MODJESKI & MASTERS
ENGINEERS

Project 17TH STREET CANAL

Subject TIED - BACK WALL - EAST
LEVEE NEAR PUMP STA #6

Made by MLS 28 MAR 88
Date

Checked by _____
Date

Sheet No. _____ of _____

(A0006745)

(SWB DATUM)

(SHRINKAGE & TEMP. STEEL REQ'D IN CAP)

ELEV. 27.5

HP 14x73

ELEV 26.0

ELEV. 26.0

6"

NORMAL WATER

Existing wall and bracing pile to be removed after completion of new wall

45°

TIE BACK
(EMBED ± 35' INTO SAND STRATA : EL. -25)

PZ 27

ELEV -16.0

00 S.W.B. DATUM
= -21.0 MSL

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Made by: MLS Date: 28 MAR [illegible]
Checked by: ____ Date: ____
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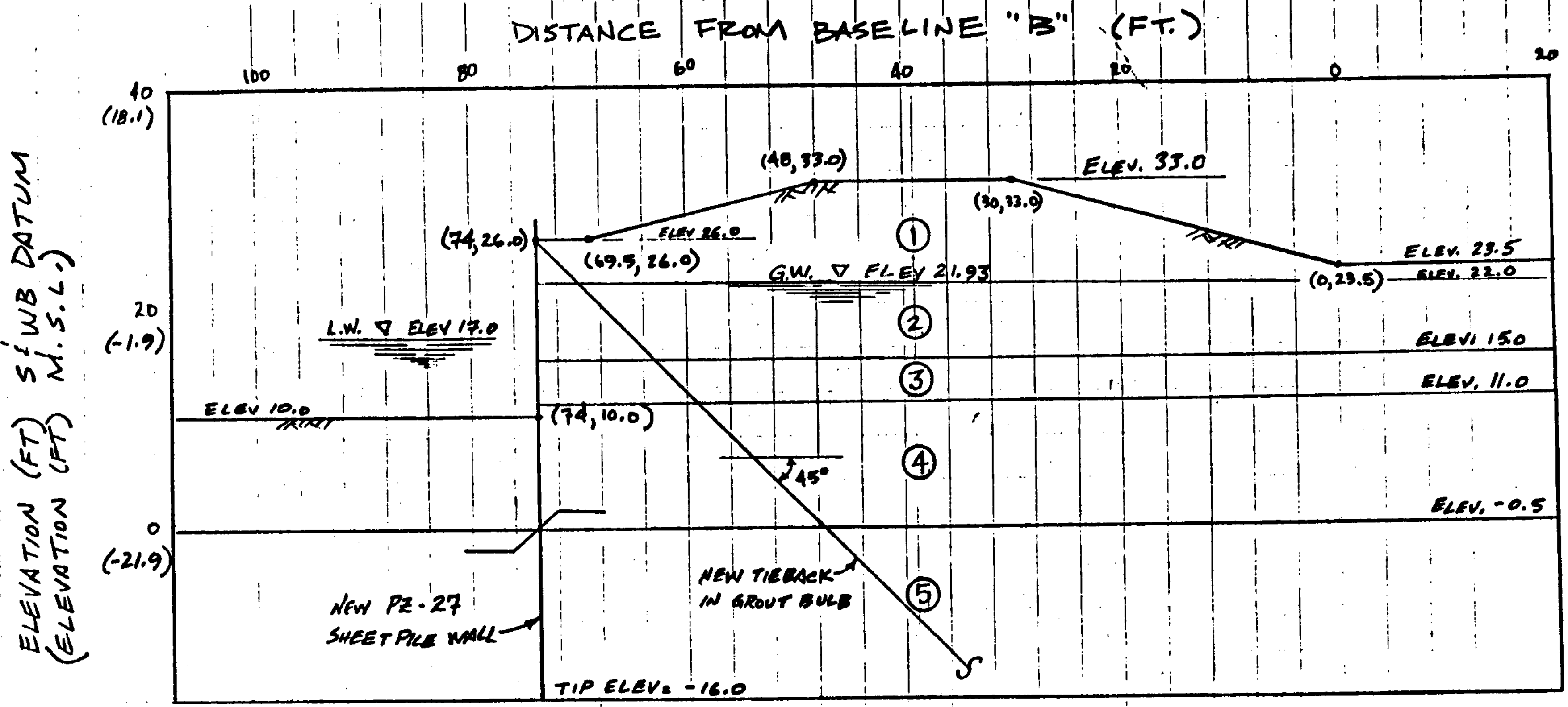

SOIL PARAMETERS

STRATA NO.	UNIT WEIGHT (PCF)	Q-CASE COHESION (PSF)	S-CASE ANGLE OF FRICTION (DEG.)
1	114	700	25
2	114	520	23
3	114	720	25
4	114	480	23
5	120	0	30

STABILITY ANALYSIS:

$\Sigma R = R_A + R_B + R_P + AF$
$= 36,980 + 10,337 + 10,080 + 5961$
$= 63,358$

$\Sigma D = D_A - D_P$
$= 46,251 - 2844$
$= 43,407$

$FS = 63,358 \div 43,407 = 1.46$

MODJESKI & MASTERS ENGINEERS

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Made by: MLS Date: 28 Mar 88
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Sheet No. ______ of ______

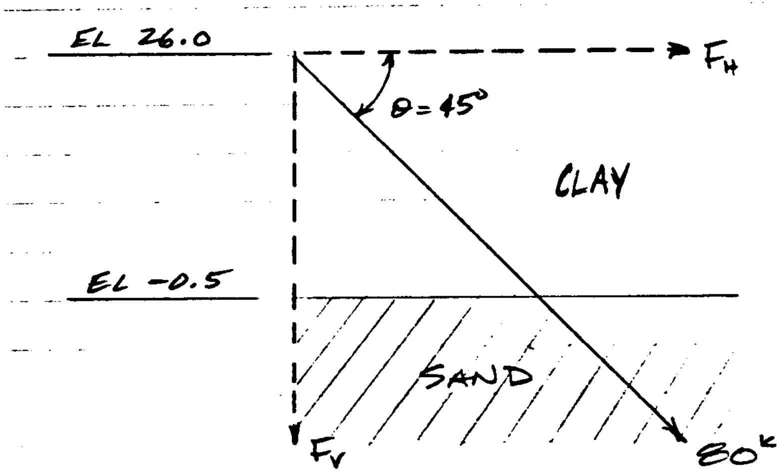
MINIMUM TIP EL = −16.0 SWB DATUM
ANCHOR FORCE = 5.96 k/f (w/ ANCHOR @ EL. 26.0)
BENDING MOMENT = 59.3 ft-k/ft (@ EL 11.3)

SHEET PILE:

$S_{REQ'D} = (59.3^{ft\text{-}k/ft} \times 12^{in/ft}) \div 24^{ksi} = 29.7 \ in^3/ft$

PZ 27 HAS 30.2 in³/ft > 29.7 in³/ft

TIE BACK:



ULT. STRENGTH EXCEEDS: 105ᵏ(1.5) = 157.5ᵏ (150%)

w/ F.S. = 2.0
ALLOW = 157.5 ÷ 2 = 78.8ᵏ
SAY 80ᵏ

$F_H = 80^k \times \cos 45^\circ = 56.6^k$

SPACING OF RODS = 56.6ᵏ ÷ 5.96 k/f = 9.50' → SAY 9'-0" o.c.

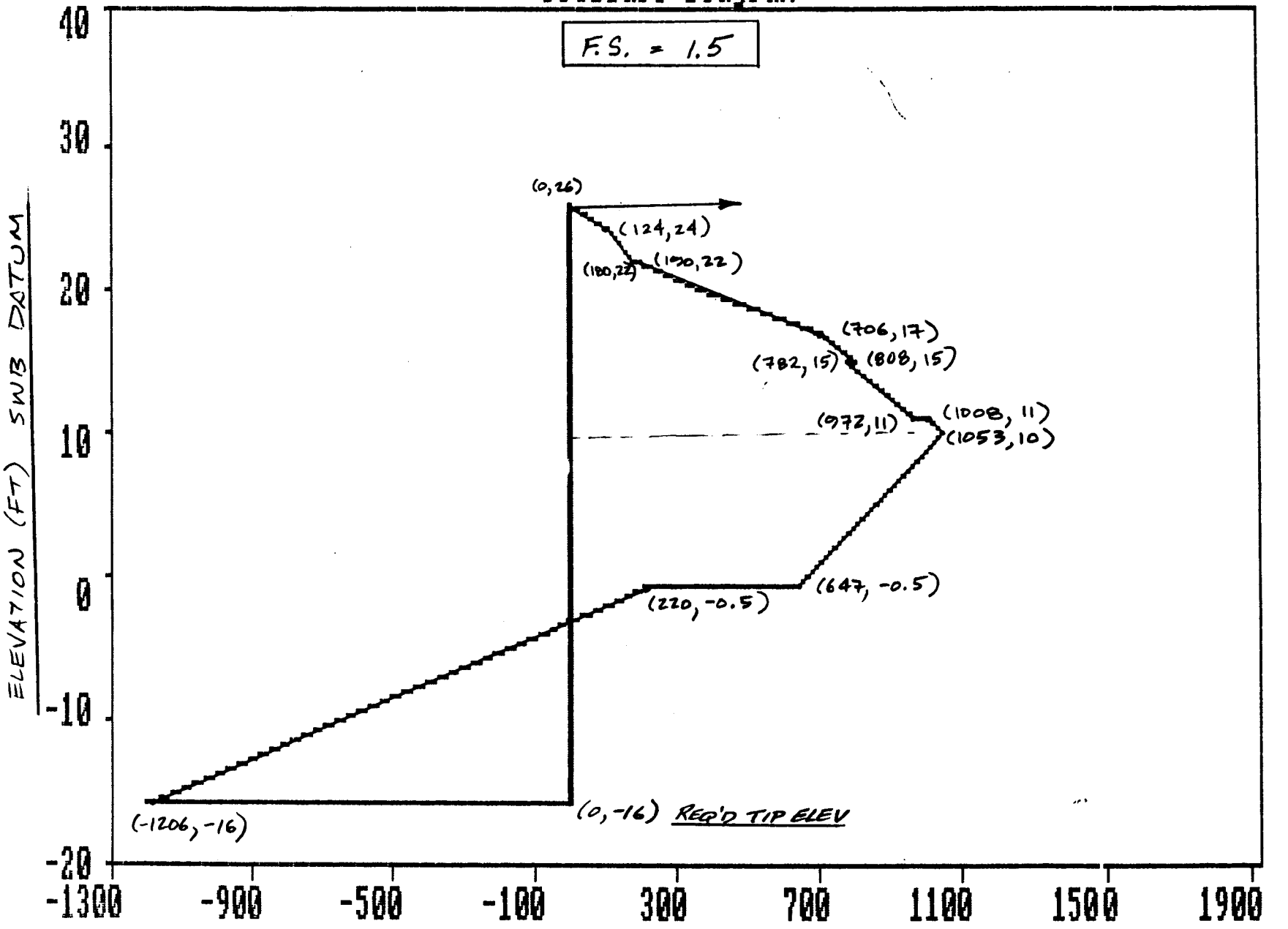
LENGTH OF ROD BEHIND ANCHORAGE FOR 35' OF EMBEDMENT INTO SAND:

35 + (26.5/cos 45) = 72.5' (< 80' O.K.)

NO. OF RODS REQ'D = 138.5' ÷ 9.0' = 15.4 → 16 RODS

1'-9" | 15 SPA. @ 9'-0" = 135'-0" | 1'-9"
138.5'

Pressure Diagram



water is not at the top of ground behind the wall

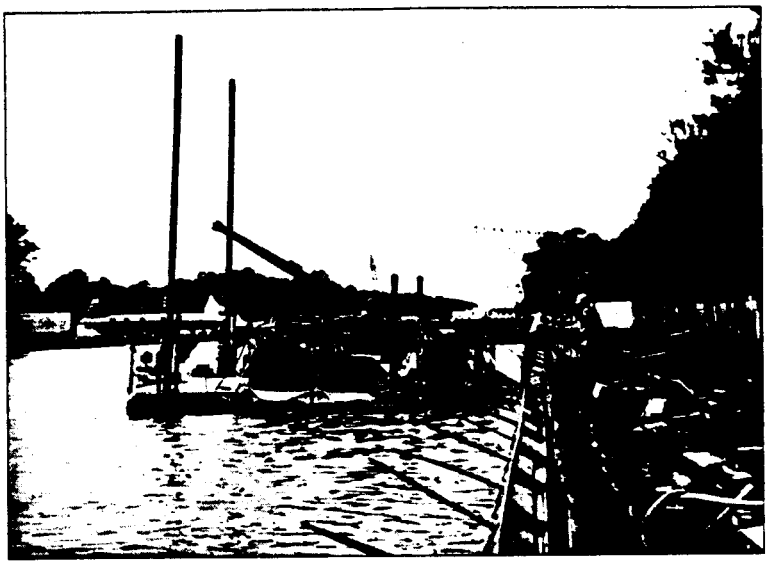
TIEBACKS

Case Study No. 2

Tiebacks Support Canal Bulkhead

TIEBACK APPLICATION

The steel sheet pile walls along the Intracoastal Waterway in Virginia had become severely corroded by the acidic and brackish water. A new bulkhead, constructed of coal-tar epoxy coated steel sheet piling, was driven in front of the existing wall. A soil anchor tieback system was required to secure the new bulkhead.



LOCALITY

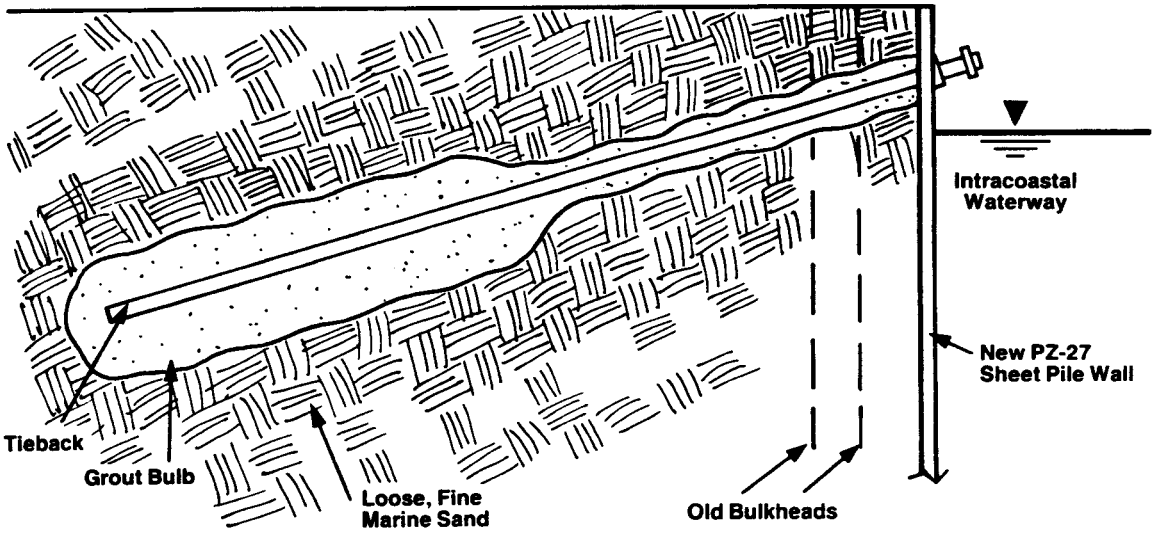
Chesapeake, Virginia

WHAT HAD TO BE DONE

Working on three separate phases of the project, Geo-Con installed 350 permanent soil anchors. The anchors were drilled off of a specially fabricated barge which also served as a work platform. Holes were drilled by advancing steel casing to depths up to 80' through 2 to 4 existing buried wood and steel bulkheads. Special coring equipment had to be used to penetrate the various obstructions. After the hole was drilled, the tendon strands with double corrosion protection were placed inside the steel casing. The casing was then slowly extracted and the bond length was pressure grouted to form a "grout bulb" in the soil. After sufficient curing time for the grout had elapsed, the anchors with capacities from 70 to 105 kips, were stressed and tested by Geo-Con personnel. The anchor head was completely encapsulated to provide corrosion protection for the entire anchor.

COMMENTS

To maintain the flow of barge and boat traffic, a flexible and cooperative work schedule was required. Special safety equipment was also used to insure that no contaminants entered the waterway from our work.



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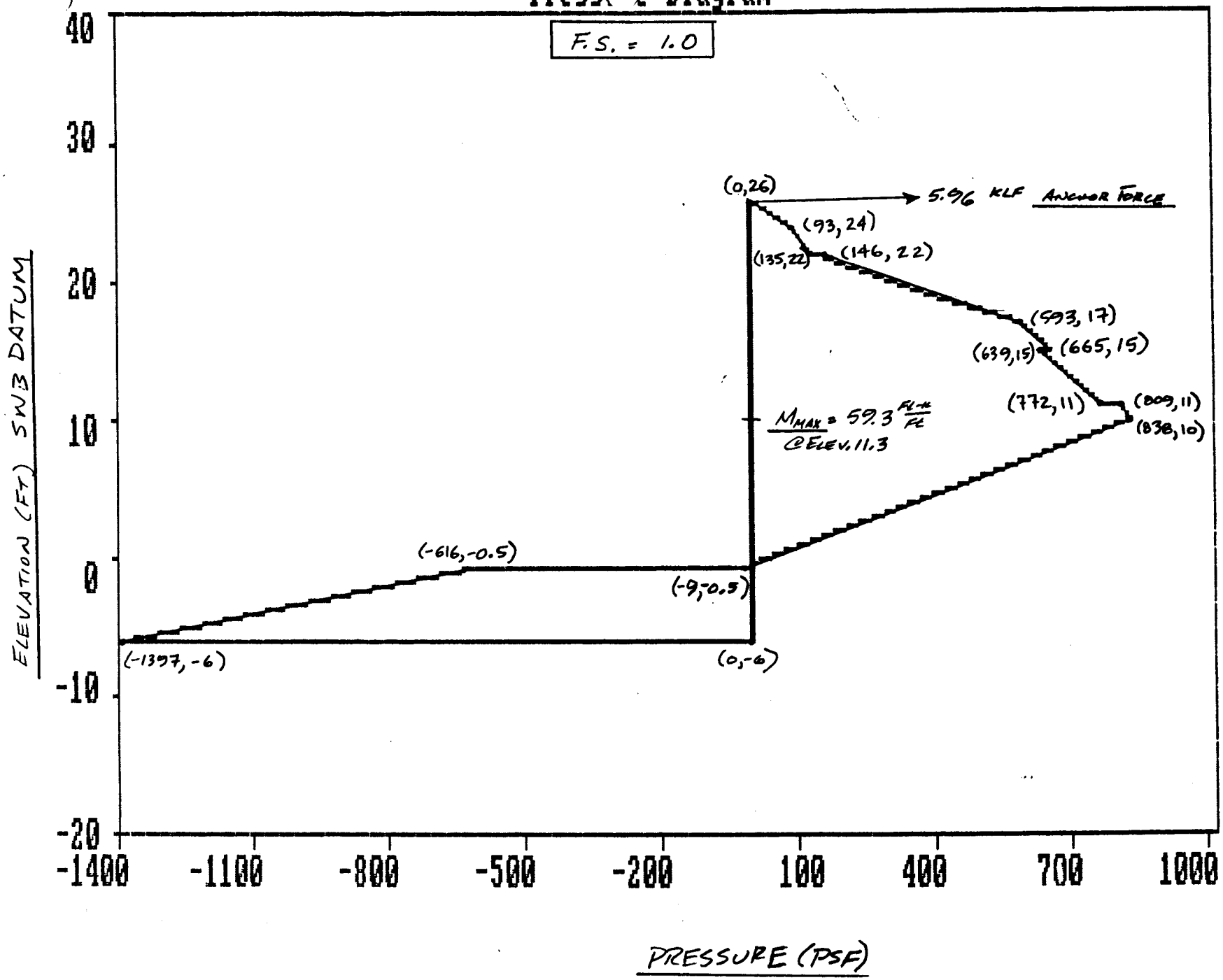
Pressure Diagram



COST ESTIMATE

TIE BACKS: 16 REQ'D @ $10,000 EA. = 160,000

SHEET PILE: $(26+16)(138.5)(27)(1050)/2000$ = 82,456

WALE (HP 14x73): $(73)(137)(\$0.80/\#)$ = 8,001

CONCRETE CAP W/REINF: $(3.0)(2.75)(138.5)(\$250/CY)/27$ = 10,580

EARTHWORK: = 5,000

$266,037

CONTINGENCIES (15%) 39,905

$305,943

$306,000

4/27/88

MODJESKI + MASTERS
BULKHEAD EAST SIDE OF PUMP STA 17th St Canal
Q FILE F.S. = 1.0 & Q17P

Frank Vojkovich

4/27/88

MODJESKI + MASTERS

BULKHEAD EAST SIDE OF PUMP STA 17th St Canal

Q FILE F.S. = 1.0 & Q17P

DRW27A
DRW35A
PZ40A

Frank Vojkovich

			DEFL.	MMAX	fs
	Q17P0	DRW27A			
Q17P0	Q17P01	DRW35A	2.16"	88,300	
	Q17P02	PZ40A	1.59	88,300	

Q17P FS = 1,0 S-CASE

f_{SMAX} = 11.7 ksi PILE TIP -8.32

ANCHOR LOAD = 9050 #/FT

	I_{xx}	A_{EFF}	f_s (#/IN²)	M_b (FT-#)	DEFL. (IN)
PZ 27	184.20	3.0	3,016	88295 M_{MAX} = ~~44,167~~ 45,299	3.15
PZ 35	361.22	3.95	2291	88295 M_{MAX} = ~~70,931~~ 72,749	2.15
PZ 40	490.85	4.91	1843	88295 M_{MAX} = ~~88773~~ 91,000	1.59

LI Q17PO

BEAMS (SHEAR, MOMENT, DEFLECTION)

17TH STR. -Q17P-SWL=17-BULKHD EAST OF PUMP STA-FS=1.0 S CAS
LKH

THE REFERENCE SYSTEM SELECTED DEFINES POSITIVE FORCES AS TO THE LEFT INCREASING MEMBER COORDINATES AS UPWARD, AND POSITIVE MOMENTS AS COUNTERCLOCKWISE.

THE MAXIMUM DEFLECTION IS -8.71 INCHES AND OCCURS AT MEMBER COORDINATE 26.10 FT.

Z27 HAS BEEN GIVEN TO SUPPORT THE LOAD SYSTEM.

THE WEIGHT OF THIS VERTICAL MEMBER HAS BEEN NEGLECTED.

