CONSTRUCTION MATERIALS INVENTORY

SHAWNEE COUNTY, KANSAS

STATE HIGHWAY COMMISSION OF KANSAS
CONSTRUCTION MATERIALS INVENTORY
OF
SHAWNEE COUNTY, KANSAS

by

George E. Petersen, Geologist
assisted by
Jim Riordan and Maurice Cummings,
Remote Sensing Section

Prepared in Cooperation with the
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Federal Highway Administration

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Construction Materials Inventory Report No. 26
This report was compiled for use as a guide when prospecting for construction material in Shawnee County.

Construction material includes all granular material, consolidated rock, and mineral filler suitable for use in highway construction.

Known open sites, prospective sites, both sampled and unsampled, and all geologic units considered to be a source of construction material are described and mapped.

Prospective sites are select geologic locations where construction materials may be found.

The diagram opposite shows how the MATERIALS INVENTORY SECTION may be used to evaluate and locate mapped sites.

The individually mapped sites certainly do not constitute the total construction material resources of the county. And, the data outlined in the diagram may be used for purposes other than the evaluation and location of these sites.

Beginning on Page 4 is a section explaining the geology of the county. This information (along with the maps, descriptions, and test data) provides the means of evaluating and locating additional construction material sources in the geologic units throughout Shawnee County.
TO LOCATE AND EVALUATE
A MAPPED SITE OF CONSTRUCTION MATERIAL IN SHAWNEE COUNTY

TURN TO THE MATERIAL INVENTORY SECTION
See
TABULATION OF CONSTRUCTION MATERIALS
Figure 7. Page 13

For material
BY TYPE
USE COLUMN 1

For Quality
Data
See Figure 14
Page 23

for material
BY INTENDED USE
USE COLUMN 2

for DESCRIPTION of material
Column 3 gives page of DETERMINATION which includes engineering characteristics, approximate locations, and references to materials map.

for AVAILABILITY of material
Column 4 gives relative amounts available, general location, and references to materials map.

MATERIALS MAP
SEE PINK SHEET, PAGE 25
Material source units, as well as all open sites, are mapped. Each site is referenced to an individual data form.

SITE DATA FORMS
OPEN SITES; SAMPLED GREEN SHEET, PAGE 28
OPEN SITES; NOT SAMPLED GREEN SHEET, PAGE 76
Each site data form includes a map for site location and provides information concerning landownership, material quality (if available), geologic age, and site accessibility.
This report is one of a series compiled for the Highway Planning and Research Program, "Materials Inventory by Photo Interpretation". The program is a cooperative effort of the Federal Highway Administration and the State Highway Commission of Kansas, financed by highway planning and research funds. The objective of the project is to provide a statewide inventory of construction materials, on a county basis, to help meet the demands of present and future construction needs.

Publications issued by the State Geological Survey of Kansas, the U.S. Geological Survey, and U.S.D.A. Soil Conservation Service, concerning Shawnee and surrounding counties, provided the basic geologic information used in this investigation. Detailed geologic and soil data were obtained from soil surveys and centerline geologic profiles prepared for design of major highways in the county by the State Highway Commission.

Appreciation is extended to Mr. H. F. Foley, Shawnee County Engineer, and John Griffith, First Division Materials Engineer, for verbal information concerning construction materials discussed in this report, and to the project leader, R. R. Biege, Jr., P.E., Engineer of Location and Design Concepts, and A. H. Stallard, Chief of the Remote Sensing Section.

Fig. 1 Index map of Kansas showing the location of Shawnee County along with the report numbers and location of counties for which reports have been or are being completed.
Shawnee County is located in northeastern Kansas, and lies in the Central Lowlands Physiographic Province. The topography is gently rolling in the uplands with steep slopes being prominent along major river valleys.

Sources of construction material in Shawnee County are limited to the thicker limestone beds of Pennsylvanian age, siliceous sand and gravel from the Kansas River valley, and a very limited amount of sand and gravel derived from Glacial Drift.

Sedimentary rocks of the Shawnee and Wabaunsee Groups of the late Pennsylvanian age are exposed in the eastern half of Shawnee County while sedimentary rocks of the Admire and Council Grove Groups of early Permian age cropout in western Shawnee County. Limestones of economic value as construction material are the Plattsmouth, Oread, Deer Creek, and Topeka Limestones of the Shawnee Group, and the Burlingame, Wakarusa, and Tarkio Limestones of the Wabaunsee Group. The quality and quantity of these units vary from one area of the county to another and quality tests should be run before use from a new location. Scattered deposits of chert gravel of pre-Kansas age occur in the area but are too small to be of economic value as construction material. River sands are being produced from the Kansas River; however, additional fines of minus 200 mesh size must be blended to meet specifications for concrete and bituminous aggregate.

Excellent water supplies of high quality are available from the Kansas River alluvium; however, the quality and quantity decrease in the Wakarusa River valley and its tributaries and only domestic water supplies are available in upland areas.
Scale in miles

Figure 8. Drainage and major transportation facilities in Shawnee County.
FACTS ABOUT SHAWNEE COUNTY

Shawnee County has an area of 545 square miles and a population of 171,999 as of January 1, 1972, according to the Kansas State Board of Agriculture. It lies in the Central Lowlands Physiographic Province. The elevations above sea level vary from 1,260 feet in the southwestern part of the county to 835 feet where the Kansas River leaves the county on the east.

A primary road system connects all major communities, and a well-developed secondary road system provides access to all small communities. Figure 2 illustrates major drainage and transportation facilities in the county.

METHODS OF INVESTIGATION

Investigation and preparation of this report consisted of three phases: (1) research and review of available information, (2) photo interpretation, and (3) field reconnaissance.

During phase one, relevant information concerning geology, soils, and construction materials of the county was reviewed and the general geology determined. Quality-test results of samples taken in Shawnee County were then correlated with the various geologic units and unconsolidated deposits.

Phase two consisted of study and interpretation of aerial photographs taken by the Kansas Highway Commission at a scale of one inch equals 2000 feet. Figure 3 illustrates aerial photographic coverage of Shawnee County. Geologic source beds and all open materials sites were mapped and classified on aerial photographs. These materials sites were then correlated with the geology of the county.

Phase three was conducted after initial study of aerial photographs. A field reconnaissance was conducted by the author to examine construction materials, to verify doubtful mapping situations, and to acquire supplemental geologic information. Geologic classifications of open sites were confirmed, and prospective sites were observed.
Figure 8. AERIAL PHOTOGRAPHIC COVERAGE MAP for Shawnee County. The numbers refer to photographs taken by the Photogrammetry Section, State Highway Commission of Kansas, on 4-10-59 at a scale of $\frac{1}{1000}$. Aerial photographs are on file in the Photogrammetry Laboratory, State Office Building, Topeka, Kansas.
GEOLGY is the basis for this materials inventory. Knowledge of the geology makes it possible to: (1) ascertain the general properties of the material source, (2) identify and classify each source according to current geologic nomenclature, and (3) establish a uniform system of material-source-bed classification. By knowing the geologic age, origin, landform, and quality information of the source units, one can derive general information for untintent materials sites and prospective locations.

It is important to note that the quality of material from a given source may vary from one location to another, especially in unconsolidated deposits.

This discussion is based primarily on information obtained from The United States Geological Survey Bulletin 1215, "Geology of Shawnee County, Kansas," by William D. Johnson, W. L. Ankrum, and H. C. Wagner. The geologic timetable, figure 4, shows in graphic form the major time periods and the approximate duration of each. Figure 8 illustrates the surface geology and stratigraphic position of each material source unit in Shawnee County.

Exposed sedimentary rocks range in age from late Cambrian to late Pennsylvanian and vary in thickness from 2700 feet in the eastern part of the county to 3300 feet in the western part. Marine deposits of late Pennsylvanian and early Permian age are the oldest rocks exposed in Shawnee County. Limestones of the Shawnee and Wabasso Groups of late Pennsylvanian age are the most abundant and important materials source units in the county.

The Pleistocene Epoch of the Quaternary Period was a period of repeated glacial and interglacial cycles. These glacial activities reached their southernmost terminus along the Wakanusa River in southeastern Shawnee County.

