0	0.0	88.86	11.14
1/2	IN	0.0	0.0	72.21	27.79
1/2	IN	0.0	0.0	66.10	33.90
1/2	IN	0.0	0.0	59.33	40.67
1/2	IN	0.0	0.0	53.08	46.92
1/2	IN	0.0	0.0	48.76	51.24
1/2	IN	0.0	0.0	37.69	62.31
1/2	IN	0.0	0.0	32.61	67.39
1/2	IN	0.0	0.0	21.95	78.05
1/2	IN	0.0	0.0	17.26	82.74
1/2	IN	0.0	0.0	10.39	89.61
1/2	IN	0.0	0.0	1.98	98.02
1/2	IN	0.0	0.0	1.44	98.56
1/2	IN	0.0	0.0	0.88	99.12
1/2	IN	0.0	0.0	0.0	100.00
200 + W		9.60	0.88	0.0	0.0

TOTALS 838.10 5155.59

SPLITTING FACTOR 4.73

FINENESS MODULUS 5.22

% COBBLES 7.57 % PEBBLES 43.67 % GRANULES 14.09 % SAND 33.79 % SILT/CLAY 0.88

INDUSTRIAL USAGE ASSESSMENT

003900A01507E16NWEN621

* NOTE - SUITABILITY OF SAMPLE IS BASED ONLY ON GRADING SPECIFICATIONS *

INDUSTRIAL USE	TOTAL RESIDUAL	RATING	SCREENING REQUIRED	REMOVAL OF MATERIAL <#200 MATERIAL	CRUSHING MATERIAL ON SITE	REQUIRED MATERIAL NOT ON SITE	ADDITION OF FINES (MATERIAL <#4)
ASPHALT A (P. OF M.)	1.90	MARGINAL	YES	YES			
ASPHALT B (P. OF M.)	48.83	MARGINAL	YES	YES			
ASPHALT C (P. OF M.)	6.85	MARGINAL	YES	YES			
BASER COURSE A (P. OF M.)	3.01	MARGINAL	YES	YES			
BASER COURSE B (P. OF M.)	3.01	MARGINAL	YES	YES			
BASER COURSE C (P. OF M.)	1.09	MARGINAL	YES	YES			
SUB-BASER COURSE A (P. OF M.)	5.09	MARGINAL	YES	YES			
SUB-BASER COURSE B (P. OF M.)	11.34	MARGINAL	YES	YES			
SUB-BASER COURSE C (P. OF M.)	4.95	MARGINAL	YES	YES			
SUB-BASER COURSE D (P. OF M.)	41.70	MARGINAL	YES	YES			
TRAFFIC GRAVEL A (P. OF M.)	10.41	MARGINAL	YES	YES	YES		YES
TRAFFIC GRAVEL B (P. OF M.)	6.93	MARGINAL	YES	YES			
TRAFFIC GRAVEL C (P. OF M.)	0.0	SUITABLE	YES	YES			
SEAL COAT A (P. OF M.)	80.62	MARGINAL	YES	YES			
SEAL COAT B (P. OF M.)	14.87	MARGINAL	YES	YES	YES		YES
SEAL COAT C (P. OF M.)	1.11	MARGINAL	YES	YES			YES
COARSE AGGREGATE I (ASTM C33, D448)	178.26	NOT SUIT					
COARSE AGGREGATE II (ASTM C33, D448)	168.26	NOT SUIT					
COARSE AGGREGATE III (ASTM C33, D448)	199.38	NOT SUIT					
COARSE AGGREGATE IV (ASTM C33, D448)	109.87	NOT SUIT					
COARSE AGGREGATE V (ASTM C33, D448)	162.65	NOT SUIT					
COARSE AGGREGATE VI (ASTM C33, D448)	99.10	NOT SUIT					
COARSE AGGREGATE VII (ASTM C33, D448)	157.39	NOT SUIT					
COARSE AGGREGATE VIII (ASTM C33, D448)	139.17	NOT SUIT					
COARSE AGGREGATE IX (ASTM C33, D448)	133.08	NOT SUIT					
COARSE AGGREGATE X (ASTM C33, D448)	104.12	NOT SUIT					
COARSE AGGREGATE XI (ASTM C33, D448)	103.06	NOT SUIT					
COARSE AGGREGATE XII (ASTM C33, D448)	103.73	NOT SUIT					
COARSE AGGREGATE XIII (ASTM C33, D448)	121.21	NOT SUIT					
COARSE AGGREGATE XIV (ASTM C33, D448)	139.47	NOT SUIT					
COARSE AGGREGATE XV (ASTM C33, D448)	84.25	NOT SUIT					
COARSE AGGREGATE XVI (ASTM C33, D448)	10.88	MARGINAL	YES	YES			YES
FINE CONCRETE AGGREGATE I (P. OF M.)	27.82	MARGINAL	YES	YES			
FINE CONCRETE AGGREGATE II (ASTM C33, C404)	29.34	MARGINAL	YES	YES			
FINE CONCRETE AGGREGATE III (ASTM C33, C404)	17.76	MARGINAL	YES	YES			
MORTAR (ASTM C144)	17.76	MARGINAL	YES	YES			
PORTLAND CEMENT (P. OF M.)	12.44	MARGINAL	YES	YES			
BUILT-UP ROOFS (ASTM D1663)	104.28	NOT SUIT					
AIRFIELD RUNWAYS (P. OF M.)	0.28	MARGINAL	YES	YES			
PIT RUN (P. OF M.)	0.0	SUITABLE	YES	YES			
SEPTIC FIELDS (U.M.A.)	16.38	MARGINAL	YES	YES	YES		
SHOULDERS (P. OF M.)	0.0	SUITABLE	YES	YES			

OVERALL SAMPLE RATING (SCALE 1 - 9) IS 4

AVAILABILITY OF CRUSHABLE MATERIAL ON SITE - NONE

TOTALS	818.30	4337.89
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SPLITTING FACTOR 4.15

FINENESS MODULUS 3.66

% COBBLES	0.0	% PEBBLES	30.08	% GRANULES	4.69	% SAND	64.28	% SILT/CLAY	0.95
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003903A01507E11SEEN558A

* NOTE - SUITABILITY OF SAMPLE IS BASED ONLY ON GRADING SPECIFICATIONS *

INDUSTRIAL USE			TOTAL RESIDUAL	RATING	SCREENING REQUIRED	REMOVAL OF <#200 MATERIAL	CRUSHING MATERIAL ON SITE	REQUIRED MATERIAL NOT ON SITE	ADDITION OF FINES (MATERIAL <#4)
ASPHALT A (P. OF M.)			83.76	NOT SUIT					
ASPHALT B (P. OF M.)			73.85	NOT SUIT					
ASPHALT C (P. OF M.)			19.15	MARGINAL	YES	YES			
ASPHALT D (P. OF M.)			64.15	NOT SUIT					
ASPHALT E (P. OF M.)			3.27	NOT SUIT					
ASPHALT F (P. OF M.)			9.37	MARGINAL	YES	YES			
ASPHALT G (P. OF M.)			9.37	NOT SUIT					
ASPHALT H (P. OF M.)			9.37	NOT SUIT					
ASPHALT I (P. OF M.)			9.37	NOT SUIT					
ASPHALT J (P. OF M.)			9.37	NOT SUIT					
ASPHALT K (P. OF M.)			9.37	NOT SUIT					
ASPHALT L (P. OF M.)			9.37	NOT SUIT					
ASPHALT M (P. OF M.)			9.37	NOT SUIT					
ASPHALT N (P. OF M.)			9.37	NOT SUIT					
ASPHALT O (P. OF M.)			9.37	NOT SUIT					
ASPHALT P (P. OF M.)			9.37	NOT SUIT					
ASPHALT Q (P. OF M.)			9.37	NOT SUIT					
ASPHALT R (P. OF M.)			9.37	NOT SUIT					
ASPHALT S (P. OF M.)			9.37	NOT SUIT					
ASPHALT T (P. OF M.)			9.37	NOT SUIT					
ASPHALT U (P. OF M.)			9.37	NOT SUIT					
ASPHALT V (P. OF M.)			9.37	NOT SUIT					
ASPHALT W (P. OF M.)			9.37	NOT SUIT					
ASPHALT X (P. OF M.)			9.37	NOT SUIT					
ASPHALT Y (P. OF M.)			9.37	NOT SUIT					
ASPHALT Z (P. OF M.)			9.37	NOT SUIT					
ASPHALT AA (P. OF M.)			9.37	NOT SUIT					
ASPHALT AB (P. OF M.)			9.37	NOT SUIT					
ASPHALT AC (P. OF M.)			9.37	NOT SUIT					
ASPHALT AD (P. OF M.)			9.37	NOT SUIT					
ASPHALT AE (P. OF M.)			9.37	NOT SUIT					
ASPHALT AF (P. OF M.)			9.37	NOT SUIT					
ASPHALT AG (P. OF M.)			9.37	NOT SUIT					
ASPHALT AH (P. OF M.)			9.37	NOT SUIT					
ASPHALT AI (P. OF M.)			9.37	NOT SUIT					
ASPHALT AJ (P. OF M.)			9.37	NOT SUIT					
ASPHALT AK (P. OF M.)			9.37	NOT SUIT					
ASPHALT AL (P. OF M.)			9.37	NOT SUIT					
ASPHALT AM (P. OF M.)			9.37	NOT SUIT					
ASPHALT AN (P. OF M.)			9.37	NOT SUIT					
ASPHALT AO (P. OF M.)			9.37	NOT SUIT					
ASPHALT AP (P. OF M.)			9.37	NOT SUIT					
ASPHALT AQ (P. OF M.)			9.37	NOT SUIT					
ASPHALT AR (P. OF M.)			9.37	NOT SUIT					
ASPHALT AS (P. OF M.)			9.37	NOT SUIT					
ASPHALT AT (P. OF M.)			9.37	NOT SUIT					
ASPHALT AU (P. OF M.)			9.37	NOT SUIT					
ASPHALT AV (P. OF M.)			9.37	NOT SUIT					
ASPHALT AW (P. OF M.)			9.37	NOT SUIT					
ASPHALT AX (P. OF M.)			9.37	NOT SUIT					
ASPHALT AY (P. OF M.)			9.37	NOT SUIT					
ASPHALT AZ (P. OF M.)			9.37	NOT SUIT					
ASPHALT BA (P. OF M.)			9.37	NOT SUIT					
ASPHALT BB (P. OF M.)			9.37	NOT SUIT					
ASPHALT BC (P. OF M.)			9.37	NOT SUIT					
ASPHALT BD (P. OF M.)			9.37	NOT SUIT					
ASPHALT BE (P. OF M.)			9.37	NOT SUIT					
ASPHALT BF (P. OF M.)			9.37	NOT SUIT					
ASPHALT BG (P. OF M.)			9.37	NOT SUIT					
ASPHALT BH (P. OF M.)			9.37	NOT SUIT					
ASPHALT BI (P. OF M.)			9.37	NOT SUIT					

OVERALL SAMPLE RATING (SCALE 1 - 9) IS 6

WEIGHT OF SAND	4370.70	GMS.	WASHED SAMPLE - WEIGHT BEFORE	741.10	AFTER	724.20	% LOSS	2.28
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% COBBLES	0.0	% PEBBLES	60.39	% GRANULES	27.44	% SAND	10.09	% SILT/CLAY	2.08
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 * NOTE - SUITABILITY OF SAMPLE IS BASED ONLY ON GRADING SPECIFICATIONS *

