SURVEY OF HIGHWAY CONSTRUCTION MATERIALS

IN THE TOWN OF RUTLAND, RUTLAND COUNTY, VERMONT

prepared by

Engineering Geology Section, Materials Division

Vermont Department of Highways

in cooperation with

United States Department of Commerce

Bureau of Public Roads

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Acknowledgments

The work of this Project was greatly implemented by the cooperation and assistance of many groups and individuals. The following were particularly helpful in carrying out the Project's objectives:

1. Various departments and individuals of the Vermont State Department of Highways, notably the Planning and Mapping Division and the Highway Testing Laboratory,

2. Professor D.P. Stewart of Miami University, Oxford, Ohio,

3. Professor C.G. Doll, Vermont State Geologist, University of Vermont, Burlington, Vermont,

4. United States Department of Commerce, Bureau of Public Roads.

History

The Materials Survey Project was formed in 1957 by the Vermont State Department of Highways with the assistance of the United States Bureau of Public Roads. Its prime objective was to compile an inventory of highway construction materials in the State of Vermont. Prior to the efforts of the personnel of the Survey as described in this and other reports, searches for highway construction materials were conducted only as the immediate situation required. Thus only limited areas were surveyed, and no overall picture of material resources was available. Highway contractors or resident engineers are usually required to locate the materials for their respective projects and have samples tested by the Highway Testing Laboratory. The additional cost of exploration for construction materials is passed onto the State in the form of higher construction costs. The Materials Survey Project was established to minimize or eliminate this factor by enabling the State and its contractors to proceed with information

on material sources available beforehand. Prior knowledge of locations of suitable material is an important factor in planning future highways.

The sources of construction materials are located by this Project through ground reconnaissance, study of maps and aerial photographs, and geological and physiographic interpretation. Maps, data sheets, and work sheets for reporting the findings of the Project were designed with their intended use in mind. These maps and data sheets were devised to furnish information of particular use to the contractor or construction man. For maximum benefit, the maps, data sheets, and this report should be studied simultaneously.

Inclosures

Included in this folder are two surface-geology maps, one defining the location of tests conducted on bedrock sources, the other defining the location of tests conducted on granular materials. These maps are derived from 15-minute or 7½-minute quadrangles of the United States Geological Survey enlarged or reduced to 1:31250 or 1" = 2604'. Delineated on the Bedrock Map are the various rock types of the area. This information was obtained from numerous sources: Vermont Geological Survey Bulletins, Vermont State Geologist Reports, United States Geological Survey Bedrock Maps, and the Centennial Geological Map of Vermont, as well as other references.

The granular materials map depicts areas covered by various types of glacial deposits (outwash, moraines, kames, kame terraces, eskers, etc.) by which potential sources of gravel and sand may be recognized. This information was obtained primarily from a survey being conducted by Professor D.P. Stewart of Miami University, Oxford, Ohio, who has been mapping the glacial features of the State of Vermont during the summer months since

1956. Further information was obtained from the Soil Survey (Reconnaissance) of Vermont conducted by the Bureau of Chemistry and Soils of the United States Department of Agriculture, and from Vermont Geological Survey Bulletins, United States Geological Survey Quadrangles, aerial photographs, and other sources. On both maps the areas tested are represented by Identification Numbers. Several tests are usually conducted in each area represented by an Identification Number, the number of such tests being more or less arbitrarily determined either by the character of the material or by the topography.

Also included in this folder are data sheets for both the Bedrock and Granular Materials Survey, which contain detailed information for each test conducted by the Project as well as information obtained from other sources, and including an active card file compiled by the Highway Testing Laboratory. The latter information was gathered over a period of years by many persons and consequently lacks the organized approach and detail required for effective use. The information on the cards varied widely in completeness. Transfer of information from the cards to the data sheets was made without elaboration or verification. When possible, the locations of the deposits listed in the card files have also been plotted on the maps; however, some cards in the file were not used because the information on the location of the deposit was incomplete or unidentifiable. Caution should be exercised wherever this information appears incomplete. This Project does not assume responsibility for the information taken from the card files.

Work sheets contain more detailed information on each test and a detailed sketch of each Identification Number Area. The work sheets and laboratory reports are on file in the office headquarters of this Project.

Location

The town of Rutland is located at the center of Rutland County in west-central Vermont. It is bounded on the north by the town of Pittsford, on the east by Mendon, on the south by Clarendon, and on the west by West Rutland and Proctor.

Rutland lies within the Vermont Valley, a southeastern portion of the Lake Champlain Lowlands. It is floored by Paleozoic sedimentary and metamorphic rocks which are easily eroded except for a few occurrences of quartzite. The southern four-tenths of the township is drained by Otter Creek and the northern six-tenths principally by East Creek which joins Otter Creek in the south center of the township. Their confluence flows northwestward from the area and eventually into Lake Champlain.

The highest elevation in Rutland township exceeds 1420 feet. It is located on Pine Hill at the northwestern boundary. The lowest elevation is less than 500 feet and is found at the point where Otter Creek crosses the western boundary.

Procedure for Rock Survey

The routine employed by the Project in the survey of possible sources of rock for highway construction is divided into two main stages; the office investigation and field investigation. The first is conducted primarily during the winter months and comprises the mapping of rock types as indicated in various reference sources. Many different sources of information were utilized, as indicated in the Bibliography. These references differ considerably in dependability due to new developments and studies contributing to the obsolescence of a number of reports. In addition, the results of samples taken by other individuals are analyzed and the location in which these samples were taken is mapped when possible. In other words, as complete a correlation as possible is made of all the information available concerning the geology of the area under consideration.

Second stage of the investigation is begun in the field by making a cursory

preliminary survey over the entire area. The information obtained in this survey, together with the information assimilated in the first stage of the investigation is employed to determine the areas in which the testing and sampling will be concentrated. When a promising source is encountered as determined not only by rock type but also by volume, accessibility, and the existence of a good working face, chip samples are taken with a hammer and submitted to the Highway Testing Laboratory for testing by the Deval Method (AASHO T-3). It is kept in mind that samples taken by the chip method are often in the weathered zone of the outcrop and consequently may show a less satisfactory test result than the fresh material deeper in the body of the rock structure. When deemed necessary, further samples are taken by drilling to a depth of approximately 3 feet and blasting across the strike or trend of the outcrop. When the material is uniform and satisfactory tests result from the chip samples, no further drilling, blasting, or sampling is done and the material source is included as being satisfactory.

Discussion of Rock and Rock Sources

It will be observed that the information on the surface-geology bedrock map in regard to rock type is simplified. For a more detailed description of the respective rock formations, a summary is included in this report. It is apparent from this summary that each formation may not be composed of one distinct rock type, but may be a complex mixture of rock types blending into one another. For this reason, the data sheets may describe the rock tested as differing from the designation on the map.

Occasionally, rocks belonging to same formation and exhibiting similar outward characteristies (i.e., color, texture, etc.) may produce different abrasion results due to different physical and chemical properties. Therefore, in no case should satisfactory test results of an area be construed

as meaning that the same formation, even in the same area, will not later produce unsatisfactory material. This is especially true of metamorphic rocks. As can readily be seen on the surface-geology rock map, there are 10 different rock formations or distinct lithological types within the Town of Rutland. For a detailed description of each type, refer to the summary included in this report. In general, the town is represented by a sequence of Vermont Valley dolomites, limestones, marbles, and quartzites which overlie the Mount Holly complex (gneiss). A portion of the western border of the town is, in turn, overlain by slate and phyllite of the Hortonville Formation that is probably a remnant of the Klippe emplaced by overthrusting from the east during formation of the Taconic Mountains.

Best rock types for crushed rock aggregate are probably quartzite and dolomite. Eight rock samples were taken in the town, of which six were dolomites, one was quartzite, and one was gneiss. Wear tests averaged 4.7% for the dolomites, 2.0% for the quartzite, and 3.4% for the gneiss. Elsewhere in the state (i.e., Town of Weathersfield), the Mount Holly gneiss has been considered for use as, but has not been recommended for, crushed rock aggregate because of the frequency of local tendencies toward schistosity.

Procedure for Sand and Gravel Survey

The method employed by the Project in the survey of possible sources of sand and gravel for highway construction is divided into two main stages: office investigation and field investigation. The office investigation is conducted primarily during the winter months and comprises the mapping of possible potentially productive areas as indicated from various references. Of these references, the survey of glacial deposits mapped by Professor Stewart proves to be valuable, particularly when used in conjunction with other references such as soil-type maps, aerial photographs, and United States Geological Survey quadrangles. The last two are used in recognizing and locating physiographic features indicating

glacial deposits and in studying drainage patterns. In addition, the location of existing pits, when known, are mapped. The locations in which samples were taken by other individuals are noted and mapped when possible.

