SURVEY OF HIGHWAY CONSTRUCTION MATERIALS
IN THE TOWN OF BERKSHIRE, FRANKLIN COUNTY, VERMONT

prepared by

Engineering Geology Section, Materials Division
Vermont Department of Highways

in cooperation with

United States Department of Transportation
Federal Highway Administration

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Acknowledgements

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 are 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 elimate this factor by enabling the State and its contractors to proceed with information

on materials 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 conducted by Professor D. P. Stewart of Miami University, Oxford, Ohio, who had been mapping the glacial features 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 Agricultrue, and from Vermont Geological Survey Bulletins, United States Geological Survey Quadrangles, aerial photographs, the Surficial Geologic Map of Vermont, 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.

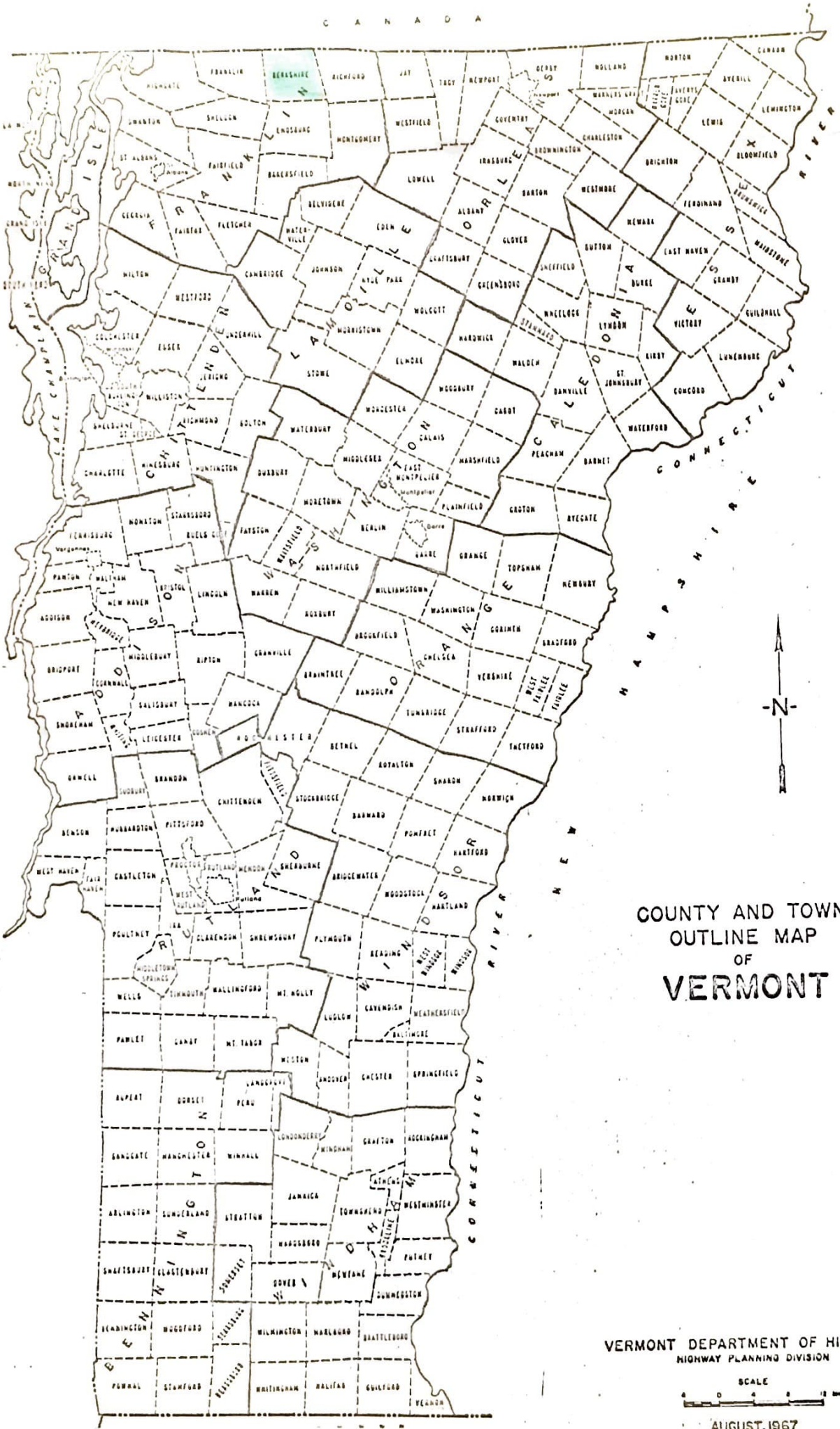
Work sheets contain more detailed information on each test and a detailed sketch of each identification Number Area. The work sheets and laboratory reports are on file in the office headquarters of this Project.

LOCATION

The town of Berkshire is situated at the north end of Franklin County in the northernmost part of Vermont. It is bounded on the north by the Province of Quebec in Canada, on the east by Richford, on the south by Enosburg, and on the west by Franklin. (See County and Town Outline Map of Vermont on the following page).

Berkshire lies mainly within the Champlain Lowland Physiographic Subdivision of the Sedimentary Appalachians; however, the region east of the Missisquoi River is in the Green Mountains. Morainal debris deposited during the Recent glaciation covers much older rock formations. The scattered hills, as well as the underlying bedrock, trend northeast-southwest. The maximum elevation is 1,326 feet, at the summit of Ayers Hill in the northeast part of the town, and the minimum is less than 400 feet where the Pike River enters Canada.

Principal drainage is southwestward via the Missisquoi River and its southward flowing tributaries, Giddings and Trout Brooks. Pike River and its tributary, Mineral Brook, flow northwestward into Franklin. There are small ponds but no large ponds or lakes in Berkshire.



COUNTY AND TOWN OUTLINE MAP OF VERMONT

VERMONT DEPARTMENT OF HIGHWAYS
HIGHWAY PLANNING DIVISION

SCALE

AUGUST 1967

SURVEY OF ROCK SOURCES

Procedure for Rock Survey

The routine employed by the project in a survey of possible sources of rock for highway construction is divided into two main stages; office and field investigations.

The office investigation is conducted primarily during the winter months and comprises the mapping and description of rock types as indicated in various reference sources. Many different sources of information are utilized, as indicated in the bibliography. These references differ considerably in dependability due to new developments and studies that have contributed to the obsolescense of a number of reports. In addition, the results of samples taken by other individuals are analyzed, and the location at 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 field investigation is begun by making a cursory preliminary survey of the entire area. The information obtained in the preliminary survey, together with the information assimilated in the office investigation, is employed to determine the areas where testing and sampling will be concentrated. When a promising source has been determined by rock type, volume of material, accessibility, and adequate exposure and relief, chip samples are taken with a hammer across the strike or trend of the rock. The samples are submitted to the Material Testing Laboratory for abrasion testing both by the Deval Method (AASHO T-3) and the Los Angeles Method (AASHO T-96). It should be kept in mind that the samples taken by the chip method are often within the weathered zone of the outcrop and consequently may give a less satisfactory test result than fresh material deeper in the rock structure. When the material is uniform and acceptable abrasion tests result from the chip samples, the material source is included in this report as being satisfactory.

