

SURVEY OF HIGHWAY CONSTRUCTION MATERIALS
IN THE TOWN OF BELVIDERE, LAMOILLE COUNTY, VERMONT

prepared by

Engineering Geology Section, Materials Division
Vermont Department of Highways

in cooperation with

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Federal Highway Administration

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

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

History

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

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

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

Inclosures

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

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

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

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

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

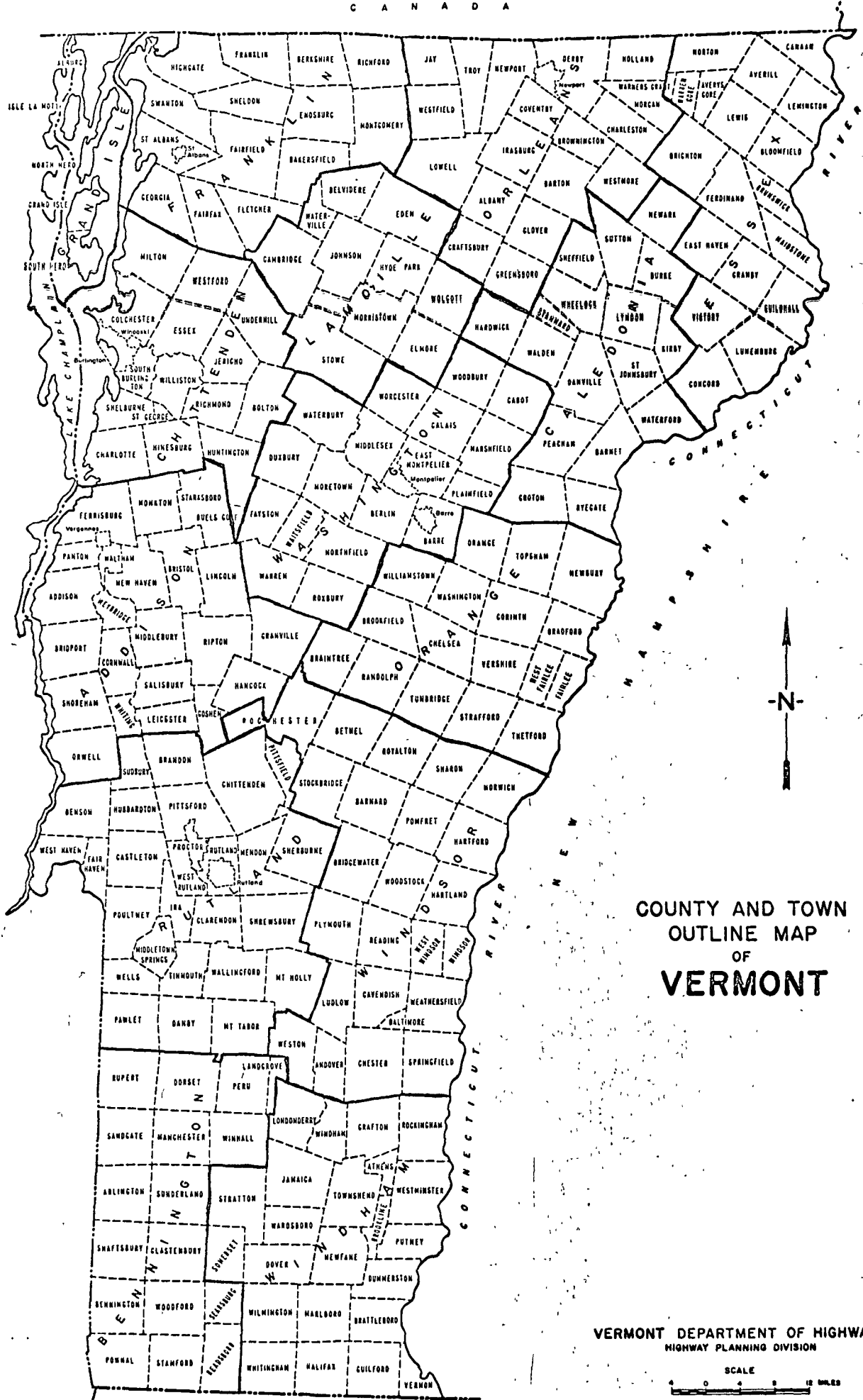
LOCATION

The town of Belvidere is situated at the north end of Lamoille County in north-central Vermont. It is bounded on the north by Bakersfield and Montgomery, on the east by Eden, on the south by Johnson, and on the southwest by Waterville. (See County and Town Outline Map of Vermont on following page.)

Belvidere lies within the Green Mountain Physiographic subdivision of the New England Upland. Topography is characterized by rugged, steep-sided, mountainous terrain. Elevations range from 3,360 feet, near the Bakersfield town line in the north-central part of the town, to less than 700 feet at the Waterville town line near Belvidere Junction.

Principal drainage is westward via the North Branch of the Lamoille River; and its tributaries, North Fork, Otter Brook, Rattling Brook, and Streeter Brook to the north, and Basin Brook to the south.

N E W Y O R K



COUNTY AND TOWN OUTLINE MAP OF VERMONT

VERMONT DEPARTMENT OF HIGHWAYS
HIGHWAY PLANNING DIVISION

SCALE
0 4 8 12 MILES

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 test 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 appearing on the Rock Materials Map is somewhat simplified. (For a more detailed description of the rock formations see the Summary of Rock Formations included in this report.) Complex metamorphic rocks comprise most of the lithology within the town of Belvidere.

All the bedrock outcrops accessible from Vermont Route 118 and Town Highway No. 8 were phyllitic schist of the Hazen Notch Formation. These outcrops were thin- ($\frac{1}{2}$ "-1") bedded; and, since no pieces of rock large enough for abrasion tests could be found, no samples were taken.

Some bedrock may outcrop south of the south end of Town Highway No. 10 that might yield samples for abrasion tests; however, due to a washed-out bridge, this portion of the highway was inaccessible.

SURVEY OF SAND AND GRAVEL SOURCES

Procedure for Sand and Gravel Survey

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

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

The field investigation is begun by making a cursory preliminary survey of the entire town. All pits and other areas which show physiographic features that give evidence of glacial or fluvial deposition are noted. These locations are later investigated by obtaining samples of pit faces and other exposed materials. Test pits, dug with a backhoe to a depth of approximately 11 feet, are also sampled. The samples are submitted to the Materials Testing Laboratory where they are tested for gradation and stone abrasion, the latter by the Deval Method (AASHTO T-4), and the Los Angeles Method (AASHTO T-96).

Discussion of Sand and Gravel Deposits

According to this survey proven granular materials in Belvidere suitable for highway and related construction purposes were deposited by glaciofluvial and glaciolacustrine processes at elevations up to 1,300 feet.

The glaciolacustrine deposits are lake sand, pebbly sands, and beach gravel emplaced in a high-level, shoaling lake that was dammed between the receding continental glacier and highlands southeast of it. Beach gravels may be found at Map Identification Numbers 1, 2, 3, 4, 18 and 19. At Map Identification Number 20 is a pebbly sand source probably deposited after the high-level lake was nearly filled with sediments.

Glaciofluvial deposits occur principally along the North Branch of the Lamoille River as kame terraces, which were sampled at Map Identification Numbers 5, 6, 7, 8, 9, 10, 11, 12, 14, 15, 16, 21, 22, 23, 24 and 25. Map Identification Number 17 is thought to be kamic because of its shape and its constituent materials.

A borrow of pit at Map Identification Number 13 is probably in glacial till.

