

(A0006940)

PITTMAN CONSTRUCTION CO., INC.

GENERAL CONTRACTORS

Phone (504) 945-4163 / 835-0747

FAX (504) 945-6813 / 835-0849

110 Veterans Blvd.
Suite 325
Metairie, LA 70005



Mailing Address:
P.O. Box 8116
New Orleans, LA 70182

July 5, 1994

New Orleans District, Corps of Engineers
United States Department of the Army
7500 Prytania Street
P. O. Box 60267
New Orleans, La. 70160-0267

Attn: Mr. Chester Ashley
Administrative Contracting Officer

Re: June 28, 1993 Contract No. DACW29-93-C-0081,
Lake Pontchartrain La. & Vicinity,
Hurricane Protection Project, High Level Plan,
17th Street Outfall Canal, Flood Protection
Improvement Project, Capping of Floodwalls,
East Side Improvements, New Orleans, La.
PCCI Job #114/PCCI #196

Dear Sir:

Mr. Richard T. Hill, Chief of Construction for C.O.E. telephoned today to request that I provide the C.O.E. with the Engineering Report that is herewith enclosed from Roussel Engineering, Inc..

I had requested Mr. Duhon to set up a meeting for today or by noon Wednesday July 6, 1994 with the C.O.E. Engineering Division and others of the C.O.E.'s design team and our engineering consultants to discuss and hopefully resolve the serious wall alignment problems that our firm has experienced since January 1994.

Mr. Hill stated that he felt that a meeting for the submission of the Engineering Report by our consultants and our representatives would not accomplish very much since the C.O.E. Engineering Division and Design Team would not or could not be in position to respond to matters that would be reviewed or discussed at the proposed meeting without the benefit of review of the Engineering Report prior to a meeting.

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*Check and
initial report
with the
will of the
10/10/94*

JUL - 6 1994

11 - 6

New Orleans District, Corps of Engineers
July 5, 1994
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The project record clearly indicates our firm has requested soil reports, soil boring information, and other data relating to the design and load carrying capacity of the existing sheet piling since April 20, 1994. The C.O.E. finally provided all available information on the project on June 27, 1994. This fact was re-confirmed with Mr. Jim Richardson on June 30, 1994.

Immediately after Mr. Richardson's confirmation that we have in fact received all engineering design data that the C.O.E. has on this project we met with our engineering consultants and advised them accordingly. Our consultants were then able to finalize their engineering report which was made available to our firm for the proposed meeting today.

Prior to our receipt of the C.O.E. Job Deficiency No. 001 dated February 8, 1994 and C.O.E. letter dated February 9, 1994, our firm had been performing additional work required in a positive effort to comply with the plans and specifications for this project of maintaining the construction tolerances specified. The C.O.E. have been very critical of our firm by alleging violations and non-compliance with the specifications in regards to our concrete operations, quality control, etc.. Not only have we suffered very serious delays in our overall construction program which has extended the completion of the project, in addition the loss of productivity, labor inefficiency, loss of the use of all construction equipment on the site, extended job overhead, etc. has increased the cost of the project tremendously.

Due to the fact of the overall delay experienced thus far in our construction program, there remains many wall sections that have not yet been constructed. Now is the time of decision for the C.O.E..

1. Should PCCI be further compelled to continue the very costly and time-consuming work in an effort to comply with the specified Construction Tolerances as indicated in the Technical provision C3D-4:2 in view of the facts as indicated in the Roussel Engineering, Inc. July 5, 1994 Report?

2. Should PCCI be permitted to construct the remaining wall sections in the normal manner of forming and placing concrete without the abnormal requirements of providing all that has been supplied such as additional labor, material, equipment, extended overhead, etc., due to conditions beyond its control?

We respectfully request a meeting with the proper authorized

PITTMAN CONSTRUCTION CO., INC.

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C.O.E. personnel to discuss this very important matter as soon as possible after the review of this letter and the enclosed Engineering Report.

PCCI has been previously advised by Mr. Duhon that the C.O.E. would certainly consider the issuance of a change order to PCCI for all additional costs incurred by PCCI if and when we were able to confirm that the existing sheet piling were in fact deflecting thus placing the additional hardship on PCCI of maintaining the tolerances specified. We think the Engineering Report provides a confirmation of sheet pile deflection.

Your consideration of our request for an early meeting to resolve this very important matter will be appreciated.

Respectfully submitted,

PITTMAN CONSTRUCTION CO., INC.


A. E. Pittman,
President

AEP/dpv

cc: Mr. Joe Towers
Mr. Richard Hill ←
Mr. Dennis Duhon
Mr. Jim Richardson
Mr. George Stoll
Mr. Herbert Roussel, Jr.
Mr. Gerald J. Gallinghouse
Mr. C. A. Pittman
Mr. Chad Frierson

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Mailing Address:
P.O. Box 8116
New Orleans, LA 70182

July 1, 1994

Fax & Mail

Department of the Army
U. S. Army Engineer District
New Orleans District
Corps of Engineers
CELMN-CD-NO
P.O. Box 60267
New Orleans, LA 70160-0267

Attention: Mr. Dennis Duhon

Re: Contract No. DACW29-93-C-0081
For construction of Lake
Pontchartrain Louisiana and Vicinity,
Hurricane Protection Project, High
Level Plan, 17th Street Outfall Canal,
Flood Protection Improvement Project,
Capping of Floodwalls, East Side
Improvements, Orleans Parish, Louisiana
Job #114/PCCI #195

Dear Mr. Duhon:

Reference is made to my telephone conversation with you today regarding the scheduling of a meeting with you, Mr. Jim Richardson of the Engineering Division and any other members of the C.O.E. Design Team to discuss and hopefully resolve the serious wall-alignment problems that our firm has experienced on the Type I and Type II walls since January 1994. Hopefully, the meeting can be held Tuesday, July 5, 1994.

PCCI engineering consultants are now prepared to review their calculations after their study of the soils report information provided by the Office of Counsel of the C.O.E. received by PCCI starting June 22, 1994. On June 30, 1994 Mr. Jim Richardson of the C.O.E. confirmed that PCCI had been furnished with all of the design information that the C.O.E. has available on the project.

I am sure, Mr. Duhon, that you will recall that when PCCI received the C.O.E. Notice Of Contract Deficiency Number 001 dated February 8, 1994 PCCI reacted immediately in an attempt to solve the wall-

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alignment problems which have continued to be a very time-consuming expensive task that has caused lack of productivity and labor inefficiency on this project. As you know, the problems have continued and are still ongoing.

During a scheduled jobsite meeting on February 23, 1994 at 1:30 p.m., PCCI advised you that PCCI had assigned our engineering consultants the task of reviewing and reporting their findings regarding the problems of wall alignment that PCCI had experienced.

Engineering studies during February and March of 1994 revealed it would be necessary that we request the C.O.E. to provide PCCI with all soil reports, soil boring information and other data relating to the design and load carrying capacity of the existing sheet piling as the information relates to the unbalanced Type I and Type II walls. On April 20, 1994 at 2:30 p.m. during a jobsite meeting you stated that you would discuss the wall design with the C.O.E. Engineering Division and request that PCCI be provided with the information that PCCI requested during the meeting, however, as of June 15, 1994, PCCI had not been provided with the information requested approximately two months earlier, on April 20, 1994.

As you should recall, Mr. Duhon, PCCI's letter Job #114/PCCI #188 again requested that PCCI be provided with the information previously requested during the April 20 jobsite meeting. You advised our Mr. Chris Pittman on June 21 that it would be necessary for PCCI to request all required engineering information through the Freedom Of Information Act by written request to Mr. Joe Towers, Office of Counsel, who represents the C.O.E.. PCCI's letter Job #114/PCCI #189 dated June 21, 1994 was hand delivered to him that day. PCCI received the first part of the requested information on June 22 and the last of the information on June 27 from the Office of Counsel.

Since it has been a very lengthy process in obtaining the engineering information, and the ongoing wall-alignment problems continue, we would appreciate being given the opportunity to meet with all parties as requested to review all information pertaining to the wall-alignment problems, hopefully next Tuesday (July 5) in the early afternoon or before noon on Wednesday (July 6).

We trust you will honor our request.

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Respectfully submitted,

PITTMAN CONSTRUCTION CO., INC.



A. E. Pittman,
President

AEP/dpv

cc: Mr. Joe Towers
Mr. Chester Ashley
Mr. Richard Hill
Mr. Jim Richardson
Mr. George Stoll
Mr. Herbert Rousell
Mr. Gerry Gallinghouse
Mr. C. A. Pittman
Mr. Chad Frierson

ROUSSEL ENGINEERING, INC.
P. O. BOX 1329, KENNER, LA 70063
4101 CALIFORNIA AVENUE, KENNER, LA 70065
(504) 469-4255
FAX (504) 469-1973

July 5, 1994

Pittman Construction Co., Inc.
110 Veterans Memorial Blvd.
Suite 325
Metairie, LA 70005

Attn: Mr. A.E. Pittman

Re: Sheet Pile Deflections

Dear sir,

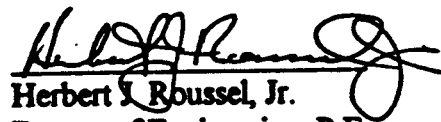
Nine cases were reviewed. Various values of the soil cohesion were used based on the soil information supplied. The summary sheet, which is the last sheet in the set of calculations, shows the deflections at the top of the concrete wall at Elevation 14.0 feet for all cases. Cases 1 through 4 are based on values from Table 4-2 in the reference noted. Cases 1A through 4A are based on values from Table 4-4 in the reference noted. Cases 1A through 4A give slightly higher deflections. Where "KS LOW" is noted, the lowest average values of the soil cohesion were used. Where "KS AVERAGE" is noted, the average values of the soil cohesion were used.

The conclusion that is noted is based on the above 8 cases. This soil is so weak and may have been further weakened by the additional driving of the sheet pile that increasing the penetration can not get the deflection within tolerance. After some period of time the soil may regain strength that was lost from driving.

Case 2B shows the effect of applying 900 pounds of lateral force at node 8, top of dry bottom on the canal side. This may be done at an additional cost during construction of the wall but once this force is removed the wall will deflect as noted on the summary sheet.

If I can be of further service, please call upon me.

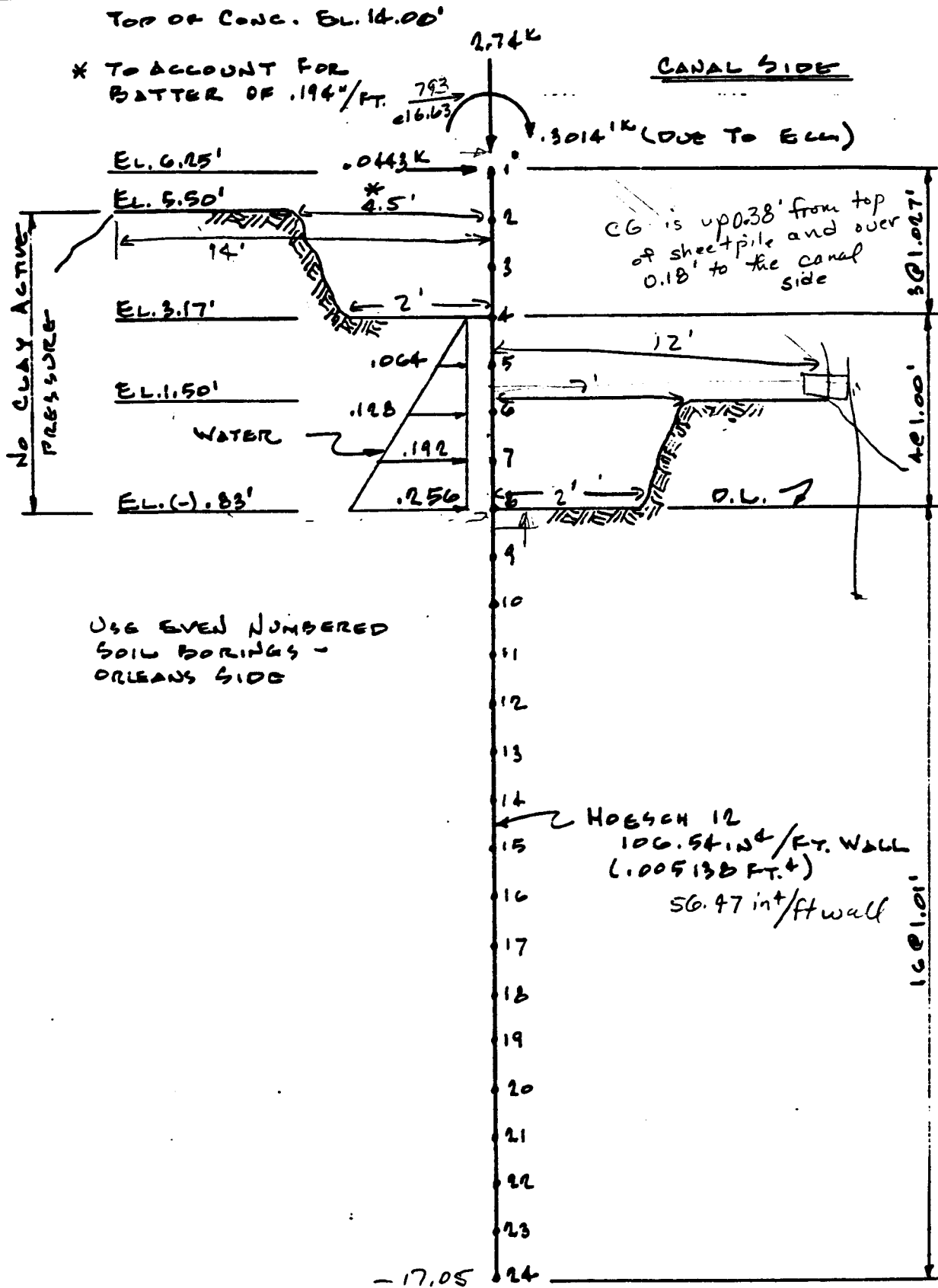
Sincerely,


Herbert J. Roussel, Jr.
Doctor of Engineering, P.E.
President

TOP OF CONC. EL. 14.00'

* TO ACCOUNT FOR
BATTER OF .194"/FT. $\frac{793}{416.63}$

CANAL SIDE



CG is up 0.38' from top
of sheet pile and over
0.18' to the canal
side

NO CLAY ACTIVE
PRESSURE

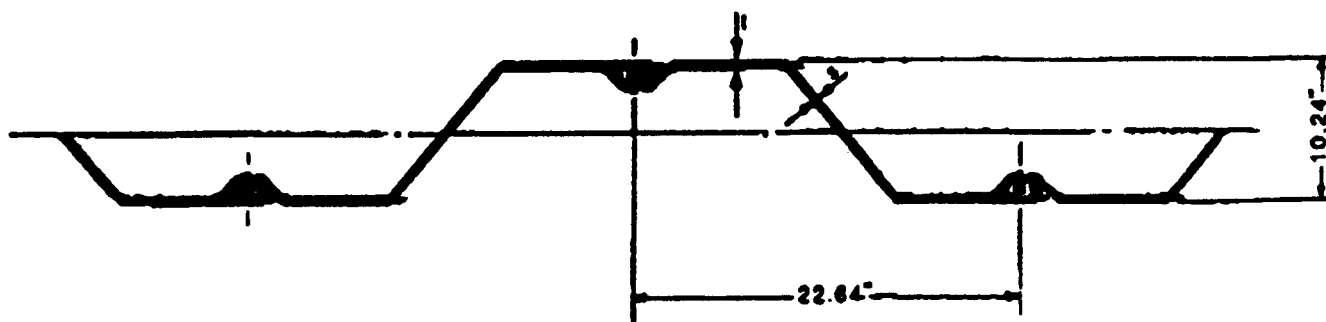
USE EVEN NUMBERED
SOIL BORINGS -
ORLEANS SIDE

Hoesch 12
106.54 in / FT. WALL
(1.005138 FT.)
56.47 int / ft wall

- 17.05

NEW

HOESCH 12



DIMENSIONS AND PROPERTIES

SECTION	DRIVING DISTANCE PER PILE	THICKNESS		WEIGHT		SECTION MODULUS		MOMENT OF INERTIA
		WEB s	FLANGE t	PER LIN. FT. OF PILE	PER SQUARE FOOT OF WALL	PER PILE	PER FOOT OF WALL	
HOESCH	INCHES	INCHES	INCHES	LBS	LBS	INCHES ²	INCHES ²	INCHES ⁴
H12	22.64	0.375	0.375	41.33	21.91	40.02	21.20	108.54

Steel Qualities

Steel Qualities	Minimum yield point	Minimum tensile strength	Minimum elongation
	psi	psi	%
ASTM A 680	80,000	70,000	17
ASTM A 572, Grade 58	58,000	70,000	17
ASTM A 572, Grade 60	60,000	68,000	18
ASTM A 572, Grade 48	48,000	60,000	18
ASTM A 328	38,500	70,000	17

**NOW AVAILABLE FROM
STEEL PILING, INC.
713 / 783-4863
P.O. Box 42448 • Houston, Texas 77042**

TABLE 4-2 Bearing-capacity factors for the Terzaghi equations
 Values of N_c for ϕ of 34 and 48° are original Terzaghi values and used to back-compute K_{ϕ}

ϕ , deg	N_c	N_q	N_γ	K_{ϕ}
0	5.7†	1.0	0.0	10.8
5	7.3	1.6	0.5	12.2
10	9.6	2.7	1.2	14.7
15	12.9	4.4	2.5	18.6
20	17.7	7.4	5.0	25.0
25	25.1	12.7	9.7	35.0
30	37.2	22.5	19.7	52.0
34	52.6	36.5	36.0	
35	57.8	41.4	42.4	82.0
40	95.7	81.3	100.4	141.0
45	172.3	173.3	297.5	298.0
48	258.3	287.9	780.1	
50	347.5	415.1	1153.2	800.0

† = $1.5\pi + 1$.

TABLE 4-4 Bearing-capacity factors for the Meyerhof, Hansen, and Vesic bearing-capacity equations

Note that N_c and N_q are same for all three methods; subscripts identify author for N_γ

ϕ	N_c	N_q	$N_{\pi M_1}$	$N_{\pi H_1}$	$N_{\pi V_1}$	N_q/N_c	$2 \tan \phi (1 - \sin \phi)^2$
0	5.14	1.0	0.0	0.0	0.0	0.195	0.000
5	6.49	1.6	0.1	0.1	0.4	0.242	0.146
10	8.34	2.5	0.4	0.4	1.2	0.296	0.241
15	10.97	3.9	1.2	1.1	2.6	0.359	0.294
20	14.83	6.4	2.9	2.9	5.4	0.431	0.315
25	20.71	10.7	6.8	6.8	10.9	0.514	0.311
26	22.25	11.8	7.9	8.0	12.5	0.533	0.308
28	25.79	14.7	10.9	11.2	16.7	0.570	0.299
30	30.13	18.4	15.1	15.7	22.4	0.610	0.289
32	35.47	23.2	20.8	22.0	30.2	0.653	0.276
34	42.14	29.4	28.7	31.1	41.0	0.698	0.262
36	50.55	37.7	40.0	44.4	56.2	0.746	0.247
38	61.31	48.9	56.1	64.0	77.9	0.797	0.231
40	75.25	64.1	79.4	93.6	109.3	0.852	0.214
45	133.73	134.7	200.5	262.3	271.3	1.007	0.172
50	266.50	318.5	567.4	871.7	761.3	1.195	0.131

$$k_s = A_s + B_s Z^n$$

$$k_s = \frac{q_{ult}}{\Delta H} = C(cN_c + \bar{q}N_q + 0.5\gamma BN_\gamma)$$

$C = 12$ for Fps and 40 for SI.

$$A_s = C(cN_c + 0.5\gamma BN_\gamma)$$

$$B_s Z^n = C(\gamma N_q Z^1)$$

BORING NUMBER	AVERAGE UNCONFIN. COMPRESS. LBS./SQ. FT.	LOW UNCONFIN. COMPRESS. LBS./SQ. FT.	AVERAGE SUBMERGED UNIT WEIGHT LBS./CU. FT.
46	413	355	28
48	567	390	41
50	612	520	28
52	618	460	35
54	648	490	36
56	638	610	33
58	588	365	28
60	615	400	29
62	647	565	29
64	455	205	42
66	643	335	33
68	780	485	31
AVERAGE VALUES	602	432	33
COHESION (PSF)	301	216	
AS (TABLE 4-2)	20.59	14.76	
AS (TABLE 4-4)	18.57	13.31	
BS	0.393	0.393	

**ONLY VALUES BETWEEN (-) 6.33 AND (-) 22.55 FEET USED
EVEN BORINGS USED AND HIGHEST VALUES OF UNCONFINED
COMPRESSIVE STRENGTH NOT USED**

REFERENCE:

**"FOUNDATION ANALYSIS AND DESIGN" BY J.E. BOWLES
FOURTH EDITION - 1988 - CHAPTERS 4 AND 13**

JOB: SHTPILE - "FOUNDATION ANALYSIS AND DESIGN" - 4TH Ed. - J.E. BOWLES
 CHAP. 13 - PG. 580

PREPARED BY: _____

1	TITLE																											
2	NP	NM	NNEP	NLC	ITYP	NCYC	NRC	JTSEL	JTSEL - NO. OF DEGREE LINE $NP = 2M(NM+1)$ $NCYC = 1 \rightarrow 5$																			
3	NBLW	NO. ANG	NEX	IPRESS. IMPT																								
4	E (KSE)	XMAX (FT.)	RBOFAC	DEMO (FT)	CINV	DEPINC (FT.)		INER/FT. (FT.)		WIDTH (FT.)																		
5	AS	BS	EXPS		$K_b = AS + BS K Z^{EXPS} (K/PT. 3)$																							
6	SER. LK. (FT.)																											

