

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

prepared by

Engineering Geology Section, Materials Division  
Vermont Department of Highways

in cooperation with

United States Department of Commerce  
Bureau of Public Roads

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### Acknowledgments

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 Divisions and the Highway Testing Laboratory.
2. Professor D. P. Stewart of Miami University, Oxford, Ohio.
3. Professor Charles G. Doll, Vermont State Geologist, University of Vermont, Burlington, Vermont.
4. The United States Department of Commerce, Bureau of Public Roads.

### History

The Materials Survey Project was formed in 1957 by the Vermont State Department of Highways with the assistance of the United States Bureau of Public Roads. Its prime objective is to compile an inventory of highway construction materials in the State of Vermont. Prior to the efforts of the survey personnel, as described in this and other reports, investigations for highway construction materials were conducted only as the immediate situation required. Thus, only limited areas were surveyed, and the over-all picture of material resources was not available. Highway contractors or resident engineers were usually required to locate the materials for projects and have samples tested by the Highway Testing Laboratory. The additional cost of repeated exploration for construction material was passed on to the state in the form of higher construction costs. The Materials Survey Project was established to minimize or eliminate this factor by enabling the state and its contractors to proceed with information on material sources available beforehand. Prior

knowledge about locations of suitable material is an important factor in the planning of future highways.

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

#### Incllosures

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

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

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

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

Work sheets contain more detailed information on each test and a detailed sketch of each Identification Number Area. The Work Sheets and Laboratory Reports are on file in the office headquarters of this project.

### Location

The Town of Thetford is located in Orange County in the eastern portion of the State. It is bounded on the north by the Towns of Fairlee and West Fairlee, on the west by the Town of Strafford, on the south by the Town of Norwich and on the east by the Connecticut River. It is in the Vermont Piedmont, a "plateau-like region" often described as an area of uplifted surface that has been dissected and glaciated similar to a peneplain. Drainage is into streams and brooks leading into a number of ponds, Lake Fairlee and the Ompompanoosuc and Connecticut Rivers. Elevations vary from 399 feet along the Connecticut River east of North Thetford, to 1511 feet in the northwest part of town, west of Post Mills.

### Procedure for Rock Survey

The routine employed by the project in the survey of possible sources of rock for highway construction is divided into two main stages; the office investigation and field investigation. The first is conducted primarily during the winter months and comprises the mapping of rock types as indicated in various reference sources. Many different sources of information were utilized, as indicated in the Bibliography. These references differ considerably in dependability due to new developments and studies contributing to the obsolescence of a number of reports. In addition, the results of samples taken by individuals are analyzed and the location in which these samples were taken is mapped whenever possible. In other words, as complete a correlation as possible is made of all the information available concerning the geology of the area under consideration.

The second stage of the investigation is begun in the field by making a cursory preliminary survey of the entire area. The information obtained in this survey, together with the information assimilated in the first stage of the investigation, is employed to determine the areas in which testing and sampling will

be concentrated. When a promising source is revealed, as determined not only by rock type but also by volume, accessibility and the existence of a good working face, chip samples are taken with a hammer and submitted to the Highway Testing Laboratory for testing by the Deval Method (AASHTO, T-3). It shall be kept in mind that samples taken by the chip method are often in a weathered zone of the outcrop. A sample may show a less satisfactory test result than fresh material deeper in the body of a rock structure. When deemed necessary, further samples are taken by drilling to a depth of approximately 3 feet and blasting across the strike or trend of the outcrop. When material is uniform and satisfactory tests result from the chip samples, no further drilling, blasting or sampling is done, and the material source is included as being satisfactory.

#### Discussion of Rock and Rock Sources

It will be observed that information on the surface-geology bedrock map is simplified in regard to rock type. For a more detailed description of the respective rock formations, a summary is included in this report. It is apparent from this summary that each formation may not be composed of one distinct rock type, but may be a complex mixture of rock types blending into one another. For this reason, the data sheets may describe the rock tested as differing from the designation on the map. Occasionally, rocks belonging to the same formation and exhibiting similar outward characteristics (i.e. color, texture, etc.) may produce different abrasion results due to differing physical and chemical properties. Therefore, in no case should satisfactory test results of an area be construed as meaning that a particular area or formation will not later produce unsatisfactory material.

Most of the rocks of Thetford are metamorphic, consisting of quartzites, schists phyllites, greenstones, slates and amphibolites. Because of the general unsuitability of much of this rock, and the distance from the proposed Interstate Route 91, no samples were taken other than the following mentioned ones (see Plate 2).

Two tests were taken in the amphibolite outcrops, in the southeastern end of town, along the proposed Interstate Route 91. The rock is dark gray, fine-grained amphibolite grading to an amphibolite schist, belonging to the Post Pond member of the Orfordville formation. The rock meets abrasion requirements for Item 204, with abrasions ranging from 4.4% to 6.2%.

There is an area of granodiorite porphyry in the northeast part of town in which a test was taken, in close proximity to the proposed Interstate Route 91. The area is difficult to reach due to the steep terrain. The rock has small phenocrysts of quartz and feldspar in a light gray groundmass, is quite massive and lacks any noticeable foliation or flow structure. It is quite hard, meeting abrasion requirements for Item 204, Sub-base of Crushed Rock with an abrasion of 1.8%. More detailed information is available at the office of the Engineering Geology Section, Materials Division, Vermont Department of Highways. It is possible that further testing may disclose other sources of acceptable material in the town.

#### Procedure for Sand and Gravel Survey

The method employed by the project in the survey of possible sources of sand and gravel for highway construction is divided into two main stages; office investigation and field investigation. The office investigation is conducted primarily during the winter months and comprises the mapping of potentially productive areas from various references. Of these references, the survey of glacial



deposits mapped by Professor Stewart proves to be valuable, particularly when used in conjunction with other references, such as soil type maps, aerial photographs and United States Geological Survey Quadrangles. The last two are used in recognizing and locating physiographic features indicating glacial deposits, and in studying drainage patterns. In addition, the location of known existing pits are mapped. Locations of samples taken by other individuals are noted and mapped whenever possible.

The second stage of the investigation is begun in the field by making a cursory preliminary survey of the entire area. Areas are noted which show physiographic features giving evidence of glacial or fluvial deposits. These locations are later examined by digging test pits with a backhoe to a depth of approximately 11 feet and again sampling the material. The samples are submitted to the Highway Testing Laboratory where they are tested for gradation and stone wear, the latter by the Deval Method (AASHTO T-4-35).

#### Discussion of Sand and Gravel Deposits

The granular deposits in the town of Thetford are chiefly of glacial, lacustrine, and marine origin. They occur in kames, kame terraces, delta and beach gravels, and lake and pebbly sands. There is also an area of fluvial sand along the Connecticut River near East Thetford. Generally speaking, the lake sands are fine to medium sands to depths about 0'-10', while the pebbly sands contain stones also to depths of 0'-10'. The beach gravels are shallow in depth, sand with stones. The delta gravels are silty in general, with stones. The kame deposits provide many acceptable sources of sand and gravel. The material is sand with stones, in most cases. The fluvial sand deposit is sand with stones also, with some silt layers.

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

SUMMARY OF ROCK FORMATIONS IN THE TOWN OF THETFORD

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

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

Orfordville Formation: Carbonaceous phyllite, minor quartzite.

Post Pond Volcanics member of the Orfordville Formation: Greenstone and green chloritic schist commonly interbedded with schistose felsite and quartz-feldspar-sericite schist; also fine-grained chloritic and biotitic gneiss all west of Ammonoosuc fault; mainly amphibolite east of the Ammonoosuc fault.

Undifferentiated granitic rocks: Granodiorite porphyry. Small phenocrysts of quartz and albite feldspar in an aphanitic, light-gray groundmass. Dikes range from a foot or two thick and a few tens of feet long, to larger bodies at least 100 feet thick and 2,000 feet long (Jarvis B. Hadley, Vermont Geological Survey Bulletin #1, 1950)

## GLOSSARY OF SELECTED GEOLOGIC TERMS

- Amphibole A general name for any member of a group of important rock making silicate minerals. Color varies from white or gray in tremolite to bright green or grayish green in actinolite, to dark green and black in hornblende and black in arfvedsonite.
- Delta A predominantly alluvial deposit built out by a stream into the sea or other body of water. Usually having the typical form of the Greek letter 'delta'.
- Fluvial Pertaining to streams or stream action.
- Granodiorite A type of deep-seated, crystalline igneous rock composed of plagioclase, a smaller amount of orthoclase or other alkalic feldspar, quartz, and usually one or more of the dark minerals, biotite, hornblende, or pyroxene.
- Greenstone A field name for rocks that have been so metamorphosed or otherwise so altered that they have assumed a distinctive color owing to the presence of chlorite, epidote, or actinolite.
- Kame A conical hill of stratified drift, deposited at a glacial terminus by glacial streams flowing in or on the ice.
- Kame Terrace An accumulation of stratified drift laid down chiefly by streams between a glacier and an adjacent valley wall.
- Lacustrine Pertaining to lakes.
- Marine Deposits Sedimentary deposits laid down in the sea.
- Metamorphic Rocks Rocks that owe their distinctive characters to the transformation of pre-existing rocks, either through intense heat or pressure or both.
- Penplain An extensive land area of very low relief produced in the ultimate stage of a normal cycle of subaerial erosion.
- Phenocryst A large, prominent crystal in a finer-grained groundmass of an igneous rock.
- Phyllite A fine grained foliated metamorphic rock intermediate between the mica schists and slates, into which it may grade. It is usually light in color, but various darker shades, even black, are found.

■ Quartzite

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

Schist

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

Slate

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

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## PARTIAL SPECIFICATIONS FOR HIGHWAY CONSTRUCTION MATERIALS

Listed below are partial specifications for Highway Construction Materials as they apply to this report at date of publication. For complete list of specifications see "Standard Specifications for Highway and Bridge Construction" approved and adopted by the Vermont Department of Highways April, 1964.

Item 105, Granular Borrow:

"Article 105.02 Materials. The granular borrow shall be obtained from approved sources and shall consist of satisfactorily graded, free draining, hard, durable stone and coarse sand practically free from loam, silt, clay, and organic matter.

"The sand portion (material passing the No. 4 screen) shall have not more than ten percent (10%) passing the No. 270 mesh sieve and shall show a color of not more than three and one-half ( $3\frac{1}{2}$ ) as determined by the colorimetric test described in AASHO Method of Test, Designation T-21.

"When used in connection with fine grading or in fills where piling is to be driven, the granular material shall all pass the nine (9) inch square opening screen."

Item 201, Sub-base of Gravel:

"Article 201.02 Materials. The gravel shall consist of material reasonably free from silt, loam, clay or organic matter. It shall be obtained from approved sources and meet the following requirements:

"Not less than forty (40) percent stone shall be retained on No. 4 sieve.

"The percent of wear shall be not more than twenty-five (25) when tested by laboratory methods, using Method AASHO T-4, or more than

forty (40) when tested by AASHO Method T-96.

"The stone portion of the gravel shall be uniformly graded from coarse to fine and the maximum size particles shall not exceed two-thirds (2/3) of the layer being spread.

"The sand portion, when tested by laboratory methods, using Method AASHO T-27, shall meet the grading requirements set up in the following table:

Minimum Percent of Stone	Percent Passing Square Openings No. 100	Percent Passing Square Openings No. 270
40	0-15	0-3
50	0-15	0-4
60	0-15	0-5
70	0-15	0-6

"The sand shall show a color of not more than three and one-half (3½) as determined by the colorimetric test described in the AASHO Method of Test, Designation T-21."

Item 202, Sub-base of Sand

"Article 202.02 Materials. The sand shall consist of material reasonably free from silt, loam, clay or organic matter. It shall be obtained from approved sources and meet the following requirements:

"The sand, when tested by laboratory methods, using Method AASHO T-27, shall meet the grading requirements set up in the following table:

Square Openings	Percent Passing
1½"	95-100
5/8"	80-100
No. 4	70-100
No. 100	0-18
No. 270	0-5



"The sand shall show a color of not more than three and one-half ( $3\frac{1}{2}$ ) as determined by the colorimetric test described in the AASHO Method of Test, Designation T-21."

Item 204, Sub-base of Crushed Rock

"Article 204.02 Materials. The materials for sub-base, filler and sand cushion shall be obtained from approved sources and meet the following requirements:

"A - Crushed Rock. The crushed rock shall be uniformly graded, crusher-run material, free from dirt. The ledge from which this material is obtained shall be stripped and cleaned before blasting. Conical stockpiling or any other method of stockpiling, which causes segregation of aggregates will not be permitted.

"The crushed rock, when tested by laboratory methods using Method AASHO T-27, shall meet the grading requirements set up in the following table:

Square Openings	Percent Passing
4"	95-100
$1\frac{1}{2}$ "	25-50
No. 4	0-15

"The percent of wear shall not be more than eight (8) when tested by laboratory methods, using Method AASHO T-3, or more than forty (40), when tested by AASHO Method T-96."

Item 205, Sub-base of Crushed Gravel

"Article 205.02 Materials.

