**Limestone Site Data Form**

**Site No.** LS+1  
**Date** October, 1977  
**Material** Limestone  
**County** Riley  
**Section** SW¼ NE¼  
**Township** 35  
**Range** 6E  
**Owner** J. Wendall  
**Address** Green, Kansas  
**Nature of Deposit** Dry  
**Source of Site** Sampled  

**Explosion Data**

<table>
<thead>
<tr>
<th>Test Hole</th>
<th>Material</th>
<th>Depth of Material</th>
<th>1/16</th>
<th>1/4</th>
<th>1/2</th>
<th>1</th>
<th>1-1/4</th>
<th>1-1/2</th>
<th>2</th>
<th>3</th>
<th>3-1/4</th>
<th>4</th>
<th>5</th>
<th>Wash</th>
<th>G.I.</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>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Correlation Data**

**Geological Age** Permian  
**Geological Source** Doyle, Shale Fm., Towanda Limestone Member  
**Material Supplier** KDOT Lab No. 67-4573  

**Specific Gravity (Sp. Gr.)** 2.35  
**Los Angeles Wear** 42.98  
**Absorption** 3.01  

*Remarks: KDOT Materials Department Site No. 51-52*
**MATERIAL SITE DATA FORM**

**Site No.** LS-2  
**Date** October, 1977  
**Material** Limestone  
**County** Riley  
**Location**  
- Pk 6  
- Sec. 7S  
- T104N  
- R6E  
**Owner**  
- ARTHUR J. PETER  
- 728 WEBSTER ST.  
- CLAY CENTER, KS  
**Nature of Deposit**  
- Fair  
- Accessory  
- Site Located on Farm  
**Open Materials Site, Sampled**

**EXCAVATION DATA**

<table>
<thead>
<tr>
<th>Test</th>
<th>10 Ft.</th>
<th>5 Ft.</th>
<th></th>
<th>50 Ft.</th>
<th>100 Ft.</th>
<th>Washed</th>
<th>Gr</th>
<th>LL</th>
<th>FL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.34</td>
<td>0.30</td>
<td></td>
<td>0.34</td>
<td>0.30</td>
<td>0.34</td>
<td>0.30</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**CORRELATION DATA**

- **Geological Age:** Permian  
- **Geological Source:**  
  - Barnepton Limestone Pm. - Port Riley Lm. MBR. (Rip.)  
  - EODT Lab. No. (1) 49439 (2) 49440 (3) 49441

**Specific Gravity:**  
- **Specific Gravity Spec.**  
  - (1) 2.22 (2) 2.34 (3) 2.37

**Los Angeles Wear:**  
- (1) 52.8 (A) (2) 49.5 (A) (3) 33.6 (A)

**Atten. No.:**  
- (1) 782 (2) 438 (3) 431

**Wt. Co. Ft.:**  
- 551 lbs.

**Remarks:** EODT Materials Department Site No. Riley Co. #1
**LS+3**

**SITE**

- Site No.: 
- Date: October, 1977
- County: 
- Material: Limestone
- In: Riley

**Licenses**

- SH: New Orleans, LA.
- Tag: 34
- Range: 6S
- Sec.: 6E

**Owner**

- John Paul Homecrafts
- Address: 

**Open Material Site:** Sampled

---

**EXPLORATION DATA**

<table>
<thead>
<tr>
<th>Test &amp; Rule</th>
<th>Material Name &amp; Source</th>
<th>Depth of Material</th>
<th>%</th>
<th>2%</th>
<th>5%</th>
<th>10%</th>
<th>20%</th>
<th>50%</th>
<th>100%</th>
<th>Weight 200</th>
<th>D.P.</th>
<th>I.L.</th>
<th>F.I.</th>
</tr>
</thead>
</table>

**CORRELATION DATA**

- **Geological Age:** Permian
- **Geological Source:** Doyle Shale Fm. Towanda Limestone Member
- **Material Similar To:** KDOT Lab. No. 67-2482 67-1027
- **Specific Gravity (SG):** 2.51 2.50 2.43 2.41
- **Los Angeles Abrasion:** 35.8 35.8
- **Absorption:** 0.93 0.92
- **Wt. Co F1:** 5.42 5.42

**Remarks:** KDOT Materials Department Site No. 81-49
MATERIAL SITE DATA FORM

Site No.: LS+4
Date: October, 1977

Material: Limestone
County: Riley

Locator: NW 4-3-7S-6E
Owner: Paul Rasmussen, Route 1, Randolph, Ks

Nature of Deposit: Dry
Accessibility: Good
Site Located on Property: II
Status of Site: Open Materials Site: Sampled

EXCAVATION DATA

Table:

Material Depth (inches) Of Material
<table>
<thead>
<tr>
<th>Depth</th>
<th>1 1/2</th>
<th>3</th>
<th>5/8</th>
<th>4</th>
<th>8</th>
<th>16</th>
<th>30</th>
<th>50</th>
<th>100</th>
</tr>
</thead>
</table>

CUMULATIVE DATA

Geological Age: Permian
Location: Barneetown Limestone
Notes: Fort Riley LS 8023 B
Material Similar to: KDOT Lab. No. 14072 14614 14418 (rimrock)

Specific Gravity (Gat) 2.32 2.36 2.37
Los Angeles Wear 47.5 42.1 58.1
Absorption 8.49 5.47 0.88 0.90 0.64

Remark: KDOT Materials Department Site No. 81-11
MATERIAL SITE DATA FORM

Site No. L5+6
Pbr.
Date October, 1977

Material Limestone
County Riley

Location SW 1/4 NW 1 Sec. 5 Twp. 65 Range 7E
Owner Carol A. Gerlach & Al
City Blue Rapids, KS

Dry

Accessability Fair
Note: Site located on Platte 11

Open Materials Site; Sampled

EXPLORATION DATA

<table>
<thead>
<tr>
<th>Tests of Hole</th>
<th>Material of Core</th>
<th>Depth of Core</th>
<th>Depth of Material</th>
<th>175</th>
<th>500</th>
<th>400</th>
<th>300</th>
<th>200</th>
<th>100</th>
<th>50</th>
<th>30</th>
<th>20</th>
</tr>
</thead>
</table>

Cores

<table>
<thead>
<tr>
<th>Material</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Permian</td>
<td>Barneon L. Fm. Fort Riley Limestone Mbr.</td>
</tr>
</tbody>
</table>

KDOT Lab No. 67-3763

<table>
<thead>
<tr>
<th>Spec. Gravity (Sp. Gr.)</th>
<th>2.56</th>
<th>2.49</th>
</tr>
</thead>
<tbody>
<tr>
<td>Los Angeles Abrasion</td>
<td>29.2 B</td>
<td>0.97</td>
</tr>
</tbody>
</table>

KDOT Materials Department Site No. 01-51
**MATERIAL SITE DATA FORM**

**Site No.:** 5G+7  
**Date:** October, 1977

**Material:** Sand - Gravel  
**County:** Riley

**Location:**  
**Owner:** Fay E. Attwood  
**Ida:**  
**Nature of Deposit:** Open Material Site; Sampled  
**State of Soil:** Good  
**Site Source on File:** II

---

**EXHIBITION DATA**

<table>
<thead>
<tr>
<th>Test Hole</th>
<th>Material Color</th>
<th>Depth of Material</th>
<th>Depth of Molding</th>
<th>Test No.</th>
<th>Wet</th>
<th>Dry</th>
<th>Cr.</th>
<th>LL</th>
<th>PI</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>7</td>
<td>17</td>
<td>35</td>
<td>1</td>
<td>75</td>
<td>94</td>
<td>99</td>
<td>0.26</td>
<td>3.9</td>
</tr>
</tbody>
</table>

