**SCHOOL OF
CIVIL ENGINEERING
INDIANA
DEPARTMENT OF HIGHWAYS**

JOINT HIGHWAY
RESEARCH PROJECT
JHRP-84-2

ENGINEERING SOILS MAP OF
GIBSON COUNTY, INDIANA

Chen-Tair Huang

PURDUE UNIVERSITY

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Final Report

ENGINEERING SOILS MAP OF GIBSON COUNTY, INDIANA

TO: H. L. Michael, Director
Joint Highway Research Project

January 10, 1984

Project: C-36-51B

FROM: R. D. Miles

File: 1-5-2-72

Attached is the Final Report on the "Engineering Soils Map of Gibson County, Indiana." The map and report have been prepared by Mr. Chen-Tair Huang, Graduate Assistant on our staff under the direction of Professor Robert D. Miles.

This is the 72nd county map which has been completed by using aerial photography and available information. The map and report should be very useful in planning and developing engineering facilities in Gibson County.

The Report is presented to the Board as a final report showing completion of the Gibson County engineering soils mapping project.

Sincerely,

Robert D. Miles

RDM:rrw

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Final Report
ENGINEERING SOILS MAP OF GIBSON COUNTY, INDIANA

by

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Joint Highway Research Project

Project No.: C-36-51B

File No. : 1-5-2-72

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Purdue University
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All airphotos used in connection with the preparation of this report were obtained by the Indiana Department of Highways and the United States Department of Agriculture.

Engineering Soils Map of Gibson County, Indiana

Introduction

The engineering soils map of Gibson County, Indiana which accompanies this report was done primarily by airphoto interpretation. The aerial photographs used in this study, having an approximate scale of 1:20,000 were taken on August 22, 1940 for the United States Department of Agriculture, Soil Conservation Service. Aerial photographic interpretation of land forms, parent materials and engineering soils of the county was accomplished in accordance with accepted principles of observation and inference (1).

A field trip was made to the area for the purpose of resolving ambiguous details and correlating aerial photographic patterns with soil texture. The final land form and parent material boundaries were graphically reduced to produce the engineering soil map (1 inch = 1 mile). Standard symbols developed by the staff of the Airphoto Interpretation Laboratory, School of Civil Engineering, Purdue University, were employed to delineate land forms, parent materials and soil textures. Parent material symbols were grouped according to land form and origin, and textural symbols were superimposed to indicate the relative composition of the parent materials. The text of this report largely represents an effort to overcome the limitation imposed by adherence to a standard symbolism and map presentation.

The map also includes a set of soil profiles which indicate the general soil profiles in the various land form-parent material areas. The soil profiles were compiled from the agricultural literature and from the boring data of roadway soil surveys along S.R. 57 (Appendix A). These data were supplied by the Indiana Department of Highways. Liberal reference was made to the "Formation Distribution and Engineering Characteristic of Soil" (2).

Description of the Area

General

Gibson County is located in southwestern Indiana (Fig. 1). Its boundary on the west coincides with the Indiana-Illinois State line in the Wabash River. The channel of the White River forms a part of the northern boundary with Knox County. On the west it is bounded by Pike County and on the south it has a common boundary with Warrick, Vanderburg, and Posey Counties. The area is a very irregular triangle in shape, measuring about 36 miles east and west by 24 miles north and south. It contains 499 square miles. The population of the county is 33,156 according to the 1980 Census data with a total rural population of 13,408. The population of Princeton is 8,976, Oakland City 3,301, Fort Branch 2,504, Haubstadt 1,389 and Owensville 1,261, and the urban population increased 12.96 percent in the 1970-1980 period. Princeton is the county seat.

FIG 1 LOCATION MAP OF GIBSON COUNTY

Drainage Features

Drainage features of Gibson County are shown in Figure 2, "Drainage Map - Gibson County, Indiana," prepared by the Joint Highway Research Project, Purdue University 1953 (3). Gibson County lies within three drainage basins of the State. Progressively from north to south they are: The White, the Patoka, and the Minor Ohio. Even though the southwestern part of the county drains into the Wabash River it has been included in the Minor Ohio basin (4).