A - Crushed Gravel. The crushed gravel shall consist of material reasonably free from silt, loam, clay or organic matter. It shall be obtained from approved sources and produced by a crusher adjusted to deliver

a product uniformly graded from coarse to fine.

"When tested by laboratory methods, using Method AASHO T-27, it shall meet the grading requirements as set forth below:

		Square Openings	Percent Passing
Sub-base of Crushed Gravel	Coarse Graded Item 205-A	4" No. 4	100 25-50
	Fine Graded Item 205-B	1½" No. 4	95-100 30-60

"At least thirty (30) percent by weight of the stone content of the crushed gravel, that is, the material retained on the Number 4 screen, shall have a minimum of one (1) fractured face as determined by actual count from the sample submitted to the laboratory.

"The percent of wear shall not be more than twenty (20) when tested by laboratory methods, using Method AASHO T-4, or more than thirty-five (35), when tested by AASHO Method T-96.

"B - Sand. The sand content of the crushed gravel, that is, the material passing the No. 4 screen, when tested by laboratory methods, using Method AASHO T-27, shall meet the grading requirements set up in the following table:

Square Openings	Percent Passing
No. 100	0-18
No. 270	0-8

"The sand shall show a color of not more than three and one-half (3½) as determined by the colorimetric test described in the AASHO Method of Test, Designation T-21."

TABLE I

## THETFORD GRANULAR DATA SHEET No. 1

Map Ident. No.	Field Test No.	Year Tested	Depth of Sample (Ft.)	Overburden (Ft.)	Existing Pit	Sieve Analysis % Passing					Color AASHO T-21	Abrasion AASHO T-4 35	Passes VHD Spec	Remarks
						1 1/2"	5/8"	#4	#100	#270				
1	1	1964	1-11	0-1	Yes	100	100	100	39.0	4.0	3	----	Gran. Borrow (Sand)	Owner: William Fitzgerald, Former Owner: H. E. Heaton. A very small shallow pit just west of a town road in the northwest corner of the town. The pit is 100' by 165'. A small area south of the pit has been stripped, but most of the extension is to the north and west, where the cover is scrub pine. Pit is directly accessible from the town road. Test #1 was taken in the south face. The material is mostly fine sand with some pebbles showing in the pit; bottom, sand. Rejected for Item 202; has excess passing the #100 mesh sieve. Acceptable for Item 105.
2	1	1964	2-14	0-2	Yes	100	100	98.9	19.0 18.8*	5.5 5.4*	1 1/2	----	Gran. Borrow (Sand)	Owner: Quentin Malmquist. A shallow pit located at east edge of meadow behind dwelling in village of Post Mills. Pit is 90' by 310' and varies from 8' to 10' deep. Test #1 taken in north face. Log of hole: 0-2' overburden, 2'-14' layers of fine gravel, sand, fine sand, and silt, some dipping in opposite directions. Bottom was sand.

\*Percent of Total Sample

TABLE I (cont'd.)

## THETFORD GRANULAR DATA SHEET No. 2

Map Ident. No.	Field Test No.	Year Tested	Depth of Sample (Ft.)	Depth of Overburden (Ft.)	Existing Pit	Sieve Analysis					Color T-21	Abrasion T-4-35	Passes VHD Spec.	Remarks
						% Passing	#100	#270	#10	#50				
	2	1964	1-8	0-1	Yes	100	100	95.3	7.0 6.7*	1.25 1.2*	2	-----	Sand	Rejected for Item 202; has excess passing No. 100 and No. 270 mesh sieves. Acceptable for Item 105. Test #2 taken in floor of pit, 225' east of Test #1 and 70' west of east end of pit. Material was all sand with sand bottom. Acceptable for Items 202 and 105. Possible extension of pit is to north and west, but limited on west by Malmquist dwelling. Pit is accessible from road south of house.
3	1	1964	1.5-9	0-1.5	Yes	100	88.7	81.3	13.0 10.6*	2.0 1.6*	1½	-----	Sand	Owner: Carl Kelly. A medium sized sand pit located east of the Kelly house, off Vt. Rte. #113A, in the village of Post Mills. Pit is 200' by 275' with a 20' face, on the east and south. Test #1 was taken in floor at upper level of pit. Material in bottom of hole was sand with stones. Acceptable for Items 202 and 105.
	2	1964	0-8	Striped	Yes	100	95.6	82.0	4.0 3.3*	1.0 0.8*	1	-----	Sand	Test #2 was taken in lower level of pit, 90' southeast of Test #1. Material in bottom was still sand with stones. Acceptable for Items 202 and 105.

\*Percent of Total Sample

TABLE I (cont'd.)

THETFORD GRANULAR DATA SHEET No. 3

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft.)	Overburden (Ft.)	Existing Pit	Sieve Analysis					Color AASHO T-21	Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
						% Passing	#10	#20	#40	#60				
	3	1964	1.5-20	0-1.5	Yes	100	100	99.5	28.0	3.25	1 1/2	-----	Gran. Borrow (Sand)	Test #3 taken in face of pit in southwest portion where face is about 20' high. Rejected for Item 202; has excess passing No. 100 mesh sieve. Acceptable for Item 105. Pit is accessible from the private drive by house. Most extension is to south.
4	1	1964	2-7	0-2	No	100	100	97.2	10.0	2.0	2	-----	Sand	Owner: Malmquist Wood Products Co., Post Mills, Vermont. Test #1 taken in the lumber yard to determine quality of material for possible future use. The cut bank of a drive just below the hole showed pebbly sand. There was a 5" layer of pebbly sand at 2' depth in the hole; bottom was medium sand. Acceptable for Items 202 and 105. Apparently material would not be available until such time as the lumber yard might be moved or re-graded.
5	1	1964	0-3	Stripped	Yes	--	--	33.1	18.0	5.5	1	26.8%	Gran. Borrow (Grav)	Owner: Myron Robinson A large pit located west of Vt. Rte. #113A, south of Post Mills. Pit is some 375' by 165', and about 50' deep at the south end. A spring is located near north end of pit. Floor of pit slopes down from the north end where it is

\*Percent of Total Sample

TABLE I (cont'd.)

THETFORD GRANULAR DATA SHEET No. 4

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft.)	Overburden (Ft.)	Existing Pit	Sieve Analysis					Color AASHO T-21	Abrasion AASHO T-4-35	Passes VID Spec.	Remarks
						1 1/2"	5/8"	#10	#100	#270				
	2	1964	0-25	Stripped	Yes	--	--	57.7	8.0	2.75	1 1/2	22.6%	Gravel	level with Vt. Rte. #113A. Test #1 taken in floor of pit, 200' north of the south face and 125' west of the east face. Almost 25% of the sample was between 2 1/2" and 3". Rejected for Item 201; has excess passing the No. 100 and #270 mesh sieves, and abrasion is slightly high. Acceptable for Item 105. Test #2 taken from face of pit in southeast corner where bulldozer had pushed gravel from upper edge of pit. Top of pit appeared to be gravel; bottom was sandy. Acceptable for Items 201 and 105, but stone content barely meets minimum required for Item 201. There is very little extension room left for this pit; it is limited on all four sides. The only remaining material appears to be under Vt. Rte. #113A on the east and across the Robinson property line on the south. The depth of the pit is limited by the water table which was at 3' below the floor of pit. Pit is accessible from Vt. Rte. #113A at its northern end.

TABLE I (cont'd)

## THETFORD GRANULAR DATA SHEET No. 5

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft.)	Overburden (Ft.)	Existing Pit	Sieve Analysis					Color AASHO T-21	Abrasion AASHO T-4-35	Passes V.B. S.S.	Remarks
						1/2"	5/8"	3/4"	No. 100	#270				
6	1	1964	1-4	0-1	Yes	--	--	31.0	16.0	4.25	1	----	Gran. Borrow (Grav)	Owner: Henry DeFalco A large deep pit located west of Vt. Rte. #113A about 2 miles north of Thetford Center. Pit is 370' by 200' and up to 50' deep on eastern edge. Test #1 taken in floor of pit 165' north of the south end. Hit water at 4', but material was still gravel. Many stones over 6" not included in sample. Rejected for Item 201; has excess passing the No. 100 mesh sieve. There was insufficient stone of proper size for percent of wear test. Acceptable for Item 105.
	2	1964	1-11	0-1	Yes	92.4	81.4	72.9	9.0	2.25 6.6*	1	----	Gran. Borrow (Sand)	Test #2 taken 15' south of the access road about 200' east of the pit. This test hole was dug in an attempt to hit the gravelly material showing in the northeast corner of the pit. Log of hole: 0-1' overburden, 1'-4' fine sand and silt, 4'-11' bands of silty sand, gravel and good clean sand. Rejected for Item 202; has 7.6% retained on the 1 1/2" screen. Acceptable for Item 105.
	3	1964	0.5-5.5	0-0.5	Yes	--	--	44.6	8.0	2.0	1	26.2%	Gran. Borrow (Grav)	Test #3 taken near top of pit at north end. Sample represents a very small area of the face where gravel is exposed.

\*Percent of Total Sample

TABLE I (cont'd.)

THETFORD GRANULAR DATA SHEET No. 6

Map Ident. No.	Field No.	Year Field Tested	Depth or Sample (Ft.)	Over- burden (Ft.)	Exist- ing Pit	Sieve Analysis % Passing					Color AASHO T-21	Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
						1 1/2"	5/8"	#4	#100	#200				
														Many stones over 6" not included in sample. Rejected for Item 201; fails abrasion requirements. Acceptable for Item 105. This pit seems to have plenty of material for borrow on the eastern side. Further exploration would be necessary to determine quantity. Pit is accessible from Vt. Rte. #113A via good gravel road. Most of the material in this pit appears to be fine sand and silt, with some layers of gravel making up a small percentage of the material.
7	1	1964	1-13	0-1	No	100	100	98.1	48.0	12.0	2 1/2	----	----	Owner: Henry DeFalco A narrow overgrown field along the east bank of the Ompompanosuc River behind the DeFalco house and south of the DeFalco pit (see Map Ident. #6). Portions of this field have been plowed in recent years, but the soil appears to be mostly sand. Test #1 taken at the east edge of the field, 275' north of the south end. An exposure of bedrock is located about 150' south of Test #1. Material in test hole was all silt and sand. Rejected for Items

\*Percent of Total Sample



TABLE I (cont'd.)

THEYFORD GRANULAR DATA SHEET No. 7

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft.)	Overburden (Ft.)	Existing %	Sieve Analysis					Color AASHO T-21	Abrasion AASHO T-4-35	Placer VID Spec.	Remarks
						% Passing								
						1/2"	5/8"	#4	#100	#270				
	2	1964	1-10	0-1	No	100	96.7	88.1	21.0 18.5*	6.0 5.3*	3	-----	Grn. Borrow (Sand)	202 and 105. Has excess passing the No. 100 and No. 270 mesh sieves. Test #2 taken at the west edge of field 130' west of Test #1. Material is sand with some pebbles. Rejected for Item 202; has excess passing No. 100 and No. 270 mesh sieves. Acceptable for Item 105. This field should be a good source of Granular Borrow, but access is limited by gradient and narrow farm road to DeFalco house. This road extends north along the river to the DeFalco Pit. (See Map Ident. No. 6.)
8	1	1964	2-11	0-2	No	100	99.3	90.2	13.0 11.7*	2.0 1.8*	1 1/2	-----	Sand	Owner: Henry DeFalco A granular area behind the DeFalco house west of Vt. Rte. #113A along narrow farm road. Test #1 was taken 25' north of farm road near west end of meadow behind barn and in woods. Material is mostly sand with some silt and stones. Acceptable for Items 202 and 105.
	2	1964	0.5-10	0-0.5	No	---	---	48.1	12.0	3.75	2	24.0%	Gravel	Test #2 taken 50' southwest of Test #1 at a fork in farm road. Material was gravel with a few stones over 6" which were not included in sample.

\*Percent of Total Sample

TABLE I (cont'd.)

THETFORD GRANULAR DATA SHEET No. 8

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft.)	Overburden (%)	Existing Pit	Sieve Analysis % Passing					Color AASHO T-21	Abrasion AASHO T-4-35	Passed VME Spec.	Remarks
						1 1/2"	5/8"	#4	#100	#270				
	3	1954	2-12.5	0-2	No	--	--	42.3	12.0	3.5	2	23.3%	Gravel	Acceptable for Items 201 and 105. Bottom of hole had more large stones. Test #3 taken 75' south of Test #2 along south fork of farm road. Material in bottom of hole was sand with stones. Acceptable for Items 201 and 105. The gravel represented by Test #2 and #3 probably is a narrow deposit along the edge of the old Ompompanoosuc River channel. Further testing is necessary to determine quantity. Area is accessible via farm road from DeFalco yard.
9	1	1964	1-12	0-1	Yes	--	--	40.9	13.0	2.0	1 1/2	23.0%	Gravel	Owner: Charles Palmer A medium-sized pit in a meadow just west of Vt. Rte. #115A, north of Thetford Center. Pit measures 190' by 175' by 12' deep. The pit occupies the western edge of the lake sand deposit which lies in the valley floor. Test #1 taken in north face of pit. Backhoe dug below floor 3' to 15' but could not sample due to caving in. Took extra stones in 1" and 1/2" range for percent of wear test. 28% of sample was retained on the 3" screen. Acceptable for Items 201 and 105.