SUMMARY OF ROCK FORMATIONS IN THE TOWN OF BELVIDERE

Foot Brook member of the Underhill formation: Sericite (muscovite-paragonite) -quartz-chlorite-chloritoid schist; minor carbonaceous interbeds.

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

Jay Peak member of the Underhill formation: pale silver-green, quartz-sericite-albite schist, locally quartzitic.

Ottawaquechee formation: Black carbonaceous phyllite or schist containing interbeds of massive quartzite commonly criss-crossed by veins of white quartz; quartzite is dark gray and carbonaceous, light gray, or white; also includes light green quartz-sericite-chlorite phyllite or schist and sericitic quartzite.

Albite - The sodium end member of the plagioclase feldspar group, light-colored and found in alkali rocks.

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

Carbonaceous - Containing carbon.

Chlorite - A general designation for a group of hydrous silicates of magnesium and iron, with or without aluminum, so named because of their green color.

Chloritoid - A brittle member of the mica mineral group.

Glacio-fluvial - A term used to denote formation by or relation to streams within, upon or emerging from glacial ice.

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

Gneiss - Originally meaning a more or less banded metamorphic rock with the mineral composition of granite. The term now designates a foliated metamorphic rock with no specific composition implied, but having layers that are mineralogically unlike and consisting of particles visible to the eye. Usually gneiss displays an alternation of granular minerals and schistose minerals with the rock tending to split along the schistose bands.

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

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

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

Phyllite - A fine-grained, foliated metamorphic rock intermediate between the mica schists and slates into which it may grade. The foliation is made possible by the development of a large amount of potash mica, sericite, which also gives the rock a distinctive silvery appearance.

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.

Sediments - All kinds of deposits from the waters of streams, lakes or seas, and in more general sense to deposits of wind and ice.

Sericite - A mineral very similar to, if not identical with, muscovite mica. It occurs in small flakes and scales in metamorphic rocks such as sericite schists and sericite gneisses.

Till - An unsorted, unstratified, and unconsolidated heterogeneous mixture of clay, silt, sand, gravel, and boulders deposited directly by glacial ice.

Water Table - The upper limit of the portion of the ground wholly saturated with water.

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PARTIAL SPECIFICATIONS FOR HIGHWAY CONSTRUCTION MATERIALS

Listed below are partial specifications for Highway Construction Materials items that will supercede the items currently in effect on July 1, 1971. The new items are included as an appendix to this report since the suitability of materials for construction is referred to the new items in many instances.

DIVISION 700 - MATERIALS

Section 703, Soils and Borrow Materials

703.03 Sand Borrow and Cushion

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

Table 703.03A - Gradation Requirements

Sieve Designation	Percentage by Weight Passing Square Mesh Sieves	
	Total Sample	Sand Portion
2"	100	
1½"	90-100	
½"	70-100	
No. 4	60-100	100
No. 100		0-30
No. 200		0-12

703.05 Granular Borrow

Granular Borrow shall be obtained from approved sources, consisting of satisfactorily graded, free draining, hard, durable stone and coarse sand reasonably free from loam, silt, clay, and organic material.

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

Table 703.05A - Gradation Requirements

Sieve Designation	Percentage by Weight Passing Square Mesh Sieves	
	Total Sample	Sand Portion
No. 4	20-100	100
No. 200		0-15

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

Section 704, Aggregate

704.05 Gravel for Sub-base

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

(a) Grading

The gravel shall meet the requirements of the following table:

Table 704.05A - Gradation Requirements

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

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

(b) Percent of Wear

The percent of wear of the gravel shall be not more than 25 when tested in accordance with AASHTO T 4, or more than 40 when tested in accordance with AASHTO T 96.

704.06 Crushed Stone for Sub-base

Crushed Stone for Sub-base shall consist of clean, hard, crushed stone, uniformly graded, reasonably free from dirt, deleterious material, pieces which are structurally weak and shall meet the following requirements:

(a) Source

This material shall be obtained from approved sources and the area from which this material is obtained shall be stripped and cleaned before blasting.

(b) Grading

This material shall meet the requirements of the following table:

Table 704.06A - Gradation Requirements

Sieve Designation	Percentage by Weight Passing Square Mesh Sieves	
	Total Sample	
$4\frac{1}{2}$ "	100	
4"	90-100	
$1\frac{1}{2}$ "	25- 50	
No. 4	0- 15	

(c) Percent of Wear

The percent of wear of the parent rock shall be not more than 8 when tested in accordance with AASHTO T 3, or the crushed stone a percent of wear of not more than 40 when tested in accordance with AASHTO T 96.

(d) Thin and Elongated Pieces

Not more than 30 percent, by weight, of thin and elongated pieces will be permitted.

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

(e) Filler

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

(f) Leveling Material

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

This material shall meet the requirements of the following table:

Table 704.06B - Gradation Requirements

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

704.07 Crushed Gravel for Sub-base

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

(a) Grading

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

Table 704.07A - Gradation Requirements

Grading	Sieve Designation	Percentage by Weight Passing Square Mesh Sieves	
		Total Sample	Sand Portion
Coarse	4"	100	
	No. 4	25- 50	100
	No. 100		0- 20
	No. 200		0- 12
Fine	2"	100	
	1 1/2"	90-100	
	No. 4	30- 60	100
	No. 100		0- 20
	No. 200		0- 12

(b) Percent of Wear

The percent of wear of the parent gravel shall be not more than 20 when tested in accordance with AASHTO T 4, or the crushed gravel a percent of wear of not more than 35 when tested in accordance with AASHTO T 96.

(c) Fractured Faces

At least 30 percent, by weight, of the stone content shall have at least one fractured face.

Fractured faces will be determined on the material coarser than the No. 4 sieve.

704.09 Dense Graded Crushed Stone for Sub-base

Dense Graded Crushed Stone for Sub-base shall consist of clean, hard, crushed stone, uniformly graded, reasonably free from dirt, deleterious material and pieces which are structurally weak, and shall meet the following requirements:

(a) Source

This material shall be obtained from approved sources and the area from which this material is obtained shall be stripped and cleaned before blasting.

(b) Grading

This material shall meet the requirements of the following table:

Table 704.09A - Gradation Requirements

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

(c) Percent of Wear

The percent of wear of the parent rock shall be not more than 8 when tested in accordance with AASHTO T 3, or the crushed stone a percent of wear of not more than 40 when tested in accordance with AASHTO T 96.

(d) Thin and Elongated Pieces

Not more than 30 percent, by weight, of thin or elongated pieces will be permitted.

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

704.10 Gravel Backfill for Slope Stabilization

Gravel Backfill for Slope Stabilization shall be obtained from approved sources, consisting of satisfactorily graded, free draining, hard, durable stone and coarse sand reasonably free from loam, silt, clay, and organic material.

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

Table 704.10A - Gradation Requirements

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

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

704.11 Granular Backfill for Structures

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

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

Table 704.11A - Gradation Requirements

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

Belvidere Granular Data Sheet No. 1

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Over- burden (Ft)	Exist- ing Pit	Sieve Analysis % Passing						Abrasion AASHTO T-4-35	Passes VHD Spec.	Remarks
						2"	1½"	¾"	#4	#100	#200			
1	1A	1973	3-18	0-1.5	Yes	87	82	65	47	5	3	25.3%	Gran. Borrow (Grav.)	Owner - Wallace Coburn Area is a wooded ridge near the Waterville town line. There was an active pit near south end of ridge. Pit is west of Town Highway No. 6 reached by access road about 0.03 mile north of Town Highway No. 5 junction, principal extension would be north into a brush-covered field. Ridge and field are readily accessible. Extension would be in woods to the west and northwest into Waterville. Test No. 1A was in the 23' west face of the pit. Material was: 0-1.5'; overburden; 1.5'-3'; not reached; 3'-18'; interbedded fine gravel, sand and cobbly gravel.
	1B	1973	18-23	- -	Yes	96	95	68	35	6	4	18.0%	Gravel	Test No. 1B was below test No. 1A, Material was: 18'-23'; clean, fine gravel.
	2	1973	0.5-11.5	0-0.5	Yes	90	85	65	46	4	3	14.8%	Gravel	Test No. 2 was in floor of pit about 25' S.10°E. of test No. 1 Material was: 0-0.5', not in place; 0.5'-11.5', fine gravel.

