

SURVEY OF HIGHWAY CONSTRUCTION MATERIALS
IN THE TOWN OF FAIRLEE, ORANGE 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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1. Various departments and individuals of the Vermont State Department of Highways, notably the Planning and Mapping Divisions and the Highway Testing Laboratory.
2. Professor D. P. Stewart of Miami University, Oxford, Ohio.
3. Professor Charles G. Doll, Vermont State Geologist, University of Vermont, Burlington, Vermont.
4. The 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 is to compile an inventory of highway construction materials in the State of Vermont. Prior to the efforts of the survey personnel, as described in this and other reports, investigations for highway construction materials were conducted only as the immediate situation required. Thus, only limited areas were surveyed, and the over-all picture of material resources was not available. Highway contractors or resident engineers were usually required to locate the materials for projects and have samples tested by the Highway Testing Laboratory. The additional cost of repeated exploration for construction material was passed on to 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 about locations of suitable material is an important factor in the planning of 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. 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.

Incllosures

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; i.e. Vermont Geological Survey Bulletins, Vermont State Geologist Reports, United States Geological Survey Bedrock Maps, 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, 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 tested 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, 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 of verification. When possible, locations of 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 whenever 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 Fairlee is located in Orange County in the eastern portion of the State. It is bounded on the north by the Town of Bradford, on the west by the Town of West Fairlee, on the south by the Town of Thetford, and on the east by the Connecticut River. It is in the Vermont Piedmont, a "plateau-like region" often described as an area of uplifted surface that has been dissected and glaciated similar to a peneplain. Drainage is into streams and brooks leading into Lake Fairlee, Lake Morey and the Connecticut River.

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.

The 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.

The rocks of Fairlee are comprised chiefly of quartzites, schists, phyllites, slates, greenstones and granitic type rocks. They are divided into numerous formations and formation members which generally strike north-south.

The Gile Mountain Formation occurs in the western half of the town (see Plate 2). The rock is schist and quartzite, generally unsuitable for highway usage. No tests were taken in this formation.

The Meetinghouse slate member of the Gile Mountain formation occurs along the western shore of Lake Morey extending to the north and south boundaries of the town.

Because of the unsuitability of this type of rock for highway usage, no tests were taken in this member.

The next rock types encountered going eastward are the greenstone and schist of the Sunday Mountain member of the Orfordville formation. This member also occurs east of Lake Morey, extending northward (see Plate 2.) Two tests were made of this rock, producing abrasions of 1.6% and 3.0%.

The Orfordville Formation occurs north and south of Lake Morey, flanked by the Sunday Mountain greenstone in the north. It extends in both directions to the town boundaries. The Albee formation occurs as a stringer in the Sunday Mountain greenstone, and along the Connecticut River. The rock in both these formations is quartzite and phyllite, not sampled.

The Fairlee quartz monzonite occurs in the eastern part of the town at the Palisades and extending north. The rock grades from a chloritic gneiss to an orbicular granitic rock. A number of tests were made of this rock, producing abrasions ranging from 2.4% to 4.6%.

There are also small, narrow outcrops of granodiorite porphyry and quartz diorite occurring in the Meetinghouse slate member. Many of these are too small in extent to be considered as the site of a quarrying operation. Two tests were taken in the quartz diorite, producing abrasions of 5.0% and 5.8%.

As is evident (Plate 2) there are numerous areas in the Town of Fairlee containing rock meeting abrasion requirements for highway usage. Generally speaking, the Fairlee quartz monzonite, the Sunday Mountain volcanics and the quartz diorite outcrop mentioned appear to offer the greatest potential. More detailed information is available at the office of the Engineering Geology Section, Materials Division, Vermont Department of Highways.

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 again 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 Deposits

The granular material of the town of Fairlee are chiefly of glacial, marine, and lacustrine origin. They occur in beach gravels, kames and lake sands throughout the town. There are numerous pits dotting these features, generally in the eastern half of the town (see Plate 1).

In most cases, the beach gravel deposits contain sand with stones, to a depth of about 3' to 9'. The lake sands are generally fine sands, of somewhat shallow depth. The kame deposit on the western shore of Lake Morey contains sand with

some stones.

There are a number of pits and areas in these features containing material acceptable for highway usage. It is possible that further testing may disclose other sources of acceptable material in the town.

SUMMARY OF ROCK FORMATIONS IN THE TOWN OF FAIRLEE

Albee Formation: Massive, gray, white-weathered quartzite and feldspathic quartzite interbedded with greenish-gray slate, phyllite, feldspathic phyllite and quartzose argillaceous phyllite. Micaceous quartzite, quartz-mica schist, mica schist, and hornfels containing porphyroblasts of biotite, garnet, staurolite, and sillimanite in the vicinity of granitic plutons. Soda rhyolite tuff occurs locally. Micaceous quartzite characterized by thin, schistose "pinstripe" partings is common in many areas.

Gile Mountain Formation: Gray quartz-muscovite phyllite or schist, interbedded and intergradational with gray micaceous quartzite (graywacke northeast of Nulhegan River), calcareous mica schist, and locally, quartzose and micaceous crystalline limestone like that of the Waits River Formation. The phyllite and schist commonly contain porphyroblasts of biotite, garnet, or staurolite and locally kyanite, andalusite, or sillimanite.

Meetinghouse Slate member of the Gile Mtn. Formation: Chiefly gray slate or phyllite characterized by beds of gray schistose quartzite 1/8" to 3" thick.

Orfordville Formation: Carbonaceous phyllite; minor quartzite.

Sunday Mountain Volcanics member of the Orfordville Formation: Greenstone, chloritic schist, felsite, and quartz-feldspar-sericite schist.

Undifferentiated Granitic Rock: Coarse-grained, greenish gray quartz monzonite, with local pink tinges. Essential minerals are bluish-gray quartz, perthitic microcline, and saussuritized oligoclase or andesine, accompanied by chlorite, sericite, and green saogenitic biotite. Generally crushed and foliated. (Jarvis B. Hadley, Vermont Geological Survey Bulletin No. 1, 1950).

Granodiorite porphyry. Small phenocrysts of quartz and albite feldspar in an aphanitic, light gray groundmass. Dikes range from a foot or two thick and a few tens of feet long, to larger bodies at least 100 feet thick and 2,000 feet long (Jarvis B. Hadley, Vermont Geological Survey Bulletin No. 1, 1950).

Quartz diorite. A moderately coarse-grained, non-porphyritic rock, composed of quartz, albite, secondary chlorite, sericite, and calcite. The rock at the margin of this body is considerably foliated parallel to the contacts with the country rock, but the central part of the body is not foliated.

GLOSSARY OF SELECTED GEOLOGIC TERMS

- Granodiorite A type of deep-seated, crystalline igneous rock composed of plagioclase, a smaller amount of orthoclase or other alkalic feldspar, quartz, and usually one or more of the dark minerals, biotite, hornblende, or pyroxene.
- Greenstone A field name for rocks that have been so metamorphosed or other wise so altered that they have assumed a distinctive color owing to the presence of chlorite, epidote, or actinolite.
- Kame A conical hill of stratified drift, deposited at a glacial terminus by glacial streams flowing in or on the ice.
- Kame Terrace An accumulation of stratified drift laid down chiefly by streams between a glacier and an adjacent valley wall.
- Lacustrine Of or pertaining to lakes.
- Marine Deposits Sedimentary deposits laid down in the sea, usually beyond the seaward edge of the littoral belt.
- Moraine An accumulation of drift with an initial topographic expression of its own built within a glaciated region chiefly by the direct action of glacier ice.
- Outwash Stratified drift that is stream built beyond the glacier; laid down by meltwater streams issuing from the face of the glacier ice.
- Penplain An extensive land area of very low relief produced in the ultimate stage of a normal cycle of subaerial erosion. The surface may be nearly level and generally bevels underlying rocks without regard to their hardness and structure. The altitude of the surface as formed is close to ultimate base level, sea level, but most of those seen today have been uplifted and dissected.
- Phyllite A fine-grained foliated metamorphic rock intermediate between the mica schists and slates, into which it may grade. The cleavage is made possible by the development of a large amount of the potash mica, sericite, which also gives the rock a distinctive silvery appearance. Between the cleavage planes minerals other than mica usually predominate and garnet and pyrite may occur in visible crystals. Phyllite is usually light in color but various darker shades, even black, are found. Practically all phyllites are derived from fine-grained sedimentary rocks by mechanical deformation and recrystallization. The fracture is intermediate between the smooth, even cleavage of slate and the rather splintery fissility of schist; the rock is not as tough as slate.