TABLE 7 (cont'd.)

## THETFORD GRANULAR DATA SHEET No. 9

Map Ident. No.	Field Test No.	Year Tested	Depth of Sample (Ft.)	Over-burden (Ft.)	Existing Pit	Sieve Analysis % Passing					Color AASHO T-21	Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
						1 1/2"	5/8"	#4	#100	#270				
	2	1964	0.5-8	0-0.5	Yes	100	100	100	26.0	5.5	1	----	Gran. Borrow (Sand)	Test #2 taken in floor of pit, 75' southwest of Test #1. Material was all sand with some silt. Hit water at 8'. Rejected for Item 202; has excess passing No. 100 and No. 270 mesh sieves. Acceptable for Item 105. Possible future extension would be to north and east, but both areas are limited. Property line is 90' north of pit and Vt. Rte. #113A is 1/3' from east edge of pit.
10	1	1964	1-12	0-1	Yes	--	--	72.1	16.0 11.5*	2.0 1.4*	5	----	----	Owner: Charles Palmer An old pit, mostly depleted, which is cut by a small stream. This is the same lake sand deposit which extends under Vt. Rte. #113A from Map Ident. No. 9, as well as up and down the Ompompanoosic Valley. Test #1 taken in the stream bank behind the barn. Rejected for Item 201; has only 27.9% stone and has an excess passing the No. 100 mesh sieve. Rejected for Item 202; has excess retained on the 1 1/2" and 5/8" screens. Rejected for Items 201, 202 and 105 on color of 5. There appears to be insufficient material left here for further exploration.

\*Percent of Total Sample

TABLE I (cont'd.)

## THETFORD GRANULAR DATA SHEET No. 10

Trip Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft.)	Overburden (Ft.)	Existing Pit	Sieve Analysis					Color AASHO T-21	Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
						% Passing 1 1/2"	% Passing 5/8"	% Passing #4	% Passing #100	% Passing #270				
11	1	1964	0.5-5	0-0.5	No	100	95.4	36.2	2.0 1.7*	0.75 0.6*	1	---	Sand	Owner: W. C. Brooke Near the upper end of a large lake sand deposit lying in the west branch of the Ompompanoosuc Valley. Area tested was a level field across Town Hwy. 29 from the Brooks house. This field has been planted with pine and spruce, but owner permitted a hand shovel sample in academic interest. Test #1 was taken in a shallow bare depression. Material was good, clean looking sand. Acceptable for Items 202 and 105. Material is not available for sale in the foreseeable future.
12	1	1964	0.5-3.5	0-0.5	No	---	---	60.4	8.0	1.25	2	---	Gran. Borrow (Grav)	Owner: U.S. Government, Corps of Engineers (Union Village Dam Area) A good-sized area of granular deposition. Probably lacustrine, but now partially dissected to an uneven contour. Area was not mapped by D. P. Stewart. Test #1 taken on west limb of horseshoe shaped ridge. Material was in nearly horizontal layers, varying from medium sand to fine gravel with a few small cobbles. Bottom of hole was gravelly. This apparently was a farm site before purchased by the U. S. Gov't.

\*Percent of Total Sample

TABLE I (cont'd.)

THETFORD GRANULAR DATA SHEET No. 11

Map Ident. No.	Field Test No.	Year Field Test	Depth of Sample (Ft.)	Overburden (Ft.)	Existing Pit	Sieve Analysis					Color AASHTO T-21	Abrasion AASHTO T-4-35	Passes VHD Spec.	Remarks
						% Passing								
						1 1/2"	5/8"	#10	#20	#270				
														for Dam Site. Sample barely fails; rejected for Item 201, had only 39.6% stone content. Also there were not enough stones in the 1" and 1/2" range for abrasion test. Acceptable for Item 105. This area is cut off from access with vehicles by the Ompompanoosuc River. Further exploration would be required to determine quantity.
13	1	1964	2-16	0-2	Yes	100	100	100	26.0	7.5	1	----	Gran. Borrow (Sand)	Owner: U.S. Government, Corps of Engineers (Union Village Dam Area) A medium-sized pit located east of town road between the dam and Thetford Center. The area around the pit is wooded, with white pines up to 25" in diameter. Maximum relief was 35' to 40'. Material is sand and silt in nearly horizontal layers, ripple marks evident. Test #1 taken in east face of pit. Could not reach 16' to 35' due to slump. Rejected for Item 202; has excess passing No. 100 and No. 270 mesh sieves. Acceptable for Item 105.
14	1A	1964	1-6	0-1	Yes	--	--	43.0	7.0	1.5	2	26.4%	Gran. Borrow (Grav)	Owner: U. S. Government, Corps of Engineers (Union Village Dam Area)

TABLE I (Cont'd.)

## THETFORD GRANULAR DATA SHEET No. 12

Map Ident. No.	Field Test No.	Year Tested	Depth of Sample (Ft.)	Overburden (Ft.)	Existing Pit	Sieve Analysis % Passing					Color: AASHO T 21	Abrasion: AASHO T-4-35	Passes: VMD Spec.	Remarks
						#2	#4	#10	#20	#40				
	1B	1964	6-15	---	Yes	100	100	100	8.0	1.5	1	-----	Sand	Granular area with a small shallow pit located along town road between dam and Thetford Center. Pit is about 55' by 35' by 15' deep. Test hole #1 was dug in east end of pit and 3 samples taken: 1A, 1B, and 1C. Log of hole: 0-1' overburden, 1'-6' gravel (sand with stones), 6'-15' sand. Test #1A taken at top of the hole from the gravel. Material contained a few stones over 6" which were not included in sample. Rejected for Item 201 on abrasion only. Acceptable for Item 105.
	1C	1964	1-15	0-1	Yes	94.1	91.6	86.3	5.0 4.3*	1.3 1.1*	1½	-----	Gran. Borrow (Sand)	Test #1B taken from sand in bottom of hole. Acceptable for Items 202 and 105. Test #1C was a composite of all material below the overburden (included material in Tests #1A and #1B). Rejected for Item 202; has excess retained on 1½" screen. Acceptable for Item 105.
	2	1964	1-11	0-1	No	100	86.9	79.2	17.0 13.5*	4.3 3.4*	3	-----	Sand	Test #2 taken 300' south of pit in clearing 30' east of town road. Log of hole: 0-1' overburden, 1'-6' fine sand, 6'-11' bands of gravel, sand and fine sand; bottom was sand. Acceptable for Items 202 and 105.

\*Percent of Total Sample

TABLE I (cont'd.)

## THETFORD GRANULAR DATA SHEET No. 13

Map Ident. No.	Field Test No.	Date Field Tested	Depth of Sample (Ft.)	Over- burden (Ft.)	Exist- ing Pit	Sieve Analysis					Color AASHTO T-21	Abrasion AASHTO T-4 35	Passes VHD Spec.	Remarks
						% Passing								
						1 1/2"	5/8"	#4	#100	#270				
														This area appears to have very limited quantity of modified gravel, but shows some promise as source of sand or granular borrow. Area is accessible, but sale of the material may not be practical.
15	1	1964	7-25	0-2	No	100	100	100	41.0	7.8	1	----	Gran. Borrow (Sand)	Owner: U. S. Government, Corps of Engineers (Union Village Dam Area) A stream bank on the West Branch of the Ompompanoosuc River where gravel was exposed. Test #1 taken in bank about 30' north of exposed gravel. Could not get backhoe any closer due to slump. Could not reach material between overburden and 7' which may contain gravel like that exposed. Rejected for Item 202; has excess passing No. 100 and No. 270 mesh sieves. Acceptable for Item No. 105.
	2	1964	2.5-5.5	0-2.5	No	--	--	38.5	11.0	3.0	2	29.0%	Gran. Borrow (Grav)	Test #2 taken with a hand shovel in the exposed gravel. Top of gravel is about 20' above level of river at low water. Log of hole: 0-1' overburden, 1'-2.5' fine sand and silt, 2.5-5.5 gravel, 5.5'-7' sand; bottom is sand. Rejected for Item 201; has wear of 29.0%. Acceptable for Item 105.

TABLE I (cont'd.)

## THETFORD GRANULAR DATA SHEET No. 14

Map Ident. No.	Field No.	Year Field Tested	Depth of Sample (ft.)	Over- burden (Ft.)	Exist- ing Pit	Sieve Analysis % Passing					Color AASHTO 1-21	Abrasion AASHTO T.4-35	Passes VHD Spec.	Remarks
						1 1/2"	5/8"	3/4"	#100	#270				
16	1	1964	0-4	----	Yes	100	97.6	90.9	8.0 7.3*	1.0 0.9*	3	----	Sand	This area is not accessible except by fording river. Not enough gravel here to justify further exploration.
	2	1964	0-10	----	Yes	100	96.6	84.3	11.0 9.3*	2.3 1.9*	1	----	Sand	Owned by U. S. Government, Corps of Engineers (Union Village Dam Area) A sand and gravel bank where some material has been removed, located at the junction of the Ompompanoosuc River and its West Branch. This area is reached by fording the West Branch of the river from former Vt. Rte. #132. The deposit is mapped as a kame terrace. Test #1 taken about 700' north of the ford, where the fine sand is slumping down the hillside. Acceptable for Items 202 and 105.
	3	1964	1-22	0-1	Yes	--	--	42.9	9.0	2.8	1	14.0%	Gravel	Test #2 taken 150' south of Test #1. Material is sand with stones. Acceptable for Items 202 and 105. Test #3 taken from the face of the bank where a small amount of gravel is showing in the sand. This test was 175' south of Test #2 and just west of the old temporary bridge (now washed out). The quantity of gravel here appears to be very small. Log of #3: 0-1' overburden,

\*Percent of Total Sample



TABLE I (cont'd.)

## THETFORD GRANULAR DATA SHEET No. 15

No. Ident. No.	Field Test No.	Year Field Test	Depth of Sample (Ft.)	Overburden (Ft.)	Existing Pit	Sieve Analysis					Color AASHO T-21	Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
						% Passing								
						1 1/2"	5/8"	#4	#10	#20				
4	1964	2-14	0-2	Yes	100	79.1	66.4	18.0 12.0*	3.3 2.2*	1 1/2	----	Gran. Borrow (Sand)	11'-22' gravel (with a few stones over 6" not included in sample), 22'-25' sand with a few stones (not sampled). Took extra stones for abrasion test. Gravel extended for about 25' north and south along face of the bank. Acceptable for Items 201 and 105. Test #4 taken in face of bank or pit where material has been removed. Test was located 170' south of Test #3 and 200' north of the ford. Log of hole: 0-2' slump, 2'-11' fine to medium sand with one 1' layer of gravel, 11'-14' gravel; large stones in bottom of hole. Rejected for Item 202; has 33.6% stone, and 0.9% excess passing the 5/8" screen. Acceptable for Item 105.	
5	1964	2-6	0-2	Yes	--	--	28.4	20.0	5.5	2	24.2%	Gran. Borrow (Grav)	Test #5 taken with hand shovel from the bank 135' north of Test #1 where gravel is exposed under tree roots. Rejected for Item 201; has excess passing No. 100 mesh sieve. Acceptable for Item 105. Quantity of test #5 unknown; could not reach area with backhoe. Stones not well rounded. This area seems to have some potential as a	

\*Percent of Total Sample

TABLE I (cont'd.)