PITTMAN SHEET PILE - CASE 1 - WATER PRESSURE AT NODES 4 THRU 8 - KS LOW

48	23	2	1	0	5	0	8		
1	0	0	9	0					
4176000.0	.04	.70	16.16	.005	0.00	.005138	1.00		
14.76	.39	.50							
1.027	1.027	1.027	1.00	1.00	1.00	1.00	1.01		
1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01		
1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01		
.000	.000	.000	.000	.064	.128	.192	.256		
.000									
1	-.30140								
2	.04430								

PITTMAN SHEET PILE - CASE 2 - WATER PRESSURE AT NODES 4 THRU 8 - KS AVERAGE

48	23	2	1	0	5	0	8		
1	0	0	9	0					
4176000.0	.04	.70	16.16	.005	0.00	.005138	1.00		
20.59	.39	.50							
1.027	1.027	1.027	1.00	1.00	1.00	1.00	1.01		
1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01		
1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01		
.000	.000	.000	.000	.064	.128	.192	.256		
.000									
1	-.30140								
2	.04430								

PITTMAN SHEET PILE - CASE 3 - WATER PRESSURE AT NODES 4 THRU 8 - KS LOW

54	26	2	1	0	5	0	8		
1	0	0	9	0					
4176000.0	.04	.70	19.19	.005	0.00	.005138	1.00		
14.76	.39	.50							
1.027	1.027	1.027	1.00	1.00	1.00	1.00	1.01		
1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01		
1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01		
1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01		
.000	.000	.000	.000	.064	.128	.192	.256		
.000									
1	-.30140								
2	.04430								

PITTMAN SHEET PILE - CASE 4 - WATER PRESSURE AT NODES 4 THRU 8 - KS LOW

76	37	2	1	0	5	0	8		
1	0	0	9	0					
4176000.0	.04	.70	30.30	.005	0.00	.005138	1.00		
14.76	.39	.50							
1.027	1.027	1.027	1.00	1.00	1.00	1.00	1.01		
1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01		
1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01		
1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01		
1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01		
.000	.000	.000	.000	.064	.128	.192	.256		
.000									
1	-.30140								
2	.04430								

PITTMAN SHEET PILE - CASE 1A - WATER PRESSURE AT NODES 4 THRU 8 - KS LOW

48	23	2	1	0	5	0	8		
1	0	0	9	0					
4176000.0	.04	.70	16.16	.005	0.00	.005138	1.00		
13.31	.39	.50							
1.027	1.027	1.027	1.00	1.00	1.00	1.00	1.01		
1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01		
1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01		
.000	.000	.000	.000	.064	.128	.192	.256		
.000									
1	-.30140								
2	.04430								

PITTMAN SHEET PILE - CASE 2A - WATER PRESSURE AT NODES 4 THRU 8 - KS AVERAGE

48	23	2	1	0	5	0	8		
1	0	0	9	0					
4176000.0	.04	.70	16.16	.005	0.00	.005138	1.00		
18.57	.39	.50							
1.027	1.027	1.027	1.00	1.00	1.00	1.00	1.01		
1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01		
1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01		
.000	.000	.000	.000	.064	.128	.192	.256		
.000									
1	-.30140								
2	.04430								

PITTMAN SHEET PILE - CASE 3A - WATER PRESSURE AT NODES 4 THRU 8 - KS LOW

62	30	2	1	0	5	0	8		
1	0	0	9	0					
4176000.0	.04	.70	23.23	.005	0.00	.005138	1.00		
13.31	.39	.50							
1.027	1.027	1.027	1.00	1.00	1.00	1.00	1.01		
1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01		
1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01		
1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01		
.000	.000	.000	.000	.064	.128	.192	.256		
.000									
1	-.30140								
2	.04430								

PITTMAN SHEET PILE - CASE 4A - WATER PRESSURE AT NODES 4 THRU 8 - KS LOW

76	37	2	1	0	5	0	8		
1	0	0	9	0					
4176000.0	.04	.70	30.30	.005	0.00	.005138	1.00		
13.31	.39	.50							
1.027	1.027	1.027	1.00	1.00	1.00	1.00	1.01		
1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01		
1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01		
1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01		
1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01		
.000	.000	.000	.000	.064	.128	.192	.256		
.000									
1	-.30140								
2	.04430								

SOLUTION FOR SHEET PILE WALL

MODULUS OF ELASTICITY = 4176000.00 KSF
NODES REQUIRING SOIL SPRINGS READ = 0
MODE D.L. SOIL STARTS = 8
MAXIMUM LINEAR SOIL DEFORMATION = .040 FT
SOIL MODULUS = $14.760 + .390 \cdot 2^{**} .500 \text{ K/FT}^{**3}$
NUMBER OF NON-ZERO P-MATRIX ENTRIES = 2

NUMBER OF LOAD CONDITIONS = 1
DEPTH INCREMENT = .000 FT
DREDGE LINE REDUCTION FACTOR = .700
NUMBER OF BOUNDARY CONDITIONS = 0
NUMBER OF NP = 48
NUMBER OF MEMBERS = 23
MAXIMUM NUMBER OF ITERATIONS = 5
NON-LINEAR CHECK (IF > 0) = 1

PITTMAN SHEET PILE - CASE 1 - WATER PRESSURE AT NODES 4 THRU 8 - KS LOW

MEMBER AND NODE DATA FOR UNIT WIDTH OF WALL

MEMNO	NP1	NP2	NP3	NP4	LENGTH	INERTIA, FT ⁴	NODE	KS, K/FT ³	SPRGS--SOIL/A.R.	MODE Q, KSF
1	1	2	3	4	1.0270	.00514	1	.000	.000	.0000
2	3	4	5	6	1.0270	.00514	2	.000	.000	.0000
3	5	6	7	8	1.0270	.00514	3	.000	.000	.0000
4	7	8	9	10	1.0000	.00514	4	.000	.000	.0000
5	9	10	11	12	1.0000	.00514	5	.000	.000	.0640
6	11	12	13	14	1.0000	.00514	6	.000	.000	.1280
7	13	14	15	16	1.0000	.00514	7	.000	.000	.1920
8	15	16	17	18	1.0100	.00514	8	14.760	5.271	.2560
9	17	18	19	20	1.0100	.00514	9	15.152	15.284	.0000
10	19	20	21	22	1.0100	.00514	10	15.314	15.464	
11	21	22	23	24	1.0100	.00514	11	15.439	15.592	
12	23	24	25	26	1.0100	.00514	12	15.544	15.698	
13	25	26	27	28	1.0100	.00514	13	15.636	15.792	
14	27	28	29	30	1.0100	.00514	14	15.720	15.877	
15	29	30	31	32	1.0100	.00514	15	15.797	15.955	
16	31	32	33	34	1.0100	.00514	16	15.869	16.027	
17	33	34	35	36	1.0100	.00514	17	15.936	16.095	
18	35	36	37	38	1.0100	.00514	18	15.999	16.159	
19	37	38	39	40	1.0100	.00514	19	16.060	16.220	
20	39	40	41	42	1.0100	.00514	20	16.118	16.279	
21	41	42	43	44	1.0100	.00514	21	16.173	16.335	
22	43	44	45	46	1.0100	.00514	22	16.227	16.389	
23	45	46	47	48	1.0100	.00514	23	16.278	16.441	
							24	16.328	8.237	

PITTMAN SHEET PILE - CASE 1 - WATER PRESSURE AT NODES 4 THRU 8 - KS LOW

THE BAND MATRIX CORRECTED FOR ANY BOUNDARY CONDITIONS				P-MATRIX (ADJUSTED FOR M2X)		
1	83569.	122058.	41784.	-122058.	1	-.3014
2	237697.	122058.	-237697.	0.	2	.0443
3	167138.	0.	41784.	-122058.	3	.0000
4	475395.	122058.	-237697.	0.	4	.0000
5	167138.	0.	41784.	-122058.	5	.0000
6	475395.	122058.	-237697.	0.	6	.0000
7	169394.	6680.	42913.	-128738.	7	.0000
8	495173.	128738.	-257475.	0.	8	.0107
9	171650.	0.	42913.	-128738.	9	.0000
10	514951.	128738.	-257475.	0.	10	.0640
11	171650.	0.	42913.	-128738.	11	.0000
12	514951.	128738.	-257475.	0.	12	.1280
13	171650.	0.	42913.	-128738.	13	.0000
14	514951.	128738.	-257475.	0.	14	.1920
15	170801.	-2537.	42488.	-126201.	15	.0000
16	507384.	126201.	-249903.	0.	16	.2035
17	169951.	0.	42488.	-126201.	17	.0000
18	499822.	126201.	-249903.	0.	18	.0000
19	169951.	0.	42488.	-126201.	19	.0000
20	499822.	126201.	-249903.	0.	20	.0000
21	169951.	0.	42488.	-126201.	21	.0000
22	499822.	126201.	-249903.	0.	22	.0000
23	169951.	0.	42488.	-126201.	23	.0000
24	499822.	126201.	-249903.	0.	24	.0000
25	169951.	0.	42488.	-126201.	25	.0000
26	499822.	126201.	-249903.	0.	26	.0000
27	169951.	0.	42488.	-126201.	27	.0000
28	499822.	126201.	-249903.	0.	28	.0000
29	169951.	0.	42488.	-126201.	29	.0000
30	499822.	126201.	-249903.	0.	30	.0000
31	169951.	0.	42488.	-126201.	31	.0000
32	499822.	126201.	-249903.	0.	32	.0000
33	169951.	0.	42488.	-126201.	33	.0000
34	499822.	126201.	-249903.	0.	34	.0000
35	169951.	0.	42488.	-126201.	35	.0000
36	499822.	126201.	-249903.	0.	36	.0000
37	169951.	0.	42488.	-126201.	37	.0000
38	499823.	126201.	-249903.	0.	38	.0000
39	169951.	0.	42488.	-126201.	39	.0000
40	499823.	126201.	-249903.	0.	40	.0000
41	169951.	0.	42488.	-126201.	41	.0000
42	499823.	126201.	-249903.	0.	42	.0000
43	169951.	0.	42488.	-126201.	43	.0000
44	499823.	126201.	-249903.	0.	44	.0000
45	169951.	0.	42488.	-126201.	45	.0000
46	499823.	126201.	-249903.	0.	46	.0000
47	84975.	-126201.	0.	0.	47	.0000
48	249911.	0.	0.	0.	48	.0000

CYCLE NO = 1 D.L. DEFL: PREVIOUS = .00000 CURRENT = .01464

PITTMAN SHEET PILE - CASE 1 - WATER PRESSURE AT NODES 4 THRU 8 - KS LOW

MEMBER AND NODE DATA FOR UNIT WIDTH OF WALL

MEMNO	NP1	NP2	NP3	NP4	LENGTH	INERTIA, FT ⁴	NODE	KS, K/FT ³	SPRGS--SOIL/A.R.	NODE Q, KSF
1	1	2	3	4	1.0270	.00514	1	.000	.000	.0000
2	3	4	5	6	1.0270	.00514	2	.000	.000	.0000
3	5	6	7	8	1.0270	.00514	3	.000	.000	.0000
4	7	8	9	10	1.0000	.00514	4	.000	.000	.0000
5	9	10	11	12	1.0000	.00514	5	.000	.000	.0640
6	11	12	13	14	1.0000	.00514	6	.000	.000	.1280
7	13	14	15	16	1.0000	.00514	7	.000	.000	.1920
8	15	16	17	18	1.0100	.00514	8	14.760	8.271	.2560
9	17	18	19	20	1.0100	.00514	9	15.152	15.284	.0000
10	19	20	21	22	1.0100	.00514	10	15.314	15.464	
11	21	22	23	24	1.0100	.00514	11	15.439	15.592	
12	23	24	25	26	1.0100	.00514	12	15.544	15.698	
13	25	26	27	28	1.0100	.00514	13	15.636	15.792	
14	27	28	29	30	1.0100	.00514	14	15.720	15.877	
15	29	30	31	32	1.0100	.00514	15	15.797	15.955	
16	31	32	33	34	1.0100	.00514	16	15.869	16.027	
17	33	34	35	36	1.0100	.00514	17	15.936	16.095	
18	35	36	37	38	1.0100	.00514	18	15.999	16.159	
19	37	38	39	40	1.0100	.00514	19	16.060	16.220	
20	39	40	41	42	1.0100	.00514	20	16.118	16.279	
21	41	42	43	44	1.0100	.00514	21	16.173	16.335	
22	43	44	45	46	1.0100	.00514	22	16.227	16.389	
23	45	46	47	48	1.0100	.00514	23	16.278	16.441	
							24	16.328	8.237	

PITTMAN-SHEET PILE - CASE 1 - WATER PRESSURE AT NODES 4 THRU 8 - KS LOW

THE BAND MATRIX CORRECTED FOR ANY BOUNDARY CONDITIONS				P-MATRIX (ADJUSTED FOR NZX)		
1	83569.	122058.	41784.	-122058.	1	-.3014
2	237697.	122058.	-237697.	0.	2	.0443
3	167138.	0.	41784.	-122058.	3	.0000
4	475395.	122058.	-237697.	0.	4	.0000
5	167138.	0.	41784.	-122058.	5	.0000
6	475395.	122058.	-237697.	0.	6	.0000
7	169394.	6680.	42913.	-128738.	7	.0000
8	495173.	128738.	-257475.	0.	8	.0107
9	171650.	0.	42913.	-128738.	9	.0000
10	514951.	128738.	-257475.	0.	10	.0640
11	171650.	0.	42913.	-128738.	11	.0000
12	514951.	128738.	-257475.	0.	12	.1280
13	171650.	0.	42913.	-128738.	13	.0000
14	514951.	128738.	-257475.	0.	14	.1920
15	170801.	-2537.	42488.	-126201.	15	.0000
16	507384.	126201.	-249903.	0.	16	.2035
17	169951.	0.	42488.	-126201.	17	.0000
18	499822.	126201.	-249903.	0.	18	.0000
19	169951.	0.	42488.	-126201.	19	.0000
20	499822.	126201.	-249903.	0.	20	.0000
21	169951.	0.	42488.	-126201.	21	.0000
22	499822.	126201.	-249903.	0.	22	.0000
23	169951.	0.	42488.	-126201.	23	.0000
24	499822.	126201.	-249903.	0.	24	.0000
25	169951.	0.	42488.	-126201.	25	.0000
26	499822.	126201.	-249903.	0.	26	.0000
27	169951.	0.	42488.	-126201.	27	.0000
28	499822.	126201.	-249903.	0.	28	.0000
29	169951.	0.	42488.	-126201.	29	.0000
30	499822.	126201.	-249903.	0.	30	.0000
31	169951.	0.	42488.	-126201.	31	.0000
32	499822.	126201.	-249903.	0.	32	.0000
33	169951.	0.	42488.	-126201.	33	.0000
34	499822.	126201.	-249903.	0.	34	.0000
35	169951.	0.	42488.	-126201.	35	.0000
36	499822.	126201.	-249903.	0.	36	.0000
37	169951.	0.	42488.	-126201.	37	.0000
38	499823.	126201.	-249903.	0.	38	.0000
39	169951.	0.	42488.	-126201.	39	.0000
40	499823.	126201.	-249903.	0.	40	.0000
41	169951.	0.	42488.	-126201.	41	.0000
42	499823.	126201.	-249903.	0.	42	.0000
43	169951.	0.	42488.	-126201.	43	.0000
44	499823.	126201.	-249903.	0.	44	.0000
45	169951.	0.	42488.	-126201.	45	.0000
46	499823.	126201.	-249903.	0.	46	.0000
47	84975.	-126201.	0.	0.	47	.0000
48	249911.	0.	0.	0.	48	.0000

D. L. DEFL CONVERGED ON CYCLE = 2

DEFLS ARE: PREVIOUS = .01464 CURRENT = .01464 FOR EMBED DEPTH = 16.16 FT

PITTMAN SHEET PILE - CASE 1 - WATER PRESSURE AT NODES 4 THRU 8 - KS LOW

MEMBER MOMENTS, NODE REACTIONS, DEFLECTIONS, SOIL PRESSURE, AND LAST USED P-MATRIX FOR LC = 1

MEMNO	MOMENTS--NEAR	END 1ST, K-FT	NODE	SPG FORCE, KIPS	ROT, RADS	DEFL, FT	SOIL Q, KSF	P-, K-FT	P-, KIPS
1	-.301	.347	1	.0000	-.00216	.02945	.0000	-.3014	.0443
2	-.347	.393	2	.0000	-.00215	.02723	.0000	.0000	.0000
3	-.393	.439	3	.0000	-.00213	.02504	.0000	.0000	.0000
4	-.439	.494	4	.0000	-.00211	.02286	.0000	.0000	.0107
5	-.494	.613	5	.0000	-.00209	.02076	.0000	.0000	.0640
6	-.613	.860	6	.0000	-.00206	.01869	.0000	.0000	.1280
7	-.859	1.297	7	.0000	-.00203	.01664	.0000	.0000	.1920
8	-1.298	1.868	8	.0771	-.00198	.01464	.2160	.0000	.2035
9	-1.868	2.243	9	.1937	-.00190	.01267	.1920	.0000	.0000
10	-2.242	2.448	10	.1670	-.00181	.01080	.1654	.0000	.0000
11	-2.448	2.512	11	.1408	-.00170	.00903	.1394	.0000	.0000
12	-2.512	2.458	12	.1158	-.00158	.00738	.1147	.0000	.0000
13	-2.458	2.312	13	.0922	-.00146	.00584	.0913	.0000	.0000
14	-2.312	2.094	14	.0702	-.00135	.00442	.0695	.0000	.0000
15	-2.094	1.827	15	.0496	-.00125	.00311	.0492	.0000	.0000
16	-1.827	1.528	16	.0305	-.00115	.00190	.0302	.0000	.0000
17	-1.528	1.217	17	.0125	-.00107	.00078	.0124	.0000	.0000
18	-1.217	.911	18	-.0045	-.00101	-.00028	-.0044	.0000	.0000
19	-.911	.625	19	-.0206	-.00096	-.00127	-.0204	.0000	.0000
20	-.625	.376	20	-.0361	-.00092	-.00222	-.0358	.0000	.0000
21	-.376	.179	21	-.0513	-.00090	-.00314	-.0508	.0000	.0000
22	-.179	.048	22	-.0663	-.00089	-.00404	-.0656	.0000	.0000
23	-.049	.000	23	-.0811	-.00088	-.00494	-.0803	.0000	.0000
			24	-.0480	-.00088	-.00583	-.0951	.0000	.0000

SUM SPRING FORCES = .6416 VS SUM APPLIED FORCES = .6425 KIPS

APPLIED FORCES ADJUSTED FOR NON LINEAR SOIL REACTIONS WHEN SPRINGS ARE ZEROED

DEFLECTION AT ELEV. 14.0 = (.02945 * 12.0) + (.00216 * 12.0 * 7.75) = .554 IN.

SOLUTION FOR SHEET PILE WALL

MODULUS OF ELASTICITY = 4176000.00 KSF
NODES REQUIRING SOIL SPRINGS READ = 0
MODE D.L. SOIL STARTS = 8
MAXIMUM LINEAR SOIL DEFORMATION = .040 FT
SOIL MODULUS = $20.590 + .390 \times 2^{.500} \text{ K/FT}^{.5}$
NUMBER OF NON-ZERO P-MATRIX ENTRIES = 2

NUMBER OF LOAD CONDITIONS = 1
DEPTH INCREMENT = .000 FT
DREDGE LINE REDUCTION FACTOR = .700
NUMBER OF BOUNDARY CONDITIONS = 0
NUMBER OF MP = 48
NUMBER OF MEMBERS = 23
MAXIMUM NUMBER OF ITERATIONS = 5
NON-LINEAR CHECK (IF > 0) = 1

PITTMAN SHEET PILE - CASE 2 - WATER PRESSURE AT NODES 4 THRU 8 - KS AVERAGE

MEMBER AND NODE DATA FOR UNIT WIDTH OF WALL

MEMNO	NP1	NP2	NP3	NP4	LENGTH	INERTIA, FT ⁴	NODE	KS, K/FT ³	SPRGS--SOIL/A.R.	NODE Q, KSF
1	1	2	3	4	1.0270	.00514	1	.000	.000	.0000
2	3	4	5	6	1.0270	.00514	2	.000	.000	.0000
3	5	6	7	8	1.0270	.00514	3	.000	.000	.0000
4	7	8	9	10	1.0000	.00514	4	.000	.000	.0000
5	9	10	11	12	1.0000	.00514	5	.000	.000	.0640
6	11	12	13	14	1.0000	.00514	6	.000	.000	.1280
7	13	14	15	16	1.0000	.00514	7	.000	.000	.1920
8	15	16	17	18	1.0100	.00514	8	20.590	7.332	.2560
9	17	18	19	20	1.0100	.00514	9	20.982	21.172	.0000
10	19	20	21	22	1.0100	.00514	10	21.144	21.353	
11	21	22	23	24	1.0100	.00514	11	21.269	21.480	
12	23	24	25	26	1.0100	.00514	12	21.374	21.587	
13	25	26	27	28	1.0100	.00514	13	21.466	21.680	
14	27	28	29	30	1.0100	.00514	14	21.550	21.765	
15	29	30	31	32	1.0100	.00514	15	21.627	21.843	
16	31	32	33	34	1.0100	.00514	16	21.699	21.915	
17	33	34	35	36	1.0100	.00514	17	21.766	21.983	
18	35	36	37	38	1.0100	.00514	18	21.829	22.047	
19	37	38	39	40	1.0100	.00514	19	21.890	22.109	
20	39	40	41	42	1.0100	.00514	20	21.948	22.167	
21	41	42	43	44	1.0100	.00514	21	22.003	22.223	
22	43	44	45	46	1.0100	.00514	22	22.057	22.277	
23	45	46	47	48	1.0100	.00514	23	22.108	22.329	
							24	22.158	11.181	

PITTMAN SHEET PILE - CASE 2 - WATER PRESSURE AT NODES 4 THRU 8 - KS AVERAGE

THE BAND MATRIX CORRECTED FOR ANY BOUNDARY CONDITIONS P-MATRIX (ADJUSTED FOR NZX)

1	83569.	122058.	41784.	-122058.	1	-.3014
2	237697.	122058.	-237697.	0.	2	.0443
3	167138.	0.	41784.	-122058.	3	.0000
4	475395.	122058.	-237697.	0.	4	.0000
5	167138.	0.	41784.	-122058.	5	.0000
6	475395.	122058.	-237697.	0.	6	.0000
7	169394.	6680.	42913.	-128738.	7	.0000
8	495173.	128738.	-257475.	0.	8	.0107
9	171650.	0.	42913.	-128738.	9	.0000
10	514951.	128738.	-257475.	0.	10	.0640
11	171650.	0.	42913.	-128738.	11	.0000
12	514951.	128738.	-257475.	0.	12	.1280
13	171650.	0.	42913.	-128738.	13	.0000
14	514951.	128738.	-257475.	0.	14	.1920
15	170801.	-2537.	42488.	-126201.	15	.0000
16	507386.	126201.	-249903.	0.	16	.2035
17	169951.	0.	42488.	-126201.	17	.0000
18	499827.	126201.	-249903.	0.	18	.0000
19	169951.	0.	42488.	-126201.	19	.0000
20	499828.	126201.	-249903.	0.	20	.0000
21	169951.	0.	42488.	-126201.	21	.0000
22	499828.	126201.	-249903.	0.	22	.0000
23	169951.	0.	42488.	-126201.	23	.0000
24	499828.	126201.	-249903.	0.	24	.0000
25	169951.	0.	42488.	-126201.	25	.0000
26	499828.	126201.	-249903.	0.	26	.0000
27	169951.	0.	42488.	-126201.	27	.0000
28	499828.	126201.	-249903.	0.	28	.0000
29	169951.	0.	42488.	-126201.	29	.0000
30	499828.	126201.	-249903.	0.	30	.0000
31	169951.	0.	42488.	-126201.	31	.0000
32	499828.	126201.	-249903.	0.	32	.0000
33	169951.	0.	42488.	-126201.	33	.0000
34	499828.	126201.	-249903.	0.	34	.0000
35	169951.	0.	42488.	-126201.	35	.0000
36	499828.	126201.	-249903.	0.	36	.0000
37	169951.	0.	42488.	-126201.	37	.0000
38	499828.	126201.	-249903.	0.	38	.0000
39	169951.	0.	42488.	-126201.	39	.0000
40	499828.	126201.	-249903.	0.	40	.0000
41	169951.	0.	42488.	-126201.	41	.0000
42	499829.	126201.	-249903.	0.	42	.0000
43	169951.	0.	42488.	-126201.	43	.0000
44	499829.	126201.	-249903.	0.	44	.0000
45	169951.	0.	42488.	-126201.	45	.0000
46	499829.	126201.	-249903.	0.	46	.0000
47	84975.	-126201.	0.	0.	47	.0000
48	249914.	0.	0.	0.	48	.0000