All of the drainage waters reach the Ohio River either directly through Pigeon Creek, which drains the southeastern part, or through the White and Patoka Rivers and other streams which empty into the Wabash River. Small streams in the valley walls of the Wabash and White Rivers have cut sharp, V-shaped gullies. Many upland streams flow through broad, shallow valleys. Upland drainage has been improved by tile and open drains, and many stream valleys have been dredged and straightened to carry off the rainfall.

The Patoka River that flows east-west across the northern part of the county is the largest tributary of the Wabash River south of the mouth of White River. The Patoka River is in a valley east of Patoka, but is very wide when it enters the broad Wabash River valley. A buried preglacial valley extends across the western part (5). The Wabash and White River valleys acted as glacial sluiceways (6). In normal stages the Wabash channel

DRAINAGE MAP
FIG 2 GIBSON COUNTY
INDIANA

varies from 200 to 900 feet (61 to 274 m) in width and from 3 to 25 feet (91 cm to 7.6 m) in depth. Portions of the abandoned Wabash and Erie Canal are traced through the Sand and Pigeon Creek valleys. The Wabash and White Rivers meander in wide, deeply alluviated valleys. Numerous oxbows and meander scrolls result from this meandering. Ditches create a rectilinear pattern in the bottom lands, sluiceways and slackwater plains. Very short streams enter the White River in the northern part of the county. In the southwest corner the sharp bend in Big Creek is the effect of glaciation. The watershed divide of Pigeon Creek separates the Ohio River drainage system from the Wabash River drainage system. The deflected courses of Black River, Big Creek, and Pigeon Creek are probably the result of glaciation (5). Bottom lands are marked with filled-in valleys with abandoned meanders and long, curving, intermittent drainageways which act as floodwater fluves.

The sand dune areas, especially in the vicinity of Johnson, exhibit a lack of developed surface drainage. Erosion on the sand dunes is reduced to a minimum. Lakes are in shallow-basins or abandoned meanders in the river valleys. Ponds of various origin are scattered over the area.

Stream gaging station are located on the White River at Hazelton and on the Patoka River near Princeton (7).

Climate

The Gibson County climate is distinct seasons with hot summers and cold winters (Seasonal range of temperature is 42.7° F), with frequent changes due to the passing of about 20 cyclonic storms (not tornadoes) over the county each year.

During summer the daily range of temperature is about 20° . Relative humidity during the day is about 70 percent and at night the air becomes saturated. Clouds and haze help conserve the heat, so that the high temperatures of the long summer days last well into the short nights, and the coolest time of day comes at dawn. Much of the summer rainfall comes during sudden, hard thunderstorms and tends to run off rapidly. Although May, June, July, August, and September average between 3 and 4 inches of rain each month, prolonged droughts sometimes occur at critical times. Cold snaps are of short duration and snow does not lie long in winter. Although the daily range of temperature in winter is only about 15° , it frequently fluctuates across the freezing point, so that the land thaws by day and freezes by night. This increases the weathering of the soils, and increases erosion by winter rains.

The average velocity of the wind is about eight miles per hour, and it seldom exceeds 40 miles per hour. The prevailing winter winds are from the southwest. Gibson County receives about 55 percent of the greatest possible number of hours of sunshine each year. One-third of the days are classed as clear,

one-third as partly cloudy, and the rest are cloudy. Mean annual precipitation is 41.62 inches at Princeton, 40.81 inches at Hazelton, and 40.60 inches at Johnson (8). An average annual snowfall above 15 inches is expected.

Table 1 shows the normal monthly, seasonal and annual temperature and precipitation at Princeton (8).

Physiography

Gibson County lies wholly within the Wabash Lowland physiographic region of the state (Figure 3) which includes both glaciated and driftless uplands with comparatively smooth topography and an average elevation of 500 feet (152 m) above sea level.

In respect to its physiographic situation in the United States, the southeastern third of the county belongs to the Aggraded Valley section of the Interior Low Plateaus Province, whereas the remainder of the county lies in the Till Plains Section of the Central Lowland Province (4).

Topography

The surface of Gibson County varies from nearly level in the western part to rolling in the central and eastern parts where streams have dissected the uplands (Figure 4). In general, the uplands are smoothly rolling, but are somewhat rougher in the unglaciated part where Kennedy and Wilson Hills rise by steep slopes above the general level. There are also rough, dissected river bluffs north of Princeton and Owensville.