## THETFORD GRANULAR DATA SHEET No. 16

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft.)	Overburden (Ft.)	Existing Pit	Sieve Analysis					Color AASHTO T-21	Abrasion AASHTO T-35	Passes VHD Spec.	Remarks
						1/2"	5/16"	3/8"	#100	#270				
														source of granular material, but sale of it may not be practical.
17	1	1964	1-11	0-1	No	100	100	73.2	13.0 9.5%	1.3 0.9%	2	----	Sand	Owner: U. S. Government, Corps of Engineers (Union Village Dam Area) A small bank with sand and stone exposed along the town road from the dam to Thetford Center. Area is located west of town road 0.65 mile north of dam. Log of Test #1: 0-1' overburden, 1'-4' pebbly sand, 4'-8' coarse sand, 8'-11' light colored medium sand; bottom of hole was fine sand. Acceptable for Items 202 and 105. Quantity here is probably quite limited due to bedrock being exposed nearby.
18	1	1964	1-80	0-1	No	100	100	100	22.0	1.3	1	----	Gran. Borrow (Sand)	Owner: U. S. Government, Corps of Engineers (Union Village Dam Area) A large sand bank along the west side of the Ompompanoosuc Valley, 1/2 mile north of Union Village Dam. Test #1 taken at toe of the bank from the slumped material. Rejected for Item 202; has excess= passing No. 100 mesh sieve. Acceptable for Item 105. The bank contains material ranging from pebbly sand to varved

\*Percent of Total Sample

TABLE 1

## THETFORD GRANULAR DATA SHEET NO. 17

No.	Field Test No.	Year Field Tested	Depth of Sample (ft.)	Overburden (ft.)	Existing Pit	Sieve Analysis % Passing					Color AASHO T-21	Abrasion AASHO T-4-35	Passes VHD Spec	Remarks
						1 1/2"	5/8"	#4	#100	#270				
													silt to clay, but most appears to be fine sand. Probably not desirable source of granular material due to the limited access and the silts and clays.	
	1	1964	0.5-14.0	0-0.5	Yes	100	100	98.3	47.0 46.2*	10.0 9.8*	2	----	Gran. Borrow (Sand)	Owner: U. S. Government, Corps of Engineers, Union Village Dam. A very small borrow pit in a large bank located just east of the town road, 0.4 mile north of the dam. Test #1 was taken in the center of the 15' wide pit. Material was medium to fine sand to silt. Bottom of hole was below water table. Rejected for Item 202. Has excess passing #100 and 270 mesh sieves. Acceptable for Item 105. Face of bank is mostly bare-large pines growing on top, with alders at bottom. This material barely meets requirements for Item 105. Would probably not be a good source for Granular Borrow.
	1	1964	1-11	0-1	Yes	100	100	87.6	46.0 40.3*	12.0 10.5*	1	----	----	Owner: Melbourne H. Wallace A medium sized pit (250'x150') located behind barn in pasture below Town Highway No. 4. Material appears to have a fairly high percent of fine particles. Feature was mapped by D. P. Stewart as a Delta. Test No. 1 taken in floor of pit 65' east of west end of pit. Rejected for

\* Percentage of Total Sample

TABLE 1

## THEYFORD GRANULAR DATA SHEET NO. 12

Map Ident. No.	Field No.	Field	Depth of Sample (Feet)	Overburden (Feet)	Existing Pit	Sieve Analysis					Color AASHTO 1-21	Abrasion AASHTO T-4-35	Passes VHD <sup>11</sup> Spec.	Remarks
						% #10	% #20	% #40	% #60	% #100				
2A	1964	1.5-11	0-1.5	Yes	100	89.7	73.4	17.0	2.25	3 1/2	----	Sand	passing #100 and #270 mesh sieves. Log of hole: 0-1' slump, 1'-8' silt with sand bands, 8'-11' clay, silt and sand. Test #2 taken in northeast corner of face of pit. Maximum height of face 20' - 25'. Test #2A taken from top of hole. Sand with some stones and pebbles. Acceptable for Items 202 and 105.	
2B	1964	11-20	-----	Yes	--	--	46.1	30.0	11.5	1	35.0%	----	Test #2B taken from bottom of Test #2. Rejected for Items 201 and 105. Has excess passing Nos. 100 and 270 mesh sieves. Has too high percent wear. Extension of material appears to be limited by road, buildings and stream. Area of pit is accessible from drive west of barn.	
21	1	1964	1-13	0-1	No	100	96.0	81.8	24.0	6.5	1	----	Gran. Borrow (Sand)	Owner: Melbourne Wallace A medium-sized sand terrace across brook to the south of pit and area (Map Ident. No. 20). Cover in area is mostly white pine growing in old pasture. Test #1 was dug at the top of slope above an old log crib and northwest of a shallow depression which may have been an old pit. Material in hole was sand with some small stones and a few bands of fine sand and silt. Rejected for Item 202; has excess

\*Percentage of Total Sample

TABLE 1

## THETFORD GRANULAR DATA SHEET NO. 19

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft.)	Overburden (Ft.)	Existing Pit	Sieve Analysis % Passing					Color AASHO T-21	Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
						1 1/2"	5/8"	#4	#10	#20				
	2	1964	0.5-7	0-0.5	No	100	100	99.0	18.0	2.0	1	----	Sand	passing #100 and #270 mesh sieves. Acceptable for Item 105. Test #2 was dug on point of terrace approximately 175' northwest of Test #1. Area appears to be part of same sand terrace as that under cemetery prior to dissection. Sand here appears to have fewer particles in silt to clay range than did that of Test #1. Depth of hole was limited to 7' by sloughing. Acceptable for Items 202 and 105. Extension of material is to southeast toward Test #1. This area is accessible via the private road from the pit, but the stream would have to be bridged for any volume of traffic.
22	1	1962	0-2	--	Yes	-- NOT SAMPLED					---	--	Owners: John Bean An extensive shallow pit, now depleted. Material removed from this pit appeared to have been mostly fine sand. Floor of pit is silt to clay.	
23	1	1962	0-2	--	Yes	-- NOT SAMPLED					---	--	Owners: John Bean A shallow pit located south of, and downhill from pit at Ident. No. 22. Test #1 taken in floor of pit near center. Material was gravel but due to shallow depth, was not sampled; clay and water at 2'. Test No. 2 taken in floor of pit	
	2	1962	0-11	-	Yes	100	100	100	40.0	11.0	1	---	--	*Percentage of Total Sample

TABLE 1

## THETFORD GRANULAR DATA SHEET NO. 20

Map Sheet No.	Field Test No.	Year Field Tested	Depth of Sample (Ft.)	Over- burden (Ft.)	Exist- ing	Sieve Analysis % Passing					Color AASHO 7-21	Abrasion AASHO T-4-35	Passes VMD Spec.	Remarks
						1/2"	3/8"	1/4"	#20	#10				
	3	1962	1-7.5	0-1	Yes	100	100	100	83.0	21.0	1	---	---	near west end. Material was fine sand with an occasional large stone. Bottom of hole was in large angular stones which could not be penetrated. Rejected for Items 202 and 105. Test No. 3 taken north of pit. Log of hole: 0-1' overburden, 1'-7.5' silt, 7.5' - 10.5' fine sand, gravel and water. Material tested (1'-7.5'). Rejected for Items 202 and 105. Pit should be considered as depleted for any large quantity of granular material.
24	1	1962	0-4.5		Yes	100	96.8	95.0	70.3	16.2	1	---	---	Owner: United States Corps of Engineers, Union Village Dam Area. A large area of sand and gravel knolls south of the buildings. Test No. 1 taken at site of old crusher. Hit ledge at 4.5'. Rejected for Items 202 and 105.
	2	1962	1-9	0-1	Yes	--	--	26.8	5.0	1.3	2 1/2	21.0%	Gravel	Test No. 2 taken in old pit east of test No. 1. Material was gravel with gravel bottom. Acceptable for Items 201 and 105. Possible extent of this material is unknown. Further testing for quantity and quality is advisable.
	3A	1962	0.5-2.5	0-0.5	Yes	--	--	34.4	9.0	3.3	3 1/2	17.8%	Gravel	Test No. 3A taken in area south of pit. Sample 3A represents gravel lying on top of sand and silt. Log of hole: 0-0.5' overburden, 0.5'-2.5' gravel, 2.5'-4.5' silt, 4.5' - 10' sand, gravel bottom at 10'.

TABLE 1

## THETFORD GRANULAR DATA SHEET NO. 21

Top No.	Field Test No.	Year Field Tested	Depth of Sample (Feet)	Over- burden (Feet)	Exist- ing Pits	Sieve Analysis % Passing					Color AASHTO T-21	Abrasion AASHTO T-4-35	Passes VHD Spec.	Remarks
						1 1/2"	5/8"	#4	#10	#20				
	3B	1962	4.5-10	--	Yes	100	100	100	12.0	1.25	1	----	Sand	Test No. 3B taken from test hole #3 represents sand layer. Acceptable for Items 202 and 105. This area requires considerable exploration.
25	1	1964	1-5	0-1	Yes	100	100	95.0	8.0 7.6*	3.0 3.3*	2 1/2	----	Sand	Owner: Earl Lallmountain A small pit in meadow on flank of large glacio-fluvial deposit. This deposit extends for about 3 miles along the Connecticut River and contains sand and gravel. The pit is a small figure "8" shaped one about 60' long, 25' wide and 10' deep. Test No. 1 was taken by handshovel in the floor of the northern portion of the pit. Log of Test No. 1: 0-1' overburden (slump and topsoil) 1'-5' coarse pebbly sand (dark colored) with 3 layers of fine sand and silt. Bottom of hole was still coarse sand. Acceptable for Items 202 and 105.
	2	1964	1.5-8	0-1.5	Yes	--	--	62.5	5.0	2.0	2 1/2	-----	Gran. Borrow (Grav.)	Test No. 2 taken in west face of south end of pit. Log of (Grav.) #2, 0-1.5' overburden (reddish brown matrix with stones), 1.5'-8' sand with stones. Rejected for Item 201. Has only 38% stone. Acceptable

\*Percentage of Total Sample

TABLE 1

## THETFORD GRANULAR DATA SHEET NO. 22

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Fe.)	Overburden (Fe.)	Existing Pit	Sieve Analysis % Passing					Color AASHTO T-21	Abrasion AASHTO T-4-35	Passes VIID Spec.	Remarks
						1/2"	5/8"	3/4"	1"	20/100				
	3	1954	1.5-10	0-1.5	No	100	100	97.0	1.0 2.9*	1.0	2	--	Sand	for Item 105 Test No. 3 was taken at the side of Town Highway No. 60 on top of the ridge, about 150' west of the pit and 75' south of the Rice-La-Mountaine property line. (A former pit on the Rice property was not sampled as owner was not interested in selling granular material). Results of testing from test hole No. 3; acceptable for Items 202 and 105. This area is of particular interest because it is near the southern end of this large glacio-fluvial deposit mapped as "Kame" by D. P. Stewart. Here it is a gently sloping low ridge which tapers into the silty lake deposits to the south.
26	1	1964	0.5-10	0-0.5	No	100	100	100	93.0	63.0	1	----	----	Owner: Arthur Bacon Test No. 1 was taken at edge of Telephone Company R.O.W., 100' south of Wilmot-Bacon property line. Hole was dug here in an attempt to locate edge of kame-like structure but without success. Material appeared to be lacustrine silts. Rejected for Item 105.

\*Percentage of Total Sample



TABLE 1

THETFORD GRANULAR DATA SHEET NO 23

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft.)	Overburden (Ft.)	Existing Pit	Sieve Analysis					Color AASHTO T-21	Abrasion AASHTO T-4-35	Passes VMD Stat.	Remarks
						%Passing								
						1 1/2"	5/8"	1/4"	#100	#200				
27	1	1964	0.5-10	0-0.5	No	90.7	89.6	80.3	5.0 4.0*	2.0 1.6*	1	----	Gran. Borrow (Sand)	Has excess passing #270 mesh sieve. Owner: A. B. Wilmot A large glacio-fluvial deposit. Test No. 1 taken on ridge along woods road just north of Wilmot-Bacon property line. Vegetation here is young hardwoods. Log of Test No. 1: 0-0.5' overburden, 0.5'-5' sand with about 30% stone 5'-10', sand with a few stones. Rejected for Item 202, acceptable for Item 105.
	2	1964	3-10	0-0.5	No	--	--	40.8	7.0	1.75	1	23.9%	Gravel	Test No. 2 taken on western slope of glacio-fluvial ridge along woods road about 600' northwest of Test #1 in cut over wood lot. Material appeared to be a silty sand with stones but stone content was nearly 60%. Log of Test #2: 0-0.5' overburden, 0.5'-3' silt, 3'-10' gravel, bottom (10') gravel. Acceptable for Items 201 and 105.
	3	1964	5.5-12	0-0.5	No	34.0	74.8	67.0	7.0 4.7*	1.75 1.2*	1	---	Gran. Borrow (Sand)	Test No. 3 taken 200' north of Test #2 on west slope of ridge. Test was dug just below break in slope of ridge which possibly represents an ancient shore line or beach. Cover here was cut-over wood lot. Log of #3: 0-0.5' overburden, 0.5'-5.5'

\*Percentage of Total Sample

TABLE 1

## THETFORD GRANULAR DATA SHEET NO. 24

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft.)	Overburden (Ft.)	Existing Pit	Sieve Analysis % Passing					Color AASHTO T-21	Abrasion AASHTO T-4-35	Passes VHD Spec.	Remarks
						1 1/2"	5/8"	#4	#100	#270				
	4	1964	2.6-10	0-0.5	No	--	--	54.8	3.0	1.5	2	18.6%	Gravel	silt and clayey silty material with stones. (possibly a mixture of lacustrine and glacio-fluvial.) 5.5'-12' sand with stones, bottom also sand with stones. This material (5.5'-12') contained 33% stones (too much for sand and not enough for gravel.) See laboratory report #120564 for sieve analysis. Test No. 4 was taken on top of ridge approximately 300' north of Test #1 along the telephone cable, and 125' south of old stone wall which crosses the ridge in an east-west direction. Log of No. 4: 0-0.5' overburden, 0-5' - 2.5' gravel with silty sandy matrix (possibly an ablation till) 2.5'-10' dark gray sand with well rounded stones (many stones over 6" were not included in sample). Had to return at a later date to get extra stones for % of wear test. Acceptable for Items 201 and 105.
28	1	1964	0.5-10	0-0.5	No	--	--	38.5	15.0	6.25	1 1/2	18.8%	Gran. Borrow (Grav.)	Owner: A. D. Wilcox This area is also on the long glacio-fluvial ridge which runs parallel to the Connecticut River south from the