The second stage of the investigation is begun in the field by making a cursory preliminary survey over the entire area noting areas which show physiographic features giving evidence of glacial or fluvial deposits. These locations are later examined by digging test pits with a backhoe to a depth of approximately 11 feet and then sampling the material. The samples are submitted to the Highway Testing Laboratory where they are tested for gradation and stone wear, the latter by the Deval Method (AASHO T-4-35).

Discussion of Sand and Gravel Sources

The granular materials of Rutland township are mainly of glacial origin.

Glaciofluvial deposition includes both kamic and outwash materials within the township. There are four separate kame moraines within the area. West of U.S. Route 7 and about a mile south of the town line, a kame moraine hinders northward extension of East Creek. Center Rutland north and east of Otter Creek is the locus of a second kame moraine. A third one occurs in the southeast corner of the township, bounded on the east by Bald Mountain and on the south by Cold River in the Town of Clarendon. It is crossed by S.A. #5 for 0.5 mile from the town line north. Finally, there is a wide-spread kame moraine along most of the eastern border of the township, which moraine extends about 1.25 miles west of the boundary at Mendon Brook. About 0.75 mile of glacial outwash is emplaced along East Creek from the last-mentioned extension.

Glaciolacustrine deposition comprises the remainder of the granular materials in the area. It is to be noted that the Otter Creek floodplain is largely covered with lake sand and a deltaic gravel west of Eddy Pond. In addition, according to Professor D.P. Stewart, within the floodplain south

of Rutland there is an area of silty clay. Acceptable gravel from within this area is probably a river gravel. Elsewhere, lake sand deposits occur north and south of the kame moraine at north-center of the township, at spots west of the Clarendon River, and northeast of Otter Creek where it leaves the township, according to Professor Stewart.

SUMMARY OF ROCK FORMATIONS IN THE TOWN OF RUTLAND

CHESHIRE QUARTZITE: Is very massive, white to faintly pink or buff vitreous quartzite near the top in west-central and southwestern Vermont; predominantly a less massive appearing mottled gray, somewhat phyllitic quartzite; dolomitic sandstone and conglomerate near the base of the formation in west-central Vermont, it apparently grades southward into the Dalton Formation.

CLARENDON SPRINGS DOLOMITE: Is fairly uniform, massive, smooth weathered gray dolomite characterized by numerous geodes and knots of white quartz; quartz sandstone and irregular masses of chert are near the top.

DALTON FORMATION: Is schistose quartzite containing pebbles of feldspar and blue quartz; impure dolomite containing pebbles of quartz and feldspar occurs locally; conglomerate common near base. Occurs in southwestern Vermont.

DANBY FORMATION: Is comprised of interbedded quartzite and dolomite; white quartzite beds, more than a foot thick, separated by 10 to 12 feet of dolomite in eastern areas, increase westward to continuous sections of white to pink weathered, massively bedded Potsdam Quartzite.

DUNHAM DOLOMITE: Is buff-weathered siliceous dolomite, pink and cream mottled or buff to gray on fresh surface; lower part is massive and upper part is sandy and resembles the Winooski Dolomite.

HORTONVILLE FORMATION: Is black, carbonaceous and pyritic slate and phyllite, locally sandy; brown weathered limy beds are common near base.

MONKTON QUARTZITE: Is distinctively red quartzite interbedded with lesser buff and white quartzite and relatively thick sections of dolomite like that of the Winooski; the quartzites thin to the east, and they become gray and phyllitic to the east and south.

MT. HOLLY COMPLEX: Is mainly fine- to medium-grained biotitic gneiss, locally muscovitic, and in western areas chloritic; massive and granitoid in some localities, fine-grained or schistose and compositionally layered in others; also abundant amphibolite and hornblende gneiss, and minor beds of mica schist, quartzite and calc-silicate granulite; includes numerous small bodies of pegmatite and gneissoid granitic rock.

SHELBURNE FORMATION: Is chiefly a white marble or gray limestone characterized by raised reticulate lines of gray dolomite on the weathered surface; includes Sutherland Falls marble, intermediate dolomite and Columbian marble of the marble quarries.

WINOOSKI DOLOMITE: Is buff-weathered, pink, buff, and gray dolomite; beds 4 inches to 1 foot thick separated by thin, protruding, red, pink, green, and black siliceous partings.

GLOSSARY OF SELECTED GEOLOGIC TERMS

DELTA is material of a predominantly alluvial deposit built out by a stream into the sea or other body of water.

DOLOMITE as a term used in this report, applies to rocks approximating the mineral dolomite in composition or consisting predominantly of dolomite. Dolomite is a mineral of definite chemical composition, $CaMg(CO_3)_2$: carbon dioxide 47.7%, calcium 30.4%, and magnesium 21.9%.

GLACIOFLUVIAL is a term used to denote formation by or relation to streams within, upon, or emerging from glacial ice.

GLACIOLACUSTRINE is a term used to denote formation by or pertaining to deposition in quiescent waters of glacial origin.

GNEISS is a banded or foliated metamorphic rock with no specific composition implied and having layers mineralogically unlike that consist of interlocking mineral particles mostly large enough to be visible to the eye. Usually gneiss tends to split along definite planes where tabular and schistose minerals predominate.

KAME MORAINE is an accumulation of material deposited directly from the frontal portion of the glacial ice and partially sorted by water action. Deposits may take the form of coalescent knolls, hummocks, ridges, etc.

KLIPPE is an eroded remnant of the overthrust sheet of a thrust fault now isolated from the main sheet by erosion.

LIMESTONE is a bedded sedimentary deposit consisting chiefly of calcium carbonate. It is the most important and widely distributed of the carbonate rocks. The percentage of calcium carbonate ranges from 40% to more than 90%. Common impurities are clay and sand.

MARBLE is a granular crystalline rock made up of calcite or dolomite grains cemented or intergrown and interlocking by means of additional calcite.

METAMORPHIC ROCKS are rocks that owe their distinctive characters to the transformation of pre-existing rocks, either through intense heat or pressure or both.

OUTWASH is stratified drift that is stream-built beyond the glacier; laid down by meltwater streams issuing from the face of the glacier ice.

OVERTHRUSTING is movement of a sheet of rock over or upon another rock sheet along a fault plane having a relatively low angle of inclination.

PHYLLITE is a fine-grained foliated metamorphic rock intermediate between the mica shists and slates, into which it may grade. The foliation is made possible by the development of a large amount of potash mica, sericite, which also gives the rock a distinctive silvery appearance.

QUARTZITE is a compact metamorphic rock composed of quartz grains so firmly cemented that fracture takes place across them and cementing material with equal ease.

SCHISTOSITY is the property of a foliated rock by which it can be split into thin layers or flakes. The property of splitting may be due to alternating layers of differing mineral composition or to preferred orientation and parallelism of cleavage planes of the mineral.

SEDIMENTARY ROCKS are rocks composed of sediment that form through the agencies of water, wind, glacial ice, or organisms and are deposited at the earth's surface.

SLATE is a very fine-grained homogeneous metamorphic rock which splits smoothly along parallel cleavage planes and yields roughly similar slabs.

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APPENDIX I

PARTIAL SPECIFICATIONS FOR HIGHWAY CONSTRUCTION MATERIALS

Listed below are partial specifications for Highway Construction Materials as they apply to this report at date of publication. For complete list of specifications see "Standard Specifications for Highway and Bridge Construction" approved and adopted by the Vermont Department of Highways April, 1964.

Item 105, Granular Borrow:

"Article 105.02 Materials. The granular borrow shall be obtained from approved sources and shall consist of satisfactorily graded, free draining, hard, durable stone and coarse sand practically free from loam, silt, clay, and organic matter.

"The sand portion (material passing the No. 4 screen) shall have not more than ten percent (10%) passing the No. 270 mesh sieve and shall show a color of not more than three and one-half ($3\frac{1}{2}$) as determined by the colorimetric test described in AASHO Method of Test, Designation T-21.

"When used in connection with fine grading or in fills where piling is to be driven, the granular material shall all pass the nine (9) inch square opening screen."

Item 201, Sub-base of Gravel.

"Article 201.02 Materials. The gravel shall consist of material reasonably free from silt, loam, clay or organic matter. It shall be obtained from approved sources and meet the following requirements:

"Not less than forty (40) percent stone shall be retained on No. 4 sieve.

"The percent of wear shall be not more than twenty-five (25) when tested by laboratory methods, using Method AASHO T-4, or more than

forty (40) when tested by AASHO Method T-96.

"The stone portion of the gravel shall be uniformly graded from coarse to fine and the maximum size particles shall not exceed two-thirds (2/3) of the layer being spread.