Discussion of Rock and Rock Sources

It should be noted that information on the Rock Materials Map is simplified. (For a more detailed description of the respective rock formations, see the Summary included in this report). Complex metamorphic rocks comprise most of the lithology within the town of Berkshire.

Occasionally, rocks belonging to the same formation and exhibiting similar characteristics (i.e. color, texture, etc.) may yield different abrasion results owing to varying physical and chemical properties. Therefore, in no case should satisfactory test results of an area be construed to mean that the same formation, even in the same area, will not later produce unsatisfactory material. This is especially true of metamorphic rocks.

The rocks in Berkshire trend roughly north-northeast - south-southwest. Proceeding from northwest to southeast, the rock formations are: the quartz-chlorite-sericite phyllite of the Fairfield Pond member of the Underhill formation, which was not sampled because phyllites are soft, slippery and somewhat slaty in nature and thus do not yield satisfactory construction materials. The Tibbit Hill Volcanic member of the Pinnacle formation underlies the central three-quarters of the town and yielded acceptable abrasion test results from the two locations which were sampled. Perhaps the greatest reserve of satisfactory construction material in Berkshire might be found on Ayers Hill and on an unnamed hill several hundred yards to the south; both hills are in the northeast corner of town and are in the Tibbit Hill Volcanics.

The schistose graywacke of the Pinnacle formation was mapped with inferred boundaries in parts of the northwest, southwest and southeast sections of town, and yielded only one satisfactory abrasion result from four bags of material obtained from Map Identification No. 2. Perhaps this formation may yield better material with future developing, but the surface rock breaks quite sharp and subangularly.

There were six mapped areas of dolomite and marble of the White Brook member of the Underhill formation, but none were found.

The southeast corner of town is underlain by quartz-sericite-chlorite schist of the Underhill formation which was sampled at Map Identification No. 4 and yielded two failing AASHO T-3 results, and two passing AASHO T-96 results. The rock is very slippery and thin-bedded. Exploration was westward from the quarry and uphill into woods and thickets, but no further outcrops were noted.

SURVEY OF SAND AND GRAVEL SOURCES

Procedure for Sand and Gravel Survey

The method employed by the project in a survey of possible sources of sand and gravel for highway construction is divided into two main stages; office and field investigations.

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

The field investigation is begun by making a cursory preliminary survey of the entire town. All pits and other areas which show physiographic features that give evidence of glacial or fluvial deposition are noted. These locations are later investigated by obtaining samples of pit faces and other exposed materials. Tests pits, dug with a backhoe to a depth of approximately 11 feet, are also sampled. The samples are submitted to the Materials Testing Laboratory where they are tested for gradation and stone abrasion, the latter by the Deval Method (AASHO T-4).

Discussion of Sand and Gravel Deposits

According to Stewart and MacClintock, most of the granular material in Berkshire was deposited as marine sands or lake sands in two zones. The major zone extends from the northwest corner of town to slightly east of south at a point about 1.5 miles east of the southwest corner of town, and contains twelve of the sixteen granular areas. Within this body of lake sediments are three zones of ice-contact deposits and five minor patches of material, all of which are located in Kame Moraines.

A narrow band of lake sediments straddles the Missisquoi River valley in the southeast corner of town, and contains the remaining four granular areas.

The gravel sources in Berkshire listed from most to least desirable are Map Identification Numbers: 9, 8, 14, 6, 11, 15, 7, and 2, which are all pits.

The most promising sand sources are Map Identification Numbers: 10, 6, 14, 9, 12, 11, 8, 3, 5, 4, 15, and 2, which are all pits.

SUMMARY OF ROCK FORMATIONS IN THE TOWN OF BERKSHIRE

Fairfield Pond member of the Underhill formation: Greenish quartzitic schist (quartz-sericite-albite-chlorite-biotite): sericite-quartz-chlorite phyllite, locally purple or red, common in lower part.

Pinnacle formation: Schistose graywacke, gray to buff, commonly striped, quartz-albite-sericite-biotite-chlorite rock predominates; quartz-cobble and boulder conglomerate is common, chiefly near base.

Sweetsburg formation: Black, carbonaceous, well-cleaved slate with characteristic thin (1-5mm) whitish silty bedding laminae; in Saint Albans and Hinesburg synclinoria and Cambridge syncline.

Tibbit Hill volcanic member of the Pinnacle formation: Albite-actinolite-chlorite-epidote greenstone; locally pillowed and vesicular.

Underhill formation greenstone: Varied composition including albite-chlorite-epidote-calcite and sericite-magnetite-chlorite-clinozoisite rocks.

Underhill formation: Silvery, gray-green quartz-sericite-albite-chlorite-biotite schist containing abundant lenticular segregations of granular white quartz; locally quartz-sericite-albite-chlorite phyllite; porphyroblasts of albite, garnet, and magnetite are common and locally very abundant in gneissic facies in axial anticlines of the Green Mountain anticlinorium.

Underhill formation: Slate (graphitic phyllite)

White Brook member of the Underhill formation: Chiefly brown-weathered whitish, tan and gray sandy dolomite, locally only a hematite zone; includes carbonaceous crystalline limestone in Cambridge syncline.

GLOSSARY OF SELECTED GEOLOGIC TERMS

Actinolite: A variety of amphibole, occurring in greenish bladed crystals or in masses.

Amygdaloid: Any igneous rock with small cavities formed during solidification by the expansion of steam and other gases, and afterward filled with deposits of different minerals such as calcite or quartz. The term is suggested by the resemblance of the filled cavities to almonds.

Anticline: In its simplest form, it is an elongate fold in which the sides or limbs slope downward away from the crest. No size limits are implied, but the term is not generally used for small folds or crinkles having dimensions of inches or a few feet, and many of the very large structures of the order of 50-100 miles long have other characteristics that more properly class them as geanticlines, arches, anticlinoriums, etc.

Anticlinorium: A large composite fold consisting of a series of anticlines and synclines which taken as a group have the general form of an arch or anticline. The term is applied only to relatively large features having a width of at least several miles.

Bedding: The arrangement of rock in layers, strata, or beds.

Biotite: The mineral commonly known as black mica.

Calcite: A common rock-forming carbonate mineral having the chemical formula $CaCO_3$. Calcite is distinguished by its softness, perfect rhombohedral cleavage, white or pale color, vitreous luster and its ready effervescence in cold dilute hydrochloric acid. The last named property serves to distinguish it from DOLOMITE with which it is ordinarily confused.

Carbonaceous: Containing carbon.

Chlorite: A general designation for a group of hydrous silicates of magnesium and iron, with or without aluminum, so named because of their green color.

Clinozoisite: Hydrous calcium aluminum silicate, $Ca_2Al_3(SiO_4)_3(OH)$. It is a mineral usually found in crystalline schists which have been derived by the metamorphism of a dark igneous rock containing calcic feldspar. It has a hardness of 6-6 1/2; specific gravity of 3.25-3.37; color grayish white, green, pink; luster vitreous and is transparent to translucent. Usually it has a columnar crystal habit.

Dolomite: A rock consisting predominantly of the mineral calcium magnesium carbonate (dolomite), containing carbon dioxide 47.7%, lime 30.4% and magnesia 21.9%.

