SURVEY OF HIGHWAY CONSTRUCTION MATERIALS

IN THE TOWN OF STOWE, LAMOILLE COUNTY, VERMONT

Prepared by

STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH DIVISION

ENGINEERING GEOLOGY SUBDIVISION

Montpelier, Vermont

March, 1980

State of Vermont
Agency of Transportation
Materials & Research Division
March, 1980

TABLE OF CONTENTS

Acknowledgments

This project acknowledges the surficial geological information obtained from Professor D. P. Stewart of Miami University, Oxford, Ohio and the bedrock information from the Centennial Geologic Map of Vermont, C. G. Doll.

History

The Materials Survey Project was initiated in 1957 by the Vermont Department of Highways with the assistance of the Bureau of Public Roads to compile an inventory of highway construction materials in the State of Vermont. Previously, investigations for highway construction materials were conducted only as the immediate situation required and only limited areas were surveyed. Since no overall picture of material resources was available, highway contractors or resident engineers were required to locate the materials for their respective projects and the samples were tested by the Materials & Research Division. The additional expense of exploration for construction materials resulted in higher construction costs being paid by the State. The Materials Survey Project was formed to minimize this factor by enabling the State and the contractors to use available information on material resources and to project cost estimates. Knowledge of locations of suitable materials is an important factor in planning 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 furnish information of particular use to contractors and construction personnel, and should be studied together for maximum benefit.

Enclosures

Included in this report are two surface-geology maps, one defining the location of tests on bedrock, the other defining the location of tests on

granular materials. These maps are based on 15-minute or 7-½-minute quadrangles of the United States Geological Survey enlarged or reduced to 1:31250 or 1" = 2604'. The various rock formations and types are delineated on the Bedrock Map of the township. This information is obtained from: Vermont Geological Survey Bulletins, Vermont State Geologist Reports, United States Geological Survey Bedrock Maps, Centennial Geologic Map of Vermont, the Surficial Geologic Map of Vermont and other references.

The granular materials map shows areas of various types of glacial deposits (outwash, moraines, kames, kame terraces, eskers, etc.) which are potential sources of gravel and sand. This information was obtained primarily from a survey conducted by Professor D. P. Stewart of Miami University, Oxford, Ohio, who mapped the glacial features of the State of Vermont during the summer months from 1956 to 1966. Further information is obtained from the Soil Survey (Reconnaissance) of Vermont (conducted by the Bureau of Chemistry and Soils of the United States Department of Agriculture), available Soil Surveys of individual counties (by the Soil Conservation Service of the United States Department of Agriculture), Vermont Geological Survey Bulletins, United States Geological Survey Quadrangles, aerial photographs and other sources. The location of each test area is represented by a Map Identification Number.

This report contains data sheets with detailed information on each test taken in the Granular and Bedrock areas. Data is also used from an active card file compiled by the Materials & Research Division over a period of years. Some cards are not used because they are incomplete or have unusable information on the location of the deposit.

Work sheets containing more detailed information and a field sketch of the area, and laboratory test results are on file in the Materials & Research Division of the Agency of Transportation, State of Vermont.

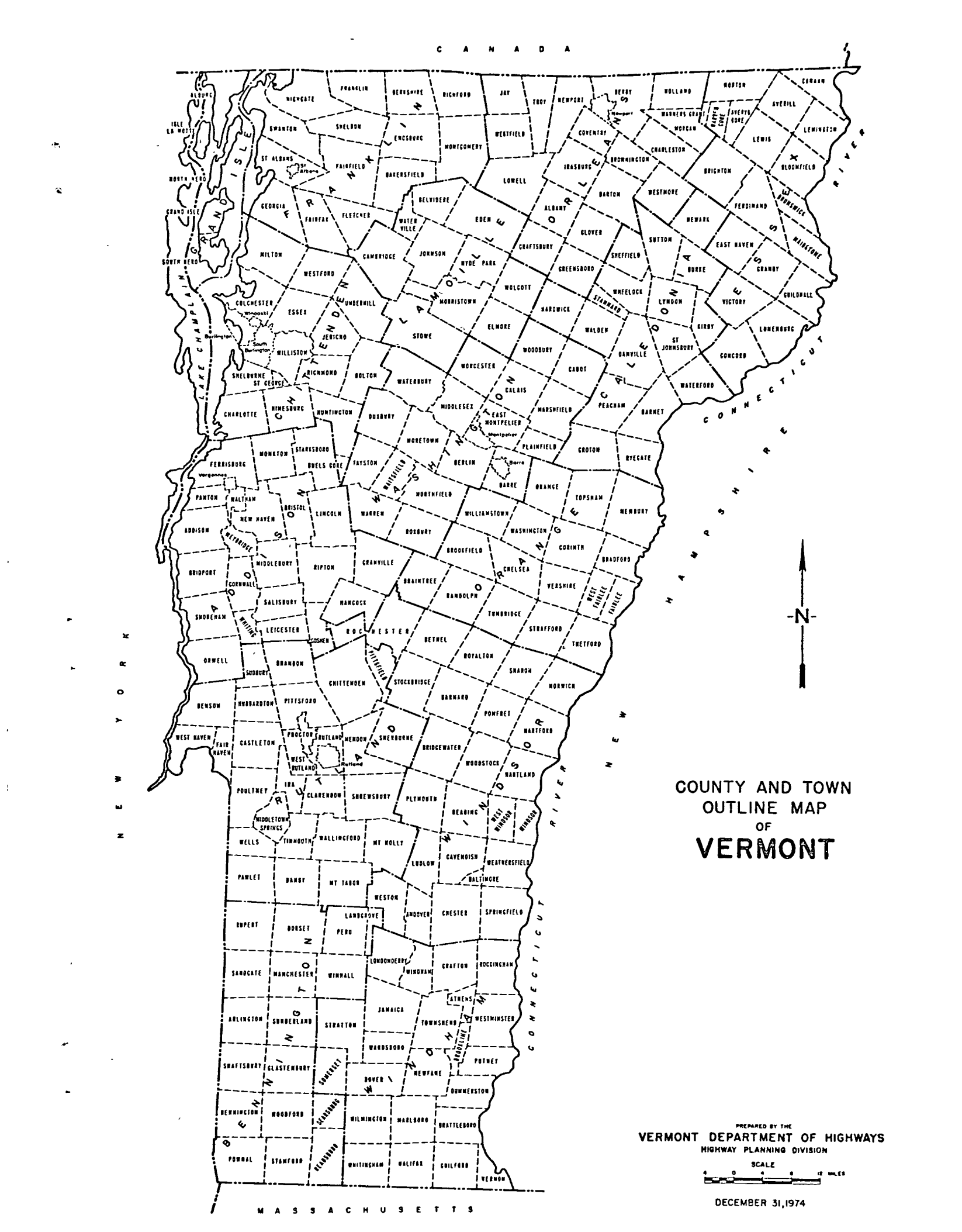
LOCATION

The Town of Stowe is in the southwest corner of Lamoille County in the northwest section of north-central Vermont. It is bounded on the northwest corner by Cambridge, the north and northeast by Morristown, the east and southeast by Worcester, the south by Waterbury, the southwest corner by Bolton, and the west by Underhill (see County and Town Outline Map of Vermont on the following page).

The western half of Stowe lies in the Green Mountain Physiographic, and the eastern half of Stowe lies in the Vermont Piedmont Physiographic Sub-divisions of the New England Upland. The Green Mountains are characterized by rugged, steep-sided mountainous terrain; whereas, the Central Plateau Region of the Vermont Piedmont has broad valleys and rounded hills. Elevations range from 4,120 feet atop Adam's Apple (in the Mount Mansfield State Forest), to less than 600 feet where the Little River crosses the Waterbury Town Line. Little River was once known as Waterbury River.

Major drainage is south via Little River into the Waterbury Reservoir, and east via West Branch Waterbury River into Little River. Secondary drainage is via Ranch and Peterson Brooks into West Branch Waterbury River; Bahannan, Sterling, Moss Glen, Gold, and Miller Brooks which are all tributaries to the Little River. Many unnamed small tributaries flow into the above brooks.

Lake Mansfield (1,150') is the only large body of water in Stowe. A small part of Sterling Pond (3,008') is in Stowe. There are close to fifty small, unnamed ponds in town.


CANADA
MASSACHUSETTS
NEW YORK
NEW HAMPSHIRE
CONNECTICUT RIVER
CONNECTICUT
LAKE CHAMPLAIN
GRAND ISLE
FRANKLIN
LAMOILLE
ORLEANS
ESSEX
CALEDONIA
WASHINGTON
ORANGE
WINDSOR
WINDHAM
RUTLAND
ADDISON
BENNINGTON
N
COUNTY AND TOWN
OUTLINE MAP
OF
VERMONT
PREPARED BY THE
VERMONT DEPARTMENT OF HIGHWAYS
HIGHWAY PLANNING DIVISION
SCALE
DECEMBER 31, 1974

SURVEY OF ROCK SOURCES

Procedure for Rock Survey

The method 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 during the winter months and comprises the mapping and description of rock types perused from many reference sources, as acknowledged in the bibliography. These references differ considerably in dependability due to subsequent developments and studies that have contributed to the obsolescence of a number of reports. The results of samples taken by other individuals are analyzed, and their location is mapped when possible. As complete a correlation as possible is made of the available geological information concerning the area under consideration.

The field investigation is begun by making a cursory survey of the entire town. The information obtained from the preliminary survey, and that from the office investigation, is used to determine where sampling will be concentrated. When a promising source has been determined by rock type, volume of material, accessibility, adequate exposure and relief, chip samples are taken with a hammer across the strike or trend of the rock, and are submitted to the Materials & Research Division for abrasion testing by the Deval Method (AASHTO T-3) and the Los Angeles Method (AASHTO T-96). Samples taken by the chip method are often within the weathered zone of the outcrop and thus may give a less satisfactory test result than fresh material from unweathered rock. When the rock is uniform, and the chip samples yield acceptable abrasion test results, the material source is listed in this report as being satisfactory.

Discussion of Rock and Rock Sources

The information on the Rock Materials Map (Plate II) is simplified. For a more detailed description of the respective rock formations, see the Summary of Rock Formations included in this report.