 Physiography

A description of nature or natural phenomena in general. Broadly it designates the study of the physical divisions of the globe-lands, seas and atmosphere; but most writers restrict it to the study of the surface features of the land.

Plateau

A tableland or flat-topped area of considerable extent elevated above surrounding country on at least one side. The surface may be fairly smooth but not necessarily so, large mountain masses may rise above it, and deep canyons may be cut into it. Generally, if a large part of the original surface has been destroyed by streams it is called a dissected plateau.

Porphyritic

The texture of igneous rocks that have larger crystals, phenocrysts, set in a finer groundmass of small crystals or glass or both.

Quartzite

A firm, compact rock composed of grains of quartz so firmly united that fracture takes place across the grains instead of around them. A metamorphosed sandstone.

 Schist

A crystalline rock with a secondary foliation or lamination based on parallelism of platy or needle-like grains. The name refers to the tendency to split along the foliation.

Slate

An homogeneous, metamorphic rock, so fine-grained that no mineral grains can be seen. Slate splits with a foliation so perfect that it yields slabs having plane smooth surfaces.

Strike

The direction of a line formed by the intersection of a bedding plane, vein, fault, slaty cleavage, schistosity, or similar geologic structure, with a horizontal plane. It is at right angles to the dip.



BIBLIOGRAPHY

1. A survey of the glacial geology of Vermont being conducted by D. P. Stewart, the partial results of which are published in Vermont Geological Survey Bulletin No. 19, 1961.
2. "Soil Survey (Reconnaissance) of Vermont" by W. J. Latimer, 1930. United States Department of Agriculture, Bureau of Chemistry and Soils.
3. "Soil Exploration and Mapping", Highway Research Board, Bulletin 28, 1950.
4. "Survey of Highway Aggregate Materials in West Virginia", Engineering Station, West Virginia University, Morgantown, West Virginia. December, 1959.
5. "Materials Inventory, Bangor Quadrangle, South Half, September, 1959", University of Maine.
6. "Glacial Geology and the Pleistocene Epoch", Richard F. Flint, John Wiley and Sons, 1947.
7. Report of Vermont State Geologist, Vol. 10, 1915-1916. "Post Glacial Marine Waters in Vermont", H. L. Fairchild.
8. "A Handbook of Rocks", J. F. Kemp, D. VanNostrand Company, Inc., June, 1946.
9. "Rock and Rock Minerals", L. V. Pirson, John Wiley and Sons, Inc., June, 1949.
10. "Glossary of Selected Geologic Terms", W. L. Stokes and D. J. Varnes, Colorado Scientific Proceedings, Vol. 16, 1955.
11. "Centennial Geologic Map of Vermont", C. G. Doll.
12. United States Department of the Interior, Geological Survey, Mt. Cube Quadrangle, New Hampshire-Vermont.
13. Geology of the Bradford-Thetford Area, Orange County, Vermont, Jarvis B. Hadley, Vermont Geological Survey Bulletin No. 1, 1950.

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	0-5
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 ($3\frac{1}{2}$) 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
1 $\frac{1}{2}$ "	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

APPENDIX I
(cont'd.)

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	4"	100
	Item 205-A	No. 4	25-50
	Fine Graded	1½"	95-100
	Item 205-B	No. 4	30-60

"At least thirty (30) percent by weight of the stone content of the crushed gravel, that is, the material retained on the Number 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 1

FAIRLEE GRANULAR DATA SHEET NO. 1

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft.)	Overburden (Ft.)	Existing Pit	Sieve Analysis % Passing					Color AASHO T-21	Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
						1/2"	5/8"	#4	#100	#270				
1	1	1964	1-9	0-1	No	--	--	51.6	13.0	4.0	3	25.0%	Gran. Borrow (Grav.)	Owner: George Milne A wooded area (small, soft-woods). Test #1 taken along woods road, 80' east of Brushwood Road. Material is sand, with large stones, from 1'-5.5', and gravel from 5.5'-9'. Barely fails to meet grading requirements for Item 201. Has slight excess passing No. 270 mesh sieve. Acceptable for Item 105.
	2	1964	0.5-10	0-0.5	No	--	--	52.5	16.0	5.0	1	29.6%	Gran. Borrow (Grav.)	Test #2 taken in cleared area. Material is similar to Test #1 with smaller stones, wet in bottom. Rejected for Item 201. Has excess material passing No. 100 and No. 270 mesh sieve. Abrasion is high. Acceptable for Item 105.
2	1	1964	1-8	0-1	No	100	100	100	10.0 10.0*	3.0 3.0*	2	----	Sand	Owner: Alberta Dragg A "triangular-shaped" meadow north of Lake Fairlee and Vt. Route 113. Test #1 taken 170' south of vacant dwelling, 73' east of town road. Material limited in quantity due to water table, influenced by nearby lake. Material is sand, wet at 8'. Acceptable for Items 202 and 105.

*Percentage of Total Sample

TABLE 1

FAIRLEE GRANULAR DATA SHEET NO. 2

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft.)	Overburden (Ft.)	Existing Pit	Sieve Analysis % Passing					Color AASHO T-21	Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
						1 1/2"	5/8"	#4	#100	#270				
3	1	1964	1-10	1-21	Yes	100	96.7	88.2	17.0 15.0*	1.75 1.5*	1	----	Sand	Owner: Donald Gulick (Britton Lumber Yard) A lumber yard through which proposed Interstate Route 91 is scheduled to pass. Test #1 taken in west face of small pit. 0-1' overburden, 1'-21' gently dipping beds of sand and sand with stones, (also some thin beds of silt to clay), 21'-26' silt to clay (wet). Sampled 1'-21' - acceptable for Item 202 and 105.
	2	1964	1-9	0-1	No	100	100	92.6	35.0 32.4*	6.0 5.6*	1	----	Gran. Borrow (Sand)	Test #2 taken south of pit, 100' east of Sta. 4725 + 0 (N.B.). Material is sand and silt with stones, silt & clay (wet) at 9'. Rejected for Item 202. Has excess passing No. 100 and No. 270 mesh sieves. Acceptable for Item 105.
	3	1964	1.5-10.5	0-1.5	No	100	100	89.1	43.0 38.3*	10.0 8.9*	1	----	Gran. Borrow (Sand)	Test #3 taken 30' left of Sta. 4724 + 90 (S.B.). Material is sand with stones, rejected for Item 202. Has an excess of material passing No. 100 and No. 270 mesh sieves. Acceptable for Item 105.
	4	1964	0.5-13.5	0-0.5	No	100	100	97.5	40.0 39.0*	6.5 6.3*	1	----	Gran. Borrow (Sand)	Test #4 taken 65' left of Sta. 4733 + 30 (S.B. Lane). Material is sand with stones,

