

SURVEY OF HIGHWAY CONSTRUCTION MATERIALS
IN THE TOWN OF TOPSHAM, ORANGE COUNTY, VERMONT

prepared by

Engineering Geology Section, Materials Division
Vermont Department of Highways

in cooperation with

United States Department of Transportation
Federal Highway Administration

Montpelier, Vermont

February, 1971

TABLE OF CONTENTS

Introduction

 Acknowledgements 1

 History 1

 Inclosures 2

Location 4

 County and Town Outline Map of Vermont

Survey of Rock Sources

 Procedure for Rock Survey 5

 Discussion of Rock and Rock Sources 6

Survey of Sand and Gravel Deposits

 Procedure for Sand and Gravel Survey

 Discussion of Sand and Gravel Deposits 8

Summary of Rock Formations in the Town of Topsham 9

Glossary of Selected Geologic Terms 10

Bibliography 11

Partial Specifications for Highway Construction Materials . . Appendix I

Topsham Granular Data Sheets Table I

Topsham Property Owners - Granular Supplement

Topsham Rock Data Sheets Table II

Topsham Property Owners - Rock Supplement

Granular Materials Map Plate I

Rock Materials Map Plate II

Acknowledgements

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

1. Various departments and individuals of the Vermont State Department of Highways, notably the Planning and Mapping Division and the Highway Testing Laboratory.
2. Professor D. P. Stewart of Miami University, Oxford, Ohio.
3. Professor C. G. Doll, Vermont State Geologist, University of Vermont, Burlington, Vermont.
4. United States Department of Commerce, Bureau of Public Roads.

History

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

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

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

Inclosures

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

The granular materials map depicts areas covered by various types of glacial deposits (outwash, moraines, kames, kame terraces, eskers, etc.) by which potential sources of gravel and sand may be recognized. This information was obtained primarily from a survey conducted by Professor D. P. Stewart of Miami University, Oxford, Ohio, who had been mapping the glacial features of Vermont during the summer months since 1956. Further

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

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

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

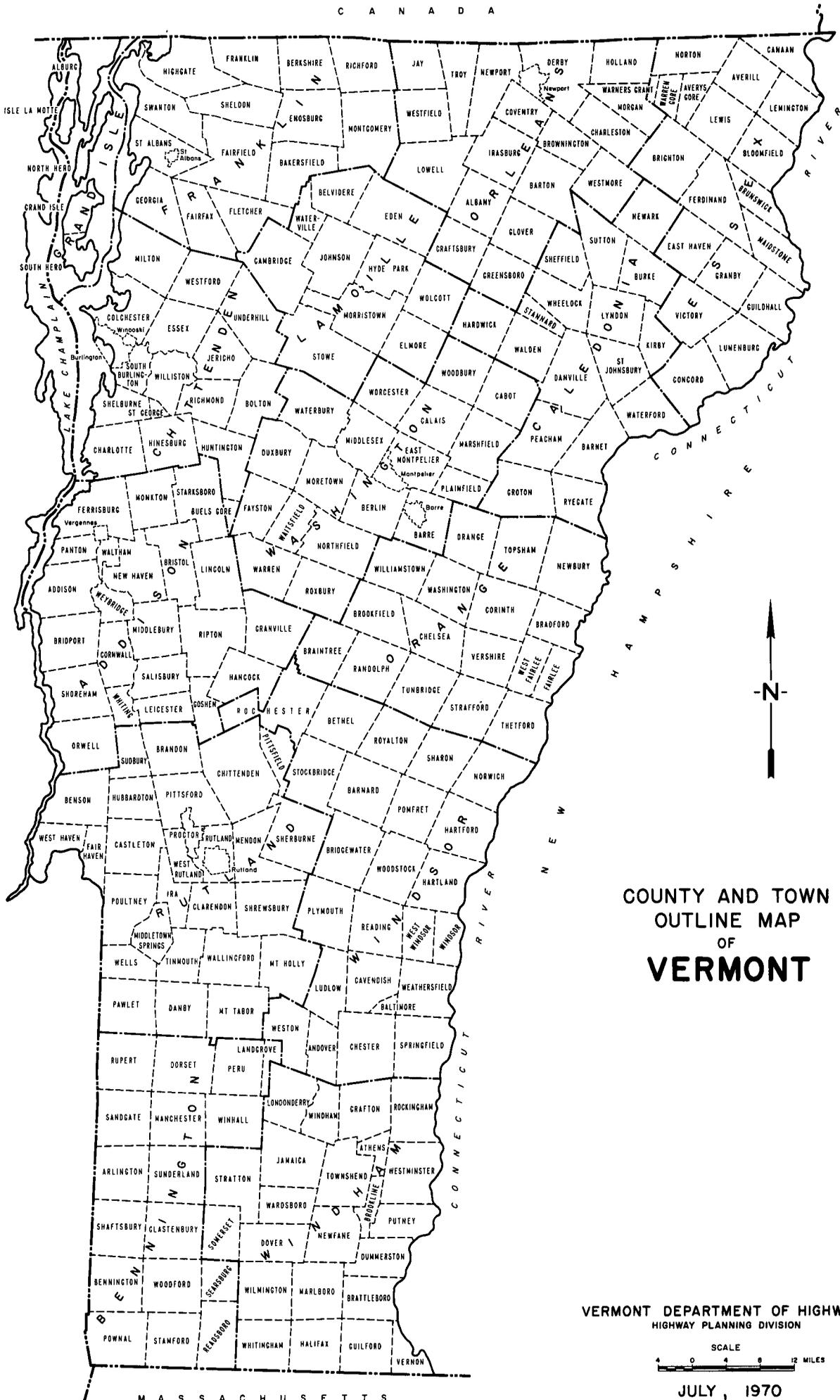
LOCATION

The town of Topsham is located in the north northeast part of Orange County, in the east-central part of the State. The town of Groton bounds it on the north; Orange on the west; Corinth on the south; and Newbury on the east. (See County and Town Outline Map on the following page.)

Topsham lies entirely within the Vermont Piedmont Physiographic Region. It is a region of moderate hills, many of which range from rolling to rather steep. Elevations range from a high of 2,350' on Fuller Hill in the northwest corner of the Town, to less than 720' where the Tabor Branch crosses the Corinth Town Line in the southeast part of town.

Drainage in the southwest part of town is south of east via the Waits River and several small tributaries; drainage in the north and central part of town is south via Powder Spring Brook, and southeast and south via the Tabor Branch which flows into the Waits River below East Corinth. Levi and Hedgehog Brooks drain westward into the Tabor Branch, in the east and southeast part of town. East and Keenan Brooks flow north into Groton.

Topsham is sparsely populated with four small villages. West Topsham and Waits River lie in the west half, and Topsham Four Corners and East Topsham lie in the east half of town. All four settlements lie in the southern half of town.



