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**SURVEY OF HIGHWAY CONSTRUCTION MATERIALS
IN THE TOWN OF SUNDERLAND, BENNINGTON 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**

Montpelier, Vermont

February, 1969

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

History

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

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

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

Inclosures

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

The granular materials map depicts areas covered by various types of glacial deposits (outwash, moraines, kames, kame terraces, eskers, etc.) by which potential sources of gravel and sand may be recognized. This information was obtained primarily from a survey 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 or by the topography.

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

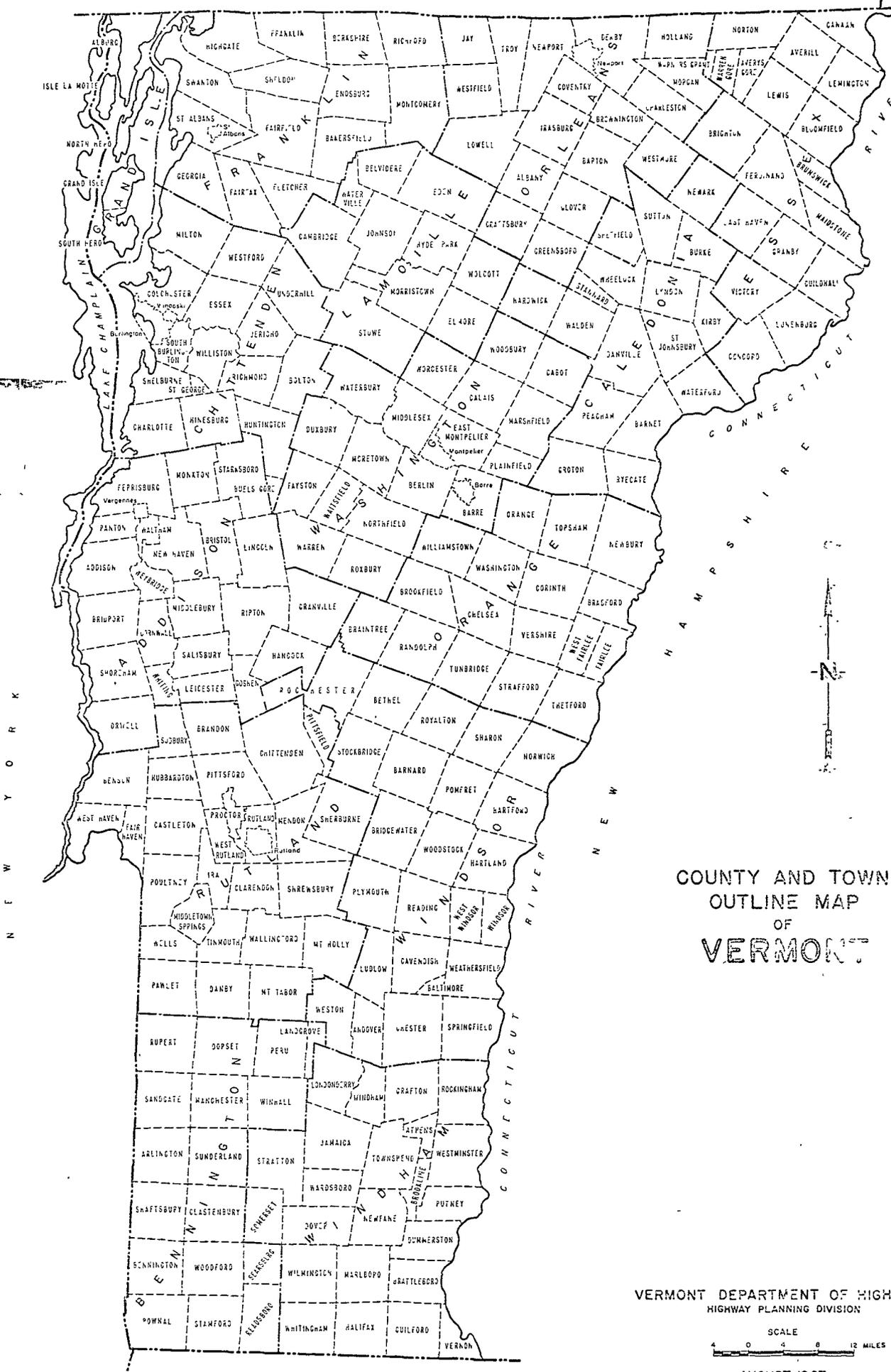
Work sheets contain more detailed information on each test and a detailed sketch of each Identification Number Area. The work sheets and laboratory reports are on file in the office headquarters of this Project.

LOCATION

The town of Sunderland is located in the east-central part of Bennington County, in the southwest section of the State. The town is bounded on the north by Manchester, on the east by Stratton, on the south by Glastenbury, and on the west by Arlington. (See County and Town Outline Map of Vermont on the following page.)

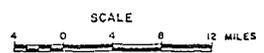
Most of Sunderland is situated on the western flank of the Green Mountains with a much lesser area crossing the Vermont Valley onto the eastern flank of the Taconic Range. The Vermont Valley is comprised chiefly of metamorphosed carbonate rocks that are less resistant to erosion than the predominantly siliceous and argillaceous metamorphic rocks of the flanking mountains.

Elevations vary from less than 640 feet in the Batten Kill valley at the Arlington line to more than 3,380 feet at the summit of an unnamed mountain near the southeast corner of the town. Drainage is into the Batten Kill via several tributaries, most of which enter that river in adjacent Manchester and Arlington.



COUNTY AND TOWN
 OUTLINE MAP
 OF
VERMONT

VERMONT DEPARTMENT OF HIGHWAYS
 HIGHWAY PLANNING DIVISION



AUGUST, 1967

SURVEY OF ROCK SOURCES

Procedure for Rock Survey

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

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

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

Discussion of Rock and Rock Sources

It should be noted that information on the Rock Materials Map is somewhat simplified. (For a more detailed description of the respective rock formations, see the Summary included in this report.) In the Summary it is apparent that complex metamorphic rocks comprise the greatest portion of the formations within the town of Sunderland. Minor amounts of sedimentary rocks, particularly limestone, occur within the town.

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

This survey did not find bedrock in the town of Sunderland suitable for Item 204, Sub-base of Crushed Rock, occurring as continuous surface exposures of appreciable size.

Two areas were sampled for their potential as sources of Item 204, Sub-base of Crushed Rock, and the availability of one of these was denied subsequent to the sampling. The other area would be an excellent source. Its location in a steep hillside adjacent to State Aid Highway No. 3, one of the better unpaved state secondaries would allow exploitation directly from the hillside. However, a probably drawback in its development would be the limited room available to set up equipment without blocking the highway. Wear tests performed gave an average value of less than 3% using AASHO T-3 methods and slightly more than 35% using AASHO T-97 methods, well within the acceptable limits.

SURVEY OF SAND AND GRAVEL SOURCES

Procedure for Sand and Gravel Survey

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

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

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

Discussion of Sand and Gravel Deposits

Available granular materials within the town of Sunderland are largely restricted to elevations below 900 feet. In general, the materials that are usable for Sub-base of Gravel, Item 201, Sub-base of Sand, Item 202, and Granular Borrow, Item 105 were probably the result of glaciofluvial deposition. Lake sand and pebbly sand mapped by D. P. Stewart as glaciolacustrine deposition failed to be acceptable for any of the above items. (See Map Identification Numbers 24 and 25.)

According to D. P. Stewart the features formed by glaciofluvial processes were all emplaced along the Batten Kill river with the exception of a kame near the south end of Town Highway No. 16 (See Map Identification Number 27) and a fluvial gravel immediately west of the covered bridge at Chiselville. The latter feature was not sampled because of its occurrence in an urban neighborhood. Additionally, a feature in East Kansas not within Stewart's outlines has acceptable material for Granular Borrow, Item 105. (See Map Identification Number 26.) The last named feature is a sand bank emplaced against the valley wall. This bank was previously mapped within the Madrid Loam, Stony Phase of W. J. Latimer's Soil Survey.

The largest unexploited source of gravel within Sunderland is probably to be found in wooded terraces, northwest of U. S. Route 7, spanned by Map Identification Numbers 3,4,5, 6, 8, and 9. There are several working pits at these numbers that have been exploiting an extensive kame terrace as mapped by D. P. Stewart. To the northeast along U. S. Route 7 the terraces taper off with little proven granular material. (See Map Identification Numbers 1 and 2.)

An extensive pit complex in a Stewart designated delta gravel is a minor source of materials. (See Map Identification Numbers 12 and 13.) There was little stratigraphic evidence to support this designation and the survey

feels that the feature tested is more apt to be a continuation of the kame moraine adjacent to, and northeast of it in Manchester.

Southeast of the railroad is another kame moraine that runs for more than four miles south to Roaring Branch. A lobe of this feature extends northward across the tracks along State Aid Highway No. 2, then eastward for about half a mile towards Sunderland Borough. A curious detail of this feature is a large wooded kettle hole in a field east of State Aid Highway No. 2 that currently belongs to Earl Hill. Available sources of material within this kame moraine are located at Map Identification Numbers 16, 17, 19, 20, 21, 22, and 23.

SUMMARY OF ROCK FORMATIONS IN THE TOWN OF SUNDERLAND

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

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

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

Danby Formation - Comprised of a white vitreous or glassy quartzite beds, often cross-laminated, interbedded with gray dolomite. White quartzite beds, more than a foot thick, separated by 10 to 12 feet of dolomite in eastern areas, increase westward to continuous sections of white to pink weathered, massively bedded Potsdam quartzite, west of Orwell thrust.