The Nebraskan, Kansan, Illinoian, and Wisconsinan ages represent major glacial advances of which only the Kansan actually reached into Shawnee County. The Arizanian, Yarmouthian and Sangamonian Stages are periods of major glacial retreats. Glacial drift, glaciolacustrine and glacioluvial deposits were laid down during this time. Alluvium of the Kansas and Wakanusa rivers in Shawnee County is composed of silt, sand, and gravel of late Wisconsinan and Recent age. Other unconsolidated sand and gravel deposits of Quaternary age are represented by the Menoken, Buck Creek, and Newman terraces; however, because of the difficulties in identification, the Menoken and a large portion of the Buck Creek terrace, has not been mapped. These are of limited value as a source of construction material. The Newman has been mapped where recognizable and could become a potential future source of sand and gravel.
<table>
<thead>
<tr>
<th>PERIODS</th>
<th>ESTIMATED LENGTH IN YEARS</th>
<th>TYPE OF ROCK IN KANSAS</th>
<th>PRINCIPAL MINERAL RESOURCES</th>
</tr>
</thead>
<tbody>
<tr>
<td>QUATERNARY (PLEISTOCENE)</td>
<td>1,000,000</td>
<td>Glacial drift; river silt, sand, and gravel; dune sand; wind-blown silt (loess); volcanic ash.</td>
<td>Sand and gravel; volcanic ash; agricultural soils; water.</td>
</tr>
<tr>
<td>TERTIARY</td>
<td>59,000,000</td>
<td>Silt, sand, and gravel; fresh-water limestone; volcanic ash; basalt, diorite, marl, opaline sandstone.</td>
<td>Sand and gravel; volcanic ash; diatomaceous sand; water.</td>
</tr>
<tr>
<td>CRETACEOUS</td>
<td>79,000,000</td>
<td>Chalky shale; dark shale; varicolored clay; sandstone; conglomerate; outcropping igneous rock.</td>
<td>Concrete and bituminous aggregate, light type surfacing, shoulder and subgrade material, riprap, and building stone; ceramic materials; water.</td>
</tr>
<tr>
<td>JURASSIC</td>
<td>29,000,000</td>
<td>Sandstone and shale, chiefly subsurface.</td>
<td>Concrete and bituminous aggregate, light type surfacing, shoulder and subgrade material; riprap, and building stone; natural gas, salt, gypsum, water.</td>
</tr>
<tr>
<td>TRIASSIC</td>
<td>30,000,000</td>
<td>Pervian</td>
<td>Concrete and bituminous aggregate, light type surfacing, shoulder and subgrade material; riprap, and building stone; ceramic materials; oil, coal, gas, and water.</td>
</tr>
<tr>
<td>PENNSYLVANIAN</td>
<td>23,000,000</td>
<td>Limestone, shale, evaporites (salt, gypsum, naphthalene); red sandstone and siltstone, chert, and some dolomite.</td>
<td>Chat and other construction materials; oil, zinc, lead, and gas.</td>
</tr>
<tr>
<td>MISSISSIPPIAN</td>
<td>30,000,000</td>
<td>Mostly limestone, predominantly cherty.</td>
<td></td>
</tr>
<tr>
<td>DEVONIAN</td>
<td>55,000,000</td>
<td>Subsurface only. Limestone and black shale.</td>
<td>Oil.</td>
</tr>
<tr>
<td>SILURIAN</td>
<td>40,000,000</td>
<td>Subsurface only. Limestone and black shale.</td>
<td>Oil.</td>
</tr>
<tr>
<td>ORDOVICAN</td>
<td>80,000,000</td>
<td>Subsurface only. Limestone, dolomite, sandstone, and shale.</td>
<td>Oil, gas, and water.</td>
</tr>
<tr>
<td>CARBONIAN</td>
<td>80,000,000</td>
<td>Subsurface only. Dolomite and sandstone.</td>
<td>Oil.</td>
</tr>
<tr>
<td>MISSOURI PROTERZOIC AND HYNDEANIC (RHYOLITE)</td>
<td>1,000,000,000</td>
<td>Subsurface only. Granite, other igneous rocks, and metasedimentary rocks.</td>
<td>Oil and gas.</td>
</tr>
</tbody>
</table>

Figure 4. Geologic timetable. 6
<table>
<thead>
<tr>
<th>Strata</th>
<th>Series</th>
<th>Group</th>
<th>Simple Rocks</th>
<th>Fossils and Minerals</th>
<th>No. Speci</th>
<th>Texture</th>
<th>General Description</th>
<th>Construction Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>sandstone</td>
<td>Quartzite Series</td>
<td>Complex Schist</td>
<td>Quartzite</td>
<td>-</td>
<td>I-35 I-11</td>
<td>Fine-grained, massive</td>
<td>Quartzite, and similar sedimentary rocks.</td>
<td>Light type cutting.</td>
</tr>
<tr>
<td>limestone</td>
<td>Limestone Series</td>
<td>Complex Schist</td>
<td>Limestone</td>
<td>-</td>
<td>I-35 I-11</td>
<td>Fine-grained, foliated</td>
<td>Limestone, and similar sedimentary rocks.</td>
<td>Light type cutting.</td>
</tr>
</tbody>
</table>

Figure 5. Generalized geologic column of the surface geology in Shawnee County.
<table>
<thead>
<tr>
<th>Period</th>
<th>Epoch</th>
<th>Age</th>
<th>Estimated length of age duration in years</th>
<th>Estimated time in years elapsed to present</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quaternary</td>
<td>Pleistocene</td>
<td>Recent</td>
<td></td>
<td>10,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wisconsin Glacial</td>
<td>45,000</td>
<td>55,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sangamonian Interglacial</td>
<td>125,000</td>
<td>190,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Illinoian Glacial</td>
<td>100,000</td>
<td>290,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Terminal Interglacial</td>
<td>310,000</td>
<td>600,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Kansas Glacial</td>
<td>100,000</td>
<td>700,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Aftonian Interglacial</td>
<td>200,000</td>
<td>900,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Nebraskan Glacial</td>
<td>100,100</td>
<td>1,000,000</td>
</tr>
</tbody>
</table>

*Figure 6. Geologic Timetable of the Quaternary Period.*

**GEO-ENGINEERING**

This section provides a general appraisal of the geo-engineering problems that may be encountered in Shawnee County during highway construction. Potential ground-water problems and the quality of water available for concrete are briefly reviewed along with engineering soil types present in the area. Detailed field investigations may be necessary to ascertain the severity of specific problems and to make recommendations in design and construction procedures.

Because of the diversification of Shawnee County geology, the nature of geo-engineering problems varies considerably from one part of the county to another.

The area north of the Kansas River flood plain in Shawnee County is characterized by alluvial filled valleys, interbedded limestone and shale beds of moderate thickness and glacial drift of varying thickness capping the higher elevations. Moderate cuts...
and fills will be required for construction in northern Shawnee County. Most cuts will be common excavation except in valley walls along major drainage channels where limestone beds will be encountered. In areas where cuts may encounter the White Cloud Shale, excess swelling may occur due to the high montmorillonite content. Large quartzite boulders may be encountered in the area along with isolated sand and gravel lenses in the glacial deposits. Ground water may be encountered along the base of many of the limestones in this area as well as in any lenses of sand and gravel which might occur in the glacial deposits. Most of the soils in this area are derived from glacial drift and are composed of silty clay, clay loam, and in severe cases clay. Most soil material is an A-6 or A-7 type of soil according to AASHO classification. Water is limited in both quality and quantity in this area although there is usually sufficient water available for domestic and stock usage.

The Kansas River valley is composed of relatively flat terrace deposits of Pleistocene age. The surface material is generally composed of clay, silt, and fine sand with granular material being prominent in the lower part of the alluvium. All excavation will be in common material and will generally encounter soils of A-6 or A-7 according to A.A.S.H.O. classification; however, better quality soil may be encountered in many areas. Soils of high organic content may be found in many old meander scars. Water problems will be minimal unless very deep excavation dips below the water table in the alluvium; however, poorly drained soils and perched water may be encountered in the Newman Terrane.

Southeastern Shawnee County (the area east of highway 75 and south of the Kansas River) is characterized by alluvium filled stream valleys, moderately thick limestone and shale sequences, and glacial deposits which cap much of the higher elevations near the Wabuneta River at Richland. Most cuts will be common excavation except in valley walls along major drainage channels where bedrock may be encountered. Large quartzite boulders and sand and gravel lenses may be encountered in the glacial deposits. Ground water may be encountered in the glacial deposits and along the base of many limestones, particularly the Hartford Member of the Topeka Formation. Soils will be predominantly A-6 or A-7 as in other parts of the county. Water supplies are limited, with larger supplies being found in the alluvium of the stream valleys.

Southwestern Shawnee County includes the area west of highway 75 and south of the Kansas River. The topography is gently rolling due to the thick shale, thin limestone sequence found in this area. Limited amounts of glacial deposits are found in the northeastern and northern edges of the area. Cuts and excavations will be in common material except where limestone units and unweathered shale are encountered. In areas where the White Cloud Shale is encountered, severe swelling of the shale can be expected upon contact with water. Where cuts and excavations intersect the Cahoun Shale, slope stability problems may be anticipated. Soils will generally be classified as A-6 or A-7 by A.A.S.H.O. standards, although other soil types may be found in the area. Water is limited in both quality and quantity with most supplies adequate for domestic use only. Minor water problems may be encountered in cut sections at the base of limestones.

Various coal beds including the Nodaway and Elmo coal beds have been mined county wide. Old drifts, shafts, strip pits, and unconsolidated mine tailings may be encountered in many areas of the county. There are no known coal mining operations now in existence in Shawnee County.
MATERIALS INVENTORY SECTION

GENERAL INFORMATION

Pennsylvania limestones make up a major part of the construction materials resources in Shawnee County. Silicicous sand and gravel could be produced from Pleistocene terraces and the Kansas River floodplain, but it is much more economical to produce such material from the Kansas River. Sand and gravel has also been produced from glaciofluvial deposits; however, the material is poorly sorted and quantities limited.