---

**CORRELATION DATA**

**Geological Age:** Quaternary  
**Geological Source:** Alluvium  
**Material Similar To:** KDOT Lab. No. 38973

**Specific Gravity:**  
**Grain Size:**  
**Absorption:**  
**Wet Co. Ft.:** 116.10

**Remarks:**  
KDOT Materials Department Site No. 81-34 Reservoir  
Covered H_2O.
MATERIAL SITE DATA FORM

| Site No. |  | Date: October, 1977 |
|----------|-----------------|
| Material | Limestone |
| County | Riley |
| SE, Sec. | 15 |
| Twp. | 7S |
| Range | 5E |
| Owner | Richard F. Stadel |
| Address | 6234 S. Good Rd., Randolph, KS |
| Nature of Deposit | Dry |
| Accessibility | Good |
| Site located on Farm | III |
| Status of Site | Open Materials Site; Sampled |

EXPLANATION DATA

| Drill No. | Fringe of Material | Depth of Material |
|-----------|--------------------|
| 15        | 10'                | 25'               |
| 16        | 50'                | 100'              |

COORELATION DATA

Geological Age: Permian
Geological Source: Doyle Shale Fm. Towanda, Limestone Mbr.
Material Similar To: KDOT Lab No. 11657 11697A 11697B 11697C

Specific Gravity (Dry): 2.46 2.44 2.46 2.48
Specific Gravity (Wet): 2.35 2.32 2.34 2.38
Los Angeles Abrasion: 22.0
Absorption: 4.86 5.51 4.98 4.82
Moisture Content: 0.89

KDOT Materials Department Site No. 81-29
MATERIAL SITE DATA FORM

Site No. LS 49
Date October, 1977

Limestone
Riley

Material Na4 Silica 74
Type 18 Range 5E

Location Bernard E. & Ernest Kinze
Randolph, KS

Depth

Driveway

Nature of Deposit Accessible
Site located on Plato 111

Status of Site: Open Materials Site: Sampled

EXPLORATION DATA

<table>
<thead>
<tr>
<th>Test No.</th>
<th>Material of Region</th>
<th>Depth</th>
<th>Depth</th>
<th>1 in.</th>
<th>5/8 in.</th>
<th>3/4 in.</th>
<th>1 in.</th>
<th>3 in.</th>
<th>5 in.</th>
<th>10 in.</th>
<th>30 in.</th>
<th>100</th>
<th>G.P.</th>
<th>LL</th>
<th>P.I.</th>
</tr>
</thead>
</table>

CORRELATION DATA

Geological Type Permian

Doyle Shale Fm. Towanda Limestone Mbr.

KDOT Lab. No. 8807

Specific Gravity (Sol.) 2.52 (Dry) 2.42
Los Angeles Wear 20.6
Absorption 4.16 Soundness 0.85

Remarks KDOT Materials Department Site No. 81-27
**MATERIAL SITE DATA FORM**

- **Site No.:** LS-10
- **Pde:**
- **Date:** October, 1977
- **Material:** Limestone
- **County:** Riley
- **Location:** NE 4 SE 4 Sec. 11 Twp. 9S Rng. 4E
- **Owner:** U.S. Government
- **Nature of Deposit:** Dry
- **Accessibiity:** Fair
- **Site Located on Plane:** V
- **Open Materials Site: Sampled**

### EXPLOSION DATA

<table>
<thead>
<tr>
<th>Test Site</th>
<th>Material at Bottom of Hole</th>
<th>Depth of Drilled Material</th>
<th>Depth of Gravel Border</th>
<th>% 1 3/8</th>
<th>4</th>
<th>6</th>
<th>10</th>
<th>30</th>
<th>50</th>
<th>100</th>
<th>Wash 200</th>
<th>GP</th>
<th>LL</th>
<th>IP</th>
</tr>
</thead>
</table>

### CORRELATION DATA

- **Geological Age:** Permian
- **Geological Source:** Doyle Shale Fm. Towanda Limestone Mbr.
- **Material Sampled To:** KDOT lab. No. 49442 49443
- **Specific Gravity (Sat.):** 2.50 2.22
- **Los Angeles Wear:** 32.9 (a) 28.4 (a)
- **Absorption:** 3.06 2.77
- **Wt. Co. Ft.:**
- **Dr. Rake:**

**Remarks:** KDOT Materials Department Site No. 81-3
**Site No.**: S+11  
**Date**: October, 1977  
**Material**: Limestone  
**County**: Riley  
**Location**: NW 1/4 Sec. 24 Tp. 9S Range 4E  
**Owner**: U.S. Government  
**Surface in Deposit**: Open Materials Site; Sampled  
**Nature of Deposit**: Good  
**Accessibility**: None

### Physical Data

| Test | Date | Anticipated | Unit of Mass | Diameter of Material | U | L | S | H | R | M | 14 | 16 | 34 | 100 | Wash | O.F. | D.L | P.E. |
|------|------|-------------|--------------|---------------------|---|---|---|---|---|---|----|----|----|----|------|------|------|-----|------|
|      |      |             |              |                     |   |   |   |   |   |   |    |    |    |     |      |      |     |     |      |

### Correlation Data

**Geological Age**: Permian  
**Geological Source**: Doyle Shale Fm. Towanda Limestone Mbr.  
**Material Similar to**: KDOT Lab. No. 67-1935 67-2769 67-2484

**Specific Gravity (Sol)**: 2.45 2.48 2.43  
**Density**: 2.36 2.40 2.32  
**Los Angeles Wear**: 31.68 26.58 34.18  
**Absorption**: 4.03 3.34 4.66  
**Wt. Co. F.**: Soundness: 0.92 0.97 0.95

**Reserves**: KDOT Materials Department Site No. 81-48

**Scale**: 1 inch = 1/2 mile
MATERIAL SITE DATA FORM

Site No. LS+12  
Date October, 1977  

Material Limestone  
County Riley  

Location SW 1/4, SW 1/4  
Sec. 27  
Twp. 8S  
Range 6E  

Owner Raymond L. Nelson  
Address Riley, KS  

Dry  
Good  

Nature of Deposit Accessible  
Site located on Prairie  

Open Materials Site; Sampled  

EXPOSURE DATA

<table>
<thead>
<tr>
<th>Test Hole</th>
<th>Material Below</th>
<th>Depth of Material</th>
<th>Depth of Bedrock</th>
<th>Water Level</th>
<th>Permeability</th>
<th>Gt. Ft.</th>
<th>I.F.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

CORRELATION DATA

Geological Age Permian  
Geological Source Doyle Shale Fm. Towanda Limestone Mbr.  
KDOT Lab. No. 8467 88678 88679 85680 85634  

Material Similar To (1) (2) (3) (4) (5)  
Specific Gravity (Gt.) 2.37 2.37 2.37 2.37 2.37  
Los Angeles Abrasion Loss (1) (2) (3) (4) (5)  
Absorption Soundness 0.35 0.35 0.35 0.35 0.35  

Sh. Co. Ft.  
Remarks KDOT Materials Department Site No. 81-20
**Material Site Data Form**

**LS-14**  
**Pate**  
Date: **October, 1977**  

**Material**  
Limestone

**Location**  
SW1  
Sec. 30  
Twp. 9S  
Range 5E

**U.S. Government**  
Dry 
Accessibility: Fair

**Nature of Project**  
Site located on Platte, VII

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

**Explanation Data**

<table>
<thead>
<tr>
<th>Test Holes</th>
<th>Material Below Surface</th>
<th>Depth of Material below surface</th>
<th>% of Material below surface</th>
<th>% of Material below surface</th>
<th>% of Material below surface</th>
<th>% of Material below surface</th>
<th>% of Material below surface</th>
<th>% of Material below surface</th>
<th>% of Material below surface</th>
<th>% of Material below surface</th>
<th>% of Material below surface</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Correlation Data**

Geological Age: **Permian**

Geological Series: **Doyle Shale Fm, Tuwanda Limestone Mbr.**

**Material Similar To**

<table>
<thead>
<tr>
<th>Specific Gravity (GSI)</th>
<th>100 Angeles Way</th>
<th>Absorption</th>
<th>Wt. Co. F.</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>KDOT Materials Department Site No. Riley #1D</td>
</tr>
</tbody>
</table>
MATERIAL SITE DATA FORM

WE+13
Fnt

Date
October, 1977

Limestone
County
Riley

Location
NWS NE4
Sec. 31
Twp. 9S
Rge. 5E

U.S. Government

Dry

Fair

Open Material Site; Sampled

EXPLORATION DATA

1st Hole Material Depth Date Code Value of Material
1 2 3/8' - 8 16 30 50 100 Weight 200 CF LS PI

CORELATION DATA

Geological Age
Permian

Geological Source
Doyle Shale Fm. Towanda Limestone Mbr.