Table 1. Normal and Extreme Monthly Temperature and Precipitation of Princeton, Gibson County

Month	Temperature			Precipitation			
	Mean °F	Absolute Maximum °F	Absolute Minimum °F	Mean Inches	Driest Year (1930)	Wettest Year (1882)	Average Snowfall
January	31.8	72	-18	3.66	1.00	2.50	8.6
February	34.0	76	-20	2.98	3.40	3.50	6.8
March	44.6	88	2	4.22	1.70	2.84	4.7
April	55.3	91	20	3.63	2.30	3.62	0.4
May	65.0	100	28	3.78	0.10	4.10	Trace
June	74.1	105	39	4.09	0.10	5.35	0.0
July	77.7	111	48	3.09	1.00	9.68	0.0
August	75.7	106	43	3.27	0.25	12.85	0.0
September	69.7	105	27	3.43	2.10	2.00	0.0
October	57.2	95	21	2.68	1.00	6.47	Trace
November	45.2	82	-4	3.25	3.90	3.00	0.8
December	35.5	71	-12	3.48	5.10	3.15	5.3
Year	55.5	111	-20	41.56	27.95	59.06	26.6

FIG. 3 Map of Indiana showing physiographic units and glacial boundaries. Modified from Indiana Geol. Survey Rept. Prog. 7, fig. 1.

FIG 4 TOPOGRAPHIC MAP OF GIBSON COUNTY

About 100 square miles, (20 percent of the county) in the western part of Gibson County are included in the Wabash River valley flood plain and terraces. (8). More than half of this valley is very smooth and flat. Between the low terrace face and the present channel of the Wabash River is a slightly lower flood plain, with a gently undulating surface cut by many old stream channels. A very striking feature of the area is the occurrence of island-like monadnocks or hills of circumnavigation: such as the Gordon Hills, which are uplands entirely surrounded by the flood plain.

A dune topography is developed in several sections along the valley wall as in the vicinity of Johnson. At several places within the county there are broad flat lacustrine plains or slackwater plains where valleys in bedrock are aggraded by backwater from historical floods on the Wabash and Patoka Rivers. The lake plains (slackwater plains) are generally level and lie at an elevation of about 440 feet (134 m). The lake plains include lower swales which act as drainage ways and, also, irregular mounded elevations which rise a few inches or feet above the level of the slackwater plains and are the result of eolian activity.

The highest elevation in Gibson County is at Balls Hill, two miles north of Princeton, which is 645 feet (197 m) above sea level. Here, also, is the maximum local relief, as the elevation

at the Patoka River channel, a short distance away, is only about 400 feet (122 m). The average elevation of the county is about 470 feet (143 m), and the minimum is 355 feet (108 m) above sea level.

Geology

Surface and near surface geologic ages represented in the county are the Quaternary period of Pleistocene age. Bedrock strata are of Pennsylvanian age (Figure 5). Outcropping rocks include sandstone, shales, limestones, and coals. These rocks outcrop in various places in the central and eastern parts of the county. Figure 6 shows a generalized bedrock geology map of Gibson County (9).

The bedrock formation of Gibson County are chiefly of post-Allegheny age. In the extreme eastern sections of the county are a few square miles underlain by rocks of the Allegheny series. The strata consists of coal, sandstone, limestone, shales and clays. Table 2 shows the generalized geologic section for Gibson County.

LEGEND

- McLeansboro Group, upper part
Shale, Sandstone and Thin Coal
- McLeansboro Group, middle part
Shale, Sandstone, Limestone and Thin Coal
- McLeansboro Group, lower part
Shale, Sandstone, Limestone and Thin Coal
- Carbondale Group
Shale, Sandstone, Limestone, Clay and Coal

FIG 5 CONSOLIDATED MATERIAL OF GIBSON COUNTY

TIME UNIT		MAP UNIT	THICKNESS(feet)	LITHOLOGY	ROCK UNIT		
PERIOD	EPOCH				SIGNIFICANT MEMBER	FORMATION	GROUP
PENNSYLVANIAN	CONEMAUGHIAN	P ₅	175+			Mattoon Fm.	McLeansboro
					Merom Ss.		
					Livingston Ls.		
		P ₄	150 200			Bond Fm.	
					Shoal Creek Ls.		
	ALLEGHENIAN	P ₃	200 350			Patoka Fm.	Carbondale
					West Franklin Ls.		
						Shelburn Fm.	
		P ₂	300 400		Danville Coal (VII)	Dugger Fm.	Carbondale
					Springfield Coal (V)	Petersburg Fm.	
					Survant Coal (IV)		
						Linton Fm.	