COUNTY AND TOWN
 OUTLINE MAP
 OF
VERMONT

VERMONT DEPARTMENT OF HIGHWAYS
 HIGHWAY PLANNING DIVISION

SCALE



JULY, 1970

SURVEY OF ROCK SOURCES

Procedure for Rock Survey

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

The office investigation is conducted primarily during the winter months and comprises the mapping and description of rock types as indicated in various reference sources. Many different sources of information are utilized, as indicated in the bibliography. These references differ considerably in dependability due to new developments and studies that have contributed to the obsolescence of a number of reports. In addition, the results of samples taken by other individuals are analyzed, and the location at which these samples were taken is mapped when possible. In other words, as complete a correlation as possible is made of all the information available concerning the geology of the area under consideration.

The field investigation is begun by making a cursory preliminary survey of the entire area. The information obtained in the preliminary survey, together with the information assimilated in the office investigation, is employed to determine the areas where testing and sampling will be concentrated. When a promising source has been determined by rock type, volume of material, accessibility, and adequate exposure and relief, chip samples are taken with a hammer across the strike or trend of the rock. The samples are submitted to the Material Testing Laboratory for abrasion testing both by the Deval Method (AASHO T-3) and the Los Angeles Method (AASHO T-96). It should be kept in mind that the samples taken by the chip method are often within the weathered zone of the outcrop and consequently may give a less satisfactory test result than fresh material deeper in the rock structure. When the material is uniform and acceptable abrasion tests result from the chip samples, the material source is included in this report as being satisfactory.

Discussion of Rock and Rock Sources

It should be noted that information on the Rock Materials Map is somewhat simplified. (For a more detailed description of the respective rock formations see the Summary included in this report.)

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

Most of the rock mapped in Topsham is the Waits River schist and limestone of the Eastern Vermont Stratigraphic Sequence. There are only nine small, scattered areas mapped as granitic rocks, all of which lie in the northern one-third of the township. Willey Hill, the only granitic body in the west part of town was not sampled because the smooth, rounded exposures of rock would require drilling and blasting to sample. Quality- and quantity-wise, this site would probably be a good source of rock, but a beautiful view would be lost.

Topsham has much terrain which has been rounded by glacial and stream erosion, and undoubtedly there are many outcrops which have been buried under an extensive ground moraine of Shelburne ablation till. Also, many hills that might have rock exposures and potential quarry sites are heavily covered by woods, and are of difficult access.

The only location that was sampled was a small, abandoned quarry on the south southwest side of Pine Mountain, located in the northeast corner of town. The Vermont Fish and Game Department owns the land and maintains a wildlife refuge on it. Access is via a woods road southward from Town Highway No. 53 in Groton. The rock is the undifferentiated granitic rock of the New Hampshire Plutonic Series.

SURVEY OF SAND AND GRAVEL SOURCES

Procedure for Sand and Gravel Survey

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

The office investigation is conducted primarily during the winter months and comprises the mapping of possible potentially productive areas as indicated from various references. Of these references, the survey of glacial deposits mapped by Professor Stewart proves to be valuable, particularly when used in conjunction with other references such as soil-type maps, aerial photographs, and United States Geological Survey quadrangles. The last two are used in the recognition and location of physiographic features indicating glacial deposits and in the study of drainage patterns. In addition, the locations of existing pits are mapped when known. The locations in which samples were taken by other individuals are noted and mapped when possible.

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

Discussion of Sand and Gravel Deposits

The granular deposits in Topsham occur as sands and gravels of ice-contact origin deposited as kame terraces, kame moraines, and kames; or material deposited as lake sands or near-shore delta deposits. The following Map Identification Numbers had material acceptable for Gravel for Sub-base, Item 704.05: 2, 7, and 24, all in pits; and 5, 13, and 14. Numbers 5, 7, 13, and 14 are probably the most promising of the gravel sources in town; Numbers 2 and 24 are nearly depleted. None of the above areas are extensive, and even the best are patchy and limited.

Sources of material acceptable for Sand Borrow and Cushion, Item 703.03, are at Numbers 1, 2, 3, 7, 10, 11, 18, 19, and 23; all but Number 1 are pit areas. Map Identification Numbers 7 and 23 are the best looking sand sources in town. The other areas are either very small or nearly depleted.

Overall, the granular material in Topsham is very limited, and much of it is close to bedrock or glacial till.

SUMMARY OF ROCK FORMATIONS IN THE TOWN OF TOPSHAM

Eastern Vermont Sequence

Waits River Formation - Gray quartzose and micaceous crystalline limestone weathered to distinctive brown earthy crust; interbedded and intergradational with gray quartz-muscovite phyllite or schist. Where more metamorphosed the limestones contain actinolite, hornblende, zoisite, diopside, wollastonite, and garnet; and the phyllite and schist, biotite, garnet, and locally andalusite, kyanite or sillimanite.

New Hampshire Plutonic Series

Undifferentiated Granitic Rocks - Fine- to coarse-grained granitoid rocks including granodiorite and quartz monzonite occurring as sills and irregular bodies.

GLOSSARY OF SELECTED GEOLOGIC TERMS

Ablation Till - Rock debris of all particle sizes released by melting glacial ice and deposited with little or no sorting.

Alluvial - Pertaining to material carried or laid down by running water.

Delta - A predominantly alluvial deposit built out by a stream into the sea or other body of water. Usually it has the typical form of the Greek letter Delta.

Fluvial - Pertaining to streams or deposition by streams.

Glaciolacustrine - A term used to denote formation by or pertaining to deposition in quiet waters of glacial lakes.

Ice-Contact - Refers to sediments which have accumulated in contact with stagnant or wasting glacial ice.

Kame Terrace - An accumulation of stratified material laid down chiefly by streams between a glacier and an adjacent valley wall.

Littoral - Of, or pertaining to, the shore or coastal region. It refers to near-shore deposits usually laid down under the influence of wave action.

Meta - A prefix used before rock names to indicate that the minerals have been altered chemically or physically.

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

Phyllite - A fine-grained, foliated metamorphic rock intermediate between the mica schists and slates into which it may grade. The foliation is made possible by the development of a large amount of potash, mica, *sericite*, which also gives the rock a distinctive silvery appearance. The fracture is intermediate between the smooth, even cleavage of slate and the rather splintery fissility of schist; the rock is not as tough as slate.

Schist - A metamorphic crystalline rock having a closely foliated structure and a tendency to split along approximately parallel planes.