Material Number
KDOT Lab. No. 76268

Specific Gravity (Sat.)
2.61

Dur.
25.8

Absorption
2.16

Wt. Co. Ft.

Remarks
KDOT Materials Department Site No. 82-16
MATERIAL SITE DATA FORM

<table>
<thead>
<tr>
<th>Site No.</th>
<th>LS+16</th>
<th>Date</th>
<th>October, 1977</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDG</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Material</td>
<td>Limestone</td>
<td>County</td>
<td>Riley</td>
</tr>
<tr>
<td>Location</td>
<td>SE1/4</td>
<td>Sec.</td>
<td>23</td>
</tr>
<tr>
<td>Township</td>
<td>Range</td>
<td>7S</td>
<td>67</td>
</tr>
<tr>
<td>Owner</td>
<td>U.S. Government</td>
<td>Address</td>
<td></td>
</tr>
<tr>
<td>Nature of Deposits</td>
<td>PRV</td>
<td>Accessibility</td>
<td>Very Good</td>
</tr>
<tr>
<td>Site No.</td>
<td>Open Materials Site: Sampled</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

EXPLORATION DATA

| Test Hole | Material | Depth in Ft. | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 | 65 | 70 | 75 | 80 | 85 | 90 |
|-----------|----------|--------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|

CORRELATION DATA

Geological Age | Permian |
Geological Source | Doyle Shale Fm. Towanda Limestone Mbr. |
Material Source | KDOT Lab. No. 23129 23129 23129 |
Specific Gravity (Dry) | (A) 2.68 (B) 2.65 (C) 2.79 |
Los Angeles Abrasion | (A) 2.54 (B) 2.54 (C) 2.54 |
SND | Soundness |
Wt. % CO2 | Moisture |
Report | KDOT Materials Department Site No. 87-37 |
MATERIAL SITE DATA FORM

LS-17
PDE

Site No. 100

Material Limestone

Location NW SW Sec. 28

Dry

No. 28

Material of Deposit: Limestone

Remarks KDOT Materials Department Site No. 81-1

Permian

Doyle Shale Fm. Towanda Limestone Md.

KDOT Lab. No. 49444 49445

2.53 2.44

2.3(A) 10.5(A)

(1)2.04 (2)2.72

2.7

81-1
MATERIAL SITE DATA FORM

LS+18
Pd

Site No. Date October, 1977
Limestone
County Riley
Location NW 1/4 Sec. 33 Twp. 98 Range 6R
U.S. Government
Owner
Name Dry
Accessibility Good
Notice of Deposit
Site located on map VIII

Open Materials Site; Sampled

EXPLORATION DATA

<table>
<thead>
<tr>
<th>Soft Site</th>
<th>Material Below Cut Plane</th>
<th>Depth of Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>15</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

CORRELATION DATA

Geological Age Permian
Geological Source Doyie Shale Fm. Towanda Limestone Mtr.
Material similar to KDOT Lab. No. 55534

Specific Gravity (Soln) 2.48
Specific Gravity (Solid) 2.8
Los Angeles Wear 28.0 (B)
Aberrance (1) 3.28

KDOT Materials Department Site No. 81-21.
**LE+19**  
Site No. 16  
Date: October, 1977  
Location:  
County: Riley  
Section: 33  
Twp.: 9S  
Range: 6E  
Owner:  
U.S. Government  
Type of Deposit: Dry  
Condition: Good  
Site Located on Plane: W  
Open Materials Site: Sampled  
Sheet of Site:  

**EXAMINATION DATA**

<table>
<thead>
<tr>
<th>Test</th>
<th>Material</th>
<th>Method</th>
<th>Depth of Material</th>
<th>% Melt</th>
<th>% Sol</th>
<th>% Coarse</th>
<th>% Medium</th>
<th>% Fine</th>
<th>Wash 2.00</th>
<th>Wash 5.00</th>
<th>Wash 10.0</th>
<th>Wash 50.0</th>
<th>G.F.</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>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**CORRELATION DATA**

Geological Age: Permian  
Geological Source: Doyle Shale Fm. Towanda Lime Stone Mbk.  
Table of Data: KDOT Lab. No. 15625 15788  
Thickness: 31.2  
Specific Gravity (Dry): 2.44  
Specific Gravity (Wet): 2.37  
Loss on Ignition: 3.87  
Soundness: 0.98  
\(\text{C}_{\text{p}}\): 3.71  
Stk. Ratio:  
Notes: KDOT Materials Department Site No. 81-25  

Scale: 1 inch = 1 mile
MAIERAL SITE DATA FORM

LS+20
Pbc

October, 1977

Limestone
Riley

NFA
Sec. 22
Lot 108
Range 7E

Irene Abramowitz 1016 Baltimore, K.C.

Dry

Good

SITE LOCATED ON PAMC VIII

Open Materials Site: Sampled

EXPLORATION DATA

<table>
<thead>
<tr>
<th>Test Hole</th>
<th>Maximum Depth</th>
<th>Depth to Water</th>
<th>Depth to Rock</th>
<th>Depth to Bedrock</th>
<th>G.F.</th>
<th>LL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

CORRELATION DATA

Geological Age: Pernian

Geological Source: Beattie Ls. Fm. Cottonwood Limestone Mbr.

KDOT Lab. No. 92218

Spec. Gravity (Dry):

2.38

Los Angeles Wear:

4.6

Absorption:

11.6.53: Soundness

11.0.97

Scale 1 inch = 1/2 mile
Material Site Data Form

LS +21

Site No. Ptd

Date October, 1977

Material Limestone

County Riley

Location NW 4 Sec. 25 Twp. 9S Range 7E

Owner Robert R. Irvine, Jr., ETAL

Nature of Deposit Dry

Accessibility Good

Site located on Map VIII

Status of Site Open Materials Site; Sampled

Materials

<table>
<thead>
<tr>
<th>Test No.</th>
<th>Material Section</th>
<th>Depth (Net)</th>
<th>Depth</th>
<th>Material</th>
<th>0'</th>
<th>5'</th>
<th>10'</th>
<th>20'</th>
<th>30'</th>
<th>50'</th>
<th>100'</th>
<th>Wash</th>
<th>ST.</th>
<th>LT.</th>
<th>FL.</th>
<th>GT.</th>
</tr>
</thead>
</table>

Correlation Data

Geological Age Permian

Geological Source Doyle Shale Fm. Towanda Limestone Mbr.