Occasionally, rocks belonging to the same formation and exhibiting similar characteristics (i.e., color and texture) produce different abrasion test results owing to differing physical properties or chemical compositions. Therefore, in no case should satisfactory test results obtained in one area be construed to mean that the same formation, even in the same area, will not later produce unsatisfactory materials; this is particularly true of metamorphic rocks.

Metamorphic rocks of the Green Mountain Sequence underlie the town. The Hazens Notch Formation gneiss, quartzite, and schist is mapped as underlying most of Stowe. The Underhill Formation schist outcrops in steep exposures in the Mount Mansfield State Forest. The Underhill schist has not yielded satisfactory material in towns where it has been sampled. The Hazens Notch Formation had no accessible outcrops in town; however, portions of the Formation yielded acceptable materials in other towns. The eastern quarter of town is underlain by phyllites and quartzites of the Ottauquechee Formation (which yielded some acceptable materials in other towns), and schist and amphibolite of the Stowe Formation. The schist is not acceptable material; however, the greenstone and amphibolite have produced usable material in other towns (see Waterbury Map Identification No. 3).

Discussion of Rock and Rock Sources (cont.)

Formations in the rest of Stowe are covered by glacial drift, alluvium, or heavy woods, or are unavailable due to commercial or residential development.

The formations mapped as underlying Stowe from west-to east are: the Underhill Formation schist, Hazens Notch Formation gneiss, quartzite, and schist, Ottauquechee Formation phyllite and quartzite, Stowe Formation schist, and the Stowe Formation greenstone and amphibolite; the last two are mapped as alternate zones in the east end of town.

SURVEY OF SAND AND GRAVEL SOURCES

Procedure for Sand and Gravel Survey

The method used for conducting the 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 during the winter months and comprises the mapping of potentially productive areas from various references. Of these references, the survey of glacial deposits mapped by Professor Stewart is particularly helpful when used with 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. The locations of existing pits are mapped, as are the locations in which samples were taken by other individuals.

The field investigation is begun by making a cursory survey of the entire town. All pits, and any areas that show evidence of glacial or fluvial deposition are noted, and later investigated by obtaining samples from pit faces and other exposed surfaces. Test holes in pit floors and extensions are later dug with a backhoe to a depth of approximately 11 feet to obtain material which is submitted to the Materials & Research Division for gradation, sieve analysis and AASHTO T-4 Method stone abrasion test.

Discussion of Sand and Gravel Deposits

Results of this survey showed that granular deposition in Stowe is generally limited to features between 600' and 1,050' elevation. There is one pit at 1,425', but it is extremely close to depletion. Highway and related construction materials are available, but very limited in Stowe.

The most promising sources of Gravel for Sub-base Item 704.05 are listed with the most favorable first: Map Identification Numbers 5, 6, 10, 11, 14, and a pit at 4.

Areas yielding acceptable Sand Borrow and Cushion Item 703.03 are listed with the most favorable first: Map Identification Numbers 11, 10, and pits at 17 and 15.

Other areas having materials passing highway specification requirements are not listed due to lack of reserves, not being available due to commercial or residential development, or stringent zoning regulations.

Summary of Rock Formations In The Town Of Stowe

Green Mountain Sequence

Stowe Formation: Quartz-sericite (muscovite-paragonite) - chlorite phyllite and schist; porphyroblasts of albite, garnet, chloritoid, or kyanite are common locally; includes phyllitic graywacke north of Lamoille River. Schist contains abundant segregations of granular white quartz.

Stowe Formation greenstone and amphibolite: Epidote-albite-chlorite rocks contain actinolite and hornblende where more metamorphosed.

Ottauquechee Formation: Black, carbonaceous phyllite or schist containing interbeds of massive quartzite commonly criss-crossed by veins of white quartz; quartzite is dark gray and carbonaceous, light gray, or white; also includes light green quartz-sericite-chlorite phyllite or schist and sericitic quartzite; beds of phyllitic graywacke and feldspar granule conglomerate are north of Lamoille River.

Camels Hump Group

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.

Hazens Notch Formation: Interbedded carbonaceous and noncarbonaceous quartz-sericite-albite-chlorite schist; grades to quartzite and gneiss.

GLOSSARY OF SELECTED GEOLOGIC TERMS

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

Albite - The light-colored, sodium end-member of the continuous plagioclase feldspar series which is found in alkali rocks. The name is often compounded with the names of rocks containing the mineral.

Amphibolite - A green-to-black, schistose, metamorphic rock consisting mostly of amphibole (i.e., tremolite, actinolite, hornblende, or arfvedsonite).

Anticline - A fold of rock strata that is convex upward, in which the older formations occur toward the center of curvature.

Anticlinorium - A composite fold consisting of connected anticlines and synclines which, grouped together, form an arch. The term applies to relatively large features extending for several miles.

Biotite - A platy, dark silicate mineral commonly known as black mica.

Carbonaceous - Containing carbon.

Chlorite - A group of green, hydrous silicates of aluminum, ferrous iron, and magnesium, which occur as plate-like crystals or scales in metamorphic rocks.

Chloritoid - A brittle member of the mica mineral group.

Drainage basin - A part of the surface of the earth that is occupied by a drainage system, or contributes surface water to that system.

Epidote - A green, calcium-aluminum-iron silicate mineral usually occurring in rocks as formless grains or masses. It is characteristically pistachio-, or yellowish-green.

Facies - The composite nature of sedimentary deposits that reflects the conditions and environments of their origins.

Feldspar - Any of an important group of rock-forming minerals which all have close chemical and physical similarity and which, except for a few special cases, cannot be told apart by ordinary field tests. Feldspars are essentially silicates of alumina and some other base: potash, soda, or lime. Orthoclase and microcline (both $K_2O\ Al_2O_3\ 6SiO_2$) are potash feldspars; Albite ($Na_2O\ Al_2O_3\ 6SiO_2$) is a soda feldspar; and anorthite ($CaO\ Al_2O_3\ 2SiO_2$) is a lime feldspar. Feldspars make up from 40% to 50% of the earth's crust, and are the most common rock-forming minerals. They commonly alter to kaolinite in the zone of weathering, and under conditions of true metamorphism give rise to other minerals such as sericite.

Fluvial - Pertaining to streams.

Garnet - An important group of minerals in which aluminum, calcium, chromium, ferric and ferrous iron, magnesium, and manganese combine with a silicate. They are commonly deep red, brown, or black, but may be any color except possible blue.

Gneiss - A metamorphic rock of alternate bands of light minerals (rich in feldspar and quartz), and dark minerals (rich in hornblende and mica).

Graywacke - Dark, hard sandstone having angular grains of quartz and feldspar in a matrix of micas, chlorite, and clay minerals.

Greenstone - A field term for metamorphic rocks so altered that they assume a distinctive color due to the presence of chlorite, epidote, or actinolite. Greenstone is usually derived from dark igneous rocks. Normally tough and hard, it is crushed to form good-to-excellent aggregate.

Hornblende - A common, dark variety of the amphibole group of silicate minerals. It is usually black, dark green, or brown, has a hardness of 5 to 6, a specific gravity of about 3.0, and often occurs in prismatic masses in igneous and metamorphic rocks.

Kyanite - A blue aluminum silicate mineral which occurs as thin-bladed crystals, or crystalline aggregates in metamorphic rocks.

Lenticular - Pertains to a mass of rock or earth that thins out in all directions from the center like a double-convex optical lens.

Magnetite - A magnetic mineral composed of iron ferrate (Fe_3O_4 or $FeO\ Fe_2O_3$).

Metamorphic Rocks - Rocks formed from pre-existing rocks altered by pressure, heat, or the infiltration of gases and liquids below the zones of oxidation and cementation. Metamorphic rocks are reconstructed in place while remaining essentially solid.

Muscovite - An important member of the mica group of silicate minerals; known also as white mica, potash mica, or isinglass.

Paragonite - A mica similar in appearance to muscovite but containing sodium instead of potassium.

Phyllite - A fine-grained, metamorphic rock intermediate between the mica schists and slates, into which it may grade. Its cleavage is due to the high content of the potash mica, sericite, which gives the rock a distinctive silvery appearance. Its fracture is intermediate between the rather splintery fissility of schist, and the smooth, even cleavage of slate; however, the rock is not as tough as slate.

Phyllitic - Pertaining to fine-grained, foliated metamorphic rock intermediate between the mica schists and slates, into which it may grade. Cleavage is due to the large amount of potash mica, sericite.

Porphyroblasts - Large crystals which have formed in place within the fine-grained matrix of a metamorphic rock. They are produced by heat, pressure, and infiltrating solutions in pre-existing rocks.

Quartz - The most common mineral (SiO_2). It occurs as hexagonal crystals or amorphous, transparent, translucent, opaque, or variously colored masses due to impurities.

Quartzite - The common, siliceous rock which is the metamorphic equivalent of sandstone. Its quartz grains are so firmly bonded that fractures occur with equal ease across the grains and cementing material.

Schist - A crystalline, metamorphic rock having secondary foliation or lamination based on the parallelism of platy or needle-like grains which causes a tendency to split along the foliation.

Segregation - The concentration of one or more minerals that have formed together during crystallization of a molten rock in place.

Sericite - A metamorphic mineral very similar to muscovite; it occurs in minute flakes or scales in schists, gneisses, and phyllites.

BIBLIOGRAPHY

Flint, Richard F. Glacial Geology and the Pleistocene Epoch. New York: John Wiley and Sons, Inc., 1947

Heinrich, E. W. Microscopic Petrography. New York: McGraw-Hill Co., Inc., 1956.

Kemp, James F. A Handbook of Rocks. New York: D. Van Nostrand Co., Inc., 1949.

National Academy of Sciences. National Research Council. Highway Research Board. Soil Exploration and Mapping, Highway Research Board Bulletin 28. Washington, D.C.: National Academy of Sciences - National Research Board, 1950.

Pirsson, L. V. Rock and Rock Minerals. New York: John Wiley and Sons, Inc., 1949.

Stokes, William L. and Varnes, David J. Glossary of Selected Geologic Terms, Colorado Scientific Society Proceedings, Vol. 16. Denver, Colo.: Colorado Scientific Society, 1955.