CALCULATED EXTERNAL LOADS

DISTANCE FROM REFERENCE(FT)	TYPE OF LOAD	MAGNITUDE OF LOAD
-8.32	POINT LD	-5.71 LBF
26.00	POINT LD	-18100.40 LBF

INPUTTED LOADS

DISTANCE FROM REFERENCE(FT)	TYPE OF LOAD	MAGNITUDE OF LOAD
26.10	CONTN LD	0.00 LBF/SQ FT
26.00	CONTN LD	4.99 LBF/SQ FT
26.00	CONTN LD	4.99 LBF/SQ FT
26.00	CONTN LD	4.99 LBF/SQ FT
26.00	POINT LD	9050.29 LBF
25.00	CONTN LD	90.06 LBF/SQ FT
24.00	CONTN LD	175.12 LBF/SQ FT
23.00	CONTN LD	260.18 LBF/SQ FT
22.00	CONTN LD	345.24 LBF/SQ FT
22.00	CONTN LD	345.24 LBF/SQ FT
21.00	CONTN LD	430.30 LBF/SQ FT
20.00	CONTN LD	515.36 LBF/SQ FT
19.00	CONTN LD	604.48 LBF/SQ FT
18.00	CONTN LD	703.02 LBF/SQ FT
17.00	CONTN LD	801.55 LBF/SQ FT
16.00	CONTN LD	837.58 LBF/SQ FT
15.00	CONTN LD	873.61 LBF/SQ FT
15.00	CONTN LD	873.61 LBF/SQ FT

```
          14.00  CONTN LD      909.64 LBF/SQ FT
          13.00  CONTN LD      945.68 LBF/SQ FT
          12.00  CONTN LD      981.71 LBF/SQ FT
          11.00  CONTN LD     1017.74 LBF/SQ FT
          11.00  CONTN LD     1017.74 LBF/SQ FT
          10.00  CONTN LD     1053.77 LBF/SQ FT
          10.00  CONTN LD     1053.77 LBF/SQ FT
           9.00  CONTN LD      972.25 LBF/SQ FT
           8.00  CONTN LD      890.72 LBF/SQ FT
           7.00  CONTN LD      809.20 LBF/SQ FT
           6.00  CONTN LD      727.68 LBF/SQ FT
           5.00  CONTN LD      646.15 LBF/SQ FT
           4.00  CONTN LD      564.63 LBF/SQ FT
           3.00  CONTN LD      483.11 LBF/SQ FT
           2.00  CONTN LD      401.58 LBF/SQ FT

           1.00  CONTN LD      320.06 LBF/SQ FT
           0.00  CONTN LD      238.54 LBF/SQ FT
          -0.50  CONTN LD      197.78 LBF/SQ FT
          -0.50  CONTN LD        0.00 LBF/SQ FT
          -0.50  CONTN LD     -398.09 LBF/SQ FT
          -1.50  CONTN LD     -542.48 LBF/SQ FT
          -2.50  CONTN LD     -686.88 LBF/SQ FT
          -3.50  CONTN LD     -831.27 LBF/SQ FT
          -4.50  CONTN LD     -975.66 LBF/SQ FT
          -5.50  CONTN LD    -1120.06 LBF/SQ FT
          -6.50  CONTN LD    -1264.45 LBF/SQ FT
          -7.50  CONTN LD    -1412.17 LBF/SQ FT
          -8.32  CONTN LD    -1538.48 LBF/SQ FT
          -8.32  CONTN LD        0.00 LBF/SQ FT


 Z27            PROPERTIES ARE AS FOLLOWS.


 MOMENT OF INERTIA=  184.20 IN. TO THE 4TH PER FOOT OF WALL
 CROSS SECTIONAL AREA=    3.00 SQ IN.
 ELASTIC MODULUS=  29000000. LBF/SQ IN.
 DEFLECTION REFERENCE IS AT  -8.320


  THE MAXIMUM BENDING MOMENT IS -88294.75 LBF-FT AND OCCURS AT   10.94
  WHICH HAS THE SHEAR FORCE OF    -1.06 LBF.

                                                          DEFLECTION  DEFL.FROM A
                                                          FROM TANG.  PARALLEL TO THE
                                                           THRU DEFLE  UNDEFORMED AXIS
 DISTANCE  SHEAR FOR  SHEAR STR  BENDING MOM  REFERENCE   & THRU DEFL REF
 (FEET)     (LBF)    (LBF/SQIN)   (LBF-FT)    (INCHES)   NOTE SIGN (IN.)

  26.100       0.00       0.00         0.00     -8.7058      -0.0302
  26.099       0.00       0.00         0.00     -8.7053      -0.0299
  26.001       0.24       0.08         0.01     -8.6504       0.0003
  25.999   -9049.86   -3016.62        -9.04     -8.6487       0.0014
  25.000   -9002.34   -3000.78     -9033.18     -8.0900       0.3083
  24.000   -8869.75   -2956.58    -17976.31     -7.5337       0.6126
  23.000   -8652.10   -2884.03    -26744.33     -6.9832       0.9111
  22.000   -8349.39   -2783.13    -35252.16     -6.4413       1.2009
  21.000   -7961.62   -2653.87    -43414.75     -5.9108       1.4794
```

113	20.000	-7488.79	-2496.26	-51147.04	-5.3943	1.7438
114	19.000	-6928.87	-2309.62	-58363.30	-4.8943	1.9917
115	18.000	-6275.12	-2091.71	-64973.50	-4.4132	2.2208
116	17.000	-5522.83	-1840.94	-70880.69	-3.9531	2.4289
117	16.000	-4703.27	-1567.76	-75996.74	-3.5158	2.6141
118	15.000	-3847.67	-1282.56	-80275.21	-3.1031	2.7747
119	14.000	-2956.05	-985.35	-83680.08	-2.7163	2.9095
120	13.000	-2028.39	-676.13	-86175.30	-2.3565	3.0172
121	12.000	-1064.69	-354.90	-87724.84	-2.0246	3.0971
122	11.000	-64.97	-21.66	-88292.68	-1.7210	3.1486
123	10.937	-1.06	-0.35	-88294.75	-1.7029	3.1509
124	10.000	970.79	323.60	-87842.77	-1.4459	3.1717
125	9.000	1983.80	661.27	-86358.68	-1.1991	3.1664
126	8.000	2915.28	971.76	-83902.35	-0.9802	3.1332
127	7.000	3765.24	1255.08	-80555.30	-0.7885	3.0729
128	6.000	4533.68	1511.23	-76399.04	-0.6227	2.9866
129	5.000	5220.60	1740.20	-71515.11	-0.4816	2.8757
130	4.000	5825.99	1942.00	-65985.02	-0.3637	2.7416
131	3.000	6349.86	2116.62	-59890.31	-0.2670	2.5862
132	2.000	6792.20	2264.07	-53312.48	-0.1897	2.4115
133	1.000	7153.02	2384.34	-46333.08	-0.1296	2.2195
134	0.000	7432.32	2477.44	-39033.61	-0.0844	2.0126
135	-0.500	7541.40	2513.80	-35289.33	-0.0668	1.9043
136	-1.000	7324.31	2441.44	-31571.40	-0.0519	1.7931
137	-2.000	6781.83	2260.61	-24506.30	-0.0297	1.5633
138	-3.000	6094.95	2031.65	-18055.88	-0.0153	1.3256
139	-4.000	5263.68	1754.56	-12364.54	-0.0069	1.0819
140	-5.000	4288.02	1429.34	-7576.66	-0.0025	0.8343
141	-6.000	3167.96	1055.99	-3836.64	-0.0007	0.5841
142	-7.000	1903.09	634.36	-1288.94	-0.0001	0.3326
143	-8.000	490.13	163.38	-79.75	0.0000	0.0807
144	-8.319	7.24	2.41	-0.01	0.0000	0.0003
145	-8.320	0.00	0.00	0.00	0.0000	0.0000
146						
147						
148						
149	*RUN COMPLETED*					
150						

EOT..

```
LIST DRW27A
1 100 2 26.1 -8.32 1 -8.32 0 -1 26
2 200 PZ27
3 300 29000000 3.0 184.2
4 400 -8.32 26.0
EOT..
```

```
LI Q17PO
1
2                        BEAMS (SHEAR, MOMENT, DEFLECTION)
3
4
5    17TH STR. -Q17P-SWL=17-BULKHD EAST OF PUMP STA-FS=1.0 S CAS
6      LKH
7
8   THE REFERENCE SYSTEM SELECTED DEFINES POSITIVE FORCES AS TO THE LEFT
9   INCREASING MEMBER COORDINATES AS UPWARD, AND POSITIVE MOMENTS
10   AS COUNTERCLOCKWISE.
11
```

```
127     7.000     3765.24     1255.08     -80555.30      -0.7885       3.0729
128     6.000     4533.68     1511.23     -76399.04      -0.6227       2.9866
129     5.000     5220.60     1740.20     -71515.11      -0.4816       2.8757
130     4.000     5825.99     1942.00     -65985.02      -0.3637       2.7416
        3.000     6349.86     2116.62     -59890.31      -0.2670       2.5862
132     2.000     6792.20     2264.07     -53312.48      -0.1897       2.4115
133     1.000     7153.02     2384.34     -46333.08      -0.1296       2.2195
134     0.000     7432.32     2477.44     -39033.61      -0.0844       2.0126
135    -0.500     7541.40     2513.80     -35289.33      -0.0668       1.9043
136    -1.000     7324.31     2441.44     -31571.40      -0.0519       1.7931
137    -2.000     6781.83     2260.61     -24506.30      -0.0297       1.5633
138    -3.000     6094.95     2031.65     -18055.88      -0.0153       1.3256

139    -4.000     5263.68     1754.56     -12364.54      -0.0069       1.0819
140    -5.000     4288.02     1429.34      -7576.66      -0.0025       0.8343
141    -6.000     3167.96     1055.99      -3836.64      -0.0007       0.5841
142    -7.000     1903.09      634.36      -1288.94      -0.0001       0.3326
143    -8.000      490.13      163.38        -79.75       0.0000       0.0807
144    -8.319        7.24        2.41         -0.01       0.0000       0.0003
145    -8.320        0.00        0.00          0.00       0.0000       0.0000
146
147
148
149  *RUN COMPLETED*
150
EOT..
LI DRW27A
1 100 2 26.1 -8.32 1 -8.32 0 -1 26
2 200 PZ27
3 300 29000000 3.0 184.2
  00 -8.32 26.0
EOT..
LI Q17P01
1
2                        BEAMS (SHEAR, MOMENT, DEFLECTION)
3
4
5    17TH STR. -Q17P-SWL=17-BULKHD EAST OF PUMP STA-FS=1.0 S CAS
6      LKH
7
8   THE REFERENCE SYSTEM SELECTED DEFINES POSITIVE FORCES AS TO THE LEFT
9   INCREASING MEMBER COORDINATES AS UPWARD, AND POSITIVE MOMENTS
10   AS COUNTERCLOCKWISE.
11
12
13    THE MAXIMUM DEFLECTION IS  -4.44 INCHES AND OCCURS AT MEMBER COORDINATE
14    26.10 FT.
15
16
17
18   Z35           HAS BEEN GIVEN TO SUPPORT THE LOAD SYSTEM.
19
20   THE WEIGHT OF THIS VERTICAL MEMBER HAS BEEN NEGLECTED.
21
22
2        CALCULATED EXTERNAL LOADS

24
25   DISTANCE FROM    TYPE OF    MAGNITUDE OF
26   REFERENCE(FT)     LOAD             LOAD
```

-8.32	POINT LD	-5.71	LBF
26.00	POINT LD	-18100.40	LBF

INPUTTED LOADS

DISTANCE FROM REFERENCE(FT)	TYPE OF LOAD	MAGNITUDE OF LOAD	
26.10	CONTN LD	0.00	LBF/SQ FT
26.00	CONTN LD	4.99	LBF/SQ FT
26.00	CONTN LD	4.99	LBF/SQ FT
26.00	CONTN LD	4.99	LBF/SQ FT
26.00	POINT LD	9050.29	LBF
25.00	CONTN LD	90.06	LBF/SQ FT
24.00	CONTN LD	175.12	LBF/SQ FT
23.00	CONTN LD	260.18	LBF/SQ FT
22.00	CONTN LD	345.24	LBF/SQ FT
22.00	CONTN LD	345.24	LBF/SQ FT
21.00	CONTN LD	430.30	LBF/SQ FT
20.00	CONTN LD	515.36	LBF/SQ FT
19.00	CONTN LD	604.48	LBF/SQ FT
18.00	CONTN LD	703.02	LBF/SQ FT
17.00	CONTN LD	801.55	LBF/SQ FT
16.00	CONTN LD	837.58	LBF/SQ FT
15.00	CONTN LD	873.61	LBF/SQ FT
15.00	CONTN LD	873.61	LBF/SQ FT
14.00	CONTN LD	909.64	LBF/SQ FT
13.00	CONTN LD	945.68	LBF/SQ FT
12.00	CONTN LD	981.71	LBF/SQ FT
11.00	CONTN LD	1017.74	LBF/SQ FT
11.00	CONTN LD	1017.74	LBF/SQ FT
10.00	CONTN LD	1053.77	LBF/SQ FT
10.00	CONTN LD	1053.77	LBF/SQ FT
9.00	CONTN LD	972.25	LBF/SQ FT
8.00	CONTN LD	890.72	LBF/SQ FT
7.00	CONTN LD	809.20	LBF/SQ FT
6.00	CONTN LD	727.68	LBF/SQ FT
5.00	CONTN LD	646.15	LBF/SQ FT
4.00	CONTN LD	564.63	LBF/SQ FT
3.00	CONTN LD	483.11	LBF/SQ FT
2.00	CONTN LD	401.58	LBF/SQ FT
1.00	CONTN LD	320.06	LBF/SQ FT
0.00	CONTN LD	238.54	LBF/SQ FT
-0.50	CONTN LD	197.78	LBF/SQ FT
-0.50	CONTN LD	0.00	LBF/SQ FT
-0.50	CONTN LD	-398.09	LBF/SQ FT
-1.50	CONTN LD	-542.48	LBF/SQ FT
-2.50	CONTN LD	-686.88	LBF/SQ FT
-3.50	CONTN LD	-831.27	LBF/SQ FT
-4.50	CONTN LD	-975.66	LBF/SQ FT
-5.50	CONTN LD	-1120.06	LBF/SQ FT
-6.50	CONTN LD	-1264.45	LBF/SQ FT
-7.50	CONTN LD	-1412.17	LBF/SQ FT
-8.32	CONTN LD	-1538.48	LBF/SQ FT
-8.32	CONTN LD	0.00	LBF/SQ FT

Z35 PROPERTIES ARE AS FOLLOWS.

MOMENT OF INERTIA= 361.22 IN. TO THE 4TH PER FOOT OF WALL
CROSS SECTIONAL AREA= 3.95 SQ IN.
ELASTIC MODULUS= 29000000. LBF/SQ IN.
DEFLECTION REFERENCE IS AT -12.500

THE MAXIMUM BENDING MOMENT IS -88294.75 LBF-FT AND OCCURS AT 10.94
WHICH HAS THE SHEAR FORCE OF -1.06 LBF.

DISTANCE (FEET)	SHEAR FOR (LBF)	SHEAR STR (LBF/SQIN)	BENDING MOM (LBF-FT)	DEFLECTION FROM TANG. THRU DEFLE REFERENCE (INCHES)	DEFL.FROM A PARALLEL TO THE UNDEFORMED AXIS & THRU DEFL REF NOTE SIGN (IN.)
26.100	0.00	0.00	0.00	-4.4394	0.5218
26.099	0.00	0.00	0.00	-4.4391	0.5220
26.001	0.24	0.06	0.01	-4.4112	0.5374
25.999	-9049.86	-2291.10	-9.04	-4.4103	0.5380
25.000	-9002.34	-2279.07	-9033.18	-4.1254	0.6945
24.000	-8869.75	-2245.51	-17976.31	-3.8417	0.8496
23.000	-8652.10	-2190.40	-26744.33	-3.5610	1.0018
22.000	-8349.39	-2113.77	-35252.16	-3.2846	1.1496
21.000	-7961.62	-2015.60	-43414.75	-3.0141	1.2916
20.000	-7488.79	-1895.90	-51147.04	-2.7508	1.4265
19.000	-6928.87	-1754.14	-58363.30	-2.4958	1.5529
18.000	-6275.12	-1588.64	-64973.50	-2.2505	1.6697
17.000	-5522.83	-1398.19	-70880.69	-2.0158	1.7758
16.000	-4703.27	-1190.70	-75996.74	-1.7928	1.8703
15.000	-3847.67	-974.09	-80275.21	-1.5824	1.9522
14.000	-2956.05	-748.37	-83680.08	-1.3852	2.0209
13.000	-2028.39	-513.52	-86175.30	-1.2017	2.0758
12.000	-1064.69	-269.54	-87724.84	-1.0324	2.1166
11.000	-64.97	-16.45	-88292.68	-0.8776	2.1429
10.937	-1.06	-0.27	-88294.75	-0.8684	2.1440
10.000	970.79	245.77	-87842.77	-0.7373	2.1546
9.000	1983.80	502.23	-86358.68	-0.6115	2.1519
8.000	2915.28	738.05	-83902.35	-0.4999	2.1350
7.000	3765.24	953.23	-80555.30	-0.4021	2.1043
6.000	4533.68	1147.77	-76399.04	-0.3175	2.0603
5.000	5220.60	1321.67	-71515.11	-0.2456	2.0037
4.000	5825.99	1474.93	-65985.02	-0.1854	1.9353
3.000	6349.86	1607.56	-59890.31	-0.1361	1.8561
2.000	6792.20	1719.54	-53312.48	-0.0967	1.7670
1.000	7153.02	1810.89	-46333.08	-0.0661	1.6691
0.000	7432.32	1881.60	-39033.61	-0.0431	1.5636
-0.500	7541.40	1909.22	-35289.33	-0.0340	1.5083
-1.000	7324.31	1854.26	-31571.40	-0.0265	1.4516
-2.000	6781.83	1716.92	-24506.30	-0.0151	1.3344
-3.000	6094.95	1543.02	-18055.88	-0.0078	1.2132
-4.000	5263.68	1332.58	-12364.54	-0.0035	1.0890
-5.000	4288.02	1085.57	-7576.66	-0.0013	0.9627
-6.000	3167.96	802.01	-3836.64	-0.0003	0.8351

```
142    -7.000     1903.09      481.80     -1288.94       0.0000       0.7069
143    -8.000      490.13      124.08       -79.75       0.0000       0.5784
144    -8.319        7.24        1.83        -0.01       0.0000       0.5374
145    -8.321        0.00        0.00         0.00       0.0000       0.5371
       -9.000        0.00        0.00         0.00       0.0000       0.4499
147   -10.000        0.00        0.00         0.00       0.0000       0.3213
148   -11.000        0.00        0.00         0.00       0.0000       0.1928
149   -12.000        0.00        0.00         0.00       0.0000       0.0643
150   -12.499        0.00        0.00         0.00       0.0000       0.0001
151   -12.500        0.00        0.00         0.00       0.0000       0.0000
152
153
154
155   *RUN COMPLETED*
156
EOT..
LI DRW35A
1 100 2 26.1 -12.5 1 -12.5 0 -1 26
2 200 PZ35
3 300 29000000 3.95 361.22
4 400 -12.5 26
EOT..
LI Q17PO2
1
2                        BEAMS (SHEAR, MOMENT, DEFLECTION)
3
4
5    17TH STR. -Q17P-SWL=17-BULKHD EAST OF PUMP STA-FS=1.0 S CAS
6      LKH
7
8    THE REFERENCE SYSTEM SELECTED DEFINES POSITIVE FORCES AS TO THE LEFT
9    INCREASING MEMBER COORDINATES AS UPWARD, AND POSITIVE MOMENTS
10   AS COUNTERCLOCKWISE.
11
12
13    THE MAXIMUM DEFLECTION IS  -3.27 INCHES AND OCCURS AT MEMBER COORDINATE
14    26.10 FT.
15
16
17
18   Z40           HAS BEEN GIVEN TO SUPPORT THE LOAD SYSTEM.
19
20   THE WEIGHT OF THIS VERTICAL MEMBER HAS BEEN NEGLECTED.
21
22
23         CALCULATED EXTERNAL LOADS

24
25   DISTANCE FROM    TYPE OF    MAGNITUDE OF
26   REFERENCE(FT)     LOAD             LOAD
27
28           -8.32   POINT LD       -5.71 LBF
29           26.00   POINT LD   -18100.40 LBF
30
31
32                INPUTTED LOADS
33
34   DISTANCE FROM    TYPE OF    MAGNITUDE OF
35   REFERENCE(FT)     LOAD             LOAD
36
```

THE MAXIMUM BENDING MOMENT IS -88294.75 LBF-FT AND OCCURS AT 10.94
WHICH HAS THE SHEAR FORCE OF -1.06 LBF.