OVERALL SAMPLE RATING (SCALE 1 - 9) IS 4

SAMPLE IDENTIFICATION 003907 01407E31SWEN618A

AVAILABILITY OF CRUSHABLE MATERIAL ON SITE - YES

WEIGHT OF SAND 2737.70 GMS. WASHED SAMPLE - WEIGHT BEFORE 729.80 AFTER 717.80 % LOSS 1.64

SIEVE SIZE	FINE FRACTION (GMS.)	SIEVE WEIGHTS (GMS.)	PERCENT	PERCENT PASSING	PERCENT RETAINED
4		0.0	0.0	100.00	0.0
10		0.0	0.0	100.00	0.0
20		0.0	0.0	100.00	0.0
40		0.0	0.0	100.00	0.0
60		0.0	0.0	100.00	0.0
80		0.0	0.0	100.00	0.0
100		0.0	0.0	100.00	0.0
150		0.0	0.0	100.00	0.0
200		0.0	0.0	100.00	0.0
250		0.0	0.0	100.00	0.0
300		0.0	0.0	100.00	0.0
350		0.0	0.0	100.00	0.0
400		0.0	0.0	100.00	0.0
450		0.0	0.0	100.00	0.0
500		0.0	0.0	100.00	0.0
550		0.0	0.0	100.00	0.0
600		0.0	0.0	100.00	0.0
650		0.0	0.0	100.00	0.0
700		0.0	0.0	100.00	0.0
750		0.0	0.0	100.00	0.0
800		0.0	0.0	100.00	0.0
850		0.0	0.0	100.00	0.0
900		0.0	0.0	100.00	0.0
950		0.0	0.0	100.00	0.0
1000		0.0	0.0	100.00	0.0
1100		0.0	0.0	100.00	0.0
1200		0.0	0.0	100.00	0.0
1300		0.0	0.0	100.00	0.0
1400		0.0	0.0	100.00	0.0
1500		0.0	0.0	100.00	0.0
1600		0.0	0.0	100.00	0.0
1700		0.0	0.0	100.00	0.0
1800		0.0	0.0	100.00	0.0
1900		0.0	0.0	100.00	0.0
2000		0.0	0.0	100.00	0.0
2100		0.0	0.0	100.00	0.0
2200		0.0	0.0	100.00	0.0
2300		0.0	0.0	100.00	0.0
2400		0.0	0.0	100.00	0.0
2500		0.0	0.0	100.00	0.0
2600		0.0	0.0	100.00	0.0
2700		0.0	0.0	100.00	0.0
2800		0.0	0.0	100.00	0.0
2900		0.0	0.0	100.00	0.0
3000		0.0	0.0	100.00	0.0
3100		0.0	0.0	100.00	0.0
3200		0.0	0.0	100.00	0.0
3300		0.0	0.0	100.00	0.0
3400		0.0	0.0	100.00	0.0
3500		0.0	0.0	100.00	0.0
3600		0.0	0.0	100.00	0.0
3700		0.0	0.0	100.00	0.0
3800		0.0	0.0	100.00	0.0
3900		0.0	0.0	100.00	0.0
4000		0.0	0.0	100.00	0.0
4100		0.0	0.0	100.00	0.0
4200		0.0	0.0	100.00	0.0
4300		0.0	0.0	100.00	0.0
4400		0.0	0.0	100.00	0.0
4500		0.0	0.0	100.00	0.0
4600		0.0	0.0	100.00	0.0
4700		0.0	0.0	100.00	0.0
4800		0.0	0.0	100.00	0.0
4900		0.0	0.0	100.00	0.0
5000		0.0	0.0	100.00	0.0
5100		0.0	0.0	100.00	0.0
5200		0.0	0.0	100.00	0.0
5300		0.0	0.0	100.00	0.0
5400		0.0	0.0	100.00	0.0
5500		0.0	0.0	100.00	0.0
5600		0.0	0.0	100.00	0.0
5700		0.0	0.0	100.00	0.0
5800		0.0	0.0	100.00	0.0
5900		0.0	0.0	100.00	0.0
6000		0.0	0.0	100.00	0.0
6100		0.0	0.0	100.00	0.0
6200		0.0	0.0	100.00	0.0
6300		0.0	0.0	100.00	0.0
6400		0.0	0.0	100.00	0.0
6500		0.0	0.0	100.00	0.0
6600		0.0	0.0	100.00	0.0
6700		0.0	0.0	100.00	0.0
6800		0.0	0.0	100.00	0.0
6900		0.0	0.0	100.00	0.0
7000		0.0	0.0	100.00	0.0
7100		0.0	0.0	100.00	0.0
7200		0.0	0.0	100.00	0.0
7300		0.0	0.0	100.00	0.0
7400		0.0	0.0	100.00	0.0
7500		0.0	0.0	100.00	0.0
7600		0.0	0.0	100.00	0.0
7700		0.0	0.0	100.00	0.0
7800		0.0	0.0	100.00	0.0
7900		0.0	0.0	100.00	0.0
8000		0.0	0.0	100.00	0.0
8100		0.0	0.0	100.00	0.0
8200		0.0	0.0	100.00	0.0
8300		0.0	0.0	100.00	0.0
8400		0.0	0.0	100.00	0.0
8500		0.0	0.0	100.00	0.0
8600		0.0	0.0	100.00	0.0
8700		0.0	0.0	100.00	0.0
8800		0.0	0.0	100.00	0.0
8900		0.0	0.0	100.00	0.0
9000		0.0	0.0	100.00	0.0
9100		0.0	0.0	100.00	0.0
9200		0.0	0.0	100.00	0.0
9300		0.0	0.0	100.00	0.0
9400		0.0	0.0	100.00	0.0
9500		0.0	0.0	100.00	0.0
9600		0.0	0.0	100.00	0.0
9700		0.0	0.0	100.00	0.0
9800		0.0	0.0	100.00	0.0
9900		0.0	0.0	100.00	0.0
10000		0.0	0.0	100.00	0.0

TOTALS 729.80 3432.20

SPLITTING FACTOR 3.75

FINESS MODULUS 4.69

% COBBLES 0.0 % PEBBLES 35.10 % GRANULES 14.43 % SAND 49.16 % SILT/CLAY 1.31

INDUSTRIAL USAGE ASSESSMENT

003907 01407E31SWEN618A

 * NOTE - SUITABILITY OF SAMPLE IS BASED ONLY ON GRADING SPECIFICATIONS *

INDUSTRIAL USE	TOTAL RESIDUAL	RATING	SCREENING REQUIRED	REMOVAL OF <#200 MATERIAL	CRUSHING REQUIRED MATERIAL ON SITE	ADDITION OF FINES (MATERIAL <#4)
ASPHALT A (P. OF M.)	29.71	MARGINAL	YES	YES	YES	YES
ASPHALT B (P. OF M.)	17.60	MARGINAL	YES	YES	YES	YES
ASPHALT C (P. OF M.)	63.57	NOT SUIT				
ASPHALT D (P. OF M.)	11.48	NOT SUIT				
ASPHALT E (P. OF M.)	12.69	MARGINAL	YES	YES		
ASPHALT F (P. OF M.)	31.63	MARGINAL				
ASPHALT G (P. OF M.)	23.13	MARGINAL	YES	YES	YES	YES
ASPHALT H (P. OF M.)	33.37	NOT SUIT				
ASPHALT I (P. OF M.)	24.33	MARGINAL	YES	YES		
ASPHALT J (P. OF M.)	32.33	MARGINAL	YES	YES		
ASPHALT K (P. OF M.)	54.66	NOT SUIT				
ASPHALT L (P. OF M.)	34.99	NOT SUIT				
ASPHALT M (P. OF M.)	19.03	MARGINAL	YES	YES	YES	YES
ASPHALT N (P. OF M.)	8.03	MARGINAL	YES	YES	YES	YES
ASPHALT O (P. OF M.)	14.44	NOT SUIT				
ASPHALT P (P. OF M.)	0.0	SUITABLE	YES		YES	
ASPHALT Q (P. OF M.)	19.95	NOT SUIT				
ASPHALT R (P. OF M.)	181.95	NOT SUIT				
ASPHALT S (P. OF M.)	171.95	NOT SUIT				
ASPHALT T (P. OF M.)	163.95	NOT SUIT				
ASPHALT U (P. OF M.)	120.95	NOT SUIT				
ASPHALT V (P. OF M.)	116.95	NOT SUIT				
ASPHALT W (P. OF M.)	180.95	NOT SUIT				
ASPHALT X (P. OF M.)	191.95	NOT SUIT				
ASPHALT Y (P. OF M.)	143.95	NOT SUIT				
ASPHALT Z (P. OF M.)	183.95	NOT SUIT				
ASPHALT AA (P. OF M.)	180.95	NOT SUIT				
ASPHALT AB (P. OF M.)	155.95	NOT SUIT				
ASPHALT AC (P. OF M.)	184.95	NOT SUIT				
ASPHALT AD (P. OF M.)	170.95	NOT SUIT				
ASPHALT AE (P. OF M.)	120.95	NOT SUIT				
ASPHALT AF (P. OF M.)	86.95	NOT SUIT				
ASPHALT AG (P. OF M.)	9.43	MARGINAL	YES			YES
ASPHALT AH (P. OF M.)	20.99	MARGINAL	YES			
ASPHALT AI (P. OF M.)	30.99	NOT SUIT				
ASPHALT AJ (P. OF M.)	10.99	MARGINAL	YES			
ASPHALT AK (P. OF M.)	10.18	MARGINAL	YES			
ASPHALT AL (P. OF M.)	153.05	NOT SUIT				
ASPHALT AM (P. OF M.)	15.04	MARGINAL	YES		YES	YES
ASPHALT AN (P. OF M.)	16.82	SUITABLE	YES		YES	
ASPHALT AO (P. OF M.)	0.0	SUITABLE				

OVERALL SAMPLE RATING (SCALE 1 - 9) IS 4

SAMPLE IDENTIFICATION 003908 01406E13NWEN619A

AVAILABILITY OF CRUSHABLE MATERIAL ON SITE - NONE

WEIGHT OF SAND 3430.90 GMS. WASHED SAMPLE - WEIGHT BEFORE 684.20 AFTER 663.40 % LOSS 3.04

STIEVE SIZE	FINE FRACTION (GMS.)	STIEVE WEIGHTS (GMS.)	PERCENT	PERCENT PASSING	PERCENT RETAINED
4		0.0	0.0	100.00	0.0
1/2 IN		0.0	0.0	100.00	0.0
1/2 IN		0.0	0.0	100.00	0.0
1/2 IN		0.0	0.0	100.00	0.0
1/2 IN		153.00	0.42	99.58	0.42
1/2 IN		473.90	10.56	89.44	10.56
1/2 IN		445.50	9.93	79.51	20.49
1/2 IN	8.00	40.12	0.64	78.87	21.13
1/2 IN	48.90	330.16	5.13	73.74	26.26
1/2 IN	74.60	374.08	5.48	68.26	31.74
1/2 IN	23.10	116.12	1.71	66.55	33.45
1/2 IN	102.60	114.48	11.46	55.09	44.91
1/2 IN	29.50	147.93	3.30	51.79	48.21
1/2 IN	49.20	246.71	5.50	46.29	53.71
1/2 IN	166.30	333.04	11.68	34.61	65.39
1/2 IN	69.50	152.93	2.24	32.37	67.63
1/2 IN	10.00	65.27	0.95	31.42	68.58
1/2 IN	3.70	13.55	0.41	31.01	68.99
1/2 IN	15.90	79.73	1.75	29.26	70.74
1/2 IN	20.71	103.83	2.31	26.95	73.05
TOTALS	681.11	4488.27			

TOTALS 681.11

4488.27

SPLITTING FACTOR 5.01

FINESS MODULUS 5.21

% COBBLES 0.0 % PEBBLES 50.66 % GRANULES 14.76 % SAND 32.27 % SILT/CLAY 2.31

INDUSTRIAL USAGE ASSESSMENT

003908 01406E13NWEN619A

***** NOTE SUITABILITY OF SAMPLE IS BASED ONLY ON GRADING SPECIFICATIONS *****

INDUSTRIAL USE	TOTAL RESIDUAL	RATING	SCREENING REQUIRED	REMOVAL OF <#200 MATERIAL	CRUSHING REQUIRED MATERIAL ON SITE	ADDITION OF FINES (MATERIAL <#4)
ASPHALT A (P. OF M.)	1.81	MARGINAL	YES			
ASPHALT B (P. OF M.)	0.0	SUITABLE	YES			
ASPHALT C (P. OF M.)	52.86	NOT SUIT				
BASE COURSE A (P. OF M.)	6.78	MARGINAL	YES	YES		
BASE COURSE B (P. OF M.)	9.22	MARGINAL	YES	YES		
BASE COURSE C (P. OF M.)	1.60	MARGINAL	YES	YES		
BASE COURSE D (P. OF M.)	9.22	MARGINAL	YES	YES		
BASE COURSE E (P. OF M.)	5.65	MARGINAL	YES	YES		
BASE COURSE F (P. OF M.)	16.65	MARGINAL	YES	YES		
BASE COURSE G (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE H (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE I (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE J (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE K (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE L (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE M (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE N (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE O (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE P (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE Q (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE R (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE S (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE T (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE U (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE V (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE W (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE X (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE Y (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE Z (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE AA (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE AB (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE AC (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE AD (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE AE (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE AF (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE AG (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE AH (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE AI (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE AJ (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE AK (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE AL (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE AM (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE AN (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE AO (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE AP (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE AQ (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE AR (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE AS (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE AT (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE AU (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE AV (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE AW (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE AX (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE AY (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE AZ (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE BA (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE BB (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE BC (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE BD (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE BE (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE BF (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE BG (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE BH (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE BI (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE BJ (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE BK (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE BL (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE BM (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE BN (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE BO (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE BP (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE BQ (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE BR (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE BS (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE BT (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE BU (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE BV (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE BW (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE BX (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE BY (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE BZ (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE CA (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE CB (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE CC (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE CD (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE CE (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE CF (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE CG (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE CH (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE CI (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE CJ (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE CK (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE CL (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE CM (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE CN (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE CO (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE CP (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE CQ (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE CR (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE CS (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE CT (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE CU (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE CV (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE CW (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE CX (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE CY (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE CZ (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE DA (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE DB (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE DC (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE DD (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE DE (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE DF (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE DG (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE DH (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE DI (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE DJ (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE DK (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE DL (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE DM (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE DN (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE DO (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE DP (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE DQ (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE DR (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE DS (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE DT (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE DU (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE DV (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE DW (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE DX (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE DY (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE DZ (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE EA (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE EB (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE EC (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE ED (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE EE (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE EF (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE EG (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE EH (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE EI (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE EJ (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE EK (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE EL (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE EM (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE EN (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE EO (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE EP (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE EQ (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE ER (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE ES (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE ET (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE EU (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE EV (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE EW (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE EX (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE EY (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE EZ (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE FA (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE FB (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE FC (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE FD (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE FE (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE FF (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE FG (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE FH (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE FI (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE FJ (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE FK (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE FL (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE FM (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE FN (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE FO (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE FP (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE FQ (P. OF M.)	11.65	MARGINAL	YES	YES		
BASE COURSE FR (P. OF M.)	11.65	MARGINAL	YES	YES		

WEIGHT OF SAND	3999.60	GMS.	WASHED SAMPLE - WEIGHT BEFORE	927.30	AFTER	901.50	% LOSS	2.78
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[illegible]

TOTALS	926.27	6043.74
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SPLITTING FACTOR 4.31

FINENESS MODULUS 5.55

% COBBLES	0.0	% PEBBLES	51.50	% GRANULES	11.33	% SAND	35.33	% SILT/CLAY	1.84
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INDUSTRIAL USAGE ASSESSMENT