U.S. Department of Agriculture. Bureau of Chemistry and Soils. Soils Survey (Reconnaissance) of Vermont, by K. V. Goodman, W. J. Latimer, F. R. Lesh, S. O. Perkins, and L. R. Smith (1930).

U.S. Department of Interior. Geological Survey. Camels Hump Quadrangle, Vermont, 15 Minute Series (Topographic) (1948).

U.S. Department of Interior. Geological Survey. Hyde Park Quadrangle, Vermont, 15 Minute Series (Topographic) (1953).

U.S. Department of Interior, Geological Survey. Montpelier Quadrangle, Vermont, 15 Minute Series (Topographic) (1921, reprinted 1951).

U.S. Department of Interior. Geological Survey. Mount Mansfield Quadrangle, Vermont, 15 Minute Series (Topographic) (1948).

U.S. Department of Water Resources. Geological Survey. Surficial Geologic Map of Vermont, edited by Charles G. Doll (1970).

U.S. Department of Water Resources. Geological Survey. The Surficial Geology and Pleistocene History of Vermont, By David P. Stewart and Paul Mac Clintock, Bulletin No. 31 (1969).

Vermont Development Commission. Geological Survey. Geology of The Mount Mansfield Quadrangle, Vermont, by Robert A. Christman, Bulletin No. 12 (1959).

Vermont Development Department. Geological Survey. Centennial Geologic Map of Vermont, edited by Charles G. Doll (1961)

Vermont Development Department. Geological Survey. The Glacial Geology of Vermont, by David P. Stewart, Bulletin No. 19 (1961).

Vermont Geological Survey. Geology of the Camels Hump Quadrangle, Vermont, by Robert A. Christman and Donald T. Secor, Jr., Bulletin No. 15 (1961).

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, March, 1976.

DIVISION 700 - 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 - SAND BORROW AND CUSHION

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	100
No. 100		0- 30
No. 200		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, or organic material.

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

TABLE 703.05A - GRANULAR BORROW

Sieve Designation	Percentage by Weight Passing Square Mesh Sieves TOTAL SAMPLE	SAND PORTION
No. 4	20-100	100
No. 200		0- 15

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

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 - GRAVEL FOR SUB-BASE

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 AASHTO T-4, or more than 40 when tested in accordance with AASHTO 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 - CRUSHED STONE FOR SUB-BASE

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 AASHTO T-3, or the crushed stone a percent of wear of not more than 40 when tested in accordance with AASHTO T-96.

(d) Thin and Elongated Pieces. Not more than 30 percent, by weight, of thin and elongated pieces 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 - LEVELING MATERIAL

Sieve Designation	Percentage by Weight Passing Square Mesh Sieves TOTAL SAMPLE
3/4"	100
1/2"	70-100
No. 4	50- 90
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 - CRUSHED GRAVEL FOR SUB-BASE

GRADING	Sieve Designation	Percentage by Weight Passing Square Mesh Sieves TOTAL SAMPLE	SAND PORTION
COARSE	4"	100	
	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 AASHTO T-4, or the crushed gravel a percent of wear of not more than 35 when tested in accordance with AASHTO 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 - DENSE GRADED CRUSHED STONE FOR SUB-BASE

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 AASHTO T-3, or the crushed stone a percent of wear of not more than 40 when tested in accordance with AASHTO 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 - GRAVEL BACKFILL FOR SLOPE STABILIZATION

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 - GRANULAR BACKFILL FOR STRUCTURES

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

TA 404 2C Rev. 2/79

STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH DIVISION - GEOLOGY SUB-DIVISION

STOWE GRANULAR DATA SHEET NO. 1

TABLE I

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Over-Burden (Ft)	Existing Pit	Sieve Analysis % Passing						Abrasion AASHTO T-4-35	Passes AOT Spec.	Remarks
						2 "	1-1/2"	1/2"	#4	#100	#200			
1	1	1979	0-6.5	-	Yes	95	88	66	51	15	8	17.3%	Gravel	Owner: Dale Percy. Area was formerly the old Cochran pit which was part of the old Tinker Farm. Pit is in Stowe but owner insists that it is in Morristown. Area is a sprawling, shallow pit which was dug from a fairly flat field. Pit access is 0.06 mile south of the Morristown Town Line marker and is on the east side of Vermont Route 100. Pit is 0.2 mile east and north of the junction of access and Vermont Route 100. Pit has been excavated to a fence running N20°E. Material probably extends into large flat field east of fence, but no permission to dig in field was obtained. Area north of pit and south of trees has been used as a dump for septic tank trucks. Test No. 1 was in the northwest face of the middle level of pit. Material is: 0'-5.5', well-nested gravel; 5.5'-6', layer of silt-clay; 6'-6.5', gravel; bottom, sloughed material.
	2-A	1979	2-5	0-2	Yes	88	81	62	45	12	6	14.2%	Gravel	Test No. 2-A was in northeast face of middle level of pit, 110' N80°E of Test No. 1. Material is: 0'-2', overburden; 2'-5', gravel; bottom, six-inch layer of silt-clay.

TA 404 2C Rev. 2/79

STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH DIVISION - GEOLOGY SUB-DIVISION

STOWE GRANULAR DATA SHEET NO. 2

TABLE I

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Over-Burden (Ft)	Existing Pit	Sieve Analysis % Passing						Abrasion AASHTO T-4-35	Passes AOT Spec.	Remarks
						2 "	1-1/2"	1/2"	#4	#100	#200			
	2-B	1979	5-9.5	-	Yes	100	100	100	96	46	19	-	-	Test No. 2-B was below Test No. 2-A. Material is: 5'-5.5', layer of silt-clay; 5.5'-9.5', layers of sand, silty sand, silt-clay, and pebbly sand; bottom, sloughed material.
	3	1979	1-9.5	0-1	Yes	97	91	66	48	15	7	15.7%	Gravel	Test No. 3 was in west face near pasture fence at east end of upper level of pit. Material is: 0'-1', overburden; 1'-4', fine gravel; 4'-5.5', pebbly, fine gravel; 5.5'-6.5', sand; 6.5'-8', pebbly sand; 8'-9.5', gravelly sand or fine gravel; bottom, sloughed material.
	4	1979	1-9	0-1	Yes	84	76	55	41	18	10	16.2%	Granular Borrow (Gravel)	Test No. 4 was in north face of west lobe of lowest level of pit. Material is: 0'-1', overburden; 1'-5', gravel; 5'-7', sand; 7'-9', gravelly sand or fine gravel; bottom, sloughed material and vegetation.
	5	1979	1-12	0-1	Yes	100	100	100	97	50	23	-	-	Test No. 5 was in upper floor, 80' N85°W of fence opening. Material is: 0'-1', overburden; 1'-12', fine to silty fine sand; bottom, fine silty sand.

TA 404 2C Rev. 2/79

STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH DIVISION - GEOLOGY SUB-DIVISION

STOWE GRANULAR DATA SHEET NO. 3 TABLE I

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Over-Burden (Ft)	Exist-ing Pit	Sieve Analysis % Passing						Abrasion AASHTO T-4-35	Passes AOT Spec.	Remarks
						2 "	1-1/2"	1/2"	#4	#100	#200			
	6	1979	1.5-12	0-1.5	Yes	100	100	78	58	27	21	-	-	Test No. 6 was dug in pit extension, 120' east of Test No. 2-A. Material is: 0'-1.5', overburden; 1.5'-7', fine gravel; 7'-8', sand; 8'-9', fine gravel;9'-10', sand; 10'-12', fine gravel; bottom, sand.
	7	1979	0.5-10	0-0.5	Yes	100	100	92	88	41	15	-	Granular Borrow (sand)	Test No. 7 was in floor, 130' S50°W of Test No. 2-A. Material is: 0'-0.5', overburden; 0.5'-10', sand with a few pebbly zones; bottom, sand. Field east of fence may become a site for housing.
2	1-A	1979	1-10	0-1	Yes	85	80	75	67	25	12	-	Granular Borrow (Sand)	Owner: Theodore Barnett. Area is small, overgrown and sloughed pit, 120' west of Town Highway No. 16. Access is 0.18 mile southeast of the junction of Town Highways No. 16 and 57. Pit is in a rather flat-topped, wooded knoll which drops steeply to a brook to the west and south-west. Test No. 1-A was in the north-west face of overgrown pit. Material is: 0'-1', overburden; 1'-2.5', pebbly sand; 2.5'-5', silty fine sand; 5'-6', pebbly sand; 6'-7', silty fine sand;

TA 404 2C Rev. 2/79

STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH DIVISION - GEOLOGY SUB-DIVISION

STOWE GRANULAR DATA SHEET NO. 4 TABLE I

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Over-Burden (Ft)	Exist-ing Pit	Sieve Analysis % Passing						Abrasion AASHTO T-4-35	Passes AOT Spec.	Remarks
						2 "	1-1/2"	1/2"	#4	#100	#200			
														7'-10', pebbly sand; bottom, sloughed material. Material is very dry and well-drained and has some random 1" to 3" stones. Note: There were many yellow jackets present.
	1-B	1979	10-15	-	Yes	100	94	85	72	22	11	-	Sand	Test No. 1-B was below Test No. 1-A. Material is: 10'-15', pebbly sand or gravelly sand; bottom, sand. Material is very dry and well-drained. Face caved dangerously.
	2-A	1979	2-17	0-2	Yes	100	100	97	91	43	23	-	-	Test No. 2-A was in southwest face of pit. Material is: 0'-2', overburden; 2'-3', pebbly sand; 3'-4', silty fine sand; 4'-8', pebbly sand; 8'-10', layers of silty fine sand and silt-clay; 10'-12', sand; 12'-15', silty fine sand; 15'-17', layer of silt-clay; bottom, sloughed material and vegetation. Material is very dry and well-drained.
	2-B	1979	17-22	-	Yes	100	100	89	77	17	8	-	Sand	Test No. 2-B was below Test No. 2-A. Material is: 17'-19', sand; 19'-20', pebbly sand; 20'-22', gravelly sand; bottom, sand. Face caved dangerously.