CYCLE NO = 1 D.L. DEFL: PREVIOUS = .00000 CURRENT = .01113

PITTMAN SHEET PILE - CASE 2 - WATER PRESSURE AT NODES 4 THRU 8 - KS AVERAGE

MEMBER AND NODE DATA FOR UNIT WIDTH OF WALL

MEMNO	NP1	NP2	NP3	NP4	LENGTH	INERTIA, FT ⁴	NODE	KS, K/FT ³	SPRGS--SOIL/A.R.	MODE Q, KSF
1	1	2	3	4	1.0270	.00514	1	.000	.000	.0000
2	3	4	5	6	1.0270	.00514	2	.000	.000	.0000
3	5	6	7	8	1.0270	.00514	3	.000	.000	.0000
4	7	8	9	10	1.0000	.00514	4	.000	.000	.0000
5	9	10	11	12	1.0000	.00514	5	.000	.000	.0640
6	11	12	13	14	1.0000	.00514	6	.000	.000	.1280
7	13	14	15	16	1.0000	.00514	7	.000	.000	.1920
8	15	16	17	18	1.0100	.00514	8	20.590	7.332	.2560
9	17	18	19	20	1.0100	.00514	9	20.982	21.172	.0000
10	19	20	21	22	1.0100	.00514	10	21.144	21.353	
11	21	22	23	24	1.0100	.00514	11	21.269	21.480	
12	23	24	25	26	1.0100	.00514	12	21.374	21.587	
13	25	26	27	28	1.0100	.00514	13	21.466	21.680	
14	27	28	29	30	1.0100	.00514	14	21.550	21.765	
15	29	30	31	32	1.0100	.00514	15	21.627	21.843	
16	31	32	33	34	1.0100	.00514	16	21.699	21.915	
17	33	34	35	36	1.0100	.00514	17	21.766	21.983	
18	35	36	37	38	1.0100	.00514	18	21.829	22.047	
19	37	38	39	40	1.0100	.00514	19	21.890	22.109	
20	39	40	41	42	1.0100	.00514	20	21.948	22.167	
21	41	42	43	44	1.0100	.00514	21	22.003	22.223	
22	43	44	45	46	1.0100	.00514	22	22.057	22.277	
23	45	46	47	48	1.0100	.00514	23	22.108	22.329	
							24	22.158	11.181	

PITTMAN SHEET PILE - CASE 2 - WATER PRESSURE AT NODES 4 THRU 8 - KS AVERAGE

THE BAND MATRIX CORRECTED FOR ANY BOUNDARY CONDITIONS					P-MATRIX (ADJUSTED FOR MZX)	
1	83569.	122058.	41784.	-122058.	1	-.3014
2	237697.	122058.	-237697.	0.	2	.0443
3	167138.	0.	41784.	-122058.	3	.0000
4	475395.	122058.	-237697.	0.	4	.0000
5	167138.	0.	41784.	-122058.	5	.0000
6	475395.	122058.	-237697.	0.	6	.0000
7	169394.	6680.	42913.	-128738.	7	.0000
8	495173.	128738.	-257475.	0.	8	.0107
9	171650.	0.	42913.	-128738.	9	.0000
10	514951.	128738.	-257475.	0.	10	.0640
11	171650.	0.	42913.	-128738.	11	.0000
12	514951.	128738.	-257475.	0.	12	.1280
13	171650.	0.	42913.	-128738.	13	.0000
14	514951.	128738.	-257475.	0.	14	.1920
15	170801.	-2537.	42488.	-126201.	15	.0000
16	507386.	126201.	-249903.	0.	16	.2035
17	169951.	0.	42488.	-126201.	17	.0000
18	499827.	126201.	-249903.	0.	18	.0000
19	169951.	0.	42488.	-126201.	19	.0000
20	499828.	126201.	-249903.	0.	20	.0000
21	169951.	0.	42488.	-126201.	21	.0000
22	499828.	126201.	-249903.	0.	22	.0000
23	169951.	0.	42488.	-126201.	23	.0000
24	499828.	126201.	-249903.	0.	24	.0000
25	169951.	0.	42488.	-126201.	25	.0000
26	499828.	126201.	-249903.	0.	26	.0000
27	169951.	0.	42488.	-126201.	27	.0000
28	499828.	126201.	-249903.	0.	28	.0000
29	169951.	0.	42488.	-126201.	29	.0000
30	499828.	126201.	-249903.	0.	30	.0000
31	169951.	0.	42488.	-126201.	31	.0000
32	499828.	126201.	-249903.	0.	32	.0000
33	169951.	0.	42488.	-126201.	33	.0000
34	499828.	126201.	-249903.	0.	34	.0000
35	169951.	0.	42488.	-126201.	35	.0000
36	499828.	126201.	-249903.	0.	36	.0000
37	169951.	0.	42488.	-126201.	37	.0000
38	499828.	126201.	-249903.	0.	38	.0000
39	169951.	0.	42488.	-126201.	39	.0000
40	499828.	126201.	-249903.	0.	40	.0000
41	169951.	0.	42488.	-126201.	41	.0000
42	499829.	126201.	-249903.	0.	42	.0000
43	169951.	0.	42488.	-126201.	43	.0000
44	499829.	126201.	-249903.	0.	44	.0000
45	169951.	0.	42488.	-126201.	45	.0000
46	499829.	126201.	-249903.	0.	46	.0000
47	84975.	-126201.	0.	0.	47	.0000
48	249914.	0.	0.	0.	48	.0000

D. L. DEFL CONVERGED ON CYCLE = 2

DEFLS ARE: PREVIOUS = .01113 CURRENT = .01113 FOR EMBED DEPTH = 16.16 FT

PITTMAN SHEET PILE - CASE 2 - WATER PRESSURE AT NODES 4 THRU 8 - KS AVERAGE

MEMBER MOMENTS, NODE REACTIONS, DEFLECTIONS, SOIL PRESSURE, AND LAST USED P-MATRIX FOR LC = 1

MEMNO	MOMENTS--NEAR END	1ST, K-FT	NODE	SPG FORCE, KIPS	ROT, RADS	DEFL, FT	SOIL Q, KSF	P-, K-FT	P-, KIPS
1	-.301	.347	1	.0000	-.00181	.02347	.0000	-.3014	.0443
2	-.347	.393	2	.0000	-.00180	.02161	.0000	.0000	.0000
3	-.393	.439	3	.0000	-.00178	.01977	.0000	.0000	.0000
4	-.439	.494	4	.0000	-.00176	.01795	.0000	.0000	.0107
5	-.494	.613	5	.0000	-.00174	.01620	.0000	.0000	.0640
6	-.613	.859	6	.0000	-.00171	.01448	.0000	.0000	.1280
7	-.859	1.298	7	.0000	-.00168	.01278	.0000	.0000	.1920
8	-1.298	1.864	8	.0816	-.00163	.01113	.2291	.0000	.2035
9	-1.864	2.226	9	.2015	-.00155	.00952	.1997	.0000	.0000
10	-2.226	2.416	10	.1707	-.00146	.00799	.1690	.0000	.0000
11	-2.416	2.463	11	.1412	-.00135	.00657	.1398	.0000	.0000
12	-2.463	2.396	12	.1138	-.00123	.00527	.1127	.0000	.0000
13	-2.396	2.239	13	.0885	-.00112	.00408	.0876	.0000	.0000
14	-2.239	2.016	14	.0655	-.00101	.00301	.0648	.0000	.0000
15	-2.016	1.748	15	.0445	-.00091	.00204	.0441	.0000	.0000
16	-1.748	1.454	16	.0255	-.00082	.00116	.0253	.0000	.0000
17	-1.454	1.152	17	.0082	-.00075	.00037	.0081	.0000	.0000
18	-1.152	.858	18	-.0077	-.00068	-.00035	-.0076	.0000	.0000
19	-.858	.586	19	-.0224	-.00064	-.00101	-.0222	.0000	.0000
20	-.586	.351	20	-.0364	-.00060	-.00164	-.0360	.0000	.0000
21	-.351	.166	21	-.0497	-.00058	-.00224	-.0492	.0000	.0000
22	-.166	.045	22	-.0628	-.00057	-.00282	-.0622	.0000	.0000
23	-.045	.000	23	-.0757	-.00056	-.00339	-.0750	.0000	.0000
			24	-.0443	-.00056	-.00396	-.0877	.0000	.0000

SUM SPRING FORCES = .6420 VS SUM APPLIED FORCES = .6425 KIPS

APPLIED FORCES ADJUSTED FOR NON LINEAR SOIL REACTIONS WHEN SPRINGS ARE ZEROED

DEFLECTION AT ELEV. 14.0 = (.02347 * 12.0) + (.00181 * 12.0 * 7.75) = .450 IN.

SOLUTION FOR SHEET PILE WALL

MODULUS OF ELASTICITY = 4176000.00 KSF
NODES REQUIRING SOIL SPRINGS READ = 0
NODE D.L. SOIL STARTS = 8
MAXIMUM LINEAR SOIL DEFORMATION = .040 FT
SOIL MODULUS = 14.760 + .390*2** .500 K/FT**3
NUMBER OF NON-ZERO P-MATRIX ENTRIES = 2

NUMBER OF LOAD CONDITIONS = 1
DEPTH INCREMENT = .000 FT
DREDGE LINE REDUCTION FACTOR = .700
NUMBER OF BOUNDARY CONDITIONS = 0
NUMBER OF NP = 54
NUMBER OF MEMBERS = 26
MAXIMUM NUMBER OF ITERATIONS = 5
NON-LINEAR CHECK (IF > 0) = 1

PITTMAN SHEET PILE - CASE 3 - WATER PRESSURE AT NODES 4 THRU 8 - KS LOW

MEMBER AND NODE DATA FOR UNIT WIDTH OF WALL

MEMNO	NP1	NP2	NP3	NP4	LENGTH	INERTIA, FT ⁴	NODE	KS, K/FT ³	SPRGS--SOIL/A.R.	NODE Q, KSF
1	1	2	3	4	1.0270	.00514	1	.000	.000	.0000
2	3	4	5	6	1.0270	.00514	2	.000	.000	.0000
3	5	6	7	8	1.0270	.00514	3	.000	.000	.0000
4	7	8	9	10	1.0000	.00514	4	.000	.000	.0000
5	9	10	11	12	1.0000	.00514	5	.000	.000	.0640
6	11	12	13	14	1.0000	.00514	6	.000	.000	.1280
7	13	14	15	16	1.0000	.00514	7	.000	.000	.1920
8	15	16	17	18	1.0100	.00514	8	14.760	5.271	.2560
9	17	18	19	20	1.0100	.00514	9	15.152	15.284	.0000
10	19	20	21	22	1.0100	.00514	10	15.314	15.464	
11	21	22	23	24	1.0100	.00514	11	15.439	15.592	
12	23	24	25	26	1.0100	.00514	12	15.544	15.698	
13	25	26	27	28	1.0100	.00514	13	15.636	15.792	
14	27	28	29	30	1.0100	.00514	14	15.720	15.877	
15	29	30	31	32	1.0100	.00514	15	15.797	15.955	
16	31	32	33	34	1.0100	.00514	16	15.869	16.027	
17	33	34	35	36	1.0100	.00514	17	15.936	16.095	
18	35	36	37	38	1.0100	.00514	18	15.999	16.159	
19	37	38	39	40	1.0100	.00514	19	16.060	16.220	
20	39	40	41	42	1.0100	.00514	20	16.118	16.279	
21	41	42	43	44	1.0100	.00514	21	16.173	16.335	
22	43	44	45	46	1.0100	.00514	22	16.227	16.389	
23	45	46	47	48	1.0100	.00514	23	16.278	16.441	
24	47	48	49	50	1.0100	.00514	24	16.328	16.491	
25	49	50	51	52	1.0100	.00514	25	16.376	16.540	
26	51	52	53	54	1.0100	.00514	26	16.423	16.587	
							27	16.468	8.309	

PITTMAN SHEET PILE - CASE 3 - WATER PRESSURE AT NODES 4 THRU 8 - KS LOW

THE BAND MATRIX CORRECTED FOR ANY BOUNDARY CONDITIONS P-MATRIX (ADJUSTED FOR NZX)

1	83569.	122058.	41784.	-122058.	1	-.3014
2	237697.	122058.	-237697.	0.	2	.0443
3	167138.	0.	41784.	-122058.	3	.0000
4	475395.	122058.	-237697.	0.	4	.0000
5	167138.	0.	41784.	-122058.	5	.0000
6	475395.	122058.	-237697.	0.	6	.0000
7	169394.	6680.	42913.	-128738.	7	.0000
8	495173.	128738.	-257475.	0.	8	.0107
9	171650.	0.	42913.	-128738.	9	.0000
10	514951.	128738.	-257475.	0.	10	.0640
11	171650.	0.	42913.	-128738.	11	.0000
12	514951.	128738.	-257475.	0.	12	.1280
13	171650.	0.	42913.	-128738.	13	.0000
14	514951.	128738.	-257475.	0.	14	.1920
15	170801.	-2537.	42488.	-126201.	15	.0000
16	507384.	126201.	-249903.	0.	16	.2035
17	169951.	0.	42488.	-126201.	17	.0000
18	499822.	126201.	-249903.	0.	18	.0000
19	169951.	0.	42488.	-126201.	19	.0000
20	499822.	126201.	-249903.	0.	20	.0000
21	169951.	0.	42488.	-126201.	21	.0000
22	499822.	126201.	-249903.	0.	22	.0000
23	169951.	0.	42488.	-126201.	23	.0000
24	499822.	126201.	-249903.	0.	24	.0000
25	169951.	0.	42488.	-126201.	25	.0000
26	499822.	126201.	-249903.	0.	26	.0000
27	169951.	0.	42488.	-126201.	27	.0000
28	499822.	126201.	-249903.	0.	28	.0000
29	169951.	0.	42488.	-126201.	29	.0000
30	499822.	126201.	-249903.	0.	30	.0000
31	169951.	0.	42488.	-126201.	31	.0000
32	499822.	126201.	-249903.	0.	32	.0000
33	169951.	0.	42488.	-126201.	33	.0000
34	499822.	126201.	-249903.	0.	34	.0000
35	169951.	0.	42488.	-126201.	35	.0000
36	499822.	126201.	-249903.	0.	36	.0000
37	169951.	0.	42488.	-126201.	37	.0000
38	499823.	126201.	-249903.	0.	38	.0000
39	169951.	0.	42488.	-126201.	39	.0000
40	499823.	126201.	-249903.	0.	40	.0000
41	169951.	0.	42488.	-126201.	41	.0000
42	499823.	126201.	-249903.	0.	42	.0000
43	169951.	0.	42488.	-126201.	43	.0000
44	499823.	126201.	-249903.	0.	44	.0000
45	169951.	0.	42488.	-126201.	45	.0000
46	499823.	126201.	-249903.	0.	46	.0000
47	169951.	0.	42488.	-126201.	47	.0000
48	499823.	126201.	-249903.	0.	48	.0000
49	169951.	0.	42488.	-126201.	49	.0000
50	499823.	126201.	-249903.	0.	50	.0000
51	169951.	0.	42488.	-126201.	51	.0000
52	499823.	126201.	-249903.	0.	52	.0000
53	84975.	-126201.	0.	0.	53	.0000
54	249911.	0.	0.	0.	54	.0000

CYCLE NO = 1 D.L. DEFL: PREVIOUS = .00000 CURRENT = .01324

PITTMAN SHEET PILE - CASE 3 - WATER PRESSURE AT NODES 4 THRU 8 - KS LOW

MEMBER AND NODE DATA FOR UNIT WIDTH OF WALL

MEMNO	NP1	NP2	NP3	NP4	LENGTH	INERTIA, FT ⁴	NODE	KS, K/FT ³	SPRGS--SOIL/A.R.	NODE Q, KSF
1	1	2	3	4	1.0270	.00514	1	.000	.000	.0000
2	3	4	5	6	1.0270	.00514	2	.000	.000	.0000
3	5	6	7	8	1.0270	.00514	3	.000	.000	.0000
4	7	8	9	10	1.0000	.00514	4	.000	.000	.0000
5	9	10	11	12	1.0000	.00514	5	.000	.000	.0640
6	11	12	13	14	1.0000	.00514	6	.000	.000	.1280
7	13	14	15	16	1.0000	.00514	7	.000	.000	.1920
8	15	16	17	18	1.0100	.00514	8	14.760	5.271	.2560
9	17	18	19	20	1.0100	.00514	9	15.152	15.284	.0000
10	19	20	21	22	1.0100	.00514	10	15.314	15.464	
11	21	22	23	24	1.0100	.00514	11	15.439	15.592	
12	23	24	25	26	1.0100	.00514	12	15.544	15.698	
13	25	26	27	28	1.0100	.00514	13	15.636	15.792	
14	27	28	29	30	1.0100	.00514	14	15.720	15.877	
15	29	30	31	32	1.0100	.00514	15	15.797	15.955	
16	31	32	33	34	1.0100	.00514	16	15.869	16.027	
17	33	34	35	36	1.0100	.00514	17	15.936	16.095	
18	35	36	37	38	1.0100	.00514	18	15.999	16.159	
19	37	38	39	40	1.0100	.00514	19	16.060	16.220	
20	39	40	41	42	1.0100	.00514	20	16.118	16.279	
21	41	42	43	44	1.0100	.00514	21	16.173	16.335	
22	43	44	45	46	1.0100	.00514	22	16.227	16.389	
23	45	46	47	48	1.0100	.00514	23	16.278	16.441	
24	47	48	49	50	1.0100	.00514	24	16.328	16.491	
25	49	50	51	52	1.0100	.00514	25	16.376	16.540	
26	51	52	53	54	1.0100	.00514	26	16.423	16.587	
							27	16.468	8.309	

PITTMAN SHEET PILE - CASE 3 - WATER PRESSURE AT NODES 4 THRU 8 - KS LOW

THE BAND MATRIX CORRECTED FOR ANY BOUNDARY CONDITIONS P-MATRIX (ADJUSTED FOR NZX)

1	83569.	122058.	41784.	-122058.	1	-.3014
2	237697.	122058.	-237697.	0.	2	.0443
3	167138.	0.	41784.	-122058.	3	.0000
4	475395.	122058.	-237697.	0.	4	.0000
5	167138.	0.	41784.	-122058.	5	.0000
6	475395.	122058.	-237697.	0.	6	.0000
7	169394.	6680.	42913.	-128738.	7	.0000
8	495173.	128738.	-257475.	0.	8	.0107
9	171650.	0.	42913.	-128738.	9	.0000
10	514951.	128738.	-257475.	0.	10	.0640
11	171650.	0.	42913.	-128738.	11	.0000
12	514951.	128738.	-257475.	0.	12	.1280
13	171650.	0.	42913.	-128738.	13	.0000
14	514951.	128738.	-257475.	0.	14	.1920
15	170801.	-2537.	42488.	-126201.	15	.0000
16	507384.	126201.	-249903.	0.	16	.2035
17	169951.	0.	42488.	-126201.	17	.0000
18	499822.	126201.	-249903.	0.	18	.0000
19	169951.	0.	42488.	-126201.	19	.0000
20	499822.	126201.	-249903.	0.	20	.0000
21	169951.	0.	42488.	-126201.	21	.0000
22	499822.	126201.	-249903.	0.	22	.0000
23	169951.	0.	42488.	-126201.	23	.0000
24	499822.	126201.	-249903.	0.	24	.0000
25	169951.	0.	42488.	-126201.	25	.0000
26	499822.	126201.	-249903.	0.	26	.0000
27	169951.	0.	42488.	-126201.	27	.0000
28	499822.	126201.	-249903.	0.	28	.0000
29	169951.	0.	42488.	-126201.	29	.0000
30	499822.	126201.	-249903.	0.	30	.0000
31	169951.	0.	42488.	-126201.	31	.0000
32	499822.	126201.	-249903.	0.	32	.0000
33	169951.	0.	42488.	-126201.	33	.0000
34	499822.	126201.	-249903.	0.	34	.0000
35	169951.	0.	42488.	-126201.	35	.0000
36	499822.	126201.	-249903.	0.	36	.0000
37	169951.	0.	42488.	-126201.	37	.0000
38	499823.	126201.	-249903.	0.	38	.0000
39	169951.	0.	42488.	-126201.	39	.0000
40	499823.	126201.	-249903.	0.	40	.0000
41	169951.	0.	42488.	-126201.	41	.0000
42	499823.	126201.	-249903.	0.	42	.0000
43	169951.	0.	42488.	-126201.	43	.0000
44	499823.	126201.	-249903.	0.	44	.0000
45	169951.	0.	42488.	-126201.	45	.0000
46	499823.	126201.	-249903.	0.	46	.0000
47	169951.	0.	42488.	-126201.	47	.0000
48	499823.	126201.	-249903.	0.	48	.0000
49	169951.	0.	42488.	-126201.	49	.0000
50	499823.	126201.	-249903.	0.	50	.0000
51	169951.	0.	42488.	-126201.	51	.0000
52	499823.	126201.	-249903.	0.	52	.0000
53	84975.	-126201.	0.	0.	53	.0000
54	249911.	0.	0.	0.	54	.0000

D. L. DEFL CONVERGED ON CYCLE = 2

DEFLS ARE: PREVIOUS = .01324 CURRENT = .01324 FOR EMBED DEPTH = 19.19 FT

PITTMAN SHEET PILE - CASE 3 - WATER PRESSURE AT NODES 4 THRU 8 - KS LOW

MEMBER MOMENTS, NODE REACTIONS, DEFLECTIONS, SOIL PRESSURE, AND LAST USED P-MATRIX FOR LC = 1

MEMNO	MOMENTS--NEAR	END 1ST, K-FT	NODE	SPG FORCE, KIPS	ROT, RADS	DEFL, FT	SOIL Q, KSF	P-, K-FT	P-, KIPS
1	-.301	.347	1	.0000	-.00196	.02659	.0000	-.3014	.0443
2	-.347	.393	2	.0000	-.00194	.02459	.0000	.0000	.0000
3	-.393	.439	3	.0000	-.00192	.02261	.0000	.0000	.0000
4	-.439	.494	4	.0000	-.00190	.02064	.0000	.0000	.0107
5	-.494	.613	5	.0000	-.00188	.01875	.0000	.0000	.0640
6	-.613	.859	6	.0000	-.00186	.01688	.0000	.0000	.1280
7	-.859	1.297	7	.0000	-.00182	.01504	.0000	.0000	.1920
8	-1.297	1.876	8	.0698	-.00177	.01324	.1955	.0000	.2035
9	-1.875	2.276	9	.1756	-.00170	.01149	.1741	.0000	.0000
10	-2.276	2.523	10	.1519	-.00160	.00982	.1504	.0000	.0000
11	-2.523	2.639	11	.1289	-.00149	.00826	.1276	.0000	.0000
12	-2.639	2.648	12	.1071	-.00136	.00682	.1061	.0000	.0000
13	-2.648	2.568	13	.0870	-.00124	.00551	.0861	.0000	.0000
14	-2.568	2.420	14	.0686	-.00112	.00432	.0679	.0000	.0000
15	-2.420	2.219	15	.0519	-.00100	.00325	.0514	.0000	.0000
16	-2.219	1.981	16	.0368	-.00089	.00230	.0364	.0000	.0000
17	-1.981	1.719	17	.0233	-.00079	.00145	.0231	.0000	.0000
18	-1.719	1.446	18	.0112	-.00070	.00069	.0111	.0000	.0000
19	-1.446	1.172	19	.0003	-.00063	.00002	.0003	.0000	.0000
20	-1.172	.909	20	-.0095	-.00057	-.00058	-.0094	.0000	.0000
21	-.909	.663	21	-.0185	-.00052	-.00113	-.0183	.0000	.0000
22	-.664	.446	22	-.0268	-.00048	-.00164	-.0266	.0000	.0000
23	-.446	.263	23	-.0347	-.00046	-.00211	-.0344	.0000	.0000
24	-.263	.122	24	-.0423	-.00044	-.00256	-.0419	.0000	.0000
25	-.122	.032	25	-.0497	-.00043	-.00300	-.0492	.0000	.0000
26	-.032	.000	26	-.0570	-.00043	-.00344	-.0564	.0000	.0000
			27	-.0321	-.00043	-.00387	-.0637	.0000	.0000

SUM SPRING FORCES = .6418 VS SUM APPLIED FORCES = .6425 KIPS

APPLIED FORCES ADJUSTED FOR NON LINEAR SOIL REACTIONS WHEN SPRINGS ARE ZEROED

DEFLECTION AT ELEV. 14.0 = (.02659 * 12.0) + (.00196 * 12.0 * 7.75) = .501 IN.