"The sand portion, when tested by laboratory methods, using Method AASHO T-27, shall meet the grading requirements set up in the following table:

Minimum Percent of Stone	Percent Passing Square Openings No. 100	Percent Passing Square Openings No. 270
40	0-15	0-3
50	0-15	0-4
60	0-15	0-5
70	0-15	0-6

"The sand shall show a color of not more than three and one-half (3½) as determined by the colorimetric test described in the AASHO Method of Test, Designation T-21."

Item 202, Sub-base of Sand

"Article 202.02 Materials. The sand shall consist of material reasonably free from silt, loam, clay or organic matter. It shall be obtained from approved sources and meet the following requirements:

"The sand, when tested by laboratory methods, using Method AASHO T-27, shall meet the grading requirements set up in the following table:

Square Openings	Percent Passing
1½"	95-100
5/8"	80-100
No. 4	70-100
No. 100	0-18
No. 270	0-5

"The sand shall show a color of not more than three and one-half (3½) as determined by the colorimetric test described in the AASHO Method of Test, Designation T-21."

Item 204, Sub-base of Crushed Rock

"Article 204.02 Materials. The materials for sub-base, filler and sand cushion shall be obtained from approved sources and meet the following requirements:

"A - Crushed Rock. The crushed rock shall be uniformly graded, crusher-run material, free from dirt. The ledge from which this material is obtained shall be stripped and cleaned before blasting. Conical stockpiling or any other method of stockpiling, which causes segregation of aggregates will not be permitted.

"The crushed rock, when tested by laboratory methods using Method AASHO T-27, shall meet the grading requirements set up in the following table:

Square Openings	Percent Passing
4"	95-100
1½"	25-50
No. 4	0-15

"The percent of wear shall not be more than eight (8) when tested by laboratory methods, using Method AASHO T-3, or more than forty (40), when tested by AASHO Method T-96."

Item 205, Sub-base of Crushed Gravel

"Article 205.02 Materials.

A - Crushed Gravel. The crushed gravel shall consist of material reasonably free from silt, loam, clay or organic matter. It shall be obtained from approved sources and produced by a crusher adjusted to deliver

a product uniformly graded from coarse to fine.

"When tested by laboratory methods, using Method AASHO T-27, it shall meet the grading requirements as set forth below:

		Square Openings	Percent Passing
Sub-base of Crushed Gravel	Coarse-Graded Item 205-A	4"	100
		No. 4	25-50
	Fine-Graded Item 205-B	1½"	95-100
		No. 4	30-60

"At least thirty percent (30%) by weight of the stone content of the crushed gravel, that is, the material retained on the No. 4 screen, shall have a minimum of one (1) fractured face as determined by actual count from the sample submitted to the laboratory.

"The percent of wear shall not be more than twenty (20) when tested by laboratory methods, using Method AASHO T-4, or more than thirty-five (35), when tested by AASHO Method T-96.

"B - Sand. The sand content of the crushed gravel, that is, the material passing the No. 4 screen, when tested by laboratory methods, using Method AASHO T-27, shall meet the grading requirements set up in the following table:

Square Openings	Percent Passing
No. 100	0-18
No. 270	0-8

"The sand shall show a color of not more than three and one-half (3½) as determined by the colorimetric test described in the AASHO Method of Test, Designation T-21."

TABLE I RUTLAND GRANULAR DATA SHEET NO. 1

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft.)	Over-burden (Ft.)	Existing Pit	Sieve Analysis % Passing 1½"	5/8"	#4	#100	#270	Color AASHO T-21	Abrasion AASHO T-4-35	Passes VHD Spec.	
1	1	1964	1-8	0-1	No	100	100	55.1	58.0	23.0	1½	----	----	Owner: Clifford Rollins Property is located on S.A. #1 about 2.95 miles east and north of junction with U.S. #7. Test #1 is silt with stones taken near south end of field farthest west from house. Rejected for Item 105.
	2	1964	1-8	0-1	No	100	100	60.8	50.0	26.0	3	----	----	Test #2 is silt with stones on brow of hill in near field 45' south of north fence line. Rejected for Item 105.
2	1	1964	1-8	0-1	No	100	100	73.2	50.0	21.0	4	----	----	Owner: Clifford Rollins Property is located east of house across S.A. #1 about 2.95 miles east and north of junction with U.S. #7. Test #1 is silt and stones on top of knoll 120' east of utility line. Rejected for Item 105.
	2	1964	0.5-9	0-0.5	No	86.4	80.0	67.8	33.9	22.0 14.9*	2½	----	----	Test #2 is fine sand with stones on knoll near south end of field. Rejected 105.
3	1	1964	0-5	Stripped	Yes	38.5	74.5	58.7	28.0	8.0	1	24.3%	Gran. Borrow (Grav.)	Owner: Joseph Carrara Property and pits are located east of S.A. #1 about 1.8 miles east and north of junction with U.S. Route 7. Test #1 is coarse dirty gravel in floor of north end of pit. Acceptable for Item 105.
	2	1964	0-10	Stripped	Yes	100	100	100	62.0	13.0	1	----	----	Test #2 is sand in floor of

* Percentage of Total Sample

TABLE I RUTLAND GRANULAR DATA SHEET NO. 2

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft.)	Over-burden (Ft.)	Existing Pit	Sieve Analysis % Passing 1½"	5/8"	#4	#100	#270	Color AASHO T-21	Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
	3A	1964	0.5-5	0-0.5	Yes	63.3	52.4	40.1	10.0	4.0	2	12.8%	Gravel	south end of pit. Rejected for Item 105. Test #3A is gravel in south face of south end of pit. Acceptable for Item 201.
	3B	1964	5-15	Stripped	Yes	100	100	97.8	10.8	2.0	2½	----	Sand	Test #3B is sand beneath Test #3A. Acceptable for Item 202.
	4A	1964	0-6	Stripped	Yes	63.5	51.5	40.5	10.0	3.0	3½	24.6%	Gravel	Test #4 A is gravel on top of stripped area south of pit. Acceptable for Item 201.
	4B	1964	6-12	Stripped	Yes	100	100	100	20.0	2.0*	1½	----	Gran. Borrow (Sand)	Test 4B is sand beneath Test 4A. Acceptable for Item 105.
4	1	1964	4-10	0-4	Yes	69.3	62.5	53.6	53.0	20.0	1	----	----	Owner: Vermont Marble Company c/o William H. Adams. Pit is located east of S.A.#1 about 1.4 miles east and north of junction with U.S. Route #7. Test #1 is silt with boulders from northeast face of pit. Rejected for Item 105.
	2	1964	0-8	Stripped	Yes	78.9	77.3	72.0	70.0	25.0	1	----	----	Test #2 is silt with stones from floor in south edge of pit. Rejected for Item 105.
5	1	1964	0-9	Stripped	Yes	100	100	100	34.0	4.0	2	----	Gran. Borrow (Sand)	Owner: Vermont Marble Company c/o William H. Adams. Property and pit are located southeast of S.A. #1 about 0.9 mile east of junction with U.S. Route #7. Test #1 is sand in top of bank at southeast corner of pit. Acceptable for Item 105.

* Percentage of Total Sample

TABLE I

RUTLAND GRANULAR DATA SHEET NO. 3

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft.)	Over-burden (Ft.)	Existing Pit	Sieve Analysis % Passing 1½"	5/8"	#4	#100	#270	Color AASHO T-21	Abrasion AASHO T-4-35	Passes VHO Spec.	Remarks
	2	1964	0-7.5	Stripped	Yes	100	100	99.0	5.0	1.25 1.2*	1½	----	Sand	Test #2 is uniform medium sand in floor of center of pit. Acceptable for Item 202.
6	1	1964	0-11	Stripped	Yes	100	98.6	97.7	22.5	3.0 2.9*	1½	----	Gran. Borrow (Sand)	Owner: Vermont Marble Company c/o William H. Adams. Pit is located east of S.A. #1 about 1.0 mile east of junction with U.S. #7. Test #1 is sand in floor near east face of north portion of south section of pit. Acceptable for Item 105.
	2	1964	0-4	Stripped	Yes	100	98.1	94.7	21.8	5.0 4.7*	2½	----	Gran. Borrow (Sand)	Test #2 is sand in floor of northeast portion of pit. Acceptable for Item 105.
7	1	1964	0-9.5	Stripped	Yes	100	99.0	94.7	17.0	2.0 1.9*	2	----	Sand	Owner: R. D. Barker Pit is located 0.5 mile north of Town Highway #17 on unimproved road, 1.45 miles east of intersection of Town Highway #30 with U.S. Route 7. Test #1 is sand in floor of pit close to south face.
	2	1964	0-25	Stripped	Yes	100	100	97.6	15.6	2.0 1.9*	2	----	Sand	Test #2 is sand in south face of pit. Tests #1 and #2 are acceptable for Item 202.
8	1	1964	0.5-10.5	0-0.5	No	100	100	100	64.0	5.0	2½	----	Gran. Borrow (Sand)	Owner: Arthur Hawley Property is located 1.15 miles east of U.S. Route 7 on Town Highway #30. Test #1 is fine sand on second knoll north of Hawley House and 300' east of swamp.