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

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

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

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

Dalton Formation - Schistose quartzite containing pebbles of feldspar and blue quartz; impure dolomite containing pebbles of quartz and feldspar occurs locally; conglomerate common near base. Occurs in southwestern Vermont.

Mount Holly Complex - Mainly fine- to medium-grained biotitic gneiss, locally muscovitic, and in western areas chloritic; massive and granitoid in some localities, fine-grained or schistose and compositionally layered in others; also abundant amphibolite and hornblende gneiss, and minor beds of mica schist, quartzite, and calc-silicate granulite; includes numerous small bodies of pegmatite and gneissoid granitic rock.

GLOSSARY OF SELECTED GEOLOGIC TERMS

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

Carbonate Rocks - Products of a process of chemical decomposition by which carbon dioxide contained in water combine with the oxides of calcium, magnesium, potassium, sodium, and iron. As a result of this union, carbonate or bicarbonates of these metals are produced, including dolomite siderite, calcite, and other less plentiful minerals.

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.

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

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

Grit - A coarse sandstone of angular grain. Some grits are so well cemented as to find use as abrasives. Sometimes the term is loosely used to designate a quartzite containing readily noticeable individual quartz or feldspar grains.

Ice Contact Deposits - Sediments having various topographic expressions that have accumulated in contact with wasting glacial ice. Included are eskers, kame terraces, kames, and features marked by numerous kettle holes.

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

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

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

Kettle - A depression found in glacial drift believed to have originated when a block of ice, left isolated by general melting away of a glacier, is partly buried by sediments and later melts entirely away. Kettle holes are usually undrained and the larger ones may contain lakes and ponds.

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

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

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

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.

Schistosity - The property of a foliated rock by which it can be split into thin layers or flakes. The property of splitting may be due to alternating layers of differing mineral composition or to preferred orientation and parallelism of cleavage planes of the mineral.

Sedimentary Rocks - Rocks composed of sediment; mechanical, chemical, or organic. They are formed through the agency of water, wind, glacial ice, or organisms and are deposited at the surface of the earth at ordinary temperatures. The materials from which they are made must originally have come from the disintegration and decomposition of older rocks, chiefly igneous.

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

Varves - The regular layers or alternations of material in sedimentary deposits, that are due to annual seasonal influences. Each varve represents the deposition during a year and consists ordinarily of a lower part deposited in summer and an upper fine-grained part deposited in the winter.

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PARTIAL SPECIFICATIONS FOR HIGHWAY CONSTRUCTION MATERIALS

Listed below are partial specifications for Highway Construction Materials as they apply to this report at date of publication. For a complete list of specifications see Standard Specifications for Highway and Bridge Construction, approved and adopted by the Vermont Department of Highways in 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 AASHTO 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-inch (9") 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 percent (40%) 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 T-4 or more than forty (40) when tested by AASHTO 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	Percent Passing Square Openings
	No. 100	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 (3½) 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 and shall be 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
1½"	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	4"	100
	Item 205-A	No. 4	25-50
	Fine-Graded	1½"	95-100
	Item 205-B	No. 4	30-60

"At least thirty percent (30%) by weight of the stone content of the crushed gravel, that is, the material retained on the No. 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 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 ($3\frac{1}{2}$) as determined by the colorimetric test described in the AASHO Method of Test, Designation T-21."

TABLE I

SUNDERLAND GRANULAR DATA SHEET NO. 1

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Overburden (Ft)	Existing Pit	Sieve Analysis % Passing					Color AASHO T-21	Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks		
						1½"	5/8"	#4	#100	#270						
1	1	1968	0.5-1.5	0-0.5	Yes	N	O	1	S	A	M	P	L	E	D	Owner: Mrs. Laura Jean Harwood. Area consists of hilltops in pasture northwest of Town Highway No. 19 just south of Manchester Town Line. Test #1 was in floor towards northeast end of pit on hilltop near Town Highway No. 19. Pit was shallow with 4'-6' faces. Material is: 0-0.5', sod; 0.5'-1.5', sandy gravel that was not sampled; 1.5'-3', gray-brown clay.
	2A	1968	0.5-3.5	0-0.5	No	84.4	63.9	43.6	10.0	5.0	1½	19.6%	Gran. Borrow (Grav.)	Test #2A was dug in lower, elongate knoll southwest of hilltop pit. Top 0.5' is sod, stones and silt. Gravel comes in that is fine and very dusty. South end of test hole had 2' of gravel; north end had 3.5' of gravel; brown silty clay in bottom was also sampled as Test #2B. It was classified as An A-4 silt.		
	2B	1968	3.5-7	---	No	100	100	100	98.5	---	---	---	---	Tests show only a thin gravel layer on knolls. Development potential is bad.		
2	1	1968	1-4.5	0-1	No	73.6	65.2	51.7	36.0	18.0	1	---	---	Owner: A. A. Cooley. Area is a clearing in woodland east of Town Highway #5 at point about 0.1 mile north of U. S. Route 7. Test #1 was located 16' east of rock wall above Town Highway No. 5. Material is: 0-1',		

*Percentage of Total Sample

TABLE I

SUNDERLAND GRANULAR DATA SHEET NO. 2

Map Ident. No.	Field Test No.	Year Field 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
						1½"	5/8"	#4	#100	#270				
														sod; 1'-4.5', silt with many +1½" stones that was rejected for Item 105 because of a great excess passing the No. 270 mesh sieve; bottom large compactly bedded cobblestones.
3	1	1968	4-18	0-4	Yes	60.5	40.7	27.0	20.0	7.0	1½	11.4%	Gran. Borrow (Grav.)	Owner: Wm. E. Dailey, Inc. Area is the north pit of former Ralph Bentley holdings northwest of U. S. Route 7. Possible extensions north and west were inaccessible to the backhoe. Test #1 was near the south corner of 30' northwest face. Material sampled from 4'-18', is a cobbly gravel with interbedded sand and silt lenses and seams. It meets the requirements for Item 105, but excesses passing the No. 100 and No. 270 mesh sieves fail it for Item 201.
	2	1968	2-12	0-2	Yes	66.9	58.1	38.3	5.0	2.0	1	11.1%	Gravel	Test #2 was in northwest face of pit. Material from 2'-12' is a cobbly gravel with sand lenses that is acceptable for Items 201 and 105.
	3	1968	26-48	0-0.5	Yes	63.0	41.7	26.2	15.0	7.0	1½	14.8%	Gran. Borrow (Grav.)	Test #3 was in west face of lower, southeast, level that consists of partially carbonate cemented gravels with much silt-clay and some cobbles. From 26' to 48' of the 52' high face was tested. The top 18' of this face corresponded to

*Percentage of Total Sample

TABLE I

SUNDERLAND GRANULAR DATA SHEET NO. 3

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
						1½"	5/8"	#4	#100	#270				
	4	1968	0-10	---	Yes	63.7	56.6	44.2	9.0	5.0	1½	12.5%	Gran. Borrow (Grav.)	material exposed in Test #1. Material is a silty gravel that is acceptable for Item 105, but a slight excess passing the No. 270 mesh sieve fails it for Item 201. Test #4 was dug in floor of lower southeast level. Material varies from cobbly sandy to clean fine gravels that are separated by a sand bed. All bedding dips southeast. Material meets requirements for Item 105, but a slight excess passing the No. 270 mesh sieve fails it for Item 201. Bottom of hole showed a cobbly sand.
4	1	1968	0.5-15	0-0.5	Yes	100	100	100	25.0	7.0	1	---	Gran. Borrow (Sand)	Owner: Wm. E. Dailey, Inc. Area comprises three level pit complex in south and west part of former Ralph Bentley holdings. Test #1 was in east "corner" of highest north face. Sand and silt beds from 0.5'-15' meet requirements for Item 105, but excesses that pass the No. 100 and No. 270 mesh sieves fail it for Item 202.
	2A	1968	0-12	---	Yes	53.5	44.8	39.5	13.0	5.0	1½	11.6%	Gravel	Test #2A was in westernmost face of highest pit. A few small boulders and large cobbles were observed. The right side (north end) of this face

*Percentage of Total Sample

TABLE I

SUNDERLAND GRANULAR DATA SHEET NO. 4

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Overburden (Ft)	Existing Pit	Sieve Analysis % Passing					Color AASHO T-21	Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
						1 1/2"	5/8"	#4	#100	#270				
	2B	1968	15-26	---	Yes	59.4	39.4	26.3	12.0	5.0	1	12.0%	Gravel	is siltier and sandier than the south end which is a cobbly, probably sandy gravel. Top of face was stripped for about 30'. Pebbly clay and somewhat clayey, hard packed gravel with cobbles and small boulders were sampled (+6" stones representing approximately 5% of face were not included). At 10'-12' was a fairly clean material consisting of cobbles, pebbles, and much sand. Material from 0 to 12' interval is acceptable for Items 201 and 105. Test #2B was in lower face 25' to the southeast of Test #2A. Bottom 11' of face were sampled. Much sloughed overburden was present. Material consists of a fairly clean gravel with a few 3"-5" stones and had a silty, moist coating near the base. It looks pretty good as a source. It meets the requirements for Items 105 and 201.
	3	1968	2-8.5	0-2	Yes	58.3	46.1	34.9	20.0	10.0	1	22.3%	Gran. Borrow (Grav.)	Test #3 was dug in floor where cobbles, boulders, roots, and a central zone of fairly clean cobbly gravel were uncovered. The top 2.5' at each end of the hole were organic, silty, and with cobbles. A sandy gravel was below that.

