SURVEY OF HIGHWAY CONSTRUCTION MATERIALS
IN THE TOWN OF PERU, BENNINGTON COUNTY, VERMONT

prepared by

Engineering Geology Section, Materials Division

Vermont Department of Highways

in cooperation with

United States Department of Transportation

Federal Highway Administration

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Acknowledgements

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

1. Various departments and individuals of the Vermont State Department of Highways, notably the Planning and Mapping Division and the Highway Testing Laboratory.

2. Professor D. P. Stewart of Miami University, Oxford, Ohio.

3. Professor C. G. Doll, Vermont State Geologist, University of Vermont, Burlington, Vermont.

4. United States Department of Commerce, Bureau of Public Roads.

History

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

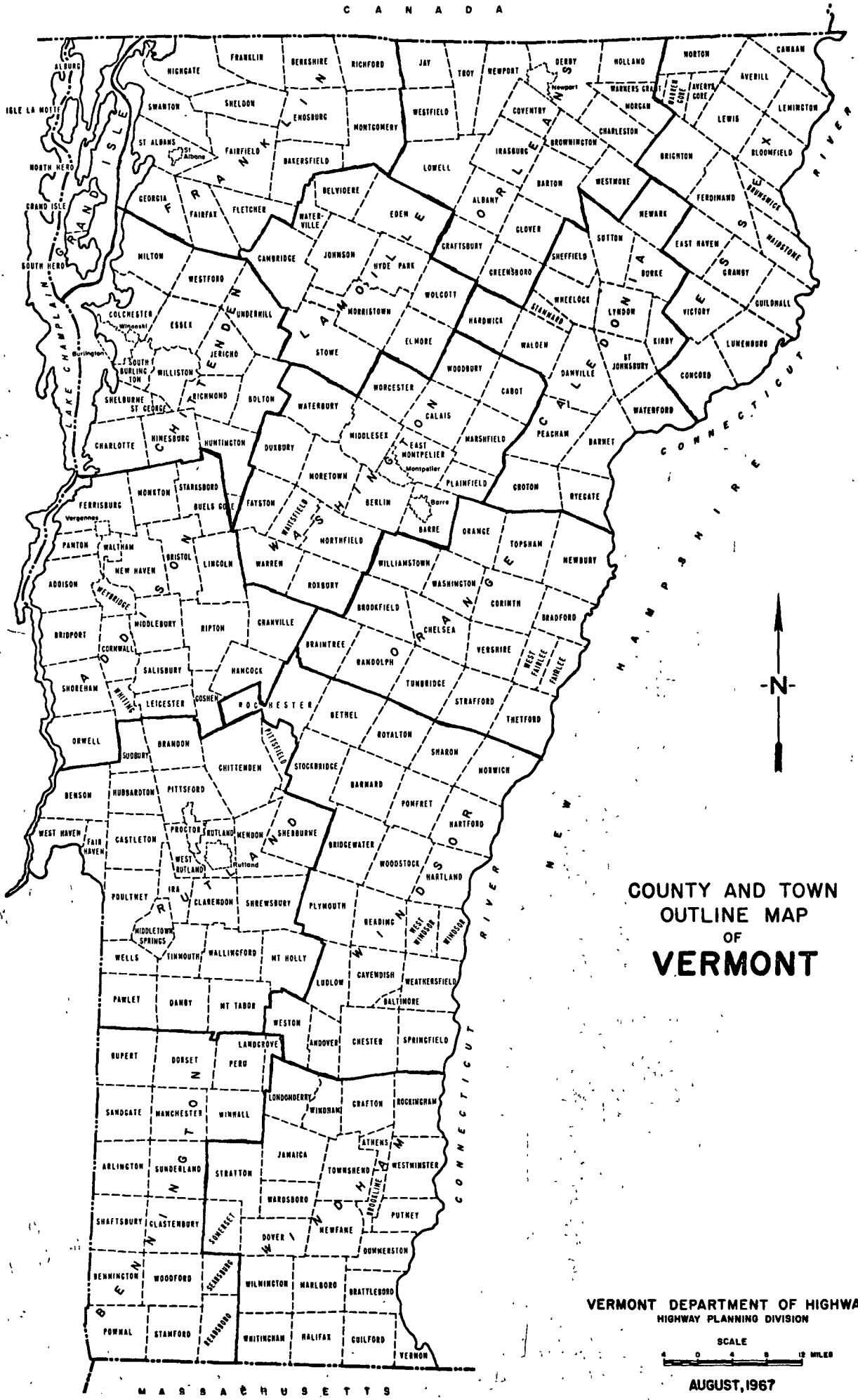
Also included in this folder are data sheets for both the Bedrock and Granular Materials Survey, which contain detailed information for each test conducted by the Project as well as information obtained from other sources, and including an active card file compiled by the Highway Testing Laboratory. 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 Peru is situated in the south-central part of Vermont at the northeast corner of Bennington County. Peru is bounded on the west by Dorset, on the northwest by Mount Tabor, on the north by Weston on the east by Landgrove and on the south by Winhall. (See County and Town Outline Map of Vermont on the following page.)