DISTANCE (FEET)	SHEAR FOR (LBF)	SHEAR STR (LBF/SQIN)	BENDING MOM (LBF-FT)	DEFLECTION FROM TANG. THRU DEFLE REFERENCE (INCHES)	DEFL.FROM A PARALLEL TO THE UNDEFORMED AXIS & THRU DEFL REF NOTE SIGN (IN.)
26.100	0.00	0.00	0.00	-3.2670	0.3840
26.099	0.00	0.00	0.00	-3.2668	0.3841
26.001	0.24	0.05	0.01	-3.2462	0.3955
25.999	-9049.86	-1843.15	-9.04	-3.2456	0.3959
25.000	-9002.34	-1833.47	-9033.18	-3.0359	0.5111
24.000	-8869.75	-1806.47	-17976.31	-2.8271	0.6253
23.000	-8652.10	-1762.14	-26744.33	-2.6205	0.7373
22.000	-8349.39	-1700.49	-35252.16	-2.4172	0.8460
21.000	-7961.62	-1621.51	-43414.75	-2.2181	0.9505
20.000	-7488.79	-1525.21	-51147.04	-2.0243	1.0498
19.000	-6928.87	-1411.17	-58363.30	-1.8367	1.1428
18.000	-6275.12	-1278.03	-64973.50	-1.6561	1.2288
17.000	-5522.83	-1124.81	-70880.69	-1.4835	1.3068
16.000	-4703.27	-957.90	-75996.74	-1.3194	1.3763
15.000	-3847.67	-783.64	-80275.21	-1.1645	1.4366
14.000	-2956.05	-602.05	-83680.08	-1.0193	1.4872
13.000	-2028.39	-413.11	-86175.30	-0.8843	1.5276
12.000	-1064.69	-216.84	-87724.84	-0.7598	1.5576
11.000	-64.97	-13.23	-88292.68	-0.6458	1.5770
10.937	-1.06	-0.22	-88294.75	-0.6390	1.5778
10.000	970.79	197.72	-87842.77	-0.5426	1.5856
9.000	1983.80	404.03	-86358.68	-0.4500	1.5836
8.000	2915.28	593.74	-83902.35	-0.3679	1.5712
7.000	3765.24	766.85	-80555.30	-0.2959	1.5485
6.000	4533.68	923.36	-76399.04	-0.2337	1.5162
5.000	5220.60	1063.26	-71515.11	-0.1807	1.4745
4.000	5825.99	1186.56	-65985.02	-0.1365	1.4242
3.000	6349.86	1293.25	-59890.31	-0.1002	1.3659
2.000	6792.20	1383.34	-53312.48	-0.0712	1.3003
1.000	7153.02	1456.83	-46333.08	-0.0486	1.2283
0.000	7432.32	1513.71	-39033.61	-0.0317	1.1506
-0.500	7541.40	1535.93	-35289.33	-0.0251	1.1100
-1.000	7324.31	1491.71	-31571.40	-0.0195	1.0683
-2.000	6781.83	1381.23	-24506.30	-0.0111	0.9820
-3.000	6094.95	1241.33	-18055.88	-0.0058	0.8928
-4.000	5263.68	1072.03	-12364.54	-0.0026	0.8014
-5.000	4288.02	873.32	-7576.66	-0.0009	0.7084
-6.000	3167.96	645.21	-3836.64	-0.0002	0.6146
-7.000	1903.09	387.60	-1288.94	0.0000	0.5202
-8.000	490.13	99.82	-79.75	0.0000	0.4256
-8.319	7.24	1.48	-0.01	0.0000	0.3955
-8.321	0.00	0.00	0.00	0.0000	0.3953
-9.000	0.00	0.00	0.00	0.0000	0.3311
-10.000	0.00	0.00	0.00	0.0000	0.2365
-11.000	0.00	0.00	0.00	0.0000	0.1419
-12.000	0.00	0.00	0.00	0.0000	0.0473
-12.499	0.00	0.00	0.00	0.0000	0.0001
-12.500	0.00	0.00	0.00	0.0000	0.0000

```
37          26.10   CONTN LD        0.00 LBF/SQ FT
38          26.00   CONTN LD        4.99 LBF/SQ FT
39          26.00   CONTN LD        4.99 LBF/SQ FT
40          26.00   CONTN LD        4.99 LBF/SQ FT
            26.00   POINT LD     9050.29 LBF
4           25.00   CONTN LD       90.06 LBF/SQ FT
43          24.00   CONTN LD      175.12 LBF/SQ FT
44          23.00   CONTN LD      260.18 LBF/SQ FT
45          22.00   CONTN LD      345.24 LBF/SQ FT
46          22.00   CONTN LD      345.24 LBF/SQ FT

47          21.00   CONTN LD      430.30 LBF/SQ FT
48          20.00   CONTN LD      515.36 LBF/SQ FT
49          19.00   CONTN LD      604.48 LBF/SQ FT
50          18.00   CONTN LD      703.02 LBF/SQ FT
51          17.00   CONTN LD      801.55 LBF/SQ FT
52          16.00   CONTN LD      837.58 LBF/SQ FT
53          15.00   CONTN LD      873.61 LBF/SQ FT
54          15.00   CONTN LD      873.61 LBF/SQ FT
55          14.00   CONTN LD      909.64 LBF/SQ FT
56          13.00   CONTN LD      945.68 LBF/SQ FT
57          12.00   CONTN LD      981.71 LBF/SQ FT
58          11.00   CONTN LD     1017.74 LBF/SQ FT
59          11.00   CONTN LD     1017.74 LBF/SQ FT
60          10.00   CONTN LD     1053.77 LBF/SQ FT
61          10.00   CONTN LD     1053.77 LBF/SQ FT
62           9.00   CONTN LD      972.25 LBF/SQ FT
63           8.00   CONTN LD      890.72 LBF/SQ FT
64           7.00   CONTN LD      809.20 LBF/SQ FT
65           6.00   CONTN LD      727.68 LBF/SQ FT
             5.00   CONTN LD      646.15 LBF/SQ FT
67           4.00   CONTN LD      564.63 LBF/SQ FT
68           3.00   CONTN LD      483.11 LBF/SQ FT
69           2.00   CONTN LD      401.58 LBF/SQ FT

70           1.00   CONTN LD      320.06 LBF/SQ FT
71           0.00   CONTN LD      238.54 LBF/SQ FT
72          -0.50   CONTN LD      197.78 LBF/SQ FT
73          -0.50   CONTN LD        0.00 LBF/SQ FT
74          -0.50   CONTN LD     -398.09 LBF/SQ FT
75          -1.50   CONTN LD     -542.48 LBF/SQ FT
76          -2.50   CONTN LD     -686.88 LBF/SQ FT
77          -3.50   CONTN LD     -831.27 LBF/SQ FT
78          -4.50   CONTN LD     -975.66 LBF/SQ FT
79          -5.50   CONTN LD    -1120.06 LBF/SQ FT
80          -6.50   CONTN LD    -1264.45 LBF/SQ FT
81          -7.50   CONTN LD    -1412.17 LBF/SQ FT
82          -8.32   CONTN LD    -1538.48 LBF/SQ FT
83          -8.32   CONTN LD        0.00 LBF/SQ FT
84
85
86  Z40           PROPERTIES ARE AS FOLLOWS.
87
88
89  MOMENT OF INERTIA=  490.85 IN. TO THE 4TH PER FOOT OF WALL
9   CROSS SECTIONAL AREA=    4.91 SQ IN.
9   ELASTIC MODULUS=  29000000. LBF/SQ IN.
92  DEFLECTION REFERENCE IS AT -12.500

93
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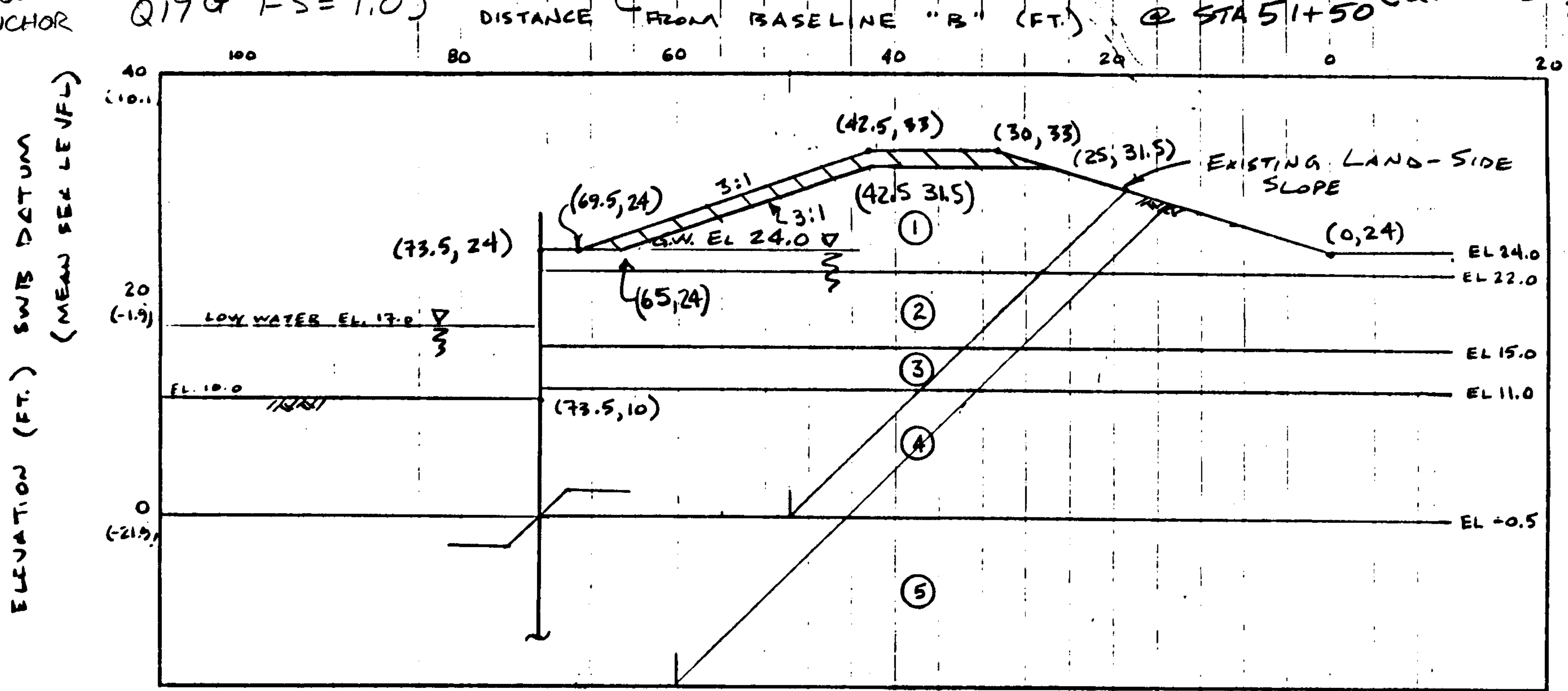
```
152
153
154
155  *RUN COMPLETED*
EOF..
LI PZ40A
1 100 2 26.1 -12.5 1 -12.5 0 -1 26
2 200 PZ40
3 300 29000000 4.91 490.85
4 400 -12.5 26.0
EOT..
```

H-BRACED 6 ∇A FS = 1.0 } S-CASE { ANCHOR EL 26.0, TIP -5.18, TOP 26.0, Q17A0, OUTPUT Q17A01 DRW35A Q17A02 } 40A 1.76"

C FS = 1.2 } S-CASE { 26.0, -8.87, 26.0, Q17C0, Q17C01 DRW35A Q17C02 PZ41A

GROUTED ANCHOR Q17F FS = 1.2 } S-CASE { 25.0 -8.69 25.0 | Q17FG { Q17F02 PZ40B

Q17G FS = 1.0 } 25.0 -5.34 25.0 | Q17G02 PZ40B



Q Files : I-wall

QPOA F.S. = 1.0 S-CASE

QPOB " = 1.5 "

QPOD " = 1.0 Q CASE

Note: Talked To Marth S. of Modjeski + Masters

Contractor wants to degrade existing levee to EL 31.0

Say's new I-wall is 15' in length Net EL 36.5. Say .5' overbuild

SOIL PARAMETERS

STRATA NO.	UNIT WEIGHT (PCF)	Q - CASE COHESION (PSF)	S - CASE ANGLE OF FRICTION (DEG.)
1	114	700	23
2	114	520	23
3	114	720	23
4	114	480	23
5	120	0	30

For new Section

Q Files : Q17A F.S. = 1.0 S-CASE } HAle braced

Q17B " = 1.2 "

Q17F " = 1.2 " } Tie back grouted

Q17G " = 1.0 "

STABILITY ANALYSIS:

$\Sigma R = R_A + R_B + R_P$

= 36,145 + 10,386 + 10,080

= 56,611

∴ 37.0 - 15.0 ⇒ TIP @ 22.0

Degrading levee new tip is 22.8 (OK)

~~$\Sigma D = D_A - D_P$~~ WRONG

~~= 44,545 - 2844~~

~~= 41,701~~

Revised F.S. = 1.30

$FS = \frac{\Sigma R}{\Sigma D}$ = ~~56,611 / 41,701~~

MODJESKI & MASTERS ENGINEERS

Project 17TH STREET CANAL

Subject WALL @ PUMP STA. #6 - ORLEANS LEVEE

PILE - BRACED WALL ALT.

Checked by

Sheet No. 2 of

MLS 13

SUMMARY

FILE	FS / CASE	SHEET PILE SECTION	M_{MAX}	$f_{s\,MAX}$	Δ	
Q17P	1.0 / S-CASE	PZ35	88,295* 21%	2291	2.15	
Q17P	1.0 / SCASE	PZ40	88,295	1843	1.59	
Q17A	1.0 / SCASE	PZ35	55138	1379	TOP 1/4" 1.12	H-BRACED
Q17A	1.0 / SCASE	PZ40	55138	1109	TOP .2" 0.83	H-BRACED
Q17C	1.2 / SCASE	PZ-35	70469	1706	TOP 0.01" 1.34	H-BRACED
Q17C	1.2 / S-CASE	PZ-40	70469	1372	TOP 0.01 0.99	H-BRACED
Q17F	1.2 / SCASE	PZ-40	66694	1412	TOP 0.02 0.89	TIE BACK ANCHORED
Q17G	1.0 / S-CASE	PZ40	52055	1183	TOP 0.18 0.74	TIE BACK ANCHORED
Q17F	1.2 / S-CASE	PZ35	66694	1755	TOP 0.03" 1.20"	TIE BACK ANCHORED
Q17G	1.0 / S-CASE	PZ35	52055	1470	TOP 0.25 1.00"	TIE BACK ANCHORED

* ALLOWABLE EXCEEDED

116	15.000	-3434.79	-699.55	-58466.19	-0.9259	0.7434
117	14.000	-2747.05	-559.48	-61559.26	-0.8133	0.7865
118	13.000	-2033.57	-414.17	-63951.71	-0.7082	0.8221
119	12.000	-1293.68	-263.48	-65617.59	-0.6108	0.8499
12	11.000	-518.75	-105.65	-66527.39	-0.5213	0.8698
12	10.366	-4.99	-1.02	-66694.39	-0.4688	0.8783
122	10.000	299.19	60.93	-66640.75	-0.4399	0.8817
123	9.000	1108.61	225.79	-65931.85	-0.3666	0.8854
124	8.000	1858.01	378.41	-64443.54	-0.3013	0.8812
125	7.000	2547.37	518.61	-62235.85	-0.2438	0.8692
126	6.000	3176.71	646.99	-59368.81	-0.1938	0.8496
127	5.000	3746.01	762.94	-55902.45	-0.1510	0.8228
128	4.000	4255.29	866.66	-51896.80	-0.1150	0.7893
129	3.000	4704.53	958.15	-47411.89	-0.0853	0.7494
130	2.000	5093.75	1037.42	-42507.75	-0.0613	0.7038
131	1.000	5422.93	1104.47	-37244.41	-0.0425	0.6531
132	0.000	5692.09	1159.29	-31681.89	-0.0282	0.5978
133	-0.500	5804.16	1182.11	-28807.20	-0.0225	0.5687
134	-1.000	5662.17	1153.19	-25939.47	-0.0177	0.5387
135	-2.000	5295.19	1078.45	-20451.57	-0.0104	0.4765
136	-3.000	4817.54	981.17	-15385.99	-0.0056	0.4117
137	-4.000	4229.22	861.35	-10853.39	-0.0027	0.3451
138	-5.000	3530.24	718.99	-6964.44	-0.0011	0.2772
139	-6.000	2720.59	554.09	-3829.80	-0.0003	0.2084
140	-7.000	1800.27	366.65	-1560.15	-0.0001	0.1391
141	-8.000	769.29	156.68	-266.15	0.0000	0.0696
142	-8.689	-5.46	-1.11	0.01	0.0000	0.0216
143	-8.671	0.00	0.00	0.00	0.0000	0.0215
144	-8.999	0.00	0.00	0.00	0.0000	0.0001
14	-9.000	0.00	0.00	0.00	0.0000	0.0000

14
147
148
149 *RUN COMPLETED*
150
EOT..
LI Q17602
1
2 BEAMS (SHEAR, MOMENT, DEFLECTION)
3
4
5 17TH STR.-Q17G-SWL=17-BULKHD EAST OF PUMP-FS=1.0 S CASE
6 EW
7
8 THE REFERENCE SYSTEM SELECTED DEFINES POSITIVE FORCES AS TO THE LEFT
9 INCREASING MEMBER COORDINATES AS UPWARD, AND POSITIVE MOMENTS
10 AS COUNTERCLOCKWISE.
11
12
13 THE MAXIMUM DEFLECTION IS -1.53 INCHES AND OCCURS AT MEMBER COORDINATE
14 25.00 FT.
15
16
17
18 Z40 HAS BEEN GIVEN TO SUPPORT THE LOAD SYSTEM.
19
20 THE WEIGHT OF THIS VERTICAL MEMBER HAS BEEN NEGLECTED.
21

CALCULATED EXTERNAL LOADS

DISTANCE FROM REFERENCE(FT)	TYPE OF LOAD	MAGNITUDE OF LOAD
-5.34	POINT LD	11.44 LBF
25.00	POINT LD	-11569.02 LBF

INPUTTED LOADS

DISTANCE FROM REFERENCE(FT)	TYPE OF LOAD	MAGNITUDE OF LOAD
25.00	POINT LD	5800.90 LBF
24.10	CONTN LD	0.00 LBF/SQ FT
25.00	CONTN LD	-44.95 LBF/SQ FT
24.00	CONTN LD	4.99 LBF/SQ FT
24.00	CONTN LD	4.99 LBF/SQ FT
23.00	CONTN LD	90.06 LBF/SQ FT
22.00	CONTN LD	175.12 LBF/SQ FT
22.00	CONTN LD	175.12 LBF/SQ FT
21.00	CONTN LD	260.18 LBF/SQ FT
20.00	CONTN LD	345.24 LBF/SQ FT
19.00	CONTN LD	430.30 LBF/SQ FT
18.00	CONTN LD	515.36 LBF/SQ FT
17.00	CONTN LD	600.43 LBF/SQ FT
16.00	CONTN LD	622.99 LBF/SQ FT
15.00	CONTN LD	645.55 LBF/SQ FT
15.00	CONTN LD	645.55 LBF/SQ FT
14.00	CONTN LD	668.11 LBF/SQ FT
13.00	CONTN LD	690.67 LBF/SQ FT
12.00	CONTN LD	713.24 LBF/SQ FT
11.00	CONTN LD	739.38 LBF/SQ FT
11.00	CONTN LD	739.38 LBF/SQ FT
10.00	CONTN LD	775.84 LBF/SQ FT
10.00	CONTN LD	775.84 LBF/SQ FT
9.00	CONTN LD	694.74 LBF/SQ FT
8.00	CONTN LD	613.65 LBF/SQ FT
7.00	CONTN LD	532.55 LBF/SQ FT
6.00	CONTN LD	451.46 LBF/SQ FT
5.00	CONTN LD	370.36 LBF/SQ FT
4.00	CONTN LD	289.26 LBF/SQ FT
3.00	CONTN LD	208.17 LBF/SQ FT
2.00	CONTN LD	127.07 LBF/SQ FT
1.00	CONTN LD	45.97 LBF/SQ FT
0.43	CONTN LD	0.00 LBF/SQ FT
0.00	CONTN LD	-35.12 LBF/SQ FT
-0.50	CONTN LD	-75.67 LBF/SQ FT
-0.50	CONTN LD	-636.04 LBF/SQ FT
-1.50	CONTN LD	-780.15 LBF/SQ FT
-2.50	CONTN LD	-924.26 LBF/SQ FT
-3.50	CONTN LD	-1068.37 LBF/SQ FT
-4.50	CONTN LD	-1212.48 LBF/SQ FT
-5.34	CONTN LD	-1333.09 LBF/SQ FT
-5.34	CONTN LD	0.00 LBF/SQ FT

_I Q17A01

BEAMS (SHEAR, MOMENT, DEFLECTION)

17TH STR. -Q17A-SWL=17-BULKHD EAST OF PUMP STA-FS=1.0 S CAS EW

THE REFERENCE SYSTEM SELECTED DEFINES POSITIVE FORCES AS TO THE LEFT INCREASING MEMBER COORDINATES AS UPWARD, AND POSITIVE MOMENTS AS COUNTERCLOCKWISE.

THE MAXIMUM DEFLECTION IS -2.39 INCHES AND OCCURS AT MEMBER COORDINATE 26.00 FT.

Z35 HAS BEEN GIVEN TO SUPPORT THE LOAD SYSTEM.

THE WEIGHT OF THIS VERTICAL MEMBER HAS BEEN NEGLECTED.

CALCULATED EXTERNAL LOADS

DISTANCE FROM REFERENCE(FT)	TYPE OF LOAD	MAGNITUDE OF LOAD
-5.48	POINT LD	17.86 LBF
26.00	POINT LD	-11057.80 LBF

INPUTTED LOADS

DISTANCE FROM REFERENCE(FT)	TYPE OF LOAD	MAGNITUDE OF LOAD
26.00	POINT LD	5611.26 LBF
24.10	CONTN LD	0.00 LBF/SQ FT
26.00	CONTN LD	-94.89 LBF/SQ FT
24.00	CONTN LD	4.99 LBF/SQ FT
24.00	CONTN LD	4.99 LBF/SQ FT
23.00	CONTN LD	90.06 LBF/SQ FT
22.00	CONTN LD	175.12 LBF/SQ FT
22.00	CONTN LD	175.12 LBF/SQ FT
21.00	CONTN LD	260.18 LBF/SQ FT
20.00	CONTN LD	345.24 LBF/SQ FT
19.00	CONTN LD	430.30 LBF/SQ FT
18.00	CONTN LD	515.36 LBF/SQ FT
17.00	CONTN LD	600.43 LBF/SQ FT
16.00	CONTN LD	622.99 LBF/SQ FT
15.00	CONTN LD	645.55 LBF/SQ FT
15.00	CONTN LD	645.55 LBF/SQ FT
14.00	CONTN LD	668.11 LBF/SQ FT
13.00	CONTN LD	690.67 LBF/SQ FT
12.00	CONTN LD	713.24 LBF/SQ FT
11.00	CONTN LD	739.38 LBF/SQ FT
11.00	CONTN LD	739.38 LBF/SQ FT

58	10.00	CONTN LD	775.84	LBF/SQ FT
59	10.00	CONTN LD	775.84	LBF/SQ FT
60	9.00	CONTN LD	694.74	LBF/SQ FT
61	8.00	CONTN LD	613.65	LBF/SQ FT
62	7.00	CONTN LD	532.55	LBF/SQ FT
63	6.00	CONTN LD	451.46	LBF/SQ FT
64	5.00	CONTN LD	370.36	LBF/SQ FT
65	4.00	CONTN LD	289.26	LBF/SQ FT
66	3.00	CONTN LD	208.17	LBF/SQ FT
67	2.00	CONTN LD	127.07	LBF/SQ FT
68	1.00	CONTN LD	45.97	LBF/SQ FT
69	0.43	CONTN LD	0.00	LBF/SQ FT
70	0.00	CONTN LD	-35.12	LBF/SQ FT
71	-0.50	CONTN LD	-75.67	LBF/SQ FT
72	-0.50	CONTN LD	-636.04	LBF/SQ FT
73	-1.50	CONTN LD	-780.15	LBF/SQ FT
74	-2.50	CONTN LD	-924.26	LBF/SQ FT
75	-3.50	CONTN LD	-1068.37	LBF/SQ FT
76	-4.50	CONTN LD	-1212.48	LBF/SQ FT
77	-5.48	CONTN LD	-1353.44	LBF/SQ FT
78	-5.48	CONTN LD	0.00	LBF/SQ FT

Z35 PROPERTIES ARE AS FOLLOWS.

MOMENT OF INERTIA= 361.22 IN. TO THE 4TH PER FOOT OF WALL
CROSS SECTIONAL AREA= 3.95 SQ IN.
ELASTIC MODULUS= 29000000. LBF/SQ IN.
DEFLECTION REFERENCE IS AT -9.000

THE MAXIMUM BENDING MOMENT IS -55138.00 LBF-FT AND OCCURS AT 11.69
WHICH HAS THE SHEAR FORCE OF -2.78 LBF.

DISTANCE (FEET)	SHEAR FOR (LBF)	SHEAR STR (LBF/SQIN)	BENDING MOM (LBF-FT)	DEFLECTION FROM TANG. THRU DEFLE REFERENCE (INCHES)	DEFL.FROM A PARALLEL TO THE UNDEFORMED AXIS & THRU DEFL REF NOTE SIGN (IN.)
26.000	-5446.53	-1378.87	0.00	-2.3905	0.2673
25.999	-5446.53	-1378.87	-5.45	-2.3905	0.2672
25.000	-5446.53	-1378.87	-5446.53	-2.2260	0.3559
24.101	-5446.53	-1378.87	-10342.97	-2.0787	0.4349
24.099	-5626.83	-1424.51	-10582.41	-2.0787	0.4348
24.000	-5626.58	-1424.45	-11139.46	-2.0625	0.4434
23.000	-5579.06	-1412.42	-16749.37	-1.9006	0.5295
22.000	-5446.47	-1378.85	-22269.22	-1.7413	0.6127
21.000	-5228.82	-1323.75	-27613.94	-1.5858	0.6924
20.000	-4926.11	-1247.12	-32698.49	-1.4348	0.7674
19.000	-4538.34	-1148.95	-37437.80	-1.2892	0.8371
18.000	-4065.51	-1029.24	-41746.81	-1.1497	0.9006
17.000	-3507.61	-888.00	-45540.46	-1.0172	0.9572
16.000	-2895.90	-733.14	-48744.09	-0.8921	1.0064
15.000	-2261.63	-572.56	-51324.74	-0.7750	1.0475
14.000	-1604.80	-406.28	-53259.83	-0.6664	1.0802
13.000	-925.41	-234.28	-54526.82	-0.5666	1.1041

116	12.000	-223.46	-56.57	-55103.13	-0.4757	1.1190
117	11.692	-2.78	-0.70	-55138.00	-0.4496	1.1218
118	11.000	502.85	127.31	-54965.61	-0.3939	1.1249
119	10.000	1260.46	319.11	-54086.99	-0.3212	1.1217
12	9.000	1995.75	505.25	-52452.12	-0.2573	1.1096
12	8.000	2649.95	670.87	-50122.51	-0.2021	1.0888
122	7.000	3223.05	815.96	-47179.25	-0.1552	1.0599
123	6.000	3715.05	940.52	-43703.44	-0.1160	1.0231
124	5.000	4125.96	1044.55	-39776.17	-0.0840	0.9792
125	4.000	4455.77	1128.04	-35478.54	-0.0585	0.9287
126	3.000	4704.49	1191.01	-30891.65	-0.0389	0.8723
127	2.000	4872.11	1233.45	-26096.60	-0.0244	0.8109
128	1.000	4958.63	1255.35	-21174.47	-0.0142	0.7452
129	0.431	4971.73	1258.67	-18348.04	-0.0100	0.7061
130	0.429	4971.73	1258.67	-18338.10	-0.0100	0.7060
131	0.000	4964.18	1256.75	-16206.31	-0.0075	0.6759
132	-1.000	4600.45	1164.67	-11344.56	-0.0035	0.6040
133	-2.000	3820.30	967.16	-7122.18	-0.0013	0.5302
134	-3.000	2896.04	733.17	-3752.00	-0.0004	0.4553
135	-4.000	1827.67	462.70	-1378.14	-0.0001	0.3796
136	-5.000	615.22	155.75	-144.69	0.0000	0.3038
137	-5.479	-16.50	-4.18	0.02	0.0000	0.2674
138	-5.481	0.00	0.00	0.00	0.0000	0.2672
139	-6.000	0.00	0.00	0.00	0.0000	0.2278
140	-7.000	0.00	0.00	0.00	0.0000	0.1519
141	-8.000	0.00	0.00	0.00	0.0000	0.0759
142	-8.999	0.00	0.00	0.00	0.0000	0.0001
143	-9.000	0.00	0.00	0.00	0.0000	0.0000

144
14
146
147 *RUN COMPLETED*
148
EOT..
LI DRW17A02
1
2 BEAMS (SHEAR, MOMENT, DEFLECTION)
3
4
5 17TH STR. -Q17A-SWL=17-BULKHD EAST OF PUMP STA-FS=1.0 S CAS
6 EW
7
8 THE REFERENCE SYSTEM SELECTED DEFINES POSITIVE FORCES AS TO THE LEFT
9 INCREASING MEMBER COORDINATES AS UPWARD, AND POSITIVE MOMENTS
10 AS COUNTERCLOCKWISE.
11
12
13 THE MAXIMUM DEFLECTION IS -1.76 INCHES AND OCCURS AT MEMBER COORDINATE
14 26.00 FT.
15
16
17
18 Z40 HAS BEEN GIVEN TO SUPPORT THE LOAD SYSTEM.
19
20 THE WEIGHT OF THIS VERTICAL MEMBER HAS BEEN NEGLECTED.
21
22
23 CALCULATED EXTERNAL LOADS

DISTANCE FROM REFERENCE(FT)	TYPE OF LOAD	MAGNITUDE OF LOAD
-5.48	POINT LD	17.86 LBF
26.00	POINT LD	-11057.80 LBF

INPUTTED LOADS

DISTANCE FROM REFERENCE(FT)	TYPE OF LOAD	MAGNITUDE OF LOAD
26.00	POINT LD	5611.26 LBF
24.10	CONTN LD	0.00 LBF/SQ FT
26.00	CONTN LD	-94.89 LBF/SQ FT
24.00	CONTN LD	4.99 LBF/SQ FT
24.00	CONTN LD	4.99 LBF/SQ FT
23.00	CONTN LD	90.06 LBF/SQ FT
22.00	CONTN LD	175.12 LBF/SQ FT
22.00	CONTN LD	175.12 LBF/SQ FT
21.00	CONTN LD	260.18 LBF/SQ FT
20.00	CONTN LD	345.24 LBF/SQ FT
19.00	CONTN LD	430.30 LBF/SQ FT
18.00	CONTN LD	515.36 LBF/SQ FT
17.00	CONTN LD	600.43 LBF/SQ FT
16.00	CONTN LD	622.99 LBF/SQ FT
15.00	CONTN LD	645.55 LBF/SQ FT
15.00	CONTN LD	645.55 LBF/SQ FT
14.00	CONTN LD	668.11 LBF/SQ FT
13.00	CONTN LD	690.67 LBF/SQ FT
12.00	CONTN LD	713.24 LBF/SQ FT
11.00	CONTN LD	739.38 LBF/SQ FT
11.00	CONTN LD	739.38 LBF/SQ FT
10.00	CONTN LD	775.84 LBF/SQ FT
10.00	CONTN LD	775.84 LBF/SQ FT
9.00	CONTN LD	694.74 LBF/SQ FT
8.00	CONTN LD	613.65 LBF/SQ FT
7.00	CONTN LD	532.55 LBF/SQ FT
6.00	CONTN LD	451.46 LBF/SQ FT
5.00	CONTN LD	370.36 LBF/SQ FT
4.00	CONTN LD	289.26 LBF/SQ FT
3.00	CONTN LD	208.17 LBF/SQ FT
2.00	CONTN LD	127.07 LBF/SQ FT
1.00	CONTN LD	45.97 LBF/SQ FT
0.43	CONTN LD	0.00 LBF/SQ FT
0.00	CONTN LD	-35.12 LBF/SQ FT
-0.50	CONTN LD	-75.67 LBF/SQ FT
-0.50	CONTN LD	-636.04 LBF/SQ FT
-1.50	CONTN LD	-780.15 LBF/SQ FT
-2.50	CONTN LD	-924.26 LBF/SQ FT
-3.50	CONTN LD	-1068.37 LBF/SQ FT
-4.50	CONTN LD	-1212.48 LBF/SQ FT
-5.48	CONTN LD	-1353.44 LBF/SQ FT
-5.48	CONTN LD	0.00 LBF/SQ FT

Z40 PROPERTIES ARE AS FOLLOWS.

MOMENT OF INERTIA= 490.85 IN. TO THE 4TH PER FOOT OF WALL
CROSS SECTIONAL AREA= 4.91 SQ IN.
ELASTIC MODULUS= 29000000. LBF/SQ IN.
DEFLECTION REFERENCE IS AT -9.000

THE MAXIMUM BENDING MOMENT IS -55138.00 LBF-FT AND OCCURS AT 11.69
WHICH HAS THE SHEAR FORCE OF -2.78 LBF.

DISTANCE (FEET)	SHEAR FOR (LBF)	SHEAR STR (LBF/SQIN)	BENDING MOM (LBF-FT)	DEFLECTION FROM TANG. THRU DEFLE REFERENCE (INCHES)	DEFL.FROM A PARALLEL TO THE UNDEFORMED AXIS & THRU DEFL REF NOTE SIGN (IN.)
26.000	-5446.53	-1109.27	0.00	-1.7592	0.1967
25.999	-5446.53	-1109.27	-5.45	-1.7592	0.1967
25.000	-5446.53	-1109.27	-5446.53	-1.6381	0.2619
24.101	-5446.53	-1109.27	-10342.97	-1.5297	0.3201
24.099	-5626.83	-1145.99	-10582.41	-1.5297	0.3200
24.000	-5626.58	-1145.94	-11139.46	-1.5178	0.3263
23.000	-5579.06	-1136.26	-16749.37	-1.3986	0.3896
22.000	-5446.47	-1109.26	-22269.22	-1.2815	0.4509
21.000	-5228.82	-1064.93	-27613.94	-1.1670	0.5095
20.000	-4926.11	-1003.28	-32698.49	-1.0559	0.5647
19.000	-4538.34	-924.30	-37437.80	-0.9487	0.6160
18.000	-4065.51	-828.01	-41746.81	-0.8461	0.6628
17.000	-3507.61	-714.38	-45540.46	-0.7485	0.7044
16.000	-2895.90	-589.80	-48744.09	-0.6565	0.7406
15.000	-2261.63	-460.62	-51324.74	-0.5703	0.7709
14.000	-1604.80	-326.84	-53259.83	-0.4904	0.7949
13.000	-925.41	-188.47	-54526.82	-0.4169	0.8125
12.000	-223.46	-45.51	-55103.13	-0.3501	0.8235
11.692	-2.78	-0.57	-55138.00	-0.3308	0.8255
11.000	502.85	102.41	-54965.61	-0.2899	0.8278
10.000	1260.46	256.71	-54086.99	-0.2363	0.8254
9.000	1995.75	406.47	-52452.12	-0.1894	0.8165
8.000	2649.95	539.70	-50122.51	-0.1487	0.8013
7.000	3223.05	656.43	-47179.25	-0.1142	0.7800
6.000	3715.05	756.63	-43703.44	-0.0853	0.7529
5.000	4125.96	840.32	-39776.17	-0.0618	0.7206
4.000	4455.77	907.49	-35478.54	-0.0431	0.6834
3.000	4704.49	958.14	-30891.65	-0.0287	0.6420
2.000	4872.11	992.28	-26096.60	-0.0180	0.5967
1.000	4958.63	1009.90	-21174.47	-0.0105	0.5484
0.431	4971.73	1012.57	-18348.04	-0.0074	0.5197
0.429	4971.73	1012.57	-18338.10	-0.0074	0.5195
0.000	4964.18	1011.03	-16206.31	-0.0055	0.4974
-1.000	4600.45	936.96	-11344.56	-0.0026	0.4445
-2.000	3820.30	778.07	-7122.18	-0.0010	0.3902
-3.000	2896.04	589.82	-3752.00	-0.0003	0.3350
-4.000	1827.67	372.23	-1378.14	0.0000	0.2794
-5.000	615.22	125.30	-144.69	0.0000	0.2235
-5.479	-16.50	-3.36	0.02	0.0000	0.1968
-5.481	0.00	0.00	0.00	0.0000	0.1967

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139    -6.000          0.00          0.00          0.00          0.0000          0.1677
140    -7.000          0.00          0.00          0.00          0.0000          0.1118
141    -8.000          0.00          0.00          0.00          0.0000          0.0559
142    -8.999          0.00          0.00          0.00          0.0000          0.0001
14     -9.000          0.00          0.00          0.00          0.0000          0.0000
14
145
146
147   *RUN COMPLETED*
148
EOT..
LI DRW35A
1 100 2 26.0 -9.0 1 -9.0 0 -1 26.0
2 200 PZ35
3 300 29000000 3.95 361.22
4 400 -9.0 26
EOT..
LI PZ40A
1 100 2 26.0 -9.0 1 -9.0 0 -1 26
2 200 PZ40
3 300 29000000 4.91 490.85
4 400 -9.0 26.0
EOT..
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LI Q17C01

BEAMS (SHEAR, MOMENT, DEFLECTION)

17TH STR.-Q17C-SWL=-BULKHD EAST OF PUMP STA-FS=1.2 S CASE
EW

THE REFERENCE SYSTEM SELECTED DEFINES POSITIVE FORCES AS TO THE LEFT INCREASING MEMBER COORDINATES AS UPWARD, AND POSITIVE MOMENTS AS COUNTERCLOCKWISE.

THE MAXIMUM DEFLECTION IS -3.62 INCHES AND OCCURS AT MEMBER COORDINATE 26.00 FT.

Z35 HAS BEEN GIVEN TO SUPPORT THE LOAD SYSTEM.

THE WEIGHT OF THIS VERTICAL MEMBER HAS BEEN NEGLECTED.

CALCULATED EXTERNAL LOADS

DISTANCE FROM REFERENCE(FT)	TYPE OF LOAD	MAGNITUDE OF LOAD
-8.87	POINT LD	21.47 LBF
26.00	POINT LD	-13256.30 LBF

INPUTTED LOADS

DISTANCE FROM REFERENCE(FT)	TYPE OF LOAD	MAGNITUDE OF LOAD
26.00	POINT LD	6722.98 LBF
24.10	CONTN LD	0.00 LBF/SQ FT
26.00	CONTN LD	-108.26 LBF/SQ FT
24.00	CONTN LD	5.70 LBF/SQ FT
24.00	CONTN LD	5.70 LBF/SQ FT
23.00	CONTN LD	93.94 LBF/SQ FT
22.00	CONTN LD	182.18 LBF/SQ FT
22.00	CONTN LD	182.18 LBF/SQ FT
21.00	CONTN LD	270.42 LBF/SQ FT
20.00	CONTN LD	358.66 LBF/SQ FT
19.00	CONTN LD	446.91 LBF/SQ FT
18.00	CONTN LD	535.15 LBF/SQ FT
17.00	CONTN LD	623.39 LBF/SQ FT
16.00	CONTN LD	649.13 LBF/SQ FT
15.00	CONTN LD	674.87 LBF/SQ FT
15.00	CONTN LD	674.87 LBF/SQ FT
14.00	CONTN LD	700.61 LBF/SQ FT
13.00	CONTN LD	726.35 LBF/SQ FT
12.00	CONTN LD	753.43 LBF/SQ FT
11.00	CONTN LD	796.43 LBF/SQ FT
11.00	CONTN LD	796.43 LBF/SQ FT

58	10.00	CONTN LD	839.44	LBF/SQ FT
59	10.00	CONTN LD	839.44	LBF/SQ FT
60	9.00	CONTN LD	779.41	LBF/SQ FT
61	8.00	CONTN LD	719.38	LBF/SQ FT
62	7.00	CONTN LD	659.35	LBF/SQ FT
63	6.00	CONTN LD	599.32	LBF/SQ FT
64	5.00	CONTN LD	539.29	LBF/SQ FT
65	4.00	CONTN LD	479.26	LBF/SQ FT
66	3.00	CONTN LD	419.23	LBF/SQ FT
67	2.00	CONTN LD	359.20	LBF/SQ FT
68	1.00	CONTN LD	299.17	LBF/SQ FT
69	0.00	CONTN LD	239.15	LBF/SQ FT
70	-0.50	CONTN LD	209.13	LBF/SQ FT
71	-0.50	CONTN LD	0.00	LBF/SQ FT
72	-0.50	CONTN LD	-256.32	LBF/SQ FT
73	-1.50	CONTN LD	-366.98	LBF/SQ FT
74	-2.50	CONTN LD	-477.65	LBF/SQ FT
75	-3.50	CONTN LD	-588.32	LBF/SQ FT
76	-4.50	CONTN LD	-698.98	LBF/SQ FT
77	-5.50	CONTN LD	-809.65	LBF/SQ FT
78	-6.50	CONTN LD	-920.32	LBF/SQ FT
79	-7.50	CONTN LD	-1030.98	LBF/SQ FT
80	-8.50	CONTN LD	-1141.65	LBF/SQ FT
81	-8.87	CONTN LD	-1182.08	LBF/SQ FT
82	-8.87	CONTN LD	0.00	LBF/SQ FT

Z35 PROPERTIES ARE AS FOLLOWS.

MOMENT OF INERTIA= 361.22 IN. TO THE 4TH PER FOOT OF WALL
CROSS SECTIONAL AREA= 3.95 SQ IN.
ELASTIC MODULUS= 29000000. LBF/SQ IN.
DEFLECTION REFERENCE IS AT -9.000

THE MAXIMUM BENDING MOMENT IS -70469.11 LBF-FT AND OCCURS AT 10.61
WHICH HAS THE SHEAR FORCE OF -5.14 LBF.

DISTANCE (FEET)	SHEAR FOR (LBF)	SHEAR STR (LBF/SQIN)	BENDING MOM (LBF-FT)	DEFLECTION FROM TANG. THRU DEFLE REFERENCE (INCHES)	DEFL.FROM A PARALLEL TO THE UNDEFORMED AXIS & THRU DEFL REF NOTE SIGN (IN.)
26.000	-6533.32	-1654.01	0.00	-3.6218	0.0135
25.999	-6533.32	-1654.01	-6.53	-3.6218	0.0134
25.000	-6533.32	-1654.01	-6533.32	-3.3923	0.1392
24.101	-6533.32	-1654.01	-12406.78	-3.1866	0.2514
24.099	-6739.02	-1706.08	-12680.60	-3.1866	0.2512
24.000	-6738.73	-1706.01	-13347.75	-3.1641	0.2635
23.000	-6688.91	-1693.40	-20068.92	-2.9376	0.3861
22.000	-6550.85	-1658.44	-26696.16	-2.7144	0.5055
21.000	-6324.55	-1601.15	-33141.21	-2.4956	0.6204
20.000	-6010.01	-1521.52	-39315.85	-2.2823	0.7298
19.000	-5607.23	-1419.55	-45131.82	-2.0754	0.8328
18.000	-5116.20	-1295.24	-50500.88	-1.8760	0.9284
17.000	-4536.93	-1148.59	-55334.79	-1.6849	1.0156

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116    16.000    -3900.67     -987.51     -59555.73      -1.5029       1.0937
117    15.000    -3238.67     -819.92     -63127.55      -1.3306       1.1620
118    14.000    -2550.93     -645.80     -66024.49      -1.1690       1.2200
119    13.000    -1837.45     -465.18     -68220.82      -1.0180       1.2670
12     12.000    -1097.56     -277.86     -69690.57      -0.8784       1.3028
12     11.000     -322.63      -81.68     -70404.25      -0.7502       1.3272
122    10.606       -5.14       -1.30     -70469.11      -0.7028       1.3336
123    10.000      495.31      125.39     -70321.49      -0.6335       1.3399
124     9.000     1304.73      330.31     -69416.46      -0.5285       1.3411
125     8.000     2054.13      520.03     -67732.03      -0.4349       1.3308
126     7.000     2743.49      694.56     -65328.21      -0.3525       1.3094
127     6.000     3372.83      853.88     -62265.05      -0.2808       1.2772
128     5.000     3942.13      998.01     -58602.56      -0.2193       1.2348
129     4.000     4451.41     1126.94     -54400.79      -0.1675       1.1827
130     3.000     4900.65     1240.67     -49719.76      -0.1247       1.1217
131     2.000     5289.87     1339.21     -44619.49      -0.0901       1.0524
132     1.000     5619.05     1422.55     -39160.03      -0.0628       0.9759
133     0.000     5888.21     1490.69     -33401.39      -0.0420       0.8928
134    -0.500     6000.28     1519.06     -30428.64      -0.0337       0.8492
135    -1.000     5858.29     1483.11     -27462.84      -0.0267       0.8043
136    -2.000     5491.31     1390.21     -21778.82      -0.0159       0.7112
137    -3.000     5013.66     1269.28     -16517.11      -0.0087       0.6145
138    -4.000     4425.34     1120.34     -11788.39      -0.0042       0.5151

139    -5.000     3726.36      943.38      -7703.31      -0.0018       0.4137
140    -6.000     2916.71      738.41      -4372.55      -0.0006       0.3110
141    -7.000     1996.39      505.42      -1906.78      -0.0001       0.2076
142    -8.000      965.41      244.41       -416.66       0.0000       0.1039
143    -8.869      -20.29       -5.14          0.02       0.0000       0.0136
144    -8.871        0.00        0.00          0.00       0.0000       0.0134
14     -8.999        0.00        0.00          0.00       0.0000       0.0001
14     -9.000        0.00        0.00          0.00       0.0000       0.0000
147
148
149
150   *RUN COMPLETED*
151
EOT..
LI DRW35A
1 100 2 26.0 -9.0 1 -9.0 0 -1 26.0
2 200 PZ35
3 300 29000000 3.95 361.22
4 400 -9.0 26
EOT..
LI Q17C02
1
2                          BEAMS (SHEAR, MOMENT, DEFLECTION)
3
4
5    17TH STR.-Q17C-SWL=-BULKHD EAST OF PUMP STA-FS=1.2 S CASE
6      EW
7
8   THE REFERENCE SYSTEM SELECTED DEFINES POSITIVE FORCES AS TO THE LEFT
9   INCREASING MEMBER COORDINATES AS UPWARD, AND POSITIVE MOMENTS
10   AS COUNTERCLOCKWISE.
11
12
13    THE MAXIMUM DEFLECTION IS  -2.67 INCHES AND OCCURS AT MEMBER COORDINATE
14    26.00 FT.
```