*Percentage of Total Sample

TABLE I

SUNDERLAND GRANULAR DATA SHEET NO. 5

Map Ident. No.	Field Test No.	Year Field 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
						1½"	5/8"	#4	#100	#270				
	4A	1968	0-15	---	Yes	72.7	58.1	50.0	30.0	10.0	1½	7.5%	Gran. Borrow (Grav.)	<p>Not included with sample was about 5% of +6" material. Sample was acceptable for Item 105, but excesses passing the No. 100 and No. 270 mesh sieves failed it for Item 201.</p> <p>Test #4A was dug 235' east of Test #2A in north face of central pit. Test represents material in floor of higher west pit. Top 3' is sand over fine gravel going to cobbly gravel, sand with cobbles, and finally sand. All of which totals 15'. Material meets the requirements for Item 105, but excesses passing the No. 100 and No. 270 mesh sieves fail it for Item 201. This test underlies the sand and silt layers of Test #1. The 45'-50' high face has slough that has apparently been pushed over at its southwest corner.</p>
	4B	1968	15-28	---	Yes	100	100	100	54.0	14.0	1	---	---	<p>Test #4B was below #4A in section of silty to medium sand beds that show a south to southeast dip. Some coarse sands were included. Material fails to meet requirements for Item 105 because of great excesses passing the No. 100 and No. 270 mesh sieves.</p> <p>An additional sieve analysis follows: Passing #10 - 100.0%</p>

*Percentage of Total Sample

TABLE I

SUNDERLAND GRANULAR DATA SHEET NO. 6

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
						1½"	5/8"	#4	#100	#270				
	4C	1968	28-44	---	Yes	59.5	47.8	37.9	14.0	7.0	1	15.7%	Gran. Borrow (Grav.)	Passing #40 - 96.8% Passing #80 - 66.1% Passing #200 - 21.1% Test #4C was from beds of hard packed gravel at bottom of face below Test #4B. A few 3"-6" cobbles and a boulder were present within the bottom 5' of gravelly silty clay. At the bottom of the face is a silty or fine sand seam. Material from 28'-44' is acceptable for Item 105, but a slight excess passing the No. 270 mesh sieve fails it for Item 201. Beds can be traced around to the northwest face.
	5A	1968	1-30	0-1	Yes	54.9	46.7	35.9	19.0	7.0	1	8.2%	Gran. Borrow (Grav.)	Test #5A was dug at top of long high north face, northeast of, and above Test #4A. Top 3.5' is sand over lenses and beds of gravel, sand and cobbly gravel. Gravel with a silty sand matrix occurs down to at least 40' and lenses of gravel that contain silty clay occur at foot of face. Material appears to be of ice-contact deposition. Lenses present vary in dip and in grain size from large to small. Material from 1' to 30' in upper face is acceptable for Item 105, but fails requirements for Item 201 because an insufficient fraction passes the

*Percentage of Total Sample

TABLE I

SUNDERLAND GRANULAR DATA SHEET NO. 7

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
						1½"	5/8"	#4	#100	#270				
						6	1968	2.5-8.5	0-2.5	Yes				
---	1957	0-20	---	Yes	78.0	55.1	37.2	6.0	3.0	1½	12.4%	Gravel	In 1957 and 1958 two face samples were taken in this area that probably were located east of, or slightly above Test #6. See tabulation for the pertinent results.	
---	1958	2-30	0-2	Yes	83.4	56.2	42.2	14.0	7.5	1	9.7%	Gran. Borrow (Grav.)		
5	1	1968	1-11	0-1	Yes	73.7	58.0	40.0	19.0	10.0	1	6.8%	Gran. Borrow (Grav.)	Owner: Jim Nelson. Area consists of the northwest portion of a pit complex that is reached from U. S. Route 7 at point 0.85 mile south of its intersection with State Aid Highway No. 2. Test #1 was in the upper 21.5' face below the highest

*Percentage of Total Sample

TABLE I

SUNDERLAND GRANULAR DATA SHEET NO. 8

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	#100	#270				
	2	1968	0-10.5	---	Yes	82.2	60.2	43.6	16.0	7.0	1	10.0%	Gran. Borrow (Grav.)	level. From 1' to 11' is a sandy gravel with a few small cobbles. Material is acceptable for Item 105, but excesses passing the No. 100 and No. 270 mesh sieves fail it for Item 201. Test #2 was in the upper 18.5' face of the middle level about 70' east of Test #1. Material from 0-10.5' is a sandy gravel that is acceptable for Item 105, but fails the requirements for Item 201 because of excesses passing the No. 100 and No. 270 mesh sieves.
	3	1968	0.5-4.5	0-0.5	Yes	87.0	80.6	66.8	23.0	8.0	1	---	Gran. Borrow (Grav.)	Test #3 was in recently opened face above lowest floor near northeast corner of area. Material is a silty fine gravel with stones that is acceptable for Item 105 but fails for Item 201 because of excesses passing the No. 4, No. 100, and No. 270 mesh sieves. There was insufficient proper size stone for the percent of wear test.
	4	1968	0-6	---	Yes	59.3	52.3	40.8	40.0	20.0	1	12.3%	---	Test #4 was in floor of middle level 20' east of Test #1. Material is: 0-3', silty coarse gravel with many cobbles and an occasional +12" stone; 3'-6', stony silt.

*Percentage of Total Sample

TABLE I

SUNDERLAND GRANULAR DATA SHEET NO. 9

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Overburden (Ft)	Existing Pit	Sieve Analysis % Passing					Color AASHO T-21	Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
						1½"	5/8"	#4	#100	#270				
						5	1968	1.5-20	0-1.5	Yes				
6	1968	0-13	---	Yes	100	100	100	25.0	5.0*	1	---	Gran. Borrow (Sand)	<p>Test #6 was in lower bank below Test #5. 13' of material, also a fine sand, is acceptable for Item 105, but an excess passing the No. 270 mesh sieve fails it for Item 202.</p> <p>An additional sieve analysis follows:</p> <p>Passing #10 - 100.0%</p> <p>Passing #40 - 88.9%</p> <p>Passing #40 - 37.2%</p> <p>Passing #200 - 9.1%</p>	
6	1	1968	1-10.5	0-1	Yes	100	100	100	94.0	39.0	1	---	---	<p>Owner: Jim Nelson.</p> <p>Area is a 50' high bank south of pits at Map Identification No. 5. There are cobbles and moss showing in woods</p>

*Percentage of Total Sample

TABLE I

SUNDERLAND GRANULAR DATA SHEET NO. 10

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Overburden (Ft)	Existing Pit	Sieve Analysis % Passing					Color AASHO T-21	Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
						1 1/2"	5/8"	#4	#100	#270				
														to south with much sloughed down silt and cobbles under high point of face. Test #1 was sampled in a recent excavation near the east end of the face from point 12' above floor. Material is silt and fine sand that fails for Item 105 because of a great excess passing the No. 270 mesh sieve. A test dug in floor northwest of Test #1 encountered at least 8' of a fine crushed product, all of which varied from 1/2 inch to very fine sand, that was not sampled.
7	1	1968	2-14	0-2	Yes	67.8	58.1	54.0	45.0	12.0	2	---	---	Owner: Jim Nelson. Area is a depleted pit south of Map Identification No. 6 and next to U. S. Route 7 and stockpiled material northeast of it. Test #1 was dug in 15' steep bank that represents face of old pit. Material is: 0-2', roots and sod overburden; 2'-4', silt and pebbly sand; 4'-7', gravel; 7'-9', silty sand; 9'-14', gravel with silt-clay, all of which is rejected as a source of Item 105 because of a slight excess passing the No. 270 mesh sieve.
	2	1968												Test #2 was dug 95' east of Test #1. Blacktop pavement

*Percentage of Total Sample

TABLE I

SUNDERLAND GRANULAR DATA SHEET NO. 11

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Overburden (Ft)	Existing Pit	Sieve Analysis % Passing					Color AASHO T-21	Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
						1 1/2"	5/8"	#4	#100	#270				
														was encountered that may possibly have been a prior location of U. S. Route 7. Material was not sampled. The wooded hill above this area would represent the north-east extension of Map Identification No. 9.
8	1A	1968	0-7	---	Yes	43.6	29.6	18.9	8.0	3.0	1	6.7%	Gravel	Owner: Gordon L. Woodard. Area is high pit next to Arlington Town Line. Test #1A was in upper 38' face. Material from 0 to 7' is gravel that is acceptable for Item 201.
	1B	1968	7-15	---	Yes	48.7	44.2	35.9	10.0	5.0	1	6.2%	Gravel	Test #1B was in upper face from 7' to 15'. Material consists of sand and gravel that is acceptable for Item 201.
	2	1968	15-27	---	Yes	45.5	28.2	22.4	11.0	1.0	1	4.9%	Gravel	Test #2 was dug in south face of same pit and corresponded to section below Test #1B. Material from 15' to 27' is very cobbly and bouldery. Fines vary from sand to silt-clay. It meets requirements for Item 201.
	3	1968	0.5-8.5	0-0.5	Yes	54.0	51.6	48.6	5.0	1.5	1	9.8%	Gravel	Test #3 was dug in floor northeast of Test #2. Top 2' of material is very cobbly; from 2' to 8.5' is a cobbly clean sand. Interval from 0.5' to 8.5' is acceptable for Item 201. There are tons of cobbles and 1'-2' boulders around the