* Percentage of Total Sample

TABLE I

RUTLAND GRANULAR DATA SHEET NO. 4

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft.)	Over-burden (Ft.)	Exist-ing Pit	Sieve Analysis % Passing 1½"	5/8"	#4	#100	#270	Color AASHO T-21	Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
	2	1964	0.5-10	0-0.5	No	100	100	98.7	42.4	6.75 6.7*	3½	----	Gran. Borrow (Sand)	Acceptable for Item 105. Test #2 is fine sand on farthest knoll northeast of house. Acceptable for Item 105.
9	1	1964	1-8	0-1	No	92.5	88.7	85.4	71.0	30.0	2	----	----	Owner: Albert Adams Property is located south of Town Highway #30 about 0.65 mile east of intersection with U.S. Route 7. Test #1 is on first large knoll east of Adams house. It is silt with boulders. Rejected for Item 105.
	2	1964	1-8	0-1	No	100	96.3	89.4	59.0	28.0 25.0*	2	----	----	Test #2 is silt with boulders on same knoll 500' south of Test #1. Rejected for Item 105.
	3	1964	1-9.5	0-1	No	91.6	89.5	86.3	63.9	24.0 20.7*	2	----	----	Test #3 is fine sand and stones in northwest corner of same field. Rejected for Item 105.
	4	1964	1-7	0-1	No	100	100	79.8	60.0	23.5	1	----	----	Test #4 is silt with stones on small knoll in center of field south of house. Rejected for Item 105.
10	1	1964	0.5-9	0-0.5	No	78.6	66.9	57.8	50.0	16.0	1½	----	----	Owner: Don LeFrancois Property is east of Town Highway #30 about 0.55 mile north of intersection with U.S. Route #4. Test #1 is silty gravel at opening in woods at end of road about 0.2 mile northeast of house. Rejected for Item 105.

* Percentage of Total Sample

TABLE I

RUTLAND GRANULAR DATA SHEET NO. 5

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Over-burden (Ft.)	Existing Pit	Sieve Analysis % Passing 1½"	5/8"	#4	#100	#270	Color AASHO T-21	Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
11	1	1964	4-10	Stripped	Yes	65.1	52.1	47.0	8.0	1.25	2	17.5%	Gravel	Owner: Don LeFrancois Property is east of Town Highway #30 about 0.55 mile north of intersection with U.S. Route 4. Test #1 is gravel located in face between levels of pit 0.3 mile east of house. Acceptable for Item 201.
	2	1964	1-10	0-1	Yes	91.5	88.5	84.1	36.2	10.0 8.4*	2½	----	Gran. Borrow (Sand)	Test #2 is medium uniform sand on top of pit 20' from face. Acceptable for Item 105.
	3	1964	1-11	0-1	No	82.0	65.6	52.2	45.0	14.0	2½	19.9%	----	Test #3 is pebbly sand and gravel about 70' southeast of pit. Rejected for Item 105.
	4	1964	0.5-10	0-0.5	Yes	100	100	100	6.0	1.0	1	----	Sand	Test #4 is white sand in face of small pit about 0.1 mile southwest of Test #1 location. Acceptable for Item 202.
	5	1964	0-10	Stripped	Yes	100	100	97.1	7.8	2.0 1.9*	1½	----	Sand	Test #5 is sand in floor of small pit. Acceptable for Item 202.
12	1	1964	1-10	0-1	No	100	100	99.6	15.9	2.5	2½	----	Sand	Owner: Mrs. Mary Crossman Property is north of U.S. Route 4 and east of Mendon town line. Test #1 is sand on top of small knoll northwest of house. Acceptable for Item 202.
	2	1964	1-5	0-1	No	100	100	71.7	72.0	23.0	3	----	----	Test #2 is silt with stones in center of field overgrown with small pines and

* Percentage of Total Sample

TABLE I

RUTLAND GRNULAR DATA SHEET NO. 6

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft.)	Over-burden (Ft.)	Existing Pit	Sieve Analysis % Passing 1½"	5/8"	#4	#100	#270	Color AASHO T-21	Abrasion Passes AASHO T-4-35	VHD Spec.	Remarks
														apple trees west of Crossman property. Rejected for Item 105.
13	1	1964	0-10	Stripped	Yes	100	100	98.0	37.0	36.0	1	----	----	Owner: Corneille Raymond Property of 0.2 mile southeast of U.S. Route 4 at point 0.1 mile northeast of intersection with Town Highway #30. Rejected for Item 105.
14	1	1964	1-9.5	0-1	No	100	91.8	85.8	74.0	32.0	2½	----	----	Owner: K. C. Conners Property is west of Mendon S.A. #8 at point 0.7 mile south of intersection with U.S. Route 4. Test #1 is silt and stones in center of field farthest west of house. Rejected for Item 105.
	2	1964	1-10	0-1	No	94.4	94.4	90.4	63.3	25.0 22.6*	2	----	----	Test #2 is fine sand and stones near northeast corner of field furthest west of house. Rejected for Item 105.
	3	1964	1-5.5	0-1	No	69.0	64.8	54.4	53.0	21.0	5	----	----	Test #3 is fine sand and stones on large knoll 500' west of S.A. #8. Rejected for Item 105.
15	1	1964	0.5-10	0-0.5	No	100	100	93.6	56.2	17.0 15.9*	4	----	----	Owner: R. S. Seward Property is north of U.S. Route 4 at point 1.6 miles east of intersection with U. S. Route #7. Test #1 is sand to silt with

*Percentage of Total Sample

TABLE I RUTLAND GRANULAR DATA SHEET NO. 7

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft.)	Over-burden (Ft.)	Existing Pit	Sieve Analysis % Passing 1½"	5/8"	#4	#100	#270	Color AASHO T-21	Abrasion Passes AASHO T-4-35	VHD Spec.	Remarks
														stones on top of knoll north of barn. Rejected for Item 105.
16	1	1964	0.5-7.5	0-0.5	No	100	100	76.4	57.3	25.0 19.1*	3½	----	----	Owner: Arthur Hawley Property is north of U.S. Route 4 at point 1.95 miles east of intersection with U.S. Route 7. Test #1 is silty sand with stones in pasture east of Pete Hall property. Rejected for Item 105.
17	1	1964	1-10	0-1	No	100	100	99.5	90.0	54.0 53.7*	1	----	----	Owner: Pete Hall Property is north of U.S. Route 4 at point 1.95 miles east of intersection with U.S. Route 7. Test #1 is silt with stones in field under powerline about 0.5 mile from U.S. Route 4 by road. Rejected for Item 105.
	2	1964	1-10	0-1	No	100	100	100	99.0	61.0	1	----	----	Test #2 is silty sand on top of knoll southeast of house. Rejected for Item 105.
18	1	1964	2-8	Stripped	Yes	100	100	90.6	43.0	17.25	2	----	----	Owner: Robert K. Huntoon Property with pit 0.2 mile east of U.S. Route 7 at point 1.25 miles north of the intersection with U.S. Route 4. Test #1 is pebbly silt in floor of main pit. Rejected for Item 105.