Construction material types, their uses, and availability are tabulated in figure 7. Test results from a limited amount of sampling and testing are presented in figure 14 (page 23).
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<thead>
<tr>
<th>TYPE material and geologic source</th>
<th>USE</th>
<th>page</th>
<th>AVAILABILITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lansingite</td>
<td>Light type surfacing material.</td>
<td>Very limited source in southeast part of the county. Plates 1V.</td>
<td></td>
</tr>
<tr>
<td>Salt Limestone Member</td>
<td>Light type surfacing material.</td>
<td>Very limited source in southeast part of the county. Plate 1V.</td>
<td></td>
</tr>
<tr>
<td>Cassville Limestone Member</td>
<td>Concrete and Siltstone aggregate. Light type surfacing, riprap.</td>
<td>Moderate source in eastern central Shawnee County. Plates IV and V.</td>
<td></td>
</tr>
<tr>
<td>Sabine Creek Limestone Member</td>
<td>Concrete and Siltstone aggregate. Light type surfacing, riprap.</td>
<td>Moderate source in east central Shawnee County. Plates IV and V.</td>
<td></td>
</tr>
<tr>
<td>Fortford Limestone Member</td>
<td>Light type surfacing, riprap.</td>
<td>Moderate source in eastern part of the county. Plates II, IV and V.</td>
<td></td>
</tr>
<tr>
<td>Harris Limestone Member</td>
<td>Light type surfacing, riprap.</td>
<td>Moderate source in eastern part of the county. Plates II, IV and V.</td>
<td></td>
</tr>
<tr>
<td>West Branch Limestone Member</td>
<td>Concrete and Siltstone aggregate. Light type surfacing, riprap.</td>
<td>Moderate source in eastern part and western parts of the county. Plates II, II, III and IV.</td>
<td></td>
</tr>
<tr>
<td>Haskell Limestone Member</td>
<td>Concrete and Siltstone aggregate. Light type surfacing, riprap.</td>
<td>Moderate source in eastern part and western parts of the county. Plates II, II, III and IV.</td>
<td></td>
</tr>
<tr>
<td>Tonkawa Limestone Member</td>
<td>Concrete and Siltstone aggregate. Light type surfacing, riprap.</td>
<td>Limited source in western half of the county. Plates II, III and IV.</td>
<td></td>
</tr>
</tbody>
</table>

**Figure 7.** Tabulation of the construction materials types and their availability in Shawnee County.

13
DESCRIPTION OF CONSTRUCTION MATERIAL
Limestone
Lecompton Limestone Formation

The Lecompton Limestone Formation is composed of four limestone and three shale members which are, in ascending order, the Spring Branch Limestone, Doniphan Shale, Big Springs Limestone, Queen Hill Shale, Beel Limestone, King Hill Shale, and Avoca Limestone.

The Lecompton Limestone outcrops in the southeastern part of Shawnee County along the Wakarusa River, in the northeastern part along Deer Creek, and on the south side of the Kansas River.

The formation ranges in thickness from about 40 feet in the Kansas River valley to about 46 feet in the Wakarusa River valley.

Due to weathering characteristics of the upper beds only the Spring Branch and the Beel Members are considered potential sources of construction materials.

Spring Branch Limestone Member

The Spring Branch Limestone is made up of two units, a lower ledge-forming limestone ranging in thickness from five and one half to nine feet and an upper less resistant unit of interbedded limestone, claystone, and siltstone varying from two to seven feet thick. The limestone is a dark gray, finely-crystalline limestone that weathers yellow brownish in color and into rather massive ledges.

The Spring Branch has been quarried on a very limited basis in eastern Kansas and not at all in Shawnee County. No quality test data are available for this unit in Shawnee County; however, in most cases it will not meet specifications for concrete and bituminous aggregate due to the high clay content, but would be suitable for light type surfacing material. The Spring Branch is exposed in the southeastern part of the county and has been mapped as a part of the Lecompton Formation in this report (plate VII).

Figure 8. Exposure of the Spring Branch Limestone Member in the NE ¼ sec. 33, T.13 S, R. 17E.
Bell Limestone Member

The Bell Limestone Member is a light-gray, wavy-bedded limestone with interbedded shale. It weathers to a yellowish brown to light-olive gray, and ranges from eight - ten feet in thickness in Shawnee County. The Bell has not been produced in the county and only on a limited basis elsewhere in eastern Kansas. No quality test results are available for the Bell in Shawnee County; however, the soft shaly nature of the rock limits its use to light type surfacing material. In areas where the Bell has been produced and tested, it fails to meet specifications for concrete and bituminous construction aggregate. The Bell is exposed in southeast Shawnee County and has been mapped as a part of the Leoompton Formation in this report (plate VI).

Deer Creek Limestone Formation

The Deer Creek Limestone Formation is composed of five members. They are, in ascending order, the Ozawkie Limestone, Oskalucoa Shale, Rock Bluff Limestone, Lush and Burroak Shale, and the Envine Creek Limestone Members. The full thickness of the Deer Creek Formation varies from 32-43 feet in Shawnee County and is mapped as one unit. However, only two limestone members, the Ozawkie and the Envine Creek are considered to be source units of construction materials (plates IV & VI).

Ozawkie Limestone Member

The Ozawkie Limestone Member is a six - ten foot thick, light-gray limestone that weathers to a yellow-brown color. In most localities in Shawnee County, the member is divided into two limestone units by a thin shale parting.

The Ozawkie Limestone has been produced for riprap on dams and embankments associated with Pomona Dam and Reservoir in Osage County, and Perry Dam and Reservoir in Jefferson County. Test data available for the Ozawkie in Shawnee, Osage, and Jefferson Counties indicate the limestone is variable and wear and absorption qualities are marginal; however, test results on rock produced in some areas in Shawnee County show the material will meet specifications for bituminous and concrete construction as well as light type surfacing and riprap. The Ozawkie has been mapped as a member of the Deer Creek Formation in this report (plates IV & VI).

Envine Creek Limestone Member

The Envine Creek Limestone Member is a light-gray to white, fine-grained limestone containing scattered chart nodules. It varies in thickness from 13-19 feet. A fresh surface appears somewhat massive but it weathers into thin, wavy beds that are light brown in color. Small shale seams prominent in most weathered exposures lower the quality of the limestone.

The Envine Creek has been quarried extensively in Jefferson County, in Shawnee County east of Topeka, and in other counties on a limited basis. Quality data on samples from these quarries indicate that most sources were good to marginal for concrete and bituminous construction; however, material quality is erratic due to weathering and changes
in lithology. Material produced from the Ervine Creek is acceptable for light type surfacing. The Ervine Creek has been mapped as a part of the Deer Creek Formation for this report (plates IV & VI).

Figure 7. Exposure of the Ervine Creek Limestone Member located in the west side of

[Image]

Topeka Limestone Formation

The Topeka Limestone Formation is composed of nine members. They are in ascending order: the Hartford Limestone, the Iowa Point Shale, the Curzon Limestone, the Jones Point Shale, the Sheldon Limestone, the Turner Creek Shale, the Du Bois Limestone, the Holt Shale, and the Coal Creek Limestone. The Topeka Limestone varies in thickness from ten feet in the Wakarusa River valley to 33 feet west of Topeka.

The main sources of construction material are the Hartford and Curzon Limestone Members of the Topeka Formation which are shown on plates II, IV and VI.

Hartford Limestone Member

The Hartford Limestone is a light-gray, fine-grained, thin-beded to massive unit that weathered to a yellowish-brown color. It has a thickness of three to eight feet and a shale bed that varies in thickness near the base of the unit. The Hartford has been quarried on a limited basis in Shawnee County and no quality test results are available for this area; however, test results on samples obtained in Osage County indicate that the unit would be acceptable for light type surfacing and riprap, but marginal for concrete and lathamous construction aggregate. The Topeka Formation of which the Hartford is a member, is shown on plates II, IV & VI.
Figure 10. Hartford and Curzon Limestone exposures in the N.E. corner, SE ¼ sec. 10, T. 12S., R. 17E.

Curzon Limestone Member

The Curzon Limestone is a dense, light-gray, crystalline limestone that weathers to a yellow-brown, and varies in thickness from four and one-half to ten and one-half feet, with thin shale beds occurring near the middle of the unit. Quality test data are not available for the Curzon in Shawnee County, but tests completed on samples obtained in Jefferson County indicate that the material is marginal for bituminous and concrete construction but acceptable for light type surfacing material and riprap. The Topeka Formation of which the Curzon is a member, is shown on plates I, IV, & VI.

Burlingame Limestone Formation

The Bern Limestone ranges in thickness from 12 to 14 feet and is comprised of the Burlingame Limestone, Soldier Creek Shale, and the Wakarusa Limestone Members. The Burlingame is the primary material source of construction material; however, the Wakarusa Member is sometimes quarried in conjunction with it. The outcrop pattern of the Bern Formation is shown on plates I, II, III and V.

Burlingame Limestone Member

The Burlingame is a light-gray limestone that weathers to a dark-brown color. It ranges in thickness from 1.5 to 12 feet and varies from a brecciated limestone north of the Kansas River to a dense crystalline rock south of the river. Quality tests of the Burlingame in Shawnee County show that in most areas the material is acceptable for concrete and bituminous aggregate as well as light type surfacing and riprap. The limestone is quarried extensively in north central Shawnee County where up to 70 feet of overburden has been removed.

Quality tests run on the Burlingame in Jackson, Jefferson, and Osage Counties

17
show the material to be marginal and that the unit is much thinner. The Burlingame is the basal member of the Bern Formation which is shown on plates I, II, III & V.

Figure 11. The Burlingame Limestone Member exposed in a roadcut in the 3E 3/4 sec. 36, T. 115, R. 14E.

Wakarusa Limestone Member

The Wakarusa Limestone is a light-gray crystalline, dense limestone that weathers to a yellow brown, varies from three to four and one third feet in thickness, and is usually divided into two separate beds by a thin shale seam.

Quality test results on samples taken from the Wakarusa in Shawnee County show that it will generally meet specifications for concrete and bituminous construction aggregate as well as light type flooring and riprap; however, due to its limited thickness, the Wakarusa is usually only produced in conjunction with the Burlingame Limestone. The Bern Formation of which the Wakarusa is the uppermost member, is shown on plates I, II, III and V.