TA 404 2C Rev. 2/79

STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH DIVISION - GEOLOGY SUB-DIVISION

STOWE GRANULAR DATA SHEET NO. 5 TABLE I

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Over-Burden (Ft)	Exist-ing Pit	Sieve Analysis % Passing						Abrasion AASHTO T-4-35	Passes AOT Spec.	Remarks
						2 "	1-1/2"	1/2"	#4	#100	#200			
	3	1979	1-11	0-1	No	100	100	100	93	61	43	-	-	Test No. 3 was in woods, 130' S65°E of Test No. 2-A. Material is: 0'-1', overburden; 1'-11', sand with a few pebbly zones; bottom, sand.
	4	1979	1-12	0-1	Yes	100	100	100	89	84	59	-	-	Test No. 4 was in floor, 35' S70°E of Test No. 1-B. Material is: 0'-1', overburden; 1'-12', pebbly silty sand; bottom, silty sand.
3	1	1979	0.5-7	0-0.5	Yes	94	94	77	60	38	18	-	-	Owner: Mount Mansfield Corporation. Area is a sprawling shallow pit in woods 300' east of Vermont Route 108. Access is 1.57 miles northwest of the junction of Town Highway No. 19 and Vermont Route 108. Pit is nearly depleted and is used as a private land fill and as a storage area for borrow. Test No. 1 was in west face of small northwest lobe of pit. Material is: 0'-0.5', overburden; 0.5'-1', sand; 1'-2', layer of silt-clay; 2'-2.5', sand; 2.5'-3.5', pebbly fine gravel; 3.5'-4', sand;4'-5', fine sand; 5'-6', gravel; 6'-7', silty fine sand; bottom, silt-clay, angular stones, and very large boulders.

TA 404 2C Rev. 2/79

STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH DIVISION - GEOLOGY SUB-DIVISION

STOWE GRANULAR DATA SHEET NO. 6

TABLE I

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Over-Burden (Ft)	Existing Pit	Sieve Analysis % Passing						Abrasion AASHTO T-4-35	Passes AOT Spec.	Remarks
						2 "	1-1/2"	1/2"	#4	#100	#200			
	2	1979	0.5-8	0-0.5	Yes	92	87	64	46	20	10	20.0%	Gran. Borrow (Gravel)	Test No. 2 was in northwest face in small, northwest lobe of pit. Material is: 0'-0.5', overburden; 0.5'-2.5', dusty, silty gravel; 2.5'-3.5', sand; 3.5'-8', pebbly fine gravel with quite a lot of quartzose and schistose stones; bottom, silty fine sand and large boulders.
	3-A	1979	0.5-5	0-0.5	Yes	100	95	83	71	25	12	18.9%	Sand	Test No. 3-A was in southeast face of southeast lobe of pit. Material is: 0'-0.5', overburden; 0.5'-2', dusty, pebbly fine gravel; 2'-3', silty fine sand; 3'5', pebbly fine gravel; bottom, silt-clay.
	3-B	1979	5-12	-	Yes	100	100	100	100	97.8	93.4	-	-	Test No. 3-B was below Test No. 3-A. Material is: 5'-12', silt-clay; bottom, sloughed material. Soil classification: Material is a silt.
4	1	1979	2-9	0-2	Yes	85	85	74	60	21	13	17.6%	Gran. Borrow (Gravel)	Owner: Stowe School. Area is a wooded terrace with two banks alongside access road to water supply in clearing atop terrace. Upper level of terrace

STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH DIVISION - GEOLOGY SUB-DIVISION

STOWE GRANULAR DATA SHEET NO. 7

TABLE I

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Over-Burden (Ft)	Existing Pit	Sieve Analysis % Passing						Abrasion AASHTO T-4-35	Passes AOT Spec.	Remarks
						2 "	1-1/2"	1/2"	#4	#100	#200			
														is 0.31 mile north and west of Vermont Route 108. Access is 0.103 mile east of the junction of Town Highway No. 19 and Vermont Route 108. Test No. 1 was on bank south of access road on upper level of wooded terrace. Material is: 0'-2', overburden; 2'-5', gravel with many tabular stones; 5'-6', layer of silty sand; 6'-7', pebbly fine gravel with angular, 1/2" to 3/4" pebbles; 7'-9', dirty fine gravel; bottom, sloughed material and some vegetation.
	2	1979	2.5-11	0-2.5	Yes	94	91	79	60	11	7	18.1%	Gravel	Test No. 2 was in overgrown face of lower slope of wooded terrace west of access road. Material is: 0'-2.5', overburden; 2.5'-5.5', bouldery gravel; 5.5'-8.5', pebbly fine gravel; 8.5'-11', fine gravel with some small cobbles; bottom, silt-clay and angular stones.
	3	1979	1-10	0-1	No	94	94	70	56	13	6	18.9%	Gravel	Test No. 3 was in woods, 90' S70°E of curve in woods road. Material is: 0'-1', overburden;

STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH DIVISION - GEOLOGY SUB-DIVISION

STOWE GRANULAR DATA SHEET NO. 8

TABLE I

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Over-Burden (Ft)	Existing Pit	Sieve Analysis % Passing						Abrasion AASHTO T-4-35	Passes AOT Spec.	Remarks
						2 "	1-1/2"	1/2"	#4	#100	#200			
														1'-4', fine gravel; 4'-6', bouldery gravel with 12" to 18" stones; 6'-8', gravel; 8'-10', bouldery gravel; bottom, boulders.
	4	1979	1-6	0-1	No	100	100	98	92	54	37	-	-	Test No. 4 was in small clearing, 90' S25°W of Test No. 3. Material is: 0'-1', overburden; 1'-4', silty fine sand; 4'-6', pebbly sand; bottom, large boulders.
	5	1979	1.5-7	0-1.5	No	76	72	51	37	11	7	23.4%	Gravel	Test No. 5 was in small clearing, 90' S60°E of Test No. 4. Material is: 0'-1.5', overburden; 1.5'-7', coarse, bouldery gravel; bottom, large boulders (many over 12").
	6	1979	0.5-10	0-0.5	No	85	85	76	66	19	6	-	Gran. Borrow (Gravel)	Test No. 6 was near woods road, 30' north of Test No. 1. Material is: 0'-0.5', overburden; 0.5'-7.5', pebbly sand; 7.5'-9', gravel; 9'-10', gravelly sand; bottom, gravelly sand.
	7	1979	1-13	0-1	No	89	82	67	51	5	3	14.8%	Gravel	Test No. 7 was in small clearing in upper, wooded terrace. Material is: 0'-1', overburden; 1'-11', coarse, bouldery gravel; 11'-13', gravel (not as coarse

STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH DIVISION - GEOLOGY SUB-DIVISION

STOWE GRANULAR DATA SHEET NO. 9

TABLE I

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Over-Burden (Ft)	Exist-ing Pit	Sieve Analysis % Passing						Abrasion AASHTO T-4-35	Passes AOT Spec.	Remarks
						2 "	1-1/2"	1/2"	#4	#100	#200			
														as above); bottom, gravel.
5	1	1979	4-10	0-4	No	81	72	49	35	14	3	15.3%	Gravel	Owner: James Rogers. Area is a 25-acre meadow adjacent to the north side of Vermont Route 108. Access is 0.3 mile east of the junction of Town Highway No. 23 and Vermont Route No. 108. Area is 2.9 miles west of the junction of Vermont Routes 100 and 108 (in the Village). There is a buried telephone cable near, and about parallel with, Vermont Route 108. Paul Percy has a lease with owner so he can use the field for hay. Test No. 1 was on small rise in field, 125' east of the east end of driveway. Material is: 0'-4', overburden; 4'-10', well-nested, but loosely consolidated gravel; bottom, gravel and water. Gravel had many tabular stones. Water was encountered at 9'.
	2	1979	2.5-7	0-2.5	No	80	80	55	41	22	15	38.9%	Gran. Borrow (Gravel)	Test No. 2 was in low part of field, 410' S55°E of Test No. 1. Material is: 0'-2.5', overburden; 2.5'-7', dirty, tabular gravel;

STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH DIVISION - GEOLOGY SUB-DIVISION

STOWE GRANULAR DATA SHEET NO. 10

TABLE I

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Over-Burden (Ft)	Existing Pit	Sieve Analysis % Passing						Abrasion AASHTO T-4-35	Passes AOT Spec.	Remarks
						2 "	1-1/2"	1/2"	#4	#100	#200			
														bottom, dirty gravel. Much water was encountered at 5'.
	3	1979	1-9	0-1	No	94	94	59	41	19	13	12.3%	Gran. Borrow (Gravel)	Test No. 3 was in low rise in field, 165' S65°W of, and 4' above Test No. 2; 425' S30°E of Test No. 1. Material is: 0'-1', overburden; 1'-9', gravel with tabular stones; bottom, gravel. Water was encountered at 7'.
	4	1979	0.5-9	0-0.5	No	96	87	48	30	7	4	13.0%	Gravel	Test No. 4 was in low rise in field, 170' S50°W of, and 5' below Test No. 3. Material is: 0'-0.5', overburden; 0.5'-9', gravel with tabular stones; bottom, gravel. Water was encountered at 7'.
	5	1979	1.5-8	0-1.5	No	93	93	65	49	13	8	23.5%	Gravel	Test No. 5 was near south corner of field, 545' S40°E of Test No. 4. Material is: 0'-1.5', overburden; 1.5'-8', gravel; bottom gravel. Much water was encountered at 5'.
6	1	1979	3.5-10.5	0-3.5	No	90	79	52	37	16	10	18.3%	Gran. Borrow (Gravel)	Owner: Raymond Field. (Former owner was Charles Gale). Paul Percy has a lease with owner to use as a cornfield. Area is a

TA 404 2C Rev. 2/79

STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH DIVISION - GEOLOGY SUB-DIVISION

STOWE GRANULAR DATA SHEET NO. 11

TABLE I

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Over-Burden (Ft)	Existing Pit	Sieve Analysis % Passing						Abrasion AASHTO T-4-35	Passes AOT Spec.	Remarks
						2 "	1-1/2"	1/2"	#4	#100	#200			
														33-acre cornfield north of Vermont Route 108. Access is 0.15 mile west of the junction of Town Highway No. 31 and Vermont Route 108, and 1.9 miles west of the junction of Vermont Routes 100 and 108 (in the Village). Test No. 1 was in south end of large cornfield, 265' N45°E of property line corner marker. Material is: 0'-3.5', overburden; 3.5'-10.5', fluvial gravel; bottom, gravel.
	2	1979	4-10	0-4	No	80	74	54	41	15	8	13.0%	Gravel	Test No. 2 was in north end of field, 910' N25°E of Test No. 1. Material is: 0'-4', overburden; 4'-10', gravel; bottom, gravel. Water was encountered at 9'.
	3	1979	4-10	0-4	No	100	98	62	42	18	12	14.6%	Gran. Borrow (Gravel)	Test No. 3 was near middle of field, 390' N25°E of Test No. 1, and 540' S25°W of Test No. 2. Material is: 0'-4', overburden; 4'-10', gravel; bottom, gravel. Tests No. 1, 2, and 3 have very similar material
	4	1979	2.5-11	0-2.5	No	95	95	64	41	13	8		Gravel	Test No. 4 was at east edge of field, 275 S70°E of Test No. 3.