BELVIDERE GRANULAR DATA SHEET NO. 2

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Overburden (Ft)	Existing Pit	Sieve Analysis % Passing						Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
						2"	1½"	1½"	#4	#100	#200			
	3A	1973	1.5-5	0-1.5	No	94	92	73	56	9	4	35.0%	Gran. Borrow (Grav.)	Test No. 3A was at west edge of field, 120' north of pit and about 10' east of town line. Material was: 0-1.5'; overburden, 1.5'-5', soft fine gravel.
	3B	1973	5-10	-----	No	-----	100	93	84	3	2	-----	Sand	Test No. 3B was below Test No. 3A. Material was: 5'-7', pebbly sand; 7'-9', sand; 9'-10', gravel.
2	1	1973	3.5-10	0-3.5	No	83	73	58	38	7	3	30.2%	Gran. Borrow (Grav.)	<p>Owner - Maurice B. McCuin</p> <p>Area is a large, slightly rolling meadow above woodland east of Town Highway No. 3. It is reached via a logging road about 0.38 mile north from Vermont Route 109.</p> <p>Test No. 1 was at northwest corner of meadow. Material was: 0-3.5', overburden; 3.5'-7', gravel 7'-7.5', sand; 7.5'-10', gravel.</p>

Belvidere Granular Data Sheet No. 3

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Over- burden (Ft)	Exist- ing Pit	Sieve Analysis % Passing						Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
						2"	1½"	¾"	#4	#100	#200			
	2	1973	3.5-11	0-3.5	No	100	92	87	84	14	4	----	Sand	Test No. 2 was at east edge of meadow, about 550' S.55°E. of Test No. 1. Material was: 0-3.5', overburden; 3.5'-8', pebbly sand; 8'-11', sand.
	3	1973	2-11	0-2	No	92	86	66	50	8	5	27.2%	Gran. Borrow (Grav.)	Test No. 3 was at southeast corner of meadow near access road to Map Identification No. 3. Material was: 0'-2', overburden; 2'-5', sand; 5'-9', pebbly sand; 9'-11', fine gravel.
	4	1973	1.5-10	0-1.5	No	87	82	59	41	8	4	22.5%	Gravel	Test No. 4 was in low wooded terrace about 130' N.20°E. of, and 45' below Test No. 1. Material was: 1.5'-10', gravel.
	5	1973	3-10	0-3	No	100	93	82	62	6	4	-----	Sand	Test No.5 was in a small clearing about 300' N.75°E. of Test No. 4. Material was: 0'-3', overburden, 3'-10', pebbly coarse sand.
	6	1973	1-1	0-1	No	----	----	100	99	15	7	----	Sand	Test No. 6 was in floor of small diggings in woods below southeast corner of meadow. Material was: 0'-1' not in place; 1'-11', sand with pebbles and silt.

Belvidere Granular Data Sheet No. 4

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Overburden (Ft)	Existing Pit	Sieve Analysis % Passing						Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
						2"	1½"	¾"	#4	#100	#200			
3	1	1973	2.5-11	0-2.5	No	92	86	67	62	7	4	28.0%	Gran. Borrow (Grav.)	<p>Owner: Maurice B. McCuin</p> <p>Area was a small meadow S.60°E. of and above meadow at Map Identification No. 2; northwest corner of meadow was about 200' east of Test No. 3 at Map Identification No. 2.</p> <p>Test No. 1 was at northwest corner of meadow. Material was: 0-2.5', overburden; 2.5'-4', pebbly sand; 4'-8', gravel; 8'-9', sand; 9'-11', pebbly gravel.</p>
	2	1973	3-8	0-3	No	81	76	62	37	7	4	27.2%	Gran. Borrow (Grav.)	<p>Test No. 2 was at southeast corner of meadow, about 425' S.57°E. of Test No. 1. Material was: 0-3', overburden; 3'-8', fine gravel; 8'-10', sand.</p>
4	1A	1973	1-13	0-1	Yes	100	93	78	62	3	1	24.6%	Sand	<p>Owner: Town of Belvidere</p> <p>Area was an active pit southeast of the town dump north of Vermont Route 100 and about 0.38 mile west of Town Highway No. 2 junction.</p> <p>Test No. 1A was in active</p>

Belvidere Granular Data Sheet No. 5

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Over- burden (Ft)	Exist- ing Pit	Sieve Analysis % Passing						Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
						2"	1½"	1"	#4	#100	#200			
	1B	1973	13-18	0-1	Yes	---	100	93	71	2	1	----	Sand	<p>east face of pit. Material was: 0'-1', overburden; 1'-6', fine gravel or pebbly sand; 6'-13', coarse to medium sand; bottom, not in place.</p> <p>Test No. 1B was below Test No. 1A. Material was: 13'-18', pebbly sand and fine gravel; bottom, sand.</p>
	2A	1973	1-7	0-1	Yes	100	97	76	59	2	1	24.6%	Gravel	<p>Test No. 2A was in face at north-central part of pit. Material was: 0'-1', overburden; 1'-7', fine gravel and pebbly sand.</p>
	2B	1973	7-21	--	Yes	---	100	98	92	67	44	-----	-----	<p>Test No. 2B was below Test No. 2A. Material was: 7'-9', pebbly sand; 9'-20', sand; 20'-21', silt.</p>
	3	1973	1-9	0-1	Yes	---	100	95	95	77	44	-----	-----	<p>Test No. 3 was in floor, 15' west of Test No. 1B. Material was: 0'-1', not in place; 1'-9', silty sand; bottom, silt to clay.</p>
	4	1973	1-7.5	0-1	Yes	100	73	70	61	14	10	-----	Sand	<p>Test No. 4 was in floor about 100'N.70°W. of Test No. 2B.</p>

Belvidere 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						Abrasion AASHTO T-4-35	Passes VHD Spec.	Remarks
						2"	1 1/2"	1/2"	#4	#100	#200			
	5	1973	1-7	0-1	Yes	---	100	88	80	13	8	----	Sand	<p>Material was: 0-1', not in place; 1'-7.5', pebbly sand with an occasional cobble; 7.5'-8', silt to clay, (wet).</p> <p>Test No. 5 was in floor of small diggings, 300' S. 30° E. of Test No. 1B. Material was: 0'-1', overburden; 1'-3', fine gravel; 3'-5', sand; 5'-7' silt to clay.</p>
5	1A	1973	0.5-11	0-0.5	Yes	100	85	69	53	10	5	20.0%	Gravel	<p>Owner: Clyde Lanpher</p> <p>Area is an overgrown pit northwest of Town Highway No. 2 about 0.97 mile east of junction of Town Highway No. 6.</p> <p>Test No. 1A was in north face of pit. Material was: 0-0.5', overburden; 0.5'-11', interbedded gravel and gravelly sand; bottom, not in place.</p>
	1B	1973	11-17	--	Yes	88	74	55	39	9	5	37.0%	Grav. Borrow (Grav.)	<p>Test No. 1B was below Test No. 1A. Material was: 11'-15', pebbly and gravelly sand; 15'-17', gravel ; 17'-18', too unstable to sample.</p>