003909 01407E18SWEN546A

* NOTE - SUITABILITY OF SAMPLE IS BASED ONLY ON GRADING SPECIFICATIONS *

INDUSTRIAL USE	TOTAL RESIDUAL	RATING	SCREENING REQUIRED	REMOVAL OF #200 MATERIAL	CRUSHING MATERIAL ON SITE	REQUIRED MATERIAL NOT ON SITE	ADDITION OF FINES (MATERIAL #4)
ASPHALT A (P. OF M.)	4.59	MARGINAL	YES		YES		YES
ASPHALT B (P. OF M.)	1.22	MARGINAL	YES				YES
ASPHALT C (P. OF M.)	48.94	NOT SUIT					
COARSE AGGREGATE (P. OF M.)	9.81	MARGINAL	YES	YES	YES		YES
COARSE AGGREGATE (P. OF M.)	1.59	MARGINAL	YES	YES			
COARSE AGGREGATE (P. OF M.)	1.52	MARGINAL	YES				
COARSE AGGREGATE (P. OF M.)	1.97	MARGINAL	YES				
COARSE AGGREGATE (P. OF M.)	4.12	MARGINAL	YES	YES			YES
COARSE AGGREGATE (P. OF M.)	7.30	MARGINAL	YES	YES	YES		YES
COARSE AGGREGATE (P. OF M.)	13.32	MARGINAL	YES	YES			
COARSE AGGREGATE (P. OF M.)	6.32	MARGINAL	YES	YES			
COARSE AGGREGATE (P. OF M.)	33.44	MARGINAL	YES	YES			
COARSE AGGREGATE (P. OF M.)	14.27	NOT SUIT					
COARSE AGGREGATE (P. OF M.)	12.67	MARGINAL	YES				
COARSE AGGREGATE (P. OF M.)	12.69	MARGINAL	YES	YES			YES
COARSE AGGREGATE (P. OF M.)	0.0	SUITABLE	YES				
SEAL COAT A (P. OF M.)	91.05	NOT SUIT					
SEAL COAT B (P. OF M.)	12.24	MARGINAL	YES		YES		YES
SEAL COAT C (P. OF M.)	0.0	SUITABLE	YES				
COARSE AGGREGATE (P. OF M.)	163.10	NOT SUIT					
COARSE AGGREGATE (P. OF M.)	141.54	NOT SUIT					
COARSE AGGREGATE (P. OF M.)	122.35	NOT SUIT					
COARSE AGGREGATE (P. OF M.)	84.70	NOT SUIT					
COARSE AGGREGATE (P. OF M.)	149.21	NOT SUIT					
COARSE AGGREGATE (P. OF M.)	198.28	NOT SUIT					
COARSE AGGREGATE (P. OF M.)	174.37	NOT SUIT					
COARSE AGGREGATE (P. OF M.)	178.06	NOT SUIT					
COARSE AGGREGATE (P. OF M.)	126.12	NOT SUIT					
COARSE AGGREGATE (P. OF M.)	154.00	NOT SUIT					
COARSE AGGREGATE (P. OF M.)	140.00	NOT SUIT					
COARSE AGGREGATE (P. OF M.)	131.47	NOT SUIT					
COARSE AGGREGATE (P. OF M.)	150.00	NOT SUIT					
COARSE AGGREGATE (P. OF M.)	146.12	NOT SUIT					
COARSE AGGREGATE (P. OF M.)	103.72	NOT SUIT					
COARSE AGGREGATE (P. OF M.)	84.49	NOT SUIT					
COARSE AGGREGATE (P. OF M.)	7.81	MARGINAL	YES				
CONCRETE AGGREGATE (P. OF M.)	4.22	MARGINAL	YES				YES
CONCRETE AGGREGATE (P. OF M.)	17.83	MARGINAL	YES				
CONCRETE AGGREGATE (P. OF M.)	12.00	MARGINAL	YES				
CONCRETE AGGREGATE (P. OF M.)	12.00	MARGINAL	YES				
PORTLAND CEMENT (P. C. A.)	4.12	MARGINAL	YES				
PORTLAND CEMENT (P. C. A.)	131.97	NOT SUIT					
BUILT UP ROOFS (ASTM D1863)	0.0	SUITABLE	YES				
BUILT UP ROOFS (P. OF M.)	0.0	SUITABLE	YES				
BITUMEN (P. OF M.)	0.0	SUITABLE	YES				
SEPTIC FIELDS (U.M.A.)	16.80	MARGINAL	YES		YES		
SHOULDERS (P. OF M.)	0.0	SUITABLE	YES				

OVERALL SAMPLE RATING (SCALE 1 - 9) IS 3

SAMPLE IDENTIFICATION 003913 01407E13NEEN557A

AVAILABILITY OF CRUSHABLE MATERIAL ON SITE - NONE

WEIGHT OF SAND 2627.30 GMS. WASHED SAMPLE - WEIGHT BEFORE 736.60 AFTER 719.30 % LOSS 2.35

SIEVE SIZE	FINE FRACTION (GMS.)	SIEVE WEIGHTS (GMS.)	PERCENT	PERCENT PASSING	PERCENT RETAINED
4	IN	0.0	0.0	100.00	0.0
1/2	IN	0.0	0.0	100.00	0.0
1/2	IN	0.0	0.0	100.00	0.0
1/2	IN	0.0	0.0	100.00	0.0
1/2	IN	525.40	12.88	87.12	12.88
1/2	IN	186.10	4.56	82.56	17.44
1/2	IN	348.90	8.55	74.01	25.99
1/2	IN	393.60	9.69	64.36	35.64
1/2	IN	1059.97	25.99	38.37	61.63
1/2	IN	46.30	11.33	27.04	72.96
1/2	IN	123.30	10.77	16.30	83.70
1/2	IN	439.43	11.77	5.53	94.47
1/2	IN	158.72	3.89	1.64	98.36
1/2	IN	470.82	11.54	0.09	99.91
1/2	IN	131.61	3.13	0.09	99.91
1/2	IN	150.16	3.53	0.09	99.91
1/2	IN	235.16	5.63	0.09	99.91
1/2	IN	30.33	0.73	0.09	99.91
1/2	IN	31.39	0.77	0.09	99.91
1/2	IN	8.92	0.22	0.09	99.91
1/2	IN	22.11	0.54	0.09	99.91
1/2	IN	61.68	1.51	0.09	99.91
1/2	IN	17.29	0.00	0.00	100.00

TOTALS 736.29 4080.20

SPLITTING FACTOR 3.57

FINENESS MODULUS 6.54

% COBBLES 0.0 % PEBBLES 73.62 % GRANULES 14.76 % SAND 10.11 % SILT/CLAY 1.51

INDUSTRIAL USAGE ASSESSMENT

003913 01407E13NEEN557A

* NOTE - SUITABILITY OF SAMPLE IS BASED ONLY ON GRADING SPECIFICATIONS *

INDUSTRIAL USE	TOTAL RESIDUAL	RATING	SCREENING REQUIRED	REMOVAL OF <#200 MATERIAL	CRUSHING REQUIRED MATERIAL ON SITE	ADDITION OF FINES (MATERIAL <#4)
ASPHALT A (P. OF M.)	42.99	NOT SUIT				
ASPHALT B (P. OF M.)	36.70	NOT SUIT				
ASPHALT C (P. OF M.)	63.62	NOT SUIT				
BASE COURSE A (P. OF M.)	22.10	MARGINAL	YES	YES		
BASE COURSE B (P. OF M.)	66.86	MARGINAL	YES	YES		
BASE COURSE C (P. OF M.)	66.86	MARGINAL	YES	YES		
SUB-BASE A (ASTM D1241)	20.97	MARGINAL	YES	YES		
SUB-BASE B (ASTM D1241)	20.97	MARGINAL	YES	YES		
SUB-BASE C (ASTM D1241)	20.97	MARGINAL	YES	YES		
SUB-BASE D (ASTM D1241)	20.97	MARGINAL	YES	YES		
SUB-BASE E (ASTM D1241)	20.97	MARGINAL	YES	YES		
SUB-BASE F (ASTM D1241)	20.97	MARGINAL	YES	YES		
TRAFFIC CONC A (P. OF M.)	21.11	MARGINAL	YES	YES		
TRAFFIC CONC B (P. OF M.)	21.91	MARGINAL	YES	YES		
TRAFFIC CONC C (P. OF M.)	20.22	MARGINAL	YES	YES		
SEAL COAT A (P. OF M.)	33.27	NOT SUIT				
SEAL COAT B (P. OF M.)	0.00	SUITABLE	YES			
SEAL COAT C (P. OF M.)	0.00	SUITABLE	YES			
COAT A (ASTM C33, D448)	167.44	NOT SUIT				
COAT B (ASTM C33, D448)	144.59	NOT SUIT				
COAT C (ASTM C33, D448)	123.43	NOT SUIT				
COAT D (ASTM C33, D448)	123.43	NOT SUIT				
COAT E (ASTM C33, D448)	123.43	NOT SUIT				
COAT F (ASTM C33, D448)	123.43	NOT SUIT				
COAT G (ASTM C33, D448)	123.43	NOT SUIT				
COAT H (ASTM C33, D448)	123.43	NOT SUIT				
COAT I (ASTM C33, D448)	123.43	NOT SUIT				
COAT J (ASTM C33, D448)	123.43	NOT SUIT				
COAT K (ASTM C33, D448)	123.43	NOT SUIT				
COAT L (ASTM C33, D448)	123.43	NOT SUIT				
COAT M (ASTM C33, D448)	123.43	NOT SUIT				
COAT N (ASTM C33, D448)	123.43	NOT SUIT				
COAT O (ASTM C33, D448)	123.43	NOT SUIT				
COAT P (ASTM C33, D448)	123.43	NOT SUIT				
COAT Q (ASTM C33, D448)	123.43	NOT SUIT				
COAT R (ASTM C33, D448)	123.43	NOT SUIT				
COAT S (ASTM C33, D448)	123.43	NOT SUIT				
COAT T (ASTM C33, D448)	123.43	NOT SUIT				
COAT U (ASTM C33, D448)	123.43	NOT SUIT				
COAT V (ASTM C33, D448)	123.43	NOT SUIT				
COAT W (ASTM C33, D448)	123.43	NOT SUIT				
COAT X (ASTM C33, D448)	123.43	NOT SUIT				
COAT Y (ASTM C33, D448)	123.43	NOT SUIT				
COAT Z (ASTM C33, D448)	123.43	NOT SUIT				
CONCRETE AGGREGATE (P. OF M.)	10.37	NOT SUIT				
CONCRETE AGGREGATE I (ASTM C33, C404)	10.37	NOT SUIT				
CONCRETE AGGREGATE II (ASTM C33, C404)	10.37	NOT SUIT				
POSTAL CEMENT (P.C.A.)	53.61	NOT SUIT				
BUILT-UP ROADS (ASTM D1863)	6.52	MARGINAL	YES			
FIELD RUNWAYS (P. OF M.)	0.00	SUITABLE	YES			
PIT RUN (P. OF M.)	0.00	SUITABLE	YES			
SEPTIC FIELDS (U.M.A.)	7.96	MARGINAL	YES			
SHOULDERS (P. OF M.)	0.00	SUITABLE	YES			

OVERALL SAMPLE RATING (SCALE 1 - 9) IS 4

WEIGHT OF SAND	3934.30	GMS.	WASHED SAMPLE - WEIGHT BEFORE	898.60	AFTER	885.00	% LOSS	1.51
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[illegible]

% COBBLES	0.0	% PEBBLES	53.60	% GRANULES	11.10	% SAND	34.30	% SILT/CLAY	1.00
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003914 01407E05SEEN584A

 * NOTE - SUITABILITY OF SAMPLE IS BASED ONLY ON GRADING SPECIFICATIONS *

INDUSTRIAL USE	TOTAL RESIDUAL	RATING	SCREENING REQUIRED	REMOVAL OF <#200 MATERIAL	CRUSHING REQUIRED MATERIAL ON SITE	CRUSHING REQUIRED MATERIAL NOT ON SITE	ADDITION OF FINES (MATERIAL <#4)
ASPHALT A (P. OF M.)	0.49	MARGINAL	YES	YES			
ASPHALT B (P. OF M.)	0.49	MARGINAL	YES	YES			
ASPHALT C (P. OF M.)	52.37	NOT SUIT					
ASPHALT D (P. OF M.)	6.49	MARGINAL	YES	YES			
ASPHALT E (P. OF M.)	6.66	MARGINAL	YES	YES			
ASPHALT F (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT G (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT H (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT I (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT J (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT K (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT L (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT M (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT N (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT O (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT P (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT Q (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT R (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT S (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT T (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT U (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT V (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT W (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT X (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT Y (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT Z (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT AA (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT AB (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT AC (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT AD (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT AE (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT AF (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT AG (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT AH (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT AI (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT AJ (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT AK (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT AL (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT AM (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT AN (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT AO (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT AP (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT AQ (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT AR (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT AS (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT AT (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT AU (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT AV (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT AW (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT AX (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT AY (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT AZ (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT BA (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT BB (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT BC (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT BD (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT BE (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT BF (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT BG (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT BH (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT BI (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT BJ (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT BK (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT BL (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT BM (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT BN (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT BO (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT BP (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT BQ (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT BR (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT BS (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT BT (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT BU (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT BV (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT BW (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT BX (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT BY (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT BZ (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT CA (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT CB (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT CC (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT CD (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT CE (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT CF (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT CG (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT CH (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT CI (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT CJ (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT CK (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT CL (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT CM (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT CN (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT CO (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT CP (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT CQ (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT CR (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT CS (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT CT (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT CU (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT CV (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT CW (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT CX (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT CY (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT CZ (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT DA (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT DB (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT DC (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT DD (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT DE (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT DF (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT DG (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT DH (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT DI (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT DJ (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT DK (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT DL (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT DM (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT DN (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT DO (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT DP (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT DQ (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT DR (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT DS (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT DT (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT DU (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT DV (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT DW (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT DX (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT DY (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT DZ (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT EA (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT EB (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT EC (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT ED (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT EE (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT EF (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT EG (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT EH (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT EI (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT EJ (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT EK (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT EL (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT EM (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT EN (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT EO (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT EP (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT EQ (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT ER (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT ES (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT ET (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT EU (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT EV (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT EW (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT EX (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT EY (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT EZ (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT FA (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT FB (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT FC (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT FD (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT FE (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT FF (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT FG (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT FH (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT FI (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT FJ (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT FK (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT FL (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT FM (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT FN (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT FO (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT FP (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT FQ (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT FR (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT FS (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT FT (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT FU (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT FV (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT FW (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT FX (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT FY (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT FZ (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT GA (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT GB (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT GC (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT GD (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT GE (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT GF (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT GH (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT GI (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT GJ (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT GK (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT GL (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT GM (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT GN (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT GO (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT GP (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT GQ (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT GR (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT GS (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT GT (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT GU (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT GV (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT GW (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT GX (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT GY (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT GZ (P. OF M.)	0.00	MARGINAL	YES	YES			
ASPHALT HA (P. OF M.)	0.00	MARGINAL	YES				

AVAILABILITY OF CRUSHABLE MATERIAL ON SITE - NONE

WEIGHT OF SAND 5542.40 GMS. FINISHED SPECIMEN 100.00 GMS.