* Percentage of Total Sample

TABLE I

RUTLAND GRANULAR DATA SHEET NO. 8

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft.)	Over-burden (Ft.)	Existing Pit	Sieve Analysis % Passing 1½"	5/8"	#4	#100	#270	Color AASHO T-21	Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
19	1A	1964	0.5-6	0-0.5	Yes	78.8	67.8	56.0	43.0	13.0	1	----	------	Owner: J. Giorgetti Property and pit are south of pond east of S.A. #5 at point 0.25 mile south of intersection with U.S. #4. Test #1A is gravel in face of pit. Rejected for Item 105.
	1B	1964	6-18	0-6	Yes	100	100	93.8	53.5	23.0 21.6*	1	----	------	Test #1B is fine sand to silt. Rejected for Item 105.
20	1	1964	1-9	0-1	No	100	100	100	93.0	37.0	1	----	------	Owner: Charles Mason Property is west of mendon S.A. #8 at point 1.35 miles south of intersection with U.S. Route #4. Test #1 is fine sand to silt on winding knoll in west end of field. Rejected for Item 105.
	2	1964	0.5-10	0-0.5	No	100	100	99.4	73.6	8.0	1½	----	Gran. Borrow (Sand)	Test #2 is fine sand on small knoll in north center of field. Acceptable for Item 105.
21	1	1964	0-5.5	Stripped	Yes	100	100	76.1	29.0	9.0	1	----	Gran. Borrow (Sand)	Owner: Joseph Pellerin Pit is south of Town Highway #20 (Killington Avenue) at point 0.6 mile east of U.S. Route 7. Test #1 is in floor of pit and consists of silt to clay. Acceptable for Item 105.
	2	1964	0.5-6	0-0.5	Yes	100	100	91.0	32.0	5.0	1	----	Gran. Borrow (Sand)	Test #2 is silt and stones in east face 90' from south

* Percentage of Total Sample

TABLE I RUTLAND GRANULAR DATA SHEET NO. 9

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft.)	Over-burden (Ft.)	Existing Pit	Sieve Analysis % Passing 1½"	5/8"	#4	#100	#270	Color AASHO T-21	Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
														end. Acceptable for Item 105.
22	1	1964	0-4.0	Stripped	Yes	100	100	89.2	47.0	11.0	1	----	-------	Owner: Elmer and Constance Erickson Property is south of Perkins Road (Curtis Avenue Extension) 0.4 mile east of S.A. #5. Test #1 is in floor of small pit about 0.2 mile southwest of house. Rejected for Item 105.
	2	1964	0.5-8	0-0.5	Yes	100	100	91.9	47.0	12.0	1	----	-----	Test #2 is in south face of pit. Material tested is silt with stones. Rejected for Item 105.
23	1	1964	3-8	0-3	No	85.6	68.4	49.0	43.0	16.0	3	18.6%	------	Owner: Ted Hubbard Property is east of S.A. #5 about 0.6 mile south of intersection with Town Highway #27. Test #1 is silt with stones in top of knoll east of Hubbard farm. Rejected for Item 105.
	2	1964	0.5-8	0-0.5	No	54.1	34.3	22.5	51.0	15.0	5+	14.4%	-----	Test #2 is pebbly gravel on same ridge as Test #1. It is northeast of Test #1 and between successive peaks. Rejected for Item 105.
24	1	1964	5-12	0-5	Yes	70.9	50.6	28.2	48.0	22.3	1	14.8%	-----	Owner: Raymond Buck Pits are east of S.A. #5 about 0.8 mile south of intersection with Town Highway #27.

* Percentage of Total Sample

TABLE I

RUTLAND GRANULAR DATA SHEET NO. 10

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft.)	Over-burden (Ft.)	Existing Pit	Sieve Analysis % Passing 1½"	5/8"	#4	#100	#270	Color AASHO T-21	Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
														Test #1 is coarse gravel in east face of north pit. Rejected for Item 105.
	2	1964	0.5-8	0-0.5	Yes	83.8	56.0	33.6	33.0	13.0	1	15.0%	-------	Test #2 is coarse gravel west of pits and 65' north of entrance road. Rejected for Item 105.
25	1	1964	0-8	Stripped	Yes	100	100	83.2	53.0	18.0	1	----	-------	Owner: Rutland Development Corporation Pit is south of Moore Business Forms Bldg., which is 0.25 mile east of U.S. Route 7, 1.75 miles south of U.S. Route 4. Test #1 is silt with stones in east end of pit. Rejected for Item 105.
	2	1964	0.5-18	0-0.5	Yes	100	100	64.3	60.0	20.0	1	----	-------	Test #2 is silt and stones in face of pit to west of Test #1. Rejected for Item 105.
26	1	1964	1-9	0-1	Yes	100	100	99.2	60.5	12.0 11.9*	1	----	-------	Owner: Rutland Fire Clay Co. Pit is 0.2 mile east of U.S. Route 7 and south of S.A. #5. Test #1 is medium sand on west of pit at foot of face. Rejected for Item 105.
	2	1964	0.5-9.5	0-0.5	Yes	100	100	100	50.0	10.0	1	----	Gran. Borrow (Sand)	Test #2 is medium sand on top of pit and 155' southwest. Acceptable for Item 105.
27	1	1964	1-9	0-1	Yes	100	100	80.4	50.0	15.0	3	----	-------	Owner: R. S. Seward Property with pits is 0.25 mile north and east of corner of S.A. #5 intersection with U.S. Route 7.

* Percentage of Total Sample

TABLE I RUTLAND GRANULAR DATA SHEET NO. 11

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft.)	Over-burden (Ft.)	Existing Pit	Sieve Analysis % Passing 1½"	5/8"	#4	#100	#270	Color T-21	Abrasion Passes AASHO T-4-35	VHD Spec.	Remarks
														Test #1 is in floor of small pit south of warehouse. It is silt with stones. Rejected for Item 105.
	2	1964	0.5-10	0-0.5	No	100	100	92.3	24.0	6.0 5.5*	2½	----	Gran. Borrow (Sand)	Test #2 is sand on top of knoll between pits. Acceptable for Item 105.
	3	1964	0.5-9	0-0.5	No	100	100	86.1	35.3	8.0 6.9*	1	----	Gran. Borrow (Sand)	Test #3 is sand on north end of same knoll as Test #2. Acceptable for Item 105.
28	1	1964	1-8	0-1	No	100	100	98.9	69.0	53.3	i	----	-------	Owner: Anthony Belock Property is east of S.A. #2 at point 1.15 miles south of intersection with S.A. #8. Test #1 is silt to clay in field 175' east of road. Rejected for Item 105.
29	1	1964	1-10	0-1	Yes	100	100	73.1	52.0	15.0	4	----	------	Owner: Jessie Billings Property is west of S.A. #2 at point 1.45 miles south of intersection with S.A. #8. Test #1 is silt with stones 10' west of top of pit. Rejected for Item 105.
30	1	1964	0.5-8	0-0.5	No	100	100	73.6	16.2	8.0 5.9*	2	----	Gran. Borrow (Sand)	Owner: Charles Heleva Property is west of S.A. #2 about 1.1 miles south of intersection with S.A. #8. Test #1 is silt with stones in pasture on top of knoll. Acceptable for Item 105.
	2	1964	0.5-7	0-0.5	No	63.9	63.5	58.7	34.0	8.8	2	----	Gran. Borrow	Test #2 is silt with stones 400' west and downhill from Test #1. Acceptable for Item 105.

* Percentage of Total Sample

TABLE I

RUTLAND GRANULAR DATA SHEET NO. 12

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft.)	Over-burden (Ft.)	Existing Pit	Sieve Analysis % Passing 1½"	5/8"	#4	#100	#270	Color AASHO T-21	Abrasion Passes AASHO T-4-35	VHD Spec.	Remarks
31	1	1964	1-9.5	0-1	No	100	100	56.6	37.0	11.0	4½	----	-------	Owner: Anthony Belock Property is west of S.A. #2 and opposite its junction with Town Highway #25. Test #1 is sandy silt with stones in large knoll 250' southwest of house. Rejected for Item 105.
32	1A	1964	1-6	0-1	Yes	73.1	60.6	47.0	11.0	4.0	1½	12.9%	Gravel	Owner: Calvary Cemetery Assoc. Property is south of cemetery on Meadow Street about 0.45 mile south of S.A. #8. Test #1A is on top of south end of knoll. It is sandy gravel. Acceptable for Item 201.
	1B	1964	6-10.5	0-6	Yes	100	100	95.0	50.4	13.0* 12.4*	2	----	------	Test#1B in fine sand. Rejected for Item 105.
	2	1964	1-9	0-1	Yes	72.4	61.5	42.6	11.0	4.0	1	23.6%	Gravel	Test #2 is coarse gravel on northeast end of knoll that overlooks cemetery to north. Acceptable for Item 201.
33	1	1964	1-8.5	0-1	No	100	100	79.8	41.0	10.0	1	----	Gran. Borrow	Owner: William Sharp Property is west of S.A. #2 and east of Campbell Road. Entrance to field is from Campbell Road at point 0.7 mile from intersection with S.A. #2. Test #1 is silt with stones on brow of hill in east part of field. Acceptable for Item 105.