Zeandale Limestone Formation

The Zeandale Limestone is composed of the Tarkio Limestone which is the basal member of the formation, Waynoka Shale, and the Maple Hill Limestone which is the uppermost unit. It varies in thickness from 15-18 feet; however, the Tarkio Limestone is the only member of the Zeandale Formation that is quarried in Shawnee County. The Zeandale Formation is shown on plates I, II, III, and V.
Tankio Limestone Member

The Tankio is a light-gray, finely-crystalline limestone that weathers to a dark brown color. It forms a prominent ledge with widely spaced vertical joints and contains numerous small fossils called fusilinids which resemble wheat grains. The limestone is highly variable in both quality and quantity throughout eastern Kansas. In Shawnee County its thickness varies from one and eight tenths feet in the north central part to four and one half feet in the southwestern corner. In Wabaunsee County to the west, the Tankio is approximately ten feet thick in the eastern part and thins to four feet to the west. In Osage County it varies from seven feet in the northern part to approximately two feet on the southern edge of the county.

Quality test results on selected outcrops show that the Tankio meets specifications for concrete aggregate as well as light type surfacing material and riprap; however, the quality is highly erratic and tests should be run on any potential quarry sites. The Tankio Limestone is mapped as part of the Zeandale Formation shown on plates I, III and V.

Figure 12. The Tankio Limestone Member exposed in the SE ¼ sec. 30, T.11S., R.14E.

Sand and Gravel

Glacial Drift

Glacial Drift is the term used here to include all material deposited directly or indirectly by glacial ice. These deposits, covering approximately 40 percent of Shawnee County, vary from a thin veneer to about 25 feet in thickness south of the Kansas River and up to 76 feet on some slopes north of the river. Deposits are also found in varying thicknesses in Wabaunsee and Pottawatomie Counties, to the north in Jackson County, and to the east in Jefferson and Douglas Counties. These deposits are composed of till, outwash and scattered erratics, with concentrations of sand and gravel in scattered lenses. Quality test data available for these deposits indicate a high percentage of clay and silt, therefore,
the material must be washed and graded to meet specifications. Sand and gravel produced from glacial deposits in Shawnee and surrounding counties is generally used in the immediate locality. The Glacial Drift is mapped on plates I, II, III, IV & VI.

Figure 13. Glacial boulders resting in a field in the SW ½ NW ½ sec. 11, T. 132, R. 16E.

Terrace Deposits

Terrace deposits of Quaternary age are present in most of the stream valleys in Shawnee County but only two have been mapped, the Buck Creek Terrace of Illinoian age and the Newman Terrace of Wisconsinan age. These terraces do not add to the construction material reserves of Shawnee County since the upper part of each terrace is composed of varying combinations of fine sand, silt, and clay. Granular material is found at lower depths but no material has been produced from this source in the county or elsewhere due mainly to the availability of siliceous sand and gravel from more recent deposits of the Kansas River alluvium and material pumped from the Kansas River channel. The greatest thickness of the Buck Creek was measured in Wabaunsee County just west of Willard where 49 feet of sediment was recorded while the Newman was found to be 75 feet thick just west of Silver Lake.

The Quaternary Terraces will assume a greater economic importance as a source of sand and gravel in coming years inasmuch as dams constructed on the tributaries of the Kansas River have eliminated the natural replenishment of sand and gravel from their sources to the north and west. These terrace deposits have been mapped on all plates.

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Quaternary Alluvium

Kansas River alluvium is an excellent source of sand and gravel. The upper alluvium is composed of clay, silt, and fine sand. Test holes drilled in the Silver Lake area show a thickness of 50 to 75 feet with the lower 2/3 to 3/4 of the deposit containing sand with substantial amounts of gravel being encountered near the base.

The alluvium of the Wakarusa River valley and other smaller stream valleys in Shawnee County contain such a limited amount of sand and gravel that they have been mapped as a part of the Newman Terrace and therefore will not be discussed here. Also, because of their clay and silt content and the relative ease of obtaining sand and gravel by pumping from the Kansas River, no material is presently being produced from the alluvium. The alluvium has been mapped on all plates.
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<th>Percent Retained</th>
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Figure 14. Results of tests completed on samples of material from the various geologic source beds in Shawnee County.
SHAWNEE COUNTY MATERIALS MAP INDEX

On the following pages are six plates covering Shawnee County as shown below.

Plate I
Rossville
Willard
Silver Lake

Plate II
Elmont

Plate III

Plate IV

Plate V
Dover
Auburn

Plate VI
Forty Creeks
Forbes Air Force Base

Note: The individual site data forms follow Plate VI.
LEGEND
MATERIALS SITE DESIGNATIONS

- Open materials sites: sampled
- Open materials sites: not sampled

Material Type
- SG Sand and Gravel
- LS Limestone

Estimated Quantity
+ indicates more than 20,000 cubic yards
- indicates less than 20,000 cubic yards

Reference to site number on following data forms

Geologic Age and Unit
- Newman Terrace
- Alluvium
- Buck Creek Terrace
- Glacial Drift

[Diagram showing stratigraphic units and numerical data]

KILOMETERS

MILES
LEGEND

MATERIALS SITE DESIGNATIONS

- Open materials sites; sampled
- Open materials sites; not sampled

Material Type

- SG Sand and Gravel
- LS Limestone

Estimated Quantity

+ indicates more than 23,000 cubic yards
- indicates less than 20,000 cubic yards

Reference to site number on following data forms

Geologic Age and Unit

- Newman Terrace
- Alluvium
- Buck Creek Terrace
- Glacial Drift

GEOLOGY

Possible Limestone Pounding

Late Cretaceous Limestone Formation

Eocene Limestone Formation

Lower Ordovician Limestone Formation

MILES

1 2 3 4 5 6

KILOMETERS

1 2 3 4
### MATERIAL SITE DATA FORM

**Site No.:** Sgrl - 1  
**Date:** September, 1973

**Material:** Sand-Gravel (Clay Gravel)  
**County:** Shawnee

**Location:** Sec. 9  
**Town:** T08S  
**Range:** R14E

**Owner:** James E. & Evelyn M. Regas  
**Address:** Rossville, Kansas

**Surface:** Dry  
**Accessibility:** Good

**Nature of Deposits:** L. s. located on Plate 1

**Status of Site:** Open Materials Site; Sampled

### EXPLANATION SHEET

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<thead>
<tr>
<th>Soil Name</th>
<th>Water民营</th>
<th>Percent Gravel</th>
<th>Percent Sand</th>
<th>Percent Silt</th>
<th>Percent Clay</th>
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<td>52</td>
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### GEOLOGICAL AGE

**Age:** Quaternary

**Source:** Glacial Drift

**Material:** SHC Lab. No. 15499

### PHYSICAL PROPERTIES

- **Specific Gravity (wet):** 2.48
- **Specific Gravity (dry):** 2.36
- **Los Angeles Abrasion:** 30.2
- **Shoreline:** 4.82
- **Silt: Clay:** 0.53

**Soil:** V.C. P.I.
MATERIAL SITE DATA FORM

Site No: 18+1

Date: September, 1973

Location: S 64th, F 110S, Range 1SE

Owner: Keith L. & JoAnn L. Hildebrandt, Shawnee Federal, Topeka

Nature of Deposit: Dry

Status of Site: Open Materials Site; Sampled

Geological Age: Pennsylvanian

Geological Source: Darn Limestone Formation - Burlingame Member

Material Sampled to: SUC Lab. No. 15146

Specimen Density (lbs./cu. ft): 2.63

Loss on Ignition: 27.6%

pH: 9.97

Remarks:

Scale: 1" = 1/4 Mile
MATERIAL SITE DATA FORM

Site No. 1844 - Rhyolite
Type - September, 1973
Material - Limestone
County - Shawnee
Location - Sec. 19, Twp. 10S, Range 15E
Owner: E.R. & Evelyn K. Bronson, Route 1, Meriden, Kansas
Note: Erosion, a problem. Good, is located on flume 11
Status of Site - Open Materials Site - Sampled

EXPLORATION DATA

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<th>Material Type</th>
<th>Percent Discovery</th>
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OVERLAPS DATA

Geological Age - Pennsylvanian
Geological Source - Born Limestone Formation - Burdige Formation Member
Material Similar to - SHC Lab, No. 70428

Specific Gravity (Soln.): 2.62
Specific Gravity (Dry): 2.57
Los Angeles Wear: 47.6 B
Absorbtion: 1.64
Weight: 9.97

Remarks:
**MATERIAL SITE DATA FORM**

**Site No.** 156-5  
**Date** September, 1973

**Location**  
**County** Shawnee  
**Section** 14  
**T.** 08  
**R.** 15E

**Owner** Chan, E. & Edith Maus  
**Address** 7233 N Elmont, Topeka, Kansas

**Nature of Survey** GOOD  
**Condition** Good  
**Type** Sampled

**Sampled Site** Open Materials Site: Sampled

**EXPLANATION DATA**

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<th>Material</th>
<th>Source of Material</th>
<th>Method of Testing</th>
<th>Analysis</th>
<th>Data</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
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**CORELATION DATA**

**Geological Age** Pennsylvanian

**Geological Source** Born Limestone Formation - Burlingame Member

**Material Specimen No.** SIC Lab. No. 27459

**Specific Gravity (Dry)** 2.60  
**Loss on Ignition** 20.20

**Specific Gravity (Wet)** 2.55  
**Loss on Ignition** 20.20

**Examination** 2.00  
**Moisture** 0.50

**NOTES**

- 1" = 1/4 Mile

**Remarks**

- [Diagram of site location]
MATERIAL SITE DATA FORM

IS-46

Site No. 1546

Limestone

County: Shawnee

Location: N14, S14, T105, R47

Owner: Ed & Elzie B. Becker

Route 2 Topinka, Kansas

Nature of Reserve: Dry

Dirt located on Plate II

Status of Site: Open Materials Site: Sampled

MINERALIZATION DATA

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<th>Mineral</th>
<th>Depth</th>
<th>Depth</th>
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<th>Translucency</th>
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<th>Break</th>
<th>G.F.</th>
<th>L.L.</th>
<th>P.I.</th>
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CORRELATION DATA

Geological Age: Pennsylvania

Geological Series: Penn Limestone Formation - Burlingame Member

Material Starter: BHC Lab No. 15274

Specific Gravity (wet): 2.61

Specific Gravity (dry): 2.56

Los Angeles Wear: 25.2

Abrasion: 3.99

Bl. Coeff.: __________

Str. Ratio: __________

Remarks: __________
MATERIAL SITE DATA FORM

<table>
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Material: Limestone
County: Shanece

Location:
Sec. 14
Town: 10S
Range: 15E
Date: September, 1973

Owner:
William F. Maus
Silver Lake State Bank, Silver Lake, Pa.