TA 404 2C Rev. 2/79

STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH DIVISION - GEOLOGY SUB-DIVISION

STOWE GRANULAR DATA SHEET NO. 12

TABLE I

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Over-Burden (Ft)	Existing Pit	Sieve Analysis % Passing						Abrasion AASHTO T-4-35	Passes AOT Spec.	Remarks
						2 "	1-1/2"	1/2"	#4	#100	#200			
	5	1979	2.5-12	0-2.5	No	95	88	59	41	17	10	16.7%	Gran. Borrow (Gravel)	Material is: 0'-2.5', overburden; 2.5'-11', gravel; bottom, gravel. Test No. 5 was in west edge of field, 630' N70°W of Test No. 3. Test was in a low sag, 4' below Test No. 3. Material is: 0'-2.5', overburden; 2.5'-10', gravel; 10'-12', sandy gravel or fine gravel; bottom, sandy gravel or fine gravel.
7	1	1979	2-12	0-2	No	92	90	59	43	18	9	12.2%	Gran. Borrow (Gravel)	Owner: Raymond Field. (Former owner: Charles Gale). Area is series of gravel bars or terraces at west edge of West Branch River. Area is 0.11 mile south of Town Highway No. 10. Access is just west of Bridge No. 53, and 0.26 mile west of the junction of Town Highway No. 10 and Vermont Route 108. Owner has been able to use material because it is for his own project and not for sale to someone else. Levees will have to be put in along the river to avoid flooding, or a shift in channel. Test No. 1 was in northeast slope at east edge of gravelly

STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH DIVISION - GEOLOGY SUB-DIVISION

STOWE GRANULAR DATA SHEET NO. 13

TABLE I

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Over-Burden (Ft)	Existing Pit	Sieve Analysis % Passing 2 "	1-1/2"	1/2"	#4	#100	#200	Abrasion AASHTO T-4-35	Passes AOT Spec.	Remarks
														terrace. Material is: 0'-2', overburden; 2'-12', gravel with tabular stones; bottom, same. Bottom is not much above river level.
	2	1979	0.5-10	0-0.5	No	77	65	46	31	17	9	16.5%	Gran. Borrow (Gravel)	Test No. 2 was in northwest face of narrow terrace west of river. Material is: 0'-0.5', overburden; 0.5'-10', gravel with tabular stones; bottom, sloughed stones down to stream level.
	3	1979	0-7	-	No	98	88	59	41	16	10	18.4%	Gran. Borrow (Gravel)	Test No. 3 was from stockpile, 240' N80°E of Test No. 1. Material is: 0'-7', stockpiled gravel; bottom, same.
8	1	1979	1-4	0-1	Yes	100	100	100	98	59	33	-	-	Owner: Raymond Spear. Area is a very shallow pit on a low cleared rise near woods south of meadows. Access is 0.27 mile southwest of the junction of Town Highway 10 and Vermont Route 108. Test No. 1 was in low north face in west end of pit. Material is: 0'-1', overburden; 1'-4', sand - with a 4" layer of silt-clay at 2'; bottom, sand.

STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH DIVISION - GEOLOGY SUB-DIVISION

STOWE GRANULAR DATA SHEET NO. 14

TABLE I

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Over-Burden (Ft)	Exist-ing Pit	Sieve Analysis % Passing						Abrasion AASHTO T-4-35	Passes AOT Spec.	Remarks
						2 "	1-1/2"	1/2"	#4	#100	#200			
	2	1979	1-4	0-1	Yes	100	100	100	100	77	30	-	-	Test No. 2 was in low face in southeast part of pit, 80' S75°E of Test No. 1. Material is: 0'-1', overburden; 1'-3', fine sand; 3'-3.5', layer of silt-clay; 3.5'-4', fine sand; bottom, silt-clay.
	3-A	1979	0-3	-	No	85	72	56	46	11	5	17.5%	Gravel	Test No. 3-A was in corner of low terrace, 70' northwest of pit face. Material is: 0'-3', a skim of fine gravel; bottom, sand.
	3-B	1979	3-9	-	No	100	100	100	96	58	19	-	-	Test No. 3-B was below Test No. 3-A. Material is: 3'-9', silty fine sand; bottom, silt-clay and a water seep.
	4	1979	0.5-5	0-0.5	Yes	80	74	60	49	24	17	-	-	Test No. 4 was near edge of pit, 150' N35°E of Test No. 3. Material is: 0'-0.5', overburden; 0.5'-3', pebbly sand; 3'-5', fine gravel; bottom, silt-clay.
9	1	1979	0.5-12	0-0.5	Yes	100	100	100	98	16	8	-	Sand	Owner: Lawrence Smith. Former owner: George Wright. Area is the old Lavanway place. Area is a narrow pit and overgrown, terraced field 0.1 mile north of Town Highway No. 1; access is

TA 404 2C Rev. 2/79

STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH DIVISION - GEOLOGY SUB-DIVISION

STOWE GRANULAR DATA SHEET NO. 15

TABLE I

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Over-Burden (Ft)	Exist-ing Pit	Sieve Analysis % Passing						Abrasion AASHTO T-4-35	Passes AOT Spec.	Remarks
						2 "	1-1/2"	1/2"	#4	#100	#200			
														0.08 mile west of the junction of Town Highways No. 1 and 10 Inactive pit is at the southern end of a grassy, steep, silty knoll.
	1	1979	0-12	0-0.5	Yes	100	100	100	100	37	11	-	Gran. Borrow (Sand)	Test No. 1 was in floor of north end of narrow, steep, sloughed pit. Material is: 0'-0.5', overburden; 0.5'-4', silty fine sand; 4'-12', sand; bottom, sand. Sand below 4' looks good.
	2	1979	0.5-12	0-0.5	Yes	100	100	100	100	37	11	-	Gran. Borrow (Sand)	Test No. 2 was in floor near south end of pit, 180' S25°W of Test No. 1. Material is: 0'-0.5', overburden; 0.5'-12', sand; bottom, sand. Test-hole caved extensively.
	3	1979	3-10	0-3	No	95	90	63	48	14	8	15.7%	Gravel	Test No. 3 was in brushy field, 235' S40°W of Test No. 2. Material is: 0'-3', overburden; 3'-10', gravel; bottom, silt-clay and water. (Material looks similar to that at Map Identification No. 11).
	4-A	1979	1-7	0-1	No	100	100	97	92	49	22	-	-	Test No. 4-A was in north end of field near wooded knoll, 165' N15°E of Test No. 3, and 120'

TA 404 2C Rev. 2/79

STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH DIVISION - GEOLOGY SUB-DIVISION

STOWE GRANULAR DATA SHEET NO. 16

TABLE I

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Over-Burden (Ft)	Existing Pit	Sieve Analysis % Passing						Abrasion AASHTO T-4-35	Passes AOT Spec.	Remarks
						2 "	1-1/2"	1/2"	#4	#100	#200			
														west of Test No. 2. Material is: 0'-1', overburden; 1'-3', silty fine sand; 3'-7', sand; bottom, gravel (Test No. 4-B).
	4-B	1979	7-11	-	No	100	100	83	71	21	13	-	Gran. Borrow (Sand)	Test No. 4-B was below Test No. 4-A. Material is: 7'-8', gravel; 8'-8.5', sand; 8.5'-11', gravel; bottom, gravel.
	5	1979	5.5-11.5	0-5.5	No	94	90	54	34	28	24	17.2%	-	Test No. 5 was in field, 145' S15°W of, and 8' below Test No. 3. Material is: 0'-5.5', overburden; 5.5'-9.5', gravel; 9.5'-11.5', gravelly sand; bottom, sand.
10	1	1979	5.5-9	0-5.5	No	94	81	58	43	39	24	19.1%	-	Owner: State of Vermont, Department of Forests and Parks. Paul Percy has a 5-year lease to hay the fields. Area is a long, irregularly shaped field south and east of Town Highway No. 1. Access is on south side of Town Highway No. 1, and 0.07 mile east of the junction of Town Highways No. 1 and 10. Test No. 1 was in uncut part of northeast corner of field. Material is: 0'-5.5', overburden;

STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH DIVISION - GEOLOGY SUB-DIVISION

STOWE GRANULAR DATA SHEET NO.17

TABLE I

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Over-Burden (Ft)	Existing Pit	Sieve Analysis % Passing						Abrasion AASHTO T-4-35	Passes AOT Spec.	Remarks
						2 "	1-1/2"	1/2"	#4	#100	#200			
														5.5'-9', gravel; bottom, gravel. Water was encountered at 7'.
	2-A	1979	0.5-5.5	0-0.5	No	100	100	100	100	81	25	-	-	Test No. 2-A was near edge of field, 395' S20°W of Test No. 1. Material is: 0'-0.5', overburden; 0.5'-5.5', sand; bottom, gravel (Test No. 2-B.
	2-B	1979	5.5-8	-	No	100	93	73	47	8	4	19.4%	Gravel	Test No. 2-B was below Test No. 2-A. Material is: 5.5'-8', gravel; bottom, tree, gravel, and water. Tree might be a remnant of the 1927 flood.
	3-A	1979	1-4	0-1	No	100	100	100	96	9	5	-	Sand	Test No. 3-A was in south corner of field, 735' S20°W of Test No. 2. Material is: 0'-1', overburden; 1'-4', sand; bottom, gravel (Test No. 3-B).
	3-B	1979	4'-8'	-	No	100	92	53	33	7	5	20.5%	Gravel	Test No. 3-B was below Test No. 3-A. Material is: 4'-8', bright, brick-red gravel with tabular and sub-round stones; bottom, gravel. Water was encountered at 6'.
	4	1979	1-4.5	0-1	No	100	100	100	100	92.0	59.0	-	-	Test No. 4 was at edge of field 255' N30°W of Test No. 3.