BIBLIOGRAPHY

- A survey of the glacial geology of Vermont being conducted by D.P. Stewart; the partial results of which are published in Vermont Geological Survey Bulletin No. 19; 1961.
- Soil Survey (Reconnaissance) of Vermont, W.J. Latimer; 1930; Bureau of Chemistry and Soils, United States Department of Agriculture.
- Soil Exploration and Mapping; 1950; Highway Research Board, Bulletin 28.
- Survey of Highway Aggregate Materials in West Virginia; December, 1959; Engineering Station, West Virginia University, Morgantown, West Virginia.
- Materials Inventory, Bangor Quadrangle, South Half; September, 1959; University of Maine.
- Glacial Geology and the Pleistocene Epoch, R.F. Flint; 1947; John Wiley and Sons, Inc.
- Rock and Rock Minerals, L.V. Pirsson; June, 1949; John Wiley and Sons, Inc.
- Glossary of Selected Geologic Terms, W.L. Stokes and D.J. Varnes; 1955; Colorado Scientific Proceedings, Vol. 16.
- Surficial Geologic Map of Vermont, C.G. Doll; 1970.
- Centennial Geologic Map of Vermont, C.G. Doll; 1961.
- Bedrock Geology of the East Barre Area, Vermont; Varanasi Rama Murthy; 1957; Vermont Geological Survey Bulletin No. 10.
- The Surficial Geology and Pleistocene History of Vermont; David P. Stewart and Paul MacClintock; 1969; Vermont Geological Survey Bulletin No. 31.
- East Barre Quadrangle, Vermont; Geological Survey, United States Department of the Interior.
- Woodsville, Quadrangle, Vermont-New Hampshire; Geological Survey, United States Department of the Interior.

PARTIAL SPECIFICATIONS FOR HIGHWAY CONSTRUCTION MATERIALS

Listed below are partial specifications for Highway Construction Materials as they apply to this report at date of publication. For a complete list of specifications see Standard Specifications for Highway and Bridge Construction, approved and adopted by the Vermont Department of Highways in July, 1971.

DIVISION 700 - MATERIALS

Section 703, Soils and Borrow Materials

703.03 Sand Borrow and Cushion

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

Table 703.03A - Gradation Requirements

Sieve Designation	Percentage by Weight Passing Square Mesh Sieves	
	Total Sample	Sand Portion
2"	100	
1½"	90-100	
½"	70-100	
No. 4	60-100	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, and organic material.

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

Table 703.05A - Gradation Requirements

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

Section 704, Aggregate

704.05 Gravel for Sub-base

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

(a) Grading

The gravel shall meet the requirements of the following table:

Table 704.05A - Gradation Requirements

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

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

(b) Percent of Wear

The percent of wear of the gravel shall be not more than 25 when tested in accordance with 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 - Gradation Requirements

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

(c) Percent of Wear

The percent of wear of the parent rock shall be not more than 8 when tested in accordance with 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 peices will be permitted.

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

(e) Filler

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

(f) Leveling Material

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

This material shall meet the requirements of the following table:

Table 704.06B - Gradation Requirements

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

704.07 Crushed Gravel for Sub-base

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

(a) Grading

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

Table 704.07A - Gradation Requirements

Grading	Sieve Designation	Percentage by Weight Passing Square Mesh Sieves	
		Total Sample	Sand Portion
Coarse	4"	100	
	No. 4	25- 50	100
	No. 100		0- 20
	No. 200		0- 12
Fine	2"	100	
	1 1/2"	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 - Gradation Requirements

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

(c) Percent of Wear

The percent of wear of the parent rock shall be not more than 8 when tested in accordance with 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 - Gradation Requirements

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

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

704.11 Granular Backfill for Structures

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

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

Table 704.11A - Gradation Requirements

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

TABLE I

TOPSHAM GRANULAR DATA SHEET NO. 1

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Overburden (Ft)	Existing Pit	Sieve Analysis % Passing						Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
						2"	1½"	¾"	#4	#100	#200			
1	1	1970	1-4.5	0-1	No	100	100	100	100	14.0	2.4	---	Sand	Owner: Gerard Chaloux. Area is a steep wooded ridge which trends roughly north-south. Access is via a poorly defined logging road which goes northwest from U.S. Route 302, 0.45 mile north of its junction with Town Highway No. 24. The feature is 0.18 mile from the highway but across some rather poor terrain. Test #1 was a hand shovel sample in a bulldozed spot near top of ridge. Log of Test #1: 1'-2', fine gravel with a couple of cobbles; 2'-4.5', sand. The backhoe was unable to get up to dig.
	2	1970	1-7.5	0-1	No	100	89.4	85.9	78.3	14.0	2.5	---	Gran. Borrow (Sand)	Test #2 was dug at the southeast base of ridge, 15' below the lower summit, and 7' above the base. Log of Test #2: 1'-4', dirty sand with stones; 4'-7.5', fine to coarse sand with pebbles. Bottoms in boulders overlain by a thin layer of gravel. There was silt in the top 4'. This sample barely fails to meet the specification requirements for Sand Borrow and Cushion, Item 703.03, because of excess retained on the 1½" screen. This feature was not mapped as a granular deposit by D.P. Stewart. It is possibly of lateral moraine origin.

TABLE I

TOPSHAM GRANULAR DATA SHEET NO. 2

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Overburden (Ft)	Existing Pit	Sieve Analysis % Passing						Abrasion AASHTO T-4-35	Passes VHD Spec.	Remarks
						2"	1½"	½"	#4	#100	#200			
2	1	1970	1-5.5	0-1	Yes	100	100	83.5	75.1	15.0	2.7	---	Sand	Owner: Gerald Chaloux. Area is pit and extension northward into a narrow field, on west side of U.S. Route 302, 0.25 mile north of its junction with Town Highway No. 24. Test #1 was sampled on west face, 100' north of the south end of pit. Log of Test: 1'-2.5', gravel; 2.5'-5.5', sand; test bottoms in fine sand.
	2	1970	1-5	0-1	Yes	58.9	47.3	36.7	27.8	11.0	5.4	19.3%	Gravel	Test #2 was sampled by hand shovel and backhoe on west side of north face, near power line. Log of Test #2: 1'-5', gravel; test bottoms at 5' on large boulder. Material is rather bony, it is estimated that 10-15% exceeds 6".
	3	1970	0.5-4.5	0-0.5	Yes	64.0	60.1	52.3	42.1	14.0	6.6	---	Gran. Borrow (Grav.)	Test #3 was dug in floor, 90' S.45°W. of Test #2. Log of Test #3: 0.5'-4.5', coarse bouldery gravel; bottoms in silt at 4.5'. Material meets grading requirements for Item 704.05, Gravel for Sub-base.
	4	1970	1-5	0-1	No	55.9	48.2	38.8	31.9	12.0	5.1	---	Gran. Borrow (Grav.)	Test #4 was dug in middle of field north of pit. Log of Test #4: 1'-5', cobbly coarse gravel bottoms on till at 5'. There were insufficient proper sized stones included for percentage of wear test. The gradation met requirements for Item 704.05, Gravel for Sub-base. This area is rather limited for material with very little west extension and some extension toward Test #4.