* Percentage of Total Sample

TABLE I

RUTLAND GRANULAR DATA SHEET NO. 13

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft.)	Over-burden (Ft.)	Existing Pit	Sieve Analysis % Passing 1½"	5/8"	#4	#100	#270	Color AASHO T-21	Abrasion Passes AASHO T-4-35	VHD Spec.	Remarks
34	1	1964	0-2.5	Stripped	Yes	100	100	66.6	40.0	10.0	1	----	Gran. Borrow	Owner: John Flory Pit is located about 0.20 mile southeast of U.S. Route #4 and 0.25 west of Campbell Road. Test #1 is silt with boulders in floor of west portion of pit. Acceptable for Item 105.
	2	1964	0-6	Stripped	Yes	84.6	70.1	53.3	32.0	11.0	2	14.7%	-------	Test #2 is sandy gravel with boulders west of pit in woods near boulder trench. Rejected for Item 105.
35	1	1964	0-5.5	Stripped	Yes	86.3	77.1	57.8	18.5	6,5 3.8*	1	----	Gran. Borrow (Grav.)	Owner: Vermont Marble Company Pit is between railroad and Clarendon River about 0.1 mile north of U.S. Route #4. Test #1 is silt with stones in floor of east part of pit. Acceptable for Item 105.
	2	1964	0-8	Stripped	Yes	100	100	95.6	63.1	26.5 25.3*	1	----	-------	Test #2 is fine sand with stones in face at south end. Rejected for Item 105.
36	1	1964	0-20	Stripped	Yes	100	93.9	97.8	13.7	4.0 3.9*	1	----	Sand	Owner: A. T. Howe Pit is 0.2 mile east of S.A. #3 at point about 0.2 mile north of U.S. Route 4. Test #1 is sand on top of southeast end. Acceptable for Item 202.
	2	1964	0-15	Stripped	Yes	82.8	65.4	50.2	21.0	6.0	1	13.0%	Gran. Borrow (Grav.)	Test #2 is gravel in face of pit at east end. Acceptable for Item 105.

* Percentage of Total Sample

TABLE I

RUTLAND GRANULAR DATA SHEET NO. 14

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft.)	Over-burden (Ft.)	Existing Pit	Sieve Analysis % Passing 1½"	5/8"	#4	#100	#270	Color AASHO T-21	Abrasion Passes AASHO T-4-35	VHD Spec.	Remarks
	3	1964	0-9	Stripped	Yes	78.5	65.1	51.9	35.0	10.0	2	----	Gran. Borrow (Grav.)	Test #3 is gravel below sand portion in southeast end. Acceptable for Item 105.
	4	1964	0-8	Stripped	Yes	74.1	68.9	56.9	27.0	8.0	2½	8.6%	Gran. Borrow (Grav.)	Test #4 is sandy gravel in south face of west end. Acceptable for Item 105.
37	1	1964	6-10	0-6	Yes	90.2	72.0	45.5	13.0	3.5	1	8.2%	Gravel	Owner: Italian Aid Society Pit is north of U.S. Route #4 at point 0.6 miles west of junction with S.A. #7. Test #1 is gravel just in back ofbuilding on east extension of pit. Acceptable for Item 201.
38	1	1964	0.5-7	0-0.5	Yes	57.9	39.4	26.8	22.0	5.5	3½	7.2%	Grav. Borrow (Grav.)	Owner: James Mainolfi Pit is located 0.1 mile north of S.A. #7 on east side of East Creek. Test #1 is coarse gravel at south end of pit floor. Acceptable for Item 105.
39	1	1964	0.5-6.0	0-0.5	No	100	98.9	90.8	37.2	13.5 12.3*	2½	----	-------	Owner: Vermont State Department of Institutions Property consists of fields and wooded slopes north of West Oak Street. Test #1 is fine sand on highest point of field about 300' north of Oak Street. Rejected for Item 105.
40	1	1964	0-3	Stripped	Yes	100	89.0	76.5	5.4	1.8 11.4*	1	----	Sand	Owner: Edward Dunton

* Percentage of Total Sample

TABLE I

RUTLAND GRANULAR DATA SHEET NO. 15

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft.)	Over-burden (Ft.)	Existing Pit	Sieve Analysis % Passing 1½"	5/8"	#4	#100	#270	Color AASHO T-21	Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
														Property and pit are east of Vt. Highway #3 0.7 mile north of intersection with U.S. Route #4. Test #1 is medium sand in face of pit northeast of house. Acceptable for Item 202.
41	1	1964	0.5-9.5	0-0.5	No	86.6	82.5	61.7	26.0	7.0	1	----	Gran. Borrow	Owner: David Dickinson Property and pit are east of Vt. Highway #3 1.7 miles north of intersection with U.S. Route #4. Test #1 is sandy gravel on second knoll east of Dickinson house. Acceptable for Item 105.
	2	1964	0.5-5	0-0.5	Yes	73.8	63.3	43.6	20.0	8.0	1½	39.0%	Gran. Borrow (Grav.)	Test #2 is coarse gravel in face of pit at northeast end of pasture. Acceptable for Item 105.
	3	1964	0-9	Stripped	No	84.5	77.5	58.1	19.1	11.0 6.4*	1	----	-------	Test #3 is fine sand to silt with stones on small stripped knoll north of barn. Rejected for Item 105.
42	1	1964	0.5-6	0-0.5	Yes	45.7	41.5	31.7	32.0	12.5	1	----	-------	Owner: Mrs. Mildred Lester Pit is located north of Town Highway #19 about 0.1 mile east of S.A. #4. Test #1 is coarse gravel in floor of small pit. Rejected for Item 105.
	2	1964	3-10	0-3	Yes	52.6	41.8	29.4	22.0	5.0	1	25.3%	Gran. Borrow (Grav.)	Test #2 is coarse gravel in face of pit. Acceptable for Item 105.

* Percentage of Total Sample

TABLE I — RUTLAND GRANULAR DATA SHEET NO.16

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft.)	Over-burden (Ft.)	Existing Pit	Sieve Analysis % Passing 1½"	5/8"	#4	#100	#270	Color AASHO T-21	Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
43	1	1964	3-15	Stripped	Yes	55.5	22.9	11.1	60.0	28.0	1	20.3%	-------	Owner: Tom Gerdin Property and pits are in area bounded by Town Highway #11 on north, U.S. Route 7 on east, Town Highway #12 on s south and S.A. #4 on west. Test #1 is sand and stones in face of first pit about 300' east of S.A. #4. Rejected for Item 105.
	2	1964	3.5-10	Stripped	Yes	100	96.4	95.2	35.2	6.0 5.7*	1	----	Gran. Borrow (Sand)	Test #2 is sand in floor of same pit. Acceptable for Item 105.
	3A	1964	0-4	Stripped	Yes	100	100	100	9.0	1.3	1	----	Sand	Test #3A is sand in face of large shallow pit southeast of Tests #1 and #2. Acceptable for Item 202.
	3B	1964	4-10	Stripped	Yes	80.2	67.2	51.9	3.0	11.0	1	----	-------	Test #3B is sand and stones in face below Test #3A. Rejected for Item 105.
	4	1964	0-8	Stripped	Yes	100	100	100	68.0	8.8	1	----	Gran. Borrow (Sand)	Test #4 is sand in floor of main pit at south end. Acceptable for Item 105.
	5	1964	0-10	Stripped	Yes	100	100	100	8.0	1.3	3	----	Sand	Test #5 is sand in floor of east portion of same pit as Test #4. Acceptable for Item 202.
	6	1964	0-7	Stripped	Yes	78.9	76.1	71.1	10.7	3.0 2.1*	1½	----	Gran. Borrow (Sand)	Test #6 is sand between two highest points in floor of main pit area. Acceptable for Item 105.
	7	1964	0-8	Stripped	Yes	100	91.6	86.0	7.7	4.0 3.4*	1½	----	Sand	Test #7 is pebbly sand in floor of pit extension southwest of Test #4. Acceptable for Item 202.

* Percentage of Total Sample

TABLE I RUTLAND GRANULAR DATA SHEET NO. 17

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft.)	Over-burden (Ft.)	Existing Pit	Sieve Analysis % Passing 1½"	5/8"	#4	#100	#270	Color AASHO T-21	Abrasion Passes AASHO T-4-35	VHD Spec.	Remarks
	8	1964	27-35	0-27	Yes	67.6	21.0	37.3	15.0	5.0	1½	-----	Gravel	Test #8 is coarse gravel in face of pit extension at extreme southwest part of pit area. Acceptable for Item 201.
	9	1964	0.5-9.5	0-0.5	Yes	60.1	46.7	36.1	25.0	8.0	2	28.4%	Gran. Borrow (Grav.)	Test #9 is coarse gravel on top of knoll south of Test #4 and southeast of Test #8. Acceptable for Item 105.
	10	1964	0.5-10	0-0.5	No	100	100	100	16.0	2.5	2½	----	Sand	Test #10 is fine sand south of Test #9 knoll. Acceptable for Item 202.
	11	1964	0.5-10	0-0.5	No	100	97.3	92.0	18.4	3.0 2.8*	2½	----	Gran. Borrow (Sand)	Test #11 is sand about 300' southwest of Test #10. Acceptable for Item 105.
	12	1964	1-9	0-1	No	78.8	76.1	53.8	6.0	8.0	1½	----	Gran. Borrow	Test #12 is silt with stones in different area 0.4 mile southwest of Gerdin residence. Acceptable for Item 105.
44	1	1964	1.5-9	Stripped	Yes	100	90.9	84.3	11.8	3.75 3.2*	1	----	Sand	Owner: Marvin Atwood Road to pits joins U.S. Route 7 at point 3.6 miles north of intersection of #7 with U.S. Route #4. Test #1 is silty sand in floor of small pit at northeast end. Acceptable for Item 201.
	2A	1964	0.5-20	0-0.5	Yes	NO RECORD OF SAMPLE SENT TO LABORATORY							-------	
	2B	1965	20-30	0-20	Yes	71.8	63.9	51.5	6.0	2.5	1	----	Gran. Borrow (Gravel)	Test#2B is sandy gravel in face of same pit as Test #1. Meets grading requirements for Item 202, but there was insufficient proper size stones for the percent of