Belvidere 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						Abrasion AASHTO T-4-35	Passes VHD Spec.	Remarks
						2"	1½"	¾"	#4	#100	#200			
	2	1973	1-5	0-1	Yes	---	--	100	97	83	68	----	----	Test No. 2 was in floor, 10'S.20°E. of Test No. 1B. Material was: 0-1', not in place; 1'-5', silty sand or silt to clay with angular stones; bottom, bedrock.
	3	1973	1.5-9	0-1.5	No	95	88	73	57	13	7	----	Gran. Borrow (Grav.)	Test No. 3 was at overgrown foot of knoll, 90' N.70 W. of Test No. 1A. Material was: 0-1.5', overburden; 1.5'-6', gravelly sand; 6'-9', light, fine sand; bottom, silt to clay with rock fragments.
6	1	1973	1.5-9	0-1.5	No	92	84	66	44	5	3	31.9%	Gran. Borrow (Grav.)	Owner: Clyde Lanpher Area was a brush-covered field north of Town Highway No. 2. Access was 1.04 miles west of junction Town Highway No. 12. Test No. 1 was near middle of grassy terrace. Material was: 0-1.5', overburden; 1.5'-9', tabular to sub-round gravel; bottom, water.

Belvidere Granular Data Sheet No. 8

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Overburden (Ft)	Existing Pit	Sieve Analysis % Passing						Abrasion AASHTO T-4-35	Passes VHD Spec.	Remarks
						2"	1½"	½"	#4	#100	#200			
	2	1973	-----	0-2	No	NOT			SAMPLED					Test No. 2 was on top of slope 190' N.25°W. of Test No. 1. Bedrock was encountered at 2'. No sample taken.
	3	1973	0.5-9.5	0-0.5	No	64	58	51	35	9	6	30.2%	Gran. Borrow (Grav.)	Test No. 3 was in terrace, 125' S.35°W. of Test No. 1. Material was: 0-0.5, overburden; 0.5'-9.5', cobbly gravel; bottom, boulder gravel.
	4	1973	1-9	0-1	No	--	100	89	76	49	37	-----	-----	Test No. 4 was in lower slope, 150' S.10°E. of, and 20' below Test No. 1. Material was: 0'-1', overburden; 1'-4', dirty gravel; 4'-9', silt to clay with angular stone fragments.
7	1	1973	1.5-5	0-1.5	No	--	100	91	83	61	57	-----	-----	Owner: Clyde Lanpher Area is an overgrown slope north of Town Highway No.2 about 0.98 mile west of Town Highway No. 12 junction. Test No. 1 was near woods west of logging road, 250' N.20°W. of start of access road at Town Highway No. 2. Material was: 0'-1.5', overburden; 1.5'-5', silty sand and silt with stone fragments; bottom, bedrock.

Belvidere Granular Data Sheet No. 9

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Over- burden (Ft)	Exist- ing Pit	Sieve Analysis % Passing						Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
						2"	1½"	¾"	#4	#100	#200			
8	1	1973	1-6	0-1	No	100	90	82	71	53	46	----	----	Owner: Clyde Lanpher Area is a field south of Town Highway No. 2, about 0.95 mile west of Town Highway No. 12 junction. Test No. 1 was near east corner of field. Material was: 0-1', overburden; 1-6', silt to clay and stones.
	2	1973	2-6	0-2	No	79	69	62	52	12	8	----	Gran. Borrow (Grav.)	Test No. 2 was at south corner of field about 220' S. 60° W. of Test No. 1. Material was: 0-2', overburden; 2'-6', gravelly sand or gravel; 6'-10', sand or silty sand.
9	1	1973	1-3	0-1	No	--	100	85	62	33	27	----	----	Owner: Clyde Lanpher Area was a clearing on wooded terrace above, and about 0.1 mile north of Map Identification No. 10. Test No. 1 was at north-west corner of clearing. Material was: 0-1', overburden; 1'-3', dirty fine gravel; bottom, silt to clay.

Belvidere Granular Data Sheet No. 10

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Overburden (Ft)	Existing Pit	Sieve Analysis % Passing						Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
						2"	1½"	½"	#4	#100	#200			
	2	1973	1-10	0-1	No	100	96	84	65	8	3	----	Sand	Test No. 2 was at southeast corner of clearing, 150' southeast of Test No. 1. Material was: 0-1', overburden; 1'-6', sand with pebbles; 6'-10', pebbly to fine gravel.
	3	1973	1-10	0-1	No	---	100	97	92	77	45	----	----	Test No. 3 was in woods about 125' N.40°E. of Test No. 2. Material was: 0-1', overburden; 1'-5', pebbly sand; 5'-9', silty sand or silt to clay; 9'-10', fine gravel.
10	1	1973	1-5	0-1	No	70	70	61	50	18	7	----	Gran. Borrow (Grav.)	Owner: Clyde Lanpher Area was a rolling field north of Town Highway No. 2 about 0.8 mile west of Town Highway No. 12 junction. Test No. 1 was in field about 70'N.75°E. of utility pole, 14/78F. Material was: 0'-1', overburden; 1'-5', fine gravel overlying sand.
	2	1973	1-11	0-1	No	89	85	70	52	7	4	36/9%	Gran. Borrow (Grav.)	Test No. 2 was at east end of field, 530'N.85°E. of Test No. 1 and 50'N18°E. of utility pole 14/78H. Material was: 0-1', overburden; 1'-4', reddish brown gravel; 4'-11', grayish gravel; bottom, boulder gravel.

Belvidere Granular Data Sheet No. 11

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Over- burden (Ft)	Exist- ing Pit	Sieve Analysis % Passing						Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
						2"	1½"	¾"	#4	#100	#200			
	3	1973	1-10	0-1	No	94	82	69	48	5	3	32.4%	Gran. Borrow (Grav.)	Test No. 3 was near woods about 120' N. 55° E. and 6' above Test No. 1. Material was: 0'-1', overburden; 1'-10', fine gravel (water table at 5').
11	1	1973	1-5	0-1	No	73	68	55	38	15	9	----	Gran. Borrow (Grav.)	Owner: Dallas Bennett Area was an overgrown field south of Vermont Route 109. Access was east of cemetery about 0.20 mile west of Town Highway No. 2 junction. Test No. 1 was 60' from west edge of field and about 400' from Route 109. Material was: 0'-1', overburden; 1'-5', boulders, silt and gravel.
	2	1973	1-8	0-1	No	85	74	61	41	14	9	38.8%	Gran. Borrow (Grav.)	Test No. 2 was on rise at southwest corner of field about 175' S. 15° E. of Test No. 1. Material was: 0'-1', overburden; 1'-8', coarse bouldery gravel; bottom, water.
	3	1973	1-3	0-1	No	72	61	49	34	24	15	39.6%	Gran. Borrow (Grav.)	Test No. 3 was 150' S. 80° E. of Test No. 2. Material was: 0'-1', overburden; 1'-3', boulders; bottom, bedrock or boulder.