ADDITIONAL PENETRATION = 19.19 - 16.16 = 3.03 FT.

PITTMAN SHEET PILE - CASE 4 - WATER PRESSURE AT NODES 4 THRU 8 - KS LOW

SOLUTION FOR SHEET PILE WALL

MODULUS OF ELASTICITY = 4176000.00 KSF
NODES REQUIRING SOIL SPRINGS READ = 0
NODE D.L. SOIL STARTS = 8
MAXIMUM LINEAR SOIL DEFORMATION = .040 FT
SOIL MODULUS = $14.760 + .390Z^{**} .500 \text{ K/FT}^{**3}$
NUMBER OF NON-ZERO P-MATRIX ENTRIES = 2

NUMBER OF LOAD CONDITIONS = 1
DEPTH INCREMENT = .000 FT
DREDGE LINE REDUCTION FACTOR = .700
NUMBER OF BOUNDARY CONDITIONS = 0
NUMBER OF NP = 76
NUMBER OF MEMBERS = 37
MAXIMUM NUMBER OF ITERATIONS = 5
NON-LINEAR CHECK (IF > 0) = 1

MEMBER AND NODE DATA FOR UNIT WIDTH OF WALL

MEMNO	NP1	NP2	NP3	NP4	LENGTH	INERTIA, FT*4	NODE	KS, K/FT*3	SPRGS--SOIL/A.R.	NODE Q, KSF
1	1	2	3	4	1.0270	.00514	1	.000	.000	.0000
2	3	4	5	6	1.0270	.00514	2	.000	.000	.0000
3	5	6	7	8	1.0270	.00514	3	.000	.000	.0000
4	7	8	9	10	1.0000	.00514	4	.000	.000	.0000
5	9	10	11	12	1.0000	.00514	5	.000	.000	.0640
6	11	12	13	14	1.0000	.00514	6	.000	.000	.1280
7	13	14	15	16	1.0000	.00514	7	.000	.000	.1920
8	15	16	17	18	1.0100	.00514	8	14.760	5.271	.2560
9	17	18	19	20	1.0100	.00514	9	15.152	15.284	.0000
10	19	20	21	22	1.0100	.00514	10	15.314	15.464	
11	21	22	23	24	1.0100	.00514	11	15.439	15.592	
12	23	24	25	26	1.0100	.00514	12	15.544	15.698	
13	25	26	27	28	1.0100	.00514	13	15.636	15.792	
14	27	28	29	30	1.0100	.00514	14	15.720	15.877	
15	29	30	31	32	1.0100	.00514	15	15.797	15.955	
16	31	32	33	34	1.0100	.00514	16	15.869	16.027	
17	33	34	35	36	1.0100	.00514	17	15.936	16.095	
18	35	36	37	38	1.0100	.00514	18	15.999	16.159	
19	37	38	39	40	1.0100	.00514	19	16.060	16.220	
20	39	40	41	42	1.0100	.00514	20	16.118	16.279	
21	41	42	43	44	1.0100	.00514	21	16.173	16.335	
22	43	44	45	46	1.0100	.00514	22	16.227	16.389	
23	45	46	47	48	1.0100	.00514	23	16.278	16.441	
24	47	48	49	50	1.0100	.00514	24	16.328	16.491	
25	49	50	51	52	1.0100	.00514	25	16.376	16.540	
26	51	52	53	54	1.0100	.00514	26	16.423	16.587	
27	53	54	55	56	1.0100	.00514	27	16.468	16.633	
28	55	56	57	58	1.0100	.00514	28	16.513	16.678	
29	57	58	59	60	1.0100	.00514	29	16.556	16.722	
30	59	60	61	62	1.0100	.00514	30	16.598	16.764	
31	61	62	63	64	1.0100	.00514	31	16.640	16.806	
32	63	64	65	66	1.0100	.00514	32	16.680	16.847	
33	65	66	67	68	1.0100	.00514	33	16.720	16.887	
34	67	68	69	70	1.0100	.00514	34	16.759	16.926	
35	69	70	71	72	1.0100	.00514	35	16.797	16.965	
36	71	72	73	74	1.0100	.00514	36	16.834	17.002	
37	73	74	75	76	1.0100	.00514	37	16.871	17.039	
							38	16.907	8.532	

THE BAND MATRIX CORRECTED FOR ANY BOUNDARY CONDITIONS

P-MATRIX (ADJUSTED FOR NZX)

1	83569.	122058.	41784.	-122058.	1	-.3014
2	237697.	122058.	-237697.	0.	2	.0443
3	167138.	0.	41784.	-122058.	3	.0000
4	475395.	122058.	-237697.	0.	4	.0000
5	167138.	0.	41784.	-122058.	5	.0000
6	475395.	122058.	-237697.	0.	6	.0000
7	169394.	6680.	42913.	-128738.	7	.0000
8	495173.	128738.	-257475.	0.	8	.0107
9	171650.	0.	42913.	-128738.	9	.0000
10	514951.	128738.	-257475.	0.	10	.0640
11	171650.	0.	42913.	-128738.	11	.0000
12	514951.	128738.	-257475.	0.	12	.1280
13	171650.	0.	42913.	-128738.	13	.0000
14	514951.	128738.	-257475.	0.	14	.1920
15	170801.	-2537.	42488.	-126201.	15	.0000
16	507384.	126201.	-249903.	0.	16	.2035
17	169951.	0.	42488.	-126201.	17	.0000
18	499822.	126201.	-249903.	0.	18	.0000
19	169951.	0.	42488.	-126201.	19	.0000
20	499822.	126201.	-249903.	0.	20	.0000
21	169951.	0.	42488.	-126201.	21	.0000
22	499822.	126201.	-249903.	0.	22	.0000
23	169951.	0.	42488.	-126201.	23	.0000
24	499822.	126201.	-249903.	0.	24	.0000
25	169951.	0.	42488.	-126201.	25	.0000
26	499822.	126201.	-249903.	0.	26	.0000
27	169951.	0.	42488.	-126201.	27	.0000
28	499822.	126201.	-249903.	0.	28	.0000
29	169951.	0.	42488.	-126201.	29	.0000
30	499822.	126201.	-249903.	0.	30	.0000
31	169951.	0.	42488.	-126201.	31	.0000
32	499822.	126201.	-249903.	0.	32	.0000
33	169951.	0.	42488.	-126201.	33	.0000
34	499822.	126201.	-249903.	0.	34	.0000
35	169951.	0.	42488.	-126201.	35	.0000
36	499822.	126201.	-249903.	0.	36	.0000
37	169951.	0.	42488.	-126201.	37	.0000
38	499823.	126201.	-249903.	0.	38	.0000
39	169951.	0.	42488.	-126201.	39	.0000
40	499823.	126201.	-249903.	0.	40	.0000
41	169951.	0.	42488.	-126201.	41	.0000
42	499823.	126201.	-249903.	0.	42	.0000
43	169951.	0.	42488.	-126201.	43	.0000
44	499823.	126201.	-249903.	0.	44	.0000
45	169951.	0.	42488.	-126201.	45	.0000
46	499823.	126201.	-249903.	0.	46	.0000
47	169951.	0.	42488.	-126201.	47	.0000
48	499823.	126201.	-249903.	0.	48	.0000
49	169951.	0.	42488.	-126201.	49	.0000
50	499823.	126201.	-249903.	0.	50	.0000
51	169951.	0.	42488.	-126201.	51	.0000
52	499823.	126201.	-249903.	0.	52	.0000
53	169951.	0.	42488.	-126201.	53	.0000
54	499823.	126201.	-249903.	0.	54	.0000
55	169951.	0.	42488.	-126201.	55	.0000
56	499823.	126201.	-249903.	0.	56	.0000
57	169951.	0.	42488.	-126201.	57	.0000
58	499823.	126201.	-249903.	0.	58	.0000
59	169951.	0.	42488.	-126201.	59	.0000
60	499823.	126201.	-249903.	0.	60	.0000
61	169951.	0.	42488.	-126201.	61	.0000
62	499823.	126201.	-249903.	0.	62	.0000
63	169951.	0.	42488.	-126201.	63	.0000
64	499823.	126201.	-249903.	0.	64	.0000
65	169951.	0.	42488.	-126201.	65	.0000
66	499823.	126201.	-249903.	0.	66	.0000
67	169951.	0.	42488.	-126201.	67	.0000
68	499823.	126201.	-249903.	0.	68	.0000
69	169951.	0.	42488.	-126201.	69	.0000
70	499823.	126201.	-249903.	0.	70	.0000
71	169951.	0.	42488.	-126201.	71	.0000
72	499823.	126201.	-249903.	0.	72	.0000
73	169951.	0.	42488.	-126201.	73	.0000
74	499823.	126201.	-249903.	0.	74	.0000
75	84975.	-126201.	0.	0.	75	.0000
76	249912.	0.	0.	0.	76	.0000

CYCLE NO = 1 D.L. DEFL: PREVIOUS = .00000 CURRENT = .01232

PITTMAN SHEET PILE - CASE 4 - WATER PRESSURE AT NODES 4 THRU 8 - KS LOW

MEMBER AND NODE DATA FOR UNIT WIDTH OF WALL

MEMNO	NP1	NP2	NP3	NP4	LENGTH	INERTIA, FT*4	NODE	KS, K/FT*3	SPRGS--SOIL/A.R.	NODE Q, KSF
1	1	2	3	4	1.0270	.00514	1	.000	.000	.0000
2	3	4	5	6	1.0270	.00514	2	.000	.000	.0000
3	5	6	7	8	1.0270	.00514	3	.000	.000	.0000
4	7	8	9	10	1.0000	.00514	4	.000	.000	.0000
5	9	10	11	12	1.0000	.00514	5	.000	.000	.0640
6	11	12	13	14	1.0000	.00514	6	.000	.000	.1280
7	13	14	15	16	1.0000	.00514	7	.000	.000	.1920
8	15	16	17	18	1.0100	.00514	8	14.760	5.271	.2560
9	17	18	19	20	1.0100	.00514	9	15.152	15.284	.0000
10	19	20	21	22	1.0100	.00514	10	15.314	15.464	
11	21	22	23	24	1.0100	.00514	11	15.439	15.592	
12	23	24	25	26	1.0100	.00514	12	15.544	15.698	
13	25	26	27	28	1.0100	.00514	13	15.636	15.792	
14	27	28	29	30	1.0100	.00514	14	15.720	15.877	
15	29	30	31	32	1.0100	.00514	15	15.797	15.955	
16	31	32	33	34	1.0100	.00514	16	15.869	16.027	
17	33	34	35	36	1.0100	.00514	17	15.936	16.095	
18	35	36	37	38	1.0100	.00514	18	15.999	16.159	
19	37	38	39	40	1.0100	.00514	19	16.060	16.220	
20	39	40	41	42	1.0100	.00514	20	16.118	16.279	
21	41	42	43	44	1.0100	.00514	21	16.173	16.335	
22	43	44	45	46	1.0100	.00514	22	16.227	16.389	
23	45	46	47	48	1.0100	.00514	23	16.278	16.441	
24	47	48	49	50	1.0100	.00514	24	16.328	16.491	
25	49	50	51	52	1.0100	.00514	25	16.376	16.540	
26	51	52	53	54	1.0100	.00514	26	16.423	16.587	
27	53	54	55	56	1.0100	.00514	27	16.468	16.633	
28	55	56	57	58	1.0100	.00514	28	16.513	16.678	
29	57	58	59	60	1.0100	.00514	29	16.556	16.722	
30	59	60	61	62	1.0100	.00514	30	16.598	16.764	
31	61	62	63	64	1.0100	.00514	31	16.640	16.806	
32	63	64	65	66	1.0100	.00514	32	16.680	16.847	
33	65	66	67	68	1.0100	.00514	33	16.720	16.887	
34	67	68	69	70	1.0100	.00514	34	16.759	16.926	
35	69	70	71	72	1.0100	.00514	35	16.797	16.965	
36	71	72	73	74	1.0100	.00514	36	16.834	17.002	
37	73	74	75	76	1.0100	.00514	37	16.871	17.039	
							38	16.907	8.532	

THE BAND MATRIX CORRECTED FOR ANY BOUNDARY CONDITIONS

P-MATRIX (ADJUSTED FOR NZX)

1	83569.	122058.	41784.	-122058.	1	-.3014
2	237697.	122058.	-237697.	0.	2	.0443
3	167138.	0.	41784.	-122058.	3	.0000
4	475395.	122058.	-237697.	0.	4	.0000
5	167138.	0.	41784.	-122058.	5	.0000
6	475395.	122058.	-237697.	0.	6	.0000
7	169394.	6680.	42913.	-128738.	7	.0000
8	495173.	128738.	-257475.	0.	8	.0107
9	171650.	0.	42913.	-128738.	9	.0000
10	514951.	128738.	-257475.	0.	10	.0640
11	171650.	0.	42913.	-128738.	11	.0000
12	514951.	128738.	-257475.	0.	12	.1280
13	171650.	0.	42913.	-128738.	13	.0000
14	514951.	128738.	-257475.	0.	14	.1920
15	170801.	-2537.	42488.	-126201.	15	.0000
16	507384.	126201.	-249903.	0.	16	.2035
17	169951.	0.	42488.	-126201.	17	.0000
18	499822.	126201.	-249903.	0.	18	.0000
19	169951.	0.	42488.	-126201.	19	.0000
20	499822.	126201.	-249903.	0.	20	.0000
21	169951.	0.	42488.	-126201.	21	.0000
22	499822.	126201.	-249903.	0.	22	.0000
23	169951.	0.	42488.	-126201.	23	.0000
24	499822.	126201.	-249903.	0.	24	.0000
25	169951.	0.	42488.	-126201.	25	.0000
26	499822.	126201.	-249903.	0.	26	.0000
27	169951.	0.	42488.	-126201.	27	.0000
28	499822.	126201.	-249903.	0.	28	.0000
29	169951.	0.	42488.	-126201.	29	.0000
30	499822.	126201.	-249903.	0.	30	.0000
31	169951.	0.	42488.	-126201.	31	.0000
32	499822.	126201.	-249903.	0.	32	.0000
33	169951.	0.	42488.	-126201.	33	.0000
34	499822.	126201.	-249903.	0.	34	.0000
35	169951.	0.	42488.	-126201.	35	.0000
36	499822.	126201.	-249903.	0.	36	.0000
37	169951.	0.	42488.	-126201.	37	.0000
38	499823.	126201.	-249903.	0.	38	.0000
39	169951.	0.	42488.	-126201.	39	.0000
40	499823.	126201.	-249903.	0.	40	.0000
41	169951.	0.	42488.	-126201.	41	.0000
42	499823.	126201.	-249903.	0.	42	.0000
43	169951.	0.	42488.	-126201.	43	.0000
44	499823.	126201.	-249903.	0.	44	.0000
45	169951.	0.	42488.	-126201.	45	.0000
46	499823.	126201.	-249903.	0.	46	.0000
47	169951.	0.	42488.	-126201.	47	.0000
48	499823.	126201.	-249903.	0.	48	.0000
49	169951.	0.	42488.	-126201.	49	.0000
50	499823.	126201.	-249903.	0.	50	.0000
51	169951.	0.	42488.	-126201.	51	.0000
52	499823.	126201.	-249903.	0.	52	.0000
53	169951.	0.	42488.	-126201.	53	.0000
54	499823.	126201.	-249903.	0.	54	.0000
55	169951.	0.	42488.	-126201.	55	.0000
56	499823.	126201.	-249903.	0.	56	.0000
57	169951.	0.	42488.	-126201.	57	.0000
58	499823.	126201.	-249903.	0.	58	.0000
59	169951.	0.	42488.	-126201.	59	.0000
60	499823.	126201.	-249903.	0.	60	.0000
61	169951.	0.	42488.	-126201.	61	.0000
62	499823.	126201.	-249903.	0.	62	.0000
63	169951.	0.	42488.	-126201.	63	.0000
64	499823.	126201.	-249903.	0.	64	.0000
65	169951.	0.	42488.	-126201.	65	.0000
66	499823.	126201.	-249903.	0.	66	.0000
67	169951.	0.	42488.	-126201.	67	.0000
68	499823.	126201.	-249903.	0.	68	.0000
69	169951.	0.	42488.	-126201.	69	.0000
70	499823.	126201.	-249903.	0.	70	.0000
71	169951.	0.	42488.	-126201.	71	.0000
72	499823.	126201.	-249903.	0.	72	.0000
73	169951.	0.	42488.	-126201.	73	.0000
74	499823.	126201.	-249903.	0.	74	.0000
75	84975.	-126201.	0.	0.	75	.0000
76	249912.	0.	0.	0.	76	.0000

D. L. DEFL CONVERGED ON CYCLE = 2

DEFLS ARE: PREVIOUS = .01232 CURRENT = .01232 FOR EMBED DEPTH = 30.30 FT

MEMBER MOMENTS, NODE REACTIONS, DEFLECTIONS, SOIL PRESSURE, AND LAST USED P-MATRIX FOR LC = 1

MEMNO	MOMENTS--NEAR	END 1ST, K-FT	NODE	SPG FORCE, KIPS	ROT, RADS	DEFL, FT	SOIL Q, KSF	P-, K-FT	P-, KIPS
1	-.301	.347	1	.0000	-.00187	.02507	.0000	-.3014	.0443
2	-.347	.393	2	.0000	-.00186	.02315	.0000	.0000	.0000
3	-.393	.439	3	.0000	-.00184	.02126	.0000	.0000	.0000
4	-.439	.494	4	.0000	-.00182	.01938	.0000	.0000	.0107
5	-.494	.613	5	.0000	-.00180	.01757	.0000	.0000	.0640
6	-.613	.859	6	.0000	-.00177	.01579	.0000	.0000	.1280
7	-.859	1.298	7	.0000	-.00174	.01403	.0000	.0000	.1920
8	-1.297	1.880	8	.0649	-.00169	.01232	.1818	.0000	.2035
9	-1.880	2.299	9	.1628	-.00161	.01065	.1613	.0000	.0000
10	-2.299	2.575	10	.1402	-.00151	.00907	.1389	.0000	.0000
11	-2.575	2.732	11	.1184	-.00140	.00760	.1173	.0000	.0000
12	-2.732	2.790	12	.0981	-.00127	.00625	.0971	.0000	.0000
13	-2.790	2.768	13	.0794	-.00114	.00503	.0786	.0000	.0000
14	-2.768	2.682	14	.0625	-.00101	.00394	.0619	.0000	.0000
15	-2.682	2.549	15	.0475	-.00088	.00298	.0470	.0000	.0000
16	-2.549	2.381	16	.0344	-.00076	.00215	.0341	.0000	.0000
17	-2.381	2.189	17	.0231	-.00065	.00144	.0229	.0000	.0000
18	-2.189	1.984	18	.0136	-.00054	.00084	.0134	.0000	.0000
19	-1.984	1.773	19	.0056	-.00044	.00035	.0056	.0000	.0000
20	-1.773	1.563	20	-.0008	-.00035	-.00005	-.0008	.0000	.0000
21	-1.563	1.359	21	-.0060	-.00027	-.00037	-.0059	.0000	.0000
22	-1.359	1.166	22	-.0099	-.00020	-.00061	-.0098	.0000	.0000
23	-1.166	.985	23	-.0129	-.00014	-.00078	-.0127	.0000	.0000
24	-.985	.819	24	-.0149	-.00009	-.00090	-.0147	.0000	.0000
25	-.819	.669	25	-.0161	-.00005	-.00097	-.0160	.0000	.0000
26	-.669	.536	26	-.0167	-.00002	-.00101	-.0166	.0000	.0000
27	-.536	.421	27	-.0168	.00001	-.00101	-.0166	.0000	.0000
28	-.421	.321	28	-.0165	.00003	-.00099	-.0163	.0000	.0000
29	-.321	.238	29	-.0158	.00005	-.00094	-.0156	.0000	.0000
30	-.238	.170	30	-.0148	.00006	-.00088	-.0147	.0000	.0000
31	-.170	.116	31	-.0137	.00007	-.00081	-.0135	.0000	.0000
32	-.116	.074	32	-.0124	.00008	-.00073	-.0122	.0000	.0000
33	-.074	.043	33	-.0110	.00009	-.00065	-.0109	.0000	.0000
34	-.043	.022	34	-.0095	.00009	-.00056	-.0094	.0000	.0000
35	-.022	.008	35	-.0080	.00009	-.00047	-.0079	.0000	.0000
36	-.008	.002	36	-.0065	.00009	-.00038	-.0064	.0000	.0000
37	-.002	.000	37	-.0049	.00009	-.00029	-.0049	.0000	.0000
			38	-.0017	.00009	-.00020	-.0033	.0000	.0000

SUM SPRING FORCES = .6418 VS SUM APPLIED FORCES = .6425 KIPS

APPLIED FORCES ADJUSTED FOR NON LINEAR SOIL REACTIONS WHEN SPRINGS ARE ZEROED

DEFLECTION AT ELEV. 14.0 = (.02507 * 12.0) + (.00187 * 12.0 * 7.75) = .475 IN.

ADDITIONAL PENETRATION = 30.30 - 16.16 = 14.14 FT.