Z40 HAS BEEN GIVEN TO SUPPORT THE LOAD SYSTEM.

THE WEIGHT OF THIS VERTICAL MEMBER HAS BEEN NEGLECTED.

CALCULATED EXTERNAL LOADS

DISTANCE FROM REFERENCE(FT)	TYPE OF LOAD	MAGNITUDE OF LOAD
-8.87	POINT LD	21.47 LBF
26.00	POINT LD	-13256.30 LBF

INPUTTED LOADS

DISTANCE FROM REFERENCE(FT)	TYPE OF LOAD	MAGNITUDE OF LOAD
26.00	POINT LD	6722.98 LBF
24.10	CONTN LD	0.00 LBF/SQ FT
26.00	CONTN LD	-108.26 LBF/SQ FT
24.00	CONTN LD	5.70 LBF/SQ FT
24.00	CONTN LD	5.70 LBF/SQ FT
23.00	CONTN LD	93.94 LBF/SQ FT
22.00	CONTN LD	182.18 LBF/SQ FT
22.00	CONTN LD	182.18 LBF/SQ FT
21.00	CONTN LD	270.42 LBF/SQ FT
20.00	CONTN LD	358.66 LBF/SQ FT
19.00	CONTN LD	446.91 LBF/SQ FT
18.00	CONTN LD	535.15 LBF/SQ FT
17.00	CONTN LD	623.39 LBF/SQ FT
16.00	CONTN LD	649.13 LBF/SQ FT
15.00	CONTN LD	674.87 LBF/SQ FT
15.00	CONTN LD	674.87 LBF/SQ FT
14.00	CONTN LD	700.61 LBF/SQ FT
13.00	CONTN LD	726.35 LBF/SQ FT
12.00	CONTN LD	753.43 LBF/SQ FT
11.00	CONTN LD	796.43 LBF/SQ FT
11.00	CONTN LD	796.43 LBF/SQ FT
10.00	CONTN LD	839.44 LBF/SQ FT
10.00	CONTN LD	839.44 LBF/SQ FT
9.00	CONTN LD	779.41 LBF/SQ FT
8.00	CONTN LD	719.38 LBF/SQ FT
7.00	CONTN LD	659.35 LBF/SQ FT
6.00	CONTN LD	599.32 LBF/SQ FT
5.00	CONTN LD	539.29 LBF/SQ FT
4.00	CONTN LD	479.26 LBF/SQ FT
3.00	CONTN LD	419.23 LBF/SQ FT
2.00	CONTN LD	359.20 LBF/SQ FT
1.00	CONTN LD	299.17 LBF/SQ FT
0.00	CONTN LD	239.15 LBF/SQ FT
-0.50	CONTN LD	209.13 LBF/SQ FT
-0.50	CONTN LD	0.00 LBF/SQ FT

-0.50	CONTN LD	-256.32	LBF/SQ FT
-1.50	CONTN LD	-366.98	LBF/SQ FT
-2.50	CONTN LD	-477.65	LBF/SQ FT
-3.50	CONTN LD	-588.32	LBF/SQ FT
-4.50	CONTN LD	-698.98	LBF/SQ FT
-5.50	CONTN LD	-809.65	LBF/SQ FT
-6.50	CONTN LD	-920.32	LBF/SQ FT
-7.50	CONTN LD	-1030.98	LBF/SQ FT
-8.50	CONTN LD	-1141.65	LBF/SQ FT
-8.87	CONTN LD	-1182.08	LBF/SQ FT
-8.87	CONTN LD	0.00	LBF/SQ FT

Z40 PROPERTIES ARE AS FOLLOWS.

