1979 REVISION OF 1968

SURVEY OF HIGHWAY CONSTRUCTION MATERIALS

IN THE TOWN OF SHAFTSBURY, BENNINGTON COUNTY, VERMONT

Prepared By

STATE OF VERMONT

AGENCY OF TRANSPORTATION

MATERIALS & RESEARCH DIVISION

Montpelier, Vermont
April, 1979

State of Vermont
Agency of Transportation
Materials & Research Division
April, 1982

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.

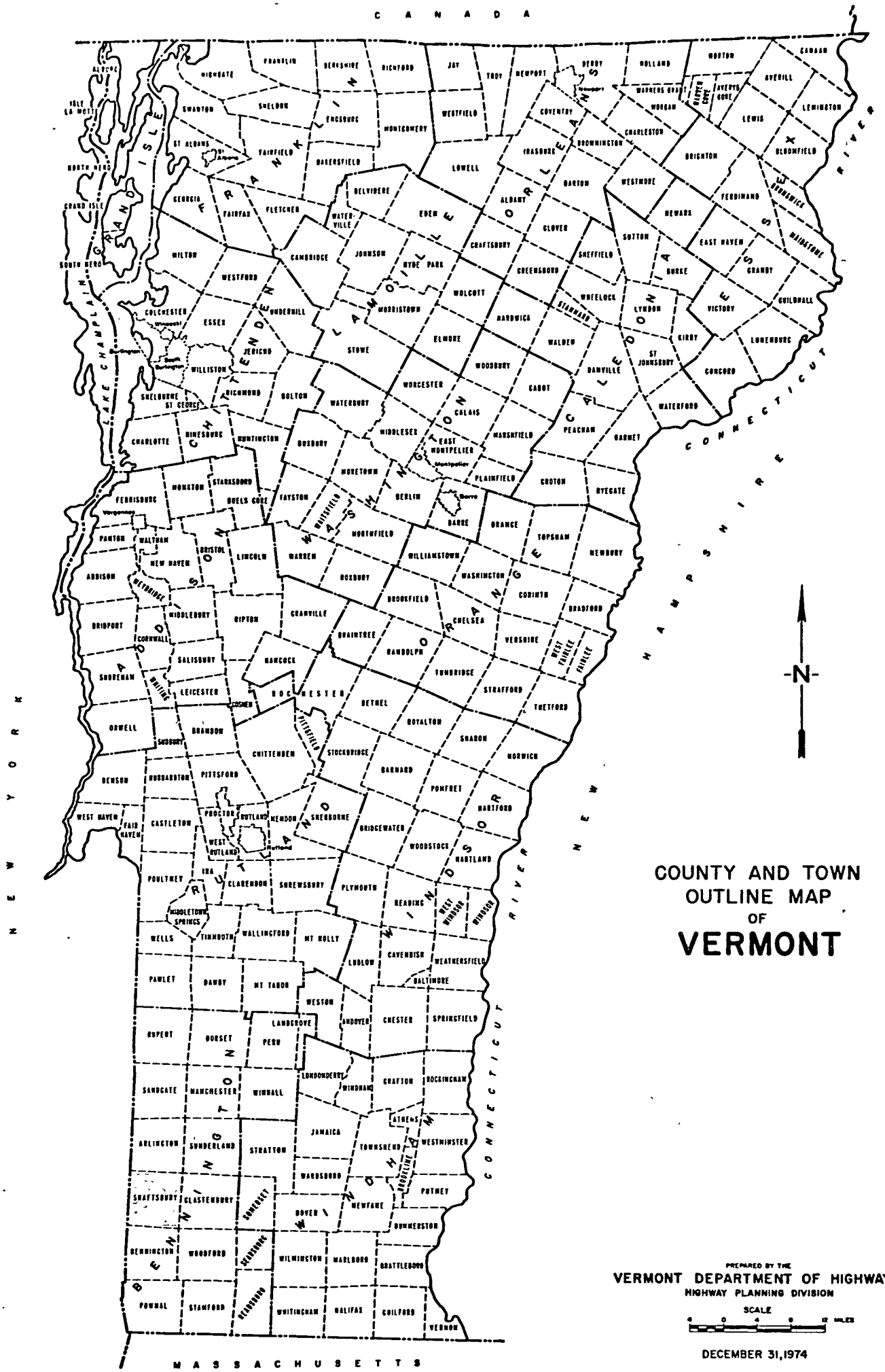
Work sheets containing more detailed information and a field sketch of the area, and laboratory test results are on file in the Materials & Research Division of the Agency of Transportation, State of Vermont.

LOCATION

The town of Shaftsbury is located in Bennington County near the southwest corner of the State. The town is bounded on the west by New York State, on the north by Arlington, on the east by Glastenbury, and on the south by Bennington. (See County and Town Outline Map of Vermont on the following page.)

Shaftsbury extends from the western flank of the Green Mountains across the Vermont Valley into the Taconic Range. The Vermont Valley is comprised chiefly of metamorphosed carbonate rocks that were less resistant to erosion than the predominantly siliceous or argillaceous metamorphic rocks of the flanking mountains.

Elevations vary from less than 520 feet in the Walloomsac River valley at the New York line to 2,420 feet on West Mountain near the north-central boundary of the town. Drainage is mainly into the Walloomsac River either directly or via its White Creek tributary, but a minor portion of the town drains northward into the Batten Kill.



COUNTY AND TOWN OUTLINE MAP OF VERMONT

PREPARED BY THE
VERMONT DEPARTMENT OF HIGHWAYS
HIGHWAY PLANNING DIVISION

SCALE
0 4 8 12 MILES

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 a cartographic simplification. A more detailed description of the respective rock formations is included in the Summary of Rock Formations 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 material; this is particularly true concerning metamorphic rocks.

Map Identification Numbers 2 and 3 yielded acceptable rock on Maple Hill. The northwest spur of Trumbull Mountain, Map Identification No. 4, and the north slope of Hale Mountain, Number 5, yielded acceptable material. Several prominent features, in the southeast corner of the town (Bucks Cobble, Hale Mountain, and Harrington Cobble) exhibit fairly continuous, 150 foot exposures. These features are within the Shelburne Formation and the Clarendon Springs dolomites and may be excellent future sources of material (See Map Identification Numbers 6, 7, 8, and 9).

The Bascom Formation was sampled from sporadic outcrops in an open field at Map Identification No. 10, and at two old marble quarries at Map Identification Numbers 11 and 12, in the southwest corner 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

Granular materials in Shaftsbury are mostly found below the 1200 foot elevation and are essentially of glaciofluvial origin. Small amounts of material are of glaciolacustrine origin.

Dr. D. P. Stewart mapped glaciofluvial deposits in the form of eskers, fluvial gravels, kames, kame moraines, a kame terrace, and outwash adjacent to Paron Creek, Shaftsbury Hollow, and Furnace Brook. The origin of granular features is difficult to determine in heavily excavated pits, especially on William E. Dailey, Co., Inc. property east of the Rutland railroad tracks.

The most favorable sources of Gravel for Sub-base, Item 704.05 are listed first: Map Identification Nos. 12, 11, 23, 21, and 1, all pits; the first three have large commercial operations where some material needs crushing. The last listed is in the northwest part of town.

There may be coarse granular material in a heavily wooded area east of Shaftsbury Center and west of the Rutland Railroad but it was inaccessible to backhoe sampling.

The most favorable sources of Sand Borrow and Cushion, Item 703.03 are listed first: Map Identification Nos. 12, 16, 17, 21, 13, 18, and 1. All are pits.

Due to changes in the materials specifications and testing procedure, two different criteria were used for the acceptance of granular materials mentioned in the report. Therefore, the tests completed in 1968 do not correspond to the Vermont Standare Specifications for 1978. The earlier test results remain with the original work sheets as a guide to those interested in granular materials.

SUMMARY OF ROCK FORMATIONS IN THE TOWN OF SHAFTSBURY

Hortonville Formation - Black, carbonaceous, and pyritic slate and phyllite, locally sandy; brown-weathered limy beds are common near base.

Bascom Formation - Interbedded dolomite, limestone or marble, calcareous sandstone, quartzite, and limestone breccia; irregular dolomitic layers, thin sandy laminae, and slaty or phyllitic partings characterize limestone and marble of lower, middle, and upper parts of the Bascom, respectively; south of West Rutland it includes some of the Chipman Formation.

Shelburne Formation - Chiefly a white marble or gray limestone characterized by raised reticulate lines of gray dolomite on the weathered surface, includes Columbian marble of the marble quarries.

Clarendon Springs Dolomite - Fairly uniform, massive, smooth-weathered gray dolomite characterized by numerous geodes and knots of white quartz; quartz sandstone and irregular masses of chert are near the top.

Winooski Dolomite - Buff-weathered, pink, buff, and gray dolomite; beds 4 inches to 1 foot thick separated by thin, protruding, red, pink, green, and black siliceous partings.

Monkton Quartzite - Distinctively red quartzite interbedded with lesser buff and white quartzite and relatively thick sections of dolomite like that of the Winnoski; the quartzites thin to the east, and they become gray and phyllitic to the east and south.

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

Cheshire Quartzite - Very massive, white to faintly pink or buff vitreous quartzite near the top in west-central and southwestern Vermont; predominantly a less massive-appearing mottled gray, somewhat phyllitic quartzite; dolomitic sandstone and conglomerate near the base of the formation in west-central Vermont apparently grades southwest into the Dalton Formation.

St. Catherine Formation - Purple, gray-green, and variegated slate and phyllite containing minor interbeds of white to green quartzite; locally albitic.

Brezee Formation - Dark gray to black phyllite with beds of blue-gray marble, dark gray dolomite, sandy dolomite, and dolomitic sandstone, in upper part; beds of massive quartzite as much as 20 feet thick occur locally and in places contain pebbles of blue quartz. Phyllites are locally highly albitic.

GLOSSARY OF SELECTED GEOLOGIC TERMS

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 names of rocks containing the mineral.

Argillaceous: Containing or consisting of clay. Commonly used to indicate the presence of clay; as argillaceous sandstone.

Bedrock: The more or less solid, undisturbed rock in place either at the surface or beneath superficial deposits of gravel, sand, or soil.

Breccia: A rock consisting of consolidated angular rock fragments larger than sand grains.

Calcareous: Consisting of, or containing calcium carbonate. As combined with rock names indicates a considerable proportion, say 50 percent, of calcium carbonate together with an equal or predominant amount of the material indicated by the rock name.

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 adid.

Carbonaceous: Containing carbon.

Carbonate Rocks: Rocks composed of the molecule CO_3 combined with calcium, magnesium, etc. Includes limestones and dolomites.

Chert: A very dense siliceous rock usually associated with limestone.