Peru lies within the Green Mountains physiographic region that is characterized by rugged, steep-sided mountains which form the backbone of the topography of Vermont. Elevations range from 3429 feet at Peru Peak to less than 1360 feet at the point where Flood Brook crosses the Landgrove Town Line. Several other brooks including Flood, Burnt Meadow and Cook are tributary to the West River east of Peru; whereas Mad Tom Brook drains southwestward to the Batten Kill River near East Dorset.



COUNTY AND TOWN OUTLINE MAP OF VERMONT

VERMONT DEPARTMENT OF HIGHWAYS
HIGHWAY PLANNING DIVISION

SCALE
4 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 obsolescense 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. See the Summary of Rock Formations included in this report. Occasionally rocks belonging to the same formation with similar characteristics (i.e., color, texture, etc.) may produce different abrasion results owing to variance in chemical compostion and other physical properties. Therefore in no case should satisfactory test results of a formation in one area be interpreted to qualify that formation as a satisfactory source wherever it occurs.

Rock in the town of Peru consists entirely of metamorphics, Lower Cambrian and older. Because of extensive glacial till and forest cover in that part of Peru reached by the existing road network few possible sites for quarries were found. However, two places were tested in the southeast corner of the township which gave satisfactory results. These areas are within the Mount Holly gneiss complex. The Dalton formation and the Cheshire quartzite, rocks of which have been proven good sources of Item 704.06 (Crushed Stone for Sub-base) were not accessible.

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 (AASHO T-4), and the Los Angeles Method (AASHO T-96).

DISCUSSION OF SAND AND GRAVEL DEPOSITS

Glaciofluval depositional features within the town of Peru consist mainly of kame moraine remnants and a small outwash deposit enclosed by kame moraine. These are lobately shaped features in aerial outline and extend across the eastern (Landgrove) town line.

Materials of other than Granular Borrow specifications (Item 703.05) are extremely limited both as to quality and extent. Only at Map Identification No. 4 was material acceptable for Sand Borrow and Cushion (Item 703.03) encountered. Gravel for Sub-base (Item 704.05) was encountered at Map Identification Nos. 5, 9, 10, and 11 but, except for very limited quantities, further sampling with a back-hoe would be needed.

SUMMARY OF ROCK FORMATIONS IN THE TOWN OF PERU

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; 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 gneiss oid granitic rock.

Mount Holly Complex: Micaceous quartzite and quartz-mica schist locally in massive beds as much as 30 feet thick. Garnets or pseudomorphs (largely chlorite) after garnet are common. Schists are locally rusty-weathered and contain graphite.

GLOSSARY OF SELECTED GEOLOGIC TERMS

Dip - The angle which a stratum, sheet, vein, fissure or similar geological feature makes with a horizontal plane.

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

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.

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

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

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

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

Pegmatite - A vein-, plug-, dike-like, or irregular igneous body associated with large intrusives of similar composition. It is charcterized by large average grain size, interlocking texture, and unusually great range in grain size.

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

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.

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

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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 July, 1971.

DIVISION 700 - MATERIALS

Section 703, Soils and Borrow Materials

703.03 Sand Borrow and Cushion

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

Table 703.03A - Gradation Requirements

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

703.05 Granular Borrow

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

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

Table 703.05A - Gradation Requirements

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

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

Section 704, Aggregate

704.05 Gravel for Sub-base

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

(a) Grading
The gravel shall meet the requirements of the following table:

Table 704.05A - Gradation Requirements

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

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

(b) Percent of Wear
The percent of wear of the gravel shall be not more than 25 when tested in accordance with AASHO T 4, or more than 40 when tested in accordance with AASHO T 96.