2000 + W	21.70	78.92	1.15	0.00	100.00
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SPLITTING FACTOR 3.62

FINENESS MODULUS	4.00								
% COBBLES	0.0	% PEBBLES	47.41	% GRANULES	10.46	% SAND	40.01	% SILT/CLAY	2.13

003916 01307E21NWEN570A

 * NOTE - SUITABILITY OF SAMPLE IS BASED ONLY ON GRADING SPECIFICATIONS *

TOTAL
RESIDUAL

SCREENING
REQUIRED

REMOVAL OF
#200 MATERIAL

CRUSHING
MATERIAL

REQUIRED
MATERIA

ADDITION
OF FINES
(MATERIAL <#4)

ITEM	DESCRIPTION	QTY	UNIT	PRICE	TOTAL	REMARKS
1	PORTLAND CEMENT (P.C.A.)	10.00	YDS	10.00	10.00	
2	BUILT-UP ROOFS (ASTM D1863)	10.00	SQ YDS	10.00	10.00	
3	PAINT RUN (P.O.F.M.)	10.00	YDS	10.00	10.00	
4	SEPTIC FIELDS (U.M.A.)	20.00	YDS	20.00	20.00	
5	SHOULDERS (P.O.F.M.)	0.00	YDS	0.00	0.00	
6	PORTLAND CEMENT (P.C.A.)	10.00	YDS	10.00	10.00	
7	BUILT-UP ROOFS (ASTM D1863)	10.00	SQ YDS	10.00	10.00	
8	PAINT RUN (P.O.F.M.)	10.00	YDS	10.00	10.00	
9	SEPTIC FIELDS (U.M.A.)	20.00	YDS	20.00	20.00	
10	SHOULDERS (P.O.F.M.)	0.00	YDS	0.00	0.00	
11	PORTLAND CEMENT (P.C.A.)	10.00	YDS	10.00	10.00	
12	BUILT-UP ROOFS (ASTM D1863)	10.00	SQ YDS	10.00	10.00	
13	PAINT RUN (P.O.F.M.)	10.00	YDS	10.00	10.00	
14	SEPTIC FIELDS (U.M.A.)	20.00	YDS	20.00	20.00	
15	SHOULDERS (P.O.F.M.)	0.00	YDS	0.00	0.00	
16	PORTLAND CEMENT (P.C.A.)	10.00	YDS	10.00	10.00	
17	BUILT-UP ROOFS (ASTM D1863)	10.00	SQ YDS	10.00	10.00	
18	PAINT RUN (P.O.F.M.)	10.00	YDS	10.00	10.00	
19	SEPTIC FIELDS (U.M.A.)	20.00	YDS	20.00	20.00	
20	SHOULDERS (P.O.F.M.)	0.00	YDS	0.00	0.00	
21	PORTLAND CEMENT (P.C.A.)	10.00	YDS	10.00	10.00	
22	BUILT-UP ROOFS (ASTM D1863)	10.00	SQ YDS	10.00	10.00	
23	PAINT RUN (P.O.F.M.)	10.00	YDS	10.00	10.00	
24	SEPTIC FIELDS (U.M.A.)	20.00	YDS	20.00	20.00	
25	SHOULDERS (P.O.F.M.)	0.00	YDS	0.00	0.00	
26	PORTLAND CEMENT (P.C.A.)	10.00	YDS	10.00	10.00	
27	BUILT-UP ROOFS (ASTM D1863)	10.00	SQ YDS	10.00	10.00	
28	PAINT RUN (P.O.F.M.)	10.00	YDS	10.00	10.00	
29	SEPTIC FIELDS (U.M.A.)	20.00	YDS	20.00	20.00	
30	SHOULDERS (P.O.F.M.)	0.00	YDS	0.00	0.00	
31	PORTLAND CEMENT (P.C.A.)	10.00	YDS	10.00	10.00	
32	BUILT-UP ROOFS (ASTM D1863)	10.00	SQ YDS	10.00	10.00	
33	PAINT RUN (P.O.F.M.)	10.00	YDS	10.00	10.00	
34	SEPTIC FIELDS (U.M.A.)	20.00	YDS	20.00	20.00	
35	SHOULDERS (P.O.F.M.)	0.00	YDS	0.00	0.00	
36	PORTLAND CEMENT (P.C.A.)	10.00	YDS	10.00	10.00	
37	BUILT-UP ROOFS (ASTM D1863)	10.00	SQ YDS	10.00	10.00	
38	PAINT RUN (P.O.F.M.)	10.00	YDS	10.00	10.00	
39	SEPTIC FIELDS (U.M.A.)	20.00	YDS	20.00	20.00	
40	SHOULDERS (P.O.F.M.)	0.00	YDS	0.00	0.00	
41	PORTLAND CEMENT (P.C.A.)	10.00	YDS	10.00	10.00	
42	BUILT-UP ROOFS (ASTM D1863)	10.00	SQ YDS	10.00	10.00	
43	PAINT RUN (P.O.F.M.)	10.00	YDS	10.00	10.00	
44	SEPTIC FIELDS (U.M.A.)	20.00	YDS	20.00	20.00	
45	SHOULDERS (P.O.F.M.)	0.00	YDS	0.00	0.00	
46	PORTLAND CEMENT (P.C.A.)	10.00	YDS	10.00	10.00	
47	BUILT-UP ROOFS (ASTM D1863)	10.00	SQ YDS	10.00	10.00	
48	PAINT RUN (P.O.F.M.)	10.00	YDS	10.00	10.00	
49	SEPTIC FIELDS (U.M.A.)	20.00	YDS	20.00	20.00	
50	SHOULDERS (P.O.F.M.)	0.00	YDS	0.00	0.00	
51	PORTLAND CEMENT (P.C.A.)	10.00	YDS	10.00	10.00	
52	BUILT-UP ROOFS (ASTM D1863)	10.00	SQ YDS	10.00	10.00	
53	PAINT RUN (P.O.F.M.)	10.0				

OVERALL SAMPLE RATING (SCALE 1 - 9) IS 3

SAMPLE IDENTIFICATION 003917 01306E23NWEN586A

AVAILABILITY OF CRUSHABLE MATERIAL ON SITE - YES

WEIGHT OF SAND 2621.80 GMS. WASHED SAMPLE - WEIGHT BEFORE 700.90 AFTER 667.50 % LOSS 4.77

SIEVE SIZE	FINE FRACTION (GMS.)	SIEVE WEIGHTS (GMS.)	PERCENT	PERCENT PASSING	PERCENT RETAINED
1/2 IN		0.0	0.0	100.00	0.0
1/2 IN		0.0	0.0	100.00	0.0
1/2 IN		0.0	0.0	100.00	0.0
1/2 IN		0.0	0.0	100.00	0.0
1/2 IN		305.00	9.58	90.42	9.58
1/2 IN		0.0	0.0	90.42	9.58
1/2 IN		151.10	4.75	85.67	14.33
1/2 IN		124.00	3.90	81.77	18.23
1/2 IN		124.00	3.90	77.87	22.13
1/2 IN		124.00	3.90	73.97	26.03
1/2 IN		124.00	3.90	70.07	29.93
1/2 IN		124.00	3.90	66.17	33.83
1/2 IN		124.00	3.90	62.27	37.73
1/2 IN		124.00	3.90	58.37	41.63
1/2 IN		124.00	3.90	54.47	45.53
1/2 IN		124.00	3.90	50.57	49.43
1/2 IN		124.00	3.90	46.67	53.33
1/2 IN		124.00	3.90	42.77	57.23
1/2 IN		124.00	3.90	38.87	61.13
1/2 IN		124.00	3.90	34.97	65.03
1/2 IN		124.00	3.90	31.07	68.93
1/2 IN		124.00	3.90	27.17	72.83
1/2 IN		124.00	3.90	23.27	76.73
1/2 IN		124.00	3.90	19.37	80.63
1/2 IN		124.00	3.90	15.47	84.53
1/2 IN		124.00	3.90	11.57	88.43
1/2 IN		124.00	3.90	7.67	92.33
1/2 IN		124.00	3.90	3.77	96.23
1/2 IN		124.00	3.90	0.0	100.00

TOTALS 695.65 3182.26

SPLITTING FACTOR 3.74

FINESS MODULUS 5.24

% COBBLES 0.0 % PEBBLES 46.24 % GRANULES 25.19 % SAND 24.67 % SILT/CLAY 3.90

INDUSTRIAL USAGE ASSESSMENT

003917 01306E23NWEN586A

* NOTE - SUITABILITY OF SAMPLE IS BASED ONLY ON GRADING SPECIFICATIONS *

INDUSTRIAL USE	TOTAL RESIDUAL	RATING	SCREENING REQUIRED	REMOVAL OF <#200 MATERIAL	CRUSHING REQUIRED MATERIAL ON SITE	ADDITION OF FINES (MATERIAL <#4)
ASPHALT A (P. OF M.)	4.12	MARGINAL	YES			
ASPHALT B (P. OF M.)	0.06	MARGINAL	YES			
ASPHALT C (P. OF M.)	52.53	NOT SUIT				
ASPHALT COURSE A (P. OF M.)	7.29	MARGINAL	YES	YES		
ASPHALT COURSE B (P. OF M.)	5.10	MARGINAL	YES			
ASPHALT COURSE C (P. OF M.)	17.14	MARGINAL	YES			
ASPHALT COURSE D (P. OF M.)	17.14	MARGINAL	YES			
ASPHALT COURSE E (P. OF M.)	5.00	MARGINAL	YES	YES	YES	
ASPHALT COURSE F (P. OF M.)	24.65	MARGINAL	YES	YES	YES	
ASPHALT COURSE G (P. OF M.)	17.65	MARGINAL	YES	YES	YES	
ASPHALT COURSE H (P. OF M.)	51.90	NOT SUIT				
ASPHALT COURSE I (P. OF M.)	12.41	MARGINAL	YES	YES	YES	
ASPHALT COURSE J (P. OF M.)	0.0	SUITABLE	YES	YES	YES	
ASPHALT COURSE K (P. OF M.)	0.0	SUITABLE	YES			
ASPHALT COURSE L (P. OF M.)	61.91	NOT SUIT				
ASPHALT COURSE M (P. OF M.)	1.63	MARGINAL	YES		YES	YES
ASPHALT COURSE N (P. OF M.)	191.11	MARGINAL	YES			
ASPHALT COURSE O (P. OF M.)	179.30	NOT SUIT				
ASPHALT COURSE P (P. OF M.)	176.32	NOT SUIT				
ASPHALT COURSE Q (P. OF M.)	165.21	NOT SUIT				
ASPHALT COURSE R (P. OF M.)	118.14	NOT SUIT				
ASPHALT COURSE S (P. OF M.)	189.84	NOT SUIT				
ASPHALT COURSE T (P. OF M.)	124.25	NOT SUIT				
ASPHALT COURSE U (P. OF M.)	183.41	NOT SUIT				
ASPHALT COURSE V (P. OF M.)	110.10	NOT SUIT				
ASPHALT COURSE W (P. OF M.)	160.87	NOT SUIT				
ASPHALT COURSE X (P. OF M.)	116.73	NOT SUIT				
ASPHALT COURSE Y (P. OF M.)	109.41	NOT SUIT				
ASPHALT COURSE Z (P. OF M.)	109.69	NOT SUIT				
ASPHALT COURSE AA (P. OF M.)	104.40	NOT SUIT				
ASPHALT COURSE AB (P. OF M.)	59.10	NOT SUIT				
ASPHALT COURSE AC (P. OF M.)	50.06	NOT SUIT				
ASPHALT COURSE AD (P. OF M.)	14.28	MARGINAL	YES			YES
ASPHALT COURSE AE (P. OF M.)	31.95	NOT SUIT				
ASPHALT COURSE AF (P. OF M.)	79.26	NOT SUIT				
ASPHALT COURSE AG (P. OF M.)	31.49	NOT SUIT				
ASPHALT COURSE AH (P. OF M.)	48.90	NOT SUIT				
ASPHALT COURSE AI (P. OF M.)	106.18	NOT SUIT				
ASPHALT COURSE AJ (P. OF M.)	0.0	SUITABLE	YES			
ASPHALT COURSE AK (P. OF M.)	0.0	SUITABLE	YES			
ASPHALT COURSE AL (P. OF M.)	20.44	MARGINAL	YES		YES	
ASPHALT COURSE AM (P. OF M.)	0.0	SUITABLE	YES			

OVERALL SAMPLE RATING (SCALE 1 - 9) IS 4

WEIGHT OF SAND	614.10	GMS.	WASHED SAMPLE - WEIGHT BEFORE	614.10	AFTER	606.90	% LOSS	1.17
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% COBBLES	0.0	% PEBBLES	1.71	% GRANULES	8.01	% SAND	89.11	% SILT/CLAY	1.17
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* NOTE - SUITABILITY OF SAMPLE IS BASED ONLY ON GRADING SPECIFICATIONS *

ADDITION
OF FINES
(MATERIAL <#4)