*Percentage of Total Sample

TABLE 1

FAIRLEE GRANULAR DATA SHEET NO. 3

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft.)	Overburden (Ft.)	Existing Pit	Sieve Analysis					Color AASHO T 21	Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
						% Passing								
						1 1/2"	5/8"	#4	#100	#270				
	5	1964	1-4.5	0-1	No	--	--	46.1	14.0	3.0	2 1/2	25.4%	Gran. Borrow (Grav.)	Rejected for Item 202. Has excess material passing No. 100 and No. 270 mesh sieves. Acceptable for Item 105. Test #5 taken 40' left of Sta. 4730 + 50 (S.B.). Material is 0-1' overburden, 1'-4.5' gravel, 4.5-11' fine silt and clay. Sampled only 1' 4.5'. Rejected for Item 201. Abrasion is high. Acceptable for Item 105.
4	1	1964	1.5-12	0-1.5	Yes	--	--	63.1	33.0	10.0	1	25.1%	Gran. Borrow (Grav.)	Owner: Norman B. Hall An old pit overgrown with trees, between town highway and Vt. Route 113. Test #1 taken 10' from west end of pit, 245' south of town highway. Material is sandy gravel, with silty gravel in bottom. Rejected for Item 201. Contains 36.9% stone, minimum allowed is 40%. Has excesses passing No. 100 and No. 270 mesh sieves. Abrasion is high. Acceptable for Item 105.
	2	1964	1-13	0-1	Yes	91.2	93.4	68.1	15.0	3.25	1	----	Gran Borrow (Sand)	Test #2 taken near eastern end of pit. Material is stony, rejected for Item 202. Has excesses retained on 1 1/2" screen, and No. 4 screen.
	3	1964	1-12	0-1	Yes	93.4	91.4	76.0	27.0	4.0	1	----	Gran. Borrow (Sand)	Test #3 taken 275' north-east of pit, 85' south of town highway. 0-1' overburden.

*Percentage of Total Sample

TABLE 1

FAIRLEE GRANULAR DATA SHEET NO. 4

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft.)	Overburden (Ft.)	Existing Pit	Sieve Analysis					Color AASHO T-2;	Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
						% Passing								
						1/2"	5/8"	#4	#100	#270				
	4	1964	0.5-12	0-0.5	Yes	95.5	86.7	71.1	29.0 20.6*	7.5 5.3*	1	----	Gran. Borrow (Sand)	en, 14' poorly sorted gravel, 4'-12' sand with stones, bottom-sand with stones. Rejected for Item 202. Has excess passing No. 100 mesh sieve. Acceptable for Item 105. Test #4 taken 90' south of town highway. Material is sand with stones, several boulders in hole. Rejected for Item 202. Has excess material passing No. 100 and No. 270 mesh sieves. Acceptable for Item 105.
5	1	1964	0-4.5	Stripped	Yes	100	100	99.5	4.0 4.0*	0.5 0.5*	1 1/2	----	Sand	Owner: B. and M. Railroad Railroad pit and area along railroad tracks. Dimensions of pit are approximately 200' by 200'. Test #1 taken in floor of pit near southeast corner. Material is sand (good-looking), with fine sand bottom. Acceptable for Items 202 and 105.
	2	1964	1-10	0-1	Yes	100	100	100	6.0 6.0*	2.0 2.0*	1	----	Sand	Test #2 taken 40' east of pit, west of wooded area. Material is sand, acceptable for Items 202 and 105.
	3	1964	0.5-9	0-0.5	Yes	100	100	99.4	3.0 3.0*	1.0 1.0*	1	----	Sand	Test #3 taken 25' east of east face of pit. Material is sand, acceptable for Items 202 and 105.
						*Percentage of Total Sample								

TABLE 1

FAIRLEE GRANULAR DATA SHEET NO. 5

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft.)	Overburden (Ft.)	Existing Pit	Sieve Analysis % Passing					Color AASHO T-21	Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
						1 1/2"	5/8"	#4	#100	#270				
	4	1964	0.5-11	0-0.5	Yes	100	100	99.0	5.0 5.0*	0.5 0.5*	1	----	Sand	Test #4 taken 110' north of Test #1, 170' east of tracks, in floor. Material is sand, acceptable for Items 202 and 105. Apparently there is a good deal of sand left here, meeting specifications for Item 202.
6	1	1964	0.5-5	0-0.5	No	100	100	90.6	8.0 7.2*	1.75 1.6*	1	----	Sand	Owner: Tal Sargent A clearing in woods along trail, 0.1 mile south of Town Road #16. Test #1 taken in center of clearing, 0-0.5' overburden, 0-5'-5' sand with stones, 5'-7' silt to clay, 7'-11' glacial till, bottom-till. Sampled 0.5'-5'-acceptable for Items 202 and 105.
7	1	1964	1-13	0-1	Yes	100	100	97.3	52.0 50.6*	21.0 20.4*	1	----	----	Owner: H. Brackett A small pit along private road, 250' south of Town Road #16. Not much material left. Test #1 taken in face of pit. Material is silt and sand with stones, with ledge at 13'. Rejected for Item 105.
8	1A	1964	1-5.5	0-1	Yes	100	100	88.2	32.0 28.2*	3.5 3.1*	1	----	Gran. Borrow (Sand)	Owner: Tal Sargent A small pit, 115' by 99', north of Town Road #16. Test #1 taken in north face of pit.

*Percentage of Total Sample

TABLE 1

FAIRLEE GRANULAR DATA SHEET NO. 6

Map Ident. No.	Field Test No.	Year Field Sample Tested (Ft.)	Depth of Sample (Ft.)	Overburden (Ft.)	Existing Pit	Sieve Analysis % Passing					Color AASHTO T-2	Abrasion AASHTO T-4-35	Passes VHD Spec.	Remarks
						1 1/2"	5/8"	#4	#100	#270				
	1B	1964	7.5-12	--	Yes	--	--	30.0	5.0	2.0	1	31.2%	Gran. Borrow	0-1' overburden, 1'-5.5' "beach sand" with stones, 5.5' - 7.5' varved silts and clays, 7.5'-12' gravel, gravel bottom. Took 2 samples. Test #1A represents 1'-5.5' level. Rejected for Item 202. Has excess material passing No. 100 mesh sieve. Acceptable for Item 105. Test #1B represents 7.5'-12' level. Material rejected for (Grav.) Item 201. Has high abrasion. Acceptable for Item 105.
	2	1964	0-12	--	Yes	100	100	72.7	13.0 9.5*2.5*	3.0	1	27.4%	Sand (Grav.)	Test #2 taken in floor of pit. Material is sand with stones. Rejected for Item 201. Has high abrasion. Has excess passing No. 4 screen. Rejected for Item 201, but acceptable for Item 202 and Item 105.
	3	1964	0.5-6.5	0-0.5	Yes	--	--	52.9	9.0	3.0	2 1/2	30.6%	Gran. Borrow (Grav.)	Test #3 taken 175' north of pit, 40' from fence, on road. 0-0.5' overburden, 0.5'-2.5' "beach gravel", 2.5'-6.5' silt, ledge bottom. Rejected for Item 201. Has high abrasion. Acceptable for Item 105.
	4	1964	1-8	0-1	Yes	100	100	82.9	14.0 11.6*2.5*	3.0	1	----	Sand	Test #4 taken in northeast corner of pine plantation, 50' west of bedrock. Material is sand with stones, acceptable for Items 202 and 105.