Belvidere Granular Data Sheet No. 12

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Over- burden (Ft)	Exist- ing Pit	Sieve Analysis % Passing						Abrasion AASHTO T-4-35	Passes VHD Spec.	Remarks
						2"	1½"	1"	#4	#100	#200			
12	1A	1973	1-16	0-1	Yes	96	92	78	51	3	2	30.4%	Gran. Borrow (Grav.)	Owner: Gerald Tatro Area is brush-covered field with a pit which is east of the north end of Town Highway No. 12. Access is about 0.22 mile from Vermont Route 109. Test No. 1A was in the north face of the pit. Material was: 0-1', overburden; 1'-16', pebbly fine gravel with a few thin layers of small cobbles.
	1B	1973	16-21	----	Yes	83	81	58	40	6	4	34.6%	Gran. Borrow (Grav.)	Test No. 1B was below Test No. 1A. Material was: 16'-21', pebbly fine gravel; bottom, sand.
	2A	1973	3-15	0-3	Yes	88	86	69	49	4	3	26.5%	Gran. Borrow (Grav.)	Test No. 2A was in the west face of the pit about 70°N.70°W. of Test 1A. Material was: 0'-3', overburden 3'-15', interbedded fine gravels, cobbles, sands and pebbly sand.
	2B	1973	15-20	----	Yes	100	94	79	56	4	3	----	Gran. Borrow (Grav.)	Test No. 2B was below Test No. 2A. Material was: 15'-20'; southeast-dipping beds of fine gravel, pebbly sand and sand.
	3	1973	0.5-10	0-0.5	Yes	83	80	69	54	4	2	----	Gran. Borrow (Grav.)	Test No. 3 was in the floor of the pit about 150' S.55°W. of Test No. 1B. Material was: 0-0.5'; not in place; 0.5'-10', interbedded fine gravel, pebbly sand, sand, and a few random cobbles from 6'-7'.

Belvidere Granular Data Sheet No. 13

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Over- burden (Ft)	Exist- ing Pit	Sieve Analysis % Passing						Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
						2"	1½"	1"	#4	#100	#200			
	4	1973	1-10	0-1	Yes	---	100	99	95	44	27	----	----	Test No. 4 was in the floor of the pit about 15'S.70°W. of Test 1B. Material was: 0-1', not in place; 1'-3.5', sand; 3.5-4.5', silty sand, or silt to clay; 4.5'-8.5', fine sand or silty sand; 8.5'-10', sand and boulders (water present).
	5	1973	1-10	0-1	No	84	78	65	43	9	4	----	Gran. Borrow (Grav.)	Test No. 5 was in a small field about 60'N.85°E. of Test No. 1A. Material was: 0-1', overburden; 1'-9', pebbly fine gravel; 9'-10', sand layer.
13	1	1973	1-17	0-1	Yes	100	86	71	58	38	32	----	----	Owner: Bernard Daudelin Area was an inactive pit or bank east of the junction of Town Highway No. 10 with Town Highway No. 8. Test No. 1 was in upper southeast 40' high face. Material was: 0'-1', overburden; 1'-17', clay with cobbles.
14	1	1973	0.5-5	0-0.5	Yes	---	---	---	100	59	54	----	----	Owner: Ken Berry Area was a depleted, smoothed-over pit south of, and across

Belvidere Granular Data Sheet No. 14

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Overburden (Ft)	Existing Pit	Sieve Analysis % Passing						Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
						2"	1½"	1½"	#4	#100	#200			
	2	1973	0.5-3.5	0-0.5	Yes	---	100	96	77	52	40	----	----	<p>Vermont Route 109 from owner's house. Access to field where pit was located is about 0.57 mile north-east of Town Highway No. 8 junction.</p> <p>Test No. 1 was at southwest corner of area near an abandoned school bus. Material was: 0'-0.5', overburden; 0.5'-3', pebbly sand; 3'-5', silt to clay.</p> <p>Test No. 2 was near 5-inch pine at east end of area, about 320' N. 62°E of Test No. 1. Material was: 0-0.5' overburden; 0.5'-3.5', silt and stone.</p>
15	1A	1973	1-28	0-1	Yes	100	95	79	60	6	3	13.9%	Sand, Gravel	<p>Owner: Mark Schroeder</p> <p>Area was an inactive pit about 0.2 mile south of Vermont Route 109. Access was about 0.3 mile east of Town Highway No. 11, junction.</p> <p>Test No. 1A was in middle of south face of pit. Material was: 0'-1', overburden; 1'-28', interbedded fine gravel and pebbly gravel.</p>

Belvidere Granular Data Sheet No. 15

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Over- burden (Ft)	Exist- ing Pit	Sieve Analysis % Passing						Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
						2"	1½"	1½"	#4	#100	#200			
	1B	1973	28-35	---	Yes	---	100	98	95	28	10	----	Sand	Test No. 1B was below Test No. 1A. Material was: 28'-35', sand with an occasional pebble or small cobble.
	1C	1973	35-45	---	Yes	100	97	80	65	8	3	----	Sand	Test No. 1C was below Test No. 1B. Material was: 35'-45', pebbly sand, sand, and fine gravel. Because of caving material, the survey was unable to sample the bottom 10'.
16	1A	1973	0-14	---	Yes	---	100	87	78	6	2	----	Sand	<p>Owner: George G. Wright</p> <p>Area was a pit about 0.2 mile south of Vermont Route 109. Access was about 0.3 mile east of Town Highway No. 11 junction. This pit was the same one as at Map Identification No. 15, but the property line was in dispute at time of survey.</p> <p>Test No. 1A was in north face of pit west of access road. Top of face had been stripped. Material was: 0-14', pebbly sand with a few interbeds of fine gravel and sand layers.</p>

Belvidere Granular Data Sheet No. 16

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Over- burden (Ft)	Exist- ing Pit	Sieve Analysis % Passing						Abrasion AASHTO T-4-35	Passes VHD Spec.	Remarks
						2"	1½"	½"	#4	#100	#200			
	1B	1973	14-17	---	Yes	95	86	56	37	12	6	18.0%	Gravel	Test No. 1B was below Test No. 1A. Material was: 14'-17', clean gravel. Because of caving material, the survey was unable to sample the bottom 3'.
	2	1973	0-12	---	Yes	94	82	70	53	5	3	16.4%	Gravel	Test No. 2 was in north face of pit at lower level east of access road. Material was: 0-12', inter-bedded fine gravel and pebbly gravel.
	3	1973	1-12	0-1	Yes	---	100	96	95	73	36	----	----	Test No. 3 was in floor at lowest part of pit. About 30' south of Test No. 1B. Material was: 0-1', not in place; 1'-2', sand with a few cobbles 2'-5', silty sand; 5'-12', sand.
	4	1973	0.5-10	0-0.5	Yes	---	100	99	95	55	47	----	----	Test No. 4 was in floor at east end of pit about 180' N. 60° E. of, and 6' below Test No. 3. Material was: 0'-0.5', overburden; 0.5'-1', pebbly sand; 1'-5', gray sand; 5'-6.5', brown, silty sand; 6.5'-10', silty sand, with a boulder layer at 8'.
	5	1973	0-13	---	Yes	---	100	86	72	5	3	----	Sand	Test No. 5 was in northeast face, about 25' east of Test No. 2. Material was: 0-3', sand; 3'-5', pebbly sand; 9'-13', sand.