Conglomerate: The consolidated equivalent of gravel. The constituent rock and mineral fragments may have varied chemical composition and a wide size range. The matrix of finer material may be sand, silt, or any of the common natural cementing materials such as calcium carbonite, silica, clay, or iron oxide.

Cross-bedding: A diagonal arrangement of bedding in sedimentary rocks with the layers inclined at various angles to the more general planes of stratification or the formational contact. Sand dune, river channel, and delta deposits commonly show extensive cross-bedding.

Dip: The angle which a stratum, sheet, vein, fissure, or similar geological feature makes with a horizontal plane, as measured in a plane normal to the strike.

Dolomite: A rock consisting predominantly of the mineral dolomite (calcium magnesium carbonate) containing CO_2, 47.7%, lime, 30.4%, and magnesia, 21.9%.

Esker: A long, narrow, winding ridge of mixed sand and gravel deposited by a stream of meltwater flowing in a tunnel or crevasse in stagnant glacial ice.

Fluvial: Pertaining to streams.

Geode: A rock cavity lined with crystals that are not separable from the surrounding rock.

Glaciofluvial: A term used to denote formation by, or relation to, streams within, upon, or emerging from glacial ice.

Glaciolacustrine: A term used to denote formation by, or pertaining to deposition in quiescent waters of glacial lakes.

Interbedded: Occurring between beds, or lying adjacent and parallel to other beds usually at a different nature.

Joint: A fracture or parting plane along which there has been little, if any, movement parallel to the walls.

Kame: A conical hill of generally poorly stratified drift deposited in contact with glacial ice by streams flowing in or on the ice.

Kame Moraine: An accumulation of material deposited directly from the frontal portion of the glacial ice and partially sorted by water. Deposits may take the form of coalescent knolls, hummocks, ridges, etc.

Kame Terrace: Stratified sands and gravels deposited by streams between a glacier and an adjacent valley wall.

Ledge: A shelf-like ridge or projection of rock, usually horizontal and much longer than high.

Limestone: A bedded sedimentary rock consisting chiefly of calcium carbonate. The most improtant and widely distributed of the carbonate rocks.

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

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

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.

Outwash: Stratified sands and gravels that are stream-built beyond the glacier; deposited by meltwater streams issuing from glacial ice.

Partings: Thin depositional layers separating thicker deposits.

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 gives the rock a distinctive silvery appearance.

Pyritic: Of, pertaining to, or resembling pyrite, a common mineral having the composition FeS_2, a pale brass-yellow color, and brilliant metalic luster.

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 normally a necessary or essential constituent, as quartz monzonite.

Quartzite: A compact metamorphic rock composed of quartz grains so firmly cemented that fracture takes place across the grains and the cementing material with equal ease.

Sandstone: A consolidated rock composed of sand grains cemented together. Sandstone fractures around the grains rather than across them, as with quartzites; the broken surface of a sandstone has a gritty feel, and loose grains are usually present.

Scoriaceous: A term applied to composition characterized by marked vesicularity, dark color, heaviness, and a texture that is partly glassy and partly crystalline.

Seam: In mining and geology the term designates a thin layer or stratum, usually of coal or other valuable material.

Siliceous: Containing or pertaining to silica (silicon dioxide, SiO_2) or partaking of its characteristics.

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

Stratification: The characteristic structural feature of sedimentary rocks produced by the deposition of sediments in beds, layers, strata, laminae, lenses, wedges, and other essentially tabular units. The general term for layering in rocks.

Strike: The direction of a line formed by the intersection of a stratum with a horizontal plane.

Vein: A fissure in a rock filled by mineral matter. The mineral mass has well-defined length, width, and depth and is clearly distinguishable in content and structure from the enclosing rock.

Weathered: Showing the effects of exposure to the atmosphere.

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: McGæw-Hill Co., Inc., 1956

Kemp, James F. A Handbook of Rocks. New York: D. VanNostrand 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, Colorade: Colorado Scientific Society, 1955.

U. S. Department of Agriculture. Bureau of Chemistry and Soils. Soil 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. Bennington Quadrangle, Vermont, 7.5 Minute Series (Topographic) (1954)

U. S. Department of Interior. Geological Survey. Bennington Quadrangle, Vermont 15 Minute SEries (Topographic) (1954)

U. S. Department of Interior. Geological Survey. Equinox Quadrangle, Vermont 15 Minute Series (Topographic) (1894)

U. S. Department of Interior. Geological Survey. Hoosick Falls Quadrangle, New York-Vermont, 7.5 Minute Series (Topographic) (1943)

U. S. Department of Interior. Geological Survey Sushan Quadrangle, New York - Vermont, 7.5 Minute Series (Topographic) (1944)

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

Vermont Department of Water Resources. Geological Survey. The Surficial Geology and Pleistocene History of Vermont, by David P. Stewart and Paul MacClintock, Bulletin No. 31 (1969).

Vermont Development Commission. Geological Survey. The Geology of The Bennington Area, Vermont by John A. MacFadyen, Jr., Bulletin No. 7, (1956)

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

Bibliography (cont.)

Vermont Development Department. Geological Survey. The Geology of the Equinox Quadrangle and Vicinity, Vermont, by Philip C. Hewitt, Bulletin No. 18 (1961)

Vermont Development Department. Geological Survey. The Glacial Geology of Vermont, by David P. Stewart, Bulletin No. 19 (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
FINE	2"	100	
	1½"	90-100	
	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

SHAFTSBURY GRANULAR DATA SHEET NO. 1

TABLE I

ip dent. o.	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"	1½"	5/8"	¼"	#4	#100	#200	#270			
1	1-A	1968	1.5'-14'	0'-1.5'	Yes	77.6	76.7	67.0	-	48.2	3.0	-	1.0	22.8%	Gravel	Owner: Kenneth Skidmore. Area is a pit on east side of Shaftsbury Town Highway No. 10 (Class 3) in the northwest corner of town. There is a possible extension into woods north of the pit. Test No. 1-A was in upper north face near east end. Material is: 0'-1.5', overburden; 1.5'-14', slaty gravel.
	1-B	1968	14'-26'	-	Yes	84.2	75.6	61.3	-	38.4	4	-	2	30.2%	Granular Borrow (gravel)	Test No. 1-B was taken below Test No. 1-A. Material is: 14'-26', slaty gravel; bottom, same.
	2	1968	0'-7'	-	Yes	86.9	81.6	60.3	-	36.1	7	-	4	27.6%	Granular Borrow (gravel)	Test No. 2 was in floor 35' southwest of Test No. 1. Material is: 0'-7', coarser slate gravel than in Test No. 1; bottom, gravel and water.
	3	1968	3'-10'	0'-3'	No	84.3	80.0	71.1	-	48.6	7	-	4	24.0%	Gravel	Test No. 3 was in woods, 100' north northwest of pit. Material is: 0'-3', overburden; 3'-10', slaty gravel with more than 10% estimated larger than 4"; bottom, same.
	4	1968	2.5'-8.5'	0'-2.5'	No	85.4	70.7	59.2	-	36.1	7	-	4	29.2%	Granular Borrow (gravel)	Test No. 4 was in woods near south end of field, 200' northeast of Test No. 3. Material is: 0'-2.5', overburden; 2.5'-8.5', slaty gravel with more than 10% estimated larger than 4". bottom, same.

SHAFTSBURY 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 2"	1½"	5/8"	¼"	#4	#100	#200	#270	Abrasion AASHTO T-4-35	Passes AOT Spec.	Remarks
	5	1968	2-8	0-2	No	87.8	87.8	68.7	-	43.2	4	-	2	-	Gravel (Grading Only)	Test No. 5 was in field 185' N of edge opposite Test No. 4. Material is: 0'-2', overburden; 2'-8', slaty gravel; bottom, same.
	6	1968	3-7.5'	0'-3'	No	93.1	89.1	78.0	-	48.1	4	-	2	-	Gravel (Grading Only)	Test No. 6 was in field, 200' north of Test No. 5. Material is: 0'-3', overburden; 3'-7.5', slaty fine gravel; bottom, same.
	7-A	1978	3'-11'	0'-3'	Yes	100	100	-	91	67	4	3	-	-	Sand	Test No. 7A was in upper part of west face of pit. Material is: 0'-3', overburden; 3'-11', interbedded and intergradational silty and pebbly slate sands.
	7-B	1978	11'-21'	-	Yes	79	73	-	56	43	7	5	-	26.4%	Granular Borrow (gravel)	Test No. 7-B was below Test No. 7-A. Material is: 11'-21', intergradational slate gravel and sands with a few cobbles larger than 3".
	7-C	1978	21'-30'	-	Yes	87	87	-	77	64	7	3	-	-	Granular Borrow (sand)	Test No. 7-C was below Test No. 7-B. Material is: 21'-30', intergradational silty and pebbly slate sands.
2	1	1968	1.5'-7.5'	0'-1.5'	No	78	67	53	-	31	7	-	5	24.4%	Gravel	Owner: William and John Westfall. Area is a terrace west of brook and northwest of farm on Shaftsbury Town Highway No. 10 (Class 3). Test No. 1 was near north end of terrace where it joins hillside to the west. Material is: 0'-1.5', overburden. 1.5'-3.5', medium gravel

SHAFTSBURY GRANULAR DATA SHEET NO. 3 TABLE I

ap dent. o.	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"	1½"	5/8"	½"	#4	#100	#200	#270			
																with sub-rounded stones; 3.5'--7.5' coarse gravel with an estimated 10% thin tabular cobbles; bottom slaty gravel.
	2	1968	1'-4'	0'-1'	No	87	78	66	-	37	4	-	1.5	28.7%	Granular Borrow (gravel)	Test No. 2 was in the level below terrace, 70' N 35° E of Test #1. The material is: 0'-1', overburden; 1'-4', medium gravel with an estimated 10% thin tabular cobbles; bottom, slaty gravel.
3	1	1968	1'-7'	0'-1'	No	89	83	65	-	40	12	-	5	23.3%	Gravel	Owner: Raymond Favreau. Area is field northwest of Bennington Town Highway No. 9, (Class 3) and southeast of owner's trailer. Test No. 1 was in field, 110'S 20° E of shed near northeast edge of field. Material is: 0'-1', overburden; 1'-7', coarse, slaty, gravel with an estimated 10% tabular stones; bottom, fine sand.
4	1-A	1968	1.5'-10'	0'-1.5'	Yes	57	50	42	-	30	6	-	3	9.4%	Gravel	Owner: Thurston Hulet. Areais an inactive small pit on the east side of a wooded granular ridge north of Shaftsbury Town Highway No. 15 (Class 3); Access is via a private drive east of U.S. Rte. 7, 0.28 mile north of its junction with Shaftsbury TH #15, (Class 3). Test No. 1-A was in face of central part of pit. Material is: 0'-1.5'm overburden; 1.5'-10', clear, cobbly gravel.