Material Similar To KDOT Lab. No. 38039

Specific Gravity (Sat.) 2.38 Dry 2.25

Los Angeles Weat 33.4 (B)

Absorption 5.93 Soundness 0.89

Wt. Ca. Ft. 56 St. Ftas

Remarks KDOT Materials Dept. Site No. 81-42
**MATERIAL SITE DATA FORM**

Site No. LS+22  
Material Class: Limestone  
County: Riley  
Location: NW NE #23  
City: Manhattan  
Nature of Deposit: Dry  
Open Materials Site: Yes  
Surveyed as Plate: VIII  
Date: October, 1977  

<table>
<thead>
<tr>
<th>Test &amp; Analyte</th>
<th>Material on Bottom</th>
<th>Depth of Material</th>
<th>Material</th>
<th>Percentage</th>
<th>1%</th>
<th>3%</th>
<th>4</th>
<th>8</th>
<th>16</th>
<th>30</th>
<th>100</th>
<th>Crush</th>
<th>OS</th>
<th>LI</th>
<th>PI</th>
</tr>
</thead>
</table>

**DEMONSTRATION**  
Permian  
Geologic Unit: Beattie Ls. Fm. Cottonwood Limestone Mbr.  
Material Sample: KDOT Lab. No. 3069  
Specific Gravity (Dr): 2.39  
Los Angeles Wear: 47.8  
Absorption: 6.95  

<table>
<thead>
<tr>
<th>Test &amp; Analyte</th>
<th>Specific Gravity (Dr)</th>
<th>Los Angeles Wear</th>
<th>Absorption</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>

**Notes:**  
KDOT Materials Dept. Site No. 81-28  
Scale: 1 inch = 1/2 mile
IS+23
Poc & Pqn
Date: October, 1977

Material: Limestone
County: Riley
Location: NE NE 1/4 Sec. 36 Tp. 9S Rng. 1E
Owner: Alta S. & Christine C. Kepler Route 4 Manhattan, KS
Accessibility: Good - Site located on Purite - VIII KS
Status of Site: Open Materials Site - Sampled

EXPLORATION DATA

<table>
<thead>
<tr>
<th>Test Hole</th>
<th>Beginning</th>
<th>Depth</th>
<th>Depth</th>
<th>ND</th>
<th>Material</th>
<th>1/8</th>
<th>1/4</th>
<th>1/2</th>
<th>4</th>
<th>8</th>
<th>16</th>
<th>32</th>
<th>64</th>
<th>100</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
</table>

COMBINED DATA

Geological Age: Permian
Geological Source: Beattie & Grenola Lk. Pm. Cottonwood & Neva Ls.
KDOT Lab. No. 95543
Material Source: Mbr.

Specific Gravity (Soln): 2.51
Specific Gravity (Dndr): 33.6 (B)
Absorption: 3.54
Wt. % Cu +: 0.97

Remarks:
Beattie & Grenola Lk. Pm.
KDOT Materials Dept. Site No. 81-18
MATERIAL SITE DATA FORM

LG+24
Pan

Site No.          Pan

Done            October, 1977

Material:           Limestone
County:             Riley

Location:          25 N
Town:              10S
Range:             7E

Owner:             Elsie R. Doug
Address:           Route 1 Manhattan, KS

Nature of Deposit:
Dry
Accessibility:     Good
Site Instruct on Map:     VII

Status of Site:    Open Materials Site: Sampled

EXPLORATION DATA

Test No. | Material | Depth | Depth | % by | G.F. | LL | PI |
|--------|----------|-------|-------|------|------|----|----|

Lab No. AA3742 Wash. 21 4

Dry 20 2

CORRELATION DATA

Geological Age:   Permian
Geological Source: Grenola Ls. Fm. Neva Limestone Mbr.
KDOT Lab. No. (1)50150 (2)50151 (3)79577

Specific Gravity:  (1)2.49 (2)2.54 (3)2.51
Los Angeles Wear: (1)32.2(A) (2)30.6(A) (3)36.5(B)
Absorption:     (1)3.09 (2)2.20 (3)4.48
S.S.          (1)9.91 (2)0.97 (3)0.87

KDOT Materials Dept. Site No. 81-9
FS+25
Qal

Fine Sand
County: Kiley

Location: NW 36th St.

Hwy

Nature of Deposits: Good

Status of Site: Open Materials Site - Sampled

EXPLORATION DATA

Test Hole Material Below Surface Depth of Material

Quaternary

Geological Age: Alluvium

Material Source: KDOT Lab. No. 23273

Specific Gravity (Sat): 2.59

Los Angeles Abrasion: 0.6

KDOT Materials Dept. Site No. 81-40
**MATERIAL SITE DATA FORM**

**Site No.**

Date: October, 1977

**Material**

Fine Sand

**County**

Riley

**Location**

SE1/4, Sec. 25, T18S, R7E

Owner

Wilhelmina Perkins, 2300 Claflin Rd., Manhattan, KS

**Address**

Dry, Good, Site Surface on Plane, W 11

**Open Materials Site: Sampled**

**EXHAUSTED DATA**

<table>
<thead>
<tr>
<th>Test Hole</th>
<th>Material</th>
<th>System of Measurement</th>
<th>Depth Below Ground Surface</th>
<th>Depth of Material</th>
<th>1%</th>
<th>5%</th>
<th>10%</th>
<th>20%</th>
<th>30%</th>
<th>50%</th>
<th>100%</th>
<th>Water</th>
<th>Gs.</th>
<th>LL</th>
<th>PI</th>
</tr>
</thead>
</table>

**COERELATION DATA**

Geological Age

Quaternary

Geological Source

Alluvium

Material Sampled

KDOT Lab. No. 65-4272

**Specific Gravity (Sat.)**

2.43 (Dry)

**Loss on Ignition**

0.30

**Atkinson**

KDOT Materials Dept. No. 81-49
**EXCAVATION DATA**

| Test Date | Material | Depth | Depth of Rock Base | Per Cent | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 50 | 60 | 70 | 80 | 90 | 100 | Marsh No. 20 | G.P. | L.I. | P.F. |
|-----------|----------|-------|--------------------|----------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

**CORRELATION DATA**

- Geologic Age: Quaternary
- Geologic Source: Alluvium
- Material Similar To: KDOT Lab. No. 94545

Specific Gravity (SG): 2.59
- Los Angeles Wear: 37.3 (D)
- Absorption: 0.5%
- Wt. Co. F.: 108.2
- Sh. Water: 1 Da., 1.47 Da., 3 Da., 1.27

Remarks: KDOT Materials Dept., Site No. 81-23
MATERIAL SITE DATA FORM

SG+28  October, 1977
Q3l

Sand & Gravel  Riley

SE8  SE4  Sec 30  TLP  10S  Range 8E

Owner: Robert Lake  Route 2  Manhattan, KS

Nature of Deposit: Wet  Accessible  Site Located on Pluca  TX

Nature of Site: Open Materials Site; Sampled

EXPOSURE DATA

<table>
<thead>
<tr>
<th>Test Hole</th>
<th>Material Below Material</th>
<th>Depth of Material</th>
<th>Depth of Material</th>
<th>15'</th>
<th>30'</th>
<th>45'</th>
<th>60'</th>
<th>75'</th>
<th>90'</th>
<th>100'</th>
<th>Mean</th>
<th>G.T.</th>
<th>L.L</th>
<th>P.L</th>
</tr>
</thead>
</table>

CORELATION DATA

Geological Age: Quaternary
Geological Source: Alluvium
Material Similar To: KDOT Lab. No. 96544

Specific Gravity (Sat):
Los Angeles Abrasion: 2.62
Absorption: 0.40
Optical Coef.: 114.0

KDOT Materials Dept. Site No. 81-15

SCALE: 1 INCH = 1/2 MILE
SG+29
Oal

Date: October, 1977

Material: Sand & Gravel
County: Riley
Section: 5
Township: 16S
Range: 8E
Owner: Maude B. Walters
Address: 1917 Humboldt, Manhattan, KS

Nature of Deposit: 

Open Materials Site: Sampled

<table>
<thead>
<tr>
<th>Test Path</th>
<th>Depth Below Grade (ft.)</th>
<th>Water Content (%)</th>
<th>1%</th>
<th>5%</th>
<th>10%</th>
<th>20%</th>
<th>30%</th>
<th>40%</th>
<th>Wash 200</th>
<th>G.O.</th>
<th>LL</th>
<th>PI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>0</td>
<td>3</td>
<td>2260</td>
<td>9097</td>
<td>9999</td>
<td>9999</td>
<td>9999</td>
<td>4.60</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Correlation Data:

Geological Age: Quaternary
Geological Source: Alluvium
Material Similar to: KDOT 14860
Specific Gravity (Dry): 2.61
Specific Gravity (Wet): 26.4
Los Angeles Wear: 0.90
Absorption: 0.97
Wi. Gravel: 107.30
Si. Grade: 1 da.-1.30 3 da.-1.26

KDOT Materials Dept. Site 81-24

Grading D

Scale: 1 inch = 1 mile
**MATERIAL SITE DATA FORM**

**Site No:** LS+30  
**Pia:** October, 1977

**Material:** Limestone  
**County:** Riley

**Location:** NE1 NE1 Sec. 19  
**Town:** 10S  
**Rang:** 8E

**Owner:** Stonehaven, Inc.  
**Address:** W. Winfred Miller Rd. 1 Manhattan  
**RIS:** KS

**Nature of Deposit:** Dry  
**Accessibility:** Good  
**Site Located on Map:** IX

**open Materials Site: Sampled**

**EXPLORATION DATA**

<table>
<thead>
<tr>
<th>Test No.</th>
<th>Material Code</th>
<th>Depth (ft)</th>
<th>Core</th>
<th>Breakout</th>
<th>Lb.</th>
<th>Fr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>LS 0.5 5.0</td>
<td>10</td>
<td>1/4</td>
<td>4</td>
<td>15</td>
<td>30</td>
</tr>
<tr>
<td>2</td>
<td>LS 3.5 5.0</td>
<td>50</td>
<td>1/8</td>
<td>4</td>
<td>15</td>
<td>30</td>
</tr>
<tr>
<td>3</td>
<td>LS 0.5 5.0</td>
<td>100</td>
<td>1/8</td>
<td>4</td>
<td>15</td>
<td>30</td>
</tr>
<tr>
<td>4</td>
<td>LS 5.0 5.0</td>
<td>200</td>
<td>1/8</td>
<td>4</td>
<td>15</td>
<td>30</td>
</tr>
<tr>
<td>5</td>
<td>LS 5.0 5.0</td>
<td>200</td>
<td>1/8</td>
<td>4</td>
<td>15</td>
<td>30</td>
</tr>
</tbody>
</table>

**CORE LENGTH DATA**

**PERSIAN**

**Geological Age:** Grenola L.B. Fm. Nava Limestone Mbr.

**Geological Source:** KDOT Lab.

**Material Similar To:** KDOT Lab. No. (1) 49446 (2) 49447 (3) 49448 (4) 49444 (5) 49450

**Specific Gravity (Sat):** (1) 2.50 (2) 2.44 (3) 2.02 (4) 2.40 (5) 2.49

**Los Angeles Wear:** (1) 32.3 (2) 37.2 (3) 33.7 (4) 38.5 (5) 30.9

**Abrasion Test:** (1) 11.88 (2) 11.88 (3) 11.88 (4) 11.88 (5) 15.88

**REMARKS:** KDOT Materials Dept. Site No. 81-8
MATERIAL SITE DATA FORM

Date: October, 1977

Limestone

Riley

28

10S

2 E

Forrest A. Moore

Route 3 Manhattan, KS

Dry

Good

Open Materials Site: Sampled

EXPOSURE DATA

DEPTH

% B/ E

% O

% W

% U

% N

% L

% L

Pennsy\'vanian

Ziegler L. Fm. Tarkio Limestone Mr.

KDOT Lab No. 57236 57237 57238

Specific Gravity (dry): 2.61 2.56 2.63

Los Angeles: 31.5 A 35.1 A 39.6 A

Absorption: 1.02 2.95 3.04

Wt. Co. %: St. Reg.

Remarks: KDOT Materials Dept. Site No. 81-11
SG-33

Qtil

October, 1977

Sand & Gravel

Riley

NEW

Sep. 16

Wet

Goo

Open Materials Site: Sampled

EXPLORATION DATA

<table>
<thead>
<tr>
<th>Test Item</th>
<th>Material Type</th>
<th>Depth of Material</th>
<th>1/8</th>
<th>1/4</th>
<th>3/8</th>
<th>1/2</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>8</th>
<th>10</th>
<th>20</th>
<th>50</th>
<th>100</th>
<th>Washed</th>
<th>CO</th>
<th>LL</th>
<th>PI</th>
</tr>
</thead>
</table>

CORRELATION DATA

Geologic Age: Quaternary

Material Similar to: KDOT Lab. No. 31914

Specific Gravity (SG): 2.50

Los Angeles Abrasion: 27.4

Absorption: 3.43

KDOT Materials Dept. Site No. 81-41

Grading A
**MATERIAL SITE DATA FORM**

**Site No:** SC-34  
**Material:** Sand & Gravel  
**County:** Riley  
**Location:** NEq  
**Date:** October, 1977  
**Owner:** C.K. Processing Co., Inc.  
**Box:** 877  
**Salina, KS**

**Weather:** Fair  
**Soil:** Open Materials Site, Sampled  
**Soil:**  
**Soil:**  

**EXPLANATION DATA**

<table>
<thead>
<tr>
<th>Test No.</th>
<th>Material No.</th>
<th>Depth of Material</th>
<th>%</th>
<th>%</th>
<th>%</th>
<th>%</th>
<th>%</th>
<th>%</th>
<th>Wash</th>
<th>GP</th>
<th>R</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**CORRELATION DATA**

- **Geological Age:** Quaternary  
- **Geological Source:** Alluvium  
- **Material Seller:** KDOT Lab. No. 15548  
- **Specific Gravity (Gy):** 2.61  
- **Los Angeles Wear:** 36.8  
- **Absorption:** 0.5  
- **Water Content:** 115.68  
- **Gradation:** KDOT Materials Dept. Site No. 81-32  
- **Color Test:** Clear
LG+15

Site No.

Kst

Date

October, 1977

Material

Limestone

County

Riley

Location

Twp 10S  Sec 29

Range 9E

Owner

Cletus & Carl Umscheid

Addressing

230 Colorado

Manhattan, KS

Nature of Deposit

Dry

Accessibility

Good

Site located on Platte

IX

States of Site

Open Materials Site; Sampled

ESUERATION DATA

|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
**MATERIAL SITE DATA FORM**

<table>
<thead>
<tr>
<th>Site No.</th>
<th>E 117.95</th>
<th>Date</th>
<th>October, 1977</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location</td>
<td>Limestone</td>
<td>County</td>
<td>Riley</td>
</tr>
<tr>
<td>Material</td>
<td>SEL, SEL, HWY</td>
<td>28</td>
<td>108</td>
</tr>
<tr>
<td>Depth</td>
<td>Range</td>
<td>9E</td>
<td></td>
</tr>
<tr>
<td>Owner</td>
<td>Forrest A. Moore</td>
<td>Rt. 1, Manhattan, KS</td>
<td></td>
</tr>
<tr>
<td>Nature of Deposit</td>
<td>Dry</td>
<td>Good</td>
<td></td>
</tr>
<tr>
<td>States of Site</td>
<td>Open Materials Site; Sampled</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Test Hole | Material | Depth of Material | Depth of Core | Core Recovery | t2 | 3/8 | 1/4 | 1/8 | 1/16 | 1/32 | 1/64 | Wash | G.I. | I.L. | P.L. |
|-----------|---------|------------------|---------------|---------------|----|-----|-----|-----|------|------|------|------|-----|-----|
| 28 | Pennsylvanian | Zeandale Limestone, Tarlton Limestone Mbr. | KDOT Lab. No. 67-244 | 2.62 | Dry | 2.56 |

**Correlation Data**

<table>
<thead>
<tr>
<th>Geologic Age</th>
<th>Pennsylvanian</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geologic Source</td>
<td>Zeandale Limestone, Tarlton Limestone Mbr.</td>
</tr>
<tr>
<td>Material Sampled</td>
<td>KDOT Lab. No. 67-244</td>
</tr>
</tbody>
</table>

Specific Gravity (Dry): 2.62
Specific Gravity (Wet): 2.32
Absorption: 0.60
Shrinkage: 0.10