*Percentage of Total Sample

TABLE I

SUNDERLAND GRANULAR DATA SHEET NO. 12

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Overburden (Ft)	Existing Pit	Sieve Analysis % Passing					Color AASHO T-21	Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
						1½"	5/8"	#4	#100	#270				
	4	1968	0.5-8.5	0-0.5	Yes	52.3	30.0	20.2	11.0	7.0	1	5.8%	Gran. Borrow (Grav.)	bottom of faces tested. Test #4 was dug 240' S20°W of Test #3 beside road atop low pit. There is a hard-packed cobbly gravel with much silt-clay binder. A few +3" stones below 4" and a layer of sub-angular 4"-8" stones at 7.5' were encountered. Material from 0.5' to 8' is acceptable for Item 105, but fails for Item 201 because a slight excess passes the No. 270 mesh sieve.
	5	1968	3.5-10	0-3.5	Yes	88.1	78.2	71.8	37.0	11.0	1½	---	---	Test #5 was dug southwest of shacks in new excavation. Trees to the southwest will be cleared and material exploited toward Map Identification No. 10. Material is: 0-3.5', overburden; 3.5'-10', sandy gravel and pebbly sand that is not acceptable for Item 105 because a slight excess passes the No. 270 mesh sieve.
	---	1958	---	2-4	Yes	93.2	61.9	34.4	14.0	4.75	1	7.9%	Gravel	In 1958 a sample was taken in this area that probably represented a face near Test #4. See tabulation for the pertinent results.
9	1	1968	1-18	0-1	Yes	74.6	56.3	34.5	20.0	10.0	1	5.2%	Gran. Borrow (Grav.)	Owner: Gordon L. Woodard. Area comprises east pit next to U. S. Route 7 that is southeast of pit at Map Identification No. 8.

*Percentage of Total Sample

TABLE I

SUNDERLAND GRANULAR DATA SHEET NO. 13

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Overburden (Ft)	Existing Pit	Sieve Analysis % Passing					Color AASHO T-21	Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
						1 1/2"	5/8"	#4	#100	#270				
	2A	1968	19-36.5	---	Yes	60.6	51.1	33.9	10.0	4.0	1-	8.2%	Gravel	Test #1 was in upper southwest corner of 59' face. Material is: 0-9', sand interbedded with gravel; 9'-18', fine sandy gravel with hard packed cobbles. From 1'-18' it is acceptable for Item 105, but excesses passing the No. 100 and No. 270 mesh sieve fail it for Item 201. Test #2A was in upper middle center of face. Material is: 19'-36.5', sand and cobbly gravel beds that meet the requirements for Item 201.
	2B	1968	36.5-48.5	---	Yes	100	100	65.2	50.0	25.0	1	---	---	Test #2B was in lower middle center of face. Material is: 36.5'-42', silt; 42'-48.5', fine gravel that collectively fail to meet the requirements for Item 105 because of a great excess passing the No. 270 mesh sieve.
	2C	1968	48-58	---	Yes	59.5	39.3	30.4	32.0	10.0	1	6.8%	Gran. Borrow (Grav.)	Test #2C was in the northwest corner of lower face. About 10' was exposed by the backhoe, but the bottom 2' had too much slough to dig through. Material from 48' to 58' is hard packed cobbly gravel with much silt-clay that is acceptable for Item 105, but excesses passing the No. 100 and No. 270 mesh sieves fail it for Item 201. Lowest foot of sample was a fine sandy gravel.

*Percentage of Total Sample

TABLE I

SUNDERLAND GRANULAR DATA SHEET NO. 14

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Overburden (Ft)	Existing Pit	Sieve Analysis % Passing					Color AASHO T-21	Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
						1½"	5/8"	#4	#100	#270				
	3	1968	0-8.5	---	Yes	68.5	58.8	45.2	7.0	2.0	1	7.3%	Gravel	Test #3 was dug in floor at north end of pit. Material is roughly stratified gravel to sampled depth of 8.5'. Hard digging was necessary to penetrate the sub-angular, sub-rounded stones which included +6" boulders within the top 2.5'. There were few +3" stones below that. It is acceptable for Item 201.
	4	1968	4-23	0-4	Yes	67.3	49.5	30.5	20.0	7.0	1½	10.0%	Gran. Borrow (Grav.)	Test #4 was in north face north of Test #3. Material is: 0-4', roots and overburden; 4'-7', silty gravel; 7'-23', beds of cobbly gravel, fine gravel, and cobbly sand. Interval from 4'-23' is acceptable for Item 105, but excessive material passing the No. 100 and No. 270 mesh sieves fail it for Item 201. Beds dip to east and bottom 3' of face is concealed by slough.
10	1	1968	2-19	0-2	Yes	61.6	50.9	41.3	24.0	8.0	1	10.7%	Gran. Borrow (Grav.)	Owner: Gordon L. Woodard. Area is a pit bordered by Arlington Town Line on west side and Town Highway No. 12 at south. There is limited extension possible to the northeast, but land to west and northwest is under consideration for building lots. Test #1 was in west face 75' north of Town Highway No.

*Percentage of Total Sample

TABLE I

SUNDERLAND GRANULAR DATA SHEET NO. 15

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Overburden (Ft)	Existing Pit	Sieve Analysis % Passing					Color AASHO T-21	Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
						1½"	5/8"	#4	#100	#270				
	2	1968	3-8.5	0-3	Yes	80.4	59.6	13.2	36.0	17.0	1	11.5%	---	12. Material is: 0-2', overburden; 2'-19', silty and sandy gravels and fine sands that is acceptable for Item 105, but excesses passing the No. 100 and No. 270 mesh sieves fail it for Item 201. Test #2 was dug in floor 80' east of Test #1. Material is: 0-3', backfill; 3'-8', sandy gravel with cobbles; 8'-8.5', clean sand. Interval from 3'-8.5' fails to meet the requirements for Item 105 because of an excess passing the No. 270 mesh sieve.
	3	1968	5-17	0-0.5	Yes	64.0	47.0	41.0	36.0	16.0	1	10.5%	---	Test #3 was dug from 5'-17' in north face. Top had been stripped to 0.5' where roots and silt remained. Material is silty sand and sandy gravel that fails to meet requirements for Item 105 because of an excess passing the No. 270 mesh sieve. Bottom 10 or 12 feet of face has cobbly slough. Top 5 feet could not be reached.
11	1	1968	3-6.5	0-3	No	54.7	42.6	31.2	31.0	14.0	1½	16.5%	---	Owner: Cecil McWain. Area is a partially wooded pasture with knolls north of Map Identification No. 12. This area is probably within the town of Manchester. Test #1 was in west side of first knoll to right of access road from area at Map Ident.

*Percentage of Total Sample

TABLE I

SUNDERLAND GRANULAR DATA SHEET NO. 16

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Overburden (Ft)	Existing Pit	Sieve Analysis % Passing					Color AASHO T-21	Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
						1½"	5/8"	#4	#100	#270				
														No. 12. Material is: 0-0.5', sod; 0.5'-3', cobbly soil (not sampled); 3'-6.5', cobbly fine sand with an occasional boulder that fails to meet requirements for Item 105 because of an excess passing the No. 270 mesh sieve.
12	1	1968	2-7	0-2	Yes	95.0	72.3	48.3	6.0	3.0	1-	12.1%	Gravel	Owner: Cecil McWain. Area is a large shallow pit northwest of State Aid Highway No. 1. Owner did not permit digging of samples in field to north because of haying season. Test #1 was in west-center of 7' north face. Material is: 0-0.5', sod; 0.5'-2', stony silt (not tested); 2'-5.5', coarse gravel; 5.5'-7', stony sand. Gravel and sand layers are acceptable for Items 201 and 105.
	2	1968	0.5-5.5	0-0.5	Yes	100	98.6	82.7	6.6	4.0 3.0*	3½	---	Sand	Test #2 was in east-center of north face about 250' east of Test #1 near some trees. Material is: 0-0.5', sod; 0.5'-3.5', fine gravel; 3.5'-5.5', medium sand. Gravel and sand layers are acceptable for Items 202 and 105.
	3	1968	1.5-6.5	0-1.5	Yes	90.7	83.0	53.1	10.0	1.5	1	---	Gran. Borrow (Grav.)	Test #3 was near east end of 8' north face about 275' east of Test #2. Material from 1.5' to 6.5' varies from dirty to clean fine gravel that meets the requirements