Soil Condition:
Dry

Accessibility:
Good
Site located on Plate II

Status of Site:
Open Material Site: Sampled

EXPLANATION SHEET

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<th>Material</th>
<th>Bedrock Material</th>
<th>Thickness of Bedrock</th>
<th>Depth of Overburden</th>
<th>Top Bedrock</th>
<th>Type of Material</th>
<th>A.P.</th>
<th>I.R.</th>
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CORRELATION SHEET

Geological Age:
Pennsylvanian

Geological Series:
Burlington Formation - Burlington Member

Material Similar to:
SRC Lab. No. 5141

Specific Gravity (Sat.): 2.57
Dens.: 2.53

Los Angeles Wear: 33.4

Absorption: 1.96

Hardness: 0.96

B. No.: S-20
Str. No.:

Remarks:
MATERIAL SITE DATA FORM

Site No. 1548

Date September, 1973

Material Limestone

County Shawnee

Location Sec. 13

Township 10S

Range 15E

Owner N. R. Ham, Inc.

Perry, Kansas

Nature of Deposit Dry

Condition: Good

Site Located at Field No.

Status at Site Open Materials Site; Sampled

EXPLANATION DATA

Depth Material of Unknown Depth of Water Particles Percent Per Cent Depth (un) (ft) (in) (in) (in)

1/2 3/4 1/2

1

Field Location B.P. L.L. P.P.

CORRELATION DATA

Geological Age Pennsylvania

Geological Source Bern Limestone Formation - Burlingame Member

Material Similar To

SGC Lab, No. 67-5005

Specific Gravity (Sat.) 2.65

Specific Gravity (Dry) 2.62

Los Angeles Abrasion 21,88

Water Content 1.33

Per Cent. Ground G.97

Moisture V. C. P. V. 0.68

Density

Security
Site No. L69

Date September, 1973

Material Limestone

Location 34° 16' N, 96° 22' W, Sec. 11, T 10 S, R 2W, 15E

Owner N.E. Hammond

Remarks

Condition of Site: Open Materials Slightly Sampled

Correlation Data

Geological Age Pennsylvanian

Geological Source Bern Limestone Formation - Burlington Member

Material Similar to SRC Lab No. 29017

Recovery Density (in.) 2.42

Los Angeles Abrasion 27.78

Observations 7.62 Sphericity 0.95

E. C. P.

Remarks

scale: 1" = 4 Mile
MATERIAL SITE DATA FORM

Site No.: 10
Date: September, 1973

Material: Limestone
County: Chase

Lat.: 32
Lon.: 106

Owner: Paul E. & Helen E. Wandel
Address: 4045 NW 62nd
Top, Kansas

Remarks: Open Materials Site; Sampled

CORRELATION DATA

Pennsylvanian

Geological Survey Data:
Geological Service: Kanz Limestone Formation, Burlingame Member
Material: Number 1, SWC Lab. No. 71-2441

Specific Gravity (Sat.): 2.69
(air): 2.54

Los Angeles Abrasion: 2.40

Size: 1/26"

Remarks: —

Scale: 1" = 1/4 Mile
MATERIAL SITE DATA FORM

Date: September, 1973

Material: Limestone
County: Shawnee

Location: Sec. 23
T. 10S
R. 15E

Owner: Alice Rowe & Helen K. Vorderman Route 2, Topeka, Kansas
Year: 

Nature of Deposit: Good
Open Materials: Site sampled

Exploitation Data

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<th>Depth to Material (ft.)</th>
<th>Depth to Fresh Water (ft.)</th>
<th>%Vap</th>
<th>%Ferrous</th>
<th>%Nonferrous</th>
<th>%V.P.</th>
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<th>P.I.</th>
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Geological Age: Pennsylvania

Geological Source: Bern Limestone Formation - Burlingame Member

Material Similar to SWC Lab. No. 65-361

Specific Gravity (Dry): 2.57 (2.48)

Los Angeles Wear: 31.00

Sedimentation: 3.27

Ht. C.F.: 

Dr. Bolin

Remarks: 
**MATERIAL SITE DATA FORM**

**LS-113**  
**Fish**

**Site No.**  99  
**Rept.**  September

**Material**  Limestone  
**County**  Shawnee

**Lineage**  NW 1/4 NW 1/4 Sec. 29 T. 10S R. 1S

**Owner**  Dana Priddy  
**Route 2**  N. Topka, Kansas

**Nature of Bedding**  Dry  
**Bedding Quality**  Good  
**Site Located on**  Place II

**Status of Site**  Open

**Materials Sited/Sampled**

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<th>Absorption</th>
<th>Hardness</th>
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**Supplementary Data**

**Geological Age**  Pennsylvania

**Geological Source**  Bern Limestone Formation - Burlingame Member

**Material Tested**  S.W.C. Lab. No. 5776

**Specific Gravity (S.G.)**  2.61  
**(Hyd.)**  2.57

**Los Angeles Wear**  26.7

**Absorption**  1.80  
**Soundness**  0.98

**Notes**
MATERIAL SITE DATA FORM

LIQ-13

Date: September, 1971

Material: Limestone
County: Shawnee

Location: W. 74th St. 26th St., 10S, Range 15E
Owner: P. H. & Maggie Lee Manning, Route 2, Topeka, Ks.

Nature of Deposit: Dry
Situability: Good

Status of Site: Open Materials Site; Sample

Exploitation Data

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Geological Age: Pennsylvanian

Geological Source: Born Limestone Formation - Burlingame Member

Material Similar To: SHC Lab. No. 30707

Specific Gravity (Sat): 2.65

Los Angeles Bear: 27.0

Hardness: 2.11

Report: Slight

Remarks: None
MATERIAL SITE DATA FORM

Site No. 8414 Date September, 1973

Material: Limestone County: Shawnee
Location: 4W 5N 26 Sec. 108 Range 3SE
Owner: P.H. & Maggie Lee Netherland Route 2 Tomoka, Kansas
Nature of Site: Dry, Good, Lined out on Plate II
Notes of Site: Open Materials Site; Sampled

Exploitation Park

Sedimentary Age: Pennsylvania
Sedimentary Source: Barn Limestone Formation - Burlington Member
Material Similar to: SNC Lab. No. 96537

Density: Moist (Ft.) 2.62 (Dry)
Los Angles Hard 28.68
Assay 1.50 Sulfates 0.97
R.P.F. 5.0

Remarks:
**Shawnee Co. #1**

**Material Site Data Form**

**Site No.:** sc-15  
**Date:** September, 1973

**Material:** Sand, Clay-Gluvoj  
**County:** Shawnee

**Location:** Sec. 9  
**Topo:** 113  
**Range:** 106

**Owner:** Fred & Laura E. Doyle  
**1236 College**  
**Ottawa, Kansas**

**Nature of Exposure:** Dry  
**Visibility:** Fair  
**Site Located on Field II

**Status of Site:** Open Materials Site; Sampled

### Field Data

<table>
<thead>
<tr>
<th>Field No.</th>
<th>Water Content (%)</th>
<th>Percent Alkali</th>
<th>Gravel</th>
<th>Sand</th>
<th>Silt</th>
<th>Clay</th>
<th>2%</th>
<th>6%</th>
<th>16%</th>
<th>30%</th>
<th>WR</th>
<th>R.O.</th>
<th>S.F.</th>
<th>S.L.</th>
<th>F.S.</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>7</td>
<td>30</td>
<td>77</td>
<td>96</td>
<td>83</td>
<td>594</td>
<td>4.01</td>
<td>3.03</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

### Geologic Data

**Geological Age:** Quaternary  
**Geological Source:** Glacial Drift

**Materials Similar to:** S.H.C. Lab. No. 15438

**Specific Gravity (Dry):** 2.67

**Los Angeles Wear:** 2,42

**Absorption:** 4.91

**Wi. Co. St.:** 96.19

**Remarks:**

**Scale:** 1" = ¼ Miles
**MATERIAL SITE DATA FORM**

**Site No.**: 8C-16  
**Date**: September, 1973

- **Material**: Glacial Clay Gravel  
- **County**: Shawnee

**Location**:  
- **SW1/4 Sec. 24**:  
- **T11S R13E**:  
- **Floyd Tabor**:  
- **1225 Knowl Avenue**:  
- **Topeka, Kansas**

**Nature of Exposure**: Dry  
**Accessibility**: Good  
**Site Description**: Open Materials Site, Sampled

**EXPLORATION DATA**

<table>
<thead>
<tr>
<th>Test No.</th>
<th>Material</th>
<th>Particle Size</th>
<th>Depth of Material</th>
<th>Description</th>
<th>Peg</th>
<th>25%</th>
<th>50%</th>
<th>75%</th>
<th>90%</th>
<th>95%</th>
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<tbody>
<tr>
<td></td>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>

