Dr. H. O. Ireland:

I am returning the original of your exploratory boring data sheet for auger borings "A" and "B", which borings were made by our Operations and Maintenance Division on the north side of the Stock Pavilion.

A Thermo-Fax copy has been furnished to Mr. Stermer, Mr. Curtis, Mr. Spencer and Mr. Dahlstrom of this office for their use. We will use the descriptions of the soil samples which you have used on your data sheet and show this on our working drawings.

We appreciate very much the assistance which you and Dr. Peck have rendered to help us in determining the simplest, most logical and least expensive footing design consistent with minimizing the effect of differential settlement. We will reinforce the brickwork as Mr. Dahlstrom suggested in our meeting with Mr. Stermer and Mr. Foster on April 4.
## EXPLORATORY BORING DATA SHEET

**Date:** March 28-58  
**Location:** Stock Pavilion  
**Operator:** V. Gomez  
**Ground Surface Elevation:**

Strength is Compressive strength in tons per sq. ft.

<table>
<thead>
<tr>
<th>Bar.</th>
<th>Samp.</th>
<th>Depth</th>
<th>Elev.</th>
<th>N</th>
<th>Strength Test Est.</th>
<th>w</th>
<th>LL</th>
<th>PL</th>
<th>Conf.</th>
<th>Description</th>
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<tbody>
<tr>
<td>A</td>
<td>1</td>
<td>5'-0&quot;</td>
<td>29.0</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>106</td>
<td>BLACK ORGANIC TOP SOIL W/ CLAY</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>6'-8&quot;</td>
<td>28.4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>108</td>
<td>LT BROWN SILTY CLAY W/ ORG. TOP SOIL</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>6'-4&quot;</td>
<td>28.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>105</td>
<td>LT BROWN SILTY CLAY W/ SMALL PERB</td>
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<tr>
<td></td>
<td>4</td>
<td>7'-0&quot;</td>
<td>27.4</td>
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<td></td>
<td>115</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>7'-8&quot;</td>
<td>28.3</td>
<td></td>
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<td></td>
<td></td>
<td>158</td>
<td>(ONE LARGE PERB)</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>8'-4&quot;</td>
<td>24.4</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>52</td>
<td>W/ LARGE PERB, T/ SAND</td>
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<tr>
<td></td>
<td>7</td>
<td>9'-0&quot;</td>
<td>24.2</td>
<td></td>
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<td></td>
<td></td>
<td>130</td>
<td>LT BROWN SILTY SANDY CLAY W/ SMALL PERB</td>
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<tr>
<td></td>
<td>8</td>
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<td>25.6</td>
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<td></td>
<td>86</td>
<td>(SOFTER)</td>
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<td>9</td>
<td>10'-4&quot;</td>
<td>27.2</td>
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<td>65</td>
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<td></td>
<td>10</td>
<td>11'-0&quot;</td>
<td>22.4</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>50</td>
<td>W/ FINE YELLOW SAND</td>
</tr>
</tbody>
</table>

| B    | 1     | 4'-6" | 26.8  |   |                   |   |    |    | 53    | BROWN CLAY W/ BLACK SPOTS W/ SILT |
|      | 2     | 5'-2" | 26.8  |   |                   |   |    |    | 86    | BROWN CLAY W/ BLACK SPOTS W/ SILT |
|      | 3     | 6'-10"| 25.2  |   |                   |   |    |    | 132   | LIGHT BROWN SILTY CLAY W/ BLACK SPOTS |
|      | 4     | 6'-6" | 25.0  |   |                   |   |    |    | 86    |                          |
|      | 5     | 7'-2" | 25.2  |   |                   |   |    |    | 116   |                          |
|      | 6     | 7'-10"| 26.0  |   |                   |   |    |    | 110   |                          |
|      | 7     | 8'-6" | 26.5  |   |                   |   |    |    | 150   |                          |
|      | 8     | 9'-2" | 26.2  |   |                   |   |    |    | 132   | LIGHT BROWN SANDY CLAY W/ BLACK SPOTS |
|      | 9     | 10'-10"| 21.4  |   |                   |   |    |    | 64    | W/ SMALL ANGULAR PERB. |
|      | 10    | 11'-6"| 22.4  |   |                   |   |    |    | 63    | LT. BROWN SANDY CLAY W/ SM. SILT |
|      | 11    | 11'-2"| 23.4  |   |                   |   |    |    | 52    |                          |
|      | 12    | 11'-10"| 21.1  |   |                   |   |    |    | 191   | LT BROWN CLAY W/ PERB. |
|      | 13    | 12'-6"| 16.7  |   |                   |   |    |    | 78    | LT. " SEDIMENTARY CLAY W/ PERB |
|      | 14    | 13'-2"| 17.3  |   |                   |   |    |    | 90    | LT. " CLAY Y SILT |