*Percentage of Total Sample

TABLE I

SUNDERLAND GRANULAR DATA SHEET NO. 17

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		
						1½"	5/8"	#4	#100	#270						
	4	1968	0-2.5	---	Yes	100	94.4	79.1	6.3	2.0 1.6*	1½	---	Sand	for Item 105 and for Item 201 on grading. There was insufficient proper size stone for the percent of wear test. Test #4 was dug in floor at point 90' south of small trees near Test #2. Top 2.5' is a fine gravel or pebbly sand that is acceptable for Items 202 and 105. An additional sieve analysis follows: Passing #10 - 79.9% Passing #40 - 30.0% Passing #80 - 11.0% Passing #200 - 4.5%		
	5	1968	0-4	---	Yes	N	O	T	S	A	M	P	L	E	D	Test #5 was dug on the east side of the pit at the north edge of a haul road at point 280' east of Test #4. Two feet of fine gravel and coarse sand overlies clay. Test #5 was not sampled.
13	1	1968	0.5-3.5	0-0.5	Yes	100	100	69.8	5.0	2.0 1.4*	1	---	Gran. Borrow (Sand)	Owner: Cecil McWain. Area is an older and deeper pit than that at Map Identification No. 12 northeast of it. There is much sloughing and grown in vegetation. Test #1 was dug on top at northeast end. Material from 0.5'-3.5' is a pebbly silt-clay that barely fails to meet the requirements for Item 202 because of a very slight excess held by the No. 4 screen. It		

*Percentage of Total Sample

TABLE I

SUNDERLAND GRANULAR DATA SHEET NO. 18

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Overburden (Ft)	Existing Pit	Sieve Analysis % Passing					Color AASHO T-21	Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
						1½"	5/8"	#4	#100	#270				
	2	1968	1-9.5	0-1	Yes	95.9	92.3	92.3	7.4	4.0 3.7*	1-	---	Sand	is acceptable for Item 105. Test #2 was dug in floor. Top 1' is silt (not tested). From 1' to 9.5' a fairly clean pebbly sand was sampled that is acceptable for Items 202 and 105. North end of floor has much washed-in gravel and sand.
	3	1968	0.5-10.5	0-0.5	Yes	97.7	81.4	66.6	5.3	2.0 1.3*	1½	10.0%	Gran. Borrow (Sand)	Test #3 was in eroded notch on east side near top of 22' face. From 0.5'-10.5' partially cemented fine gravels and pebbly or fine sands were sampled that are collectively too fine for Item 201 and too coarse for Item 202. Material is acceptable for Item 105. Below 10.5' a silt-clay is present. A gravelly layer is visible along the east side of this pit that is underlain by clays.
14	1	1968	1-10.5	0-1	Yes	100	98.9	96.7	48.4	16.4	1½	---	---	Owner: Donald L. Nichols. Area is sand bank with small pit south of Town Highway No. 20 under utility lines. Test #1 was below high point of 12' face. Material is 0-1', stony silt; 1'-5', brown silt; 5'-10.5', very fine stony sand. Interval from 1' to 10.5' fails to meet the requirements for Item 105 because of a great excess passing the No. 270 mesh sieve.

*Percentage of Total Sample

TABLE I

SUNDERLAND 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	#100	#270				
	2	1968	0.5-5	0-0.5	Yes	80.5	71.3	60.9	33.0	13.0	1	---	---	<p>An additional sieve analysis follows:</p> <p>Passing #10 - 98.3%</p> <p>Passing #40 - 76.7%</p> <p>Passing #80 - 52.0%</p> <p>Passing #200 - 22.2%</p> <p>Test #2 was about 12' east of Test #1 on top of bank. Material is: 0-0.5', sod; 0.5'-5' of coarse gravel overlying sand that fails the requirements for Item 105 because of an excess passing the No. 270 mesh sieve.</p> <p>In the southeast end of the pit a 6' thickness of sandy silt with a perched remnant of clean sand and occasional boulders was exposed.</p>
15	1	1968	1.5-12.5	0-1.5	Yes	74.2	56.0	36.6	16.0	8.0	1 1/2	18.2%	Gran. Borrow (Grav.)	<p>Owner: Clifford Bacon.</p> <p>Area consists of a 14' high pit at the northeast end of Town Highway No. 6 near Camp Ondawa. Subsequent to hand sampling the face the field survey was unable to contact the owner. Therefore, it was assumed that because of proximity of pit to summer camp additional testing would be denied.</p> <p>Test #1 was in center of 12.5' north face. From 1.5'-12.5' material is a silty coarse gravel with an occasional cobble that is acceptable</p>

*Percentage of Total Sample

TABLE I

SUNDERLAND GRANULAR DATA SHEET NO. 20

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Overburden (Ft)	Existing Pit	Sieve Analysis % Passing					Color AASHO T-21	Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
						1½"	5/8"	#4	#100	#270				
														for Item 105, but fails the requirements for Item 201 because of excesses passing the No. 100 and No. 270 mesh sieves.
16	1	1968	1-6.5	0-1	Yes	100	92.9	85.5	7.0	3.0 2.6*	1-	---	Sand	Owner: Everett Randall. Area is comprised of Randall's shallow east pits in woods near utility lines. Pits are old bulldozer scars where only small amounts of material have been removed. Test #1 was in west corner of easternmost pit face. Material is: 0-0.5', sod; 0.5'-3.5', fine sand; 3.5'-6.5', pebbly sand; gravel at bottom. The sand intervals are acceptable for Items 202 and 105. An additional sieve analysis follows: Passing #10 - 98.0% Passing #40 - 40.0% Passing #80 - 12.0% Passing #200 - 4.8%
	2	1968	1-6	0-1	Yes	60.3	43.3	29.1	11.0	3.0	1½	9.8%	Gravel	Test #2 was in floor about 6' south of Test #1. Material is: 0-1', silty overburden; 1'-6', medium-coarse gravel apparently dipping south that is acceptable for Items 201 and 105. Bottom is sandy silt.
	3	1968.	2-8	0-2	Yes	100	98.8	97.7	7.8	2.0	1	---	Sand	Test #3 was dug about 180' west of Tests #1 and #2 in westernmost pit. About 2' of overburden consists of thin, scattered gravels in a brown,

*Percentage of Total Sample

TABLE I

SUNDERLAND GRANULAR DATA SHEET NO. 21

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	#100	#270				
	4	1968	1-10	0-1	No	100	100	100	84.0	42.0	1	---	---	<p>fine or silty sand. Sample consisted of 6' of gray medium sand that is acceptable for Items 202 and 105.</p> <p>An additional sieve analysis follows:</p> <p> Passing #10 - 98.8%</p> <p> Passing #40 - 41.3%</p> <p> Passing #80 - 15.1%</p> <p> Passing #200 - 5.1%</p> <p>At 8' is a pebbly sand.</p> <p>Test #4 was dug 160' N10°W of Test #3 atop knoll about 270' east of pit at Map Identification No. 17. Test #4 was about 20' above Test #3 in sparse pine woods. Beneath 1' of overburden, 9' of material sampled included 3' of reddish brown silty sand underlain by tan silty sand. It fails requirements for Item 105 because a great excess passes the No. 270 mesh sieve. Bottom is gray fine sand.</p>
17	1	1968	2-10.5	0-2	Yes	87.3	67.7	45.3	10.0	5.0	1-	8.1%	Gran. Borrow (Grav.)	<p>Owner: Everett Randall.</p> <p>Area consists of 36' high pit south of State Aid Highway No. 1.</p> <p>Test #1 was in upper center of north face. Material is: 0-2', sod and stones; 2'-10.5', coarse sandy gravel with an occasional cobble that is acceptable for Item 105 and that</p>

*Percentage of Total Sample

TABLE I

SUNDERLAND GRANULAR DATA SHEET NO. 22

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
						1½"	5/8"	#4	#100	#270				
	2	1968	10.5-17	---	Yes	40.9	25.8	22.7	40.0	15.0	1	---	---	barely fails to meet requirements for Item 201 because of a slight excess passing the No. 270 mesh sieve. Test #2 was below Test #1 in lower center of north face. Material from 10.5' to 17' is silty stones that fails to meet the requirements for Item 105 because of an excess passing the No. 270 mesh sieve.
	3	1968	1-20	0-1	Yes	74.5	66.2	51.5	17.0	7.0	1½	16.4%	Gran. Borrow (Grav.)	Test #3 was below high point of east face. Material is: 0-1', sod; 1'-14', interbedded gravel and sand; 14'-20', sandy pebble gravel with silt-clay.. Interval from 1'-20' meets requirements for Item 105, but excesses passing the No. 100 and No. 270 mesh sieves fail it for Item 201. Bottom is silt-clay.
	--	1958	2-30	0-2	Yes	84.4	64.2	35.9	15.0	5.0	1-	11.2%	Gravel	In 1958 two samples were taken in this pit that probably were located west of Test #3. See tabulation for the pertinent results.
	--	1958	2-30	0-2	Yes	56.4	41.0	27.2	11.0	4.85	1	10.5%	Gravel	
18	1	1968	2.5-7.5	0-2.5	No	100	100	100	75.0	28.0	1½	---	---	Owner: Everett Randall. Area is an open field southwest of pit at Map Identification No. 17. Test #1 was located 20' south of fence near its high point. Material is: 0-0.5', sod; 0.5'-2.5', brown silt (not sampled); 2.5'-7.5', tan