TABLE 1

## THETFORD GRANULAR DATA SHEET NO. 25

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft.)	Overburden (Ft.)	Existing Pit	Sieve Analysis					Color AASHTO T-21	Abrasion AASHTO T-4-35	Passes VHD Spec.	Remarks
						1 1/2"	5/8"	3/4"	#100	#270				
														village of East Thetford. Test No. 1 was dug on top of the ridge of a very narrow area just south of the corner of W. H. Sayre Jr. meadow. Test taken about 800' north of Test No. 4, Ident. No. 27 (along telephone cable). Log of #1: 0-0.5' overburden, 0.5'-4' gravel, 4'-6' coarse sand, 6'-6.5' fine sand, 6.5'-10' sandy gravel. Rejected for Item 201. Has excess passing #270 sieve. Acceptable for Item 105. Apparently there are large quantities of material available in this granular ridge.
29	1	1964	0.5-2.5	0-0.5	No	--	--	30.7	10.0	3.0	3 1/2	18.9%	Gravel	Owner: W. H. Sayre, Jr. A very gravelly section of the large granular ridge. Area presently inaccessible by vehicle without crossing meadows and fences, but is not far from U.S. Route 5. Area sampled is a steep-sided small knoll with very little vegetation, (about 150' long x 20' wide). High color is due to difficulty in getting handshovel sample from this extremely plentiful

TABLE 1

## THETFORD GRANULAR DATA SHEET NO. 26

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft.)	Overburden (Ft.)	Existing Pit	Sieve Analysis % Passing					Color AASHO T-21	Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
						1/2"	5/8"	#4	#100	#270				
														stony gravel without getting dry overburden into hole too. (44% of the sample was retained on the 2" screen.) This knoll is perhaps a crevasse filling. This area needs further exploration with power digging equipment to determine extent of material.
30	1	1964	1-6	0-1	No	100	100	99.5	6.0 6.0*	1.5 1.5*	1	----	Sand	Owner: W. H. Sayre, Jr. Area is the north end of a knoll on the south bank of Zebedee Brook. The material (sand) appears to be in a layer 10'-15' thick with silt on the top and bottom. Estimated thickness of silt on top is 15'-20'. This sand is apparently associated with the granular material in Ident. # 31 across the brook to the north. Easily excavated quantity would be small.
31	1	1964	3-11	0-3	Yes	--	--	63.6	4.0 2.5*	1.75 1.1*	1 1/2	12.3 %	Gran. Borrow (Grav.)	Owner: W. H. Sayre, Jr. A large deep pit in the long glacio-fluvial deposit extending south from East Thetford. Tel-

\*Percentage of Total Sample

TABLE 1

THETFORD GRANULAR DATA SHEET NO. 27

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft.)	Overburden (Ft.)	Existing Pit	Sieve Analysis % Passing					Color AASHTO T-21	Abrasion AASHTO T-4-35	Passes WID Spec.	Remarks
						1 1/2"	5/8"	#4	#100	#270				
	2	1964	3-15	0-1	Yes	--	--	49.5	5.0	2.5	1	-----	Gran. Borrow (Grav.)	phone cable on poles runs through western edge of pit. Test No. 1 was taken in floor of pit. Log of #1: 0-3' silty sand with organic material, 3'-11' sand with stones. Sample 3'-11' had only 36.4% stone - not enough for Item 201 and too much for Item 202. Bottom of hole was still sand with stones. Test No. 2 was taken down north face of pit with handshovel to point where slump became too deep. Material met grading requirements for Item 201, but not enough of proper size stones for % of wear test. Acceptable for Item 105. Log of No. 2: 0-1' overburden, 1'-3' silt, 3'-15' dark brown fine gravel. (Sample) 15'-18' band of sand, 18'-25' coarse gravel (many stones over 6"). This pit seems to be a good source of granular material for processing. Total depth of granular material appears to be over 75'.
32	1	1964	0-13'	--	Yes	--	--	57.0	3.0	1.75	1 1/2	19.2%	Gravel	Owner: W. H. Sayre, Jr. A small pit along the eastern edge of the large glacio-fluvial ridge in pasture west of U.S. Route 5. Pit was 15' x 25' x 3' deep. Acceptable for Items 201 and 105. Material was sandy.

TABLE 1

## THETFORD GRANULAR DATA SHEET NO. 28

Top Ident. no.	Field Test No.	Year Field Tested	Depth of Sample (Ft.)	Over- burden (Ft.)	Exist- ing Pit	Sieve Analysis % Passing					Color AASHTO T-21	Abrasion AASHTO T-4-35	Passes V:ID Spec.	Remarks
						1 1/2"	5/8"	#4	#100	#270				
33	1	1964	0.5-10	0-0.5	Yes	--	--	45.2	4.0	1.5	1	19.6%	Gravel	Owner: W. H. Sayre, Jr. A small pit in top of ridge about 300' south of Town Hwy No. 58. Pit was mostly overgrown with poplar, white birch, and white pine. Test No. 1 was dug in western face of pit. Material was gravel with many stones over 6" which were not included in sample. Acceptable for Items 201 and 105. Bottom was sandy gravel.
	2	1964	1.5-10	0-1.5	Yes	--	--	52.4	5.0	1.75	2 1/2	21.2%	Gravel	Test No. 2 taken at eastern edge of pit in floor. Material had some stones over 6" and up to 2'. Acceptable for Items 201 and 105. This large granular ridge has much potential for development as a source for processing.
34	1	1964	0.5-10	0-0.5	No	--	--	42.0	7.0	2.5	1 1/2	21.2%	Gravel	Owner: W. H. Sayre, Jr. Narrow steep-sided section of large granular ridge located 200' north of Town Road # 58. Material is a dark brown gravel with very few stones over 6". Test No. 1 taken at top of ridge in cow pass. Acceptable for Items 201 and 105. Extension of material is north and south. Would be readily accessible from Town Highway No. 58.

TABLE 1

## THETFORD GRANULAR DATA SHEET NO. 29

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft.)	Overburden (Ft.)	Existing Pit	Sieve Analysis % Passing					Color AASHTO T-21	Abrasion AASHTO T-4-35	Passes VHD Spec.	Remarks
						1 1/2"	5/8"	#4	#100	#270				
35	1	1964	1-7	0-1	Yes	--	--	56.1	23.0	4.0	1	--	Gran. Borrow (Grav.)	Owner: Gordon Chamberlain A small pit 20'x50' in a knoll in woods, north of Town Hwy # 58 and east of saw mill. Knoll appears to be a kame or kame terrace remnant which has been reworked by wave action as part of D.P.S.'s 'Beach'. Test No. 1 taken in southwest corner of pit. Log of No. 1: 0-1' overburden (stony sandy loam), 1'-5' sand with stones, 5'-7' layers-sand with stones and some silt. Rejected for Item 201. Has excess passing # 100 and # 270 mesh sieves. Acceptable for Item 105.
	2A	1964	1-7.5	0-1	Yes	--	--	56.6	17.0	3.0	2	23.2%	Gran. Borrow (Grav.)	Test #2A taken in northwest corner of pit, from top of pit to 7.5'. Rejected for Item 201, has excess passing No. 100 mesh sieve. Acceptable for Item 105.
	2B	1964	7.5-14	--	Yes	--	--	37.2	25.0	9.0	1	28.6%	Gran. Borrow (Grav.)	Test #2B extends from bottom of Test #2A to 14'. Rejected for Item 201. Has excess passing No's 100 and 270 mesh sieves. Has too high % of wear. Acceptable for Item 105. Quantity of material appears to be limited.
36	1	1964	7-13	0-1	Yes	100	93.1	85.7	15.0 12.9*	3.0 2.6*	1	--	Sand	Owner: Robert Vaughn A large pit south of drive to

\*Percentage of Total Sample

TABLE 1

THETFORD GRANULAR DATA SHEET NO. 30

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft.)	Overburden (Ft.)	Existing Pit	Sieve Analysis % Passing					Color AASHTO T-21	Abrasion AASHTO T-4-35	Passes VHD Spec.	Remarks
						1 1/2"	5/8"	#4	#100	#270				
	2	1964	13-19	--	Yes	--	--	33.7	12.0	2.0	1 1/2	16.4 %	Gravel	Vaughn farm located in the large granular ridge which extends along the west bank of the Connecticut River. Ridge is heavily wooded here. Humus layer (overburden) is 0-1'. 1'-7' at test #1 site is fine sand and silt in layers. This material is probably lake sediment deposited over the glacio-fluvial ridge. Test No. 1 was taken in south face of pit, in upper portion of the face. Material was sand with some stone. Acceptable for Items 202 and 105.
	3	1964	0-10	--	Yes	--	--	31.9	11.0	5.0	1	12.0 %	Gravel	Test No. 2 was taken in the south face in a gravelly portion, just below Test No. 1. This gravel is a very small percentage of the material exposed in the face. Acceptable for Items 201 and 105. Test No. 3 was taken in bulldozer trench in floor of pit. Bottom of hole was still gravel. Acceptable for Items 201 and 105.



TABLE 1

THETFORD GRANULAR DATA SHEET NO. 31

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft.)	Overburden (Ft.)	Existing Pit	Sieve Analysis % Passing					Color AASHO T-21	Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
						1 1/2"	5/3"	#4	#100	#270				
37	1	1964	3-14	0-3	Yes	--	--	38.6	11.0	4.0	1	19.2	Gravel	Owner: Robert Vaughn A large pit located north of road to Vaughn farm in large granular ridge. Test No. 1 was taken in northwest corner of pit, under the telephone cable. Material (gravel) appears to be in beds dipping to the west under an increasing burden of fine lake sediments. The overburden includes varved silt to clay. Acceptable for Items 201 and 105.
	2	1964	2.5-10.5	0-2.5	Yes	100	89.6	80.5	37.0 29.8*	8.25 6.6*	1	----	Gran. Borrow (Sand)	Test #2 taken in floor of pit, near center and 65' east of telephone cable. Log of hole: 0-2.5' slump from walls of pit, 2.5' - 7' coarse pebbly sand, 7'-10.5' fine sand layer (1ft.) and sandy gravel. (Some stones over 6" not in sample). Rejected for Item 202, has excess passing Nos. 100 and 270 mesh sieves. Acceptable for Item 105.
	3	1964	1-10	0-1	Yes	--	--	36.9	4.0	1.25	1	15.0 %	Gravel	Test No. 3 dug in floor of pit near south end 110' east of telephone cable. Log of hole: 0-1' slump, 1'-10' coarse gravel (many stones over 6" not in sample). Acceptable for Items 201 and 105.
	4	1964	2-11	0-2	Yes	--	--	32.6	15.0	6.0	1	13.8 %	Gran. Borrow (Grav.)	Test No. 4 taken in southwest corner of pit, in floor 10' west of telephone cable. Re-

\*Percentage of Total Sample

TABLE 1

## THETFORD GRANULAR DATA SHEET NO. 32

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft.)	Overburden (Ft.)	Existing Pit	Sieve Analysis					Color AASHO T-21	Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
						% Passing								
						1 1/2"	5/8"	#4	#10	#20				
	5	1964	1-13	0-1	No	100	100	100	78.0	36.8	1	--	--	jected for Item 201. Has excess passing No. 270 mesh sieve. Acceptable for Item 105. Had some stones over 6" not in sample. Test No. 5 taken in field southeast of pit, and 75' west from edge of U.S. Route 5. Material is silt and sand. Rejected for Items 202 and 105. Has excess passing Nos. 100 and 270 mesh sieves. Floor of pit appears to be best source of gravel and sand here. Telephone cable might have to be relocated.
38	1	1964	1-7	0-1	Yes	--	--	30.3	6.0	2.25	1	19.3%	Gravel	Owner: Robert Vaughn A medium sized pit 160' long x 50' wide x 12' deep on top of large granular ridge. Pit is located just north of larger pit described in Map Ident. #37. This pit is dug into the west flank of the ridge from the level of the meadow on the west and continuous to the eastern side at the ridge. The only apparent extension here is down. Test No. 1 taken in floor of pit midway from north and south ends. Bottom of test hole (7'-10') was fine sand and silt. It is possible that more gravel exists at greater depths. Material sampled met requirements

TABLE 1

## THETFORD GRANULAR DATA SHEET NO. 33

Point No.	Field Test No.	Year Field Tested	Depth of Sample (Ft.)	Overburden (Ft.)	Existing Pit	Sieve Analysis % Passing					Color AASHTO T-21	Abrasion AASHTO T-4-35	Passes VHD Spec.	Remarks
						1 1/2"	5/8"	#4	#100	#270				
	2	1964	0.5-12	0-0.5	Yes	100	95.7	84.5	26.0 22.0*8.0*	9.5	1	-----	Gran. Borrow (Sand)	For Items 201 and 105. Test No. 2 taken on top of ridge 25' north of pit. Material was sand, not gravel as is showing in north face of pit. Rejected for Item 202, acceptable for Item 105.
	3	1964	0.5-8.5	0-0.5	Yes	--	--	30.6	10.0	2.75	2 1/2	-----	Gran. Borrow (Grav.)	Test No. 3 taken in northeast corner of pit. Insufficient proper size stone for % of wear test. Stones are soft-looking and a dark color.
19	1	1964	8-14	0-0.5	Yes	--	--	28.0	7.0	2.5	1	14.4%	Gravel	Owner: Robert Vaughn A small pit (100'x25') along the top of the large granular ridge. Ridge is covered with large white pine and drops steeply to U.S. Route 5 on the east. Test No. 1 was dug 25' west of middle of pit. Log of Hole #1: 0-0.5' overburden, 0.5'-4' clay (varved) 4'-8' fine sand and silt, 8'-14' gravel, gravel in bottom. Acceptable for Items 201 and 105. This stratigraphy indicates lake sediments lapping up on sides of glacio-fluvial ridge.
	2	1964	1-9	0-1	Yes	--	--	51.5	5.0	1.75	2	18.8%	Gravel	Test No. 2 taken in floor of pit at north end of pit. Material was gravel but hole showed clay in northwest corner. Acceptable for Items