ITEM	DESCRIPTION	QTY	UNIT	PRICE	TOTAL	REMARKS
1	ASPHALT A (P. OF M.)	76.21	NOT SUIT			
2	ASPHALT B (P. OF M.)	63.84	NOT SUIT			
3	ASPHALT C (P. OF M.)	57.54	NOT SUIT			
4	CONCRETE A (P. OF M.)	72.76	NOT SUIT			
5	CONCRETE B (P. OF M.)	53.76	NOT SUIT			
6	CONCRETE C (P. OF M.)	22.12	MARGINAL	YES		YES
7	CONCRETE D (P. OF M.)	12.08	NOT SUIT			
8	CONCRETE E (P. OF M.)	12.08	NOT SUIT			
9	CONCRETE F (P. OF M.)	12.08	NOT SUIT			
10	CONCRETE G (P. OF M.)	12.08	NOT SUIT			
11	CONCRETE H (P. OF M.)	12.08	NOT SUIT			
12	CONCRETE I (P. OF M.)	12.08	NOT SUIT			
13	CONCRETE J (P. OF M.)	12.08	NOT SUIT			
14	CONCRETE K (P. OF M.)	12.08	NOT SUIT			
15	CONCRETE L (P. OF M.)	12.08	NOT SUIT			
16	CONCRETE M (P. OF M.)	12.08	NOT SUIT			
17	CONCRETE N (P. OF M.)	12.08	NOT SUIT			
18	CONCRETE O (P. OF M.)	12.08	NOT SUIT			
19	CONCRETE P (P. OF M.)	12.08	NOT SUIT			
20	CONCRETE Q (P. OF M.)	12.08	NOT SUIT			
21	CONCRETE R (P. OF M.)	12.08	NOT SUIT			
22	CONCRETE S (P. OF M.)	12.08	NOT SUIT			
23	CONCRETE T (P. OF M.)	12.08	NOT SUIT			
24	CONCRETE U (P. OF M.)	12.08	NOT SUIT			
25	CONCRETE V (P. OF M.)	12.08	NOT SUIT			
26	CONCRETE W (P. OF M.)	12.08	NOT SUIT			
27	CONCRETE X (P. OF M.)	12.08	NOT SUIT			
28	CONCRETE Y (P. OF M.)	12.08	NOT SUIT			
29	CONCRETE Z (P. OF M.)	12.08	NOT SUIT			
30	CONCRETE AA (P. OF M.)	12.08	NOT SUIT			
31	CONCRETE AB (P. OF M.)	12.08	NOT SUIT			
32	CONCRETE AC (P. OF M.)	12.08	NOT SUIT			
33	CONCRETE AD (P. OF M.)	12.08	NOT SUIT			
34	CONCRETE AE (P. OF M.)	12.08	NOT SUIT			
35	CONCRETE AF (P. OF M.)	12.08	NOT SUIT			
36	CONCRETE AG (P. OF M.)	12.08	NOT SUIT			
37	CONCRETE AH (P. OF M.)	12.08	NOT SUIT			
38	CONCRETE AI (P. OF M.)	12.08	NOT SUIT			
39	CONCRETE AJ (P. OF M.)	12.08	NOT SUIT			
40	CONCRETE AK (P. OF M.)	12.08	NOT SUIT			
41	CONCRETE AL (P. OF M.)	12.08	NOT SUIT			
42	CONCRETE AM (P. OF M.)	12.08	NOT SUIT			
43	CONCRETE AN (P. OF M.)	12.08	NOT SUIT			
44	CONCRETE AO (P. OF M.)	12.08	NOT SUIT			
45	CONCRETE AP (P. OF M.)	12.08	NOT SUIT			
46	CONCRETE AQ (P. OF M.)	12.08	NOT SUIT			
47	CONCRETE AR (P. OF M.)	12.08	NOT SUIT			
48	CONCRETE AS (P. OF M.)	12.08	NOT SUIT			
49	CONCRETE AT (P. OF M.)	12.08	NOT SUIT			
50	CONCRETE AU (P. OF M.)	12.08	NOT SUIT			
51	CONCRETE AV (P. OF M.)	12.08	NOT SUIT			
52	CONCRETE AW (P. OF M.)	12.08	NOT SUIT			
53	CONCRETE AX (P. OF M.)	12.08	NOT SUIT			
54	CONCRETE AY (P. OF M.)	12.08	NOT SUIT			
55	CONCRETE AZ (P. OF M.)	12.08	NOT SUIT			
56	CONCRETE BA (P. OF M.)	12.08	NOT SUIT			
57	CONCRETE BB (P. OF M.)	12.08	NOT SUIT			
58	CONCRETE BC (P. OF M.)	12.08	NOT SUIT			
59	CONCRETE BD (P. OF M.)	12.08	NOT SUIT			
60	CONCRETE BE (P. OF M.)	12.08	NOT SUIT			
61	CONCRETE BF (P. OF M.)	12.08	NOT SUIT			

OVERALL SAMPLE RATING (SCALE 1 - 9) IS 5

AVAILABILITY OF CRUSHABLE MATERIAL ON SITE - NONE

TOTALS	807.30	3408.90							
SPLITTING FACTOR	3.80								
FINENESS MODULUS	3.79								
% COBBLES	0.0	% PEBBLES	36.69	% GRANULES	10.88	% SAND	48.74	% SILT/CLAY	3.69

003919 01306E24SWEN582A

* NOTE - SUITABILITY OF SAMPLE IS BASED ONLY ON GRADING SPECIFICATIONS *

OVERALL SAMPLE RATING (SCALE 1 - 9) IS 4

AVAILABILITY OF CRUSHABLE MATERIAL ON SITE - NONE

SIEVE SIZE	FINE FRACTION (GMS.)	SIEVE WEIGHTS (GMS.)	PERCENT	PERCENT PASSING	PERCENT RETAINED
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TOTALS	723.09	3726.38
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FINENESS MODULUS 4.45

% COBBLES	0.0	% PEBBLES	45.07	% GRANULES	11.20	% SAND	39.14	% SILT/CLAY	4.59
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003920 01307E21SWEN568A

	TOTAL RESIDUAL	RATING	SCREENING REQUIRED	REMOVAL OF MATERIAL <#200 MATERIAL	CRUSHING REQUIRED MATERIAL ON SITE	CRUSHING REQUIRED MATERIAL NOT ON SITE	ADDITION OF FINES (MATERIAL <#4)
M.)	8.56	MARGINAL	YES				YES
M.)	8.56	MARGINAL	YES				YES
OFF M.)	22.14	MARGINAL	YES				
OFF M.)	10.11	MARGINAL	YES	YES			YES
COARSE A	0.0	SUITABLE	YES				
COARSE B (ASTM D1241)	17.31	MARGINAL				YES	YES
COARSE C (ASTM D1241)	2.89	MARGINAL		YES			YES
COURT (ASTM D1241)	5.43	MARGINAL	YES				YES
COURT (ASTM D1241)	2.99	MARGINAL	YES	YES			YES
COURT (ASTM D1241)	2.99	MARGINAL	YES	YES			YES
COURT (ASTM D1241)	2.99	MARGINAL	YES	YES			YES
COURT (ASTM D1241)	2.99	MARGINAL	YES	YES			YES
(P. OF H.)	2.99	MARGINAL	YES		YES		YES
(P. OF H.)	3.54	MARGINAL	YES	YES			YES
(P. OF H.)	5.43	MARGINAL	YES				YES
OFF M.)	3.19	NOT SUIT					
OFF M.)	38.87	NOT SUIT					
OFF M.)	22.53	MARGINAL	YES				YES
(ASTM C33, D448)	264.73	NOT SUIT					
(ASTM C33, D448)	94.73	NOT SUIT					
(ASTM C33, D448)	81.63	NOT SUIT					
(ASTM C33, D448)	74.11	NOT SUIT					
(ASTM C33, D448)	17.15	NOT SUIT					
(ASTM C33, D448)	170.63	NOT SUIT					
(ASTM C33, D448)	103.87	NOT SUIT					
(ASTM C33, D448)	163.18	NOT SUIT					
(ASTM C33, D448)	152.87	NOT SUIT					
(ASTM C33, D448)	137.80	NOT SUIT					
(ASTM C33, D448)	139.68	NOT SUIT					
(ASTM C33, D448)	116.24	NOT SUIT					
(ASTM C33, D448)	135.91	NOT SUIT					
(ASTM C33, D448)	117.36	NOT SUIT					
(ASTM C33, D448)	140.97	NOT SUIT					
(ASTM C33, D448)	157.66	NOT SUIT					
(ASTM C33, D448)	134.88	NOT SUIT					
(ASTM C33, D448)	119.57	NOT SUIT					
GATE (P. OF H.)	7.86	MARGINAL	YES				YES
GATE I (ASTM C33, C404)	15.43	MARGINAL	YES				YES
GATE II (ASTM C33, C404)	29.25	MARGINAL	YES				YES
(C.A.)	21.71	MARGINAL	YES				YES
(ASTM D1863)	11.14	MARGINAL	YES				
(P. OF H.)	39.35	NOT SUIT					
(H.)	11.63	NOT SUIT					
(U.M.A.)	5.43	MARGINAL	YES				YES
(H.)	0.0	SUITABLE	YES				
(H.)	16.96	MARGINAL	YES		YES		
(H.)	0.0	SUITABLE					

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% COBBLES	0.0	% PEBBLES	39.40	% GRANULES	11.44	% SAND	48.45	% SILT/CLAY	0.72
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* NOTE - SUITABILITY OF SAMPLE IS BASED ONLY ON GRADING SPECIFICATIONS *

OVERALL SAMPLE RATING (SCALE 1 - 9) IS 4

AVAILABILITY OF CRUSHABLE MATERIAL ON SITE - NONE

TOTALS	723.10	3180.20
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SPLITTING FACTOR 3.69

FINENESS MODULUS 3.88

% COBBLES	0.0	% PEBBLES	32.64	% GRANULES	13.27	% SAND	50.55	% SILT/CLAY	3.54
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INDUSTRIAL USAGE ASSESSMENT

003923 01207E32SEEN564A

* NOTE - SUITABILITY OF SAMPLE IS BASED ONLY ON GRADING SPECIFICATIONS *

INDUSTRIAL USE	TOTAL RESIDUAL	RATING	SCREENING REQUIRED	REMOVAL OF #200 MATERIAL	CRUSHING MATERIAL ON SITE	REQUIRED MATERIAL NOT ON SITE	ADDITION OF FINES (MATERIAL <#4)
ASPHALT A (P. OF M.)	31.84	NOT SUIT					
ASPHALT B (P. OF M.)	26.38	MARGINAL	YES		YES		YES
ASPHALT C (P. OF M.)	9.38	MARGINAL	YES	YES			
COURT A (P. OF M.)	35.16	NOT SUIT					
COURT B (P. OF M.)	1.23	MARGINAL	YES	YES			YES
COURT C (P. OF M.)	0.01	MARGINAL		YES			
COURT D (P. OF M.)	5.23	NOT SUIT					
COURT E (P. OF M.)	3.08	MARGINAL		YES		YES	YES
COURT F (P. OF M.)	3.67	NOT SUIT					
COURT G (P. OF M.)	3.92	MARGINAL	YES	YES			
COURT H (P. OF M.)	1.1	MARGINAL	YES	YES			
COURT I (P. OF M.)	3.92	MARGINAL	YES	YES			
COURT J (P. OF M.)	3.67	NOT SUIT					
COURT K (P. OF M.)	3.92	MARGINAL	YES	YES			
COURT L (P. OF M.)	3.67	NOT SUIT					
COURT M (P. OF M.)	3.92	MARGINAL	YES	YES			
COURT N (P. OF M.)	3.67	NOT SUIT					
COURT O (P. OF M.)	3.92	MARGINAL	YES	YES			
COURT P (P. OF M.)	3.67	NOT SUIT					
COURT Q (P. OF M.)	3.92	MARGINAL	YES	YES			
COURT R (P. OF M.)	3.67	NOT SUIT					
COURT S (P. OF M.)	3.92	MARGINAL	YES	YES			
COURT T (P. OF M.)	3.67	NOT SUIT					
COURT U (P. OF M.)	3.92	MARGINAL	YES	YES			
COURT V (P. OF M.)	3.67	NOT SUIT					
COURT W (P. OF M.)	3.92	MARGINAL	YES	YES			
COURT X (P. OF M.)	3.67	NOT SUIT					
COURT Y (P. OF M.)	3.92	MARGINAL	YES	YES			
COURT Z (P. OF M.)	3.67	NOT SUIT					
COURT AA (P. OF M.)	3.92	MARGINAL	YES	YES			
COURT AB (P. OF M.)	3.67	NOT SUIT					
COURT AC (P. OF M.)	3.92	MARGINAL	YES	YES			
COURT AD (P. OF M.)	3.67	NOT SUIT					
COURT AE (P. OF M.)	3.92	MARGINAL	YES	YES			
COURT AF (P. OF M.)	3.67	NOT SUIT					
COURT AG (P. OF M.)	3.92	MARGINAL	YES	YES			
COURT AH (P. OF M.)	3.67	NOT SUIT					
COURT AI (P. OF M.)	3.92	MARGINAL	YES	YES			
COURT AJ (P. OF M.)	3.67	NOT SUIT					
COURT AK (P. OF M.)	3.92	MARGINAL	YES	YES			
COURT AL (P. OF M.)	3.67	NOT SUIT					
COURT AM (P. OF M.)	3.92	MARGINAL	YES	YES			
COURT AN (P. OF M.)	3.67	NOT SUIT					
COURT AO (P. OF M.)	3.92	MARGINAL	YES	YES			
COURT AP (P. OF M.)	3.67	NOT SUIT					
COURT AQ (P. OF M.)	3.92	MARGINAL	YES	YES			
COURT AR (P. OF M.)	3.67	NOT SUIT					
COURT AS (P. OF M.)	3.92	MARGINAL	YES	YES			
COURT AT (P. OF M.)	3.67	NOT SUIT					
COURT AU (P. OF M.)	3.92	MARGINAL	YES	YES			
COURT AV (P. OF M.)	3.67	NOT SUIT					
COURT AW (P. OF M.)	3.92	MARGINAL	YES	YES			
COURT AX (P. OF M.)	3.67	NOT SUIT					
COURT AY (P. OF M.)	3.92	MARGINAL	YES	YES			
COURT AZ (P. OF M.)	3.67	NOT SUIT					
COURT BA (P. OF M.)	3.92	MARGINAL	YES	YES			
COURT BB (P. OF M.)	3.67	NOT SUIT					
COURT BC (P. OF M.)	3.92	MARGINAL	YES	YES			
COURT BD (P. OF M.)	3.67	NOT SUIT					
COURT BE (P. OF M.)	3.92	MARGINAL	YES	YES			
COURT BF (P. OF M.)	3.67	NOT SUIT					
COURT BG (P. OF M.)	3.92	MARGINAL	YES	YES			
COURT BH (P. OF M.)	3.67	NOT SUIT					
COURT BI (P. OF M.)	3.92	MARGINAL	YES	YES			
COURT BJ (P. OF M.)	3.67	NOT SUIT					
COURT BK (P. OF M.)	3.92	MARGINAL	YES	YES			
COURT BL (P. OF M.)	3.67	NOT SUIT					
COURT BM (P. OF M.)	3.92	MARGINAL					

OVERALL SAMPLE RATING (SCALE 1 - 9) IS 4

WEIGHT OF SAND	4811.30	GMS.	WASHED SAMPLE - WEIGHT BEFORE	848.00	AFTER	831.50	% LOSS	1.95
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% COBBLES	0.0	% PEBBLES	41.59	% GRANULES	14.48	% SAND	42.21	% SILT/CLAY	1.72
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 * NOTE - SUITABILITY OF SAMPLE IS BASED ONLY ON GRADING SPECIFICATIONS *