*Percentage of Total Sample

TABLE I

SUNDERLAND GRANULAR DATA SHEET NO. 23

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				
														<p>silty sand that fails to meet requirements for Item 105 because a great excess passes the No. 270 mesh sieve.</p> <p>An additional sieve analysis follows:</p> <p>Passing #10 - 100.0%</p> <p>Passing #40 - 99.6%</p> <p>Passing #80 - 83.0%</p> <p>Passing #200 - 29.5%</p> <p>Test #1 was located 1/8 of a mile from pit at Map Identification No. 17.</p>
19	1	1968	0.5-6	0-0.5	No	53.6	39.8	31.6	24.0	10.0	2.	5.4%	Gran. Borrow (Grav.)	<p>Owner: Earl Hill.</p> <p>Area is field with hillside knolls southeast of State Aid Highway No. 1 intersection with State Aid Highway No. 2. The knolls are coalescent with gravel showing that may extend into Randall property to the south.</p> <p>Test #1 was dug on west slope of north central knoll halfway to top. Sampled material consists of gravel with reddish silty fines and some +6" cobbles in the top 4', but gray below that. The poorly sorted material is acceptable for Item 105, but excesses passing the No. 100 and No. 270 mesh sieves fail it for Item 201.</p>
	2	1968	1.5-10	0-1.5	No	100	100	100	12.0	3.0	1-	---	Sand	<p>Test #2 was dug on flat hill-top south of and above Test #1.</p>

*Percentage of Total Sample

TABLE I

SUNDERLAND 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 AASHO T-21	Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
						1½"	5/8"	#4	#100	#270				
	3	1968	0.5-9.5	0-0.5	No	100	97.6	95.7	36.0	11.5 11.0*	1-	---	---	<p>Top 1.5' is brown silty overburden with a cobble or two that was not sampled. From 1.5'-10' is a gray medium or fine sand that is acceptable for Items 202 and 105.</p> <p>An additional sieve analysis follows:</p> <p> Passing #10 - 98.0%</p> <p> Passing #40 - 42.8%</p> <p> Passing #80 - 17.0%</p> <p> Passing #200 - 5.7%</p> <p>Flat area at top of hill is about 150' by 70'.</p> <p>Test #3 was dug on knoll in southeast corner of field at point 275' east of and about 12' below Test #2 in elevation. A pebbly sand lens occurred down to 3' at the north end of the hole which otherwise showed a fine or very fine sand. Material is: 0-0.5', overburden; 0.5'-3', pebbly sand; 3'-8.5', fine sand that fails to be acceptable for Item 105 because an excess passes the No. 270 mesh sieve.</p> <p>An additional sieve analysis follows:</p> <p> Passing #10 - 99.8%</p> <p> Passing #40 - 89.3%</p> <p> Passing #80 - 46.0%</p> <p> Passing #200 - 11.5%</p>
20	1	1968	1-9.5	0-1	No	78.7	64.0	49.0	3.0	1.0	1½	16.1%	Gravel	Owner: Earl Hill. Area is north end of a field

*Percentage of Total Sample

TABLE I

SUNDERLAND GRANULAR DATA SHEET NO. 25

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
						1½"	5/8"	#4	#100	#270				
	2	1968	2-9	0-2	No	78.4	58.6	34.8	11.0	5.0	1½	17.6%	Gravel	<p>southeast of the intersection of Town Highway No. 7 with State Aid Highway No. 2. At this locality a flat terrace about 25' above the town highway merges into a large knoll east of it. The terrace scarp shows exposures of fine gravel.</p> <p>Test #1 was dug at edge of terrace near its northeast end just south of gate to field. Material from 1'-3' is pebble gravel, from 3'-7' sand with occasional pebbles; from 7'-9.5', pebble gravel. These intervals collectively are acceptable for Items 201 and 105. Test bottomed in silt seam.</p> <p>Test #2 was dug about 210' south of Test #1 near the southeast corner of the terrace. Top 3' is a fine gravel with included reddish fines. Below 3' material looks fairly clean and stonier than Test #1 sample. Gravel becomes finer below 6'. Interval from 2' to 9' is acceptable for Items 201 and 105.</p> <p>Test #3 was dug on high knoll at east side of property about 100' west of State Aid Highway No. 2. Material is: 0-1', stones and sod; reddish</p>
	3	1968	3-10	0-3	No	100	100	100	50.0	15.0	2	---	---	

*Percentage of Total Sample

TABLE I

SUNDERLAND 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 1/2"	5/8"	#4	#100	#270				
														tan silty sand with roots to 3' (not sampled); tan very fine sand at 3.5' going to medium sand at 6'; bottom at 10'. This material is rejected for Item 105 because of an excess passing the No. 270 mesh sieve. An additional sieve analysis follows: Passing #10 - 99.8% Passing #40 - 84.9% Passing #80 - 58.2% Passing #200 - 24.1%
21	1	1968	2-8	0-2	No	100	100	60.9	38.4	2.0 1.2*	1	---	Gran. Borrow (Grav.)	Owner: Earl Hill. Area is the southwest end of the same field where Map Identification No. 20 area is located. Area contains several knolls and a hillside to south that appears to have been planted with pines. Test #1 was on the east knoll, east of a deep gully and only about 200' southwest of the terrace at Map Identification No. 20. It was dug on the north side of the knoll where there is a flattening or "shelf" about 20' below the top of the knoll in elevation. Material from 1' to 4' is a fine sandy gravel with cobbles overlying a tan silty sand from 4' to 6.5'. Below 6.5'

*Percentage of Total Sample

TABLE I

SUNDERLAND 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 AASHO T-21	Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
						1½"	5/8"	#4	#100	#270				
	2	1968	1.5-8.5	0-1.5	No	100	100	86.0	73.1	45.0 38.7*	1-	---	---	<p>material is a hard-packed silt with stones. Stones are angular to sub-angular below 4'. Further testing in the area might find gravels. Material tested from 2' to 8' is acceptable for Item 105, but failed the requirements for grading of Item 202 and 201. No wear test was performed.</p> <p>An additional sieve analysis follows:</p> <p> Passing #10 - 90.9%</p> <p> Passing #40 - 79.6%</p> <p> Passing #80 - 70.0%</p> <p> Passing #200 - 44.3%</p> <p>Test #2 was dug about 375' west of intermittent stream running out of gully between east and central knolls. It was about 90' southeast of and somewhat above the town highway. There were cobbles at the surface of and imbedded in the reddish, silty sand which occurs to a depth of 3'. Below 3' to the depth of 8.5' that was tested is a tan, silty sand. Material from 1.5' to 8.5' is not acceptable for Item 105 because of a great excess passing the No. 270 mesh sieve. This is not a promising area. It is probably either too bouldery or too silty.</p>

*Percentage of Total Sample

TABLE I

SUNDERLAND GRANULAR DATA SHEET NO. 28

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				
22	1A	1968	1-6	0-1	Yes	100	100	100	42.0	9.0	1	---	Gran. Borrow (Sand)	<p>Owner: Clyde Dunlap.</p> <p>Area consists of a hummocky east-northeast trending wooded ridge with pit at west end next to the Arlington Town Line.</p> <p>Test #1A was at southeast corner of pit near top of 19' face. Turf overlies sampled material as follows: 1'-6', fine sand with coarse sand lenses that meets requirements for Item 105, but excesses passing the No. 100 and No. 270 mesh sieves fail it for Item 202.</p>
	1B	1968	6-11	---	Yes	100	85.3	76.1	4.6	3.0 2.3*	1-	---	Sand	<p>Test #1B was in upper central face below Test #1A. Material from 6'-11' consists of alternate stony and pebbly sand layers that are acceptable for Items 202 and 105.</p>
	2	1968	1-6.5	0-1	Yes	100	100	100	50.0	15.0	1-	---	---	<p>Test #2 was dug in floor. Material is: 0-1', overburden; then 1' or 2' of medium sand; then silty sand to 6.5'; bottom silty sand and large stones. Interval from 1' to 6.5' was sampled and rejected, as a source of Item 105 because of a large excess passing the No. 270 mesh sieve.</p>
	3	1968	8-15.5	0-1	Yes	100	97.9	95.5	3.0	1.5	1	---	Sand	<p>Test #3 was in lower central northeast face, stopping 1' above floor. Material from 8' to 15.5' is a medium to</p>

*Percentage of Total Sample

TABLE I

SUNDERLAND 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 AASHO T-21	Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
						1 1/2"	5/8"	#4	#100	#270				
	4	1968	1.5-8.5	0-1.5	No	100	100	100	7.0	3.0	1	---	Sand	<p>coarse gray sand with pebbles that is acceptable for Items 202 and 105.</p> <p>Test #4 was dug about 500' northeast of the pit on its access road. Material from top 1.5' to 2.5' is silty; below this to 3.5' is a tan fine sand, from 3.5'-8.5' there is a gray medium sand or fine sand. These intervals collectively meet the requirements for Items 202 and 105.</p> <p>An additional sieve analysis follows:</p> <p>Passing #10 - 99.9%</p> <p>Passing #40 - 31.3%</p> <p>Passing #80 - 8.5%</p> <p>Passing #200 - 3.9%</p> <p>This area is thickly wooded and would be hard to develop.</p>
23	1A	1968	0-2	---	Yes	100	70.5	36.2	13.0	7.0	1 1/2	---	Gran. Borrow (Grav.)	<p>Owner: Clyde Dunlap.</p> <p>Area consists of a pit in woods about 500' due east of pit at Map Identification No. 22.</p> <p>Test #1A was in west-center of 9.5' north face. 2' of fine gravel meet requirements for Item 105, but an excess of material passing the No. 270 mesh sieve fail it for Item 201. There was insufficient proper size stone for the percent of wear test.</p>

*Percentage of Total Sample

TABLE I

SUNDERLAND 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 AASHO T-21	Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
						1 1/2"	5/8"	#4	#100	#270				
	1B	1968	2-7.5	---	Yes	100	100	98.8	4.0	1.0*	1	---	Sand	Test #1B was immediately below Test #1A in north face. A 5.5' layer of fine-medium sand is acceptable for Items 202 and 105.
	2	1968	0.5-4	0-0.5	Yes	100	100	100	53.0	19.0	1	---	---	Test #2 was dug at south edge of the floor. 1.5' of medium sand overlying 2' of silty sand was sampled. Material fails to meet requirements for Item 105 because of a great excess passing the No. 270 mesh sieve.
	3	1968	1.5-9	0-1.5	No	100	100	100	89.0	39.0	1	---	---	Test #3 was dug about 75' N60°E of the pit at edge of access road. Material is: 0-1.5', roots and loam; 1.5'-7', reddish-tan silty sand; 7'-9', tan silty sand. Silty sands are not acceptable for Item 105 because of a great excess passing the No. 270 mesh sieve. An additional sieve analysis follows: Passing #10 - 99.1% Passing #40 - 98.1% Passing #80 - 92.9% Passing #200 - 49.5% Terrain rises gently to the northeast in the general direction of this test.
24	1	1968	1.5-4	0-1.5	No	100	100	58.8	29.4	19.0 11.2*	5	---	---	Owner: Edgar Lawrence. Area is woodland south of Town Highway No. 10 and northwest of proposed AP019 location.