TA 404 2C Rev. 2/79

STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH DIVISION - GEOLOGY SUB-DIVISION

STOWE GRANULAR DATA SHEET NO. 18

TABLE I

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Over-Burden (Ft)	Existing Pit	Sieve Analysis % Passing						Abrasion AASHTO T-4-35	Passes AOT Spec.	Remarks
						2 "	1-1/2"	1/2"	#4	#100	#200			
														Material is: 0'-0.5', overburden; 0.5'-4.5', sand; bottom, gravel (Test No. 5-B).
	5-B	1979	4.5-10	-	No	100	87	56	37	11	7	21.3%	Gravel	Test No. 5-B was below Test No. 5-A. Material is: 4.5'-10', gravel; bottom, gravel. Water was encountered at 9'. There was a layer of black gravel from 4.5'-5.5'.
	6	1979	1-9	0-1	No	100	100	100	100	8	5	-	Sand	Test No. 6 was near trees at southwest edge of field, 340' N30°W of Test No. 5, and 180' S40°W of Test No. 4. Material is: 0'-1', overburden; 1'-3', silty fine sand; 3'-5', sand; 5'-6', silt-clay; 6'-9', sand; bottom, sand. Water was encountered at 7.5'.
	7	1979	1-6.5	0-1	No	100	100	100	96	13	8	-	Sand	Test No. 7 was near northwest edge of field, 515' S75°W of Test No. 2, and 360' N25°W of Test No. 4. Material is: 0'-1', overburden; 1'-3', brown silty sand; 3'-6.5', rusty, pebbly, coarse sand; bottom, fine gravel. Water was encountered at 6.5'.

TA 404 2C Rev. 2/79

STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH DIVISION - GEOLOGY SUB-DIVISION

STOWE GRANULAR DATA SHEET NO. 19

TABLE I

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Over-Burden (Ft)	Existing Pit	Sieve Analysis % Passing						Abrasion AASHTO T-4-35	Passes AOT Spec.	Remarks
						2 "	1-1/2"	1/2"	#4	#100	#200			
	8-A	1979	1-5.5	0-1	No	100	94	85	73	32	18	-	-	Test No. 8-A was atop small rise in field, 205' N50°W of Test No. 2 and 405' N50°E of Test No. 7. Material is: 0'-1', overburden; 1'-5.5', sand; bottom, gravel (Test No. 8-B).
	8-B	1979	5.5-9.5	-	No	95	92	66	49	11	7	22.2%	Gravel	Test No. 8-B was below Test No. 8-A. Material is: 5.5'-9.5', gravel; bottom, gravel. Water was encountered at 8.5'.
11	1	1979	1-11	0-1	No	100	100	71	52	11	8	16.9%	Gravel	Owner: State of Vermont. Department of Forests and Parks. Paul Percy has a 5-year lease to hay the fields. Area is an 8-acre field southeast of the junction of Town Highways No. 43 and 48. Access is 50' south of the junction and on the east side of Town Highway No. 48. Test No. 1 was near river at southeast edge of field. Material is: 0'-1', overburden; 1'-11', loose, well-graded gravel; bottom, gravel.
	2	1979	5-11	0-5	No	92	84	61	41	14	10	11.1%	Gran. Borrow (Gravel)	Test No. 2 was in northwest corner of south part of field, 425' north of Test No. 1.

TA 404 2C Rev. 2/79

STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH DIVISION - GEOLOGY SUB-DIVISION

STOWE GRANULAR DATA SHEET NO. 20

TABLE I

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Over-Burden (Ft)	Exist-ing Pit	Sieve Analysis % Passing						Abrasion AASHTO T-4-35	Passes AOT Spec.	Remarks
						2 "	1-1/2"	1/2"	#4	#100	#200			
														Material is: 0'-5', overburden; 5'-11', rusty colored gravel; bottom, gravel. Looks like a fluvial gravel.
	3-A	1979	1.5-8.5	0-1.5	No	90	90	63	44	22	15	13.4%	Gran. Borrow (Gravel)	Test No. 3-A was in northeast corner of south part of field, 235' S70°E of Test No. 2, and 435' N40°E of Test No. 1. Material is: 0'-1.5', overburden; 1.5'-8.5', gravel; bottom, sand (Test No. 3-B).
	3-B	1979	8.5-14	-	No	100	100	84	69	17	12	-	Sand	Test No. 3-B was below Test No. 3-A. Material is: 8.5'-14', sand; bottom, sand.
	4	1979	2.5-6	0-2.5	No	100	100	76	48	12	7	12.6%	Gravel	Test No. 4 was near edge of southeast corner of north field, 145' N30°E of, and 7' below Test No. 3. Material is: 0'-2.5', overburden; 2.5'-4', fine gravel; 4'-5', rusty gravel; 5'-6', gravelly sand; bottom, sand (6'-10'); water was encountered at 8.5'.
	5	1979	1-8	0-1	No	83	76	57	41	12	7	10.8%	Gravel	Test No. 5 was in northeast corner of north field, 465' north of Test No. 4. Material is: 0'-1', overburden; 1'-4', sand;

STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH DIVISION - GEOLOGY SUB-DIVISION

STOWE GRANULAR DATA SHEET NO. 21

TABLE 1

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Over-Burden (Ft)	Existing Pit	Sieve Analysis % Passing						Abrasion AASHTO T-4-35	Passes AOT Spec.	Remarks
						2 "	1-1/2"	1/2"	#4	#100	#200			
														4'-8', coarse gravel; bottom, gravel and water.
	6	1979	1-10	0-1	No	96	89	63	43	15	9	11.9%	Gran. Borrow (Gravel)	Test No. 6 was along middle of east edge of north field, 200' N20°E of Test No. 4. Material is: 0'-1', overburden; 1'-10', gravel; bottom, gravel and water.
	7	1979	3.5-8	0-3.5	No	69	69	47	35	11	6	8.9%	Gravel	Test No. 7 was in northwest corner of north field, 485' N80°W of Test No. 5. Material is: 0'-3.5', overburden; 3.5'-8', gravel; bottom, gravel. Water was encountered at 6'.
	8	1979	0.5-4	0-0.5	No	100	100	62	39	5	4	14.4%	Gravel	Test No. 8 was in southwest corner of north field, 420' S10°E of Test No. 7. Material is 0'-0.5', overburden; 0.5-4', a skim of gravel; bottom, silty fine sand or silt-clay. The test exposed a very limited amount of gravel.
	9	1979	3-8	0-3	No	83	73	46	33	18	9	12.7%	Gran. Borrow (Gravel)	Test No. 9 was near center of north field, 220' N35°E of Test No. 8 and 270' S60°W of Test No. 5. Material is: 0'-3', overburden; 3'-8', gravel; bottom,

STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH DIVISION - GEOLOGY SUB-DIVISION

STOWE GRANULAR DATA SHEET NO. 22

TABLE I

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Over-Burden (Ft)	Exist-ing Pit	Sieve Analysis % Passing						Abrasion AASHTO T-4-35	Passes AOT Spec.	Remarks
						2 "	1-1/2"	1/2"	#4	#100	#200			
														gravel. Water was encountered at 6'. Material probably should be crushed.
12	1	1979	0.5-4.5	0-0.5	Yes	94	85	65	50	19	13	14.2%	Gran. Borrow (Gravel)	Owner: State of Vermont, Department of Forests and Parks. Area is a small, overgrown, nearly depleted pit east of Town Highway No. 48. Access is 0.25 mile south of the junction of Town Highways No. 43 and 48. Test No. 1 was in floor of pit. Material is: 0'-0.5', overburden; 0.5'-4.5', dirty, silty gravel; bottom, sand.
	2	1979	0.5-4.5	0-0.5	Yes	100	88	83	81	63	37	-	-	Test No. 2 was at edge of field, 12' below the southeast edge of pit floor. Material is: 0'-0.5', overburden; 0.5'-4', silty fine sand; 4'-4.5', gravelly layer; bottom, silt-clay.
13	1	1979	1-9	0-1	No	100	100	86	69	21	15	-	Gran. Borrow (Sand)	Owner: State of Vermont, Department of Forests and Parks. Area is base of wooded knoll and a small clearing northwest of Town Highway No. 48. Access

TA 404 2C Rev. 2/79

STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH DIVISION - GEOLOGY SUB-DIVISION

STOWE GRANULAR DATA SHEET NO. 23

TABLE I

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Over-Burden (Ft)	Existing Pit	Sieve Analysis % Passing						Abrasion AASHTO T-4-35	Passes AOT Spec.	Remarks
						2 "	1-1/2"	1/2"	#4	#100	#200			
														is 0.25 mile south of the junction of Town Highways No. 43 and 48. Test No. 1 was near tree-line at base of wooded slope. Material is: 0'-1', overburden; 1'-5', sand; 5'-6', layer of silt-clay; 6'-8', gravelly sand; 8'-9', sand; bottom, silt-clay. Water was encountered at 8'.
	2	1979	1-12	0-1	No	100	100	96	90	77	48	-	-	Test No. 2 was in woods near logging road at base of wooded knoll, 240' N40°W of Test No. 1. Material is: 0'-1', overburden; 1'-3', stony sand; 3'-8', silty fine sand; 8'-9', layer of silt-clay; 9'-12', silty fine sand; bottom, silty fine sand. Water was encountered at 8'.
14	1-A	1979	0.5-3.5	0-0.5	No	93	90	58	40	4	2	9.2%	Gravel	Owner: State of Vermont, Department of Forests and Parks. Paul Percy has a 5-year lease on field. Area is a nearly flat meadow southwest of the junction of Town Highways No. 43 and 48. Access to field is via field path 100' south of Town Highway No. 43.