**Remarks:**
KDOT Materials Dept. Site No. 81-47
**SITE DATA FORM**

**Site No.** L8+37  
**Date** October, 1977

**Material** Limestone  
**County** Hills

**Location** Sec. 28  
**Twp.** 108  
**Rng.** 9E

**Owner** Forrest A. Moore  
**Route** Route 3  
**Mile** Manhattan, KS

**Dirt** Tarp  
**Site Located in Field** IX

**Shali 9 Site** Open Materials Site; Sampled

**EXTRATION DATA**

<table>
<thead>
<tr>
<th>Test Name</th>
<th>Material</th>
<th>Depth</th>
<th>Depth of Material</th>
<th>%</th>
<th>8</th>
<th>16</th>
<th>30</th>
<th>100</th>
<th>Washed</th>
<th>O.P.</th>
<th>LL</th>
<th>PI</th>
</tr>
</thead>
</table>

**CORELATION DATA**

**Geological Age** Pennsylvanian

**Geological Source** Zeandale Ls. Fm. Tarkio Limestone Mbr.

**Laboratory** KDOT Lab. No.: 17818 17819

**Material Similar To**

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
</table>

**Specific Gravity**

| (A) | 2.63 | 2.61 | 2.61 |

**Los Angeles Wear**

<table>
<thead>
<tr>
<th>(A)</th>
<th>(B)</th>
<th>(C)</th>
</tr>
</thead>
</table>

**Solvent Loss**

| 2.40 | 2.60 | 2.54 | 2.33 |

**Wt. of Ca. Pt.** 0.00  
**Sh. Balls**

**Remarks** KDOT Materials Dept. Site No. 81-35
<table>
<thead>
<tr>
<th>Test No.</th>
<th>Material Depth of Hole</th>
<th>Depth of Material</th>
<th>%</th>
<th>0.5</th>
<th>1</th>
<th>2</th>
<th>4</th>
<th>8</th>
<th>16</th>
<th>30</th>
<th>50</th>
<th>100</th>
<th>Moisture</th>
<th>G.F.</th>
<th>LL</th>
<th>PI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Correlation Data**

- *Geological Age*: Permian
- *KDOT Lab No.*: 93202 93203

- *Material Similar To*: 2.34 2.30
- *Specific Gravity (Dry)*: 2.34 2.30
- *Los Angeles Wear*:
  - (Dry): 43.0(B) 50.6(B)
  - (Saturated): 18.77 28.63
- *Absorption*: 0.87 0.72

**Remarks**: KDOT Materials Dept. Site No. 81-19
MATERIAL SITE DATA FORM

Site No.: LS+41
Pbc

Date: October, 1977

Limestone
Riley

Material

Location: NE4, SE4 Sec. 21 Twp. 11S Range. 7E

Owner: Leonard N. Erickson
Route 2, Manhattan, KS

Nature of Deposit: Dry
Accessibility: Good
Site Located on Pk.

Open Materials Site: Sampled

InCLINATION DATA

Test Drills

Depth

Bottom

Top

Drill

Material

Cone

Rocker

15

4

30

50

100

G.F.

LL

P.I.

70

CORELATION DATA

Geological Age: Permian

Geological Source: Beattie Ls. Fm. Cottonwood Limestone Mar.

Material Similar To: KDOT Lab No. 65-750

Specific Gravity (dry): 2.43

Los Angeles Abrasion: 30.5(B)

Absorption: 5.25

Remarks: KDOT Materials Dept., Site No. 61-46

Scale: 1 inch = 1/4 mile
SG+42
Date: October, 1977

Material: Sand & Gravel
County: Riley
Location: NE 1/4 Sec. 31 Tp. 10S Rng. 8E
Owner: Robert Lake
Route: 2 Manhattan, KS
Wet Accessability: Good
Site located on Plate XII
Open Materials Site; Sampled

EXPLORATION DATA

<table>
<thead>
<tr>
<th>Tax. Holes</th>
<th>Material</th>
<th>Depth of Material</th>
<th>%</th>
<th>F.I.</th>
<th>4</th>
<th>8</th>
<th>16</th>
<th>30</th>
<th>50</th>
<th>Wet</th>
<th>March 3000</th>
<th>G.F.</th>
<th>L.L.</th>
<th>P.L.</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td>5</td>
<td>16</td>
<td>40</td>
<td>71</td>
<td>95</td>
<td></td>
<td>1004.493.27</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

CIRCULATION DATA

Geological Age: Quaternary
Geological Source: Alluvium
Material Similar To: KDOT Lab No. 15279
Specific Gravity (SG): 2.62
Specific Gravity (Dry): 35.6
Absorption: 0.5
Mo. Co. M: 112.86
St. Bulb, la. 1.30
KDOT Materials Dept. Site No. 81-33
Grading D
Color Test: Clear

SCALE: 1 inch = 1/2 mile
**MATERIAL SITE DATA FORM**

**Site No.** LS443  
**Pmc**  
**Date** October, 1977

**Material** Limestone  
**County** Riley  
**NW**4  
**Sec.** 26  
**Twp.** 11S  
**Range**  1E  
**Owner** A. B. Hudson  
**Address** 1st National Bank Tower, Topeka, KS  
**Nature of Property** Dry  
**Accessibility** Good  
**Status** Open Materials Site: Sampled

**EXPLORATION DATA**

<table>
<thead>
<tr>
<th>Test Hole</th>
<th>Material</th>
<th>Depth of Material</th>
<th>Depth of Water</th>
<th>%</th>
<th>04</th>
<th>08</th>
<th>02</th>
<th>16</th>
<th>30</th>
<th>50</th>
<th>100</th>
<th>Wash</th>
<th># of Samples</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**CORRELATION DATA**

**Geological Age** Permian  
**Geological Source** Beattie Ls. Fr. Cottonwood limestone Mar.  
**KOOT Lat. No.** 24677 24677 24677

<table>
<thead>
<tr>
<th>Material Similar To</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Specific Gravity</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.41</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Water Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.74</td>
</tr>
</tbody>
</table>

**St. Andrews Limestone**

**Absorption**

**Texture**

**Moisture**

**ULTIMATE MATERIAL FRACTURE SITE No. 81-39**
MATERIAL SITE DATA FORM

**Site No.** LS-45  
**Date** October, 1977

**Material** Limestone  
**County** Riley

**Location**  
By: 29  
Sec: 11S  
Twp: 9E

Oliver W. Hess Trustee  
4736 W. El Camino Dr. Glendale, AZ

**Owner**  
**Property of Deposit** Dry  
**Access by** Good  
**Site located on Plate XII

**Open Materials Site: Sampled**

---

**EXPLORATION DATA**

<table>
<thead>
<tr>
<th>Test hole</th>
<th>Material of Deposit</th>
<th>Depth of Material</th>
<th>Depth of Drilled Material</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1/8</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8</td>
<td>30</td>
</tr>
</tbody>
</table>

**Mush** 200  
**G.I.**  
**L.L.**  
**P.I.**

---

**CORRELATION DATA**

**Geological Age**  
Permian

**Geological Source**  
Wrisford Ls. Fm. Havensville Shale Mbr. "Reef"

**Material Similar to**  
KDOT Lab. No. 81636

**Specific Gravity (Dry)**  
2.28

**Los Angeles Abrasion**  
52.5 A  51.8 B

*(1) 6.17  Soundness  (1) 0.95

---

**Remarks** KDOT Materials Dept.  Site No. 81-17
**LS+31**

**Pbc**

<table>
<thead>
<tr>
<th>Site No.</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>October, 1977</td>
</tr>
</tbody>
</table>

**Location**

<table>
<thead>
<tr>
<th>Location</th>
<th>Lat.</th>
<th>Long.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M18, SW4</td>
<td>21</td>
</tr>
</tbody>
</table>

**Topographic Map**

<table>
<thead>
<tr>
<th>Topographic Map</th>
<th>Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>10S</td>
</tr>
</tbody>
</table>