SOLUTION FOR SHEET PILE WALL

MODULUS OF ELASTICITY = 4176000.00 KSF
NODES REQUIRING SOIL SPRINGS READ = 0
NODE D.L. SOIL STARTS = 8
MAXIMUM LINEAR SOIL DEFORMATION = .040 FT
SOIL MODULUS = 13.310 + .390*Z**2 + .500 K/FT**3
NUMBER OF NON-ZERO P-MATRIX ENTRIES = 2

NUMBER OF LOAD CONDITIONS = 1
DEPTH INCREMENT = .000 FT
DREDGE LINE REDUCTION FACTOR = .700
NUMBER OF BOUNDARY CONDITIONS = 0
NUMBER OF MP = 48
NUMBER OF MEMBERS = 23
MAXIMUM NUMBER OF ITERATIONS = 5
NON-LINEAR CHECK (IF > 0) = 1

PITTMAN SHEET PILE - CASE 1A - WATER PRESSURE AT NODES 4 THRU 8 - KS LOW

MEMBER AND NODE DATA FOR UNIT WIDTH OF WALL

MEMNO	MP1	MP2	MP3	MP4	LENGTH	INERTIA, FT ⁴	NODE	KS, K/FT ³	SPRGS--SOIL/A.R.	NODE Q, KSF
1	1	2	3	4	1.0270	.00514	1	.000	.000	.0000
2	3	4	5	6	1.0270	.00514	2	.000	.000	.0000
3	5	6	7	8	1.0270	.00514	3	.000	.000	.0000
4	7	8	9	10	1.0000	.00514	4	.000	.000	.0000
5	9	10	11	12	1.0000	.00514	5	.000	.000	.0640
6	11	12	13	14	1.0000	.00514	6	.000	.000	.1280
7	13	14	15	16	1.0000	.00514	7	.000	.000	.1920
8	15	16	17	18	1.0100	.00514	8	13.310	4.758	.2560
9	17	18	19	20	1.0100	.00514	9	13.702	13.820	.0000
10	19	20	21	22	1.0100	.00514	10	13.864	14.000	
11	21	22	23	24	1.0100	.00514	11	13.989	14.127	
12	23	24	25	26	1.0100	.00514	12	14.094	14.234	
13	25	26	27	28	1.0100	.00514	13	14.186	14.328	
14	27	28	29	30	1.0100	.00514	14	14.270	14.412	
15	29	30	31	32	1.0100	.00514	15	14.347	14.490	
16	31	32	33	34	1.0100	.00514	16	14.419	14.562	
17	33	34	35	36	1.0100	.00514	17	14.486	14.630	
18	35	36	37	38	1.0100	.00514	18	14.549	14.695	
19	37	38	39	40	1.0100	.00514	19	14.610	14.756	
20	39	40	41	42	1.0100	.00514	20	14.668	14.814	
21	41	42	43	44	1.0100	.00514	21	14.723	14.870	
22	43	44	45	46	1.0100	.00514	22	14.777	14.924	
23	45	46	47	48	1.0100	.00514	23	14.828	14.976	
							24	14.878	7.505	

PITTMAN SHEET PILE - CASE 1A - WATER PRESSURE AT NODES 4 THRU 8 - KS LOW

THE BAND MATRIX CORRECTED FOR ANY BOUNDARY CONDITIONS				P-MATRIX (ADJUSTED FOR NZX)		
1	83569.	122058.	41784.	-122058.	1	-.3014
2	237697.	122058.	-237697.	0.	2	.0443
3	167138.	0.	41784.	-122058.	3	.0000
4	475395.	122058.	-237697.	0.	4	.0000
5	167138.	0.	41784.	-122058.	5	.0000
6	475395.	122058.	-237697.	0.	6	.0000
7	169394.	6680.	42913.	-128738.	7	.0000
8	495173.	128738.	-257475.	0.	8	.0107
9	171650.	0.	42913.	-128738.	9	.0000
10	514951.	128738.	-257475.	0.	10	.0640
11	171650.	0.	42913.	-128738.	11	.0000
12	514951.	128738.	-257475.	0.	12	.1280
13	171650.	0.	42913.	-128738.	13	.0000
14	514951.	128738.	-257475.	0.	14	.1920
15	170801.	-2537.	42488.	-126201.	15	.0000
16	507383.	126201.	-249903.	0.	16	.2035
17	169951.	0.	42488.	-126201.	17	.0000
18	499820.	126201.	-249903.	0.	18	.0000
19	169951.	0.	42488.	-126201.	19	.0000
20	499820.	126201.	-249903.	0.	20	.0000
21	169951.	0.	42488.	-126201.	21	.0000
22	499820.	126201.	-249903.	0.	22	.0000
23	169951.	0.	42488.	-126201.	23	.0000
24	499821.	126201.	-249903.	0.	24	.0000
25	169951.	0.	42488.	-126201.	25	.0000
26	499821.	126201.	-249903.	0.	26	.0000
27	169951.	0.	42488.	-126201.	27	.0000
28	499821.	126201.	-249903.	0.	28	.0000
29	169951.	0.	42488.	-126201.	29	.0000
30	499821.	126201.	-249903.	0.	30	.0000
31	169951.	0.	42488.	-126201.	31	.0000
32	499821.	126201.	-249903.	0.	32	.0000
33	169951.	0.	42488.	-126201.	33	.0000
34	499821.	126201.	-249903.	0.	34	.0000
35	169951.	0.	42488.	-126201.	35	.0000
36	499821.	126201.	-249903.	0.	36	.0000
37	169951.	0.	42488.	-126201.	37	.0000
38	499821.	126201.	-249903.	0.	38	.0000
39	169951.	0.	42488.	-126201.	39	.0000
40	499821.	126201.	-249903.	0.	40	.0000
41	169951.	0.	42488.	-126201.	41	.0000
42	499821.	126201.	-249903.	0.	42	.0000
43	169951.	0.	42488.	-126201.	43	.0000
44	499821.	126201.	-249903.	0.	44	.0000
45	169951.	0.	42488.	-126201.	45	.0000
46	499821.	126201.	-249903.	0.	46	.0000
47	84975.	-126201.	0.	0.	47	.0000
48	249911.	0.	0.	0.	48	.0000

CYCLE NO = 1 D.L. DEFL: PREVIOUS = .00000 CURRENT = .01598

PITTMAN SHEET PILE - CASE 1A - WATER PRESSURE AT NODES 4 THRU 8 - KS LOW

MEMBER AND NODE DATA FOR UNIT WIDTH OF MALL

MEMNO	MP1	MP2	MP3	MP4	LENGTH	INERTIA, FT ⁴	NODE	KS, K/FT ³	SPRGS--SOIL/A.R.	NODE Q, KSF
1	1	2	3	4	1.0270	.00514	1	.000	.000	.0000
2	3	4	5	6	1.0270	.00514	2	.000	.000	.0000
3	5	6	7	8	1.0270	.00514	3	.000	.000	.0000
4	7	8	9	10	1.0000	.00514	4	.000	.000	.0000
5	9	10	11	12	1.0000	.00514	5	.000	.000	.0640
6	11	12	13	14	1.0000	.00514	6	.000	.000	.1280
7	13	14	15	16	1.0000	.00514	7	.000	.000	.1920
8	15	16	17	18	1.0100	.00514	8	13.310	4.758	.2560
9	17	18	19	20	1.0100	.00514	9	13.702	13.820	.0000
10	19	20	21	22	1.0100	.00514	10	13.864	14.000	
11	21	22	23	24	1.0100	.00514	11	13.989	14.127	
12	23	24	25	26	1.0100	.00514	12	14.094	14.234	
13	25	26	27	28	1.0100	.00514	13	14.186	14.328	
14	27	28	29	30	1.0100	.00514	14	14.270	14.412	
15	29	30	31	32	1.0100	.00514	15	14.347	14.490	
16	31	32	33	34	1.0100	.00514	16	14.419	14.562	
17	33	34	35	36	1.0100	.00514	17	14.486	14.630	
18	35	36	37	38	1.0100	.00514	18	14.549	14.695	
19	37	38	39	40	1.0100	.00514	19	14.610	14.756	
20	39	40	41	42	1.0100	.00514	20	14.668	14.814	
21	41	42	43	44	1.0100	.00514	21	14.723	14.870	
22	43	44	45	46	1.0100	.00514	22	14.777	14.924	
23	45	46	47	48	1.0100	.00514	23	14.828	14.976	
							24	14.878	7.505	

PITTMAN SHEET PILE - CASE 1A - WATER PRESSURE AT NODES 4 THRU 8 - KS LOW

THE BAND MATRIX CORRECTED FOR ANY BOUNDARY CONDITIONS

P-MATRIX (ADJUSTED FOR NZX)

1	83569.	122058.	41784.	-122058.	1	-.3014
2	237697.	122058.	-237697.	0.	2	.0443
3	167138.	0.	41784.	-122058.	3	.0000
4	475395.	122058.	-237697.	0.	4	.0000
5	167138.	0.	41784.	-122058.	5	.0000
6	475395.	122058.	-237697.	0.	6	.0000
7	169394.	6680.	42913.	-128738.	7	.0000
8	495173.	128738.	-257475.	0.	8	.0107
9	171650.	0.	42913.	-128738.	9	.0000
10	514951.	128738.	-257475.	0.	10	.0640
11	171650.	0.	42913.	-128738.	11	.0000
12	514951.	128738.	-257475.	0.	12	.1280
13	171650.	0.	42913.	-128738.	13	.0000
14	514951.	128738.	-257475.	0.	14	.1920
15	170801.	-2537.	42488.	-126201.	15	.0000
16	507383.	126201.	-249903.	0.	16	.2035
17	169951.	0.	42488.	-126201.	17	.0000
18	499820.	126201.	-249903.	0.	18	.0000
19	169951.	0.	42488.	-126201.	19	.0000
20	499820.	126201.	-249903.	0.	20	.0000
21	169951.	0.	42488.	-126201.	21	.0000
22	499820.	126201.	-249903.	0.	22	.0000
23	169951.	0.	42488.	-126201.	23	.0000
24	499821.	126201.	-249903.	0.	24	.0000
25	169951.	0.	42488.	-126201.	25	.0000
26	499821.	126201.	-249903.	0.	26	.0000
27	169951.	0.	42488.	-126201.	27	.0000
28	499821.	126201.	-249903.	0.	28	.0000
29	169951.	0.	42488.	-126201.	29	.0000
30	499821.	126201.	-249903.	0.	30	.0000
31	169951.	0.	42488.	-126201.	31	.0000
32	499821.	126201.	-249903.	0.	32	.0000
33	169951.	0.	42488.	-126201.	33	.0000
34	499821.	126201.	-249903.	0.	34	.0000
35	169951.	0.	42488.	-126201.	35	.0000
36	499821.	126201.	-249903.	0.	36	.0000
37	169951.	0.	42488.	-126201.	37	.0000
38	499821.	126201.	-249903.	0.	38	.0000
39	169951.	0.	42488.	-126201.	39	.0000
40	499821.	126201.	-249903.	0.	40	.0000
41	169951.	0.	42488.	-126201.	41	.0000
42	499821.	126201.	-249903.	0.	42	.0000
43	169951.	0.	42488.	-126201.	43	.0000
44	499821.	126201.	-249903.	0.	44	.0000
45	169951.	0.	42488.	-126201.	45	.0000
46	499821.	126201.	-249903.	0.	46	.0000
47	84975.	-126201.	0.	0.	47	.0000
48	249911.	0.	0.	0.	48	.0000

D. L. DEFL CONVERGED ON CYCLE = 2

DEFLS ARE: PREVIOUS = .01598 CURRENT = .01598 FOR EMBED DEPTH = 16.16 FT

PITTMAN SHEET PILE - CASE 1A - WATER PRESSURE AT NODES 4 THRU 8 - KS LOW

MEMBER MOMENTS, NODE REACTIONS, DEFLECTIONS, SOIL PRESSURE, AND LAST USED P-MATRIX FOR LC = 1

MEMNO	MOMENTS--NEAR END	1ST, K-FT	NODE	SPG FORCE, KIPS	ROT, RADS	DEFL, FT	SOIL Q, KSF	P-, K-FT	P-, KIPS
1	-.301	.347	1	.0000	-.00229	.03172	.0000	-.3014	.0443
2	-.347	.393	2	.0000	-.00228	.02937	.0000	.0000	.0000
3	-.393	.439	3	.0000	-.00226	.02704	.0000	.0000	.0000
4	-.439	.494	4	.0000	-.00224	.02473	.0000	.0000	.0107
5	-.495	.613	5	.0000	-.00222	.02250	.0000	.0000	.0640
6	-.613	.859	6	.0000	-.00219	.02029	.0000	.0000	.1280
7	-.859	1.297	7	.0000	-.00216	.01811	.0000	.0000	.1920
8	-1.298	1.869	8	.0760	-.00211	.01598	.2127	.0000	.2035
9	-1.869	2.247	9	.1919	-.00203	.01388	.1902	.0000	.0000
10	-2.247	2.458	10	.1663	-.00194	.01188	.1646	.0000	.0000
11	-2.458	2.526	11	.1409	-.00183	.00997	.1395	.0000	.0000
12	-2.526	2.476	12	.1165	-.00171	.00819	.1154	.0000	.0000
13	-2.476	2.333	13	.0934	-.00159	.00652	.0925	.0000	.0000
14	-2.333	2.117	14	.0716	-.00148	.00497	.0709	.0000	.0000
15	-2.117	1.850	15	.0511	-.00137	.00353	.0506	.0000	.0000
16	-1.850	1.550	16	.0319	-.00128	.00219	.0316	.0000	.0000
17	-1.550	1.236	17	.0137	-.00120	.00094	.0136	.0000	.0000
18	-1.236	.926	18	-.0035	-.00114	-.00024	-.0035	.0000	.0000
19	-.926	.637	19	-.0201	-.00108	-.00136	-.0199	.0000	.0000
20	-.637	.383	20	-.0361	-.00105	-.00243	-.0357	.0000	.0000
21	-.383	.182	21	-.0517	-.00102	-.00348	-.0512	.0000	.0000
22	-.183	.049	22	-.0672	-.00101	-.00451	-.0666	.0000	.0000
23	-.050	.000	23	-.0827	-.00100	-.00552	-.0819	.0000	.0000
			24	-.0491	-.00100	-.00654	-.0972	.0000	.0000

SUM SPRING FORCES = .6430 VS SUM APPLIED FORCES = .6425 KIPS

APPLIED FORCES ADJUSTED FOR NON LINEAR SOIL REACTIONS WHEN SPRINGS ARE ZEROED

DEFLECTION AT ELEV. 14.0 = (.03172 * 12.0) + (.00229 * 12.0 * 7.75) = .594 IN.

SOLUTION FOR SHEET PILE WALL

MODULUS OF ELASTICITY = 4176000.00 KSF
NODES REQUIRING SOIL SPRINGS READ = 0
NODE D.L. SOIL STARTS = 8
MAXIMUM LINEAR SOIL DEFORMATION = .040 FT
SOIL MODULUS = $18.570 + .390 \times 2^{.500} \text{ K/FT}^{.3}$
NUMBER OF NON-ZERO P-MATRIX ENTRIES = 2

NUMBER OF LOAD CONDITIONS = 1
DEPTH INCREMENT = .000 FT
DREDGE LINE REDUCTION FACTOR = .700
NUMBER OF BOUNDARY CONDITIONS = 0
NUMBER OF MP = 48
NUMBER OF MEMBERS = 23
MAXIMUM NUMBER OF ITERATIONS = 5
NON-LINEAR CHECK (IF > 0) = 1

PITTMAN SHEET PILE - CASE 2A - WATER PRESSURE AT NODES 4 THRU 8 - KS AVERAGE

MEMBER AND NODE DATA FOR UNIT WIDTH OF WALL

MEMNO	NP1	NP2	NP3	NP4	LENGTH	INERTIA, FT ⁴	NODE	KS, K/FT ³	SPRGS--SOIL/A.R.	NODE Q, KSF
1	1	2	3	4	1.0270	.00514	1	.000	.000	.0000
2	3	4	5	6	1.0270	.00514	2	.000	.000	.0000
3	5	6	7	8	1.0270	.00514	3	.000	.000	.0000
4	7	8	9	10	1.0000	.00514	4	.000	.000	.0000
5	9	10	11	12	1.0000	.00514	5	.000	.000	.0640
6	11	12	13	14	1.0000	.00514	6	.000	.000	.1280
7	13	14	15	16	1.0000	.00514	7	.000	.000	.1920
8	15	16	17	18	1.0100	.00514	8	18.570	6.617	.2560
9	17	18	19	20	1.0100	.00514	9	18.962	19.132	.0000
10	19	20	21	22	1.0100	.00514	10	19.124	19.312	
11	21	22	23	24	1.0100	.00514	11	19.249	19.440	
12	23	24	25	26	1.0100	.00514	12	19.354	19.546	
13	25	26	27	28	1.0100	.00514	13	19.446	19.640	
14	27	28	29	30	1.0100	.00514	14	19.530	19.725	
15	29	30	31	32	1.0100	.00514	15	19.607	19.803	
16	31	32	33	34	1.0100	.00514	16	19.679	19.875	
17	33	34	35	36	1.0100	.00514	17	19.746	19.943	
18	35	36	37	38	1.0100	.00514	18	19.809	20.007	
19	37	38	39	40	1.0100	.00514	19	19.870	20.068	
20	39	40	41	42	1.0100	.00514	20	19.928	20.127	
21	41	42	43	44	1.0100	.00514	21	19.983	20.183	
22	43	44	45	46	1.0100	.00514	22	20.037	20.237	
23	45	46	47	48	1.0100	.00514	23	20.088	20.289	
							24	20.138	10.161	

PITTMAN SHEET PILE - CASE 2A - WATER PRESSURE AT NODES 4 THRU 8 - KS AVERAGE

THE BAND MATRIX CORRECTED FOR ANY BOUNDARY CONDITIONS

P-MATRIX (ADJUSTED FOR NZX)

1	83569.	122058.	41784.	-122058.	1	-.3014
2	237697.	122058.	-237697.	0.	2	.0443
3	167138.	0.	41784.	-122058.	3	.0000
4	475395.	122058.	-237697.	0.	4	.0000
5	167138.	0.	41784.	-122058.	5	.0000
6	475395.	122058.	-237697.	0.	6	.0000
7	169394.	6680.	42913.	-128738.	7	.0000
8	495173.	128738.	-257475.	0.	8	.0107
9	171650.	0.	42913.	-128738.	9	.0000
10	514951.	128738.	-257475.	0.	10	.0640
11	171650.	0.	42913.	-128738.	11	.0000
12	514951.	128738.	-257475.	0.	12	.1280
13	171650.	0.	42913.	-128738.	13	.0000
14	514951.	128738.	-257475.	0.	14	.1920
15	170801.	-2537.	42488.	-126201.	15	.0000
16	507385.	126201.	-249903.	0.	16	.2035
17	169951.	0.	42488.	-126201.	17	.0000
18	499825.	126201.	-249903.	0.	18	.0000
19	169951.	0.	42488.	-126201.	19	.0000
20	499826.	126201.	-249903.	0.	20	.0000
21	169951.	0.	42488.	-126201.	21	.0000
22	499826.	126201.	-249903.	0.	22	.0000
23	169951.	0.	42488.	-126201.	23	.0000
24	499826.	126201.	-249903.	0.	24	.0000
25	169951.	0.	42488.	-126201.	25	.0000
26	499826.	126201.	-249903.	0.	26	.0000
27	169951.	0.	42488.	-126201.	27	.0000
28	499826.	126201.	-249903.	0.	28	.0000
29	169951.	0.	42488.	-126201.	29	.0000
30	499826.	126201.	-249903.	0.	30	.0000
31	169951.	0.	42488.	-126201.	31	.0000
32	499826.	126201.	-249903.	0.	32	.0000
33	169951.	0.	42488.	-126201.	33	.0000
34	499826.	126201.	-249903.	0.	34	.0000
35	169951.	0.	42488.	-126201.	35	.0000
36	499826.	126201.	-249903.	0.	36	.0000
37	169951.	0.	42488.	-126201.	37	.0000
38	499826.	126201.	-249903.	0.	38	.0000
39	169951.	0.	42488.	-126201.	39	.0000
40	499826.	126201.	-249903.	0.	40	.0000
41	169951.	0.	42488.	-126201.	41	.0000
42	499826.	126201.	-249903.	0.	42	.0000
43	169951.	0.	42488.	-126201.	43	.0000
44	499827.	126201.	-249903.	0.	44	.0000
45	169951.	0.	42488.	-126201.	45	.0000
46	499827.	126201.	-249903.	0.	46	.0000
47	84975.	-126201.	0.	0.	47	.0000
48	249913.	0.	0.	0.	48	.0000

CYCLE NO = 1 D.L. DEFL: PREVIOUS = .00000 CURRENT = .01211

PITTMAN SHEET PILE - CASE 2A - WATER PRESSURE AT NODES 4 THRU 8 - KS AVERAGE

MEMBER AND NODE DATA FOR UNIT WIDTH OF WALL

MEMNO	NP1	NP2	NP3	NP4	LENGTH	INERTIA, FT ⁴	NODE	KS, K/FT ³	SPRGS--SOIL/A.R.	NODE Q, KSF
1	1	2	3	4	1.0270	.00514	1	.000	.000	.0000
2	3	4	5	6	1.0270	.00514	2	.000	.000	.0000
3	5	6	7	8	1.0270	.00514	3	.000	.000	.0000
4	7	8	9	10	1.0000	.00514	4	.000	.000	.0000
5	9	10	11	12	1.0000	.00514	5	.000	.000	.0640
6	11	12	13	14	1.0000	.00514	6	.000	.000	.1280
7	13	14	15	16	1.0000	.00514	7	.000	.000	.1920
8	15	16	17	18	1.0100	.00514	8	18.570	6.617	.2560
9	17	18	19	20	1.0100	.00514	9	18.962	19.132	.0000
10	19	20	21	22	1.0100	.00514	10	19.124	19.312	
11	21	22	23	24	1.0100	.00514	11	19.249	19.440	
12	23	24	25	26	1.0100	.00514	12	19.354	19.546	
13	25	26	27	28	1.0100	.00514	13	19.446	19.640	
14	27	28	29	30	1.0100	.00514	14	19.530	19.725	
15	29	30	31	32	1.0100	.00514	15	19.607	19.803	
16	31	32	33	34	1.0100	.00514	16	19.679	19.875	
17	33	34	35	36	1.0100	.00514	17	19.746	19.943	
18	35	36	37	38	1.0100	.00514	18	19.809	20.007	
19	37	38	39	40	1.0100	.00514	19	19.870	20.068	
20	39	40	41	42	1.0100	.00514	20	19.928	20.127	
21	41	42	43	44	1.0100	.00514	21	19.983	20.183	
22	43	44	45	46	1.0100	.00514	22	20.037	20.237	
23	45	46	47	48	1.0100	.00514	23	20.088	20.289	
							24	20.138	10.161	

PITTMAN SHEET PILE - CASE 2A - WATER PRESSURE AT NODES 4 THRU 8 - KS AVERAGE

THE BAND MATRIX CORRECTED FOR ANY BOUNDARY CONDITIONS

P-MATRIX (ADJUSTED FOR NZX)

1	83569.	122058.	41784.	-122058.	1	-.3014
2	237697.	122058.	-237697.	0.	2	.0443
3	167138.	0.	41784.	-122058.	3	.0000
4	475395.	122058.	-237697.	0.	4	.0000
5	167138.	0.	41784.	-122058.	5	.0000
6	475395.	122058.	-237697.	0.	6	.0000
7	169394.	6680.	42913.	-128738.	7	.0000
8	495173.	128738.	-257475.	0.	8	.0107
9	171650.	0.	42913.	-128738.	9	.0000
10	514951.	128738.	-257475.	0.	10	.0640
11	171650.	0.	42913.	-128738.	11	.0000
12	514951.	128738.	-257475.	0.	12	.1280
13	171650.	0.	42913.	-128738.	13	.0000
14	514951.	128738.	-257475.	0.	14	.1920
15	170801.	-2537.	42488.	-126201.	15	.0000
16	507385.	126201.	-249903.	0.	16	.2035
17	169951.	0.	42488.	-126201.	17	.0000
18	499825.	126201.	-249903.	0.	18	.0000
19	169951.	0.	42488.	-126201.	19	.0000
20	499826.	126201.	-249903.	0.	20	.0000
21	169951.	0.	42488.	-126201.	21	.0000
22	499826.	126201.	-249903.	0.	22	.0000
23	169951.	0.	42488.	-126201.	23	.0000
24	499826.	126201.	-249903.	0.	24	.0000
25	169951.	0.	42488.	-126201.	25	.0000
26	499826.	126201.	-249903.	0.	26	.0000
27	169951.	0.	42488.	-126201.	27	.0000
28	499826.	126201.	-249903.	0.	28	.0000
29	169951.	0.	42488.	-126201.	29	.0000
30	499826.	126201.	-249903.	0.	30	.0000
31	169951.	0.	42488.	-126201.	31	.0000
32	499826.	126201.	-249903.	0.	32	.0000
33	169951.	0.	42488.	-126201.	33	.0000
34	499826.	126201.	-249903.	0.	34	.0000
35	169951.	0.	42488.	-126201.	35	.0000
36	499826.	126201.	-249903.	0.	36	.0000
37	169951.	0.	42488.	-126201.	37	.0000
38	499826.	126201.	-249903.	0.	38	.0000
39	169951.	0.	42488.	-126201.	39	.0000
40	499826.	126201.	-249903.	0.	40	.0000
41	169951.	0.	42488.	-126201.	41	.0000
42	499826.	126201.	-249903.	0.	42	.0000
43	169951.	0.	42488.	-126201.	43	.0000
44	499827.	126201.	-249903.	0.	44	.0000
45	169951.	0.	42488.	-126201.	45	.0000
46	499827.	126201.	-249903.	0.	46	.0000
47	84975.	-126201.	0.	0.	47	.0000
48	249913.	0.	0.	0.	48	.0000