SHAFTSBURY GRANULAR DATA SHEET NO. 4

TABLE I

ip dent. o.	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"	1½"	5/8"	⅜"	#4	#100	#200	#270			
	1-B	1968	10'-15'	-	Yes	86	82	78	-	72	8	-	3	-	Granular Borrow (Sand)	Test No. 1-B was below Test No. 1-A. Material is: 10-12', clean cobbly gravel; 12'-13', coarse sand; 13'-15', medium, clean sand; bottom, medium sand.
	2	1978	0.5'-13'	0'-0.5'	Yes	75	65	-	53	46	9	6	-	-	Gravel (Grading only)	Test No. 2 was in face at north end of pit. Material is: 0'-0.5', overburden; 0.5'-3', sand; 4'-9', sandy gravel; 9'-13', cobbly gravel; bottom, sloughed material.
5	1-A	1968	1'-7.5'	0'-1'	Yes	76	67	54	-	39	35	-	10	5.3%	Granular Borrow (Gravel)	Owner: F. S. Hohm. Area is a pit in woods, 100' north of Shaftsbury Town Highway No. 15 (Class 3), 0.20 mile east of its junction with U.S. Rte 7. There are two knolls west of the one which contains the overgrown pit. Test No. 1-A was in upper 16' face at north end of pit. Material is: 0'-1', overburden; 1'-7.5', stoney fine sand over gravel.
	1-B	1968	7.5'-15'	-	Yes	72	66	48	-	32	23	-	8	10.0%	Granular Borrow (Gravel)	Test No. 1-B was below Test No. 1-A. Material is: 7.5'-8.5', stony fine sand; 8.5'-15', sandy gravel; bottom, stoney silt-clay.
	2-A	1978	3'-12'	0'-1'	Yes	77	77	-	73	66	33	15	-	-	Granular Borrow (Sand)	Test No. 2-A was in north face of small pit on wooded knoll. Material is: 0'-1', overburden; 1'-3', inaccessible; 3'-12', silty fine sand with gap-graded stones and cobbles.

SHAFTSBURY GRANULAR DATA SHEET NO. 5

TABLE I

ap dent. o.	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"	1½"	5/8"	⅜"	#4	#100	#200	#270			
	2-B	'1978	12'-16'	-	Yes	100	100	100	100	100	57	32	-	-	-	Test No. 2-B was below Test No. 2-A. Material is: 12'-16', fine sand; bottom, sand.
6	1	1968	1'-8'	0'-1'	Yes	100	100	100	100	98	12	-	3	-	Sand	Owner: William Maitland. Area is a small pit west of house, 0.13 mile west of Shaftsbury Town Highway No. 1 (Class 2), 1.1 miles northeast of its junction with U.S. Rte 7. There were three exposures of bedrock between the owner's house and the pit. Test No. 1 was on face in northeast corner of pit. Material is: 0'-1', overburden; 1'-8', fine brown sand becoming coarse gray sand with depth; bottom, pebbly sand.
7	1	1968	1'-9.5'	0'-1'	Yes	81	68	51	-	39	18	-	9	8.4%	Granular Borrow (Gravel)	Owner: Redford P. King. Area is a small pit in meadow, 225' west of Shaftsbury Town Highway No. 1 (Class 2), 0.97 mile northeast of its junction with U.S. Rte. 7. Test No. 1 was in east face of small pit. Material is: 0'-1', overburden; 1'-4', poorly sorted silty gravel; 4'-9.5', clean gravelly sand; bottom, gravelly sand
	2	1968	0'-3.5'	-	Yes	89	87	70	-	58	48	-	33	9.0%	-	Test No. 2 was in floor, 12' southwest of Test No. 1. Material is: 0'-3.5', silty gravel; bottom silt-clay and water.

SHAFTSBURY GRANULAR DATA SHEET NO. 6

TABLE I

ap dent. o.	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"	1½"	5/8"	¼"	#4	#100	#200	#270			
8	1	'1968	0.5-11.5'	0'-0.5'	Yes	56	47	35	-	18	20	-	13	11.4%	-	Owner: Mrs. Gladys Brundage. Area is a deep pit on ease side of railroad tracks, 0.05mile north of Shaftsbury Town Highway No. 1 (Class 2). Test No. 1 was below high point of 300' high north face. Material is: 0'-0.5', overburden; 0.5'-11.5', dirty, cobbley, gravel; bottom, same.
9	1	1968	1-11'	0'-1'	Yes	45	36	19	-	18	28	-	14	-	-	Owner: Jessie Hulet & Marion Spear. Area is several pits on knolls east-northeast of Spear Farm on U.S. Route 7. Material is: 0'-1', overburden; 1'-11', cobbley gravel; bottom, cobbles and sand.
	2	1968	2'-9.5'	0'-2'	Yes	42	32	21	-	16	19	-	11	-	-	Test No. 2 was in upper 11' high face of middle pit. Material is: 0'02', overburden; 2'-9.5', cobbley sandy gravel; bottom, silty gravel; bottom, silty gravel.
	3	1968	1.5'-6'	0'-1.5'	Yes	100	100	100	-	99	45	-	22	-	-	Test No. 3 was in upper face of west pit. Material is: 0'-1.5', overburden; 1.5'-6', silty sand; bottom, fine sand.
10	1	1968	0.5-10.5'	0'-0.5'	Yes	100	94	84	-	59	7	-	2	11.4%	Gravel	Owner: William Hall. Area is a wooded ridge with two small overgrown pits, 0.22 mile west of U. S. Rte.7, 0.25 mile south of the junction of U.S. Rte 7 and Shaftsbury TH No. 67 (Class 3). Extensions are to northeast on a northeast sloping wooded ridge, and northwest into a wooded knoll

SHAFTSBURY GRANULAR DATA SHEET NO. 7

TABLE I

ap dent. o.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Over-burden (Ft)	Exist-ing Pit	Sieve Analysis % Passing 2"	1½"	5/8"	¼"	#4	#100	#200	#270	Abrasion AASHTO T-4-35	Passes AOT Spec.	Remarks
																occupied by old pit. Test No. 1 was on north face of east pit. Material is: 0'-0.5', overburden; 0.5'-10.5', fine gravel with a few small cobbles interlayered with pebbly and gravelly sand; bottom, pebbly sand.
	2-A	1968	2.5'-7'	0'-2.5'	Yes	91	91	84	-	55	12	-	5	-	Granular Borrow (Gravel)	Test No. 2-A was in upper west central face of west (old) pit. Material is: 0'-2.5;, overburden; 2.5'-7', fine gravel with a 2" clay lens.
	2-B	1968	7'-12.5'	-	Yes	69	63	52	-	32	4	-	2	19.4%	Gravel	Test No. 2-B was below Test No. 2-A. Material is: 7'-12.5', coarse clean gravel; bottom, fine sand.
	3	1968	7'-11'	Not Measured	Yes	100	100	100	100	98	12	4	3	-	Sand	Test No. 3 was in south end of west face of old pit. Material is 0'-7', overburden and coarse clean gravel (as in Test No. 2-B) 7'-11', fine sand with silt; bottom, silt-clay.
	4	1978	1'-10'	0'-1'	Yes	100	98	-	90	74	21	11	-	-	Sand	Test NO. 4 was in west face of new excavation of east pit. Material is: 0'-1', overburden; 1'-2', pebbly sand; 2'-6', sand; 6'-10', fine pebbly gravel; bottom, sloughed material.
	5	1978	1'-9'	0'-1'	Yes	95	91	-	75	57	6	3	-	-	Gravel (Grading Only)	Test No. 5 was in north face of east pit, 155' S 85° E of Test No. 4. Material is: 0'-1', overburden; 1'-6', fine gravel; 6'-8', silt; 8'-9', cobbles and sand. bottom, sloughed material.

SHAFTSBURY GRANULAR DATA SHEET NO. 8

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"	1½"	5/8"	¼"	#4	#100	#200	#270			
11	1-A	1968	2'-18'	0'-2'	Yes	100	100	100	100	100	46	-	6	-	Granular Borrow (Sand)	Owner: Charles Myers. Area is comprised of pits and overgrown fields east of U.S. Rte. 7; access is 0.62 mile south of the junction of US Rte 7 and Shaftsbury Town Highway No. 1 (Class2). Test No. 1-A was in upper 30' face in southernmost pit. Material is: 0'-2', overburden; 2'-18', uniform fine sand.
	1-B	1968	18'-24'	-	Yes	100	100	96	96	92	4	-	2	-	Sand	Test No. 1-B was below Test No. was below Test No. 1-A. Material is: 18'-24', coarse sand with a few pebbles.
	1C	1968	24-32	-	Yes	100	100	100	100	100	37	-	2	-	Granular Borrow (Sand)	Test No. 1-C was below Test No. 1-B. Material is: 24'-32', uniform silty fine sand; bottom, same.
	2	1968	0.5-7.5'	0'-0.5'	Yes	100	100	100	100	100	25	-	3	-	Sand	Test No. 2 was in floor, 40' from face. Material is: 0'-0.5', overburden; 0.5'-4', medium fine sand; 4'-7.4', silty fine sand; bottom, same.
	3-A	1968	0.5-13'	0'-0.5'	Yes	82	82	66	-	57	5	-	2	5.7%	Gravel	Test No. 3-A was in upper part of face in west corner of another pit. Material is: 0'-0.5', overburden; 0.5'-13', layers of cobbles and pebbly sand.
	3-B	1968	13'-16'	-	Yes	100	100	100	100	100	18	-	3	-	Sand	Test No. 3-B was below Test No. 3-A. Material is: 13'-16', fine sand; bottom, silty sand.

SHAFTSBURY GRANULAR DATA SHEET NO. 9

TABLE I

ap dent. o.	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"	1½"	5/8"	⅜"	#4	#100	#200	#270			
	4	1968	0.5'-9'	0'-0.5'	Yes	100	100	100	100	100	25	-	5	-	Sand	Test No. 4 was in center of pit floor, 60' southeast of Test No. 3B. Material is: 0'-0.5', overburden; 0.5'-9', fine sand to silt; bottom, same.
	5	1968	4'-9'	0'-4'	No	100	100	100	100	97	14	-	4	-	Sand	Test No. 5 was near woodchuck hole 150' south of north bound and 300' west of east bound. Material is: 0'-4', overburden; 4'-9', fine to medium sand with a few stones; bottom, same.
	6	1968	2.5-15'	0'-2.5'	Yes	100	100	100	100	100	39	-	18	-	-	Test No. 6 was in face of pit at east end of ridge, southeast of Test No. 5. Material is: 0'-2.5', overburden; 2.5'-15', sandy silt with a few lenses of pebbly sand; bottom, sandy silt.
	7	1968	0.5'-3'	0'-0.5'	No	68	56	40	-	26	23	-	10	7.4%	Granular Borrow (Gravel)	Test No. 7 was at north end of narrow field, 60' west of opening in rock wall, and 800' SSE of Test No. 4. Material is: 0'-0.5', overburden; 0.5'-3', dirty coarse gravel; 3'-7.5', medium clean sand (inaccessible).
	8	1968	1'-5.5'	0'-1'	No	80	80	71	-	54	12	-	6	-	Granular Borrow (Gravel)	Test No. 8 was near west end of field, 110' west of Test No. 7.
12	1	1968	2'-11'	0'-2'	Yes	76	63	49	-	33	25	-	9	10.6%	Granular Borrow (Gravel)	Owner: W. E. Dailey, Inc., former owner, Green. Area is large pit complex which owner refers to as "Green Pits" - Area is west of Town Highway No. 8 with access 0.84 mile north of its junction with Town Highway No. 25.