Epidote: A mineral, calcium aluminum iron silicate that usually occurs in rocks as formless grains and masses. The color is usually some shade of green, pistachio-green or yellowish-green being the most characteristic.

Facies: In general, the term designates the aspect or appearance of a mass of earth material different in one or several respects from surrounding material.

Gneissic: Having the banded, streaked, and foliated appearance and texture of gneiss which is a more or less banded metamorphic rock with the mineral composition of granite.

Graphitic: Pertaining to graphite, a very common mineral composed of soft carbon. It is black to dark gray in color, with metallic luster and greasy feel.

Graywacke: An old rock name loosely applied. Most writers now apply it to a dark-colored, hard sandstone consisting of angular grains of quartz, feldspar, and rock fragments embedded in a fine, compact matrix composed of micas, clay minerals, and chlorite.

Greenstone: A field name for rocks that have been so metamorphosed or otherwise so altered that they have assumed a distinctive color owing to the presence of chlorite, epidote, or actinolite.

Hematite: A common ore mineral of iron, Fe_2O_3, occurring in steel-gray to black crystals and in red earthy masses. It has a distinctive cherry red to reddish brown streak. It alters principally into limonite on exposure to weather.

Ice-Contact: Refers to sediments which have accumulated in contact with stagnant or wasting ice. They assume the varied topographic forms expressed by eskers, kames, and kame terraces.

Kame Moraine: 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.

Lamina: A thin layer of stratified rock; specifically a stratum 1 cm. or less in thickness.

Limestone: A bedded sedimentary deposit consisting chiefly of calcium carbonate. The most important and widely distributed of the carbonate rocks. The percentage of calcium carbonate ranges from 40 percent to more than 98 percent. Common impurities are clay and sand.

Magnetite: Iron ferrate, Fe_3O_4. It is a very common and widely distributed accessory mineral in rocks of all classes. It is distinguished chiefly by its strong magnetism, black color and streak, and 5.5-6.5 hardness. Specific gravity is 5.16 to 5.18, luster metallic.

Marble: A soft, white rock being the metamorphic form of limestone in which the calcium carbonate (calcite) is recrystallized and the calcite crystals are overgrown and interlocked with additional calcite. Commercially it is a trade name applied to any carbonate rock of good color and texture and hard enough to take a polish.

Marine Sands: Sand deposits laid down in the sea.

Metamorphic Rocks: Rocks that owe their distinctive characteristics to the transformation of pre-existing rocks, either through intense heat or pressure or both.

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.

Outcrop: A part of a body of rock that appears, bare and exposed, at the surface of the ground. In a more general sense the term applies also to areas where the rock formation occurs next beneath the soil, even though it is not exposed.

Pillow Structure: The structure of pillow lavas. Lava, usually basaltic, that has congealed in rounded masses resembling a pile of pillows... The pillows range from a few inches to several feet in diameter and the spaces between may be filled with volcanic ash, clastic sediments, or mineral deposits. Most pillow lavas are thought to have been formed through the chilling of lava flows by water.

Phyllite: A fine-grained, foliated metamorphic rock intermediate between the mica schists 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.

Physiographic: Pertaining to the physical divisions of the earth.

Porphyroblasts: Large crystals which have grown in place within the fine-grained groundmass of a metamorphic rock.. They have been formed by action of heat, pressure and infiltrating solutions occurring later than the rocks in which they form.

Quartz: Anhydrous crystalline silica, SiO_2. It is the most common of minerals. It has a hardness of 7, specific gravity of 2.65, color from colorless to white or variously colored depending on impurities, luster vitreous or greasy, fracture conchoidal, crystals hexagonal or amorphous. The word quartz is prefixed to the names of many rocks when quartz is not a normal necessary or essential constituent, as quartz monzonite.

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.

Sediment: All kinds of deposits from the waters of streams, lakes, or seas, and in a more general sense , deposits of wind and ice.

Segregation: In the strict sense, a "segregation" is a concentration of one or more minerals that have grown together during the crystallization of a molten rock. It is restricted to concentrations of early crystallizing minerals in place and is to be distinguished from an injection where the differentiate has undergone a change of position before consolidation.

Sericite: A mineral very similar to, if not identical with, muscovite mica. It occurs in small flakes and scales in metamorphic rocks such as sericite schists and sericite gneisses.

Slate: A very fine-grained homogeneous metamorphic rock which splits smoothly along parallel cleavage planes and yields roughly similar slabs.

Syncline: A fold of rock stata that is concave upward, and in which younger formations occur toward the center of curvature.

Synclinorium: A large composite fold of the earth's crust consisting of a series of anticlines and synclines which, taken together, have the general form of a syncline. The term is reserved for folds of relatively large dimension having a width of at least several miles.

Trend: The direction or bearing of the outcrop of a bed, vein, fault, or body, contact or linear structure. Also the direction or bearing of larger features such as folds, mountains and ridges.

Truncated: Having the end cut off.

Vesicular: A texture of rocks which are full of air bubbles, which may be almond-shaped, rounded, ellipsoidal, or tubular. They are due to the expansion of the gases of the lava, and their shape is due to movement in the still liquid lava.

Water Table: The upper limit of the portion of the ground wholly saturated with water.

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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 a complete list of specifications see Standard Specifications for Highway and Bridge Construction, approved and adopted by the Vermont Department of Highways in July, 1971.

DIVISION 700 - MATERIALS

Section 703, Soils and Borrow Materials

703.03 Sand Borrow and Cushion

Sand Borrow shall consist of material reasonably free from silt, loam, clay, or organic matter. It shall be obtained from approved sources and shall meet the requirements of the following table:

Table 703.03A - Gradation Requirements

Sieve Designation	Percentage by Weight Passing Square Mesh Sieves	
	Total Sample	Sand Portion
2"	100	
1½"	90-100	
½"	70-100	
No. 4	60-100	
No. 100		100
No. 200		0- 30
		0- 12

703.05 Granular Borrow

Granular Borrow shall be obtained from approved sources, consisting of satisfactorily graded, free draining, hard, durable stone and coarse sand reasonably free from loam, silt, clay, and organic material.

The Granular Borrow shall meet the requirements of the following table:

Table 703.05A - Gradation Requirements

Sieve Designation	Percentage by Weight Passing Square Mesh Sieves	
	Total Sample	Sand Portion
No. 4	20-100	
No. 200		100
		0- 15

The maximum size stone particles of the Granular Borrow shall not exceed 2/3 of the thickness of the layer being spread.

Section 704, Aggregate

704.05 Gravel for Sub-base

Gravel for Sub-base shall consist of material reasonably free from silt, loam, clay, or organic matter. It shall be obtained from approved sources and shall meet the following requirements:

(a) Grading
The gravel shall meet the requirements of the following table:

Table 704.05A - Gradation Requirements

Sieve Designation	Percentage by Weight Passing Square Mesh Sieves	
	Total Sample	Sand Portion
No. 4	(20-60)	100
No. 100		0-18
No. 200		0- 8

The stone portion of the gravel shall be uniformly graded from coarse to fine, and the maximum size stone particles shall not exceed 2/3 the thickness of the layer being placed.

(b) Percent of Wear
The percent of wear of the gravel shall be not more than 25 when tested in accordance with AASHO T 4, or more than 40 when tested in accordance with AASHO T 96.