D. L. DEFL CONVERGED ON CYCLE = 2

DEFLS ARE: PREVIOUS = .01211 CURRENT = .01211 FOR EMBED DEPTH = 16.16 FT

PITTMAN SHEET PILE - CASE 2A - WATER PRESSURE AT NODES 4 THRU 8 - KS AVERAGE

MEMBER MOMENTS, NODE REACTIONS, DEFLECTIONS, SOIL PRESSURE, AND LAST USED P-MATRIX FOR LC = 1

MEMNO	MOMENTS--NEAR	END 1ST, K-FT	NODE	SPG FORCE, KIPS	ROT, RADS	DEFL, FT	SOIL Q, KSF	P-, K-FT	P-, KIPS
1	-.301	.347	1	.0000	-.00191	.02515	.0000	-.3014	.0443
2	-.347	.393	2	.0000	-.00190	.02319	.0000	.0000	.0000
3	-.393	.439	3	.0000	-.00188	.02125	.0000	.0000	.0000
4	-.439	.494	4	.0000	-.00186	.01933	.0000	.0000	.0107
5	-.494	.613	5	.0000	-.00184	.01748	.0000	.0000	.0640
6	-.613	.859	6	.0000	-.00181	.01566	.0000	.0000	.1280
7	-.859	1.298	7	.0000	-.00178	.01386	.0000	.0000	.1920
8	-1.298	1.865	8	.0801	-.00173	.01211	.2249	.0000	.2035
9	-1.865	2.232	9	.1990	-.00165	.01040	.1972	.0000	.0000
10	-2.232	2.427	10	.1695	-.00156	.00878	.1679	.0000	.0000
11	-2.427	2.480	11	.1412	-.00145	.00726	.1398	.0000	.0000
12	-2.480	2.417	12	.1145	-.00133	.00586	.1134	.0000	.0000
13	-2.417	2.263	13	.0898	-.00122	.00457	.0889	.0000	.0000
14	-2.263	2.042	14	.0671	-.00111	.00340	.0664	.0000	.0000
15	-2.042	1.774	15	.0462	-.00100	.00234	.0458	.0000	.0000
16	-1.774	1.479	16	.0272	-.00091	.00137	.0269	.0000	.0000
17	-1.479	1.174	17	.0096	-.00084	.00048	.0095	.0000	.0000
18	-1.174	.875	18	-.0066	-.00078	-.00033	-.0065	.0000	.0000
19	-.875	.599	19	-.0218	-.00073	-.00109	-.0216	.0000	.0000
20	-.599	.359	20	-.0363	-.00069	-.00180	-.0360	.0000	.0000
21	-.359	.170	21	-.0503	-.00067	-.00249	-.0498	.0000	.0000
22	-.170	.046	22	-.0640	-.00066	-.00316	-.0633	.0000	.0000
23	-.046	.000	23	-.0776	-.00065	-.00382	-.0768	.0000	.0000
			24	-.0455	-.00065	-.00448	-.0902	.0000	.0000

SUM SPRING FORCES = .6422 VS SUM APPLIED FORCES = .6425 KIPS

APPLIED FORCES ADJUSTED FOR NON LINEAR SOIL REACTIONS WHEN SPRINGS ARE ZEROED

DEFLECTION AT ELEV. 14.0 = (.02515 * 12.0) + (.00191 * 12.0 * 7.75) = .479 IN.

SOLUTION FOR SHEET PILE WALL

MODULUS OF ELASTICITY = 4176000.00 KSF
NODES REQUIRING SOIL SPRINGS READ = 0
NODE D.L. SOIL STARTS = 8
MAXIMUM LINEAR SOIL DEFORMATION = .040 FT
SOIL MODULUS = $13.310 + .390 \times 2^{**} .500 \text{ K/FT}^{**3}$
NUMBER OF NON-ZERO P-MATRIX ENTRIES = 2

NUMBER OF LOAD CONDITIONS = 1
DEPTH INCREMENT = .000 FT
DREDGE LINE REDUCTION FACTOR = .700
NUMBER OF BOUNDARY CONDITIONS = 0
NUMBER OF NP = 62
NUMBER OF MEMBERS = 30
MAXIMUM NUMBER OF ITERATIONS = 5
NON-LINEAR CHECK (IF > 0) = 1

PITTMAN SHEET PILE - CASE 3A - WATER PRESSURE AT NODES 4 THRU 8 - KS LOW

MEMBER AND NODE DATA FOR UNIT WIDTH OF WALL

MEMNO	NP1	NP2	NP3	NP4	LENGTH	INERTIA, FT*4	NODE	KS, K/FT*3	SPRGS--SOIL/A.R.	NODE Q, KSF
1	1	2	3	4	1.0270	.00514	1	.000	.000	.0000
2	3	4	5	6	1.0270	.00514	2	.000	.000	.0000
3	5	6	7	8	1.0270	.00514	3	.000	.000	.0000
4	7	8	9	10	1.0000	.00514	4	.000	.000	.0000
5	9	10	11	12	1.0000	.00514	5	.000	.000	.0640
6	11	12	13	14	1.0000	.00514	6	.000	.000	.1280
7	13	14	15	16	1.0000	.00514	7	.000	.000	.1920
8	15	16	17	18	1.0100	.00514	8	13.310	4.758	.2560
9	17	18	19	20	1.0100	.00514	9	13.702	13.820	.0000
10	19	20	21	22	1.0100	.00514	10	13.864	14.000	
11	21	22	23	24	1.0100	.00514	11	13.989	14.127	
12	23	24	25	26	1.0100	.00514	12	14.094	14.234	
13	25	26	27	28	1.0100	.00514	13	14.186	14.328	
14	27	28	29	30	1.0100	.00514	14	14.270	14.412	
15	29	30	31	32	1.0100	.00514	15	14.347	14.490	
16	31	32	33	34	1.0100	.00514	16	14.419	14.562	
17	33	34	35	36	1.0100	.00514	17	14.486	14.630	
18	35	36	37	38	1.0100	.00514	18	14.549	14.695	
19	37	38	39	40	1.0100	.00514	19	14.610	14.756	
20	39	40	41	42	1.0100	.00514	20	14.668	14.814	
21	41	42	43	44	1.0100	.00514	21	14.723	14.870	
22	43	44	45	46	1.0100	.00514	22	14.777	14.924	
23	45	46	47	48	1.0100	.00514	23	14.828	14.976	
24	47	48	49	50	1.0100	.00514	24	14.878	15.026	
25	49	50	51	52	1.0100	.00514	25	14.926	15.075	
26	51	52	53	54	1.0100	.00514	26	14.973	15.123	
27	53	54	55	56	1.0100	.00514	27	15.018	15.169	
28	55	56	57	58	1.0100	.00514	28	15.063	15.213	
29	57	58	59	60	1.0100	.00514	29	15.106	15.257	
30	59	60	61	62	1.0100	.00514	30	15.148	15.300	
							31	15.190	7.664	

PITTMAN SHEET PILE - CASE 3A - WATER PRESSURE AT NODES 4 THRU 8 - KS LOW

THE BAND MATRIX CORRECTED FOR ANY BOUNDARY CONDITIONS P-MATRIX (ADJUSTED FOR NZX)

1	83569.	122058.	41784.	-122058.	1	-.3014
2	237697.	122058.	-237697.	0.	2	.0443
3	167138.	0.	41784.	-122058.	3	.0000
4	475395.	122058.	-237697.	0.	4	.0000
5	167138.	0.	41784.	-122058.	5	.0000
6	475395.	122058.	-237697.	0.	6	.0000
7	169394.	6680.	42913.	-128738.	7	.0000
8	495173.	128738.	-257475.	0.	8	.0107
9	171650.	0.	42913.	-128738.	9	.0000
10	514951.	128738.	-257475.	0.	10	.0640
11	171650.	0.	42913.	-128738.	11	.0000
12	514951.	128738.	-257475.	0.	12	.1280
13	171650.	0.	42913.	-128738.	13	.0000
14	514951.	128738.	-257475.	0.	14	.1920
15	170801.	-2537.	42488.	-126201.	15	.0000
16	507383.	126201.	-249903.	0.	16	.2035
17	169951.	0.	42488.	-126201.	17	.0000
18	499820.	126201.	-249903.	0.	18	.0000
19	169951.	0.	42488.	-126201.	19	.0000
20	499820.	126201.	-249903.	0.	20	.0000
21	169951.	0.	42488.	-126201.	21	.0000
22	499820.	126201.	-249903.	0.	22	.0000
23	169951.	0.	42488.	-126201.	23	.0000
24	499821.	126201.	-249903.	0.	24	.0000
25	169951.	0.	42488.	-126201.	25	.0000
26	499821.	126201.	-249903.	0.	26	.0000
27	169951.	0.	42488.	-126201.	27	.0000
28	499821.	126201.	-249903.	0.	28	.0000
29	169951.	0.	42488.	-126201.	29	.0000
30	499821.	126201.	-249903.	0.	30	.0000
31	169951.	0.	42488.	-126201.	31	.0000
32	499821.	126201.	-249903.	0.	32	.0000
33	169951.	0.	42488.	-126201.	33	.0000
34	499821.	126201.	-249903.	0.	34	.0000
35	169951.	0.	42488.	-126201.	35	.0000
36	499821.	126201.	-249903.	0.	36	.0000
37	169951.	0.	42488.	-126201.	37	.0000
38	499821.	126201.	-249903.	0.	38	.0000
39	169951.	0.	42488.	-126201.	39	.0000
40	499821.	126201.	-249903.	0.	40	.0000
41	169951.	0.	42488.	-126201.	41	.0000
42	499821.	126201.	-249903.	0.	42	.0000
43	169951.	0.	42488.	-126201.	43	.0000
44	499821.	126201.	-249903.	0.	44	.0000
45	169951.	0.	42488.	-126201.	45	.0000
46	499821.	126201.	-249903.	0.	46	.0000
47	169951.	0.	42488.	-126201.	47	.0000
48	499821.	126201.	-249903.	0.	48	.0000
49	169951.	0.	42488.	-126201.	49	.0000
50	499821.	126201.	-249903.	0.	50	.0000
51	169951.	0.	42488.	-126201.	51	.0000
52	499821.	126201.	-249903.	0.	52	.0000
53	169951.	0.	42488.	-126201.	53	.0000
54	499821.	126201.	-249903.	0.	54	.0000
55	169951.	0.	42488.	-126201.	55	.0000
56	499822.	126201.	-249903.	0.	56	.0000
57	169951.	0.	42488.	-126201.	57	.0000
58	499822.	126201.	-249903.	0.	58	.0000
59	169951.	0.	42488.	-126201.	59	.0000
60	499822.	126201.	-249903.	0.	60	.0000
61	84975.	-126201.	0.	0.	61	.0000
62	249911.	0.	0.	0.	62	.0000

CYCLE NO = 1 D.L. DEFL: PREVIOUS = .00000 CURRENT = .01348

PITTMAN SHEET PILE - CASE 3A - WATER PRESSURE AT NODES 4 THRU 8 - KS LOW

MEMBER AND NODE DATA FOR UNIT WIDTH OF WALL

MEMNO	NP1	NP2	NP3	NP4	LENGTH	INERTIA, FT ⁴	NODE	KS, K/FT ³	SPRGS--SOIL/A.R.	NODE Q, KSF
1	1	2	3	4	1.0270	.00514	1	.000	.000	.0000
2	3	4	5	6	1.0270	.00514	2	.000	.000	.0000
3	5	6	7	8	1.0270	.00514	3	.000	.000	.0000
4	7	8	9	10	1.0000	.00514	4	.000	.000	.0000
5	9	10	11	12	1.0000	.00514	5	.000	.000	.0640
6	11	12	13	14	1.0000	.00514	6	.000	.000	.1280
7	13	14	15	16	1.0000	.00514	7	.000	.000	.1920
8	15	16	17	18	1.0100	.00514	8	13.310	4.758	.2560
9	17	18	19	20	1.0100	.00514	9	13.702	13.820	.0000
10	19	20	21	22	1.0100	.00514	10	13.864	14.000	
11	21	22	23	24	1.0100	.00514	11	13.989	14.127	
12	23	24	25	26	1.0100	.00514	12	14.094	14.234	
13	25	26	27	28	1.0100	.00514	13	14.186	14.328	
14	27	28	29	30	1.0100	.00514	14	14.270	14.412	
15	29	30	31	32	1.0100	.00514	15	14.347	14.490	
16	31	32	33	34	1.0100	.00514	16	14.419	14.562	
17	33	34	35	36	1.0100	.00514	17	14.486	14.630	
18	35	36	37	38	1.0100	.00514	18	14.549	14.695	
19	37	38	39	40	1.0100	.00514	19	14.610	14.756	
20	39	40	41	42	1.0100	.00514	20	14.668	14.814	
21	41	42	43	44	1.0100	.00514	21	14.723	14.870	
22	43	44	45	46	1.0100	.00514	22	14.777	14.924	
23	45	46	47	48	1.0100	.00514	23	14.828	14.976	
24	47	48	49	50	1.0100	.00514	24	14.878	15.026	
25	49	50	51	52	1.0100	.00514	25	14.926	15.075	
26	51	52	53	54	1.0100	.00514	26	14.973	15.123	
27	53	54	55	56	1.0100	.00514	27	15.018	15.169	
28	55	56	57	58	1.0100	.00514	28	15.063	15.213	
29	57	58	59	60	1.0100	.00514	29	15.106	15.257	
30	59	60	61	62	1.0100	.00514	30	15.148	15.300	
							31	15.190	7.664	

PITTMAN SHEET PILE - CASE 3A - WATER PRESSURE AT NODES 4 THRU 8 - KS LOW

THE BAND MATRIX CORRECTED FOR ANY BOUNDARY CONDITIONS P-MATRIX (ADJUSTED FOR NZX)

1	83569.	122058.	41784.	-122058.	1	-.3014
2	237697.	122058.	-237697.	0.	2	.0443
3	167138.	0.	41784.	-122058.	3	.0000
4	475395.	122058.	-237697.	0.	4	.0000
5	167138.	0.	41784.	-122058.	5	.0000
6	475395.	122058.	-237697.	0.	6	.0000
7	169394.	6680.	42913.	-128738.	7	.0000
8	495173.	128738.	-257475.	0.	8	-.0107
9	171650.	0.	42913.	-128738.	9	.0000
10	514951.	128738.	-257475.	0.	10	.0640
11	171650.	0.	42913.	-128738.	11	.0000
12	514951.	128738.	-257475.	0.	12	.1280
13	171650.	0.	42913.	-128738.	13	.0000
14	514951.	128738.	-257475.	0.	14	.1920
15	170801.	-2537.	42488.	-126201.	15	.0000
16	507383.	126201.	-249903.	0.	16	.2035
17	169951.	0.	42488.	-126201.	17	.0000
18	499820.	126201.	-249903.	0.	18	.0000
19	169951.	0.	42488.	-126201.	19	.0000
20	499820.	126201.	-249903.	0.	20	.0000
21	169951.	0.	42488.	-126201.	21	.0000
22	499820.	126201.	-249903.	0.	22	.0000
23	169951.	0.	42488.	-126201.	23	.0000
24	499821.	126201.	-249903.	0.	24	.0000
25	169951.	0.	42488.	-126201.	25	.0000
26	499821.	126201.	-249903.	0.	26	.0000
27	169951.	0.	42488.	-126201.	27	.0000
28	499821.	126201.	-249903.	0.	28	.0000
29	169951.	0.	42488.	-126201.	29	.0000
30	499821.	126201.	-249903.	0.	30	.0000
31	169951.	0.	42488.	-126201.	31	.0000
32	499821.	126201.	-249903.	0.	32	.0000
33	169951.	0.	42488.	-126201.	33	.0000
34	499821.	126201.	-249903.	0.	34	.0000
35	169951.	0.	42488.	-126201.	35	.0000
36	499821.	126201.	-249903.	0.	36	.0000
37	169951.	0.	42488.	-126201.	37	.0000
38	499821.	126201.	-249903.	0.	38	.0000
39	169951.	0.	42488.	-126201.	39	.0000
40	499821.	126201.	-249903.	0.	40	.0000
41	169951.	0.	42488.	-126201.	41	.0000
42	499821.	126201.	-249903.	0.	42	.0000
43	169951.	0.	42488.	-126201.	43	.0000
44	499821.	126201.	-249903.	0.	44	.0000
45	169951.	0.	42488.	-126201.	45	.0000
46	499821.	126201.	-249903.	0.	46	.0000
47	169951.	0.	42488.	-126201.	47	.0000
48	499821.	126201.	-249903.	0.	48	.0000
49	169951.	0.	42488.	-126201.	49	.0000
50	499821.	126201.	-249903.	0.	50	.0000
51	169951.	0.	42488.	-126201.	51	.0000
52	499821.	126201.	-249903.	0.	52	.0000
53	169951.	0.	42488.	-126201.	53	.0000
54	499821.	126201.	-249903.	0.	54	.0000
55	169951.	0.	42488.	-126201.	55	.0000
56	499822.	126201.	-249903.	0.	56	.0000
57	169951.	0.	42488.	-126201.	57	.0000
58	499822.	126201.	-249903.	0.	58	.0000
59	169951.	0.	42488.	-126201.	59	.0000
60	499822.	126201.	-249903.	0.	60	.0000
61	84975.	-126201.	0.	0.	61	.0000
62	249911.	0.	0.	0.	62	.0000

D. L. DEFL CONVERGED ON CYCLE = 2

DEFLS ARE: PREVIOUS = .01348 CURRENT = .01348 FOR EMBED DEPTH = 23.23 FT

PITTMAN SHEET PILE - CASE 3A - WATER PRESSURE AT MODES 4 THRU 8 - KS LOW

MEMBER MOMENTS, MODE REACTIONS, DEFLECTIONS, SOIL PRESSURE, AND LAST USED P-MATRIX FOR LC = 1

MEMNO	MOMENTS--NEAR END	1ST, K-FT	MODE	SPG FORCE, KIPS	ROT, RADS	DEFL, FT	SOIL Q, KSF	P-, K-FT	P-, KIPS
1	-.301	.347	1	.0000	-.00196	.02683	.0000	-.3014	.0443
2	-.347	.393	2	.0000	-.00194	.02483	.0000	.0000	.0000
3	-.393	.439	3	.0000	-.00192	.02284	.0000	.0000	.0000
4	-.439	.494	4	.0000	-.00190	.02088	.0000	.0000	.0107
5	-.494	.613	5	.0000	-.00188	.01898	.0000	.0000	.0640
6	-.613	.859	6	.0000	-.00186	.01711	.0000	.0000	.1280
7	-.859	1.298	7	.0000	-.00182	.01527	.0000	.0000	.1920
8	-1.298	1.881	8	.0641	-.00177	.01348	.1794	.0000	.2035
9	-1.881	2.302	9	.1620	-.00170	.01172	.1606	.0000	.0000
10	-2.302	2.580	10	.1408	-.00160	.01006	.1394	.0000	.0000
11	-2.580	2.737	11	.1201	-.00148	.00850	.1189	.0000	.0000
12	-2.737	2.792	12	.1006	-.00136	.00706	.0996	.0000	.0000
13	-2.792	2.765	13	.0825	-.00123	.00576	.0817	.0000	.0000
14	-2.765	2.671	14	.0661	-.00110	.00458	.0654	.0000	.0000
15	-2.671	2.525	15	.0513	-.00097	.00354	.0508	.0000	.0000
16	-2.525	2.340	16	.0382	-.00085	.00262	.0378	.0000	.0000
17	-2.340	2.129	17	.0267	-.00073	.00183	.0265	.0000	.0000
18	-2.129	1.900	18	.0168	-.00063	.00114	.0166	.0000	.0000
19	-1.900	1.663	19	.0082	-.00053	.00056	.0081	.0000	.0000
20	-1.663	1.425	20	.0009	-.00045	.00006	.0009	.0000	.0000
21	-1.426	1.193	21	-.0053	-.00038	-.00035	-.0052	.0000	.0000
22	-1.193	.971	22	-.0105	-.00031	-.00070	-.0104	.0000	.0000
23	-.971	.764	23	-.0149	-.00026	-.00099	-.0147	.0000	.0000
24	-.764	.576	24	-.0186	-.00022	-.00124	-.0184	.0000	.0000
25	-.576	.410	25	-.0218	-.00019	-.00144	-.0216	.0000	.0000
26	-.410	.269	26	-.0246	-.00017	-.00162	-.0243	.0000	.0000
27	-.269	.155	27	-.0271	-.00015	-.00179	-.0268	.0000	.0000
28	-.155	.070	28	-.0294	-.00014	-.00193	-.0291	.0000	.0000
29	-.070	.018	29	-.0316	-.00014	-.00207	-.0313	.0000	.0000
30	-.018	.000	30	-.0338	-.00013	-.00221	-.0335	.0000	.0000
			31	-.0180	-.00013	-.00235	-.0356	.0000	.0000

SUM SPRING FORCES = .6429 VS SUM APPLIED FORCES = .6425 KIPS

APPLIED FORCES ADJUSTED FOR NON LINEAR SOIL REACTIONS WHEN SPRINGS ARE ZEROED

DEFLECTION AT ELEV. 14.0 = (.02683 * 12.0) + (.00196 * 12.0 * 7.75) = .504 IN.

ADDITIONAL PENETRATION = 23.23 - 16.16 = 7.07 FT.