**CORELATION DATA**

- **Geological Age**: Quaternary
- **Geological Source**: Glacial Drift
- **Material Sample Tissue**: S.H.C. Lab. No. 15361

- **Specific Gravity (Std.)**: 2.45  
  **(Avg)**: 2.43
- **Los Angeles Wear**: 31.1
- **Atterberg Limit**:  
  - **Plasticity Index**: 1.80
  - **Liquid Limit**: 99.78
  - **Plasticity Index**: Sr. Ratio

**Reports**
MATERIAL SITE DATA FORM

Site No. SG-17  Date: September, 1973
Material: Sand-Gravel  County: Shawnee
Location: SE 1/4 NW 1/4  Sec. 21  Twp. 118  Range 14E
Owner: Arthur Atwood  Route 2  Silver Lake, Kansas
Nature of Deposits: Wet  Accessibility: Fair
Nature of Deposits: Site Located on Ridge III
Status of Site: Open Material Site: Sampled

EXPLANATION DATA

<table>
<thead>
<tr>
<th>Depth of Material</th>
<th>Width of Material (ft)</th>
<th>Height of Material (ft)</th>
<th>Amount of Material (ft)</th>
<th>Density (lb/ft³)</th>
<th>E.F.</th>
<th>L.L.</th>
<th>P.I.</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>2</td>
<td>6</td>
<td>22 51 76</td>
<td>94</td>
<td>24%</td>
<td>3.50</td>
<td></td>
</tr>
</tbody>
</table>

Correlation Data

Geological Age: Quaternary
Geological Source: Alluvium
Material Similar To: SHU Lab. No. 3397

Specific Gravity: 2.42
Los Angeles Wear: 22.7
Absorption: 0.4%  Soundness: 0.97

Scale: 1" = 1/4 Mile
**MATERIAL SITE DATA FORM**

**SG-18**

Volume: September, 1973

*Site No.*

*Location:*

*Elevation:*

*Material:*

*Owner:*

*Nature of Survey:*

*Status of Site:*

**EXPLOSION DATA**

<table>
<thead>
<tr>
<th>Depth</th>
<th>Material of Section</th>
<th>Depth of Section</th>
<th>Percent Explosive</th>
<th>B.F.</th>
</tr>
</thead>
<tbody>
<tr>
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<td>(1)</td>
</tr>
<tr>
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<td></td>
<td></td>
<td></td>
<td>(2)</td>
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**CONSOLIDATION DATA**

*Geological Age:*

*Geological Source:*

*Material Similar To:*

*Sonic Gravity (S):*

*Sonic Velocity (V):*

*Los Angeles Hardness:*

*Absorption:*

*St. Br. No.*

*Density:*

---

**Diagram:**

- **KANSAS RIVER**
- **C.B.I. & P.R.R.**
  - Scale: 1" = 1/4 Mile
MATERIAL SITE DATA FORM

Site No.: 19

Date: September, 1973

Material: Limestone

Location: N4

Owner: Martin Marietta Corp.

Description: Open Materials Site; Sampled

CATION DATA

Geological Age: Pennsylvanian

Geological Source: Bird Lime- stone Formation - Burlington Member

Material Similar to: SHC Lab. No. 15043

Specific Gravity (wet) 2.63

Los Angeles Wear: 29.4

Absorption: 1.93

Permeability: 0.94

Note: 1" = 1/4 Mile
MATERIAL SITE DATA FORM

Site No. 150

Data September, 1973

Material Limestone

County Shawnee

Location SW 1/4 Sec. 31 Twp. 118 Range 15p

Owner Albert H. Fisher

Route 8

Topka, Ks.

Drainage Dry

Soil Type Good

Nature of Deposit Accessible Site located on Flat

Status of Site Open Materials Site Sampled

EXPLANATION DATA

<table>
<thead>
<tr>
<th>Test Data</th>
<th>Number of Monster of Hole</th>
<th>Depth in Foot</th>
<th>Water level</th>
<th>B.P.</th>
<th>L.L.</th>
<th>P.I.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

CORE EXAMINATION

Geological Age Pennsylvanian

Geological Source Barn Limestone Formation - Burlingame Member

Material Similar To SHC Lab. No. 65-1245

Specific Gravity (Wat.) 2.60 (Dry) 2.58

Los Angeles Weat 25.58

Absorption 1.60

Wt. Co./Pt. Not Rated

Remarks

Scale 1" = 1/4 Mile
**MATERIAL SITE DATA FORM**

**Site No.:** L8+21

**Date:** September, 1973

**Material:** Limestone

**Location:** 45° 45' 30" N, 128° 14' 30" W

**Owner:** Red R. Fleming

**Surface:** Dry

**Nature of Bed:** Open Materials Site; Sampled

**Fusion Table:**

<table>
<thead>
<tr>
<th>Test No.</th>
<th>Material</th>
<th>Depth</th>
<th>Percent Recovered</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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</table>

**Correlation Table:**

**Geological Age:** Pennsylvania

**Geological Unit:** Berea Limestone Formation - Burlingame Member

**Material Source:** SRC Lab., No. 15271

**Net Lime Gravity (lb./cu.ft.):** 2.59

**Los Angeles Hardness:** 23.5

**Absorption:** 0.96

**Mo. Co. R.:** 1.156

**Remarks:** The two symbols are in the same quarry.
**MATERIAL SITE DATA FORM**

**LIS # 22**

**Site No.** -- N/A  
**Date** -- September, 1973

**Material** -- Limestone  
**County** -- Shawnee

**Location** -- Sec. 2  
**Township** -- 12S  
**Range** -- 14E

**Owner** -- W.W. Stogdill  
**Address** -- Route 8, Topeka, Kansas

**Nature of Receipt** -- Dry  
**Condition** -- Good  
**Location or Field** -- In location or field

**Status of Site** -- Open Material Site; Sampled

**EXPLORATION DATA**

<table>
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<tr>
<th>Soil Type</th>
<th>Name of Source of Site</th>
<th>Name of Source of Material</th>
<th>Size of Material</th>
<th>%</th>
<th>%</th>
<th>%</th>
<th>%</th>
<th>%</th>
<th>%</th>
<th>%</th>
<th>%</th>
<th>%</th>
<th>%</th>
<th>%</th>
<th>%</th>
<th>%</th>
<th>%</th>
</tr>
</thead>
</table>

**CORRELATION DATA**

**Geological Age** -- Pennsylvania

**Geological Source** -- Beth Limestone Formation - Burlingame Member  
**SHC Lab. No.** -- 15272

**Specific Gravity (Dry)** -- 2.58  
**Specific Gravity (Wet)** -- 2.52

**Los Angeles Abrasion** -- 28.0  
**Soundness** -- 0.97

**Wt. Coefficient** -- 2.14  
**Str. Testing** --

**Remarks** --

---

**Scale:** 1" = 1/4 Mile
MATERIAL SITE DATA FORM

Site No. 23
Date: September, 1973

Material: Limestone
County: Shawnee

Location
SNW: 23
Range: 13E
Section:

Owner:
Name:
Address:

Nature of Deposit:
Dry
Extensibility:
Good
Site Located or Field:

Open Materials Site: Sampled
Status of Site:

DESCRIPTION OF SITE

Pennsylvania

Geological age:

Geological series:

Material Similar to:

Specific Gravity (Sat.)

Los Angeles:-

Absorption:

Remarks:
MATERIAL SITE DATA FORM

L97-4  
Fch  

Date  September, 1973  

Site No.  

Material  Limestone  

County  .  

Location  SW\(\frac{1}{4}\)  

Sec  16  

T  31S  

R.  16E  

Owner  O. W. Griffin  

Address  Topeka, Kansas  

Nature of Deposit:  Dry  

Drillability:  Good  

Site located at Site IV  

Status of Site: Open Materials Site, Sampled  

EXPLORATION DATA  

Pennsylvania  

Geological Age:  

Topka Limestone Formation - Hartford Member  

Geological Source:  

Material Similar to:  

USC Lab. No. 91543  

Specific Gravity (dry):  2.47  

Los Angeles Wear:  22.8  

Desorption:  

Min. Co. Ft. Ratio:  

Remarks:  

CORRELATION DATA  

1" = 1/2 Mile
Material Site Data Form

Site No. 15425
Date September, 1973

County Leavenworth

Limestone

Location:
N44 S4 E15 115 Range 16E

Owner Robert Gladelever Jr., State Bank, Lancaster, Kansas

Material of Deposit: Dry
Accessibility Poor
Site located on field

Status of Site: Open Materials Site; Sampled

Explanation of a

<table>
<thead>
<tr>
<th>Material</th>
<th>Water in</th>
<th>Depth of</th>
<th>Percent</th>
<th>L.L.</th>
<th>P.I.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>tests</td>
<td>below</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Pennsylvania
Geological Age

Geological Source: Deer Creek Limestone Formation - Ervine Creek Member

Material Source: SHE Lab, No. 13657

Specific Gravity (Sat.) 2.52 (Dry) 2.39

Los Angeles Abrasion 36.9

sln. Co. Ft. 5.09

Remarks

Scale: 1" = 1/2 Mile
**MATERIAL SITE DATA FORM**

**SG-26**  
**Q81**  
**Date:** September, 1973  
**County:** Shawnee

**Location:**  
**Dec. 26**  
**Range:** 11E  
**Twp.:** 11S  
**Sec.:** 15E

**Owner:** State of Kansas  
**Topo:** Topeka, Kansas  
**Served by:** TV

**Water of Resport:**  
**Receptability:** Good  
**Site located on Shade:** TV

**Status of Site:** Open Materials Site, Sampled

**EXPLANATION DATA**

<table>
<thead>
<tr>
<th>Test No.</th>
<th>Material</th>
<th>Percent Material</th>
<th>Depth Below Ground</th>
<th>Percent Silt</th>
<th>Percent Clay</th>
<th>LL</th>
<th>PI</th>
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<tr>
<td>0</td>
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<td>1</td>
<td>4</td>
<td>12</td>
<td>30,64</td>
<td>92</td>
<td>98</td>
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</tbody>
</table>