TA 404 2C Rev. 2/79

STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH DIVISION - GEOLOGY SUB-DIVISION

STOWE GRANULAR DATA SHEET NO. 24

TABLE I

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Over-Burden (Ft)	Existing Pit	Sieve Analysis % Passing						Abrasion AASHTO T-4-35	Passes AOT Spec.	Remarks
						2 "	1-1/2"	1/2"	#4	#100	#200			
														Test No. 1-A near tree-line in southeast corner of field. Material is: 0'-0.5', overburden; 0.5'-3.5', quite fine gravel; bottom, sand (Test No. 1-B).
	1-B	1979	3.5-9	-	No	100	100	96	92	41	13	-	Gran. Borrow (Sand)	Test No. 1-B was below Test No. 1-A. Material is: 3.5'-9', sand; bottom, sand. Hole caved excessively.
	2	1979	0.5-5	0-0.5	No	100	90	65	44	12	7	11.8%	Gravel	Test No. 2 was in southwest corner of field, 495' N75°W of Test No. 1-A. Material is: 0'-0.5', overburden; 0.5'-2', gravel; 2'-2.5', sand; 2.5'-5', gravel; bottom, gravel. Water was encountered at 4.5'.
	3	1979	0.5-9	0-0.5	No	100	85	55	33	11	7	12.6%	Gravel	Test No. 3 was near road at northwest corner of field, 260' N20°E of Test No. 2. Material is: 0'-0.5', overburden; 0.5'-3', fine gravel; 3'-9', coarse gravel; bottom, gravel and water.
	4	1979	1-4	0-1	No	91	87	58	43	11	7	11.1%	Gravel	Test No. 4 was near the center of field, 235' southeast of Test No. 3. Material is: 0'-1', overburden; 1'-4', gravel; bottom, gravel and water.

TA 404 2C Rev. 2/79

STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH DIVISION - GEOLOGY SUB-DIVISION

STOWE GRANULAR DATA SHEET NO. 25

TABLE I

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Over-Burden (Ft)	Existing Pit	Sieve Analysis % Passing						Abrasion AASHTO T-4-35	Passes AOT Spec.	Remarks
						2 "	1-1/2"	1/2"	#4	#100	#200			
	5	1979	0.5-6	0-0.5	No	79	62	36	26	14	8	10.2%	Gravel	Test No. 5 was along northeast edge of field, 225' S85°E of Test No. 4, and 205' N10°E of Test No. 1. Material is: 0'-0.5', overburden; 0.5-6', gravel; bottom, silty fine sand. Water was encountered at 8'.
15	1-A	1979	10-20	0-2	Yes	96	92	65	49	15	9	12.2%	Gran. Borrow (Gravel)	Owner: Valemont, Inc. Former owner: Stowe School. Area is part of the old Anderson property. Material is only available to the Town of Stowe. Area is an upper (recent) and lower (older) pit on a kame terrace adjacent to the south side of Town Highway No. 43. Access is 4.44 miles west of the junction of Town Highway No. 1 and Vermont Route 100. The faces on the lower pit are very steep and not very accessible. Test No. 1-A was on upper part of steep southwest face in lower pit. Material is: 0'-2', overburden; 2'-10', inaccessible (silty fine sand and some gravel); 10'-12', silty fine sand and some small cobbles; 12'-20', bouldery,

STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH DIVISION - GEOLOGY SUB-DIVISION

STOWE GRANULAR DATA SHEET NO. 26

TABLE I

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Over-Burden (Ft)	Existing Pit	Sieve Analysis % Passing						Abrasion AASHTO T-4-35	Passes AOT Spec.	Remarks
						2 "	1-1/2"	1/2"	#4	#100	#200			
														coarse gravel with many 8" to 12" stones; bottom, bouldery, coarse gravel (Test No. 1-B).
	1-B	1979	20-30	-	Yes	97	86	65	52	15	8	20.8%	Gravel	Test No. 1-B was below Test No. 1-A. Material is: 20'-30', bouldery, coarse gravel with some cementation; bottom, gravel (Test No. 1-C).
	1-C	1979	30-50	-	Yes	100	90	66	53	17	9	17.9%	Gran. Borrow (Gravel)	Test No. 1-C was below Test No. 1-B. Material is: 30'-50', layers of gravel, sand, silt-clay, and pebbly gravel; bottom, sloughed material. The fines in this test might just have been washed down from above.
	2-A	1979	4-15	-	Yes	100	94	65	44	10	5	25.3%	Gran. Borrow (Gravel)	Test No. 2-A was in southeast face of upper pit level. Material is: 0'-2', sand; 2'-3', pebbly gravel; 3'-4', boulders (0'-4', not accessible); 4'-10', pebbly gravel with a few 12" stones; 10'-11', sand; 11'-13', pebbly gravel; 13'- 15', sand with some 6" stones; bottom, gravel (Test No. 2-B). Stones get smaller with depth.
	2-B	1979	15-20	-	Yes	100	100	73	46	12	8	17.2%	Gravel	Test No. 2-B was below Test

TA 404 2C Rev. 2/79

STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH DIVISION - GEOLOGY SUB-DIVISION

STOWE GRANULAR DATA SHEET NO. 27

TABLE I

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Over-Burden (Ft)	Existing Pit	Sieve Analysis % Passing						Abrasion AASHTO T-4-35	Passes AOT Spec.	Remarks
						2 "	1-1/2"	1/2"	#4	#100	#200			
														No. 2-A. Material is: 15'-20', silt-clay coated, fine gravel; bottom, silt-clay coated, fine gravel. Bottom is at floor level.
	3	1979	0-5	-	Yes	100	100	100	100	63	25	-	-	Test No. 3 was in low bank near access road, 210' N65°W of Test No. 2-A. Material is: 0'-3', silty fine sand; 3'-3.5', layer of silt-clay; 3.5'-5', silty fine sand; bottom, sloughed material (floor level).
	4-A	1979	4-10	-	Yes	91	86	71	51	12	7	21.6%	Gravel	Test No. 4-A was in steep north of upper pit level, 105' northwest of Test No. 1. Material is: 0'-4', inaccessible pebbly gravel and gravel; 4'-10', gravel and fine pebbly gravel; bottom, sand (Test No. 4-B).
	4-B	1979	10-15	-	Yes	100	100	100	100	12	6	-	Sand	Test No. 4-B was below Test No. 4-A. Material is: 10'-15', sand with some inclined layers of iron-rich sand; bottom, sloughed material.
	5	1979	6-15	-	Yes	100	100	100	99	57	21	-	-	Test No. 5 was in northwest face of upper pit level. Material is: 0'-6', silty fine sand

STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH DIVISION - GEOLOGY SUB-DIVISION

STOWE GRANULAR DATA SHEET NO. 28 TABLE I

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Over-Burden (Ft)	Existing Pit	Sieve Analysis % Passing						Abrasion AASHTO T-4-35	Passes AOT Spec.	Remarks
						2 "	1-1/2"	1/2"	#4	#100	#200			
														(inaccessible); 6'-15', silty fine sand with some layers of silt-clay; bottom, silty fine sand with some layers of silt-clay.
	6	1979	1-9.5	0-1	Yes	100	100	88	73	10	6	-	Sand	Test No. 6 was in floor of lower pit (near road), 50' northwest of grizzly. Material is: 0'-1', overburden; 1'-4', gravel; 4'-6', pebbly sand; 6'-9.5', sandy gravel or pebbly fine gravel; bottom, fine gravel.
	7	1979	1-11.5	0-1	Yes	97	90	66	50	19	9	-	Gran. Borrow (Gravel)	Test No. 7 was in southeast floor of lower pit. Material is: 0'-1', overburden; 1'-2', sand; 2'-5', gravelly sand; 5'-6', sand; 6'-9.5', gravel with 4" to 6" stones; 9.5'-11.5', sand; bottom, sand.
	8	1979	2.5-19	0-2.5	Yes	80	76	60	47	23	14	-	Gran. Borrow (Gravel)	Test No. 8 was in floor of upper pit level, 200' N65°W of Test No. 2-B. Material is: 0'-2.5', overburden; 2.5'-6', bouldery gravel; 6'-10', coarse gravel; bottom, gravel.
	9	1979	0-11.5	-	Yes	100	95	69	43	8	6	14.1%	Gravel	Test No. 9 was in southeast floor of upper pit, 145' S60°E

STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH DIVISION - GEOLOGY SUB-DIVISION

STOWE GRANULAR DATA SHEET NO. 29

TABLE I

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Over-Burden (Ft)	Existing Pit	Sieve Analysis % Passing						Abrasion AASHTO T-4-35	Passes AOT Spec.	Remarks
						2 "	1-1/2"	1/2"	#4	#100	#200			
														of Test No. 8. Material is: 0'-1', gravel; 1'-2', sand; 2'-4', coarse gravel with a few boulders; 4'-11.5', gravel; bottom, gravel.
	10	1979	1.5-10	0-1.5	No	78	78	70	64	30	15	-	Gran. Borrow (Sand)	Test No. 10 was near tree-line atop small knoll southwest of upper pit. Material is: 0'-1.5', overburden; 1.5'-2.5', sand; 2.5', -3.5', fine gravel; 3.5'-10', sand; bottom, sand.
	11	1979	1-6	0-1	No	89	89	84	74	20	13	-	Gran. Borrow (Sand)	Test No. 11 was in northwest corner of field, 280' N25°W of, and 12' below Test No. 10. Material is: 0'-1', overburden; 1'-6', sand with a few random 6" to 8" boulders; bottom, boulders or bedrock.
16	1-A	1979	3-17	0-3	Yes	100	100	65	50	22	9	23.2%	Gran. Borrow (Gravel)	Owner: Lake Mansfield Trout Club. (Former owner: Burt Estate). Area is a crude pit on the north slope of a granular feature just south of Town Highway No. 43. Area includes a brush-covered, partly overgrown field above and south of the pit.