*Percentage of Total Sample

TABLE 1

FAIRLEE GRANULAR DATA SHEET NO. 7

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft.)	Overburden (Ft.)	Existing Pit	Sieve Analysis % Passing					Color AASHO T-21	Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
						1 1/2"	5/8"	#4	#100	#270				
9	1	1964	1-25	0-1	Yes	100	100	99.7	4.0 4.0*	1.0 1.0*	1	----	Sand	Owner: Verne Batchelder A sand pit in bank, north of road leading to U.S. Route 5. Test #1 taken in north face of pit. Material appears to be "lake sand", with cross-bedding, and some silt lenses and bands of silt. Acceptable for Items 202 and 105.
	2	1964	0-7	Stripped	Yes	100	100	98.6	9.0 8.9*	1.75 1.7*	1	----	Sand	Test #2 taken in floor of pit, 40' south of north face of pit. Material is sand, acceptable for Items 202 and 105. Extension lies to the north; limited by ledge to the west.
10	1	1964	1-5	0-1	Yes	94.6	81.7	65.2	22.0 14.3*2.6*	4.0	1	----	Gran. Borrow (Grav.) (Sand)	Owner: Verne Batchelder A large pit in two levels. Dimensions are 100' by 395'. Test #1 taken 80' south of fence, (west of path and east of pit). 0-1' overburden, 1'-5' sand and stones, 5'-11' fine sand and silt, 11'-13' silt to clay. Water at 11'. Rejected for Item 202. Has excess passing No. 4 screen, and excess retained on 1 1/2" screen. Also rejected for Item 201. Contains too little stone; insufficient proper-size stone for abrasion test. Acceptable for Item 105.
	2	1964	--	--	--	*Percentage of Total Sample NOT SAMPLED					--	--	--	Test #2 taken south of dam and

TABLE 1

FAIRLEE GRANULAR DATA SHEET NO. 3

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft.)	Overburden (Ft.)	Existing Pit	Sieve Analysis % Passing					Color AASHO T-21	Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
						1/2"	5/8"	#4	#100	#270				
	3	1964	1-8	0-1	Yes	100	100	49.4	10.0 4.9*1.0*	3.0	1 1/2	----	Gran. Borrow (Sand)	stream. Material is silt to clay, not sampled. Test #3 taken 115' north of stream and dam. 0-1' overburden, 1'-3' "beach gravel", 8'-9' glacial till, till bottom. Sampled 1'-3'. Rejected for Item 202. Has excess retained on No. 4 mesh sieve. Acceptable for Item 105.
	4	1964	1-9	0-1	Yes	--	--	49.8	13.0	3.0	2 1/2	32.5%	Gran. Borrow (Grav.)	Test #4 taken 20' right of old Town Road #14 above pit. Material is "beach gravel" rejected for Item 201. Has high abrasion. Acceptable for Item 105.
	5	1964	0-14	Stripped	Yes	--	--	54.4	10.0	1.25	1	41.9%	Gran. Borrow (Grav.)	Test #5 taken in floor of upper level (east end) of pit. Material is "beach gravel", rejected for Item 201. Has high abrasion. Acceptable for Item 105.
	6	1964	1.5-15	0-1.5	Yes	92.4	80.6	58.5	10.0 5.9*0.9*	1.5	1	33.7%	Gran. Borrow (Sand)	Test #6 taken in west face of pit, near middle. Material is sand with stones. Rejected for Item 201. Has high abrasion. Rejected for Item 202. Excess material retained on No. 4 screen. Acceptable for Item 105.
11	1	1964	4-10	0-1	No	100	100	66.9	21.0	7.0	1 1/2	----	Gran. Borrow	Owner: Verne Batchelder A small clearing in overgrown

*Percentage of Total Sample

TABLE 1

FAIRLEE GRANULAR DATA SHEET No. 9

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft.)	Overburden (Ft.)	Existing Pit	Sieve Analysis % Passing					Color AASHTO T-21	Abrasion AASHTO T-4-35	Passed VHD Spec.	Remarks
						1 1/2"	5/8"	#4	#100	#270				
	2	1964	0.5-11	0-0.5	No	---	--	50.9	27.0	9.0	1	--	Gran. Borrow (Grav.)	pasture, on side hill. Test #1 taken in level area in edge of road. 0-1' overburden, 1'-3' ablation till, 3'-10' some stratified sands with boulders. Acceptable for Item 105. Test #2 taken in north end of clearing, 200' north of Test #1, on "dryer" spot on slope. Area appears to contain ablation till with pockets of stratified drift, perhaps an old beach. Material rejected for Item 201. Has excess passing No. 100 and No. 270 mesh sieve. Insufficient proper-size stone for abrasion test. Acceptable for Item 105.
12	1	1964	0-60	Stripped	Yes	--	--	66.5	12.0	2.0	1	22.2%	Gran. Borrow (Grav.)	Owner: Layton Blake A large pit with many levels, west of Lake Road. Test #1 taken in face of upper-most level of pit. Material is mostly sand with layers of stones. Bottom half of face appears to be dipping slightly to southeast. Rejected for Item 201. Has excess passing No. 4 screen. Acceptable for Item 105.
	2	1964	0-9	Stripped	Yes	90.2	81.7	72.5	14.0 10.2*	1.5 1.1*	1	-----	Gran. Borrow (Grav.) (Sand)	Test #2 taken in floor of upper level. 0-9' layers of sand, fine sand and stones

*Percentage of Total Sample

TABLE 1

FAIRLEE GRANULAR DATA SHEET NO. 10

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft.)	Over-burden (Ft.)	Exist. ing Pit	Sieve Analysis % Passing					Color AASHO T-21	Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
						1 1/2"	5/8"	#4	#100	#270				
	3	1964	0.5-7	0-0.5	Yes	84.3	73.7	57.0	13.0 7.4*	3.0 1.7*	1	35.2%	Gran. Borrow	(few over 6") similar to top of face, of Test #1, 9'-11' fine sand to silt to clay (wet), in thin layers, ledge at 11'. Rejected for Item 201-contains only 27.5% stone. Insufficient proper-size stone for abrasion test. Also rejected for Item 202. Has excess retained on 1 1/2" screen. Acceptable for Item 105. Test #3 taken in floor of lowest level of pit. Ledge showing in west face of lower level. Material is sand with stones, with broken ledge at 7'. Rejected for Item 201. Has high abrasion. Acceptable for Item 105.
13	1	1964	2-12	0-2	Yes	---	--	55.9	5.0	2.0	1	23.4%	Gravel	Owner: Vermont Highway Dept. A large pit west of Lake Morey. Test #1 taken in floor of pit, 65' west of bins. Material is sand with stones, some of which are over 6", but not included in sample. Acceptable for Items 201 and 105.
	2	1964	0-12	Stripped	Yes	93.5	79.5	62.1	6.0 3.7*	1.75 1.1*	1	20.0%	Gran. Borrow (Grav.)	Test #2 taken in northeast edge of upper level - at edge of a narrow shelf. Material is sand with stones, rejected for Item 201. Has excess passing No. 4 screen. Also rejected for Item 202. Insufficient material passing No. 4 screen Acceptable for Item 105.