Belvidere Granular Data Sheet No. 17

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Over- burden (Ft)	Exist- ing Pit	Sieve Analysis % Passing						Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
						2"	1½"	¾"	#4	#100	#200			
	6	1973	1-10	0-1	No	98	83	60	34	11	6	26.8%	Gran. Borrow (Grav.)	Test No. 6 was near trees west of access road about 110' northwest of Test No. 2. Material was: 0-1', not in place; 1'-10', pebbly fine gravel.
	7	1973	1.5-7	0-1.5	No	---	100	87	80	28	15	----	Gran. Borrow (Sand)	Test No. 7 was in partly overgrown clearing just north of access road, about 340'N.35°W. of Test No. 6. Material was: 0-1.5', overburden; 1.5'-3', pebbly sand; 3'-7', sand; bottom, silt to clay and water seep.
	8	1973	1-7	0-1	No	---	100	83	56	9	6	----	Gran. Borrow (Grav.)	Test No. 8 was in overgrown clearing south of access road, about 195' S.80°W. of Test No. 7. Material was: 0-1', overburden; 1'-7', pebbly sand; 7'-9', silt to clay; 9' water.
17	1A	1973	0.5-7	0-0.5	Yes	84	77	60	43	4	2	42.7%	Gran. Borrow (Grav.)	Owner: Jack Corse Area was an overgrown pit and westward extension, north of Town Highway No. 8. Access was about 1.85 southwest of junction with Vermont Route No. 109. Test No. 1A was in south face of pit. Material was: 0-0.5', silt and gravel; 0.5'-7', tabular, slate gravel that caves readily.

Belvidere Granular Data Sheet No. 18

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Over- burden (Ft)	Exist- ing Pit	Sieve Analysis % Passing						Abrasion AASHTO T-4-35	Passes VHD Spec.	Remarks
						2"	1½"	½"	#4	#100	#200			
	1B	1973	7-11	---	Yes	96	90	72	51	3	2	----	Gran. Borrow (Grav.)	Test No. 1B was below Test No. 1A. Material was: 7'-9', hard-packed fine gravel; 9'-11', loosely con- solidated gravel; bottom, sand.
	2	1973	1-10	0-1	Yes	84	82	62	43	5	3	31.8%	Gran. Borrow (Grav.)	Test No. 2 was in west face of pit. Material was: 0'-1', over- burden; 1'-10', soft gravel; bottom, sand with tabular pebbles.
	3	1973	0.5-9	0-0.5	Yes	95	88	64	42	7	5	30.4%	Gran. Borrow (Grav.)	Test No. 3 was in floor of pit about 65°N.85°E. of Test No. 2. Material was: 0'-0.5', overburden; 0.5'-9', hard-packed slaty gravel; bottom, water table.
	4	1973	1-9	0-1	No	---	100	85	68	20	6	----	Sand	Test No. 4 was at northwest corner of overgrown field, about 155°N.65°W. of Test No. 2. Material was: 0'-1', overburden; 1'-6', pebbly sand; 6'-9', fine and/or silty sand.
	5	1973	1.5-10	0-1.5	Yes	100	86	52	31	9	6	26.6%	Gran. Borrow (Grav.)	Test No. 5 was near east end of overgrown field, about 25°N.55°W. of Test No. 2. Material was: 0-1.5', overburden; 1.5'-6', coarse (3"-8" stones), tabular gravel; 6'-10', finer (2"-5" stones) tabular gravel.

Belvidere Granular Data Sheet No. 19

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Over- burden (Ft)	Exist- ing Pit	Sieve Analysis % Passing						Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
						2"	1½"	1½"	#4	#100	#200			
18	1A	1973	1-7	0-1	Yes	----	100	96	94	24	9	----	Sand	Owner: Atlas General Ind., Inc. Plywood Division Area had small diggings south of a woods road east of Town Highway No. 8. Woods road was about 0.89 mile south- west of junction with Vermont Route 109. Test No. 1A was in bank next to logging road. Material was: 0-1', overburden; 1'-2', brown silty sand; 2'-5', gray sand with sharp grains; 5'-6', white fine sand; 6'-7', boulders.
	1B	1973	7-14	----	Yes	----	100	95	78	5	3	----	Sand	Test No. 1B was below Test No. 1A. Material was: 7'-14', clean pebbly sand that caves readily.
19	1	1973	0.5-7	0-0.5	Yes	----	100	94	89	8	2	----	Sand	Owner: John Nolan Area had small diggings on both sides of Town Highway No. 8, about 0.74 mile southwest of its junction with Vermont Route 109. Test No. 1 was in face of diggings northwest of Town Highway No. 8. Material was: 0-0.5', overburden; 0.5'-3', sand; 3'-4', pebbly sand; 4'-7', sand.

Belvidere Granular Data Sheet No. 20

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Overburden (Ft)	Existing Pit	Sieve Analysis % Passing						Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
						2"	1½"	1"	#4	#100	#200			
	2	1973	0.5-7	0-0.5	Yes	----	---	100	98	76	23	----	-----	Test No. 2 was in face of diggings southeast of Town Highway No. 8. Material was: 0'-0.5', overburden; 0.5'-7', fine sand.
	3	1973	0.5-7	0-0.5	Yes	----	---	---	100	97	74	----	-----	Test No. 3 was in floor of diggings 30'N.70°E. of Test No. 1. Material was: 0'-0.5', overburden; 0.5'-7', wet silty sand.
	4	1973	0.5-5	0-0.5	Yes	----	---	---	100	97	81	----	-----	Test No. 4 was in floor of diggings about 75'S.10°E. of Test No. 3. Material was: 0'-0.5', overburden; 0.5'-5', silty fine sand; bottom, moist.
	5	1973	2-10	0-2	No	----	---	100	93	80	54	----	-----	Test No. 5 was in woods about 110' N.40°W. of Town Highway No. 8 at southwest end of diggings. Material was: 0-2', overburden; 2'-2.5', fine gravel; 2.5'-9', fine or silty sand.
20	1	1973	0.5-7	0-0.5	No	100	93	89	75	8	2	----	Sand	Owner: George King Area was a small bank on side of gully on knoll south of Vermont Route 109. Access to area was about 0.62 mile west of junction of Town Highway No. 8 with Route 109. Test No. 1 was in south - facing slope of gully. Material was: 0'-0.5', overburden; 0.5'-7', sand and pebbly sand.

Belvidere Granular Data Sheet No. 21

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Over- burden (Ft)	Exist- ing Pit	Sieve Analysis % Passing						Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
						2"	1½"	1½"	#4	#100	#200			
21	1	1973	1-9	0-1	No	82	77	57	40	6	4	29.1%	Gran. Borrow (Grav.)	Owner: R. H. Donnelly-Erdman Area was an overgrown field south of Vermont Route 118 access to which was about 0.3 mile east of Belvidere Corners. Test No. 1 was at southwest corner of field. Material was: 0-1', overburden; 1'-6', sand and pebbly sand; 6'-9', fine gravel.
	2	1973	2-9	0-2	No	90	85	72	58	5	3	----	Gran. Borrow (Grav.)	Test No. 2 was at northwest corner field, about 450'N.12°E. of Test No. 1. Material was: 0-2', overburden; 2'-9', sand with gravelly fine sand layers from 4'-7'.
	3	1973	1-10	0-1	No	100	90	88	82	2	1	----	Sand	Test No. 3 was at northeast corner of field, about 800'S.85°E. of Test No. 2. Material was: 0-1', overburden; 1'-4', sand; 4'-10', pebbly sand.
	4	1973	1-11	0-1	No	----	100	96	95	42	18	---	----	Test No. 4 was at southeast corner of field, about 480'S.35°W. of Test No. 3. Material was: 0-1', overburden; 1'-3', fine gravel; 3'-3.5' silt; 3.5'-11', sand with yellow stratum at 7'.