PITTMAN SHEET PILE - CASE 4A - WATER PRESSURE AT NODES 4 THRU 8 - KS LOW

SOLUTION FOR SHEET PILE WALL

MODULUS OF ELASTICITY = 4176000.00 KSF
NODES REQUIRING SOIL SPRINGS READ = 0
NODE D.L. SOIL STARTS = 8
MAXIMUM LINEAR SOIL DEFORMATION = .040 FT
SOIL MODULUS = 13.310 + .390*Z**2 .500 K/FT**3
NUMBER OF NON-ZERO P-MATRIX ENTRIES = 2

NUMBER OF LOAD CONDITIONS = 1
DEPTH INCREMENT = .000 FT
DREDGE LINE REDUCTION FACTOR = .700
NUMBER OF BOUNDARY CONDITIONS = 0
NUMBER OF NP = 76
NUMBER OF MEMBERS = 37
MAXIMUM NUMBER OF ITERATIONS = 5
NON-LINEAR CHECK (IF > 0) = 1

MEMBER AND NODE DATA FOR UNIT WIDTH OF WALL

MEMNO	MP1	MP2	MP3	MP4	LENGTH	INERTIA, FT*4	NODE	KS, K/FT*3	SPRGS--SOIL/A.R.	NODE Q, KSF
1	1	2	3	4	1.0270	.00514	1	.000	.000	.0000
2	3	4	5	6	1.0270	.00514	2	.000	.000	.0000
3	5	6	7	8	1.0270	.00514	3	.000	.000	.0000
4	7	8	9	10	1.0000	.00514	4	.000	.000	.0000
5	9	10	11	12	1.0000	.00514	5	.000	.000	.0640
6	11	12	13	14	1.0000	.00514	6	.000	.000	.1280
7	13	14	15	16	1.0000	.00514	7	.000	.000	.1920
8	15	16	17	18	1.0100	.00514	8	13.310	4.758	.2560
9	17	18	19	20	1.0100	.00514	9	13.702	13.820	.0000
10	19	20	21	22	1.0100	.00514	10	13.864	14.000	
11	21	22	23	24	1.0100	.00514	11	13.989	14.127	
12	23	24	25	26	1.0100	.00514	12	14.094	14.234	
13	25	26	27	28	1.0100	.00514	13	14.186	14.328	
14	27	28	29	30	1.0100	.00514	14	14.270	14.412	
15	29	30	31	32	1.0100	.00514	15	14.347	14.490	
16	31	32	33	34	1.0100	.00514	16	14.419	14.562	
17	33	34	35	36	1.0100	.00514	17	14.486	14.630	
18	35	36	37	38	1.0100	.00514	18	14.549	14.695	
19	37	38	39	40	1.0100	.00514	19	14.610	14.756	
20	39	40	41	42	1.0100	.00514	20	14.668	14.814	
21	41	42	43	44	1.0100	.00514	21	14.723	14.870	
22	43	44	45	46	1.0100	.00514	22	14.777	14.924	
23	45	46	47	48	1.0100	.00514	23	14.828	14.976	
24	47	48	49	50	1.0100	.00514	24	14.878	15.026	
25	49	50	51	52	1.0100	.00514	25	14.926	15.075	
26	51	52	53	54	1.0100	.00514	26	14.973	15.123	
27	53	54	55	56	1.0100	.00514	27	15.018	15.169	
28	55	56	57	58	1.0100	.00514	28	15.063	15.213	
29	57	58	59	60	1.0100	.00514	29	15.106	15.257	
30	59	60	61	62	1.0100	.00514	30	15.148	15.300	
31	61	62	63	64	1.0100	.00514	31	15.190	15.342	
32	63	64	65	66	1.0100	.00514	32	15.230	15.382	
33	65	66	67	68	1.0100	.00514	33	15.270	15.422	
34	67	68	69	70	1.0100	.00514	34	15.309	15.462	
35	69	70	71	72	1.0100	.00514	35	15.347	15.500	
36	71	72	73	74	1.0100	.00514	36	15.384	15.538	
37	73	74	75	76	1.0100	.00514	37	15.421	15.575	
							38	15.457	7.800	

THE BAND MATRIX CORRECTED FOR ANY BOUNDARY CONDITIONS

P-MATRIX (ADJUSTED FOR NZX)

1	83569.	122058.	41784.	-122058.	1	-.3014
2	237697.	122058.	-237697.	0.	2	.0443
3	167138.	0.	41784.	-122058.	3	.0000
4	475395.	122058.	-237697.	0.	4	.0000
5	167138.	0.	41784.	-122058.	5	.0000
6	475395.	122058.	-237697.	0.	6	.0000
7	169394.	6680.	42913.	-128738.	7	.0000
8	495173.	128738.	-257475.	0.	8	.0107
9	171650.	0.	42913.	-128738.	9	.0000
10	514951.	128738.	-257475.	0.	10	.0640
11	171650.	0.	42913.	-128738.	11	.0000
12	514951.	128738.	-257475.	0.	12	.1280
13	171650.	0.	42913.	-128738.	13	.0000
14	514951.	128738.	-257475.	0.	14	.1920
15	170801.	-2537.	42488.	-126201.	15	.0000
16	507383.	126201.	-249903.	0.	16	.2035
17	169951.	0.	42488.	-126201.	17	.0000
18	499820.	126201.	-249903.	0.	18	.0000
19	169951.	0.	42488.	-126201.	19	.0000
20	499820.	126201.	-249903.	0.	20	.0000
21	169951.	0.	42488.	-126201.	21	.0000
22	499820.	126201.	-249903.	0.	22	.0000
23	169951.	0.	42488.	-126201.	23	.0000
24	499821.	126201.	-249903.	0.	24	.0000
25	169951.	0.	42488.	-126201.	25	.0000
26	499821.	126201.	-249903.	0.	26	.0000
27	169951.	0.	42488.	-126201.	27	.0000
28	499821.	126201.	-249903.	0.	28	.0000
29	169951.	0.	42488.	-126201.	29	.0000
30	499821.	126201.	-249903.	0.	30	.0000
31	169951.	0.	42488.	-126201.	31	.0000
32	499821.	126201.	-249903.	0.	32	.0000
33	169951.	0.	42488.	-126201.	33	.0000
34	499821.	126201.	-249903.	0.	34	.0000
35	169951.	0.	42488.	-126201.	35	.0000
36	499821.	126201.	-249903.	0.	36	.0000
37	169951.	0.	42488.	-126201.	37	.0000
38	499821.	126201.	-249903.	0.	38	.0000
39	169951.	0.	42488.	-126201.	39	.0000
40	499821.	126201.	-249903.	0.	40	.0000
41	169951.	0.	42488.	-126201.	41	.0000
42	499821.	126201.	-249903.	0.	42	.0000
43	169951.	0.	42488.	-126201.	43	.0000
44	499821.	126201.	-249903.	0.	44	.0000
45	169951.	0.	42488.	-126201.	45	.0000
46	499821.	126201.	-249903.	0.	46	.0000
47	169951.	0.	42488.	-126201.	47	.0000
48	499821.	126201.	-249903.	0.	48	.0000
49	169951.	0.	42488.	-126201.	49	.0000
50	499821.	126201.	-249903.	0.	50	.0000
51	169951.	0.	42488.	-126201.	51	.0000
52	499821.	126201.	-249903.	0.	52	.0000
53	169951.	0.	42488.	-126201.	53	.0000
54	499821.	126201.	-249903.	0.	54	.0000
55	169951.	0.	42488.	-126201.	55	.0000
56	499822.	126201.	-249903.	0.	56	.0000
57	169951.	0.	42488.	-126201.	57	.0000
58	499822.	126201.	-249903.	0.	58	.0000
59	169951.	0.	42488.	-126201.	59	.0000
60	499822.	126201.	-249903.	0.	60	.0000
61	169951.	0.	42488.	-126201.	61	.0000
62	499822.	126201.	-249903.	0.	62	.0000
63	169951.	0.	42488.	-126201.	63	.0000
64	499822.	126201.	-249903.	0.	64	.0000
65	169951.	0.	42488.	-126201.	65	.0000
66	499822.	126201.	-249903.	0.	66	.0000
67	169951.	0.	42488.	-126201.	67	.0000
68	499822.	126201.	-249903.	0.	68	.0000
69	169951.	0.	42488.	-126201.	69	.0000
70	499822.	126201.	-249903.	0.	70	.0000
71	169951.	0.	42488.	-126201.	71	.0000
72	499822.	126201.	-249903.	0.	72	.0000
73	169951.	0.	42488.	-126201.	73	.0000
74	499822.	126201.	-249903.	0.	74	.0000
75	84975.	-126201.	0.	0.	75	.0000
76	249911.	0.	0.	0.	76	.0000

CYCLE NO = 1 D.L. DEFL: PREVIOUS = .00000 CURRENT = .01321

MEMBER AND NODE DATA FOR UNIT WIDTH OF WALL

MEMNO	NP1	NP2	NP3	NP4	LENGTH	INERTIA, FT ⁴	MODE	KS, K/FT ³	SPRGS--SOIL/A.R.	MODE Q, KSF
1	1	2	3	4	1.0270	.00514	1	.000	.000	.0000
2	3	4	5	6	1.0270	.00514	2	.000	.000	.0000
3	5	6	7	8	1.0270	.00514	3	.000	.000	.0000
4	7	8	9	10	1.0000	.00514	4	.000	.000	.0000
5	9	10	11	12	1.0000	.00514	5	.000	.000	.0640
6	11	12	13	14	1.0000	.00514	6	.000	.000	.1280
7	13	14	15	16	1.0000	.00514	7	.000	.000	.1920
8	15	16	17	18	1.0100	.00514	8	13.310	4.758	.2560
9	17	18	19	20	1.0100	.00514	9	13.702	13.820	.0000
10	19	20	21	22	1.0100	.00514	10	13.864	14.000	
11	21	22	23	24	1.0100	.00514	11	13.989	14.127	
12	23	24	25	26	1.0100	.00514	12	14.094	14.234	
13	25	26	27	28	1.0100	.00514	13	14.186	14.328	
14	27	28	29	30	1.0100	.00514	14	14.270	14.412	
15	29	30	31	32	1.0100	.00514	15	14.347	14.490	
16	31	32	33	34	1.0100	.00514	16	14.419	14.562	
17	33	34	35	36	1.0100	.00514	17	14.486	14.630	
18	35	36	37	38	1.0100	.00514	18	14.549	14.695	
19	37	38	39	40	1.0100	.00514	19	14.610	14.756	
20	39	40	41	42	1.0100	.00514	20	14.668	14.814	
21	41	42	43	44	1.0100	.00514	21	14.723	14.870	
22	43	44	45	46	1.0100	.00514	22	14.777	14.924	
23	45	46	47	48	1.0100	.00514	23	14.828	14.976	
24	47	48	49	50	1.0100	.00514	24	14.878	15.026	
25	49	50	51	52	1.0100	.00514	25	14.926	15.075	
26	51	52	53	54	1.0100	.00514	26	14.973	15.123	
27	53	54	55	56	1.0100	.00514	27	15.018	15.169	
28	55	56	57	58	1.0100	.00514	28	15.063	15.213	
29	57	58	59	60	1.0100	.00514	29	15.106	15.257	
30	59	60	61	62	1.0100	.00514	30	15.148	15.300	
31	61	62	63	64	1.0100	.00514	31	15.190	15.342	
32	63	64	65	66	1.0100	.00514	32	15.230	15.382	
33	65	66	67	68	1.0100	.00514	33	15.270	15.422	
34	67	68	69	70	1.0100	.00514	34	15.309	15.462	
35	69	70	71	72	1.0100	.00514	35	15.347	15.500	
36	71	72	73	74	1.0100	.00514	36	15.384	15.538	
37	73	74	75	76	1.0100	.00514	37	15.421	15.575	
							38	15.457	7.800	

MEMBER MOMENTS, NODE REACTIONS, DEFLECTIONS, SOIL PRESSURE, AND LAST USED P-MATRIX FOR LC = 1

MEMNO	MOMENTS--NEAR	END	1ST, K-FT	NODE	SPG FORCE, KIPS	ROT, RADS	DEFL, FT	SOIL Q, KSF	P-, K-FT	P-, KIPS
1	-.302	.347		1	.0000	-.00194	.02647	.0000	-.3014	.0443
2	-.347	.393		2	.0000	-.00193	.02448	.0000	.0000	.0000
3	-.392	.439		3	.0000	-.00191	.02251	.0000	.0000	.0000
4	-.439	.494		4	.0000	-.00189	.02056	.0000	.0000	.0107
5	-.494	.613		5	.0000	-.00187	.01868	.0000	.0000	.0640
6	-.613	.859		6	.0000	-.00184	.01682	.0000	.0000	.1280
7	-.859	1.298		7	.0000	-.00181	.01500	.0000	.0000	.1920
8	-1.298	1.883		8	.0629	-.00176	.01321	.1758	.0000	.2035
9	-1.883	2.308		9	.1585	-.00168	.01147	.1571	.0000	.0000
10	-2.308	2.594		10	.1374	-.00159	.00982	.1361	.0000	.0000
11	-2.594	2.763		11	.1168	-.00147	.00827	.1157	.0000	.0000
12	-2.763	2.833		12	.0975	-.00134	.00685	.0965	.0000	.0000
13	-2.833	2.823		13	.0796	-.00121	.00556	.0789	.0000	.0000
14	-2.823	2.749		14	.0634	-.00108	.00440	.0628	.0000	.0000
15	-2.749	2.625		15	.0489	-.00095	.00338	.0485	.0000	.0000
16	-2.625	2.465		16	.0362	-.00082	.00248	.0358	.0000	.0000
17	-2.466	2.280		17	.0251	-.00070	.00172	.0249	.0000	.0000
18	-2.280	2.079		18	.0156	-.00059	.00106	.0155	.0000	.0000
19	-2.079	1.870		19	.0077	-.00049	.00052	.0076	.0000	.0000
20	-1.870	1.660		20	.0011	-.00039	.00008	.0011	.0000	.0000
21	-1.660	1.454		21	-.0042	-.00031	-.00028	-.0041	.0000	.0000
22	-1.454	1.257		22	-.0083	-.00024	-.00056	-.0082	.0000	.0000
23	-1.257	1.071		23	-.0114	-.00017	-.00076	-.0113	.0000	.0000
24	-1.071	.899		24	-.0137	-.00012	-.00091	-.0136	.0000	.0000
25	-.899	.742		25	-.0152	-.00007	-.00101	-.0150	.0000	.0000
26	-.742	.602		26	-.0161	-.00003	-.00106	-.0159	.0000	.0000
27	-.602	.478		27	-.0164	.00000	-.00108	-.0162	.0000	.0000
28	-.478	.370		28	-.0163	.00002	-.00107	-.0161	.0000	.0000
29	-.370	.279		29	-.0158	.00004	-.00104	-.0157	.0000	.0000
30	-.279	.203		30	-.0151	.00006	-.00099	-.0149	.0000	.0000
31	-.203	.141		31	-.0141	.00007	-.00092	-.0140	.0000	.0000
32	-.141	.092		32	-.0130	.00008	-.00085	-.0129	.0000	.0000
33	-.092	.055		33	-.0118	.00008	-.00077	-.0117	.0000	.0000
34	-.055	.029		34	-.0105	.00009	-.00068	-.0104	.0000	.0000
35	-.029	.012		35	-.0092	.00009	-.00059	-.0091	.0000	.0000
36	-.012	.003		36	-.0078	.00009	-.00050	-.0077	.0000	.0000
37	-.003	.000		37	-.0064	.00009	-.00041	-.0064	.0000	.0000
				38	-.0025	.00009	-.00032	-.0050	.0000	.0000

SUM SPRING FORCES = .6429 VS SUM APPLIED FORCES = .6425 KIPS

APPLIED FORCES ADJUSTED FOR NON LINEAR SOIL REACTIONS WHEN SPRINGS ARE ZEROED

DEFLECTION AT ELEV. 14.0 = (.02647 * 12.0) + (.00194 * 12.0 * 7.75) = .498 IN.

ADDITIONAL PENETRATION = 30.30 - 16.16 = 14.14 FT.

THE BAND MATRIX CORRECTED FOR ANY BOUNDARY CONDITIONS

P-MATRIX (ADJUSTED FOR NZX)

1	83569.	122058.	41784.	-122058.	1	-.3014
2	237697.	122058.	-237697.	0.	2	.0443
3	167138.	0.	41784.	-122058.	3	.0000
4	475395.	122058.	-237697.	0.	4	.0000
5	167138.	0.	41784.	-122058.	5	.0000
6	475395.	122058.	-237697.	0.	6	.0000
7	169394.	6680.	42913.	-128738.	7	.0000
8	495173.	128738.	-257475.	0.	8	.0107
9	171650.	0.	42913.	-128738.	9	.0000
10	514951.	128738.	-257475.	0.	10	.0640
11	171650.	0.	42913.	-128738.	11	.0000
12	514951.	128738.	-257475.	0.	12	.1280
13	171650.	0.	42913.	-128738.	13	.0000
14	514951.	128738.	-257475.	0.	14	.1920
15	170801.	-2537.	42488.	-126201.	15	.0000
16	507383.	126201.	-249903.	0.	16	.2035
17	169951.	0.	42488.	-126201.	17	.0000
18	499820.	126201.	-249903.	0.	18	.0000
19	169951.	0.	42488.	-126201.	19	.0000
20	499820.	126201.	-249903.	0.	20	.0000
21	169951.	0.	42488.	-126201.	21	.0000
22	499820.	126201.	-249903.	0.	22	.0000
23	169951.	0.	42488.	-126201.	23	.0000
24	499821.	126201.	-249903.	0.	24	.0000
25	169951.	0.	42488.	-126201.	25	.0000
26	499821.	126201.	-249903.	0.	26	.0000
27	169951.	0.	42488.	-126201.	27	.0000
28	499821.	126201.	-249903.	0.	28	.0000
29	169951.	0.	42488.	-126201.	29	.0000
30	499821.	126201.	-249903.	0.	30	.0000
31	169951.	0.	42488.	-126201.	31	.0000
32	499821.	126201.	-249903.	0.	32	.0000
33	169951.	0.	42488.	-126201.	33	.0000
34	499821.	126201.	-249903.	0.	34	.0000
35	169951.	0.	42488.	-126201.	35	.0000
36	499821.	126201.	-249903.	0.	36	.0000
37	169951.	0.	42488.	-126201.	37	.0000
38	499821.	126201.	-249903.	0.	38	.0000
39	169951.	0.	42488.	-126201.	39	.0000
40	499821.	126201.	-249903.	0.	40	.0000
41	169951.	0.	42488.	-126201.	41	.0000
42	499821.	126201.	-249903.	0.	42	.0000
43	169951.	0.	42488.	-126201.	43	.0000
44	499821.	126201.	-249903.	0.	44	.0000
45	169951.	0.	42488.	-126201.	45	.0000
46	499821.	126201.	-249903.	0.	46	.0000
47	169951.	0.	42488.	-126201.	47	.0000
48	499821.	126201.	-249903.	0.	48	.0000
49	169951.	0.	42488.	-126201.	49	.0000
50	499821.	126201.	-249903.	0.	50	.0000
51	169951.	0.	42488.	-126201.	51	.0000
52	499821.	126201.	-249903.	0.	52	.0000
53	169951.	0.	42488.	-126201.	53	.0000
54	499821.	126201.	-249903.	0.	54	.0000
55	169951.	0.	42488.	-126201.	55	.0000
56	499822.	126201.	-249903.	0.	56	.0000
57	169951.	0.	42488.	-126201.	57	.0000
58	499822.	126201.	-249903.	0.	58	.0000
59	169951.	0.	42488.	-126201.	59	.0000
60	499822.	126201.	-249903.	0.	60	.0000
61	169951.	0.	42488.	-126201.	61	.0000
62	499822.	126201.	-249903.	0.	62	.0000
63	169951.	0.	42488.	-126201.	63	.0000
64	499822.	126201.	-249903.	0.	64	.0000
65	169951.	0.	42488.	-126201.	65	.0000
66	499822.	126201.	-249903.	0.	66	.0000
67	169951.	0.	42488.	-126201.	67	.0000
68	499822.	126201.	-249903.	0.	68	.0000
69	169951.	0.	42488.	-126201.	69	.0000
70	499822.	126201.	-249903.	0.	70	.0000
71	169951.	0.	42488.	-126201.	71	.0000
72	499822.	126201.	-249903.	0.	72	.0000
73	169951.	0.	42488.	-126201.	73	.0000
74	499822.	126201.	-249903.	0.	74	.0000
75	84975.	-126201.	0.	0.	75	.0000
76	249911.	0.	0.	0.	76	.0000

D. L. DEFL CONVERGED ON CYCLE = 2

DEFLS ARE: PREVIOUS = .01321 CURRENT = .01321 FOR EMBED DEPTH = 30.30 FT

SOLUTION FOR SHEET PILE WALL

MODULUS OF ELASTICITY = 4176000.00 KSF
NODES REQUIRING SOIL SPRINGS READ = 0
NODE D.L. SOIL STARTS = 8
MAXIMUM LINEAR SOIL DEFORMATION = .040 FT
SOIL MODULUS = $20.590 + .390 \cdot Z^{**} .500 \text{ K/FT}^{**3}$
NUMBER OF NON-ZERO P-MATRIX ENTRIES = 3

NUMBER OF LOAD CONDITIONS = 1
DEPTH INCREMENT = .000 FT
DREDGE LINE REDUCTION FACTOR = .700
NUMBER OF BOUNDARY CONDITIONS = 0
NUMBER OF NP = 48
NUMBER OF MEMBERS = 23
MAXIMUM NUMBER OF ITERATIONS = 5
NON-LINEAR CHECK (IF > 0) = 1

PITTMAN SHEET PILE - CASE 2B - WATER PRESSURE AT NODES 4 THRU 8 - KS AVERAGE

MEMBER AND NODE DATA FOR UNIT WIDTH OF WALL

MEMNO	NP1	NP2	NP3	NP4	LENGTH	INERTIA, FT ⁴	NODE	KS, K/FT ³	SPRGS--SOIL/A.R.	NODE Q, KSF
1	1	2	3	4	1.0270	.00514	1	.000	.000	.0000
2	3	4	5	6	1.0270	.00514	2	.000	.000	.0000
3	5	6	7	8	1.0270	.00514	3	.000	.000	.0000
4	7	8	9	10	1.0000	.00514	4	.000	.000	.0000
5	9	10	11	12	1.0000	.00514	5	.000	.000	.0640
6	11	12	13	14	1.0000	.00514	6	.000	.000	.1280
7	13	14	15	16	1.0000	.00514	7	.000	.000	.1920
8	15	16	17	18	1.0100	.00514	8	20.590	7.332	.2560
9	17	18	19	20	1.0100	.00514	9	20.982	21.172	.0000
10	19	20	21	22	1.0100	.00514	10	21.144	21.353	
11	21	22	23	24	1.0100	.00514	11	21.269	21.480	
12	23	24	25	26	1.0100	.00514	12	21.374	21.587	
13	25	26	27	28	1.0100	.00514	13	21.466	21.680	
14	27	28	29	30	1.0100	.00514	14	21.550	21.765	
15	29	30	31	32	1.0100	.00514	15	21.627	21.843	
16	31	32	33	34	1.0100	.00514	16	21.699	21.915	
17	33	34	35	36	1.0100	.00514	17	21.766	21.983	
18	35	36	37	38	1.0100	.00514	18	21.829	22.047	
19	37	38	39	40	1.0100	.00514	19	21.890	22.109	
20	39	40	41	42	1.0100	.00514	20	21.948	22.167	
21	41	42	43	44	1.0100	.00514	21	22.003	22.223	
22	43	44	45	46	1.0100	.00514	22	22.057	22.277	
23	45	46	47	48	1.0100	.00514	23	22.108	22.329	
							24	22.158	11.181	

PITMAN SHEET PILE - CASE 2B - WATER PRESSURE AT NODES 4 THRU 8 - KS AVERAGE

THE BAND MATRIX CORRECTED FOR ANY BOUNDARY CONDITIONS

P-MATRIX (ADJUSTED FOR NZX)