SHAFTSBURY GRANULAR DATA SHEET NO. 10

TABLE I

ıp dent. o.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Over-burden (Ft)	Exist-ing Pit	Sieve Analysis % Passing 2"	1½"	5/8"	¼"	#4	#100	#200	#270	Abrasion AASHTO T-4-35	Passes AOT Spec.	Remarks
																Test Nos. 1-5 were of southern-most pit, to right of access road, and its 500' northward ex-tension. Test No. 1 was in upper east face of north lobe. Material is: 0'-2', overburden; 2'-11', cobbly gravel; bottom, gravelly sand.
	2	1978	22'-27'	0'-0.5'	Yes	100	100	-	95	87	22	20	-	-	-	Test No. 2 was in face at north corner of south lobe. Material is: 0'-0.5', overburden; 0.5'-2', cobbles and silt-clay;2'-8', peb-bly sand; 8'-20', coarse sand; 20'022', silty gravel (Face above 22' was inaccessible);22'-25', sand; 25'-27', pebbly sand; bot-tom, silt, cobbles and sloughed material.
	3	1978	0.5-11'	0'-0.5'	Yes	56	40	-	21	12	17	16	-	6.1%	-	Test No. 3 was in south face of north lobe. Material is: 0'-0.5', overburden; 0.5'-11', gravel with silt-clay coating; bottom, cob-bles and sloughed material.
	4	1978	20'-32'	0'-2'	Yes	96	79	-	55	37	16	12	-	9.2%	Granular Borrow (Gravel)	Test No. 4 was at north side of easternmost face. Material is: 0'-2', overburden; 2'-20', inac-cessible;20'-32', gravel, cob-bles and sand; bottom, sloughed material.
	5	1968	11'-20.5'	0'-11'	Yes	46	40	34	-	26	9	-	6	3.2%	Gravel	Test No. 5 was in upper face of stripped ridge and represents northwasd extension of southern-most pit. Material is: 0'-8.5', cobbles and dirty granular; 8.5'-11', silt seam (face above 11'

ip dent. o.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Over-burden (Ft)	Exist-ing Pit	Sieve Analysis % Passing 2"	1½"	5/8"	¼"	#4	#100	#200	#270	Abrasion AASHTO T-4-35	Passes AOT Spec.	Remarks
																was not sampled); 11'-20.5', cobbly gravel; bottom, same.
	6	1968	0.5'-16'	0'-0.5'	Yes	-	63	49	-	33	25	-	9	4.6%	Granular Borrow (Gravel)	Test No. 6 was in upper north face. Material is: 0'-0.5', overburden; 0.5'-3', cobbles and sand; 3'-16', sand with scattered stones.
	7	1968	16'-19'	0'-0.5'	Yes	68	60	48	-	41	13	-	7	-	Granular Borrow (Gravel)	Test No. 7 was in lower north face, 15' west-southwest of Test No. 6. Material is: 16'-19', sandy gravel; bottom, same.
	8	1968	0.5'-11'	0'-0.5'	Yes	73	65	51	-	41	24	-	11	4.6%	-	Test No. 8 was in upper face of stripped ridge southwest of the slough. Material is: 0'-0.5', overburden; 0.5'-11', cobbly gravel; bottom, same. Test Nos. 9A - 11 were in northeasternmost pit, 1000' west of the junction of TH No. 18 with TH No. 8.
	9A	1968	0.5'-14'	0'-0.5'	Yes	100	82	82	82	80	25	-	10	-	Granular Borrow (Sand)	Test No. 9A was in highest excavation at east end of pit. Material is: 0'-0.5', overburden; 0.5'-14', sand with stones and cobbles; bottom, same.
	9B	1968	14'-28'	-	Yes	100	100	93	93	92	21	14	8	-	Granular Borrow (Sand)	Test No. 9B was below No. 9A. Material is: 14'-15', sand with stones; 15'-18', sand; bottom, silt.

SHAFTSBURY GRANULAR DATA SHEET NO. 12

TABLE I

ıp dent. o.	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"	1½"	5/8"	⅜"	#4	#100	#200	#270			
	10	1971	0'-30'	-	Yes	84	79	-	56	37	13	9	8	8.1%	Gran. Borrow (Gravel)	Test No. 10 was in southeast face of pit.
	11	1978	3'-11'	0'-3'	Yes	100	100	100	100	100	47	22	-	-	-	Test No. 11 was new excavation of easternmost face. Material is: 0'-3', overburden; 3'-7', medium-fine sand; 7'-11', 1" thick interlayers of silt and silt-clay; bottom, gravel.
	12A	1968	0'-10'	-	Yes	80	70	56	-	31	12	-	7	6.7%	Granular Borrow (Gravel)	Test No. 12A was in upper north-east face. Material is: 0'-10', cobbly gravel.
	12B	1968	10'-20'	-	Yes	100	80	80	-	60	48	-	7	-	Granular Borrow (Gravel)	Test No. 12B was below Test No. 12A. Material is: 10'-20', silty sand with stones.
	12C	1968	20'-30'	-	Yes	91	84	41	-	21	26	-	18	5.4%	-	Test No. 12C was below Test No. 12B. Material is: 20'-30', gravel; bottom, cobbles.
	13	1971	0'-15'	-	Yes	100	100	100	100	100	38	32	4	-	-	Test No. 13 was in upper north-east face. Material is: 0'-15', gravel lenses.
	14	1978	35'-38'	0'-35'	Yes	100	100	-	88	77	18	16	-	-	-	Test No. 14 was in lower middle of central east face. Material is: 0'-25', sloughings; 35'-38', sandy silt and stones.
	15	1968	1'-11'	0'-11'	Yes	100	86	75	-	61	11	-	5	-	Granular Borrow (Sand)	Test Nos. 15 and 16 were in south face of hilltop pit near north limits of 1968 excavation. Test No, 15 was in upper south face; Material is: 0'-1', over-burden; 1'-11', stony sand; bot-tom, same,

SHAFTSBURY GRANULAR DATA SHEET NO. 13

TABLE I

ıp dent. o.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Over-burden (Ft)	Exist-ing Pit	Sieve Analysis % Passing 2"	1½"	5/8"	¼"	#4	#100	#200	#270	Abrasion AASHTO T-4-35	Passes AOT Spec.	Remarks
	16	1971	0'-25'	-	Yes	84	78	-	51	30	17	14	12	10.8%	Granular Borrow (Gravel)	Test No.16 was in east face. Material is: 0/25', gravel (many large cobbles not included); bottom, same.
	17	1978	0.5'-6'	0'-0.5'	Yes	95	90	-	65	48	7	3	-	3.6%	Gravel	Test No. 17 was in bulldozed furrow in floor northwest of Test No. 14. Material is: 0'-0.5', overburden; 0.5'-6', sandy coarse-medium gravel. Test Numbers 18 & 19 were at north end of 1978 pit complex.
	18	1978	4'-13'	0'-0.5'	Yes	100	96	-	80	56	21	13	-	5.9%	Granular Borrow (Gravel)	Test No. 18 was in upper west face. Material is: 0'-0.5', overburden; 0.5'-4', cobbles and sand (inaccessible); 4'-6', sand with silt; 6'-7', coarse cobbly gravel; 7'-13', medium sandy gravel; bottom, sandy gravel.
	19	1978	7'-10'	0'-7'	Yes	100	100	100	100	98	4	3	-	-	Sand	Test No. 19 was in upper north face. Material is: 0'-7', overburden; 7'-10', medium sand; bottom, gravel. Test Nos. 20-23 were in a stripped "pillar" in the northwest central part of the area.
	20	1968	0.5'-13.5	0'-0.5'	Yes	65	61	51	-	44	17	-	5	8.0%	Gravel	Test No. 20 was in upper west face. Material is: 0'-0.5',overburden; 0.5'-13.5', sand and gravel; bottom, gravel.
	21	1968	26-36.5'	-	Yes	100	100	100	-	80	7	4	3	-	Sand	Test No. 21 was in lower face, northwest of Test No. 20. Material is: 26'-30', sand; 30'-36.5', stony sand; bottom, same.

SHAFTSBURY GRANULAR DATA SHEET NO. 14

TABLE I

ap dent. o.	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"	1½"	5/8"	⅜"	#4	#100	#200	#270			
	22	1968	0'-22'	-	Yes	66	61	58	-	51	17	-	6	3.8%	Granular Borrow (Gravel)	Test No. 22 was in upper south face. Material is: 0'-22', sand and gravel; bottom, cobbles.
	23	1968	34'-44'	-	Yes	100	100	99	99	98	25	10	8	-	Sand	Test No. 23 was in southeast face. Material is: 0'-34', sloughed (not sampled); 34'-44', fine sand; bottom, same.
	24A	1968	1'-10'	0'-1'	Yes	67	59	53	-	44	22	-	7	6.5%	Granular Borrow (Gravel)	Test No. 24A was in upper west face of westernmost pit, 0.5 mile from TH No. 8. Material is: 0'-1', overburden; 1'-10', sand and stones.
	24B	1968	10'-21'	-	Yes	76	64	55	-	43	17	-	8	6.4%	Granular Borrow (Gravel)	Test No. 24B was below Test No. 24A. Material is: 10'-21', silty gravel; bottom, same.
13	1	1968	1'-11.5'	0'-1'	Yes	100	100	96	96	94	22	-	5	-	Sand	Owner: Mrs. Mary Whitney. Area is small pit south of Shaftsbury TH No. 26 (Class 3), and east of Paran Creek. Test No. 1 was in southeast part of excavated area. Material is: 0'-2', overburden; 2'-3', silty sand; 3'-10', silty sand with some thin silt-clay seams, some 4" cobbles and small stones.
14	1-A	1968	1.5-12.5	0'-1.5'	Yes	-	-	-	-	44	13	-	6	21.8%	Granular Borrow (Gravel)	Owner: Horace M. Galusha. Area is pit on hillside west of Shaftsbury TH No. 54 (Class 3). Test No. 1A was in upper part of west face. Material is: 0'-1.5', overburden; 1.5'-8.5', medium to coarse gravel; 8.5'-12.5', fine gravel.