* Percentage of Total Sample

TABLE 1

FAIRLEE GRANULAR DATA SHEET NO. 11

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft.)	Overburden (Ft.)	Existing Pit	Sieve Analysis % Passing					Color AASHTO T-21	Abrasion AASHTO T-4-35	Passes VHD Spec.	Remarks
						1 1/2"	5/8"	#4	#100	#270				
	3	1964	3.5-40	0-3.5	Yes	--	--	38.1	8.0	2.0	1	25.0%	Gravel	Test #3 taken in uppermost face of pit. Material is gravel, (many stones over 6" not included in sample). Acceptable for Item 201 and 105.
	4	1964	0-13	Stripped	Yes	--	--	49.6	4.0	1.0	1	19.2%	Gravel	Test #4 taken in west face of lower level of pit. 0-13' mostly fine gravel, 13'-41' slope, covered by slumped-in material, floor of pit at 41'. Acceptable for both Items 201 and 105.
14	1	1964	1-5.5	0-1	No	100	100	100	90.0 90.0*26.0*	26.0	1	--	--	Owner: Dorothy Dickinson A ridge along proposed Interstate Route 91, west of U.S. Route 5. Test #1 taken in point of ridge at southern end, 70' left of Sta. 4932+00 of median line. Material is fine sand, rejected for both Items 202 and 105. Has excess material passing ilo. 100 and No. 270 mesh sieves.
15	1	1964	1-9	0-1	Yes	100	100	100	32.0 32.0*	14.0 14.0*	1 1/2	----	----	Owner: Henry Fairbrother A small sand pit east of railroad tracks, and U.S. Route 5. Low-lying meadows on east, sloping down to the Connecticut River. Test #1 taken 30' east of fence, north of pit. Material is sandy, with clay bottom. Rejected for both Items 202 and 105. Has excess

*Percentage of Total Sample

TABLE 1

FAIRLEE GRANULAR DATA SHEET NO. 12

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft.)	Overburden (Ft.)	Existing Pit	Sieve Analysis % Passing					Color AASHO T-21	Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
						1 1/2"	5/8"	#4	#100	#270				
	2	1964	5-10	0-0.5	No	100	100	99.1	5.0 5.0*	1.0 1.0*	2	----	Sand	passing No. 100 and No. 270 mesh sieves. Test #2 taken 110' east of Test #1, near edge of bank. 0-0.5' overburden, 0-5'-5' fine sand and silt, 5'-10' sand. Sampled sand level-acceptable for both Items 202 and 105.
16	1	1964	1-6	0-1	No	--	N O T	S A M P L E D			--	--	--	Owner: Franklin Ordway A clearing in woods, west of proposed Interstate Route 91 and powerline. Test # 1 taken 15' north of trail. Ledge showing in area. Material is till, not sampled.
17	1	1964	0.5-10	0-0.5	No	100	100	100	60.0 60.0*	22.0 22.0*	1	----	----	Owner: Francis O'Brien A meadow east of U. S. Route 5, and west of the Connecticut River. Test #1 taken 10' east of fence along railroad tracks. Material is fine sand and silt, rejected for both Items 202 and 105. Has excess passing No. 100 and No. 270 mesh sieves.
	2	1964	1.5-9	0-1.5	No	100	100	100	68.0 68.0*	23.0 23.0*	4 1/2	---	--	Test #2 taken 20' west of end of fence, west of corn field. Material is silty sand, rejected for both Items 202 and 105. Has excess passing No. 100 and No. 270 mesh sieves. Has a color of 4 1/2.
	3	1964	4-8	0-1	No	100	100	99.4	6.0 6.0*	2.0 2.0*	2 1/2	----	Sand	Test #3 taken 20' from east edge of field, 0-1' overburden, 1'-4'

*Percentage of Total Sample

TABLE 1

FAIRLEE GRANULAR DATA SHEET NO. 13

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft.)	Overburden (Ft.)	Existing Pit	Sieve Analysis % Passing					Color AASHO T-21	Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks	
						1 1/2"	5/8"	#4	#100	#270					
														sand and silt, 4'-8.5' sand (uniform). Acceptable for Items 202 and 105.	
18	1	1964	1-8	0-1	No	100	100	100	97.0 97.0*	43.0 43.0*	1	---	---	Owner: Francis O'Brien An area across U. S. Route 5 from Area #17, and west of O'Brien home. Test #1 taken at junction of field drives, 15' south of one, 20' west of other. Material is fine sand with silt. Rejected for Items 202 and 105.	
19	1	1964	0-4	Stripped	Yes	--	N O T S A M P L E D					---	--	---	Owner: Camp Lanakila (Mrs. Carole Huibert) A small pit north of Lanakila Lodge, west of private road. Pit has a maximum height of 15'. Test #1 taken along entrance to pit. 0-4' silty sand, 4'-5' clay. Not sampled.
	2	1964	1-8	0-1	Yes	96.5	88.2	73.2	11.0 8.1*	2.0 1.5*	3	----	Sand	Test #2 taken in face of pit. Material is stony sand, acceptable for Item 202 and 105.	
	3	1964	0-3	Stripped	Yes	N O T S A M P L E D					--	----	----	Test #3 taken in floor of pit. Material is sand with stones, with silt to clay at 3'-4.5'. Not sampled.	
20	1	1964	0-6.5	Stripped	Yes	--	--	66.5	12.0 8.0*	1.0 0.7*	1	33.3%	Gran.	Owner: Aloha Manor Borrow A large pit (235' by 80'), north (Grav.) of Lake Morey, and east of Lake Road. Maximum height of pit face is 35'. Test #1 taken 80' east of west face of pit, in floor of pit. Material is sand with stones	

*Percentage of Total Sample

TABLE 1

FAIRLEE GRANULAR DATA SHEET NO. 14

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft.)	Overburden (Ft.)	Existing Pit	Sieve Analysis % Passing					Color AASHO T-21	Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
						1 1/2"	5/8"	#4	#100	#270				
	2	1964	1-14	0-1	Yes	99.2	91.0	74.4	8.0 5.9*	1.25 0.9*	1	24.0%	Sand (Grav.)	with clay bottom. Rejected for Item 201. Has excess passing No. 4 screen. Has high abrasion. Acceptable for Item 105. Test #2 taken in westface 2' below floor. Material is sand with stones. Tested the material for both Items 201 and 202. Rejected for Item 201-has excess passing No. 4 screen. Acceptable for Items 202 and 105.
21	1	1964	1.5-6	0-1.5	No	100	100	86.3	31.0 26.8*	11.5 9.9*	1	----	----	Owner: George Pratt A clearing in woods (partially grown-over), east of Lake Road, and west of powerline. Test #1 taken 20' north of cellar hole, and north-east of cabin. Material is till, with ledge at 6'. Rejected for Items 202 and 105. Has excess passing No. 100 and No. 270 mesh sieves.
	2	1964	1-4 ?	0-1	No	100	100	76.4	33.0 25.2*	13.0 9.9*	1	----	----	Test #2 taken 200' south of woods road, along fire lane, in small clearing. Material is silty sand with stones, rejected for

*Percentage of Total Sample

TABLE 1

FAIRLEE GRANULAR DATA SHEET NO. 15

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft.)	Overburden (Ft.)	Existing Pit	Sieve Analysis					Color AASHO T-21	Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
						% Passing								
						1 1/2" #4	5/8" #10	#20	#40	#60				
													Items 202 and 105. Has excess passing No. 100 and No. 270 mesh sieves.	
22	1	1964	1-5.5	0-1	Yes	100	95.6	80.5	23.0 18.5*	3.5 2.3*	1	-----	Gran. Borrow (Sand)	Owner: Harold Sargent A medium-size pit, north of Lake Morey, along the Lake Road. Dimensions of pit are 145' by 90'. Test #1 taken in east face of pit. Material is sand with stones, rejected for Item 202. Slight excess passing No. 100 mesh sieve. Acceptable for Item 105.
	2	1964	0-3	Stripped	Yes	100	97.0	83.1	33.0 27.4*	5.0 4.2*	1	-----	Gran. Borrow (Sand)	Test #2 taken in floor of pit. Material is sand with stones, with stones in bottom, rejected for Item 202. Has excess passing No. 100 mesh sieve. Acceptable for Item 105.
23	1	1964	1 7.5	0-1	No	100	95.8	81.1	17.0 13.8*	2.5 2.0*	1	----	Sand	Owner: Bonnie Oaks Lodge A pit and area north of Lake Morey, and west of Lake Road. Test #1 taken south of pit, 250' left of Sta. 5050 + 00 S.B. lane of proposed Interstate Route 91. 0-1' overburden, 1'-7.5' sand with stones, 7.5'-3.5' silt and clay, silt and clay bottom. Sampled 1'-7.5'; acceptable for Items 202 and 105.
	2	1964	1-6	0-1	No	100	100	81.7	30.0	13.0	1	----	---	Test #2 taken 387' left of Sta. 5050 + 00 on knoll. Ma-