Belvidere 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						Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
						2"	1½"	¾"	#4	#100	#200			
	5	1973	2-11	0-2	No	----	----	----	100	5	2	----	Sand	Test No. 5 was near center of field, about 350'N.52°W. of Test No. 4. Material was: 0-2', overburden; 2'-7', sand; 7'-9', silty sand; 9'-11', sand.
	6	1973	0.5-11	0-0.5	Yes	----	----	----	100	20	6	----	Sand	Test No. 6 was in sag near east side of field, about 290' east of Test No. 5. Sag was old floor of overgrown pit. Material was: 0'-0'5 overburden; 0.5'-11', uniform tan sand.
22	1	1973	0.5-10	0-0.5	Yes	100	94	78	60	7	5	21.4%	Sand, Gravel	Owner: Amsden Brown Area was a small pit southeast of the junction of Vermont Routes 109 and 118. Pit was on flat, brush-covered land. Test No. 1 was in middle of east face of pit. Material was: 0'-0.5', overburden; 0.5'-3', fine gravel; 3'-8', pebbly sand or fine gravel; 8'-10', sand with pebbly layers.
	2	1973	1-11.5	0-1	Yes	----	100	98	96	26	8	----	Sand	Test No. 2 was in floor of pit, about 35'N.80°W. of Test No. 1. Material was: 0-1', not in place; 1'-4', uniform tan sand; 4'-7', pebbly sand; 7'-11.5', fine tan sand.

Belvidere Granular Data Sheet No. 23

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Over- burden (Ft)	Exist- ing Pit	Sieve Analysis % Passing						Abrasion AASHTO T-4-35	Passes VHD Spec.	Remarks
						2"	1½"	¾"	#4	#100	#200			
	3	1973	1-10	0-1	No	96	88	69	54	8	4	24.6%	Gravel	Test No. 3 was in field, about 500'S.50°W. of Test No. 2. Material was: 0-1', overburden; 1'-2', brown sand; 4.5'-6.5', medium-to fine gravel; 6.5'-7', sand; 7'-10', gravel.
23	1	1973	0.5-6	0-0.5	Yes	100	97	75	50	5	1	21.4%	Gravel	Owner: Mrs. Sylvia Brown Area was an inactive, depleted pit west of Vermont Route 118. Access road was about 0.35 mile north of Vermont Route 109 junction. Test No. 1 was in southwest face of pit. Material was: 0'-0.5', overburden; 0.5'-6', pebbly sand and fine gravel; bottom, bedrock.
	2	1973	0.5-12	0-0.5	Yes	100	97	68	49	16	10	34.0%	Gran. Borrow (Grav.)	Test No. 2 was in northwest face of upper diggings, about 270'S.60°W. of, and 25' above Test No. 1. Material was: 0-0.5', overburden; .5'-3', sand; 3'-5', cobbles; 5'-12', sand with fine gravel layers; bottom, sand.

Belvidere 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						Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
						2"	1½"	1"	#4	#100	#200			
24	1	1973	0.5-5	0-0.5	Yes	84	77	55	40	8	5	27.1%	Gran. Borrow (Grav.)	Owner: Raymond Howard Area is a small pit in a field east of Vermont Route 118 about 0.74 mile north of Vermont Route 109 junction. Test No. 1 was in north face of pit. Material was: 0'-0.5', overburden; 0.5'-2', sand; 2'-5', gravel; bottom, sand and stones.
	2	1973	1-5	0-1	Yes	93	88	77	63	3	2	----	Sand	Test No. 2 was in floor of pit at southeast corner of long field, about 20' south of Test No. 1. Material was: 0'-1', overburden; 1'-5', pebbly sand; bottom, gravel in water table.
25	1	1973	1-7	0-1	Yes	----	100	90	76	15	11	----	Sand	Owner: Raymond Howard Area is a low bank with some diggings about 0.05 mile west of Vermont route 118, access to which is 0.9 mile north of Town Highway No. 8 junction. Test No. 1 was in southeast face of bank on wooded knoll. Material was: 0'-1', overburden; 1'-7', very hard-packed, silty sand and pebbles; bottom, clay.

2. 4. 0

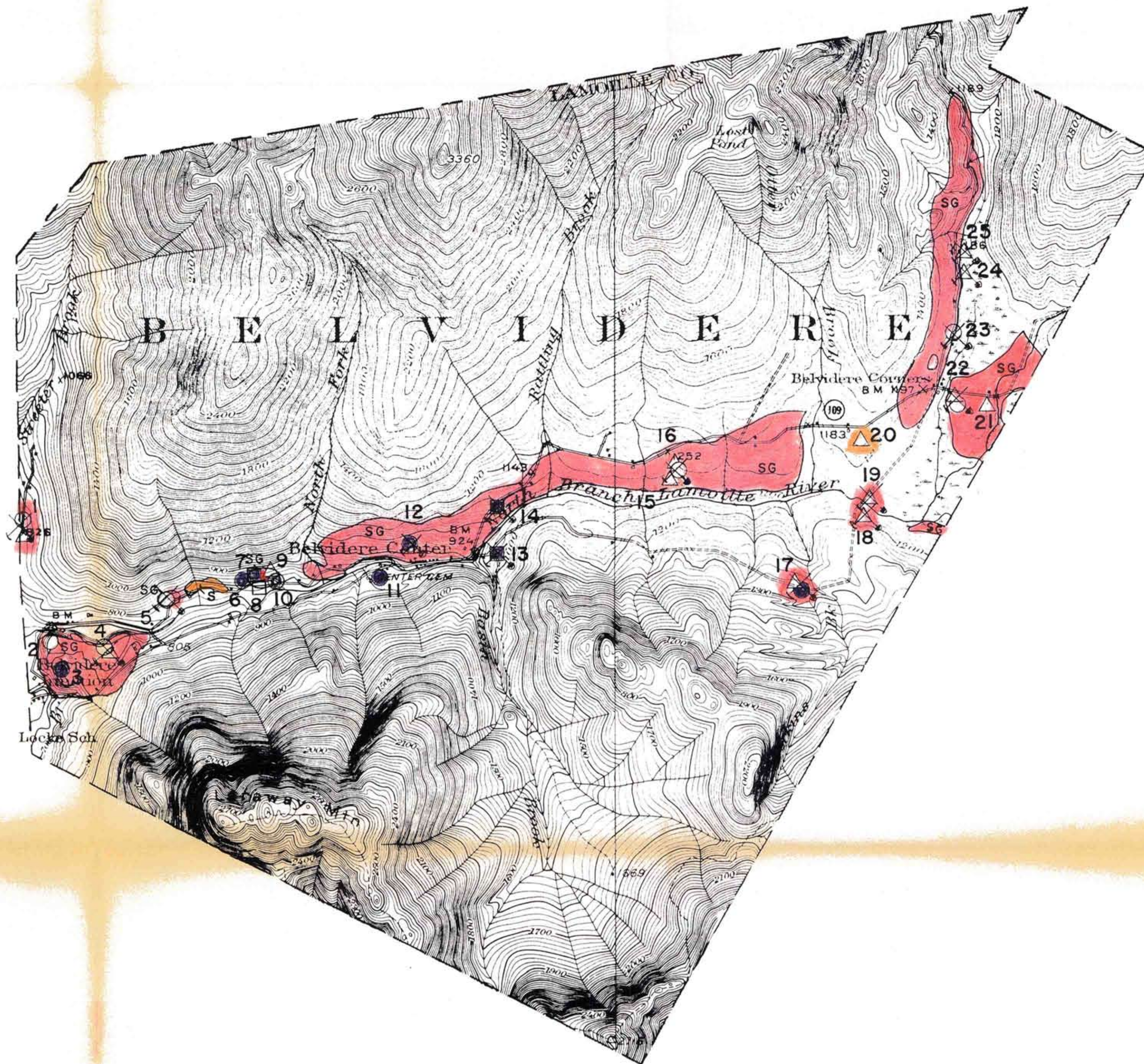
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TABLE I
SUPPLEMENT

BELVIDERE PROPERTY OWNERS - GRANULAR

MAP IDENTIFICATION NO.