SHAFTSBURY GRANULAR DATA SHEET NO. 15

TABLE I

ip dent. o.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Over-burden (Ft)	Exist-ing Pit	Sieve Analysis % Passing 2"	1½"	5/8"	¼"	#4	#100	#200	#270	Abrasion AASHTO T-4-35	Passes AOT Spec.	Remarks
	1-B	1968	12.5-25'	-	Yes	89	86	68	-	42	8	-	4	23.4%	Gravel	Test No. 1-B was below Test No. 1-A. Material is: 12.5'-25', fine to medium gravel; bottom, silt-clay.
	2	1968	3'-8'	0'-3'	No	100	100	100	100	48	8	5	3	-	Granular Borrow (Sand)	Test No. 2 was at edge of woods road just west of skidway.
15	1	1968	1.5-11.5'	0'-1.5'	Yes	82	80	63	-	34	5	-	1	26.4%	Granular Borrow (Gravel)	Owner: E. F. Jones. Area is pit on hillside southeast of the junction of Shaftsbury TH No. 64 (Class 3) and 54 (Class 3). Test No. 1 was in upper part of north face. Material is: 0'-1.5', overburden; 1.5'-11.5', slaty fine gravel; bottom, same.
16	1A	1978	12.5-16.5	0-1	Yes	42	31	-	17	12	20	10	4	11.1%	-	Owner: W. E. Dailey Co., Inc. Area is formerly owned by Mary B. Golding. Pit is 0.09 mile northwest of Shaftsbury TH No. 26 (Class 3) and 0.27 mile northeast of its junction with Shaftsbury TH No. 8(Class 3). Test No. 1-A was in north face near west end of pit. Material is: 0'-1', overburden; 1'-2.5', sand; 2.5'-3.5', cobbles; 3.5'-12.5', interbedded sand and silt (0'--12.5', inaccessible); 12.5'-16.5', coarse gravel.
	1B	1978	16.5-19.5	-	Yes	100	100	100	100	100	28	7	-	-	Sand	Test No. 1B was below Test No. 1A. Material is: 16.5'-19.5', sand becoming finer with depth; bottom, cobbles.
	1C	1978	21.5-27.5	-	Yes	100	100	100	100	90	56	35	-	-	-	Test No. 1C was 12' east of and 2' below Test No. 1B. Material is: 21.5'-27.5', interbedded sand and silt, bottom, cobbles.

SHAFTSBURY GRANULAR DATA SHEET NO. 16 TABLE I

ip dent. o.	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"	1½"	5/8"	⅜"	#4	#100	#200	#270			
	2	1978	0.5'-5'	0'-0.5'	Yes	87	65	-	44	31	13	9	-	12.3%	Granular Borrow (Gravel)	Test No. 2 was in north face of pit, 110' east of Test No. 1C. Material is: 0'-0.5', overburden; 0.5'-5', coarse to medium gravel; bottom, same.
	3	1978	5'-11.5'	0'-.5'	Yes	100	100	100	100	99	12	5	-	-	Sand	Test No. 3 was in northeast face of lower level. Material is: 0'-0.5', overburden; 5'-11.5', inter bedded sand and silt seams; bottom, sand.
	4	1978	0.5'-5.	0'-0.5'	Yes	100	95	-	91	85	13	5	-	-	Sand	Test No. 4 was in south face of pit near road, 100' southwest of Test No. 3. Material is: 0'-0.5', overburden; 0.5'-2', fine sand; 2'-3', stony sand; 3'-5', fine to medium sand; bottom, sand and stones.
	5	1978	8'-15'	0'-8'	Yes	100	85	-	75	73	27	16	-	-	-	Test No. 5 was in central west face of pit.Material is: 0'-8', overburden; 8'-10.5', sand with gravel stringers; 10.5'-12', clean medium sand; 12'-15', fine sand-silt; bottom, silty sand.
	6	1978	-	-	Yes	100	100	-	85	74	29	18	-	-	-	Test No. 6 was an unofficial sample taken from a pile of material near a backhoe test hole in floor.
17	1	1968	5'-16'	-	Yes	100	100	89	89	76	47	-	20	-	-	Owner: W. E. Dailey, Co., formerly part of "Young's Holdings". Area is a pit northwest of the junction of Shaftsbury TH No.8 (Class 3) and 30, (Class 3), and west of railroad tracks.

SHAFTSBURY GRANULAR DATA SHEET NO. 17 TABLE I

ip dent. o.	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"	1½"	5/8"	⅜"	#4	#100	#200	#270			
																Test No. 1 was below top of center of pit. Material is: 0'-5', cobbly gravel (not sampled); 5'-16', fine sand with a 2.5' layer of fine gravel; bottom, ginr dsnf.
	2	1978	10'-24'	0'-1.5'	Yes	100	100	100	100	100	14	6	-	-	Sand	Test No. 2 was in face of south-west lobe of southern pit. Material is: 0'-1.5', overburden; 1.5'-2.5', gravel; 2.5'-24', silty fine sand interbedded with seams of silt-clay; bottom, sloughed material. Sample was only the 10'-24' interval.
	3A	1978	15'-40'	-	Yes	100	100	-	90	85	18	12	-	-	Sand	Test No. 3A was in the northwest face of southern pit. Material is: 0'-1.5', overburden; 1.5'-9', sand, silty sand, pebbly sand, and cobbles in interbeds 1' thick 9'-15', silty sand and gravelly sand.
	3B	1978	15'-40'	-	Yes	100	100	-	90	85	18	12	-	-	Sand	Test No. 3B was below Test No. 3A. Material is: 15'-20', sandy gravel; 20'-36', silty fine sand; 36'-40', pebbly sand; bottom, sloughed material.
	4	1978	0.5-4.5'	0'-0.5'	Yes	100	100	100	100	95	31	13	-	-	Granular Borrow (Sand)	Test No. 4 was in excavation in floor of northern pit on access road, 65' west of main access road. Material is: 0'-0.5', over burden; 0.5'-2', gravel; 2'-4.5', silty sand; bottom, sand and cobbles.

SHAFTSBURY 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"	1½"	5/8"	⅜"	#4	#100	#200	#270			
18	1	1968	3'-16'	0'-3'	Yes	57	55	43	-	29	31	-	17	9.6%	-	Owner: W. E. Dailey Co., Inc. Area is part of what is known as the Waite's Holdings", Test No. 1 was the upper part of south-east face of the northernmost pit of large pit complex. Material is: 0'-3', overburden; 3'-16', poorly sorted coarse gravel with angular stones and much silty sand; bottom, silty coarse gravel.
	2	1968	1-15.5'	0'-1'	Yes	100	62	57	57	52	39	-	11	-	Granular Borrow (Sand)	Test No. 2 was in the upper part of 30' face on west end of ridge near center of Waite's Holdings. Material is: 0'-1', overburden; 1'-15.5', sand with a 3' thick bed of gravel; bottom, fine sand.
	3	1968	19.5-28.5	-	Yes	100	100	100	100	100	13	4	4	-	Sand	Test No. 3 was in end of face, 25' west of TEst No. 2. Material is: 0'-15.5', inaccessible; 15.5'-28.5', medium to fine sand; bottom, fine sand.
	4A	1978	5'-8'	0'-5'	Yes	100	100	100	100	98	77	44	-	-	-	Test No. 4A was in upper corner at south end of east face. Material is: 0'-5', overburden; 5'-8', cross-bedded, silty, fine sand.
	4B	1978	8'-11'	-	Yes	63	51	-	36	18	9	5	-	7.8%	-	Test No. 4B was below Test No. 4A. Material is: 8'-11', gravel.
	4C	1978	15'-20'	-	Yes	100	100	100	100	100	11	4	-	-	Sand	Test No. 4C was below Test No. 4B. Material is: 11'-15', cobbles (not sampled) 15'-20', silty to clean sand; bottom, cobbles.

SHAFTSBURY GRANULAR DATA SHEET NO. 19

TABLE I

ap dent. o.	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"	1½"	5/8"	⅜"	#4	#100	#200	#270			
	5	1968	1'-13'	0'-1'	Yes	57	48	40	-	30	18	-	1	3.8%	Granular Borrow (gravel)	Test No. 5 was in upper center of east face of "pillar". Material is: 0'-1', overburden; 1'-13', cobbly gravel; bottom, same.
	6	1968	13'-26'	0'-1'	Yes	90	82	68	-	48	7	-	2	3.8%	Gravel	Test No. 6 was in lower face northeast of Test No. 5. Material is: 13'-26', cobbly gravel; bottom, same.
	7	1968	0.5-10.5	0'-0.5'	Yes	96	81	59	-	46	7	-	3	5.6%	Gravel	Test No. 7 was in northwest corner of upper face south of pillar Material is: 0'-0.5', overburden; 0.5'-10.5', gravelly sand; bottom, same.
	8	1968	10.5-19.5	-	Yes	100	100	100	-	71	7	2	1	-	Sand	Test No. 8 was in lower face, 15' east of Test No. 7. Material is: 10.5'-14', gravelly sand; 14'-19.5', stony sand; bottom, same.
	9	1968	0'-10'	-	Yes	78	70	59	-	46	5	-	1	5.0%	Gravel	Test No. 9 was in upper north face of lowest level. Material is: 0'-10', gravel and gravelly sand beds with a few cobbles; bottom, sloughed material.
	10	1968	2'-20'	0'-2'	Yes	100	100	100	100	100	23	-	6	-	Granular Borrow (Sand)	Test No. 10 was in upper south face of highest level. Material is: 0'-2', overburden; 2'-20', sand with layers of pebbles and silt; bottom, sloughed material.
	11	1968	0'-18'	-	Yes	100	100	100	100	100	16	-	4	-	Sand	Test No. 11 was in upper east side of southwest face. Material is: 0'-18', fine to medium sand; bottom, sloughed material.