TABLE I

TOPSHAM GRANULAR DATA SHEET NO. 3

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Overburden (Ft)	Existing Pit	Sieve Analysis						Abrasion AASHTO T-4-35	Passes VHD Spec.	Remarks
						% Passing								
						2"	1½"	½"	#4	#100	#200			
3	1A	1970	0.5-14.5	0-0.5	Yes	100	100	86.6	84.2	4.0	1.3	---	Sand	Owner: Charles T. Cilley, Jr. Area is a pit southwest of, and above Vermont Route No. 25. The access is about southwest from Town Highway No. 70 where it ends in owner's dooryard. The pit is 0.22 mile from the paved road. The pit is on two levels and is rather spread out. The material seems to be quite thinly mantled over till or bedrock. This is not mapped as a granular area, but it may be the remains of a local lateral moraine or a small kame terrace. Test #1A was a hand shovel sample on southwest face near the pit road and 25' east of a large boulder atop the face. Log of Test #1A: 0.5'-3.5', sand; 3.5'-6.5', gravelly sand; 6.5'-14.5', sand with a few boulders at 11.5'-12'.
	1B	1970	14.5-20	---	Yes	100	82.7	76.4	69.4	15.0	6.6	---	Gran. Borrow	Test #1B was dug 12' north of Test #1A. Log of Test #1B: 14.5'-17', sand and boulders; 17'-20', till; test bottoms in till.
	2A	1970	1-14	0-1	Yes	100	100	68.2	63.3	11.0	8.7	---	Gran. Borrow	Test #2A was dug on northwest face of pit. Log of Test #2A: 1'-4', dirt and rocks; 4'-14', clean and dirty sand, and silty gravel.
	2B	1970	14-21	---	Yes	61.8	59.9	44.8	33.5	25.0	13.0	22.1%	Gran. Borrow	Test #2B was dug below and 15' north of Test #2A. Log of Test #2B: 14'-19', dirty gravel with

TABLE I

TOPSHAM GRANULAR DATA SHEET NO. 4

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Overburden (Ft)	Existing Pit	Sieve Analysis % Passing						Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
						2"	1½"	½"	#4	#100	#200			
	3	1970	0.5-4.5	0-0.5	Yes	100	87.3	72.2	61.9	21.0	9.5	---	Gran. Borrow (Sand)	a few boulders; 19-21', sand and silt with pebbles; bottoms at 21' in till. Test #3 was dug on face of lower east level of pit, 60' N.45° E. of Test #1B. Log of Test #3: 0.5'-4.5', dirty, stony sand, with a quartzose sand layer; bottoms at 4.5' in till. Area is not a very good source.
4	1	1970	1-20	0-1	Yes	100	78.6	73.5	68.6	15.0	8.3	---	Gran. Borrow (Sand)	Owner: Theodore Beams. Area is a small, nearly exhausted pit 0.14 mile southwest of the junction of Town Highway No. 34 with Vermont Route No. 25. Access is via pit road through Bean's dooryard. The feature is very limited and appears to have had some water working of an ablation till. Test #1 was a hand shovel sample on spur in west part of pit. Log of Test #1: 1'-2', silty sand with pebbles; 2'-14', boulders, silt and sand; 14'-20', silty sand. There are too many stones retained on the ½" sieve to meet requirements for Sand Borrow and Cushion, Item 703.03.
	2	1970	0.5-7.5	0-0.5	Yes	82.0	82.0	71.3	62.9	6.0	2.7	---	Gran. Borrow (Sand)	Test #2 was dug in floor, 10' east of face. From 0.5'-7.5' was gravelly sand; bottoms at 7.5' in pebbly gravel. Test hole caved a lot.

TABLE I

TOPSHAM GRANULAR DATA SHEET NO. 5

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Overburden (Ft)	Existing Pit	Sieve Analysis % Passing						Abrasion AASHTO T-4-35	Passes VHD Spec.	Remarks
						2"	1½"	¾"	#4	#100	#200			
5	1	1970	1-7	0-1	No	54.4	47.4	39.3	34.9	15.0	6.9	27.7%	Gran. Borrow (Sand)	Owner: Edward Limlaw. Area comprises two pastures west of Limlaw's buildings and south of the Waits River. The pastures run parallel to Vermont Route 25. The area is not mapped as a granular feature, but it seems to be a post-glacial fluvial gravel. Test #1 was dug near fence on ridge near west end of westerly pasture. Log of Test #1: 1'-7', dirty bouldery gravel; test bottoms on boulders and till at 7'. The abrasion is slightly too high for specification gravel.
	2	1970	1-5	0-1	No	51.6	47.6	37.3	29.8	4.0	1.6	12.8%	Gravel	Test #2 was dug in north part of lower side of pasture, near the Waits River, 210' N.30°E. of Test #1. Log of Test #2: 1'-3.5', fine gravel; 3.5'-5', cobbly gravel with boulders; test hole bottoms on boulders and water at 5'.
	3	1970	1-6.5	0-1	No	78.6	59.2	36.4	28.1	14.0	5.7	28.3%	Gran. Borrow (Grav.)	Test #3 was dug near west end of large pasture east of Test #2. Log of Test #3: 1'-6.5', sandy gravel with cobbles and boulders. Test bottoms at 6.5'.
	4	1970	1-12	0-1	No	85.5	82.6	67.8	62.4	35.0	8.3	---	Gran. Borrow (Sand)	Test #4 was dug in small pit in upper west corner above east pasture. Log of Test #4: 1'-4', pebbly, cobbly sand; 4'-6.5', fine to silty sand; 6.5'-12', sand and stones with a few boulders. Test bottoms at 12'.