704.06 Crushed Stone for Sub-base

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

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

(b) Grading
This material shall meet the requirements of the following table:

Table 704.06A - Gradation Requirements

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

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

(d) Thin and Elongated Pieces
Not more than 30 percent, by weight, of thin and elongated peices will be permitted.
Thin and elongated pieces will be determined on the material coarser than the No. 4 sieve.

(e) Filler

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

(f) Leveling Material

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

This material shall meet the requirements of the following table:

Table 704.06B - Gradation Requirements

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

704.07 Grushed 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
	4"	100	
Coarse	No. 4	25- 50	100
	No. 100		0- 20
	No. 200		0- 12
	2"	100	
	1½"	90-100	
Fine	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 AASHO T 4, or the crushed gravel a percent of wear of not more than 35 when tested in accordance with AASHO 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 AASHO T 3, or the crushed stone a percent of wear of not more than 40 when tested in accordance with AASHO 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

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 AASHO T-4-35	Passes VHD Spec.	Remarks
						2"	1½"	½"	#4	#100	#200			
1	1	1971	1-7.5	0-1	yes	74	62	--	34	28.8	11	20.5	Gran. Borrow (grav.)	Owner: Karl Pfeister. Area contains inactive, nearly depleted pit between Utley Brook and Danby Truck Trail No. 10 at point 0.25 mile from T.H. No. 6. There is about 225' of northward extension between a pond and the brook. The pit, possible extension as well as the surrounding countryside are generally covered with trees and brush. A hand sample of the 12' north face of the pit tested as follows: Test #1, 1.0'-3.0', bouldery gravel; 3.0'-7.5', hard-packed fairly well graded gravel with a few cobbles
2	1	1971	0-5.0	----	Yes	--	89	81	71	9	5	------	Gran. Borrow (Sand)	Owner: U.S. Forest Service. Area consists of an inactive nearly depleted pit 0.6 mile northwest of the end of T.H.No.9. There is no extension and thick forest covers the area. Pit contains two levels, both of which were boulder strewn. Test # 1 was at the southeast end of the pit of a low face and 2' into the floor. Material is: 0-5.5', fairly uniform, stony medium coarse sand.

GRANULAR DATA SHEET NO. 2

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Over-burden (Ft)	Exist-ing Pit	Sieve Analysis % Passing 2"	1½"	½"	#4	#100	#200	Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
	2	1971	0.5-2'	0-0.5	Yes	----Not		Tested-		-----	-----	---------	--------	Test # 2 was dug into the upper floor 60' from the south-west face. A thin layer of strat-ified medium sand was encountered but not tested. Silty clay and boulders underlie the sand at 2' depth.
3	1	1971	1-15	0-1	Yes		84	64	55	32	15	------	Gran. Borrow (Grav.)	Owner: U.S. Forest Service. Area consists of an inactive pit south and near the end of T.H. No.9 with about 100' extension to the NORTHWEST. Area is over-grown with forest and brush. Pit floor is inaccessible because access road has bulldozed stumps and boulders blocking vehicular traffic. Test # 1 was in upper north-west pit face. Material is: 1'-4', pebbly sand; 4'-5', gravel; 5-6', pebbly sand, 6-12', fine sand w. silt; 12-15', sand w. stones.
4	1	1971	2-10	0-2	Yes	74	70	---	35	---	9	88%	Gran. Borrow (Grav.)	Owner: Dr. Joseph Farnum estate. Area consists of a pit in thick woods north of T.H. #9 at point 0.36 mile west of T.H. # 4. There is the possibility of 140' exten-sion to the north.

Peru 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 2"	1½"	½"	#4	#100	#200	Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
														Test # 1 was in northwest face of pit, 135' from its east end. Material is: 2'-4.5', poorly bedded silty gravel; 4.5'-10' fine gravel with cobbles and boulders Bottom is fine sand.
	2	1971	2-8	0-2	Yes			99	93	22	12	------	Sand	Test # 2 was in 9 foot northeast pit face at east end. Material is: 2'-6' medium and pebbly sand; 6'-8', fine sand. Bottom is fine sand.
	3	1971	0.5-8	0-0.5	Yes	--	--	--	100	58	31	-----	sand	Test #3 was in upper floor at southwest corner of pit. Material is: 0.5--8', fine brown sand with a pocket of pebbly sand and a silt seam. Bottom is silt.
	4a	1971	0-5.8	0.0.5	Yes	---	--	95	89	23	10	------	Sand	Test # 4a was in upper northwest face. Material is 0.5-8', interbedded silty, very fine and medium to coarse sand.
	4b	1971	8-20	--	Yes	68	57	37	28	15	11	20.3%	Gran. Borrow (Grav.)	Test # 4b was below test # 4a and in floor below face. Material is: 8'-16', gravelly sand with pockets of cobbles or pebbles; 16-20', sandy cobbly gravel. Bottom is nested boulders and cobbles.