SHAFTSBURY GRANULAR DATA SHEET NO. 20

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"	1½"	5/8"	⅜"	#4	#100	#200	#270			
	12	1968	44'-50'	-	Yes	100	100	100	100	99	18	6	5	-	Sand	Test No. 12 was near base of face below Test No. 11. Material is: 44'-50', fine sand; bottom, stony sand.
	13	1968	12'-20'	0'-2'	Yes	100	100	100	100	100	8	3	2	-	Sand	Test No. 13 was face at east end of pit. Material is:0'-2', overburden; 2'-12', not sampled; 12'-20', cross-bedded fine sand; bottom, stony sand.
	14	1978	10'-21'	0'-10'	Yes	100	100	100	100	100	27	10	-	-	Sand	Test No. 14 was in middle of west face of north end of pit. Material is: 0'-10', inaccessible 10'-21', interbedded fine sand, silt and clean sand; bottom, sloughed material.
	15	1978	1'-8'	0'-1'	Yes	100	100	100	100	100	38	20	-	-	-	Test No. 15 was in face, 360' south-southeast of Test No.14. Material is: 0'-1', overburden; 1'-8', interbedded silt and silty sand; bottom, sandy silt.
19	1	1968	1'-11.5'	0'-1'	Yes	56	46	36	-	30	36	-	17	-	-	Owner: Horace M. Young, Jr. Area is small pit N 30° W of the junction of Shaftsbury TH No. 8 (Class 3) and No. 29,(Class 3). Test No. 1 was in southwest face. Material is: 0'-1', overburden; 1'-4', silty cobbly gravel; 4'-8.5;, silty sand with stones; 8.5'-11.5', fine silty gravel; bottom, clean fine gravel.
20	1A	1968	1'-5.5'	0'-1'	Yes	64	58	48	-	36	8	-	5	9.3%	Gravel	Owner: Harry Bahan. Area is a large pit complex, 150' south of Shaftsbury TH No. 30 (Class 3), 0.22 mile east of its junction

ip dent. o.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Over-burden (Ft)	Exist-ing Pit	Sieve Analysis % Passing 2"	1½"	5/8"	¼"	#4	#100	#200	#270	Abrasion AASHTO T-4-35	Passes AOT Spec.	Remarks
																with U.S. Rte 7, and a smaller pit 300' south of TH No. 30, 0.53 mile east of Rte. 7. Pits are nearly depleted because meadow extension between them is reserved for housing. Test No. 1A was in southeast face of northeast lobe of pit. Material is: 0'-1', overburden; 1'-5.5', clean sandy gravel.
	1B	1968	5.5'-16'	-	Yes	100	100	100	100	100	55	-	11	-	-	Test No. 1B was below Test No. 1A. Material is: 5.5'-16',clean sand and silt; bottom, same.
	2	1968	2.5-8.5'	0'-2.5'	No	86	74	61	-	44	8	-	4	13.6%	Gravel	Test No. 2 was in southeast corner of meadow, 150' east of Test No. 1A (now unavailable). Material is: 0'-2.5', overburden; 2.5'-8.5', westward-dipping sandy coarse gravel; bottom, same.
	3	1968	2.5'-9'	0'-2.5'	No	92	80	70	-	59	4	-	2	-	Gravel (Grading Only)	Test No. 3 was 314' north of Test No. 2 (now unavailable). Material is: 0'-2.5', overburden; 2.5'-9', cobbly coarse gravel; bottom, same.
	4	1978	2'-10.5'	0'-2'	Yes	100	100	100	100	97	21	10	-	-	Sand	Test No. 4 was in east face near northeast corner of lower level. Material is: 0'-2', silty gravel; (not sampled); 2'-10.5', interbedded fine to medium sand with a few pebbles and thin silt seams bottom, same.
	5	1978	5.5'-17'	-	Yes	100	100	100	100	100	33	15	-	-	Granular Borrow (Sand)	Test No. 5 was in east face of pit, 105; south of Test No. 4. Material is: 0'-5.5, silty gravel (not sampled); 5.5-14', fine

ip dent. o.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Over-burden (Ft)	Exist-ing Pit	Sieve Analysis % Passing 2"	1½"	5/8"	¼"	#4	#100	#200	#270	Abrasion AASHTO T-4-35	Passes AOT Spec.	Remarks
																silty sand; 14'-17', cross-bedded medium sand; bottom, silt-clay and stones.
	6	1978	9.5-16.5	-	Yes	100	100	100	100	100	27	8	-	-	Sand	Test No. 6 was in east face of pit, 215 ' south of Test No. 5. Material is: 0'-7', silty, cobbly gravel (inaccessible); 7'-9.5', medium sand with some stony inter beds; 9.5'-16.5', silty fine sand bottom, same.
	7	1978	6.5-11'	-	Yes	100	100	100	100	100	62	29	-	-	-	Test No. 7 was in east face of pit, 245' south of Test No. 6. Material is: 0'-6.5', sandy gravel (inaccessible); 6.5'-11;, silty fine sand; bottom, sand.
	8	1968	2'-7'	0'-2'	Yes	88	79	66	-	54	5	-	2	9.2%	Gravel	Test No. 8 was in southernmost pit, 400' S 10° W of Test No. 2. Material is: 0'-2', overburden; 2'-7', cobbly clean gravel; bottom, same.
	9	1968	0.5-9'	0'-0.5'	Yes	100	100	100	100	100	80	-	25	-	-	Test No. 9 was in floor, 20' east of Test No. 8. Material is: 0'-0.5', overburden; 0.5'-9', fine sand and silt; bottom, same.
	10	1978	4'-11'	0'-4'	Yes	90	86	-	65	51	5	4	-	11.4%	Gravel	Test No. 10 was in east face of pit. Material is: 0'-4', overburden; 4'-11', gravel; bottom, same.
	11	1968	2.5'-8'	0'-2.5'	No	91	82	68	-	59	3	-	1.5	7.2%	Gravel	Test No. 11 was northwest of eastern pit, and 385' south of rock wall. Material is: 0'-2.5', overburden; 2.5'-8.5', cobbly coarse gravel; bottom, same.

SHAFTSBURY 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"	1½"	5/8"	¼"	#4	#100	#200	#270			
	12A	1968	1'-7'	0'-1'	Yes	68	58	38	-	24	13	-	6	11.2%	Gravel	Test No. 12A was in central north face of pit. Material is: 0'-1', overburden; 1'-7', coarse clean gravel.
	12B	1968	7'-9'	-	Yes	100	88	75	-	60	6	-	3	-	Gravel Grading Only	Test No. 12B was 30' west of Test No. 12A. Material is: 7'-9', gravel; bottom, silt-clay.
21	1	1968	1.5'-5.5'	0'-1.5'	Yes	89	72	61	-	44	6	-	4	10.6%	Gravel	Owner: Leo Harrington. Formerly owned by Harry Bahan. Area is a series of shallow, sprawling pits east and southeast of Map Ident. No. 20. Area is 0.42 mile northeast of U.S. Rte. 7 via Shaftsbury TH No. 31 (Class 3). Test No. 1 was in southwest face of pit. Material is: 0'-1.5', overburden; 1.5'-4', coarse cobbly gravel; 4'-5.5', stony coarse sand; bottom, stony sand.
	2	1968	0'-9.5'	-	Yes	100	100	100	100	100	75	-	10	-	Granular Borrow (Sand)	Test No. 2 was in floor, 35' southeast of Test No. 1. Material is: 0'-9.5', fine sand to silt; bottom, silt to sand.
	3	1968	2.5'-11'	0'-2.5'	Yes	70	59	37	-	22	8	-	5	12.4%	Gravel	Test No. 3 was in west central face. Material is: 0'-2.5', overburden; 2.5'-11', cobbly coarse gravel; bottom, silt-clay and stones.
	4A	1968	2'-6'	0'-2'	No	89	74	64	-	42	5	-	2	5.7%	Gravel	Test No. 4A was in brush-covered extension, 155; N 65° W of Test No. 3. Material is: 0'-2', overburden; 2'-6', cobbly coarse gravel with northward dipping beds.

TABLE I

ent.	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"	1½"	5/8"	⅜"	#4	#100	#200	#270			
	4B	1968	6'-10'	-	No	100	100	100	100	100	71	-	10	-	Granular Borrow (Sand)	Test No. 4B was below Test No. 4A. Material is: 6'-10', fine sand to silt; bottom, sand to silt.
	5	1978	2'-7'	0'-2'	Yes	100	100	-	84	66	6	4	-	-	Sand	Test No. 5 was in southeast face of southeast pit. Material is: 0'-2', overburden; 2'-3', pebbly sand; 3'-3.5', pebbly gravel; 3.5'-5', sand and pebbly sand; 5'-6', pebbly fine gravel; 6'-7', pebbly fine gravel and pebbly sand; bottom, silty fine sand.
	6	1978	0.5'-7'	0'-0.5'	Yes	86	77	-	56	46	10	6	-	10.3%	Gravel	Test No. 6 was in northeast face of southeast pit, 155' N 25° E of Test No. 5. Material is: 0'-0.5', overburden; 0.5'-2', pebbly fine gravel; 2'-4', fine gravel; 4'-7', gravel with 2" to 4" cobbles and sand; bottom, cobbles. This test represents the northeast extension of the southeast pit into woods.
	7A	1978	1'-7'	0'-1'	Yes	89	72	-	55	43	9	7	-	7.0%	Gravel	Test No. 7A was in northeast face of northwest lobe of southeast pit, 80' west of Test No.6. Material is: 0'-1', overburden; 1'-2', sand; 2'-3', silty fine sand; 3'-7', gravel with 2" to 4" stones; bottom, sand.
	7B	1978	7'-11'	-	Yes	100	100	100	100	98	11	3	-	-	Sand	Test No. 7B was below Test No. 7A. Material is: 7'-11', silty fine sand; bottom, sand and cobbles.
	8	1978	1'-12'	0'-1'	Yes	100	100	100	100	97	10	5	-	-	Sand	Test No. 8 was in southeast face of south lobe of pit. Material is:

TABLE I

ent.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Over-burden (Ft)	Exist-ing Pit	Sieve Analysis % Passing 2"	1½"	5/8"	¾"	#4	#100	#200	#270	Abrasion AASHTO T-4-35	Passes AOT Spec.	Remarks
																0'-1', overburden; 1'-2', sand; 2'-5', sand with a few thin layers of small pebbles; 5'-12', silty fine sand; bottom, sloughed material.
	9	1978	1'-9'	0'-1'	Yes	71	56	-	37	24	30	26	-	4.5%	-	Test No. 9 was in south face of east lobe of northernmost pit. Material is: 0'-1', overburden; 1'-4', cobbly gravel (4" to 6" stones) with a thin silt seam; 4'-9', gravel with mostly 1" to 3" stones; bottom, sloughed cobbles.
	10	1978	1'-10'	0'-1'	Yes	73	57	-	37	24	10	7	-	7.3%	Gravel	Test No. 10 was in northwest face of northernmost pit, 20' south of ramp. Material is: 0'-1', overburden; 1'-10', gravel with some silt-clay coating; bottom, sloughed cobbles.
	11	1978	1'-14'	0'-1'	Yes	74	68	-	42	31	3	2	-	15.0%	Gravel	Test No. 11 was in south face of northeast corner of northernmost pit, 120' N 50° E of Test No. 9. Material is: 0'-1', overburden; 1'-3', gravel; 3'-4', sand; 4'-14', gravel with 3" to 6" stones and some silt-clay layers; bottom, sloughed cobbles.
22	1	1968	0.5-6.5'	0'-0.5'	Yes	100	100	100	100	72	57	-	46	-	-	Owner: William E. Dailey Co., Inc. Area is small, depleted, pit, 0.09 mile northwest of Shaftsbury TH No. 8 (Class 3), 0.41 mile northeast of its junction with U.S. Rte 7. Test No. 1 was in the north face of pit. Material is: 0'-0.5', overburden; 0.5'-6.5', silt with stones; bottom, silt-clay.