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STOOG PAWILION TEST BORINGS
MADE MARCH 7, 1959
BY PHYSICAL PLANT DEPARTMENT
ELECTRICALLY LOCATED 6" A ABOVE

DEPTH 1860' 3" 741
S-1 41'0"
S-2 62'1"
S-3 62'4"
S-4 70'4"
S-5 70'8"
S-6 70'1"
S-7 70'4"
S-8 70'8"
S-9 70'1"
S-10 61'0"
S-11 62'1"
S-12 62'4"
S-13 62'7"
S-14 62'10"
S-15 62'6"
S-16 71'2"
S-17 71'10"
S-18 10'4"
S-19 10'8"
S-20 10'10"
S-21 11'2"
S-22 11'10"
S-23 12'6"
S-24 13'2"

Come to Field Barn
R E S
Aug 3rd 1758
S A O
W H B
3-17-58
## Stock Pavilion Test Boreings

**Mar. 17 1952 - Granger**

### Hole A

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.1</td>
<td>Loose loam and clay fill</td>
</tr>
<tr>
<td>5.2</td>
<td>Yellow clay - traces of loam</td>
</tr>
<tr>
<td>5.3</td>
<td>Sandy yellow clay</td>
</tr>
<tr>
<td>5.4</td>
<td>Medium sandy yellow clay - some gravel noted</td>
</tr>
<tr>
<td>5.5</td>
<td>Soft sandy yellow clay</td>
</tr>
<tr>
<td>5.6</td>
<td>Soft sandy yellow clay</td>
</tr>
<tr>
<td>5.7</td>
<td>10.4</td>
</tr>
<tr>
<td>5.8</td>
<td>11.0</td>
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### Hole B

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Description</th>
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<tbody>
<tr>
<td>5.1</td>
<td>Loose yellow clay and loam filled</td>
</tr>
<tr>
<td>5.2</td>
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</tr>
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<tr>
<td>5.6</td>
<td>9.2</td>
</tr>
<tr>
<td>5.7</td>
<td>Some gravel noted</td>
</tr>
<tr>
<td>5.8</td>
<td>10.6</td>
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<tr>
<td>5.9</td>
<td>11.2</td>
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<tr>
<td>5.10</td>
<td>Soft yellow clay - some gravel noted</td>
</tr>
<tr>
<td>5.11</td>
<td>Sandy yellow clay</td>
</tr>
<tr>
<td>5.12</td>
<td>Sandy yellow clay</td>
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<tr>
<td>5.13</td>
<td>12.6</td>
</tr>
<tr>
<td>5.14</td>
<td>13.2</td>
</tr>
</tbody>
</table>

*Elevations from top of berm: 210.1 m*
STOCK PAVILION IMPROVEMENTS

Memorandum of meeting in Dr. H. O. Ireland's office
April 4, 1958

Those present:

Dr. H. O. Ireland
Mr. A. S. Davis
Mr. W. H. Stermer
Mr. John Foster
Mr. S. A. Dahlstrom

The purpose was to review the design of footings for the north wall of the Stock Pavilion in relation to soil bearing problems and possible differential settlement between new and existing footings.