(After Gray, Henry H., etal. 1970)

FIG 6 COLUMNAR SECTION SHOWING BEDROCK UNITS GIBSON COUNTY

Table 2. Generalized Geologic Section for Gibson County

Quaternary:

Recent, -- alluvium 0- 50'

Pleistocene 0-100'

Pennsylvanian 1150'

Post Allegheny

Allegheny

Pottsville (Not exposed at surface)

Land Form and Engineering Soil Areas

The engineering soils in Gibson County are derived both from unconsolidated material and from the weathering of sandstone, shale, coal, and limestone bedrock. The unconsolidated materials include lacustrine deposits, fluvial deposits, glacial deposits, glacio-fluvial deposits, and eolian deposits (Figure 7).

About three-fourths of Gibson County is glaciated, the southeastern part is in the unglaciated region of the state (4). The glacial and glacio-fluvial deposits are subdued or actually lacking as they are overlain with eolian deposits or are eroded. The lacustrine materials are deposits of the Illinoian stage and Wisconsinan stage of glaciation. Extensive flood plains occur along the Wabash River, the White River and the Patoka River.

FIG 7 UNCONSOLIDATED MATERIAL OF GIBSON COUNTY

There are a few steep bluffs which are produced by local undercutting of the valley walls of some of the streams. Alluvial fans are noticeable along the westward facing valley wall in the Wabash lowlands.

The dissected plain between the White River and the Patoka River valleys is rolling because of the mantle of eolian drift overlying the bedrock. The loose sand in the natural levees and point bars of the rivers is shifted by the wind into dunes on the adjacent upland surface. Extensive sand areas are near Johnson, Princeton, and Patoka. Uplands in the south-central, central and northeastern parts are mapped as being covered with deep loess deposits of eolian origin (10).

Fluvial Deposited Materials

The fluvial drift in Gibson County include alluvial plains, terraces, valley trains, slackwater plains, and lacustrine plains.

1. Alluvial plains

The alluvial drifts of the alluvial plain are sandy silts, silts and clays that are deposited in association with the flood plains of the many stream valleys within the county. The alluvial plains (bounded by sawteeth on the map) are along the Wabash, White, Patoka Rivers. The major tributaries to these streams, such as Pigeon creek, also are bordered by alluvial

plains. A large number of smaller alluvial plains exist within the county, but are too narrow to be mapped at the map scale.

The thickness of the top soils in the alluvial plains varies from 6 in. to 15 in. (15-38 cm) and is silty clay loam (A-6 or A-7 soils), silty loam (A-2, A-4 or A-6 soils) or loam (A-6 soils). The subsoil at depth of about 6 in. to 64 in. (15-163 cm) is silt loam (A-4 or A-6 soils), silty clay loam (A-7 soils) or sandy loam (A-6 or A-7 soils). The underlying soil is clay loam; sandy loam; silty loam and loam (A-7, A-6, A-4, A-2 or A-1 soils). At depth coarse textured fluvial deposits are expected with complex layers related to pool and riffle deposition.

Boring Site No. 3, 4, 5, 6, 7 and 8 are located in the alluvial plains along the Patoka River. At site no. 4 the profile shows 3.0 ft (91 cm) of clay loam underlain by 9 ft (27 m) of medium stiff silty clay (A-7-6 (19) soils) which is composed of 2% sand, 63% silt and 35% clay. Further down in the profile, about 6 ft (1.8 m) of silty clay loam and about 3 ft (91 cm) of silty clay is encountered before the thick sand layer is reached.

More complex fluvial drift deposits occur in the wide flood plains and terraces of the Wabash River. In general, coarse gravel deposits are not plentiful, but, at depth, stratified sand deposits occur.