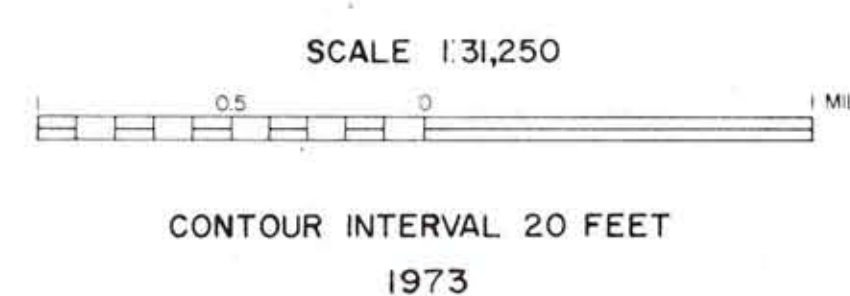
Atlas General Ind., Inc. (Plywood Division)	18
Belvidere, Town of	4
Bennett, Dallas	11
Berry, Ken	14
Brown, Amsden	22
Brown, Sylvia, Mrs.	23
Coburn, Wallace	1
Corse, Jack	17
Daudelin, Bernard	13
Donnelly-Erdman, R. H.	21
Howard, Raymond	24, 25
King, George	20
Lanpher, Clyde	5, 6, 7, 8, 9, 10
McCuin, Maurice B.	2, 3
Nolan, John	19
Schroeder, Mark	15
Tatro, Gerald	12
Wright, George G.	16



LEGEND

- GRAVEL, ACCEPTABLE FOR SEC. 704.05 (gravel for sub-base)
- GRAVEL, DEPLETED OR NOT ACCEPTABLE FOR SEC. 704.05
- △ SAND, ACCEPTABLE FOR SEC. 703.03 (sand borrow and cushion)
- ▲ SAND, DEPLETED OR NOT ACCEPTABLE FOR SEC. 703.03
- GRANULAR BORROW, SEC. 703.05
- MATERIAL NOT ACCEPTABLE FOR SEC. 703.05
- × EXISTING PIT
- SG SAND & GRAVEL DEPOSIT
- S SAND DEPOSIT
- 3 IDENTIFICATION NUMBER (refer to data sheets)

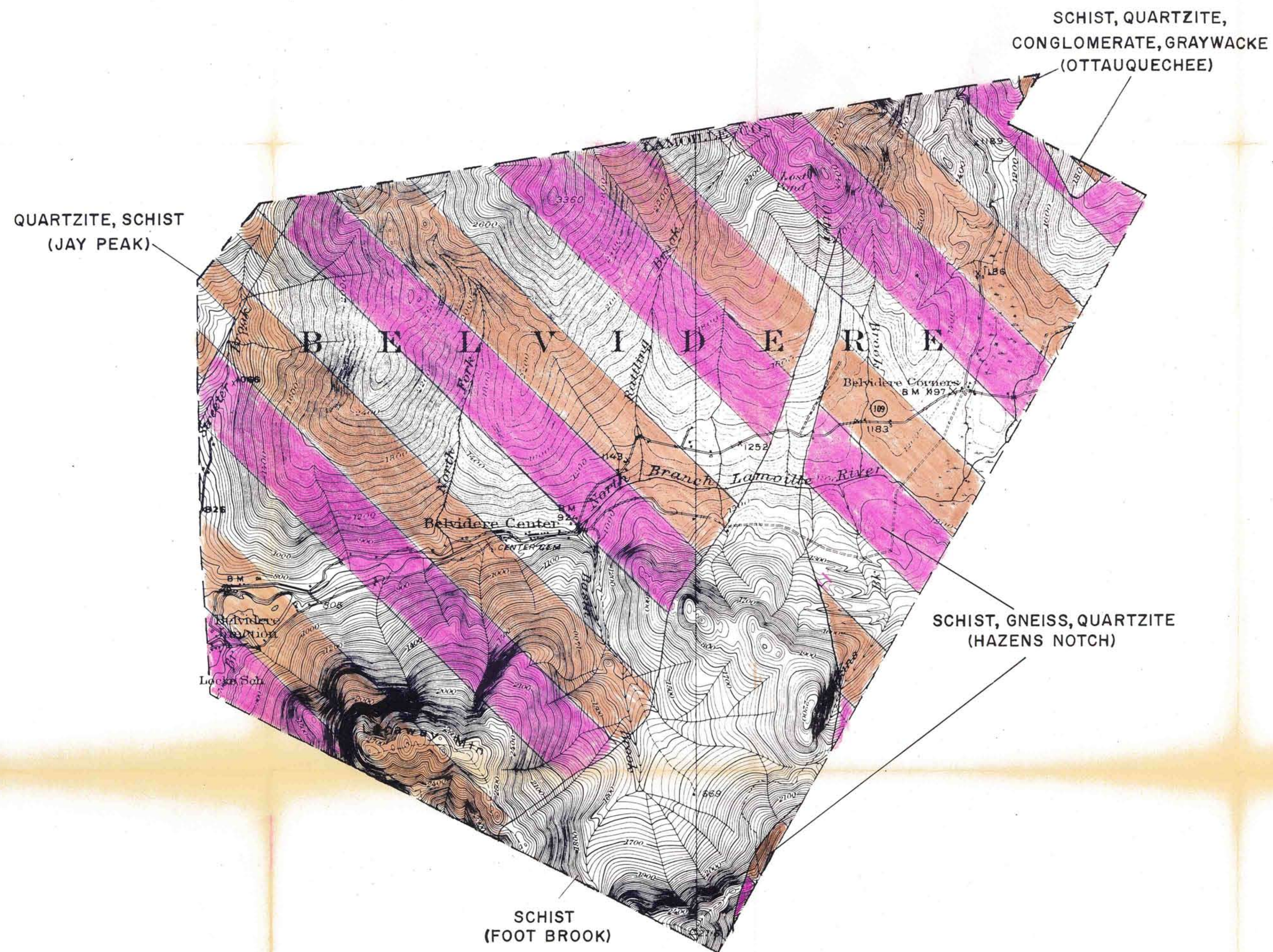
BELVIDERE



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

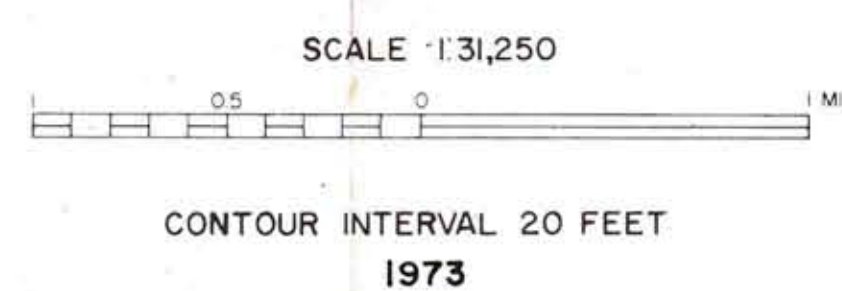
DATE					
BY					



LEGEND

- ROCK, ACCEPTABLE FOR SEC. 704.06 (crushed stone for sub-base)
- ROCK, NOT ACCEPTABLE FOR SEC. 704.06
- 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)

BELVIDERE



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						