\*Percentage of Total Sample

TABLE 1

## THETFORD GRANULAR DATA SHEET NO. 34

Top Soil No.	Field Test No.	Year Field Tested	Depth of Sample (Ft.)	Over- burden (Ft.)	Exist- ing Pit	Sieve Analysis % Passing					Color AASHO T-21	Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
						1½"	5/8"	#4	#100	#270				
														#201 and 105. Extension of material would be north and south and down. There is a property line fence just north of the pit, however.
40	1	1964	1-12.5	0-1	No	100	100	100	87.0	40.0	2½	--	--	Owner: Robert Vaughn Test hole dug in level sandy looking terrace under telephone cable. Hit old lead water pipe at 3' ±. System no longer usable fortunately. Material too fine for Items 202 and 105. Had excess passing #100 and 270 mesh sieves.
41	1A	1964	1-7	0-1	No	100	98.2	96.1	21.0 20.2*	4.75 4.6*	1	----	Gran. Borrow (Sand)	Owner: Robert Vaughn Another section of the large granular ridge which runs north-south along the eastern edge of Thetford. The ridge here is broad with gentle slopes. Test No. 1 taken on top of ridge 25' east of the telephone cable. Took 3 samples from one hole. 1A 1'-7' 1B 7'-11.5' 1C 1'-11.5' Composite. Log of Hole: 0-1' overburden, 1'-7' sand and silt, 7'-11.5' medium sand.

\*Percentage of Total Sample

TABLE 1

## THETFORD GRANULAR DATA SHEET NO. 35

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft.)	Overburden (Ft.)	Existing Pit	Sieve Analysis % Passing					Color AASHTO T-21	Abrasion AASHTO T-4-35	Passes VHD Spec.	Remarks
						1 1/2"	5/8"	#4	#100	#270				
	1B	1964	7-11.5	---	No	100	100	96.0	6.0 5.7*	2.25 2.2*	1	-----	Sand	Test No. 1B Acceptable for Items 202 and 105. Material is well sorted sand of uniform grain size.
	1C	1964	1-11.5	0-1	No	100	99.4	96.6	12.0 11.6*	3.25 3.1*	1	-----	Sand	Test No. 1C- a composite sample of material from entire depth of hole.
42	1	1964	22.5-29	0-22.5	Yes	100	100	100	9.0 9.0*	1.75 1.75*	1	-----	Sand	Owner: Perry Goodell A large pit, 500' long (north-south) and 50'-60' wide across floor of pit. Area has been used in recent years for storage of peastone for highway retreatment. Pit appears to cover entire width of granular ridge. Material which appears in face of pit is mostly fine sand & silt. Test No. 1 taken by handshovel up the central portion of the west face. Material was layers of sand and fine sediments. Only possible extension appears to be to the south under the Jenks property.
43	1	1964	1-13.5	0-1	No	100	100	100	98.0 98.0*	96.5 96.5*	1 1/2	-----	--	Owner: Perry Goodell An area just north of the large Goodell pit (Ident. No. 42) Test No. 1 was taken in the pine woods 130' east of the power line along the woods road.

\* Percentage of Total Sample

TABLE I

## THETFORD GRANULAR DATA SHEET NO. 36

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft.)	Overburden (Ft.)	Existing Pit	Sieve Analysis % Passing					Color A.S.H.O. T-21	Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
						20	5/8"	#4	#100	#200				
44	1	1964	0.5-15	0-0.5	Yes	--	--	52.0	9.0	2.5	1	19.0%	Gravel	Test hole was an attempt to reach granular material such as exposed in pits along granular ridge. No sand or gravel to depth. Rejected for Items 202 and 105. Owner: Stanley Wing A small pit located in remnant of glacio-fluvial ridge behind Wing's Supermarket. Pit is reached from drive off Vt. Route 113A. Pit is about 25' wide (north-south) and 15'-20' deep (into bank). Maximum relief is about 25'. Test No. 1 taken by handshovel from center of face of pit. Could not reach material in 15'-25' range due to slump. Owner not interested in selling material or having backhoe Test. Material ranged from well sorted to barely sorted gravel with a covering (partially stripped) of fine sand and silt. Vegetation is trees up to 15" diameter. Acceptable for Items 201 and 105.
45	1	1964	1.5-8	0-1.5	Yes	100	100	100	58.0	20.5	1	---	--	Owner: Carroll Snelling A shallow pit dug into face of steep bank northwest of lumber mill and below U. S. Route 5. Top of pit does not extend to top of slope. Future expansion

\*Percentage of Total Sample

TABLE 1

## THETFORD GRANULAR DATA SHEET NO. 37

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft.)	Over-burden (Ft.)	Existing Pit	Sieve Analysis					Color AASHO T-21	Abrasion AASHO T-4-35	Passes VIID Spec.	Remarks
						% Passing								
						1 1/2"	5/8"	#40	#100	#270				
	2	1964	8-15	--	Yes	--	--	57.6	5.0	1.5	1	16.4%	Gravel	of this pit will be difficult due to slope and location of U. S. Route 5. Owner not interested in selling material or having dust raised in his lumber yard. Test No. 1 taken from fine sediments near top of pit. Rejected for Items 202 and 105. Test No. 2 taken with hand-shovel from upper portion of pit, below fine sediments (Test No. 1) and above slump which extends from 15' down to floor of pit at about 35'-40'. Material tested w.c layers of sand and gravel. Acceptable for Items 201 and 105.
46	1	1964	1-4	0-1	No	--	--	55.8	38.0	10.75	2 1/2	--	----	Owner: W. G. Colton A side hill orchard mostly cleared for building lots. Area is mapped as an old beach which is what it looks like. Material seems to be a lodgement till which was worked by wave action and partially sorted. Stones were black and soft looking. Hit bed rock in bottom (4').

TABLE 1

## THETFORD GRANULAR DATA SHEET NO. 30

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft.)	Overburden (Ft.)	Existing Pit	Sieve Analysis					Color AASHO T-21	Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
						% Passing								
						1/2"	5/8"	#1	#100	#270				
	2	1964	0.57	0-0.5	Yes	100	100	74.4	44.0	15.5	1	--	--	<p>Test No. 1 dug near break in slope 200' west of fence at bottom of field. Results of Test No. 1: Barely rejected for Item 105. Has excess passing No. 270 mesh sieve.</p> <p>Test No. 2 taken 250' south of Test #1 and 15' north of old shallow pit in woods. Material similar to that of Test No. 1. Rejected for Item 105.</p>
47	1	1964	0.5-2.5	0-0.5	No	--	--	62.1	12.0	2.0	3 1/2	32.0%	Gran. Borrow (Grav.)	<p>Owner: W. G. Colton</p> <p>A flat lying, densely wooded area east of Town Highway #9 and 5' left of Station 4518 + 0 south-bound center line.</p> <p>Auger hole here showed A-1-b material but silt and clay is showing around collar of hole.</p> <p>Test No. 1 dug with hand-shovel. Material appeared to be "beach gravel". Re-</p>



TABLE 1

## THETFORD GRANULAR DATA SHEET NO. 39

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft.)	Overburden (Ft.)	Existing Pit	Sieve Analysis % Passing					Color AASHO T-21	Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
						1 1/2"	5/8"	#4	#100	#270				
														ected for Item 201. Has only 37.9% stone. Has excessive wear (32.0%). Acceptable for Item 105.
48	1	1964	1.5-10.5	0.-1.5	Yes	100	100	73.5	27.0	10.0	1	--	--	Gran. Borrow (Sand) owned by Charles Wilcox. A large pasture located west of Wilcox pit and east of I-91 proposed location. Test No. 1 taken 100' right of sta. 4567 + 50 northbound centerline. Material appears to be a sandy ablation till with faceted stones and poor to no sorting. Acceptable (barely) for Item 105.
	2	1964	1.5-11	0.1.5	Yes	--	--	41.0	31.0	12.25	1	--	--	Test No. 2 taken 100' right of Sta. 4565 + 00 of northbound centerline. Log of No. 2: 0-1.5' overburden, 1.5--9' ablation till (sandy & silty) with faceted stones, 9'-11' wet gravel, very stony. Not enough stones of proper size for % of wear test. Rejected for Items 202 and 105. Has excess passing No. 270 mesh sieve. Hit water at 10.5'.
	3	1964	0.5-11'	0-0.5	Yes	100	100	78.6	38.0	13.5	1	--	--	Test No. 3 taken 300' right of Sta. 4565 + 00 northbound lane centerline. Log of hole: 0-0.5' overburden, 0.5'-2' gravel, 2'-6' silt to clay,

TABLE 1

## THETFORD GRANULAR DATA SHEET NO. 40

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft.)	Overburden (Ft.)	Existing Pit	Sieve Analysis % Passing					Color AASHTO T-21	Abrasion AASHTO T-11-35	Passes VHD Spec.	Remarks
						1 1/2"	5/8"	#4	#100	#270				
4	1964	1-6	0-1	Yes	84.9	78.5	65.1	14.0	3.0	1	--	--	6'-11' clayey till (till bottom). Rejected for Item 105, has excess passing #270 mesh sieve.	
5	1964	14-21	0-1.5	Yes	100	77.6	59.7	13.0	2.5	1	---	Gran. Borrow (Grav.)	Test No. 4 taken in toe of south face of pit. Material was layers of sand & stones with silt layers. Water in bottom of hole. Water stand in floor of pit. Rejected for Items 201 & 202. Acceptable for Item 105. Test No. 5 taken in north face of pit, near center. Backhoe could only reach up to 14' below rim of pit. Hit water at 1' below floor of pit. (21'). Material is sand with stones. (40.3% stone.) Rejected for Item 202. Has too much stone. Would not meet specs. for Item 201-not uniformly graded. Acceptable for Item 105.	
6	1964	1.5-11	0-1.5	Yes	--	--	39.1	11.0	3.0	1	25.0 %	Gravel	Test No. 6, dug 15' south of south face of pit just above Test No. 4. Material mostly sand with assorted stones and some small boulders. Acceptable for Items 201 and 105.	

\*Percentage of Total Sample

TABLE 1

## WETSFORD GRANULAR DATA SHEET NO. 41

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft.)	Overburden (Ft.)	Existing Pit	Sieve Analysis % Passing					Color AASHTO T-21-	Abrasion AASHTO T-4-35	Passes VHD Spec.	Remarks
						1 1/2"	5/8"	#4	#10	#20				
	7	1964	1-8.5	0-1	Yes	--	--	35.5	17.0	4.75	2	29.4%	Gran. Borrow (Grav.)	Test No. 7: taken in woods 175' north of pit and 80' south of Town Highway #17. Log of No. 7: 0-1' overburden, 1'-3.5' coarse gravel about 50% over 6" in size, 3.5'-11' silt to clay (with varves). Rejected for Item 201 has excess passing #100 mesh sieve and too high % wear.
	8	1964	1-6.5	0-1	Yes	--	--	44.1	10.0	2.25	2	28.0%	Gran. Borrow (Grav.)	Test No. 8 taken in north face of pit, just above Test #5 with handshovel. Could not reach below 6.5' due to slump. Log of hole: 0-1' overburden, 1'-3' gravel, 3'-6.5' sand with stones. Rejected for Item 201, has too high % wear. Acceptable for Item 105.
49	1	1962	1-8	0-1	Yes	--	--	34.9	9.0	3.0	1	30.0%	Gran. Borrow (Grav.)	Owner: Edward Clay A large granular deposit with a large pit. Has served as gravel source for area for some years. Test No. 1 taken approximately 260' southwest of pit, in old bulldozer trench. Rejected for Item 201. Has too high % wear. Acceptable for Item 105.
	2	1962	1-5	0-1	Yes	--	--	33.6	11.0	3.5	1	24.4%	Gravel	Test No. 2 taken 100' north of the Test No. 1 and 245'

TABLE 1

## THETFORD GRANULAR DATA SHEET NO. 42

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft.)	Overburden (Ft.)	Existing Pit	Sieve Analysis % Passing					Color AASHO T-21	Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
						1 1/2"	5/8"	#4	#100	#200				
	3	1962	1-6	0-1	Yes	--	--	41.8	4.0	1.0	1	22.8 %	Gravel	west of pit, also in old bulldozer pit. Log of hole: 0-1' overburden, 1'-5' coarse gravel, gravel bottom. Acceptable for Items 201 and 105. Test No. 3 taken in bulldozer trench 227' west of Test #2. Log of No. 3: 0-1' overburden 1'-4' coarse gravel (stones over 6") 4'-6' fine gravel, gravel bottom. Stones over 6" not in sample. Material seems to have a coarse layer with boulders to 4'-6' (top-set beds) then goes into a fine delta gravel with dipping beds (erosion). Extension of material here is definitely to the west.
50	1	1964	1-10.5	0-1	Yes	100	100	100	6.0 6.0*	2.3 2.3*	1 1/2	--	Sand	Owner: Ernest Clay A large sand terrace with a small pit in the southern end. Pit is located at junction of U.S. Route 5 and Town Highway #16. Top of terrace is accessible from Ernest Clay house on Town Highway #16. Test No. 1 taken in floor of pit level with U.S. Route 5 (caution: water pipe buried on or near U.S. Route 5 R.O.W.) Material was uniform medium to fine sand. Acceptable for Items 202 and 105.