TABLE I

Pit Ident.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Overburden (Ft)	Existing Pit	Sieve Analysis % Passing 2"	1½"	5/8"	¼"	#4	#100	#200	#270	Abrasion AASHTO T-4-35	Passes AOT Spec.	Remarks
23	1	1968	1'-11.5'	0'-1'	Yes	46	44	35	-	23	11	-	6	9.8%	Gravel	Owner: W. E. Dailey Co., Inc. Area is part of old "Hawkins-Patton Holdings", 0.04 mile south of Shaftsbury TH No.8 (Class 3), 0.57 mile northeast of its junction with U.S. Rte. 7. Test No. 1 was in southeast face of north lobe of pit. Material is: 0'-1', overburden; 1'-11.5', cobbly gravel; bottom, cobbly gravel.
	2	1968	11.5-23.5	-	Yes	76	68	56	-	42	11	-	6	9.2%	Granular Borrow (Gravel)	Test No. 2 was in north face of layer south lobe west of railroad tracks and Hawkins-Patton Holdings Material is: 0'-11.5', cobbles & dirty gravel (not sampled); 11.5'-19', sandy gravel; 19'-21', medium sand; 21'-23.5', silty fine gravel; bottom, same.
	3A	1968	2'-9'	0'-2'	Yes	100	100	100	100	100	18	-	4	-	Sand	Test No. 3A was in southeast face of south lobe west of pit roads. Material is: 0'-2', overburden; 2'-9', fine sand or silt.
	3B	1968	9'-12.5'	-	Yes	100	100	100	-	83	2	-	1	-	Sand	Test No. 3B was below Test No. 3A. Material is: 0'-1', overburden; 1'-8.5', sandy gravel with minor amounts of silt-caly; bottom same.
24	1	1968	1'-8.5'	0'-1'	Yes	82	67	54	-	40	5	-	2	6.0%	Gravel	Owner: Mrs. E. S. Cushman. Area is small pit west of U.S. Route 7 and W. E. Dailey, Co., Inc. office. Test No. 1 was in upper part of northeast face of pit. Material is: 0'-1', overburden; 1'-8.5', sandy gravel with minor amounts of silt-clay; bottom, same

SHAFTSBURY GRANULAR DATA SHEET NO. 27 TABLE I

ent.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Over-burden (Ft)	Exist-ing Pit	Sieve Analysis % Passing 2"	1½"	5/8"	¼"	#4	#100	#200	#270	Abrasion AASHTO T-4-35	Passes AOT Spec.	Remarks
	2	1968	2'-6'	0'-2'	Yes	96	80	69	-	56	32	-	11	8.8%	-	Test No. 2 was in floor, 42' south-southwest of Test No. 1. Material is: 0'-2', overburden; 2'-6', fine sand and stones (getting coarser with depth); bottom, stoney sand.
25	1A	1968	1'-18'	0'-1'	Yes	82	79	63	-	40	8	-	3	5.4%	Gravel	Owner: Arthur Howard. Area is pit in west side of knoll near edge of woods, 0.25 mile north of Shaftsbury TH No. 6 (Class 2), 0.47 mile east of its junction with U.S. Rte.7. Test No. 1-A was in upper part of east face of pit. Material is: 0'-1', overburden; 1'-18',cobbly gravel; bottom, gravelly sand. The stones in the gravel are mostly from 3" to 6".
	1B	1968	27'-35'	-	Yes	96	94	61	-	41	12	-	5	8.8%	Granular Borrow (Gravel)	Test No. 1B was in lower face of southeast corner of pit. Material is: 27'-35', layers of clean and sandy gravel with a few silt-clay lenses; bottom, sandy gravel.
	2	1971	10'-20'	0'-10'	Yes	100	97	-	68	39	9	7	-	5.9%	Gravel	Test No. 2 was in northeast face. Material is: 0'-10', overburden; 10'-20', gravel.
26	1	1968	1'-5'	0'-1'	Yes	72	66	59	-	49	4	-	3	-	Gravel (Grading Only)	Owner: Alfred Wade. Area is a large shallow pit east across Furnace Brook from the junction of Shaftsbury TH No. 5 (Class 2) and No. 33 (Class 3). Test No. 1 was in northeast face of upper level of pit. Material is: 0'-1', overburden; 1'-5', gravel; bottom, same.

SHAFTSBURY GRANULAR DATA SHEET NO. 28 TABLE I

Mt.	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"	1½"	5/8"	¼"	#4	#100	#200	#270			
	2	1968	0'5-4.5'	0'-0.5'	Yes	96	91	71	-	47	6	-	3	11.5%	Gravel	Test No. 2 was in east face of lower level. Material is: 0'-0.5', overburden; 0.5'-4', gravel bottom, silt-clay and sloughed material.
27	1	1968	2'-11'	0'-2'	Yes	100	100	96	96	92	16	-	3	-	Sand	Owner: Lawrence Cornell. Area is large pit, 0.04 mile east of Shaftsbury TH No. 5 (Class 2) 0.27 mile north of its junction with the south end of Shaftsbury TH No. 33 (Class 3). Test No. 1 was in upper west face of pit. Material is: 0'-2', overburden; 2'-11', layers of sand and pebbly sand; bottom, same.
	2	1968	0'-10'	-	Yes	100	100	100	-	91	53	-	15	-	-	Test No. 2 was in lower west face below stripped area southeast of Test No. 1. Material is: 0'-10', fine sand with silt and a few pebbles near the top; bottom, silty sand.
	3 A	1968	2'-13'	0'-2'	Yes	100	100	100	-	87	12	-	5	-	Sand	Test No. 3A was in upper face at east center of pit. Material is: 0'-2', overburden; 2'-6', pebbly coarse sand; 6'-13', fine sand with pebbly and silty sand layers.
	3B	1968	13'-20'	-	Yes	100	100	97	97	88	11	4	2	-	Sand	Test No. 3B was below Test No. 3A. Material is: 13'-20', pebbly sand with minor silt seams; bottom, same.

SHAFTSBURY GRANULAR DATA SHEET NO. 29 TABLE I

ent.	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"	1½"	5/8"	¼"	#4	#100	#200	#270			
	4	1968	0.5-12'	0'-0.5'	Yes	100	100	100	-	89	9	-	3	-	Sand	Test No. 4 was in upper east face of pit, 650' east of State Aid Highway No. 5. Material is: 0'-0.5', overburden; 0.5'-6.5', pebbly sand; 6.5'-12', fine sand; bottom, same.
	5	1968	4.5'-10'	-	Yes	100	100	100	100	100	90	47	39	-	-	Test No. 5 was in lower west face, 27' S 60°W of Test No. 2. Material is: 0'-4.5', overburden; 4.5'-10', silt-clay; bottom, same.
	6	1968	2'-10'	0'-2'	Yes	100	100	98	98	95	46	-	12	-	-	Test No. 6 was in floor, 20' S 60° W of Test No. 3B. Material is: 0'-2', overburden; 2'-6', pebbly sand with a few stones; 6'-10', sandy silt; bottom, same.
	7	1968	0.5'-6'	0'-0.5'	Yes	100	100	96	96	85	10	4	2	-	Sand	Test No. 7 was in southeast floor of pit. Material is: 0'-0.5', overburden; 0.5'-6', pebbly sand; bottom, same.
	8	1968	2'-8'	0'-2'	No	100	100	100	100	100	34	14	9	-	Granular Borrow (Sand)	Test No. 8 was in field just south of fence line and birch woods, and N 15° W of the Cornell home. Material is: 0'-2', overburden; 2'-8', fine to medium sand; bottom, stoney sand.
	9	1978	4'-16'	0'-4'	Yes	95	89	-	75	65	9	5	-	-	Granular Borrow (Sand)	Test No. 9 was at east end of pit, 1000' east of State Aid Highway No. 5. Material is: 0'-2', overburden; 4'-9', sandy gravel; 9'-16', slightly silty sand; bottom, sand.

SHAFTSBURY GRANULAR DATA SHEET NO. 30

TABLE I

Cent.	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"	1½"	5/8"	⅜"	#4	#100	#200	#270			
28	1	1968	1'-9.5'	0'-1'	Yes	100	92	74	-	53	10	-	6	23.4%	Granular Borrow (Gravel)	Owner: Merritt S. Hewitt, Jr. Area is an overgrown pit behind house, north of the junction of Shaftsbury TH No. 65 (Class 3) and Vt. State Highway No. 67 in the southwest corner of town. Test No. 1 was in east face of pit. Material is: 0'-1', over-burden; 1'-9.5', dirty, fine, slaty gravel which gets finer with depth; bottom, dirty, slaty gravel. A hole was dug in terrace, 150' east of Test No. 1, but was not sampled. Material is: 0'-0.5', stoney silt-clay; 0.5'-7.5', layers of yellow and blue silt-clays; 7.5;-11.5;, blue silt-clay, bottom, same.
29	1	1979	Stockpile (Crushed)	-	Yes	100	98	-	68	39	15	12	-	-	Crushed Gravel	Owner: William Morse. Area, known as the Tunic Pit, is 500' north of a trail at end of TH 56. The access to the pit is 0.87 mile along the trail to the end of TH 56 . TH 56 is 0.13 mile in length, making the total distance from the pit access to U.S. Rte. 7 in Shaftsbury Center 1.0 mile. All samples are Job Samples taken by S. Eddington, Resident Engineer, for Shaftsbury HHS 0137(3). Gravels are all crushed material.
	2	1979	Stockpile	-	Yes	100	98	-	68	39	15	12	-	-	Crushed Gravel	Test No 2 is a job sample.
	3	1979	Stockpile	-	Yes	100	100	-	-	44	16	11	-	28.1% on T96	Crushed Gravel	Test No. 3 is a job sample
	4	1979	Stockpile	-	Yes	100	100	-	-	30	9	7	-	33.7% on T96	Crushed Gravel	Test No. 4 is a preliminary sample.

SHAFTSBURY GRANULAR DATA SHEET NO. 31

TABLE I

ent.	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"	1½"	5/8"	⅜"	#4	#100	#200	#270			
	5	1979	Stockpile	-	Yes	100	100	-	-	34	18	14	-	-	Crushed Gravel	Test No. 5 is a job sample.
	6	1979	On project	-	Yes	100	100	100	100	77	9	4	-	-	Sand Borrow	Test No. 6 is a job sample.
	7	1979	On project	-	Yes	100	100	100	100	92	13	7	-	-	Sand Borrow	Test No. 7 is a job sample
	8	1979	Pit	-	Yes	100	100	100	100	99	7	3	-	-	Sand Borrow	Test No. 8 is a job sample.