2. Terrace and valley trains

A few scattered low terraces are recognized in Gibson County. Infiltration basins are a common feature of these coarse-textured terraces deposits. The terrace surface and the lower flood plain is subjected to flood erosion and deposition.

The texture of the terrace varies greatly from place to place. The soil profile consists of a sandy loam to silty clay loam topsoil underlain by a silty clay loam to clay then a gravelly to sandy clay subsoil. Stratified sands with some gravels are encountered at depth.

3. Lacustrine Plains

The lacustrine materials (and slackwater plains) are deposits of the Illinoian and Wisconsinan stage of glaciation and are laid down in lakes formed by ponding as the flood waters backed up into tributary valleys. Major floods occurring today cause extensive backwater to temporarily flood these slackwater plains. The topography of the lacustrine plain is a nearly level plain broken only by widely spaced drainage channels. The soil is developed partly from eroded loess that is redeposited by fluvial action as sheet wash materials spread from the surrounding upland. No beach ridges or strand lines exist on the edge of the plains as the lakes are temporal.

The thickness of the top soils varies from 6 in. to 11 in. (15-28 cm) and is silt loam (A-4 or A-6 soils) or silty clay (A-7 or A-6 soils). The subsoil at depth about 11 in. to 39 in. (28-99 cm) is silty clay (A-7 soils), clay (A-7 soils) and

stratified silty clay loam (A-6 or A-7 soils) is found as underlying soils. All the soils are gray to dark gray indicating the wet environment.

Most engineering problems associated with the lacustrine deposits are the result of the behavior of contained water. The lacustrine material in most places, is water saturated. Typically, the more permeable materials are scattered through the lake deposits as thin horizontal layers and lenses and they provide the only effective avenues for water movement. Because of the poorly drained situation in some areas frost heave, settlement and weak supporting power of the soils are the major problems in this deposit.

Eolian Drift

There are extensive eolian (wind) deposits in Gibson County (Figure 8, Appendix B). Except for the alluvial plains, the entire county is covered by windblown silt or loess deposits of varying depth. The eolian deposits are subdivided into two groups: sand deposits and loess deposits.

1. Windblown Sand Deposits

The windblown sand deposits are accumulated along the Wabash and White Rivers bluffs that form the eastern valley wall. These dune-shaped hills are formed where strong westerly winds carried sands of certain size up onto the uplands to the east. In some

FIG 8 ISOPACHOUS MAP OF LOESS DEPOSIT IN GIBSON COUNTY

places, these sand hills end in steep-faced terminal dunes, and in other places there are low mounds where the original silty soils are mantled with a veneer of sands.

The materials of the sand dune are predominantly fine, uniform, windblown sand. A small amount of silt and some clay particles is mixed with the sand especially near the surface soil layer.

On the aerial photographs, the surface of the sand dune area appears to have a coarse texture when compared with that of the smooth loess plain. Surface drainage is generally absent in the sand dune deposits, but well developed in the loess deposits. As the water infiltrates into the sand, it tends to form slight infiltration basins producing a somewhat darker area on the air-photo pattern. These darker areas create a speckled appearance which contrasts with the more uniform gray tone appearance of the loess (10).

The soil profile of sand dune deposits consist of sandy loam (A-4 or A-6 soils), or sand (A-2-4 or A-3 soils) topsoil, overlying a sandy clay loam (A-6 soils), sandy loam (A-4 soils), or fine sand subsoil.

Little or no problems other than stabilization and compaction are expected in this area. However, if deep cuts are required the characteristics of the underlying materials is important.

2. Windblown Silt Deposits

In Gibson County, the land form of the loess is influenced by the underlying materials usually bedrock. As a result of its method of deposition, the loess tends to modify and smooth out the existing topography. The streamlining or wind swept appearance is an important feature in the identification of loess on aerial photography.

The windblown silt deposits are subdivided into three mapping units: (1) moderately deep loess deposits (2) discontinuous loess over sedimentary rock, and (3) loess covered sedimentary rock.

(a) Moderately Deep Loess Deposits

About one third of Gibson County is considered as moderately deep (above five feet and up to 25 feet or 1.5 to 7.6 m) loess deposits in the form of a loess plain or hills. The loess deposits are thicker (about 25 ft or 7.6 m) in the west central part of the county and decrease in thickness in the east as illustrated in Figure 8 and Appendix B.