TABLE I

TOPSHAM GRANULAR DATA SHEET NO. 6

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Overburden (Ft)	Existing Pit	Sieve Analysis						Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
						% Passing								
						2"	1½"	½"	#4	#100	#200			
	5	1970	1-10	0-1	No	61.7	57.2	51.8	39.8	16.0	7.4	---	Gran. Borrow (Grav.)	Test #5 was dug near east end of area, 10' below and 525' east of Test #4, 160' from the shed, and 65' from the road. Log of Test #5: 1'-4', cobbly fine gravel; 4'-6.5', bouldery coarse gravel; 6.5'-10', gravel. There are no abrasion test results available.
	6	1970	1-5	0-1	No	100	81.1	71.0	64.2	25.0	8.8	---	Gran. Borrow (Sand)	Test #6 was dug atop summit of pasture, west and above small apple orchard, and above Test #4. Log of Test #6: 1'-5', pebbly sand; test hole bottoms at 5' on till.
	7	1970	1-10	0-1	No	74.1	73.0	61.2	46.7	10.0	4.6	27.3%	Gran. Borrow (Grav.)	Test #7 was dug alongside fence, 150' N.70°E. of, and 24' below Test #6. Log of Test #7: 1'-8', beds of gravel, and gravelly or pebbly sand; 8'-10', pebbly coarse sand. Test hole bottoms at 10' in same.
6	1	1970	1-10	0-1	No	72.2	54.4	40.8	35.0	25.0	14.4	26.0%	Gran. Borrow (Grav.)	Owner: Edward Limlaw. Area is a low pasture with an 8- to 12-foot high ridge, south of Vermont Route No. 25, and 0.31 mile west northwest of Town Highway No. 36. The ridge is about the same trend as the Waits River, and is probably a gravel bar which formed when the river flowed at a different position. This feature is not mapped as a granular area, but it is probably a fluvial gravel. Test

TABLE I

TOPSHAM GRANULAR DATA SHEET NO. 7

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Over-burden (Ft)	Exist-ing Pit	Sieve Analysis						Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
						% Passing								
						2"	1½"	½"	#4	#100	#200			
														#1 was dug atop west end of pasture ridge, just east of trees. Log of Test #1: 1'-4', nested small boulders with gravel; 4'-6.5', sandy cobbly gravel with small boulders; 6.5'-10', gravel which is finer than the material from 4'-6.5'. The feature is quite limited.
7	1A	1970	0.5-12	0-0.5	Yes	100	100	96.1	94.1	14.0	3.3	---	Sand	Owner: Kenneth Batten. Area is a large pit north and west of the junction of Town Highway No. 36 with Vermont Route No. 25. The access is via pit road which leaves Vermont Route 25 0.20 mile northwest of Town Highway No. 36. Test #1A was a hand shovel sample atop north face of lower level in the middle section of pit. Log of Test #1A: 0.5'-12', sand with a few pebbles and cobbles, and one or two boulders. The beds seem to dip south out of the face, which would be consistent with a kame terrace.
	1B	1970	12-29	---	Yes	100	100	63.0	59.5	11.0	4.8	---	Gran. Borrow (Sand)	Test #1B: 12'-29', sand, with pebbly coarse sand layers.
	1C	1970	29-41	---	Yes	76.6	61.4	46.9	38.6	12.0	4.9	---	Gravel	Test #1C: 29'-34', silty sand; 34'-41', well-packed gravel with sub-angular stones. Test bottoms on boulders.
	2A	1970	1-6	0-1	Yes	100	100	93.7	85.3	8.0	4.0	---	Sand	Test #2A was a handshovel sample on northwest face of upper

TABLE I

TOPSHAM GRANULAR DATA SHEET NO. 8

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Overburden (Ft)	Existing Pit	Sieve Analysis % Passing						Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
						2"	1½"	½"	#4	#100	#200			
	2B	1970	6-14	---	Yes	68.2	57.2	49.8	44.6	13.0	6.3	30.0%	Gran. Borrow (Grav.) Sand	level of pit. Log of Test #2A: 1'-6', sand with layers of pebbly sand. Test #2B: 6'-14', gravel and cobbles. Test bottoms at 14' in sand.
	3	1970	0-13	---	Yes	100	100	96.2	94.6	2.0	1.0	---	Sand	Test #3 was dug in floor, 100' S.15°E. of Test #2B. Log of Test #3: 0'-13', sand, with a few pebbles; test bottoms at 13' in cleaner, coarser sand.
	4A	1970	0-4.5	---	Yes	55.6	40.6	36.9	35.1	15.0	5.8	14.9%	Gravel	Test #4A was on north face in center of upper level of pit. Log of Test #4A: 0'-4.5', dirty, bouldery gravel.
	4B	1970	4.5-13	---	Yes	100	93.6	89.4	84.6	7.0	1.8	---	Sand	Log of Test #4B: 4.5'-7', layer of stones over fine sand; 7'-13', clean, sharp, pebbly, coarse quartzose sand. Test bottoms in same.
	5	1970	0.5-10	0-0.5	Yes	84.6	80.1	80.1	79.1	12.0	3.9	---	Gran. Borrow (Sand)	Test #5 was dug in floor, 70' S.60°E. of Test #4B. Log of Test #5: 0.5'-2', gravel; 2'-10', sand. Test bottoms in sand.
	6	1970	0.5-12	0-0.5	Yes	86.5	81.6	78.4	69.6	5.0	1.8	---	Gran. Borrow (Sand)	Test #6 was dug on north face of east end of upper level of pit. Log of Test #6: 0.5'-2.5', sand; 2.5'-3.5', fine gravel; 3.5'-5.5', sand; 5.5'-6.5', fine gravel; 6.5'-10', sand; 10'-12', fine gravel.
	7	1970	1-10.5	0-1	Yes	100	100	100	99.6	21.0	4.6	---	Sand	Test #7 was dug in floor, 30' S.40°W. of Test #6. From 1'-10.5' was sand. Test hole bottomed in same.

TABLE I

TOPSHAM GRANULAR DATA SHEET NO. 9

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Overburden (Ft)	Existing Pit	Sieve Analysis % Passing						Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
						2"	1½"	½"	#4	#100	#200			
	8	1970	1-10	0-1	Yes	62.6	56.6	49.4	36.8	23.0	10.7	---	Gran. Borrow (Grav.)	<p>Test #8 was dug in floor of lower level of pit, 45' S.15°W. of Test #1. From 1'-10' was a poorly sorted and poorly stratified, gravelly, silty sand. The stones are angular.</p> <p>Overall, this pit should be considered as a sand source only, even though it has tests which meet gravel specifications; these were small, isolated patches of gravel and do not indicate the pit's material accurately. There may be more gravel in upper level, near north end of pit.</p>
8	1	1970	0.5-9.5	0-0.5	Yes	67.3	61.5	53.6	45.9	10.0	2.9	---	Gran. Borrow (Grav.)	<p>Owner: Calvin Colby (former Kenneth Batten property). Area is a pit which lies east of the pit in Map Ident. No. 7. Access is via driveway through Colby's yard, 0.05 mile northwest of the junction of Town Highway No. 36 with Vermont Route No. 25. Test #1 was dug in floor near southeast end of pit. The top 3' of the northwest end of the test hole was fine gravel; underlain by 6' of sand; the southeast end of hole was 0.5'-9.5', gravel. The beds dip rather steeply to the southeast. There was insufficient proper sized stones included for the percent of wear test. This area would probably not be available as it is just behind Colby's back yard.</p>