PERU GRANULAR DATA SHEET NO.4

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Over-burden (Ft)	Exist-ing Pit	Sieve Analysis % Passing 2"	1½"	½"	#4	#100	#200	Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
5	1	1971	1.5-7.5	0-1.5	No	62	--	58	57	--	15	-----	Gran. Borrow	Owner: U.S. Forest Service Area is a southwest trending ridge on S.A. No. 1 near National Forest Highway access to Hapgood Pond. Access to this ridge is next to a town of Peru stockpiling location 0.8 mile north of T.H.# 16 intersection with S.A. No.1. Access to the heavily wooded ridge is via woods road. Best location for a pit would be 350' southwest of S. A. No.1. Test # 1 was at east end of ridge next to stockpiling. Material is : 1.5-2.5, tan sandy gravel 2.5-7.5, fine sand. Bottom is fine sand.
	2	1971	2-8	0-2	No	60	49	37	32	--	8	16.2%	Gravel	Test # 2 was north of woods road at point 380' southwest of Test # 1. Material is : 2'-8', fine reddish gravel with bottom in same.
	1	1971	---	---	Yes	--NOT TESTED--								Owner: Eugene Rostow Area consists of an inactive pit on a partially wooded hillside north of Town Highway No. 15. It is reached by a woods road 0.85 mile west of State Aid Highway No. 1. Test # 1 in the upper northeast pit face revealed boulders too

PERU 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"	½"	#4	#100	#200			
														numerous for a representative sample in addition to cobbles, silt and pebbles.
	2	1971	0.5-7	0-0.5	Yes	68	58	46	25	19	13	12.4%	Gran. Borrow (Grav.)	Test # 2 in the northwest pit face above the lower level revealed material as follows: 0.5'-7', silty sand and stones, including a few cobbles and boulders.
7	1	1971	1-5	0-1	Yes	67	50	33	21	18	13	21.6%	Gran. Borrow (Grav.)	Owner: Eugene Rostow. Area consists of an inactive previously tested but undeveloped pit in the woods 0.12 miles north of Town Highway No. 15. It is reached by a woods road 0.39 mile west of State Aid Highway No. 1. Test # 1 was in a low bank on the south side of southward sloping hillside. Material is : 1'-5', hard packed, silty gravel with cobbles that becomes finer below 5'.
	2	1971	0.5-3.5	0.-0.5	Yes	----	----	--NOT	-------	-TESTED	----	----	----	Test # 2 was located 45' east of Test # 1 in south side of old pit area. Material is: 0.5-3.5', brown gravely sand. Bottom is silt and stones.

PERU GRANULAR DATA SHEET NO. 6

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"	½"	#4	#100	#200			
	3	1971	0.5-7	0-0.5	Yes	54	39	27	20	17	11	16.2	Gran. Borrow (Grav)	Test # 3 was in the southwest side of area northwest and above Tests #1 and #2. Material is: 0.5-5', cobbly gravel with boulders 5'-7', cobbly gravel. Water was encountered at 7' and hole bottomed in till.
8	1	1971	0.5-5	0-0.5	Yes	54	39	26	21	14	9	17.1	Gran. Borrow (Grav.)	Owner: James Wheeler Area consists of an inactive pit north of Farnum Brook and 0.05 mile west of Town Highway No. 14. Pit is brush-covered with no extension into surrounding woodland possible. Test # 1 was in west end of pitfloor. Material is: 0.5-5'+, boulders and cobbles with minor gravel. Water was encountered at 3.5'.
9	1a	1971	0-8	---	Yes	65	55	43	35	16	8	20.5	Gravel	Owner: Mrs. Eleanor Baldwin Area is an inactive pit northeast of pond near Peru village. Test # 1a was in upper northwest pit face. Material is 0-3', hard-packed fine sand, stones; 3'-5', sand; 5'-8', fine gravel.
	1b	1971	8-14	---	Yes	--	---	97	96	52	20	-------	------	Test 1b was in lower northwest pit face. Material is 8'-14', fine sand with a boulder that became moist and pebbly at 14'.