The use of grade beams was discussed, but in order to be effective, they would have to be continuous and existing conditions made this solution impractical. The existing pier footings extend too close to the ground floor elevation to permit installing the grade beam over the top of the footings and any other method of obtaining continuity would be too costly.

Dr. Ireland pointed out that the existing footings and piers could be underpinned and extended deeper to soil with higher load bearing capacity and a continuous footing installed which would practically assure that there would be no differential settlement and consequent cracking of new masonry walls. However, the cost could not be justified on this project.

It was decided that the most practical and economical solution would be to install new wall footings between the existing pier footings, use a low soil bearing value for design of the new footings, and reinforce the new masonry wall. Where the new footings abut the existing footings, the concrete should be roughened. It should be recognized that this procedure will permit some differential settlement tending to crack the masonry walls, but the reinforcement should prevent any wide cracks from developing. Repointing of the masonry would be a relatively easy operation compared to installing footings designed to eliminate any differential settlement.

Physical Plant Department

S. A. Dahlstrom

SAD:jmo
cc: Mr. E. L. Stouffer
      Mr. R. E. Spencer
      Mr. J. A. Curtis
<table>
<thead>
<tr>
<th>SAMPLE NO.</th>
<th>A-1</th>
<th>A-2</th>
<th>A-3</th>
<th>A-4</th>
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<tr>
<td>CONTAINER</td>
<td>78</td>
<td>90</td>
<td>106</td>
<td>108</td>
</tr>
<tr>
<td>Wt./TARE</td>
<td>48.0</td>
<td>47.3</td>
<td>41.6</td>
<td>42.4</td>
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<tr>
<td>DRY Wt./TARE</td>
<td>43.6</td>
<td>48.7</td>
<td>36.9</td>
<td>37.0</td>
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<tr>
<td>WT. WATER</td>
<td>4.4</td>
<td>5.5</td>
<td>5.3</td>
<td>5.4</td>
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<tr>
<td>TARE</td>
<td>17.2</td>
<td>17.8</td>
<td>17.7</td>
<td>18.0</td>
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<tr>
<td>DRY WT.</td>
<td>26.4</td>
<td>20.9</td>
<td>18.8</td>
<td>19.0</td>
</tr>
<tr>
<td>W %</td>
<td>26.6</td>
<td>17.8</td>
<td>29.0</td>
<td>28.4</td>
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</tbody>
</table>

Soil Mechanics Laboratory, University of Illinois
Sights taken by well within
April 2, 1959.

End of trusses all notched to turn down (downward) at pier.
<table>
<thead>
<tr>
<th>LEVELS OF BOTTOM OF LOWER CHORD OF TRUSSES @ PIERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stock Pavilion 4/2/58 JVF</td>
</tr>
</tbody>
</table>

<table>
<thead>
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</tr>
</tbody>
</table>

Sights Taken By Phil Withrow
April 2, 1959
LEVELS OF BOTTOM OF
LOWER CHORD OF TRUSSES
& PIERs.

BASE PL. NOT
VISIBLE FOR
SIGHTS

LOWER CHORD
OF TRUSSE

SHOTS TAKEN AT THIS POINT

SOUTH

BEACk MARK

C & BLDG

SIGHTS TAKEN BY PHIL WITHERow
APRIL 2, 1958.
EXISTING LOADS ON FOOTINGS

TYPICAL FOOTING: NEAR N.E. CORNER OF BLOCK (DEEPEST FOOT).
6'-6" DEEP

\[ A_{FG} = (5.75 \times 5.15) = 30.4\text{ ft}^2 \]
\[ \text{WT.} = (27.4) (6') (1.50) = 24.66 \text{ k} \]