TABLE I

TOPSHAM GRANULAR DATA SHEET NO. 10

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Overburden (Ft)	Existing Pit	Sieve Analysis % Passing						Abrasion AASHTO T-4-35	Passes VHD Spec.	Remarks
						2"	1½"	¾"	#4	#100	#200			
9	1	1970	1-9	0-1	No	100	100	81.8	75.7	30.0	15.5	---	Gran. Borrow	Owner: Edward Limlaw. Area is a rocky, sloping pasture north of trailer near Edward Limlaw's house. The area is 0.25 mile north of Vermont Route No. 25. The access is 0.4 mile northwest of the junction of Town Highway No. 57 with Vermont Route No. 25. The material seems to be sandy ablation till at best. From 1'-9' was sandy till with angular stones. Test hole bottoms at 9' on angular boulders.
10	1	1970	1-10	0-1	Yes	67.4	56.1	43.7	32.8	12.0	9.2	20.5%	Gran. Borrow (Grav.)	<p>Owner: Peter E. Herman. Area is a shallow, nearly depleted pit on hill slope southwest of the Waits River, and 0.21 mile northwest of the junction of Town Highway No. 57 with Town Highway No. 50. Access is via bar-way across driveway of owner's vacant house. The feature seems to be the remnant of a small, local kame terrace, but it is not mapped as being in a granular feature.</p> <p>Test #1 was a hand shovel sample on the west face near the north end of pit. Log of Test #1: 1'-2.5', fine gravel with silt; 2.5'-4.5', fine gravel; 4.5'-5', cobbly gravel; 5'-10', gravel with silt; area is very dry, and material caves easily while being sampled.</p>

TABLE I

TOPSHAM GRANULAR DATA SHEET NO. 11

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Overburden (Ft)	Existing Pit	Sieve Analysis % Passing						Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
						2"	1½"	½"	#4	#100	#200			
	2	1970	0.5-5	0-0.5	Yes	100	100	100	98.3	18.0	5.1	---	Sand	Test #2 was dug in east face of lower western-most lobe of pit. From 0.5'-5' was poorly stratified and ill-sorted sand and stones. Test bottoms on till at 5'.
	3	1970	0.5-6.5	0-0.5	Yes	64.2	52.3	41.0	33.5	17.0	9.5	27.8%	Gran. Borrow (Grav.)	Test #3 was dug in floor near east-central end of boulder-strewn pit. From 0.5'-2.5' was sand underlain by 4' of gravel with boulders. Test bottoms in boulders. There was a bit of fine gravel with boulders in uppermost north and south end of test hole.
11	1	1970	0.5-7.5	0-0.5	Yes	100	91.2	80.3	74.5	5.0	1.2	---	Sand	Owner: Kenneth Appleton. Area is two small pits west of cornfield and the Waits River, and 0.48 mile southeast of the junction of Town Highways No. 57 and 58. Access is via a field road. Test #1 was a hand shovel sample on the south southwest face of southern pit. The faces in this pit average 15'-20'. Log of Test #1: 0.5'-1.5', compact, partly cemented, silty fine gravel; 1.5'-2.5', fine gravel; 2.5'-3', sand; 3'-3.5', silt; 3.5'-7.5', lenses of pebbly sand, fine gravel, sand and silt. The bottom is sloughed sand.
	2	1970	0.5-7	0-0.5	Yes	100	93.2	90.5	83.3	5.0	1.7	---	Sand	Test #2 was a hand shovel sample on the southwest face of the northern pit. The faces in this

TABLE I

TOPSHAM GRANULAR DATA SHEET NO. 12

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Overburden (Ft)	Existing Pit	Sieve Analysis % Passing						Abrasion AASHTO T-4-35	Passes VHD Spec.	Remarks
						2"	1½"	½"	#4	#100	#200			
	3	1970	0.5-11	0-0.5	Yes	100	85.1	75.1	67.8	6.0	1.7	---	Gran. Borrow (Sand)	pit average 12'-15'. Log of Test #2: 0.5'-1.5', pebbly sand; 1.5'-3.5', sand; 3.5'-7', pebbly sand, silt and sand, interbedded. Bottoms in sand. Test #3 was dug on northwest face of southern pit. Log of Test #3: 0.5'-5.5', fine gravel; 5.5'-6.5', sand; 6.5'-11', gravelly sand; test bottoms at 11' in till.
	4	1970	0.5-4.5	0-0.5	Yes	57.3	53.0	44.5	36.6	27.0	12.5	20.2%	Gran. Borrow (Grav.)	Test #4 was dug in floor of southern pit, 35' N.45°E. of Test #3. Log of Test #4: 0.5'-2.5', gravel; 2.5'-4.5', sand, silt and pebbles. Test bottoms in till at 4.5'.
	5	1970	0.5-9.5	0-0.5	No	100	100	61.7	57.3	27.0	11.0	---	Gran. Borrow (Sand)	Test #5 was dug atop a small knoll just west of small northern pit. Log of Test #5: 0.5'-9.5', layers of pebbly sand.
12	1	1970	1-10	0-1	No	60.0	54.7	43.9	37.0	10.0	4.2	29.5%	Gran. Borrow (Grav.)	Owner: Kenneth Appleton. Area is a rolling pasture terrace which rises to some non-granular slopes. The field is northwest of Appleton's buildings and southeast of the junction of Town Highway No. 38 with Vermont Route 25. Test #1 was dug near a small rise at east end of field, 100' N.30°E. of Vermont Route 25, and near the tree line. Log of Test #1: 1'-5.5', cobbly gravel; 5.5'-8', sand; 8'-10', gravel.

TABLE I

TOPSHAM GRANULAR DATA SHEET NO. 13

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Overburden (Ft)	Existing Pit	Sieve Analysis % Passing						Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
						2"	1½"	½"	#4	#100	#200			
	2	1970	1-4	0-1	No	N O T S A M P L E D								Test #2 was dug near wall at west end of terrace in field. Log of Test #2: 1'-4', boulder, silt and sand. Glacial till-not sampled.
13	1	1970	1.5-8.5	0-1.5	No	61.5	50.8	41.9	37.0	30.0	11.9	18.4%	Gran. Borrow (Grav.)	Owner: Topsham School Board, H.P. Otterman, West Topsham, Chairman, (formerly Gene Eastman property). Area is a hilly pasture northwest of the junction of Town Highway No. 62 with Vermont Route 25. Access is via field road 0.1 mile northwest of the Corinth Town Line. Test #1 was dug near southeast corner of hilly pasture. Log of Test #1: 1.5'-3.5', sand and silty sand; 3.5'-8.5', sandy gravel with cobbles. Test hole bottoms in till.
	2	1970	1.5-7.5	0-1.5	No	61.4	52.7	40.4	30.2	12.0	4.9	24.7%	Gravel	Test #2 was dug in southwest corner of field, and also represents material to the west in Appleton's pasture. Material is a somewhat sandy gravel which is quite dirty from 1'-2'. Some cobbles and a few boulders noted. There were four or five large ones below 6.5'. Overall, the gravel looks fairly good. The boulders are mostly from the Waits River formation, but one or two granitic boulders were seen. Test hole bottoms on till at 7.5'. The terrain looks much less promising up-slope from both tests.