704.06 Crushed Stone for Sub-base

Crushed Stone for Sub-base shall consist of clean, hard, crushed stone, uniformly graded, reasonably free from dirt, deleterious material, pieces which are structurally weak and shall meet the following requirements:

(a) Source
This material shall be obtained from approved sources and the area from which this material is obtained shall be stripped and cleaned before blasting.

(b) Grading
This material shall meet the requirements of the following table:

Table 704.06A - Gradation Requirements

Sieve Designation	Percentage by Weight Passing Square Mesh Sieves
	Total Sample
4½"	100
4"	90-100
1½"	25- 50
No. 4	0- 15

(c) Percent of Wear
The percent of wear of the parent rock shall be not more than 8 when tested in accordance with AASHO T 3, or the crushed stone a percent of wear of not more than 40 when tested in accordance with AASHO T 96.

(d) Thin and Elongated Pieces
Not more than 30 percent, by weight, of thin and elongated peices will be permitted.
Thin and elongated pieces will be determined on the material coarser than the No. 4 sieve.

(e) Filler

The filler shall be obtained from approved sources and shall meet the requirements as set up for Sand Cushion, Subsection 703.03.

(f) Leveling Material

The leveling material shall be obtained from approved sources and may be either crushed gravel or stone screening produced by the crushing process. The material shall consist of hard durable particles, reasonably free from silt, loam, clay or organic matter.

This material shall meet the requirements of the following table:

Table 704.06B - Gradation Requirements

Sieve Designation	Percentage by Weight Passing Square Mesh Sieves Total Sample
1"	100
3/4"	90-100
1/2"	50- 90
No. 4	30- 70
No. 100	0- 20
No. 200	0- 10

704.07 Crushed Gravel for Sub-base

Crushed Gravel for Sub-base shall consist of material reasonably free from silt, loam, clay or organic matter. It shall be obtained from approved sources and shall meet the following requirements:

(a) Grading

The crushed gravel shall be uniformly graded from coarse to fine and shall meet the requirements of the following table:

Table 704.07A - Gradation Requirements

Grading	Sieve Designation	Percentage by Weight Passing Square Mesh Sieves Total Sample	Sand Portion
	4"	100	
Coarse	No. 4	25- 50	100
	No. 100		0- 20
	No. 200		0- 12
	2"	100	
	1½"	90-100	
Fine	No. 4	30- 60	100
	No. 100		0- 20
	No. 200		0- 12

(b) Percent of Wear

The percent of wear of the parent gravel shall be not more than 20 when tested in accordance with AASHO T 4, or the crushed gravel a percent of wear of not more than 35 when tested in accordance with AASHO T 96.

(c) Fractured Faces

At least 30 percent, by weight, of the stone content shall have at least one fractured face.

Fractured faces will be determined on the material coarser than the No. 4 sieve.

704.09 Dense Graded Crushed Stone for Sub-base

Dense Graded Crushed Stone for Sub-base shall consist of clean, hard, crushed stone, uniformly graded, reasonably free from dirt, deleterious material and pieces which are structurally weak, and shall meet the following requirements:

(a) Source

This material shall be obtained from approved sources and the area from which this material is obtained shall be stripped and cleaned before blasting.

(b) Grading

This material shall meet the requirements of the following table:

Table 704.09A - Gradation Requirements

Sieve Designation	Percentage by Weight Passing Square Mesh Sieves Total Sample
3½"	100
3"	90-100
2"	75-100
1"	50- 80
½"	30- 60
No. 4	15- 40
No. 200	0- 10

(c) Percent of Wear

The percent of wear of the parent rock shall be not more than 8 when tested in accordance with AASHO T 3, or the crushed stone a percent of wear of not more than 40 when tested in accordance with AASHO T 96.

(d) Thin and Elongated Pieces

Not more than 30 percent, by weight, of thin or elongated pieces will be permitted.

Thin and elongated pieces will be determined on the material coarser than the No. 4 sieve.

704.10 Gravel Backfill for Slope Stabilization

Gravel Backfill for Slope Stabilization shall be obtained from approved sources, consisting of satisfactorily graded, free draining, hard, durable stone and coarse sand reasonably free from loam, silt, clay, and organic material.

The gravel backfill shall meet the requirements of the following table:

Table 704.10A - Gradation Requirements

Sieve Designation	Percentage by Weight Passing Square Mesh Sieves	
	Total Sample	Sand Portion
No. 4	20-50	100
No. 100		0- 20
No. 200		0- 10

The stone portion of the gravel backfill shall be uniformly graded from coarse to fine, and the maximum size stone particles shall not exceed 2/3 the thickness of the layer being placed.

704.11 Granular Backfill for Structures

Granular Backfill for Structures shall be obtained from approved sources, consisting of satisfactorily graded, free draining granular material reasonably free from loam, silt, clay, and organic material.

The granular backfill shall meet the requirements of the following table:

Table 704.11A - Gradation Requirements

Sieve Designation	Percentage by Weight Passing Square Mesh Sieves	
	Total Sample	Sand Portion
3"	100	
2½"	90-100	
No. 4	50-100	100
No. 100		0- 18
No. 200		0- 8

BERKSHIRE GRANULAR DATA SHEET NO. 1

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Over-burden (Ft)	Exist-ing Pit	Sieve Analysis % Passing						Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
						2"	1½"	½"	#4	#100	#200			
1	1	1974	1-10	0-1	Yes	--	--	--	100	89	57	---	---	Owner: Roger Brosseau. Area contains a small, nearly depleted pit behind trailers northwest of junction of Vermont Route 120 with Vermont Route 108. Stripping piles and junk were in overgrown pit. Test No. 1 was in field about 800' southwest of junction. Material is: 1'-10', fine sandy silt; bottom, silt.
2	1	1974	3-14	0-1.5	Yes	--	--	--	100	7	5	---	Sand	Owner: Sterling Kinney. Area is a large, inactive pit southwest of State Aid Highway No. 2 about 0.22 mile northwest of its intersection with State Aid Highway No. 3 and Town Highway No. 11. Pit was poorly stripped with stripping piles and junk littering the floor. Test No. 1 was in east face of pit, about 300' southeast of access road. Material was: 3'-14', sand; bottom, same.
	2	1974	2-10	0-1	Yes	84	79	53	25	12	6	13.9%	Gravel	Test No. 2 was in west face of pit. Material was: 2'-10', fine gravel; bottom, same.
3	1	1974	0-12	--	Yes	83	73	54	34	12	10	27.8%	Gran. Borrow (Grav.)	Owner: Sterling Kinney (formerly: Hudson Mosier). Area is two pits located northwest of Vermont Route 108. The larger, northeast pit had a spring house on its floor along with standing water flowing from a bank near its center. Test No. 1 was the upper and middle north face of this pit. Material was: 0-12', sandy gravel; bottom, fine gravel.