The thick loess deposits occur on all the ridge tops where erosion is at a minimum. The depth of the loess decreases rapidly towards the nearby streams and gullies where surface drainageways are well developed along the major streams. The typical pinnate drainage pattern for deep loess deposits occurs occasionally.

The soil profile of the moderately deep loess deposit contains silt loam (A-4 or A-6 soils) in the top soil. The subsoil is silt loam or silty clay loam (A-4, A-6 or A-7) soil. The underlying material is silt loam (A-4 or A-6) soil.

The engineering problems in this area are primarily the control of moisture during construction and compaction of the silty material. The subgrade becomes weak under adverse moisture or due to frost action in winter. Pumping and slope erosion are potential problems in this area.

Boring site No. 1 and No. 2 are located in this region. No. 2 was taken approximately 0.5 mile north of S.R. 64 on S.R. 57 at an altitude of 462.3 ft (140.9 m) above sea level. A 2.0 ft (61 cm) silty loam (A-4) soil is underlain by 6.0 ft (1.8 m) of silty loam (A-6) silt. Then a 12 ft (3.7 m) clay (A-7-6 (39)) layer which contains 0.2% gravel, 2.0% sand, 46.0% silt and 51.8% clay, and this is followed by 4.6 ft (1.4 m) clay loam (A-4 (4)) with a trace of rock fragments. Siltstone is encountered at a depth of 34.0 ft (10 m).

(b) Discontinuous Loess Over Weathered Sedimentary Rock

The area is covered by loess up to 55 inches (140 cm). The soil parent materials are weathered Pennsylvanian shale, sandstone, siltstone and limestone and the overlying loess. The top soil is silt loam (A-4 or A-6 soils). The subsoils range from

silt loam (A-4 or A-6) to silty clay loam (A-6 or A-7 soils). The underlying material is silt loam, loam or sandstone, shale, siltstone, and/or limestone.

The engineering problems associated with this region are associated with the cuts and fills. Different types and characteristics of residual soils or bedrock are encountered within short distances both horizontally and vertically.

(c) Loess Covered Sedimentary Rock

The area classified as loess covered shale, sandstone and/or limestone is confined near the southeastern part of the county. The region is dissected by streams and gullies.

Since the sandstone-shale-limestone bedrock is covered by a blanket of loess with a thickness which varies from 55 to 80 inches (1.4 to 2.0 m) the upper soil profile is derived from the leached loess material. The top soil is silt loam (A-4 or A-6 soils). The subsoils are silt loam (A-4 or A-6 soils) or silty clay loam (A-6 or A-7 soils). The weathered sandstone-shale-limestone residual soil is sandy loam, silt loam or clay under the loess deposits.

Engineering problems in this soil region are generally associated with the different characteristics of the underlying residual bedrock soils and the layered bedrock materials. A shallow cut and fill alignment encounters several different materials in a short distance.

Miscellaneous

Organic Deposits

Two small areas of muck are mapped. One is located in Section 24 R13W,T2S. The other one is located in Section 17, R11W, T2S.

Muck, as mapped in Gibson County, is a mixture of more or less decomposed plant remains with silt and sand accumulated in poorly drained basins or abandoned meander channels. Organic matter is the dominant constituent, and the material is black and structureless to a depth of 30 or 36 in. (76-91 cm). Below this there is more or less brown, fibrous peat, resting on grayish sandy material containing some shell fragments or marly material (8).