TABLE I

TOPSHAM GRANULAR DATA SHEET NO. 14

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Overburden (Ft)	Existing Pit	Sieve Analysis % Passing						Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
						2"	1½"	½"	#4	#100	#200			
14	1	1970	1.5-10	0-1.5	No	48.6	37.8	31.4	25.2	9.0	3.9	18.0%	Gravel	<p>Owner: Topsham School Board. Area is a field which is the south-east extension of Map Identification No. 13. Access is via field road through fence opening between the two areas. The topography is rolling with a south slope. The field abuts pasture hillsides to the north and east.</p> <p>Test #1 was dug in southeast corner of field atop a steep slope above a marshy area. From 1.5'-4' is a pebbly gravel; from 4'-10' is a sand with cobbles, and gravel layers. Overall, a well-graded, quite clean material which has ice-contact stratification. Two or three small boulders were noted.</p>
	2	1970	1.5-6	0-1.5	No	100	100	100	91.5	41.0	17.4	---	---	<p>Test #2 was dug at upper edge of field, about 15' above, and 140' north of Test #1. Test is at foot of steep pasture hillside. The top 2.5' is mainly silt and sand. From 2.5' to 6' is unsorted silt, or silty clay, with a few stones and some boulders. Test hole bottomed at 6' on till.</p>
15	1	1970	1-16	0-1	Yes	100	100	100	73.6	35.0	11.7	---	---	<p>Owner: Topsham School Board. Area is a pit just northwest of the junction of Town Highway No. 62 with Vermont Route No. 25. Access is northwest from the town road, 0.03 mile northeast of the state highway. The material seems to be an ablation till composed of silt</p>

TABLE I

TOPSHAM GRANULAR DATA SHEET NO. 15

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Overburden (Ft)	Existing Pit	Sieve Analysis % Passing						Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
						2"	1½"	½"	#4	#100	#200			
														and rock. Test #1 was a hand shovel sample down a spur in north end of pit. Log of Test #1: 1'-16', silt, stones and some rotted rock fragments; 16'-26', piles of boulders. Area is just a borrow pit, at best.
16	1	1970	1-6.5	0-1	No	100	100	77.5	69.1	42.0	21.0	---	---	Owner: Lyle Thompson. Area is a tiny diggings in rolling field, south of Town Highway No. 66, and 0.11 mile east of its junction with State Aid Highway No. 1 near East Corinth. The area is mapped as being part of a delta gravel, but it is not! From 1'-6.5' were beds of sand, silt, silt to clay, and angular stones. Glacial till.
17	1	1970	1-18	0-1	Yes	89.4	80.6	71.2	65.3	37.0	23.3	---	---	Owner: Wilfred Sweet. Area is a small pit on the west side of a steep knoll, 0.3 mile north of the junction of Town Highway No. 64 with State Aid Highway No. 1. The pit is on the east side of the road, and is mapped as being in a zone of delta gravels. This is just a borrow pit. Test #1 was a hand shovel sample on east face. Log of Test #1: 1'-11', rock, stones, silt and sand; 11'-18', sand to silt with stones.

TABLE I

TOPSHAM GRANULAR DATA SHEET NO. 16

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Overburden (Ft)	Existing Pit	Sieve Analysis % Passing						Abrasion AASHTO T-4-35	Passes VHD Spec.	Remarks
						2"	1½"	½"	#4	#100	#200			
18	1	1970	1-8	0-1	Yes	100	80.9	72.4	64.9	6.0	2.4	---	Gran. Borrow (Sand)	<p>Owner: James D. Vance. Area is a small, shallow, fenced-in pit near the north end of Vance's oat-field, 0.06 mile west of State Aid Highway No. 1, and 1.08 miles north of Town Highway No. 64. Test #1 was a hand shovel sample of face near north end of pit, 70' N.60°W. of Pole #35. Log of Test #1: 1'-3', pebbly sand; 3'-4.5', fine gravel; 4.5'-8', sand and pebbly sand layers. The pit is part of a small, nearly exhausted feature which rises 10'-15' above the surrounding fields.</p> <p>Test #2 was dug near access road, 170' N.8°E. of power pole near pile of pea stone. Log of Test #2: 0.5'-7', pebbly sand and sand; water at 7'; test hole bottoms at 7.5' in gravelly sand and water.</p>
	2	1970	0.5-7.5	0-0.5	No	100	100	99.2	89.4	3.0	0.8	---	Sand	
19	1A	1970	0.5-10	0-0.5	Yes	100	92.4	90.2	86.4	8.0	1.4	---	Sand	<p>Owner: James D. Vance. Area is a small pit 60' west of State Aid Highway No. 1, and 1.2 miles north of Town Highway No. 64. The area is mapped as a delta gravel. Material is a sand capped by 2'-3' of fine gravel. Test #1A was a hand shovel sample on east face. Log of Test #1A: 0.5'-2', fine gravel or gravelly sand; 2'-10', sand.</p>

TABLE I

TOPSHAM GRANULAR SHEET NO. 17

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Overburden (Ft)	Existing Pit	Sieve Analysis % Passing						Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
						2"	1½"	½"	#4	#100	#200			
	1B	1970	10-15	---	Yes	100	100	95.0	95.0	8.0	1.2	---	Sand	Test #1B: 10'-15', interbedded pebbly, coarse sand and sand. Test #2 was dug in floor, 50' S.35°W. of Test #1. Till and boulders within 2'. Not sampled. Floor is same level as the main part of field which is below the granular feature.
	2	1970	0-2	---	Yes	N O T S A M P L E D								
20	1	1970	0.5-10	0-0.5	Yes	100	86.8	74.0	65.5	9.0	3.4	---	Gran. Borrow (Sand)	Owner: Mrs. Marjorie Colby. Area is pit on east side of Town Highway No. 63, and 0.35 mile west from its junction with State Aid Highway No. 1. Owner does not wish to further exploit the area. Test #1 was dug by hand shovel on north face, 45' east of the northwest corner. Log of Test #1: 0.5'-3.5', fine gravel; 3.5'-4', gravel; 4'-7', sand; 7'-8', pebbly sand; 8'-9', sand with some pebbles. Test bottoms in pebbly sand at 10'.
21	1A	1970	1-16	0-1	Yes	69.5	69.5	65.7	60.6	30.0	13.0	---	Gran. Borrow	Owner: Frost Bros. Area is a borrow pit on a steep, wooded bank on the west side of State Aid Highway No. 1, 0.57 mile north of Town Highway No. 16. Test #1A was dug by hand shovel at top of north face of pit. Log of Test #1A: 1'-16', dusty, silty, unsorted glacial rubble.
	1B	1970	16-27	---	Yes	100	82.1	74.8	70.6	25.0	12.4	---	Gran. Borrow	Test #1B: 16'-27', silty till underlain by a clay with angular rock fragments.