1	83569.	122058.	41784.	-122058.	1	-.3014
2	237697.	122058.	-237697.	0.	2	.0443
3	167138.	0.	41784.	-122058.	3	.0000
4	475395.	122058.	-237697.	0.	4	.0000
5	167138.	0.	41784.	-122058.	5	.0000
6	475395.	122058.	-237697.	0.	6	.0000
7	169394.	6680.	42913.	-128738.	7	.0000
8	495173.	128738.	-257475.	0.	8	.0107
9	171650.	0.	42913.	-128738.	9	.0000
10	514951.	128738.	-257475.	0.	10	.0640
11	171650.	0.	42913.	-128738.	11	.0000
12	514951.	128738.	-257475.	0.	12	.1280
13	171650.	0.	42913.	-128738.	13	.0000
14	514951.	128738.	-257475.	0.	14	.1920
15	170801.	-2537.	42488.	-126201.	15	.0000
16	507386.	126201.	-249903.	0.	16	-.6965
17	169951.	0.	42488.	-126201.	17	.0000
18	499827.	126201.	-249903.	0.	18	.0000
19	169951.	0.	42488.	-126201.	19	.0000
20	499828.	126201.	-249903.	0.	20	.0000
21	169951.	0.	42488.	-126201.	21	.0000
22	499828.	126201.	-249903.	0.	22	.0000
23	169951.	0.	42488.	-126201.	23	.0000
24	499828.	126201.	-249903.	0.	24	.0000
25	169951.	0.	42488.	-126201.	25	.0000
26	499828.	126201.	-249903.	0.	26	.0000
27	169951.	0.	42488.	-126201.	27	.0000
28	499828.	126201.	-249903.	0.	28	.0000
29	169951.	0.	42488.	-126201.	29	.0000
30	499828.	126201.	-249903.	0.	30	.0000
31	169951.	0.	42488.	-126201.	31	.0000
32	499828.	126201.	-249903.	0.	32	.0000
33	169951.	0.	42488.	-126201.	33	.0000
34	499828.	126201.	-249903.	0.	34	.0000
35	169951.	0.	42488.	-126201.	35	.0000
36	499828.	126201.	-249903.	0.	36	.0000
37	169951.	0.	42488.	-126201.	37	.0000
38	499828.	126201.	-249903.	0.	38	.0000
39	169951.	0.	42488.	-126201.	39	.0000
40	499828.	126201.	-249903.	0.	40	.0000
41	169951.	0.	42488.	-126201.	41	.0000
42	499829.	126201.	-249903.	0.	42	.0000
43	169951.	0.	42488.	-126201.	43	.0000
44	499829.	126201.	-249903.	0.	44	.0000
45	169951.	0.	42488.	-126201.	45	.0000
46	499829.	126201.	-249903.	0.	46	.0000
47	84975.	-126201.	0.	0.	47	.0000
48	249914.	0.	0.	0.	48	.0000

D. L. DEFL CONVERGED ON CYCLE = 1

DEFLS ARE: PREVIOUS = .00000 CURRENT = .00133 FOR EMBED DEPTH = 16.16 FT

PITTMAN SHEET PILE - CASE 28 - WATER PRESSURE AT NODES 4 THRU 8 - KS AVERAGE

MEMBER MOMENTS, NODE REACTIONS, DEFLECTIONS, SOIL PRESSURE, AND LAST USED P-MATRIX FOR LC = 1

MEMNO	MOMENTS--NEAR	END 1ST, K-FT	NODE	SPG FORCE, KIPS	ROT, RADS	DEFL, FT	SOIL Q, KSF	P-, K-FT	P-, KIPS
1	-.301	.347	1	.0000	-.00026	.00004	.0000	-.3014	.0443
2	-.347	.392	2	.0000	-.00025	-.00022	.0000	.0000	.0000
3	-.392	.438	3	.0000	-.00023	-.00047	.0000	.0000	.0000
4	-.438	.493	4	.0000	-.00021	-.00070	.0000	.0000	.0107
5	-.493	.612	5	.0000	-.00019	-.00090	.0000	.0000	.0640
6	-.612	.859	6	.0000	-.00016	-.00108	.0000	.0000	.1280
7	-.859	1.298	7	.0000	-.00013	-.00122	.0000	.0000	.1920
8	-1.298	1.048	8	-.0098	-.00008	-.00133	-.0274	.0000	-.6965
9	-1.048	.827	9	-.0292	-.00002	-.00138	-.0290	.0000	.0000
10	-.827	.636	10	-.0295	.00002	-.00138	-.0292	.0000	.0000
11	-.636	.475	11	-.0289	.00005	-.00134	-.0286	.0000	.0000
12	-.475	.341	12	-.0275	.00008	-.00128	-.0273	.0000	.0000
13	-.341	.233	13	-.0257	.00010	-.00118	-.0254	.0000	.0000
14	-.233	.149	14	-.0234	.00011	-.00108	-.0232	.0000	.0000
15	-.149	.086	15	-.0209	.00012	-.00096	-.0207	.0000	.0000
16	-.086	.041	16	-.0182	.00013	-.00083	-.0180	.0000	.0000
17	-.041	.012	17	-.0154	.00013	-.00070	-.0153	.0000	.0000
18	-.012	-.004	18	-.0125	.00013	-.00057	-.0124	.0000	.0000
19	.004	-.011	19	-.0096	.00013	-.00044	-.0095	.0000	.0000
20	.011	-.011	20	-.0067	.00013	-.00030	-.0066	.0000	.0000
21	.011	-.007	21	-.0038	.00013	-.00017	-.0037	.0000	.0000
22	.007	-.003	22	-.0008	.00013	-.00004	-.0008	.0000	.0000
23	.003	.000	23	.0021	.00013	.00009	.0021	.0000	.0000
			24	.0025	.00013	.00023	.0050	.0000	.0000

SUM SPRING FORCES = -.2574 VS SUM APPLIED FORCES = -.2575 KIPS

APPLIED FORCES ADJUSTED FOR NON LINEAR SOIL REACTIONS WHEN SPRINGS ARE ZEROED

SOLUTION FOR SHEET PILE WALL

MODULUS OF ELASTICITY = 4176000.00 KSF
NODES REQUIRING SOIL SPRINGS READ = 0
NODE D.L. SOIL STARTS = 8
MAXIMUM LINEAR SOIL DEFORMATION = .040 FT
SOIL MODULUS = $8.330 + .390 \times 2^{**} .500 \text{ K/FT}^{**3}$
NUMBER OF NON-ZERO P-MATRIX ENTRIES = 2

NUMBER OF LOAD CONDITIONS = 1
DEPTH INCREMENT = .000 FT
DREDGE LINE REDUCTION FACTOR = .700
NUMBER OF BOUNDARY CONDITIONS = 0
NUMBER OF NP = 48
NUMBER OF MEMBERS = 23
MAXIMUM NUMBER OF ITERATIONS = 5
NON-LINEAR CHECK (IF > 0) = 1

*Using removed strengths
- 45% of original*

PITTMAN SHEET PILE - CASE REM. RATIO = .45 - WATER PRESSURE AT NODES 4 THRU 8

MEMBER AND NODE DATA FOR UNIT WIDTH OF WALL

MEMNO	NP1	NP2	NP3	NP4	LENGTH	INERTIA, FT*4	NODE	KS, K/FT*3	SPRGS--SOIL/A.R.	NODE Q, KSF
1	1	2	3	4	1.0270	.00514	1	.000	.000	.0000
2	3	4	5	6	1.0270	.00514	2	.000	.000	.0000
3	5	6	7	8	1.0270	.00514	3	.000	.000	.0000
4	7	8	9	10	1.0000	.00514	4	.000	.000	.0000
5	9	10	11	12	1.0000	.00514	5	.000	.000	.0640
6	11	12	13	14	1.0000	.00514	6	.000	.000	.1280
7	13	14	15	16	1.0000	.00514	7	.000	.000	.1920
8	15	16	17	18	1.0100	.00514	8	8.330	2.998	.2560
9	17	18	19	20	1.0100	.00514	9	8.722	8.790	.0000
10	19	20	21	22	1.0100	.00514	10	8.884	8.970	
11	21	22	23	24	1.0100	.00514	11	9.009	9.097	
12	23	24	25	26	1.0100	.00514	12	9.114	9.204	
13	25	26	27	28	1.0100	.00514	13	9.206	9.298	
14	27	28	29	30	1.0100	.00514	14	9.290	9.382	
15	29	30	31	32	1.0100	.00514	15	9.367	9.460	
16	31	32	33	34	1.0100	.00514	16	9.439	9.533	
17	33	34	35	36	1.0100	.00514	17	9.506	9.601	
18	35	36	37	38	1.0100	.00514	18	9.569	9.665	
19	37	38	39	40	1.0100	.00514	19	9.630	9.726	
20	39	40	41	42	1.0100	.00514	20	9.688	9.784	
21	41	42	43	44	1.0100	.00514	21	9.743	9.840	
22	43	44	45	46	1.0100	.00514	22	9.797	9.894	
23	45	46	47	48	1.0100	.00514	23	9.848	9.946	
							24	9.898	4.990	

PITTMAN SHEET PILE - CASE REM. RATIO = .45 - WATER PRESSURE AT NODES 4 THRU 8

THE BAND MATRIX CORRECTED FOR ANY BOUNDARY CONDITIONS				P-MATRIX (ADJUSTED FOR NZX)		
1	83569.	122058.	41784.	-122058.	1	-.3014
2	237697.	122058.	-237697.	0.	2	.0443
3	167138.	0.	41784.	-122058.	3	.0000
4	475395.	122058.	-237697.	0.	4	.0000
5	167138.	0.	41784.	-122058.	5	.0000
6	475395.	122058.	-237697.	0.	6	.0000
7	169394.	6680.	42913.	-128738.	7	.0000
8	495173.	128738.	-257475.	0.	8	.0107
9	171650.	0.	42913.	-128738.	9	.0000
10	514951.	128738.	-257475.	0.	10	.0640
11	171650.	0.	42913.	-128738.	11	.0000
12	514951.	128738.	-257475.	0.	12	.1280
13	171650.	0.	42913.	-128738.	13	.0000
14	514951.	128738.	-257475.	0.	14	.1920
15	170801.	-2537.	42488.	-126201.	15	.0000
16	507382.	126201.	-249903.	0.	16	.2035
17	169951.	0.	42488.	-126201.	17	.0000
18	499815.	126201.	-249903.	0.	18	.0000
19	169951.	0.	42488.	-126201.	19	.0000
20	499815.	126201.	-249903.	0.	20	.0000
21	169951.	0.	42488.	-126201.	21	.0000
22	499815.	126201.	-249903.	0.	22	.0000
23	169951.	0.	42488.	-126201.	23	.0000
24	499816.	126201.	-249903.	0.	24	.0000
25	169951.	0.	42488.	-126201.	25	.0000
26	499816.	126201.	-249903.	0.	26	.0000
27	169951.	0.	42488.	-126201.	27	.0000
28	499816.	126201.	-249903.	0.	28	.0000
29	169951.	0.	42488.	-126201.	29	.0000
30	499816.	126201.	-249903.	0.	30	.0000
31	169951.	0.	42488.	-126201.	31	.0000
32	499816.	126201.	-249903.	0.	32	.0000
33	169951.	0.	42488.	-126201.	33	.0000
34	499816.	126201.	-249903.	0.	34	.0000
35	169951.	0.	42488.	-126201.	35	.0000
36	499816.	126201.	-249903.	0.	36	.0000
37	169951.	0.	42488.	-126201.	37	.0000
38	499816.	126201.	-249903.	0.	38	.0000
39	169951.	0.	42488.	-126201.	39	.0000
40	499816.	126201.	-249903.	0.	40	.0000
41	169951.	0.	42488.	-126201.	41	.0000
42	499816.	126201.	-249903.	0.	42	.0000
43	169951.	0.	42488.	-126201.	43	.0000
44	499816.	126201.	-249903.	0.	44	.0000
45	169951.	0.	42488.	-126201.	45	.0000
46	499816.	126201.	-249903.	0.	46	.0000
47	84975.	-126201.	0.	0.	47	.0000
48	249908.	0.	0.	0.	48	.0000

D. L. DEFL CONVERGED ON CYCLE = 2

DEFLS ARE: PREVIOUS = .02369 CURRENT = .02369 FOR EMBED DEPTH = 16.16 FT

PITTMAN SHEET PILE - CASE REM. RATIO = .45 - WATER PRESSURE AT MODES 4 THRU 8
 MEMBER MOMENTS, NODE REACTIONS, DEFLECTIONS, SOIL PRESSURE, AND LAST USED P-MATRIX FOR LC = 1

MEMNO	MOMENTS--NEAR	END 1ST, K-FT	MODE	SPG FORCE, KIPS	ROT, RADS	DEFL, FT	SOIL Q, KSF	P-, K-FT	P-, KIPS
1	-.301	.347	1	.0000	-.00304	.04474	.0000	-.3014	.0443
2	-.347	.393	2	.0000	-.00303	.04163	.0000	.0000	.0000
3	-.394	.440	3	.0000	-.00301	.03852	.0000	.0000	.0000
4	-.440	.495	4	.0000	-.00299	.03544	.0000	.0000	.0107
5	-.495	.613	5	.0000	-.00297	.03246	.0000	.0000	.0640
6	-.613	.860	6	.0000	-.00294	.02950	.0000	.0000	.1280
7	-.860	1.297	7	.0000	-.00291	.02658	.0000	.0000	.1920
8	-1.297	1.874	8	.0710	-.00286	.02369	.1974	.0000	.2035
9	-1.874	2.265	9	.1832	-.00278	.02084	.1818	.0000	.0000
10	-2.265	2.493	10	.1621	-.00269	.01808	.1606	.0000	.0000
11	-2.493	2.578	11	.1403	-.00257	.01542	.1389	.0000	.0000
12	-2.578	2.544	12	.1185	-.00246	.01288	.1174	.0000	.0000
13	-2.544	2.412	13	.0972	-.00233	.01046	.0963	.0000	.0000
14	-2.412	2.202	14	.0765	-.00222	.00816	.0758	.0000	.0000
15	-2.202	1.935	15	.0565	-.00211	.00597	.0560	.0000	.0000
16	-1.935	1.630	16	.0371	-.00201	.00389	.0367	.0000	.0000
17	-1.630	1.307	17	.0183	-.00193	.00190	.0181	.0000	.0000
18	-1.307	.984	18	-.0001	-.00186	-.00001	-.0001	.0000	.0000
19	-.984	.679	19	-.0181	-.00181	-.00186	-.0179	.0000	.0000
20	-.679	.411	20	-.0358	-.00177	-.00366	-.0354	.0000	.0000
21	-.411	.196	21	-.0534	-.00174	-.00543	-.0529	.0000	.0000
22	-.196	.054	22	-.0710	-.00173	-.00718	-.0703	.0000	.0000
23	-.053	.000	23	-.0887	-.00172	-.00892	-.0878	.0000	.0000
			24	-.0532	-.00172	-.01065	-.1055	.0000	.0000

SUM SPRING FORCES = .6405 VS SUM APPLIED FORCES = .6425 KIPS

APPLIED FORCES ADJUSTED FOR NON LINEAR SOIL REACTIONS WHEN SPRINGS ARE ZEROED

DEFLECTION AT ELEV. 14.0 = (.04474 * 12.0) + (.00304 * 12.0 * 7.75) = .820 IN.

SUMMARY SHEET

REFERENCE: "FOUNDATION ANALYSIS AND DESIGN" BY J.E. BOWLES, FOURTH EDITION, 1988, CHAPTERS 4 AND 13

CASES 1, 2, 3 AND 4 ARE BASED ON VALUES FROM TABLE 4-2. WEIGHT OF CONCRETE, AFTER FORMS ARE REMOVED, IS APPLIED AT TOP OF SHEET PILE. A MOMENT DUE TO ECCENTRICITY OF WEIGHT AND A HORIZONTAL FORCE TO ACCOUNT FOR SHEET PILE BATTER ARE APPLIED AT ELEVATION 6.25 FEET.

PITTMAN SHEET PILE - CASE 1 - WATER PRESSURE AT NODES 4 THRU 8 - KS LOW
DEFLECTION AT ELEV. 14.0 = $(.02945 * 12.0) + (.00216 * 12.0 * 7.75) = .554$ IN.

PITTMAN SHEET PILE - CASE 2 - WATER PRESSURE AT NODES 4 THRU 8 - KS AVERAGE
DEFLECTION AT ELEV. 14.0 = $(.02347 * 12.0) + (.00181 * 12.0 * 7.75) = .450$ IN.

PITTMAN SHEET PILE - CASE 3 - WATER PRESSURE AT NODES 4 THRU 8 - KS LOW
DEFLECTION AT ELEV. 14.0 = $(.02659 * 12.0) + (.00196 * 12.0 * 7.75) = .501$ IN.

ADDITIONAL PENETRATION = $19.19 - 16.16 = 3.03$ FT.

PITTMAN SHEET PILE - CASE 4 - WATER PRESSURE AT NODES 4 THRU 8 - KS LOW
DEFLECTION AT ELEV. 14.0 = $(.02507 * 12.0) + (.00187 * 12.0 * 7.75) = .475$ IN.

ADDITIONAL PENETRATION = $30.30 - 16.16 = 14.14$ FT.

NOTE: CASE 3 ASSUMES 3.03 FT. OF ADDITIONAL PENETRATION AND ONLY REDUCES THE DEFLECTION AT ELEV. 14.0 BY .053 IN. RELATIVE TO CASE 1

CASE 4 ASSUMES 14.14 FT. OF ADDITIONAL PENETRATION AND ONLY REDUCES THE DEFLECTION AT ELEV. 14.0 BY .079 IN. RELATIVE TO CASE 1

CONCLUSION: ADDITIONAL PENETRATION WILL NOT REDUCE THE DEFLECTION TO WITHIN TOLERANCE .

CASES 1A, 2A, 3A AND 4A ARE BASED ON VALUES FROM TABLE 4-4. WEIGHT OF CONCRETE, AFTER FORMS ARE REMOVED, IS APPLIED AT TOP OF SHEET PILE. A MOMENT DUE TO ECCENTRICITY OF WEIGHT AND A HORIZONTAL FORCE TO ACCOUNT FOR SHEET PILE BATTER ARE APPLIED AT ELEVATION 6.25 FEET.

PITTMAN SHEET PILE - CASE 1A - WATER PRESSURE AT NODES 4 THRU 8 - KS LOW
DEFLECTION AT ELEV. 14.0 = $(.03172 * 12.0) + (.00229 * 12.0 * 7.75) = .594$ IN.

PITTMAN SHEET PILE - CASE 2A - WATER PRESSURE AT NODES 4 THRU 8 - KS AVERAGE
DEFLECTION AT ELEV. 14.0 = $(.02515 * 12.0) + (.00191 * 12.0 * 7.75) = .479$ IN.

PITTMAN SHEET PILE - CASE 3A - WATER PRESSURE AT NODES 4 THRU 8 - KS LOW
DEFLECTION AT ELEV. 14.0 = $(.02683 * 12.0) + (.00196 * 12.0 * 7.75) = .504$ IN.

ADDITIONAL PENETRATION = $23.23 - 16.16 = 7.07$ FT.

PITTMAN SHEET PILE - CASE 4A - WATER PRESSURE AT NODES 4 THRU 8 - KS LOW
DEFLECTION AT ELEV. 14.0 = $(.02647 * 12.0) + (.00194 * 12.0 * 7.75) = .498$ IN.

ADDITIONAL PENETRATION = $30.30 - 16.16 = 14.14$ FT.

NOTE: CASE 3A ASSUMES 7.07 FT. OF ADDITIONAL PENETRATION AND ONLY REDUCES THE DEFLECTION AT ELEV. 14.0 BY .090 IN. RELATIVE TO CASE 1A

CASE 4A ASSUMES 14.14 FT. OF ADDITIONAL PENETRATION AND ONLY REDUCES THE DEFLECTION AT ELEV. 14.0 BY .096 IN. RELATIVE TO CASE 1A

CONCLUSION: ADDITIONAL PENETRATION WILL NOT REDUCE THE DEFLECTION TO WITHIN TOLERANCE

THIS CASE ASSUMES THAT 900 POUNDS LATERAL FORCE CAN BE APPLIED AT NODE 8 TOWARDS PROTECTED SIDE

PITTMAN SHEET PILE - CASE 2B - WATER PRESSURE AT NODES 4 THRU 8 - KS AVERAGE
DEFLECTION AT ELEV. 14.0 = $(.00004 * 12.0) + (.00026 * 12.0 * 7.75) = .025$ IN.

PITTMAN CONSTRUCTION CO., INC.

GENERAL CONTRACTORS

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Mailing Address:
P.O. Box 8116
New Orleans, LA 70182

July 27, 1994

Mr. Dennis Duhon
Department of the Army
U. S. Army Engineer District
New Orleans District
Corps of Engineers
CELMN-CD-NO
P.O. Box 60267
New Orleans, LA 70160-0267

Re: Contract No. DACW29-93-C-0081
For construction of Lake
Pontchartrain Louisiana and Vicinity,
Hurricane Protection Project, High
Level Plan, 17th Street Outfall Canal,
Flood Protection Improvement Project,
Capping of Floodwalls, East Side
Improvements, Orleans Parish, Louisiana
Job #114/PCCI #201

Dear Mr. Duhon:

This letter confirms our telephone conversation at approximately 1:40 this afternoon. You advised the writer that you and other C.O.E. personnel discussed my request to permit me and Mr. Herbert J. Roussel, Jr. to meet and provide you and other C.O.E. personnel with the Roussel Engineering, Inc. July 27, 1994 Report (copy enclosed). We regret that you declined to let us meet with you today. You further advised that PCCI should provide the report for you and the other C.O.E. personnel to review and then sometime in the near future, you and the other C.O.E. personnel might agree to let us meet with you all, and that you would then respond to the Roussel Engineering, Inc. Report herewith enclosed.

Mr. Roussel and I were hoping that we would be permitted to provide to you and some of your technical engineers further input, if so required, regarding the enclosed Report. We certainly did not expect any decisions from you or the technical engineers in your office today.

We are aware of the fact that you and other C.O.E. personnel are very busy. We do not expect to receive any special consideration; however, we thought that, inasmuch as you and Mr. Chester Ashley were in attendance during the placement of concrete

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Corps of Engineers
July 27, 1994
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and the special testing on Monolith Number 108 that was video taped, perhaps you, Mr. Chester Ashley and your other technical engineers would be interested in discussing this matter with Mr. Roussel.

Mr. Duhon, please be advised that PCCI has not responded to three letters from the C.O.E. to PCCI signed by Mr. Chester Ashley that are dated: July 11, 1994, July 15, 1994 & July 22, 1994, pending the completion of the tests that were detailed and conducted by Roussel Engineering, Inc. that were started shortly after our July 12, 1994 meeting in your office and completed yesterday (July 26, 1994).

The enclosed Roussel Engineering, Inc. Report provides detailed information that substantiates the position of PCCI for the entitlement of monetary consideration due to the C.O.E. design deficiencies.

Needless to say, PCCI is in total disagreement with the C.O.E.'s July 22, 1994 letter signed by Mr. Chester Ashley, -in particular, the last sentence on page 2 which states: "Your alleged claim for additional compensation has no merit."

PCCI certainly will continue to perform the work included in the scope of its contract for this project; however, we hereby request an early meeting, hopefully, this week, to discuss the remaining work yet to be performed on the project and to obtain the the C.O.E.'s position in view of the Roussel Engineering, Inc. Report.

We trust you understand our position. Rest assured of our cooperation. Hopefully we will be able to negotiate a settlement on this matter with the C.O.E. without the necessity of litigation.

Respectfully submitted,

PITTMAN CONSTRUCTION CO., INC.



A. E. Pittman,
President

AEP/dpv

Corps of Engineers
July 27, 1994
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cc: Ms. Diane Pecoul
Mr. Joe Towers
Mr. Chester Ashley ←
Mr. Richard Hill
Mr. Jim Richardson
Mr. George Stoll
Mr. Herbert Roussell
Mr. Gerry Gallinghouse
Mr. C. A. Pittman
Mr. Chad Frierson