MOMENT OF INERTIA= 490.85 IN. TO THE 4TH PER FOOT OF WALL
CROSS SECTIONAL AREA= 4.91 SQ IN.
ELASTIC MODULUS= 29000000. LBF/SQ IN.
DEFLECTION REFERENCE IS AT -9.000

THE MAXIMUM BENDING MOMENT IS -70469.11 LBF-FT AND OCCURS AT 10.61
WHICH HAS THE SHEAR FORCE OF -5.14 LBF.

DISTANCE (FEET)	SHEAR FOR (LBF)	SHEAR STR (LBF/SQIN)	BENDING MOM (LBF-FT)	DEFLECTION FROM TANG. THRU DEFLE REFERENCE (INCHES)	DEFL.FROM A PARALLEL TO THE UNDEFORMED AXIS & THRU DEFL REF NOTE SIGN (IN.)
26.000	-6533.32	-1330.62	0.00	-2.6653	0.0099
25.999	-6533.32	-1330.62	-6.53	-2.6653	0.0099
25.000	-6533.32	-1330.62	-6533.32	-2.4964	0.1024
24.101	-6533.32	-1330.62	-12406.78	-2.3451	0.1850
24.099	-6739.02	-1372.51	-12680.60	-2.3451	0.1849
24.000	-6738.73	-1372.45	-13347.75	-2.3285	0.1939
23.000	-6688.71	-1362.30	-20068.92	-2.1616	0.2842
22.000	-6550.85	-1334.19	-26696.16	-1.9976	0.3720
21.000	-6324.55	-1288.10	-33141.21	-1.8365	0.4565
20.000	-6010.01	-1224.03	-39315.85	-1.6796	0.5371
19.000	-5607.23	-1142.00	-45131.82	-1.5273	0.6129
18.000	-5116.20	-1041.99	-50500.88	-1.3806	0.6832
17.000	-4536.93	-924.02	-55334.79	-1.2399	0.7474
16.000	-3900.67	-794.43	-59555.73	-1.1060	0.8049
15.000	-3238.67	-659.61	-63127.55	-0.9793	0.8552
14.000	-2550.93	-519.54	-66024.49	-0.8602	0.8978
13.000	-1837.45	-374.23	-68220.82	-0.7492	0.9324
12.000	-1097.56	-223.53	-69690.57	-0.6464	0.9588
11.000	-322.63	-65.71	-70404.25	-0.5520	0.9767
10.606	-5.14	-1.05	-70469.11	-0.5172	0.9814
10.000	495.31	100.88	-70321.49	-0.4662	0.9861
9.000	1304.73	265.73	-69416.46	-0.3889	0.9869
8.000	2054.13	418.36	-67732.03	-0.3201	0.9794
7.000	2743.49	558.76	-65328.21	-0.2594	0.9636
6.000	3372.83	686.93	-62265.05	-0.2066	0.9399
5.000	3942.13	802.88	-58602.56	-0.1614	0.9087
4.000	4451.41	906.60	-54400.79	-0.1233	0.8704

130	3.000	4900.65	998.10	-49719.76	-0.0918	0.8254
131	2.000	5289.87	1077.37	-44619.49	-0.0663	0.7745
132	1.000	5619.05	1144.41	-39160.03	-0.0462	0.7181
133	0.000	5888.21	1199.23	-33401.39	-0.0309	0.6570
134	-0.500	6000.28	1222.05	-30428.64	-0.0248	0.6249
13	-1.000	5858.29	1193.13	-27462.84	-0.0196	0.5919
13	-2.000	5491.31	1118.39	-21778.82	-0.0117	0.5234
137	-3.000	5013.66	1021.11	-16517.11	-0.0064	0.4522
138	-4.000	4425.34	901.29	-11788.39	-0.0031	0.3791
139	-5.000	3726.36	758.93	-7703.31	-0.0013	0.3045
140	-6.000	2916.71	594.03	-4372.55	-0.0004	0.2289
141	-7.000	1996.39	406.60	-1906.78	-0.0001	0.1528
142	-8.000	965.41	196.62	-416.66	0.0000	0.0764
143	-8.869	-20.29	-4.13	0.02	0.0000	0.0100
144	-8.871	0.00	0.00	0.00	0.0000	0.0099
145	-8.999	0.00	0.00	0.00	0.0000	0.0001
146	-9.000	0.00	0.00	0.00	0.0000	0.0000

147
148
149
150 *RUN COMPLETED*
151
EOT..

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LI PZ40A
1 100 2 26.0 -9.0 1 -9.0 0 -1 26
2 200 PZ40
3 300 29000000 4.91 490.85
4 400 -9.0 26.0
EOT..
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Z40 PROPERTIES ARE AS FOLLOWS.

MOMENT OF INERTIA= 490.85 IN. TO THE 4TH PER FOOT OF WALL
CROSS SECTIONAL AREA= 4.91 SQ IN.
ELASTIC MODULUS= 29000000. LBF/SQ IN.
DEFLECTION REFERENCE IS AT -9.000

THE MAXIMUM BENDING MOMENT IS -52055.33 LBF-FT AND OCCURS AT 11.44
WHICH HAS THE SHEAR FORCE OF -3.22 LBF.

DISTANCE (FEET)	SHEAR FOR (LBF)	SHEAR STR (LBF/SQIN)	BENDING MOM (LBF-FT)	DEFLECTION FROM TANG. THRU DEFLE REFERENCE (INCHES)	DEFL.FROM A PARALLEL TO THE UNDEFORMED AXIS & THRU DEFL REF NOTE SIGN (IN.)
25.000	-5768.12	-1174.77	0.00	-1.5347	0.1851
24.999	-5768.12	-1174.77	-5.77	-1.5347	0.1851
24.101	-5768.12	-1174.77	-5185.54	-1.4353	0.2391
24.099	-5808.57	-1183.01	-5221.39	-1.4353	0.2390
24.000	-5808.32	-1182.96	-5796.43	-1.4244	0.2449
23.000	-5760.80	-1173.28	-11588.08	-1.3144	0.3043
22.000	-5628.21	-1146.27	-17289.67	-1.2058	0.3623
21.000	-5410.56	-1101.95	-22816.14	-1.0993	0.4182
20.000	-5107.85	-1040.30	-28062.43	-0.9956	0.4713
19.000	-4720.08	-961.32	-33003.49	-0.8953	0.5211
18.000	-4247.25	-865.02	-37494.24	-0.7990	0.5668
17.000	-3689.35	-751.40	-41469.63	-0.7072	0.6080
16.000	-3077.64	-626.81	-44855.01	-0.6204	0.6442
15.000	-2443.37	-497.63	-47617.40	-0.5391	0.6749
14.000	-1786.54	-363.86	-49734.24	-0.4636	0.6999
13.000	-1107.15	-225.49	-51182.96	-0.3940	0.7188
12.000	-405.20	-82.53	-51941.02	-0.3307	0.7316
11.442	-3.22	-0.66	-52055.33	-0.2981	0.7360
11.000	321.11	65.40	-51985.24	-0.2737	0.7380
10.000	1078.72	219.70	-51288.37	-0.2229	0.7382
9.000	1814.01	369.45	-49835.24	-0.1784	0.7322
8.000	2468.21	502.69	-47687.37	-0.1399	0.7201
7.000	3041.31	619.41	-44925.86	-0.1072	0.7022
6.000	3533.31	719.62	-41631.79	-0.0799	0.6789
5.000	3944.22	803.30	-37686.27	-0.0577	0.6505
4.000	4274.03	870.47	-33770.38	-0.0400	0.6176
3.000	4522.75	921.13	-29365.24	-0.0265	0.5806
2.000	4690.37	955.27	-24751.92	-0.0165	0.5400
1.000	4776.89	972.89	-20011.54	-0.0095	0.4964
0.431	4789.99	975.56	-17288.53	-0.0066	0.4704
0.429	4789.99	975.56	-17278.95	-0.0066	0.4703
0.000	4782.44	974.02	-15225.12	-0.0049	0.4503
-1.000	4416.71	899.94	-10545.12	-0.0022	0.4024
-2.000	3638.56	741.05	-6504.48	-0.0008	0.3533
-3.000	2714.30	552.81	-3316.05	-0.0002	0.3033
-4.000	1645.93	335.22	-1123.93	0.0000	0.2529
-5.000	433.51	88.29	-72.22	0.0000	0.2023
-5.339	-10.11	-2.06	0.01	0.0000	0.1852

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137    -5.341          0.00          0.00          0.00          0.0000          0.1851
138    -6.000          0.00          0.00          0.00          0.0000          0.1518

139    -7.000          0.00          0.00          0.00          0.0000          0.1012
140    -8.000          0.00          0.00          0.00          0.0000          0.0506
14     -8.999          0.00          0.00          0.00          0.0000          0.0001
14.    -9.000          0.00          0.00          0.00          0.0000          0.0000
143
144
145
146   *RUN COMPLETED*
147
EOT..
LI PZ40B
1 100 2 25 -9.0 1 -9.0 0 -1 25
2 200 PZ40
3 300 29000000 4.91 490.85
4 400 -9.0 25
EOT..
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LI Q17FO.

BEAMS (SHEAR, MOMENT, DEFLECTION)

17TH STR-Q17F-SWL=17-BULKHD EAST OF PUMP STA-FS=1.2 S CASE
EW

THE REFERENCE SYSTEM SELECTED DEFINES POSITIVE FORCES AS TO THE LEFT INCREASING MEMBER COORDINATES AS UPWARD, AND POSITIVE MOMENTS AS COUNTERCLOCKWISE.

THE MAXIMUM DEFLECTION IS -3.18 INCHES AND OCCURS AT MEMBER COORDINATE 25.00 FT.

Z35 HAS BEEN GIVEN TO SUPPORT THE LOAD SYSTEM.

THE WEIGHT OF THIS VERTICAL MEMBER HAS BEEN NEGLECTED.

CALCULATED EXTERNAL LOADS

DISTANCE FROM REFERENCE(FT)	TYPE OF LOAD	MAGNITUDE OF LOAD
-8.69	POINT LD	6.63 LBF
25.00	POINT LD	-13816.21 LBF

INPUTTED LOADS

DISTANCE FROM REFERENCE(FT)	TYPE OF LOAD	MAGNITUDE OF LOAD
25.00	POINT LD	6927.22 LBF
24.10	CONTN LD	0.00 LBF/SQ FT
25.00	CONTN LD	-51.28 LBF/SQ FT
24.00	CONTN LD	5.70 LBF/SQ FT
24.00	CONTN LD	5.70 LBF/SQ FT
23.00	CONTN LD	93.94 LBF/SQ FT
22.00	CONTN LD	182.18 LBF/SQ FT
22.00	CONTN LD	182.18 LBF/SQ FT
21.00	CONTN LD	270.42 LBF/SQ FT
20.00	CONTN LD	358.66 LBF/SQ FT
19.00	CONTN LD	446.91 LBF/SQ FT
18.00	CONTN LD	535.15 LBF/SQ FT
17.00	CONTN LD	623.39 LBF/SQ FT
16.00	CONTN LD	649.13 LBF/SQ FT
15.00	CONTN LD	674.87 LBF/SQ FT
15.00	CONTN LD	674.87 LBF/SQ FT
14.00	CONTN LD	700.61 LBF/SQ FT
13.00	CONTN LD	726.35 LBF/SQ FT
12.00	CONTN LD	753.43 LBF/SQ FT
11.00	CONTN LD	796.43 LBF/SQ FT
11.00	CONTN LD	796.43 LBF/SQ FT

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          10.00  CONTN LD      839.44 LBF/SQ FT
          10.00  CONTN LD      839.44 LBF/SQ FT
           9.00  CONTN LD      779.41 LBF/SQ FT
           8.00  CONTN LD      719.38 LBF/SQ FT
           7.00  CONTN LD      659.35 LBF/SQ FT
           6.00  CONTN LD      599.32 LBF/SQ FT
           5.00  CONTN LD      539.29 LBF/SQ FT
           4.00  CONTN LD      479.26 LBF/SQ FT
           3.00  CONTN LD      419.23 LBF/SQ FT
           2.00  CONTN LD      359.20 LBF/SQ FT
           1.00  CONTN LD      299.17 LBF/SQ FT
           0.00  CONTN LD      239.15 LBF/SQ FT

          -0.50  CONTN LD      209.13 LBF/SQ FT
          -0.50  CONTN LD        0.00 LBF/SQ FT
          -0.50  CONTN LD     -256.32 LBF/SQ FT
          -1.50  CONTN LD     -366.98 LBF/SQ FT
          -2.50  CONTN LD     -477.65 LBF/SQ FT
          -3.50  CONTN LD     -588.32 LBF/SQ FT
          -4.50  CONTN LD     -698.98 LBF/SQ FT
          -5.50  CONTN LD     -809.65 LBF/SQ FT
          -6.50  CONTN LD     -920.32 LBF/SQ FT
          -7.50  CONTN LD    -1030.98 LBF/SQ FT
          -8.50  CONTN LD    -1141.65 LBF/SQ FT
          -8.69  CONTN LD    -1162.80 LBF/SQ FT
          -8.69  CONTN LD        0.00 LBF/SQ FT


Z35            PROPERTIES ARE AS FOLLOWS.


 MOMENT OF INERTIA=  361.22 IN. TO THE 4TH PER FOOT OF WALL
 CROSS SECTIONAL AREA=   3.95 SQ IN.
 ELASTIC MODULUS=  29000000. LBF/SQ IN.
 DEFLECTION REFERENCE IS AT  -9.000


  THE MAXIMUM BENDING MOMENT IS -66694.39 LBF-FT AND OCCURS AT   10.37
  WHICH HAS THE SHEAR FORCE OF   -4.99 LBF.

                                                          DEFLECTION  DEFL.FROM A
                                                          FROM TANG.  PARALLEL TO THE
                                                          THRU DEFLE  UNDEFORMED AXIS
 DISTANCE   SHEAR FOR   SHEAR STR   BENDING MOM  REFERENCE   & THRU DEFL REF
 (FEET)      (LBF)     (LBF/SQIN)    (LBF-FT)    (INCHES)   NOTE SIGN (IN.)

  25.000    -6888.99    -1744.05          0.00     -3.1844       0.0293
  24.999    -6888.99    -1744.05         -6.89     -3.1844       0.0292
  24.101    -6888.99    -1744.05      -6193.20     -2.9950       0.1336
  24.099    -6935.14    -1755.73      -6234.72     -2.9950       0.1335
  24.000    -6934.85    -1755.66      -6921.28     -2.9742       0.1449
  23.000    -6885.03    -1743.05     -13838.58     -2.7646       0.2601
  22.000    -6746.97    -1708.09     -20661.94     -2.5572       0.3729
  21.000    -6520.67    -1650.80     -27303.12     -2.3532       0.4823
  20.000    -6206.13    -1571.17     -33673.87     -2.1538       0.5873
  19.000    -5803.35    -1469.20     -39685.97     -1.9599       0.6867
  18.000    -5312.32    -1344.89     -45251.16     -1.7725       0.7795
  17.000    -4733.05    -1198.24     -50281.19     -1.5925       0.8650
  16.000    -4096.79    -1037.16     -54698.26     -1.4209       0.9421
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116	15.000	-3434.79	-869.57	-58466.19	-1.2582	1.0102
117	14.000	-2747.05	-695.46	-61559.26	-1.1052	1.0687
118	13.000	-2033.57	-514.83	-63951.71	-0.9623	1.1171
119	12.000	-1293.68	-327.51	-65617.59	-0.8300	1.1549
120	11.000	-518.75	-131.33	-66527.39	-0.7084	1.1820
121	10.366	-4.99	-1.26	-66694.39	-0.6370	1.1935
122	10.000	299.19	75.74	-66640.75	-0.5978	1.1981
123	9.000	1108.61	280.66	-65931.85	-0.4982	1.2032
124	8.000	1858.01	470.38	-64443.54	-0.4094	1.1974
125	7.000	2547.37	644.90	-62235.85	-0.3312	1.1811
126	6.000	3176.71	804.23	-59368.81	-0.2633	1.1545
127	5.000	3746.01	948.36	-55902.45	-0.2052	1.1181
128	4.000	4255.29	1077.29	-51896.80	-0.1563	1.0725
129	3.000	4704.53	1191.02	-47411.89	-0.1159	1.0184
130	2.000	5093.75	1289.56	-42507.75	-0.0833	0.9564
131	1.000	5422.93	1372.89	-37244.41	-0.0577	0.8875
132	0.000	5692.09	1441.04	-31681.89	-0.0383	0.8124
133	-0.500	5804.16	1469.41	-28807.20	-0.0306	0.7728
134	-1.000	5662.17	1433.46	-25939.47	-0.0241	0.7321
135	-2.000	5295.19	1340.55	-20451.57	-0.0142	0.6475
136	-3.000	4817.54	1219.63	-15385.99	-0.0076	0.5595
137	-4.000	4229.22	1070.69	-10853.39	-0.0036	0.4690
138	-5.000	3530.24	893.73	-6964.44	-0.0014	0.3766
139	-6.000	2720.59	688.76	-3829.80	-0.0004	0.2831
140	-7.000	1800.27	455.76	-1560.15	-0.0001	0.1890
141	-8.000	769.29	194.76	-266.15	0.0000	0.0945
142	-8.689	-5.46	-1.38	0.01	0.0000	0.0294
143	-8.691	0.00	0.00	0.00	0.0000	0.0292
144	-8.999	0.00	0.00	0.00	0.0000	0.0001
145	-9.000	0.00	0.00	0.00	0.0000	0.0000

146

147

148

149 *RUN COMPLETED*

150

EOT..

LI Q17G01

1

2 BEAMS (SHEAR, MOMENT, DEFLECTION)

3

4

5 17TH STR.-Q17G-SWL=17-BULKHD EAST OF PUMP-FS=1.0 S CASE

6 EW

7

8 THE REFERENCE SYSTEM SELECTED DEFINES POSITIVE FORCES AS TO THE LEFT

9 INCREASING MEMBER COORDINATES AS UPWARD, AND POSITIVE MOMENTS

10 AS COUNTERCLOCKWISE.

11

12

13 THE MAXIMUM DEFLECTION IS -2.09 INCHES AND OCCURS AT MEMBER COORDINATE

14 25.00 FT.

15

16

17

18 Z35 HAS BEEN GIVEN TO SUPPORT THE LOAD SYSTEM.

19

20 THE WEIGHT OF THIS VERTICAL MEMBER HAS BEEN NEGLECTED.

21

CALCULATED EXTERNAL LOADS

DISTANCE FROM REFERENCE(FT)	TYPE OF LOAD	MAGNITUDE OF LOAD
-5.34	POINT LD	11.44 LBF
25.00	POINT LD	-11569.02 LBF

INPUTTED LOADS

DISTANCE FROM REFERENCE(FT)	TYPE OF LOAD	MAGNITUDE OF LOAD
25.00	POINT LD	5800.90 LBF
24.10	CONTN LD	0.00 LBF/SQ FT
25.00	CONTN LD	-44.95 LBF/SQ FT
24.00	CONTN LD	4.99 LBF/SQ FT
24.00	CONTN LD	4.99 LBF/SQ FT
23.00	CONTN LD	90.06 LBF/SQ FT
22.00	CONTN LD	175.12 LBF/SQ FT
22.00	CONTN LD	175.12 LBF/SQ FT
21.00	CONTN LD	260.18 LBF/SQ FT
20.00	CONTN LD	345.24 LBF/SQ FT
19.00	CONTN LD	430.30 LBF/SQ FT
18.00	CONTN LD	515.36 LBF/SQ FT
17.00	CONTN LD	600.43 LBF/SQ FT
16.00	CONTN LD	622.99 LBF/SQ FT
15.00	CONTN LD	645.55 LBF/SQ FT
15.00	CONTN LD	645.55 LBF/SQ FT
14.00	CONTN LD	668.11 LBF/SQ FT
13.00	CONTN LD	690.67 LBF/SQ FT
12.00	CONTN LD	713.24 LBF/SQ FT
11.00	CONTN LD	739.38 LBF/SQ FT
11.00	CONTN LD	739.38 LBF/SQ FT
10.00	CONTN LD	775.84 LBF/SQ FT
10.00	CONTN LD	775.84 LBF/SQ FT
9.00	CONTN LD	694.74 LBF/SQ FT
8.00	CONTN LD	613.65 LBF/SQ FT
7.00	CONTN LD	532.55 LBF/SQ FT
6.00	CONTN LD	451.46 LBF/SQ FT
5.00	CONTN LD	370.36 LBF/SQ FT
4.00	CONTN LD	289.26 LBF/SQ FT
3.00	CONTN LD	208.17 LBF/SQ FT
2.00	CONTN LD	127.07 LBF/SQ FT
1.00	CONTN LD	45.97 LBF/SQ FT
0.43	CONTN LD	0.00 LBF/SQ FT
0.00	CONTN LD	-35.12 LBF/SQ FT
-0.50	CONTN LD	-75.67 LBF/SQ FT
-0.50	CONTN LD	-636.04 LBF/SQ FT
-1.50	CONTN LD	-780.15 LBF/SQ FT
-2.50	CONTN LD	-924.26 LBF/SQ FT
-3.50	CONTN LD	-1068.37 LBF/SQ FT
-4.50	CONTN LD	-1212.48 LBF/SQ FT
-5.34	CONTN LD	-1333.09 LBF/SQ FT
-5.34	CONTN LD	0.00 LBF/SQ FT

Z35 PROPERTIES ARE AS FOLLOWS.