*Percentage of Total Sample

TABLE I

SUNDERLAND GRANULAR DATA SHEET NO. 31

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	#100	#270				
	2	1968	1-6.5	0-1	No	100	100	92.8	79.8	30.0 27.8*	4	---	---	<p>Access is via a woods road that crosses some rises of low relief that stand above a rocky lowland.</p> <p>Test #1 was dug about 0.14 mile S20°W of the Grant and Bruckheimer Camps. Material is: 0-2.5', silty sand; 2.5'-4', silt and unsorted occasional stones including a boulder or two. Lowest 2.5' of this material is unacceptable for Item 105 because of an excess passing the No. 270 mesh sieve.</p> <p>An additional sieve analysis follows:</p> <p>Passing #10 - 91.7%</p> <p>Passing #40 - 65.1%</p> <p>Passing #80 - 50.5%</p> <p>Passing #200 - 19.2%</p> <p>Test hole bottomed at a large rock.</p> <p>Test #2 was dug on a low knoll in the pines about 70' south of an east-west woods trail at point about 270' west of Test #1. Material tested is a silty sand or sandy silt to a depth of 6.5' with occasional small stones in top 2.5'. This test also is unacceptable for Item 105 because of a great excess passing the No. 270 mesh sieve.</p> <p>An additional sieve analysis follows:</p>

*Percentage of Total Sample:

TABLE I

SUNDERLAND GRANULAR DATA SHEET NO. 32

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
						1½"	5/8"	#4	#100	#270				
														Passing #10 - 97.8% Passing #40 - 94.8% Passing #80 - 88.2% Passing #200 - 24.6%
25	1	1968	1.5-7	0-1.5	No	100	100	78.7	28.2	30.0 23.6*	1	---	---	Owner: Richardson Bronson. Area is in gently sloping pine woodland within Stewart's pebbly sand area. Land surface has occasional cobbles. Test #1 was dug 140' east of Town Highway No. 4 in cut-over area at point about 375' south of rock wall bounding Edgar Lawrence property. Material under 1.5' of overburden is a reddish-tan silt or silty sand with occasional -6" sub-angular cobbles, and pebbles to a depth of 7'. It fails for Item 105 because of a great excess passing the No. 270 mesh sieve. Test hole revealed no apparent bedding or sorting.
26	1	1968	1-13	0-1	Yes	100	100	98.6	58.0	17.6 13.0*	1½	---	---	Owner: Norman Burns. Area consists of a sand bank in woods with pit about 0.1 mile east of Town Highway No. 4 at point about 0.4 mile north of its intersection with State Aid Highway No. 3. Material consists of intermittent clay varves, sand and silt lenses. Test #1 sampled from 1' to 13' of 14' face. Material

*Percentage of Total Sample

TABLE I

SUNDERLAND GRANULAR DATA SHEET NO. 33

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
						1½"	5/8"	#4	#100	#270				
	2	1968	2-25	0-2	Yes	87.9	87.2	84.5	58.0	7.0 5.9*	1½	---	Gran. Borrow (Sand)	<p>fails to meet requirements for Item 105 because of an excess passing the No. 270 mesh sieve.</p> <p>An additional sieve analysis follows:</p> <p>Passing #10 - 97.4%</p> <p>Passing #40 - 86.3%</p> <p>Passing #80 - 66.4%</p> <p>Passing #200 - 17.8%</p> <p>Test #2 was sampled on steep slope above Test #1 where woods thin on otherwise thickly wooded northwest/southeast trending ridge. Material is: 0-2', overburden; 2'-11', interbedded medium to fine sand; 11'-12', fine gravel; 12'-20', fine sand with silt layers; 20'-25', silt with fine sand and a few 1" pebbles. This material meets the requirements for Item 105, but an excess retained by the 1½" screen, and excesses passing the No. 100 and #270 mesh sieves fail it for Item 202.</p> <p>An additional sieve analysis follows:</p> <p>Passing #10 - 96.0%</p> <p>Passing #40 - 72.0%</p> <p>Passing #80 - 44.0%</p> <p>Passing #200 - 12.0%</p>
27	1	1968	1-10.5	0-1	Yes	85.1	77.2	66.8	37.0	9.0	1½	5.8%	Gran. Borrow (Grav.)	<p>Owner: George F. Kron.</p> <p>Area is a pit near the south end of Town Highway No. 16.</p>

*Percentage of Total Sample

TABLE I

SUNDERLAND GRANULAR DATA SHEET NO. 34

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 VHD Spec.	Remarks
						% Passing								
						1½"	5/8"	#4	#100	#270				
	2	1968	3-8	0-3	Yes	64.3	60.2	58.7	59.9	29.0 17.0*	1	---	---	<p>Test #1 was in the 13' north-central face near a utility pole. Material is: 0-1' sod and stony silt; 1'-10.5', interbedded sand and gravel that is acceptable for Item 105, but excesses passing the No. 100 and No. 270 mesh sieves fail it for Items 201 and 202.</p> <p>Test #2 was in 15' south-east corner of face. Material is: 0-3', sod and stones; 3'-8', silty sand with stone pockets that is rejected as a source of Item 105 because of a great excess that passes the No. 270 mesh sieve.</p>

*Percentage of Total Sample

TABLE I
Supplement

SUNDERLAND PROPERTY OWNERS - GRANULAR

Map Ident. No.

Bacon, Clifford	15
Bronson, Richardson	25
Burns, Norman	26
Cooley, A. A.	2
Dailey, William E., Inc.	3, 4
Dunlap, Clyde	22, 23
Harwood, Laura Jean Lathrop (Mrs.)	1
Hill, Earl	19, 20, 21
Kron, George F.	27
Lawrence, Edgar	24
McWain, Cecil	11, 12, 13
Nelson, Jim	5, 6, 7
Nichols, Donald L.	14
Randall, Everett	16, 17, 18
Woodard, Gordon L.	8, 9, 10

TABLE II

SUNDERLAND ROCK DATA SHEET NO. 1

Map Ident. No.	Field Test No.	Year Field Tested	Rock Type	Existing Quarry	Method of Sampling	Abrasion AASHO T-3	Remarks
1	1	1968	Quartzite	No	Chip	3.0%	<p>Owner: United States Forest Service.</p> <p>This area is located on a steeply wooded hillside west of State Aid Highway No. 3, locally known as the East Arlington - West Wardsboro Road, three miles above its intersection with Town Highway No. 4. Bedrock material occurs in a series of blue-green schistose quartzite ledges of the Dalton formation that was formerly ascribed to the Nickwacket member of the Mendon formation. The bedding dips steeply eastward at angles approaching 60° and the strike is approximately N15°E, paralleling the highway for at least 0.1 mile. The rock has a well-developed cleavage also parallel to the strike.</p> <p>Test #1 was taken from the edge of the highway up a 40° slope for 75' in a N75°W direction. This sample, taken at random, additionally had an AASHO T-96 abrasion result of 37.3%.</p>
	2	1968	Quartzite	No	Chip	2.8%	<p>Test #2 was also taken in a N75°W direction for an additional 75' up a somewhat gentler slope. Material is similar to that of Test #1 with the possible augmentation of some Cheshire quartzite that is questionably in place. An AASHO T-96 abrasion test performed on this material gave a result of 33.1%.</p>
2	1	1968	Quartzite and Grit	No	Chip	5.0%	<p>Owner: Mrs. Colbert C. Mullener, now Shirley McTernan.</p> <p>This area is located on a steeply wooded hillside north of State Aid Highway No. 3, locally known as the East Arlington - West Wardsboro Road, 1.4 miles east of its intersection with Town Highway No. 4. Material sampled varies from grit to schistose quartzite, probably in the Dalton formation, that was formerly designated as the Nickwacket member of the Mendon formation. The bedding here dips southeastward and strikes approximately N20°E roughly at right angles to the highway. It should be noted that subsequent to testing a communication was received from the owner indicating that at no foreseeable time in the future would the rock be for sale to any company.</p>