* Percentage of Total Sample

TABLE I RUTLAND GRANULAR DATA SHEET NO. 18

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft.)	Over-burden (Ft.)	Existing Pit	Sieve Analysis % Passing 1½"	5/8"	#4	#100	#270	Color AASHO T-21	Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
														wear test.
44	3	1964	0-3	Stripped	Yes	[illegible]	89.0	70.8	18.4	10.0 7.1*	1	----	Gran. Borrow	Test #3 is silt to clay in east portion of main pit floor. Acceptable for Item 105.
	4	1964	0-6.5	Stripped	Yes	[illegible]	55.3	27.1	13.0	6.25	1	21.3%	Gran. Borrow (Grav.)	Test #4 is coarse gravel in floor of southernmost extension of same pit. Acceptable for Item 105.
	5	1964	0.5-6	0-0.5	Yes	72.0	59.4	42.4	16.0	7.0	1½	24.3%	Gran. Borrow (Grav.)	Test #5 is dirty gravel above pits on east. Acceptable for Item 105.
	6	1964	1-4.5	0-1	Yes	69.5	58.2	42.5	10.0	4.0	3	20.6%	Gravel	Test #6 is dirty gravel taken on top of pit where Test #1 and #2 were taken and about 35 feet south of Rim.
	7	1964	1-7	0-1	No	82.7	76.6	69.4	2.1	1.25 0.9*	2	----	Gran. Borrow (Sand)	Acceptable for Item 201. Test #7 is coarse sand in pasture south east of main pit. Acceptable for Item 105.

* Percentage of Total Sample

RUTLAND PROPERTY OWNERS - GRANULAR

TABLE II RUTLAND ROCK DATA SHEET NO. I

Map Ident. No.	Field Test No.	Year Field Tested	Rock Type	Existing Quarry	Method of sampling	Abrasion AASHO T-3	Remarks
1	1	1964	Gneiss	No	Chip	3.4%	Owner: Thomas Gerdin. Test #1 was taken on a hillside about 0.3 mile west of S.A. #4 at point 1.05 miles north of intersection with Town Highway #19. Apparently this material is Biotite-Microcline Gneiss which has been mapped as the Mount Holly complex. Sample representative of about 400 feet of material along the ridge. Rock is weathered smooth, black and white banded and verges on quartzite in places. The sample was taken on or near contact with the overlying Cheshire Quartzite. A field road leads from Gerdins's home to end of field below ridge.
2	1	1964	Dolomite	No	Chip	3.8%	Owner: Anna E. Young. Test #1 was taken along a blasted face north of Town Highway #30 at point 1.1 miles east of U.S. Route 7. This material is typical Dunham dolomite, buff-weathered and grayish on fresh surface. Sample is representative of 210 feet of material alongside the road. This sample is typical of a large knoll with extension possibilities.
3	1	1964	Dolomite	Yes	Chip	5.2%	Owner: Robert J. Huntoon. Test #1 was taken along eastern facing west face of quarry which is located south of Dave Mac's junk yard on U.S. Route 7 at point 1.3 miles north of U.S. Route 4. This material is typical Dunham Dolomite Buff- weathered and grayish on fresh surface. Quarry is 200' by 170' and has a 10'-15' face. Bedding dips gently to the east. In the northeast

TABLE II RUTLAND ROCK DATA SHEET NO. 2

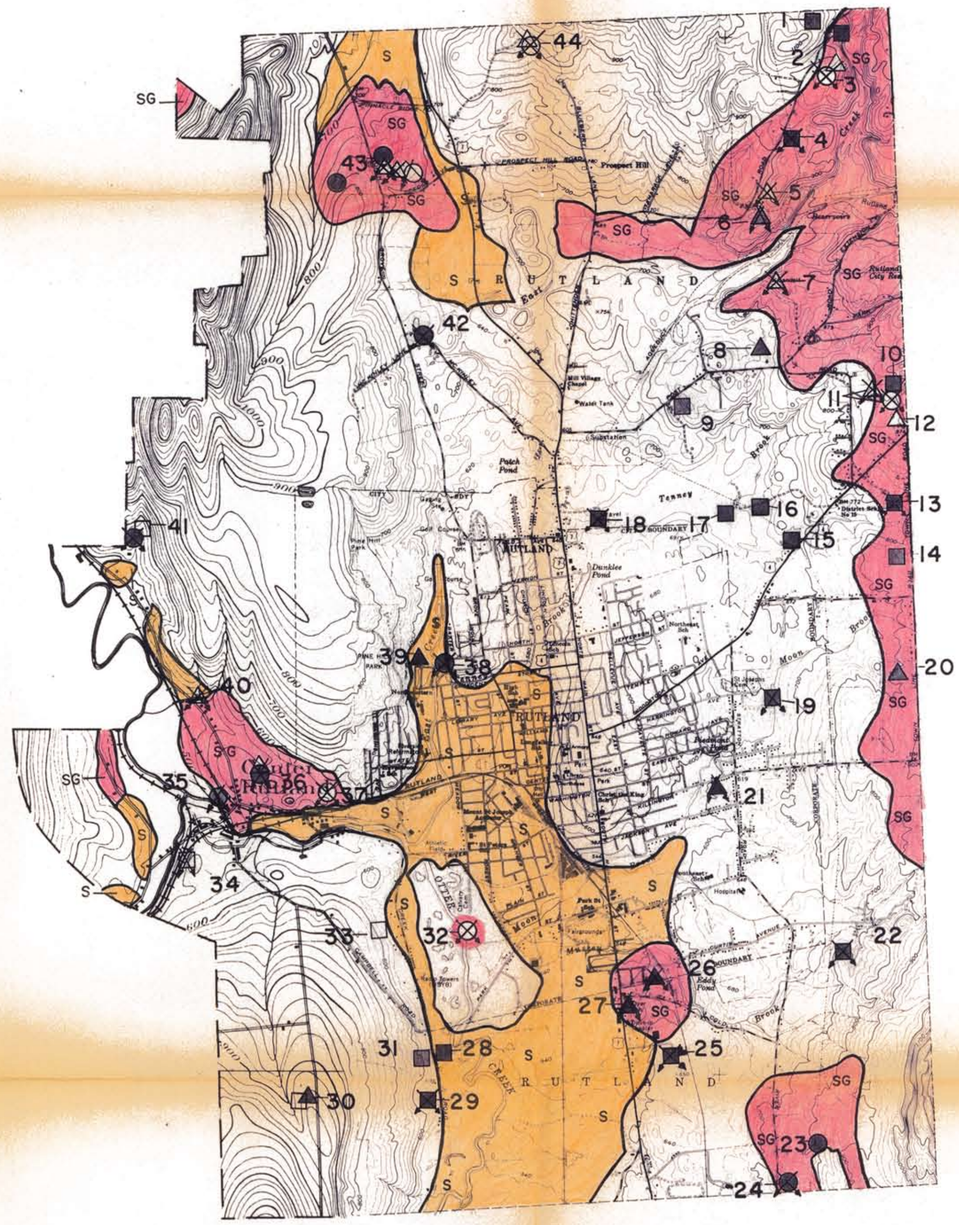
Map Ident. No.	Field Test No	Year Field Tested	Rock Type	Existing Quarry	Method Of Sampling	Abrasion AASHO T-3	Remarks
							ccrner of the quarry rock is quite shattered and broken up. There is a 0.25 mile access road from U.S. Route 7.
4	1	1964	Dolomite	No	Chip	5.8%	Owner: David Dickinson Test #1 was taken along predominant outcrop about 0.2 mile east of house on State Highway #3 at point 1.75 miles north of intersection with U.S. #4. Out crop is grayish dolomite with quartzose veins. The sample represented 175' of outcrop in the middle of the north-south exposure that is 625' in overall lenght. This probably is the Clarendon Springs Dolomite. There is a farm road to field at western edge of outcrop.
5	1	1964	Quartzite	Yes	Chip	2.6%	Owners: City of Rutland Quarry is located about 0.75 mile southeast of Rocky Pond. Test #1 was taken near south end of rim and represents 145 feet along strike. Test #2 was taken near north end and represents 130' along strike. Face varies from 10-35 feet in depth. Quarry was formerly used for a crushing operation but is now in disuse. Rock is typical Cheshire Quartzite predominantly white with black graphtic phyllite and sandy dolomite inclusions. There is an access road from old crusher plant and U.S. #4, 1.05 miles to south.
	2	1964	Quartzite	Yes	Chip	1.4%	
6	1	1964	Dolomite	Yes	Chip	5.2%	Owner: Larry Ward Quarry is east of U.S. Route 7 at point 0.65 mile north of intersection with U.S. Route 4. Test #1 is taken along face which is 175' long and varies from 40' - 60' in depth. Materials is typical Dunham