\*Percentage of Total Sample

TABLE 1

## THETFORD GRANULAR DATA SHEET NO. 43

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft.)	Over- burden (Ft.)	Exist- ing Pit	Sieve Analysis % Passing					Color AASHTO T-21	Abrasion AASHTO T-4-35	Passes VHD Spec.	Remarks
						1/2"	5/16"	#4	#10	#20				
	2	1964	1-10.5	0-1	Yes	100	100	100	7.0 7.0*	1.5 1.5*	1 1/2	----	Sand	Test No. 2 taken on terrace 240' west of west cemetery fence and 120' west of top of pit. Material was similar to that in Test No. 1. Acceptable for Items 202 and 105.
	3	1964	1.5-8	0-1.5	Yes	100	100	100	3.0 3.0*	1.0 1.0*	2 1/2	--	Sand	Test No. 3 taken on terrace 350' north of Test No. 2 and 30' west of edge of terrace. Material was similar to that of Test No. 1 and 2. Acceptable for Items 202 and 105.
	4A	1964	1-3	0-1	Yes	100	100	100	74.0 74.0*	32.0 32.0*	2 1/2	----	----	Test No. 4A taken from top of test hole No. 4 located 500' north of test hole No. 3 and 250' south of property line fence at north end of meadow. Rejected for Items 202 and 105. Has excess passing No. 100 and No. 270 mesh sieves. Test No. 4B taken from Test hole #4. Acceptable for Items 202 and 105.
	4B	1964	3-10	--	Yes	100	100	100	2.0	0.5	1	----	Sand	Test No. 4B taken from Test hole #4. Acceptable for Items 202 and 105.
	4C	1964	1-10	0-1	Yes	100	100	100	14.0 14.0*	4.75 4.75*	1	----	Sand	Test No. 4C composite sample from whole depth of hole #4. Acceptable for Items 202 and 105.
51	1	1964	0.5-4	0-0.5	No	--	--	39.2	13.0	4.0	1	32.5 %	Gran.	Owner: Town of Thetford Small body of gravel exposed in cut on Town Hwy. No. 18 at junction with Town Hwy No. 16. This was only place in "beach gravel" deposit that looked like gravel.

\*Percentage of Total Sample

TABLE 1

## THETFORD GRANULAR DATA SHEET NO. 44

Top Plant	Field Test No.	Year Field Tested	Depth of Sample (Ft.)	Over- burden (Ft.)	Exist- ing Pit	Sieve Analysis % Passing					Color AASHTO 1-21	Abrasion AASHTO T-4-35	Passes VHD Spec.	Remarks
						#3	#10	#20	#40	#270				
														Pocket of gravel was only a few feet across, its extension of material likely. Test No. 1 taken with handshovel where grader blade had cut bank exposing gravel. Rejected for Item 201, has too high % wear. Acceptable for Item 105.
52	1	1964	1-2.5	0-1	No	--	--	40.6	16.0	7.0	3½	----	Gran. Borrow (Grav.)	Owner: Edward Clay Feature appears to be a "beach gravel" deposit from glacial lake. Material was mostly soft looking dark colored elongated stones. Rejected for Item 201; has excess passing Nos. 100 and 270 mesh sieves. Not enough proper sized stone for % wear test. Acceptable for Item 105. Test located 25' left of northbound station 4595 + 00.
53	1	1964	0.5-2	0-0.5	No	100	100	58.5	38.0	19.0	2	--	--	Owner: Edward Clay "Beach Gravel" area mapped by Dr. Stewart. Test No. 1 taken from bank on east side of Town Highway #16. Rejected for Item 105; has excess passing No. 270 mesh sieve.
	2	1964	0.5-2.5	0-0.5	No	100	100	63.5	38.0	17.0	5	----	----	Test No. 2 taken in pasture on west of Town Highway #16. Rejected for Item 105, has excess passing No. 270 mesh sieve and too high color. Area undoubt-

TABLE 1

THETFORD GRANULAR DATA SHEET NO. 45

Map Ident No.	Field Post No.	Year Field Tested	Depth of Sample (Ft.)	Over- burden (Ft.)	Exist- ing Pit	Sieve Analysis % Passing					Color AASHTO T-21	Abrasion AASHTO T-4-35-	Passes VHD Spec.	Remarks
						1 1/2"	5/8"	#4	#100	#270				
														edily was a beach in glacial times but not much gravel is present today.
54	1	1964	0.5-8	0-0.5	Yes	--	--	68.0	9.0 6.1*	2.0 1.4*	1 1/2	-----	Gran. Borrow (Grav.)	Owner: A. M. Palmer A glacio fluvial deposit on side hill above U. S. Route 5 on west bank of Connecticut River Valley. Test No. 1 located in face of small log "skidway" hole 15' right of southbound station 4655 + 50. Material is sand with stones. Too many stones for Item 202, too few for Item 201. Acceptable for Item 105.
	2	1964	1.5-12	0-1.5	No	--	--	35.8	10.0	2.75	1	28.9%	Gran. Borrow (Grav.)	Test No. 2 taken on ridge 20' left of northbound station 4658 + 73. Material was poorly sorted, a few stones over 6" not in sample. Rejected for Item 201 has too high % wear. Acceptable for Item 105.
	3	1964	1.5-6.5	0-1.5	No	94.9	94.9	90.9	80.0 72.7*	51.5 46.0*	3	-----	-----	Test No. 3 taken 160' right of northbound station 4659 + 30. Rejected for Items 202 and 105. Has excess passing Nos. 100 and 270 mesh sieves. Material is sand and silt with 5.1% stone on 1 1/2 inch screen.

\*Percentage of Total Sample

TABLE 1

## THETFORD GRANULAR DATA SHEET NO. 46

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft.)	Over- burden (Ft.)	Exhib- ing PTC	Sieve Analysis % Passing					Color AASHTO T-21	Abrasion AASHTO T-4-35	Passes VHD Spec.	Remarks
						1 1/2"	2"	4.75"	#100	#270				
	4	1964	1-12	0-1	No	--	--	55.1	30.0 16.5*	6.75 3.7*	2	----	Gran. Borrow (Grav)	Test No. 4 taken 25' right of northbound station 4661 + 60. Rejected for Item 201. Has excess passing Nos. 100 and 270 mesh sieves. Not enough proper sized stones for % of wear test. Acceptable for Item 105.
	5	1964	1-5.5	0-1	Yes	---	--	61.0	9.0	2.25	2	----	Gran. Borrow (Grav)	Test No. 5 taken 15' left of southbound station 4655+70. Rejected for Item 201; has only 39% stone, not enough proper sized stone for % of wear test. Acceptable for Item 105.
	6	1964	1.5-12	0-1.5	No	93.6	86.9	74.3	11.0 8.2*	2.75 2.0*	3	-----	Gran. Borrow (Grav)	Test No. 6 taken at side of woods road on ridge 190' left of southbound station 4655+15. Barely rejected for Item 202; has excess retained on 1 1/2" screen. Acceptable for Item 105.
55	1	1964	3-13	0-0.5	No	100	100	97.7	2.0 1.95* 1.0*	1.0	4	--	--	Owner: A. N. Palmer Sand bank just above Connecticut River. Owner has removed small amounts here to repair river bank. Test No. 1 taken in face of bank where material has been removed. Log of Test No. 1: 0-0.5' overburden (slump), 0.5'-3' silt and fine sand, 3'-13' sand medium to coarse with deep reddish brown stain. Rejected for Items 202 and 105. Has color of "1/4". Meets grading requirements.

\*Percentage of Total Sample



TABLE 1

## THETFORD GRANULAR DATA SHEET NO. 47

Map Ident No.	Field Test No.	Year Field Tested	Depth of Sample (Ft.)	Over- burden (Ft.)	Exist- ing Pit	Sieve Analysis					Color AASHTO T-21	Abrasion AASHTO T-4-35	Passes VHD Spec.	Remarks
						% Passing								
						1/2"	5/8"	#10	#100	#270				
	2	1964	1-5	0-1	No	--	--	32.3	7.0	2.0	3 1/2	20.6%	Gran. Borrow (Grav)	Test No. 2 taken near top of bank just north of Test No. 1. Gravel, apparently fluvial lies over sand in Test #1. Rejected for Item 201, has too high % of wear. Acceptable for Item 105. Owner not too interested in selling material here, due to proximity of river and possible subsequent erosion if material was removed.
56	1	1964	0.5-5	0-0.5	Yes	100	90.7	69.3	2.0 1.4*	1.0 0.7*	3 1/2		Gran. Borrow (Sand)	Owner: Robert Atkins Appears to be the remnants of an old beach line at foot of slate cliff. Material is mostly a sand. Test No. 1 taken in west face of small pit at 60' left of south-bound station 4673+50. Barely rejected for Item 202, has a little too much stone. Acceptable for Item 105.

TABLE I  
Supplement

THETFORD PROPERTY OWNERS - GRANULAR

Map Ident. No.

Atkins, Robert	56
Bacon, Arthur	26
Bean, John	22, 23
Brooke, W. C.	11
Chamberlin, Gordon	35
Clay, Edward	49, 52, 53
Clay, Ernest	50
Colton, W. G.	46, 47
DeFaico, Henry	6, 7, 8
Fitzgerald, William	1
Goodell, Perry	42, 43
Kelly, Carl	3
LaMountain, Earl	25
Malmquist Wood Products Company	4
Malmquist, Quentin	2
Palmer, A. M.	54, 55
Palmer, Charles	9, 10
Robinson, Myron	5
Sayre, W. H. Jr.	29, 30, 31, 32, 33, 34
Snelling, Carroll	45
Thetford, Town of, Right-of-Way	51
United States Government, Corps of Engineers, Union Village Dam sit	12, 13, 14, 15, 16 17, 18, 19, 24
Vaughn, Robert	36, 37, 38, 39, 40, 41
Wallace, Melbourne H.	20, 21
Wilcox, Charles	48
Wilmot, A. B.	27, 28
Wing, Stanley	44

TABLE II

## THETFORD ROCK DATA SHEET NO. II

Ident. No.	Field Test No.	Year Field Tested	Rock Type	Existing Quarry	Method of Sampling	Abrasion AASHTO T-3	Remarks
1	1	1964	Amphibolite	No	Chip	6.2	Owner: Earl LaMountain. A series of side-hill outcrops located in the woods left of Sta. 4349+00 of the south bound lane of I-91. Outcrops extend to the north under the Perry Goodell property and uphill to the west. These outcrops are a part of the Post Pond metavolcanic member of the Orfordville formation. Rock Type: massive dark gray fine grained amphibolite grading to an amphibolite schist. The schistosity is not well developed, however, so that most of the pieces broken were quite angular but with the longest dimension parallel to the strike of the schistosity. This area is very accessible from the Interstate line, and prior to construction of I-91 this area is accessible via farm and wood roads from the LaMountain barnyard. Test No. 1 was taken along a section 290' to 390' left of Sta. 4349+00 of the south bound lane. This section was approximately at right angles to the strike of the rock.
2	2	1964	Amphibolite	No	Chip	5.5	Test No. 2 was taken on the same section from 390' left to 540' left. Both samples met the abrasion requirements for Sub-base of Crushed Rock, Item 204. Unweathered samples were difficult to obtain by chipping. Further testing of this source would seem advisable to determine more exactly the quantity of a uniform good quality rock.
2	1	1964	Amphibolite	No	Chip	6.0	Owner: Katie Bacon. A series of scattered hillside outcrops located in the woods left of Sta. 4379+00 of the south bound lane of I-91. These outcrops are part of the Post Pond metavolcanic member of the Orfordville formation. Rock Type varies from amphibolite to hornblende schist to felsite. The amphibolite is composed of partially oriented and elongated hornblende crystals varying in length from 2mm to 7mm in a fine grained dark gray matrix. The hornblende schist is a dark gray-green color with small to medium somewhat disoriented hornblende crystals. The cleavage is

TABLE II (cont'd.)