CORNER FOOTING AT N.E. CORNER.
6'-0" DEEP

\[ A_{FG} = (3.50' \times 3.75') = 13.13 \text{ ft}^2 \]
\[ + (5.25' \times 1.90') = 47.98 \]
\[ - (1.5' \times .92') = 1.38 \]
\[ \text{WT.} = (6') (61.93) (1.50) = 83.74 \text{ k} \]
**Stack Pavilion**

9/26/84 - JYP

**Typical Brick Pier**

- **T.C.**
- 15'-0" ± High
- 8'-0" High

**Above Pier**

- 9'-7" High
- 1'-10" Thick

**Wall Above Windows**

- 1'-9" Brick
- 11" T.C. @ 70% = \( \frac{9.7}{20.7} \)
- \( \frac{12.7}{15.4} \)

**Weight**

- \( \frac{28.7''}{15.4} \)(.120)(G' 1400)(15.0''

- = 28.9"
TYPICAL PIER 1 POUND

DL FOUND PIER WALL = 73.16 k (p. 2) 14.66 k (p.1)
97.82 k
3.00
100.9 k

EST. BOLTED AREA VT = 250 sq. ft x 15 = 3750 sq. ft

LOADS ON PIER FROM TRUE S: TYPICAL.
SPAN: 19.12'

END TRUSS 7'-0' I 8'-11'

LOADS: LL DL

SNOW 20 k/ft

2.3 = 1x8-16' O.C.
2.3 = SUBAVERS
1.0 = TRUSS
5.8 = METAL DOOR
129 k

DEAD LOAD ON TRUE S (12.9%)(15.08')(19.12)/2 = 186 k
LIVE (20%)(15.08')(19.12)/2 = 248 k

LOADS ON PIER FROM ASHOUNT!
SPAN: 19.16'
15.08' E - E on N.E. TYPICAL PIERS.

LOADS: LL DL

100 k/ft

62 = 5' SLAB.
8 = PLAST. CLO.
24 = B 108 = 65/8(1.08')/2.85'

DL = 95 k/ft (19.12')(15.08') + 15 k/ft(19.16) = 13.9 k
LL = 100 (19.12')(15.08') = 14.37 k
SOIL PRESSURE ON TYPICAL FOOTING

TOTAL DL = 73.14 + 24.66 + 1.06 + 13.92 = 116.60 k
TOTAL LL = 2.80 + 14.87 = 17.67

\[
\frac{116.60 \text{ k}}{27.4} = 4.260 \text{ k/ft}
\]

\[
\frac{-660}{36.00 \text{ k/ft}} = -18.33 \text{ k/ft}
\]

\[
\frac{133.45 \text{ kTOT}}{125.23 \text{ ft}} = 1.062 \text{ k/ft LL}
\]

\[
\frac{125.23 \text{ kTOT}}{27.4} = 4.670 \text{ k/ft}
\]
NEW AND EXISTING LOADS:

**BRICK PIER @ N.E. CORNER (W/ MASONRY PIER). 15'-6" HIGH.**

**TOTAL AREA OF PIER:**

- 1.75 x 5.5 = 9.35
- 4.25 x 1.5 = 6.38
- 4.15 x 5.61 = 23.68
- 1.3 x 3.5 = 4.45
- 3.5 x 5.95 = 21.33

Total = 53.8 ft²

**NEW MASONRY**

- 20.29 ft²
- 9.00 ft² (brick)

Total = 29.29 ft²

**ADD MASONRY = 29.29 ft²**

**TOTAL AREA**

- 2(1.75) = 3.50
- 4(5.61) = 22.44
- 1(1.5) = 1.50
- 1.3(4) = 5.20
- 1.3(2.67) = 3.42
- 3.5(3.16) = 11.05