BERKSHIRE GRANULAR DATA SHEET NO. 2

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Over-burden (Ft)	Exist-ing Pit	Sieve Analysis % Passing 2"	1½"	½"	#4	#100	#200	Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
	2	1973	0-6	--	Yes	--	100	90	55	23	17	---	---	The smaller, southwest pit was inactive, with grass-covered faces and a boulder pile on the floor. Test No. 2 was 35' southwest of the southern face. Material was: 0-1.5', small stones; 1.5'-6', sand with silt traces; bottom, ledge.
	3	1973	0.5-10	0-0.5	No	--	100	89	62	12	10	---	Sand	Test No. 3 was on the side of a grassy ridge about 170' southwest of Test No. 2. Material was: 0.5'-10', fine gravel; bottom, fine gravel.
	4	1973	0-0.5	0.5-10	No	100	95	85	62	12	10	---	Sand	Test No. 4 was about 160' southwest of Test No. 3. Material was: 0.5'-10', pebbly sand and fine gravel; bottom, fine gravel. Access to northeast pit was 0.13 mile southwest of the intersection of Vermont Route 108 with State Aid No. 3 and Town Highway No. 11. Field drive to southwest pit was 0.21 mile southwest of the same intersection.
4	1	1973	1-9	0-1	Yes	100	88	82	64	14	11	---	Sand	Owner: Sterling Kinney. Area is an elongate terrace with prominent knobs at each end. An inactive, depleted pit at the north end of the terrace was being leveled by owner at time of the survey. The pit was in a fenced-in cornfield reached by field drive about 0.29 mile from State Aid Highway No. 3. Entrance to field drive was about 0.02 mile from intersection of Vermont Route 108 with the State Aid Highway. Test No. 1 was just north of the 10-foot north face of the pit. Material

BERKSHIRE GRANULAR DATA SHEET NO. 3

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Over-burden (Ft)	Exist-ing Pit	Sieve Analysis % Passing 2"	1½"	½"	#4	#100	#200	Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
														was: 1'-6', sand; 6'-9', gravel; bottom, gravel.
	2	1973	1-8	0-1	No	100	97	69	37	20	15	22.9%	Gran. Borrow (Grav.)	Test No. 2 was in field about 0.1 mile southwest of pit. This part of field is gently rolling with U-shaped drainage ditches. Material was: 1'-8', fine gravel; bottom, same.
	3	1973	0.5-9	0-0.5	No	100	98	75	54	19	15	16.0%	Gran. Borrow (Grav.)	Test No. 3 was near crest of south-west knob about 0.12 mile southwest of Test No. 2. Material is: 0.5'-9', gravel; bottom, same.
5	1	1973	5-12	0-1	Yes	--	100	77	60	20	8	---	Sand	Owner: Sterling Kinney. Area is the north end of a terrace southwest of Town Highway No. 26. An active pit truncated a knob in middle of the terrace. 0.14-mile field drive to pit is 0.43 mile from junc-tion of Town Highway with State Aid Highway No. 3. Test No. 1 was in southeast face of pit. Material was: 5'-12', silty pebbly sand; bottom, pebbly sand.
	2	1973	1-9	0-1	No	--	100	96	94	57	27	---	---	Test No. 2 was in field, about 420' northeast of Test No. 1. Material was: 1'-9', silty fine sand; bottom, same. Ledge is exposed in the field south of Test No. 2 and a test hole 240' southwest of Test No. 2 hit ledge at 2'.
6	1	1973	5-17	0-1	Yes	--	100	93	79	9	4	---	Sand	Owner: Sterling Kinney. Area is a pit southwest of Town High-way No. 26. 0.17 mile-field drive to

BERKSHIRE 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 2"	1½"	½"	#4	#100	#200	Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
														pit connects with Town Highway No. 26 about 0.8 mile from its junction with State Aid Highway No. 3. Pit truncates the southeast end of a wooded ridge. Test No. 1 was in the northwest face of the active pit. Material was: 5'- 17', pebbly sand; bottom, fine sand.
	2	1973	8-25	0-1	Yes	89	82	57	37	9	6	20.0%	Gravel	Test No. 2 was in the west face of the pit. Material was: 8'- 25', gravel; bottom, fine gravel.
	3	1973	1.5-6	0-1.5	Yes	--	100	94	79	19	8	---	Sand	Test No. 3 was in the east face of the pit. Material was: 1'- 10', fine sand; bottom, silty sand.
	4	1973	1-6	0-1	Yes	--	100	98	93	19	8	---	Sand	Test No. 4 was in the northeast face of a higher level east of the main pit area. Material was: 1'- 6', fine sand; bottom, same.
	5	1973	0-8	---	Yes	--	100	92	72	10	5	---	Sand	Test No. 5 was in the floor of the higher level about 30' southwest of Test No. 4 . Material was: 0-8', pebbly sand; bottom, sand.
	6	1973	1-10	0-1	Yes	--	--	100	96	26	9	---	Sand	Test No. 6 was in possible extension, 60' southeast of Test No. 4. Material was: 1'- 10', fine sand; bottom, silty sand.
7	1	197	1-8	0-1	Yes	78	67	42	30	12	7	16.4%	Gravel	Owner: Sterling Kinney (formerly: Hebert Dudley). Area is an active pit located southwest of Town Highway No. 26 about 0.82 mile from its junction with State Aid Highway No. 3. Pit is mainly an excavated knob with perhaps 50' extension in all directions.

BERKSHIRE

GRANULAR DATA SHEET NO. 5

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Over-burden (Ft)	Exist-ing Pit	Sieve Analysis % Passing 2"	1½"	½"	#4	#100	#200	Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
	2	1973	2-8	0-2	Yes	100	85	82	52	5	3	---	Gran. Borrow (Grav.)	Test No. 1 was in the southwest face. Material was: 1'- 8', gravel; bottom, fine gravel. Test No. 2 was in southeast face of pit. Material was: 2'- 8', fine gravel; bottom, (?).
	3	1973	0-4	--	Yes	77	68	32	15	13	8	15.0%	Gravel	Test No. 3 was in floor, about 100' northwest of Test No. 2. Material was: 0-4', coarse gravel; bottom, gravel. Water table was 1'-1.5' below floor.
8	1	1973	0.5-5.5	0-0.5	Yes	95	71	58	27	9	7	23.9%	Gravel	Owner: Kenneth Kimmins. Area is a grass-covered, north-south trending ridge southwest of Town Highway No. 26. Access road to the small, inactive pit was about 0.7 mile northwest of State Aid Highway No.4. Test No. 1 was in northeast face of pit. Material was: 0.5'-5.5', tabular gravel; bottom, sloughed material.
9	1	1973	2-17	0-2	Yes	100	88	72	59	9	4	25.9%	Gran. Borrow (Grav.)	Owner: Roger Larose. Area is a large active pit northwest of State Aid Highway No. 4. Access is 1.17 miles southwest of its junction with Town Highway No. 36. Test No. 1 was in north face of upper level. Material was: 2'-4', fine gravel; 4'-8', sand; 8'-17', fine gravel; bottom, sand or pebbly sand.
	2	1973	9-16	--	Yes	--	100	99	97	15	8	---	Sand	Test No. 2 was in northeast face of lower level. Material was: 9'-16', sand; bottom, same.