PERU GRANULAR DATA SHEET NO. 7

Map Ident. No.	Field Test No.	Year Field Tested	Depth of Sample (Ft)	Over-burden (Ft)	Exist-ing Pit	Sieve Analysis % Passing						Abrasion AASHO T-4-35	Passes VHD Spec.	Remarks
						2"	1½"	½"	#4	#100	#200			
10	1A	1971	1-12	0-1	Yes	72	58	43	34	9	6	13.1%	Gravel	Owner: Charles H. Grant Area is a pit reached by private road about 0.75 mile north of Vermont Route 11 near the Landgrove Town Line. Development as a materials source would be limited by proximity to a housing development currently in progress Test #1a was in the upper west pit face. Material is: 1'-8', slumped beds of fine and cobbly gravel; 8'-12', coarse, silt-coated sand with pebbles.
	1B	1971	12-18	-----	Yes	55	-----	30	23	15	11	------	Gran. Borrow (Grav.)	Test 1b was in the lower west pit face. Material is sandy gravel.
11	1	1971	1-9	0-1	Yes	65	65	52	43	10	4	12.4%	Gravel	Owner: Town of Peru. Area is pit at south end of town dump about 0.45 mile south of Vermont Route 11. Test#1 was in North center of west pit face. Material is: 0.5-2.5', fine sand with pebbles; 2.5-9' gravelly sand and gravel with cobbles.
	2	1971	2-8	0-2	Yes	60	51	40	32	15	9	22.8%	Gran. Borrow (Grav.)	Test #2 was in south pit face at north end of west extension. Material is: 2'-8', gravel with boulders and cobbles.

PERU GRANULAR DATA SHEET NO. 8

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"	½"	#4	#100	#200			
,	3	1971	2.5-6.5	0-2.5	Yes	----	----	Not		Tested-	----	----	----	Test#3 was dug by back-hoe 50' southwest of Test #1 in possible extension. Material is: 2.5-5', silty sand; 5'-6.5', gravel. Bottom is boulders or bedrock and water was present at 6.5'.

TABLE I
Supplement

Peru Property Owners - Granular	Map Ident. No.
Baldwin, Eleanor L. Mrs.	9
Farnum, Dr. Joseph, estate	4
Grant, Charles H.	10
Peru, Town of	11
Pfeister, Karl	1
Rostow, Eugene	6,7
U.S. National Forest	2,3,5
Wheeler, James	8

PERU ROCK DATA SHEET NO. 1

Ident. No.	Field Test No.	Year Field Tested	Rock Type	Existing Quarry	Method of Sampling	Abrasion AASHO T-3	Remarks
1	1	1971	Gneiss	No	Chip	4.0%	Owner: Trask and Waite, Realtors, Inc. Mount Holly gneiss outcrops on a gentle slope west of road into the Beechwood Development Area south of Vermont Route 11. Rock appears to be a gray to green amphibole gneiss. Beds dip westward at an angle of about 32°. Exposures vary from schistose to granitic in texture and very soft to hard, particularly in the quartzitic zones. Test #1 was alona a 120' Traverse N 80°W from a point 120' west of the road, and at right angles to the strike of the bedding. AASHO-T-96 is 31.8%
2	1	1971	Gneiss	No	Chip	2.8%	Owner: Trask and Waite, Realtors, Inc. Mount Holly gneiss is exposed for about 350' along a blasted cut on the east side of a road in Beechwood Development Area south of Vermont Route 11. Rock is dark to light, very slightly greenish-gray, biotite-quartz-feldspar gneiss with occasional pegmatite zones. Gneissoid bedding dips morthward at an angle of 60°. Rock is fairly blocky with an intersecting joint set. Test #1 was of both blasted and in place material from a point 70' North of the south end of the exposure for 100' Northwards. AASHO-T-96 is 28.0%.
	2	1971	gneiss	No	Chip	4.3%	Test #2 continued northwards for an additional 100'. AASHO-T-96 is 31.2%.

TABLE II
Supplement

Peru Property Owners - Rock	Map Ident. No.
Trask and Waite, Realtors	1,2