OVERALL SAMPLE RATING (SCALE 1 - 9) IS 3

SAMPLE IDENTIFICATION 003925A01208E33NEEN580A

AVAILABILITY OF CRUSHABLE MATERIAL ON SITE - NONE

WEIGHT OF SAND 2445.80 GMS. WASHED SAMPLE - WEIGHT BEFORE 644.80 AFTER 631.50 % LOSS 2.06

STIEVE SIZE	FINE FRACTION (GMS.)	STIEVE WEIGHTS (GMS.)	PERCENT	PERCENT PASSING	PERCENT RETAINED
4		0.0	0.0	100.00	0.0
10		0.0	0.0	100.00	0.0
20		0.0	0.0	100.00	0.0
40		0.0	0.0	100.00	0.0
60		0.0	0.0	100.00	0.0
80		0.0	0.0	100.00	0.0
100		0.0	0.0	100.00	0.0
150		0.0	0.0	100.00	0.0
200		0.0	0.0	100.00	0.0
250		0.0	0.0	100.00	0.0
300		0.0	0.0	100.00	0.0
350		0.0	0.0	100.00	0.0
400		0.0	0.0	100.00	0.0
450		0.0	0.0	100.00	0.0
500		0.0	0.0	100.00	0.0
550		0.0	0.0	100.00	0.0
600		0.0	0.0	100.00	0.0
650		0.0	0.0	100.00	0.0
700		0.0	0.0	100.00	0.0
750		0.0	0.0	100.00	0.0
800		0.0	0.0	100.00	0.0
850		0.0	0.0	100.00	0.0
900		0.0	0.0	100.00	0.0
950		0.0	0.0	100.00	0.0
1000		0.0	0.0	100.00	0.0
1100		0.0	0.0	100.00	0.0
1200		0.0	0.0	100.00	0.0
1300		0.0	0.0	100.00	0.0
1400		0.0	0.0	100.00	0.0
1500		0.0	0.0	100.00	0.0
1600		0.0	0.0	100.00	0.0
1700		0.0	0.0	100.00	0.0
1800		0.0	0.0	100.00	0.0
1900		0.0	0.0	100.00	0.0
2000		0.0	0.0	100.00	0.0
2100		0.0	0.0	100.00	0.0
2200		0.0	0.0	100.00	0.0
2300		0.0	0.0	100.00	0.0
2400		0.0	0.0	100.00	0.0
2500		0.0	0.0	100.00	0.0
2600		0.0	0.0	100.00	0.0
2700		0.0	0.0	100.00	0.0
2800		0.0	0.0	100.00	0.0
2900		0.0	0.0	100.00	0.0
3000		0.0	0.0	100.00	0.0
3100		0.0	0.0	100.00	0.0
3200		0.0	0.0	100.00	0.0
3300		0.0	0.0	100.00	0.0
3400		0.0	0.0	100.00	0.0
3500		0.0	0.0	100.00	0.0
3600		0.0	0.0	100.00	0.0
3700		0.0	0.0	100.00	0.0
3800		0.0	0.0	100.00	0.0
3900		0.0	0.0	100.00	0.0
4000		0.0	0.0	100.00	0.0
4100		0.0	0.0	100.00	0.0
4200		0.0	0.0	100.00	0.0
4300		0.0	0.0	100.00	0.0
4400		0.0	0.0	100.00	0.0
4500		0.0	0.0	100.00	0.0
4600		0.0	0.0	100.00	0.0
4700		0.0	0.0	100.00	0.0
4800		0.0	0.0	100.00	0.0
4900		0.0	0.0	100.00	0.0
5000		0.0	0.0	100.00	0.0
5100		0.0	0.0	100.00	0.0
5200		0.0	0.0	100.00	0.0
5300		0.0	0.0	100.00	0.0
5400		0.0	0.0	100.00	0.0
5500		0.0	0.0	100.00	0.0
5600		0.0	0.0	100.00	0.0
5700		0.0	0.0	100.00	0.0
5800		0.0	0.0	100.00	0.0
5900		0.0	0.0	100.00	0.0
6000		0.0	0.0	100.00	0.0
6100		0.0	0.0	100.00	0.0
6200		0.0	0.0	100.00	0.0
6300		0.0	0.0	100.00	0.0
6400		0.0	0.0	100.00	0.0
6500		0.0	0.0	100.00	0.0
6600		0.0	0.0	100.00	0.0
6700		0.0	0.0	100.00	0.0
6800		0.0	0.0	100.00	0.0
6900		0.0	0.0	100.00	0.0
7000		0.0	0.0	100.00	0.0
7100		0.0	0.0	100.00	0.0
7200		0.0	0.0	100.00	0.0
7300		0.0	0.0	100.00	0.0
7400		0.0	0.0	100.00	0.0
7500		0.0	0.0	100.00	0.0
7600		0.0	0.0	100.00	0.0
7700		0.0	0.0	100.00	0.0
7800		0.0	0.0	100.00	0.0
7900		0.0	0.0	100.00	0.0
8000		0.0	0.0	100.00	0.0
8100		0.0	0.0	100.00	0.0
8200		0.0	0.0	100.00	0.0
8300		0.0	0.0	100.00	0.0
8400		0.0	0.0	100.00	0.0
8500		0.0	0.0	100.00	0.0
8600		0.0	0.0	100.00	0.0
8700		0.0	0.0	100.00	0.0
8800		0.0	0.0	100.00	0.0
8900		0.0	0.0	100.00	0.0
9000		0.0	0.0	100.00	0.0
9100		0.0	0.0	100.00	0.0
9200		0.0	0.0	100.00	0.0
9300		0.0	0.0	100.00	0.0
9400		0.0	0.0	100.00	0.0
9500		0.0	0.0	100.00	0.0
9600		0.0	0.0	100.00	0.0
9700		0.0	0.0	100.00	0.0
9800		0.0	0.0	100.00	0.0
9900		0.0	0.0	100.00	0.0
10000		0.0	0.0	100.00	0.0