BERKSHIRE GRANULAR DATA SHEET NO. 6

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Over-burden (Ft)	Exist-ing Pit	Sieve Analysis % Passing 2"	1½"	½"	#4	#100	#200	Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
	3	1973	0-12	—	Yes	100	88	60	45	5	3	24.0%	Gravel	Test No. 3 was in west face of upper level. Material was: 0-12', fine gravel; bottom, same.
	4	1973	12-28	0-2	Yes	98	89	74	54	10	6	---	Gran. Borrow (Grav.)	Test No. 4 was in southwest face of excavated area southwest of pit. Owner did not allow sampling in surrounding fields.
10	1	1973	0-15	—	Yes	92	89	85	68	13	6	---	Sand	Owner: Calco, Inc. Area is the west end of a grass-covered ridge. Part of the ridge has been neatly stripped and has been truncated by a 30-foot face. About 500 feet north of this face is a pit with an active, 35-foot northeast face. Pit was reached by 0.34 mile long field drive that joins State Aid Highway No. 1 about 1.25 miles north of Town Highway No. 36. Test No. 1 was in the 30-foot face at south end of the ridge. Material was: 0-15', gravelly sand; bottom, sand.
	2	1973	18-30	0-0.5	Yes	100	85	76	71	15	5	---	Sand	Test No. 2 was in the lower, active 35-foot northeast face. Material was: 18'-30', pebbly sand; bottom, same.
	3	1973	1-10	0-1	Yes	100	94	82	60	15	9	---	Sand	Test No. 3 was near southwest corner of pit, 190' southwest of Test No. 2. Material was: 1'-4', pebbly sand; 4'-8', pebbly sand with gravel layers; 8'-9.5', pebbly sand; 9.5'-10', silt; bottom, silt.
	4	1973	0.5-10	0-0.5	No	100	94	85	74	30	17	---	---	Test No. 4 was near access road, about 210' south of test No. 3. Material was: 0.5'-10'. silty sand with

BERKSHIRE GRANULAR DATA SHEET NO. 7

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Over-burden (Ft)	Exist-ing Pit	Sieve Analysis % Passing 2"	1½"	½"	#4	#100	#200	Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
														traces of fine gravel.
11	1A	1973	0.5-5	0-0.5	Yes	80	70	48	39	8	6	23.5%	Gravel	Owner: Maurice Messier (formerly: Frank Lefebvre). Area is a pit north of Town Highway No. 36 about 0.7 mile east of State Aid Highway No. 4. Possible extension to the northeast has been stripped. Test No. 1A was in upper north face of active pit. Material was: 0.5'-3', gravel; 3'-3.75', pebbly sand; 3.75'-5', gravel; bottom, pebbly sand.
	1B	1973	5-15	0-0.5	Yes	100	93	85	68	3	2	---	Sand	Test No. 1B was in middle of north face below Test No. 1A. Material was: 5'-15', pebbly sand; bottom, same.
	2	1973	0-10	--	No	--	91	74	49	12	11	17.8%	Gran. Borrow (Grav.)	Test No. 2 was in ridge, 135' north-east of Test No. 1A. Material was: 0-1', sandy gravel; 1'-3', coarse gravel; 3'-8', gravel; 8'-10', fine gravel; bottom, fine gravel.
	3	1973	1-10	0-1	No	--	100	90	66	10	6	---	Sand	Test No. 3 was located 15' south of fence, about 150' northwest of Test No. 1A. Material was: 1'-4', pebbly sand; 4'-5', fine gravel; 5'-10', pebbly sand; bottom, pebbly sand.
	4	1973	0-8	--	No	--	100	97	84	7	4	---	Sand	Test No. 4 was located 50' north of Town Highway, and 65' south of main pit face. Material was:0-8', sand and pebbly sand; bottom, pebbly sand.
	5	1973	1-15	0-1	Yes	--	91	73	50	10	8	---	Gran. Borrow (Grav.)	Test No. 5 was in southwest face of an old grass-covered pit west of the active pit. Material was: 1'-3', coarse gravel; 3'-9', gravel; 9'-12', fine gravel and pebbly sand; 12'-15',

BERKSHIRE GRANULAR DATA SHEET NO. 8

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Over-burden (Ft)	Exist-ing Pit	Sieve Analysis % Passing 2"	1½"	½"	#4	#100	#200	Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
														sand; bottom, sand.
12	1	1973	15-25	0-4	Yes	--	--	100	90	3	1	---	Sand	Owner: Arlin Jewett. Area is an active pit east of cemetery on Town Highway No. 36. 0.14-mile access road joins the Town Highway 0.61 mile south of State Aid Highway No. 4. Test No. 1 was in southeast face above second floor of pit. Material was: 15'-25', pebbly sand; bottom, same.
	2	1973	0-15	--	Yes	--	100	95	82	2	1	---	Sand	Test No. 2 was in south face above first floor of pit. Material was: 0-15', pebbly sand; bottom, same. Major extension would be in hayfield south of the pit; however, owner would not allow backhoe sampling in the area.
13	--	1973	--	--	Yes	--	N O	T	S A	M P L	E D	---	---	Owner: Vensen. Area consists of two overgrown pits northeast of Town Highway No. 17 about half a mile east of its junction with Town Highway No. 24. Because of limited extension, no samples were taken.
14	1A	1973	0.5-30		Yes	93	82	73	46	29	26	19.9%	---	Owner: Arthur Weld. Area is a large, active pit, overgrown in places, with 3 floors, located about 1/4 mile north of Town Highway No. 35. Access road joins Town Highway No. 35 about 0.11 mile east

BERKSHIRE GRANULAR DATA SHEET NO. 9

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Over-burden (Ft)	Exist-ing Pit	Sieve Analysis % Passing 2"	1½"	½"	#4	#100	#200	Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
														of Town Highway No. 42. Possible wooded extension to the south was inaccessible to a backhoe.
	1A													Test No. 1A was in the upper south face above 3rd floor of pit. Material was: 0.5'-30', fine gravel.
	1B	1973	30-55	0-0.5	Yes	87	73	60	51	15	14	18.0%	Gran. Borrow (Grav.)	Test No. 1B was in lower face below Test No. 1A. Material was: 30'-55', fine gravel; bottom, fine silty gravel.
	2	1973	0-6	--	Yes	91	82	59	36	14	11	21.2%	Gran. Borrow (Grav.)	Test No. 2 was in east face of "hole" near center of pit. Material was: 0-6', fine gravel; bottom, same.
	3	1973	0-15	--	Yes	89	84	55	29	8	6	20.0%	Gravel	Test No. 3 was in east face above 2nd floor of pit. Material was: 0-15', fine gravel; bottom, same.
	4	1973	0-12	--	Yes	63	62	45	18	13	10	17.4%	Gran. Borrow (Grav.)	Test No. 4 was in east face above 1st floor of pit. Material was: 0-12', fine gravel; bottom, same.
	5	1973	20-40	0-0.5	Yes	94	75	58	50	8	7	17.4%	Gravel	Test No. 5 was in south face of pit above 2nd floor. Material was: 20'-40', fine gravel; bottom, same.
	6	1973	0-8	--	Yes	86	82	48	16	13	10	21.3%	Gran. Borrow (Grav.)	Test No. 6 was in 3rd floor of pit about 30' northeast of Test No. 3. Material was: 0-8', coarse gravel; bottom, same.
	7	1973	0-4	--	Yes	90	85	71	51	11	9	22.6%	Gran. Borrow (Grav.)	Test No. 7 was in 3rd floor of pit, about 120' northeast of Test No. 6. Material was: 0-4', fine gravel; bottom, clay.
	8	1973	0.5-4.5	0-0.5	No	100	95	93	81	39	25	---	---	Test No. 8 was in clearing, about 160' north of Test No. 2. Material was: o.5'-1.0', pebbly sand; 1.0'-4.5', fine sand and sand; bottom, silt.
	9	1973	0-8	--	Yes	64	57	39	22	12	10	20.7%	Gran. Borrow (Grav.)	Test No. 9 was in "hole", about 100' southwest of Test No. 4. Material