*Percentage of Total Sample

TABLE 1

FAIRLEE GRANULAR DATA SHEET NO. 16

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft.)	Overburden (Ft.)	Existing Pit	Sieve Analysis % Passing					Color AASHTO T-21	Abrasion AASHTO T-4-35	Passes VHD Spec.	Remarks	
						1 1/2"	5/8"	#4	#100	#270					
	3	1964	0-9	Stripped	Yes	100	100	86.9	31.0 26.9*	13.0 11.3*	2	-----	-----	Material is sandy till, with ledge at 6'. Rejected for Item 105. Has excess material passing No. 270 mesh sieve. Test #3 taken in north face of pit, north of Tests #1 and #2. Material is sand with stones, rejected for both Items 202 and 105. Has excess passing No. 100 and No. 270 mesh sieves.	
	4	1964	0-8	Stripped	Yes	100	87.4	72.4	29.0 21.0*	10.0 7.2*	3 1/2	-----	Gran. Borrow (Sand)	Test #4 taken in floor of pit, 145' left of Sta. 5051+00 S.B. of proposed Interstate Route 91. Material is sand with stones, rejected for Item 202. Has excess passing No. 100 and No. 270 mesh sieve.	
	5	1964	1-1.5	0-1	No	--	NOT SAMPLED					--	-----	-----	Test #5 taken north of pit, along road. Hit ledge at 1.5', not sampled.
	6	1964	2.5-9	0-2.5	No	100	100	94.8	27.0 25.6*	11.0 10.4	3	-----	-----	Test #6 taken 330' left of Sta. 5055+50, S.B. Lane and 15' north of large elm. 0-2.5' overburden, 2.5-4.5' sand, 4.5'-9' sand and silt, sand and silt bottom. Sampled 2.5'-9' - rejected for Items 202 and 105. Has excesses passing No. 100 and No. 270 mesh sieves.	
24	1	1964	2-4	0-1.5	No	NOT SAMPLED					--	-----	---	Owner: Mallary Farms A-pit just east of Lake Road; Test #1 taken by maple tree	

* Percentage of Total Sample

TABLE 1

FAIRLEE GRANULAR DATA SHEET NO. 17

Map Ident. No.	Field Test No.	Year	Depth of Field Sample Tested (Ft.)	Overburden (Ft.)	Existing Pit	Sieve Analysis					Color AASHO T-21	Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
						% Passing								
						1 1/2"	5/8"	#4	#100	#270				
	2A	1964	0.5-4.5	0-0.5	No	--	--	52.8	10.0	3.0	2 1/2	31.4%	Gran. Borrow	east of pit and powerline. Material is silt and sand with stones, ledge at 4'. Not sampled. Test #2 taken in south face. 0-0.5' overburden, 0-5'-4.5' "beach gravel", 4.5'-14' sand with silt. Took two samples- Test #2A represents upper gravel portion. Material rejected for Item 201. Has high abrasion. Acceptable for Item 105.
	2B	1964	4.5-14	--	Yes	100	100	98.9	65.0 64.3*	14.0 13.3*	1	----	----	Test #2B represents lower portion of face (4.5'-14'), Material is silty sand, rejected for Items 202 and 105. Has excess material passing No. 100 and No. 270 mesh sieves.
	3	1964	0-5	Stripped	Yes	100	100	97.1	46.0 44.7*	6.5 6.3*	1	----	Gran. Borrow (Sand)	Test #3 taken in southern corner, in pit floor. 0-5' sand, 5'-9' sand and silt. Sampled sandy portion- rejected for Item 202. Has excess material passing No. 100 and No. 270 mesh sieves. Acceptable for Item 105.
	4	1964	1-12	0-1	Yes	--	--	61.1	5.0	1.25	3	35.3%	Gran. Borrow (Grav.)	Test #4 taken in northwest face of pit. Material is "beach gravel" - rejected for Item 201. Has excess passing No. 4 screen. Also, abrasion is high. Acceptable for Item 105.

*Percentage of Total Sample

TABLE 1

FAIRLEE GRANULAR DATA SHEET NO. 18

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft.)	Overburden (Ft.)	Existing Pit	Sieve Analysis					Color AASHO T-21	Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
						%Passing								
						1 1/2"	5/8"	#4	#100	#270				
	5	1964	0-10	Stripped	Yes	100	100	96.1	28.0 26.9*	4.0 3.8*	2	----	Gran. Borrow (Sand)	Test #5 taken 25' east of Test #4 in pit floor. Material is sand with silt, more silt near bottom, with water in bottom; rejected for Item 202. Has excess passing No. 100 mesh sieve. Acceptable for Item 105.
25	1A	1964	1-5	0-1	Yes	--	--	63.6	8.0	2.0	1	33.6%	Gran. Borrow (Grav.)	Owner: Mallary Farms A recently opened pit being used by the Town of Bradford, north of other Mallary pit, just east of Lake Road. Present dimensions of pit are 110' north-south, by 30' east-west. Test #1 taken in west face. 0-1' overburden, 1'-5' "beach gravel", 5'-12' fine sand with some layers of good-sized stones. Water at 12'. Two tests taken. Test #1A represents upper portion; flat-lying beds, mostly flat stones, imbricated. Rejected for Item 201. Has excess passing No. 4 screen. Has high abrasion. Acceptable for Item 105.
	1B	1964	5-12	---	Yes	100	100	93.7	29.0 27.2*	1.0 0.9*	1	----	Gran. Borrow (Sand)	Test #1B represents lower portion. Most of the layered stones are sub-angular, dipping northeast. Rejected for Item 202. Has excess passing No. 100 mesh sieve. Acceptable for Item 105.
	2	1964	0-4	Stripped	Yes	87.0	85.8	76.4	25.0 19.1*	4.0 3.1*	1 1/2	----	Gran. Borrow	Test #2 taken in floor of pit. Material is sand with stones,

*Percentage of Total Sample

TABLE 1

FAIRLEE GRANULAR DATA SHEET NO. 19

p ent. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft.)	Over- burden (Ft.)	Exist- ing Pit	Sieve Analysis % Passing					Color AASHTO T-21	Abrasion AASHTO T-4-35	Passes VHD Spec.	Remarks
						1 1/2"	5/8"	#4	#100	#270				
	3	1964	0-4.5	Stripped	Yes	100	96.2	88.3	18.0 15.9*3.5*	4.0	1	----	(Sand) Sand	rejected for Item 202. Has excess retained on 1 1/2" screen. Has excess passing No. 100 mesh sieve. Acceptable for Item 105. Test #3 taken in a small depression, 150' north of Test #2. Material is sand, wet at 4.5'. Acceptable for Items 202 and 105.
26	1	1964	2-6	0-2	Yes	--	--	55.6	15.0	3.0	3	40.0%	Gran. Borrow (Grav.)	Owner: George Pratt A pit west of Lake Road and Map Ident. No. 25. Test #1 taken in west face of pit. 0-2' overburden, 2'-6' sand and large stones. 6'-11' silt and sand in layers with stones, bottom-silt to clay. Rejected for Item 201. Has high abrasion. Acceptable for Item 105.
	2	1964	0.5-10	0-0.5	Yes	92.3	86.0	69.9	22.0 15.4*2.1*	3.0	1	----	Gran. Borrow (Grav.) (Sand)	Test #2 taken in pit floor, 55' from Test #1. Material from 0-0.5' overburden, 0.5'-6' gravel, 6'-10' sand bottom. Sampled 0.5'-10' - rejected for Item 201. Has excess passing No. 100 mesh sieve. Insufficient proper-size stone for abrasion test. Rejected for Item 202. Has excesses retained on 1 1/2" screen and No. 4 screen. Acceptable for Item 105.
	3A	1964	1-4	0-1	Yes	--	--	47.1	10.0	2.75	3	28.5%	Gran. Borrow (Grav.)	Test #3 taken in north end of pit, 34' west of Lake Road. 0-1' overburden, 1'-4' gravel (large stones),