MOMENT OF INERTIA= 361.22 IN. TO THE 4TH PER FOOT OF WALL
CROSS SECTIONAL AREA= 3.95 SQ IN.
ELASTIC MODULUS= 29000000. LBF/SQ IN.
DEFLECTION REFERENCE IS AT -9.000

THE MAXIMUM BENDING MOMENT IS -52055.33 LBF-FT AND OCCURS AT 11.44
WHICH HAS THE SHEAR FORCE OF -3.22 LBF.

DISTANCE (FEET)	SHEAR FOR (LBF)	SHEAR STR (LBF/SQIN)	BENDING MOM (LBF-FT)	DEFLECTION FROM TANG. THRU DEFLE REFERENCE (INCHES)	DEFL.FROM A PARALLEL TO THE UNDEFORMED AXIS & THRU DEFL REF NOTE SIGN (IN.)
25.000	-5768.12	-1460.28	0.00	-2.0855	0.2516
24.999	-5768.12	-1460.28	-5.77	-2.0855	0.2515
24.101	-5768.12	-1460.28	-5185.54	-1.9504	0.3249
24.099	-5808.57	-1470.52	-5221.39	-1.9504	0.3247
24.000	-5808.32	-1470.46	-5796.43	-1.9356	0.3328
23.000	-5760.80	-1458.43	-11588.08	-1.7861	0.4135
22.000	-5628.21	-1424.86	-17289.67	-1.6386	0.4923
21.000	-5410.56	-1369.76	-22816.14	-1.4939	0.5683
20.000	-5107.85	-1293.13	-28082.43	-1.3529	0.6405
19.000	-4720.08	-1194.96	-33003.49	-1.2166	0.7081
18.000	-4247.25	-1075.25	-37494.24	-1.0857	0.7702
17.000	-3689.35	-934.01	-41469.63	-0.9610	0.8262
16.000	-3077.64	-779.15	-44855.01	-0.8431	0.8754
15.000	-2443.37	-618.58	-47617.40	-0.7326	0.9171
14.000	-1786.54	-452.29	-49734.24	-0.6299	0.9511
13.000	-1107.15	-280.29	-51182.96	-0.5354	0.9768
12.000	-405.20	-102.58	-51941.02	-0.4494	0.9941
11.442	-3.22	-0.82	-52055.33	-0.4051	1.0001
11.000	321.11	81.29	-51985.24	-0.3719	1.0029
10.000	1078.72	273.09	-51288.37	-0.3029	1.0031
9.000	1814.01	459.24	-49835.24	-0.2424	0.9949
8.000	2468.21	624.86	-47687.37	-0.1901	0.9785
7.000	3041.31	769.95	-44925.86	-0.1456	0.9542
6.000	3533.31	894.51	-41631.79	-0.1086	0.9225
5.000	3944.22	998.54	-37886.27	-0.0783	0.8840
4.000	4274.03	1082.03	-33770.38	-0.0544	0.8392
3.000	4522.75	1145.00	-29365.24	-0.0360	0.7889
2.000	4690.37	1187.43	-24751.92	-0.0224	0.7337
1.000	4776.89	1209.34	-20011.54	-0.0129	0.6745
0.431	4789.99	1212.66	-17288.53	-0.0090	0.6392
0.429	4789.99	1212.66	-17278.95	-0.0090	0.6391
0.000	4782.44	1210.74	-15225.12	-0.0067	0.6119
-1.000	4418.71	1118.66	-10545.12	-0.0030	0.5469
-2.000	3638.56	921.15	-6504.48	-0.0011	0.4800
-3.000	2714.30	687.16	-3316.05	-0.0003	0.4121
-4.000	1645.93	416.69	-1123.93	0.0000	0.3437
-5.000	433.51	109.75	-72.22	0.0000	0.2750
-5.339	-10.11	-2.56	0.01	0.0000	0.2517

```
137    -5.341          0.00          0.00          0.00          0.0000          0.2515
138    -6.000          0.00          0.00          0.00          0.0000          0.2062

139    -7.000          0.00          0.00          0.00          0.0000          0.1375
140    -8.000          0.00          0.00          0.00          0.0000          0.0687
       -8.999          0.00          0.00          0.00          0.0000          0.0001
142    -9.000          0.00          0.00          0.00          0.0000          0.0000
143
144
145
146   *RUN COMPLETED*
147
EOT..
LI PZ35A
1 100 2 25 -9.0 1 -9.0 0 -1 25
2 200 PZ35
3 300 29000000 3.95 361.22
4 400 -9.0 25
EOT..
```

```
LI Q17F02
1
2                        BEAMS (SHEAR, MOMENT, DEFLECTION)
3
4
5  17TH STR-Q17F-SWL=17-BULKHD EAST OF PUMP STA-FS=1.2 S CASE
6     EW
7
8   THE REFERENCE SYSTEM SELECTED DEFINES POSITIVE FORCES AS TO THE LEFT
9   INCREASING MEMBER COORDINATES AS UPWARD, AND POSITIVE MOMENTS
10   AS COUNTERCLOCKWISE.
11
12
13    THE MAXIMUM DEFLECTION IS  -2.34 INCHES AND OCCURS AT MEMBER COORDINATE
14    25.00 FT.
15
16
17
18   Z40           HAS BEEN GIVEN TO SUPPORT THE LOAD SYSTEM.
19
20   THE WEIGHT OF THIS VERTICAL MEMBER HAS BEEN NEGLECTED.
21
22
23         CALCULATED EXTERNAL LOADS

24
25   DISTANCE FROM    TYPE OF    MAGNITUDE OF
26   REFERENCE(FT)     LOAD             LOAD
27
28          -8.69  POINT LD        6.63 LBF
29          25.00  POINT LD  -13816.21 LBF
30
31
32                INPUTTED LOADS
33
34   DISTANCE FROM    TYPE OF    MAGNITUDE OF
35   REFERENCE(FT)     LOAD             LOAD
36     .
37          25.00  POINT LD    6927.22 LBF
38          24.10  CONTN LD       0.00 LBF/SQ FT
39          25.00  CONTN LD     -51.28 LBF/SQ FT
40          24.00  CONTN LD       5.70 LBF/SQ FT
41          24.00  CONTN LD       5.70 LBF/SQ FT
42          23.00  CONTN LD      93.94 LBF/SQ FT
43          22.00  CONTN LD     182.18 LBF/SQ FT
44          22.00  CONTN LD     182.18 LBF/SQ FT
45          21.00  CONTN LD     270.42 LBF/SQ FT
46          20.00  CONTN LD     358.66 LBF/SQ FT

47          19.00  CONTN LD     446.91 LBF/SQ FT
48          18.00  CONTN LD     535.15 LBF/SQ FT
49          17.00  CONTN LD     623.39 LBF/SQ FT
50          16.00  CONTN LD     649.13 LBF/SQ FT
51          15.00  CONTN LD     674.87 LBF/SQ FT
52          15.00  CONTN LD     674.87 LBF/SQ FT
53          14.00  CONTN LD     700.61 LBF/SQ FT
54          13.00  CONTN LD     726.35 LBF/SQ FT
55          12.00  CONTN LD     753.43 LBF/SQ FT
56          11.00  CONTN LD     796.43 LBF/SQ FT
57          11.00  CONTN LD     796.43 LBF/SQ FT
```

58	10.00	CONTN LD	839.44	LBF/SQ FT
59	10.00	CONTN LD	839.44	LBF/SQ FT
60	9.00	CONTN LD	779.41	LBF/SQ FT
61	8.00	CONTN LD	719.36	LBF/SQ FT
62	7.00	CONTN LD	659.35	LBF/SQ FT
63	6.00	CONTN LD	599.32	LBF/SQ FT
64	5.00	CONTN LD	539.29	LBF/SQ FT
65	4.00	CONTN LD	479.26	LBF/SQ FT
66	3.00	CONTN LD	419.23	LBF/SQ FT
67	2.00	CONTN LD	359.20	LBF/SQ FT
68	1.00	CONTN LD	299.17	LBF/SQ FT
69	0.00	CONTN LD	239.15	LBF/SQ FT
70	-0.50	CONTN LD	209.13	LBF/SQ FT
71	-0.50	CONTN LD	0.00	LBF/SQ FT
72	-0.50	CONTN LD	-256.32	LBF/SQ FT
73	-1.50	CONTN LD	-366.98	LBF/SQ FT
74	-2.50	CONTN LD	-477.65	LBF/SQ FT
75	-3.50	CONTN LD	-588.32	LBF/SQ FT
76	-4.50	CONTN LD	-698.98	LBF/SQ FT
77	-5.50	CONTN LD	-809.65	LBF/SQ FT
78	-6.50	CONTN LD	-920.32	LBF/SQ FT
79	-7.50	CONTN LD	-1030.98	LBF/SQ FT
80	-8.50	CONTN LD	-1141.65	LBF/SQ FT
81	-8.69	CONTN LD	-1162.80	LBF/SQ FT
82	-8.69	CONTN LD	0.00	LBF/SQ FT
83				
84				

85 Z40 PROPERTIES ARE AS FOLLOWS.

86
87
88 MOMENT OF INERTIA= 490.85 IN. TO THE 4TH PER FOOT OF WALL
89 CROSS SECTIONAL AREA= 4.91 SQ IN.
90 ELASTIC MODULUS= 29000000. LBF/SQ IN.
91 DEFLECTION REFERENCE IS AT -9.000
92

93
94 THE MAXIMUM BENDING MOMENT IS -66694.39 LBF-FT AND OCCURS AT 10.37
95 WHICH HAS THE SHEAR FORCE OF -4.99 LBF.
96
97
98
99

100 DISTANCE	SHEAR FOR	SHEAR STR	BENDING MOM	DEFLECTION FROM TANG. THRU DEFLE	DEFL.FROM A PARALLEL TO THE UNDEFORMED AXIS & THRU DEFL REF
101 (FEET)	(LBF)	(LBF/SQIN)	(LBF-FT)	REFERENCE (INCHES)	NOTE SIGN (IN.)
102					
103 25.000	-6888.99	-1403.05	0.00	-2.3434	0.0216
104 24.999	-6888.99	-1403.05	-6.89	-2.3434	0.0215
105 24.101	-6888.99	-1403.05	-6193.20	-2.2041	0.0983
106 24.099	-6935.14	-1412.45	-6234.72	-2.2041	0.0982
107 24.000	-6934.85	-1412.39	-6921.28	-2.1887	0.1067
108 23.000	-6885.03	-1402.25	-13838.58	-2.0345	0.1914
109 22.000	-6746.97	-1374.13	-20661.94	-1.8819	0.2744
110 21.000	-6520.67	-1328.04	-27303.12	-1.7318	0.3550
111 20.000	-6206.13	-1263.98	-33673.87	-1.5850	0.4322
112 19.000	-5803.35	-1181.94	-39685.97	-1.4423	0.5053
113 18.000	-5312.32	-1081.94	-45251.16	-1.3044	0.5737
114 17.000	-4733.05	-963.96	-50281.19	-1.1720	0.6365
115 16.000	-4096.79	-834.38	-54698.26	-1.0456	0.6933

QP17BC

BEAMS (SHEAR, MOMENT, DEFLECTION)

7TH STR-QP17B-SWL=17S+WB-BULKHD EAST OF PUMP STA-FS=~~1.3~~ 1.0 S
EW

THE REFERENCE SYSTEM SELECTED DEFINES POSITIVE FORCES AS TO THE LEFT
INCREASING MEMBER COORDINATES AS UPWARD, AND POSITIVE MOMENTS
AS COUNTERCLOCKWISE.

THE MAXIMUM DEFLECTION IS 1.51 INCHES AND OCCURS AT MEMBER COORDINATE
13.18 FT.

Z27 HAS BEEN GIVEN TO SUPPORT THE LOAD SYSTEM.

THE WEIGHT OF THIS VERTICAL MEMBER HAS BEEN NEGLECTED.
LIST MORE?
Y

CALCULATED EXTERNAL LOADS

DISTANCE FROM REFERENCE(FT)	TYPE OF LOAD	MAGNITUDE OF LOAD
-13.50	POINT LD	16.29 LBF
26.00	POINT LD	-8960.87 LBF

INPUTTED LOADS

DISTANCE FROM REFERENCE(FT)	TYPE OF LOAD	MAGNITUDE OF LOAD
26.00	POINT LD	4564.46 LBF
24.10	CONTN LD	0.00 LBF/SQ FT
26.00	CONTN LD	-94.89 LBF/SQ FT
24.00	CONTN LD	4.99 LBF/SQ FT

LIST MORE?
Y

24.00	CONTN LD	4.99 LBF/SQ FT
23.00	CONTN LD	90.06 LBF/SQ FT
22.00	CONTN LD	175.12 LBF/SQ FT
22.00	CONTN LD	175.12 LBF/SQ FT
21.00	CONTN LD	260.18 LBF/SQ FT
20.00	CONTN LD	345.24 LBF/SQ FT
19.00	CONTN LD	430.30 LBF/SQ FT
18.00	CONTN LD	515.36 LBF/SQ FT
17.00	CONTN LD	600.43 LBF/SQ FT
16.00	CONTN LD	622.99 LBF/SQ FT
15.00	CONTN LD	645.55 LBF/SQ FT
15.00	CONTN LD	645.55 LBF/SQ FT
14.00	CONTN LD	668.11 LBF/SQ FT
13.00	CONTN LD	690.67 LBF/SQ FT
12.00	CONTN LD	713.24 LBF/SQ FT

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        11.00  CONTN LD      739.38 LBF/SQ FT
        11.00  CONTN LD      739.38 LBF/SQ FT
        10.00  CONTN LD      775.84 LBF/SQ FT
        10.00  CONTN LD      775.84 LBF/SQ FT
         9.00  CONTN LD      694.74 LBF/SQ FT
LIST MORE?
Y
         8.00  CONTN LD      613.65 LBF/SQ FT
         7.00  CONTN LD      532.55 LBF/SQ FT
         6.00  CONTN LD      451.46 LBF/SQ FT
         5.00  CONTN LD      370.36 LBF/SQ FT
         4.00  CONTN LD      289.26 LBF/SQ FT
         3.00  CONTN LD      208.17 LBF/SQ FT
         2.00  CONTN LD      127.07 LBF/SQ FT
         1.00  CONTN LD       45.97 LBF/SQ FT
         0.43  CONTN LD        0.00 LBF/SQ FT
         0.00  CONTN LD      -35.12 LBF/SQ FT
        -0.50  CONTN LD      -75.67 LBF/SQ FT
        -0.50  CONTN LD     -636.04 LBF/SQ FT
        -1.50  CONTN LD     -780.15 LBF/SQ FT
        -2.50  CONTN LD     -924.26 LBF/SQ FT
        -3.50  CONTN LD    -1068.37 LBF/SQ FT
        -4.50  CONTN LD    -1212.48 LBF/SQ FT
        -5.50  CONTN LD    -1356.59 LBF/SQ FT
        -6.50  CONTN LD    -1500.70 LBF/SQ FT
        -7.50  CONTN LD    -1644.81 LBF/SQ FT
        -8.50  CONTN LD    -1788.92 LBF/SQ FT
LIST MORE?
Y
        -9.50  CONTN LD    -1933.03 LBF/SQ FT
       -10.47  CONTN LD    -2072.61 LBF/SQ FT
       -11.16  CONTN LD        0.00 LBF/SQ FT
       -13.50  CONTN LD     7021.97 LBF/SQ FT
       -13.50  CONTN LD        0.00 LBF/SQ FT


 Z27           PROPERTIES ARE AS FOLLOWS.


 MOMENT OF INERTIA=  184.20 IN. TO THE 4TH PER FOOT OF WALL
 CROSS SECTIONAL AREA=   3.00 SQ IN.
 ELASTIC MODULUS=  29000000. LBF/SQ IN.
 DEFLECTION REFERENCE IS AT -13.500


  THE MAXIMUM BENDING MOMENT IS -40886.48 LBF-FT AND OCCURS AT   13.18
  WHICH HAS THE SHEAR FORCE OF    -1.69 LBF.

                                                    DEFLECTION  DEFL.FROM A
LIST MORE?
Y
                                                    FROM TANG.  PARALLEL TO THE
                                                    THRU DEFLE  UNDEFORMED AXIS
 DISTANCE  SHEAR FOR  SHEAR STR  BENDING MOM  REFERENCE   & THRU DEFL REF
 (FEET)      (LBF)    (LBF/SQIN)   (LBF-FT)    (INCHES)   NOTE SIGN (IN.)

  0.000   -4396.41    -1465.47         0.00      0.7018       0.0000
  3.999   -4396.41    -1465.47        -4.40      0.7018       0.0000
 25.000   -4396.41    -1465.47     -4396.41      0.8022       0.1181
 24.101   -4396.41    -1465.47     -8348.78      0.8913       0.2232
```

24.099	-4576.70	-1525.57	-8586.13	0.8913	0.2233
24.000	-4576.46	-1525.49	-9039.21	0.9010	0.2347
23.000	-4528.93	-1509.64	-13598.99	0.9971	0.3486
22.000	-4396.34	-1465.45	-18068.72	1.0889	0.4581
21.000	-4178.69	-1392.90	-22363.32	1.1748	0.5618
20.000	-3875.98	-1291.99	-26397.75	1.2535	0.6583
19.000	-3488.21	-1162.74	-30086.93	1.3236	0.7462
18.000	-3015.38	-1005.13	-33345.81	1.3841	0.8244
17.000	-2457.49	-819.16	-36089.33	1.4338	0.8919
16.000	-1845.78	-615.26	-38242.85	1.4718	0.9477
15.000	-1211.51	-403.84	-39773.37	1.4976	0.9912

LIST MORE?
Y

14.000	-554.68	-184.89	-40658.34	1.5104	1.0218
13.184	-1.69	-0.56	-40886.48	1.5112	1.0372
13.000	124.71	41.57	-40875.20	1.5102	1.0394
12.000	826.67	275.56	-40401.39	1.4968	1.0437
11.000	1552.98	517.66	-39213.74	1.4703	1.0350
10.000	2310.59	770.20	-37284.99	1.4312	1.0137
9.000	3045.88	1015.29	-34600.00	1.3801	0.9804
8.000	3700.07	1233.36	-31220.27	1.3178	0.9358
7.000	4273.17	1424.39	-27226.88	1.2455	0.8813
6.000	4765.18	1588.39	-22700.95	1.1644	0.8179
5.000	5176.09	1725.36	-17723.55	1.0759	0.7472
4.000	5505.90	1835.30	-12375.80	0.9818	0.6709
3.000	5754.61	1918.20	-6738.79	0.8836	0.5905
2.000	5922.23	1974.08	-893.60	0.7833	0.5079
1.000	6008.75	2002.92	5078.65	0.6827	0.4251
0.431	6021.86	2007.29	8502.60	0.6261	0.3786
0.429	6021.86	2007.29	8514.64	0.6261	0.3786
0.000	6014.31	2004.77	11096.93	0.5840	0.3441
-1.000	5650.57	1883.52	17008.80	0.4886	0.2665
-2.000	4870.42	1623.47	22281.31	0.3987	0.1944

LIST MORE?
Y

-3.000	3946.16	1315.39	26701.61	0.3160	0.1294
-4.000	2877.79	959.26	30125.60	0.2418	0.0730
-5.000	1665.31	555.10	32409.17	0.1774	0.0263
-6.000	308.72	102.91	33408.19	0.1233	-0.0099
-7.000	-1191.98	-397.33	32978.58	0.0800	-0.0355
-8.000	-2836.79	-945.60	30976.21	0.0472	-0.0505
-9.000	-4625.71	-1541.90	27256.97	0.0244	-0.0555
-10.000	-6558.71	-2186.24	21676.76	0.0103	-0.0519
-11.000	-8193.54	-2731.18	14169.68	0.0031	-0.0413
-11.159	-8231.99	-2744.00	12862.85	0.0025	-0.0391
-11.161	-8231.99	-2744.00	12846.38	0.0025	-0.0391
-12.000	-7173.30	-2391.10	6236.18	0.0005	-0.0261
-13.000	-3152.17	-1050.72	823.37	0.0000	-0.0089
-13.499	-23.31	-7.77	0.02	0.0000	0.0000
-13.500	0.00	0.00	0.00	0.0000	0.0000

RUN COMPLETED

LIST MORE?
N
WOULD YOU LIKE TO LIST A FILE?
Y
NAME OF FILE?

```
DRW27A
100 2 26.1 -8.32 1 -8.32 0 -1 26
200 PZ27
300 29000000 3.0 184.2
400 -8.32 26.0
...
LIST MORE?
N
WOULD YOU LIKE TO LIST A FILE?
Y
NAME OF FILE?
Y
QP17B                                                                    1.0
10001 17TH STR-QP17B-SWL=17S+WB-BULKHD EAST OF PUMP STA-FS=1.2 S CASE
10002 'NEW BULKHEAD
10003                      1  0.26000000E+02  0.45644646E+04
10004                      3  0.24100000E+02  0.00000000E+01
10005                      3  0.26000000E+02 -0.94890000E+02
10006                      3  0.24000000E+02  0.49900000E+01
10007                      3  0.24000000E+02  0.49900000E+01
10008                      3  0.23000000E+02  0.90060000E+02
10009                      3  0.22000000E+02  0.17512000E+03
10010                      3  0.22000000E+02  0.17512000E+03
10011                      3  0.21000000E+02  0.26018000E+03
10012                      3  0.20000000E+02  0.34524000E+03
10013                      3  0.19000000E+02  0.43030000E+03
10014                      3  0.18000000E+02  0.51536000E+03
10015                      3  0.17000000E+02  0.60043000E+03
10016                      3  0.16000000E+02  0.62299000E+03
10017                      3  0.15000000E+02  0.64555000E+03
10018                      3  0.15000000E+02  0.64555000E+03
 19                        3  0.14000000E+02  0.66811000E+03
10020                      3  0.13000000E+02  0.69067000E+03
LIST MORE?
Y
10021                      3  0.12000000E+02  0.71324000E+03
10022                      3  0.11000000E+02  0.73938000E+03
10023                      3  0.11000000E+02  0.73938000E+03
10024                      3  0.10000000E+02  0.77584000E+03
10025                      3  0.10000000E+02  0.77584000E+03
10026                      3  0.90000000E+01  0.69474000E+03
10027                      3  0.80000000E+01  0.61365000E+03
10028                      3  0.70000000E+01  0.53255000E+03
10029                      3  0.60000000E+01  0.45146000E+03
10030                      3  0.50000000E+01  0.37036000E+03
10031                      3  0.40000000E+01  0.28926000E+03
10032                      3  0.30000000E+01  0.20817000E+03
10033                      3  0.20000000E+01  0.12707000E+03
10034                      3  0.10000000E+01  0.45970000E+02
10035                      3  0.43000000E+00  0.00000000E+01
10036                      3  0.00000000E+01 -0.35120000E+02
10037                      3 -0.50000000E+00 -0.75670000E+02
10038                      3 -0.50000000E+00 -0.63604000E+03
10039                      3 -0.15000000E+01 -0.78015000E+03
10040                      3 -0.25000000E+01 -0.92426000E+03
LIST MORE?
Y
1  41                      3 -0.35000000E+01 -0.10683700E+04
10042                      3 -0.45000000E+01 -0.12124800E+04
10043                      3 -0.55000000E+01 -0.13565900E+04
```

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10044                    3 -0.65000000E+01 -0.15007000E+04
10045                    3 -0.75000000E+01 -0.16448100E+04
10046                    3 -0.85000000E+01 -0.17889200E+04
10047                    3 -0.95000000E+01 -0.19330300E+04
10048                    3 -0.10470000E+02 -0.20726100E+04
10049                    3 -0.11160000E+02  0.00000000E+01
10050                    3 -0.13500000E+02  0.70219700E+04
10051                    4 -0.13500000E+02  0.00000000E+01
10052                    0 -0.13500000E+02  0.00000000E+01
10053  -0.13500000E+02  0.00000000E+01  0.12403870E+00
EOF..
EOT..
LIST MORE?
N
```

BEAMS (SHEAR, MOMENT, DEFLECTION)

27TH STR QP17A-SWL=17S+WL-BULKHD EAST OF PUMP STA-FS=1.2 S
EW

THE REFERENCE SYSTEM SELECTED DEFINES POSITIVE FORCES AS TO THE LEFT
INCREASING MEMBER COORDINATES AS UPWARD, AND POSITIVE MOMENTS
AS COUNTERCLOCKWISE.