TABLE I

TOPSHAM GRANULAR DATA SHEET NO. 18

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Overburden (Ft)	Existing Pit	Sieve Analysis % Passing						Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
						2"	1½"	½"	#4	#100	#200			
	2	1970	1-21	0-1	Yes	100	100	100	82.7	31.0	10.6	---	Gran. Borrow	<p>Test #2 was dug down spur of northeast face, 50' east of Test #1B. Log of Test #2: 0'-1', overburden with some angular cobbles in it; 1'-21', silty till underlain by clay and rock fragments.</p> <p>The material from this pit is not good, and just meets requirements for granular borrow.</p>
22	1	1970	1-12	0-1	Yes	100	100	100	98.7	28.0	12.3	---	Gran. Borrow	<p>Owner: Rupert Ricker. Area is pit east of State Aid No. 1, and 0.47 mile north of its junction with Town Highway No. 21. Test #1 was dug by hand shovel on northeast face. From 1'-12' was very fine sand with angular blocks. The sand is fine and nearly white, and may be a feldspar sand. The floor of pit is moist and probably close to bed rock. Overall, not a good source of material.</p>
23	1	1970	1.5-8.5	0-1.5	Yes	100	100	94.5	82.7	3.0	1.2	---	Sand	<p>Owner: Rupert Ricker. Area is a pit which is not mapped in a granular area, but which seems to be either a kame terrace or possibly a deltaic deposit; either origin would have been localized. This pit is 0.09 mile southwest of the junction of Town Highway No. 7 with Town Highway No. 6, and 0.22 mile west from the junction of Town Highway No. 6 with State Aid Highway No. 1. The pit is just</p>

TABLE I

TOPSHAM GRANULAR DATA SHEET NO. 19

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Overburden (Ft)	Existing Pit	Sieve Analysis						Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
						% Passing								
						2"	1½"	½"	#4	#100	#200			
	2	1970	0-11.5	---	Yes	100	100	92.8	85.0	1.2	0.7	---	Sand	southeast of Town Highway No. 6 where it makes a swing to the southwest. Test #1 was a hand shovel sample on south face, 55' east of road. Overburden varies from 1'-2'; face height varies from 7'-9.5'. Material is a buff, coarse quartzose sand with angular grains and sub-angular to angular small to large pebbles. Sand is stratified. Test #2 was dug by hand shovel on north face, 50' east of road. The top 5.5' is a buff, stony sand; from 5.5'-8.5' on face is clean, coarse, gray sand that continues at least 3' into floor.
	3	1970	0-9	---	Yes	100	100	87.5	73.2	2.0	0.5	---	Sand	Test #3 was dug in floor, 20' northeast of Test #1. Log of Test #3: 0'-9', pebbly sand. There was a lens of fine gravel at 7'.
	4	1970	1-12	0-1	No	100	95.9	92.4	85.0	7.0	0.9	---	Sand	Test #4 was dug on extension in woods, 200' N.78°E. of spur in east end of pit. Log of Test #4: 1'-8', pebbly sand; 8'-12', sand; test hole bottoms in sand. Material is good; area is a good source for Sand Borrow and Cushion, Item 703.03.
24	1A	1970	0-5.5	---	Yes	100	87.0	77.9	72.8	12.0	4.3	---	Gran. Borrow (Sand)	Owner: Hazen Keenan (former Ray Keenan property). Area is pit on knoll northwest of junction of Town Highway No. 6 with State Aid No. 1. Access is via pit road northeast from the town road.

TABLE I

TOPSHAM GRANULAR DATA SHEET NO. 20

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Overburden (Ft)	Existing Pit	Sieve Analysis % Passing						Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
						2"	1½"	½"	#4	#100	#200			
	1B	1970	5.5-10.5	---	Yes	60.3	56.5	50.6	42.8	16.0	6.1	18.4%	Gravel	<p>Test #1A was a hand shovel sample at top of west face. 0'-5.5', sand.</p> <p>Test #1B: 5.5'-10.5', sand with angular rocks. The sand is pretty clean, rather quartzose, and appears to be granitic in origin. It is partly cemented.</p>
	2	1970	0.5-10	0-0.5	Yes	100	100	100	100	48.0	18.4	---	---	<p>Test #2 was dug in middle of pit floor. Log of Test #2: 0.5'-10', fine sand; test hole bottoms at 10' in till. There were some of fine and very fine sand.</p> <p>There is not much extension of this area.</p>

Table I
Supplement

Topsham Property Owners - Granular

Map Ident. No.

Appleton, Kenneth	11, 12
Batten, Kenneth	7
Beams, Theodore	4
Chaloux, Gerard	1, 2
Cilley, Charles T., Jr.	3
Colby, Calvin	8
Colby, Mrs. Marjorie	20
Frost Brothers	21
Herman, Peter E.	10
Keenan, Hazen	24
Limlaw, Edward	5, 6, 9
Ricker, Rupert	22, 23
Sweet, Wilfred	17
Thompson, Lyle	16
Topsham, Town of	13, 14, 15
Vance, James D.	18, 19

TABLE I

TOPSHAM RCCK DATA SHEET NO. 1

Map Ident No.	Field Test No.	Year Field Tested	Rock Type	Exist- ing Quarry	Method of Sampling	Abrasion AASHO T-3	Remarks
1	1	1970	Granite	Yes	Chip	3.3%	<p>Owner: State of Vermont, Fish and Game Department. Area is a small abandoned quarry near the southwest base of Pine Mountain in the northeast corner of Topsham. Access is via Town Highway No. 53 in Groton, south via woods road, past a new hunting camp and on to the quarry. The quarry is 2.04 mile from Town Highway No. 53. Ready access is only through Groton. The quarry could be easily developed as the faces are steep and there is an abundant supply. The rock is mostly medium-grained, fairly hard, quite uniform granite, which is about the same light gray as the Barre granite. Nearly horizontal sheeting was noted. The quarry is somewhat remote, however, it is accessible enough to be considered as a source of rock. This area is all contained within land which is used by the Fish and Game Department as a wildlife Refuge. Both tests were taken on random blocks. The AASHO-T-96 for Test #1 was 38.2%.</p> <p>The AASHO-T-96 for Test #2 was 37.8%.</p>
	2	1970	Granite	Yes	Chip	1.6%	

Topsham Property Owners - Rock

Map Ident. No.

Vermont, State of
(Fish and Game Department)

1