**CORRELATION DATA**

**Geological Age:** Quaternary  
**Geological Source:** Alluvium  
**Material Similar To:** Silt-Loam, No. 15046

**Specific Gravity (Typ.):** 2.62  
**(Py.):**

**Los Angeles Hardness:** 34.0  
**Abrasion:** 0.7

**mt. East:** 112.06  
**mt. North:**

**Remarks:**

**Scale:** 1" = 1/4 Mile
MATERIAL SITE DATA FORM

NG-27
O&M
Site No.: Sand & Sand Gravel
County: Shawnee
Location: Foot of Waite Street
Tow. 25
Range 15E
Victory Sand Co., Topeka, Kansas
Owner
Notes:
Nature of Soils: Not accessible
Site located on flat IV
Status of Site: Open Materials Site; Sampled

EXPLANATION DATA

<table>
<thead>
<tr>
<th>Depth</th>
<th>Material or Section of Mile</th>
<th>Material or Section of Mile</th>
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</thead>
<tbody>
<tr>
<td>0</td>
<td>3</td>
<td>14.35 79.50 1000.10 3.33</td>
</tr>
</tbody>
</table>

QUATERNARY

Geological Age
Geological Source: Alluvium
Material Similar To: SRC Lab. No. 15361
Specific Gravity (Sat.) 2.62 (Drk)
Los Angeles Wear 38.8
Assumption 0.6
ML. Co. ft. 110.87
Str. Ratio
Remarks

SCALE: 1" = 1/4 Mile
MATERIAL SITE DATA FORM

Site No. Cal 9729

September, 1973

Shawnee

Kansas Half Breed

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>118</td>
</tr>
<tr>
<td>16E</td>
<td></td>
</tr>
</tbody>
</table>

Kansas Sand Co., Inc.

531 N. Tyler, Topeka, Kansas

Weather

West

Accessibility

Good

Site covered by Flood IV

Open Materials Site; Sampled

EXPLANATION DATA

<table>
<thead>
<tr>
<th>Land Area</th>
<th>Buffer (m)</th>
<th>Depth (ft)</th>
<th>%</th>
<th>%</th>
<th>%</th>
<th>%</th>
<th>%</th>
<th>%</th>
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<tbody>
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<td>99</td>
<td>1</td>
<td>2-65</td>
<td></td>
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</tbody>
</table>

KANSAS RIVER

C.R.I.S.P. R.B.

Scale: 1" = 1/2 Mile

GEOLOGICAL DATA

Quaternary

Alluvium

Geological Source

SHI Lab, No. 14520

Material Sampled

Specific Gravity (Drill): 2.62

Los Angeles Abrasion: 30.0

Free Swelling: 0.4

Sieve Analysis:

- 112.0

Remarks:
MATERIAL SITE DATA FORM

SITE NO. 31  

Site No. 31  

Material: Sand Gravel  

County: Shawnee  

Location:  

Merle D. 4 Helen M. Winter Route 4  

Topeka, Kansas  

Dw. 23  

Loc. 118  

Exposure:  

Dry  

Condition:  

Cool  

Source of Deposit:  

Site Located on Field  

Status at Site:  

Open Materials Site, Sampled  

EXCAVATION DATA

<table>
<thead>
<tr>
<th>Layer</th>
<th>Material of</th>
<th>Depth of</th>
<th>Percent Retained</th>
<th>B.F.</th>
<th>L.T.</th>
<th>P.F.</th>
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<tbody>
<tr>
<td>1</td>
<td>Material</td>
<td>0-30</td>
<td>90</td>
<td>1</td>
<td>0.01</td>
<td>34.0</td>
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</table>

CONSTITUENTS DATA

Geological Age: Quaternary  

Geological Source: Alluvium  

Material Source:  

Shawnee Co.  

Specific Gravity (Test): 2.52  

Specific Gravity (Mol):  

Los Angeles Coat: 30.0  

Absorption: 2.42  

Water Content: 0.01  

Other:  

Remarks:  

SCALE: 1" = 1 Mile  

KANSAS RIVER
MATERIAL SITE DATA FORM

SG-32
Cal
Site Name
Sand-Gravel
Sinkhole
County

Location
SE 1/4
Sec.
73
T.E.
116
Range
16E

Origin
Albert, Jr. & Vivian R. Jackson, 924 W. Railroad, Topeka, Ks.

Material of Deposit
Wet

Site Located on Plate

Status of Site
Open Materials Siter Sampled

EXPLANATION DATA

<table>
<thead>
<tr>
<th>Material</th>
<th>Water</th>
<th>Depth of Material</th>
<th>Percent Gravel</th>
<th>Percent Boulders</th>
<th>1/2</th>
<th>1/4</th>
<th>3/8</th>
<th>1/2</th>
<th>1</th>
<th>3</th>
<th>5</th>
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<th>30</th>
<th>50</th>
<th>100</th>
<th>200</th>
<th>600</th>
<th>L.P.</th>
<th>P.L.</th>
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</tr>
</tbody>
</table>

0 0 4 39.46 72 91 98 .65 1.30

CORRELATION DATA

Geological Age
Quaternary

Geological Source
Alluvium

Material Similar To
SHC Lab., No. 27561

Specific Gravity (Fab.)
2.62

Los Angeles Wear
38.7

Consistency
0.8

Wt. Co.,
112.28

Remarks

SCALE 1" = 1/4 mile

KANSAS RIVER
**MATERIAL SITE DATA FORM**

**Site Name:** SG-13  
**Location:** Topeka, Kansas

**Material:** Sand-Sand Gravel  
**Shawnee County**

**Date:** September, 1973

**Geological Age:** Quaternary

**Geological Source:** Alluvium

**Material Similar To:** SHC Lab. No. 15042

**Specific Gravity (Sat.)** 2.62  
**Los Angeles Impactor** 33.8

**Water Content** 1.1  
**Total Solids** 111.49

<table>
<thead>
<tr>
<th>Material</th>
<th>Sieve Size (mm)</th>
<th>Percent</th>
<th>Density (g/ml)</th>
<th>Proctor (wt %)</th>
<th>Water (wt %)</th>
</tr>
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<tbody>
<tr>
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<td>100</td>
<td>6.0</td>
<td>2.37</td>
<td>93.1</td>
<td>85.957</td>
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<td>7.1</td>
<td>2.9</td>
<td>3.03</td>
<td>88.3</td>
<td>90.493</td>
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<tr>
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<td>5.0</td>
<td>2.3</td>
<td>3.38</td>
<td>84.4</td>
<td>89.592</td>
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<tr>
<td></td>
<td>2.0</td>
<td>1.3</td>
<td>4.03</td>
<td>78.4</td>
<td>87.036</td>
</tr>
</tbody>
</table>

---

**Sieve Size:** 1" = 1/4 Mile
**MATERIAL SITE DATA FORM**

*Site Number:* LS424

*Date:* September, 1973

*Site Name:* 

*County:* Shawnee

*Material:* Limestone

*Location:* 33S 11E

*Owner:* Frank & Katheryn Spurley

*Notes:* Route 1, Tecumseh, Kansas

*Nature of Work:* Open Materials Site, Sampled

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Water of Material at Site</th>
<th>Parts of Site Boiled</th>
<th>Percent Remaining</th>
<th>G.F.</th>
<th>L.L.</th>
<th>P.L.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Formation Data**

- **Pennsylvanian**

**Geological Series:** Deer Creek Limestone Formation - Ervine Creek Member

**Material Sampled from:** SHC Lab. No. 62088

**Specific Gravity (Tot.):** 2.53

**Los Angeles Abrasion:** 26.68

**Absorption:** 2.74

**Gr. So. F.:** 5.89

**Remarks:**

![Map Diagram]
MATERIAL SITE DATA FORM

LS-438
Ede
September, 1973

Site No. 