THE MAXIMUM DEFLECTION IS -5.49 INCHES AND OCCURS AT MEMBER COORDINATE
26.00 FT.

Z27 HAS BEEN GIVEN TO SUPPORT THE LOAD SYSTEM.

THE WEIGHT OF THIS VERTICAL MEMBER HAS BEEN NEGLECTED.
LIST MORE?
Y

CALCULATED EXTERNAL LOADS

DISTANCE FROM REFERENCE(FT)	TYPE OF LOAD	MAGNITUDE OF LOAD
-13.50	POINT LD	13.72 LBF
26.00	POINT LD	-12694.45 LBF

INPUTTED LOADS

DISTANCE FROM REFERENCE(FT)	TYPE OF LOAD	MAGNITUDE OF LOAD
26.00	POINT LD	6442.70 LBF
24.10	CONTN LD	0.00 LBF/SQ FT
26.00	CONTN LD	-108.26 LBF/SQ FT
24.00	CONTN LD	5.70 LBF/SQ FT

LIST MORE?
Y

24.00	CONTN LD	5.70 LBF/SQ FT
23.00	CONTN LD	93.94 LBF/SQ FT
22.00	CONTN LD	182.18 LBF/SQ FT
22.00	CONTN LD	182.18 LBF/SQ FT
21.00	CONTN LD	270.42 LBF/SQ FT
20.00	CONTN LD	358.66 LBF/SQ FT
19.00	CONTN LD	446.91 LBF/SQ FT
18.00	CONTN LD	535.15 LBF/SQ FT
17.00	CONTN LD	623.39 LBF/SQ FT
16.00	CONTN LD	649.13 LBF/SQ FT
15.00	CONTN LD	674.87 LBF/SQ FT
15.00	CONTN LD	674.87 LBF/SQ FT
14.00	CONTN LD	700.61 LBF/SQ FT
13.00	CONTN LD	726.35 LBF/SQ FT

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        12.00   CONTN LD      753.43 LBF/SQ FT
        11.00   CONTN LD      796.43 LBF/SQ FT
        11.00   CONTN LD      796.43 LBF/SQ FT
        10.00   CONTN LD      839.44 LBF/SQ FT
        10.00   CONTN LD      839.44 LBF/SQ FT
         9.00   CONTN LD      779.41 LBF/SQ FT
LIST MORE?
Y
         8.00   CONTN LD      719.38 LBF/SQ FT
         7.00   CONTN LD      659.35 LBF/SQ FT
         6.00   CONTN LD      599.32 LBF/SQ FT
         5.00   CONTN LD      539.29 LBF/SQ FT
         4.00   CONTN LD      479.26 LBF/SQ FT
         3.00   CONTN LD      419.23 LBF/SQ FT
         2.00   CONTN LD      359.20 LBF/SQ FT
         1.00   CONTN LD      299.17 LBF/SQ FT
         0.00   CONTN LD      239.15 LBF/SQ FT
        -0.50   CONTN LD      209.13 LBF/SQ FT
        -0.50   CONTN LD        0.00 LBF/SQ FT
        -0.50   CONTN LD     -256.32 LBF/SQ FT
        -1.50   CONTN LD     -366.98 LBF/SQ FT
        -2.50   CONTN LD     -477.65 LBF/SQ FT
        -3.50   CONTN LD     -588.32 LBF/SQ FT
        -4.50   CONTN LD     -698.98 LBF/SQ FT
        -5.50   CONTN LD     -809.65 LBF/SQ FT
        -6.50   CONTN LD     -920.32 LBF/SQ FT
        -7.50   CONTN LD    -1030.98 LBF/SQ FT
        -8.50   CONTN LD    -1141.65 LBF/SQ FT
LIST MORE?
Y
        -9.50   CONTN LD    -1252.32 LBF/SQ FT
       -10.50   CONTN LD    -1362.98 LBF/SQ FT
       -11.50   CONTN LD    -1473.65 LBF/SQ FT
       -11.86   CONTN LD    -1514.03 LBF/SQ FT
       -12.19   CONTN LD        0.00 LBF/SQ FT
       -13.50   CONTN LD     6117.30 LBF/SQ FT
       -13.50   CONTN LD        0.00 LBF/SQ FT


 Z27           PROPERTIES ARE AS FOLLOWS.


 MOMENT OF INERTIA=  184.20 IN. TO THE 4TH PER FOOT OF WALL
 CROSS SECTIONAL AREA=    3.00 SQ IN.
 ELASTIC MODULUS=  29000000. LBF/SQ IN.
 DEFLECTION REFERENCE IS AT -13.500


  THE MAXIMUM BENDING MOMENT IS -66181.69 LBF-FT AND OCCURS AT   10.95
  WHICH HAS THE SHEAR FORCE OF    -1.03 LBF.
LIST MORE?
Y

                                                    DEFLECTION  DEFL.FROM A
                                                    FROM TANG.  PARALLEL TO THE
                                                    THRU DEFLE  UNDEFORMED AXIS
 DISTANCE  SHEAR FOR  SHEAR STR  BENDING MOM  REFERENCE   & THRU DEFL REF
   FEET)     (LBF)    (LBF/SQIN)   (LBF-FT)    (INCHES)   NOTE SIGN (IN.)

  26.000   -6251.75   -2083.92         0.00      -5.4879       0.0000
```

```
  25.999    -6251.75    -2083.92        -6.25      -5.4879      -0.0001
  25.000    -6251.75    -2083.92     -6251.75      -5.1021       0.2469
  24.101    -6251.75    -2083.92    -11872.07      -4.7566       0.4675
  24.099    -6457.44    -2152.48    -12145.33      -4.7566       0.4672
  24.000    -6457.16    -2152.39    -12784.60      -4.7187       0.4914
  23.000    -6407.34    -2135.78    -19224.20      -4.3386       0.7325
  22.000    -6269.28    -2089.76    -25569.86      -3.9647       0.9674
  21.000    -6042.98    -2014.33    -31733.34      -3.5991       1.1941
  20.000    -5728.44    -1909.48    -37626.40      -3.2438       1.4105
  19.000    -5325.65    -1775.22    -43160.80      -2.9006       1.6148
  18.000    -4834.62    -1611.54    -48248.29      -2.5713       1.8051
  17.000    -4255.35    -1418.45    -52800.63      -2.2576       1.9799
LIST MORE?
Y
  16.000    -3619.09    -1206.36    -56740.00      -1.9610       2.1376
  15.000    -2957.09     -985.70    -60030.23      -1.6827       2.2770
  14.000    -2269.35     -756.45    -62645.60      -1.4237       2.3970
  13.000    -1555.87     -518.62    -64560.35      -1.1850       2.4967
  12.000     -815.98     -271.99    -65748.54      -0.9672       2.5757
  11.000      -41.05      -13.68    -66180.64      -0.7705       2.6334
  10.950       -1.03       -0.34    -66181.69      -0.7612       2.6357
  10.000      776.88      258.96    -65816.30      -0.5953       2.6697
   9.000     1586.31      528.77    -64629.71      -0.4413       2.6848
   8.000     2335.70      778.57    -62663.70      -0.3081       2.6790
   7.000     3025.07     1008.36    -59978.31      -0.1952       2.6530
   6.000     3654.40     1218.13    -56633.57      -0.1016       2.6076
   5.000     4223.71     1407.90    -52689.51      -0.0263       2.5439
   4.000     4732.98     1577.66    -48206.16       0.0319       2.4633
   3.000     5182.23     1727.41    -43243.55       0.0746       2.3670
   2.000     5571.44     1857.15    -37861.72       0.1033       2.2568
   1.000     5900.63     1966.88    -32120.68       0.1198       2.1344
   0.000     6169.79     2056.60    -26080.47       0.1259       2.0015
  -0.500     6281.86     2093.95    -22966.93       0.1257       1.9318
  -1.000     6139.87     2046.62    -19860.35       0.1236       1.8603
LIST MORE?
Y
  -2.000     5772.88     1924.29    -13894.75       0.1149       1.7126
  -3.000     5295.23     1765.08     -8351.47       0.1016       1.5604
  -4.000     4706.92     1568.97     -3341.17       0.0856       1.4055
  -5.000     4007.93     1335.98      1025.48       0.0685       1.2494
  -6.000     3198.28     1066.09      4637.81       0.0517       1.0937
  -7.000     2277.97      759.32      7385.16       0.0363       0.9394
  -8.000     1246.98      415.66      9156.86       0.0233       0.7874
  -9.000      105.33       35.11      9842.24       0.0131       0.6383
 -10.000    -1146.98     -382.33      9330.64       0.0061       0.4924
 -11.000    -2509.97     -836.66      7511.39       0.0021       0.3494
 -12.000    -3937.74    -1312.58      4275.94       0.0004       0.2088
 -12.189    -4020.55    -1340.18      3521.30       0.0002       0.1824
 -12.191    -4020.55    -1340.18      3513.26       0.0002       0.1821
 -13.000    -2488.66     -829.55       674.24       0.0000       0.0695
 -13.499      -19.84       -6.61         0.02       0.0000       0.0001
 -13.500        0.00        0.00         0.00       0.0000       0.0000


 *RUN COMPLETED*
LIST MORE?
N
WOULD YOU LIKE TO LIST A FILE?
Y
```

```
NAME OF FILE?
QP17A
10001 17TH STR QP17A-SWL=17S+WL-BULKHD EAST OF PUMP STA-FS=1.2 S CASE
10002 'NEW BULKHEAD
10003                    1  0.26000000E+02  0.64427019E+04
10004                    3  0.24100000E+02  0.00000000E+01
10005                    3  0.26000000E+02 -0.10826000E+03
10006                    3  0.24000000E+02  0.57000000E+01
10007                    3  0.24000000E+02  0.57000000E+01
10008                    3  0.23000000E+02  0.93940000E+02
10009                    3  0.22000000E+02  0.18218000E+03
10010                    3  0.22000000E+02  0.18218000E+03
10011                    3  0.21000000E+02  0.27042000E+03
10012                    3  0.20000000E+02  0.35866000E+03
10013                    3  0.19000000E+02  0.44691000E+03
10014                    3  0.18000000E+02  0.53515000E+03
10015                    3  0.17000000E+02  0.62339000E+03
10016                    3  0.16000000E+02  0.64913000E+03
10017                    3  0.15000000E+02  0.67487000E+03
10018                    3  0.15000000E+02  0.67487000E+03
10019                    3  0.14000000E+02  0.70061000E+03
10020                    3  0.13000000E+02  0.72635000E+03
LIST MORE?
Y
10021                    3  0.12000000E+02  0.75343000E+03
10022                    3  0.11000000E+02  0.79643000E+03
10023                    3  0.11000000E+02  0.79643000E+03
10024                    3  0.10000000E+02  0.83944000E+03
10025                    3  0.10000000E+02  0.83944000E+03
10026                    3  0.90000000E+01  0.77941000E+03
10027                    3  0.80000000E+01  0.71938000E+03
10028                    3  0.70000000E+01  0.65935000E+03
10029                    3  0.60000000E+01  0.59932000E+03
10030                    3  0.50000000E+01  0.53929000E+03
10031                    3  0.40000000E+01  0.47926000E+03
10032                    3  0.30000000E+01  0.41923000E+03
10033                    3  0.20000000E+01  0.35920000E+03
10034                    3  0.10000000E+01  0.29917000E+03
10035                    3  0.00000000E+01  0.23915000E+03
10036                    3 -0.50000000E+00  0.20913000E+03
10037                    3 -0.50000000E+00  0.00000000E+01
10038                    3 -0.50000000E+00 -0.25632000E+03
10039                    3 -0.15000000E+01 -0.36698000E+03
10040                    3 -0.25000000E+01 -0.47765000E+03
LIST MORE?
Y
10041                    3 -0.35000000E+01 -0.58832000E+03
10042                    3 -0.45000000E+01 -0.69898000E+03
10043                    3 -0.55000000E+01 -0.80965000E+03
10044                    3 -0.65000000E+01 -0.92032000E+03
10045                    3 -0.75000000E+01 -0.10309800E+04
10046                    3 -0.85000000E+01 -0.11416500E+04
10047                    3 -0.95000000E+01 -0.12523200E+04
10048                    3 -0.10500000E+02 -0.13629800E+04
10049                    3 -0.11500000E+02 -0.14736500E+04
10050                    3 -0.11860000E+02 -0.15140300E+04
10051                    3 -0.12190000E+02  0.00000000E+01
10052                    3 -0.13500000E+02  0.61173000E+04
10053                    4 -0.13500000E+02  0.00000000E+01
10054                    0 -0.13500000E+02  0.00000000E+01
```

```
10055  -0.13500000E+02  0.00000000E+01  0.16501255E+01
EOF..
EOT..
LIST MORE?
N
WOULD YOU LIKE TO LIST A FILE?
Y
NAME OF FILE?
LI DRW27B
100 2 26 -13.5 1 -13.5 0 -1 26
200 PZ27
300 29000000 3.0 184.2
400 -13.5 26.0
EOT..
LIST MORE?
N
```

LI QP17DC

BEAMS (SHEAR, MOMENT, DEFLECTION)

17TH STR-QP17D-SWL=17S+WB-BULKHD EAST OF PUMP STA-FS=1.2 S EW

THE REFERENCE SYSTEM SELECTED DEFINES POSITIVE FORCES AS TO THE LEFT INCREASING MEMBER COORDINATES AS UPWARD, AND POSITIVE MOMENTS AS COUNTERCLOCKWISE.

THE MAXIMUM DEFLECTION IS -7.10 INCHES AND OCCURS AT MEMBER COORDINATE 26.00 FT.

Z27 HAS BEEN GIVEN TO SUPPORT THE LOAD SYSTEM.

THE WEIGHT OF THIS VERTICAL MEMBER HAS BEEN NEGLECTED.

CALCULATED EXTERNAL LOADS

DISTANCE FROM REFERENCE(FT)	TYPE OF LOAD	MAGNITUDE OF LOAD
-8.87	POINT LD	21.47 LBF
26.00	POINT LD	-13256.30 LBF

INPUTTED LOADS

DISTANCE FROM REFERENCE(FT)	TYPE OF LOAD	MAGNITUDE OF LOAD
26.00	POINT LD	6722.98 LBF
24.10	CONTN LD	0.00 LBF/SQ FT
26.00	CONTN LD	-108.26 LBF/SQ FT
24.00	CONTN LD	5.70 LBF/SQ FT
24.00	CONTN LD	5.70 LBF/SQ FT
23.00	CONTN LD	93.94 LBF/SQ FT
22.00	CONTN LD	182.18 LBF/SQ FT
22.00	CONTN LD	182.18 LBF/SQ FT
21.00	CONTN LD	270.42 LBF/SQ FT
20.00	CONTN LD	358.66 LBF/SQ FT
19.00	CONTN LD	446.91 LBF/SQ FT
18.00	CONTN LD	535.15 LBF/SQ FT
17.00	CONTN LD	623.39 LBF/SQ FT
16.00	CONTN LD	649.13 LBF/SQ FT
15.00	CONTN LD	674.87 LBF/SQ FT
15.00	CONTN LD	674.87 LBF/SQ FT
14.00	CONTN LD	700.61 LBF/SQ FT
13.00	CONTN LD	726.35 LBF/SQ FT
12.00	CONTN LD	753.43 LBF/SQ FT
11.00	CONTN LD	796.43 LBF/SQ FT

11.00	CONTN LD	796.43	LBF/SQ FT
10.00	CONTN LD	839.44	LBF/SQ FT
10.00	CONTN LD	839.44	LBF/SQ FT
9.00	CONTN LD	779.41	LBF/SQ FT
8.00	CONTN LD	719.38	LBF/SQ FT
7.00	CONTN LD	659.35	LBF/SQ FT
6.00	CONTN LD	599.32	LBF/SQ FT
5.00	CONTN LD	539.29	LBF/SQ FT
4.00	CONTN LD	479.26	LBF/SQ FT
3.00	CONTN LD	419.23	LBF/SQ FT
2.00	CONTN LD	359.20	LBF/SQ FT
1.00	CONTN LD	299.17	LBF/SQ FT
0.00	CONTN LD	239.15	LBF/SQ FT
-0.50	CONTN LD	209.13	LBF/SQ FT
-0.50	CONTN LD	0.00	LBF/SQ FT
-0.50	CONTN LD	-256.32	LBF/SQ FT
-1.50	CONTN LD	-366.98	LBF/SQ FT
-2.50	CONTN LD	-477.65	LBF/SQ FT
-3.50	CONTN LD	-588.32	LBF/SQ FT
-4.50	CONTN LD	-698.98	LBF/SQ FT
-5.50	CONTN LD	-809.65	LBF/SQ FT
-6.50	CONTN LD	-920.32	LBF/SQ FT
-7.50	CONTN LD	-1030.98	LBF/SQ FT
-8.50	CONTN LD	-1141.65	LBF/SQ FT
-8.87	CONTN LD	-1182.08	LBF/SQ FT
-8.87	CONTN LD	0.00	LBF/SQ FT

Z27 PROPERTIES ARE AS FOLLOWS.

MOMENT OF INERTIA= 184.20 IN. TO THE 4TH PER FOOT OF WALL
CROSS SECTIONAL AREA= 3.00 SQ IN.
ELASTIC MODULUS= 29000000. LBF/SQ IN.
DEFLECTION REFERENCE IS AT -13.500

THE MAXIMUM BENDING MOMENT IS -70469.11 LBF-FT AND OCCURS AT 10.61
WHICH HAS THE SHEAR FORCE OF -5.14 LBF.

DISTANCE (FEET)	SHEAR FOR (LBF)	SHEAR STR (LBF/SQIN)	BENDING MOM (LBF-FT)	DEFLECTION FROM TANG. THRU DEFLE REFERENCE (INCHES)	DEFL.FROM A PARALLEL TO THE UNDEFORMED AXIS & THRU DEFL REF NOTE SIGN (IN.)
26.000	-6533.32	-2177.77	0.00	-7.1025	0.9431
25.999	-6533.32	-2177.77	-6.53	-7.1025	0.9429
25.000	-6533.32	-2177.77	-6533.32	-6.6524	1.1895
24.101	-6533.32	-2177.77	-12406.78	-6.2491	1.4097
24.099	-6739.02	-2246.34	-12680.60	-6.2491	1.4093
24.000	-6738.73	-2246.24	-13347.75	-6.2048	1.4333
23.000	-6688.91	-2229.64	-20068.92	-5.7607	1.6738
22.000	-6550.85	-2183.62	-26696.16	-5.3230	1.9078
21.000	-6324.55	-2108.18	-33141.21	-4.8940	2.1331
20.000	-6010.01	-2003.34	-39315.85	-4.4756	2.3478
19.000	-5607.23	-1869.08	-45131.82	-4.0700	2.5498
18.000	-5116.20	-1705.40	-50500.88	-3.6789	2.7371

115	17.000	-4536.93	-1512.31	-55334.79	-3.3042	2.9082
116	16.000	-3900.67	-1300.22	-59555.73	-2.9473	3.0614
117	15.000	-3238.67	-1079.56	-63127.55	-2.6096	3.1954
118	14.000	-2550.93	-850.31	-66024.49	-2.2924	3.3090
119	13.000	-1837.45	-612.48	-68220.82	-1.9964	3.4012
120	12.000	-1097.56	-365.85	-69690.57	-1.7225	3.4715
121	11.000	-322.63	-107.54	-70404.25	-1.4711	3.5192
122	10.606	-5.14	-1.71	-70469.11	-1.3781	3.5318
123	10.000	495.31	165.10	-70321.49	-1.2424	3.5442
124	9.000	1304.73	434.91	-69416.46	-1.0364	3.5465
125	8.000	2054.13	684.71	-67732.03	-0.8529	3.5264
126	7.000	2743.49	914.50	-65328.21	-0.6912	3.4844
127	6.000	3372.83	1124.28	-62265.05	-0.5506	3.4213
128	5.000	3942.13	1314.04	-58602.56	-0.4301	3.3380
129	4.000	4451.41	1483.80	-54400.79	-0.3286	3.2359
130	3.000	4900.65	1633.55	-49719.76	-0.2446	3.1162
131	2.000	5289.87	1763.29	-44619.49	-0.1767	2.9804
132	1.000	5619.05	1873.02	-39160.03	-0.1232	2.8303
133	0.000	5888.21	1962.74	-33401.39	-0.0823	2.6674
134	-0.500	6000.28	2000.09	-30428.64	-0.0661	2.5818
135	-1.000	5858.29	1952.76	-27462.84	-0.0523	2.4938
136	-2.000	5491.31	1830.44	-21778.82	-0.0311	2.3113
137	-3.000	5013.66	1671.22	-16517.11	-0.0170	2.1217
138	-4.000	4425.34	1475.11	-11788.39	-0.0083	1.9267
139	-5.000	3726.36	1242.12	-7703.31	-0.0034	1.7279
140	-6.000	2916.71	972.24	-4372.55	-0.0011	1.5265
141	-7.000	1996.39	665.46	-1906.78	-0.0002	1.3237
142	-8.000	965.41	321.80	-416.66	0.0000	1.1202
143	-8.869	-20.29	-6.76	0.02	0.0000	0.9433
144	-8.871	0.00	0.00	0.00	0.0000	0.9429
145	-9.000	0.00	0.00	0.00	0.0000	0.9166
146	-10.000	0.00	0.00	0.00	0.0000	0.7129
147	-11.000	0.00	0.00	0.00	0.0000	0.5092
148	-12.000	0.00	0.00	0.00	0.0000	0.3055
149	-13.000	0.00	0.00	0.00	0.0000	0.1018
150	-13.499	0.00	0.00	0.00	0.0000	0.0002
151	-13.500	0.00	0.00	0.00	0.0000	0.0000

152
153
154
155 *RUN COMPLETED*
156
EOT..
LI QP17D
1 10001 17TH STR-QP17D-SWL=17S+WB-BULKHD EAST OF PUMP STA-FS=1.2 S CASE
2 10002 'NEW BULKHEAD
3 10003 1 0.26000000E+02 0.67229784E+04
4 10004 3 0.24100000E+02 0.00000000E+01
5 10005 3 0.26000000E+02 -0.10826000E+03
6 10006 3 0.24000000E+02 0.57000000E+01
7 10007 3 0.24000000E+02 0.57000000E+01
8 10008 3 0.23000000E+02 0.93940000E+02
9 10009 3 0.22000000E+02 0.18218000E+03
10 10010 3 0.22000000E+02 0.18218000E+03
11 10011 3 0.21000000E+02 0.27042000E+03
12 10012 3 0.20000000E+02 0.35866000E+03
13 10013 3 0.19000000E+02 0.44691000E+03
14 10014 3 0.18000000E+02 0.53515000E+03