TOTALS 644.80 2445.80

SPLITTING FACTOR 3.79

FINENESS MODULUS 2.27

% COBBLES 0.0 % PEBBLES 7.52 % GRANULES 5.16 % SAND 85.25 % SILT/CLAY 2.06

INDUSTRIAL USAGE ASSESSMENT

003925A01208E33NEEN580A

 * NOTE - SUITABILITY OF SAMPLE IS BASED ONLY ON GRADING SPECIFICATIONS *

INDUSTRIAL USE	TOTAL RESIDUAL	RATING	SCREENING REQUIRED	REMOVAL OF <#200 MATERIAL	CRUSHING REQUIRED MATERIAL ON SITE	MATERIAL NOT ON SITE	ADDITION OF FINES (MATERIAL <#4)
ASPHALT A (P. OF M.)	83.50	NOT SUIT					
ASPHALT B (P. OF M.)	73.50	NOT SUIT					
ASPHALT C (P. OF M.)	14.39	MARGINAL	YES	YES			
ASPHALT D (P. OF M.)	14.39	NOT SUIT					
ASPHALT E (P. OF M.)	14.39	NOT SUIT					
ASPHALT F (P. OF M.)	14.39	NOT SUIT					
ASPHALT G (P. OF M.)	14.39	MARGINAL		YES		YES	
ASPHALT H (P. OF M.)	148.50	NOT SUIT					
ASPHALT I (P. OF M.)	126.44	NOT SUIT					
ASPHALT J (P. OF M.)	101.44	NOT SUIT					
ASPHALT K (P. OF M.)	37.73	NOT SUIT					
ASPHALT L (P. OF M.)	37.73	NOT SUIT					
ASPHALT M (P. OF M.)	37.73	MARGINAL		YES			YES
ASPHALT N (P. OF M.)	37.73	MARGINAL		YES			
ASPHALT O (P. OF M.)	11.93	NOT SUIT					
ASPHALT P (P. OF M.)	8.97	NOT SUIT					
ASPHALT Q (P. OF M.)	81.09	NOT SUIT					
ASPHALT R (P. OF M.)	48.78	NOT SUIT					
ASPHALT S (P. OF M.)	125.90	NOT SUIT					
ASPHALT T (P. OF M.)	60.49	NOT SUIT					
ASPHALT U (P. OF M.)	27.37	MARGINAL	YES				YES
ASPHALT V (P. OF M.)	21.09	NOT SUIT					
ASPHALT W (P. OF M.)	33.96	NOT SUIT					
ASPHALT X (P. OF M.)	10.36	NOT SUIT					
ASPHALT Y (P. OF M.)	167.84	NOT SUIT					
ASPHALT Z (P. OF M.)	222.77	NOT SUIT					
ASPHALT AA (P. OF M.)	166.25	NOT SUIT					
ASPHALT AB (P. OF M.)	166.25	NOT SUIT					
ASPHALT AC (P. OF M.)	166.25	NOT SUIT					
ASPHALT AD (P. OF M.)	166.25	NOT SUIT					
ASPHALT AE (P. OF M.)	166.25	NOT SUIT					
ASPHALT AF (P. OF M.)	166.25	NOT SUIT					
ASPHALT AG (P. OF M.)	166.25	NOT SUIT					
ASPHALT AH (P. OF M.)	166.25	NOT SUIT					
ASPHALT AI (P. OF M.)	166.25	NOT SUIT					
ASPHALT AJ (P. OF M.)	166.25	NOT SUIT					
ASPHALT AK (P. OF M.)	166.25	NOT SUIT					
ASPHALT AL (P. OF M.)	166.25	NOT SUIT					
ASPHALT AM (P. OF M.)	166.25	NOT SUIT					
ASPHALT AN (P. OF M.)	166.25	NOT SUIT					
ASPHALT AO (P. OF M.)	166.25	NOT SUIT					
ASPHALT AP (P. OF M.)	166.25	NOT SUIT					
ASPHALT AQ (P. OF M.)	166.25	NOT SUIT					
ASPHALT AR (P. OF M.)	166.25	NOT SUIT					
ASPHALT AS (P. OF M.)	166.25	NOT SUIT					
ASPHALT AT (P. OF M.)	166.25	NOT SUIT					
ASPHALT AU (P. OF M.)	166.25	NOT SUIT					
ASPHALT AV (P. OF M.)	166.25	NOT SUIT					
ASPHALT AW (P. OF M.)	166.25	NOT SUIT					
ASPHALT AX (P. OF M.)	166.25	NOT SUIT					
ASPHALT AY (P. OF M.)	166.25	NOT SUIT					
ASPHALT AZ (P. OF M.)	166.25	NOT SUIT					
ASPHALT BA (P. OF M.)	166.25	NOT SUIT					
ASPHALT BB (P. OF M.)	166.25	NOT SUIT					
ASPHALT BC (P. OF M.)	166.25	NOT SUIT					
ASPHALT BD (P. OF M.)	166.25	NOT SUIT					
ASPHALT BE (P. OF M.)	166.25	NOT SUIT					
ASPHALT BF (P. OF M.)	166.25	NOT SUIT					
ASPHALT BG (P. OF M.)	166.25	NOT SUIT					
ASPHALT BH (P. OF M.)	166.25	NOT SUIT					
ASPHALT BI (P. OF M.)	166.25	NOT SUIT					
ASPHALT BJ (P. OF M.)	166.25	NOT SUIT					
ASPHALT BK (P. OF M.)	166.25	NOT SUIT					
ASPHALT BL (P. OF M.)	166.25	NOT SUIT					
ASPHALT BM (P. OF M.)	166.25	NOT SUIT					
ASPHALT BN (P. OF M.)	166.25	NOT SUIT					
ASPHALT BO (P. OF M.)	166.25	NOT SUIT					
ASPHALT BP (P. OF M.)	166.25	NOT SUIT					
ASPHALT BQ (P. OF M.)	166.25	NOT SUIT					
ASPHALT BR (P. OF M.)	166.25	NOT SUIT					
ASPHALT BS (P. OF M.)	166.25	NOT SUIT					
ASPHALT BT (P. OF M.)	166.25	NOT SUIT					
ASPHALT BU (P. OF M.)	166.25	NOT SUIT					
ASPHALT BV (P. OF M.)	166.25	NOT SUIT					
ASPHALT BW (P. OF M.)	166.25	NOT SUIT					
ASPHALT BX (P. OF M.)	166.25	NOT SUIT					
ASPHALT BY (P. OF M.)	166.25	NOT SUIT					
ASPHALT BZ (P. OF M.)	166.25	NOT SUIT					
ASPHALT CA (P. OF M.)	166.25	NOT SUIT					
ASPHALT CB (P. OF M.)	166.25	NOT SUIT					
ASPHALT CC (P. OF M.)	166.25	NOT SUIT					
ASPHALT CD (P. OF M.)	166.25	NOT SUIT					
ASPHALT CE (P. OF M.)	166.25	NOT SUIT					
ASPHALT CF (P. OF M.)	166.25	NOT SUIT					
ASPHALT CG (P. OF M.)	166.25	NOT SUIT					
ASPHALT CH (P. OF M.)	166.25	NOT SUIT					
ASPHALT CI (P. OF M.)	166.25	NOT SUIT					
ASPHALT CJ (P. OF M.)	166.25	NOT SUIT					
ASPHALT CK (P. OF M.)	166.25	NOT SUIT					
ASPHALT CL (P. OF M.)	166.25	NOT SUIT					
ASPHALT CM (P. OF M.)	166.25	NOT SUIT					
ASPHALT CN (P. OF M.)	166.25	NOT SUIT					
ASPHALT CO (P. OF M.)	166.25	NOT SUIT					
ASPHALT CP (P. OF M.)	166.25	NOT SUIT					
ASPHALT CQ (P. OF M.)	166.25	NOT SUIT					
ASPHALT CR (P. OF M.)	166.25	NOT SUIT					
ASPHALT CS (P. OF M.)	166.25	NOT SUIT					
ASPHALT CT (P. OF M.)	166.25	NOT SUIT					
ASPHALT CU (P. OF M.)	166.25	NOT SUIT					
ASPHALT CV (P. OF M.)	166.25	NOT SUIT					
ASPHALT CW (P. OF M.)	166.25	NOT SUIT					
ASPHALT CX (P. OF M.)	166.25	NOT SUIT					
ASPHALT CY (P. OF M.)	166.25	NOT SUIT					
ASPHALT CZ (P. OF M.)	166.25	NOT SUIT					
ASPHALT DA (P. OF M.)	166.25	NOT SUIT					
ASPHALT DB (P. OF M.)	166.25	NOT SUIT					
ASPHALT DC (P. OF M.)	166.25	NOT SUIT					
ASPHALT DD (P. OF M.)	166.25	NOT SUIT					
ASPHALT DE (P. OF M.)	166.25	NOT SUIT					
ASPHALT DF (P. OF M.)	166.25	NOT SUIT					
ASPHALT DG (P. OF M.)	166.25	NOT SUIT					
ASPHALT DH (P. OF M.)	166.25	NOT SUIT					
ASPHALT DI (P. OF M.)	166.25	NOT SUIT					
ASPHALT DJ (P. OF M.)	166.25	NOT SUIT					
ASPHALT DK (P. OF M.)	166.25	NOT SUIT					
ASPHALT DL (P. OF M.)	166.25	NOT SUIT					
ASPHALT DM (P. OF M.)	166.25	NOT SUIT					
ASPHALT DN (P. OF M.)	166.25	NOT SUIT					
ASPHALT DO (P. OF M.)	166.25	NOT SUIT					
ASPHALT DP (P. OF M.)	166.25	NOT SUIT					
ASPHALT DQ (P. OF M.)	166.25	NOT SUIT					
ASPHALT DR (P. OF M.)	166.25	NOT SUIT					
ASPHALT DS (P. OF M.)	166.25	NOT SUIT					
ASPHALT DT (P. OF M.)	166.25	NOT SUIT					
ASPHALT DU (P. OF M.)	166.25	NOT SUIT					
ASPHALT DV (P. OF M.)	166.25	NOT SUIT					
ASPHALT DW (P. OF M.)	166.25	NOT SUIT					
ASPHALT DX (P. OF M.)	166.25	NOT SUIT					
ASPHALT DY (P. OF M.)	166.25	NOT SUIT					
ASPHALT DZ (P. OF M.)	166.25	NOT SUIT					
ASPHALT EA (P. OF M.)	166.25	NOT SUIT					
ASPHALT EB (P. OF M.)	166.25	NOT SUIT					
ASPHALT EC (P. OF M.)	166.25	NOT SUIT					
ASPHALT ED (P. OF M.)	166.25	NOT SUIT					
ASPHALT EE (P. OF M.)	166.25	NOT SUIT					
ASPHALT EF (P. OF M.)	166.25	NOT SUIT					
ASPHALT EG (P. OF M.)	166.25	NOT SUIT					
ASPHALT EH (P. OF M.)	166.25	NOT SUIT					
ASPHALT EI (P. OF M.)	166.25	NOT SUIT					
ASPHALT EJ (P. OF M.)	166.25	NOT SUIT					
ASPHALT EK (P. OF M.)	166.25	NOT SUIT					
ASPHALT EL (P. OF M.)	166.25	NOT SUIT					
ASPHALT EM (P. OF M.)	166.25	NOT SUIT					
ASPHALT EN (P. OF M.)	166.25	NOT SUIT					
ASPHALT EO (P. OF M.)	166.25	NOT SUIT					
ASPHALT EP (P. OF M.)	166.25	NOT SUIT					
ASPHALT EQ (P. OF M.)	166.25	NOT SUIT					
ASPHALT ER (P. OF M.)	166.25	NOT SUIT					
ASPHALT ES (P. OF M.)	166.25	NOT SUIT					
ASPHALT ET (P. OF M.)	166.25	NOT SUIT					
ASPHALT EU (P. OF M.)	166.25	NOT SUIT					
ASPHALT EV (P. OF M.)	166.25	NOT SUIT					
ASPHALT EW (P. OF M.)	166.25	NOT SUIT					
ASPHALT EX (P. OF M.)	166.25	NOT SUIT					
ASPHALT EY (P. OF M.)	166.25	NOT SUIT					
ASPHALT EZ (P. OF M.)	166.25	NOT SUIT					
ASPHALT FA (P. OF M.)	166.25	NOT SUIT					
ASPHALT FB (P. OF M.)	166.25	NOT SUIT					
ASPHALT FC (P. OF M.)	166.25	NOT SUIT					
ASPHALT FD (P. OF M.)	166.25	NOT SUIT					
ASPHALT FE (P. OF M.)	166.25	NOT SUIT					
ASPHALT FF (P. OF M.)	166.25	NOT SUIT					
ASPHALT FG (P. OF M.)	166.25	NOT SUIT					
ASPHALT FH (P. OF M.)	166.25	NOT SUIT					
ASPHALT FI (P. OF M.)	166.25	NOT SUIT					
ASPHALT FJ (P. OF M.)	166.25	NOT SUIT					
ASPHALT FK (P. OF M.)	166.25	NOT SUIT					
ASPHALT FL (P. OF M.)	166.25	NOT SUIT					
ASPHALT FM (P. OF M.)	166.25	NOT SUIT					
ASPHALT FN (P. OF M.)	166.25	NOT SUIT					
ASPHALT FO (P. OF M.)	166.25	NOT SUIT					
ASPHALT FP (P. OF M.)	166.25	NOT SUIT					
ASPHALT FQ (P. OF M.)	166.25	NOT SUIT					
ASPHALT FR (P. OF M.)	166.25	NOT SUIT					
ASPHALT FS (P. OF M.)	166.25	NOT SUIT					
ASPHALT FT (P. OF M.)	166.25	NOT SUIT					
ASPHALT FU (P. OF M.)	166.25	NOT SUIT					
ASPHALT FV (P. OF M.)	166.25	NOT SUIT					
ASPHALT FW (P. OF M.)	166.25	NOT SUIT					
ASPHALT FX (P. OF M.)	166.25	NOT SUIT					
ASPHALT FY (P. OF M.)	166.25	NOT SUIT					
ASPHALT FZ (P. OF M.)	166.25	NOT SUIT					
ASPHALT GA (P. OF M.)	166.25	NOT SUIT					
ASPHALT GB (P. OF M.)	166.25	NOT SUIT					
ASPHALT GC (P. OF M.)	166.25	NOT SUIT					
ASPHALT GD (P. OF M.)	166.25	NOT SUIT					
ASPHALT GE (P. OF M.)	166.25	NOT SUIT					
ASPHALT GF (P. OF M.)	166.25	NOT SUIT					
ASPHALT GG (P. OF M.)	166.25	NOT SUIT					
ASPHALT GH (P. OF M.)	166.25	NOT SUIT					
ASPHALT GI (P. OF M.)	166.25	NOT SUIT					
ASPHALT GJ (P. OF M.)	166.25	NOT SUIT					
ASPHALT GK (P. OF M.)	166.25	NOT SUIT					
ASPHALT GL (P. OF M.)	166.25	NOT SUIT					
ASPHALT GM (P. OF M.)	166.25	NOT SUIT					
ASPHALT GN (P. OF M.)	166.25	NOT SUIT					
ASPHALT GO (P. OF M.)	166.25	NOT SUIT					
ASPHALT GP (P. OF M.)	166.25	NOT SUIT					
ASPHALT GQ (P. OF M.)	166.25	NOT SUIT					
ASPHALT GR (P. OF M.)	166.25	NOT SUIT					
ASPHALT GS (P. OF M.)	166.25	NOT SUIT					
ASPHALT GT (P. OF M.)	166.25	NOT SUIT					
ASPHALT GU (P. OF M.)	166.25	NOT SUIT					
ASPHALT GV (P. OF M.)	166.25	NOT SUIT					
ASPHALT GW (P. OF M.)	166.25	NOT SUIT					
ASPHALT GX (P. OF M.)	166.25	NOT SUIT					
ASPHALT GY (P. OF M.)	166.25	NOT SUIT					
ASPHALT GZ (P. OF M.)	166.25	NOT SUIT					
ASPHALT HA (P. OF M.)	166.25	NOT SUIT					
ASPHALT HB (P. OF M.)	166.25	NOT SUIT					
ASPHALT HC (P. OF M.)	166.25	NOT SUIT					
ASPHALT HD (P. OF M.)	166.25						

WEIGHT OF SAND	3036.80	GMS.	WASHED SAMPLE - WEIGHT BEFORE	740.20	AFTER	723.50	% LOSS	2.26
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% COBBLES	0.0	% PEBBLES	29.17	% GRANULES	17.18	% SAND	51.75	% SILT/CLAY	1.90
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 * NOTE - SUITABILITY OF SAMPLE IS BASED ONLY ON GRADING SPECIFICATIONS *

OVERALL SAMPLE RATING (SCALE 1 - 9) IS 4

WEIGHT OF SAND	5539.60	GMS.	WASHED SAMPLE - WEIGHT BEFORE	734.90	AFTER	714.60	% LOSS	2.76
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% COBBLES	0.0	% PEBBLES	46.08	% GRANULES	13.81	% SAND	37.58	% SILT/CLAY	2.53
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* NOTE - SUITABILITY OF SAMPLE IS BASED ONLY ON GRADING SPECIFICATIONS *

OVERALL SAMPLE RATING (SCALE 1 - 9) IS 3

WEIGHT OF SAND	3942.80	GMS.	WASHED SAMPLE - WEIGHT BEFORE	944.10	AFTER	918.70	% LOSS	2.69
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% COBBLES	0.0	% PEBBLES	35.60	% GRANULES	18.59	% SAND	43.44	% SILT/CLAY	2.37
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003928 01208E14SWEN604A

* NOTE - SUITABILITY OF SAMPLE IS BASED ONLY ON GRADING SPECIFICATIONS *

OVERALL SAMPLE RATING (SCALE 1 - 9) IS 3

AVAILABILITY OF CRUSHABLE MATERIALS ON SITE									
WEIGHT OF SAND	3257.90	GMS.	WASHED SAMPLE -	WEIGHT BEFORE	894.90	AFTER	882.80	% LOSS	1.35

% COBBLES	0.0	% PEBBLES	9.31	% GRANULES	15.50	% SAND	73.84	% SILT/CLAY	1.35
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* NOTE - SUITABILITY OF SAMPLE IS BASED ONLY ON GRADING SPECIFICATIONS *

OVERALL SAMPLE RATING (SCALE 1 - 9) IS 5

WEIGHT OF SAND	270.70	GMS.	WASHED SAMPLE - WEIGHT BEFORE	270.70	AFTER	253.00	% LOSS	6.54
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SIEVE SIZE	FINE FRACTION (GMS.)	SIEVE WEIGHTS (GMS.)	PERCENT	PERCENT PASSING	PERCENT RETAINED
4		0.0	0.0	100.00	0.0
1/2		0.0	0.0	100.00	0.0
1/2		0.0	0.0	100.00	0.0
1/2		0.0	0.0	100.00	0.0
4		0.0	0.0	100.00	0.0
8	0.0	0.0	0.0	100.00	0.0
16	0.0	0.0	0.0	100.00	0.0
30	0.0	0.0	0.0	100.00	0.0
40	0.0	0.0	0.0	100.00	0.0
50	0.0	0.0	0.0	100.00	0.0
60	0.0	0.0	0.0	100.00	0.0
70	0.0	0.0	0.0	100.00	0.0
80	0.0	0.0	0.0	100.00	0.0
100	0.0	0.0	0.0	100.00	0.0
120	0.0	0.0	0.0	100.00	0.0
140	0.0	0.0	0.0	100.00	0.0
160	0.0	0.0	0.0	100.00	0.0
180	0.0	0.0	0.0	100.00	0.0
200	0.0	0.0	0.0	100.00	0.0
200 + W	17.70	17.70	100.00	100.00	0.0

TOTALS	270.70	270.70
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SPLITTING FACTOR 1.00

FINENESS MODULUS 0.51

% COBBLES	0.0	% PEBBLES	0.0	% GRANULES	0.0	% SAND	93.46	% SILT/CLAY	6.54
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003931 01208E18NWEN554A

***** NOTE - SUITABILITY OF SAMPLE IS BASED ONLY ON GRADING SPECIFICATIONS *****

INDUSTRIAL USE	TOTAL RESIDUAL	RATING	SCREENING REQUIRED	REMOVAL OF <#200 MATERIAL	CRUSHING REQUIRED MATERIAL ON SITE	CRUSHING REQUIRED MATERIAL NOT ON SITE	ADDITION OF FINES (MATERIAL <#4)
ASPHALT A (P. OF M.)	154.93	NOT SUIT					
ASPHALT B (P. OF M.)	144.93	NOT SUIT					
ASPHALT C (P. OF M.)	140.00	SUITABLE					
ASPHALT D (P. OF M.)	128.93	NOT SUIT					
ASPHALT E (P. OF M.)	128.93	NOT SUIT					
ASPHALT F (P. OF M.)	128.93	NOT SUIT					
ASPHALT G (P. OF M.)	128.93	NOT SUIT					
ASPHALT H (P. OF M.)	128.93	NOT SUIT					
ASPHALT I (P. OF M.)	128.93	NOT SUIT					
ASPHALT J (P. OF M.)	128.93	NOT SUIT					
ASPHALT K (P. OF M.)	128.93	NOT SUIT					
ASPHALT L (P. OF M.)	128.93	NOT SUIT					
ASPHALT M (P. OF M.)	128.93	NOT SUIT					
ASPHALT N (P. OF M.)	128.93	NOT SUIT					
ASPHALT O (P. OF M.)	128.93	NOT SUIT					
ASPHALT P (P. OF M.)	128.93	NOT SUIT					
ASPHALT Q (P. OF M.)	128.93	NOT SUIT					
ASPHALT R (P. OF M.)	128.93	NOT SUIT					
ASPHALT S (P. OF M.)	128.93	NOT SUIT					
ASPHALT T (P. OF M.)	128.93	NOT SUIT					
ASPHALT U (P. OF M.)	128.93	NOT SUIT					
ASPHALT V (P. OF M.)	128.93	NOT SUIT					
ASPHALT W (P. OF M.)	128.93	NOT SUIT					
ASPHALT X (P. OF M.)	128.93	NOT SUIT					
ASPHALT Y (P. OF M.)	128.93	NOT SUIT					
ASPHALT Z (P. OF M.)	128.93	NOT SUIT					
ASPHALT AA (P. OF M.)	128.93	NOT SUIT					
ASPHALT AB (P. OF M.)	128.93	NOT SUIT					
ASPHALT AC (P. OF M.)	128.93	NOT SUIT					
ASPHALT AD (P. OF M.)	128.93	NOT SUIT					
ASPHALT AE (P. OF M.)	128.93	NOT SUIT					
ASPHALT AF (P. OF M.)	128.93	NOT SUIT					
ASPHALT AG (P. OF M.)	128.93	NOT SUIT					
ASPHALT AH (P. OF M.)	128.93	NOT SUIT					
ASPHALT AI (P. OF M.)	128.93	NOT SUIT					
ASPHALT AJ (P. OF M.)	128.93	NOT SUIT					
ASPHALT AK (P. OF M.)	128.93	NOT SUIT					
ASPHALT AL (P. OF M.)	128.93	NOT SUIT					
ASPHALT AM (P. OF M.)	128.93	NOT SUIT					
ASPHALT AN (P. OF M.)	128.93	NOT SUIT					
ASPHALT AO (P. OF M.)	128.93	NOT SUIT					
ASPHALT AP (P. OF M.)	128.93	NOT SUIT					
ASPHALT AQ (P. OF M.)	128.93	NOT SUIT					
ASPHALT AR (P. OF M.)	128.93	NOT SUIT					
ASPHALT AS (P. OF M.)	128.93	NOT SUIT					
ASPHALT AT (P. OF M.)	128.93	NOT SUIT					
ASPHALT AU (P. OF M.)	128.93	NOT SUIT					
ASPHALT AV (P. OF M.)	128.93	NOT SUIT					
ASPHALT AW (P. OF M.)	128.93	NOT SUIT					
ASPHALT AX (P. OF M.)	128.93	NOT SUIT					
ASPHALT AY (P. OF M.)	128.93	NOT SUIT					
ASPHALT AZ (P. OF M.)	128.93	NOT SUIT					
ASPHALT BA (P. OF M.)	128.93	NOT SUIT					
ASPHALT BB (P. OF M.)	128.93	NOT SUIT					
ASPHALT BC (P. OF M.)	128.93	NOT SUIT					
ASPHALT BD (P. OF M.)	128.93	NOT SUIT					
ASPHALT BE (P. OF M.)	128.93	NOT SUIT					
ASPHALT BF (P. OF M.)							