*Percentage of Total Sample

TABLE 1

FAIRLEE GRANULAR DATA SHEET NO. 20

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft.)	Over-burden (Ft.)	Existing Pit	Sieve Analysis % Passing					Color AASHO T-21	Abrasion AASHO T-4-35	Passes VWD Spec.	Remarks
						1 1/2"	5/8"	#4	#100	#270				
	3B 1964		4-8	--	Yes	100	100	99.5	42.0 41.8*	6.0 6.0*	1	----	Gran. Borrow (Sand)	4'-8' fine sand to silt. Took 2 samples. Test #4A represents upper level. Rejected for Item 201. Has high abrasion. Acceptable for Item 105. Test #3 B represents lower portion. Material rejected for Item 202. Has excess material passing No. 100 and No. 270 mesh sieves. Acceptable for Item 105.
27	1	1964	1-4.5	0-1	No	NOT SAMPLED					--	--	--	Owner: George Pratt A knoll west of Lake Road, partially wooded. Test #1 taken 85' south of large butternut tree, 145' west of Lake Road. Material is till, with ledge at 4.5', not sampled.

*Percentage of Total Sample

TABLE I
Supplement

FAIRLEE PROPERTY OWNERS - GRANULAR

Map Ident. No.

Aloha Manor (Mr. Pierce)	20
Batchelder, Verne	9, 10, 11
Blake, Layton	12
Bonnie Oaks Lodge	23
Boston & Maine Railroad	5
Brackett, H.	7
Bragg, Alberta	2
Dickinson, Dorothy	14
Fairbrother, Henry	15
Gulick, Donald	3
Hall, Norman B.	4
Hulbert, Mrs. Carole (Camp Lanakila)	19
Mallary Farms	24, 25
Milne, George	1
O'Brien, Francis	17, 18
Ordway, Franklin	16
Pratt, George	21, 26, 27
Sargent, Harold	22
Sargent, Tal	6, 8
Vermont, State of, Highway Department	13

TABLE II

FAIRLEE ROCK DATA SHEET NO. 1

Map Ident No.	Field Test No.	Year Field Tested	Rock Type	Exist- ing Quarry	Method of Sampling	Abrasion AASHO T-3	Remarks
1	1	1964	Quartz Diorite	No	Chip	5.0%	Owner: Verne Batchelder. A small ridge, approximately 300' long (north-south) by 140' wide. Test #1 taken on east half of ridge, represents 50' width. Rock is a quartz-diorite, moderately coarse-grained and non-porphyrific. Meets abrasion requirements for Item 204. Test #2 taken on same eastern half of ridge, for same 50' width as Test #1. Rock is quartz-diorite, also acceptable for Item 204.
	2	1964	Quartz Diorite	No	Chip	5.8%	
2	1	1964	Quartz Monzonite	Yes	Chip	4.0%	Owner: Charles H. Pike. A talus pile near old quarry below cliff, 500' northwest of Pike house, and west of Sta. 4897 + 50 of proposed Interstate Route 91. Sample taken at random. Rock is quartz monzonite, coarse-grained and greenish gray in color. Meets abrasion requirements for Item 204.
3	1	1964	Quartz Monzonite	No	Chip	4.6%	Owner: Henry Fairbrother. A talus pile at base of the Palisades, directly behind Fairbrother's house, approximately 150' west of Sta. 4903 + 50 of proposed Interstate Route 91. Rock is quartz monzonite, similar to that of Map Ident. No. 2. Meets abrasion requirements for Item 204. Test #2 also taken from same 100' talus area. Area is 800' (along road), west of U.S. Route 5. Rock is same as Test #1, again meeting abrasion requirements for Item 204.
	2	1964	Quartz Monzonite	No	Chip	4.0%	
4	1	1964	Quartz Monzonite	No	Chip	3.6%	Owner: Unknown. A large talus pile, directly behind (west of) cemetery. Test #1 taken 150' west of Sta. 4925 + 00 of proposed Interstate Route 91. Rock is a quartz-monzonite, coarse-

TABLE II

FAIRLEE ROCK DATA SHEET NO. 2

Map Ident. No.	Field Test No.	Year Field Tested	Rock Type	Existing Quarry	Method of Sampling	Abrasion AASHTO T-3	Remarks
	2	1964	Quartz Monzonite	No	Chip	2.4%	grained and greenish-gray in color. Meets abrasion requirements for Item 204. Test #2 taken from same talus deposit as Test #1. Rock is the same, also a quartz-monzonite. Acceptable for Item 204.
5	1	1964	Quartz Monzonite	No	Chip	2.6%	Owner: Aloha Manor. A steep cliff 500' - 600' east of powerline. Test #1 taken for 50' across strike just east of contact with Sunday Mountain volcanics. Rock appears to grade from a schistose gneiss with chlorite (or a greenish-gray mica) to an orbicular granitic rock. Meets abrasion requirements for Item 204.
	2	1964	Quartz Monzonite	No	Chip	2.7%	Test #2 taken for 50' width east of Test #1. Rock is same as Test #1. The strike of the banding (or poorly developed schistosity) appears to parallel the strike of the Sunday Mountain Formation. Deeply weathered. Meets abrasion requirements for Item 204.
6	1	1964	Greenstone	No	Chip	3.0%	Owner: Aloha Manor. A high cliff, with talus below cliff. Test #1 taken 0-50' west of powerline. Rock type is greenstone and schist of the Sunday Mountain Formation. Strike appears to be nearly north-south. Dip (apparent) on face of cliff is approximately 30°. Rock sampled appears to be quite massive, with a slight parallelism. Talus blocks were angular, rather than platy. Meets abrasion requirements for Item 204.
	2	1964	Greenstone	No	Chip	1.6%	Test #2 taken 50' - 100' west of powerline. Rock is the same as Test #1. Meets abrasion requirements for Item 204.

TABLE II
Supplement

FAIRLEE PROPERTY OWNERS - ROCK

Map Ident. No.