BERKSHIRE

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 2"	1½"	½"	#4	#100	#200	Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
	10	1973	1.5-8	0-1.5	No	94	90	59	31	20	17	22.9%	---	was: 0-8, coarse sandy gravel; bottom, same. Test No. 10 was in woodland, 130' south of face above 1st floor. Material was: 1.5'- 8', coarse gravel; bottom, same. Mention should be made of field north of Town Highway No. 35 and west of Map Identification Number 15. Owner had stripped topsoil, exposing good-looking granular material; however, because field was too poorly drained to exploit, he replaced topsoil and now uses it as a hayfield.
15	1	1973	10-20	0-1.5	Yes	92	87	73	51	13	8	18.0%	Gravel	Owner: Arthur Weld. Area is an inactive pit which was opened prior to the pit at Map Identification No. 14. Owner stated that contractor who opened this pit found material unacceptable for his purposes, so moved to the other location. Access road is same as for Map Identification No. 14 and joins Town Highway No. 35 about 475 feet from pit entrance. Test No. 1 was in north face of pit. Material was: 10'- 20', silty fine gravel.
	2	1973	6-20	0-1	Yes	96	95	79	54	16	13	15.0%	Gran. Borrow (Grav.)	Test No. 2 was in northeast face of pit. Material was: 6'- 20', silty fine gravel. There was a spring in the floor near Test No. 2. The survey dug a backhoe test hole in the center of the floor, but because

BERKSHIRE GRANULAR DATA SHEET NO. 11

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Over-burden (Ft)	Exist-ing Pit	Sieve Analysis % Passing 2"	1½"	½"	#4	#100	#200	Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
														a silt layer was encountered at 1.5', no sample was taken.
16	1	1973	1-10	0-1	No	--	--	--	100	64	45	---	---	Owner: Michael Stankiewicz. Area was an old borrow pit north of Vermont Route 118 about 1/4 mile east of Town Highway No. 42. Test No. 1, about 55' north of the pit face, consisted of fine sandy silt with bottom in silt at 10'.
	2	1973	1-6	0-1	No	--	100	95	81	80	76	---	---	Test No. 2 was about 160' northeast of Test No. 1. Material was: 1'- 6', AASHO A-4 Soil Type (Silt).

TABLE I
Supplement

BERKSHIRE PROPERTY OWNERS - GRANULAR	Map Ident. No.
Brosseau, Roger	1
Calco, Incorporated	10
Jewett, Arlin	12
Kimmins, Kenneth	8
Kinney, Sterling	2,3,4,5,6,7
Larose, Roger	9
Messier, Maurice	11
Stankiewicz, Michael	16
Vensen, (?)	13
Weld, Arthur	14,15

BERKSHIRE ROCK DATA SHEET NO. 1

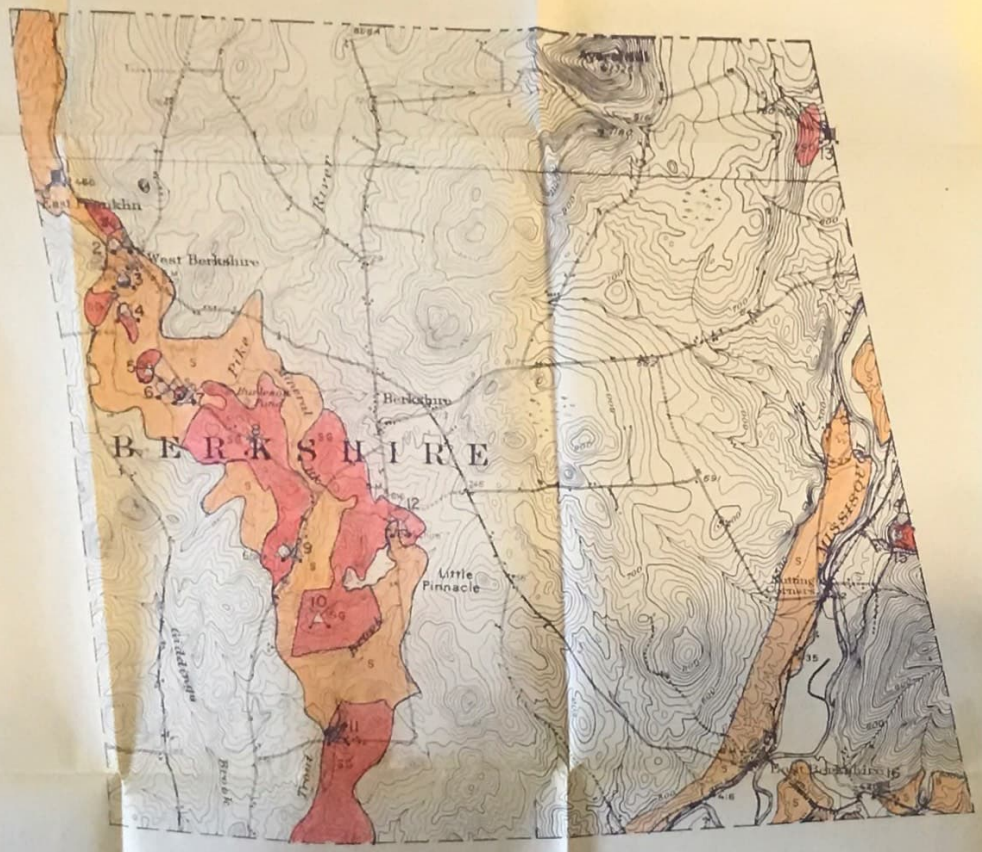
Ident. No.	Field Test No.	Year Field Tested	Rock Type	Existing Quarry	Method of Sampling	Abrasion AASHO T-3	Abrasion AASHO T-96	Remarks
1	1A	1973	Gray-wacke	No	Chip	7.3%	28.8%	Owner: George Costes. Area is partly wooded southeast slope of a rocky knob west of Town Highway No. 11, about 0.6 mile north of its intersection with Vermont Route 108. The sampled ledge rock was a dark gray graywacke of the Pinnacle formation. Test No. 1A was parallel to, and 25' south of a 4-strand wire fence. N-S striking, vertically dipping rock was sampled at random from west to east, 0 to 75'.
	1B	1973	Gray-wacke	No	Chip	7.0%	28.9%	Test No. 1B extended northeast from 75' to 150'. Rock apparently strikes N. 50°W. and dips 55° to the north. This site would have good access to an adequate volume of material for crushing.
2	1A	1973	Gray-wacke	No	Chip	10.3%	42.1%	Owner: Richard Ewins. Area is partly wooded hillside north of State Aid Highway No. 3, about 0.3 mile east of its junction with Town Highway No. 26. Rock tested is schistose graywacke that somewhat resembles a "grit-stone". Sampled material tended to break obliquely to bedding planes which dip 85° to the north. Apparent strike is N. 37° E. Rock is mapped as the Pinnacle formation. Test No. 1A was taken north-northeast along the strike, from 0-75', beginning at the west edge of the outcrops.
	1B	1973	Gray-wacke	No	Chip	8.1%	35.8%	Test No. 1B continued up slope from the east end of Test No. 1A from 75'- 100'. Development of this site would be best from east to west, starting about 300' north of the highway.
3	1A	1973	Green-stone	No	Chip	6.2%	34.5%	Owners: Gordon LaFlamme, Hilton Dash.