**Owner**

<table>
<thead>
<tr>
<th>Owner</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lee F. Murphy</td>
</tr>
</tbody>
</table>

**Location**

<table>
<thead>
<tr>
<th>Location</th>
<th>Route</th>
<th>City</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2</td>
<td>Manhattan</td>
</tr>
</tbody>
</table>

**Nature of Deposit**

<table>
<thead>
<tr>
<th>Nature of Deposit</th>
<th>Depth of Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry</td>
<td></td>
</tr>
</tbody>
</table>

**Accessibility**

<table>
<thead>
<tr>
<th>Accessibility</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good</td>
<td>Site located on Main</td>
</tr>
</tbody>
</table>

**Open Material Site:** Not sampled

**EXPLORATION DATA**

<table>
<thead>
<tr>
<th>Test Pole</th>
<th>Material of Bureau of Mines</th>
<th>Depth of Material</th>
<th>Percent</th>
<th>% 0.05</th>
<th>10</th>
<th>16</th>
<th>30</th>
<th>50</th>
<th>100</th>
<th>Wash 200</th>
<th>G.P.</th>
<th>LL</th>
<th>F.L.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**CORELATION DATA**

**Geological Age**

<table>
<thead>
<tr>
<th>Geological Age</th>
<th>Permian</th>
</tr>
</thead>
</table>

**Geological Source**

<table>
<thead>
<tr>
<th>Geological Source</th>
<th>Beattie Lg. Pm. Cottonwood Limestone Mbr.</th>
</tr>
</thead>
</table>

**Material Similar To**

<table>
<thead>
<tr>
<th>Material Similar To</th>
<th></th>
</tr>
</thead>
</table>

**Specific Gravity (Dry)**

<table>
<thead>
<tr>
<th>Specific Gravity (Dry)</th>
<th></th>
</tr>
</thead>
</table>

**Los Angeles Wear**

<table>
<thead>
<tr>
<th>Los Angeles Wear</th>
<th></th>
</tr>
</thead>
</table>

**Absorption**

<table>
<thead>
<tr>
<th>Absorption</th>
<th>Soundness</th>
</tr>
</thead>
</table>

**Wet Co. R**

<table>
<thead>
<tr>
<th>Wet Co. R</th>
<th>Sh. Rais</th>
</tr>
</thead>
</table>

**Remarks**

<table>
<thead>
<tr>
<th>Remarks</th>
<th></th>
</tr>
</thead>
</table>

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

Site No. LS 47

Date October, 1977

Material Limestone

County Riley

Location NE ¼ Sec. 29 Twp. 6S Range 7E

Owner USA

Nature of Deposit Dry Poor Site located on Prairie

Open Materials Site: Not Sampled

EXCAVATION DATA

[Table for excavation data]

CORRELATION DATA

Geological Age Permian

Geological Source Barneston Ls., Ft. Riley Limestone Mbr.

Material Similar To

Specific Gravity (Sat.) (Dry)

Los Angeles Wear

Absorption

Wt. % Ca. M. Sr. Ratio

Remarks KDOT Materials Dept, Site No. 619 (50)
Site No. 53717

**Material:**
- Limestone Gravel
- Riley

**Location:**
- Smith Sties
- 912 Kearney
- Manhattan, KS

**Description of Site:**
- Open Materials Site; Not Sampled

**EXPLORATION DATA**

| Test Hole | Material of Material | Depth of Material | Description of Material | 10 | 1/8 | 4 | 8 | 16 | 30 | 60 | 100 | Moist | O.C. | L.L. | P.I. |
|-----------|----------------------|-------------------|-------------------------|----|-----|---|---|----|-----|-----|-----|------|------|-----|-----|-----|
| 53717     |                      | 2                 |                         | 3  | 11  | 80| 93| 96 |     |      | 0.56 |

**CORRELATION DATA**

- Geologic Age: Quaternary
- Geologic Source: Alluvium
- KDOT Lab. No.: 53717

**Specific Gravity (Dry):** 2.45
**Specific Gravity (Wet):** 27.4 A

**Absorption:** 9.2%

**KDOT Materials Dept. Site No.:** Riley #2

**Remarks:**
- This material not sampled by a representative of KDOT
MATERIAL SITE DATA FORM

Site No. 15453
Zt.

Date October, 1977

Material Limestone
Clay

Owner

Nature of Deposit Dry
Accessibility Good

Open Materials Site: Not Sampled

EXCAVATION DATA

Test Hole Material Button Depth, of Border Depth, of material 15 5 3-8 6 9 16 30 50 100 Wind 200 0.7 1.1

CORRELATION DATA

Geological Age Pennsylvanian
Geological Source Zeandale Is., Fm., Tarkio Limestone Mar.
Material (similar to

Specific Gravity (Sat.)

Los Angeles Weer

Absorption

Water Co. M.

Remarks

Scale: 1 inch = 1/2 mile
LS#46
Poc	October, 1977

Limestone	Riley
Material	County
N/A	N/A
Location
Sec. 29	Twp. 6S
Range	SE

Erla C. Bergstrom	Greene, Kansas
Owner

Dry	Accessible: Good

Nature of Deposit
The location on plat

Open Materials Site; Not Sampled

EXPLANATORY DATA


CORRELATION DATA

Geological Age	Permian
Geological Source:	Boyle Sh. Fm. Towanda Limestone Mbr.

Material Similar To

Specific Gravity (Dr)

Los Angeles Wear

Absorption

Wil. Co. Ft

Remarks: KDOT Materials Dept. Site No. 619 46
MATERIAL SITE DATA FORM

Site No. 1s+54

Date October, 1977

Material Limestone

County Riley

Section 6

Tage 6S

Range 6E

Wayne E. Anderson, Waterville, KS

Owner

Dry Accessible

Site Located on Plate I

Nature of Reuse Prospective Materials Site; Not Sampled

PROTECTION DATA

Test Hole

Material

Depth

Drift

 Quarzite

Drift

100

30

20

10

5

4

3

Drift Material

Wash

C.T.

G.T.

L.L.

P.I.

PERCOLATION DATA

GEOCHEMICAL DATA

Geological Age Permian

Geological Source Doyle Sh. Fm. Towanda Limestone Mbr.

Material Source

Specific Gravity (Basal)

Los Angeles Abrasion

Atterberg

Unit. No.

KDOT Materials Dept. Site No. 619 (55)
GLOSSARY


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

Aggregate: Any of several hard, inert, construction materials (such as sand, gravel, shells, slag, crushed stone, or other mineral material), or combinations thereof, used for mixing in various-sized fragments with a cementing or bituminous material to form concrete of bituminous mix.

Alluvium: A deposit of clay, silt, sand, or gravel deposited by a stream or other body of running water.

Aquifer: A body of rock that contains sufficient saturated permeable material to conduct ground water and to yield economically significant quantities of ground water to wells and springs.

Bedded: A characteristic of some rock units which shows distinct layers due to the manner in which they were deposited.

Biothem: They represent accumulations of organic remains and debris formed under conditions of prolific life.

Coarse sand: An aggregate of unconsolidated aggregate of rounded minerals or rock particles, the dimensions of which are usually more than two millimeters.

Consolidated deposit: A deposit of limestone, shale, or sandstone. In Kansas, this term generally applies to rock older than Pliocene age.

Construction aggregate: Processed rock that will meet standard specifications for concrete and bituminous construction.

Crossbedding: Term applied to sedimentary deposits whose bedding is inclined at various angles to the stratification.

Cyclothem: A series of beds deposited during a single sedimentary cycle.

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

Exposure patterns: Topographic features formed on the land surface by the exposure of geologic units.

Fine sand: An aggregate of consolidated 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.
Flaggy: Descriptive of a sedimentary rock that splits into layers from 1 cm to 5 cm in thickness.