THETFORD ROCK DATA SHEET NO. 2

Ident. No.	Field Test No.	Year Field Tested	Rock Type	Existing Quarry	Method of Sampling	Abrasion AASHO T-3	Remarks
	2	1964	Amphibolite	ilo	Chip	4.4	<p>not strongly developed. The light gray felsite contains elongated and oriented hornblende crystals up to 5mm in length and numerous small garnets. The area is readily accessible from the Interstate line except for the steep slope.</p> <p>Test No. 1 was taken across the strike of the rock along a section 200' to 350' left of Sta. 4379+00 of the south bound lane.</p> <p>Test No. 2 was taken along the same section from 350' to 500' left of Sta. 4379+00 of the south bound lane.</p> <p>Both samples met the abrasion requirements for Sub-base of Crushed Rock, Item 204. The rock broke into irregular angular pieces except for the schist which broke into somewhat tabular pieces. Only one band of really schistose rock was observed, but due to the scattered outcrops more may be present. This area should be carefully examined to determine the quantity of rock available which would be free from soft schist. Some stripping of trees would be required on this steep side hill.</p>
3	1	1964	Granodiorite porphyry	No	Chip	1.8	<p>Owner: Hawley George. An escarpment face located in the woods on a steep slope left of Sta. 4715+50 of the south bound lane of I-91 and west of the village of Ely, Vermont. The narrow outcrop of granodiorite porphyry (a dike) forms the face of a cliff which extends north across the Theetford-Fairlee town line. This dike is supposed to be up to 100' wide according to previous geologic work, but it did not appear to be much more than 50' wide where sampled. Behind (west of) the granodiorite face and below it on the east the Meetinghouse Slate is exposed. The dike lies parallel to the strike of the cleavage in the surrounding slate and presumably parallel to the nearly vertical dip also. The rock type is granodiorite porphyry with small phenocrysts of quartz and albite feldspar up to 2mm in length on a light</p>

TABLE II (cont'd.)

THETFORD ROCK DATA SHEET NO. 3

Ident. No.	Field Test No.	Year Field Tested	Rock Type	Existing Quantity	Method of Sampling	Abrasion AASHO T-3	Remarks
							<p>gray aphanitic ground mass of quartz and albite with traces of other minerals. The rock is noticeably peppered with small reddish brown stained spots from some "weathered out" constituent. The rock along the eastern edge of the dike at the base of the cliff is an aphanitic massive rock with more of the reddish brown spots, giving a definite pink cast, but with no phenocrysts. This is apparently a contact feature caused by rapid cooling against the country rock. The rock throughout the dike is quite massive without foliation or flow structure.</p> <p>Test No. 1 was taken at random along the face of the cliff and should be fairly representative of the entire dike due to the uniform nature of the rock. The test area is approximately 450' left of Sta. 4715+50 of the south bound lane of I-91. The rock broke unevenly and with difficulty when using the 6 lb. hammer. The rock meets the abrasion requirements for Sub-base of Crushed Rock, Item 20<math>\frac{1}{2}</math>. This may not be an economically feasible source of highway material due to the narrow width and the steep terrain which affords poor accessibility. The area is presently accessible via an old road from the southwest corner of Britton's Lumber Yard. It seems very advisable that further exploration be carried out here to determine the quantity available.</p>

TABLE II  
Supplement

—  
THETFORD PROPERTY OWNERS - ROCK

Map Ident. No.

Bacon, Katie

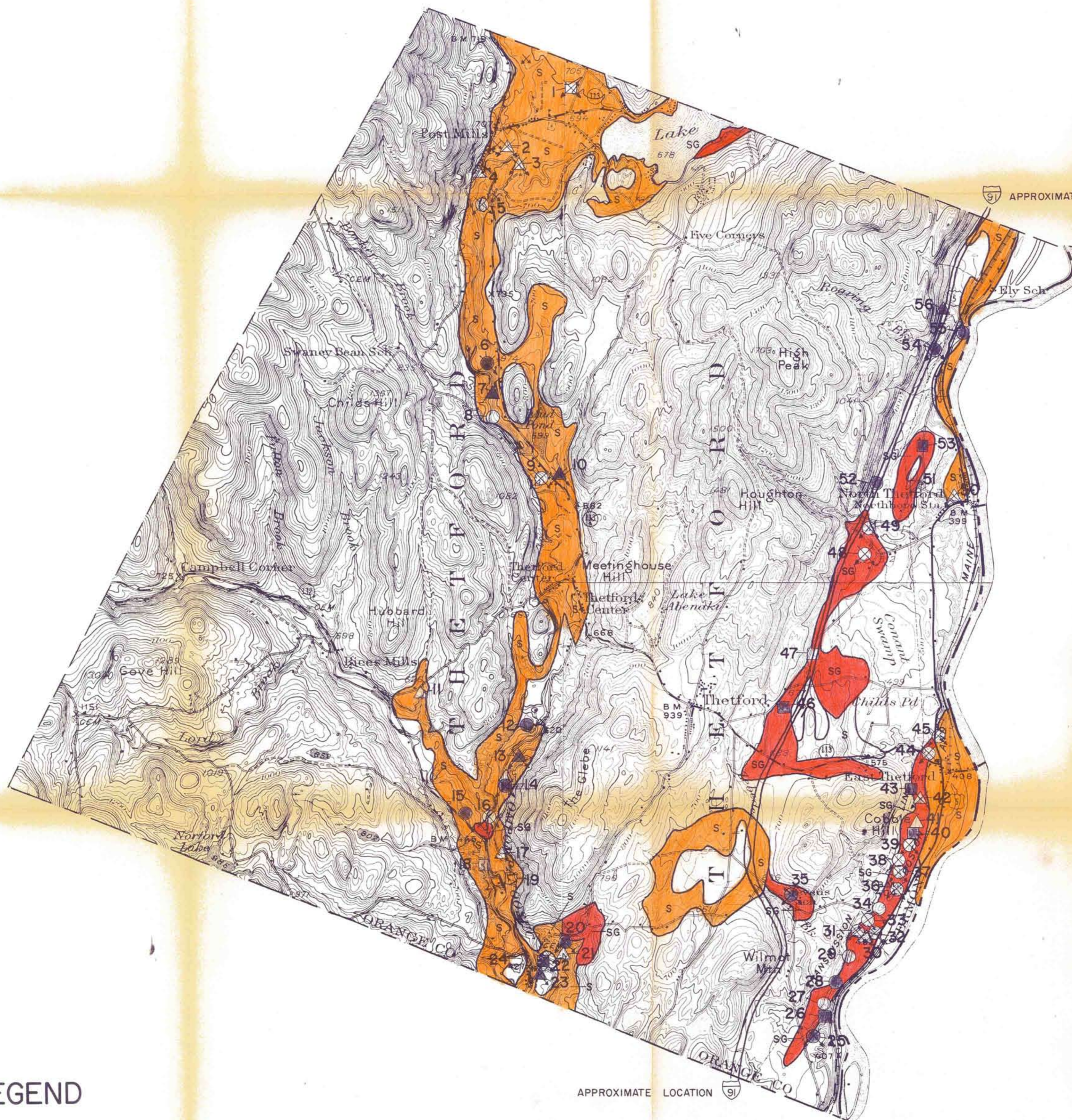
2

George, Hawley

3

LaMountain, Earl

1

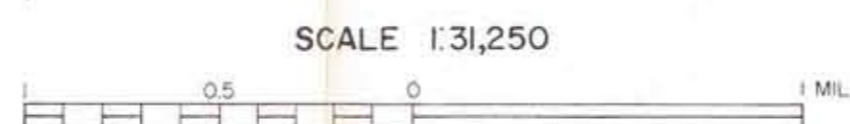


LEGEND

- GRAVEL, ACCEPTABLE FOR ITEM 201 (sub-base of gravel)
- GRAVEL, DEPLETED OR NOT ACCEPTABLE FOR ITEM 201
- △ SAND, ACCEPTABLE FOR ITEM 202 (sub-base of sand)
- ▲ SAND, DEPLETED OR NOT ACCEPTABLE FOR ITEM 202
- GRANULAR BORROW, ITEM 105
- MATERIAL NOT ACCEPTABLE FOR ITEM 105
- ✕ EXISTING PIT
- SG SAND & GRAVEL DEPOSIT
- S SAND DEPOSIT
- 3 IDENTIFICATION NUMBER (refer to data sheets)

APPROXIMATE LOCATION

THETFORD



CONTOUR INTERVAL 20 FEET

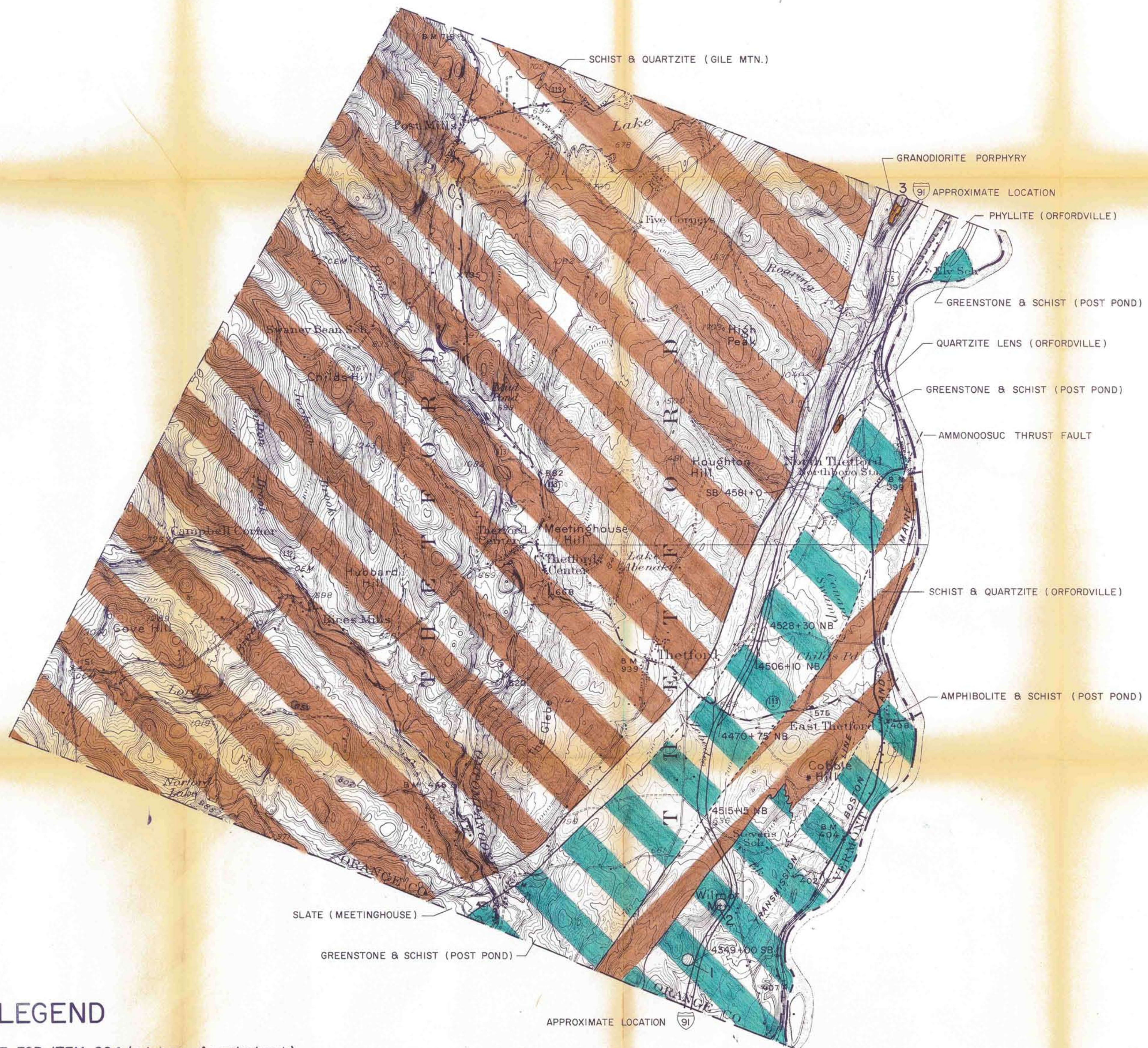
1965

GRANULAR  
MATERIALS MAP  
BY  
VERMONT DEPARTMENT OF HIGHWAYS  
IN COOPERATION WITH  
U.S. BUREAU OF PUBLIC ROADS

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

PLATE I  
GRANULAR

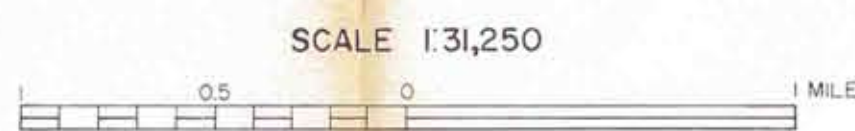
DATE				
BY				



LEGEND

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

THETFORD



CONTOUR INTERVAL 20 FEET

1965

ROCK  
MATERIALS MAP  
BY  
VERMONT DEPARTMENT OF HIGHWAYS  
IN COOPERATION WITH  
U.S. BUREAU OF PUBLIC ROADS

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

DATE				
BY				