RUTLAND ROCK DATA SHEET NO. 3

Map Ident. No.	Field Test No.	Year Field Tested	Rock Type	Existing Quarry	Method of Sampling	Abrasion AASHO T-3	Remarks
							dolomite, buff-weathered and grayish on fresh surface. There is an access road to U.S. Route #7.
7	1	1964	Dolomite	Yes	Chip	2.0%	Owner: Raymond Stearns Quarry is north of U.S. Route #4 at point 0.45 miles west of intersection with S.A. #7. Tee Test #1 is taken along face which is 175' long and varies from 40-10' in depth. Material is buff-weathered Dunham Dolomite b but is silicious in spots and becomes schistose on surface at north end of quarry.
8	1	1964	Dolomite	No	Chip	6.2%	Owner: Ted Hubbard Area sampled is a ridge of Danby formation outcrops about 0.4 mile east of Hubbard's house which is on S.A. #5 at point 0.6 mile south of intersection with Town Highway #27. Test #1 is taken at random along north-south trending ridge. It consits of white to dark gray dolomite with numerous quartz stringers and knots. 250' are of test quality but the southern 300' of ridge is too weathered to sample. There is an access road from house.

RUTLAND PROPERTY OWNERS-ROCK

Dickinson, David	4
Gerdin, Tom	1
Hubbard, Ted	8
Huntoon, Robert J.	3
Rutland, City of	5
Stearns, Raymond	7
Ward, Larry	6
Young, Anna E.	2



LEGEND

- ○ GRAVEL, ACCEPTABLE FOR ITEM 201 (sub-base of gravel)
- ● GRAVEL, DEPLETED OR NOT ACCEPTABLE FOR ITEM 201
- △ SAND, ACCEPTABLE FOR ITEM 202 (sub-base of sand)
- ▲ SAND, DEPLETED OR NOT ACCEPTABLE FOR ITEM 202
- □ GRANULAR BORROW, ITEM 105
- ■ MATERIAL NOT ACCEPTABLE FOR ITEM 105
- ⊗ EXISTING PIT
- SG SAND & GRAVEL DEPOSIT
- S SAND DEPOSIT
- 3 IDENTIFICATION NUMBER (refer to data sheets)

RUTLAND

SCALE 1:31,250

0.5 0 1 MILE

CONTOUR INTERVAL 20 FEET

1966

GRANULAR MATERIALS MAP

BY

VERMONT DEPARTMENT OF HIGHWAYS

IN COOPERATION WITH

U.S. BUREAU OF PUBLIC ROADS

NOTE: BASED ON U.S.G.S. TOPOGRAPHIC MAPS

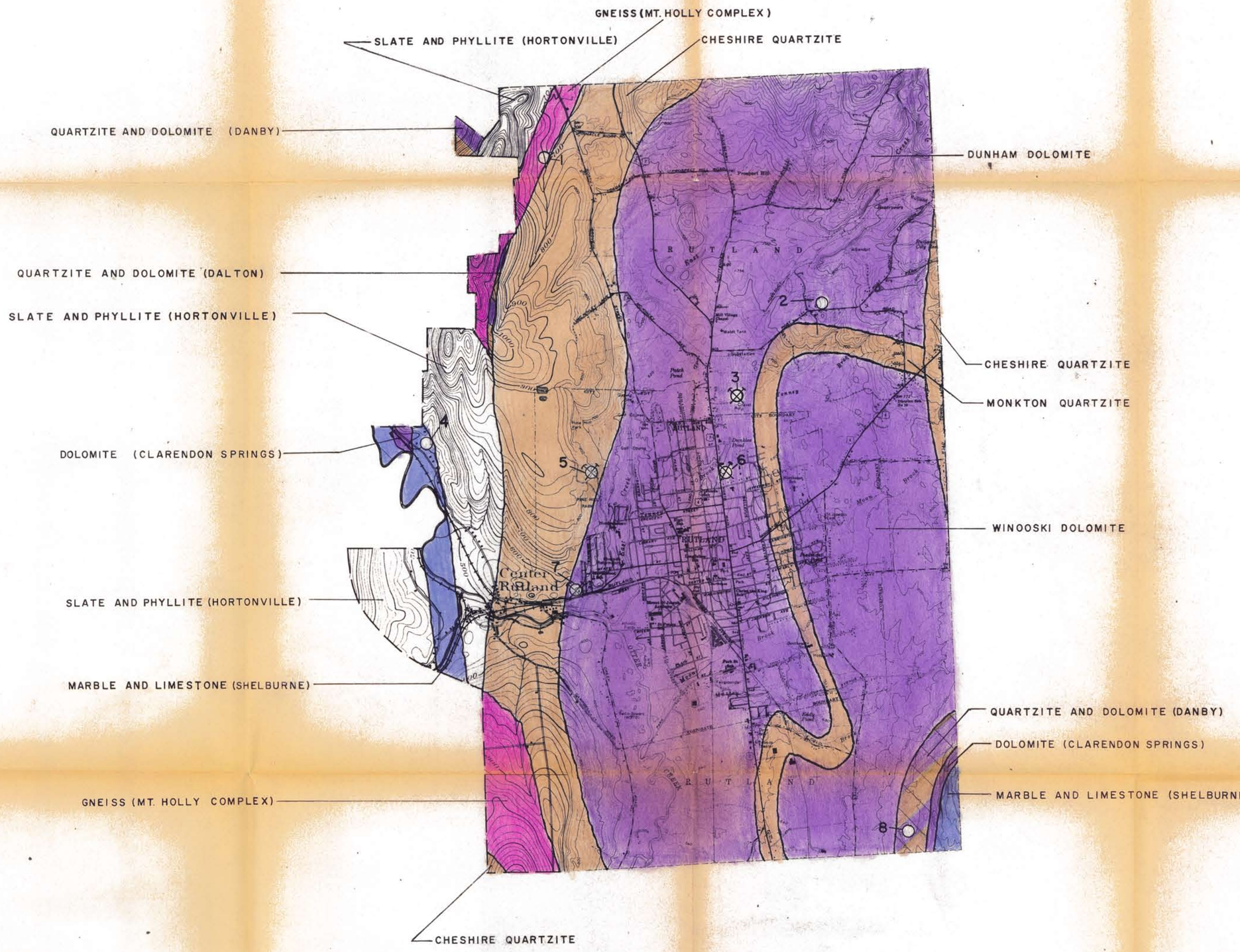
PLATE 1

GRANULAR

RUTLAND COUNTY VT. HWY. DISTRICT NO. 3

REVISIONS

DATE							
BY							



LEGEND

- ROCK, ACCEPTABLE FOR ITEM 204 (sub-base of crushed rock)
- ROCK, NOT ACCEPTABLE FOR ITEM 204
- EXISTING QUARRY
- GRANITE TO DIORITE (light to intermediate igneous rocks)
- AMPHIBOLITE, GABBRO, DIABASE, METADIABASE, GREENSTONE, TRAP DIKES (basic or dark igneous rocks)
- PERIDOTITE, PYROXENITE, SERPENTINITE (ultra-basic igneous rocks)
- GNEISS
- QUARTZITE
- DOLOMITE
- MARBLE, LIMESTONE
- SCHISTS, SLATES, PHYLLITES, SHALES, CONGLOMERATES
- 3 IDENTIFICATION NUMBER (refer to data sheets)

RUTLAND

SCALE 1:31,250

1 .5 0 1 MILE

CONTOUR INTERVAL 20 FEET

1966

ROCK MATERIALS MAP

BY

VERMONT DEPARTMENT OF HIGHWAYS

IN COOPERATION WITH

U.S. BUREAU OF PUBLIC ROADS

NOTE: BASED ON U.S.G.S. TOPOGRAPHIC MAPS

PLATE II

ROCK

RUTLAND COUNTY VT. HWY. DISTRICT NO. 3

REVISIONS

DATE							
BY							