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APPENDIX A

ENGINEERING SOIL TEST RESULTS

Site	Station	Offset (ft.)	Depth (ft.)	Texture	Classification	Gravel	Sand	Silt	Clay	L.L.	P.L.	P.I.
1a	770+89	21LT	0.0-1.5	A-4(7)	Silty Loam	0.0	13.5	73.7	12.8	27.5	18.2	9.3
1b	770+89	21LT	10.0-11.5	A-6(9)	Silty Loam	0.0	14.1	69.5	16.4	28.6	16.8	12.0
1c	770+89	21LT	30.0-31.5	A-7-6(35)	Clay	0.0	0.0	37.4	62.0	57.2	27.5	29.7
2a	771+94	20LT	20.0-21.5	A-4(4)	Clay Loam	0.0	36.9	41.5	21.6	23.9	13.6	10.3
2b	771+94	20LT	8.5-18.5	A-7-6(39)	Clay	0.2	2.0	46.0	51.8	61.5	27.2	34.3
3	60+60	35LT	0.5-3.0	A-7-6(15)	Silty Clay	3	7	55	35	41	26	15
4	58+10	19LT	3.5-5.0	A-7-6(19)	Silty Clay	0	2	63	35	42	25	17
5	92+45	15RT	5.5-8.0	A-6(11)	Silty Clay Loam	0	15	50	26	34	21	13
6	95+51	12RT	28.5-30.0	A-1-6(0)	Sand	17	80	-3-		NP		
7	97+39	12LT	38.5-40.0	A-1-6(0)	Gravelly Sand	30	68	-2-		NP		
8	98+50	15LT	1.0-2.5	A-4(7)	Silty Loam	0	18	65	17	31	22	9

The soil test data tabulated above was obtained from consultant's reports prepared for the Indiana State Highway Commission. The location of the site is shown on the attached engineering soils map.

APPENDIX B

LOESS THICKNESS MEASUREMENT IN GIBSON COUNTY: BY J. B. Fehrenbacker

<u>Site No.</u>	<u>Township</u>	<u>Range</u>	<u>Section</u>	<u>Total Depth in Inches</u>	<u>Underlying Material</u>
1	1N	10W	27,SW160,NE40	220	Red I-Outwash Soil
2	1N	10W	3,NE40	250	Silt
3	1N	10W	32,NW160,NE40	210	Red I-Outwash Soil
4	1N	10W	35,SW160,N10	110	Gritty Silty Loam
5	1S	9W	28,NE40	70	Silty Clay
6	1S	10W	7,SW40	175	Red I-Outwash Soil
7	1S	10W	31,NE160,NE40	110	Red I-Outwash Shale Soil
8	1S	11W	12,SW160,SE40	275	Red I-Outwash Soil
9	1S	11W	26,SE160,SW40	50	SS and Sh
10	2S	8W	6,SE160,SW40	50	Red I-Outwash Soil
11	2S	8W	31,SW160	396	Red I-drift Soil on Sh & SS
12	2S	9W	20,SW10	75	Till or residuum
13	2S	10W	19,SE10	90	Silty Clay
14	2S	10W	33,NW160,SW40	80	Silty Loam and Silty Clay
15	2S	11W	13,SW160,SE40	120	Sand Loam over SS & Sh
16	2S	11W	14,SW160,NW40	180	Sandy Loam
17	2S	11W	21,NE160,SE40	240	Gritty Silty Loam and light Silty Clay Loam
18	2S	11W	31,SE160,NW40	175	Red Gritty Silty Loam
19	2S	12W	27,SE160,SW40	300	Gritty
20	3S	8W	7,SE160,SW40	108	SS and Sh
21	3S	9W	15,NW160,SW10	60	Sh Soil
22	3S	10W	13,NW160,SE40	70	Sh Soil
23	3S	10W	16,NW160,SE40	80	Lacustrine Soil
24	3S	10W	18,NW160,SE10	95	Heavy Silty Loam and light Silty Clay Loam
25	3S	11W	17,NE160,SE40	120	Gritty heavy Silty Loam
26	3S	12W	3,NW 1/4	96	---
27	3S	12W	15,NE160,NW40	210	Silty Clay Loam
28	3S	12W	27,SE160,NE10	150	Gritty heavy Silty Loam
29	4S	10W	2,NW160,NW40	60	SS Soil
30	4S	11W	4,SW 1/4	96	Silty Loam and Fine Sand

I = Illinois

JHRP 84/2

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Profile 1, 2, 3

ENGINEERING SOILS MAP GIBSON COUNTY INDIANA

INDIANA

ENGINEERING SOILS MAP
GIBSON COUNTY
INDIANA

ENGINEERING SOILS MAP
GIBSON COUNTY
INDIANA

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ENGINEERING SOILS MAP
GIBSON COUNTY
INDIANA

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Figure 1

ENGINEERING SOILS MAP
GIBSON COUNTY[illegible]

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Keywords: child sexual abuse; disclosure; self-blame

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