BERKSHIRE ROCK DATA SHEET NO. 2

Ident. No.	Field Test No.	Year Field Tested	Rock Type	Existing Quarry	Method of Sampling	Abrasion AASHO T-3	Abrasion AASHO T-96	Remarks
	1B	1973	Green-stone	No	Chip	10.3%	33.4%	Area is a wooded hillside south of Town Highway No. 15, about 0.27 mile west of its junction with Town Highway No. 9. Material in Test No. 1A was a dark green to gray, dense, very hard greenstone of the Tibbit Hill volcanic member of the Pinnacle formation. It was sampled from the lowest of several outcrops, beginning about 100' south of the highway. Test was from 0-75' southwest along trend of outcrop. Test No. 1B was a softer, amygdaloidal green-stone which breaks into thin (1/2"- 1"), tabular pieces. It was sampled along a higher outcrop beginning about 40' southwest of Test No. 1A. Test was for an additional 75' along similar trend. This site would have good access and development would be easy.
4	1A	1973	Schist	Yes	Chip	9.6%	35.6%	Owner: George Brouillette. Area is an inactive quarry whose access road is west of Town Highway No. 34 about 1/4 mile north of its junction with Town Highway No. 29. 0.3-mile long field drive leads to wet floor of quarry which has 35-foot vertical faces. Rock tested was a silvery gray sericite schist of the Underhill formation. Test No. 1A was taken for 150 feet diagonally across the face from the northeast corner of the quarry.
	1B	1973	Schist	Yes	Chip	11.0%	30.2%	Test No. 1B continued from 150'- 300' southwards to the southeast corner of the quarry. The rock strikes N. 25°E. and dips 65°- 70° toward the west. Extension into hillside west of quarry could not be confirmed because of lack of outcrops.

TABLE II
Supplement

BERKSHIRE PROPERTY OWNERS - ROCK	Map Indent. No.
Brouillette, George	4
Costes, George	1
Dash, Hilton	3
Ewins, Richard	2
LaFlamme, Gordon	3



LEGEND

- ○ GRAVEL, ACCEPTABLE FOR SEC. 704.05 (gravel for sub-base)
- ● GRAVEL, DEPLETED OR NOT ACCEPTABLE FOR SEC. 704.05
- △ SAND, ACCEPTABLE FOR SEC. 703.03 (sand borrow and cushion)
- ▲ SAND, DEPLETED OR NOT ACCEPTABLE FOR SEC. 703.03
- □ GRANULAR BORROW, SEC. 703.05
- ■ MATERIAL NOT ACCEPTABLE FOR SEC. 703.05
- EXISTING PIT
- SAND and GRAVEL DEPOSIT
- SAND DEPOSIT
- 3 IDENTIFICATION NUMBER (refer to data sheets)

BERKSHIRE

SCALE 1:31,250

CONTOUR INTERVAL 20 FEET

1974

GRANULAR MATERIALS MAP

BY

VERMONT DEPARTMENT OF HIGHWAYS

IN COOPERATION WITH

U.S. BUREAU OF PUBLIC ROADS

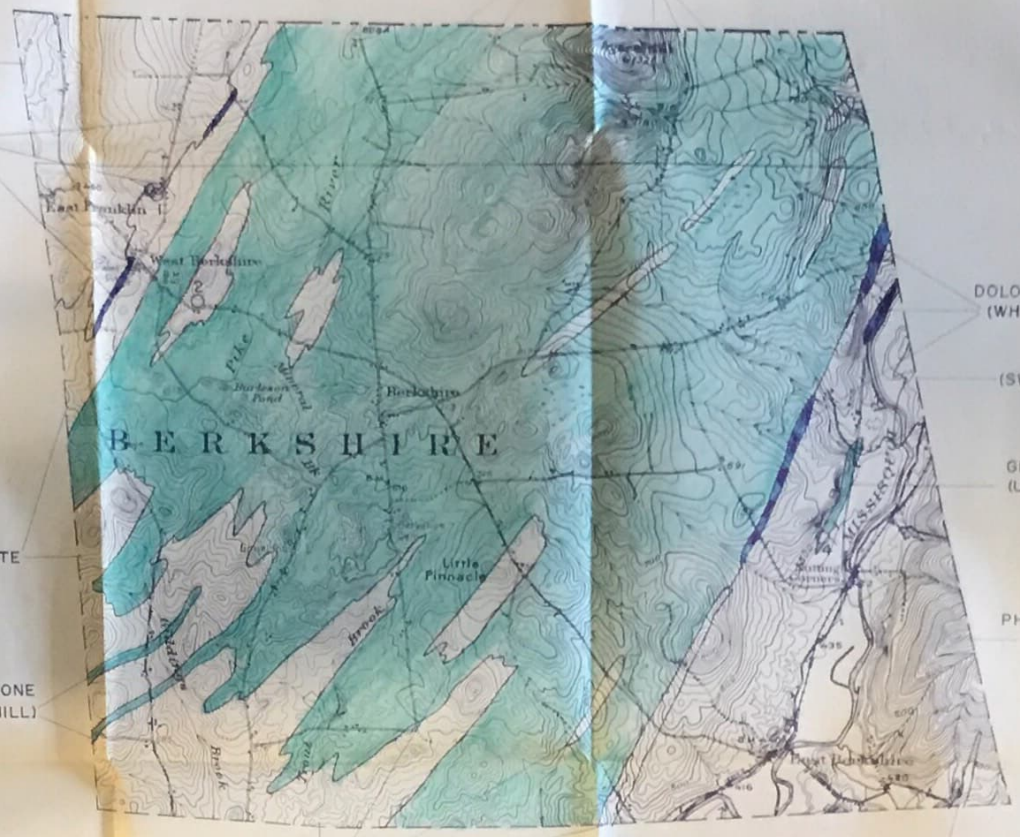
NOTE: BASED ON U.S.G.S. TOPOGRAPHIC MAPS

FRANKLIN COUNTY VT. HWY. DISTRICT NO. 8

REVISIONS

DATE						
BY						

GRANULAR
BERKSHIRE



LEGEND

- ROCK, ACCEPTABLE FOR SEC. 704.06 (crushed stone for sub-base)
- ROCK, NOT ACCEPTABLE FOR SEC. 704.06
- EXISTING QUARRY
- GRANITE TO DIORITE (light to intermediate igneous rock)
- 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)

BERKSHIRE

SCALE 1:3,250

CONTOUR INTERVAL 20 FEET

1974

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

FRANKLIN COUNTY VT. HWY. DISTRICT NO. 8

REVISIONS

DATE					
BY					