Table I

Supplement

Shaftsbury Property Owners - Granular	Map Identification Number
Bahan, Harold	20
Brundage, Mrs. Gladys	8
Cornell, Lawrence	27
Cushman, Mrs. E. S.	24
Dailey, William, E., Co., Inc.	12, 16, 17, 18, 22, 23
Favreau, Raymond.	3
Galusha, Horace M.	14
Hall, William	10
Harrington, Leo	21
Hewitt, Merritt S., Jr.	28
Howard, Arthur	25
Hulet, Jessie & Spear, Marian	9
Hulet, Thurston	4
Jones, E. F..	15
King, Redford P..	7
Maitland, William	6
Morse, William	29
Myers, Charles	11
Rohm, F. A.	5
Skidmore, Kenneth	1

Shaftsbury Property Owners - Granular (cont.) Map Identification Number

TA 404A 50 Rev. 1/82

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

Shaftsbury ROCK DATA SHEET NO. 1

TABLE II

Map Ident. No.	Field Test No.	Year Field Tested	Rock Type	Existing Quarry	Method of Sampling	Abrasion AASHTO T-3	Abrasion AASHTO T-96	Remarks
1	1	1968	Dolomite	No	Chip	2.4%	27.8%	Owner: John T. Harrison, Jr. Area is a wooded hillside with outcrops occurring in north-south trending ledges, 0.08 mile east of Shaftsbury TH No. 20 (Class 3), 0.25 mile south of its intersection with Shaftsbury TH No. 21 (Class 3). Rock is mapped as Clarendon Springs dolomite. Test No. 1 started 235' east of the road and extended for 75' west. It was a hard, quartzitic dolomite. Test
	2	1968	Dolomite	No	Chip	2.1%	20.1%	No. 2 was continued westward for 80' from Test No. 1. The rock was a quartzitic dolomite with phylletic partings. Mr. Harrison wrote indicating that he and his wife did not want a processing plant or large trucking operation on the site.
2	1	1978	Dolomite	No	Chip	-	29.1%	Owner: Thomas Hall Estate. Area is an outcrop in a gulley on the wooded northeast slope of Maple Hill. The location is 0.75 mile southwest of station 915+00 of the southbound lane, via Shaftsbury TH No. 22 (Class 3) and a logging road; it is 0.4 mile due west of station 908+50 of the southbound lane, via a gradual downslope to the east, through a small wet area. Calcareous rock is mapped as the Dunham Dolomite. Test No. 1 was on the steep slope of the north outcrop. Material is: 0'-30', dolomite.
	B-R #1	1978	Dolomite	No	Blasted	3.8%	29.9%	Test No. B-R-1 was from a blast hole atop north ledge exposure on Maple Hill.
3	1	1978	Quartzite	No	Chip	-	25.6%	Owner: Thomas Hall Estate. Area is a north-south tranding wooded ridge south-southeast of the summit of Maple Hill, 0.35 mile west of station 883+0 of the northbound lane. The quartzite ledges are 200' long, 50' wide, and 30' high. A haul road is needed to give good access to the project to the east. Rock is mapped as Monkton quartzite.
4	1	1978	Dolomite	No	Chip	-	31.2%	Owner: Mrs. Lynn Taliaferro. Area consists of north-south trending cliffs on the lower northwest slope of Trumbull Mountain. Access is via an old overgrown wood road to within 75' of cliffs. The site is 0.27 mile southeast of Shaftsbury TH No. 8 (Class 3),

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

Shaftsbury ROCK DATA SHEET NO. 2

TABLE II

Map Ident. No.	Field Test No.	Year Field Tested	Rock Type	Existing Quarry	Method of Sampling	Abrasion AASHTO T-3	Abrasion AASHTO T-96	Remarks
								0.81 mile south of its junction with Shaftsbury TH No. 21 (Class 3). Rock is Dunham dolomite. The outcrop is 600' long by 100' high.
5	1	1978	Dolomite	No	Chip	-	34.8%	Owner: Thomas Hall Estate. Area is the north slope of Hale Mt., 0.33 mile west of the sharp curve on Shaftsbury TH No. 27 (Class 3), 0.44 mile west of its junction with Shaftsbury TH No. 5 (Class 2). The rock is mapped as Winooski dolomite and is thick-bedded and fairly hard. Fractures on joints produce blocky fragments. Site development would needa road and staging area.
6	1	1968	Dolomite	No	Chip	2.9%	27.1%	Owner: Bennington Rod & Gun Club. Area is comprised of extensive exposures of gray-weathered, massive to fairly thin-bedded dolomite on the steep, heavily wooded south and southwest slopes of Hale Mountain. Both samples were taken due west across the strike in the woods northwest of a large open pasture at the east side of the property. Test No. 1 was begun 675' west of a stone wall and fence forming the east boundary of the property, and was taken for 65' to the west.
	2	1968	Dolomite	No	Chip	2.6%	27.1%	Test No. 2 was continued westward for 85' from Test No. 1 The best access is via a large open pasture to the southwest. Rock is mapped as Winooski dolomite.
7	1	1968	Dolomite	No	Chip	3.0%	28.9%	Owner: Benningto Rod and Gun Club. Area is on easternmost ridge of property on the wooded southeast slope of Hale Mountain. The rock is coarse-to-fine, mainly gray-weathered, but sometimes buff weathered, soemwhat scored dolomite with calcite and scattered knots of white quartz. Test No. 1 was begun 100' west of stone wall and fence on the east side of property. Sample was taken for 75' S 50° W across the strike. Rock is light gray to light blue gray dolomite that breaks in an angular or blocky manner.
	2	1968	Dolomite	No	Chip	4.0%	25.9%	Test No. 2 continued along the same traverse for 75'.

TA 404A 50 Rev. 1/82

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

Shaftsbury ROCK DATA SHEET NO. 3 TABLE II

Map Ident. No.	Field Test No.	Year Field Tested	Rock Type	Existing Quarry	Method of Sampling	Abrasion AASHTO T-3	Abrasion AASHTO T-96	Remarks
	3	1968	Dolomite	No	Chip	4.4%	29.5%	Test No. 3 was continued for 75' across the strike. The lower slope has much loose rock and many variable-sized boulders. There is plenty of relief for a quarrying operation, but outcrops west of Test No. 3 are very limited. The best access would be from the south via a large open pasture. Rock is mapped as Clarendon Springs dolomite.
8	1	1968	Limestone	No	Chip	8.6% fails	50.5% fails	Owner: Lawrence (Lonnie) Wasco. (Former owner: Alfred Niles). Area is at the north end of Harrington Cobble. Eastward dipping, soft, crystalline limestone and marble with scoriaceous weathering was sampled along an east-west traverse 50' north of USC & GS benchmark No. 2. Rock breaks in a splintery and blocky manner. Test No. 1 was taken from 0'-75'.
	2	1968	Limestone	No	Chip	4.4%	55.4% fails	Test No. 2 was taken for an additional 75' eastward from Test No. 1.
	3	1978	Limestone	No	Chip	-	51.1%	Test No. 3 was on west slope of summit, 420' west of the southbound lane of the project. The rock in Tests No. 1,2 3, & 4 is mapped as Shelburne limestone and marble.
	4	1978	Limestone	No	Chip	-	37.0%	Test No. 4 was in small prospect hole, 225' N 40° W of, and 47' above R.O.W. stake that was 120' left of station 741+50 of the southbound lane.
9	1	1968	Limestone	No	Chip	3.6%	29.6%	Owner: Thurston Hulet. Area is the crest and upper east slope of Bucks Cobble which is an elongate hill with a rounded summit and a vertical west scarp. Tests were taken from top of the scarp S70°E along the strike. The rock is a thin-bedded, gray to blue-gray weathered limestone or marble that varies from soft to fairly hard. It broke in splintery or angular pieces. Test No. 1 was for 80' eastward from west scarp.

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

ROCK DATA SHEET NO. 4

TABLE II

Map Ident. No.	Field Test No.	Year Field Tested	Rock Type	Existing Quarry	Method of Sampling	Abrasion AASHTO T-3	Abrasion AASHTO T-96	Remarks
	2	1968	Lime-stone	No	Chip	3.2%	45.5% faile	Test No. 2 was for an additional 70' east across the strike. Rock is mapped as Shelburne limestone or marble.
10	1	1968	Dolo-mite	No	Chip	1.2%	26.3%	Owner: Donald Peters. Area is a large open field southeast of Peters' farm on the east side of Shaftsbury TH No. 9 (Class 3). Rock is mapped as the Bascom dolomite, marble, and limestone, and varies from medium gray dolomite to light gray limestone and marble Test No. 1 started 90' east of Shaftsbury TH No. 9 (Class 3), and 50' north of rock wall and woods at south end of field. Test extended for 60' eastward across the strike.
	2	1968	Dolo-mite	No	Chip	2.0%	22.2%	Test No. 2 began 125' east of Test No. 1 and 135' north of rock wall, and continued for 100' S 75° E to 250' west of bluffs overlooking Cold Spring Brook.
11	1	1968	Lime-stone	Yes	Chip	4.9%	-	Owner: Robert Marsh. Area is a small old quarry and extension on the south slope of a hill north of Shaftsbury TH No. 7 (Class 3) near the New York State Line. Test No. 1 was for 82' eastward from the east edge of quarry. Rock is a light gray limestone with tiny veins of calcite at the east end, and white marble at the west end.
	2	1968	Marble	Yes	Chip	7.0%	51.3% fails	Test No. 2 was for 68' westward across the quarry floor. Rock is white to light gray marble. Rock is mapped as Bascom limestone and marble.
12	1	1968	Marble	Yes	Chip	7.0%	51.3% fails	Owner: Robert Marsh. Area is a small old quarry on north slope of hill north of Shaftsbury TH No. 7 (Class 3) near the New York State line. Quarry was sampled on 15' vertical east wall and 65' west across the floor. Rock is thin- bedded, white to gray marble or limestone with some interbedded dolomite. A wooded, steep downslope is west of the quarry and has a few exposures. The land slopes

TA 404A 50 Rev. 1/82

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

Shaftsbury ROCK DATA SHEET NO. 5

TABLE II

Map Ident. No.	Field Test No.	Year Field Tested	Rock Type	Existing Quarry	Method of Sampling	Abrasion AASHTO T-3	Abrasion AASHTO T-96	Remarks
								gently east of the quarry with a few trees and scattered outcrop. The bedding dips 15° to the east. The rock fractures angularly with many flat pieces. There were phyllitic partings.

Table II
Supplement

Shaftsbury Property Owners - Rock	Map Identification Number
Bennington Rod & Gun Club	6, 7
Hall, Thomas (Estate)	2, 3, 5
Harrison, John T., Jr.	1
Hulet, Thurston	9
Marsh, Robert	11, 12
Peters, Donald	10
Taliaferro, Mrs. Lynn	4
Wasco, Lawrence (Lonnie).	8