Aloha Manor (Mr. Pierce)

5, 6

Batchelder, Verne

1

Fairbrother, Henry

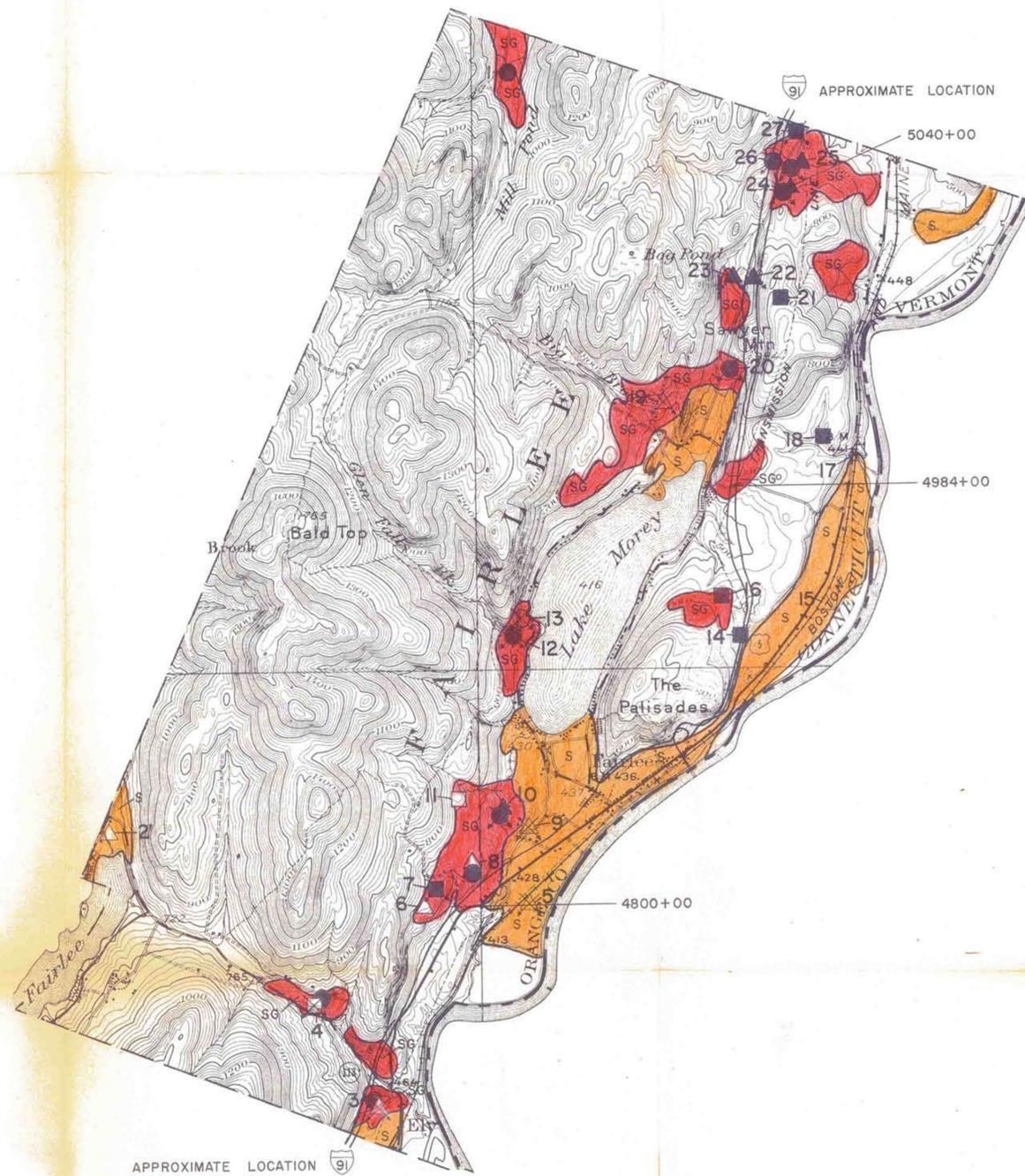
3

Pike, Charles H.

2

Unknown (Behind cemetery West)

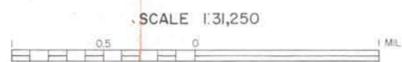
4



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)

FAIRLEE



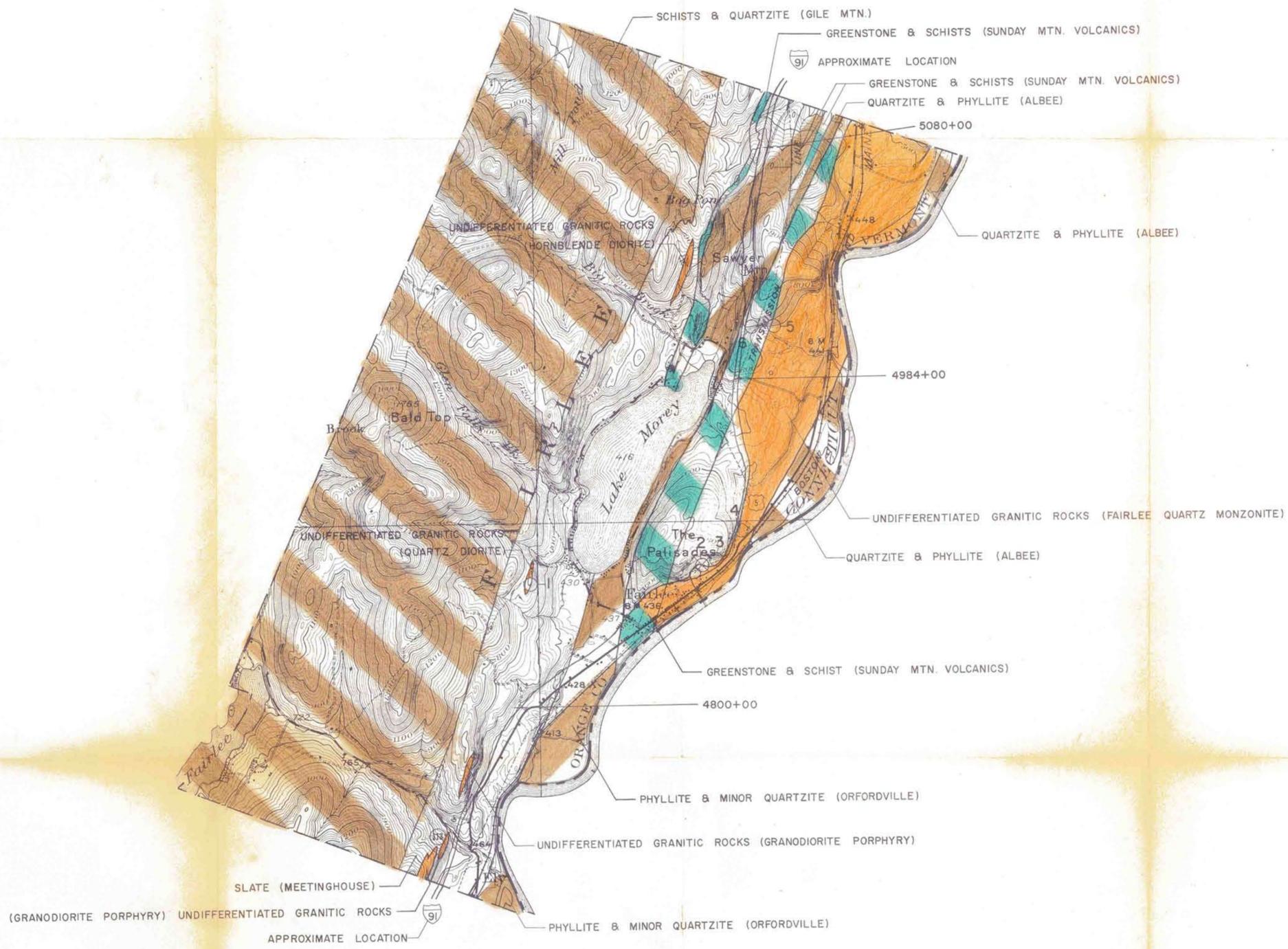
CONTOUR INTERVAL 20 FEET

1965

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

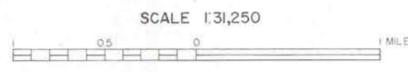
DATE				
BY				



LEGEND

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

FAIRLEE



1965

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

REVISIONS

DATE	BY			