TA 404 2C Rev. 2/79

STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH DIVISION - GEOLOGY SUB-DIVISION

STOWE GRANULAR DATA SHEET NO. 30

TABLE I

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Over-Burden (Ft)	Existing Pit	Sieve Analysis % Passing						Abrasion AASHTO T-4-35	Passes AOT Spec.	Remarks
						2 "	1-1/2"	1/2"	#4	#100	#200			
														Access is 1.15 miles west of the junction of Town Highways No. 43 and 46. Test No. 1-A was on the south face of pit. Material is: 0'-3', overburden; 3'-5', pebbly sand; 5'-8', gravel; 8'-9', silty sand with weathered rock fragments; 9'-11', dirty bouldery gravel; 11'-12', layer of sand; 12'-16', pebbly gravel with firmly packed sand and angular pebbles; 16'-17', boulders, bottom, boulders.
	1-B	1979	17-27	-	Yes	85	76	61	49	26	15	20.2%	Gran. Borrow (Gravel)	Test No. 1-B was below Test No. 1-A. Material is: 17'-20', boulders and some coarse gravel; 20'-23', hard-packed, silty, pebbly sand with angular pebbles; 23'-25', bouldery gravel; 25'-27', firmly-packed, silty, fine sand with some random, 3" to 5" cobbles; bottom, sloughed material.
	1-C	1979	45-50	-	Yes	94	94	67	34	19	11	21.6%	Gran. Borrow (Gravel)	Test No. 1-C was below Test No. 1-B. Material is: 27'-45', sloughed material (not accessible to the back-hoe); 45'-47', layer of pebbles; 47'-48', gravel; 48'-50', gravel (a bit dirtier

TA 404 2C Rev. 2/79

STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH DIVISION - GEOLOGY SUB-DIVISION

STOWE GRANULAR DATA SHEET NO. 31

TABLE 1

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Over-Burden (Ft)	Exist-ing Pit	Sieve Analysis % Passing						Abrasion AASHTO T-4-35	Passes AOT Spec.	Remarks
						2 "	1-1/2"	1/2"	#4	#100	#200			
														than above); bottom, dirty gravel.
	2	1979	1.5-8.5	0-1.5	Yes	95	95	77	65	24	11	-	Gran. Borrow (Gravel)	Test No. 2 was in the sloping floor near road. Material is: 0'-1.5', overburden; 1.5'-8.5', dirty, poorly graded gravel; bottom, dirty gravel and water.
	3	1979	4-10	0-4	No	100	92	67	48	15	9	21.3%	Gran. Borrow (Gravel)	Test No. 3 was in overgrown field, 75' N70°W of pole 134, and 75' S40°W of the top of pit face. Material is: 0'-4', overburden; 4'-8', firmly packed gravel; 8'-10', gravelly sand; bottom, sand.
	4	1979	2-10	0-2	No	96	96	70	58	23	14	21.7%	Gran. Borrow (Gravel)	Test No. 4 was near tree-line at west edge of field, 175' S55°W of Test No. 3. Material is: 0'-2', overburden; 2'-5', dirty gravel; 5'-8', bouldery gravel (dirty and ill-sorted); 8'-10', boulders; bottom, boulders.
17	1-A	1979	2.5-11	0-2.5	Yes	92	89	83	70	19	10	-	Gran. Borrow (Sand)	Owner: Lake Mansfield Trout Club. (Former owner: Burt Estate). Area is being given by the L. M. Trout Club to the Nature Conservancy which will

STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH DIVISION - GEOLOGY SUB-DIVISION

STOWE GRANULAR DATA SHEET NO. 32

TABLE I

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Over-Burden (Ft)	Existing Pit	Sieve Analysis % Passing						Abrasion AASHTO T-4-35	Passes AOT Spec.	Remarks
						2 "	1-1/2"	1/2"	#4	#100	#200			
														eventually swap the land to the State of Vermont for other land in a rather complex deal. Area is a multi-levelled pit on a sinuous, wooded, elongate knoll (an esker?). Area is 0.1 mile south of Town Highway No. 43; access is 5.3 miles west of the junction of Town Highway No. 1 and Vermont Route 100. Water seeped in the lower floor (nearest the road).
														Test No. 1-A was in middle of low south face of pit. Material is: 0'-2.5', overburden; 2.5'-4', pebbly sand; 4'-5', dirty, silt-clay coated, fine gravel; 5'-7', sand; 7'-9', gravelly sand or sandy fine gravel; 9'-11', dirty fine gravel or gravelly sand; bottom, sloughed material.
	1-B	1979	11-14	-	Yes	100	100	93	83	19	8	-	Sand	Test No. 1-B was below Test No. 1-A. Material is: 11'-14', sand with a few layers of pebbles and silt-clay; bottom, sand.
	2-A	1979	4-15	0-4	Yes	95	91	70	55	19	9	19.4%	Gran. Borrow (Gravel)	Test No. 2-A was on west face of pit, 85' N60°W of Test No. 1-A. Material is: 0'-4', overburden; 4'-6', fine gravel; 6'-8',

STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH DIVISION - GEOLOGY SUB-DIVISION

STOWE GRANULAR DATA SHEET NO. 33

TABLE I

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Over-Burden (Ft)	Existing Pit	Sieve Analysis % Passing						Abrasion AASHTO T-4-35	Passes AOT Spec.	Remarks
						2 "	1-1/2"	1/2"	#4	#100	#200			
														hard-packed, pebbly sand with angular pebbles; 8'-9', sand; 9'- 10', silty pebbly sand; 10'-13', hard-packed sand and angular stones (not a gravel); 13'-15', silt-clay coated, dirty gravel with angular stones.
	2-B	1979	15-21	-	Yes	100	100	88	68	28	15	-	Gran. Borrow (Sand)	Test No. 2-B was below Test No. 2-A. Material is: 15'-16', pebbly fine gravel; 16'-18', sand; 18'-19', sand with pebbles; 19'-21', sand with layers of silt-clay and a few, small (3") stones; bottom, stones.
	3	1979	3-19	0-3	Yes	97	97	81	66	10	6	20.1%	Gran. Borrow (Gravel)	Test No. 3 was in upper north face of upper level of pit. Material is: 0'-3', overburden; 3'-10', pebbly sand and sand; 10'-14', quite clean-looking gravel; 14'-18', pebbly sand and fine pebbly gravel; 18'-19', gravel with angular, silt-clay coated stones; bottom, sloughed material. The upper portion was quite clean, but the lower part was much siltier.
	4-A	1979	2.5-12	0-2.5	Yes	100	94	86	81	16	6	-	Sand	Test No. 4-A was under power line in center of north face of pit. Material is: 0'-2.5',

STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH DIVISION - GEOLOGY SUB-DIVISION

STOWE GRANULAR DATA SHEET NO. 34

TABLE I

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Over-Burden (Ft)	Existing Pit	Sieve Analysis % Passing						Abrasion AASHTO T-4-35	Passes AOT Spec.	Remarks
						2 "	1-1/2"	1/2"	#4	#100	#200			
														overburden; 2.5'-5', pebbly sand; 5'-6', gravelly sand with angular stones; 6'-7', sand; 7'-11', gravelly sand with 1" angular stones; 11'-12', silt-clay and sand with a few angular stones; bottom, sand (Test No. 4-B).
	4-B	1979	12-20	-	Yes	84	84	78	65	21	10	-	Gran. Borrow (Sand)	Test No. 4-B was below Test No. 4-A. Material is: 12'-13', sand with a few, random, small cobbles; 13'-20', poorly graded gravel in pockets or seams of sand, silt-clay, and angular stones; bottom, same.
	5-A	1979	1-8	0-1	Yes	96	90	64	48	15	8	20.6%	Gravel	Test No. 5-A was in north face near east end of pit, 65' east of power line. Material is: 0'-1', overburden; 1'-5', pebbly fine gravel; 5'-7', sand with angular stones; 7'-8', angular boulders; bottom, sand (Test No. 5-B).
	5-B	1979	8-15	-	Yes	100	100	81	65	20	10	-	Sand	Test No. 5-B was below Test No. 5-A. Material is: 8'-15', sand with angular, 3/4" to 1" stones (not a gravel); bottom, sand.

TA 404 2C Rev. 2/79

STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH DIVISION - GEOLOGY SUB-DIVISION

STOWE GRANULAR DATA SHEET NO. 35

TABLE I

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Over-Burden (Ft)	Existing Pit	Sieve Analysis % Passing						Abrasion AASHTO T-4-35	Passes AOT Spec.	Remarks
						2 "	1-1/2"	1/2"	#4	#100	#200			
	6	1979	1-8	0-1	Yes	100	81	60	45	13	8	20.6%	Gravel	Test No. 6 was in low bank near access; south end of lowest pit level. Material is: 0'-1', overburden; 1'-5', gravel; 5'-8', gravel with angular stones; bottom, silt-clay, angular stones, and sloughed material.
	7	1979	0.5-10.5	0-0.5	Yes	80	80	66	57	23	12	-	Gran. Borrow (Gravel)	Test No. 7 was in floor, 30' N30°E of Test No. 1-B. Material is: 0'-0.5', overburden; 0.5'-3', sand; 3'-4.5', gravel; 4.5'-5', sand; 5'-8', poorly graded gravel with mostly 4" stones and sand; however, there were some 8" stones as well; 8'-10.5', sand with a bit of pebbly gravel; bottom, boulders.
	8	1979	0.5-6	0-0.5	Yes	100	89	70	58	32	18	-	-	Test No. 8 was in lower floor in east lobe of pit. Material is: 0'-0.5', overburden; 0.5'-2', pebbly gravel; 2'-6', gravel; bottom, sandy gravel and much water. The gravel was sticky and had a high silt-clay content. Water was encountered at 2'.

TABLE I
SUPPLEMENT

STOWE PROPERTY OWNERS - GRANULAR	Map Identification No.
Barnett, Theodore	2
Field, Raymond	6, 7
Lake Mansfield Trout Club	16, 17
Mount Mansfield Corp	3
Percy, Dale	1
Rogers, James	5
School, The Stowe	4
Smith, Lawrence	9
Spear, Raymond	8
Valemont, Inc	15
Vermont, State of, (Dept. of Forests & Parks)	10, 11, 12, 13, 14

TABLE II
SUPPLEMENT

STOWE PROPERTY OWNERS - ROCK | Map Identification No.

Some Rock resources exist in the Town of Stowe but are not exploitable in the forseeable future because they are in the Mt. Mansfield State Forest, or are physically inaccessible.