OVERALL SAMPLE RATING (SCALE 1 - 9) IS 7

SAMPLE IDENTIFICATION 003932 01207E04NEEN610A

AVAILABILITY OF CRUSHABLE MATERIAL ON SITE - NONE

WEIGHT OF SAND 2734.60 GMS. WASHED SAMPLE - WEIGHT BEFORE 787.70 AFTER 780.00 % LOSS 0.98

STEEVE SIZE	FINE FRACTION (GMS.)	SIEVE WEIGHTS (GMS.)	PERCENT	PERCENT PASSING	PERCENT RETAINED
4 IN		0.0	0.0	100.00	0.0
1/2 IN		0.0	0.0	100.00	0.0
1/2 IN		0.0	0.0	100.00	0.0
1/2 IN		178.80	3.50	96.50	3.50
1/2 IN		0.0	0.0	96.50	3.50
3/4 IN		47.60	0.93	95.57	4.43
3/4 IN		48.10	0.94	94.63	5.37
3/4 IN	21.40	74.29	1.45	93.18	6.82
3/4 IN	12.50	159.53	3.04	90.14	9.86
3/4 IN	60.90	210.03	4.11	86.03	13.97
3/4 IN	44.00	152.75	2.99	83.04	16.96
3/4 IN	148.00	513.60	10.00	73.04	26.96
3/4 IN	43.00	149.28	2.93	70.11	29.89
3/4 IN	137.00	148.59	2.91	67.20	32.80
3/4 IN	60.00	223.99	4.44	62.76	37.24
3/4 IN	95.00	323.90	6.33	56.43	43.57
3/4 IN	5.00	17.36	0.34	56.09	43.91
3/4 IN	13.00	21.87	0.43	55.66	44.34
3/4 IN	13.63	47.31	0.93	54.73	45.27

TOTALS 1394.03 5114.03

SPLITTING FACTOR 3.47

FINENESS MODULUS 3.33

% COBBLES 0.0 % PEBBLES 17.81 % GRANULES 12.97 % SAND 68.30 % SILT/CLAY 0.93

INDUSTRIAL USAGE ASSESSMENT

003932 01207E04NEEN610A

 * NOTE - SUITABILITY OF SAMPLE IS BASED ONLY ON GRADING SPECIFICATIONS *

INDUSTRIAL USE	TOTAL RESIDUAL	RATING	SCREENING REQUIRED	REMOVAL OF <#200 MATERIAL	CRUSHING REQUIRED MATERIAL ON SITE	ADDITION OF FINES (MATERIAL <#4)
ASPHALT A (P. OF M.)	42.53	NOT SUIT				
ASPHALT B (P. OF M.)	59.00	NOT SUIT				
ASPHALT C (P. OF M.)	44.18	NOT SUIT				
BASE COURSE A (P. OF M.)	22.35	MARGINAL	YES	YES	YES	YES
BASE COURSE B (P. OF M.)	8.21	MARGINAL	YES	YES	YES	YES
SUB-BASE A (ASTM D1241)	90.46	NOT SUIT				
SUB-BASE B (ASTM D1241)	79.90	NOT SUIT				
SUB-BASE C (ASTM D1241)	38.46	NOT SUIT				
SUB-BASE D (ASTM D1241)	32.74	MARGINAL	YES	YES	YES	YES
SUB-BASE E (ASTM D1241)	32.32	MARGINAL	YES	YES	YES	YES
SUB-BASE F (ASTM D1241)	34.38	MARGINAL	YES	YES	YES	YES
TRAFFIC GRAVEL A (P. OF M.)	99.53	NOT SUIT				
TRAFFIC GRAVEL B (P. OF M.)	49.53	NOT SUIT				
TRAFFIC GRAVEL C (P. OF M.)	40.03	NOT SUIT				
TRAFFIC GRAVEL D (P. OF M.)	17.69	MARGINAL	YES	YES	YES	YES
SEAL COAT A (P. OF M.)	109.99	NOT SUIT				
SEAL COAT B (P. OF M.)	19.02	MARGINAL	YES	YES	YES	YES
SEAL COAT C (P. OF M.)	0.0	SUITABLE	YES			
AGGREGATE I (ASTM C33, D448)	211.44	NOT SUIT				
AGGREGATE II (ASTM C33, D448)	197.64	NOT SUIT				
AGGREGATE III (ASTM C33, D448)	208.46	NOT SUIT				
AGGREGATE IV (ASTM C33, D448)	154.40	NOT SUIT				
AGGREGATE V (ASTM C33, D448)	145.09	NOT SUIT				
AGGREGATE VI (ASTM C33, D448)	214.61	NOT SUIT				
AGGREGATE VII (ASTM C33, D448)	170.75	NOT SUIT				
AGGREGATE VIII (ASTM C33, D448)	216.45	NOT SUIT				
AGGREGATE IX (ASTM C33, D448)	241.41	NOT SUIT				
AGGREGATE X (ASTM C33, D448)	180.58	NOT SUIT				
AGGREGATE XI (ASTM C33, D448)	201.92	NOT SUIT				
AGGREGATE XII (ASTM C33, D448)	201.90	NOT SUIT				
AGGREGATE XIII (ASTM C33, D448)	219.29	NOT SUIT				
AGGREGATE XIV (ASTM C33, D448)	167.43	NOT SUIT				
AGGREGATE XV (ASTM C33, D448)	212.91	NOT SUIT				
AGGREGATE XVI (ASTM C33, D448)	144.00	NOT SUIT				
AGGREGATE XVII (ASTM C33, D448)	147.69	NOT SUIT				
AGGREGATE XVIII (ASTM C33, D448)	109.99	NOT SUIT				
AGGREGATE XIX (ASTM C33, D448)	8.52	MARGINAL	YES	YES	YES	YES
AGGREGATE XX (ASTM C33, D448)	1.01	MARGINAL	YES	YES	YES	YES
AGGREGATE XXI (ASTM C33, D448)	8.28	MARGINAL	YES	YES	YES	YES
AGGREGATE XXII (ASTM C33, D448)	13.81	MARGINAL	YES	YES	YES	YES
AGGREGATE XXIII (ASTM C33, D448)	7.22	MARGINAL	YES	YES	YES	YES
AGGREGATE XXIV (ASTM C33, D448)	24.61	MARGINAL	YES	YES	YES	YES
AGGREGATE XXV (ASTM C33, D448)	167.69	NOT SUIT				
AGGREGATE XXVI (ASTM C33, D448)	107.03	NOT SUIT				
AGGREGATE XXVII (ASTM C33, D448)	10.17	MARGINAL	YES	YES	YES	YES
AGGREGATE XXVIII (ASTM C33, D448)	28.06	MARGINAL	YES	YES	YES	YES
AGGREGATE XXIX (ASTM C33, D448)	15.17	MARGINAL	YES	YES	YES	YES

OVERALL SAMPLE RATING (SCALE 1 - 9) IS 5

WEIGHT OF SAND	1993.80	GMS.	WASHED SAMPLE -	WEIGHT BEFORE	1006.20	AFTER	881.00	% LOSS	12.44
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% COBBLES	22.47	% PEBBLES	17.79	% GRANULES	9.39	% SAND	41.07	% SILT/CLAY	9.28
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* NOTE - SUITABILITY OF SAMPLE IS BASED ONLY ON GRADING SPECIFICATIONS *

OVERALL SAMPLE RATING (SCALE 1 - 9) IS 5

AVAILABILITY OF CRUSHABLE MATERIAL ON SITE - YES

WEIGHT OF SAND	2517.20	GMS.	WASHED SAMPLE -	WEIGHT BEFORE	706.10	AFTER	659.00	% LOSS	6.67
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TOTALS	706.10	4543.98
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SPLITTING FACTOR 3.56

FINENESS MODULUS 6.45

% COBBLES	14.58	% PEBBLES	58.91	% GRANULES	8.36	% SAND	14.45	% SILT/CLAY	3.70
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INDUSTRIAL USAGE ASSESSMENT

003934 01207E07SWEN598A

 * NOTE - SUITABILITY OF SAMPLE IS BASED ONLY ON GRADING SPECIFICATIONS *

INDUSTRIAL USE	TOTAL RESIDUAL	RATING	SCREENING REQUIRED	REMOVAL OF MATERIAL <#200	CRUSHING ON SITE	REQUIRED MATERIAL NOT ON SITE	ADDITION OF FINES (MATERIAL <#4)
ASPHALT A (P. OF M.)	23.25	MARGINAL	YES				
ASPHALT B (P. OF M.)	9.78	MARGINAL	YES				
ASPHALT C (P. OF M.)	47.14	NOT SUIT					
BASS COURSE (P. OF M.)	2.93	MARGINAL	YES	YES			
COURSE (P. OF M.)	10.06	SUITABLE	YES				
COURSE (P. OF M.)	0.0	SUITABLE	YES				
COURSE (ASTH D1241)	0.0	SUITABLE	YES				
COURSE (ASTH D1241)	6.69	MARGINAL	YES	YES			
COURSE (ASTH D1241)	3.66	MARGINAL	YES				
COURSE (ASTH D1241)	43.38	NOT SUIT					
COURSE (ASTH D1241)	35.95	NOT SUIT					
COURSE (ASTH D1241)	77.95	NOT SUIT					
COURSE (ASTH D1241)	1.33	MARGINAL	YES	YES			
COURSE (ASTH D1241)	16.44	MARGINAL	YES	YES			
COURSE (ASTH D1241)	0.0	SUITABLE	YES				
SEAL COAT A (P. OF M.)	72.09	NOT SUIT					
SEAL COAT B (P. OF M.)	7.53	MARGINAL	YES				YES
SEAL COAT C (P. OF M.)	4.82	MARGINAL	YES				YES
COARSE AGGREGATE I (ASTH C33, D448)	143.72	NOT SUIT					
COARSE AGGREGATE II (ASTH C33, D448)	109.73	NOT SUIT					
COARSE AGGREGATE III (ASTH C33, D448)	133.06	NOT SUIT					
COARSE AGGREGATE IV (ASTH C33, D448)	155.18	NOT SUIT					
COARSE AGGREGATE V (ASTH C33, D448)	111.66	NOT SUIT					
COARSE AGGREGATE VI (ASTH C33, D448)	42.35	NOT SUIT					
COARSE AGGREGATE VII (ASTH C33, D448)	107.76	NOT SUIT					
COARSE AGGREGATE VIII (ASTH C33, D448)	86.75	NOT SUIT					
COARSE AGGREGATE IX (ASTH C33, D448)	86.01	NOT SUIT					
COARSE AGGREGATE X (ASTH C33, D448)	74.94	NOT SUIT					
COARSE AGGREGATE XI (ASTH C33, D448)	66.33	NOT SUIT					
COARSE AGGREGATE XII (ASTH C33, D448)	66.02	NOT SUIT					
COARSE AGGREGATE XIII (ASTH C33, D448)	84.69	NOT SUIT					
COARSE AGGREGATE XIV (ASTH C33, D448)	93.72	NOT SUIT					
COARSE AGGREGATE XV (ASTH C33, D448)	112.87	NOT SUIT					
COARSE AGGREGATE XVI (ASTH C33, D448)	78.08	NOT SUIT					
COARSE AGGREGATE XVII (ASTH C33, D448)	99.24	NOT SUIT					
FINE CONC RETE AGGREGATE I (ASTH C33, C404)	51.74	MARGINAL	YES				YES
FINE CONC RETE AGGREGATE II (ASTH C33, C404)	38.74	NOT SUIT	YES				YES
PORTLAND CEMENT (P. C. A.)	22.83	MARGINAL	YES				YES
BUFFED ROOFS (ASTH D1863)	84.99	NOT SUIT					
FIELD RUNWAYS (P. OF H.)	0.0	SUITABLE	YES				
PIT RUN (P. OF H.)	0.0	SUITABLE	YES				
SEPTIC FIELDS (U.M.A.)	0.0	SUITABLE	YES				
SHOULDERS (P. OF H.)	0.0	SUITABLE	YES				

OVERALL SAMPLE RATING (SCALE 1 - 9) IS 4