```
15 10015                        3   0.17000000E+02   0.62339000E+03
16 10016                        3   0.16000000E+02   0.64913000E+03
17 10017                        3   0.15000000E+02   0.67487000E+03
18 10018                        3   0.15000000E+02   0.67487000E+03
19 10019                        3   0.14000000E+02   0.70061000E+03
20 10020                        3   0.13000000E+02   0.72635000E+03
21 10021                        3   0.12000000E+02   0.75343000E+03
22 10022                        3   0.11000000E+02   0.79643000E+03
23 10023                        3   0.11000000E+02   0.79643000E+03

24 10024                        3   0.10000000E+02   0.83944000E+03
25 10025                        3   0.10000000E+02   0.83944000E+03
26 10026                        3   0.90000000E+01   0.77941000E+03
27 10027                        3   0.80000000E+01   0.71938000E+03
28 10028                        3   0.70000000E+01   0.65935000E+03
29 10029                        3   0.60000000E+01   0.59932000E+03
30 10030                        3   0.50000000E+01   0.53929000E+03
31 10031                        3   0.40000000E+01   0.47926000E+03
32 10032                        3   0.30000000E+01   0.41923000E+03
33 10033                        3   0.20000000E+01   0.35920000E+03
34 10034                        3   0.10000000E+01   0.29917000E+03
35 10035                        3   0.00000000E+01   0.23915000E+03
36 10036                        3  -0.50000000E+00   0.20913000E+03
37 10037                        3  -0.50000000E+00   0.00000000E+01
38 10038                        3  -0.50000000E+00  -0.25632000E+03
39 10039                        3  -0.15000000E+01  -0.36698000E+03
40 10040                        3  -0.25000000E+01  -0.47765000E+03
41 10041                        3  -0.35000000E+01  -0.58832000E+03
42 10042                        3  -0.45000000E+01  -0.69898000E+03
43 10043                        3  -0.55000000E+01  -0.80965000E+03
   10044                        3  -0.65000000E+01  -0.92032000E+03
45 10045                        3  -0.75000000E+01  -0.10309800E+04
46 10046                        3  -0.85000000E+01  -0.11416500E+04

47 10047                        3  -0.88700000E+01  -0.11820800E+04
48 10048                        4  -0.88700000E+01   0.00000000E+01
49 10049                        0  -0.88700000E+01   0.00000000E+01
50 10050   -0.88700000E+01   0.00000000E+01   0.21759117E+02
EOF..
EOT..
LI DRW27B
1 100 2 26 -13.5 1 -13.5 0 -1 26
2 200 PZ27
3 300 29000000 3.0 184.2
4 400 -13.5 26.0
EOT..
```

QP17CC

BEAMS (SHEAR, MOMENT, DEFLECTION)

17TH STR-QP17C-SWL=17S+WB-BULKHD EAST OF PUMP STA-FS=1.0 S
EW

THE REFERENCE SYSTEM SELECTED DEFINES POSITIVE FORCES AS TO THE LEFT
INCREASING MEMBER COORDINATES AS UPWARD, AND POSITIVE MOMENTS
AS COUNTERCLOCKWISE.

THE MAXIMUM DEFLECTION IS -4.69 INCHES AND OCCURS AT MEMBER COORDINATE
26.00 FT.

Z27 HAS BEEN GIVEN TO SUPPORT THE LOAD SYSTEM.

THE WEIGHT OF THIS VERTICAL MEMBER HAS BEEN NEGLECTED.
LIST MORE?
Y

CALCULATED EXTERNAL LOADS

DISTANCE FROM REFERENCE(FT)	TYPE OF LOAD	MAGNITUDE OF LOAD
-5.48	POINT LD	17.86 LBF
26.00	POINT LD	-11057.80 LBF

INPUTTED LOADS

DISTANCE FROM REFERENCE(FT)	TYPE OF LOAD	MAGNITUDE OF LOAD
26.00	POINT LD	5611.26 LBF
24.10	CONTN LD	0.00 LBF/SQ FT
26.00	CONTN LD	-94.89 LBF/SQ FT
24.00	CONTN LD	4.99 LBF/SQ FT

LIST MORE?
Y

24.00	CONTN LD	4.99 LBF/SQ FT
23.00	CONTN LD	90.06 LBF/SQ FT
22.00	CONTN LD	175.12 LBF/SQ FT
22.00	CONTN LD	175.12 LBF/SQ FT
21.00	CONTN LD	260.18 LBF/SQ FT
20.00	CONTN LD	345.24 LBF/SQ FT
19.00	CONTN LD	430.30 LBF/SQ FT
18.00	CONTN LD	515.36 LBF/SQ FT
17.00	CONTN LD	600.43 LBF/SQ FT
16.00	CONTN LD	622.99 LBF/SQ FT
15.00	CONTN LD	645.55 LBF/SQ FT
15.00	CONTN LD	645.55 LBF/SQ FT
14.00	CONTN LD	668.11 LBF/SQ FT
13.00	CONTN LD	690.67 LBF/SQ FT
12.00	CONTN LD	713.24 LBF/SQ FT

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        11.00   CONTN LD       739.38 LBF/SQ FT
        11.00   CONTN LD       739.38 LBF/SQ FT
        10.00   CONTN LD       775.84 LBF/SQ FT
        10.00   CONTN LD       775.84 LBF/SQ FT
         9.00   CONTN LD       694.74 LBF/SQ FT
LIST MORE?
Y
         8.00   CONTN LD       613.65 LBF/SQ FT
         7.00   CONTN LD       532.55 LBF/SQ FT
         6.00   CONTN LD       451.46 LBF/SQ FT
         5.00   CONTN LD       370.36 LBF/SQ FT
         4.00   CONTN LD       289.26 LBF/SQ FT
         3.00   CONTN LD       208.17 LBF/SQ FT
         2.00   CONTN LD       127.07 LBF/SQ FT
         1.00   CONTN LD        45.97 LBF/SQ FT
         0.43   CONTN LD         0.00 LBF/SQ FT
         0.00   CONTN LD       -35.12 LBF/SQ FT
        -0.50   CONTN LD       -75.67 LBF/SQ FT
        -0.50   CONTN LD      -636.04 LBF/SQ FT
        -1.50   CONTN LD      -780.15 LBF/SQ FT
        -2.50   CONTN LD      -924.26 LBF/SQ FT
        -3.50   CONTN LD     -1068.37 LBF/SQ FT
        -4.50   CONTN LD     -1212.48 LBF/SQ FT
        -5.48   CONTN LD     -1353.44 LBF/SQ FT
        -5.48   CONTN LD         0.00 LBF/SQ FT

LIST MORE?
Y
 Z27            PROPERTIES ARE AS FOLLOWS.

 MOMENT OF INERTIA=  184.20 IN. TO THE 4TH PER FOOT OF WALL
 CROSS SECTIONAL AREA=   3.00 SQ IN.
 ELASTIC MODULUS=  29000000. LBF/SQ IN.
 DEFLECTION REFERENCE IS AT -13.500

  THE MAXIMUM BENDING MOMENT IS -55138.00 LBF-FT AND OCCURS AT  11.69
  WHICH HAS THE SHEAR FORCE OF  -2.78 LBF.

                                                    DEFLECTION  DEFL.FROM A
                                                    FROM TANG.  PARALLEL TO THE
                                                    THRU DEFLE  UNDEFORMED AXIS
 DISTANCE  SHEAR FOR  SHEAR STR  BENDING MOM  REFERENCE  & THRU DEFL REF
 (FEET)      (LBF)   (LBF/SQIN)   (LBF-FT)   (INCHES)  NOTE SIGN (IN.)

  26.000   -5446.53   -1815.51        0.00    -4.6879      1.1943
  25.999   -5446.53   -1815.51       -5.45    -4.6879      1.1942
LIST MORE?
Y
  25.000   -5446.53   -1815.51    -5446.53    -4.3653      1.3680
  24.101   -5446.53   -1815.51   -10342.97    -4.0764      1.5231
  24.099   -5626.83   -1875.61   -10582.41    -4.0764      1.5228
  24.000   -5626.58   -1875.53   -11139.46    -4.0447      1.5397
  23.000   -5579.06   -1859.69   -16749.37    -3.7270      1.7084
  22.000   -5446.47   -1815.49   -22269.22    -3.4148      1.8717
  21.000   -5228.82   -1742.94   -27613.94    -3.1098      2.0278
  20.000   -4926.11   -1642.04   -32698.49    -2.8137      2.1750
  19.000   -4538.34   -1512.78   -37437.80    -2.5281      2.3117
```

18.000	-4065.51	-1355.17	-41746.81	-2.2547	2.4362
17.000	-3507.61	-1169.20	-45540.46	-1.9947	2.5473
16.000	-2895.90	-965.30	-48744.09	-1.7494	2.6437
15.000	-2261.63	-753.88	-51324.74	-1.5198	2.7243
14.000	-1604.80	-534.93	-53259.83	-1.3068	2.7884
13.000	-925.41	-308.47	-54526.82	-1.1111	2.8352
12.000	-223.46	-74.49	-55103.13	-0.9329	2.8645
11.692	-2.78	-0.93	-55138.00	-0.8816	2.8699
11.000	502.85	167.62	-54965.61	-0.7725	2.8760
10.000	1260.46	420.15	-54086.99	-0.6298	2.8697
9.000	1995.75	665.25	-52452.12	-0.5046	2.8460

LIST MORE?
Y

8.000	2649.95	883.32	-50122.51	-0.3963	2.8054
7.000	3223.05	1074.35	-47179.25	-0.3043	2.7485
6.000	3715.05	1238.35	-43703.44	-0.2274	2.6765
5.000	4125.96	1375.32	-39776.17	-0.1647	2.5903
4.000	4455.77	1485.26	-35478.54	-0.1148	2.4913
3.000	4704.49	1568.16	-30891.65	-0.0764	2.3808
2.000	4872.11	1624.04	-26096.60	-0.0479	2.2603
1.000	4958.63	1652.88	-21174.47	-0.0279	2.1314
0.431	4971.73	1657.24	-18348.04	-0.0197	2.0549
0.429	4971.73	1657.24	-18338.10	-0.0197	2.0546
0.000	4964.18	1654.73	-16206.31	-0.0147	1.9956
-1.000	4600.45	1533.48	-11344.56	-0.0068	1.8546
-2.000	3820.30	1273.43	-7122.18	-0.0026	1.7100
-3.000	2896.04	965.35	-3752.00	-0.0007	1.5629
-4.000	1827.67	609.22	-1378.14	-0.0001	1.4146
-5.000	615.22	205.07	-144.69	0.0000	1.2658
-5.479	-16.50	-5.50	0.02	0.0000	1.1945
-5.481	0.00	0.00	0.00	0.0000	1.1942
-6.000	0.00	0.00	0.00	0.0000	1.1169
-7.000	0.00	0.00	0.00	0.0000	0.9680

LIST MORE?
Y

-8.000	0.00	0.00	0.00	0.0000	0.8190
-9.000	0.00	0.00	0.00	0.0000	0.6701
-10.000	0.00	0.00	0.00	0.0000	0.5212
-11.000	0.00	0.00	0.00	0.0000	0.3723
-12.000	0.00	0.00	0.00	0.0000	0.2234
-13.000	0.00	0.00	0.00	0.0000	0.0745
-13.499	0.00	0.00	0.00	0.0000	0.0001
-13.500	0.00	0.00	0.00	0.0000	0.0000

RUN COMPLETED

EOT..
LIST MORE?
N
WOULD YOU LIKE TO LIST A FILE?
Y
NAME OF FILE?
QP17C01

BEAMS (SHEAR, MOMENT, DEFLECTION)

17TH STR-QP17C-SWL=17S+WB-BULKHD EAST OF PUMP STA-FS=1.0 S

EW

THE REFERENCE SYSTEM SELECTED DEFINES POSITIVE FORCES AS TO THE LEFT
INCREASING MEMBER COORDINATES AS UPWARD, AND POSITIVE MOMENTS
AS COUNTERCLOCKWISE.

THE MAXIMUM DEFLECTION IS -4.69 INCHES AND OCCURS AT MEMBER COORDINATE
26.00 FT.

Z27 HAS BEEN GIVEN TO SUPPORT THE LOAD SYSTEM.

THE WEIGHT OF THIS VERTICAL MEMBER HAS BEEN NEGLECTED.
LIST MORE?
Y

CALCULATED EXTERNAL LOADS

DISTANCE FROM REFERENCE(FT)	TYPE OF LOAD	MAGNITUDE OF LOAD
-5.48	POINT LD	17.86 LBF
26.00	POINT LD	-11057.80 LBF

INPUTTED LOADS

DISTANCE FROM REFERENCE(FT)	TYPE OF LOAD	MAGNITUDE OF LOAD
26.00	POINT LD	5611.26 LBF
24.10	CONTN LD	0.00 LBF/SQ FT
26.00	CONTN LD	-94.89 LBF/SQ FT
24.00	CONTN LD	4.99 LBF/SQ FT

LIST MORE?
Y

24.00	CONTN LD	4.99 LBF/SQ FT
23.00	CONTN LD	90.06 LBF/SQ FT
22.00	CONTN LD	175.12 LBF/SQ FT
22.00	CONTN LD	175.12 LBF/SQ FT
21.00	CONTN LD	260.18 LBF/SQ FT
20.00	CONTN LD	345.24 LBF/SQ FT
19.00	CONTN LD	430.30 LBF/SQ FT
18.00	CONTN LD	515.36 LBF/SQ FT
17.00	CONTN LD	600.43 LBF/SQ FT
16.00	CONTN LD	622.99 LBF/SQ FT
15.00	CONTN LD	645.55 LBF/SQ FT
15.00	CONTN LD	645.55 LBF/SQ FT
14.00	CONTN LD	668.11 LBF/SQ FT
13.00	CONTN LD	690.67 LBF/SQ FT
12.00	CONTN LD	713.24 LBF/SQ FT
11.00	CONTN LD	739.38 LBF/SQ FT
11.00	CONTN LD	739.38 LBF/SQ FT
10.00	CONTN LD	775.84 LBF/SQ FT
10.00	CONTN LD	775.84 LBF/SQ FT
9.00	CONTN LD	694.74 LBF/SQ FT

LIST MORE?

Y

8.00	CONTN LD	613.65	LBF/SQ FT
7.00	CONTN LD	532.55	LBF/SQ FT
6.00	CONTN LD	451.46	LBF/SQ FT
5.00	CONTN LD	370.36	LBF/SQ FT
4.00	CONTN LD	289.26	LBF/SQ FT
3.00	CONTN LD	208.17	LBF/SQ FT
2.00	CONTN LD	127.07	LBF/SQ FT
1.00	CONTN LD	45.97	LBF/SQ FT
0.43	CONTN LD	0.00	LBF/SQ FT
0.00	CONTN LD	-35.12	LBF/SQ FT
-0.50	CONTN LD	-75.67	LBF/SQ FT
-0.50	CONTN LD	-636.04	LBF/SQ FT
-1.50	CONTN LD	-780.15	LBF/SQ FT
-2.50	CONTN LD	-924.26	LBF/SQ FT
-3.50	CONTN LD	-1068.37	LBF/SQ FT
-4.50	CONTN LD	-1212.48	LBF/SQ FT
-5.48	CONTN LD	-1353.44	LBF/SQ FT
-5.48	CONTN LD	0.00	LBF/SQ FT

LIST MORE?
Y
Z27 PROPERTIES ARE AS FOLLOWS.

MOMENT OF INERTIA= 184.20 IN. TO THE 4TH PER FOOT OF WALL
CROSS SECTIONAL AREA= 3.00 SQ IN.
ELASTIC MODULUS= 29000000. LBF/SQ IN.
DEFLECTION REFERENCE IS AT -5.480

THE MAXIMUM BENDING MOMENT IS -55138.00 LBF-FT AND OCCURS AT 11.69
WHICH HAS THE SHEAR FORCE OF -2.78 LBF.

DISTANCE (FEET)	SHEAR FOR (LBF)	SHEAR STR (LBF/SQIN)	BENDING MOM (LBF-FT)	DEFLECTION FROM TANG. THRU DEFLE REFERENCE (INCHES)	DEFL.FROM A PARALLEL TO THE UNDEFORMED AXIS & THRU DEFL REF NOTE SIGN (IN.)
26.000	-5446.53	-1815.51	0.00	-4.6879	0.0000
25.999	-5446.53	-1815.51	-5.45	-4.6879	-0.0001

LIST MORE?
Y

25.000	-5446.53	-1815.51	-5446.53	-4.3653	0.1737
24.101	-5446.53	-1815.51	-10342.97	-4.0764	0.3288
24.099	-5626.83	-1875.61	-10582.41	-4.0764	0.3285
24.000	-5626.58	-1875.53	-11139.46	-4.0447	0.3454
23.000	-5579.06	-1859.69	-16749.37	-3.7270	0.5141
22.000	-5446.47	-1815.49	-22269.22	-3.4148	0.6774
21.000	-5228.82	-1742.94	-27613.94	-3.1098	0.8335
20.000	-4926.11	-1642.04	-32698.49	-2.8137	0.9807
19.000	-4538.34	-1512.78	-37437.80	-2.5281	1.1174
18.000	-4065.51	-1355.17	-41746.81	-2.2547	1.2419
17.000	-3507.61	-1169.20	-45540.46	-1.9947	1.3530
6.000	-2895.90	-965.30	-48744.09	-1.7494	1.4493
15.000	-2261.63	-753.88	-51324.74	-1.5198	1.5300
14.000	-1604.80	-534.93	-53259.83	-1.3068	1.5941
13.000	-925.41	-308.47	-54526.82	-1.1111	1.6409

```
  12.000     -223.46      -74.49     -55103.13      -0.9329       1.6702
  11.692       -2.78       -0.93     -55138.00      -0.8816       1.6756
  11.000      502.85      167.62     -54965.61      -0.7725       1.6817
  10.000     1260.46      420.15     -54086.99      -0.6298       1.6754
   9.000     1995.75      665.25     -52452.12      -0.5046       1.6517
LIST MORE?
Y
   8.000     2649.95      883.32     -50122.51      -0.3963       1.6110
   7.000     3223.05     1074.35     -47179.25      -0.3043       1.5542
   6.000     3715.05     1238.35     -43703.44      -0.2274       1.4822
   5.000     4125.96     1375.32     -39776.17      -0.1647       1.3960
   4.000     4455.77     1485.26     -35478.54      -0.1148       1.2969
   3.000     4704.49     1568.16     -30891.65      -0.0764       1.1865
   2.000     4872.11     1624.04     -26096.60      -0.0479       1.0660
   1.000     4958.63     1652.88     -21174.47      -0.0279       0.9371
   0.431     4971.73     1657.24     -18348.04      -0.0197       0.8606
   0.429     4971.73     1657.24     -18338.10      -0.0197       0.8603
   0.000     4964.18     1654.73     -16206.31      -0.0147       0.8013
  -1.000     4600.45     1533.48     -11344.56      -0.0068       0.6603
  -2.000     3820.30     1273.43      -7122.18      -0.0026       0.5156
  -3.000     2896.04      965.35      -3752.00      -0.0007       0.3686
  -4.000     1827.67      609.22      -1378.14      -0.0001       0.2203
  -5.000      615.22      205.07       -144.69       0.0000       0.0715
  -5.479      -16.50       -5.50          0.02       0.0000       0.0001
  -5.480        0.00        0.00          0.00       0.0000       0.0000


LIST MORE?
Y

RUN COMPLETED*

EOT..
LIST MORE?
N
WOULD YOU LIKE TO LIST A FILE?
Y
NAME OF FILE?
QP17C
10001 17TH STR-QP17C-SWL=17S+WB-BULKHD EAST OF PUMP STA-FS=1.0 S
10002 'NEW BULKHEAD
10003                    1  0.26000000E+02  0.56112643E+04
10004                    3  0.24100000E+02  0.00000000E+01
10005                    3  0.26000000E+02 -0.94890000E+02
10006                    3  0.24000000E+02  0.49900000E+01
10007                    3  0.24000000E+02  0.49900000E+01
10008                    3  0.23000000E+02  0.90060000E+02
10009                    3  0.22000000E+02  0.17512000E+03
10010                    3  0.22000000E+02  0.17512000E+03
10011                    3  0.21000000E+02  0.26018000E+03
10012                    3  0.20000000E+02  0.34524000E+03
10013                    3  0.19000000E+02  0.43030000E+03
10014                    3  0.18000000E+02  0.51536000E+03
10015                    3  0.17000000E+02  0.60043000E+03
10016                    3  0.16000000E+02  0.62299000E+03
10017                    3  0.15000000E+02  0.64555000E+03
1   18                   3  0.15000000E+02  0.64555000E+03
10019                    3  0.14000000E+02  0.66811000E+03
10020                    3  0.13000000E+02  0.69067000E+03
LIST MORE?
```

```
Y
10021                          3  0.12000000E+02  0.71324000E+03
10022                          3  0.11000000E+02  0.73938000E+03
10023                          3  0.11000000E+02  0.73938000E+03
10024                          3  0.10000000E+02  0.77584000E+03
10025                          3  0.10000000E+02  0.77584000E+03
10026                          3  0.90000000E+01  0.69474000E+03
10027                          3  0.80000000E+01  0.61365000E+03
10028                          3  0.70000000E+01  0.53255000E+03
10029                          3  0.60000000E+01  0.45146000E+03
10030                          3  0.50000000E+01  0.37036000E+03
10031                          3  0.40000000E+01  0.28926000E+03
10032                          3  0.30000000E+01  0.20817000E+03
10033                          3  0.20000000E+01  0.12707000E+03
10034                          3  0.10000000E+01  0.45970000E+02
10035                          3  0.43000000E+00  0.00000000E+01
10036                          3  0.00000000E+01 -0.35120000E+02
10037                          3 -0.50000000E+00 -0.75670000E+02
10038                          3 -0.50000000E+00 -0.63604000E+03
10039                          3 -0.15000000E+01 -0.78015000E+03
10040                          3 -0.25000000E+01 -0.92426000E+03
LIST MORE?
Y
10041                          3 -0.35000000E+01 -0.10683700E+04
10042                          3 -0.45000000E+01 -0.12124800E+04
10043                          3 -0.54800000E+01 -0.13534400E+04
10044                          4 -0.54800000E+01  0.00000000E+01
10045                          0 -0.54800000E+01  0.00000000E+01
10046  -0.54800000E+01  0.00000000E+01  0.15203476E+01
EOF..
  T..
LIST MORE?
N
WOULD YOU LIKE TO LIST A FILE?
Y
NAME OF FILE?
DRW27C
100 2 26 -5.48 1 -5.48 0 -1 26
200 PZ27
300 29000000 3.0 184.2
400 -5.48 26.0
EOT..
LIST MORE?
N
```