Total = 44.72 ft²

**WT:**

- 120.8 ft³ x 9.66 (lbs/ft³) = 1173 lbs
- 50 x 1.5 (lbs/ft³) = 75 lbs

Total = 1248 lbs

**NEW LOAD**

**BALCONY PIER @ N.E. CORNER. 15'-6" HIGH.**

**AREA BLOCK = (4.67 x 1.5) = 7.01**

**AREA BLOCK (4') (1/2) = 2.67**

Total = 9.68 ft²

**WT:**

- (26.78)(120)(15.6) = 49.7 K
- (9.72)(.080)(15.6) = 14.0 K

Total = 63.7 K
WALLS (NEW) NEXT TO PIER:

\[ A = (4.67)(9.0) = 42.06 \]
\[ - (5.14)(3.5) = -10.54 \]
\[ \frac{-22.2}{31.6} \]

WALLS ABOVE WINDOWS:

||| 9'-0" high | 1-3" wide thick |
|---|---|---|
| 1'-0" wide | |
| \[ A = 71.6 \text{ CF} \] | |
| approx. 40% block | \[ 18.6 \] | \[ 45.0 \] |
| \[ \text{WT block} = (1.20)(20.6) = 24.7 \] | |
| \[ \text{WT arch} = (1.20)(20.6) = 24.7 \] | |
| arch = (HAR)(1.5)(6) | | |
| \[ \text{WT} = (0.14)(6)(1.6)(420) = 9.79 \] | |

ADD. LOAD:

\[ \begin{align*}
\text{NEW LOAD} & = 1431 \text{ k} + 237 \text{ k} + 2466 \text{ k} = 4134 \text{ k} \\
\text{ADDITIONAL LOAD - WALK} & = 8.80 \text{ k} + 33.66 \text{ k} + 81.14 \text{ k} = 123.6 \text{ k} \\
\text{ADD. LOAD - PIER} & = 6460 \text{ k}
\end{align*} \]
NEW AND EXISTING LOADS:

STACK FOUNDATION 5/26/83 - JVP

NEW FOOTING FOUNDATION 0 P.C. WDRT @ N.E. EXTENSION

4'-0' DEEP FOOTING

\[ A = (1.64 \times 6') = 9.84' \]
\[ + (1.67 \times 8') = 13.36' \]
\[ + (6.13 \times 2.4') = 14.71' \]
\[ + (1.14 \times 5.3') = 6.00' \]
\[ \frac{56.91'}{56.91'} \]

\[ V_{T, NW} = (106.9 \times 4') = 427.6' \]
\[ = 52.15' \]

2'-0' DEEP FOOTING

\[ A = (9' \times 9') = 81' \]
\[ + (9' \times 2.4') = 21.6' \]
\[ = \frac{102.6'}{100'} \]

\[ V_{T} = (100.9 \times 2.4') = 241.8' \]
\[ = 57.5' \]

\[ W_{T, Found} = 29.15' \]
\[ = 27.5' \]
\[ = 59.65' \]

TOTAL NEW LOAD = 59.65'

\[ \frac{64.60'}{164.25'} \]

\[ P_{hm} = \frac{124.25'}{100'} = 1.24' \]

@ POLE NEXT TO N.E. CORNER
NEW FOUNDATION & FLOORING  @ TYPICAL PIER.

\[ A_{\text{post}} = 2(6.83)(6.83) = 64 \text{ ft}^2 \]

\[ W_{\text{post}} = 10.6 \times 6.83 \times 2.8 \times 0.15 = 21 \text{ kN} \]

\[ W_{\text{pen}} = 10.5 \times 1.78 \times 5.5 \times 0.15 = 9.6 \text{ kN} \]

\[ W_{\text{T}} = \frac{64.60}{95.8} \text{ kN} \]

\[ P_{\text{load}} = \frac{95.20}{56} = 1.70 \text{ kN/ft} \]

\[ P_{\text{total}} = \frac{300}{1.70} = 176.47 \text{ kN/ft} \]

This is assuming equal distribution of mass of footing, which will not exactly happen. With a tentative assumption of 20% increase due to unequal dist.

\[ P = (120)(1.10) = 2.04 \text{ kN} \text{ from D.L.} \]