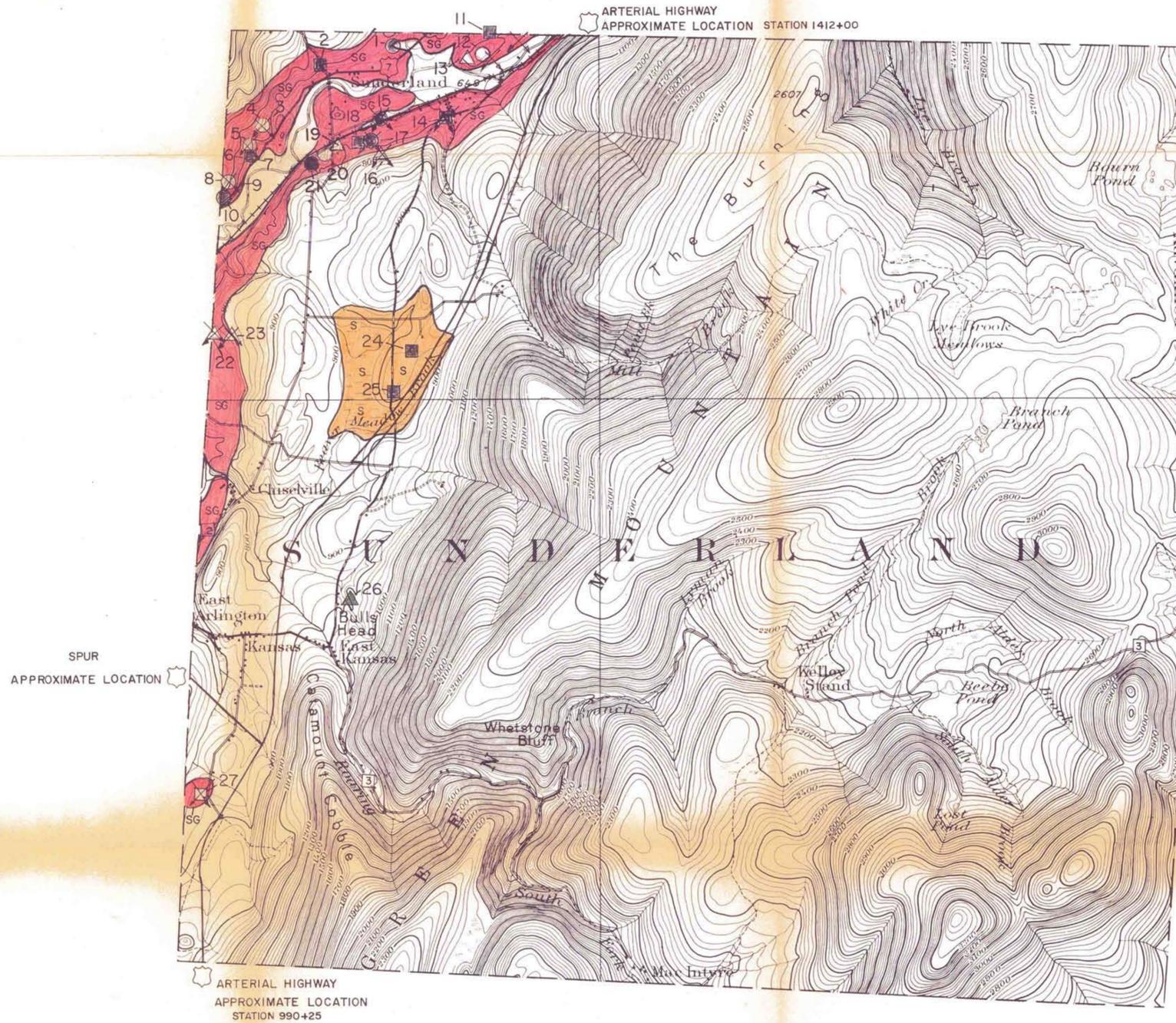
TABLE II

SUNDERLAND ROCK DATA SHEET NO. 2

Map Ident. No.	Field Test No.	Year Field Tested	Rock Type	Existing Quarry	Method of Sampling	Abrasion AASHO T-3	Remarks
	2	1968	Quartzite and Grit	No	Chip	3.0%	<p>Test #1 started at a point 45' north of the highway and was sampled at random for 75' in a N70°W direction diagonally up the slope.</p> <p>Test #2 continued in the same direction for an additional 75' along a somewhat gentler slope.</p>

TABLE II
Supplement

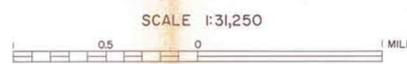
	Map Ident. No.
SUNDERLAND PROPERTY OWNERS - ROCK	
McTernan, Shirley (Mrs.) (Mullener, Colbert C. (Mrs.))	2
United States Forest Service	1



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)

SUNDERLAND



1969

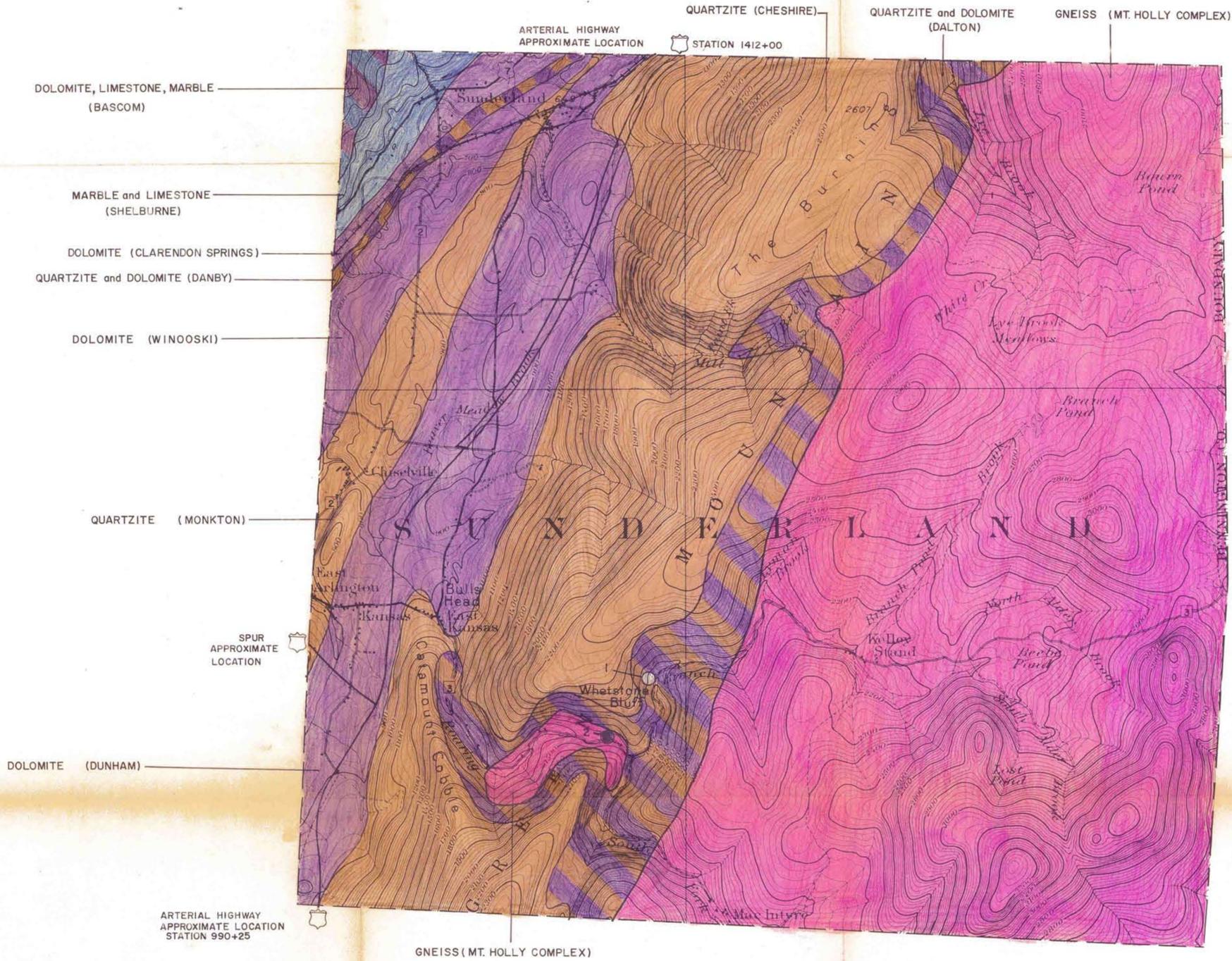
GRANULAR MATERIALS MAP

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

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

REVISIONS

DATE				
BY				



DOLOMITE, LIMESTONE, MARBLE (BASCOM)

MARBLE and LIMESTONE (SHELBURNE)

DOLOMITE (CLARENDON SPRINGS)

QUARTZITE and DOLOMITE (DANBY)

DOLOMITE (WINOOSKI)

QUARTZITE (MONKTON)

SPUR APPROXIMATE LOCATION

DOLOMITE (DUNHAM)

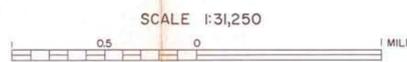
ARTERIAL HIGHWAY APPROXIMATE LOCATION STATION 990+25

GNEISS (MT. HOLLY COMPLEX)

LEGEND

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

SUNDERLAND



CONTOUR INTERVAL 20 FEET

1969

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

REVISIONS

DATE				
BY				