Material 
Limestone

County 
Shawnee

Location 
N44° W45°

Owner 
Norma Keller

Address 
1229 Lakeside Drive
Topoka, Kansas

Nature of Request 
Dry

Open Materials Site: Sampled

EXPLORATION DATA

Test 
Site

Depth of 
Material

Depth of 
Surface

Percent Exposure

CORRELATION DATA

Geological Age 
Pennsylvanian

Geological Source 
Deer Creek Limestone Formation-Ervine Creek Member

Material Similar to 
BHC Lab. No. 15149

Specific Gravity (Sat) 
2.49

Drying (Dry) 
2.42

Los Angeles Wear 
29.5

Absorption 
2.96

M. Co. Ft. 

Dr. Ratio

Remarks

Scale: 1" = 1/4 Mile
**MATERIAL SITE DATA FORM**

**Site No.:** 36  
**Date:** September, 1973

**Material:** Limestone  
**County:** Shawnee

**Location:** NE 11 T36S R12E  
**Size:** 128  
**Form:** 16E

**Owner:** Wilbur & Nellie Fraites  
**Route:** 4  
**Town:** Topeka, Kansas  
**State:** Kansas

**Geologic Age:** Pennsylvanian  
**Geological Source:** Deer Creek Limestone Formation-Erving Creek Member  
**Material Similar To:** SMC Lab. No. 15699

**Density/Gravity (lb./cu. ft.):** 2.56  
**Dry:** 2.49

**Los Angeles Wear:** 12.4

**Assumption:** 2.02  
**Inclination:** 0.03

**Wt. C. H.:**  
**Est. Ba. F.:**

**Remarks:**

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<table>
<thead>
<tr>
<th>Expulsion Data</th>
<th>Correlation Data</th>
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</thead>
<tbody>
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<td></td>
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</tbody>
</table>

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**Scale:** 1" = 1/4 mile
MATERIAL SITE DATA FORM

Site No. 711

Data: September, 1973

Limestone

Shawnee

Material: Limestone

Shawnee County

Location: Sec. 22, Tp. 128, Rng. 166

Owner: Topka, Kansas

Nature of Deposit: Dry

Accessibility: Good

Status of Site: Open Materials Site; Sampled

EXPLOSION DATA

CUMULATIVE DATA

Pennsylvania

Geological Age: Topka Limestone Formation-Hartford Member

Geological Source: S.H.C. Lab. No. 15144

Material Source: Topka, Shawnee County

Specific Gravity (Pct.) 2.44

Los Angeles Abrasion 29.6

Expansion 4.36

S.R. Ratio 0.97

Remarks:
MATERIAL SITE DATA FORM

Site No. LA-42  Date: September, 1973
Limestone  County: Shawnee
Location SPA: Sec. 4  Twp. 11E  Range 16E
Alley, Bill M.  1125 Taylor  Topeka, Kansas
Nature of Deposit:  Dry
Status of Site: Open Materials Site, Sampled

EXPANSION DATA

<table>
<thead>
<tr>
<th>Test No.</th>
<th>Material Description</th>
<th>Depth Below Mean, ft</th>
<th>Percent Rained</th>
<th>Silt</th>
<th>M</th>
<th>G</th>
<th>5%</th>
<th>10%</th>
<th>20%</th>
<th>50%</th>
<th>80%</th>
<th>B.P.</th>
<th>I.I.</th>
<th>P.I.</th>
</tr>
</thead>
</table>

CORRELATION DATA

Geological Age: Pennsylvania
Geological Source: Chief Creek Limestone Formation—Irville Creek Member
Material Similar To: GEC Lab. No. 35202

Specific Gravity (sat.): 2.45  (dry): 2.32
Los Angeles Abrasion: 35.7
Absorption: 5.53  Soundness: 0.9
M, Ca, Ti: 1st: Below
Heat: 200°
MATERIAL SITE DATA FORM

LS+43

Site No. 9th

Date September, 1973

Location 34 S1/2 Sec. 10 Tug Range 138

Frank L. Snell Berryton, Kansas

Nature of Deposit DRY Good Site located on Plate VI

Open Materials Site; Sampled

Table of Site Data

<table>
<thead>
<tr>
<th>Land</th>
<th>Material</th>
<th>Method of Test</th>
<th>Depth of Material</th>
<th>USCS Type</th>
<th>V</th>
<th>B</th>
<th>R</th>
<th>W</th>
<th>D</th>
<th>D %</th>
</tr>
</thead>
</table>

Compressibility Data

Stratum 1

Pennsylvania

Specific Gravity of Test 2.59

Los Angeles Abrasion 29.9

Rate of Compressibility 1.88

Mic. Eo. St. 6.95

Remarks

Scale 1" = ½ Mile
MATERIAL SITE DATA FORM

Site No. 13445       Date: September, 1973
Shawnee
County

Material: Limestone

Location: Sec. 20       Tp. 13 S       Rge. 16 E

Owner: Mr. & Mrs. McCossen
Address: Urbana, Missouri

Nature of Deposit: Dry
Condition: Good

Status of Site: Open Materials Site Sampled

EXPLORATION DATA

<table>
<thead>
<tr>
<th>Test Hole</th>
<th>Depth (ft)</th>
<th>Description</th>
<th>Physical Property</th>
<th>Percent Moisture</th>
<th>Permeability</th>
<th>S.P.</th>
<th>L.L.</th>
<th>P.I.</th>
</tr>
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<tbody>
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</tbody>
</table>

CORELATION DATA

Geological Age: Pennsylvanian

Locality: Deer Creek Limestone Formation-Ervine Creek Member

Material Similar To: SNC Lab. No. 17660

Specific Gravity (F.T.): 2.56
Specific Gravity (D.R.): 2.48

Los Angeles Abrasion: 32.6

Crushing: 2.38

 Mold. Coef.: 0.96

Remarks:
### OPEN MATERIALS SITES; NOT SAMPLED

#### LEGEND

- **Trail or lane**: 
- **Road**: 
- **Railroad**: 
- **Hedge or trees**: 
- **Major streams**: 
- **Intermittent streams**: 
- **Pond or lake**: 
- **Open materials sites; not sampled**: 
- **Open materials sites; sampled**: 
- **Center of section**: 
- **Dwelling**: 
- **Cemetery**: 
- **School**: 
- **Church**: 
- **Town or city**: 

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MATERIAL SITE DATA FORM

Site No.: LSA-50  
Date: September, 1973

Material: Limestone  
County: Shawnee

Location:  
Sec.: 2  
Tow.: 12S  
Range: 13E

Owner: J. C. Miller and R. Hatch

Nature of Deposits: Sandstone

Status of Site: Open Materials Site, Not Sampled

Geological Age: Pennsylvanian

Geological Source: Zoandale Limestone Formation-Yarkin Member

Material Similar To:  

Specific Gravity (Sat.):  

Los Angeles wear:  

Description:  

Mt. Co. Fl.:  

St. Route:  

Remarks: J. A. Liebehardt 491 E. 400 N. Provo, Utah
GLOSSARY


Absorption: Determined by tests performed in accordance with A.A.S.H.O. designation T85.

Alluvium: Deposit of clay, silt, sand, or gravel laid down by flowing water.

Aquifer: Water-bearing geologic unit.

Arkose gravel: Gravel composed of mineral fragments derived from weathered granite.

Bedding: Characteristic of some rock units which shows distinct layers due to the manner in which they were deposited.

Chert: A dull, flint-like, siliceous rock.

Coarse sand: An aggregate of unconsolidated mineral or rock particles, the dimensions of which are not less than 0.42 of a millimeter and not more than 2.00 millimeters.

Degradal: To lower the level of a stream or river valley by stream erosive action.

Exposure pattern: Topographic feature formed on the land surface by the exposure of geologic units.

Fine sand: An aggregate of unconsolidated minerals or rock particles the dimensions of which are not less than 0.05 of a millimeter and not more than 0.42 of a millimeter. The term refers to size of grain and not to composition; however, since most sands are composed of quartz and feldspar, and the term is used without qualifications, a siliceous composition is implied.

Fluvial deposit: Deposits laid down by a river or stream.

Formation: A layer of persistent strata of one general kind of rock.

Fusulinids: Small marine fossils, about the shape and size of a grain of wheat, belonging to the Foraminifera.

Geologic era: Largest unit of geologic time (e.g. Paleozoic, Mesozoic, and Cenozoic).

Geologic period: A unit of geologic time, shorter than an era and longer than an epoch (e.g. Cambrian, Cretaceous, and Tertiary).
Geologic process: Term pertaining to erosion, deposition, and diastrophic methods by which the earth’s surface has been shaped.

Glacial drift: A general term for all rock debris which has been transported and deposited either directly by the ice or from the accompanying meltwater of the glacier.

Glaciolacustrine: Term applied to deposits laid down in glacial lakes.


Ground-water: Water in the zone of saturation, that is, below the water table.

Light type surfacing: A surface course constructed from aggregate which is not bound by water, cement, or bituminous material.

Lithology: Physical properties or rocks such as grain size, mineral content, and color.


Outwash: Material that is transported and deposited by glacial meltwater.

Material source bed: A geologic unit from which construction material is being or can be produced.

Matrix: The fine components of a rock that binds the larger components, sometimes called groundmass.

Member: A division of a formation, generally of distinct lithologic character or of only local extent.

Montmorillonite: A clay mineral which has the outstanding feature of allowing water and other polar molecules to enter into the lattice causing it to expand.

Open material site: A pit or quarry from which material is produced for possible construction purposes.

Perched groundwater: Groundwater separated from an underlying body of groundwater by unsaturated material.

Physiographic division: A division of the state, based on general geologic and (or) geographic features.
Plasticity index: Determined by tests performed in accordance with section Y1-18 of the State Highway Commission of Kansas Standard Specifications, 1966 edition.

Pleistocene Series: Deposits laid down during the Pleistocene Epoch.

Pliocene Epoch: The youngest major subdivision of the Tertiary Period.

Prospective materials site: A location where the geologic conditions are favorable for finding construction materials.

Quartzite: Metamorphic rock produced by recrystallization of primarily quartz sandstone under heat and pressure. Term is sometimes misapplied for unmetamorphosed sandstone.

Residual soil: In place material resulting from the decomposition of rocks.


Specific gravity: Determined by tests performed in accordance with A.A.S.H.O. designation T84 for fine aggregate and T85 for coarse aggregate.

Stereoscopic vision: Three-dimensional vision by means of viewing identical images on two photographs exposed from equal distance but at different angles.

Stratigraphic position: The vertical position of a geologic unit in relation to other geologic units.

Terrace: A plain built up by the deposition of sediments by water.

Wash: (Material passing the no. 200 sieve). Determined by tests performed in accordance with A.A.S.H.O. designation T11.

Weathering: The disintegration (physical change) or decomposition (chemical change) of rock by atmospheric agents.
SELECTED REFERENCES