Formation: A persistent body of rocks, having easily recognizable upper and lower boundaries that can be traced in the field without recourse to detailed paleontologic or petrologic analysis, and large enough to be represented on a geologic map as a practical or convenient unit for mapping and description.

Fossil: Any remains, trace, or imprint of a plant or animal that has been preserved, by natural processes, in the Earth's crust since some past geologic time.

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

gal/min: Gallons per minute.

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.

Geologic structure: The attitude of the rock units (i.e., whether they are horizontal or tilted).

Geologic system: A term that refers to rocks or deposits that were laid down during a particular geologic period (e.g. the Pennsylvanian, Permian, and Quaternary).

Geologic unit: A general term used to denote a geologic formation, member, or an unconsolidated deposit.

Gradation factor: The value obtained by adding the percentages of material retained on the 1/8", 3/16", 3/8", 4, 8, 16, 30, 50 and 100 sieves, respectively and dividing the sum by 100.


Ground-water: That part of the subsurface water that is the zone of saturation, including underground streams.

Igneous rocks: Rocks produced from molten or partly molten material.

Kimberlites: A porphyritic alkaline peridotite containing abundant phenocrysts of olivine (commonly serpentinized or carbonatized) and phlogopite (commonly chloritized).

Landform: Any physical, recognizable form or feature of the Earth's surface, having a characteristic shape, and produced by natural causes; it includes major forms such as plains, plateaus, mountains, hills, valley, slope, easter, and dune.

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

U/s: Liters per second.

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


m: Meter

Marine deposits: Deposits laid down in a sea.

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

Matrix: The smaller or finer-grained, continuous material enclosing, or filling the interstices between the larger grains or particles of a sediment or sedimentary rock.

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

mg/l: Milligrams per liter.

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

Outwash: Stratified detritus (chiefly sand and gravel) removed or 'washed out' from a glacier by meltwater streams and deposited in front of or beyond the terminal moraines or the margin of an active glacier.

Physiographic division: A division of the state, based on general geologic and/or geographic features.

Plasticity index: The water-content range of a soil at which it is plastic as determined by tests performed in accordance with the Kansas Test Method KT-10 of the State Highway Commission of Kansas Construction Manual, Part V, 1969 edition.

Pliocene Series: Deposits laid down during the Pliocene Epoch.

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

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

92
Reef: A ridge or mound-like, layered, sedimentary rock structure, built by and composed almost exclusively of the remains of sedimentary organisms (esp: corals) and usually enclosed in rock of differing lithology.

Soundness: Determined by tests performed in accordance with section 3001 of the State Highway Commission of Kansas Standard Specifications, 1972 edition.

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.

Stream meander: One of a series of beds or curves in the course of a stream caused by lateral movement of a stream in its valley.

Strength ratio: Determined by tests performed in accordance with A.A.S.H.O. designation T19.

Talus: A sloping mass of rock fragments at the base of a cliff.

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

Unconsolidated deposits: A sediment that is loosely arranged or unstratified, or whose particles are not cemented together, occurring either at the surface or at depth.

Wash: Material passing the no. 200 sieve. Determined by tests performed in accordance with A.A.S.H.O. designation T71.

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

Weight per cubic foot: Determined by tests performed in accordance with A.A.S.H.O. designation T19.
Selected References


<table>
<thead>
<tr>
<th>County</th>
<th>Year</th>
<th>Pimply</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ellis County, Kansas</td>
<td>1963</td>
<td>A. H. Stallard</td>
</tr>
<tr>
<td>Coffey County, Kansas</td>
<td>1966</td>
<td>A. H. Stallard</td>
</tr>
<tr>
<td>Mitchell County, Kansas</td>
<td>1966</td>
<td>G. Hargadine</td>
</tr>
<tr>
<td>Sumner County, Kansas</td>
<td>1964</td>
<td>G. Hargadine</td>
</tr>
<tr>
<td>Linn County, Kansas</td>
<td>1966</td>
<td>G. Hargadine</td>
</tr>
<tr>
<td>Sherman County, Kansas</td>
<td>1964</td>
<td>G. Hargadine</td>
</tr>
<tr>
<td>Marshall County, Kansas</td>
<td>1965</td>
<td>G. Hargadine</td>
</tr>
<tr>
<td>Brown County, Kansas</td>
<td>1966</td>
<td>A. H. Stallard &amp; G. Fenny</td>
</tr>
<tr>
<td>McPherson County, Kansas</td>
<td>1969</td>
<td>G. Hargadine</td>
</tr>
<tr>
<td>Harvey County, Kansas</td>
<td>1966</td>
<td>G. Hargadine</td>
</tr>
<tr>
<td>Osage County, Kansas</td>
<td>1966</td>
<td>A. H. Stallard</td>
</tr>
<tr>
<td>Kingman County, Kansas</td>
<td>1966</td>
<td>G. Hargadine</td>
</tr>
<tr>
<td>Pratt County, Kansas</td>
<td>1969</td>
<td>G. Hargadine</td>
</tr>
<tr>
<td>Morton County, Kansas</td>
<td>1971</td>
<td>G. Hargadine</td>
</tr>
<tr>
<td>Seward County, Kansas</td>
<td>1970</td>
<td>G. Hargadine</td>
</tr>
<tr>
<td>Stevens County, Kansas</td>
<td>1970</td>
<td>G. Hargadine</td>
</tr>
<tr>
<td>Rawlins County, Kansas</td>
<td>1968</td>
<td>A. H. Stallard</td>
</tr>
<tr>
<td>Franklin County, Kansas</td>
<td>1969</td>
<td>A. H. Stallard</td>
</tr>
<tr>
<td>Neosha County, Kansas</td>
<td>1970</td>
<td>G. D. Hargadine</td>
</tr>
<tr>
<td>Jefferson County, Kansas</td>
<td>1971</td>
<td>A. H. Stallard</td>
</tr>
<tr>
<td>Butler County, Kansas</td>
<td>1967</td>
<td>G. D. Hargadine</td>
</tr>
<tr>
<td>Doniphan County, Kansas</td>
<td>1974</td>
<td>G. E. Petersen</td>
</tr>
<tr>
<td>Bourbon County, Kansas</td>
<td>1976</td>
<td>L. D. Myers</td>
</tr>
<tr>
<td>Johnson County, Kansas</td>
<td>1970</td>
<td>G. E. Hilmes</td>
</tr>
<tr>
<td>Douglas County, Kansas</td>
<td>1972</td>
<td>J. Jimenes</td>
</tr>
<tr>
<td>Shawnee County, Kansas</td>
<td>1974</td>
<td>G. E. Petersen</td>
</tr>
<tr>
<td>Miami County, Kansas</td>
<td>1975</td>
<td>G. E. Petersen &amp; L. D. Myers</td>
</tr>
<tr>
<td>Crawford County, Kansas</td>
<td>1975</td>
<td>G. E. Petersen</td>
</tr>
<tr>
<td>Republic County, Kansas</td>
<td>1976</td>
<td>G. E. Petersen</td>
</tr>
<tr>
<td>Cloud County, Kansas</td>
<td>1978</td>
<td>L. D. Myers</td>
</tr>
<tr>
<td>Ottawa County, Kansas</td>
<td>1977</td>
<td>G. E. Petersen</td>
</tr>
<tr>
<td>Cowley County, Kansas</td>
<td>1978</td>
<td>G. E. Petersen</td>
</tr>
<tr>
<td>Neosho County, Kansas</td>
<td><strong>31</strong></td>
<td>G. E. Petersen</td>
</tr>
<tr>
<td>Allen County, Kansas</td>
<td><strong>34</strong></td>
<td>L. D. Myers</td>
</tr>
<tr>
<td>Riley County, Kansas</td>
<td><strong>35</strong></td>
<td>P. C. Clark</td>
</tr>
<tr>
<td>Greenwood County, Kansas</td>
<td><strong>36</strong></td>
<td>P. C. Clark</td>
</tr>
</tbody>
</table>

* This Report
** In Progress

95